

## **SUBTERRANEAN SPECIES OF THE US AND CANADA**

By John Roth, October 5, 2001

Includes cave or aquatic subterranean (cavernicoles, cave fossils, hyporheic, marine infauna, aquatic interstitial) and bat and woodrat parasites; excludes most soil fauna and marine burrowers

First cave mentioned is type locality unless preceded by Ac (accidental) or Tp (troglophile)

See "Bibliography of Subterranean Species of the US and Canada" in this CDROM for extended citations.

@ - Taxonomic citation &/or spelling not verified

\* - Only found in that area

Groups reviewed by taxonomists (Since new data has been added to most groups since the reviews, all errors are the responsibility of the author)

amphipods (Bousfield)

annelids (Mark Wetzel, William Fender)

ants (Mark DuBois)

bacteria (Bruce Thompson)

beetles -

Carabidae (Don Schwert, George Ball, Richard Krinsky)

Dysticidae - Paul Spangler

Elateridae - Jim Smith

Elmidae - Cheryl Barr

Leiodidae - Stewart Peck

Pslaphidae - Don Chandler

Scarabidae - Henry Howden, Mary Liz Jameson, Bret Ratcliffe

Staphilinidae - Rod Hanley, Margaret Thayer

centipedes (Richard Shelley)

copepods (Janet Reid)

crayfish (Keith Crandall)

earthworms (William M. Fender & Dorothy McKey-Fender)

fish (Bob Pruitt)

fleas (Dr. Allen Benton; Robert Lewis)

flies (Scott Fitzgerald, Greg Courtney)

Anthomyiidae - Graham Griffiths

Calliphoridae - Bruce Cooper

Chironomidae - John Epler, Broughton Caldwell

Mycetophilidae - J. Vockeroth

Simuliidae - Peter Adler, Greg Courtney

Tachinidae - Jim O'Hara

fungi (John Rutherford, Frank Dugin)

harvestmen (James Cokendolpher)

homoptera & hemiptera/heteroptera - Richard Packauskas

isopods - Julian Lewis

leeches - Mark Wetzel

midges - John Epler

millipedes (Richard Shelley)

mites, cave (Miloslav Zacharda)

    water mites (David Cook)

    oribatida/astigmata (Roy Norton)

    astigmata (James Philips)

    mesostigmata (Frank Radowsky)

moths (Don Lafontaine)

nematodes (George Caine, Allen Shostak, Ivan Kanev Stoyanov)

ostracods (Rosalie Maddocks)

pseudoscorpions (William Muchmore)

psocoptera (Thomas Sidebottom)

salamanders (Andy Grubbs)

schizomids (James Cokendolpher)

snails (Terry Feest)

spiders (Norm Platnick, Joseph Beatty)

springtails (Ken Christiansen)

symphylids (Clive Edwards)

trematode (Allen Shostak, Jeff Lotz, Ivan Kanev Stoyanov)

turbellaria (Ronald Sluys)

worms (William Fender)

Major State references: Alabama (**AL**): Peck 1989; Alaska (**AK**): Carlson 1994; Arizona (**AZ**): Dorst & Blinn 1997; Peck 1980; Welbourne 1976, 1999; Arkansas (**AR**): Barnett 1970; Dunivan et al. 1982; Grove 1974; McDaniel, Paige & Tumilson 1979; McDaniel & Smith 1976; Peck & Peck 1982; British Columbia (**BC**): Shaw 1999; California (**CA**): Crawford 1989; Rudolph, et al. 1985; Colorado (**CO**): S. Fitzgerald; Georgia (**GA**): Holsinger & Peck 1971; Reeves 2000; Reeves, Jensen & Ozier 2001; Illinois (**IL**): Peck & Christiansen 1990; Webb, Taylor & Krejca 1993; Iowa (**IA**): Alexander 1980; Peck & Christiansen 1990; Indiana (**IN**): Lewis 1999; Kentucky (**KY**): Barr 1958, 1971; Harker & Barr 1979; Maryland (**MD**): Franz & Slifer 1971; Minnesota (**MN**): Alexander 1980; Peck & 1990; Mississippi (**MS**): Middleton 1976; Missouri (**MO**): Gardner 1986; New Jersey (**NJ**): Nicholas 1976; New Mexico (**NM**): Barr & Reddell 1967; Northup & Welbourn 1997; North Carolina (**NC**): Holler 1976; Nova Scotia (**NV**): Moselely 1999; Ohio (**OH**): Hobbs & Flynn 1981; Oklahoma (**OK**): Black 1971; Ontario (**ON**): Peck 1988; Oregon (**OR**): Benedict & McEvoy 1995; Crawford 1994, 1996; Pennsylvania (**PA**): Dearolf 1941, 1953; Holsinger 1976; South Carolina (**SC**): Holler 2000; Tennessee (**TN**): Barr 1958, 1961; Holsinger & Culver 1985; Texas (**TX**): Reddell 1998; Utah (UT) Peck 198; Virginia (**VA**): Holsinger & Culver 1985; Washington (**WA**): Crawford & Sender 1985; Crawford 1993; West Virginia (**WV**): Holsinger, Baroody & Culver. 1975; Wisconsin (**WI**): Alexander 1980; Peck & Christiansen 1990

**ABALONE** - **Gastropod** of Order Archaeogastropoda  
Superfamily Pleurotomariacea  
Family Haliotidae (*Haliotis*)

***Haliotis*** Linnaeus, 1758 - Haliotidae abalone (9 species in US or Canada)  
***Haliotis*** undet. sp. (TTx in CA marine)

abiotics (see climate, habitat, metabolism, temperature, relative humidity, oxygen, weather)  
Keith 1975/a, 1977; Williams & Moore 1982

**abbreviation** or abbreviated development - Phylogenetic abbreviation of the process of structural development, as in neoteny.

**abundance** - Number of individuals of a certain taxon level in a given area or volume.  
**abundant - Population** usually present with > 50 individuals or more per day.

**acclimation** - The change in a biologic rate (such as breathing or heart beat) to a change in surrounding temperatures

**actinomycetes** - A bacteria **microbe** with fungi-like mycelium. May cause "cavers' perfume" odor See cave **slime**. Lavoie & Northrup 1994

**adaptation** - Inherited structure, function, or behavior that improves survival in a particular habitat. (See abiotics, evolution, natural selection) - Brigg 1986; Bull & Mitchell 1970, 1972; Culver, Kane, Fong 1995; Culver, Kane, Fong, Jones, Taylor & Sauereisen 1990; Dickson 1977; LaVal 1965a; Parzefall 1986; Poulson 1961, 1964; Sbordonni 1982; Sket 1985; Starr 1968; Turner & Clench 1974; Ueno, S.I. 1987

**adaptive radiation** - The relatively rapid evolutionary divergence of one phylogenetic line into different adaptive forms.

**adaptive shift/radiation** - Bibl.: Howarth 1981, 1986, 1987, 1987a, 1991

**accidental** - 1. **Population** of 1-3 records/year, judged unlikely to be repeated on a regular basis. Incl. ants, bears, mites, people, rabbits, most snakes, & turtles. 2. Species that have fallen, washed or otherwise gotten into a cave without purposal locomotion. Rare intruders from other habitats. Syn.: strange, xenoc(o)enic.

**accidental** (geologic) - Pyroclastics formed from fragments of nonvolcanic rocks or from volcanics not related to the erupting volcano.

**acoenic** or acenic - Species who live in many different habitats and high ecological amplitudes.

**adult** - Males and females which are sexually mature.

**adventitious** - Found in an area to which it is not native, having been introduced by humans..

**aerogenic** - Adj. for bacteria that liberate gas during metabolism of certain substrates, as may be the case in hydromagnesite balloons.

**aerotolerant** - Anaerobic bacteria which will not be inhibited by oxygen and can still grow at sub-optimal rates.

aesthetase – Sensory (especially olfactory) bristles on antenna or antennules.

Agnathans – Part of Subphylum Vertebrata that includes ostracoderms, conodonts and Peyromyzontiformes (lampreys).

**agonistic** - See behavior

**albinism** - The genetically determined absence of pigments in animals. Mohr 1938

**algae**, blue-green - See bacteria, cyanobacteria

## Algae

Approx. = Phycophyta (see also blue-green algae **bacteria**). About 33,000 species. A relatively simple plant or photosynthetic cell without root, stem & leaves; which has no true vascular system. Incl. diatoms, green, red & yellow-green algae. Euglenoids are placed among the **protists**.

Not a formal taxon group, green algae are paraphyletic with respect to Plantae. Like plants, "green algae" have chlorophylls "a" & "b" & an alternation of generations. Unlike plants, alternations may be isomorphic, so that gametophyte & sporophyte are indistinguishable. Major groups distinguished by number & arrangement of flagella.

**Bibl.:** Aley 1972, 1976, 1984, 1985; Aley, Aley & Rhodes 1984; Claus 1963; Dalby 1966; Dobat 1998; Nagy, J. P. 1964; Wong 1975; J.H. Jones 1965?; W. Lang 1946; McNeil 1935; Oneil & Kuehn 1988; Trepasso & Kaletsky 1994; J. Ward & Dufford 1979

## Brown Algae

Phylum or Division Chromophyta  
Division Phaeophycophyta  
Class Phaeophyceae (brown algae)

Order Fucales  
Fucaceae (*Ascophyllum*, *Fucus*)

***Ascophyllum*** Stackhouse, 1809 - Fucaceae algae, Order Fucales

***Ascophyllum nodosum*** (*Fucus nodosus* Linnaeus, 1753) Le Jolis (NE Atlantic, Britain/ Knotted wrackweed/ sea cave in ME),

*Fucus* Linnaeus, 1753 (rockreefs) undet. sp. (sea cave in ME)

## Diatoms

May be >12,000 sp. Domain Eucarya, Kingdom (or division) Bacillariophyta, class Bacillariophyceae (= Diatomeae) or an algae division (Bacillariophyta) or order (Bacillariales or Diatomales). Within a grouping with five other kingdoms that seem to be related: labyrinthulids, Oomycota, Chrysophyta, Xanthophyta, and Phaeophyta. Considered by some authors a cyst differentiation within phylum Chrysophyta. Dominant group of phytoplankton. Can be 1mm across, most are smaller. Thin double shells of silica called frustules. Shell top has hole pattern characteristic of the sp. Spines or setae chain with other cells, increasing buoyancy. Appear 100 myrs ago & reach peak abundance in Miocene. Sediments called diatomites or diatomaceous earths used in insulation, abrasives, ceramics & fillers. **Bibl.:** Cox 1996; **CA:** W. Shepard et al. 2000; **OR:** St. Clair, Rushforth & Allen 1982; **KY:** Van Landingham 1964-7); **MT:** Bahls 1981; **NA:** Vineyard 1979; **US:** Patrick & Reimer 1967, 1975; **UT:** St. Clair, Rushforth.

Division Heterokontophyta (= Kingdom or Division Bacillariophyta)  
(also put in Kingdom Protoctistae)

Class Bacillariophyceae (= Diatomatae)

Order Centrales

Thalassiosiraceae (*Cyclotella*, *Stephanodiscus*)

Suborder Discineae

Superfamily Coscinodiscinea

Coscinodiscaceae (*Coscinodiscus*)

Melosiraceae (*Melosira*, *Pyxidicula*)

Order Navicales

Suborder Biraphidineae (also put in Raphidineae),

Naviculaceae (also put in Order Pennales)

(*Amphipecta*, *Amphipecta*, *Anomoeneis*, *Diploneis* (also in own family), *Caloneis*, *Cocconeis* (also put in Achnanthaceae), *Frustulia*, *Gyrosigma*, *Mastogloia*, *Melosira*, *Navicula P innularia*, *Pleurosigma*, *Stauroneis*)

Suborder Neidiineae

Brachysiraceae (*Brachysira*) (also put in Order Pennales)

Order Pennales (see also protists)

Gomphonemaceae (*Gomphonema*)

Suborder Arphidineae

Diatomaceae

(*Asterionella*, *Cymatopleura*, *Diatoma* (also in Rhizophoraceae), *Fragilaria*, *Meridion*, *Neidium*, *Opephora*, *Synedra*, *Tabellaria*)

Suborder Biraphidineae

Epithemiaceae (*Epithemia*, *Rhopalodia*)

Suborder Fragilarineae

Eunotiaceae (*Eunotia*)

Suborder Monoraphidineae

Achnanthaceae (*Achnanthes*, *Cocconeis* (also put in *Naviculaceae*), *Rhoicosphenia*),

Suborder Raphidineae

Cymbellaceae (*Amphora*, *Cymbella*)

Naviculaceae (put in Order Naviculales)

Nitzschiaceae (*Cylindrotheca*, *Denticula*, *Hantzschia*, *Nitzschia*)

**Achnanthes** Bory De St. Vincent, 1822 - Achnanthaceae diatoms

**Achnanthes** *affinis* Grun. (benthic in Devil's Hole, swNV)

**Achnanthes** *clevei* Grun. var. *c.* Patrick (MN hyporheic)

**Achnanthes** *coarctata* (*Eurotia c.* Breb. in W.Sm.Grun., 1855)

**Achnanthes** *exigua* Grun. (MT,OR; benthic in Devil's Hole, swNV)

**Achnanthes** *exigua e. var. constricta* (Grun.) Hust. (MT caves; MN hyporheic)

**Achnanthes** *exigua* var. *heterovalva* (OR; benthic in Devil's Hole, swNV)

**Achnanthes** *gibberula* Grun. (benthic in Devil's Hole, swNV)

**Achnanthes** *grimmer* Grun. (benthic in Devil's Hole, swNV)

**Achnanthes** *hungarica* (Grun.) Grun. (benthic in Devil's Hole, swNV)

**Achnanthes** *lanceolata* (Brebisson, 1846) Grunow (MT,OR caves; MN hyporheic; benthic in Devil's Hole, swNV)

**Achnanthes** *linearis* (W.M.Smith, 1855) Grun forma *curta* H.L. Smith ex. Boyer, 1916 (MT caves; MN hyporheic; benthic in Devil's Hole, swNV)

**Achnanthes** *microcephala* Kuetzing, 1844 (OR), *minutissima* Kuetz, 1833. (MT,OR),

**Achnanthes** *minutissima* Kutz (benthic in Devil's Hole, swNV)

**Achnanthes** *montana* (Kuetz) Krasske, 1929 (OR),

**Achnanthes** undet. species (MT,OR,UT)

**Achnanthes** *submarina* Hust. (benthic in Devil's Hole, swNV)

**Achnanthes** *suchlandtii* Hust.(benthic in Devil's Hole, swNV)

**Achnanthes** 2 undet. species (benthic in Devil's Hole, swNV)

***Amphipectora*** Kuetzing, 1844 – Naviculaceae diatoms

***Amphipectora*** *pellucida* (Kutz.) Kuetzing var. *p.* Patrick (MN hyporheic)

*Amphora* Ehrenberg & Kuetzing, 1844 - Raphidineae diatom (also classified as a protist)

*Amphora coffeaiformis* (Agardh) (MN hyporheic)

*Amphora coffeaiformis* (Agardh) var. *perpusilla* (Grunow, 1880) Detoni (=A.p.) (OR/by lights, alien?)

*Amphora ovalis* var. *libyca* (Her.) Cl. (MN hyporheic)

*Amphora ovalis* var. *pediculus* Kutz.(MN hyporheic)

*Amphiprora* Ehrenberg, 1841 – Naviculaceae diatoms

*Amphiprora alata* Ehrenberg (MN hyporheic)

*Amphiprora ornata* Bailey (MN hyporheic)

*Anomooneis serians* (Bre'b.) Cl. Var. *brachysira* (Bre'b) Cl. (benthic in Devil's Hole, swNV)

*Anomooneis* Phitzer, 1871 – Naviculaceae diatoms

*Anomooneis sphaerophora* (Her.) Pfitzer, 1871 var. s. Patrick (MN hyporheic)

*Asterionella* Hassal, 1850 Diatomaceae diatoms

*Asterionella formosa* Hassal, 1850 var. *formosa* Patrick (MN hyporheic)

*Brachysira* Kutz., 1836 – Brachysiraceae in Order Naviculales

*Brachysira aponina* Kutz. (benthic in Devil's Hole, swNV)

*Caloneis* Cleve, 1894 - Naviculaceae diatoms

*Caloneis bacillum* Cleve, 1894 (UT/by lights, alien?; MN hyporheic)

*Caloneis lewisii* Patrick var. *l.* Patrick (MN hyporheic)

*Caloneis limosa* (Kutz) Patrick var. *limosa* Patrick (MN hyporheic)

*Caloneis* undet. sp. (benthic in Devil's Hole, swNV)

*Caloneis ventricosa* Ehr. (benthic in Devil's Hole, swNV)

*Cocconeis* Ehrenberg, 1837 - Naviculaceae or Achnanthaceae diatoms

*Cocconeis pediculus* Ehr. var. *p.* Patrick (MN hyporheic)

*Cocconeis placentula* (Ehrenb.)

*Cocconeis placentula* var. *euglypta* (Her.)( Cl.(MT caves; MN hyporheic)

*Cocconeis placentula* var. *lineata* (C.l. Ehrenberg, 1849) (MT,UT/by lights, alien?; MN hyporheic)

*Cocconeis placentula* var. *placentula* Patrick (MN hyporheic)

*Cocconeis* undet. sp. (benthic in Devil's Hole, swNV)

*Coscinodiscus* Ehrenberg, 1938 (= *Phacodiscus*) Coscinodiscaceae diatoms

Coscinodiscus undet. sp or species (near lights in NV; benthic in Devil's Hole, swNV)

Cyclotella Kuetzing, 1834 – Thalassiosiraceae diatoms

Cyclotella catenata Brun. (MN hyporheic)

Cyclotella comata (Her.) Kutz. (MN hyporheic)

Cyclotella glomerata Bachmann (MN hyporheic)

Cyclotella meneghiniana Kuetzing (MN hyporheic)

Cyclotella striata Grun var. *bipunctata* Fricke (MN hyporheic)

Cylindrotheca - Nitzschiaceae diatoms

Cylindrotheca gracilis (Breb.) Grun. (MN hyporheic)

Cymatopleura W.Smith, 1851 - Diatomaceae diatoms

Cymatopleura undet. sp. (OR cave)

Cymatopleura solea (Berb.) W. Sm. (MN hyporheic)

Cymatopleura solea (Berb.) W. Sm. var. *regula* (Ehr.) Grun. (MN hyporheic)

Cymbella C.A.Agardh, 1830 - Cymbellaceae diatoms

Cymbella affinis (*Achnanthes a.* Grun in Cl. & Svenska, 1880 (MT caves; MN hyporheic)

Cymbella angustata (W. Sm.) Cl. (benthic in Devil's Hole, swNV)

Cymbella cesati (Rabh.) Grun.(benthic in Devil's Hole, swNV)

Cymbella cistula (Hemprich) Grun. (MN hyporheic)

Cymbella clausii Van Landingham, 1967 (Tp? in Mammoth Cave,KY)

Cymbella delicatula (W. Sm.) Cl. (benthic in Devil's Hole, swNV)

Cymbella ehrenbergii Kutz. (MN hyporheic)

Cymbella fonticola Hust. (benthic in Devil's Hole, swNV)

Cymbella gerloffii VanLandingham, 1967 (Tp? in Mammoth Cave,KY)

Cymbella gracilis (Rabh.) Cl. (MN hyporheic)

Cymbella hebridica (Greg.) Grun. (MN hyporheic)

Cymbella hohnii VanLandingham, 1967 (Tp? in Mammoth Cave,KY)

Cymbella microcephala Grun.(benthic in Devil's Hole, swNV)

Cymbella microcephala Grun.forma *lateus* (Krassler) Reim. (benthic in Devil's Hole, swNV)

Cymbella minuta Hilse (benthic in Devil's Hole, swNV)

Cymbella minuta var. *silesiaca* (Bleisch ex Rabh, 1864.) Reim. Comb nov. (MT,OR)

Cymbella norvegica Grun.(benthic & phytoplankton in Devil's Hole, swNV)

Cymbella obtusiuscula Kutz. (MN hyporheic)



Cymbella *prostata* Kutz. (MN hyporheic)

Cymbella *sinuata* Gregory, 1856 (MT caves; MN hyporheic)

Cymbella undet. sp. (phytoplankton in Devil's Hole, swNV)

Cymbella *tumidai* (Breb.) Van Heurck (MN hyporheic)

Cymbella *tumida* (Breb.) Van Heurck (MN hyporheic)

Cymbella *ventricosa* Kutz. (MN hyporheic)

Denticula Kuetzing, 1844 – Nitzschiaceae diatoms

Denticula *elegans* Kutz (benthic in Devil's Hole, swNV)

Diatoma Bory De St. Vincent, 1824 - Diatomaceae diatoms

Diatoma *hiemale* Lyngbye, 1819 (UT/by lights, alien?)

Diatoma *hiemale* var. *mesodon* (UT/by lights, alien?)

Diatoma *vulgare* Bory De St. Vincent, 1824 (MT, UT caves by lights, alien?; MN hyporheic)

Diploneis C.G.Ehrenberg ex Cleve, 1894 - Naviculaceae diatoms

Diploneis undet. sp. or species (OR,NM)

Epithemia - Epithemiaceae diatoms

Epithemia *argus* Kuetz. var. *longicornis* Grun. (MN hyporheic)

Epithemia *sorex* Kutz. (MN hyporheic)

Epithemia *turgida* (Her.) Kutz. (MN hyporheic)

Eurotia Ehrenberg, 1937 – Eunotiaceae diatoms

Eurotia *monodon* Her. var. *m.* Patrick (MN hyporheic)

Eurotia *praerupta* Ehr. (benthic in Devil's Hole, swNV)

Eurotia *praerupta* Ehr. var. *p.* Patrick (MN hyporheic)

Eurotia undet. sp. (benthic & phytoplankton in Devil's Hole, swNV)

Fragilaria Lyngbye, 1819 - Diatomaceae diatoms

Fragilaria *brevistriata* var. *inflata* (Pant.) Hust. (MN hyporheic)

Fragilaria *capucina* var. *mesolepta* Rabh. (MN hyporheic)

Fragilaria *construens* (Ehr., 1893) Grun. (MT,OR/by lights, alien?),

Fragilaria *construens* var. *binodis* (UT/by lights, alien?)

Fragilaria *construens* var. *c.* Patrick (MN hyporheic)

Fragilaria *leptostauron* var. *dubia* (Grun.) Hust. (MN hyporheic)

Fragilaria *pinnata* var. *intercedens* (Grun.) Hust. (MN hyporheic)

Fragilaria undet. sp. (benthic & phytoplankton in Devil's Hole, swNV)

Fragilaria *vaucheriae* (Kutz) Rabh (benthic in Devil's Hole, swNV)

**Fragilaria** *vaucheriae* var. *v.* Patrick (MN hyporheic)

***Frustulia*** Agardh, 1824 – Naviculaceae diatoms

***Frustulia rhomboides*** (Her) De Tonis var. *r.* Patrick (MN hyporheic)

***Frustulia vulgaris*** (Thwaites) DeT. var. *v.* Patrick (MN hyporheic)

**Gomphonema** Agardh, 1824 - Gomphonemaceae diatoms

**Gomphonema** *acuminatum* var. *brebissonii* (Kutz.) Cl. (MN hyporheic)

**Gomphonema** *acuminatum* var. *coronata* (Her.) W. Sm. (MN hyporheic)

**Gomphonema** *acuminatum* var. *trigonocephala* (Her.) Grun. (MN hyporheic)

**Gomphonema** *angustatum* (Kutz.) Rabenh (benthic in Devil's Hole, swNV)

**Gomphonema** *angustatum* var. *producta* Grun. (MN hyporheic)

**Gomphonema** *constrictum* Ehr. (MN hyporheic)

**Gomphonema** *gracile* Ehr. (MN hyporheic)

**Gomphonema** *hotchkissii* VanLandingham, 1966 (Tp in Mammoth Cave, KY), *olivaceum* (UT/by lights, alien?)

**Gomphonema** *intricatum* Kutz (benthic in Devil's Hole, swNV)

**Gomphonema** *intricatum* var. *pumila* Grunow (MN hyporheic)

**Gomphonema** *olivaceum* (Lyng.) Kutz. (MN hyporheic)

**Gomphonema** *parvulum* var. *micropus* (Kutz.) Cl. (MN hyporheic)

**Gomphonema** *sphaerophorum* Ehr. (MN hyporheic)

**Gomphonema** undet. sp. (benthic in Devil's Hole, swNV)

***Gyrosigma*** Hassall, 1845 - Naviculaceae diatoms

***Gyrosigma attenuatum*** (Kutz) Rabdh. Var. *a.* Parick (MN hyporheic)

*Gyrosigma acuminatum* (Kutz.) Rabh. = *Pleurosigma scalptrum*

***Gyrosigma obtusatum*** (Sulliv. & Wormley) Boyer var. *a.* Parick (MN hyporheic)

**Hantzschia** Grunow, 1877 - Nitzschiaceae diatoms

**Hantzschia** *amphioxys* (Ehr.) Grunow in Cleve & Grunow.

**Hantzschia** *amphioxys* var. *erassaw* M. Peragallo in Heribaud et al., 1920 (MT, OR, UT/by lights, alien?)

**Hantzschia** *amphioxys* var. *major* Grun. (MN hyporheic)

***Mastogloia*** Thwaites ex W. Sm. – Naviculaceae diatoms

***Mastogloia smithi*** Thw. var. *lacustris* Grun. (benthic in Devil's Hole, swNV)

***Melosira*** C.A. Agardh, 1824 - Naviculaceae diatoms . Bibl. Kashima & Ogawa 1995 (UT, OR (assoc. with siliceous coralloids)/by lights, alien?) (also placed in Protista)

*Melosira* *ambigua* (Grun.) O. Mull. (MN hyporheic)

*Melosira* *distans* var. *Lyrata* forma *curvata* Jouse, 1952. (NM,MT)

*Melosira* *granulata* (Ehr., 1843) Ralfs, 1861 (MT caves; MN hyporheic)

*Melosira* *roseana* Rabhehorst, 1852 (MT)

*Melosira* undet. sp., (NM/by lights, alien?)

*Melosira* *varians* (?Agardh, 1827) Kirchner, 1878 (MT caves; MN hyporheic)

*Meridion* - Diatomaceae diatoms

*Meridion* *circulare* (Grev.) Ag. var. *circulare* Patrick (MN hyporheic)

*Navicula* Bory de St.-Vicent, 1822 (all sp. by lights, aliens?) - Naviculaceae diatoms

*Navicula* *anglica* var. *subsalsa* (Grun.) Cl. (MN hyporheic)

*Navicula* *atomus* (Kutzing, 1844) Grunow, 1860 (UT cave)

*Navicula* *brekkaensis* Petersen, 1928 (OR cave)

*Navicula* *capitata* Ehr. var. *capitata* Patrick. (MN hyporheic)

*Navicula* *cincta* (Ehr., 1854) Ralfs in Pritch, 1861

*Navicula* *cincta* var. *rostrata* Reimer, 1962 (MT)

*Navicula* *clamans* Hustedt, 1939. (MT)

*Navicula* *contenta* Grunow in Van Heurek, 1880 (UT)

*Navicula* *contenta* var. *biceps* Arnott Ms., Grunow in van Heurek, 1885 (OR)

*Navicula* *contenta* f. *parallela* J.B. Petersen, 1928 (MT)

*Navicula* *cryptocephala* Kuetzing, 1844 var. *veneta* (N.v. Kutz., 1844) (MT, OR, UT caves; MN hyporheic)

*Navicula* *cuspidata* (Kutz.) Kutz. var. *c.* Patrick. (MN hyporheic)

*Navicula* *declivis* Hust. (MN hyporheic)

*Navicula* *frustulum* Hust. (benthic in Devil's Hole, swNV)

*Navicula* *gallica* (W.M. Smith, 1857) var. *montana* Bahls (MT,OR)

*Navicula* *gastrum* (Ehr.) Kutz. var. *gastrum* Patrick. (MN hyporheic)

*Navicula* *halophila* (Grun.) Cl. Ehr. var. *h.* Patrick. (MN hyporheic)

*Navicula* *hambergii* Hust. var. *h.* Patrick. (MN hyporheic)

*Navicula* *insociabilis* Krasske, 1961 (OR)

*Navicula* *laterostrata* Hust. var. *l.* Patrick. (MN hyporheic)

*Navicula* *minima* Grun. (benthic in Devil's Hole, swNV)

*Navicula* *menisculus* var. *upsaliensis* (Grun.) Grun. (MN hyporheic)

*Navicula* *minima* var. *minima* Grun., 1880 (MT,OR)

*Navicula murrayii* West et G.S. West, 1911 (UT)

*Navicula mutica* Kuetzing, 1844

*Navicula mutica* var. *m.* Kuetzing, 1844 (MT,UT)

*Navicula mutica* var. *binoidis* (MT,UT)

*Navicula mutica* var. *n.* (Ehr.) Hust (KY/unlighted)

*Navicula mutica* var. *undulata* (Hilse in Rabdh., 1860) Grun., 1880 (MT,UT)

*Navicula nivalis* = *N. mutica* var. *n.* (Ehr.) Hust

*Navicula odiosa* Wallace var. *o.* Patrick. (MN hyporheic)

*Navicula parva* (Menegh.) Cl.-Euler (benthic in Devil's Hole, swNV)

*Navicula pelliculosa* Breb ex Gilse, 1849 (OR)

*Navicula permitis* Hustedt, 1945 (UT)

*Navicula perpucilla* (*Synedra p.* Kutz., 1844) Grun. (Epigeal in SE, middle Atlantic states/ near cave lights in MT,OR)

*Navicula procracta* Grun. var. *p.* Patrick. (MN hyporheic)

*Navicula pupula* (*Stauroneis p.* R. Gregory, 1854) Grun. in Cl. & Grun, 1880

*Navicula pupula* var. *elliptica*. (MN hyporheic)

*Navicula pupula* var. *rectangularis* (N.p. forma r. Gregory, 1854) (MT, OR)

*Navicula radiosa* var. *r.* Kuetzing, 1844 (UT)

*Navicula radiosa* var. *tenella* (Breb. & Kutz.) Grun. (MN hyporheic)

*Navicula rinehardtii* (Grun.) var. *salinarum* Patrick (MN hyporheic)

*Navicula salinarum* Grun. var. *s.* Patrick (MN hyporheic)

*Navicula salinarum* Grun. var. *intermedia* (Grun.) Cl. Patrick (MN hyporheic)

*Navicula securo* Patrick, 1759 (OR),

*Navicula seminulum* var. *hustedtii*. Patrick (MN hyporheic)

*Navicula* undet. species (6 species in NV cave near lights; benthic in Devil's Hole, swNV)

*Navicula texana* Patrick var. *t.* Patrick (MN hyporheic)

*Navicula tripunctata* (O.F. Mueller, 1786) Bory (MT; MN hyporheic; benthic in Devil's Hole, swNV)

*Navicula tuscula* Her. var. *t.* Patrick (MN hyporheic)

*Navicula vulpina* Kutz. var. *v.* Patrick (MN hyporheic)

*Neidium* - Diatomaceae diatoms

*Neidium affine* var. *humerus* Reim. (MN hyporheic)

*Neidium dubium* (Her.) Cl. var. *d* Patrick (MN hyporheic)

*Neidium kozlowii* var. *parvum* Mareschk (MN hyporheic)

*Nitzschia* Hassall, 1845 (by lights, alien?) - Nitzschiaceae diatoms

*Nitzschia acicularis* Grun. (MN hyporheic)

*Nitzschia acuta* Hantzsch (MN hyporheic)

*Nitzschia amphibia* Grun. (MN hyporheic; benthic in Devil's Hole, swNV)

*Nitzschia denticula* Grun. (benthic in Devil's Hole, swNV)

*Nitzschia dissipata* (Kuetzing, 1844) Grun, 1862 (MT caves; MN hyporheic; benthic in Devil's Hole, swNV))

*Nitzschia filiformis* (W. Sm.) Hust. (MN hyporheic)

*Nitzschia fonticola* Grun. (MN hyporheic; benthic in Devil's Hole, swNV)

*Nitzschia frustulum* (Kuetz, 1844) Grun. (MT,UT caves; benthic in Devil's Hole, swNV)

*Nitzschia hantzchiana* Rabh. (benthic in Devil's Hole, swNV)

*Nitzschia kutzingiana* Hilsen (benthic in Devil's Hole, swNV)

*Nitzschia linearis* W.Smith (MT, OR, UT caves)

*Nitzschia palea* (Kutz.) W. Sm. (MN hyporheic; benthic in Devil's Hole, swNV))

*Nitzschia paleacea* Grun. (MT,OR; phytoplankton in Devil's Hole, swNV)

*Nitzschia romana* Grun. (benthic in Devil's Hole, swNV)

*Nitzschia sigmoidea* (Ehr.) W.Sm. (MN hyporheic)

*Nitzschia* undet. sp. or species (NM caves; benthic in Devil's Hole, swNV)

*Nitzschia vitrea* Norman (benthic in Devil's Hole, swNV)

*Opephora* Petit, 1888- Diatomaceae diatoms

*Opephora martyi* Herib. var. *martyi* Patrick (MN hyporheic)

*Pinnularia* Lindley, 1834 - Naviculaceae diatoms

*Pinnularia intermedia* C. G. Ehrenberg, 1843 (UT/by lights, alien?)

*Pinnularia* undet. sp. or species (OR by lights, alien?; MN hyporheic; benthic in Devil's Hole, swNV)

*Pleurosigma* W. Smith, 1852 - Naviculaceae diatoms

*Pleurosigma scalptrum* Corda, 1835 (MT caves; MN hyporheic)

*Pyxidicula* –N.I. Strelnikova & V.A. Nikolaev, 1986 - Melosiraceae diatoms (also placed in Protista)

*Pyxidicula cymbalum* Penard (MN hyporheic)

*Pyxidicula operculata* Ehrenberg (MN hyporheic)

*Rhoicosphenia* Grunow, 1860 - Achnanthaceae diatoms

*Rhoicosphenia curvata* (Kutz., 1833) Grunow ex Rabdh, 1864 (MT)

*Rhopalodia* - Epithemiaceae diatoms

*Rhopalodia gibba* (Ehr.) O. Mull. (MN hyporheic)

*Rhopalodia giberula* (Ehr.) O. Mull. (MN hyporheic)

*Stauroneis* Ehrenberg, 1843 - Naviculaceae diatoms

*Stauroneis kriegeri* Patrick var. *k.* Patrick (MN hyporheic)

*Stauroneis phoenicenteron* forma *gracilis* (Her.) Hust. (MN hyporheic)

*Stauroneis salina* W. Sm. (MN hyporheic)

*Stauroneis smithii* Grun. var. *s.* Patrick (MN hyporheic)

*Stauroneis* undet. sp. (UT/by lights, alien?)

*Rhoicosphenia* Grunow, 1860 – Achnanthaceae diatoms

*Rhoicosphenia curvata* (Kutz.) Grun. var. *curvata* Patrick (MN hyporheic)

*Stephanodiscus* Ehrenberg, 1845 – Thalassiosiraceae diatoms

*Stephanodiscus astraea* (Ehr.) Grun. *minutula* (Ehr.) Grun. (benthic in Devil's Hole, swNV)

*Stephanodiscus niagarae* Ehrenberg, 1845 (MN hyporheic)

*Surirella* – Surirellaceae diatoms

*Surirella angustata* Kutz., *elegans* Ehr. (MN hyporheic)

*Surirella linearis* var. *helvetica* (Brun.) Meister (MN hyporheic)

*Surirella ovata* Kuetzing (MN hyporheic)

*Surirella ovalis* Breb. (MN hyporheic)

*Surirella robusta* var. *splendida* (Ehr.) Van Heurck (MN hyporheic)

*Surirella spiralis* Kuetzing (MN hyporheic)

*Synedra* Ehrenberg, 1832 - Diatomaceae diatoms

*Synedra acus* Kutz. var. *acus* Patrick (MN hyporheic)

*Synedra capitata* Kutz. var. *c.* Patrick (MN hyporheic)

*Synedra delicatissima* Wm. Smith var. *d.* Patrick (MN hyporheic)

*Synedra parasitica* Kutz. var. *p.* Patrick (MN hyporheic)

*Synedra parasitica* Kutz. var. *subconstricta* Patrick (MN hyporheic)

*Synedra rumpens* (Kutz) (benthic in Devil's Hole, swNV)

*Synedra* undet. species (MT,NM/by lights, alien?)

*Synedra ulna* (*Bacillaria u.* Nitz., 1817) (Mammoth Cave,KY; MN hyporheic)

*Tabellaria* Ehrenberg, 1840 - Diatomaceae diatoms

*Tabellaria fenestrata* (*Diastoma t.* Lyngb. 1819) (MN, TX sandy hyporheic)

*Tabellaria flocculosa* (Roth) Kutz (benthic in Devil's Hole, swNV)

*Tabellaria flocculosa* var. *flocculosa* (Roth) Kutz (MN, TX sandy hyporheic)

**Euglenoid Algae** – See protists

## **Green Algae** (Division Chlorophyta)

Class Chlorophyceae (A large, important group of about 10,000 species now placed in Plantae. Some members also placed in Protista; mostly freshwater, a few marine in coastal waters)

Bibl.: W. Shepard et al. 2000

Division or Kingdom Chlorophyta

Class Chlorophyceae

Order Chaetophorales

Superfamily Trebouxiophyceae

Chaetophoraceae (*Microthamnion*, *Stigeoclonium*)

Order Chlorococcales

Chlorococcaceae (*Chlorococcum*, *Tetraedron*)

Chlorellaceae (=Oocystaceae)

(incl. *Ankistrodesmus*, *Chlorella*, *Kirchneriella*, *Nannochloris*, *Tetrachloris*, *Trebouxia*)

Coelastraceae (*Coelastrum*)

Dictyosphaeriaceae (*Dictyosphaerium*, *Dimorphococcus*, *Polysphondylium*)

Hydrodictyaceae (*Pediastrum*, *Sorastrum*)

Scenedesmaceae (now in Zygnematales)

Order Chlorosarcinales

Borodinellaceae (*Chlorosarcina*, *Chlorosphaera*, *Chlorosphaeropsis*)

Coccomyxaceae (*Coccomyxa*, *Diogenes*, *Gloeocystis* (put in Palmellaceae))

Order Cladophorales

Cladophoraceae (*Cladophora*), now in Ulvophyceae,

Order Ctenocladales

Ctenocladaceae (*Protococcus*)

Order Desmidiiales

Desmidiaceae (*Closterium*, *Cosmarium*, *Euastrum*, *Staurastrum*)

Order Klebsormidiales

Elakatotrichaceae (*Elakotothrix*)

Klebsormidiae (*Klebsormidium*)

Order Laminariales

Alariaceae (*Alaria*)

Laminariaceae (*Laminaria*, *Ulva*)

Order Microsporales

Microsporaceae (*Microspora*)

Order Oedogoniales

Oedogoniaceae (*Bulbochaete*, *Oedogonium*)

Order Prasioales

Prasiolaceae (*Hormidium*),

Order Sphaeropleales

Superfamily Palmellopsidacea

Parmellaceae (*Asterococcus*, *Gloecystis* (also put in Coccomyxaceae), *Neochloris*,  
*Parmella*, *Sphaerocystis*)

Order Trentepohliales

Trentepohliaceae (*Pseudopleurococcus*),

Order Ulotrichales

Ulotrichaceae (*Hormidiopsis*, *Klebsormidium*, *Oocystis* (once in Chlorococcaceae)  
*Stichococcus*, *Ulothrix*)

Order Ulvales

Ulvaceae (*Ulva*) (also subsumed in Laminariales)

Ulvophyceae (*Cladophora*, *Ulva*)

Order Volvocales (also placed in protists)

Chlamydomonadaceae (*Lobomonas Polytoma*)

(both once put in protists, Order Volvocida)

Phacotaceae (*Phacotus*)

Volvocaceae (*Eudorina*)

Order Zygnematales

Mesotaeniaceae (*Mesotaenium*, *Netrium*, *Roya*)

Scenedesmaceae (*Actinastrum*, *Crucigenia*, *Scenedesmus*) (also put in Chlorococcales)

Tetracystaceae (*Planophila*)

Zygnemataceae (*Mougeotia*, *Sirogonium*, *Spirogyra*)



**Actinastrum** Langerheim, 1882 – Zygnematales green algae in Scenedesmaceae  
**Actinastrum gracilimum** G.M. Sm. (MN hyporheic)

**Alaria** Greville, 1830 (edible kelp) Laminariales green algae in Alariaceae  
**Alaria** undet. sp. (sea cave in ME),

**Ankistrodesmus** Corda, 1838 - Chaetophorales green algae in Chlorellaceae  
**Ankistrodesmus falcatus** (Corda) Ralfs (MN hyporheic)  
**Ankistrodesmus falcatus** var. f. (Corda) Ralfs (KY caves)

**Asterococcus** Scherffel, 1908 Sphaeropleales green algae in Palmellaceae  
**Asterococcus superbus** (Cienkowski) Scherffel (KY),

**Bulbochaete** C.A. Agardh, 1817 – Oedogoniales green algae in Oedogoniaceae  
**Bulbochaete** undet. sp. (MN hyporheic)

**Chlorella** Beijerinck, 1890 - Chaetophorales green algae in Chlorellaceae  
**Chlorella ellipsoidea** G. Gartner, 1974 (*C. saccharophila* var. *e.* Gern) (KY),  
**Chlorella** undet. sp. or species (NM,OR/alien?; endolithic in ON karst)  
**Chlorella vulgaris** (Beijerinck, 1890) Beijer (KY,NV near lights),

**Chlorococcum** Meneghini, 1842 - Chaetophorales green algae in Chlorococcaceae  
**Chlorococcum humicola** (Naegeli, 1868) Rabenhorst (Palla) (NV near lights)  
**Chlorococcum** undet. sp. or species (KY, NM/ alien?; endolithic in ON karst; benthic in Devil's Hole, NV)

**Chlorhormidium** Fott, 1960 = *Hormidium*

**Chlorosphaera** Klebs, 1883 - Chlorosarcinales green algae in Borodinellaceae  
**Chlorosphaera** undet. sp. (OR/alien?)

**Chlorosphaeropsis** Vischer, 1933 - Chlorosarcinales green algae in Borodinellaceae  
**Chlorosphaeropsis** undet. sp. (OR/alien?)

**Chlorosarcina** Gerneck, 1907 - Chlorosarcinales green algae in Borodinellaceae  
**Chlorosarcina consociata** (Klebs in Artari, 1893) G.M. Smith, 1933 (KY)  
**Chlorosarcina** undet. sp. (NM/alien?; endolithic in ON karst)

**Cladophora** Ulvales green algae in Ulvophyceae  
**Cladophora** Kuetzing, 1843 *kuetzingianum* = *Microthamnion k.*  
**Cladophora** undet. sp. (MN hyporheic)

**Closterium** J. Ralfs, 1848 - Desmidiiales green algae in Desmidiaceae  
**Closterium moniliferum** (Bory.) Ehr. (MN hyporheic)  
**Closterium** undet. sp. (sandy TX hyporheic)

**Coccomyxa** W. Schmidle, 1901 - Chlorosarcinales green algae in Coccomyxaceae

**Coccomyxa** *dispar* W. Schmidle, 1901 (KY, NV? near lights),

**Coccomyxa** undet. sp. (endolithic in ON karst),

**Coelastrum** Naegeli, 1849 – Chlorococcales green algae in Coelastraceae

**Coelastrum** *microporum* Naegeli (MN hyporheic)

**Cosmarium** Dulac, 1867 - Desmidiatales green algae in Desmidiaceae

**Cosmarium** undet. sp. or species (NV cave near lights; MN hyporheic)

**Crucigenia** Morren, 1850 – Zygnematales green algae in Scenedesmaceae

**Crucigenia** *rectangularis* (A. Braun) Gay (MN hyporheic)

**Dictyosphaerium** Naegeli, 1849 – Chlorococcales green algae in Dictyosphaeriaceae

**Dictyosphaerium** *pulchellum* Wood, 1872 (MN hyporheic)

**Dimorphococcus** A. Braun, 1855 - Chlorococcales green algae in Dictyosphaeriaceae

**Dimorphococcus** *lanatus* A. Braun, 1855 (MN hyporheic)

**Diogenes** Pennington, 1941 Chlorosarcinales green algae in Coccomyxaceae

**Diogenes** prob. *rotundus* Pennington, 1941 (KY)

**Elakatothrix** Wille, 1898 – Elakatotrichaceae, green algae in Order Klebsormidiales

**Elakatothrix** *viridis* Wille (benthic in Devil's Hole, NV)

**Eudorina** Ehrenberg, 1832 – Volvocaceae protists in Volvocales (also put in protists)

**Eudorina** *elegans* Ehrenberg, 1832 (MN hyporheic)

**Euastrum** Ehrenberg & Ralfs, 1848 – Desmidiatales green algae in Desmidiaceae

**Euastrum** undet. sp. (MN hyporheic)

**Gloeocystis** Naegeli, 1849 Chlorosarcinales green algae in Palmellaceae

**Gloeocystis** undet. sp. (endolithic in ON karst; benthic in Devil's Hole, NV))

**Hormidiopsis** Heering in Pascher, 1914 - Ulotrichales green algae in Ulotrichaceae

**Hormidiopsis** undet. sp. (NM/alien?)

**Hormidium** Kuetzing, 1843 - Prasioales green algae in Prasiolaceae

**Hormidium** undet. sp. (OR/alien?)

**Kirchneriella** Schmidle, 1893 Chlorococcales green algae in Chlorellaceae

**Kirchneriella** *lunaris* (Kirchner) Moebius, 1894 (*Rhapidium vonvolutum lunare*) (KY),

**Klebsormidium** Silva, Mattox & Blackwell, 1972 - Ulotrichales green algae in Ulotrichaceae

**Klebsormidium** *flaccidum* (*Chlorhormidium* f. A. Braun) Kutz. (endolithic in ON karst),

**Laminaria** J. Lamouroux, 1813 - Laminariales green algae in Laminariaceae  
**Laminaria digitata** (Fucus d. Hudson, 1762) Lamouroux (= *Fomes & Fucus digitatus*; *L. intermedia* Foslie, 1884; *L. stenophgylla* (Harvey) J. Agardh, 1868; *Laminaria d. var. stenophylla*) (horsetail kelp) (ME sea cave)

**Lobomonas** P.A. Dangeard, 1898 – Chlamydomonadaceae green algae  
(once in Volvocales protests)

**Lobomonas** undet. sp. (MN lake benthic)

**Mesotaenium** Naegeli, 1849- Zygnematales green algae in Mesotaeniaceae  
**Mesotaenium** undet. sp. (OR/alien?)

**Microthamnion** Naegeli in Kuetzing, 1849 - Chaetophorales green algae in Chaetophoraceae  
**Microthamnion kutzingianum** Naegeli in Kuetzing, 1849 (KY)

**Microspora** Thured, 1850 – Microsporales green algae in Microsporaceae  
**Microspora stagnorum** (Kuetz.) Lagerheim (MN hyporheic)

**Mougeotia** C.A. Agardh, 1824 - Zygnematales green algae in Zygnemataceae  
**Mougeotia** undet. sp. (sandy TX, MN hyporheic)

**Mougeotiopsis** Palla, 1894 - Zygnematales green algae in Zygnemataceae  
**Mougeotiopsis calospora** Palla, 1894 (NV near lights)

**Nannochloris** Naumann, 1890 - Chlorococcales green algae in Chlorellaceae  
**Nannochloris** undet. sp. (NV near lights)

**Neochloris** Starr, 1955 - Sphaeropleales green algae in Palmellaceae  
**Neochloris minuta** Arce & Bold (Mammoth Cave, KY)

**Netrium** (Naegeli) Itzigsohn & Rothe - Zygnematales green algae in Mesotaeniaceae  
**Netrium** undet. sp. (MN hyporheic)

**Oedogonium** Hirn, 1900 – Oedogoniales green algae in Oedogoniaceae  
**Oedogonium** undet. sp. or species (MN hyporheic; benthic & phytoplankton in Devil's Hole, NV)

**Oocystis** Naegeli Ex A.Braun, 1855 - Ulotrichales green algae Ulotrichaceae  
**Oocystis borgei** Snow (MN hyporheic)  
**Oocystis** undet. sp. (MN hyporheic)

**Oocystis borgei** Naegeli (KY)  
**Oocystis** undet. sp. (MN hyporheic)

**Palmella** Lyngbye, 1819 - Sphaeropleales green algae in Palmellaceae

**Palmella** *minuta* Leiblein, 1830 (NV near lights)

**Pediastrum** Meyen, 1829 – Chlorococcales green algae in Hydrodictyaceae

**Pediastrum** *boryanum* (Turpin) Meneghini (MN hyporheic)

**Pediastrum** *duplex* Meyen (MN hyporheic)

**Pediastrum** *duplex* var. *clathratum* (A. Braun) Lagerheim (MN hyporheic)

**Pediastrum** *glanduliferum* Bennett (MN hyporheic)

**Pediastrum** *simplex* (Meyen) Lemmermann (MN hyporheic)

**Pediastrum** *tetras* (Ehr.) Ralfs (MN hyporheic)

**Phacotus**. Perty, 1852 - (also placed in Chlamydomonadales or Volvocales protists)

**Phacotus** *lenticularis* (Ehrenberg, 1831) (MN lake benthic)

**Planophila** Gerneck, 1907 - green algae in Tetracystaceae

**Planophila** *laetevirens* Gerneck (KY)

**Pleurococcus** Meneghini, 1837 - Ctenocladales green algae in Ctenocladaceae

**Pleurococcus** undet. sp. (NM/alien?; also deep in cave)

**Polytoma** Ehrenberg, 1838 - Chlamydomonadaceae green algae

(once put in Chlorophyceae protists, Order Volvocida)

**Polytoma** *minus* Pascher (Mammoth Cave, KY)

**Protococcus** C.A Agardh, 1824 (= *Pleurococcus*, *Pseudopleurococcus*) Ctenocladales green algae in Ctenocladaceae

**Protococcus** undet. sp. or species (AR cave; benthic in Devil's Hole, NV))

**Protococcus** *viridis* (F. Bauer) C.A. Agardh, 1824 (KY, NV near lights; nNM twilight zone)

**Pseudopleurococcus** J.W. Snow, 1899 - Trentepohliales green algae in Trentepohliaceae

**Pseudopleurococcus** *printizii* (Vischer, 1933) (endolithic in ON karst)

**Roya** W. West and G.S. West, 1896 emend. Hodgetts, 1920 - Zygnematales green algae in Mesotaeniaceae

**Roya** undet. sp. (NV near lights)

**Scenedesmus** Meyen, 1829 - Zygnematales green algae in Scenedesmaceae (also put in Chlorococcales)

**Scenedesmus** *arcuatus* var. *platydisca* G.M. Sm. (MN hyporheic)

**Scenedesmus** *brasiliensis* Bohlin, 1897 (Mammoth Cave, KY)

*Scenedesmus dimorphus* (Turp.) Breb. (MN hyporheic)

*Scenedesmus opoliensis* var. *contacta* Prescott (MN hyporheic)

*Scenedesmus quadricauda* (Turp.) Breb. (MN hyporheic)

*Sorastrum* Kuetzing, 1845 – Hydrodictyaceae green algae

*Sorastrum spinulosum* Naegeli (MN hyporheic)

*Sphaerocystis* R. Chodat, 1897 Sphaeropleales green algae in Palmellaceae

*Sphaerocystis schroeteri* Chodat (MN hyporheic)

*Sphaerocystis* undet. sp. (OR/alien?)

*Sirogonium* Kuetzing, 1843 - Zygnematales green algae in Zygnemataceae

*Sirogonium* undet. sp. (sandy TX hyporheic)

*Spirogyra* Link in C. G. Nees, 1820 - Zygnematales green algae in Zygnemataceae

*Spirogyra* undet. sp. or species (MN, sandy TX hyporheic; benthic in Devil's Hole, NV)

*Staurastrum* Meyen & J. Ralfs, 1848 – Desmidiaceae green algae in Desmidiaceae

*Staurastrum* undet. sp. (MN hyporheic)

*Stichococcus* Naegeli, 1849 - Ulotrichales green algae in Ulotrichaceae

*Stichococcus bacillarus* Naegeli, 1849 (endolithic in ON karst; MN hyporheic)

*Stichococcus chlorelloides* Naegeli, 1849 (endolithic in ON karst)

*Stichococcus* undet. sp. (OR/alien?; endolithic in ON karst)

*Stigeoclonium* Kuetzing, 1843 – Chaetophorales green algae in Chaetophoraceae

*Stigeoclonium pachydermum* Prescott (MN hyporheic)

*Tetrachloris* Pascher, 1925 - Chlorellaceae green algae in Chlorococcales (also placed in cyanobacteria)

*Tetrachloris inconstans* Pascher, 1925 (KY)

*Tetraedron* Kuetzing, 1845 – Chaetophorales green algae in Chlorococcaceae

*Tetraedron hastatum* (Reinsch) Hansgirg (MN hyporheic)

*Tetraedron trigonum* var. *gracile* (Reinsch) DeToni (MN hyporheic)

*Trebouxia* Puymaly, 1924 - Chaetophorales green algae in Chlorellaceae

*Trebouxia* undet. sp. (endolithic in ON karst),

*Ulothrix* Kuetzing, 1836 - Ulotrichales green algae in Ulotrichaceae

*Ulothrix tenerrima* Kuetzing, 1843 fa. (KY)

*Ulothrix zonata* (Weber & Mohr) Kuetz. (MN hyporheic)

*Ulva* Linnaeus, 1753 Ulvales green algae in Ulvophyceae

*Ulva lactuca* J. Lamouroux, 1813 (sea cave in ME),

**Golden algae** (= golden brown algae) Kingdom (or Division) Chrysophyta, Class Chrysophyceae. Many are unicellular but some are colonial. Marine ones have silica skeletons extending to the Cambrian. May be sisters to the phaeophytes (brown seaweeds)

Order Chromalinales  
Chromulinaceae (*Oikomonas*)

Order Ochromonadales  
Ochromonadaceae (*Uroglenopsis*)  
Synuraceae (also put in Mallomonadales) (*Mallomonas*, *Monas*)

*Mallomonas* Perty, 1851 - Synuraceae in Mallomonadales yellow green algae (also treated as a protist)

*Mallomonas elongata* Reverdin, 1919 (*Monas e.*) (Shelta CAVE,AL)

*Monas* O.F. Mueller, 1786 (Ehrenberg) (= *Spumella* Cienkowsky, 1870) Synuraceae in Mallomonadales yellow green algae (microflagellates) (also classified as a protist & bacteria)

*Monas elongata* = *Mallomonas e.*

*Monas dangeardii* Lemmermann (Pascher) (Mammoth Cave, KY),

*Monas colpoda* (Mammoth Cave, KY)

*Monas* undet. sp. (AK freshwater pond interstitial)

*Monas obliqua* Schewiakoff (Pascher) (Mammoth Cave., KY & Shelta Cave, AL)

*Monas guttula* Ehrenberg (Kudo) (Mammoth Cave, KY)

*Monas socialis* Pascher (Mammoth Cave, KY)

*Oikomonas* Kent, 1880 – Chromulinaceae in Chromalinales golden algae (also put in protests)

*Oikomonas* undet. sp. (AK freshwater pond interstitial)

*Uroglenopsis* Calkin – Ochromonadaceae golden algae

*Uroglenopsis americana* (Calkins) Lemmermann (MN hyporheic)

## Red Seaweeds or Algae

Kingdom (or Division) Rhodophyta. First multicellular photobionts. About 4,000 species nearly all marine; most tropical. All are sexual with haploid dominant but with some with haploid and diploid alternate generations. All have reddish plastids with chlorophyll a (no b or c) and phycobilins. Some are calcified.

Class Florideophyceae

Order Corallinales

Corallinaceae (*Corallina*)

Spongitaceae

Subfamily Mastophoroideae (*Archeolithoporella*) (uncertain taxonomic placement)

Order Rhodymeniales

Rhodymeniaceae (*Rhodymenia*)

Order Gonotrichales

Gonotrichaceae (*Asterocystis*)

*Archeolithoporella* – Spongitaceae red algae, Subfamily Mastophoroideae (uncertain taxonomic placement)

*Archeolithoporella* undet. sp. (Permian fossil in Lechuguilla Cave, Eddy Co., NM)

*Asterocystis* Gobi, 1878 Ex T Schmitz, 1896 Gonotrichales red algae in Gonotrichaceae  
*Asterocystis smaragdiana* (Reinsch) Forti, 907 (Mammoth Cave, KY)

*Corallina* Linnaeus, 1759 Corallinales red algae in Corallinaceae

*Corallina* undet. sp. (sea cave in ME)

*Lemanea* Bory de St. Vicent, 1808- Lemaneaceae red algae

*Lemanea torulosa* (Carmichael) Sirdot (KY)

*Rhodochorton* C. Naegeli, 1862 - Nemaliales red algae in Acrochaetiaceae

*Rhodochorton* undet.sp. (KY))

*Rhodymenia* Greville, 1830 - Rhodymeniales red algae in Rhodymeniaceae

*Rhodymenia palmata* (J.V. Lamoureux) Kuntze, 1891 (dulce/sea cave in ME),

## Yellow-green Algae

Kingdon (or Divison) Xanthophyta

About 100 species that tend to form freshwater colonies (sometimes discrete cells or syncytial).

Yellow from several xanthins and green from chlorophyll a, c, and e.

Class Xanthophyceae (= Heterocontae)

Order Mischococcales

Characiopsidaceae (*Harpochytrium*)

Ophiocytaceae (*Ophiocytium*)

Pleurochloridaceae (*Botrydiopsis*, *Chloridella*)

Order Tribonematales

Heteropediaceae (*Heterococcus*)

Order Vaucheriales  
Vaucheriaceae (*Vaucheria*)

***Botrydiopsis*** Borzi, 1895 - Order Mischococcales yellow-green algae in Pleurochloridaceae:  
***Botrydiopsis*** undet. sp. or *arhiza* B.1895 (NM/alien?),

***Chloridella*** Pascher, 1932 Order Mischococcales yellow-green algae in Pleurochloridaceae (also put in Xanthophyceae)

***Chloridella neglecta*** (Pascher & Geitler) Pascher (endolithic in ON karst)

***Chrysococcus*** Klebs, 1892 - Order Chromallinales yellow green algae in Chrysococcaceae:  
***Chrysococcus klebsianus*** Pascher (KY)

***Harpochytrium*** Lagerheim, 1890 - Characiopsidaceae in Mischococcales yellow-green algae  
***Harpochytrium hyalotheca*** Lagerheim, 1890 (KY)

***Heterococcus*** Chodat, 1907- Heteropediaceae yellow-green algae in Order Tribonematales  
***Heterococcus*** undet. sp. (endolithic in ON karst),

***Heterothrix*** Pascher, 1932 - Xanthonemataceae yellow green algae  
***Heterothrix*** undet. sp. (endolithic in ON karst)

***Ophiocytium*** Naegeli, 1849 – Ophiocytaceae yellow-green algae  
***Ophiocytium*** undet. sp. (MN hyporheic)

***Vaucheria*** De Candolle, 1801 – Vaucheriaceae yellow green algae in Order Vaucheriales (also put in Siphonales)

***Vaucheria*** undet. sp. (MN hyporheic)

**alien - Population** of current macroinvertebrate, vertebrate, fungi, microbe, or plant directly or indirectly introduced into an area by people. Also when a native population has increased due to human impact. In show caves includes algae, rats, ants, algae, ferns, mites, spiders, & mosses. Certain amphipods, spiders, & springtails are aliens in other caves. See human impacts. Elliott, 1992c; Howarth 1985; Hyman 1943

**Allee effect** - Failure to reproduce due to lack of social stimulation caused by low populations.

**allele** - Abbrev. for allelomorph - A mutated gene that occupies the same locus on a chromosome as the unmutated gene.

**allelochemicals** - Serve to communicate between species, esp. insects. Compare pheromones.

## Alligators



Crocodylian reptile of Order Crocodylia

Family Alligatoridae (alligators and caimans) (*Alligator*)

***Alligator*** Cuvier, 1807 – Alligatoridae reptile (1 species in US)

***Alligator mississippiensis*** (Daudin, 1803)) (late Pleist.? In Herculaneum Crevice, Jefferson Co., MO/ alligator/ seNC to sFL, w. along coastal plain to sTX,n. to se OK,sAR),

**allochthonous** - Not native, substances that come from outside a habitat.

**allometry** - Growth of characters at different rates, resulting in changes in shape correlated with size changes.

**allomorphy** - Rapid speciation.

**allopatric** - Adj. for species or population in an area different from that of other, closely related species/population. Cf. parapatric. Allopatric speciation results from separation due to geographic barrier or climatic change. Incl. clinal speciation.

**amberat** or amber rat - Varnish-like yellow, red, brown, or black **stain** of **woodrat** urine residue in dry caves. Sheep Canyon Cave, MT. **Bibl.:** R. Benedict 1982; Orr 1957

Amblypygida - See whipless **whipscorpions**.

amensalism - Syn: antibiosis.

**ammonia** - Gas **hazard** from decomposition of guano (usually bats). Knutson 1984.

**ammonoid** - Any extinct **cephalopod** of subclass Ammonoidea, typified by an external shell symmetrical & coiled in a plane & with a bulbous protoconch & septa with angular sutural flexures & a small marginal siphuncle.

Amphibian (See **frog**, **salamander** & **toad**) - **Biology:** Duellman & Trueb 1994; Noble 1954; **Migration** - Mohr 1944; Names: American Soc. 1956; Collins. 1990, 1997; **Areas:** **AR:** Dellinger & Black 1938; Dowling 1957; **AZ:** Duellman 1955; **BC:** Carl 1959; **CA:** Brattstrom 1953, 1958; Canada: Conant 1958; **CO:** Douglas 1966; **CT:** Klemens 1991; **FL:** Carr & Goin 1955; Holman 1958-9; **HI:** McKeown 1996; **IL:** R. Olson 1956; **IN:** Hay, 1891; Minton 1972; **KS:** J. Bruiekelman 1946; Collins 1974; B. & Smith 1946; Karns et al. 1974; Tihen 1939; Craddock & Minckley 1965; Tihen 1937; **KY:** Bishop 1926; Hale 1984; **MD:** Franz 1969; McCauley 1945; **MN:** Breckenridge 1944; Oldfield & Moriarty 1994; **MO:** Myers 1958-9; C. Meyers 1958; Wiley 1968-9; **New England:** DeGraaf & Rudis 1983; **nNA:** ..: A. Wright & Wright 1949; **ND:** : A. Blair 1952; **NV:** Brattstrom 1958; **OH:** Duellman 1951; Langlois 1964; C. Walker 1946; **OK :** A. Blair 1952; A. Bragg 1955; A. Bragg & Hudson 1951; Ortenburger 1930; O. & Freeman 1930; **TX:** Strecker and Williams; **PA:** Conant 1974; Mohr 1939; A. Smith 1945; Yoder 1940; **TN:** Blair 1961; **US:** : A. Blair 1957; Conant 1958; Redmond 1985; **TX:** Raun 1971,; Brame 1962; B. Brown 1948; Mosauer 1932; Holman 1969; **VA:** R. Hoffman

1955; Hutchinson 1956; Netting & Wilson 1940; Tobey 1985; **World:** S. Gorham 1974; **WV:** Llewellyn 1940; Netting 1936; N. Green 1964; **Paleo:** Fay 1984; Holman 1995; Van Dam 1976; Holman 1969;

**amphibiont** - Invertebrates with both hypogean & epigeal life stages, as in certain **amphipods**, **hellgrammites**, **flies** (esp. midges), **mayflies** & **caddisflies**. Syn.: amphibite. Cf. stygobiont.

**Amphiesmenoptera** - Superorder of Insect that includes Orders Trichoptera (stoneflies), Lepidoptera (moths and butterflies) and Hymenoptera (wasps, bees and kin)

## Amphipods

Tiny peracaridan **crustacean** of Phylum Arthropoda, Subphylum Crustacea, Class Malacostraca Subclass Eumalacostraca, Superorder Syncarida (=Paracarida), Order Amphipoda. Similar to an isopod in lacking a carapace & stalked eyes & having many jointed legs. 7 pairs of uniramous pereopodal (thoracic) limbs, first 4 pairs directed backwards, last 3 pairs directed forwards, hence term "amphi-pod" (both kinds of legs), vs. "iso-pod (equal or similar kinds of legs) with unique arrangement of abdominal limbs (first 3 pairs are pleopods, last 3 pairs are uropods whereas in all other eumalacostracans the first five pairs are pleopods & the sixth only is a uropod.

Amphipods are unique also in having coaxial gill respiration. Most of the 3,650 known species are marine. Syns.: scuds, water fleas, fresh-water shrimp, sideswimmers. Bousfield 1958, 1877, 1982; Holsinger 1972, 1985, 1986; Barnard 1983, Stock 1986; Holsinger & Longley 1980

**Bibl:** Bousfield 1978, 1982; Buuikema 1980; Crawford 1976, 1977,; Culver 1976,, Culver & Poulson 1971; Fitzpatrick 1983,; Holsinger 1985, 1995; Holsinger & Buikema 1979a; Holsinger, Mort & Recklies 1983; Hubricht 1959; Notenboom 1991; Stock 1986a; Kane & Culver 1986; A. Pearse 1913.

**Areas:** **CO:** Pennak & Rosin 1976; Ward & Holsinger 1981; **GA** Bilbo 1971; **HI:** Barnard 1970, 1977; **IL:** Jenio 1972; **IN:** Fage 1931; Vandel 1964; **KS:** .: Moffett & Huggins 1982; **KY:** Hay 1903; Minckley & Cole 1963,; Fage 1931; Pederson 1990; **OK:** Black 1973a; Mackin 1935a, 1940a, 1941; **OR:** Benedict 1974a, 1973c; **NA:** Holsinger 1986; **OH:** Beckett 1977; Patton 1956; **ON:** Huntsman 1915,; **TX:** Barnard & Barnard 1982; Elliott & Mitchell 1973; Holsinger 1966b; Holsinger & Longley 1980; Grubbs 1976; **WA:** Benedict 1974a; Hubricht & Harrison 1941; Pearse 1917; **WV:** Culver 1976

### Suborder Caprellidea

Family Aeginellidae (*Tritella* (put in Caprellidae)

Family Caprellidae (*Caprella*, *Deutella*, *Luconacia*, *Mayerella*, *Metacaprella*, *Paracaprella*, *Tritella* (also placed in Aeginellidae))

Family Phtiscidae (*Hemiproto*)

Natantia infraordinal grouping (of Bousfield & Shih 1994.

Superfamily Eusiroidea Bousfield, 1979

Eusiridae

(*Eusiroides*, *Eusirus*, *Oradarea*, *Paramoera*, *Pontogeneia*, *Rhachotropis*, *Tethygeneia*)

Pontogeneiidae (*Accedomoera*, *Paramoera*)

Superfamily Pardiliscoidea Bousfield, 1979

Paradalscidae (*Halicoides*, *Nicippe*, *Pardalisca*, *Rhynohalicella*, *Spelaeonicippe*)

Reptantia infraordinal grouping (of Bousfield & Shih, 1994)

Superfamily Bogidielloidea Bousfield, 1977

Artesiidae (=Artisiidae) (*Artesia* - also put in Bogidiellidae) Bibl.: Koenemann 2000  
Bogidiellidae (*Artesia* (also put in own family), *Parabogidiella*, *Stygogidiella*).

Superfamily Corophioidea Barnard & B., 1983

Aoridae

(*Aoroides*, *Acuminodeutopus*, *Amphideutopus*, *Grandidierella* (once in Corophiidae),  
*Lembos*, *Leptocheirus*, *Microdeutopus*, *Rudilemboides*)

Corophiidae (*Globosolembos*, *Grandidierella* (now in Aoridae), *Cerapus*, *Corophium*,  
*Erichthonius*, *Lembos* (also put in Aoridae), *Microprotopus*, *Monocorophium*, *Photis*,  
*Pseudunciola*, *Unciola*)

Isaeidae

(*Cheirimeidia*, *Gammaropsis*, *Kermystheas*, *Microprotopus*, *Photis*, *Protomeidia*)

Superfamily Crangonyctoidea Bousfield, 1973

Allocrangonyctidae (put in Gammaridea & also subsumed in Crangonyctidae)

Crangonyctidae (put in Gammaridea)

Suborder Gammaridaea (=Gammaridea)

Superfamily Gammaroidea Bousfield, 1977

Acanthonotozomatidae ((*Acanthonotozoma*, *Odius*)

Ampithoidae (*Cymadusa*)

Argissidae (*Argissa*)

Amphilochidae (*Amphilochus*, *Gitana*, *Gitanopsis*, *Peramphithoe*)

**Anisogammaridae** (*Anisogammarus* (put in Melitidae), *Ramellogammarus*)

**Ampeliscidae** (*Amplisca*, *Byblis*)

**Atylidae** (*Atylus*)

**Bateidae** (*Batea*)

**Calliopiidae** (*Calliopi*, *Halirages*, *Leptamphoos*)

**Crangonyctidae** (also put in own superfamily, Crangonyctoidea)

(*Apocrangonyx*, *Bactrurus*, *Crangonyx*, *Stygobromus*, *Stygonectes*, *Stygonyx*,  
*Synpleonia*, *Synurella*)

**Dexaminidae** (*Dexamonica*)

**Eusiridae** (now in Eusiroidea)

**Gammaridae**

(*Dulichella*, *Elasmopus*, *Eriopisa*, *Gamarellus*, *Gammarus* (see Crangonyctidae),  
*Maera*, *Marinagammarus*, *Weyprechtia*)

**Haustoriidae**

*Acanthohaustorius*, *Amphiporeia*, *Bathyporeia*, *Eohaustorius*, *Haustorius*,  
*Lepidactylus*, *Parahaustorius*, *Pontoporeia*, *Protohaustorius*, *Pseudohaustorius*,  
*Urothoe*

**Ischyroceridae** (*Erichthonius*, *Ischyrocerus*, *Microjassa*, *Jassa*)

**Leucothoidae** (*Leucothoe*)

Lysianassidae

(*Acidostoma*, *Allogaussia*, *Anonyx*, *Cyphocaris*, *Hippomedon*, *Lepidepcreum*  
*Lysianassa*, *Lysianopsis*, *Onisimus*, *Opisa*, *Orchomene*, *Orchomenella*, *Pachynus*,  
*Prachynella*, *Psammonyx*)

Megaluropidae (*Gibberosus*)

Melphidippidae (*Eogammarus*, *Melphidippa*, *Melphis(s)ana*)

Oedicerotidae

(*Americhelidium*, *Ameroculodes*, *Arrhis*, *Bathymedon*, *Deflexilodes*, *Monoculodes*,  
*Monoculopsis*, *Paroedicerus*, *Synchelidium*, *Westwoodilla*)

Phoxocephalidae

(*Cephalophoxoides*, *Eobrolgus*, *Eudevenopu* (also put in Platyschnopidae), *Eobrolgus*,  
*Eyakia*, *Foxiphalus*, *Grandifloxus*, *Harpinia*, *Harpiniopsis*, *Heterophoxus*  
*Mandibulophoxus*, *Metaphoxus*, *Metharpinia*, *Parametaphoxus*, *Phoxocephalus*,  
*Paraphoxus*, *Pontharpinia*, *Pseudoharpinia?*, *Rhepoxynius*)

Platyschnopidae (*Eudevenopus*) (put in Phoxocephalidae)

Pleustidae

(*Chromopleustes*, *Dactypleustes*, *Gnathopleustes*, *Incisocalliope*, *Micropleustes*,  
*Parapleustes*, *Neopleustes*, *Pleusirus*, *Pleusymtes*, *Stenopleustes*, *Thorlaksonius*)

Podoceridae (*Dulichia*, *Dyopedos*, *Paradulichia*, *Podocerus*)

Stenothoidae

(*Metopa*, *Metopella*, *Parametopella*, *Probolisca*, *Proboloides*, *Stenothoe*,  
*Stenothoides*, *Stenula*)

Synopiidae (*Bruzelia*, *Tiron*, *Syrrohoe*)

Superfamily Hadziioidea Bousfield, 1982

(Allocrangonyctidae (also incl. in Crangonyctoidea) (*Allocrangonyx*))

Hadziidae (incl. in Melitoidea)

(*Allotexiweckelia*, *Hadzia*, *Holsingerius*, *Liagoceradocus*, *Metaniphargus*,  
*Mexiweckellia*, *Paramexiweckelia*, *Psammogammarus*, *Texiweckelia*, *Texiweckeliopsis*)

Melitidae (also incl. in Melitoidea)

(*Anisogammarus* (also put in Anisogammaridae), *Canarimelita*, *Desdimelita*, *Dulzura*,  
*Melita*, *Eriopisella*, *Megamoera*, *Rotomelita*)

Nuuanidae (*Nuuanu*)

Superfamily Ingolfiellidea

Ingolfiellidae (*Ingolfiella*)

Superfamily Melitoidea

Hadziidae, Melitidae (both put in Hadzioidea)

Superfamily Talitroidea Bulycheva, 1957

Hyaellidae (*Hyaella*, *Talitroides* (now in own family))

Talitridae

(*Americorchestia*, *Platorchestia*, *Spelaeorchestia* (once put in Hyaellidae);  
*Orchestia*, *Talitroides* (once put in Hyaellidae))

Superfamily Liljeborgioidea Bousfield, 1977

Liljeborgiidae (*Listriella*)

Sebidae (*Seborgia*)

Suborder Hyperiidea

Hyperiidae (*Hyperia*, *Hyperoche*, *Parathemisto*)

Families incl.

**Acanthonotozomatidae** (*Acanthonotozoma*, *Odius*)

**Ampithoidae** (*Cymadusa*)

**Allocrangonyctidae** (*Allocrangonyx*) Holsinger, 1989

**Ampeliscidae** (*Amplisca*, *Byblis*)

**Amphilochidae** (*Amphilochus*, *Gitana*, *Gitanopsis*)

**Anisogammaridae** Bousfield, 1977 (*Ramellogammarus*)

**Aoridae** Stebbing, 1899 (*Aoroides*, *Acuminodeutopus*, *Amphideutopus*, *Grandidierella* (once in  
Corophiidae), *Lembos*, *Leptocheirus*, *Microdeutopus*, *Rudilemboides*)

**Argissidae** (*Argissa*)

**Artesiidae** H.1980 (*Artesia* - also put in Bogidiellidae)

**Atylidae** (*Atylus*)

**Bateidae** (*Batea*)

**Bogidiellidae** Hertzog, 1936 (incl. *Artesiidae*)

(*Artesia*, *Parabogidiella*, *Stygogidiella*). 23 genera, approx. 109 sp. & ssp. Only St. Some generic differentiation before Pangean breakup. K-strategy (few eggs, long life). undescr.? genus & species (TX/Pb). **Bibl.** Coineau & Stock 1986; Koenemann 2000; Stock, 1981

**Calliopiidae** (*Calliopi*, *Halirages*, *Leptamphopus*)

**Caprellidae** (ghost shrimps) (*Caprella*, *Deutella*, *Luconacia*, *Mayerella*, *Metacaprella*, *Paracaprella*, *Tritella*)

**Corophiidae** (*Grandidierella* (now in *Aoridae*), *Cerapus*, *Corophium*, *Erichthonius*, *Lembos* (also put in *Aoridae*), *Microprotopus*, *Photis*, *Pseudunciola*, *Unciola* undet. genus in brackish LA beach)

**Crangonyctidae** Bousfield, 1973, emend Holsinger, 1977 (most genera once in *Gammaridae*) (*Apocrangonyx*, *Bacrurus*, *Crangonyx*, *Stygobromus*, *Stygonectes*, *Stygonyx*, *Synpleonia*, *Synurella*) Bousfield & Holsinger 1989 ; Holsinger 1977, 1985; Koenemann 2000

**Eusiridae**

(*Eusiroides*, *Eusirus*, *Oradarea*, *Paramoera*, *Pontogeneia*, *Rhachotropis*, *Tethygeneia*)

**Gammaridae** Leach, 1813 (*Elasmopus*, *Eriopisa*, *Gamarellus*, *Gammarus* (see *Crangonyctidae*), *Maera*, *Marinagammarus*, *Weyprechtia*; undet. genus in brackish beach sediment at Lake Pontchartrain, LA). **Bibl.:** Barnard & Karaman 1982; Bousfield 1977; Stock, 1986; Holsinger 1969, 1976c, 1972

**Hadziidae** Karaman, 1943 (*Allotexiweckelia*, *Hadzia*, *Holsingerius*, *Liagoceradocus*, *Metaniphargus*, *Mexiweckellia*, *Paramexiweckelia*, *Psammogammarus*, *Texiweckelia*, *Texiweckeliopsis*, new genus & species in TX/Pb) (also subsumed in *Melitidae*) **Bibl.:** Barnard 1958; Stock 1977

**Haustoriidae** (undet. genus in brackish beach sediment at Lake Pontchartrain, LA; *Acanthohaustorius*, *Amphiporeia*, *Bathyporeia*, *Eohaustorius*, *Haustorius*, *Lepidactylus*, *Neohaustorius*, *Parahaustorius*, *Pontoporeia*, *Protohaustorius*, *Pseudohaustorius*, *Urothoe*) **Bibl.:** M. Sweet 1996

**Hyaellidae** Bulycheva, 1957; Subfamily *Hyaellinae* Bousfield, 1996 (*Hyaella*, *Talitroides* (now in own family))

**Ingolfiellidae** (*Ingolfiella*)

**Isaeidae** (*Cheirimedeia*, *Gammaropsis*, *Kermystheas*, *Microprotopus*, *Photis*, *Protomedeia*)

**Ischyroceridae** (*Erichthonius*, *Ischyrocerus*, *Jassa*, *Microjassa*)

**Liljeborgiidae** (*Listriella*)

**Lysianassidae** (*Acidostoma, Allogaussia, Anonyx, Cyphocaris, Hippomedon, Lepidepcreum, Lysianassa, Lysianopsis, Onisimus, Opisa, Orchomene, Orchomene\lla, Pachynus, Prachynella, Psammonyx*)

**Megaluropidae** (*Gibberosus*)

**Melitidae** Bousfield, 1973 (also subsumed in Gammaridae) (see Hadziidae) (*Anisogammarus, Canarimelita, Desdimelita, Dulzura, Eriopisella, Megamoera, Melita, Rotomelita*)

**Melphidippidae** (*Eogammarus, , Melphidippa, Melphisana*)

**Niphargidae** (*Metaniphargus* (now in Hadziidae)) - Niphargidae is strictly Eurasian  
**Nuuanidae** McKinney & Barnard? (*Nuuanu*)

### **Oedicerotidae**

(*Americhelidium, Ameroculodes, Arrhis, Bathymedon, Deflexilodes, Monoculodes, Monoculopsis, Paroediceros, Synchelidium, Westwoodilla*)

**Paradaliscidae** Boeck, 1871 (*Halicoides, Nicippe, Spelaeonicippe*)

### **Phoxocephalidae**

(*Cephalophoxoides, Eobrolgus, Eudevenopu* (also put in Platyschnopidae), *Eobrolgus, Eyakia, Foxiphalus, Grandifloxus, Harpinia, Harpiniopsis, Heterophoxus, Mandibulophoxus, Metaphoxus, Metharpinia, Parametaphoxus, Phoxocephalus, Paraphoxus, Pontharpinia, Pseudoharpinia, Rhepoxynius*)

### **Pleustidae**

(*Chromopleustes, Dactypleustes, Gnathopleustes, Incisocalliope, Micropleustes, Parapleustes, Neopleustes, Pleusirus, Pleusymtes, Stenopleustes, Thorlaksonius* )

**Podoceridae** (*Dulichia, Dyopedos, Paradulichia, Podocerus*)

**Pontogeneiidae** Stebbing, 1906 (*Accedomoera, Peramoera*)

**Pontoporeiidae** (*Monoporeia*)

**Sebiidae** Walker, 1908 (*Seborgia*) Holsinger, 1986a

### **Stenothoidae**

(*Metopa, Metopella, Parametopella, Probolisca, Proboloides, Stenothoe, Stenothoides, Stenula*)

**Synopiidae** (*Bruzelia, Tiron, Syrrhoe*)

**Talitridae** (sand and beach fleas) (*Americorchestia, Platorchestia, Spelaeorchestia* (once put in Hyalellidae; *Talitroides* (once put in Hyalellidae)) (*Americorchestia, Orchestia*, undet. genus in brackish beach sediment at Lake Pontchartrain, LA)



*Acanthohaustorius* Bousfield, 1965 - Haustoriidae amphipods

*Acanthohaustorius intermedius* Bousfield, 1965 (rare Virginian marine infauna)

*Acanthohaustorius millsii* Bousfield, 1965 (FL, GA, MD, SC, VA, Carolinian marine infauna)

*Acanthohaustorius similis* A.B. Frame, 1980 (uncommon Virginian marine infauna)

*Acanthohaustorius uncinus* J.M. Foste, 1989 (wFL Gulf of Mex. marine infauna)

*Acanthonotozoma* Boeck, 1876 - Acanthonotozomatidae amphipods

*Acanthonotozoma rusanorae* Bryazgin, 1974 (AK marine infauna)

*Accedomoera* J.L. Barnard, 1964 – Pontogeneiidae amphipods

*Accedomoera vagor* J.L. Barnard, 1969 (WA marine infauna)

*Acidostoma* Lilljeborg, 1865 – Lyasianassidae amphipods

*Acidostoma hancocki* Hurley, 1963 (WA marine infauna)

*Acuminodeutopus* J.L. Barnard, 1959 - Aoridae amphipods

*Acuminodeutopus naglei* (Bousfield, 1973) (FL & Carolinian marine infauna)

*Acuminodeutopus heteruopus* (SC marine infauna)

*Allocrangonyx* Schellenberg, 1937 - Allocrangonyctidae amphipod. Bibl.: Holsinger 1971

*Allocrangonyx hubrichti* Holsinger, 1971 (type locality in cave in Phelps Co. + caves in WA, Crawford & Pulaski Cos., MO & White Co., AR/ Tb/ MO State T&E/Central Missouri Cave Amphipod)

*Allocrangonyx pellucidus* (*Niphargus p.* Mackin, 1953) Holsinger, 1971 (s.Pontotoc Co., scOK +Murray Co., \*Arbuckle Mts., AR/ Pb? or Pp, caves, crevice rivulets, karst springs/ OK T&E/ OK Cave Amphipod/ G1G3)

*Allocrangonyx* undet. sp. (crevice rivulets in San Blois Mts. near Wilburton, Latimer Co., OK+AR, MO/Pb?)

*Allogaussia* Schellenberg, 1926 – Lysianassoidae amphipods

*Allogaussia* undet. sp. (WA marine infauna)

*Allotexiweckelia* Holsinger in Holsinger, & Longley, 1980 - Hadziidae amphipods (once put in elitidae)

*Allotexiweckelia hamakua* J.L. Barnard, 1970 (anchialine cave in HI)

*Allotexiweckelia hirsuta* Holsinger in Holsinger, & Longley, 1980 (Artesian well in San Marcos, Hays Co., TX/ Pb/ Hairy well amphipod)

*Allotexiweckelia sal* J.L. Barnard, 1952 (sea caves in CA)

*Americhelidium* E.L. Bousfield & A. Chevrier, 1996 – Oedicerotidae amphipods  
*Americhelidium americanum* (Bousfield, 1973) (rare Virginian marine infauna)  
*Americhelidium millsii* E.L. Bousfield & A. Chevrier, 1996 (WA marine infauna)

*Americhelidium pectinatum* E.L. Bousfield & A. Chevrier, 1996 (WA marine infauna)  
*Americhelidium rectipalmum* (*Synchelidium* r. Mills, 1962) Bousfield & Chevrier, 1996 (WA marine infauna)

*Americhelidium variabilum* E.L. Bousfield & A. Chevrier, 1996 (WA marine infauna)

*Americorchestia* E.L. Bousfield, 1991 - Talitridae amphipods  
*Americorchestia longicornis* (Say, 1818) (NB, PQ Gulf of St. Lawrence sandy marine interstitial)

*Americorchestia megalophthalma* (Bate, 1862) (NB, PQ Gulf of St. Lawrence sandy marine interstitial)

*Ameroculodes* E.L. Bousfield & A. Chevrier, 1996 – Oedicerotidae amphipods  
*Ameroculodes* undet. sp. (Carolinian, Virginian, MA marine infauna)

*Ampelisca* Kroyer, 1842 - Ampeliscidae amphipods  
*Ampelisca abdita* Mills, 1964 (CA (alien), FL, LA, MA, MD, TX, NJ, RI, VA marine infauna)

*Ampelisca agassizi* (*Byblis a.* Judd, 1896) (AK, CA, wFL, WA marine infauna)  
*Ampelisca bicarinata* G.D. Goetze & R.W. Heard, Jr., 1983 (FL Gulf of Mex. marine infauna)

*Ampelisca brachycladus* Roney, 1890) (AK, CA marine infauna)  
*Ampelisca brevisimulata* J.L. Barnard (AK, CA, WA marine infauna)  
*Ampelisca careyi* Dickinson, 1982 (CA, WA marine infauna)

*Ampelisca compressa* (WA marine infauna)  
*Ampelisca cristata* Holmes, 1908 (WA marine infauna)  
*Ampelisca eschrichti* Kroyer, 1842 (AK marine infauna)

*Ampelisca cristata c.* Holmes, 1908 (CA marine infauna)  
*Ampelisca cristata microdentata* J. Barnard, 1954 (CA marine infauna)  
*Ampelisca furcigera* Bulycheva, 1936 (AK marine infauna)

*Ampelisca hancocki* complex (CA, WA marine infauna)  
*Ampelisca hessleri* J.J. Dickinson, 1982 (AK marine infauna)  
*Ampelisca holmesi* Pearse, 1908 (FL, LA marine benthic)

*Ampelisca identata* J. Barnard, 1954 (CA marine infauna)  
*Ampelisca lobata* Holmes, 1908 (WA marine infauna)

*Ampelisca lobatata c.* Holmes, 1908 (CA marine infauna)

*Ampelisca macrocephala* Liljeborg, 1852 (AK, NJ, NC, WA marine infauna)

*Ampelisca milleri* J.L. Barnard, 1954 (CA marine infauna)

*Ampelisca pacifica* Holmes, 1908 (CA marine infauna)

*Ampelisca pugetica* Stimpson, 1864 (CA, WA marine infauna)

*Ampelisca romigi* J.L. Barnard, 1954 (CA marine infauna)

*Ampelisca shoemakeri* J.L. Barnard, 1954 (CA marine infauna)

*Ampelisca* undet. sp. or species (tube-dwelling in MA benthic; Baffin Island (neCanada) marine infauna)

*Ampelisca unsocalae* J.L. Barnard, 1954 (CA, WA marine infauna)

*Ampelisca vadorum* Mills, 1963 (FL, LA, MA, MD, NJ, NY, VA marine infauna & surface deposit feeder)

*Ampelisca verrilli* Mills, 1967 (LA, MA, MD, NC, NJ, VA marine infauna)

*Amphideutopus* J.L. Barnard, 1959 - Aoridae amphipods

*Amphideutopus oculatus* J.L. Barnard, 1959 (CA marine infauna)

*Amphilochus* Bate, 1862 - Amphilochidae amphipods

*Amphilochus casahoya* McInney, 1978 (LA marine infauna?; (cf. *A.c.*) FL Gulf of Mex. marine infauna)

*Amphilochus littoralis* Stout, 1912 (CA marine infauna)

*Amphilochus neopolitanus* Della Valle, 1893 complex (CA marine infauna)

*Amphilochus picadrus* j. Barnard, 1962 (CA marine infauna)

*Amphilochus* undet. sp. or species (TX, wFL marine infauna)

*Amphiporeia* Shoemaker, 1929 - Haustoriidae amphipods

*Amphiporeia lawrenciana* Shoemaker, 1930 (NB, PQ Gulf of St. Lawrence sandy marine interstitial)

*Ampithoe* Leach, 1814 - Amphitoidae amphipods

*Ampithoe lacertosa* Bate, 1858 (AK, WA marine infauna)

*Ampithoe longimana* Smith, 1873 (Carolinian, Virginian, LA, w,eFL marine infauna)

*Ampithoe plumulosa* Shoemaker, 1938 (CA marine benthic)

*Ampithoe raymondi* "Audouin, 1826 (CA marine benthic)

*Ampithoe rubricata* (Montagu, 1808) (MA sandy marine infauna; (NB, PQ Gulf of St. Lawrence sandy marine interstitial)

*Ampithoe valida* Smith, 1873 (*A. shimizuensis* Stephensen, 1944) (CA, LA, MD, VA marine benthic)

*Anisogammarus* Derjavin, 1927 (also put in Anisogammaridae) – Melitideae amphipods  
*Anisogammarus pugettensis* (Dana, 1853) (CA marine infauna)

*Anonyx* Kroyer, 1833 - Lysianassidae amphipods  
*Anonyx lilljeborgi* Boeck, 1871 (WA marine infauna)  
*Anonyx multiarticulatus* (Pearse, 1913) (AK marine infauna)

*Anonyx nugax* (Phipps, 1774) (Baffin Island (neCanada) marine infauna)  
*Anonyx sarsi* Steele & Brunel, 1968 (NB, PQ Gulf of St. Lawrence sandy marine interstitial)

*Aoroides* Walker, 1898 - Aoridae amphipods  
*Aoroides columbiae* Walker, 1898 (CA, WA marine infauna)  
*Aoroides exilis* Conlan & Bousfield, 1982 (WA marine infauna)

*Aoroides inermis* Conlan & Bousfield, 1982 (WA marine infauna)  
*Aoroides intermedius* Conlan & Bousfield, 1982 (AK, WA marine infauna)  
*Aoroides* undet. sp. or species (sCA, WA marine infauna)

*Apocrangonyx* Karaman, 1974 = *Stygebromus*. Bibl.: Holsinger 1969a, 1977, 1978

*Argissa* Boeck, 1871 - Argissidae amphipods  
*Argissa hamatipes* (Syrroë l. Norman, 1869 (AK, sCA, wFL, OR, LA, WA marine infauna)

*Arrhis* Boeck, 1861 - Oedicerotidae amphipods  
*Arrhis lutheki* (AK marine infauna)  
*Arrhis* undet sp. (WA marine infauna)

*Aruga* - Lysianassidae amphipods  
*Aruga oculata* Holmes, 1908 (sCA marine infauna)  
*Aruga holmesi* J.L. Barnard, 1955 (sCA marine infauna)

*Artesia* Holsinger, & Longley, 1980 - Bogidiellidae amphipods (also put in Artesidae)

*Artesia subterranea* Holsinger in Holsinger & Longley, 1980 (Artesian well in San Marcos, Hays Co.,scTX/Pb/Artesian well amphipod)

*Artesia welbourni* Holsinger, 1992 (caves& wells, \*Culberson Co.,TX/rare gypsum St,Pb/West Texas cave amphipod)

*Atylus* Leach, 1815 - Atylidae amphipods  
*Atylus collingi* Gurjanova, 1938 (WA marine infauna)  
*Atylus levidensus* J.L. Barnard (WA marine infauna)

*Bactrurus* Hay, 1902 - Crangonyctidae amphipods. **Bibl.:** Koenemann 2000; Koenemann & Holsinger 1999, 2000

***Bactrurus angulus***” Koenemann & Holsinger 2001? (Claiborne Co.,TN & cave in Lee Co.,VA/  
Tb in slow flow cave streams)

***Bactrurus brachycaudus*** Hubricht & Mackin, 1940 (type locality in walled spring, St. Louis  
Co.,MO/ Pp (caves, seeps, ditches, and springs) in swIL (Calhoun, Green, Union, St. Clair,  
Sangamon, Pike, Monroe, Montgomery, Jackson, Johnson, Greene, Williamson, St. Claire,  
Adams Cos.) & eMO (Boone, Crawford, Dent, Franklin, Iron, Lincoln, Perry, Texas, St. Louis,  
St. Genevieve, St. Charles, St. Francois, Scott, Reynolds, Ralls, Pike, Madison, Lincoln,  
Jefferson, Bollinger Cos.) **Bibl.:** Bechler 1981, 1985

***Bactrurus cellulanus***” Koenemann & Holsinger 2001? (\*spring at IN Univ., Monroe Co., IN/  
Pb/ extinct?, can’t relocate, last seen in 1963, pesticides used and spring sealed)

***Bactrurus hubrichti*** Shoemaker, 1945 (well,Topeka,Shawnee Co.,eKS (Cowley, Neosbo, Riley,  
Shawnee, Bourbon, Butler, Chautaugua, Clay Cos.) +wcMO(Miller Co.), OK (Muskogee &  
Rogers Cos.)/St, Pb in springs, seeps, caves, or wells/ MO State T&E Status Uncertain/ Kansas  
well amphipod) **Bibl.:** C. Edler & Dodds 1996; Shoemaker 1945

***Bactrurus mucronatus*** (=Gammarus m.; Carinogammarus m.; Crangonyx m. Forbes, 1876)  
Hay, 1902 (Pb in seIA (Des Moines, Henry, Washington Cos.), c,nIL (Champaign, Coles,  
Fulton, Gallatin, Henderson, Knox, La Salle, McDonough, McLean, Montgomery, Moultrie,  
Peoria, Saline, Vermillion, Warren, Williamson), s,cIN (Grant, Henry, Marion, Montgomery,  
Noble, Shelby Cos.) (MI (Berrien, Monroe Cos.), wOH (Bulter, Clinton, Logan, Lucas, Marion,  
Montgomery, Preble, Wayne, Wood Cos./ Pb,Tp,seep,well,drain,salt marsh; MA, MS, NC, NJ,  
TX, VA marine infauna; PEI, NB, PQ Gulf of St. Lawrence sandy marine interstitial) /  
mucronate groundwater amphipod). **Bibl.:** L. Ross 1926; S. Williams 1932

*Bactrurus parvus* - see *Stygobromus p.*

***Bactrurus pseudomucronatus***” Koenemann & Holsinger 2001? (Pb in caves, wells, seeps in  
neAR (Lawrence, Randolph Co.) & scMO (Carter, Douglas, Oregon, Shannon Cos.) Gardner  
1986; Sutton 1997)

***Bactrurus*** undescr. sp. #1 (cave in Loudoun Co.,VA/Pb)

***Bactrurus*** undet. sp. (Pb in 2 caves in Carter Co.,MO)

*Bactrurus subtilis* - see *Stygobromus s.*

***Bactrurus wilsoni***” Koenemann & Holsinger 2001? (Pb in wells in AL (Blount Co. (Caldwell  
& Wilson residences)

***Batea*** Muller, 1865 - Bateidae amphipods

***Batea catharinensis*** Muller, 1865 (FL, LA, NJ, TX, VA marine infauna)

***Batea insipida*** (FL Gulf of Mex. marine infauna)

***Batea secunda*** (MA marine sandy infauna)

*Batea transversa* Shoemaker, 1926 (CA marine sandy infauna)

*Bathymedon* Sars, 1895 - Oedicerotidae amphipods

*Bathymedon kassites* Barnard, 1966 (sCA marine infauna)

*Bathymedon pumilis* Barnard, 1962 (sCA, WA marine infauna)

*Bathymedon roquedo* Barnard, 1962 (sCA marine infauna)

*Bathymedon vulpeculus* J.L. Barnard, 1971 (sCA marine infauna)

*Bathymedon* undet. sp. (AK marine infauna)

*Bathyporeia* Lindstrom, 1855 - Haustoriidae amphipods

*Bathyporeia parkeri* Bousfield, 1973 (rare Virginian marine infauna)

*Bathyporeia porteri* Lindstrom, 1855 (VA marine infauna)

*Bathyporeia quoddyensis* Shoemaker, 1949 (Virginian marine infauna)

*Bathyporeia* undet. sp. (GA marine infauna)

*Bemlos* Shoemaker, 1925 - Corophiidae amphipods

*Bemlos audbettius* (*Lembos a.* J.L. Barnard, 1962) (sCA marine infauna)

*Bemlos brunneomaculatus* (Meyer, 1977)

*Bemlos brunneomaculatus mackinneyi* (eFl, wFL Gulf of Mex. marine infauna)

*Bemlos concavus* (*Lembos a.* Stout, 1913) (sCA marine infauna)

*Bemlos setosus* (*Lembos s.* A.A. Myers, 1978) (FL, LA marine benthic)

*Bemlos unicornis* (Carolinian, wFL Gulf of Mex. marine infauna)

*Bruzelia* Boeck, 1871 – Synopiidae amphipods

*Bruzelia tuberculata* Sars, 1883 (WA marine infauna)

*Byblis* Boeck, 1871- Ampeliscidae amphipods

*Byblis* undet. sp. or sp. (AK, Baffin Island (neCanada) marine infauna)

*Byblis millsii* Dickerson, 1983 (WA marine infauna)

*Byblis veleronis* J. L. Barnard, 1954 (sCA, WA marine infauna)

*Calliopius* Liljeborg, 1865 - Calliopiidae amphipods

*Calliopius columbianus* Bousfield & Hendrycks, 1997 (BC, WA marine infauna)

*Calliopius laeviusculus* (Kroyer, 1838) (NB, PQ Gulf of St. Lawrence sandy marine interstitial)

*Canarimelita* Bousfield, 1990 - Melitidae amphipods (also subsumed in Gammaridae)

*Canarimelita janstocki* B., 1990 (anchialine pool near Hilo, HI/Pb)

*Caprella* Guilding, 1824 (ghost shrimps) Caprellidae amphipods

*Caprella acutifrons* Stimpson, 1957 (CA marine sandy infauna)

*Caprella californica* Stimpson, 1957 (CA marine sandy infauna)

*Caprella equilibra* Say, 1818 (CA marine sandy infauna)

*Caprella geometrica* (MA marine sandy infauna)

*Caprella gracilior* Mayer, 1903 (CA marine sandy infauna)

*Caprella mendax* Mayer, 1903 (CA marine sandy infauna)

*Caprella natalensis* (*Caperlla acutifrons* var. n. Mayer, 1903) (CA marine sandy infauna)

*Caprella penantis* Leach, 1814 (= *C. acutifrons* Latreille, 1816)(e,wFL, MD, NC, VA, PEI (Gulf of St. Lawrence) marine interstitial)

*Caprella septrionalis* Kroyer, 1838 (PEI, PQ, NB Gulf of St. Lawrence sandy marine interstitial)

*Caprella* undet. sp. (AK marine infauna)

*Caprella unica* Mayer, 1903 (PQ Gulf of St. Lawrence sandy marine interstitial)

*Caprella verrucosa* Boeck, 1872 (CA marine sandy infauna)

*Carinogammarus mucronatus* (Say) (MA, NC, NS marine sandy infauna)

*Cephalophoxoides* Gurjanova, 1977 - Phoxocephalidae amphipods

*Cephalophoxoides homilis* (*Phoxocephalus h.* Barnard, 1960) (sCA marine infauna)

*Cerapus* Say, 1817 - Corophiidae amphipods

*Cerapus estuarius* (wFL marine infauna)

*Cerapus* undet. sp. (Carolinian marine infauna)

*Cerapus tubularis* Say, 1817 (sCA, MD, MA, VA, Carolinian marine infauna)

*Cheirimedeia* Barnard, 1962 – Isaeidae amphipods

*Cheirimedeia zotea* Barnard, 1962 (WA marine infauna)

*Chromopleustes* E. L. Bousfield & E.A. Hendrycks, 1995 – Pleustidae amphipods

*Chromopleustes* (CA marine benthic & infauna?)

*Corophium* Latreille, 1806 - Corophiidae amphipods

*Corophium* (*Monocorophium*) *acherusicum* Costa, 1857 (AK, TX, e,wFL, VA, WA, PQ Gulf of St. Lawrence (NB, PQ) sandy marine interstitial)

*Corophium alienense* Chapman, 1988 (CA (alien) marine infauna)

*Corophium* (*Laticorophium*) *baconi* Shoemaker, 1934 (Carolinian, wFl Gulf of Mex. (cf. *C. b.*) marine infauna)

*Corophium bonelli* G.O. Sars, 1895 (NB, PQ Gulf of St. Lawrence sandy marine interstitial)

*Corophium brevis* Shoemaker, 1949 (OR, WA marine infauna)

*Corophium* (*Monocorophium*) *carlottensis* Bousfield & Hoover, 1997 WA marine infauna)

***Corophium crassicorne*** Bruzelius, 1859 (WA marine infauna)

***Corophium heteroceratum*** Yu, 1938 (CA marine infauna)

***Corophium* (*Monocorophium*) *insidiosum*** Crawford, 1937 (CT, MA marine sandy infauna; NB, PQ Gulf of St. Lawrence sandy marine interstitial)

***Corophium lacustre*** Vanhoffen, 1911 (NC rare marine infauna)

***Corophium louisianum*** Shoemaker, 1934 (wFL, LA, TX estuary marine infauna)

***Corophium*** undet. sp. or species (Salton Sea (CA) & sCA marine infauna)

***Corophium salmonis*** Stimpson, 1857 (AK, OR, WA marine infauna)

***Corophium simile*** Shoemaker, 1934 (Carolinian, GA marine infauna)

***Corophium* (*Americorophium*) *spinicorne*** Stimpson, 1857 (CA (alien), OR, WA marine infauna)

***Corophium stimpsoni*** Shoemaker, 1941 (CA (alien) marine infauna)

***Corophium tuberculatum*** Shoemaker, 1934 (FL, MD, NJ, VA estuary marine infauna)

***Corophium volutator*** Pallas, 1766 (NC marine infauna)

***Crangonyx*** Bate, 1859 - Crangonyctidae amphipods

**Bibl.:** Bechler 1977; Zhang 1997. Most epigean as adults but some hypogean as immatures

***Crangonyx anomalus*** Hubricht, 1943 (IL, nKY, sOH spr. (-fed stream, seep)/ Tx or Ac in IL?, KY/ IL State T&E/ Anomalous Spring Amphipod)

***Crangonyx antennatus*** (= *Niphargus a.* Packard, 1881; *Eucrangonyx a.*) Cope (type in Marion Co., eTN)/ sprs. & spring fed streams in nAL (Blount, Calhoun, De Kalb, Jackson, Jefferson, Marshall, St. Clair Cos.), neGA (upper AL River basin -. Chatooga, Floyd, Walker & Dade Co.), sIL, IN (1 cave in Jennings Co.); seKY, swOH (1 cave in Shelby Co.). se, eTN (21 cos., incl. Anderson, Bledsoe, Campbell, Claiborne, Cumberland, Decatur, Franklin, Grainger, Hamilton, Hancock, Hawkins, Knox, Marion, McMinn, Meigs, Rhea, Roane, Sullivan, Union, Washington, Wayne Cos.), swVA (Lee, Scott, Wise, WA Cos.)/ St, Tb/ VA Special Concern T&E; IL State T&E/ Appalachian Valley cave amphipod)

***Crangonyx antennatus*** **Bibl.:** Culver 1976, 1981; Dickson 1976-7, 1977a, 1978, 1979; Dickson & Holsinger 1981; Dickson, H. Patton & Avise 1979; Holsinger 1975a; Holsinger, & Dickson 1977; Shoemaker 1942.

***Crangonyx dearolfi*** Shoemaker, 1942 (type locality cave in Berks Co., PA + Piedmont & Valley & Ridge Provinces (Cumberland, Dauphin, Franklin & York Cos., PA) & 3 caves in WA Co. (MD T & E S1 G2G3)/ Pennsylvania or Dearolf's cave amphipod)

***Crangonyx floridanus*** Bousfield, 1963 (eLA, east, central US w. to KS, introduced into CO, OR, Japan/swamp, pools/ Tp in n&s. FL (Dade, Suwannee, Polk?, & Jackson Cos.) & MO (Camden Co.); Tx or Ac in ne AL)



***Crangonyx forbesi*** (= *Eucrangonyx f.* Hubricht & Mackin, 1940) Hubricht, 1943 (type locality in spring in St. Louis Co.(MO)+sprs. in IL, IN, OH/ spr.,pond,stream,Tp in nAR (Fulton Co.), OK (Mayes Co.), swIL(Monroe, Jackson, Williamson, Pike & St. Clair Cos.), KS (Cherokee Co.); KY (Barren, Christian, Edmonson (Mammoth C.), Grayson, Green, Hart, Meade Cos.), eMO (St. Louis, Barry, Benton, Callaway, Camden, Carter, Christian, Franklin, Hickory, Jefferson, Jasper, Madison Cos.)/ WV (epigean in Mason Co.) ; Tp or Tx in IN (Floyd, Dubois, Jefferson, Lawrence, Orange & Harrison Cos.) & PA (Fayette Co.) /Forbes' amphipod/S3(IN)/G4) **Bibl.:** D. Crawford & Tarter 1979

***Crangonyx gracilis*** S.I. Smith, 1871 group/complex (see *C. indianensis* in undesr. sp) (epigean (primarily Great Lakes region,less common in IN, ON, WI, MI ,IL, OH/ Tx or Tp in CO, IL, KS, KY, NY, sON, seVA, WV/hyporheic in CO & NY/ T&E VA S1S3) Shoemaker 1933

*Crangonyx g. packardi* - see *C.p.*

***Crangonyx grandimanus*** Bousfield, 1963 (type locality in Marion Co., FL/ Northern Highland, Woodville Karst (St.Marks-Wakulla R. Basin), Crystal Beach & Miami karst,FL (Alachua, Citrus, Dade, Gilchrist, Hernando, Leon, Levy,, Madison, Marion, Pasco, Pinellas, Suwanee, Wakulla, Madison Co. in n., s. to Dade Co.: most of FL except for Choctawhatchee-Yellow-Escambia & Apalachicola-Chattahoochee Flint hydrologic subregions in wFL Panhandle)/Pb, caaves, wells, karst springs/Federal T&E species of concern & FL T&E S2 global G2/ Florida cave amphipod)

***Crangonyx hobbsi*** Shoemaker, 1941 (type locality cave in Alachua Co.,FL + Alachua, Citrus, Columbia, Dade, Gilchrist, Hernando, Leon, Levy, Madison, Marion, Pasco, Pinellas, Suwanee, Wakulla Cos., FL/Pb/Federal T&E special concern; FL T&E S2S3 global G2G3/Hobbs' cave amphipod)

***Crangonyx minor*** Bousfield, 1953 (stream & ponds in neAR, seIA, sIL, MO, sOK, sON,wTN; Tp or Tx in IL,KY(Rockcastle Co.),TN; Tp? in OH/ Federal sp. of concern/ Minor or minor cave amphipod)

*Crangonyx mucronatus* - see *Baetrurus m.*

***Crangonyx obliquus*** Bates, 1859 (Ac or Tx in Mammoth C.,KY; *C.o.* complex in seVA hyporheic)

***Crangonyx packardi*** (*C.gracilis p.* S.I. Smith, 1888; *C.p* & *g.*,*E.p* Stebbing, 1899) S.I. Smith, 1888 (type locality in Lawrence Co.,IN/ (Clark, Crawford, Decatur, Greene, Harrison, Jefferson, Jennings, Lawrence, Monroe, Orange, Owen, Wahshington Cos.)+sIL(mostly caves in Shawnee Hills Natural Div.: Hardins, Saline, Union, Johnson Cos.), KS (Anderson, Barren, Bourbon, Butler, Franklin, Marion, Miami, Pottawatomie, Riley & Wilson Cos.); sc,wKY; (Crittenden, Carter, Edmonson (Mammoth C.), Rockcastle, Simpson Cos.); wcMO (Benton, Boone, Cass, Jackson Cos.)/Pb/ IL State T&E;IN T&E/Packard's Cave Amphipod) Hubricht 1943

*Crangonyx packardi* group or complex (IL & KY(Carter, Estill,Jackson, Lee & Pulaski Cos.))/Tb,Pb)

*Crangonyx pseudogracilis* Bousfield, 1958 (*C. aberrans* Smith, 1983) (most freshwater habitats in eCT,eMA,RI, largely west of Appalachians from GreatLakes area s.,sw. to LA,TX/ Tx? in sON & KY (2 caves in Jackson Co.)) **Bibl.:** MacNeil 1997

*Crangonyx richmondensis richmondensis* (*C.r.* Ellis, 1940) Bousfield, 1958 (*C. occidentalis* Hubricht & Harrison, 1941; *C. r. occidentalis* Bousfield, 1958; *C. r. laurnetianus* Bousfield, 1958; *C. alpinus* Bousfield,1963) (streams, lakes, ponds, swamps, bogs, ditches, drains and rarely caves in seAK to NF,NS, s. to FL/Pp in 3 se AK caves)

*Crangonyx rivularis* Bousfield, 1958 (epigean in rivers, streams, springs, ditches, ponds, small lakes, rarely caves in seON, IN,n,se.IL,cKY,n,seOH,c.s.MI,eMO,sWV/ Tx? in KY(Estill, Fayette Cos.),sON/ ON stream amphipod)

*Crangonyx setodactylus* Bousfield, 1958 (seON w. to sMI, s. to e.cIN, ncKY in cold streams,drain outlets, springs, sloughs, temporary pools/ very rare Tx in cave in KY)

*Crangonyx shoemakeri* (*Eucrangonyx s.* Hubricht & Mackin, 1940) Bousfield, 1958 (DC, scMD s. & sw. to scVA/sprs., streams, bogs, temporary pools/ Tx? in MD/ Shoemaker's amphipod) **Bibl.:** Holsinger 1972

*Crangonyx* undescr sp. #1 (“*C. aka*” in Zhang 1997/ streams & seeps in Pope, Van Buren, Saline Cos.,AR)

*Crangonyx* undescr sp. #2 (“*C. acicularis*” in Zhang 1997/ sprs.. & spr.-fed streams, some karstic, in TN (Sullivan Co.) & VA (Montgomery Co.))

*Crangonyx* undescr sp. #3 (“*C. castellanum*” in Zhang 1997/ sinkhole & five caves in Rockcastle Co.,one cave in Pulaski Co, w. margin of Cumberland Plateau, KY/ known only from caves & sinkholes) **Bibl.:** Seibert 1973

*Crangonyx* undescr. sp.#4 (*C. "barri"* in Zhang 1997/KY (Adair, Barren, Cumberland, Edmonson, Fayette, Jefferson, Madison, Meade, Monroe, Nelson Cos.) n.to IN half way up Blue River (Clark & Crawford Cos.),IN) Lewis 1997

*Crangonyx* undescr sp. #5 (*C. bousfieldi*” in Zhang 1997/ small streams, one spr, one well/ Tp? in one cave in Highland Co.,OH)

*Crangonyx* undescr sp. #6 (“*C. caecus*” in Zhang 1997)/ Cascade (=North Cave) Cavern + five other caves in \*Carter Co.,KY/ mainly cave pools, one stream/ Pb)

*Crangonyx* undescr sp. #7 (“*C. consimilis*” in Zhang 1997/epigean in eTN, nAL, ecMS/ Tp? in TN (Rutherford Co.)

**Crangonyx** undescr sp. #8 (“*C. cooperi*” Zhang/ type & 3 other caves in Morgan Co. & 1 cave in Colbert Co., both in AL/ Tb, not troglomorphic)

**Crangonyx** undescr sp. #9-? (“*C. fontinalis*” in Zhang 1997/ epigean in karstic sprs. near Repass & 2 caves in Bland Co.,VA/ same sp.? as in \*?well, Bland Co.,VA/Tb/VA T&E S1, Global G1))

**Crangonyx** undescr sp.#10 (*C. "indianensis"* in Zhang 1997 (= *C. gracilis* in part) / type locality cave in Greene Co.,IN (type locality)/ cKY n. into scIN karst/ Pb? Tp, not troglomorphic. **Bibl.:** Porter & Hobbs 1997/ /IN T&E) Lewis 1997

**Crangonyx** undescr sp. #11 (“*C. insolitus*” in Zhang 1997 (\*type locality cave in Shannon Co.,MO/Pb)

**Crangonyx** undescr sp.#12 (*C. "lewisi"* in Zhang 1997/ type locality in cave in Jennings Co., IN/ Clark, Jefferson Cos., seIN & ncKY (Mead, Owen Cos.)/ Tp, springs)

**Crangonyx** undescr. sp. #13 (“*C. longidactylus*” in Zhang 1997/ swales, cave spr. (Simpson Co.,KY), reservoirs in scKY,swNC)

**Crangonyx** undescr sp. #14 (“*C. montanus*” in Zhang 1997/ springs., spring-fed swamps & ponds/ karst window in WV (Greenbrier Co.) & VA karst sprs. (“Alleghany, Bath, Rockbridge Cos.)

**Crangonyx** undescr sp. #15 (“*C. ohioensis*” in Zhang 1997(seeps in IN (Clark Co.), KY (Carter, Lewis Cos.)/ St, Tp? (Adams Co.) & well in OH River drainage)

**Crangonyx** undescr sp. #16 (“*C. specus*” in Zhang 1997 (type in cave, Pulaski Co., KY/ two other caves in Pulaski Co.) & one cave in Wayne Co., extreme w. margin of Cumberland Plateau or e.margin of Cumberland Saddle, small part of Cumberland River drainage, KY/ Tb, Pb)

**Crangonyx** undescr sp.#17 (Wakulla Co., FL/ T&E S? & global G1 rank)

**Crangonyx** undescr sp.#18 (Dade Co., FL/ stygophile or stygobiotic)

**Crangonyx** undet. species (near *C. obliquus* Bates, 1859 & *C. richmondensis occidentalis* Hubricht & Harrison, 1941 in NW)

**Cymadusa** Savigny, 1816 - Ampithoidae amphipods

**Cymadusa compta** Smith, 1873 (e,wFL, LA, Virginian marine infauna)

**Cymadusa uncinata** (*Acanthogrubia u.* Stout, 1912) (CA marine benthic)

**Cyphocaris** Boeck, 1871 - Lysianassidae amphipods

**Cyphocaris challengeri** Stebbing, 1888 (WA marine infauna)

**Deflexilodes** E. L. Bousfield & A. Chevrier, 1996 - Oedicerotidae amphipods

*Deflexilodes enigmaticus* E. L. Bousfield & A. Chevrier, 1996 (WA marine infauna)

*Desdimelita* N. E. Jarrett & E.L. Bousfield, 1996 – Melitidae amphipods  
*Desdimelita desdichada* (= *Melita d.* Barnard, 1962) (WA marine infauna)

*Deutella* Mayer, 1890 - Caprellidae amphipods  
*Deutella incerta* (Virginian, wFL, LA Gulf of Mex. marine infauna)

*Dexamonica* – Dexaminidae amphipods  
*Dexamonica reduncans* (WA marine infauna)

*Dulichia* Kroyer, 1845 – Podoceridae amphipods  
*Dulichia rhabdoplastis* McCloskey, 1970 (CA, WA marine infauna)

*Dulichella* Stout, 1912 – Gammaridae amphipods  
*Dulichella appendiculata* Say, 1818 (Carolinian marine infauna)

*Dulzura* J.L. Barnard, 1969 - Melitidae amphipods (also subsumed in Gammaridae)  
*Dulzura hamakua* J.L. Barnard, 1970 (4-5 m. deep, marine sublittoral (probable) interstitial  
*Dulzura sal* J.L. Barnard, 1969 (CA marine beach & sublittoral interstitial)

*Dyopedos* Bate, 1857 – Podoceridae amphipods  
*Dyopedos arcticus* (Murdoch, 1885)(WA marine infauna)

*Dyopedos bispinis* (Gurjanova, 1930) (CA, WA, North Atlantic marine infauna)  
*Dyopedos monacanthus* (Metzger, 1875) (WA marine infauna)  
*Dyopedos* undet. sp. (AK marine infauna)

*Elasmopus* Costa, 1853 - Gammaridae amphipods  
*Elasmopus bampo*. J.L. Barnard, 1979 (CA marine benthic)  
*Elasmopus laevis* S.I. Smith, 1873 (e,wFL, LA, MD, VA marine infauna)

*Elasmopus mutatus* J.L. Barnard, 1962 (CA marine benthic)  
*Elasmopus procellimanus* FL Gulf of Mex. marine infauna)  
*Elasmopus rapax* Costa, 1853 (FL marine benthic)

*Eobrolgus* J.L. Barnard, 1979 – Phoxocephalidae amphipods  
*Eobrolgus spinosus* Holmes, 1905 (Carolinian, e,w,FL, Virginian, WA marine infauna)

*Eogammarus* Birstein, 1933 – Melphidippidae amphipods (also put in Gammaridae)  
*Eogammarus confervicolus* (Stimpson, 1856) (AK, OR, WA marine infauna)  
*Eogammarus oclairi* Bousfield, 1979 (WA marine infauna)

*Eohaustorius* J.L. Barnard, 1957 - Haustoriidae amphipods  
*Eohaustorius estuarius* Bosworth, 1973 (WA marine & brackish sandy interstitial burrower)

*Eohaustorius washingtonianus* (Thorsteinson, 1941) (OR, WA marine & brackish sandy interstitial burrower)

*Ericthonius* Milne-Edwards, 1830 - Corophiidae amphipods

*Ericthonius brasiliensis* (*Pyctilus b.* Dana, 1852) (sCA, FL, MD, TX, VA, WA marine infauna)

*Ericthonius hunteri* (AK, WA marine infauna)

*Ericthonius rubricornis* (*Cerapus r.* Stimpson, 1853) (sCA, WA marine infauna)

*Ericthonius tolli* Bruggen, 1909 (AK marine infauna)

*Eriopisa* Wrzesniovsky, 1890 - Gammaridae amphipods

*Eriopisa laakona* = *Metaniphargus l.*

*Eriopisella* Chevreux, 1920 - Melitidae amphipods (also subsumed in Gammaridae)

*Eriopisella upolu* J.L. Barnard, 1970 (Oahu (HI) marine sublittoral (probable) interstitial)

*Eudevenopus* Thomas & Barnard, 1983 - Phoxocephalidae amphipods (also put in Platyschnopidae)

*Eudevenopus honduranus* Thomas & Barnard, 1983 (w,eFL, LA marine infauna)

*Eusiroides* Stebbing, 1888 - Eusiridae amphipods

*Eusiroides monoculoides* (*Atylus m.* Haswell, 1879) (CA marine benthic, infauna?)

*Eusirus* Kroyer, 1845 - Eusiridae amphipods

*Eusirus columbianus* E.L. Bousfield & E.A. Hendrycks, 1995 (WA marine infauna)

*Eusirus cuspidatus* Kroyer, 1845 (WA marine infauna)

*Eusirus propinquus* G.O. Sars, 1893 (NB, PQ Gulf of St. Lawrence sandy marine interstitial)

*Eusirus* undet. sp. (CA marine infauna)

*Eyakia* J.L. Barnard, 1979 - Phoxocephalidae amphipods

*Eyakia robusta* (*Paraphoxus robustus* Holmes, 1908) (AK, sCA, WA marine infauna)

*Foxiphalus* J.L. Barnard, 1979 - Phoxocephalidae amphipods

*Foxiphalus cognatus* (*Paraphoxus c.* Barnard, 1960) (AK, sCA, WA marine infauna)

*Foxiphalus golfensis* Barnard & Barnard, 1982 (sCA marine infauna)

*Foxiphalus obtusidens* Alderman, 1936 (sCA, WA marine infauna)

*Foxiphalus similis* (*Paraphoxus s.* Barnard, 1960) (sCA, WA marine infauna)

*Gamarellus* Herbst, 1793 - Gammaridae amphipods

*Gamarellus angulosus* (Rathke, 1843) NB, PQ Gulf of St. Lawrence sandy marine interstitial)

*Gamarellus homari* (J.C. Fabricius, 1779) NB, PQ Gulf of St. Lawrence sandy marine interstitial)

***Gammaropsis*** Liljeborg, 1855 - Isaeidae amphipods

***Gammaropsis barnardi*** Kudryashov & Tzvetkova, 1975 (CA marine infauna?)

***Gammaropsis ellisi*** K.E. Conlan, 1983 (WA marine infauna)

***Gammaropsis mamola*** (*Megamphopus m.* J.L. Barnard, 1962) (sCA marine infauna)

***Gammaropsis melanops*** Sars, 1895 (AK marine infauna)

***Gammaropsis*** (*Podocerosis*) ***ociosa*** (J.L. Barnard, 1962) (sCA, WA marine infauna)

***Gammaropsis shoemakeri*** K.E. Conlan, 1983 (WA marine infauna)

***Gammaropsis*** (*Gammaropsis*) ***thompsoni*** (*Kermystheus o.* Walker, 1898) (sCA, WA marine infauna)

***Gammarus*** Fabricius, 1775 (= *Cancer*, *Pepredo*, *Lepleurus*, *Rivulogammarus*, *Fluviogammarus*, *Lagunogammarus*) Gammaridae amphipods

**Gammarus Bibl.:** Bechler 1977; Borowsky 1984, 1991; Bousfield 1958, 1976; Cole 1970, 1980, Holsinger 1977; Marchant 1981; Minckley 1964; M.& Cole 1963; Whitehurst 1988

**Gammarus acherondytes** Hubricht & Mackin, 1940 (type locality + 3 other caves in Monroe Co. & one cave in St.Clair Co. + 6 other sites in St.Clair or Monroe Cos.,swIL/Federal taxa proposed to be listed as endangered T&E; IL State T&E, global G3/Illinois cave amphipod/ Tb) **Bibl.:** Holsinger 1972; S. Taylor & Bade 1998; Webb 1995.

***Gammarus annulatus*** Smith, 1873 (PQ Gulf of St. Lawrence sandy marine interstitial)

***Gammarus chesapeakeensis*** (MA marine sandy infauna)

***Gammarus daiberi*** Bousfield, 1969 (Carolinian, Virginian marine infauna)

***Gammarus desparatus*** Cole, 1981 (Noels Amphipod/G2S2 in freshwater FL/Pb?),

***Gammarus duebeni*** Liljeborg, 1851 (PQ Gulf of St. Lawrence sandy marine interstitial)

***Gammarus fasciatus*** Say, 1818 (PQ Gulf of St. Lawrence sandy marine interstitial)

**Gammarus hyalelloides** Cole, 1976 \*\*(one spring and one cave in Jeff Davis Co., TX/ Pb,spring outlet/ diminutive amphipod/ G1)

**Gammarus lacustris lacustris** G.O. Sars, 1864 (Epigeal in nUS, Lower CO River, OK disjunct/ Pp in 6 seAK caves; AB lake benthic)

**Gammarus lacustris limnaeus** S.I.Smith, 1874 (= *G. robustus* S.I. Smith, 1875) (OK/ Pb,Tp or Tb) **Bibl.:** Hubricht 1943

***Gammarus lawrencianus*** Bousfield, 1956 (PEI Gulf of St. Lawrence sandy marine interstitial)

**Gammarus minus minus** Say, 1818 (= *R.m.*, *G. elki* Reinmer, 1969, *propinquus* Hay, 1902, *purpurascens* Hay, 1902 & *tenuipes* Shoemaker, 1940) (spring 1mi.w of Exteon, Chester

Co.,PA/ /Pb?, epigean, Tp in AL, AR, GA, IL, IN, KY, MD, MO, OH, OK, PA, TN, VA, WV;  
Tx in AR)

**Gammarus minus** **Bibl.:** Cole 1970a; Culver 1986a, 1987; Culver, Chang et al. 1995; Culver & Fong 1994; & Culver 1970; Culver, Jernigan, O'Connell & Kane 1994; Culver, Kane & Fong 1995; Fong 1983, 1985, 1991; Fong & Dai 1991; Gooch 1980, 1990; Gooch & Wiseman 1980; Gooch & Glazier 1986; Gooch & Golladay 1981; Gooch & Hetrick 1979; Haley 1997; Hervant, Mathieu & Barre' 1999; Hervant, Mathieu, Barre' & Simon 1999; Hetrick 1973 Hetrick & Gooch 1973, 1981; Holsinger 1987; Hoyte 1994; Jernigan, Culver & Fong 1994; R. Jones 1988, 1990; Jones & Culver 1989; R. Jones 1989, 1990; Kane & Chang 1995; Kane, Culver & Jones 1992; Kane & Chang 1995; Khashoggi 1988; Kostalos 1971, 1979; Kostalos & Seymour 1976; Khashoggi 1988; Lapp 1993; McCormick & Sarbu 1991; Man 1991; Man & Fong 1991; Mixon 1995; Nadel 1993; Ning 1989; B. Parker 2000; Schram 1987; Vawter, Fong & Culver 1987, 1989; Zeit 1993; Zhang 1997

**Gammarus minus pinicollis** Cole, 1976 (non-cave IL, MO/ Pb in IL,MO)

**Gammarus minus** var. *tenuipes* Shoemaker (interstitial)

*Gammarus mucronatus* Say, 1818 = *Mucrogammarus m.*

*Gammarus obliquus* = *Crangonyx o.*

**Gammarus palustris** Bousfield, 1969 (NC marine infauna)

**Gammarus pecos** Cole & Blousfield, 1970 (TX epigean, spring outlets, Pb?/ Pecos amphipod)

*Gammarus pinicollis* = see *B.m.p.*

**Gammarus pseudolimnaeus** Bousfield, 1958 (epigean in upper MS & Great Lakes drainage and Atlantic coastal plain to NC, lakes, and rivers (AR, cE, IL, IA, KY, MI, OK, sON, PQ, TN, WI)/ stream, spr.,Tp or Tx in AR, IL, MO) **Bibl.:** Barlocher & Kendrick 1975; Hynes & Harper 1972; S. Miller 1978; Rees 1972; Williams & Moore 1982

**Gammarus purpurascens** Hay, 1902 - now subsumed in *G.minus*

**Gammarus setosus** Dementieva, 1931 (PEI Gulf of St. Lawrence sandy marine interstitial)

**Gammarus tigrinus** Sexton, 1939 (hyporheic? in NB; rare NC marine infauna)

**Gammarus** undescr. sp.#1 (\*spring in Chaves Co., NM/spring)

**Gammarus** undescr. sp.#1 sp.#2? (sc, swMO, nAr, neOK/Tb)

**Gammarus** undescr. sp.#1 sp.#3 or ssp. near *forbesi* (sc,swMO, n.AR,neOK?/ Tb)

**Gammarus** undet. sp(p). (Estill, Powell, Rockcastle & Wayne Co.,KY/Pb;Tp in OH; sea cave in ME)

**Gammarus troglophilus** Hubricht & Mackin, 1940 (type locality in Monroe Co.,IL/ sw IL(St.Clair & Monroe Cos.), MO, swTN + Williams Co.,VA?/ Tp,spr.) **Bibl.:** Bechler 1981, 1985; Cole 1970; Jenio 1980; Weise 1953

***Gibberosus*** J.D. Thomas & J.L. Barnard, 1986 - Megalurotidae amphipods

*Gibberosus myersi* (McKinney, 1980) (w,eFL marine infauna)

*Gitana* Boeck, 1871 - Amphilochidae amphipods  
*Gitana calitemplado* J.L. Barnard, 1962 (sCA marine infauna)

*Gitanopsis* Sars, 1892 – Amphilochidae amphipods  
*Gitanopsis laguna* Mckinney, 1978 (wFL Gulf of Mex. marine infauna)  
*Gitanopsis* cf. *laguna* Mckinney, 1978 (Carolinian marine infauna)

*Gitanopsis* undet. sp (WA marine infauna)  
*Gitanopsis tortugae* Shoemaker, 1933 (Carolinian marine infauna)

*Globosolembos* Myers, 1985 – Corophiidae amphipods  
*Globosolembos smithi* (*Lembos* s. Holmes) (Carolinian, e,wFL, LA, NC marine infauna)

*Gnathopleustes* E.L. Bousfield & E.A. Hendrycks, 1995 - Pleustidae amphipods  
*Gnathopleustes pugettensis* (Dana, 1853)(WA marine infauna)

*Grandidierella* Coutiere, 1904; Myers 1970 - Aoridae amphipods  
*Grandidierella bonnieroides* Stephensen, 1947 (e,wFL, LA, TX, VA marine infauna)  
*Grandidierella japonica* Stephensen, 1938 (AK, CA, FL, LA, VA, WA marine infauna)

*Grandidierella koa* Barnard, 1977 (Hawaii I.,HI/Pp?)  
*Grandidierella palama* Barnard, 1977 (\*? type in Maui, HI/ lava tube anchialine Pb)

*Grandifoxus* J.L. Barnard, 1979 – Phoxocephalidae amphipods  
*Grandifoxus dixonensis* N.E. Jarrett & E.L. Bousfield, 1994 (WA marine infauna)  
*Grandifoxus grandis* Stimpson, 1857 (WA marine infauna)

*Hadzia* S. Karaman, 1932 (= *Liagoceradocus*) Hadziidae amphipods (once put in Melitidae)  
*Hadzia lonomaka* Barnard, 1977 (Maui I,Cape Kinau, Nukuele No.1/anchialine),

*Halicoides* - Paradaliscidae amphipods  
*Halicoides synopiae* (Barnard, 1962) (sCA marine infauna)

*Halirages* Boeck, 1971 - Calliopiidae amphipods  
*Halirages fulvocinctus* M.Sars, 1858 (PQ, NB Gulf of St. Lawrence sandy marine interstitial)

*Haploops* Liljeborg, 1856 - Ampeliscidae amphipods  
*Haploops* undet. sp. (Baffin Island (neCanada) marine infauna)  
*Haploops tubicola* Liljeborg, 1856 (WA marine infauna)

*Harpinia* Boeck, 1871 - Phoxocephalidae amphipods  
*Harpinia kobjakovae* Whittington, 1959 (AK marine infauna)

*Harpiniopsis* Stephensen, 1925 - Phoxocephalidae amphipods



*Harpiniopsis epistomata* J. Barnard, 1960 (CA marine infauna)

*Harpiniopsis excavata* (AK marine infauna)

*Harpiniopsis fulgens* J. L. Barnard, 1960 (sCA, WA marine infauna)

*Harpiniopsis galera* J. Barnard, 1960 (CA marine infauna)

*Haustorius* Muller, 1775 - Haustoriidae amphipods

*Haustorius* undet. sp. or species (GA, MS marine interstitial)

*Hemiproto* McCain, 1968 - Phtiscidae amphipods

*Hemiproto* undescr. sp. (sCA marine infauna)

*Heterophoxus* Shoemaker, 1925 - Phoxocephalidae amphipods

*Heterophoxus affinis* (*Harpinia a.* Holmes, 1908) (BC, CA marine infauna)

*Heterophoxus conlanae* (WA marine infauna)

*Heterophoxus ellisi* Jarrett & Bousfield, 1994 (CA,OR,WA marine infauna)

*Heterophoxus oculatus* (*Harpinia o.* Holmes, 1908) (AK, CA, WA marine infauna)

*Heterophoxus* undet. sp. (sCA marine infauna)

*Hippomedon* Boeck, 1871 – Lysianassidae amphipods

*Hippomedon* cf *coecus* Holmes, 1908 (WA marine infauna)

*Hippomedon columbianus* Jarrett & Bousfield, 1982 (CA, OR, WA marine infauna)

*Hippomedon denticulatus* Bate, 1857 (WA marine infauna)

*Hippomedon* undet. sp. (AK marine infauna)

*Hippomedon subrobustus* Hurley 1963 (CA, OR, WA marine infauna)

*Hippomedon tenax* Barnard, 1966 (CA marine infauna)

*Hippomedon zetesimus* Hurley 1963 (CA marine infauna)

*Holsingerius* Karaman & Barnard, 1982 - Hadziidae amphipods (once put in Melitidae)

*Holsingerius samacos* (*Texiweckelia s.* Holsinger in Holsinger, & Longley, 1980) (artesian well at San Marcos, Hays Co.,TX/Tb,St./ San Marcos well amphipod)

*Holsingerius smaragdinus* Holsinger, 1992 (type in sink and cave in Stockton Plateau,Val Verde Co.,TX/ St./ Emerald Sink amphipod)

*Hyale* Rathke, 1837 - Hyalidae amphipods

*Hyale nilssoni* (Rathke, 1843) (PQ, NB Gulf of St. Lawrence sandy marine interstitial)

*Hyale plumulosa* Stimpson, 1857 (WA marine sandy infauna)

*Hyale prevostii* (MA marine sandy infauna)

*Hyale* undet. sp. (sCA marine infauna)

*Hyaella* Latreille, 1806 - Hyaellidae amphipods, Subfamily Hyaellinae

*Hyaella azteca* (Saussure, 1858) (epigeal in MT, VA, WA, WI/ Tx in AR, FL, OK, TX; karstic spr. & hyporheic in CA; AB lake benthic; IL river benthic/ harmed by zinc, copper, and cadmium) **Bibl.:** Hargrave 1970.

*Hyaella montezuma* Cole & Watkins, 1977 (\*Montezuma Well,AZ/sink Pb?/ Montezuma's Well amphipod). **Bibl.:** Dehdashtii 1987; Dehdashti, English & Blinn 1983; Runck 1993

*Hyaella* (prob.) undet. sp. or species (hyporheic (probable) of Rio Calaveras, Jemez Mts.,NM; Ttp in Devil's Hole, NV)

*Hyaella* undescr. sp. (\*Death Valley Texas Spring,CA/ Pb) **Bibl.:** Baldinger 1998

*Hyperia* Latreille I Desmarest, 1823 – Hyperiididae amphipods

*Hyperia* undet. sp. (WA marine infauna)

*Hyperoche* Bovallius, 1887 – Hyperiididae amphipods

*Hyperoche* undet. sp. (WA marine infauna)

*Ingolfiella* Hansen, 1903 - Ingolfiellidae amphipods

*Ingolfiella fuscina* Dojiri & Sieg, 1987 (Gulf of Mexico, Atlantic coast of NA/ shallow water 17-151 m., interstitial? & infauna)

*Ischyrocerus* Kroyer, 1838 - Ischyroceridae amphipods

*Ischyrocerus anguipes* Kroyer, 1838 (CA, WA & PEI, PQ, NB Gulf of St. Lawrence sandy marine interstitial)

*Ischyrocerus pelagops* J.L. Barnard, 1962 (CA marine infauna)

*Ischyrocerus* undet. sp. or species (AK, WA marine infauna)

*Jassa* Leach, 1814 - Ischyroceridae amphipods

*Jassa falcata* (Virginian (rare), WA marine infauna)

*Jassa marmorata* Holmes, 1903 (PQ, NB Gulf of St. Lawrence, Virginian sandy marine interstitial)

*Jassa slatteryi* Conlan, 1909 (CA marine infauna)

*Kermystheas ociosa* = *Gammaropsis* (*Podoceropsis*) *o.*

*Lembos* J. L. Barnard, 1973 - Corophiidae or Aoridae amphipods

*Lembos rectangulatus* A.A. Myers, 1977 (FL marine infauna)

*Lembos setosus* = *Bembos* *s.*

*Lembos smithi* (Holmes, 1873) (FL, LA, NC, NJ marine infauna)

*Lembos unifasciatus* Myers, 1977 (LA marine infauna)

*Lembos websteri* Bate, 1857 (NC marine infauna)

*Lembos* undet. sp. (TX estuary marine infauna)

*Marinagammarus* – Gammarida amphipods

*Marinagammarus stierorsis* (NC marine infauna)

*Lepidactylus* Say, 1818 - Haustoriidae amphipods

*Lepidactylus dytiscus* Say, 1818 (GA, MD, MA, VA marine infauna)

*Lepidactylus* undet. sp. (LA marine benthic infauna)

*Lepidepcreum* Bate & Westwood, 1868 - Lysianassidae amphipods

*Lepidepcreum comatum* Gurjanova, 1962 (AK marine infauna)

*Lepidepcreum garthi* Hurley, 1963 (sCA, OR, WA marine infauna)

*Lepidepcreum gurjanovae* Hurley, 1963 (sCA, OR, WA marine infauna)

*Lepidepcreum* undescr. sp. (sCA marine infauna)

*Leptamphopus* Sars, 1895 – Calliopiidae amphipods

*Leptamphopus* undet. sp. (WA marine infauna)

*Leptocheirus* Zaddach, 1884 - Aoridae amphipods

*Leptocheirus pinguis* Stimpson, 1853 (MA, NY, RI marine infauna filter feeder)

*Leptocheirus plumulosus* Shoemaker, 1932 (Carolinian, MD, MA, VA marine infauna)

*Leucothoe* Leach, 1814 – Leucothoidae amphipods

*Leucothoe spinicarpa* Abildgaard (NC marine infauna)

*Liagoceradocus* Barnard, 1965 - Hadziidae amphipods (once put in Melitidae)

*Liagoceradocus lonomaka* (J.L. Barnard, 1977) (anchialine cave in Maui, HI)

*Listriella* Barnard, 1959 - Liljeborgiidae amphipods

*Listriella albina* J.L. Barnard, 1959 (FL, TX marine infauna)

*Listriella barnardi* Wigley, 1963 (e,wFL, LA, TX, VA marine infauna)

*Listriella clymenellae* (Mills, 1961) (TX, VA estuary marine infauna)

*Listriella eriopisa* J.L. Barnard, 1959 (sCA marine infauna)

*Listriella diffusa* J.L. Barnard, 1959 (sCA marine infauna)

*Listriella goleta* J.L. Barnard, 1959 (sCA marine infauna)

*Listriella melanica* J.L. Barnard, 1959 (sCA marine infauna)

*Luconacia* Mayer, 1903 - Caprellidae amphipods

*Luconacia incerta* (Mayer, 1903) (FL, Virginian marine infauna)

*Lysianassa* Milne-Edwards, 1830 - Lysianassidae amphipods  
*Lysianassa holmesi* (WA marine infauna)

*Lysianopsis* Stebbing, 1906 - Lysiannassidae amphipods  
*Lysianopsis alba* Holmes, 1903 (CA, FL, NC, Virginian infauna)

*Maera* Leach, 1814 - Gammaridae amphipods  
*Maera caroliniana* Bynum & Fox, 1977 (Carolinian marine infauna)

*Maera danae* Stimpson, 1853 (AK, NJ, WA & Gulf of St. Lawrence (PQ, NB) marine interstitial)

*Maera loveni* (AK, WA sandy marine interstitial)

*Maera simile* Stout, 1913 (sCA marine infauna)  
*Maera* undet. species (Cape Kinau, Maui, HI/hypogean, anchialine cave; NC marine infauna)  
*Maera vigota* J.L. Barnard, 1969 (sCA marine infauna)

*Mandibulophoxus* J.L. Barnard, 1957 - Phoxocephalidae amphipods  
*Mandibulophoxus uncirostratus* Giles, 1890 (OR, WA marine infauna)

*Marinagammarus* Sexton & Spooner, 1940 (also treated as subgenus of *Gammarus*) – Gammaridae amphipods

*Marinagammarus stoerorsis* (NC marine infauna)

*Megamoera* Bate, 1862 – Melitidae amphipods  
*Megamoera borealis* N.E. Jarrett & E.L. Bousfield, 1996 (WA marine infauna)

*Melita* Leach, 1814 - Gammaridae amphipods  
*Melita californica* (WA marine infauna)

*Melita dentata* Kroyer, 1842 (AK, CA, WA marine infauna)  
*Melita desdichada* Barnard, 1962 (AK, CA marine infauna)

*Melita elongata* Sheridan, 1979 (wFl Gulf of Mex. marine infauna)  
*Melita nitida* Smith, 1873 (Virginian, Carolinian, MA marine infauna)

*Melita oregonensis* Barnard, 1954 (AK, OR, WA marine infauna)  
*Melita sulca* (Stout, 1913) (WA marine infauna)

*Melphidippa* Boeck, 1871 - Melphidippidae amphipods  
*Melphidippa goesi* Stebbing, 1899 (WA marine infauna)

*Melphisana* J.L. Barnard, 1962 - Melphidippidae amphipods  
*Melphisana bola* J.L. Barnard, 1962 (sCA, WA marine infauna)

*Metaniphargus* Stephensen, 1933 - Hadziidae amphipods (once put in Melitidae)  
*Metaniphargus laakona* J.L. Barnard, 1970 (= *Eriopisa l.*) (Cape Kinau ( Maui) & Kaho'olawe Island, HI/ hypogean, anchialinecaves, interstitial)

*Metaphoxus* Lincoln, 1979 - Phoxocephalidae amphipods  
*Metaphoxus frequens* J.L. Barnard, 1960 (sCA, WA marine infauna)  
*Metaphoxus fultoni* (Scott, 1890) (WA marine infauna)

*Metharpinia* Schellenberg, 1931 - Phoxocephalidae amphipods  
*Metharpinia coronadoi* Barnard, 1980 (CA marine benthic)

*Metharpinia floridana* Shoemaker, 1933 (e,wFL marine infauna)  
*Metharpinia jonesii* (*Paraphoxus j.* Barnard, 1980) (CA marine benthic)

*Metopa* Boeck, 1871 - Stenothoidae amphipods  
*Metopa bruzelii* (Goes, 1866) (PQ, NB Gulf of St. Lawrence sandy marine interstitial)

*Metopa dawsoni* J.L. Barnard, 1962 (sCA, WA marine infauna)  
@*Metopa proboldes* (WA marine infauna)

*Metopella* Stebbing, 1906 - Stenothoidae amphipods  
*Metopella* undet sp. (WA marine infauna)

*Mexiweckelia* Holsinger & Minckley, 1971 - Hadziidae amphipods. **Bibl.:** Barnard & B. 1983; Holsinger 1973a

*Mexiweckelia coahuila* Bowman 1992 (type in cave in Coahuila, Mexico +Bexar & Medina Cos.(TX)/St)

*Mexiweckelia hardeni* Holsinger, 1992 (hyporheic in creek in Medina Co. +Comal Co, TX/ Pb, hyporheic/ Harden's interstitial amphipod)

*Mexiweckelia texensis* - see *Texiweckelia*

*Mayerella* Janko, 1987 - Caprellidae amphipods  
*Mayerella banksia* Laubitz, 1970 (sCA, WA marine infauna)

*Metacaprella* - Caprellidae amphipods  
*Metacaprella anomala* (WA marine infauna)  
*Metacaprella kennerlyi* (WA marine infauna)

*Microdeutopus* Costa, 1853 - Aoridae amphipods

*Microdeutopus anomalus* (Rathke, 1843) (Europe (Spain) & CT marine infauna)

*Microdeutopus gryllotalpa* Costa, 1853 (MA, NY, Virginian marine sandy infauna, suspension deposit feeder, tubiculous)

*Microdeutopus myersi* Bynum & Fox, 1977 (FL marine benthic)

*Microjassa* Stebbing, 1899 - Ischyroceridae amphipods

*Microjassa litotes* Stebbing, 1899 (WA marine infauna)

*Microprotopus* Norman, 1867 - Isaeidae amphipods

*Microprotopus* undet. sp. or species (FL, TX estuary benthic)

*Microprotopus raneyi* Wigley, 1966. (e,wFL, MD, VA rare marine infauna)

*Monocorophium* E.L. Bousfield & P.M. Hoover, 1997 – Corophiidae amphipods

*Monocorophium carlottensis* E.L. Bousfield & P.M. Hoover, 1997 (WA (alien) marine infauna?)

*Monocorophium acherusicum* (MD, VA marine infauna?)

*Monocorophium tuberculatum* (Shoemaker, 1934) (Virginian, Carolinian marine infauna)

*Monoculodes* Stimpson, 1853 - Oedicerotidae amphipods

*Monoculodes edwardsi* Holmes, 1905 (wFL, MA, Gulf of St. Lawrence (PQ, NB), Virginian (rare) sandy marine infauna)

*Monoculodes emarginatus* Barnard, 1962 (CA marine infauna)

*Monoculodes latissimanus* Stephensen, 1931 (CA marine infauna)

*Monoculodes norvegicus* Bloeck, 1876 (WA marine infauna)

*Monoculodes nyei* Shoemaker, 1933 (wFL, LA, TX estuary marine infauna)

*Monoculodes* undet. sp. or species (Baffin Island (neCanada), GA, NC & sCA marine infauna)

*Monoculodes rectipalmum* Mills, 1962 (CA marine infauna)

*Monoculodes spinipes* Mills, 1962 (OR, WA marine infauna)

*Monoculodes tuberculatus* Boeck, 1871 (MA marine sandy infauna; PQ, NB Gulf of St. Lawrence sandy marine interstitial)

*Monoculodes zernovi* Gurjanova, 1938 (AK, WA marine infauna)

*Monoculopsis* Ledoyer, 1973 - Oedicerotidae amphipods

*Monoculopsis longicornis* (Boeck, 1871) (PEI, PQ, NB Gulf of St. Lawrence sandy marine interstitial)

*Monoporeia* E.L. Bousfield, 1989 - Pontoporeiidae amphipods

*Monoporeia* undet. sp. (PQ Gulf of St. Lawrence sandy marine interstitial)

*Mucrogammarus* – Gammaridae amphipods

*Mucrogammarus mucronatus* (= *Gammarus g.* Say, 1818) (TX, Virginian marine infauna)

*Neohaustorius* Bousfield, 1965 – Haustoriidae amphipods

*Neohaustorius schmitzi* Bousfield, 1965 (GA marine infauna)

*Neopleustes* Stebbing, 1906 - Pleustidae amphipods

*Neopleustes* undet. sp. (AK marine infauna)

*Nicippe* Bruzellius, 1859 - Pardaliscidae amphipods

*Nicippe tumida* Bruzellius, 1859 (AK, sCA marine infauna)

*Niphargus* - see *Allocrangonyx p.* Bibl.: Mackin, 1935

*Nuuanu* Barnard, 1970 - Nuuanidae amphipods

*Nuuanu amikai* J. Barnard, 1977 (Cape Kinau (Maui) & Kaho'olawe Island, HI/ hypogean, anchialine caves)

*Odius* Liljeborg, 1865 - Acanthonotozomatidae amphipods

*Odius crassiginus* Liljeborg, 1865 (AK marine infauna)

*Oediceros* Kroyer, 1842 - Oedicerotidae amphipods

*Oediceros saginatus* Kroyer, 1842 (PEI, PQ, NB Gulf of St. Lawrence sandy marine interstitial)

*Onisimus* Boeck, 1871 - Lysianassidae amphipods

*Onisimus* undet. sp. (Baffin Island (neCanada) marine infauna)

*Opisa* Kroyer, 1842 - Lysianassidae amphipods

*Opisa tridentata* Hurley, 1963 (sCA, OR, WA marine infauna)

*Oradarea* A.O. Walker, 1903 - Eusiridae amphipods

*Oradarea longimana* (*Amphithopsis l.* Boeck, 1871) (CA, WA marine infauna)

*Orchestia* Leach, 1814 - Talitridae amphipods

*Orchestia grillus* (Bosc, 1802) (NC & PEI, PQ, NB Gulf of St. Lawrence sandy marine interstitial)

*Orchomene* Boeck, 1871 Lysianassidae amphipods

*Orchomene anaquelus* J.L. Barnard, 1954 (sCA marine infauna)

*Orchomene decipiens* (*Orchomenella p.* Hurley, 1963) (sCA, OR, WA marine infauna)

*Orchomene pacificus* (*Orchomenella p.* Gurjanova, 1938) (sCA, OR, WA marine infauna)

*Orchomene obtusa* Sars, 1895 (WA marine infauna)

*Orchomene pinguis* Boeck, 1861 = *Orchomenella p.*

*Orchomene* undet. sp. (AK marine infauna)

*Orchomenella* Sars, 1890 - Lysiannassidae amphipods

*Orchomenella* (*Orchomenopsis*) *minuta* (MA marine infauna)

*Orchomenella* (*Orchomenopsis*) *pinguis* (G.O. Sars, 1891) (AK, PEI, PQ, NB Gulf of St. Lawrence sandy marine interstitial; sCA, MA, WA marine infauna)

*Pachynus* Bulycheva, 1955 - Lysianassidae amphipods

*Pachynus barnardi* Hurley, 1963 (sCA, OR, WA marine infauna)

*Parabogidiella* Holsinger, & Longley, 1980 - Bogidiellidae amphipods

*Parabogidiella americana* Holsinger in Holsinger & Longley, 1980 (artesian well in San Marcos (Hays Co.) +Bexar Co.,scTX/Pb)

*Paracaprella* Mayer, 1903 - Caprellidae amphipods

*Paracaprella pusilla* (Carolinian , wFL Gulf of Mex.marine interstitial)

*Paracaprella tenuis* Mayer, 1903 (e,wFL, LA, MD, VA marine infauna; PEI Gulf of St. Lawrence sandy marine interstitial)

*Paradulichia* Boeck, 1871 – Podoceridae amphipods

*Paradulichia typica* Boeck, 1871 (WA marine infauna)

*Parahaustorius* Bousfield, 1965 – Haustoriidae amphipods

*Parahaustorius attenuatus* (Carolinian, Virginian marine infauna)

*Parahaustorius longimerus* (Carolinian, Virginian GA marine infauna)

*Parametaphoxus* Gurjanova, 1977 - Phoxocephalidae amphipods

*Parametaphoxus fultoni* (Scott, 1890) (sCA marine infauna)

*Parametaphoxus quaylei* Jarrett & Bousfield, 1994(sCA marine infauna)

*Parametopella* Gurjanova, 1938 - Stenothoidae amphipods

*Parametopella cypris* Holmes, 1905 (MD, VA marine infauna?)

*Parametopella* undet. sp. or species (TX estuary benthic; WA, wFL Gulf of Mex. marine infauna)

*Paramexiweckelia* Holsinger, 1981 - Hadziidae amphipods

*Paramexiweckelia ruffoi* Holsinger, 1993 (Val Verde Co.,TX/St/ Ruffo's spring amphipod) Holsinger, 1995a

*Paramicrodeutopus* A.A. Myers, 1988 - amphipods

*Paramicrodeutopus* cf. *myersi* (Bynum & Fox, 1977) (wFL Gulf of Mex. marine infauna)

*Paramicrodeutopus schmitti* (*Microdeutopus* s. Shoemaker, 1942) (sCA marine infauna)

*Paramoera* Miers, 1875 - Eusiridae amphipods. **Bibl.:** Staude 1986

*Paramoera columbiana* Bousfield, 1958 (intertidal & freshwater in 3 seAK caves)



*Paramoera lokowai* J. Barnard, 1977 (\*Honaunau Well No. 1, Hawaii I., HI/anchialine/ G1)  
*Paramoera paakai* J. Barnard, 1977 (\*Tokyo-Land lava pond, Hawaii I., HI/anchialine/ G1G2)  
*Paramoera rua* J. Barnard, 1977 (\*type locality cave in Big Island, HI/ anchialine/ G1)

*Paraphoxus* Sars, 1891- Phoxocephalidae amphipods  
*Paraphoxus bicuspidatus* Barnard, 1960 (CA marine infauna)

*Paraphoxus epistomus* (Shoemaker, 1938) (Atlantic marine infauna burrower)  
*Paraphoxus gracilis* N.E. Jarrett & E.L. Bousfield, 1994 (WA marine infauna)  
*Paraphoxus heterocuspoidatus* Barnard, 1960 (WA marine infauna)

*Paraphoxus holbolli* (Kroyer, 1842) (Atlantic marine infauna burrower)  
*Paraphoxus milleri* (Thornsteinson, 1941) (OR, WA marine infauna)  
*Paraphoxus robustus* = *Eyakia robusta*

*Paraphoxus oculatus* (Carolinian, WA marine infauna)  
*Paraphoxus similis* Barnard, 1960 (AK, CA marine infauna)

*Parapleustes* Buchholz, 1874 - Pleustidae amphipods  
*Parapleustes americanus* E.L. Bousfield & E.A. Hendrycks, 1995 (WA marine infauna)

*Parapleustes gracilis* Buchholz, 1874 (PEI, PQ, NB Gulf of St. Lawrence sandy marine interstitial)

*Parapleustes pugettensis* (Dana, 1853) (WA marine infauna)

*Parathemisto* Boeck, 1870 – Hyperiididae amphipods  
*Parathemisto pacifica* (WA marine infauna)

*Pardalisca* Kroyer, 1842 - Pardaliscidae amphipods  
*Pardalisca cuspidata* (WA marine infauna)

*Pardalisca tenuipes* G.O. Sars, 1893 (WA & Gulf of St. Lawrence (PEI, PQ, NB) sandy marine interstitial)

*Paroedicerus* Sars, 1895 - Oedicerotidae amphipods  
*Paroedicerus* undet. sp. (Baffin Island (neCanada) marine infauna)

*Peramphithoe* Conlan & Bousfield, 1982 – Amphilochidae amphipods  
*Peramphithoe* undet. sp. (WA marine infauna)

*Photis* Kroyer, 1842 - Isaeidae amphipods  
*Photis acia* J.L. Barnard, 1962 (CA marine infauna)  
*Photis bifurcata* J.L. Barnard, 1962 (CA, WA marine infauna)

*Photis brevipes* Shoemaker, 1942 (AK, CA, WA marine infauna)

*Photis californica* Stout, 1913 (CA marine infauna)

*Photis conchiola* Alderman, 1936 (CA marine infauna)

*Photis lacia* J.L. Barnard, 1962 (CA, WA marine infauna)

*Photis linearmanus* Conlan, 1994 (CA marine infauna)

*Photis longicaudata* (Bate & Westwood, 1862) (Carolinian marine infauna)

*Photis macinerneyi* Conlan, 1983 (CA, WA marine infauna)

*Photis macrotica* J.L. Barnard, 1962 (CA, WA marine infauna)

*Photis macromanus* Mckinney, Kalke, & Holland, 1978 (LA marine infauna)

*Photis melanicus* Mckinney, 1980 (LA marine infauna)

*Photis oligochaeta* K.E. Conlan, 1983 (WA marine infauna)

*Photis pachydactyla* K.E. Conlan, 1983 (WA marine infauna)

*Photis parvidons* K.E. Conlan, 1983 (CA, WA marine infauna)

*Photis pugnator* Shoemaker, 1945 (Virginian marine infauna)

*Photis reinhardi* Kroeyer, 1842 (rare Virginian marine infauna)

*Photis spasskii* Gurjanova, 1951 (WA marine infauna)

*Photis viuda* J.L. Barnard, 1962 (CA marine infauna)

*Phoxocephalus* Stebbing, 1888 - Phoxocephalidae amphipods

*Phoxocephalus holbolli* (Kroyer, 1842) (PEI, PQ, NB Gulf of St. Lawrence sandy marine interstitial & NY, MA surface/ suspension deposit feeder, tubiculous))

*Platorchestia* Bousfield, 1982 - Talitridae amphipods

*Platorchestia platensis* (Kroyer, 1845) (PEI, PQ, NB Gulf of St. Lawrence sandy marine interstitial)

*Pleusymtes* J.L. Barnard, 1969 - Pleustidae amphipods

*Pleusymtes coquilla* J.L. Barnard, 1969 (WA marine infauna)

*Pleusymtes glaber* (Boeck, 1861) (Virginian (rare) Gulf of St. Lawrence (PEI, PQ, NB) sandy marine interstitial)

*Pleusymtes pulchella* (G.O. Sars, 1876) (PEI, PQ, NB Gulf of St. Lawrence sandy marine interstitial)

*Pleusymtes* undet. sp. (AK marine infauna)

*Pleusymtes subglaber* (Barnard & Given, 1960) (sCA, WA marine infauna)

*Photis* Kroyer, 1842 - Isaeidae amphipods

*Photis lacia* J.L. Barnard, 1962 (sCA marine infauna)

*Podocerus* Leach, 1814 - Podoceridae amphipods

*Podocerus brasiliensis* (*Platophium b.* Dana, 1853 (CA, FL marine infauna)

*Podocerus cristatus* (*Cyrtophium c.* Thomson, 1879) (CA, FL, WA marine infauna)

*Podocerus* undet. sp. (sCA marine infauna)

*Pontharpinia* Stebbing, 1897 - Phoxocephalidae amphipods

*Pontharpinia floridana* Shoemaker (NC marine infauna)

*Pontogeneia* Boeck, 1871 - Eusiridae amphipods

*Pontogeneia inermis* (*Amphithoe i.* Kroyer, 1838) Kroyer, 1838 (CA, WA & PEI, PQ, NB Gulf of St. Lawrence sandy marine interstitial)

*Pontogeneia intermedia* Gurjanova, 1938 (WA marine infauna)

*Pontogeneia rostrata* (WA marine infauna)

*Pontoporeia* Kroyer, 1842 - Haustoriidae amphipods

*Pontoporeia affinis* Lindstrom (OR, WA marine infauna)

*Pontoporeia femorata* Kroyer, 1842 (Baffin Island (neCanada), WA marine infauna)

*Pontoporeia inermis* (*Amphithoe i.* Kroyer, 1838) (CA marine infauna)

*Pontoporeia rostrata* Gurjanova, 1938 (CA, Baffin Island (neCanada) marine infauna)

*Prachynella* J.L. Barnard, 1964 - Lysianassidae amphipods

*Prachynella lodo* J.L. Barnard, 1964 (sCA, WA marine infauna)

*Probolooides* Della Valle, 1893 - Stenothoidae amphipods

*Probolooides* undet. sp. (WA marine infauna)

*Protohaustorius* Bousfield, 1965 – Haustoriidae amphipods

*Protohaustorius deichmannae* Bousfield, 1965 (Carolinian, Virginian (cf. *P.d.*) marine infauna)

*Protohaustorius wigleyi* Bousfield, 1965 (Carolinian, Virginian marine infauna)

*Protomedeia* Kroyer, 1842 - Isaeidae amphipods

*Protomedeia articulata* J.L. Barnard, 1962 (WA marine infauna)

*Protomedeia grandimana* Bruggen, 1906 (WA marine infauna)

*Protomedeia penates* Barnard or *P. prudens* (WA marine infauna)

*Protomedeia prudens* J.L. Barnard, 1966 (AK, WA marine infauna)

*Protomedeia prudens*/ *Cheirimedeia* (WA marine infauna)

*Protomedeia* undet. sp. or species (AK, sCA marine infauna)

*Psammogammarus* Karaman, 1955 - Hadziidae amphipods (once put in Melitidae)  
*Psammogammarus garthi* J.L. Barnard, 1952 (sCA sea caves?; CA marine sublittoral interstitial)

*Psammonyx* Bousfield, 1973 – Lysianassidae amphipods  
*Psammonyx nobilis* (Stimpson, 1853) (NH marine infauna) K. Scott 1975

*Pseudalibrotus* Della Valle, 1893 - Lysiannassidae amphipods  
*Pseudalibrotus* undet. sp. (Baffin Island (neCanada) marine infauna)

*Pseudohaustorius* Bousfield, 1965 - Haustoriidae amphipods  
*Pseudohaustorius caroliniensis* Bousfield, 1965 (eFL marine infauna)  
*Pseudohaustorius* undet. sp. or species (wFL Gulf of Mex., SC marine infauna)

*Pseudunciola* Bousfield, 1973 – Corophiidae amphipods  
*Pseudunciola* obliquua Virginian marine infauna)

*Ramellogammarus* Bousfield, 1979 - Anisogammaridae amphipods  
*Ramellogammarus* undet. sp. or species (Tx or Tp in 3 seAK intertidal & freshwatercaves: anticipated for other Pacific seaside freshwatercaves)

*Relictoseborgia hershleri* = *Seborgia h.*

*Rhachotropis* Boeck, 1871 - Eusiridae amphipods  
*Rhachotropis barnardi* Bousfield & Hyndrycks, 1995 (sCA, WA marine infauna)

*Rhachotropis clemens* Barnard, 1967 (WA marine infauna)

*Rhachotropis distincta* (Holmes, 1908) (CA & PEI, PQ, NB Gulf of St. Lawrence sandy marine interstitial)

*Rhachotropis inflata* Sars, 1883 (WA marine infauna)  
*Rhachotropis oculata* Hansen, 1888 (WA marine infauna)

*Rhepoxynius* J.L. Barnard, 1979 - Phoxocephalidae amphipods  
*Rhepoxynius abronius* (*Paraphoxus a.* J. Barnard, 1960) (AK, sCA, NY, WA marine infauna)

*Rhepoxynius barnardi* N.E. Jarrett & E.L. Bousfield, 1994 (WA marine infauna)  
*Rhepoxynius bicuspidatus* (*Paraphoxus b.* J.L. Barnard, 1960) (sCA marine infauna)  
*Rhepoxynius boreovariatus* N.E. Jarrett & E.L. Bousfield, 1994 (WA marine infauna)

*Rhepoxynius daboius* (*Paraphoxus d.* J. Barnard, 1960) (sCA, OR, WA marine infauna)  
*Rhepoxynius fatigans* (*Paraphoxus f.* J. Barnard, 1960) (sCA marine infauna)

*Rhepoxynius heterocuspoidatus* (*Paraphoxus h.* Barnard, 1960) (sCA marine infauna)

*Rhepoxynius hudsoni* J.L. Barnard & C.M. Barnard, 1982 (Carolinian, Virginian marine infauna)

*Rhepoxynius lacubrans* (*Paraphoxus l.* J. Barnard, 1960) (sCA marine infauna)

*Rhepoxynius menziesi* Barnard & Barnard, 1982 (sCA, WA marine infauna)

*Rhepoxynius pallidus* (*R. tridentatus* ssp. *p.*) (WA marine infauna)

*Rhepoxynius* undet. sp. (Virginian marine infauna)

*Rhepoxynius stenodes* (*Paraphoxus s.* Barnard, 1960) J.L. Barnard, 1954 (sCA marine infauna)

*Rhepoxynius variatus* (*Paraphoxus v.* J.L. Barnard, 1960) (sCA, WA marine infauna)

*Rhynohalicella* – Pardaliscidae amphipods

*Rhynohalicella halona* (Barnard, 1971 (WA marine infauna)

*Rotomelita* J.L. Barnard, 1976 - Melitidae amphipods (also subsumed in Gammaridae)

*Rotomelita ana* J.L. Barnard, 1977 (\*cave in Maui, HI/ Pb, anchialine, 1-2% salinity)

*Rotomelita lokoia* J.L. Barnard, 1977 (\*type locality cave in Big Island, HI/ Pp,Tb?, anchialine, 2-12% salinity)

*Rudilemboides* Barnard, 1959 - Aoridae amphipods

*Rudilemboides naglei* Bousfield, 1973 (Carolinian, LA, e,wFL marine infauna)

*Rudilemboides stenopropodus* Barnard, 1959 (sCA marine infauna)

*Schisturella* Norman, 1900 - Lysianassidae amphipods

*Schisturella cocula* Hurley, 1963 (WA marine infauna)

*Seborgia* Bousfield, 1970- Sebidae.amphipods. **Bibl.:** Karaman 1982

*Seborgia* (*Relictoseborgia*) *hershleri* Holsinger, 1992 (spr.e. of Devils R.,32km n. of Del Rio, Val Verde Co.,scTX/ St /Hershler's spring amphipod)

*Seborgia* (*Relictoseborgia*) *relicta* Holsinger in Holsinger, & Longley, 1980 (= *Texiweckelia r.*) (artesian well in San Marcos (Hays Co.) +Medina & Comal Cos.,Edwards Aquifer, scTx/Pb/ Minute artesian well amphipod),

*Spelaeonicippe* Stock & Vermeulen, 1982 - Pardaliscidae amphipods

*Spelaeonicippe* undet.sp. (possibly in anchialinecaves in Florida Keys)

*Spelaeorchestia* Bousfield & Howarth, 1976 - Talitridae amphipods

*Spelaeorchestia koloana* Bousfield & Howarth, 1976 (Kauai cave amphipod/Koloa Cave #2, \*caves near Koloa,s.coastal plain of Kauai,HI/Federal T&E ; HI S1.1, global G1 rank/ threatened by surface activities such as vegetation removal, grading, filling, paving, agricultural development, and chemical and biological controls employed to control non-native plants)

*Stenopleustes* Sars, 1893 – Pleustidae amphipods

*Stenopleustes inermis* Shoemaker, 1949 (Carolinian marine infauna)

*Stenopleustes inermis* Shoemaker, 1949 (= *S. thermis* misspelling?) (Virginian marine infauna)

*Stenothoe* Dana, 1852 - Stenothoidae amphipods

*Stenothoe* undet. sp. or species (WA, FL Gulf of Mex. marine infauna)

*Stenothoides* Chevreux, 1900 - Stenothoidae amphipods

*Stenothoides bicoma* J.L. Barnard, 1962 (sCA marine infauna)

*Stenula* J.L. Barnard, 1962 - Stenothoidae amphipods

*Stenula* undet. sp. (WA marine infauna)

*Stygobromus* Cope, 1872 (= *Apocrangonyx*, *Boruta*, *Stygonectes*, *Synpleonia*, *Synurella*)

Crangonyctidae amphipods. **Bibl.:** Holsinger 1974a, 1976b, 1978; Holsinger, & Cooper 1977; Karaman 1974; Koenemann 2000; Ward & Holsinger 1981

*Stygobromus* *abditus* Holsinger, 1978 (type & one other cave in Pulaski Co., 1 cave in Smyth Co. & 2 caves in WA Co., all VA/ Tb, St/ VA Threatened T&E/James Cave amphipod)

*Stygobromus* *acicularis* Holsinger (in ms.)

*Stygobromus* *ackerlyi* Holsinger, 1978 (type in cave in Polk Co.; also in one cave in Floyd Co., both counties of GA/ Tb, Pb/ Ackerly's cave amphipod/ G1)

*Stygobromus* *affinis* Holsinger (in ms.)

*Stygobromus* *alabamensis a.* (*Stygonectes a.* Stout, 1911; *Stygonectes americana* Mackin, 1935; *Sstygonectes a.occidentalis* Holsinger, 1967) (sc,swAL(Clark, Lee, Wilcox Cos.) &nLA(Union Co.) to ecMS (Clarke, Lauderdale Cos.), nw.to swTN (S3?, G4G5), w.to nAr(Benton, Boone, Cleburne, Conway, Garland, Independence, IZard, Jackson, Johnson, Logan, Marion, Newton, Searcy, Stone, Van Buren, Washington Cos.), KS (Cheokee,Douglas, Marion Cos.), eTX (Dallas, Nacogdoches, Palo Pinto Cos.), eOk (Adair, Choctaw, Delaware, Latimer, Mayes, Murray, Ottawa, Pontotoc, Tulsa, Tipton Cos.), n.to cMO(12cos.), MD(3cos.) /Pb,rarely cr.) Hubricht 1947,

*Stygobromus* *alabamensis occidentalis* (*Stygonectes a.o.* Holsinger, 1967; part of *S.a.* Stout, 1911; *Synpleonia* & *C. a.*) (well 2 mi. e of Auburn, Lee Co.,AL+LA?,OK(Pontotoc & Murray Cos.),TX(Palo Pinto, Irion?, & Dallas Cos.)/ Alabama groundwater amphipod/ phreatobite, seep,spr.),

*Stygobromus* *alleggheniensis* (*Stygonectes a.* Holsinger, 1967) (wMD(Allegany, Garrett, Washington Cos.), c&eNY(Albany, Chemung, Chenango, Hekimer, Jefferson, Livingston, Montgomery, Onondaga, Orange, Schohaire, Steuben, Sullivan, Ulster Cos.), cPA(Berks, Blair, Cameron, Center, Clearfield, Clinton, Fayette, Lancaster, Lebanon, Miffli, Monroe, Schuyskill, Somerset, Tioga, Union, Westmoreland Cos.), neWV(Hardy, Jefferson, Morgan Cos. – S1)/

St, seep, spr., well/Shenandoah or Allegheny cave amphipod/MD rare T&E S2S3; WV T&E S1, global G4 or G5) Karaman 1974

**Stygobromus araeus** (*Crangonyx a.* Holsinger, 1969) (seep 1.6km n of Crittenden Nansemond (VA) +neVA (Chesapeake, Isle of Wight, James City, New Kent, Newport News, Surry, York Cos.) & Gates Co., NC/Pb/NC State T&E/Tidewater interstitial amphipod),

**Stygobromus arbucklensis** Holsinger (in ms.)

**Stygobromus arizonensis** Holsinger, 1974 (cave (type locality), nearby mine spr. & other cave, all in Cochise Co. & bog spr. (Santa Cruz Co.), & Sycamore Cr. 32 km ne of Phoenix (Maricopa Co.), all in AZ/ federal T&E species of concern/ St in caves, bog springs, seeps/AZ cave amphipod)

**Stygobromus balconis** (*Stygonectes b.* Hubricht, 1943) (type locality in cave in Hays Co./ caves in Hays, Coryell, Kendall, San Saba & Travis Cos., Balcones Fault Zone, TX/Tb/Balcones cave amphipod) Bibl.: Holsinger 1978

**Stygobromus barodyi** Holsinger, 1978 (type locality in cave in \*Rockbridge Co., VA/ Tp, St/ VA Special Concern T&E & S1S2, Global G2/Rockbridge Co. cave amphipod)

**Stygobromus barri** (*Stygonectes b.* Holsinger, 1967) (\*MO seep/Madison, St. Francois & Wayne Cos./Pb/MO State T&E; Federal Species of Concern/ Barr's cave amphipod)

**Stygobromus barryi** Holsinger, 1978 (\*cave in Unicoi Co., TN/St/ Blankenship Cave amphipod/ G1)

*Stygobromus bifurca* = *Synurella b.*

**Stygobromus bifurcatus** (*Stygonectes b.* Holsinger, 1967) (type in San Saba Co./ caves in Bell, Coryell, Hays, Kendall, Lampasas, San Saba, Travis, Williamson Cos., scTX/ St/ Bifurcated cave amphipod)

**Stygobromus biggersi** Holsinger, 1978 (type locality in Frederick Co. (VA)/ other caves in VA (WA Co. (2-3c.), MD, WV (Jefferson Co.), PA (Cumberland & Franklin Cos.)/St/VA T&E; MD T&E S1; WV T&E S1, global G4 or G2G4/ Bigger's cave amphipod)

**Stygobromus borealis** Holsinger, 1978 (type locality in cave in Rutland Co. (VT)/ seeps in Rensselaer Co. (NY) & MA, Taconic Mts. (Berkshire Co.)/ Pb/ MA State Special Concern T&E/ New England cave amphipod)

**“Stygobromus bosanaki”** Holsinger (in ms.)

**Stygobromus bowmani** (*Stygonectes b.* Holsinger, 1967) (\*seep, Mayes Co., OK/Bowman's cave amphipod/ St./ G1G3)

**Stygobromus canadensis** Holsinger, 1980a (type locality cave in Alberta/ St, glacial refugia/Castleguard Cave amphipod) **Bibl.:** Holsinger, 1981; Holsinger, & Shaw 1986

**Stygobromus carolinensis** Holsinger, 1978 (seeps in Yancey Co.,NC/Tb/Carolina seep scud/NC T&E S1?; NC & Federal Special Concern/Carolina groundwater amphipod)

**Stygobromus clantoni** (=Synpleonia c. Creaser, 1934; *Boruta a.* Mackin, 1935; *Synpleonia americana* Hubricht, 1947) (well 4mi.se of Ottawa, eKS (Anderson, Butler, Chase, Cowley, Franklin, Miami Cos.) +nAR(Clay Co.), wMO (Camden, Cass, Hickory, Jefferson Cos.), OK/ St, mostly wells/KS T&E S2S4, G2G4 global rank/Clanton's cave amphipod)

**Stygobromus coloradensis** Ward, 1977 (N.Fork S.Platte R.,Jefferson Co.,CO/ Pb, hyporheic/ Colorado groundwater amphipod)

**Stygobromus conradi** (*Stygonectes c.* Holsinger, 1967) Karaman 1974 (type locality cave and one othe cave in Bath Co.) + one cave in Highland Co., all in VA/ Tb/ VA Special Concern T&E & S1S2, Global G1G2/Burnsville Cove cave amphipod)

**“Stygobromus consobrinus”** Holsinger (in ms.)

**Stygobromus cooperi** (*Stygonectes c.* Holsinger, 1967) Karaman1974 (\*one cave, once sealed shut, Berkeley Co., WV/ Tb/ WV T&E S1, global G1; Federal Species of Concern/ Cooper's cave amphipod)

**Stygobromus culveri** Holsinger, 1978 (type locality in Randolph Co., also caves in Tucker Co., bothWV/ St/ WV T&E S1, global G3; Federal Species of Concern/Culver's cave amphipod)

**Stygobromus cumberlandus** Holsinger,1978 (type locality cave I n Wise Co./ 2 caves in Lee Co. +Scott Co. & well (Duffield),VA/Tb,St/ VA Special Concern T&E & S1, Global 1/ Cumberland cave amphipod)

**“Stygobromus davisi”** Holsinger (in ms.)

**Stygobromus dejectus** (*Stygonectes d.* Holsinger, 1967) (type locality cave & Boxed Spr.?, Kendall Co.,TX/ Cascade cave amphipod/ Pb)

*Stygobromus dentata* = *Synurella d.*

**Stygobromus dicksoni** Holsinger, 1978 (type locality cave in Jackson Co.,AL/ caves in neAL(Marison & Marshall Cos.), TN (Hamilton Co.) & nGA (Chattooga, Dade & Walker Cos.)/ St, Tb/ Dickson's cave amphipod)

**Stygobromus elatus** (*Stygonectes* Holsinger, 1967b) (\*AR seep near Magazine Mtn.,Logan Co./Pb/elevated spring amphipod)



**Stygobromus *elliotti*** Holsinger, 1974b (type locality and 2 othe caves in Skamania Co.,WA/Sb,St/ Washington lava cave amphipod/ G1)

**Stygobromus *emarginatus*** (*Synpleonia e.* Hubricht, 1943) (type locality cave and one other cave in Greenbrier Co., one in Tucker Co., one cave in Pocahontas Co.) one in Randolph Co., + caves in Monroe Co., WV & Garrett Co.,MD/ Tb/ WV T&E S3, global G3; MD T&E S1/Greenbrier Cave Amphipod) Culver 1976; Knapp & Fong 1997

**Stygobromus *ephemerus*** (*Stygobronyx e.* Holsinger, 1969a; *Apocrangonyx e.* Holsinger, 1969a) (\*\*type locality cave in Giles Co.,VA/Tb/ VA Special Concern T&E & S1, Global G1/Ephemeral cave amphipod)

**Stygobromus *estesi*** Holsinger, 1978 (type locality cave and one othe cave in Craig Co. + cave in Allegheny Co.,VA/Tb,St/ VA Special Concern T&E & S1, Global G1/Craig Co. cave amphipod)

**Stygobromus *exilis*** Hubricht, 1943 (= in part *C. vitreus* (Cope) Holmes 1909, *E. & S.v.*) (Mammoth C. type locality/ KY (Barren, Christian, Edmonson, Hart, Logan, McCreary, Metcalf, Russell, Simpson, Todd, Trigg, Warren, Wayne Cos.), Bibb Co.(AL) & TN (Bedford, Bledsoe, Campbell, Cannon, Clay, De Kalb, Fentress, Franklin, Maury, Putnam, Robertson, Rutherford, Smith, Trousdale, Wislon Cos.)/Tp or St/ central Kentucky cave amphipod)

**Stygobromus *fecundus*** Holsinger, 1978 (\*cave in Great Smoky Mts.Natl. Park, Blount Co.,TN/ Cades Cove cave amphipod/ St/ G1)

**Stygobromus *fergusoni*** Holsinger, 1978 (type & one other cave in Montgomery Co. & one or more caves in Botetourt Co., both in VA/Tb/ VA Special Concern T&E & S1, Global G1/Montgomery Co. cave amphipod),

**Stygobromus *finleyi*** Holsinger, 1978 (type locality cave in Claiborne Co.,TN + cave in, Lee Co., both VA/ Tb/ VA T&E S1, G1G4/ English or Finley's Cave Amphipod)

**Stygobromus *flagellatus*** (*Crangonyx f.* Benedict, 1896; Hay, 1902; *S. bowersii* Ulrich, 1902; *Stygonectes f.*) Karaman, 1974; Holsinger, 1967 (artesian well at San Marcos + 2 caves in Hays Co. & cave or caves in Bexar Co.,TX/ Tp,hypogean), Holsinger 1995, group (Val Verde Co.,TX/St/ Ezell's Cave amphipod),

**Stygobromus *franzi*** Holsinger, 1978 (type locality cave in in Garrett Co. + caves in Garrett, WA & Allegany Cos.,MD (S1) & Monongalia, Bedford, Mineral & Preston Cos.,WV (SU) & /Pb in karst & nonkarst sprs./Franz's cave amphipod/ G2G3)

**Stygobromus *gardneri*** Holsinger (in ms.) (Carter, Crawford, Dent, Franklin, Iron, Jefferson, Oregon, Perry, Phelps, Shannon, St. Francois, WA Cos.,MO/ Pb in caves & springs)

**“Stygobromus *giovannolii*”** Holsinger (in ms.) (cave & 3 seeps in Edmonson Co.,KY)

**“Stygobromus *godfreyi*”** Holsinger (in ms.) (\*?cave in Morgan Co.,AL)

*Stygobromus gracilipes* (*Stygonectes* g. Holsinger, 1967) Karaman, 1974 (type locality cave in Warren Co. + other caves in Frederick, Warren, & Rockingham Cos., all VA +MD (WA Co.), WV (Berkeley & Jefferson Cos. – S1) & PA (Franklin Co.)/Tb,St/VA Special Concern T&E & S1, Global G2G4; MD T&E S1/ Shenandoah Valley cave amphipod)

*Stygobromus gradyi* Holsinger, 1974b (type locality cave in Tuolumne Co. + other cave (or new sp.) & 2 other caves in Amador Co. & 5 caves in Calaveras Co.,CA (Tb G3/CA T&E G1S1, Federal Species of Concern/ Grady's cave amphipod)

*Stygobromus grahami* Holsinger, 1974b (type locality cave in Calaveras Co. + caves in Amador Co.,CA/ Tb,Pb/ G3/ Graham's cave amphipod),

*Stygobromus grandis* Holsinger, 1978 (\*cave in Chattooga Co.,GA/Tb/ P. Cave amphipod)

*Stygobromus hadenoecus* (*Stygonectes* h. Holsinger, 1966) (\*cave in Edwards Co.,TX/Devil's Sinkhole amphipod/St) Bibl.: Elliot 1973

*Stygobromus harai* Holsinger, 1974a \*\*\* (type locality & mine & one other cave in Tuolumne Co.,CA/G3G4? Tb/CA T&E G1S1, Federal Species of Concern/ Hara's cave amphipod)

*Stygobromus hayi* (*Synpleonia* h. Hubricht & Mackin, 1940) K.1974 (\*? Natl. Zoological Pk., DC + WV?/ spr.,Tp/ federal T&E/ Hay's Spring amphipod)

*Stygobromus heteropodus* Hubricht, 1943 (Pickle Spr.& other springs, Ste. Genevieve Co.,MO/ Pb/ Pickle Sprs. amphipod)

*Stygobromus hoffmani* Holsinger, 1978 (type locality cave & one other cave (destroyed by highway),Alleghany Co.,VA/Tb/VA Threatened T&E & S1, Global G1G2/Alleghany County cave amphipod) Holsinger, 1978

*Stygobromus holsingeri* Ward, 1977 (spr.3.2 km.w of Fort Collins + other sprs. in Larimer Co. & Devils Gulch & Redstone seep springs in Tanager Co., CO/ Pb/ Holsinger's groundwater amphipod)

*Stygobromus hubbsi* Shoemaker, 1942 (\*type locality cave in Harney Co.,OR/FC-2 T&E/ Malheur Cave amphipod) **Bibl.:** Benedict & McEvoy 1995

*Stygobromus hubbsi* sp. group (nAZ & all CA sp.(but *S. mysticus*)/Pb)

*Stygobromus ictalurus* Holsinger (in ms.) (\*cave in Blount Co.,AL/ Tb)

*Stygobromus illinoisensis* Holsinger (in ms.) (\*discharge pipe in Pope Co.,IL)

*Stygobromus indentatus* (Holsinger, 1967) (= *Synpleonia pizzinii* Shoemaker, 1938) Karaman1974 (MD (Anne Arundel Co. – G3), NC(Nash Co.), seVA (Isle of Wright, Lancaster, Nansemond, Northumberland & Caroline Cos.)/ Pb?/NC T&E S1?, G3G4 global rank; NC & Federal Special Concern/ tidewater stygonectid amphipod) Holsinger 1967

*Stygobromus indianensis* Holsinger (in ms.) (drain tile in Floyd Co., IN)

*Stygobromus inexpectatus* Holsinger, 1978 (\*one cave in Calhoun Co.,AL/ M. Cave amphipod)

*Stygobromus inopinus* Holsinger (in ms.) (creek in Winston Co., AL)

*Stygobromus interitus* Holsinger, 1978 (\*one cave in Craig Co.,VA/Tb/VA T&E S1, Global G1/New Castle Murder Hole amphipod)

*Stygobromus iowae* Hubricht, 1943 (spr. .7mi.n of Fayette,Fayette Co.+ 2 caves in Winneshiek Co.,IA & mine in Daviess Co., Ozarks, IL)/Tp,mine- subglacial survival?/IL State T&E/Iowa Amphipod)

*Stygobromus kenki* Holsinger, 1978 (spr.in Rock Cr. Park,DC + Fairfax Co.,VA/Pb/VA T&E S1, Global G1/Rock Cr. groundwater amphipod)

*Stygobromus koloana* = *Spelaeorchestia k.*

*Stygobromus lacicolus* Holsinger, 1974 (Lake Tahoe at Cave Rock, El Dorado & Placer Cos.,CA & Douglas Co.,NV/ Pb? & lake (480', 18-197', 392' deep)/ G3G3/ deep lake amphipod)

*Stygobromus leensis* Holsinger, 1978 (type locality cave and 3 othe caves in Lee Co.,VA/Tb/VA Special Concern T&E & S1, Global G1/Lee Co. cave amphipod)

*Stygobromus lewisi* Holsinger (in ms.) (\*cave in Hardin Co., CA)

*Stygobromus longipes* (*S.l.* Holsinger, 1966) (type locality cave in Kendall Co. + cave in Comal Co., TX/ Tb/ G1) Harden 1984

*Stygobromus lucifugus* (*Crangonyx l.* Hay, 1882) Stebbing, 1899 (\*well in Abingdon, Nox Co.,IL/Dubious cave amphipod) (extinct? As last seen in 1882 but is probable syn. of *S. subtilis* Hubricht, 1943 according to Holsinger 1969)

*Stygobromus mackenziei* Holsinger, 1974b (cave type locality in Santa Cruz Co. & possibly Montgomery Spr.(or new sp., Santa Barbara Co.,CA/CA T&E G1S1, Federal Species of Concern/ MacKenzie's Cave Amphipod/ St)

*Stygobromus mackini* Hubricht, 1943 (cave type locality in, Russell Co.,swVA(Blank, Giles, Lee, Russell, Scott, Smyth, Tazewell, Washington, Wise Cos.) +neTN(Anderson, Grainger, Hancock, Hawkins, Roane, Sullivan, Union Cos.), KY(Carter, Estill, Jessamine, Lee, Woodford Cos.), IN(Clark Co. - or a closely related undescr. sp.),WV (SR) (Mercer & Monroe Cos.)/Pb/VA Special Concern T&E; IN T&E/ Southwestern VA cave amphipod/ G3G4)

*Stygobromus megapodus* Holsinger (in ms.)

**Stygobromus minutus** Holsinger, 1978 (cave type locality & one other cave in Walker Co., GA/Pettijohn Cave amphipod/St,Pb) **Bibl.:** Buhmann 1996, 2000

**Stygobromus montanensis** Holsinger, 1974b (well at Victor Crossing, Ravalli Co., MT/ Pb/ Montana groundwater amphipod)

**Stygobromus montanus** (*Stygonectes m.* Holsinger, 1967) (\*AR spr. near Rich Mt., Polk Co./ Pb/ Mountain cave amphipod)

**Stygobromus morrisoni** (*Stygonectes m.* Holsinger, 1967) K.1974 (cave type locality & two other caves in Bath Co., 2 caves in Highland Co., VA & one in Pendleton Co. + Hardy Co., WV/ Tb/ VA & WV T&E & S1, Global G2G3; Federal & WV Species of Concern/ Morrison's cave amphipod)

**Stygobromus mundus** (*Stygonectes m.* Holsinger, 1967) K.1974 (cave type locality Bath Co. & tributary to Cowpasture R. (Alleghany Co.), VA/Tb/ VA Special Concern T&E & S1, Global G3/ Bath Co. cave amphipod)

**Stygobromus mysticus** Holsinger, 1974 (well? at Greenview, Siskiyou Co., CA/ Pb/ Northern California groundwater amphipod)

**Stygobromus nanus** Holsinger, 1978 (\*cave type locality in Pocahontas Co., WV/Tb/WV T&E S1, global G1; Federal Species of Concern/ Pocahontas cave amphipod)

**Stygobromus nortoni** (= *Stygonectes n.* Holsinger, 1969a) (cave type locality in Clay Co., + one other cave in Hamilton Co., both TN & one cave in Jackson Co., AL/ Tb/ TN State T&E/ Norton's cave amphipod/ TN SH G3)

**Stygobromus obrutus** Holsinger, 1978 (well w. of Danville, Pittsylvania Co. Roanoke River Basin, VA/ Pb/ VA T&E S1, Global G1G2/Pittsylvania well amphipod) Holsinger 1978,

**Stygobromus obscurus** Holsinger, 1974b (well at Victor Crossing, Ravalli Co., MT/Pb/ obscure well amphipod)

**Stygobromus onondagaensis** (*Cragonyx o.* Hubricht & Mackin, 1940) (cave type locality in Onondaga C., (MO)/ c,se & swMO(12cos., incl. Camden, Crawford, Dent, Franklin Howell, Lawrence, Madison, Miller, Oregon, Ozark, Phelps, Pulaski, Shannon, St. Francois, Taney, Washington, Wayne), AR (Benton, Lawrence, Madison, Miller Cos.), OK (Adair, Cherokee, Delaware, Mayes, Rogers Cos.) & seKS (Butler & Cowley Cos.)/Pb/MO State T&E Watch list; Federal Species of Concern/ Onondaga Cave amphipod)

**Stygobromus oregonensis** Holsinger, 1974b (\*cave type locality /crevice in basalt near Roseburg, Douglas Co., OR/ Tb/ Oregon cave amphipod/ critically imperiled in OR Natural Heritage list)

**Stygobromus ozarkensis** (*Stygonectes o.* Holsinger, 1967) (cave type locality in Stone Co., MO)/ MO (Barry, Greene, McDonald, Stone, Taney, Wright Cos.), OK (Adair, Benton, Cherokee, DE, Mayes, Madison & Mayes Cos.) & AR (Benton, IZard, Logan, Madison & Newton Cos./ Tb,seep/ OK T&E; MO State T&E Watch list; Federal Species of Concern/G3G4/ Ozark cave amphipod)

**Stygobromus parvus** (*Stygonectes p.* Holsinger, 1969) (cave type locality in Randolph Co., 2 caves in Pocahontas Co.) & one cave in Tucker Co., all WV/ Tb/ WV T&E S1; global G1G2; Federal Species of Concern/ Minute cave amphipod)

**Stygobromus pecki** (*Stygonectes p.* Holsinger, 1967) (\*Peck's cave amphipod in Comal Springs, Landa Park,New Braunfels,Comal Co.,TX/ Federally Endangered T&E/Pb) C. Barr 1993; USFWS 1997

**Stygobromus pennaki** Ward, 1977 (N.Fork S.Platte R.,Jefferson Co. +Arapahoe Co.,CO/ Pb, hyporheic/ G3/Pennak's groundwater amphipod)

**Stygobromus phreaticus** Holsinger, 1978 (well in Fairfax Co. +Alexandria Co.,VA/Pb/VA Undet. T&E & S1, Global G3/ northern Virginia well amphipod)

**Stygobromus pizzinii** (*Synpleonia p.* Shoemaker, 1938) (Wetzel's Spr.w of Georgetown, DC+ MD (Frederick, Howard, WA & Montgomery Cos.,VA(Fairfax Co.), PA(4sites, Chester, Lancaster, Fayette & Montgomery Cos.)/Pb,spr.,seep,well/VA Special Concern T&E & S1, Global G3 or G2/Pizzini's groundwater amphipod)

**Stygobromus pollostus** Holsinger, 1978 (cave type locality & 4 other caves in Greenbrier Co., one cave in Monroe Co. one cave in Pocohontas Co., all WV/ Tb/ WV T&E S1, global G1G3/Least cave amphipod)

**Stygobromus pseudospinosus** Holsinger, 1978 (\*Luray C.,Page Co.,VA/VA Threatened T&E & S1, Global G1/Luray Caverns amphipod)

**Stygobromus putealis** (*Crangonyx s.* Holmes, 1909; Schellenberg, 1936; *C.p.*), (well, Rosendale, Fond du Lac Co.,WI + wells in Dodge & Green Lake Cos./Wisconsin well amphibod/Pb, wells, spring, subglacial survival?/ on IL rare list)

**Stygobromus puteanus** Holsinger, 1974b (well near Three Forks,Gallatin Co.,MT/Pb/ Montana well amphipod)

**Stygobromus pygmaeus** Holsinger (in ms.)

**Stygobromus quatsinensis** Holsinger & Shaw, 1987 (cave type locality & one other cave on Vancouver Island, BC + cave on Heceta Island & springs, resurgent streams and caves on Prince of Wales Island,AK/ Pb/ Vancouver Island cave amphipod)

*Stygobromus redactus* Holsinger, 1978 (\*cave type locality in Monroe Co., WV/ Tb/ P. Cave amphipod/ S1G1)

*Stygobromus reddelli* (*Stygonectes r.* Holsinger, 1966) (\*cave type locality in San Saba Co., TX/ Tb/ Reddell's cave amphipod)

*Stygobromus russelli* (*S.r.* Holsinger, 1967) Holsinger, 1992 (cave type locality in Coryell Co., TX/ Bandera, Bell, Bexar, Burnet, Comal, Coryell, Hays, Kendall, Kerr, Mason, Medina, San Saba, Travis, Williamson Cos., Balcones Fault Zone (& just s.(Medina Co.)), Edwards Plateau TX/Tb/ Russel's cave amphipod) **Bibl.:** Elliott 1973

*Stygobromus secundus* Bousfield & Holsinger, 1981 (Pb?/ Alberta spring amphipod)

*Stygobromus sheldoni* Holsinger, 1974 (bog spr.by Sagehen Cr., NV Co., CA/Pb/ Sheldon's spring amphipod)

*“Stygobromus sheltae”* Holsinger (in ms.) (one cave in Madison Co., AL/ Tb, Pb)

*Stygobromus sierrensis* Holsinger, 1974 (\*spr. in Trosi Canyon, Sierra Co., CA/ Pb/ Sierra spring amphipod)

*Stygobromus simulatus* Holsinger (in ms.)

*Stygobromus smithi* Hubricht, 1943 (Bibb, Blount & Tuscaloosa Cos., AL/spr., well/G3/Pb/ Alabama well amphipod) **Bibl.:** Holsinger 1972

*Stygobromus* undescr. sp.#2 (Dixon Spr., Hardin Co., IL/Tb or Pb)

*Stygobromus* undescr. sp.#3 (Univ. IN at Albany, Floyd Co./poss. extinct?)

*Stygobromus* undescr. sp.#4 (2 caves in Harrison Co., scIN/ Pb/ IN T&E) Lewis 1997

*Stygobromus* undescr. sp.#5 (Wahkeena Cr., Multnomah Co., OR/Pb)

*Stygobromus* undescr. sp.#6 *flagellatus* group (Val Verde Co., TX/St) Holsinger 1995

*Stygobromus* undescr. sp.#6 (well at French Cr., Upshur Co., WV/Tb/WV T&E S1S2, global G1),

*Stygobromus* undescr. sp.#7 (spr.at Milepost 6, Blue Ridge Parkway, Augusta Co., VA/Pb?, *spinus* group?)

*Stygobromus* undescr. sp.#8 (\*one cave in Craig Co., VA/Tb/VA T&E S1, Global G1)

*Stygobromus* undescr. sp.#8 (near *S. onondagaensis*, 10 cos. in ecMO/Tb)

*Stygobromus* undescr. sp.#9 (Rockcastle & nearby Cos., KY/Tb) Seibert (1973),

*Stygobromus* undescr. sp.#10 (*hubbsi* group, \*Border C., Culberson Co., TX/St)

*Stygobromus* undescr. sp.#11 (\*?cave in Uinta Mt., Uintah Co., UT/Tb)

*Stygobromus* undescr.(probable) sp.#12 (*onodagaensis* group, one cave each in Adair, Cherokee & DE Co.), OK/Tb)

*Stygobromus* undescr. sp.#13 (cave in Murray Co.,OK/Tb)

*Stygobromus* undescr. (possible) sp.#14 (one cave in Crawford Co. & possibly in 3 caves in WA Co.), MO/Tb/ G1?)

*Stygobromus* undescr. sp.#15 (3 caves in Jackson Co.,AL/Pb,Tb)

*Stygobromus* undescr. sp.16 (Rockbridge Co.,VA/Tb/VA T&E S1, Global G1)

*Stygobromus* undescr. sp.17 (Nelson Co.,VA/Tb/VA T&E S1, Global G1)

*Stygobromus* undescr. sp.18 (Patrick Co.,VA/Tb/VA T&E S1, Global G1),

*Stygobromus* undescr. sp.19 (Shenandoah Co.,VA/Tb/VA T&E S1, Global G1),

*Stygobromus* undescr. sp.20 (\*one cave in Rockbridge Co.,VA/Tb/VA T&E S1, Global G1)

*Stygobromus* undescr. sp.#21 (\*one cave in Monroe Co.,WV/ Tb/ WV T&E S1S2, global G1)

*Stygobromus* undescr. sp.#22 (\*one cave in Hardy Co.,WV/Tb//WV T&E S1, global G1)

*Stygobromus* undescr. sp.#23 (\*one cave in WV/Pb/WV T&E S3, global G3; Federal Species of Concern)

*Stygobromus* undescr. sp.#24 (\*one cave in Menard Co.,TX)

*Stygobromus* undescr. sp.#25(Barrelville Spr.(Allegany Co.) & one cave in Garrett Co., MD/ Pb/ sp. #5 in MD T&E/ S1 G?)

*Stygobromus* undescr. sp.#26 (caves e.of Conococheague Cr.,WA Co.,MD/Pb <5c.?! sp. #14 in MD T&E/ Roundtop amphipod)

*Stygobromus* undescr. sp.26-7? (TX/Pb)

*Stygobromus* sp. 28-9 (Montgomery Spr.,Santa Barbara Co.,CA/Pb)

*Stygobromus* undescr. sp. #30 (nonkarst hyporheic, Gallina Cr., near Taos,NM)

*Stygobromus* undescr. sp. #31 (or *S. mackini* in Clark Co.,IN)

*Stygobromus* undescr. sp. #32 (WA Co.,IN)

*Stygobromus* undescr. sp. #33 (\*one cave in Botetourt Co.,VA)

*Stygobromus* undescr. sp. #34 (Pb in two cave in Prince of Wales Island, seAK/G1)

*Stygobromus* undescr. sp. #35 (two caves in WA Co.,IN/ Pb)

*Stygobromus* undescr sp. #36 (\*?cave in Orangeburg Co., SC/Tb,. St?)

*Stygobromus* undescr. sp.#26 (MD/Pb/ sp. #6 in MD T&E S1G?! Roundtop amphipod)

*Stygobromus* undet. sp.1-2 (c. at Trail Cr.,Flathead R.,MT) Stanford, Ward & Ellis 1994)

*Stygobromus* undet. sp.#3 (nMS/Tp or habitual Tx)

*Stygobromus* undet. sp.#4 (near *clantoni*) (nAR/Tb?)

*Stygobromus* undet. sp.#5-? (Carter, Estill, Lee, McCreary, Pulaski, Rockcastle & Wayne Cos., KY)

*Stygobromus* undet. sp.#6-? (Calaveras, Santa Cruz, Trinity & Tuolumne Cos., CA/Pb)

*Stygobromus* undet. sp #7? (hyporheic in SC coastal blackwater stream)

*Stygobromus* undet. sp. #8? (OK hyporheic)

*Stygobromus sparsus* Holsinger, 1978 \*\*\* (cave type locality and 2 other caves in Great Smoky Mt. Natl. Park, Blount Co., TN/ Tb/ G. Cave amphipod/ SR G1G2)

*Stygobromus spinatus* (*Stygonectes s.* Holsinger, 1967) K. 1974 (type locality cave + >4 other caves in Greenbrier + caves in s Monroe Cos. nne to cPocahontas Co., WV/Tb/ Southern West Virginia cave amphipod or Spr. cave amphipod/ S3G3) Bibl.: Culver 1976

*Stygobromus spinosus* (*Crangonyx s.* Hubricht & Mackin, 1940; *Stygonectes s.* Holsinger, 1943 (in part)) (spring near Hawksbill Mt. (Madison Co.)/ Albermarle, Augusta, Clarke, Fauquier, Madison, Page, Rappahannock, Warren Cos., VA/Tp, phreatobia/ VA Special Concern T&E & S1, global G3/Blue Ridge Mt. amphipod)

*Stygobromus stegerorum* Holsinger, 1978 \*\* (type locality cave & one other cave in Augusta Co., VA/Tb/VA Threatened T&E & S1, global G1/Madison Cave amphipod)

*Stygobromus stellmacki* (*Stygonectes s.* Holsinger, 1967) (type locality cave in Centre Co. + cave in Mifflin Co., both in PA/Tb/ Stellmack's cave amphipod)

*Stygobromus subtilis* (*Apocrangonyx s.* Hubricht, 1943) (small seep near cave in Jackson Co.) + Adams Co. sse to Union, Monroe & Jersey Cos., IL + MO (Ste. Genevieve Co.)/Pb/MO State T&E; Federal Species of Concern/Subtle cave amphipod),

*Stygobromus subtilis* Hubricht, 1943 (Pb? & deep lake (1534-410') in Lake Tahoe, Washoe Co., CA)

*Stygobromus tenuis t.* (*Crangonyx t.* (S.I. Smith, 1874; *S.t.* Shoemaker, 1938) Karaman, 1974 (well in Middletown, Middlesex Co. (CT)/CT (Litchfield, Middlesex & New Haven Cos.), NY (NY Co.), MA (Berkshire Co.)/glacial refugia to MD (6cos.) & PA/Pb)

*Stygobromus tenuis potomacus* (*Stygonectes t.p.* Holsinger, 1967) Karaman, 1974 (DC, MD (Anne Arundel, Baltimore, Frederick, Harford, Howard, Montgomery, Prince George, Washington Cos.), PA (Adams Co.) & VA (Alexandria, Arlington, Caroline, Fairfax, Falls Church, Loudoun, Prince William Cos.)/Pb/VA Special Concern T&E; WV T&E S1 rank & global G1/ Potomac groundwater amphipod),

*Stygobromus tritus* Holsinger, 1974b (shallow well at Victor Crossing, Ravalli Co. & Missoula Co., MT/Pb)

*Stygobromus vescus* Holsinger (in ms.)



*Stygobromus vitreus* Cope, 1872 (Mammoth C. (Type locality) /+nAL(Colbert, Jackson, Lauderdale, Madison, Mogan Cos.),cKY(Barren, Edmonson, Hart, Trigg Cos.) & cTN (SR) (Franklin & Montgomery Cos.)/ Tp,seep/ KY Special Concern T&E/ Mammoth Cave amphipod/ G3G4) **Bibl.:** Shoemaker 1942

*Stygobromus wengerorum* Holsinger, 1974b (type locality cave & one other cave in Mariposa Co.,CA/CA T&E G1S1 Federal Species of Concern/Tb/ Wenger's cave amphipod)

*Stygogidiella* Stock, 1981 - Bogidiellidae amphipods

*Stygogidiella virginalis* Stock, 1981 (Virgin Islands)

*Stygonectes* Hay, 1902 = *Stygobromus* (see also *Synpleonia*, *Crangonyx*) - Crangonyctidae amphipods. **Bibl.:** Culver & Holsinger (1969; Holsinger, 1966, 1966b, 1967e, 1977a, 1978; R. Graham 1967

*Stygonyx* Bousfield & Holsinger, 1989 - Crangonyctidae amphipods

*Stygonyx courtneyi* Bousfield & Holsinger, 1989 (\*under & on sides of Wahkeena Cr.,OR/Pb, hypogean /Courtney's groundwater amphipod)

*Synchelidium* Sars, 1895 - Oedicerotidae amphipods

*Synchelidium americanum* Bousfield, 1973 (FL, LA, Virginian marine infauna)

*Synchelidium rectipalmum* Mills, 1962 (AK, sCA, OR, WA marine infauna)

*Synchelidium shoemakeri* Mills, 1962 (AK, sCA, OR, WA marine infauna)

*Synpleonia* Wrzesniowski, 1881. - Crangonyctidae amphipods. **Bibl.:** Creaser 1934 (see *Crangonyx a.*, *Stygobromus cl.*, *em.*, *hayi*)

*Synpleonia americana* = *Stygobromus clantoni*

*Synurella* Wrzesniowski, 1877 (see *Stygobromus dentata*) - Crangonyctidae amphipods

*Synurella bifurca* (Hay, 1882) (AR, IL,TN, s.to Gulf/spr.,stream,pond,Tx? in TN)

*Synurella dentata* Hubricht, 1943 (*Stygobromus d.*) (sprs., ponds & small streams in sIL,seIN,cKS,swOH, s to KY & ncTN/Tx?) **Bibl.:** Mackin 1935; Porter 1995

*Syrrhoë* Chevreux, 1908 - Synopiidae amphipods

*Syrrhoë crenulata* Goes, 1866 (AK marine infauna)

*Syrrhoë longifrons* Shoemaker, 1964 (AK, sCA, WA marine infauna)

*Talitroides* Bonnier, 1898 - Talitridae amphipods

*Talitroides alluaudi* (Chevreux, 1901) (HI/alien epigean, Eb & Tx or Ac)

*Talitroides topitotum* (Burt, 1934) (HI/alien epigean, Eb & Tx or Ac)

*Tethygenia*- Eusiridae amphipods

*Tethygenia opata* (*Pontogeneia o.* J.L. Barnard, 1979) (CA marine benthic, infauna?)

***Texiweckelia*** Holsinger in Holsinger & Longley, 1980 (= *Mexiweckelia* (in part) Holsinger, & Minckley, 1971) (see *Holsingerius*, *Texiweckeliopsis*) - Hadziidae amphipods (once put in Melitidae)

*Texiweckelia insolita* = *Texiweckeliopsis i.*

*Texiweckelia relictata* = *Seborgia relictata*,

*Texiweckelia samacos* = *Holsingerius s.*

***Texiweckelia texensis*** (*Mexiweckelia t.* Holsinger, 1973) (artesian well at San Marcos, Hays Co. + Bexar Co., Edwards Aquifer, scTX/Pb) **Bibl.:** Holsinger, & Langley 1980

***Texiweckeliopsis*** Karaman & Barnard, 1982 - Hadziidae amphipods (once put in Melitidae)

***Texiweckeliopsis insolita*** (*Texiweckelia i.* Holsinger in Holsinger & Longley, 1980a) (artesian well at San Marcos, Hays Co., + Bexar Co., Edwards Aquifer, scTX/ Pb/ Unusual well amphipod)

***Thorlaksonius*** E.L. Bousfield & E.A. Hendrycks, 1994 - Pleustidae amphipods

***Thorlaksonius carinatus*** E.L. Bousfield & E.A. Hendrycks, 1994 (WA marine infauna)

***Thorlaksonius depressus*** (Alderman, 1936) (WA marine infauna)

***Thorlaksonius platypus*** (Barnard & Given, 1960) (WA marine infauna)

***Tiron*** Liljeborg, 1865 - Synopiidae amphipods

***Tiron biocellata*** J.L. Barnard, 1972 (AK, WA marine infauna)

***Tiron triocellatus*** G.D. Goeke, 1982 (w,eFL marine infauna)

***Tiron tropakis*** Barnard, 1972 (FL marine benthic)

***Trachypleustes*** E.L. Bousfield & E.A. Hendrycks, 1995 – Pleustidae amphipods

***Trachypleustes cf trevori*** E.L. Bousfield & E.A. Hendrycks, 1995 (WA marine infauna)

***Tritella*** Mayer, 1890 - Caprellidae amphipods (also placed in Aeginellidae)

***Tritella pilimana*** Mayer, 1890 (sCA, WA marine infauna)

***Unciola*** Say, 1818 - Corophiidae amphipods

***Unciola irrorata*** Say, 1818 (MA, NY, NC, VA marine sandy infauna)

***Unciola serrata*** Shoemaker, 1945 (Carolinian, MD, VA marine infauna)

***Urothoe*** Dana, 1852 - Haustoriidae amphipods

***Urothoe denticulata*** Gurjanova, 1951 (AK marine infauna)

***Urothoe varvarini*** Gurjanova, 1953 (sCA marine infauna)

***Westwoodilla*** Bate, 1856 - Oedicerotidae amphipods

***Westwoodilla caecula*** Bate, 1856 (AK, sCA, WA marine infauna)

***Weyprechtia*** Stuxberg, 1880 - Gammaridae amphipods

***Weyprechtia pinguis*** (Kroyer, 1838) (PEI, PQ, NB Gulf of St. Lawrence sandy marine interstitial)

anaerobes - Bacteria that can grow only in the absence of oxygen.

anaerobic - Pertaining to an organism living with or conditions of no free oxygen.

analogous - Adjs. for traits shared by different species due to convergent evolution. Cf. homologous.

analysis of variance - Statistics method for dividing total variance so as to attribute the parts to different sources or to compare different samples.

anchialine - 1. Karst caves submerged even at low tide. Incl. blue hole (inland & ocean). 2. Bodies of haline water usually with a restricted exposure to open air, always with more or less extensive subterranean connection to the sea & with both marine & terrestrial influences. M. Garman 1997; Stock, Illife & Williams 1986

angel insects – See Zoraptera. Not known from US or Canadian caves or aquatic interstitial habitats

## **Anemones** (= see anemones; ‘true’ sea anemones)

Phylum **Cnidaria**, class **Anthozoa** (or phylum), subclass Zoantharia (=Hexacorallia) (sea anemones, true corals, black corals, tube anemones), order Actiniaria. See Cnidaria. About 41 families either solitary or forming clones but never colonial or with calcified skeletons (like most corals). Unlike Subclass Octocorallia, tentacles are in multiples of six. Some secrete chiton and most have symbiotic zooxanthellae. The main body (the column) has holes (to release water upon contractions), warts, verrucas, pseudotentacles, or vesicles. The hollow tentacles are like fingers or branched.

Subclass Zoantharia (=Hexacorallia)

Order Actiniaria

Suborder Nynantheae: (=Thenaria)

Superfamily Endomyaria

Actiniidae (*Aulactinia*, *Tealia*)

***Aulactinia*** Verill, 1864 - Actiniidae anemones

***Aulactinia stella*** (Patella s. F.C. Muewcher, 1987) (silver spotted anemone/ TTp in ME sea cave)

***Tealia*** Gosse, 1858 (= *Urticina* Marenzeller, 1977) - Actiniidae anemones

***Tealia felina*** (Linneaus, 1767) (dahlia anemone/ME sea cave)

anabolism - All of the metabolic reactions that involve a energy input and resulting in production of organics.

anchialine – Subterranean habitat of salty or brackish waters that can appear as landlocked ponds, etc. but which are hydraulically connected to normal seawater. Syn.: anchihaline.

angiosperm - Plant with **flowers**, in which seeds, resulting from double fertilization, are in an ovary, comprising the fruit.

anhydrobiosis - Adj. for the ability to tolerate dessication, as in many rotifers and tardigrades.

anisotropic - Having different shapes or properties in different directions. Cf. isotropic.

Annelida - Phylum of coelomate, segmented animals that are almost all wormlike & elongate. Foster 1972. Incl. Oligochaeta (earth**worms**, esp. Lumbriculidae), branchiobdelids (on amphipods, crayfish), & **leeches**

anophthalmia - Eyelessness caused by genetic change in a previously sighted organism. See evolution, regressive.

anoxia - lacks of dissolved oxygen

anoxybiosis - Cryptobiotic state in Tardigrada caused by low amounts of dissolved oxygen  
ant - see Hymenoptera.

anthropic - See human impacts

antelope - See **mammal, antelope**

**Anthozoa** - Marine **macroinvertebrate** phylum. Incl. **corals**, sea pens & sea **anemones**.

antibiosis - Unintentional action by one organism that is harmful to another.

antlion - See **Neuroptera**

anurans (= Salienta, Ecaudata) (anurans, frogs and toads). An order of Amphibia. Adults lack tails and are rather stocky or squat. 4 limbs bear 4 fingers and 5 toes, the latter often webbed. Hindlimbs are usually longer and adapted for jumping &/or swimming. About 2,600 species. See **frogs** and **toads**.

aplodontia - Syn: **mountain beaver** (see **Mammals**)

apomixis - Reproduction without fertilization and/or meiosis but with the appearance of an ordinary sexual cycle. Incl. parthenogenesis and adventitious embryony.

apomorphic - Pertaining to a derived character state with the group of taxa being considered, in contrast to the ancestral (plesiomorphic) state.

aposymbiotic - A species normally symbiotic but without its symbiotic partner.

apterous - without wings.

**Arachnida** - Class of phylum Arthropoda. Coddington et al. 1990. Orders incl. Acari (**mites/ticks**), Araneae (**spiders**), Opiliones (**harvestmen**), Palpigradi (microwhipscorpions), Schizomida (**schizomids**), Pseudoscorpiones (**pseudoscorpions**), Ricinulei (ricinuleids), Scorpiones (**scorpions**), Solifugae (**solifugids, wind scorpions, etc.**) & Pedipalpi (Suborders Uropygi (or Order) (**whipscorpions**) & Amblypygi (whipspiders))

Nearly all species are land-based except for water mites and a few water spiders. Head and thorax combined with a rear part, prosoma, composed of six adult parts, each with a pair of appendages (first front pair the chelicerae, second the pedipalps) and usually covered with a shield (carapace). The rear body (abdomen or opisthosoma) has at most 13 segments. In most orders, the chelicerae ends are pincer-like or claw-like. The pedipalps may serve as walking legs but in spiders, windscorpions, harvestmen, mites, they have become palps. Fossils from Silurian to present. About 38.000 known living species.

Araneae - Syn: **spider**.

archeocyathid - **Fossil** & extinct macro-invertebrate of the Phylum Archaeocyatha & typified by a cone-, goblet-, or vase-shaped skeleton of calcium carbonate. Included with **sponges**.

Archaeognatha - Subclass of Insecta. Includes Order Archaeognatha (=Microcryphia)

area-effect speciation - From differentiation of two subspecies with incompatible gene complexes, so that hybrids are strongly selected against. Common in taxon in stable habitats & with low dispersal ability.

armadillo - See **mammal**.

aromatic hydrocarbon - See organic, pollution, & impacts

Arthropoda - Phylum of bilaterally symmetrical invertebrates with a segmented body & jointed legs. Incl. arachnid (**harvestmen, spiders, pseudoscorpions, schizomids, scorpions, whipscorpions**), crustacean (**amphipods, branchiopods, copepods, crayfish, isopods, ostracods, shrimp**), bristletail, hexapod (**diplurans, springtails, insects, thysanurans**) & **mites**. Howarth, 1983

“Arthropoda” – Ecdysozoa with appendages. Does appear monophyletic and incl. nematodes, Nematomorpha, Kinorhyncha, Pripulida, Loricifera, tardigrades, Onychophora (considered by some a subphylum of Arthropoda) & arthropods.

Antliophora - Insecta superorder that includes Orders Mecoptera, Siphonaptera (fleas), Diptera (flies).

Artiodactyla - Even toed **ungulate** (see **mammal**). Incl. **antelope, caribou, bison, goat & sheep**.

Aschelminthes (= Nematelminthes) - A “worm” phylum of about 12,500 species, incl. classes Rotifera, Nematoda, Nematomorpha and Acanthocephala (see WORM)..

aspect succession - Changes in the composition of communities due to changes in the seasons.

assimilation - The ingestion of nutrients and their transformation into organic materials of the ingestors..

association - The gathering of different animal taxa in a particular place.

atavism- The occurrence of traits originally those of an ancestor.

atmobios - All those species living above ground and which are surrounded by the Earth’s normal atmosphere. Incl. epigaion. Cf. Edaphon.

autapomorphy – Having a unique derivd trait by a species of monophyletic taxon. Cf. synapomorphy.

autoecology - Interactions of individuals & populations usually of only 1-2 species.

autopoesis - Adaptation to environmental changes that result in little morphologic change. Usually due to initial behavioural flexibility or morphologic non-specialization.

autotroph - In reference to carbon source - an organism which uses carbon dioxide as the sole carbon source.

autotrophy - A process in which organics of a species are synthesized from simple inorganics such as carbon dioxide, ammonia, nitrate and sulfate, with the energy source being light or inorganic chemicals.

Babesiosis - Disease carried by *Ixodes* **mites**.

## **Bacteria & Achaea**

(see also microbe, moonmilk, nitrification) - A unicellular **microbe**. Once in Kingdom Monera (Division Bacteria) but now divided into Superkingdoms or Kingdoms Bacteria (=Eubacteria) & Archaea (=Archaeobacteria). Incl. saprophytes, pathogens, chemotrophs, **actinomycetes**, cave **slime**, iron, sulfur, thermophilic.

**Bibl.:** Albrechtsen 1990; Amy & Halderman; Bengtsson 1989; Angert 1998; J. Anderson & Meadows 1969; Angert et al 1998; J. Anderson & Meadows 1969; Bitton & Gerba 1984; Boston 1999; Brock, Passman & Voder 1973; Brockman, Donovan et al. 1989; Butoryak 1988; Caldwell 1977; Caumartin 1963; Chapelle et al 1988; Chess 1987; Chess & White 1989; Cunningham 1991; Cunningham, Northup, Pollastro, Wright & Larock 1995; Dickson 1975; J. Duff & Triska 1990-1; Ehrlich 1996; Feldhake & Vestal 1985; R.Fallon & Boylen 1990; Findlay, Meyer & Smith 1984, 1986; Fliermans & Hazen 1990; Friedmann 1979; Hoey 1971; Koehn 1991; Kostalos & Seymour 1976; Lavoie 1981a, 1981b,c; Lavoie & McCrossnoe 1982; Nemetz et al. 1994; Northup, Barnes et al. 1998; Northup, Beck & Mallory 1997; Northup, Dahm, et al. 2001;

Nelson 1996; Palmer & P. 1990a; Peck 1987, Rusterholtz 1994; Samuelson 1997; Saswosky & Palmer 1994a; Skerman et al. 1989; Thompson & Olson 1988; D.C. White et al. 1983. : R. Boyd 1974; 1952; Greer 1985; Koehn et al. 1991; Limeres 1961; Northup, Lavoie & Mallory 1997; Olson & Thompson 1988; Rusterholtz 1989; Rusterholtz & Mallory 1994; J. Smith 1976; Spilde et al. 1998; Thornton & Thonrton 1986; W. White & Ellisher 1959; K. Williams 1990; Zanowiak 1987; Zanowiak et al. 1993

**biothems** - Cunningham et al. 1995; LaRock & Cunningham 1995; Palmer & P. 1991; Yonge & Krouse 1989

**moonmilk** - Boyd 1965

**calcium carbonate** (see also **moonmilk**) - Chafetz 1994; Reddy 1994; W. White, Smailer & Brennan 1994; W. White 1994

**iron** - Caldwell & C. 1980; Ghiorse 1984, 1988,; Peck 1965-6

**manganese** - Di Ruggiero & Gounot 1990; Ghiorse 1984, 1988,; Nealsen 1992; N. & Ford 1980; Peck 1965-6  
todorokite - Cunningham et al. 1995

**nitrate**s: Fliermans & Schmidt 1977; Gerundo & Schwartz 1949; Hill 1981; Jameson et al. 1994; Lewis 1991; Moore 1994; Nemetz et al. 1994 Hess 1900; Mansfield & Boardman 1932;

**sulfur** - Buck et al. 1994; Cunningham, DuChene et al. 1994-a; Ehrlich 1994; Grubbs 1989; Hill 1995; Lackey & Morgan 1965; Lovely et al. 1994; Holsinger, Martin & Brigmon 1994; Maslyn & Pizarowicz 1994; Northup, Dahm, et al. 2001; Palmer & P. 1990, 1994; Queen 1994-a; Stoner 1994; Stossell 1994; Summers 1995; Vlasceanu & Kinkle 1994; Worthington 1994. Grubbs 1991; Pohl & White 1965

**Empire** (=Domain, Urkingdom or Superkingdom) **Archaea** (=Archaeobaktra, Archae-bacteria)  
Kingdom Crenarchaeota (use sulfur compound as terminal electron acceptor)  
(thermophilic and low temperature marine & freshwater)  
(marsh and lake infauna in IN)

Order Pyrodictia?

Pyrodictiaceae (*Pyrodictium*, *Pyrolobus*)

Order Thermoproteales

Family Thermofiliaceae (*Thermofilum*)

Family Thermoproteaceae (*Thermoproteus*, *Pyrobaculum*)

Kingdom "Korarchaeota" (WY hot springs)

Kingdom Euryarchaeota (use carbon dioxide as main electron acceptor and produce methane)  
Order Methanococcales

Methanococcaceae (*Methanococcus*)

Order Methanobacteriales

Methanobacteriaceae (*Methanothermus* (put in Methanothermaceae)  
(*Methanomicrobium*)

Methanothermaceae (*Methanothermus* (also put in Methanobacteriaceae)

Order Methanosarcinales

Methanosarcinaceae (once in Order Methanobacteriales) (*Methanosarcina*)

Order Pseudomonadales (put in proteobacteria or cyanobacteria (see below)  
or subsumed in Cytophagales)

Order Halobacteriales

Halobacteriaceae (once grouped with eubacterial gram-positive) (*Halobacterium*)

**Empire, Domain or Superkingdom Bacteria** (=Prokaryote)

Kingdom Aquificae

Order Aquificales

Aquificaceae (*Aquifex*)

Order Deinococcales

Deinococcaceae (*Deinococcus*)

Kingdom Eubacteria (= Eubaktra)

Subkingdom or Division Gracilicutes (all Gram-negative Eubacteria with extra cell wall)

Class Nitrochematia

Order Nitrobactines

Nitrobacteraceae (also put in proteobacteria & Pseudomonadales

Suborder Pseudomonadinae)

(*Nitrobacter*, *Nitrosomonas*, *Prochlorales*?)

Phylum Bacteroidetes (also subsumed in Phylum Cytophaga-Flavobacterium-Bacteroides)

Class Sphingobacteria

Order Sphingobacteriales

Flexibacteraceae (*Runella*)

Phylum Cytophaga-Flavobacterium-Bacteroides (see above)

Order Cytophagales

Flavobacteriaceae

(also but in Phylum Bacteroidetes, Class Flavobacteria, Order Flavobacteriales)



(*Cytophaga-Flavobacterium*)

Kingdom or Phylum Proteobacteria (= purple bacteria)

Gram-Negative Proteobacteria

Neisseriaceae

(*Acinetobacter* (also put in Chromobacteraceae)

*Moraxella* (now in Moraxellaceae), *Paracolonobacterium*)

Order Hyphomicrobiales

Hyphomicrobiaceae Badudieri 1950 (*Hyphomicrobium*)

Alpha Subdivision (or as Class Alphaproteobacteria)

Caulobacterales

Caulobacteraceae (*Caulobacter*)

Order Rhizobiales

Hyphomicrobiaceae (= Athiorhodaceae) (Rhizobiaceae group & family uncertain)

(*Pedomicrobium*)

Beta Subdivision (or as Class Betaproteobacteria)

Class Nitrochematia

Order Nitrosomanadines (also put in Phylum Chemobacteria)

Nitrobacteraceae (*Nitrosomonas*) (once in Pseudomonadales)

Order Burkholderiales

Alcaligenaceae (once in Order Alcaligenes) (*Achromobacter*, *Alcaligenes*)

Comamonadaceae (*Variovorax*)

Gram Negative

Order Thiobacteriales

Thiobacteriaceae (*Thiobacillus*) (some species alpha or gamma purple)

Gram Positive

Order Nitrosomonadales

Gallionellaceae (*Gallionella*)

Gamma Subdivision

Order Eubacteriales (gram positive)

Azotobacteraceae (*Azotobacter*)

Order Pseudomonadales

Moraxellaceae (=Acinetobacteraceae)

(*Acinetobacter* (once put in Achromobacteraceae (of Eubacteriales)

& Alcaligenaceae, Chromobacteraceae & Neisseriaceae), *Chromobacterium*

*Moraxella* (also put in Neisseriaceae)

Pseudomonadaceae

(*Aeromonas*, *Altermononas*, *Chryseomonas*, *Pseudomonas*, *Shewanella*)  
(all uncertain classification)

Order Spirillales

Vibrionaceae (*Vibrio*)

Epsilon Subdivision

Order Beggiatoales

Oscillatoriaceae (*Beggiatoa* (once in protista, now in cyanobacteria)

*Thiothrix* (also put in Pseudomonadales)

Nitrobacteraceae (now in Pseudomonadales)

Subkingdom Firmicutes (also as Class, Division, Phylum or Order)

Class Bacilli (Gram-positive)

Order Bacillales

Bacillus/Clostridium group

Bacillaceae (*Bacillus*, *Listeria*)

Subkingdom Sporofirmabacteria (motile, endospore forming Gram-positive Eubacteria)

Phylum Anoxybacteria

Gram-positive Proteobacteria

Low G-C

Order Chlamydobacteriales (once in Eubacteriales)

Lactobacillaceae (*Lactobacillus*, *Sphaerocilus*, *Streptococcus*) (sheathed bacteria)

Crenotrichaceae (*Crenothrix* (also put in Actinomycetales), *Leptothrix*)

Phylum Aerendosporobacteria

Order Bacillines

Bacillaceae (once in Eubacteriales) (*Bacillus*)

Phylum Micrococcobacteria

Order Micrococcines

Micrococcaceae (*Arthrobacter* (see cyanobacteria), *Micrococcus*, *Staphylococcus*)

Kingdom Spirochaetes

Order Spirochaetales

Spirochaetaceae (*Borrelia*)

Kingdom Cyanobacteria (=blue-green algae or bacteria), part of the eubacteria)

Phylum Cyanophycota (also as Division)

**Bibl.:** DeSaussure 1961; J. James, Patsalides & Cox 1994, 1994a; W. Shepard et al. 2000

Class Chlorococcatia

Order Chamaesiphonales (= Chamaesiphonines)

(or put in Class Cyanophyceae) (=Schizophyceae, Mixophyceae)

Chamaesiphonaceae (*Chamaesiphon*)

Class Oxyphotobacteria (= Class Cyanophyceae (=Schizophyceae, Mixophyceae) in part)

Order Chroococcales

Chroococcaceae

(*Anacystis*, *Aphanothece*, *Chroococciopsis*, *Coccochloris*, *Chroococcus*,  
*Gloeocapsa*, *Gloeothece*, *Lungbya*, *Microcystis* (also in Eubacteriobionta),  
*Synechococcus*, *Synechocystis*)

Entophysalidaceae (*Chlorogloea*)

Microcystaceae (*Aphanothece*)

Order Nostocales (= Nostocines)

Nostocaceae (*Anabaena*, *Cylindrospermum*, *Nostoc*)

Oscillatoriaceae (now in own order)

Rivulariaceae (*Calothrix*, *Gloeotrichia*, *Raphidiopsis*)

Scytonemataceae (*Hydrocoryne*, *Scytonema*, *Tolypothrix*)

Order Oscillatoriales

Oscillatoriaceae

(*Arthrospira*, *Beggiatoa*, *Gomontiella*, *Oscillatoria*, *Microcoleus*, *Phormidium* (also  
of uncertain family status) *Plectonema*, *Schizothrix*, *Spirulina*, *Thiotrix*)

Scytonemataceae (*Tolypothrix*)

Order Pleurocapsales

Chaesiphonaceae (*Chamaesiphon*)

Pleurocapsaceae (*Myxosarcina*)

Order Pseudomonadales (also not incl. in blue-green, see above) (*Aphanothece*)

Class Hormogoniatia

Order Stigonematales (= Stigonematines)

Stigonemataceae (*Geitleria*, *Hapalosiphon*, *Thalpophila*)

Domain or Empire Eucarya (= Kingdom Eubacteria) (bacteria with nuclei)

Order Maduromycetes (now in fungi)

Suborder Streptosporangineae

Thermomonosporaceae

(*Actinomadura*) (now in Actinomycetales, see below)

Subkingdom Staticfirmabacteria (all Gram-positive, non-motile, non-spore Eubacteria)

Division Firmicutes

Phylum or Class Actinobacteria (=Thallobacteria?)

Order Actinomycetales

Actinomycetaceae

(*Actinomadura*, *Actinomyces* (gram positive, also put in fungi), *Actinomycetes*  
*Curtobacterium* (also put in Microbacteriaceae) *Thermoactinomyces*)

Corynebacteriaceae

(*Aureobacterium*, *Brevibacterium* (also put in Enterobacteriaceae), *Clavibacter*,  
*Corynebacterium*)

Mycobacteriaceae (*Mycobacterium*, *Rhodococcus*)

Suborder Streptomycineae

Streptomycetaceae (Gram positive) (*Streptomyces*)

Order Enterobacteriales (once subsumed in Order Eubacteriales)

Enterobacteriaceae

(*Aerobacter*, *Arizona*, *Brevibacterium* (also in Corynebacteriaceae), *Citrobacter*,  
*Enterobacter*, *Escherichia*, *Proteus*, *Salmonella*, *Serratia*, *Yersinia*)

Order Cytophagales (*Geitleria*) (or in order Stigonematales) (also placed in algae)

Superfamily Beggiatoaceae (now elevated to order and put in cyanobacteria))

**Achromobacter** Yabuuchi & Yanko, 1981 (groundwater) Eubacteriales bacteria in  
Alcaligenaceae

**Achromobacter** undet. sp. (groundwater; OR Caves, OR)

**Acinetobacter** Brisou & Prevot, 1954 (groundwater; ID basalt aquifer) Eubacteriales bacteria in  
Neisseriaceae

*Acinetobacter anitratus* = *Paracolobactrum* a.

**Acinetobacter** *calcoaceticus* (Beijerinck, 1911) Bauman, Doudoroff & Stanier, 1968) Migula,  
1895 (on OK *Myotis velifer* bats)

**Acinetobacter** *lwoffii* (*A. calcoaceticus* var. *l.*) (Andreau, 1940) Brisou & Prevot 1940 emend.  
Bouvet & Grimont, 1986 (on OK Tx *Myotis velifer* bats)

*Actinomadura* H. Lechev. & M.P. Lechev, 1969 - Actinomycetales bacteria in in Actinomycetaceae (also put in Thermomonosporaceae)

*Actinomadura* undet. sp. (WV)

*Actinomyces* - Harz, 1877 - Actinomycetales gram positive prokaryote in Actinomycetaceae (also put in fungi)

*Actinomyces* undet sp. or species (KY (Mammoth C.) water; OR (OR C.) moonmilk)

*Actinomycetes* Krassilnikove, 1949 (name now obsolete) Actinomycetales bacteria in Actinomycetaceae

*Actinomycetes* undet. sp. #1 (Lechuguilla C.,NM) Lavoie & Northrup 1994

*Actinomycetes* undet. sp. #2 (high organic muds in Knox Co., TN)

*Aerobacter* Beijerinck, 1900 - Eubacteriales bacteria in Enterobacteriaceae

*Aerobacter* undet. sp. ( in aphotic (no light) Edwards Aquifer, San Marcos (Hays Co.), TX

*Aeromonas* Stanier, 1936 (groundwater) Pseudomonadales gamma proteobacteria in Pseudomonadaceae

*Aeromonas* undet. sp. (WV)

*Alcaligenes* Castellani & Chalmers, 1919 - Eubacteriales bacteria in Alcaligenaceae

*Alcaligenes* undet.sp. (groundwater; ID basalt aquifer; KY (Mammoth C.) water)

*Alteromonas* Baumann, Baumann, Mandel & Allen, 1972 emend. Gauthier et al. 1995 (=Alterimonas) (brown-pigmented agarolytic bacteria) Pseudomonadales gamma proteobacteria in Pseudomonadaceae

*Alteromonas putrefaciens* = *Shewanella p.*

*Anacystis* Meneghini, 1836 - Chroococcaceae cyanobacteria

*Anacystis gelatinosa* (Henn.) Lemm. (benthic in Devil's Hole, swNV)

*Anacystis montana* (Lightf.) F.E. Drouet & W.A. Daily

*Anacystis montana* forma *m.* (NM)

*Anacystis* undet. sp. ( in aphotic (no light) Edwards Aquifer, San Marcos (Hays Co.), TX)

*Anabaena* Bory de St Vincent ex Bornet & Flah, 1886 '1888' Nostocales bacteria or cyanobacteria in Nostocaceae

*Anabaena affinis* Watanabe, 1992 (NV,OR caves by lights, alien?; MN hyporheic),

*Anabaena catenula* (Kutzing) Bornet & Flahault, 1886 (OR/by lights, alien?)

*Anabaena* undet. sp. or species ( in aphotic (no light) Edwards Aquifer, San Marcos (Hays Co.), TX); benthic in Devil's Hole, swNV)

*Anabaena* *spiroides* Klebahn (MN hyporheic)

*Aphanizomenon* Morren, 1888 Ex Bornet & Flahault - Nostocales cyanobacteria in Nostocaceae  
*Aphanizomenon* *flos-aquae* (L.) Ralfs (MN hyporheic)

*Aphanocapsa* Nageli, 1849 - Chroococcales cyanobacteria in Chroococcaceae  
*Aphanocapsa* undet. sp. (benthic in Devil's Hole, swNV)

*Aphanothece* Naegeli, 1849 - Chroococcales cyanobacteria in Chroococcaceae (once placed in Pseudomonadales bacteria, family Microcystaceae) (genus questionable and may be included into genus *Synechococcus*)

*Aphanothece* *castagnei* (NM, OR/ by lights, alien?),  
*Aphanothece* *gelatinosa* (Henn.) Lemmermann (OR/by lights, alien?),

*Aphanothece* *nidulans* P. Richter, 1884 (NM/by lights, alien?)  
*Aphanothece* undet. sp. (OR/by lights, alien?)

*Aquifex* Huber et al., 1992 - Aquificaceae archaea  
*Aquifex* undet sp. (WY hot springs)

*Arizona* Kauffmann & Edwards, 1952 (= *Salmonella*) Eubacteriales bacteria in Enterobacteriaceae

*Arizona* *hinshawii* (*Salmonella III arizonae*? (Borman, 1957) Kauffman 1964)) on OK *Myotis velifer* bats)

*Arthrobacter* Conn & Dimmick, 1947 - Eubacteriales bacteria in Micrococcaceae  
*Arthrobacter* undet. sp. or species (Lechuguilla (NM), Oregon (OR) pool water & Mammoth (KY) Caves; deep US groundwater; ID basalt aquifer; TN cave stream)

*Arthrobacter* *globiformis* (Conn, 1928) Conn & Dimmick, 1947 (TN cave stream)

*Arthrospira* Sitzenberger & Gomont, 1893 – Oscillatoriales cyanobacteria in Oscillatoriaceae  
*Arthrospira* *gomontiana* Setchell, 1985 (MN hyporheic)

*Aureobacterium* Collins, Jones, Keddie, Kroppenstedt & Schleifer, 1983 - Corynebacteriaceae bacteria

*Aureobacterium* undet. sp. (water in Mammoth C., KY)

*Azotobacter* Beijerinck, 1901 – Azotobacteraceae Gamma Proteobacteria

*Azotobacter* undet. sp. or species (cave stream water, feces, and cave slime in OR C., OR)  
eubacteriales

*Bacillus* Cohn, 1872 – Gram positive procaryote (aerobic or facultatively anaerobic, most sp. chemoorganoheterotrophic; US groundwater; ID basalt aquifer) Eubacteriales bacteria in Bacillaceae

*Bacillus azotoformans* Pichinoty, Debarjac, Mandel & Asselineau, 1983 (Low organic muds in Knox Co., TN),

*Bacillus cereus* Frankland & Frankland, 1887 (on OK *Myotis velifer* bat; low organic muds in TN)

*Bacillus brevis* Migula, 1900 (= *B. canicolis* b.) (low organic muds in Knox Co., TN)

*Bacillus circulans* Jordan, 1890 (low organic muds in Knox Co., TN)

*Bacillus firmus* Bredemann & Werner, 1933 (TN cave stream)

*Bacillus globisporus* Larkin & Stokes, 1967 (= *B. g.* ssp. *g.*) (TN cave stream)

*Bacillus macerans* Schardinger, 1905 (on OK *Myotis velifer* bats)

*Bacillus megaterium* DeBary, 1884 (on OK *Myotis velifer* bats; TN cave stream)

*Bacillus mycoides* Flugger, 1886 (= *B. cereus* ssp. *m.*) (TN cave stream)

*Bacillus polymyxa* (Prazmowski, 1880) Mace, 1889 (low organic muds in Knox Co., TN),

*Bacillus* undet. sp. or species (Lechuguilla C., NM; water in Mammoth C., KY; high organic muds in Knox Co., TN; in aphotic (no light) Edwards Aquifer, San Marcos (Hays Co.), TX; KY (Mammoth C.) water; on OK Tx *Myotis velifer* bats)

*Bacillus subtilis*. (Ehrenberg, 1835) Cohn, 1872 (low organic muds in Knox Co., TN),

*Bacillus thuringiensis* Berliner, 1915 (= *B. cereus* ssp. *t.*; *B. t.* ssp. *t.*) (TN cave stream)

*Beggiatoa* Trevisan, 1842 - Oscillatoriaceae cyanobacteria (also put in bacteria) - roteobacteria gamma (aerobic, microaerophilic; anaerobic, respiratory; typically chemoorganoheterotrophic; acetate, hexoses (e.g. glucose) are not used; often aquatic; reduces sulfur compounds)  
Eubacteriales **Bibl.:** Larkin & Strohl 1983; T. Williams & Unz 1985

*Beggiatoa alba* (Vaucher, 1803) Trevisan, 1845 (KY) Schmidt et al. 1987

*Borrelia* Swellengrebel, 1907 – Domain Prokaryote in Kingdom Spirochaetes, Spirochaetaceae in Spirochaetales

*Borrelia* undet. sp. (On CA *Antrozous pallidus* bats) (cause of relapsing fever)

*Borrelia burgdorferi* Johnson, Schmid, Hyde, Steigerwalt & Brenner, 1984 (in ticks on CA *Neotoma micropus* woodrats/ cause of lyme disease)

**Brevibacterium** Breed, 1953 - Eubacteriales gram positives and relatives - Corynebacteriaceae bacteria (also put in Enterobacteriaceae)

**Brevibacterium megaterium** Breed, 1953 (water in Mammoth C., KY)

**Brevibacterium** undet. sp. #1 (water in Mammoth C., KY)

**Brucella** Meyer & Shaw, 1920 - Eubacteriales bacteria

**Brucella neotomae** Stoenner & Lackman, 1957 (= *B. abortus* ssp. *neotomae*?) (endoparasite on UT *Neotoma lepida* woodrats)

**Calothrix** Agardh, 1886 Ex Bornet & Flahault - Rivulariaceae in Order Nostocales

**Calothrix thermalis** (Schwae) Hansg. (benthic in Devil's Hole, swNV)

**Caulobacter** Henrici & Johnson, 1935 Pseudomonadales gamma proteobacteria in Caulobacteraceae

**Caulobacter** undet. sp. (groundwater)

**Chamaesiphon** A. Braun in Rabenhorst, 1864, emend. Geitler, 1925 or (Braun & Grunow, 1865) Pleurocapsales cyanobacteria in Chaesiphonaceae. **Bibl.:** Geitler 1925

**Chamaesiphon gracilis** Rabenhorst, 1864 (Mammoth C., KY)

**Chamaesiphon** undet. sp. (benthic in Devil's Hole, swNV)

**Chlorogloea** Wille, 1900 - Chroococcales cyanobacteria in Entophysalidaceae

**Chlorogloea** undet. sp. (endolithic in ON karst)

**Chromobacterium** Bergonzini, 1881 (= *Chromobacter*) - Eubacteriales bacteria in Chromobacteraceae (also put in Neisseriaceae)

**Chromobacterium** undet. sp. or species (US groundwater; water in Mammoth C., KY & OR Caves, OR; in aphotic (no light) Edwards Aquifer, San Marcos (Hays Co.), TX)

**Chroococcidiopsis** (Geitler, 1933) Waterbury & Stanier, 1976 - Chroococcales cyanobacteria in Chroococcaceae

**Chroococcidiopsis** undet. sp. (endolithic in ON karst)

**Chroococcus** Nageli, 1849 - Chroococcales cyanobacteria in Chroococcaceae

**Chroococcus** undet. sp. (benthic in Devil's Hole, swNV)

**Chryseomonas** Holmes, Steigerwalt, Weaver & Brenner, 1986 emend. Holmes et al. 1987 (may be junior syn. of *Pseudomonas*) Pseudomonadales Archae in Pseudomonadaceae

**Chryseomonas luteola** (Kodama, Kimura & Komogata, 1985) Holmes et al., 1987 (Lechuguilla C., NM)



**Citrobacter** Werkman & Gillen, 1932 - Eubacteriales bacteria in Enterobacteriaceae

**Citrobacter freundii** Werkman & Gillen, 1932 (on OK Tx *Myotis velifer* bats)

**Clavibacter** Davis, Gallaspie, Vidaver, & Harris, 1984 - Corynebacteriaceae? bacteria

**Clavibacter** undet. sp. (ID basalt aquifer)

**Coccochloris** Sprengel, 1807 - - Chroococcales cyanobacteria in Chroococcaceae

**Coccochloris** undet. sp. (Lehman C., NV)

**Corynebacterium** Lehmann & Neumann, 1896 - Corynebacteriaceae bacteria

**Corynebacterium** undet. sp. or species (water in Mammoth C., KY; moonmilk in OR C., OR; on OK *Myotis velifer* bats)

**Corynebacterium aquaticum** Leifson, 1962 (WI hyporheic; NM & SD caves; on OK Tx *Myotis velifer* bats) (reduces sulfur compounds)

**Corynebacterium pseudodiphtheriticum** Lehmann & Neumann, 1896 (on OK Tx *Myotis velifer* bats)

**Curtobacterium** Yamada & Komagata, 1972 - Actinomycetales bacteria in Actinomycetaceae (also put in Microbacteriaceae)

**Curtobacterium** undet. sp. (water in Mammoth C., KY)

**Cylindrospermum** Kuetzing, 1843 Ex Bornet & Flahault, 1887 - Nostocales bacteria or cyanobacteria in Nostocaceae

**Cylindrospermum catenatum** Ralfs in Bornet & Flahault, 1887 (OR/by lights, alien?)

**Deinococcus** Brooks and Murray, 1981 – Deinococcaceae bacteria in Order Deinococcales

**Deinococcus** undet. sp. (aerobic groundwaters)

**Enterobacter** Hormaeche & Edwards, 1960 - Eubacteriales bacteria in Enterobacteriaceae

**Enterobacter aerogenes** Hormaeche & Edwards, 1960 (on OK *Myotis velifer* bats)

**Enterobacter agglomerans** Ewing & Fife, 1972 (on OK Tx *Myotis velifer* bats)

**Escherichia** Castellani and Chalmers, 1919 - Enterobacteriaceae bacteria in Eubacteriales

**Escherichia** undet. sp. (in aphotic (no light) Edwards Aquifer, San Marcos (Hays Co.), TX)

**Flavobacterium** Bergey et al., 1923 (groundwater) Eubacteriales bacteria in Flavobacteriaceae

**Flavobacterium** undet. sp. (KY (Mammoth C.) water)

**Gallionella** Ehrenberg, 1838 (Gram-positive with stalked, bean-shaped cells)

Nitrosomonadales Beta proteobacteria in Gallionellaceae

**Gallionella ferruginea** E., 1838 (producer? of branching iron oxides in C. of the Winds, CO +WV groundwater)

**Geitleria** Friedmann, 1955 - Stigonemataceae cyanobacteria in Order Stigonematales (also placed in Cytophagales)

**Geitleria calcarea** Friedmann 1979 (FL)

**Geitleria floridana** Friedmann 1979 (FL)

**Gloeocapsa** Kuetzing, 1843 - Chroococcales cyanobacteria in Chroococcaceae

**Gloeocapsa** undet. sp. or species (endolithic in ON karst; near lights in NV; in aphotic (no light) Edwards Aquifer, San Marcos (Hays Co.), TX); benthic & phytoplankton in Devil's Hole, swNV)

**Gloeotheca** Nageli, 1849 - Chroococcales cyanobacteria in Chroococcaceae

**Gloeotheca** undet. sp. (endolithic in ON karst),

**Gloeotrichia** Jg. Agardh & Bornet & Flah., 1886 - Nostocales cyanobacteria in Rivulariaceae

**Gloeotrichia natans** (Hedwig) Rabenhorst (MN hyporheic)

**Gloeotrichia spsum** (C. A. Ag.) Thurst (MN hyporheic)

**Gomontiella** Teodoresco, 1901 Oscillatoriaceae cyanobacteria

**Gomontiella magyariana** Claus (KY)

**Halobacterium** Elazari-Volcani, 1957 - Halobacteriaceae bacteria in Pesudomonadales bacteria (salty groundwater rich in organics)

**Halococcus** Schoop, 1935- Pesudomonadales bacteria in (salty groundwater rich in organics)

**Hapalosiphon** (Naeg. in Kuetzing, 1849) Ex Bornet & Flahault, 1887 - Stigonematales cyanobacteria in Stigonemataceae

**Hapalosiphon intricatus** West or West & West. Bibl.: Davis & Rands 1982

**Hapalosiphon** undet. sp. (MN hyporheic)

**@Heterohormogonium** (Smith, 1950) Burr. in Copeland

**Heterohormogonium schizodichotmum** (benthic in Devil's Hole, swNV)

**Hydrocoryne** Schwabe, 1827 Ex Bornet & Flahault, 1887 - Nostocales cyanobacteria in Scytonemataceae

**Hydrocoryne** undet. sp. (OR/by lights, alien?)

**Hyphomicrobium** Stutzer & Hartleb, 1898 - Hyphomicrobiales eucaryote proteobacteria in Hyphomicrobiaceae

**Hyphomicrobium** undet. sp. (groundwater)

**Kurthia** Trevisan, 1885 (exiguobacterium, gram positive) Eubacteriales bacteria in Bacillaceae

**Kurthia** undet. sp. #2 (high organic muds in Maury Co., TN)

**Lactobacillus** Beijerinck, 1901 - Gram positive eucaryote, Lactobacillaceae bacteria in Chlamydobacteriales

**Lactobacillus** undet. sp. (on OK Tx *Myotis velifer* bats)

**Leptothrix** Kuetzing, 1843 - Chlamydobacteriales bacteria in Crenotrichaceae

Gram-positive flagellated **bacteria**. Sheaths often contain oxides of iron or manganese. Aerobic **chemo-organotrophs** in slow-moving, unpolluted, iron-containing streams. Pools more than 2' deep often orange-yellow. Peck 1987; Northrup, Dahm et al. 2000

**Leptothrix** undet. sp. or species (NM (Lechuguilla & Carlsbad C., Eddy Co.), SD)

**Listeria** Pirie, 1940 - Formicutes bacteria in Bacillaceae

**Listeria** *denitrificans* Prevot, 1961 (cave stream in Knox Co., TN)

**Listeria** undet. sp. #1 (low organic muds in Knox Co., TN)

**Listeria** undet. sp. #2 (high organic muds in Knox Co., TN)

**Lyngbya** Agardh & Gomont, 1892 - **Oscillatoriales cyanobacteria in Oscillatoriaceae**

**Lyngbya** *aestuarii* (Mert.) Liebmann (MN hyporheic)

**Lyngbya** *birgei* G.M. Smith (MN hyporheic)

**Lyngbya** *limnetica* Lemm. (benthic & phytoplankton in Devil's Hole, swNV)

**Lyngbya** *maiuscula* (Dillw.) Harvey (benthic in Devil's Hole, swNV)

**Lyngbya** *pusilla tenuior* fa.nov. = *Micromonas p.*

**Lyngbya** undet. sp. (benthic in Devil's Hole, swNV)

**Methanobacterium** Kluver & Van Niel, 1936 (= *Methanibacterium*) Pseudomonadales Archae

**Methanobacterium** undet sp. (anaerobic groundwater rich in organics)

**Methanococcus** (Kluver & Van Niel, 1936) emend. Mah & Kuhn, 1984 - Methanococcaceae Archae in Methanococcales

**Methanococcus** undet sp. (anaerobic groundwater rich in organics)

**Methanomicrobium** Balch & Wolfe, 1981 - Pseudomonadales Archae in Methanobacteriaceae

**Methanomicrobium** undet sp. (anaerobic groundwater rich in organics)

*Methanosarcina* (Kluyver & Van Niel, 1936) emend. Mah & Kuhn, 1984 – Methanosarcinaceae  
Archae in Methanobacteriales

*Methanosarcina* undet sp. (anaerobic groundwater rich in organics)

*Methanothermus* Pseudomonadales Archae in Methanothermaceae (also put in  
Methanobacteriaceae)

*Methanothermus* undet sp. (anaerobic groundwater rich in organics)

*Micrococcus* Cohn, 1872 - Eubacteriales bacteria in Micrococcaceae

*Micrococcus* *luteus* (Schroeter, 1872) Cohn, 1872 (low organic muds in Knox Co., TN; on OK  
Tx *Myotis velifer* bats)

*Micrococcus* undet. sp. (low organic muds in Knox Co., TN; in aphotic (no light) Edwards  
Aquifer, San Marcos (Hays Co.), TX; KY (Mammoth C.) water)

*Micrococcus* *variens* Migula, 1900 (low organic muds in Knox Co., TN; on OK Tx *Myotis*  
*velifer* bats)

*Microcoleus* Desmazieres & Gomont - Oscillatoriales cyanobacteria in Oscillatoriaceae

*Microcoleus* *vaginatus* (Vauch.) Gomont (MN hyporheic; benthic in Devil's Hole, swNV)

*Microcystis* Lemmermann, 1907 (= *Polycystis*) Chroococcales cyanobacteria in Microcystaceae

*Microcystis* *stagnalis* Lemmermann, 1907 (KY),

*Microcystis* undet. sp. or species (near lights in NV; benthic in Devil's Hole, swNV)

*Micromonas pusilla* (Butcher) = *Oocystis p.*

*Moraxella* Lwoff, 1939 - Eubacteriales bacteria in Neisseriaceae

*Moraxella* undet. sp. (groundwater; on OK Tx *Myotis velifer* bats (or *Pseudomonas*))

*Mycobacterium* Lehmann & Neumann, 1896 - Actinomycetales bacteria in Mycobacteriaceae

*Mycobacterium* undet. sp. or species (water in Mammoth C., KY; in aphotic (no light) Edwards  
Aquifer, San Marcos (Hays Co.), TX)

*Myxosarcina* Printz, 1921 – Pleurocapsaceae in Order Pleurocapsales

*Myxosarcina* *amethystine* Copeland (benthic in Devil's Hole, swNV)

*Nitrobacter* Winogradsky, 1892 - Eubacteriales in Nitrobacteraceae . **Bibl.:** Fliermans &  
Schmidt 1974, 1977

*Nitrobacter* undet. sp. W(WV),

*Nitrosomonas* Winogradsky, 1892 - Nitrobacteraceae beta proteobacteria prokaryote in  
Eubacteriales

*Nitrosomonas* undet. sp. (WV)

*Nocardia* Trevisan, 1889 - Actinomycetales bacteria in Nocardiaceae

*Nocardia* undet. sp. (WV)

*Nostoc* (Vaucher, 1803) Bornet & Flahault, 1886 - Nostocales bacteria or cyanobacteria in Nostocaceae

*Nostoc minutissimum* Kutzing ex Bornet & Flahault, 1887 (KY)

*Nostoc paludosum* Klebahn (MN hyporheic)

*Nostoc* undet. sp. (endolithic in ON karst),

*Oscillatoria* Vaucher, 1803 Ex Gomont, 1893 - Oscillatoriales cyanobacteria in Oscillatoriaceae

*Oscillatoria acutissima* Dufferath (MN hyporheic)

*Oscillatoria agardhii* Gomont, 1892 (OR/by lights, alien?; MN hyporheic)

*Oscillatoria amoena* (Kuetz.) Gomont (OR/by lights, alien?)

*Oscillatoria amphibia* C.A. Agardh (MN hyporheic; benthic in Devil's Hole, swNV)

*Oscillatoria amphigranulata* van Goor (benthic in Devil's Hole, swNV)

*Oscillatoria animalis* Agardh ex Gomont, 1892 (KY)

*Oscillatoria ariticulata* Gardner (MN hyporheic)

*Oscillatoria chalybea* Mertens (MN hyporheic)

*Oscillatoria clausiana* (KY)

*Oscillatoria curviceps* C.A. Agardh (MN hyporheic)

*Oscillatoria formosa* Bory (MN hyporheic)

*Oscillatoria limnetica* Lemmermann (MN hyporheic)

*Oscillatoria limosa* (Roth) C.A. Agardh (MN hyporheic)

*Oscillatoria neglecta* Lemmermann, 1910 (Mammoth C.,KY)

*Oscillatoria negra* Vaucher (MN hyporheic)

*Oscillatoria princeps* Vauch. (benthic in Devil's Hole, swNV)

*Oscillatoria* undet. sp. or species ( in aphotic (no light) Edwards Aquifer, San Marcos (Hays Co.), TX; benthic in Devil's Hole, swNV)

*Oscillatoria subbrevis* Schmidle (MN hyporheic)

*Oscillatoria substillissima* Kuetzing (KY)

*Oscillatoria tenuis* Agardh ex Gomont, 1892 (OR/by lights, alien?), & undet. sp. (NV/alien?),

*Oscillatoria terebriformis* C.A. Agardh (MN hyporheic)

**Paracolobactrum** Borman, Stuart and Wheeler, 1944 - Neisseriaceae bacteria in Eubacteriales  
**Paracolobactrum anitratus**. (*Achromobacter anitratum* (Schaub & Hauber) Brissow, 1953;  
*Acinetobacter a.*) (on OK Tx *Myotis velifer* bats)

**Pedomicrobium** (Aristovskaya, 1961) Gebers & Beese, 1988 – Hyphomicrobiaceae (= Athiorhodaceae) (Rhizobiaceae group) bacteria in Rhizobiales (also put in Pseudomonadales) alpha proteobacteria

**Pedomicrobium manganicum** (Aristovskaya, 1961) Gebers, 1981 (or undescr. sp.) (in corrosion residues in wallrock in Lechuguilla C., Eddy Co., NM) **Bibl.:** Northrup, Dahm et al. 2000

**Phormidium** (Kutzing, 1843) Ex Gomont, 1893 - Oscillatoriales cyanobacteria in Oscillatoriaceae

**Phormidium cebennense** Gomont (KY),

**Phormidium purpurascens** (Kutz.) Gom.(benthic in Devil's Hole, swNV)

**Phormidium** undet. sp. (endolithic in ON karst),

**Phormidium subtruncatum** Woronich.f.a. (KY),

**Plectonema** (Thuret, 1875) ex Gomont, 1892 - Oscillatoriales cyanobacteria in Oscillatoriaceae

**Plectonema notatum** Schmidle, 1901 (OR/by lights, alien?),

**Plectonema** undet. sp. or species (endolithic in ON karst; benthic in Devil's Hole, swNV)

**Proteus** Hauser, 1885 Enterobacteriaceae bacteria in Eubacteriales

**Proteus** undet. sp. (in aphotic (no light) Edwards Aquifer, San Marcos (Hays Co.), TX; KY (Mammoth C.) water)

**Pseudomonas** Migula, 1894 - Pseudomonadales Archae in Pseudomonadaceae

**Pseudomonas aeruginosa** (Schroeter, 1872) Migula, 1900 (TN cave stream)

**Pseudomonas calciprecipitans** Molish, 1925 (incertae sedis) (prob. in WI moonmilk)

**Pseudomonas diminuta** Leifson & Hugh, 1954 (on OK *Myotis velifer* bats)

**Pseudomonas fluorescens** Migula, 1895 (on OK Tx *Myotis velifer* bat; TN cave stream)

**Pseudomonas putida** (Trevisan, 1889) Migula, 1895 (TN cave stream)

**Pseudomonas** undet. sp. (in aphotic (no light) Edwards Aquifer, San Marcos (Hays Co.), TX)

**Pseudomonas** undet. sp. #1 (low organic muds in Knox Co., TN),

**Pseudomonas** undet. sp. #2 (high organic muds in Knox Co., TN; ID basalt aquifer)

**Pseudonocardia** (Henssen, 1967 or 1957 emend. Warwick et al. 1994 Actinomycetales bacteria in Nocardiaceae

**Pseudonocardia** undet. sp.(WV)

***Pyrodictium*** Stetter, Koenig & Stackebrandt, 1983 - Pyridictiaceae gram-positive archaea in Order Pyrodictia?

***Pyrodictium*** undet. sp. (WY hot springs)

***Pyrolobus*** - Pyridictiaceae gram-positive archaea in Order Pyrodictia?

***Pyrolobus*** undet. sp. (WY hot springs)

***Rhaphidiopsis*** Fritsch & Rich, 1929 – Rivulariaceae bacteria in Order Nostocales

***Rhaphidiopsis*** undet. sp. (benthic in Devil's Hole, swNV)

***Runella*** Larkin & Williams, 1978 – Flexibacteraceae bacteria in Sphingobacteriales

***Runella*** undet. sp. or species (moonmilk, suspected feces on silt and silt in OR C., OR)

***Rhodococcus*** Zopf, 1891 - Mycobacteriaceae bacteria in Actinomycetales

***Rhodococcus*** undet. sp. (Lechuguilla C., NM)

***Salmonella*** Lignieres, 1900 - Eubacteriales gamma proteobacteria prokaryote in Enterobacteriaceae

***Salmonella*** undet. sp. (KY cave water; *Salmonella*-like spp. on OK Tx *Myotis velifer* bats)

Bibl.: Rusterholtz & Mallory 1990

***Schizothrix*** Kutzing, 1843 Ex Gomont, 1892 - Oscillatoriales cyanobacteria in Oscillatoriaceae

***Schizothrix calcicola*** (C. Agardh) Gomont, 1892 (NV/alien?)

***Schizothrix*** undet. sp. or species (endolithic in ON karst; in aphotic (no light) Edwards Aquifer, San Marcos (Hays Co.), TX))

***Scytonema*** Agardh, 1887 Ex Bornet & Flahault - Nostocales cyanobacteria in Scytonemataceae

***Scytonema*** undet. sp. (benthic in Devil's Hole, swNV)

***Serratia*** Bizio, 1823 - Eubacteriales bacteria in Enterobacteriaceae

***Serratia liquefaciens*** (Brimes & Hennerty, 1931) Bascomb, Lapage, Willcox & Curtis, 1971)

(on OK Tx *Myotis velifer* bats)

***Serratia*** undet. sp. (in aphotic (no light) Edwards Aquifer, San Marcos (Hays Co.), TX)

***Shewanella*** MacDonell & Colwell, 1986 - Pseudomonadales Archae in Pseudomonadaceae

***Shewanella putrefaciens*** (*Alteromonas putrefaciens* Lee, Gibson & Shewan, 1981) MacDonell & Colwell, 1986 (TN cave water)

***Sphaerocilus*** Kuetzing, 1833 (sheathed bacteria) - Lactobacillaceae bacteria in Chlamydoxiales

**Sphaerotilus** *natans* Kuetzing, 1833 (KY caves)

**Sphaerotilus** undet. sp. (up to 3cm. thick films on cave walls in IN; in polluted caves in KY; US groundwater)

**Spirulina** Turpin & Gomont, 1893 - Oscillatoriales cyanobacteria in Oscillatoriaceae

**Spirulina** *laxissima* G.S. West (MN hyporheic)

**Spirulina** *major* Kuetz. (MN hyporheic)

**Staphylococcus** Rosenbach, 1884 – Gram positive eucaryote, Eubacteriales in Micrococcaceae

**Staphylococcus** *aureus* Rosenbach, 1884 (= *S. a.* ssp. *a.*) (KY (Mammoth C.) water)

**Staphylococcus** *cohnii* Schleifer & Kloos, 1975 (on OK *Myotis velifer* bats)

**Staphylococcus** *faecalis* Andrewes & Horder, 1906 (on OK *Myotis velifer* bats)

**Staphylococcus** *facium* Orla-Jensen, 1919 (on OK *Myotis velifer* bats)

**Staphylococcus** *lentus* (Kloos et al. 1976) Schleifer, Geyer, Klipper-Baelz & Devriese, 1983 (on OK *Myotis velifer* bats)

**Staphylococcus** undet. sp. (Lechuguilla C., NM; on OK Tx *Myotis velifer* bats)

**Staphylococcus** *sciuri* Kloos, Schleifer & Smith, 1976 (on OK *Myotis velifer* bats)

**Staphylococcus** *xylosus* Schleifer & Kloos, 1975 (on OK *Myotis velifer* bats)

**Streptococcus** Rosenbach, 1884 - Gram positive eucaryote, Chlamydo bacteriales in Lactobacillaceae

**Streptococcus** *faecalis* Andrewes & Horder, 1906 (sewage contaminated groundwaters)

**Streptococcus** undet. sp. (on OK Tx *Myotis velifer* bats)

**Streptomyces** (Waksman & Henrici, 1943) Emend. Wellington et al., 1992 – Gram positive eucaryote, Eubacteriales in Streptomycetaceae

**Streptomyces** undet. sp. #1 (WV),

**Streptomyces** undet. sp. #2 (high organic muds in Maury Co., TN),

**Synechococcus** Negeli, 1849- Chroococcales cyanobacteria in Chroococcaceae

**Synechococcus** *lividus* Copeland (benthic in Devil's Hole, swNV)

**Synechococcus** *minervae* Copeland. (benthic in Devil's Hole, swNV)

**Synechococcus** undet. sp. (benthic in Devil's Hole, swNV)

**Synechocystis** C. Sauvageau, 1892 - Oscillatoriales cyanobacteria in Oscillatoriaceae

**Synechocystis** undet. sp. or species (endolithic in ON karst; benthic in Devil's Hole, swNV)

**Tetrachloris** Pascher, 1925 - See algae

**Thalpophila** Borzi, 1906 – Stigonemataceae cyanobacteria in Order Stigonematales



*Thalporhila imperialis* Copeland (benthic in Devil's Hole, swNV)

*Thermoactinomyces* Tsilinsky, 1899 - Actinomycetales bacteria in Actinomycetaceae

*Thermoactinomyces* undet. sp. (WV)

*Thermofilum* Zillig, Gierl, Schreiber, Wunderl, Janekovic, Stetter & Klenk, 1983

Thermofiliaceae archae in Order Thermoproteales

*Thermofilum* undet. sp. (WY hot springs)

*Thiobacillus* Beijerinck, 1904 (reduces sulfur compounds) Pseudomonadales Archae in Thiobacteriaceae

*Thiobacillus* undet. sp. (NM,SD)

*Thiothrix* Winogradsky, 1888 Oscillatoriaceae gamma proteobacteria (reduces sulfur compounds) (also put in cyanobacteria) **Bibl.:** (FL,KY) Brigmon et al. 1994(a-b); Larkin 1980; Larkin & Strohl 1983; T. Williams & Unz 1985; Polman & Larkin 1990; Strohl & Schmidt 1984

*Thiothrix nivea* (Rabenhorst, 1865) Winogradsky, 1888 (FL)

*Thiothrix tenuissima* Winogradsky, 1888 (KY)

*Tolypothrix* Kuetzing, 1887 Ex Bornet & Flahault, 1887 - Oscillatoriales cyanobacteria in Scytonemataceae

*Tolypothrix distorta* Kuetz. Ex Bornet & Flahault (MN hyporheic)

*Tolypothrix lanata* (Desv.) Wartm. (OR/by lights, alien?)

*Variovorax* Willems et al., 1991 – Comamonadaceae in Order Burkholderiales in beta division of Proteobacteria)

*Variovorax paradoxus* (*Alcaligenes p.* Davis, 1969) Willems et al., 1991 (or undescr. sp.) (in corrosion residues in wallrock in Lechuguilla C., Eddy Co., NM) **Bibl.:** Northrup, Dahm et al. 2000

*Vibrio* Pacini, 1854- Pseudomonadales gamma proteobacteria prokaryote in Vibrionaceae

*Vibrio* undet. sp. (Mammoth C.,KY)

*Yersinia* Van Loghem, 1944 -= Eubacteriales Enterobacteriaceae bacteria in Division Gracilicutes, gamma Proteobacteria, Class Enterics

*Yersinia pseudotuberculosis* ssp. *pestis* Bercovier, Mollaret, Alonso, Brault, Fanning, Steigerwalt and Brenner, 1981 (*Y.p* (Lehmann and Newmann, 1896) Van Loghem, 1944) (in CA *Neotoma fuscipes* & *N. cinerea* woodrats) (cause of bubonic plague)

**badger** - See **mammal**, Carnivora, badger

bandits - Marauding cavernicolous predators & scavengers which plunder the resources of communities which inhabit guano beds, but which live mainly in other cave microhabitats.

barklice - **Insect Order Psocoptera**.

**Barnacles** - **Crustacean** of Subclass Cirripedia (= Thecostraca). Adults always attached to a substrate or as a parasite. Body short and compressed, the pleon strongly reduced and with no appendages. Noexternal segments in thorax of most species. Each segment with a pair of long, biramous appendages (cirri, absent or degenerate in parasites) densely covered with setae. Larvae in two-valved carapace that forms the mantle in adults. About 800 species known. May be the ancestors of ostracods. **Bibl.:** Russell & Elliott 1994

Subclass Cirripedia

Order Thoracica:

Suborder Balanomorpha

Superfamily Balanoidea

Archaeobalanidae: *Semibalanus*

Balanidae: *Balanus* da Costa, 1778 (CA marine)

Superfamily Coronuloidea

Tetraclitidae: *Tetraclita*

Superfamily Chthamaloidea (=Ththamaloida)

Chthamalidae: *Chthamalus*

Suborder Scalpellomorpha

Scalpellidae (also put in Suborder Lepadomorpha)

(*Hamatoscalpellum*)

*Balanus* De Costa, 1887 - Balanidae barnacles

*Balanus amphitrite* Darwin (Salton Sea benthic, CA)

*Balanus balanus* (O. Fabricius, 1780) (PQ Gulf of St. Lawrence sandy marine interstitial)

*Balanus crenatus* Bruguere, 1789 (CA, WA, PQ Gulf of St. Lawrence sandy marine interstitial)

*Balanus glandula* Darwin, 1854 (WA marine infauna)

*Balanus* (*Solidobalanus*) *hesperius* (AK, WA marine infauna)

*Balanus improvisus* Darwin, 1854 (rare MA, Virginian marine infauna)

*Balanus rostratus* Hoek (AK marine infauna)

*Balanus* undet. sp. (WA marine infauna)

*Balanus venustus* (FL Gulf of Mex. marine infauna)

*Chthamalus* Ranzani, 1817 - Chthamalidae barnacles

*Chthamalus* undet. sp. (CA marine caves)

*Hamatoscalpellum* Zevina, 1978 - Scalpellidae barnacles

*Hamatoscalpellum californicum* (*Scalpellum c.* Pilsbry, 1907; *S. osseum* Pilsbry, 1907) (sCA marine infauna)

*Scalpellum* Leach, 1817 – Scalpellidae barnacles

*Scalpellum californicum* (WA marine infauna)

*Scalpellum sanctipretensis* (WA marine infauna)

*Semibalanus* Pilsbry, 1916 - Archaeobalanidae barnacles

*Semibalanus balanoides* (Linne', 1767) (PQ Gulf of St. Lawrence sandy marine interstitial; ME sea caves)

*Tetraclita* Schumacher, 1817 - Tetraclitidae barnacles

*Tetraclita* undet. sp. (CA marine caves)

barotolerant - A organism able to tolerate high hydrostaic pressure, although growing better at normal pressures.

barrier - Features such as rivers, canyons, oceans, deserts, etc. that prevent dispersal & mixing of gene pools. See dispersal.

bat - See **mammal**, insectivore.

bat fleas - See fleas.

bat **flies** (Streblidae) & bat spider flies (Nycteribiidae) - See **fly**.

batellite - **Type** of current species assoc. with bats or bat guano. Cf. bandit.

**bat scat** - Small, elongate, & rough-surfaced. It may occur in **guano** piles (especially at day roosts) or may be widely scattered (especially at night roosts). Bat scat crumbles between the fingers, breaking into small shiny particles, the remains of insect bodies. Incl. **guano**.

**bear** - See **mammal**, **Carnivora**

**beaver** - See **mammal**, **rodent**

bed bug - Hemiptera **bug** parasite of Family Cimicidae. Paleolithic humans probably got them from bats as both share three species.

bee - See Hymenoptera

## Beetles & Weevils

Main group of **insects** of Order Coleoptera (= Eleutherata, Elytroptera), Subclass Pterygota, Division Neoptera, Subdivision Endopterygota (=Holometabola), Section Neuropterida (or divided in various sections, see below). Name from Greek koleos, "sheath" and pteron, "wing,"

referring to the formation of the front pair of wings into hardened wing covers. Wing are also folded when not in use, enabling beetles to utilize almost any habitat. This partly accounts for their great diversity, over 350,000 known species, with 23,800 species and 3,145 genera in the US and Canada, about a third of all species known there. First found in Permian.

.025-150 mm. (usually 2-20mm). Body hard or leathery, often elongate, cylindrical, hemispherical, or slightly to extremely flattened. Some females resemble larvae rather than adults. Most are black or dark brown but some are colorful, especially in reds and yellows. Heads are small except for heads elongated into snouts in weevils. No cerci. Biting mouth parts, horny front wing covers over membranous rear wings, & all legs similar. Several groups are aquatic both as larvae and as adults, some of them predators and others herbivores. Most adults are leaf feeders or scavengers but many are ectoparasites, pollinators or predators. Cave-adapted ones tend to have longer antennae, enhanced humidity detection, smaller eyes & less pigment than related, non-cave ones. Larvae are usually pale, with sparse hairs, & head distinct & darker than body. Most adults live above ground but many live under bark or bore into wood.

**Bibl.:** Anon. 1973; Ashworth 1973; H. Barber 1929; Barr 1959c; Bruce Conn & Demoss 1984.; Crowson 1981; Leng 1920; Poulson 1973, 1975; Spangler 1986; Valentine 1941; **Evolution & Taxonomy:** Beutel 1995; Crowson 1960; Lawrence & Newton 1995; Pakaluk & Slipinski 1995; Poulson 1979a; **Areas:** **AL:** Nicholas 1966a; Hebard 1934; Loeding 1945; Nicholas 1966; **Appalachia:** Jeannel & Henrot, 1949; Motas 1973; Henrot 1949; Jennel & Henrot 1949; **CA:** R. Graham 1963; **IN:** Blatchley 1910; Krekeler 1961; Krekeler 1969; Wickham, 1896; **KY:** Anon., 1881; Barr 1959c; Hubbard, 1881; **NA:** Arnett 1978; T. Erwin et al. 1977; Lindroth 1961-9; H. Scott 1967; Erwin & Ball 1977; Chemsak & Linsley 1982; **NE:** Dillon & D. 1961; Downie & Arnett 1996; **NW:** 1953-71; **Ozarks:** Barr 1964d; **TN:** Barr 1959c; Hebard 1934 **TX:** Barr 1964e; Barr & Steeves 1963; West: Benedict 1976a; **US:** Arnett 1963; **WV:** Hebard 1934; **VA :** Hebard 1934

Suborder Adephaga Schellenberg, 1806

Section Geadephaga  
Series Carabiformia

Superfamily Caraboidea (or no superfamily)  
(Carabidae, Cicindelidae (or as subfamily of Carabidae), Dysticidae, Gyrinidae,  
Haliplidae, Noteridae)

Section Hydradephaga  
(Cicindelidae, Dysticidae, Gyrinidae, Haliplidae, Noteridae)

Superfamily Dermestoidea - see above

Suborder Polyphaga Emery, 1886

Series Bostrichiformia

Superfamily Bostrichoidea Latreille, 1802  
(Anobiidae, Bostrichidae, Dermestidae (also put in Dermestidea), Ptinidae)

Series Chrysomeliformia

- Superfamily Chrysomeloidea (also put in Cucujiformia) (Cerambycidae, Chrysomelidae)
- Superfamily Cleroidea (also put in Cucujiformia) (Cleridae, Melyridae)

Series Cucujiformia

- Superfamily Chrysomeloidea L. 1902 (now in Chrysomeliformia)
- Superfamily Cleroidea L., 1802 – (now in Chrysomeliformia) (Cleridae, Melyridae)
- Superfamily Curculionoidea L., 1902 (Anthribidae, Curculionidae)

- Superfamily Cucujoidea L., 1802 (Cleridae, Melyridae)
- Superfamily Tenebrionoidea L., 1802  
(Aderidae, Alleculidae, Mycetophagidae, Salpingidae, Tenebrionidae)

Series Elateriformia

- Superfamily Byrrhoidea Latreille, 1804  
(Byrrhidae, Elmidae, Dryopidae, Ptilodactylidae (last 3 also put in Dryopoidea))

- Superfamily Buprestoidea (Buprestidae)
- Superfamily Cantharoidea (see Elateroidea)
- Superfamily Dascilloidea (Dascillidae)

- Superfamily Dryopoidea (also subsumed in Byrrhoidea)  
(Brachypsectridae (now in Cucujoidea), Dryopidae, Elmidae (now in Byrrhoidea), Ptilodactylidae)

Section Elateridina

- Superfamily Elateroidea Leach, 1815  
(Cantharidae (also put in own superfamily), Elateridae, Lampyridae, Phengodidae)

Section Catharidina (not used by Lawrence & Newton)

- Superfamily Cucujoidea  
(Brachypsectridae) (once in Dryopoidea), Coccinellidae, Corylophidae, Cryptophagidae, Cucujidae, Languriidae, Nitidulidae)

Series Staphyliniformia

- Superfamily Hydrophiloidea Latreille, 1802 (Histeridae, Hydrophilidae)
- Superfamily Staphylinoidea Latreille, 1802  
(Agyrtidae, Leiodidae, Ptiliidae, Silphidae, Staphylinidae)

Series Scirtoformia

- Superfamily Scirtoidea Fleming, 1821 (Dascillidae, Scirtidae)

Series Scarabeiformia

- Superfamily Scarabaeoidea L., 1802  
(Scarabaeidae, Hybosoridae (or as Subfamily Hybosorinae in Scarabaeidae), Trogidae)

**ADERIDAE** Winkler, 1927 (antlike leaf beetles) (=Euglenidae)

*Vanonus* Casey, 1895 (= *Tanilotes* Casey, 1895) (13 species in US or Canada)

*Vanonus* undet. sp. (Ac? in cave in Edwards Co., TX)

**AGYRTIDAE** Thomson, 1859 (agyrtidae beetles; primitive carrion beetles) (=Elateridae) -  
Subsumed in Silphidae) **Bibl.:** Peck, 1990

**ALLECULIDAE** (Latreille, 1802) = Alleculinae in Tenebrionidae

**AMPHIZOIDAE** (trout stream beetles)

*Amphizoa* Leconte, 1853 - Amphizoidae beetles (13 species in US or Canada)

*Amphizoa* undet. sp. (Tx or Ac in 2 seAKcaves)

**ANOBIIDAE** Fleming, 1821 (drugstore and deathwatch beetles; deathwatch, drugstore, spider or ptinid beetles) (=Ptinidae). About, 17 sp. n. of Mex., mostly alien. Feed mostly on seeds or scavenge in mammal, bird & bee nests. Undet. genus in 16,150 & 9,320 years old in *Neotoma* woodrat nest in Tinajas Mts., Yuma Co, AZ) **Bibl.** Papp 1962; Spilman 1975

Ptininae Latreille, 1802 (Spider Beetles) (*Niptinus*, *Niptus*, *Ptinus*) **Bibl.:** T. Philips 1997  
Xyletinae (*Lasioderma*)

*Lasioderma* Stephens, 1835 (= *Pseudochina* Jacqueln du Val, 1860; *Hypora* Mulsant & Rey, 1864) Anobiidae beetles, Subfamily Xyletinae (4 species in US or Canada)

*Lasioderma serricorne* (*Ptinus s.* Fabricius; *Ptilinus testaceus* Duftschmid, 1825; *L. castaneum* Melsheimer, 1846; *Xyletinus brevis* Wollaston, 1861) (NA/ Ac in cave in Edwards Co., TX)

*Niptinus* Fall, 1905 - Anobiidae beetles, Subfamily Ptininae (2 species in US or Canada)

*Niptinus ovalipennis* Fall, 1905 (Tp? in cave in Travis Co., TX)

*Niptus* Boieldieu, 1856 (spider beetles) Anobiidae beetles, Subfamily Ptininae. (7 species in US & Canada) **Bibl.:**Spilman 1968; Aalbu & Andrews 1992; W. Brown 1959

*Niptus abditus* Brown, 1959 (\*one cave in Great Salt Lake, Tooele Co.,UT/Tx? in woodrat nests)

*Niptus abtrusus* Spilman, 1968 (cave type locality in Val Verde Co. & one cave in Brewster Co., both TX (also fossil in woodrat middens & epigeal in Tx pastures & barnyards), Mexico & Big Bend Natl. Park; nr. *N. abtrusus* - 13,500 to 1,200 years old in *Neotoma* nest, Ajo Mts., Pima Co., AZ) /Texan spider beetles/Tp)

*Niptus arcanus* Aalbu & Andrews, 1992 (\*\*Mitchell (type locality) & El Pakiva C., Providence Mts. State Rec. Area, San Bernadino Co., CA/ Tb)

*Niptus kelleri* (*Pseudeurostus k.* Brown, 1959) (\*one cave in Cache Co., UT/Tb or Tp)

*Niptus* undet. species (Tb in CA; *Neotoma* woodrat midden in Canyonlands, UT; 32,000 to 1,200 years old in *Neotoma* nest, Ajo Mts., Pima Co., AZ)

*Niptus ventriculus* LeConte, 1859. (Ac or Tx in woodrat nest in cave in Grand Canyon, Coconino Co., AZ; fossil in *Neotoma* woodrat midden, Puerto Blanco Mts., Pima Co., sAZ;)/ 13 time periods from 0 to >26,000 yrs. BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM))

*Ptinus* Linnaeus, 1767 (= *Gynopterus* Mulsant & Rey, 1868) - Anobiidae beetles, Subfamily Ptininae. (38 species in US & Canada)

*Ptinus* (*Ptinus*) *clavipes* Panzer (= *P. brunneus* Duftschmidt, 1825; *P. hirtellus* Sturm, 1837, *P. testaceus* Olivier, 1790) (epigean in NY, s. to GA, Guatemala, w. to CA/ Habitual Tx in CA/ brown spider beetle ).

*Ptinus* (*Gynopterus*) *feminalis* Fall, 1905 (epigean in central AZ/ fossil in *Neotoma* woodrat midden, Puerto Blanco Mts., Pima Co., sAZ; 20,500 & 1,200 years old in *Neotoma* nest, Ajo Mts., Pima Co., AZ) )

*Ptinus* cf. (*Ptinus*) *fur* (*Cerambyx f.* Linnaeus, 1758) (cosmopolitan/ white-marked spider beetle/ 32,000 to 1,200 years old in *Neotoma* nest, Ajo Mts., Pima Co., AZ)

*Ptinus priminidi* Spilman, 1976 (extinct Wisconsin fossil from *Neotoma* woodrat nests in Whipple Artillery, Kofa & Puerto Blanco Mts. of AZ)

*Ptinus* undet. sp. (Ac or Tx in woodrat nest in cave in Grand Canyon, Coconino Co., AZ & *Neotoma* woodrat midden in Canyonlands, UT/ 12,000 to 12,300 BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM; 9,120 to 2,260 years oldl in scNM *Neotoma* woodrat nest)

Antblood beetles family - See Dermestidae

**ANTHICIDAE** (antlike flower beetles)  
Subfamily Notoxinae (*Notoxus*)

*Notoxus* Geoffroy, 1762 (= *Nonocerus* Faldeman, 1837; *Ceratoderus* Blanchard, 1846)  
Anthicidae beetles, Subfamily Notoxinae (46 species in US or Canada)

*Notoxus murinipennis* LeConte, 1851 (= *N. bicolor* Say, 1917 Homo.) (Tx in WA Co., IN (S3/G4))

**Formicilla** Leconte, 1851 (= *Formicus* L.1861) Anthicidae beetles (1 species in US or Canada)  
**Formicilla munda** L., 1851 (*F. evanescens, gilensis* Casey, 1895) (Ac in cave in Uvalde Co., TX)

Antloving beetles family - See Pselaphidae

**APIONIDAE** - Subsumed in Curculionidae

**ARTEMATOPODIDAE** Lacordaire, 1857 (soft-bodied plant beetles) (= Eurypogonidae) (also subsumed in Dascilliade)

Subfamily Macropogoninae (*Macropogon*)

**Macropogon** Motschulsky, 1859 (once in Dascillidae) - Artematopodidae beetles (3 species in US or Canada)

**Macropogon** undet. sp. (Ac or Tx in WA? cave)

**BOSTRICHIDAE** (branch & twig borers; false power-post beetles)

undet. genus (8,700 to 7,000 years old in *Neotoma* woodrat nest in Tinajas Mts., Yuma Co,AZ)

**BRACHYPSECTRIDAE** (Texas beetles)

***Brachypsectra*** LeConte, 1874 - Brachypsectridae beetles

***Brachypsectra fulva*** LeConte, 1874 (epigeal in AZ, CA, UT, TX/ 9,120+- 500 years old in *Neotoma* woodrat nest in scNM/ Texas beetle)

**BRUCHIDAE** (pea & bean weevils) (also subsumed in Chrysomelidae)

Subfamily Bruchinae (*Acanthoscelides, Algarobius, Bruchus, Mimosetes, Stator*)

***Acanthoscelides*** Schilsky, 1905- Bruchidae beetles, Subfamily Bruchinae (also put in Chrysomelidae & Cleridae) (61 species in US or Canada)

**Acanthoscelides** undet. sp. (Ac or Tx in woodrat nest in cave in Grand Canyon, Coconino Co., AZ)

**Algarobius** Bridwell, 1946 (also put in Chrysomelidae) Bruchidae beetles, Subfamily Bruchinae (2 species in SW)

**Algarobius** undet. sp. or species (Ac in cave in Sutton Co., TX\ 9,600 & 1,200 years old in *Neotoma* nest, Ajo Mts., Pima Co., AZ)



**Bruchus** Linnaeus, 1767 - Bruchidae beetles, Subfamily Bruchinae (4 species in US)

**Bruchus** undet. sp. (15,00 to 15,500 yrs.BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM/ 9,000 to 6,000 year old in *Neotoma* woodrat nest in Big Bend Natl. Park, wTX))

*Mimosestes* (see Chrysomelidae)

**Mimosestes** Bridwell, 1946 (= *Cercidiestes* Bridwell, 1946) Bruchida beetles, Subfamily Bruchinae (also put in Chrysomelidae (5 species in US or Canada)

**Mimosestes** *amicus* (*Bruchus a.* Horn, 1873) (Ac in cave in Sutton Co., TX)

**Mimosestes** *nubigens* (*Bruchus n.* Motschulsky, 1874 (3,200 to >26,000 yrs.BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM)

**Stator** Bridwell, 1946 - Bruchidae beetles, Subfamily Bruchinae (also put in Chrysomelidae) (10 species in US or Canada)

**Stator** *limbatus* (*Bruchus l.* Horn, 1873). ( 13,500 & 1,200 years old in *Neotoma* nest, Ajo Mts., Pima Co., AZ)

**BUPRESTIDAE** Leach, 1815 (flatheaded or metallic wood borers; metallic wood-boring beetles)

Subfamily Agrilinae Laporte, 1835 (branch-and-leaf buprestids)  
Tribe Agrilini (*Agrilus*)

Subfamily Buprestinae (sculptured buprestids)  
Tribe Acmaeoderini (*Acmaeodera* (once put in Buprestinae)  
Tribe Chrysobothrini (*Chrysobothris*) (once put in Buprestinae)

**Acmaeodera** Eschscholtz, 1829 - Buprestidae beetles, Subfamily Buprestinae, Tribe Acmaeoderini (128 species in US or Canada)

**Acmaeodera** *cuneata* Fall, 1869 (0 to 100 years BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM)

**Acmaeodera** undet. sp. (12,250 years old in *Neotoma* woodrat nest in Butler Mts., Yuma Co.,AZ)

**Agrilus** Curtis, 182 ( *Teres* Harris, 1829; *Anambus* Thomson, 1864; *Engyaulus* Waterhouse, 1889; *Diplolophotus* Abeille, 1897; *Agrilomorphus* Thery, 1909; *Coroebilus*, *Personatus*, *Duttus*, *Bubbagrillus*, *Melagrillus* Curletti, 1993) Buprestidae beetles, Subfamily Argilinae, Tribe Agrilini (161 species in US or Canada)

**Agrilus** *aurichalceus* Redtenbacher, 1849 (= *A. proximus* Rey, 1891; *A. rubicola* & *obtusus* Abeille, 1897; *A. chrysoderes* Bedel, 1921; *A. communis* Obenberger, 1924; *A. antiquus* Gavoy, 1926) (Tx in TX)

**Agrilus** undet. sp. (8,100 years old in *Neotoma* woodrat nest, Ajo Mts., Pima Co., AZ)

**Chrysobothris** Eschscholtz, 1829 (= *Chrysobotis* E.1829; *Odontomus* Kirby, 1837; *Knowltonia* Fisher, 1935) (borers) Buprestidae beetles, Subfamily Buprestinae, Tribe Chrysobothrini (133 species in US or Canada)

**Chrysobothris** undet. sp. (Ac in cave in Pecos Co., TX)

*Euspilotus* - put in Histeridae

**BYRRHIDAE** Latreille, 1802 (pill beetles)

Subfamily Byrrhinae L., 1804

Tribe Byrrhini (*Byrrhus*)

Tribe Lioonini (*Lioligus*)

Subfamily Syncalypinae (once treated as Syncalypidae) (*Syncalypa*)

**Byrrhus** Linnaeus, 1767 - Byrrhidae beetles, Subfamily Byrrhinae, Tribe Byrrhini (28 species in US, Canada)

**Byrrhus** undet sp. ( 2,000 year old remains in entrance pit in cave in AB, Canada)

**Lioligus** Casey, 1912 - Byrrhidae beetles, Subfamily Byrrhinae, Tribe Lioonini (5 species in US)

**Lioligus** *nitida* (*Simplocaria n.* Motschulsky, 1845; *L. striolatus* Casey, 1912; *L. keeni* Casey, 1912; *L. aequabilis* Casey, 1912) (TTP in WA).

**Syncalypa** Dillwyn, 1829 (= *Curimopsis* in part) Byrrhidae beetles, Subfamily Syncalypinae (1-2 species in US, Canada)

**Syncalypa** cf. *tessellata* (*Byrrhus t.* LeConte, 1850 (= *S. grisea*?) (3,200 to 4,000 yrs. BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM)

**BRACHYPSECTRIDAE** (Texas beetles)

**Brachypsectra** LeConte, 1872 - Brachypsectridae beetles (one species in US)

**Brachypsectra** *fulva* LeConte, 1872 (epigean in AZ, CA, TX, UT/ Texas beetle/ Late Quaternary fossil in scNM *Neotoma* woodrat nest)

**CANTHARIDAE** Imhoff, 1856 (soldier or leather-winged beetles). **Bibl.:** Peck, 1975a  
Undet. genus - Tx or Ac in Vancouver Island, BC

Subfamily Cantharinae Imhoff., 1856  
Tribe Cauliognathini (*Chauliognathus*)

Tribe Cantharini (*Cantharis*)  
Tribe Podabrini (*Podabrus*)

***Cantharis*** Linnaeus, 1758 - Canthariidae beetles in Subfamily Cantharinae, Tribe Cantharini (36 species in US, Canada)

***Cantharis*** undet. sp. or species (Tx in AL?, GA (Chattooga, Dade, Walker Cos.), IN (Harrison, Crawford Cos.), MO, sON, TN, TX, VA) **Bibl.:** Peck, 1975a

***Chauliognathus*** Hentz, 1830 - Canthariidae beetles in Subfamily Cantharinae, Tribe Cauliognathini (18 species in US, Canada)

***Chauliognathus*** undet. sp. (Ac in 1 seAKcaves)

***Podabrus*** Westwood, 1838 (leather-wing) Canthariidae beetles in Subfamily Cantharinae, Tribe Podabrini (107 species in US, Canada)

***Podabrus*** undet. sp. (Tx or Ac in CA)

**CARABIDAE** Latreille, 1810 (predaceous or carnivorous ground, carabid or ground & tiger beetles). About 1,000 sp. n. of Mex. Most predaceous or omnivorous, a few feed on fungi.

**Bibl.:** Acorn & Ball, 1991; Alie, 1967; Badaracca, 1986a; Bartkowiak, Tschardtke & Weber, 1991; Kane 1986; Valentine 1952; Barr 1966-7, 1981, 1985b,c; Casele & Laneyrie 1989; Casey 1931; Erwin et al. 1979; Jeannel 1920, 1926-30, 1931, 1941-2, 1949a,, Kane 1984a, 1986a; Kane & Brunner 1986a; LeConte, 1848; Kane 1986, 1985; Lindroth 1961a; Keith 1973; Lindroth 1968; Van Zant, Poulson, & Kane 1978; Schaeffer 1910; Kane 1979, 1984, 1986; LeConte & Horn, 1883; W. Martin & Weber 1985. **Areas:** **AL:** Vigna Taglianti 1973; **AR:** Barr 1964c, 1966b; **Appalachian:** Barr 1965a, 1981b, 1985a; **CA:** Horn, 1888; **Canada & AK:** Lindroth 1961a.; **E:** Kane 1985.; **IN:** Van Dyke 1940; **KY:** Barr 1959c, 1966; Packard, 1876; Van Dyke 1940; **NM:** Van Dyke 1949; **TN:** Barr 1959c, 1971a; **TX:** Barr 1959f, 1965; **US:** Barr 1981; **VA:** Barr 1960c; Van Dyke 1940; **WV:** Barr 1959d, 1960b; Horn, 1868; Thaxter 1893

***Brachininae*** Bonelli, 1810  
Tribe Brachinini (bombadier beetles) (*Brachinus*)

***Carabinae*** Latreille, 1802. **Bibl.:** Garner 1955  
Supertribe Carabitae

Carabini (searchers) (*Calosoma*, *Carabus*),

Cydrini (snail-eating ground beetles),  
(*Carabus* (now in Carabini) *Cydrus*, *Scaphinotus*, *Sphaeroderus*)

Supertribe Nebriitae

Tribe Nebriini (*Nebria*) (also put in Subfamily Nebriinae)

Tribe Notiophilini (*Notiophilus*) (also put in Subfamily Nebriinae)

Supertribe Scarititae

Scaritini (*Clivina*, *Dyschirius*, *Pasimachus*, *Scarites*, *Schizogenius*)

**Cicindelinae** Latreille, 1802 (tiger beetles) **Bibl.:** Boyd 1982; J. Leonard & Bell 1998

Tribe Cincindelini

Subtribe Cincidelina (*Cicindela*)

Tribe Megacephalini

Subtribe Omina (*Amblycheila*, *Omus*) (put in Subfamily Cicindelinae, Tribe Omini)

Tribe Omini (*Amblycheila*, *Omus*) (also put in Megacephalini, Subtribe Omina)

**Cymidine**

Tribe Lebiini (now put in Harpalinae)

**Harpalinae** Bonelli, 1810 (also subsumed in Carabinae)

Tribe Platynini (*Agonum*, *Atranus* (also put in Harpalini), *Calathus* (also put in Pterostichini), *Chaenius*, *Mexisphodrus* (also put in Prospodriini), *Notiobia* (put in Harpalini), *Platynus*, *Rhadine* (also put in Tribe Bembidiini), *Synuchus* (also put in Pterostichini))

Tribe Prospodriini (*Mexisphodrus*) (also put in Platynini)

Supertribe Callistitae

Callistini (*Chlaenius*) (put in Chlaenini)

Chlaenini (vivid metallic ground beetles)

Subtribe Chlaeniina (*Chlaenius*) (also put in Callistini)

Licinini (notched-mouthed ground beetles)

Subtribe Dicaelina (also put in Panagaeini) (*Dicaelus*)

Supertribe Dryptitae

Tribe Galeritini (false bombardier beetles) (*Galerita*) (also placed as subtribe of Zuphiini)

Supertribe Harpalitae

Tribe Harpalini (dingy ground beetles) (*Amara* (put in Zabрини), *Apenes* (put in Lebiini), *Atelothrus*?, *Atranus* (put in Platynini), *Cymindis* (put in Lebiini), *Gastrellarius*, *Poecilus* (both in Pterostichini))

Subtribe Anisodactylina

Genus-group Anisodactyli (*Anisodactylus*)

Genus-group Notiobii (*Notiobia*) (also put in Platynini)

Subtribe Harpalina

Genus-group Harpali (*Harpalus*) (also put in Platynini)

Genus-group Selenophori (*Discoderus*, *Selenophorus*)

Genus-group Trichotichni (*Trichotichnus*)

Subtribe Stenolophina

Genus-group Stenolophi

(*Acupalpus*, *Bradycellus*, *Stenolophus*) **Bibl.:** Kraim 1983

Tribe Zabрини (= Amarini) (*Amara*) (also put in Harpalini)

Supertribe Anthiitae

Tribe Helluonini (flat-horned ground beetles)

Subtribe Omphrina (*Helluomorphoides*)

Supertribe Lebiitae

Lebiini (colorful foliage ground beetles)

Subtribe Apenina (*Apenes*)

Subtribe Calleidina (*Calleida*)

Subtribe Cymindidina (*Cymindis*, *Pinacodera*)

Subtribe Dromiina (*Syntomus*)

Subtribe Lebiina (*Lebia*)

Odacanthini (long-necked ground beetles) (*Colliuris*)

Supertribe Panagaetiae

Tribe Panagaeini (hairy ground beetles) (*Dicaelus* (now in Licinini))

Supertribe Pterostichitae

Tribe Pterostichini (woodland ground beetles) (*Agonum*, *Platynus*, *Calathus* (all now in

Platynini), *Cyclotrachelus*, *Gastrellarius* (also put in Harpilini), *Poecilus* (also put in

Platynini), *Pterostichus*, *Synuchus* (put in Platynini) **Bibl.:** R. Thompson 1979; Will 2000

**Omophroninae** Bonelli, 1810:

Omophronini (round sand beetles) (*Omophron*)

**Scaritinae** Bonelli, 1810 (Pedunculate ground beetles) (now put in Carabinae)

Scaritini (*Clivina*, *Dyschirius*, *Pasimachus*, *Scarites*, *Schizogenius*)

**Trechinae** Bonelli, 1810:

Bembidiini (minute ground beetles) (*Anillinus*, *Anilloides*, *Bembidion*) (all put in Trechini), *Elaphropus*, *Horologion*, *Paratachys*, *Tachys*, *Rhadine* (put in Subfamily Harpalinae, Tribe Platynini), *Troglanillus*) (probable undescr. sp. in \*cave in Tulare Co., CA)

Subtribe Anillina (*Anillaspis*) (once in Trichini & Psydrini), *Anillinus*, *Anillodes*, new genus (one sp.? in \*cave in Tuolumne Co., CA/Tb or epigean & one sp.? in (Calaveras, Tulare Co. & Tuolumne Cos.) /Tb or epigean)

Broscini (*Brascodera*)

Patrobini (*Patrobus*)

Supertribe Trechitae

Tribe Trechini (Trechine beetles) (*Ameroduvalius*, *Anillaspis* (now in Bembidiini (minute ground beetles) (*Anillinus*, *Anilloides*, *Bembidion*) (all put in Trechini), *Aphanotrechus*, *Bembidion* (also put in Bembidiini), *Darlingtonia*, *Neaphaenops*, *Nelsonites*, *Pseudanophthalmus*, *Trechus*, *Xenotrechus*) **Bibl.:** Jennel 1920, 1938

***Acupalpus*** Latreille, 1829 (= *Anthracus* Motschulsky, 1850; *Philodes* LeConte, 1861; *Balius* Schiodte, 1861; *Manicellus* M.1864; *Goniolophus* & *Tachistodes* Casey, 1914) Carabidae beetles in Subfamily Harpalinae, Tribe Harpalini, Subtribe Stenolophina, Genus-group Stenolophi (19 species in US, Canada)

***Acupalpus partarius*** (= *Agonoderus* & *Trechus partarius* Say, 1823; *Tachistodes lyratus* & *convergens* Casey, 1924) (epigean ME to AZ, w. to SD/ TTx in TX)

***Acupalpus*** undet. sp. (Ac in cave in Culberson Co., TX)

*Agonoderus* Dejean, 1829 = subgenus of *Stenolophus*

*Agonoderus partarius* = *Acupalpus p.*

***Agonum*** Bonelli, 1810; Sanderson & Miller, 1941 (= *Agonothorax* Motschulsky, 1850; *Europhilus* Chaudoir, 1859; *Olisares* M.165; *Platynomicrus*, *Melanogonum*, *Pragonum*, *Taphranchus*, *Circinalidia*, *Micragonum*, *Circinalia*, *Stereagonum*, *Stictanchus*, *Deratanchus* Casey, 1920; *Punctagonum* Gray, 1937) (See *Platynus*, *Rhadine*) Carabidae beetles in Subfamily Pterostichinae, Tribe Pterostichini (115 species in US, Canada) **Bibl.:** Liebherr 1983

***Agonum*** (*Platynomicrus*) *bicolor* (= *Anchomenus b.* Dejean, 1828; *P. marginellus* LeConte, 1860) (NW, AK, YK, NT, BC, AB epigean/Ac or Tx in IN)

*Agonum caudatum* = *Rhadine c.*

**Agonum** *cyclifer* (= *Anchomenus c.* Bates, 1883; *Platynus arizonensis* Horn, 1892) (epigean in AZ, TX/ Tp? in AZ,NM)

**Agonum** (*Stictanchus*) *extensicolle* (*Feronia e.* Say, 1823; *Anchomenus proximus* T.W. Harris, 1828; *A. obscuratus chaudi*, 1843; *A. lecontei* LeConte, 1844; *A. viridis* LeConte, 1848, *A. cyanescens* Motschulsky, 1859, *A. gaudens* Casey, 1920; *A. gaudens clientulus* Casey, 1920, *A. vigilans* C.1920) (US, Canada(w. to SK) except NW,NV/ Tp in caves in Bexar & King Cos.,TX; Ac or Tx in cave in Jackson Co.,AL & MO; Ac in Livingston Co.,KY) **Bibl.:** Liebherr 1983

*Agonum howdeni* = *Rhadine h.*

*Agonum jonesi* = *Rhadine j.*

*Agonum longicollis* = *Rhadine l.*

*Agonum ozarkense* = *Rhadine o.*

**Agonum** *pallipes* (*Carabus p.* Fabricius, 1787; *Harpalus p.* Fabricius, 1792) (epigean ON s. to FL, w. to AR, IL, MO, TN/ Tx in cave in Monroe Co.,KY)

*Agonum perlevis* Csy. = *Rhadine p.*

*Agonum* (*Micragonum*) *punctiforme* = *Platynus p.*

*Agonum reflexum* = *Platynus r.*

**Agonum** undet. sp. (2,000 year old remains in entrance pit in cave in AB; (>43,300 & 9,9,00 years old in *Neotoma* woodrat nest in Tinajas Mts., Yuma Co,AZ); Tx in Bat Cave., Carter Co. Caves)

*Agonum tenuicolle* - see *Platynus*

**Agonum** *texanus* (= *Platynus t.* LeConte, 1878; *Anchomenus megillus* Bates, 1891) (AZ, KS, NM, OK, TX epigean/ Tp in Lampasas & Culberson? Cos.,TX)

**Agonum** *viride* (= *Selenophorus gagatinus* Dejean, 1829; *S.v.* LeConte, 1848; *S. maurus* Haldeman, 1843) or *Anisodactylus viridescens* Leconte, 1861?) (SE/?Ac in one cave each in Bexar & Hays Co.,TX)

**Amara** Bonelli, 1810 (= *Centrioptera*) Carabidae beetles in Subfamily Harpalinae, Tribe Zabrini (also put in Harpalini) (191 species in US or Canada)

**Amara** *chalcea* Dejean, 1828 (epigean in most of NA/ 1->/26 thousand yrs.BP in *Neotoma* woodrat nest in wTX (El Paso Co.) & 9,120+- 500 years & 4,340-2,260 years old in *Neotoma* nestin scNM)

**Amara** (*Celia*) *musculus* (*Feronia m.* Say, 1823; *C.m.* Say, 1925; *C. lyncea*, *nugator*, *curticeps*, *shoemakeri*, *vegrandis*, *fluminea*, *crenulata*, *limbalis*, *paululua*, *scintilla*, *brevitarsis*, *pimalis* & *minnesotana* Casey, 1924) (Tx or Ac in cave in Carter Co.,KY)

*Amara* undet. sp. (*Neotoma* woodrat midden in Canyonlands, UT; (2,000 year old remains in entrance pit in AB cave; (or *Cryptoglossa*) (740 years old in *Neotoma* woodrat nest in Butler Mts., Yuma Co,AZ))

*Amara* (*Celia*) *texana* (*Celia t.* Putzeys, 1866) Blaisdell, 1924 (E except FL/ Ttx in TX)

*Amara* (*Curtonotus*) *torrida* (*Carabus t.* Panzer, 1797; *A. infausta* LeConte, 1855; *Centrioptera t.*; *Curtonotus albertanus*, *biarcuatus*, *brevipennis* Casey, 1924; *C. scutana*, *labradorensis* Casey, 1918; *C. brevilabris* Kirby, 1837; *A. consueta* Fall, 1926; *A. cylindrica* LeConte, 1878; *C. dura* Casey; *C. holmbergi*, *somnolentus*, *reflexus* Putzeys, 1866; *A. hudsonica* Hayward, 1908; *A. melanogastrica* Dejean, 1828) (NA/ Ttx in TX)

*Amblycheila* Say, 1830 (= *Amblychila*) - Carabidae beetles in Subfamily Cicindelinae, Tribe Omini (also put in Megacephalini, Subtribe Omina) (15 species in US, Canada)

*Amblycheila* *schwartzi* Horn, 1903 (epigean in AZ, CA, UT/ Habitual Tx in CA)

*Amerizus* - see *Bembidion w.*

*Amerodualius* Valentine, 1952 - Carabidae beetles in Subfamily Trechinae, Tribe Trichini.(1-3? species in US, Canada) **Bibl.:** Kane, 1986a

*Amerodualius* *jeanneli* Valentine, 1952 (Cumberland Plateau of sKY/ Tb)

*Amerodualius* *jeanneli j.* (=A.j. Valentine, 1952) (Grand Crystal Cave (now flooded by Lake Cumberland) & two other caves in Pulaski Co.+ one cave in McCreary Co, KY/ Tb/ G3T3)

*Amerodualius* *jeanneli pubescens* (A.j. Valentine, 1952) (type locality cave & one other cave in Wayne Co.,KY/Tb)

*Amerodualius* *jeanneli rockcastlei* Valentine, 1952 (type locality cave \*& 7 other caves in Rockcastle Co. +7 caves in Pulaski Co. & 9 caves in Jackson Co.,KY/Tb/G3T3)

*Amerodualius* *jeanneli valentinei* Valentine, 1952 (type locality cave & one other caves in Wayne Co.,KY/Tb)

*Amerodualius* *krekeri*? (type locality cave & 2 other caves in Wayne Co.,KY/Tb)

*Amerodualius* *persimilis* \*(cave in Rockcastle Co.,KY/Tb) =? *Pseudanopthalmus p.*

*Anillaspis* Casey, 1918 - Carabidae beetles in Subfamily Trechinae, Tribe Bembidiini, Subtribe Anilina (once in Trechinae, Tribe Trechini) (2 species in US or Canada)

*Anillaspis* *explanatus* (*Anillus e.* Horn, 1888) (epigean in CA/Tx in cave in El Dorado Co.,CA)

*Anillaspis* undet. sp. (Calaveras Co.,CA/ Tx or Ac)



**Anillinus** Casey, 1918 (= *Troglanillus* Jeannel, 1963) Carabidae beetles in Subfamily Trechinae, Tribe Bembidiini, Subtribe Anilina (also put in Trechini) (12 species in US, Canada)

**Anillinus** *longiceps* Jeannel, 1963 (\*type locality cave in Marion Co., TN/ Tb, Tp or Tx)

**Anillinus** undescr. sps. (Al, GA/ Edaphobite, Tp)

**Anillinus** undet. sp. (Tp or Tb or edaphic in GA (Dade Co.))

**Anillinus** *valentinei* (*Troglanillus* v. Jeannel, 1963) (\*\*\*?type locality cave & one other cave in De Kalb Co., & one cave in Jefferson Co., neAL/ Tb ,Ed/ G3 or G1?)

**Anillodes** J., 1963 - Carabidae beetles in Subfamily Trechinae, Tribe Bembidiini, Subtribe Anilina (also put in Trechini) (2 species in US, Canada)

**Anillodes** undet. sp. (Calavaras, Santa Cruz, Tulare & Tuolumne Cos., CA/ Tp?)

**Anillodes** cf. *sinuatus* Jeannel, 1963 (epigean in TX/ Tx or Ac in TX)

**Anisodactylus** Dejean, 1829 - Carabidae beetles in Subfamily Harpalinae, Tribe Harpalini, Subtribe Anisodactylina, Genus-group Anisodactyli (33 species in US, Canada)

**Anisodactylus** undet. sp. (E/Tx; Tx in cave in Edwards Co., TX)

*Anisotarsus* Chaudoir, 1837 = subgenus of *Notiobia*

*Anophthalmus* Horn, 1883 (see *Pseudanophthalmus*. **Bibl.:** Jeannel, 1926)

*Anophthalmus interstitialis* Hubbard, 1880 = *P. striatus*

**Apenes** LeConte, 1851 - Carabidae beetles in Subfamily Harpilinae, Tribe Lebiini, Subtribe Apenina (also put in Harpalini) (6 species in US or Canada)

**Apenes** (*Apenes*) *sinuata* (*Cymindis* s. Say, 1823; *A. pustulata* Dejean, 1831) (E to ON/ Tx or Ac in cave in Val Verde Co., TX)

*Aphanotrechus* Barr, 1960 - See *Pseudanophthalmus virginicus*

**Atelothrus** Sharp, 1903 - Carabidae beetles in Subfamily Harpilinae, Tribe Harpalini

**Atelothrus** *aaae* Samuelson & Liebherr in Liebherr & Samuelson, 1992 (\*one cave in Haleakala Natl. Park, HI)

**Atelothrus** *howarthi* Samuelson & Liebherr in Liebherr & Samuelson, 1992 (\*one cave in Haleakala Natl. Park, HI)

**Atranus** LeConte, 1848 - Carabidae beetles in Subfamily Harpilinae, Tribe Platynini (1 species in US or Canada)

***Atranus pubescens*** (*Anchomenus p.* Dejean, 1828; *A. obconicus* Halderman, 1843) LeConte, 1848 (MW, E n. to ON, PQ, NB/ Tp in AL, AR, GA (Dade Co.), IL, IN, KY (Mammoth C.), MO, OK, VA, TX)

*Batriasymmodes* (now in Pselaphidae)

***Bembidion*** Latreille, 1802 (= *Peryphys* Hayward, 1897) (bombardier beetles) Carabidae beetles in Subfamily Trechinae, Tribe Bembidini (also put in Trichini) (255 species in US, Canada)

***Bembidion*** (*Peryphanes*) *grapii* Gyllenhal, 1827 (= *Peryphys picipes* Kirby, 1837; *B. seductum*, *scrutatatum* & *nitens* Casey, 1918; *B. picipes*) (NA epigeal/ Tx or Tp in Kendall Co., TX; Pendleton Co., WV & Camden Co., MO)

***Bembidion*** (*Peryphanes*) *grapii* group (Tp or Tx in cave in Eddy Co., NM)

***Bembidion*** (*Pseudoperyphus*) *honestum* Say, 1823 (*Bembidion hesperium* & *binarium* Casey, 1918; *Pterostichus h.*) (NE to New Brunswick, ON, PQ/ TTx in KY)

***Bembidion*** (*Trechonepha*) *iridescens* (*Ochthedromus i.* LeConte, 1852; *Trechonepha* Casey) (*B. amicum*, *deceptor*, *fabrum*, *impium*, *obliviosum*, *repens*, *volatile* Casey; *B. parallelocolle* (Motschulsky)) (AB, BC, CA, ID, MT, NV, OR, UT, WA epigeal/ Tp or Tx in NM, WA; Tp in CA (Amador, Calaveras, Mariposa & Santa Cruz Cos., CA))

***Bembidion*** (*Peryphanes*) *lacunarium* (P.L. Zimmerman, 1827; *B. militare* Casey, 1884; *B. histricum* Casey, 1918) (eUS, Canada to IA, TX; BC?, ID?, WA? epigeal/ Tp in AR, GA (Dade Co.), IL, IN (Crawford, Orange Cos. (S4?/G4)), KY (Mammoth C.), OK, TX)

***Bembidion*** (*Amerizus*) *oblongulum* (*Trechus o.* Mann., 1852; *A. crassicornis* & *keeni* Casey, 1918) (eUS, Canada to AK, BC, IL, TN, NC /Tx in TN),

***Bembidion*** undet. sp. or species (Tp in Childress, Comal, Crockett, Culberson, Kinney, Williamson Cos., TX; Tx or Tp in MO; TTx or Ac in AZ)

*Bembidion proximus* = *Paratachys p.*

***Bembidion*** (*Coxendix*) undet. sp. (1,400 & 3,200 yrs.BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM)

***Bembidion*** (*Peryphanes*) *texanum* Chaudoir, 1868 (*Peryphus t.*; *B. inquietum* & *cogitans* Casey, 1918) (AZ, MB, NM, OK, SD, WI/ Tp in IL, OK, TX)

***Bembidion*** (*Notaphus*) *viridicolle* (= *N.v.* LaFerte'-Se'nectere, 1841; *B. apicale* Jaquelin du Val, 1857; *B. hamiferum* Chaudoir, 1868; *Bembicidium chevrolati* Gemminger & Harold, 1868; *B. particeps* Casey, 1918) La Ferte (epigeal AB to ON, s. to FL, WY/ Tx or Tp in Val Verde Co., TX)

**Bembidion** (*Amerizus*) *wingatei* (A.w. Bland, 1864) (IL, IN, KY, LB, MA, ME, MI, NB, NC, NF, NH, NS, NY, OR, ON, PA, PM, PQ, VA, VT, WI, VW/disjunct Tp glacial relict in IL, IA, neKY, nwVA, swPA, WI, neWV)

**Brachinus** Weber, 1801- Carabidae beetles in Subfamily Brachininae, Tribe Brachinini (48 species in US, Canada)

**Brachinus** (*Neobrachinus*) undet. sp. (bombadier beetles) (Tx, Ac or Tp in Comal & King Cos.,TX; Tx in cave in Lawrence Co.,IN)

**Bradycellus** Erichson, 1837 - Carabidae beetles in Subfamily Harpilinae, Tribe Harpalini, Subtribe Stenolophina, Genus-group Stenolophi (also put in Platynini) (54 species in US, Canada)

**Bradycellus** (*Stenocellus*) *nubifer* LeConte, 1858 (*B. ventralis*, 1858; *Stenocellus n.* Casey, 1914) (AB, AZ, BC, CA, ID, MT, NV, OR, SK, TX, UT, WA/Tx? in Collingsworth Co., TX)

**Bradycellus** (*S.*) *rupestris* (*Trechus r.* Say, 1823; *Acupalpus elongatulus* Dejean, 1829; *Stenolophus cinctus* & *debilipes* Say, 1830; *Trechus flavipes* Kirby, 1837; *B. parallelus* Chudoir, 1868; *Tachycellus n.* Dejean) (eUS & Canada (ON,PQ,NB,NS) to OK,SD,CA?,CO?,NM?,WY?/ Tp or Tx? in Comal, Edwards & San Saba Cos.,TX; Tp, Tx or Ac in IN; Ac in AL)

**Brascodera** Lindroth, 1961 - Carabidae beetles in Subfamily Trechinae, Tribe Broscini (1 species in US)

**Brascodera** (*Brascodera*) *insignis* (*Miscodera i.* Mannerheim, 1852) (seAK, s. to OR, e. to WY epigean/ Tp in WA & OR C.,OR)

**Calathus** Bonelli, 1810 (= *Procalathus* Jedlicka, 1953; *Neocalathus* Ball & Negre, 1972) Carabidae beetles in Subfamily Harpilinae, Tribe Platynini (also put in Pterostichini) (11 species in US, Canada)

**Calathus** *ingratus* Dejean, 1828 (epigean BC to NF,s.to VA,WY/ 2,000 year old remains in entrance pit in AB cave)

**Calathus** *opaculus* LeConte, 1854 (= *C. sonoricus*, *alutaceus*, *appalachius*, *obesulus* Casey, 1913; *C. ventricosus* C., 1920) (Tp in Childress & Culberson Cos., TX)

**Calleida** Latreille & Dejean, 1824 (= *Callida*) Carabidae beetles in Subfamily Harpilinae, Tribe Lebiini, Subtribe Calleidina (12 species in US, Canada)

**Calleida** (*Philophuga*) *viridis* Dejean, 1831 (CA, e. to KS, n. to BC, e. to Manitoba/ 1,400 to 1,700 yrs.BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM)

**Calosoma** Weber, 1801 (22 syns.) Carabidae beetles in Subfamily Carabinae, Tribe Carabini (41 species in US, Canada)

**Calosoma** (*Camedula*) *peregrinator* Guerin-Meneville, 1844 (4,000 to 2,500 years old in *Neotoma* woodrat nest in Big Bend Natl. Park, wTX)

**Calosoma** (*Calodrepa*) *scrutator* (*Carabus* s. Fabricius, 1775) (epigean NH, CT s. to NE, w. to CO, SD, TX/ caterpillar hunter/ Ac? in Bexar Co., TX & Grand Canyon, Coconino Co., AZ)

**Calosoma** undet. sp. (Ac? in Menard Co., TX)

**Carabus** Linnaeus, 1758 - Carabidae beetles in Subfamily Carabinae, Tribe Carabini (13 species in US, Canada)

**Carabus** (*Archicarabus*) *nemoralis* O.F. Muller, 1764 (Atlantic coast to NJ, w.to WI; OR to BC/European ground beetles/ GA to NM, n.to BC/ Tx or Ac in sOR)

**Carabus** undet sp. (2,000 year old remains in entrance pit in AB cave)

**Carabus** (*Tomocarabus*) *taedatus* Fabricius, 1787 (epigean AK to NF, s. to OR ,UT, CO/ 2,000 year old remains in entrance pit in AB cave)

*Celia* Zimmerman, 1832 = subgenus of *Amara*  
*Celia muscula* = *Amara m.*

*Centrioptera* Horn, 1870 (also put in Tenebrionidae) = *Amara* & *Cryptoglossa*

**Chlaenius** Bonelli, 1810 - Carabidae beetles in Subfamily Harpilinae, Tribe Chlaenini, Subtribe Chlaeniina (also put in Callistini) (51 species in US or Canada)

**Chlaenius** (*C.*) *aestivus* Say, 1823 (*C. cobaltinus* Dejean, 1826; *C. congener* LeConte, 1844) (eUS,Canada to AR, LA, OK? epigean/ Tx? in FL,IL)

**Chlaenius** (*Chlaeniellus*) *brevilabris* b. (*Chlaenius* b. & *consimilis* LeConte, 1848; *C. texanellus* Casey) (eUS to SD,AR,TX,CO?,NM?,ON)/ Tp in cave in Crawford Co., MO)

**Chlaenius** *eurythropus* Germar, 1824 (*C.rufilabris* Dejean, 1826; *C. umbratarsis* & *oblongipennis* Casey, 1920) (eUS,Canada to SD, OK/ Tx or Ac in FL,TX)

**Chlaenius** (*Chalaenius*) *laticollis* Say, 1823 (*C. rufipes* Dejean, 1826; *C. brevicollis* LeConte, 1848; *C. brachyderus* Chaudoir, 1856) (NE to ON/ Tx in OK)

**Chlaenius** *punctulatus* (= *Acupalpus* p. Hatch, 1953?) (Pleistocene fossil in Port Kennedy C., Montgomery Co., PA)

**Cicindela** Linnaeus, 1758 (tiger beetles) Carabidae beetles in Subfamily Cicindelinae, Tribe Cincindelini (86 species in US, Canada)

**Cicindela** undet. sp. (7,000 to 2,500 years old in Neotoma woodrat nest in Big Bend Natl. Park, wTX)

**Clivina** Latreille, 1801 (seedcorn beetle) Carabidae beetles in Subfamily Carabinae (= Scaritinae), Tribe Scaritini (24 species in US, Canada)

**Clivina** undet. sp. (Tx in KY, TX; Ac in TN (Davidson Co.))

**Colliurus** De Geer, 1774 (*Casnonia* Dejean, 1821; *Odacanthella* Liebke, 1930, *Calocolliuris* L., 1938 - Carabidae beetles in Subfamily Harpilinae, Tribe Odacanthini (5 species in US or Canada)

**Colliurus** (*Cosnonia*) *pennsylvanica* (*Attelabus p.* Linneaus, 1767) (E to ON,PQ/ prob.Tx in TX)

*Cryptophagus* - now in Cryptophagidae

**Cychnus** Fabricius, 1794 - Carabidae beetles in Subfamily Carabinae, Tribe Cychnini (3 species in US, Canada)

**Cychnus minor** (extinct?, valid species?) (Pleistocene fossil in Port Kennedy C., Montgomery Co., PA)

**Cychnus tuberculatus** Harris, 1839 (epigean AK to OR & seID, e. to wWY/ Tx in 2 seAKcaves & Vancouver Island, BC)

**Cychnus wheatleyi** (extinct?, valid species?) Pleistocene fossil in Port Kennedy C., Montgomery Co., PA)

**Cyclotrachelus** Chaudoir, 1838 (= *Evarthrus* LeConte, 1852; *Fortax* Motschulsky, 1866; *Ferestria* Leng, 1915; *Anaferonia*, *Megasteropus*, *Eumolops* Casey, 1918; *Cyclotrachelus* Chaudoir, 1838 ; *Evarthrus* LeConte, 1852; *Fortax* Motschulsky, 1866; *Ferestria* Leng, 1915; *Anaferonia*, *Megasteropus*, *Eumolops* Casey, 1918) Carabidae beetles in Subfamily Harpilinae, Tribe Pterostichini (43 species in US or Canada)

**Cyclotrachelus** (*Evarthrus*) *fuscatus* (*Evarthrus f.* Freitag, 1969) (Tx or Ac in 1 IL cave)

**Cyclotrachelus** (*Evarthrus*) *sodalis* (Feronia S. LeConte, 1848; *F. vagans*, *corax*, *colossus* L.1848; *E. fatuus* L.1852; *Eumolops sulcata* Casey, 1918; *Evarthrinus retractus* C., 1920; *E. inflatipennis* C.1924; *Evarthrus lodingi* Van Dyke, 1926) (epigean IA, KS, MO, NE, AL, TN, GA to ON/ Tx or Ac in 1 IL cave),

**Cymindis** Latreille, 1802 (= *Pinacodera* Schaum, 1857; *Planesus* Motschulsky, 1864) Carabidae beetles in Subfamily Harpilinae, Tribe Lebiini, Subtribe Cymindidina (also put in Platynini) (27 species in US or Canada)

*Cymindis* (*Pinacodera*) *arizonensis* Schaeffer, 1910 (*C. zuniana* Casey, 1913) (epigean AZ,CA,NM/ occasional Tx in CA/ 2,000 to 16,3000 yrs.BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM))

*Cymindis* (*P.*) *interior* Lindroth, 1969 (epigean NE,ON s. to CO,CA, w. to BC/ 100 to > 26,000 yrs.BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM)

*Cymindis* (*P.*) *aurora* (valid species?) (extinct? Pleistocene fossil in Port Kennedy C., Montgomery Co., PA)

*Cymindis* (*P.*) *laticollis* Say, 1830 (*C. villigera* Chaudoir, 1873) (epigean AZ?, AR, CO,NM, Ok, SD, TX,WY, MB? MD?/ Ac in Edwards Co., TX)

*Cymindis* (*P.*) *platicollis* (*Cymindis p.* Say, 1823) (100 to >26,000 yrs.BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM)

*Cymindus* (*P.*) *unicolor* Kirby, 1837 (2,000 year old remains in entrance pit in AB cave)

*Darlingtonea* Val., 1952 - Carabidae beetles in Subfamily Trechinae, Tribe Trichini (1 species in US or Canada) **Bibl.:** Kane, 1986a

*Darlingtonea kentuckensis k.* (= *D. k.* Val., 1952) (cave type locality cave in Pulaski Co. +McCreary, Wayne, Estill, Rockcastle, Jackson & Clinton Cos.(KY) & cave in Fentress Co.(TN); Cumberland Plateau of seKY and adjacent TN/ Tb) **Bibl.:** T. Marsh 1969; Norton, 1984; Sperka, 1974

*Darlingtonea kentuckensis lexingtoni* Val., 1952 (type locality cave in \*Rockcastle Co.,KY/ Tb)

*Darlingtonea kentuckensis* undescr. ssp. (central Jackson Co.,KY/Tb)

*Dicaelus* Bonelli, 1813 (= *Liodycaelus* Casey, 1913; *Paradicaelus* Ball, 1841) Carabidae beetles in Subfamily Harpilinae, Tribe Licinini, Subtribe Dicaelina (also put in Panagaeini) (14 species in US or Canada)

*Dicaelus alutaceus* Mesa, 1916? (Pleistocene fossil in Port Kennedy C., Montgomery Co., PA)

*Dicaelus ambiguus* Laferte'-Senectere, 1841 (nomina nuda) (epigean in IN/ Tp in Onondaga Co.,Crawford Co.,MO)

*Dicaelus (D.) crenatus* LeConte, 1853 (epigean AR, KS, MO, OK, TX, AZ? FL? LA?/ Ac in Burnet Co., TX)

*Discoderus* LeConte, 1853 - Carabidae beetles in Subfamily Harpilinae, Tribe Harpalini, Subtribe Harpalina, Genus-group Selenophori (also put in Platynini) (18 species in US or Canada)

**Discoderus** undet. sp. (Tx in Uvalde Co., TX)

**Discoderus impotens** LeConte, 1858 (Holocene remains in woodrat nest in Grand Canyon, Coconino Co., AZ & *Neotoma* woodrat midden in Canyonlands, UT/ 2,00 to 15,500 yrs.BP in *Neotoma* woodrat nest in wTX (El Paso Co.) & 24,00 to 23,000 years old in Big Bend Natl.Park)

**Discoderus (D.) parallelus** Haldeman, 1843 (100 to 15,500 yrs.BP in *Neotoma* woodrat nest in wTX (El Paso Co.)

**Dyschirius** Bonelli, 1810 (= *Akephorus* LeConte, 1852; *Dyschiridius*, *Dyschiriodes* Jeannel, 1941) Carabidae beetles in Subfamily Carabinae (= Scaritinae), Tribe Scaritini (56 species in US, Canada)

**Dyschirius** undet. sp. or species (Tx in stream-bank detritus in Monroe & Carter Cos., KY)

**Elaphropus** Motschulsky, 1839 (*Barytachys* Chaudoir, 1868; *Tachyura* Motschulsky, 1839) Carabidae beetles in Subfamily Harpilinae, Tribe Bembidiini (31 species in US, Canada)

**Elaphropus (Tachyura) incurvus (Bembidion i.** Say, 1830; *Tachyura parallela* Casey, 1918 homo.; *Tachys rhodensis* Csiki, 1928; *Tachyura*, *Tachys i.*) (epigean nNA s. to AL, CO, OR/ Tx or Ac in 1 IL cave)

**Elaphropus (Tachyura) ferrugineus (=Bembidium f.** Dejean, 1831; *Tachys ferrugineus*; *T. ovipennis* Chaudoir, 1868) (epigean AL n.to CT, w. to TN, IL, IA/ Tp in GA, MO, TX (common, San Saba Co.), OK) **Bibl.:** Barr, 1964; Loding, 1945

*Eurytrichus* - see *Notiobia* & *Anisotarsus*

*Evarthrus* = *Cyclotrachelus*

*Feronia honesta* = *Gastrellarius h.*,

*Feronia chalcites* = *Poecilus c.*,

*Feronia lachrymosus* = *Pterostichus l.*,

**Galerita** Fabricius, 1801 - Carabidae beetles in Subfamily Harpilinae, Tribe Galeritini in Subfamily Harpilinae, Tribe Galaeritini (*Galaerita* also placed as subtribe of Zuphiini) (8 species in US, Canada)

*Galerita (Progaleritina) janus* Fabricius, 1792 = *Progaleritina j.*

**Galerita** undet. sp. of subg. *Progaleritina* (Tx in AR, OK)

**Galerita** undet. sp. (Ac in gypsum cave in Culberson Co., TX)

**Gastrellarius** Casey, 1918 - Carabidae beetles in Subfamily Harpilinae, Tribe Pterostichini (also put in Platynini) (3 species in US or Canada)

**Gastrellarius honestus (=Feronia h.** Say, 1823; *Pterostichus h.*) (Epigean AL n.to NB, w. to TN, KY, IL/ Ac or Tx in sON)

*Goniolophus* = *Acupalpus*

***Harpalus*** Latreille, 1802 - Carabidae beetles in Subfamily Harpilinae, Tribe Harpalini, Subtribe Harpalina, Genus-group Harpali (also put in Platynini) (97 species in US, Canada)

***Harpalus*** (*Megapangus*) *caliginosus* (*Carabus c.* Fabricius, 1775) (epigean sCanada to nw Mexico/ Ac in San Saba Co., TX)

***Harpalus*** (*Cordoharpalus*) *fulgens* Csiki, 1931 (*H. nitidulus* Chaudori, 1843 (secondary homonym of *H.n.* (Stephens, 1828; *H.f.* C.1931 (replacement name for *H.n.*)) (eUS to AR, TX, IL, n.to ON/ Tp or Tx in Onondaga C., Crawford Co., MO/ 16-16.3 thousand yrs.BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM; 3,200-15,500 yrs.BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM)

***Harpalus*** (*Pseudophonus*) *pennsylvanicus* (*Carabus p.* DeGeer, 1774; *H. longior* Kirby, 1837; *H. p. mormonicus* Casey, 1914; *H. immixtus* Casey, 1924) (NA, Canada (BC, MB, ON, PQ, NB, NS, PE epigean/ Tx? in WA Co., IN; Ac in GA (Bartow Co.))

***Harpalus*** (*H.*) sp. cf. *spadiceus* Dejean, 1829 (*H. comis* Haldeman; *H. carolinae* Schaeffer, 1910) (epigean GA n.to PQ, ON, w.to OH, KY, TN/ Ac in Williamson Co., TX; 100 to 19,700 yrs.BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM)

***Helluomorphoides*** Ball, 1951 - Carabidae beetles in Subfamily Harpilinae, Tribe Helluonini, Subtribe Omphrina (8 species in US, Canada)

***Helluomorphoides*** *ferrugineus* (*Helluomorpha f.* LeConte, 1853; *H. languida* Casey, 1913)) (VA (NY?) to GA (FL?()), w. to SW, KS/ Tx in Edwards, Williamson Cos., TX)

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***Helluomorphoides*** *texanus* LeConte, 1853 (12,000 to 15,500 yrs.BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM)

***Helluomorphoides*** undet. sp. (Ac or Tx in Edwards Co., TX; )

***Horologion*** Valentine, 1932a - Carabidae beetles in Subfamily Harpilinae, Tribe Bembidiini, Subtribe Anillina (one species in US)

***Horologion*** *speokoites* Val., 1932a (\*type locality cave in Greenbrier Co., WV/Tb or Eb?/WV T&E S1 rank & global G1 rank; Federal Species of Concern/A. Cave Ground Beetle)

***Lebia*** Latreille, 1802 - Carabidae beetles in Subfamily Harpilinae, Tribe Lebiini, Subtribe Lebiina (= *Loxopeza* Chaudoir, 1870; *Metabola*, *Dianchomena*, *Aphelogenia* Chaudoir, 1871) (51 species in US, Canada)



*Lebia* (*Polycheloma*) *lecontei* Madge 1967 (epigeal in TX & AZ/ 7,300 to 17,800 yrs.BP in *Neotoma* woodrat nest in wTX (El Paso Co.) & ,120+- 500 years old in scNM *Neotoma* woodrat nest)

*Lebia* undet. sp. (6,400 to 6,800 yrs.BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM)

*Mecyclothorax* Sharp, 1903 Carabidae beetles (also put in Psydritae, Tribe Trepidopterini)

*Mecyclothorax* undet. sp. (Tx? in HI)

*Metabletus americanus* = *Syntomus a.*

*Mexisphodrus* Barr, 1965 - Carabidae beetles in Subfamily Harpilinae, Tribe Platynini or Prospodrinini. **Bibl.:** Barr 1982

*Mexisphodrus* *valverdensis* Barr, 1982 (type cave locality? & one other cave in Val Verde Co., TX/ Tp)

*Microtrechus* - see *Trechus*

*Neaphaenops* Jeannel, 1920 (see *Pseudanothalmus*) - Carabidae beetles in Subfamily Harpilinae, Tribe Trechini (1 US species). **Bibl.:** Barr, 1979a; Kane, 1986a; Packard, 1874; Griffith, 1986-8, 1990-1

*Neaphaenops* *henroti* (*P.h.* Jeannel, 1949, *Batrisodes h.?*) (type locality cave in Greenbrier Co. (WV) + other caves in KY?/ Tb/ semispecies with *N.m.*)

*Neaphaenops* *tellkampfi* (Erichson, 1844) (Tb from eastern part of western Pennyroyal Plateau of KY from Ohio River s. to TN border)

*Neaphaenops* *tellkampfi henroti* Jeannel, 1949 (type locality cave in Meade, Co. + other caves in Breckinridge, Hart, Hardin Cos., KY/ Tb) **Bibl.:** D. Griffith; Kane 1981

*Neaphaenops* *tellkampfi meridionalis* Barr, 1959 (= *N.m.*) (type locality cave in Simpson, Co./ other caves in Simpson, Warren, Logan & Allen Cos., KY/ Tb semispecies with *N.h.* or *N.t.h.*) **Bibl.:** D. Griffith; Kane 1981

*Neaphaenops* *tellkampfi t.* Barr, 1959 (*N.t.* & *Anopthalmus t.* Erickson (in Tellkampfi, 1844) ; *P.t.* Jeannel, 1928) J.1949 (type locality cave in Mammoth C., Edmonson Co./ other caves in Allen, Barren, Edmonson, Hardin, Hart, Jefferson, Jennings, Montgomery, Warren, Meade & Simpson Cos., KY/ Tb/ G3T3)

*Neaphaenops* *tellkampfi t.* **Bibl.:** Barr, 1967; Brunner & Kane, 1981; Caccone, 1985; Ghaffar, 1985; Ghaffar, et al, 1984; Giuseffi, Kane & Duggley, 1978; Griffith, 1988-a, 1990a; Kane, 1981; Kane & Brunner, 1986; Kane & Poulson, 1975, 1976, 1984; Kane & Ryan, 1983; Larsen, Booth & Perkes, 1984; Norton, 1984; N., Kane & Poulson, 1975; Martin, 1977; Poulson, Griffith & Schmidt, 1992; Studier, 1996; Turanchik & Kane, 1979; Van Zant & Poulson, 1975;

***Neapphaenops tellkampfi viator*** Barr, 1979 (type locality cave in Green Co., other caves in Green, Robertson, Hart & Metcalfe Cos., KY/ Tb) **Bibl.:** D. Griffith; Kane, 1981

***Nebria*** Latreille, 1806 - Carabidae beetles in Subfamily Carabinae, Tribe Nebriniini (also put in Subfamily Nebriinae) (43 species in US, Canada, mostly along margins of cold streams)

***Nebria kincaidi*** k. Schwarz, 1900 (Tx or Ac in Vancouver Island, BC)

***Nebria*** (*Boreonebria*) *gyllenhali* Schonherr, 1806 (epigean ON to OR, AK, s. to NY/ 2,000 year old remains in entrance pit in AB cave)

***Nebria*** undet. sp. (Tx or Ac in MN)

***Nebria suturalis*** Leconte, 1850 (*N. longula* L., 1878; *N. nimbose* Casey) (AB, CO, LB, MI?, NF?, NH, NY, ON, PQ, VT epigean/ Tx in VT)

***Nelsonites*** Valentine, 1952 - Carabidae beetles in Subfamily Harpilinae, Tribe Trechini (also put in Bembidiini) (2-3 species in US, Canada)

***Nelsonites jonesi*** j. (N.j. Val., 1952) (type locality cave in Pulaski Co. +7 other caves in Pulaski Co. & Rockcastle Cos., seKY/ Tb/ G1G2T1T2?)

***Nelsonites*** undescr. sp.#1-3? (KY &/or TN/Tb)

***Nelsonites walteri*** Val., 1952 (type locality cave in Putnam Co./ Putnam, Overton, Fentress, White & Van Buren Cos., TN/ Tb/ S3G3)

***Notiobia*** Perty, 1830 (*Anisotarsus* Chaudoir, 1837; *Eurytrichus* LeConte, 1848; *Stilbolidus* Casey, 1914; *Notiobis*) Carabidae beetles in Subfamily Harpilinae, Subtribe Anisodactylina, Genus-group Notiobii (also put in Tribe Platynini) (7 species in US, Canada) **Bibl.:** Noonan 1971

***Notiobia*** (*Notiobia*) undet. sp. (Tp in Terrell, Uvalde, Val Verde Cos., TX)

***Notiophilus*** Dumeril, 1806 - Carabidae beetles in Subfamily Carabinae, Tribe Notiophilini (also put in Subfamily Nebriinae) (15 species in US, Canada)

***Notiophilus simulator*** Fall, 1906 (epigean AB, BC, CO, ID, MT, OR, UT, WY, AK?, TX?/ 2,000 year old remains in entrance pit in AB cave)

***Omophron*** Latreille, 1802 (*Homophron*, *Paromophron*, *Istor*, *Prosecon*, *Semebnov*, 1922) Carabidae beetles in Subfamily Omophroninae, Tribe Omophronini (11 species in US, Canada)

***Omophron americanum*** Dejean, 1831 (*O. saii* Kirby, 1837; *O. lacustre* & *texanum* Casey, 1897; *O. fontinale* & *iridescens* C.1913; *O. lengi* & *illustre* C.1920; *Homophron tanneri* & *t.proximum*

Chandler, 1841) (US, Canada except Far West/ hunch-backed beetle/ Tx or Ac in KY (Carter Co.))

**Omus** Eschscholtz, 1813 (= *Leptomus*, *Megomus* Casey, 1914) Carabidae beetles in Subfamily Cicindelinae, Tribe Omini (also put in Megacephalini, Subtribe Omina) (5-15 species in US, Canada)

**Omus californicus** c. E.1829 (epigean CA,OR/Tx or Ac in CA)

**Omus dejeanii** Reiche, 1838 (epigean BC, OR, WA, AK, CA, MT?, UT? Epigean/ Ac or Tx in 1 OK cave)

**Paratachys** Casey, 1918 - Carabidae beetles in Subfamily Harpilinae, Tribe Bembidiini (20 species in US, Canada)

**Paratachys oblitus** (*Tachys o.*, *cuneatus*, *appalachius*, *iowensis*, *gentilis*, *obliquus* Casey, 1918) (NE to ON, PQ/ Tp or Tx in Carter Co., KY)

**Paratachys proximus** (= *Bembidium p.* Say, 1823; *Tachys nubifer* & *proximus*) Casey, 1918 ) (eUS,Canada(PQ,ON) to SD,AR,MO/ Tp in Mex., seNM, cTX)

**Paratachys** undet. sp. (Tp in GA (Brady Co.))

**Pasimachus** Bonelli, 1813 - Carabidae beetles in Subfamily Caribinae (or Scaritinae), Tribe Scaritini (10 species in US, Canada)

**Pasimachus** (*P.*) *californicus* Chaudoir, 1850 (*P. validus* LeConte, 1858; *P. corpulentus* LeConte, 1858; *P. c. transversus*, *P. acomanus*, *P. obesus* & *P. cephaotes* Casey, 1913) (AZ to AR, CO, OK, UT/ Tx in NM, TX)

**Pasimachus** undet. sp. (Tx in TX)

**Patrobus** Dejean, 1821 - Carabidae beetles in Subfamily Trechinae, Tribe Patrobini (6 species in US, Canada)

**Patrobus** (*Neopatrobis*) *longicornis* (*Feronia l.* Say, 1823; *P. americanus* Dejean) (nAK, BC to Newfoundland, s. to nAB; most US, Canada, except CA, LB, TX, YK/ Tx in AL, IL, IN, KY, MO, VA)

*Pinacodera* Schaum, 1857 = subgenus of *Cymindis*

*Platynidius* Casey, 1920 (also put in Staphylinidae) = *Platynus*

**Platynus** Bonelli, 1810 (= *Limodromus* Motschulsky; *Batenus* M., 1865; *Platynidius*, *Paranchomenus* Casey, 1920; *Microplatynus* Barr, 1982; *Glyptolenopsis* Perrault, 1991; *Agonum* (in part) Lindroth, 1966) Carabidae beetles in Subfamily Harpilinae, Tribe Platynini (19 species in US or Canada)

**Platynus** (*P.*) *bruneomarginatus* (*Achomenus b.* Mannerheim, 1843; *A. rugiceps* M., 1843; *A. marginatus* Menetries, 1843 (Homo.); *P. cinctellus* & *bicolor* LeConte, 1854; *P. tenebricosus* & *bicoloratus* Gemminger & Harold, 1868) (epigean BC, ID, OR, WA, AZ?, NM?, NV?/ Tx or Ac in Calaveras & Tuolumne Cos.,CA)

**Platynus** *cervicalis* (*Platynidius c.* Casey, 1920) (Tx or Ac in KY (1c.))

**Platynus** *jonesi* (Rhadine j. Barr,1960; *Agonum j.*) (type locality cave in Conecuh Co.,sAL +nFL/ Tb or Tp/ G1?)

**Platynus** *parmarginatus* Hamilton, 1893 (= *P. cincticollis p.*) (type locality cave in Newton Co., AR/ epigean in E,e.Canada to IA,SC/ Tx or Tp in AR, IL, KY, MO, TN; Tp in GA (Walker Co.))

*Platynus jonesi* = *Rhadine j.*

*Platynus marginatus* = *Agonum bicolor*

**Platynus** (*Microplatynus*) *pecki* Barr, 1982 (Tp? in NM)

**Platynus** *punctiformis* Say, 1823 (= *Agonum (Micragonum) p.*) (E/Tx in TN (Smith Co.),TX; Tx or Ac in IN?)

*Platynus reflexus* = *P. tenuicollis*

**Platynus** undescr. sp. (Tp in 6 MO cos.)

**Platynus** undet. sp. (Tx in AR; Tx or Ac in MN)

**Platynus** (*P.*) *tenuicollis* (*Anchomenus marginatus* & *t.* LeConte, 1848; *Limodromus acuticollis* Motschulsky, 1865; *Colpodes approximatus* Chaudoir, 1879; *P. reflexus* LeConte, 1879; *A. distinguendus* Casey, 1920; *A. pennsylvanicus* T. LeConte, 1863; *A. reflexion*; *Agonum t.*) (E, MW to SD, CA?, CO?/ Tp in AL (Jackson Co.),AR,IL,IN (Lawrence Co.), KY (Mammoth Cave), MO, OK, sON, TN, TX, VA, WV; Tx in GA; Tp or Tx in IN (Crawford, Harrison Co.(S3/G4)) Liebherr 1988

**Poecilus** Bonelli, 1810 (= *Feronia* Latreille, 1817; *Derus* Motschulsky, 1844; *Derulus* Tschitscherine, 1896; *Leconteus*, *Americobius* Lutshnik, 1915) Carabidae beetles in Subfamily Harpilinae, Tribe Pterostichini (also put in Platynini) (13 species in US or Canada)

**Poecilus** (*P.*) *chalcites* (*Feronia c.* Say, 1823; *Pterostichus sayi*; *P. micrans* Chaudoir, 1843; *Feronia s.* Brulle, 1835) (NE to ON, PQ/ Tx or Ac in IN)

*Progaleritina* = subgenus. of *Galerita*

**Pseudanophthalmus** Jeannel, 1920 (*Aphanotrechus* Barr, 1960) Carabidae beetles in Subfamily Harpilinae, Tribe Trechini (also put in Bembidiini) (89 species in US, Canada)

**Bibl.:** Barr, 1960b, 1962, 1965, 1979a, 1980, 1981, 1986,, Krekeler, 1958-9, 1961, 1973, Badaracca, 1986; Buhlmann, 1992a; Horn, 1883a; Kane, 1986a; Krekeler, 1958a; McKinney 1974; Valentine, 1932; Van Zant & Poulson, 1975;

**Pseudanophthalmus *abditus*** (*P. horni a.* Krekeler, 1973) (type locality cave & two others in Woodford Co. + cave or caves in Jessamine Co.,KY/ Tb/ G1?/ KY, VA T&E/ concealed cave beetle)

**Pseudanophthalmus *acherontis*** (*P. tiresias acherontis* Barr, 1959) Barr, 1980 (\*type locality cave in Rutherford Co.,TN/Tb/State T&E/ Ec. Cave Beetle/ S1S2 G1G2)

**Pseudanophthalmus *alabamae*** Val., 1932 (\*type locality cave in De Kalb Co.,AL) Barr, 1965); Jeannel, 1949

**Pseudanophthalmus *alladini*** (= *P. loedingi a.* Val., 1945) (type locality cave in Madison Co./ caves of Flint & Paint Rock R. tributaries,n. of TN R. in Madison & Jackson Cos.,AL/Tb/G3)

**Pseudanophthalmus *andrewsi*** Barr, 1981 (type locality cave + 7 other caves in Jackson Co., KY/ Tb)

*Pseudanophthalmus angulatus* LeConte, 1863 = *P. menetriesii*

**Pseudanophthalmus *apicalis*** Barr, 1981 (\*type locality cave in Wayne Co.,KY/Tb)  
*Pseudanophthalmus aquaticus* Val., 1945 = *P. loedingi a.*

**Pseudanophthalmus *assimilis*** Barr, 1981a (type locality cave & one other caves in De Kalb Co.,nAL/ Tb/ G1G2)

**Pseudanophthalmus *audax*** Horn, 1883 (type locality cave, Mammoth Cave and one other cave in Edmonson Co., and one cave in Hart Co., all in KY/ upper hypogean?/ KY T&E G3 or G1/ Concealed Cave Beetle) Barr 1959b

**Pseudanophthalmus *avernus*** (= *P. hubbardi a.* Valentine, 1945) Barr, 1965 (\*Endless C.,Rockingham Co.,VA/Tb/VA T&E S1 rank & Species of Concern; global G1 rank/Avernus Cave Beetle)

**Pseudanophthalmus *barberi*** (= *P. eremita b.* Jeannel, 1931) J.1928 (cave type locality in Meade Co. & one other cave in Hart Co., all in KY/ Tb/ G1G2) Badaracca, 1986

**Pseudanophthalmus *barri*** K.1973 (cave type locality & one other cave Clark Co.,IN/ IN T&E G1/ Tb)

*Pseudanophthalmus bathycola* Valentine, 1932 = *P. pusio*

**Pseudanophthalmus** *beakleyi* (= *P. robustus* b. Valentine, 1937; *P.(r.) lupus* Barr, 1959) Barr, 1980 (cave type locality in Pickett Co./ Pickett, Overton, Fentress Cos.(TN) & s.Clinton & s.Wayne Cos.(KY)/Tb/G3G4)

**Pseudanophthalmus** *bendermani* (*P.tiresias* b. Barr, 1959) Barr, 1980 (\*cave type locality in Maury Co.,TN/ Tb/ State T&E/ Be. Cave Beetle/ S1S2 G1G2)

**Pseudanophthalmus** *blatchleyi* (*P.tenuis* b. Barr, 1960) (cave type locality in \*Monroe Co.,IN/ Tb/ G3T1T2)

*Pseudanophthalmus bloomi* = *P. tenuis* t.

*Pseudanophthalmus boonensis* Krekeler, 1958 = *P. shilohensis* b.

**Pseudanophthalmus** *caecus* (*P. horni* c. Krekeler, 1973) (\*?cave type locality in Woodford Co.,KY/ State T&E G3T3 or G1/ Cl. Cave Beetle)

**Pseudanophthalmus** *calcareus* Barr, 1981 (\*cave type locality in Whitley Co.,KY/Tb/State T&E/Limestone Cave Beetle)

**Pseudanophthalmus** *catherinae* (= *P. tiresias* c. Barr, 1959) Barr, 1980 (\*cave type locality in Marshall Co.,TN/Tb/State T&E/Catherine's Cave Beetle/ S1S2 G1G2)

**Pseudanophthalmus** *catoryctos* Krekeler, 1973 (\*cave type locality in Madison Co.,KY/Tb/ State T&E/Lesser Adams Cave Beetle)

**Pseudanophthalmus** *cerberus cerberus* Barr, 1985 (= *P. completus* B., 1985) (cave type locality in Monroe Co. +nw. to se.Barren & sw.Metcalf Cos., ne to s.Adair & nw.Cumberland Cos.,scKY +Clay & Jackson Cos.,TN/G34T3T4/Tb)

**Pseudanophthalmus** *cerberus completus* Barr, 1985 (cave type locality in \*cBarren Co., scKY/ G34T3T2/Tb)

**Pseudanophthalmus** *chthonius* K.1973 (cave type locality & one other cave in Jefferson Co./ one cave in Jennings Co. , 2 caves in Clark Co.), & many other caves along OH R., all in IN/Tb/G3)

**Pseudanophthalmus** *ciliaris* c. (= *P.c.* Valentine, 1937; = *P. c. colemanensis* & *loganensis* Barr, 1959) Barr, 1979 (cave type locality in Montgomery Co.), +Robertson & e.Christian Cos.,TN, polytypic in KY/ Tb)

**Pseudanophthalmus** *ciliaris colemanensis* Barr, 1959 (\*cave type locality in Montgomery Co.,TN/TN State T&E),

*Pseudanophthalmus ciliaris loganensis* (= *P.l.*)

*Pseudanophthalmus ciliaris orlindae* (= *P.o.*)

*Pseudanophthalmus colemanensis* Barr, 1959 = *P. ciliaris colemanensis*

*Pseudanophthalmus completus* Barr, 1985 = *P. cerberus completus*

**Pseudanophthalmus** *cnephusus* Krekeler, 1973 (\*cave type locality in Larue Co.,KY/Tb/ G1)

**Pseudanophthalmus** *conditus* Krekeler, 1973 (\*cave type locality in Boyle Co.,KY/Tb)

*Pseudanophthalmus constrictus* Val., 1932 = *P. fuscus constrictus*

**Pseudanophthalmus** *cordicollis* Barr, 1981 (\*cave type locality near edge of Allegheny Front, Wise Co.,VA/Tb)

**Pseudanophthalmus** *cumberlandus* Val., 1937 (\*\*\*?cave type locality & one other cave in Smith Co. & one cave in Macon Co., all in TN/ Tb/ S3 G3 or G1)

**Pseudanophthalmus** *darlingtoni d.* Barr, 1985 (type locality cave in Adair Co. +Green & Metcalfe Cos.,scKY/Tb/G3T3)

**Pseudanophthalmus** *darlingtoni persimilis* Barr, 1985 (= *Ameroduvalius p.?*) (type locality cave in Green Co. +Hart & Rockcastle? Cos.,scKY/Tb/G3T3)

**Pseudanophthalmus** *deceptivus* Barr, 1981 (\*type locality cave in Lee Co.,VA/Tb/Lee Co. cave beetle/State T&E)

**Pseudanophthalmus** *delicatus* (= *P. hirsutus d.* Val., 1932) Barr, 1981 (\*type locality cave in Lee Co., VA/ Tb)

**Pseudanophthalmus** *desertus* (= *P.d.d.* Krekeler, 1973) Barr, 1985 (type locality cave in Clark Co., one cave each in Henry Co., Scott Co. & Owen Co., all in KY/Tb/ G1)

*Pseudanophthalmus desertus major* = *P.m.*

**Pseudanophthalmus** *digitus* Val., 1932 (type locality cave in Hamilton Co.,TN +Byers & 2 caves in Dade Co.,GA/G3G4)

**Pseudanophthalmus** *distinguens* Val., 1948 (*loedingi d.* Val.1945) (type locality cave & 3 other caves Morgan Co.,AL/Tb/G1G2) Jeannel, 1949

*Pseudanophthalmus donaldsoni* Krekeler, 1958 = *P. youngi d.*,

**Pseudanophthalmus** *egberti* Barr, 1965 (type locality cave & one other cave in New River Valley,Giles Co.,VA/ Tb/ VA T&E S1 rank & Species of Concern; global G1 rank/New River Valley Cave Beetle)

**Pseudanophthalmus** *elevatus* (*P.grandis e.* Valentine, 1932) (\*Organ C.(near Ronceverte), Greenbrier Co., WV/ Tb/WV T&E S1; global G3T2)

**Pseudanophthalmus** *elongatus* Krekeler, 1973 (type locality cave & 3 other caves in Garrard Co. + caves in Mercer Co.,KY/ Tb/ G3)

**Pseudanophthalmus emersoni** Krekeler, 1958 (\*type locality cave in Lawrence Co.,IN)

**Pseudanophthalmus engelhardti** (*Anophthalmus e.* Barber, 1928) Jeannel, 1928 (\*type locality cave in Claiborne Co.,TN/Tb/TN State T&E/Englehart's Cave Beetle/ S1S2 G1G2). Bibl.: Barr 1981b

**Pseudanophthalmus eremita** (*A.e. & tenuis* Horn, 1871) Jeannel, 1928 (Wyandotte C.,Crawford Co. + 3 other caves in Harrison Co., \*Crawford Upland area of lower Blue River basin, IN/ Tb/G1 - IN T&E)

**Pseudanophthalmus eureka** Barr, 1981 (type locality cave & one other cave in McCreary Co. & 2 caves in Wayne Co., KY/ Tb)

**Pseudanophthalmus exiguus e.** Krekeler, 1973 (type locality cave in Estill Co. + caves in Lee & Powell Cos., KY/ Tb/ G3T3)

**Pseudanophthalmus exiguus furtivus** Krekeler, 1973 (type locality cave in \*Estill Co.,KY/State T&E, G3T1T2)

**Pseudanophthalmus exoticus** Krekeler, 1973 (\*type locality cave in Estill Co.,KY/Tb/State T&E or H)

**Pseudanophthalmus farrelli** (= *P. robustus f.* Barr, 1959) (type locality cave in \*s.De Kalb Co.,AL/Tb/ / S1S2 G1G2)

**Pseudanophthalmus fastigatus** Barr, 1981 (\*type locality cave in Walker Co.,GA/ tapered cave beetle/ Tb/ S1? G1G2)

**Pseudanophthalmus fluviatilis** (*P. loedingi f.* Val., 1948) (type locality cave & other caves of Newsome Sinks, Morgan Co. +Marshall Co.,AL/Tb G3) Jeannel, 1949

**Pseudanophthalmus fowlerae** Barr, 1980 (\*type locality cave in Clay Co.,TN/Tb/TN State T&E/Fowler's Cave Beetle/ S1S2 G1G2)

**Pseudanophthalmus frigidus** Barr, 1981 (\*type locality cave in Bell Co.,KY/Tb/State T&E/Icebox Cave Beetle)

**Pseudanophthalmus fulleri** Val., 1932 (*P.loedingi f.* Val., 1948) (type locality cave + other caves of Lookout Valley, Hamilton Co.(TN) + Dade, Hamilton & Walker Cos. (GA)/ Tb/ G3G4) Barr 1965, 1981a; Buhlamann 2000; Jeannel 1949

*Pseudanophthalmus furtivus* Krekeler, 1973 = *P. exiguus f.*

**Pseudanophthalmus fuscus f.** Val., 1932 (type locality cave & 3 other caves in Greenbrier Co., 2 caves in Pocohontas Co., & 2 caves in Monroe Co., all WV/Tb/WV T&E S2; global G2G3),



**Pseudanophthalmus fuscus constrictus** Val., 1932 (Organ C.,\*s Greenbrier Co.,WV/Tb/WV T&E S2; global G3)

*Pseudanophthalmus fuscus subaequalis* = *P.s.*

*Pseudanophthalmus garmani* Jeannel, 1949 = *P. horni*

**Pseudanophthalmus georgiae** Barr, 1981 (type locality cave in Chattooga Co. & 3 caves in Walker Co., both GA/ Georgian cave beetle/ Tb/ / S1? G1G2)

**Pseudanophthalmus globiceps** Barr, 1985 (\*type locality cave in Hart Co.,scKY/Tb/State T&E)

**Pseudanophthalmus gracilis** Val., 1932 (type locality cave in Giles Co. & one other cave in Craig Co., both VA/ Tb)

*Pseudanophthalmus grandis elevatus* = *P.e.*

**Pseudanophthalmus grandis** Val.1931 (=P.g.g. Val.1932) (type locality cave & >5 other caves in Greenbrier Co., 3 caves in Pocohontas Co. & 2-3 caves in Monroe Co., allWV/ Tb/ WV T&E S1; global G3T3)

*Pseudanophthalmus grandis orthosulcatus* = *P.o.*

**Pseudanophthalmus grandis** undescr. ssp. (Tb in WV/ S1G3T?)

**Pseudanophthalmus hadenoecus** Barr, 1965 (\*type locality cave in Pendleton Co.,WV/Tb/WV T&E S1; global G1; Federal Species of Concern/Timber Ridge Cave Beetle)

**Pseudanophthalmus hesperus** Barr, 1959 (\*type locality cave in Perry Co.,TN/ Tb/ / S1S2 G1G2 )

**Pseudanophthalmus higinbothami** Val., 1931 (type locality cave & > 4 other caves (n.Greenbrier Co.) & 3 caves in Pocahontas Co., all WV/ Tb/ WV T&E S2; global G2G3)

**Pseudanophthalmus hirsutus** (=P.h.h. Val., 1931) Barr, 1981 (\*type locality cave at Cumberland Gap),Lee Co.,VA & Claiborne Co.,TN/ Tb/ VA T&E S1 rank & Species of Concern; global G1 rank; TN State T&E/Lee County Cave Beetle)

*Pseudanophthalmus h. delicatus* = *P.d.*

**Pseudanophthalmus hoffmani** Barr, 1965 (type locality cave & 2 other caves in Smyth Co. + <3 caves in Bland Co., both VA/Tb/VA T&E S1 rank & Species of Concern; global G1G2 rank/Hoffman's Cave Beetle)

**Pseudanophthalmus holsingeri** Barr, 1965 (\*type locality cave in Lee Co.,VA/Holsinger's Cave Beetle/ Federal Candidate T&E, priority 8/Tb) Buhlmann, 1992

*Pseudanophthalmus horni abditus* = *P.a.*

**Pseudanophthalmus** *horni* (= *Anophthalmus h.* Garman, 1892; *P. minor* & (*h.*) *garmani* Jeannel, 1949; *P. abditus*, *caecus* & *h.h.* Krekeler, 1973) Jeannel, 1928 (type locality cave & quarry fissures in Fayette Co. + caves in Scott Co., KY/ Tb/ State T&E G3T3) Krekeler, 1972

*Pseudanophthalmus horni caecus* = *P.c.*

*Pseudanophthalmus horni abditus* = *P.a.*

**Pseudanophthalmus** *hortulanus* Barr, 1965 (\*type locality cave in Tazewell Co., VA/Tb//VA T&E S1 rank & Species of Concern; global G1 rank/Burke's Garden Cave Beetle)

**Pseudanophthalmus** *hubbardi* (*A.b.* Barber, 1928; *A.h.h.* Jeannel, 1931 *A.tenuis* Horn) J., 1928 (\*Luray C., VA/Tb//VA T&E S1 rank & Species of Concern; global G1 rank/Hubbard's Cave Beetle)

*Pseudanophthalmus hubbardi avernis* = *P. a.*

*Pseudanophthalmus hubbardi limicola* = *P. l.*

*Pseudanophthalmus hubbardi parvicollis* = *P. h.*

**Pseudanophthalmus** *hubrichti* Valentine, 1948 (\*type locality cave in Russell Co., VA/Tb//VA T&E S1 rank & Species of Concern; global G1 rank) Buhlmann, 1992

**Pseudanophthalmus** *humeralis* (*P.loedingi h.* Jeannel, 1949, *P.l.brevis* Val.1945, *P.h.b* Val.1932) Valentine, 1931 (type locality cave in Hamilton Co., cave in Grundy Co., 2 caves in Franklin Co., all TN +n.AL?/Tb/or semispecies/G3)

**Pseudanophthalmus** *hypertrichosis* Val., 1932 (type locality cave in Pocahontas Co. +Greenbrier & Randolph Cos.,sWV/Tb/WV T&E S3; global G3)

**Pseudanophthalmus** *hypolithos* Barr, 1981 (type locality cave in Pike Co., KY + cave in Campbell Co., TN/ Tb/ TN State T&E/Ashcamp Cave Beetle)

**Pseudanophthalmus** *illinoisensis* Barr & Peck, 1966 (\*type locality cave in Hardin Co., IL/Tb)

**Pseudanophthalmus** *inexpectatus i.* (= *P.i.* Barr, 1959) Krekeler, 1973 (type locality cave in White or Mammoth Edmonson Co., KY/Tb/State T&E G3T1T2/Surprising Cave Beetle)

**Pseudanophthalmus** *inexpectatus orientalis* Krekeler, 1973 (type locality cave in Green Co. & one cave in Taylor Co., both KY/ Tb/ G3T3)

**Pseudanophthalmus** *inquisitor* Barr, 1980 (\*type locality cave in Clay Co., TN/ Tb/ S1S2 G1G2)

**Pseudanophthalmus** *insularis* (*P.tiresias i.* Barr, 1959) Barr, 1980 (\*type locality cave in Davidson Co., TN/ Tb/ TN State T&E/ Ba. Sta. Cave Beetle/ S1S2 G1G2)

**Pseudanophthalmus intermedius** (*Neaphaenops i.* Val.1931) Val., 1932 \*\* (type locality cave and one other cave in Grundy Co.,TN/ Tb)

**Pseudanophthalmus intersectus** Barr, 1965 (\*type locality cave in Bath Co.,VA/Tb/VA T&E S1 rank & Species of Concern; global G1 rank/ Cro. Cave Beetle)

*Pseudanophthalmus jeanneli* Krekeler, 1958 = *P. tenuis j.*

**Pseudanophthalmus jonesi** Val., 1945 (type locality cave in Grassy Cove, Cumberland Co.,TN/Tb/TN State T&E/Grassy Cove Cave Beetle/ S1S2 G1G2)

**Pseudanophthalmus krameri** Krekeler, 1973 (\*type locality cave in Adams Co.,OH/extinct? Tb) Hobbs III, 1997)

**Pseudanophthalmus krekeri** Barr, 1965 (\*type locality cave (destroyed by quarry) in Randolph Co.,WV/ Tb/ WV T&E SH; global G1; Federal Species of Concern/ extinct?)

**Pseudanophthalmus lallemani** Jeannel, 1949 (\*type locality cave in TNC G.D.C. Preserve, Greenbrier Co.,WV/Tb/WV T&E S1; global G1; Federal Sp. of Concern/ lalleman's cave beetle)

**Pseudanophthalmus leonae** Barr, 1960 (\*type locality cave in Hoosier Natl. Forest, Lawrence Co.,IN/Tb/IN T&E)

**Pseudanophthalmus limicola** (*P.hubbardi ssp. l.* Jeannel, 1931) Valentine,1932 (type locality cave & 2 other caves in Shenandoah Co.,VA/Tb//VA T&E S1 rank & Species of Concern; global G1 rank/Mud-dwelling Cave Beetle)

*Pseudanophthalmus loedingi aquaticus* Val., 1945 (\*type locality cave in Morgan Co.,AL/ Tb)  
*Pseudanophthalmus loedingi aladdini* = *P.a.*

*Pseudanophthalmus loedingi distinguens* = *P.d.*

*Pseudanophthalmus loedingi fluviatilis* = *P.f.*

*Pseudanophthalmus loedingi humeralis* = *P.h.*

**Pseudanophthalmus loedingi** (= *P.l.l.* Val., 1931) (type locality cave in \*nwMadison Co.,AL/Tb/or semispecies)

*Pseudanophthalmus loedingi meridionalis* = *P.m.*

*Pseudanophthalmus loedingi profundus* = *P.p.*

**Pseudanophthalmus loganensis** (*P.ciliaris l.* Barr, 1959) Barr, 1979 (type locality cave in Logan Co.,+other caves of upper Red River Valley,KY (Warren & Simpson Cos.)+Robertson & Sumner Cos., TN/ Tb/S1 G1G2)

**Pseudanophthalmus longiceps** Barr, 1981 (type locality cave in Lee Co.,VA & one cave in Hancock Co.,TN/Tb/VA T&E S1 rank & Species of Concern; global G1 rank; TN State T&E/Long-headed Cave Beetle)

*Pseudanophthalmus longicollis* Jeannel, 1949 = *P. tenuis* l.

**Pseudanophthalmus macradei** Val., 1948 (Cumberland C.,\*e.Warren Co.,TN/ S1S2 G1G2)

**Pseudanophthalmus major** (= *P. desertus* m. Krekeler, 1973) Barr, 1985 (\*type locality cave in Harrison Co., KY/ Tb/ KY T&E/G3T1T2)

**Pseudanophthalmus masoni** Barr, 1981 (type locality cave + 6 other caves in Wayne Co.,KY)

*Pseudanophthalmus mayfieldensis* = *P. shilohensis* m.

*Pseudanophthalmus megosteus* Barr, 1959 = *P. robustus*

**Pseudanophthalmus menestriasi** m. (*A.m.*, *striatus* & *ventricosus* Motschoulsky, 1862; *A. angulatus* LeConte, 1863; *A. interstitialis* Hubbard, 1880; *P.m.* Jeannel, 1928) Barr, 1985 (Mammoth & four other caves in \*?Edmonson Co, KY/Tb G3T1T2) Barr 1967; Kane & Ryan 1983

**Pseudanophthalmus menestriasi campestris** Barr, 1985 (type locality cave & 2 other caves in Barren Co., to Hart Co., KY & 2 caves in Warren Co., all TN/ Tb)

**Pseudanophthalmus meridionalis** Val.1945 (*P. loedingi* m.) (type locality cave in \*Marshall Co.,AL)

*Pseudanophthalmus minor* Jeannel, 1949 = *P. horni*

**Pseudanophthalmus montanus** Barr, 1965 (type locality cave & two other caves in \*Tucker Co.,WV/Tb/WV T&E S1; global G1; Federal Species of Concern/Dry Fork Valley Cave Beetle)

*Pseudanophthalmus morrisoni* = *P. tenuis* m.

*Pseudanophthalmus neglectus* Jeannel, 1949 = *P. robustus*

**Pseudanophthalmus nelsoni** Barr, 1965 (\*?\*type locality & 1 other cave (or undescr. sp.), Alleghany Co.,VA/ Tb/ federal species of concern) Buhlmann 1992

**Pseudanophthalmus nickajackensis** Barr, 1981a (Nickajack C.(now flooded),Marion Co.(TN), +adjacent Jackson Co.,AL/Tb/TN State T&E, S1 G3G4/Nickajack Cave Beetle),

**Pseudanophthalmus nortoni** Barr, 1981 (\*type locality cave in Rhea Co.,TN/Tb/ State T&E/ Norton's Cave Beetle/ S1S2 G1G2)

**Pseudanophthalmus** *occidentalis* (*P.tiresias* o. Barr, 1959) Barr, 1980 (type locality cave in Lewis Co.) & one cave in Hickman Co., both TN/ Tb/ TN State T&E/ S2 G1G2/ western cave beetle)

**Pseudanophthalmus** *ohioensis* Krekeler, 1973 (\*type locality cave in Adams Co.,OH/Tb)  
*Pseudanophthalmus orientalis* Krekeler, 1973 = *P. inexpectatus* o.

**Pseudanophthalmus** *orlindae* (= *P.ciliaris* o. Barr, 1959) Barr, 1979 (type locality cave in \*s.Fork of Red River, Robertson Co.,TN/ Tb/ G1)

**Pseudanophthalmus** *orpheus* Barr, 1981 (type locality cave & 3 other caves in Wayne Co.,KY/ Tb)

**Pseudanophthalmus** *orthosulcatus* (*P.grandis* o. Val., 1932) Jeannel, 1949 (type locality cave in \*Monroe Co.,WV/Tb/WV T&E S1; global G3T1)

**Pseudanophthalmus** *packardi* Barr, 1959 (type locality cave in Carter Co. +Elliot Co.(prob.),KY/Tb/G3)

**Pseudanophthalmus** *pallidus* Barr, 1981 (type locality cave in \*Claiborne Co.,TN/Tb/TN State T&E/ / S1S2 G1G2/ Pale Cave Beetle)

**Pseudanophthalmus** *paradoxus* Barr, 1981 (\*type locality cave in Hawkins Co.,TN/Tb/TN State T&E/Ridgetop Cave Beetle/ S1S2 G1G2)

**Pseudanophthalmus** *parvicollis* (*P.hubbardi* p. Jeannel, 1931) Barr, 1965 (\*type locality cave in Shenandoah Co.,VA/Tb/VA T&E S1 rank & Species of Concern; global G1 rank/Thin-neck Cave Beetle),

**Pseudanophthalmus** *parvus* Krekeler, 1973 (\*type locality cave in Marion Co.,KY)

**Pseudanophthalmus** *paulus* Barr, 1981 (\*type locality cave in Monroe Co.,TN/Tb/State T&E/ S1S2 G1G2)

**Pseudanophthalmus** *paynei* Barr, 1981 (\*type locality cave in Anderson Co.,TN/ Tb/ State T&E/ Payne's Cave Beetle/ S1S2 G1G2)

*Pseudanophthalmus persimilis* (= *P. darlingtoni* p.)

**Pseudanophthalmus** *petrunkevitchi* Val., 1945 (Skyline (Warren Co.) & one cave in Page Co., both VA/ Tb/ VA T&E S1 rank & Species of Concern; global G3 rank/ Petrunkevitch's Cave Beetle)

**Pseudanophthalmus** *pholeter* K.1973 (\*type locality cave in Madison Co.,KY/ State T&E),

**Pseudanophthalmus pilosus** Barr, 1985 (type locality cave in swHardin Co. + other caves in nwHart Co. n. of Hart Co. Ridge,scKY/ Tb/ G3)

**Pseudanophthalmus pontis** Barr, 1965 (\*Buck Hill (=Natural Bridge) C.,Rockbridge Co.VA/Tb/VA T&E S1 rank & global G1 rank/Natural Bridge Cave Beetle/ cave now commercialized with tunnel, lights & altered RH, temp.)

**Pseudanophthalmus potomaca p.** (*P.p.* Val., 1932; *P.hubbardi p.* Val.1945) Jeannel, 1949, (type locality cave in Pendleton Co.,WV & cave in Highland Co.,VA/Tb/VA T&E S1 rank & Species of Concern; global G3G4T3T4 rank/South Branch Valley Cave Beetle)

**Pseudanophthalmus potomaca senecae** Val., 1932 (*P.hubbardi s.* Val.1945) (type locality cave in Pendleton Co.,WV/ WV T&E S1/ Tb/ G2T1)

**Pseudanophthalmus praetermissus** Barr, 1981 (\*type locality cave in Scott Co.,VA/Tb/VA T&E S1 rank & Species of Concern; global G1 rank/Overlooked Cave Beetle)

**Pseudanophthalmus princeps** Barr, 1979 (type locality cave in Franklin Co. + caves in Warren & Summer Cos., KY/ G3/ Tb)

**Pseudanophthalmus productus** Barr, 1980 (type locality cave in Smith Co. +Jackson & Putnam Cos.,TN/Tb/ S3 G3)

**Pseudanophthalmus profundus** (=loedingi *p.* Val., 1943; *P. aquaticus* Val.1945) Val.1945 (type locality cave in Madison Co. & other caves in Jackson Co.,\*n.AL/Tb/or semispecies/G3)

**Pseudanophthalmus proximus** Barr, 1981 (type locality & one other cave in Jackson Co.,KY/ G1/ Tb)

**Pseudanophthalmus pubescens p.** (*A.p.* Horn, 1868; *P.p.* Jeannel, 1928) (type locality cave in Barren Co. & Mammoth C., Edmonson, both KY/ Tb/ G3T3) Kane 1981; Kane & Ryan 1983

**Pseudanophthalmus pubescens intrepidus** Barr, 1985 (type locality cave in Allen Co. & other caves in Barren Co., both scKY/ Tb/ State T&E G3T3)

**Pseudanophthalmus punctatus** Val.1932 (=P.pusio var. *punctatus* Val.1931) (type locality cave & one other cave in Giles Co., 2 caves in Pendleton Co.,WV/ Tb/ VA T&E S1 rank & Species of Concern; global G1 rank/ Spotted Cave Beetle)

**Pseudanophthalmus pusillus** Barr, 1981 (\*type locality cave in Anderson Co.,TN/Tb/State T&E/ Tiny Cave Beetle/ S1S2 G1G2)

**Pseudanophthalmus pusio** Horn, 1868 (*P. pusio p.* Val.1932, Jeannel, 1949; *P.pusio bathycola* Val.1932) (type locality cave in Montgomery Co.) + caves in Roanoke Co.,VA/Tb/VA T&E S1 rank & Species of Concern; global G3 rank/ Tb)

**Pseudanophthalmus puteanus** Krekeler, 1973 (\*type locality cave in Mercer Co.,KY/ Tb/ State T&E/Old Well Cave Beetle)

**Pseudanophthalmus quadratus** Barr, 1965 (\*type locality cave in Giles Co.,VA/Tb/VA T&E S1 rank & Species of Concern; global G1 rank/Strayleys Cave Beetle)

**Pseudanophthalmus rittmani** Krekeler, 1973 (type locality cave + 5 other caves in Estill Co. & 2 cave in Powell Co., bothKY/Tb G3)

*Pseudanophthalmus robustus beaklei* = *P. b.*

*Pseudanophthalmus robustus farrelli* =*P. f.*

*Pseudanophthalmus robustus lupus* = *P. beakleyi*

**Pseudanophthalmus robustus megosteus** Barr, 1959 (type locality cave in \*Van Buren Co.,TN/Tb)

**Pseudanophthalmus robustus neglectus** Jeannel, 1949 (\*\*type locality in Cumberland Cave + 2 other caves in \*e.Warren Co.,TN/Tb)

**Pseudanophthalmus robustus r.** (*P.r.* Val., 1931) Barr, 1959 (type locality cave in Putnam Co., 2 caves in White Co., + other caves in Van Buren & Warren Cos.,TN/Tb S3 G3). **Bibl.:** Barr, 1962c

**Pseudanophthalmus rogersae** Barr, 1981 (\*type locality cave in Harlan Co.,KY/Tb/State T&E/ Roger's Cave Beetle/ KY secretary's order in 2000 found lands that included this site to be unsuitable for mining)

**Pseudanophthalmus rotundatus** Val., 1932 (type locality cave in Claiborne Co. + Hancock Co., both TN & Lee Co.,VA/ Tb/ VA T&E S1 rank & global G3G4 rank/ Rotund Cave Beetle)

**Pseudanophthalmus sanctipauli** (= *S. hubrichti* Barr, 1965) Barr, 1981 (type locality & one other cave in Russell Co.,VA/ Tb/ VA T&E S1 rank & global G1 rank/ Saint Paul Cave Beetle)

**Pseudanophthalmus sanguineus** Barr, 1981 (\*type locality cave in Meniffee Co.,KY/Tb)

**Pseudanophthalmus scholasticus** Barr, 1981 (\*type locality cave in Harlan Co.,KY/Tb/State T&E/Scholarly Cave Beetle/ KY secretary's order in 2000 found lands that included this site to be unsuitable for mining))

**Pseudanophthalmus scutillus** Barr, 1981 (\*type locality cave in Campbell Co.,TN/Tb/State T&E/ Lean Cave Beetle/ S1S2 G1G2)

**Pseudanophthalmus seclusus** Barr, 1981 (type locality cave in Scott Co.,VA/Tb/VA T&E S1 rank & Species of Concern; global G1 rank)

**Pseudanophthalmus sequoyah** Barr, 1981 (\*type locality cave in De Kalb Co.,n.AL/Tb)

**Pseudanophthalmus** *sericus* Barr, 1981 (\*type locality cave in Scott Co.,VA/Tb/VA T&E S1 rank & Species of Concern; global G1 rank/Silken Cave Beetle)

**Pseudanophthalmus** *shilohensis boonensis* (P.b. K., 1958) Barr, 1960 (type locality cave in Owen Co. & other caves in WA Co., IN/ Tb/ G3T1T2 - IN T&E)

**Pseudanophthalmus** *shilohensis mayfieldensis* (P.m. K., 1958) Barr, 1960 (type locality cave in \*Monroe Co.,IN/Tb/G3T1T2 - IN T&E)

**Pseudanophthalmus** *shilohensis s.* (P.s. Krekeler, 1958) Barr, 1960 (type locality cave in \*w. Lawrence Co.,IN/G3T1T2 - IN T&E)

**Pseudanophthalmus** *sidus* Barr, 1965 (\*type locality cave in Campbell Co.,TN/Tb/State T&E/ Mer. Cave Beetle/ S1S2 G1G2)

**Pseudanophthalmus** *simplex* Barr, 1980 \*\*\* ( type locality cave & two other caves in Jackson Co., TN/ Tb/ State T&E/ S1S2 G1G2/ simple cave beetle)

**Pseudanophthalmus** *simulans* Barr, 1985 (\*type locality cave in Hart Co.,KY/State T&E)

**Pseudanophthalmus** undescr. sp.#2 (\*cave in Campbell Co.,TN/Tb)

**Pseudanophthalmus** undescr. sp.#3 (two caves in Bath Co,VA/Tb/VA T&E S1 rank & global G1 rank)

**Pseudanophthalmus** undescr. sp.#4 (\*cave in Russell Co.VA/Tb/VA T&E S1 rank & global G1 rank)

**Pseudanophthalmus** undescr. sp.#5 (\*cave in Russell Co.,VA/Tb/VA T&E S1 rank & global G1 rank/ entrance filled in)

**Pseudanophthalmus** undescr. sp.#6? (\*cave in Russell Co.,VA/Tb/VA T&E S1 rank & global G1 rank)

**Pseudanophthalmus** undescr. sp.#8 (\*cave in WA Co.,VA/Tb/VA T&E S1 rank & global G1 rank)

**Pseudanophthalmus** undescr. sp.#9 (3 caves in Wythe Co.,VA/Tb)

**Pseudanophthalmus** undescr. sp.#10 (\*cave in Pulaski Co.,VA/Tb/VA T&E S1 rank & global G1 rank)

**Pseudanophthalmus** undescr. sp.#11 (\*cave in Rockbridge Co.,VA/Tb/VA T&E S1 rank & global G1 rank)



*Pseudanophthalmus* undescr. sp.#12 (*cumberlandus* sp. group, Limestone Co.,AL & sTN)

*Pseudanophthalmus* undescr. sp.#13 (\*cave in Lauderdale Co.,AL/Tb)

*Pseudanophthalmus* undescr. sp.#14 (3 caves in Colbert Co.,AL/Tb)

*Pseudanophthalmus* undescr. sp.#15 (\*?cave in Tingling Hole,Lawrence Co.,AL/ Tb)

*Pseudanophthalmus* undescr. sp.#16 (\*cave in Morgan Co.,AL/ Tb)

*Pseudanophthalmus* undescr. sp.#17 (\*?cave in Jackson Co.,AL/ Tb)

*Pseudanophthalmus* undescr. sp.#18 (Marshall & Jackson Cos.,AL/Tb)

*Pseudanophthalmus* undescr. sp.#18 (\*?cave in Jackson Co.,AL/Tb)

*Pseudanophthalmus* undescr. sp.#19 (*intermedius* group, Jackson Co.,AL +adj.TN/Tb) Barr & Peck 1965

*Pseudanophthalmus* undescr. sp.#20 (*intermedius* group, Jackson Co.,AL/Tb)

*Pseudanophthalmus* undescr. #21 (\*\*?cave in Jackson Co. (*P.andrewsi*?) & Rockcastle Co.,KY/Tb) Seibert, 1973)

*Pseudanophthalmus* undescr. sp.#22 (\*?cave in Todd Co.,KY)

*Pseudanophthalmus* undescr. sp.#23 (\*cave in Todd Co.,KY)

*Pseudanophthalmus* undescr. sp.#24 (from *eremita* group in KY Bluegrass)

*Pseudanophthalmus* undescr. sp.#25 (\*Clark Co.,IN)

*Pseudanophthalmus* sp.#26, (\*?cave in WV/WV T&E S1; global G1/ same? as sp. #14 in MD T&E S1)

*Pseudanophthalmus* undescr. sp #27 (\*? cave in Orange Co.,IN)

*Pseudanophthalmus* undescr. sp.#28 (\*c. in Fayette Co.,PA)

*Pseudanophthalmus* undescr. sp.#29 (\* cave in IN)

*Pseudanophthalmus* undescr. sp.#30 (\* cave in Monroe Co.,IN)

*Pseudanophthalmus* undescr. sp.#31 (\*Mercer Co.,WV/WV T&E S1; global G1)

*Pseudanophthalmus* undescr. sp.#32 (\* cave in Randolph Co.,WV/WV T&E S1; global G1)

*Pseudanophthalmus* undescr. sp.#34 (\*\*\*near Hadley,Warren Co.,KY)

*Pseudanophthalmus* undescr. sp.35 (\*\*\*Warren & Butler Co.,KY)

*Pseudanophthalmus* undescr. sp. 36 (\* cave in Boutetourt Co., VA/ Tb/ VA T&E S1 rank & global G1 rank)

*Pseudanophthalmus* undescr. sp.#37 ( cave in VA/ Tb/ VA T&E S1 rank & global G1 rank)

*Pseudanophthalmus* undescr. sp.#38 ( cave in VA/ Tb/ VA T&E S1 rank & global G1 rank)

*Pseudanophthalmus* undescr. sp. #39 (possibly new sp. (or *P. nelsoni*) in Alleghany Co.,VA;  
>1 species.of TN R.Basin, Grayson Co.,KY)

*Pseudanophthalmus* undescr. sp. A (*cumberlandus* group) ( cave & one other cave Rockcastle Co., KY/Tb)

*Pseudanophthalmus* undescr. sp.B (*cumberlandus* group) ( cave & 5 other caves in Pulaski Co.,KY/Tb)

*Pseudanophthalmus* undescr. sp.C (*cumberlandus* group) (2 caves in Wayne Co., KY)

*Pseudanophthalmus solivagus* Krekeler, 1973 (type locality cave & 4 other caves in Woodford Co.,KY/Tb/ G1)

*Pseudanophthalmus steevesi* Barr, 1981 (type locality cave & at least 4 other caves in\*Blount Co.,nAL/ Tb)

*Pseudanophthalmus striatus* Motschoulsky, 1862 (Mammoth (Edmonson Co.)+Barren & Hart Cos.,KY/Tb/G3) Barr, 1967

*Pseudanophthalmus stricticollis* (*P. eremita* s. Jeannel, 1931; *P. tenuis* s. Barr, 1960) (Marengo C.(Crawford Co.) + Orange Co.,Upper Blue River area,IN/Tb/G3T1T2) **Bibl.:** Badaracca, 1986; Keith 1979; Krekeler 1958

*Pseudanophthalmus subaequalis* (*P. fuscus* s. Val., 1931) Val., 1952 (\*\* type locality cave & 2 other caves in Greenbriar Co., WV/ Tb/ WV T&E S1; global G1/ Greenbrier cave beetle)

*Pseudanophthalmus sylvaticus* Barr, 1967 (Cranberry Glades,WV/edaphobitic)

*Pseudanophthalmus templetoni* Val., 1952 (*P. intermedius* t. Val., 1948; *P. tennesseensis* t.; *P.t.t.* Barr, 1959) (Cumberland C.,e.Warren Co. +n.Grundy Co.,TN/Tb/ / S1S2 G1G2)

*Pseudanophthalmus tenebrosus* Krekeler, 1973 (\*\* type locality cave in Henry Co.,KY/Tb/State T&E/ Stevens Cr.)

*Pseudanophthalmus tennesseensis* (= *P. tenesensis* V., 1937) (\* type locality cave & 2 other caves in Knox Co.) & 1 cave in Roane Co., both TN/ Tb/ S3G3)

*Pseudanophthalmus tenuis* t. (*Anophthalmus* t. Horn, 1871; *A. eremita* Horn, Leng, 1920, *P. eremita* Jeannel, 1928; *P. bloomi* & *jeanneli* Krekeler, 1958; *P. longicollis* Jeannel, 1949) Barr, 1960 (Wyandotte C.,Crawford Co. +Harrison, Orange? & sWA Cos., IN/ Blue River cave ground beetle/ Tb - IN T&E) **Bibl.:** Badaracca, 1986; Keith, 1975a, 1979

*Pseudanophthalmus tenuis blatchleyi* = *P.b.*

*Pseudanophthalmus tenuis jeanneli* = *T. stricticollis*

**Pseudanophthalmus** *tenuis morrisoni* Barr, 1960 (= *P.m.*) (= *P. eremita m.* Jeannel, 1931) Krekeler, 1958 (\*type locality & 2 other caves (all in same cave system) in Lawrence Co., IN/ Tb/ G3T1T2)

*Pseudanophthalmus tenuis stricticollis* = *P.s.*

**Pseudanophthalmus** *thomasi* Barr, 1981 (\*\*(\* type locality cave in Scott Co.,VA),

**Pseudanophthalmus** *tiresias* (*P.t.t.* Barr, 1959) Barr, 1980 (\* type locality cave & 1 other cave in De Kalb Co.,TN/State T&E/ Ind. C. Pt. C. Beetle/ S1S2 G1G2)

*Pseudanophthalmus tiresias acherontis* = *P.a.*

*Pseudanophthalmus tiresias bandermani* = *P.b.*

*Pseudanophthalmus tiresias catherinae* = *P.c.*

*Pseudanophthalmus tiresias insularis* = *P.i.*

*Pseudanophthalmus tiresias occidentalis* = *P.o.*

**Pseudanophthalmus** *tortus* ((\* type locality cave & 1 other cave in Wayne Co.,KY/Tb)

**Pseudanophthalmus** *transfluvialis* Barr, 1985 (type locality cave in Warren Co.,\*Bowling Green area,KY & one cave in Logan Co., scKY/Tb/G1G2)

**Pseudanophthalmus** *trogloxytes* Krekeler, 1973 (type locality cave in Jefferson Co., KY (extinct in type locality?)/ Tb/State T&E/ Louisville Cave Beetle/ G1G2)

**Pseudanophthalmus** *tullahoma* (*P. tiresias tullahoma* Barr, 1959) Barr, 1980 (type locality cave (mostly inundated by dam) & other cave (prob.) (inundated by dam) & cave near dam,Coffee Co.,TN/TN State T&E G1G2/Duck River Cave Beetle/ S1 G1G2) Smyre, 1977

**Pseudanophthalmus** *umbratilis* Krekeler, 1972 or, 1973 (type locality cave in Garrard Co. & other caves in Dix R. & Elkhorn Cr. drainage,Fayette, Garrard, Owen & Woodford Cos.,KY/Tb G3)

**Pseudanophthalmus** *unionis* Barr, 1981 (type locality & one other cave Union Co.,TN/Tb/State T&E G1G2/Union County Cave Beetle/ S1S2 G1G2)

**Pseudanophthalmus** *valentinei* Jeann., 1949 (type locality cave in e.Putnam Co. +e.Overton Co.,KY/Tb/ S3 G2G4)

**Pseudanophthalmus** *vanburenensis* (*P. templetoni* v. Barr, 1959) Barr, 1962 (\*type locality cave in an Buren Co.,TN/ Tb/ S1S2 G1G2)

**Pseudanophthalmus** *ventus* Barr, 1981 (\*type locality cave in Marion Co.,TN/ Tb/ State T&E/ Bl. Cave Beetle/ S1S2 G1G2)

**Pseudanophthalmus** *vicarius* Barr, 1965 (type locality & five other caves in Tazewell Co.,VA/Tb G1G2)

**Pseudanophthalmus** *virginicus* (Barr) Barr, 1981 (*Aphanotrechus* v. Barr) (\*type locality cave in Tazewell Co.,VA/Tb/VA T&E S1 rank, Species of Concern & global G1 rank/Maiden Spr. Cave Beetle)

**Pseudanophthalmus** *wallacei* Barr, 1981 (\*type locality cave in Anderson Co.,TN/Tb/State T&E/Wallace's Cave Beetle/ S1S2 G1G2)

**Pseudanophthalmus** *youngi donaldsoni* (P.d. Krekeler, 1958) Barr, 1960 (\*type locality & 2 other caves (all in same cave system) in Lawrence Co.,IN/Tb - IN T&E)

**Pseudanophthalmus** *youngi y.* (P.y. Krekeler, 1958) Barr, 1960 (type locality cave in WA Co.,Upper Blue River area, Lost River, Cave River Valley, incl. Orange Co.,IN/Tb/G3T1T2 - IN T&E),

**Pterostichus** Bonelli, 1810 (=Hypherpes Chaudoir, 1838 +>45 syns.) (common black ground beetles) Carabidae beetles in Subfamily Harpilinae, Tribe Pterostichini.(234 species in US, Canada) **Bibl.:** Ball 1963

**Pterostichus** (*Hypherpes*) *algidus* LeConte, 1852 (=Feronia valida Dejean, 1828 (primary homonym of *F.v.*); *H. innatus* Casey, 1918; *H. responsor* & *anthrax* C.1918 (AK, BC, CA, OR, WA epigeal/ Tx in CA,WA)

**Pterostichus** *californicus* Dejean, 1828 (woodrat ectoparasite in CA non-cave *Neotoma fuscipes* woodrat nest)

**Pterostichus** *congestus* Menetries, 1843 (woodrat ectoparasite in CA non-cave *Neotoma fuscipes* woodrat nest)

**Pterostichus** (*Morphnosoma*) *coracinus* Newmann, 1838 (*Feronia c.*, *monedula*, *moerens* Newman, 1838; *P.adjunctus*, *flebilis* LeConte, 1852; *P. erebeus* Casey, 1913; *Euferonia roanica*, *coracina venator* & *c. ludibunda* Casey, 1920; *E.lacustris* & *strigosula* Casey, 1924; *E. washingtonensis* (var. *rufitarsis*) Nicolay & Weiss, 1934 (eUS & Canada to IL,GA,wON/Ac or TTx in AL,IL(1 cave))

**Pterostichus** (*Hypherpes*) *herculaneus* Mannerheim, 1843 (AK?,BC,ID,MT,OR,WA/ Tp? in WA)

*Pterostichus honestus* = *Bembidion h.*

**Pterostichus** (*Morphnosoma*) *lachrymosus* (=Feronia c. Newman, 1838) (BC to NF/ Tx or Ac in sON),

**Pterostichus** (*Holciophorus*) *lama* (*Feronia atra* Dejean, 1828 (secondary homonym of *P. ater*; *F.l.* Menetries, 1843; *H. vancouveri*, *pollens*, *cephalus* & *domitor* Casey, 1913) (epigeal in BC, CA, NV?, OR, WA/ Tx in BC, CA)

**Pterostichus** (*Hypherpes*) *nigrocoreuleus* Van Dyke, 1925 (Tx in Vancouver Island, BC)

**Pterostichus** *permundus* (*Feronia permunda* Say, 1830) (Tx in Camden Co., MO)

**Pterostichus** *protractus* LeConte, 1860 (2,000 year old remains in entrance pit in Rat's Nest Cave, AB)

**Pterostichus** near *punctiventris* (= *Feronia amnicola* Chaudoir, 1878; *P.a.* Casey, 1918) (AL? to AR,MO/Tx in in OK)

*Pterostichus sayi* = *Poecilus chalcites*

**Pterostichus** *relictus* (*Feronia relictus* Newman, 1838) (Tp or Tx in GA (Dade Co.))

**Pterostichus** undet. sp(s). (TTx in KY; Ttx or Ac in 3 seAK; (2,000 year old remains in entrance pit in Rat's Nest Cave, AB)

**Pterostichus** (*Holciophorus*) undet. sp. or species (Tx? in one cave in Mariposa Co.,CA; Ac or Tx in Blount Co.,TN; Ttx in one cave in Carter Co., KY; Pleistocene fossil in Port Kennedy C., Montgomery Co., PA)

**Pterostichus** undescr. sp.#1 (near *P. algidus*) (Tx or Ac? in Mitchell C., San Bernadino Co., CA)

**Pterostichus** (*Hypherpes*) undescr. sp.#2 (subgenus ( cave in Mariposa Co.,CA/Tx?)

**Pterostichus** (*Hypherpes*) undescr. sp.#3 (\*\*? 2 caves in Santa Cruz Co.,CA/Tx?)

**Pterostichus** (*Hypherpes*) undescr. sp.#4 ( cave in Santa Cruz Co.,CA/Tx?),

**Pterostichus** undescr. sp.#5 ( cave in Tuolumne Co.,CA/Tx?)

**Pterostichus** (*Hypherpes*) undescr. sp.#6 ( cave in Santa Cruz Co.,CA/Tx?)

**Pterostichus** (*Holciophorus*) undescr. sp.#7? (or undet.) ( cave in Mariposa Co.,CA/Tx?)

**Pterostichus** cf. *vicinus* Mannerheim, 1843 (CA epigeal/ Tx in CA)

**Rhadine** LeConte, 1848 (*Comstockia* Van Dyke, 1918; *Spelaeorhadine* Bolivar & Peltain, 1944) Carabidae beetles in Subfamily Harpilinae, Tribe Platynini (also put in Tribe Bembidiini) (40 species in US, Canada. **Bibl.:**Barr, 1964c,e, 1965, 1974a; Elliott, 1976b; Reddell, 1965

*Rhadine arizai* = *Spelaeorhadine* a. Bolivar & Peltain, 1944

*Rhadine arizai babcocki* – see *R. b.*; *Rhadine arizai howdeni* - See *R.h.*

**Rhadine** *austinica* Barr, 1974 (type locality cave in \*sTravis Co.,TX/Tb G1G2)

**Rhadine** *babcocki* Barr, 1960 (Tp in Sutton Co., Edwards, Pecos, Terrell, Val Verde Cos., TX)

*Rhadine crinicollis* Barr, 1974 = *R. specia c.*  
*Rhadine ewersi* = *R. infernalis e.*

**Rhadine** *caudata* (*Platynus c.* LeConte, 1863; *A.c.* Csiki, 1931) (Cumberland C.(TN) /E to IN,AR/TTx in nAL (Marshall Co.),AR,WI,PA; Tp in TN (Warren Co.),GA,VA (Roanoke Co.) Barr, 1964

**Rhadine** *exilis* (*A.(Rhadine) exile* Barr & Lawrence, 1960) Reddell, 1966 (type locality + many other caves in Bexar Co.,TX/Tb G1G2/ Federal endangered T&E)

*Rhadine gentilis* Barr, 1974 = *R. specia g.*

**Rhadine** *howdeni* Barr & Lawrence, 1960 (= *Agonum h.* Barr & Lawrence; *R. arizai h.*) (type locality cave in Kerr Co. +Edwards & Uvalde Cos.,Edwards Plateau & Balcones Fault Zone,scTX; 9,120+- 500 years old in scNM *Neotoma* woodrat nest)/ Tp)

**Rhadine** *infernalis ewersi* (*A.i.e.* Barr, 1960) (type locality & at least 3 other caves in Bexar Co.,TX/Tb G3T1T2)

**Rhadine** *infernalis i.* (*A.i.i.* Barr & Lawrence, 1960) (type locality & other caves in wBexar Co., TX/ Tb/ G1 or G3 T1T2/ Federal endangered T&E, first listed Dec. 2000)

**Rhadine** *insolita* Barr, 1974 (type locality cave in Comal Co., + cave in Hays Co., TX/Tb/ G1G2)

*Rhadine jonesi* Barr, 1960 = *Platynus j.*

**Rhadine** *koepkei k.* (*A.j., A. & R.k.* Barr, 1960) 1-3,200 yrs.BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM)

**Rhadine** *koepkei k.* (*A.j., A. & R.k.* Barr, 1960) \*( type locality & at least one other cave in Kendall Co., TX/Tb/ G3 or G1 T1T2)

**Rhadine** *koepkei privata* Barr, 1974 (type locality & at least four other caves in Kendall Co.,TX/Tb G3 T1T2)

**Rhadine** *larvalis* LeConte, 1848 (*Agonum jonesi* Barr, 1960) (type locality cave in Conecuh Co., AL/epigean in AL, AR, CA?, FL, MO, MT?, NV?, MS, PA?/ Tx? in AR, IL, MO, MS, TN(1c.)/ Tp in FL) Choate & Rogers 1976

**Rhadine** *larvalis* group (Tx in TX)

**Rhadine** *longiceps* Van Dyke, 1949 (swTX/ TTp in 2 caves in Brewster Co.,TX)

**Rhadine** *longicollis* (*A.longicolle* Csiki, 1931) Benedict, 1927 (Tp in Carlsbad C.,Eddy Co.,NM, +Culberson Co.,TX/ .1 to 18,000 yrs.BP in wTX (El Paso Co.) Or sNM & 24,00 to 22,500 years old in Big Bend Natl. Park, wTX) Bibl.: Pate 1996

*Rhadine mckenziei* Barr, 1974 = *R. tenebrosa* m.

***Rhadine menetriesi*** Motsch, 1862 (Mammoth C. type locality & three other caves in Edmonson Co.,KY/Tb) Kane 1981; Kane & Poulson 1976

***Rhadine noctivaga*** Barr, 1974 \*\* ( type locality cave + caves N of North San Gabriel River, Williamson Co.,TX)

***Rhadine ozarkensis*** Sanderson & Miller, 1941 (\*type locality cave in WA Co.,AR/Tb or Tp)

***Rhadine perlevis*** Casey, 1913 (epigean from nMex.to sAZ/Tx or Tp in Chihuahua, Mex., Chiricahua Mts, AZ; extralimital fossil remains in woodrat nest in Bida Canyon, Grand Canyon, AZ)

***Rhadine persephone*** Barr, 1974 (To. C. ground beetle) (type locality cave in Travis Co., +19 caves in Travis Co. & 25 caves in Williamson Co.,TX/ Tp, T&E/ G1 or G3) Reddell, 1984

*Rhadine privata* Barr, 1974 = *R. koepkei* p.

***Rhadine rubra*** (*A. rubrum* Barr, 1960) (type locality cave in heeler Co.,TX+ 12 cos.,(w,cTX) & wOK/ gypsum Tp)

***Rhadine russelli*** Barr, 1974 (\*type locality & one other cave in Travis Co., 3 caves in Burnet Co., +2 caves in Williamson Co., TX/ Tb/ G3)

***Rhadine*** undescr. sp.#1-2 (Hays, Coryell Cos.,TX/Tb) Reddell, 1994)

***Rhadine*** undescr. sp.#3 (2 caves in Eddy Co.,NM/ G1/ Tb?)

***Rhadine*** undescr. sp.#4 (nr. *longipes*) (\*cave in Culberson Co.,TX/ Tp)

***Rhadine*** undescr. sp.#5 (prob.) (\*?cave in Murray Co.,OK/Tp or Tb)

***Rhadine*** undescr. sp.#6 (\*cave in Inyo Co.,CA/Tb) Ubick & Briggs, 1992

***Rhadine*** undescr. sp.#7 (Carlsbad C.,NM/Tp)

***Rhadine*** undet. sp. or species (Tx in Coconino Co.,AZ; Tp in El Malpais Natl. Monument, nNM; Tx in cave in Grand Canyon, Coconino Co.,AZ); 2-3 & 15-15.5 thousand yrs.BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM))

***Rhadine specia crinicollis*** Barr, 1974 \*\* ( type locality & one other cave in Comal Co.,TX/Tb/ G1)

***Rhadine specia s.*** (*A. specum* Barr, 1960) (type locality & one other cave in Kendall Co. & 2 caves in Comal Co., TX/ Tb/ G3T1T2),

***Rhadine specia gentilis*** Barr, 1974 \*\* ( type locality & at least one other cave in Comal Co.,TX/ G3T1T2/ Tb)

**Rhadine** *subterranea* s. (*Comstockia* s. Van Dyke, 1918; *A.s* Barr & Lawrence, 1960) Barr, 1964 (type locality & at least 2 other caves in Travis Co.+ cave(s) in Williamson Co., TX/ Tb/ G3T3)  
**Bibl.:** Barr, 1981; Mitchell, 1965, 1968a, 1970, 1971, 1971a-b

**Rhadine** *subterranea mitchelli* Barr, 1974 (type locality cave in Williamson Co. +Travis Co.,TX/ Tb/ G1?)

**Rhadine** *tenebrosa* t. (*A. tenebrosum* Barr, 1960) Barr, 1974 (type locality cave in Kerr Co.,TX,+Bandera, Real & Medina Co./Tb)

**Rhadine** *tenebrosa mckenziei* Barr, 1974 (type locality & at least 2 other caves in Uvalde Co +Real Co.,TX/Tb/G3T3)

**Scaphinotus** DeJean, 1826 (=Irichroa Newman, 1838; *Nomaretus* LeConte, 1853; *Anobolus*, *Stenocantharus* Gistel, 1857; *Maronetus* Casey, 1914; *Megaliridia* C., 1920; *Steniridia* C., 1924 *Pemphus*, *Brennus* Motschulsky, 1866; *Pseudonomaretus*, *Neocychnus* Roeschke, 1907) (boat-backed ground beetles) Carabidae beetles in Subfamily Carabinae, Tribe Cychrini (49 species in US, Canada) **Bibl.:** Ball 1965, 1966a; Gidaspow 1959

**Scaphinotus** (*Neocychnus*) *angulatus* Harris, 1839 (epigean nCA to swBC/ Tx or Tp in Vancouver Island, BC)

**Scaphinotus** (*Stenocantharus*) *angusticollis* (*Cychnus a.* Fischer von Waldheim, 1823; *Pemphus a.* var. *nigripennis* Roeschke, 1907; *S.a. olympiae* Van Dyke, 1944; *S. longipes* Casey) (Siberia to CA,AB?,NT?/Tp in Vancouver Island, BC; cave in Skagit Co.,WA & 3 seAK caves)

**Scaphinotus** (*Brennus*) *interruptus* (*Cychnus i.* Menetries, 1843; *C. constrictus* LeConte, 1853; *C. dissolutus* Schaum, 1863; *Brennus politus*, *sinuatus*, *corpulentus*, Casey, 1897; *B. integer* C., 1914; *B. beringi*, *parvulicollis*, *procerus* C., 1920) (cCA/Tx or Ac in Napa Co.,CA)

**Scaphinotus** (*Brennus*) *johnsoni* Van Dyke, 1924 (epigean CA to AK/ Tx or Tp in Vancouver Island, BC)

**Scaphinotus** (*B.*) *marginatus* (*Cychnus m.* Fischer von Waldheim, 1820; *Brennus cupripennis* Casey, 1897; *B.m.* var. *fallax* Roeschke, 1907; *B. columbianus*, *gracilis*, *wrangelli* & *montanicus* Casey, 1920; *B. oregonus* Casey, 1920) (AB, AK to BC, CA, ID, MT, WY/ Tp or Tx in AK, BC, OR, WA) **Bibl.:** Carcamo 1997; Cheeseman & Pritchard, 1984

**Scaphinotus** (*B.*) *riversi* (*Brennus r.* & *S. oreophilus r.* Roeschke, 1907) (epigean in CA/ Tx in CA)

**Scaphinotus** (*Brennus*) *rugiceps* r. (*Cychnus r.* Horn, 1872; *Brennus orcatus* & *compositus* Casey, 1897; *B.r. congener* C.1914) (epigean in sOR,nwCA/Tx or Tp in CA mine)

**Scaphinotus** undet. sp. (Tx or Ac in nMS)



**Scaphinotus unicolor** (*Carabus u.* Fabricius, 1787)

**Scaphinotus unicolor** undescr. ssp. (Tp in nAL, MS, nAR, sIL, sMO)

**Scarites** Fabricius, 1775 (emits a distinctive odor if disturbed) Carabidae beetles in Subfamily Carabinae (= Scaritinae), Tribe Scaritini (7 species in US, Canada)

**Scarites** (*Scarites*) *subterraneus* Fabr., 1775 (*Carabus s.* Sulzer, 1776; *Carabus interruptus* Herbst, 1874; *S. subterreus* Bonelli, 1813; *S. beckwithii* Stephens, 1827; *S. denticollis* Chaudoir, 1843; *S. californicus* LeConte, 1852; *S. durangoensis* Bates, 1891) (ON to FL, w. to SD, TX epigeal/ Tp in Porter's (IN) (type?) & Carlsbad (NM) & Ac in Dudley (Crockett Co., TX)

**Schizogenius** Putzeys, 1846 (= *Genioschizus* Whitehead, 1972) - Carabidae beetles in Subfamily Carabinae (or Scaritinae), Tribe Scaritini. (24 species in US, Canada) **Bibl.:** Whitehead, 1972.

**Schizogenius** (*Schizogenius*) *tibialis* Whitehead, 1972 (Tp in one cave in Uvalde Co., TX)

*Spelaeorhadine* Bolivar & Peltain, 1944

*Spelaeorhadine araizai* = *Rhadine a.*

**Selenophorus** Dejean, 1829 - Carabidae beetles in Subfamily Harpilinae, Tribe Harpalini, Subtribe Harpalina, Genus-group Selenophori (97 species in US, Canada)

**Selenophorus gagatinus** Dejean, 1829 (1,200 to 12,300 yrs.BP in *Neotoma* woodrat nest in wTX (El Paso Co.) & Big Bend Natl. Park)

**Selenophorus palliatus** (*Carabus p.* Fabricius, 1798 (14,300 to 15,500 yrs.BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM)

**Selenophorus** undet.? (Tp or Tx in Eddy Co.(NM) & wTX/ 3,200 to 4,300 yrs.BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM)

*Speleobama vana* - put in Pselaphidae

**Sphaeroderus** Dejean, 1826 – Carabidae beetles, Subfamily Carabinae, Tribe Cychrini

**Sphaeroderus stenostomus** (*Cychrus s.* Weber, 1801) (Tx in GA (Dade Co.))

**Stenolophus** Dejean, 1821 (= *Agonoderus* Dejean, 1829) Carabidae beetles in Subfamily Harpilinae, Tribe Harpalini, Subtribe Stenolophina, Genus-group Stenolophi (also put in Platynini) (41 species in US, Canada)

**Stenolophus** (*S.*) *ochropezus* (*Feronia o.* Say, 1823; *S. convexicollis* LeConte, 1848; *S. laticollis* Motschulsky, 1864; *S. gracilis*, *floridanus* & *testaceicollis* Casey, 1924; *S.o.*) (eUS & Canada to MB, AZ, CO/Tx in MO, VA/Ac or Tx in IN)

**Stenolophus** undet. sp. or species (E/Tx in TN (Overton Co.), TX; Ac in IN)

**Syntomus** Hope, 1838 (*Metabletus* Schmidt-Goebel, 1846) Carabidae beetles in Subfamily Harpalinae, Tribe Lebiini, Subtribe Dromiina (1 species in US or Canada)

**Syntomus** *americanus* (*Dromius a.* Dejean, 1831; *M. borealis* Zimmermann, 1869) (epigean Newfoundland w. to BC, s. to Mexico/ Ac in one cave in Culberson Co., TX)

**Synuchus** Gyllenhal, 1810 - Carabidae beetles in Subfamily Harpilinae, Tribe Platynini (also put in Pterostichini) (2 species in US or Canada)

**Synuchus** *impunctatus* (*Feronia i.* Say, 1823) (Canada, s. to GA/ 1,400 & 3,200 yrs.BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM)

**Tachys** Dejean, 1821 (= *Tachyura* Hayward, 1897; *Isotachys* Casey, 1918) Carabidae beetles in Subfamily Harpilinae, Tribe Bembidiini (12 species in US, Canada)

*Tachys appalachius* Casey, 1918 = *Paratachys oblitus*

**Tachys** *arcanicola* Blackburn, 1878 (alien Tp in HI)

*Tachys ferrugineus* = *Elaphropus f.*

*Tachys incurva* = *Elaphropus i.*

**Tachys** *undet. sp.* (Tx or Ac in 1 IL cave; Tx in cave in Montgomery Co., TN)

**Tachys** *undescr. sp.?* (\*cave in Kendall Co, TX)

*Tachys proximus* (Say) (= *Paratachys p.*),

*Trechonepha iridescens* = *Bembidion i.*

**Trechus** Clairville, 1806 - Carabidae beetles in Subfamily Trechinae, Tribe Trichini. (48 species in US, Canada) **Bibl.:** Val., 1952, Barr, 1962a, 1985, 1985, Ebbets, 1986; Schaeffer, 1901

**Trechus** (*Trechus*) *cumberlandus* Barr, 1962 (type locality cave in Wayne Co. +Rockcastle & Pulaski Cos., KY & Cumberland, Van Buren, Overton & Grundy Cos., TN/ cold springs & sinkholes in wet debris epigean/ Cumberland Plateau Tp, glacial relict) Barr, 1979a; Ebbets, 1986

**Trechus** (*Trechus*) *hydropicus canus* (= *T. beutenmulleri c.* Barr, 1962) Barr, 1979a (swVA, seKY/ Tx or Tp, mts.)

**Trechus** (*Trechus*) *ovipennis* Motschulsky, 1845 (AK, BC, CA, OR, WA epigean/ epigean, Tp in cave (closed) in Santa Cruz Co., CA),

**Trechus** (*T.*) *ovipennis californicus* Motschulsky, 1845 (Tx? in Santa Cruz Co., CA)

**Trechus** *undescr. sp.* (Ed, TTP? in Snowbird Mts., NC)

**Trechus** (*Trechus*) *tauricus* Barr, 1979a (\*type locality cave in Great Smoky Mts. Natl. Park, Blount Co., TN/Tb &/or sinkhole Ep)

*Trechus (Trechus) tennesseensis tauricus* Barr, 1962 = *T. tauricus*

**Trechus** (*Trechus*) *tennesseensis tennesensis* Barr, 1962 (\*type locality cave in Roane Co., TN/Tb)

**Trechus** (*Microtrechus*) *tuckaleechee* (*Microtrechus t.*) Barr, 1962 (Tuckaleechee C., T. Cove, Blount Co., \*eTN/ Tp)

**Trechus** (*Trechus*) *vandikei* (*M. v.* Jeannel, 1927) group (Tx or Ac in CA)

**Trichotichnus** Morawitz, 1863 (*Pteropalus*, *Episcopellus* Casey, 1914) Carabidae beetles in Subfamily Harpilinae, Tribe Harpalini (4 species in US, Canada)

**Trichotichnus** (*Iridessus*) undet. sp. (Ac in TX)

*Troglanillus* Jeannel, 1963 = *Anillinus*

*Troglanillus valentinei* Jeannel, 1963 = *Anillinus v.*

**Troglanillus**? undet. sp. (Tx in cave in Grundy Co., TN/ determined by Barr 1957 as *Anillus*)

**Xenotrechus** Barr & Krekeler, 1967 - Carabidae beetles in Subfamily Trechinae, Tribe Trichini (2 species in US)

**Xenotrechus** *condei* Barr & Krekeler, 1967 (type locality & one other cave in Jefferson Co., MO/ Tb/ G3 or G1)

**Xenotrechus** *denticollis* Barr & Krekeler, 1967 (\*\*type locality & one other cave Ste. Genevieve Co., MO/Tb/ G1G2)

**CATOPIDAE** - put in Leiodidae

Checkered beetles family - See Cleridae

**CERAMBYCIDAE** Latreille, 1802 (long-horned beetles) **Bibl.:** Linsley & Chemsak 1961-76  
Subfamilies incl.

Lamiinae (flat-faced long-horns)

Tribe Moneilemini (*Moneilema*, *Plectrura*)

Prioninae (tooth-necked long-horns)

Tribe Prionini (*Prionus*)

Spondylinae (*Spondylis*) (also put in Spondylidae)

**Moneilema** Say, 1824 (*Collapteryx* Newman, 1838; *Monilema* LeConte, 1852; *Omoscylon* Thomson, 1867; *Monoplesa* Motschulsky, 1875) Cerambycidae beetles, Subfamily Lamiinae (6 species in US or Canada)

*Moneilema* undet. sp. (Ac in one cave in Lampasas Co., TX)

*Plectrura* Mannerheim, 1852 - Cerambycidae beetles, Subfamily Lamiinae (1 species in US or Canada)

*Plectrura dentipes* (*Callidium d.* Olivier, 1790) undet. sp. (Ac in 1 seAK cave)

*Prionus* Fabricius, 1775 (= *Homaesthesis* LeConte, 1873; *Neopolyarthron* Semenov, 1899; *Microarthron* Pic, 1900; *Riponus*, *Prionina* Casey, 1912; *Prionellus*, *Antennalia* C.1924) Cerambycidae beetles, Subfamily Prioninae, Tribe Prionini (13 species in US, Canada; feed on roots)

*Prionus* undet. sp. (Ac in cave in King Co., TX)

*Spondylis* Fabricius, 1775 - Cerambycidae beetles, Subfamily Spondyliinae (1 species in US, Canada)

*Spondylis upiformis* Mannerheim, 1843 (swCanada, s. to CA, AZ, CO/ 2,000 year old remains in entrance pit in AB cave)

**CHRYSOMELIDAE** Latreille, 1802 (leaf beetles) **Bibl.:** Jacques 1988; Wilcox 1975  
One or two undet. genera 10,950 & 7,530 to 6,000 years old in *Neotoma* woodrat nests in Tinajas & Butler Mts., Yuma Co,AZ))

Subfamilies incl.

Alticinae (once subsumed in Galerucinae) (*Altica*, *Chaetocnema*, *Glyptina*, *Phyllotreta*)

Bruchinae (seed beetles)

(*Acanthoscelides*, *Algarobius*, *Bruchus*, *Stator*, *Mimosestes*) (all in Bruchidae)

Chrysomelinae (broad-bodied leaf beetles)

(*Calligrapha*, *Chrysolina*, *Disonycha*, *Leptinotarsa*, *Zygogramma*)

Tribe Chrysomelini (*Chrysomela*)

Criocerinae (shining leaf beetles) (*Lema*)

Cryptocephalinae (cylindrical leaf beetles) (*Pachybrachis*)

Eumolpinae (oval leaf beetles)

Tribe Adoxiini (*Fidia*, *Myochrous*)

Galerucinae (skeletonizing leaf beetles)

(*Altica*, *Chaetocnema*, *Glyptina*, *Phyllotreta*) (all now in Alticinae))

Tribe Galerucini (*Pyrrhalta*, *Trirhabda*)

Tribe Luperini

Subtribe Luperina (*Triarius*)

*Acanthoscelides* & *Algarobius*- put in Bruchidae

**Altica** Muller, 1764 (flea beetles)- Chrysomelidae beetles, Subfamily Alticinae (once in Galerucinae) (6 species in US or Canada)

**Altica** undet. sp. or species (*Neotoma* woodrat midden in Glen Canyon cave, UT; yrs.BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM/ 22,00 to 2,100 & 6,000 to 4,000 year old in *Neotoma* woodrat nest in Big Bend Natl. Park, wTX))

*Bruchus* Linnaeus, 1767 - See Bruchidae

**Calligrapha** Chevrolat, 1837 - Chrysomelidae beetles, Subfamily Chrysomelinae (36 species in US, Canada)

**Calligrapha** *dislocata* Rogers, 1854 (9,400 to 10,300 yrs.BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM)

**Chaetocnema** Stephens, 1831 (*Odontocnema* S., 1831; *Plectroscelis* Redtenbacher, 1845; *Udorpes*, *Ydorpes* Motschulsky, 1845; *Hydrous* M., 1860; *Carcharodis* Weise, 1910) flea beetles in Chrysomelidae, Subfamily Subfamily Alticinae (once in Galerucinae) (31 species in US or Canada)

**Chaetocnema** *elongatula* Crotch, 1873 (9,400 to 15,500 yrs.BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM)

**Chaetocnema** undet. sp. (Ac in Irion, Uvalde Cos., TX; Ac or Tx in one cave in Grand Canyon, Coconino Co., AZ)

**Chrysolina** Motschulsky, 1860 - Chrysomelidae beetles, Subfamily Chrysomelinae (16 species in US, Canada)

**Chrysolina** *auripennis* (*Chrysomela* a. Say, 1824) (Ac in cave in Val Verde Co., TX)

**Chrysolina** undet. sp. (>26,000 yrs.BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM)

**Chrysomela** Linnaeus, 1758 - Chrysomelidae beetles, Subfamily Chrysomelinae, Tribe Chrysomelini (17 species in US, Canada)

**Chrysomela** undet. sp. (9,120+- 500 years old in scNM *Neotoma* woodrat nest)

**Disonycha** Chevrolat, 1844 - Chrysomelidae beetles, Subfamily Chrysomelinae (35 species in US or Canada)

**Disonycha** undet. sp. (Ac in cave in Sutton Co., TX)

**Fidia** Walsh, 1867 - Chrysomelidae beetles, Subfamily Eumolpinae, Tribe Adoxiini (rootworms)(6 species in US or Canada)

**Fidia longipes** (*Eumolpus l.* Melsheimer, 1847) (Tx or Ac in one cave in AR)

**Glyptina** LeConte, 1859 (flea beetle) - Chrysomelidae beetles, Subfamily Alticinae (once in Galerucinae) (12 species in US or Canada)

**Glyptina** undet. sp. (20,500 years old in *Neotoma* nest, Ajo Mts., Pima Co., AZ)

**Lema** Fabricius, 1798 - Chrysomelidae beetles in Subfamily Criocerinae (25 species in US, Canada)

**Lema trilinea** White, 1993 (Ac or Tx in one cave in Grand Canyon, Coconino Co., AZ/ threelined potato beetle)

**Leptinotarsa** Stal, 1858 (= *Myocoryna* S.1858) Chrysomelidae beetles, Subfamily Chrysomelinae (12 species in US, Canada)

**Leptinotarsa** sp. prob. *haldemani* (*Doryphora h.* Rogers, 1856; *D. libatrix*, *chlorizans* Suffrian, 1858; *Myocoryna violascens* Stal, 1859) Rogers (Ac in cave in Sutton Co. & cave in Burnet Co., TX)

**Leptinotarsa decemlineata** (*Doryphora d.* Say, 1824; 15 syns.) (Colorado potato beetle/ Ac in one cave in Uvalde Co., TX),

*Mimosestes* Bridwell, 1946 - put in Bruchidae

**Myochrous** Erichson, 1847 - Chrysomelidae beetles, Subfamily Eumolpinae, Tribe Adoxiini (13 species in US, Canada)

**Myochrous denticollis** (*Colaspis* Say, 1824) (Ac in one cave in Uvalde Co., TX)

**Pachybrachis** Chevrolat, 1837 -Chrysomelidae beetles, Subfamily Cryptocephalinae (151 species in US, Canada)

**Pachybrachis mitis** Fall, 1915 (0-10,300 yrs.BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM)

**Pachybrachis** undet. sp. (*Neotoma* woodrat midden in Canyonlands, UT; cf. *Pachybrachis* 10,300 years old in *Neotoma* woodrat nest in Tinajas Mts., Yuma Co.,AZ)

**Phyllotreta** Chevrolat, 1837 (= *Orchestris* Kirby, 1837; *Tanygaster* Blatchley, 1921) (flea beetles) Chrysomelidae beetles, Subfamily Alticinae (once in Galerucinae) (38 species in US or Canada)

**Phyllotreta** *mitis* Fall, 1915 (0 to 10,300 yrs. BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM))

**Phyllotreta** undet. sp. (Ac in Irion, Uvalde Cos., TX/ flea beetles)

**Pyrhalta** Joannis, 1866 (= *Galeruca*) Chrysomelidae beetles, Subfamily Galerucinae, Tribe Galerucini (16 species in US or Canada)

**Pyrhalta** undet. sp. (0 to >26,000 yrs.BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM)

**Scelolyperus** Crotch, 1874 - Chrysomelidae beetles, Subfamily Galerucinae (27 species in US or Canada)

**Scelolyperus** undet sp. (21,000 to 14,000 year old in *Neotoma* woodrat nest in Big Bend Natl. Park, wTX; 9,120+- 500 years old in scNM *Neotoma* woodrat nest)

*Stator* Bridwell, 1946 - put in Bruchidae

**Triarius** Jacoby, 1887 - Chrysomelidae beetles, Subfamily Galerucinae, Tribe Luperini, Subtribe Luperina (6 species in US, Canada)

**Triarius** *vittipennis* (*Malacosoma* v. Horn, 1893) (Ac in a mine in Presidio Co., TX)

**Trirhabda** LeConte, 1865 - Chrysomelidae beetles, Subfamily Galerucinae, Tribe Galerucini (27 species in US or Canada)

**Trirhabda** undet. sp. (9,120+- 500 years old in scNM *Neotoma* woodrat nest)

**Zygogramma** Chevrolat, 1837 - Chrysomelidae beetles, Subfamily Chrysomelinae  
*Zygogramma dislocata* = *Calligrapha* d.

CICINDELIDAE (tiger beetles) (now in Tribe Cincindelini in Carabidae)

**CLERIDAE** Latreille, 1802 (checkered beetles). About 55 sp. & ssp. n. of Mex. Most adults feed on bark beetles; a few scavenge or feed on pollen.

Tellinae Leach, 1815 or Clerinae (Tribe Tillini) (*Cymatodera*)

**Cymatodera** Gray, 1832 - Cleridae beetles in Tellinae or Clerinae (Tribe Tillini) (71 species in US or Canada) **Bibl.:** W. Barr 1951

**Cymatodera** *antennata* Schaeffer, 1908 (0 to 11,400 years BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM)

**Cymatodera** *latefascia* Schaeffer, 1904 (epigean in US?! Tp in Mitchell C., San Bernardino, CA/ 3,200 to 4,00 and 10,500 to 10,800 years BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM)).

**Cymatodera** undet. sp. (Ac in cave in Menard Co., TX; fossil in *Neotoma* woodrat midden, Puerto Blanco Mts., Pima Co., AZ)

**Cymatodera** *pallida* Schaeffer, 1908 (late Pleistocene extralimital in Grand Canyon, Coconino Co., AZ)

Click beetle family - See Elateridae

Clown beetle family - See Histeridae

**COCCINELLIDAE** Latreille, 1807 (lady(bird) beetles)

Subfamily Chilocorinae (*Chilocorus*)

Subfamily Coccinellinae

Tribe Coccinellini (*Hippodamia*, *Olla*)

Subfamily Scymninae

Tribe Hyperaspini (*Hyperaspis*)

**Chilocorus** Leach, 1815 - Coccinellidae beetles, Subfamily Chilocorinae (9 species in US or Canada)

**Chilocorus** *stigma* (*Coccinella* s. Say, 1835) (Ac in one cave in Edwards Co., TX)

**Hippodamia** Dejean, 1837 (= *Hemisphaerica* Hope, 1840; *Adonia* Myulsant, 1846; *Parippidamia* Iablokoff-Khnzorian, 1979) - Coccinellidae beetles, Subfamily Coccinellinae, Tribe Coccinellini (13 species in US or Canada)

**Hippodamia** *convergens* Guerin-Meneville (*H. modesta* Melsheimer, 1847; *H. praticola* Mulsant, 1850; *H. obsoleta* Crotch, 1873; *H. juncta* Casey, 1899) (Ac in Culberson, Edwards, Presidio, Sutton Cos., TX)

**Hyperaspis** Redtenbach, 1844 (= *Oxynchus* LeConte, 1850) - Coccinellidae beetles, Subfamily Scymninae, Tribe Hyperaspini (87 species in US or Canada)

**Hyperaspis** *lateralis* Mulsant, 1850 (= *H. omissa* Casey, 1879; *H. montanica*, *laevipennis* C. 1899; *H. flammula*, *wellmani* Nunenmacher, 1911; *H. idae* N. 1941; *H. nigrocauda* Dobzhansky, 1941) (Ac in one cave in Edwards Co., TX)

**Hyperaspis** *trifurcata* Schaeffer, 1905 (0 to 1000 years BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM))



**Olla** Casey, 1899 - Coccinellidae beetles, Subfamily Coccinellinae, Tribe Coccinellini (1 species in US)

**Olla** *v-nigrum* (*Harmonia* *v.* Mulsant, 1866; *Coccinella abdominalis* Say, 1824 Homo.; *Cycloneda sayi* Crotch, 1871; *O. plagiata*, *sobrino*, *fenestralis* Casey, 1899; *O. semilunaris* Johnson, 1910; *O. arizonae* Casey, 1924) (CA, TX, BC, ID, CO epigeal/ ash-gray ladybird beetle/Ac in cave in Sutton Co., TX)

**COLYDIIDAE** (cylindrical bark beetles)

**Lasconotus** Erichson, 1845 - Colydiidae beetles in Subfamily Colydiinae (21 species in US or Canada)

**Lasconotus** undet. sp. (>26,000 yrs.in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM))

**CORYLOPHIDAE** LeConte, 1852 (minute fungus beetles)

**Rypobius** LeConte, 1852 - Corylophidae beetles, Subfamily Orthoperinae (2 species in US or Canada)

**Rypobius** undet. sp. (Ac in cave in Burnet Co., TX)

**CRYPTOPHAGIDAE** Kirby, 1837 ((silken) fungus beetles) (incl. Hypocopridae) incl.  
undet. Tx genus and species in CO

Tribe Atomariini (*Atomaria*)

Tribe Cryptophagini (*Cryptophagus*)

**Atomaria** Stephens, 1830 - Cryptophagidae beetles, Subfamily Atomariinae, Tribe Atomariini (41 species in US or Canada)

**Atomaria** undet. sp. (Tx or Ac in CA)

**Atomaria** *subrecta* Casey, 1900 (Tx or Ac in WA)

**Cryptophagus** Herbst, 1792 (fungus beetles) - Cryptophagidae beetles, Subfamily Cryptophilinae, Tribe Cryptophagini (43 species in US or Canada)

**Cryptophagus** near *fumidulus* Casey, 1900 (CA/occasional Tx)

**Cryptophagus** near *politus* Casey, 1900 (CA/occasional Tx)

**Cryptophagus** undet. species (NW/ Tx or Tp in AL,IL,KY; Tx in IN (Crawford, Harrison Cos.), MO; Tp in AR; Tx or Ac in CA, TX; Tx or Tp in one cave in MT; (in CA non-cave *Neotoma fuscipes* woodrat nest); on PA *Neotoma magister* woodrat)

**Cryptophagus** *valens* Casey, 1900 (Tx or Ac in 1 IL cave)

## **CUCUJIDAE**

*Cathartus* - now in Silvanidae

**CURCULIONIDAE** Latreille, 1802 (snout beetles, (true) weevil (beetles) or water weevils)

**Bibl.: Kissinger 1964**

Undet. Genus (10,070 to 9,900 years old in *Neotoma* woodrat nest in Tinajas Mts., Yuma C Co,AZ)

**Apioninae** (pear-shaped weevils)

Tribe Apionini (*Apion*) (also put in Apionidae, also once in Brentidae)

**Brachyderinae** Billberg, 1820 (broad-nosed weevils) (= Thylacitinae) (*Otiorrhynchus* ( now in Otiorrhynchinae),)

Tribe Brachyderini (*Mitostylus*, *Sciaphilus*)

Tribe Polydrusini (*Pantomorus*, *Polydrusus*)

Tribe Tanymecini (*Piscatopus*)

**Cleoninae**

Tribe Cleoninini (*Cleonis*)

**Cossoninae** (bark weevils) (also put in Cossonidae)

Tribe Onycholipini (*Onychobaris*)

**Cryptorhynchinae**

Tribe Cryptorhynchini

SubTribe Tylodnia (*Calles*) (also put in Curculioninae)

Tribe Ithyporini (*Conotrachelus*, *Micromastus*) (both also put in Curculioninae)

**Curculioninae** L., 1802 (acorn and nut weevils)

(*Apleurus*, *Calles*, *Conotrachelus* (both now in Cryptorhynchinae), *Curculio*, *Steremnius*,)

Tribe Baridini, SubTribe Centrinina (*Anacentrinus*)

Tribe Smicronychini (*Smicronyx*)

Tribe Lixini, SubTribe Cleonina (*Cleonidius*)

Tribe Erirhinini, SubTribe Smicronychina (*Smicronyx*) (now in Smicronychini)

**Dryophthorinae** (*Scyphophorus*) (now in Baridinae)

**Hylobiinae**

Tribe Anchonini (*Lymnantes*)

**Hyperinae** (clover and alfalfa weevils)

Tribe Hyperini (*Hypera*)

**Otiorrhynchinae**

Tribe Leptopiini (*Dichoxenus, Orimodema, Sapotes, Trichalophus*)

Tribe Ophryastini (*Ophryastes*)

Tribe Otiorrhinini (*Otiorrhynchus*)

Tribe Peritelini (*Eucyllus*)

**Prionomerinae**

Tribe Tychiini (*Tychius*)

**Rhynchophorinae**

Tribe Sphenophorini (*Scyphophorus*)

**Scolytinae** (typical bark beetles) (also placed in own family)

Tribe Cactopinini (*Cactopinus*)

Tribe Corythylini (*Pityophthorus*)

Tribe Hylastini (*Hylastes*)

**Anacentrinus** Buchanan, 1932 - Curculionidae beetles in Subfamily Curculioninae, Tribe Baridini, subTribe Centrinina (14 species in US or Canada)

**Anacentrinus** *deplanatus* (*Limnobaris a.* Casey, 1892)) (Ac in one cave ni Edwards Co., TX)

**Anchytarsus** Guerin-Meneville, 1843 - now in Ptilodactylidae

**Apion** Herbst, 1797 - Curculionidae beetles, Subfamily Apioninae, Tribe Apionini (also put in Apionidae) (145 species in US or Canada)

**Apion** undet. sp. (0 to 1,000 & 7,300 to >26,000 yrs.BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM)

**Apleurus** Chevrolat, 1873 - Curculionidae beetles in Subfamily Curculioninae (7 species in US or Canada)

**Apleurus** *angularis* (*Cleonus a.* LeConte, 1859) (Ac or Tx remains in woodrat nest in one cave in Grand Canyon, Coconino Co.,AZ)

**Cactopinus** Schwarz, 1899 - Curculionidae beetles, Subfamily Scolytinae, Tribe Cactopinini (also put in Scolytidae) (5 species in US)

**Cactopinus** *hubbardi* Schwarz, 1899 (saguaro bark beetle/ fossil in *Neotoma* woodrat midden, Puerto Blanco Mts.,Pima Co., sAZ; 9,600 to 8,600 years old in *Neotoma* nest, Ajo Mts., Pima Co., AZ)

**Calles** Kissinger, 1964 - Curculionidae beetles in Subfamily Cryptorhynchinae, Tribe Cryptorhynchini, Subtribe Tyloclonia (once in Curculioninae) (1 species in US)

**Calles cladotrichis** (*Tyloclonia c.* Pierce, 1912) (12,900 yrs.BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM)

**Cleonidius** Casey, 1891 (= *Lixestus* Reitter, 1916) Curculionidae beetles in Subfamily Curculioninae, Tribe Lixini, Subtribe Cleonina (20 species in US or Canada)

**Cleonidius quadrilineatus** (*Apleurus q.* Chevrolat, 1873; *Cleonis q.*) (Ac or Tx remains in woodrat nest in Bida Cave, Grand Canyon, Coconino Co., AZ; *Cleonidius* sp. nr. *q.* Ac in Devil's Sinkhole, Edwards Co., TX;)

**Cleonidius** undet. sp. (Ac or Tx remains in woodrat nest in one cave in Grand Canyon, Coconino Co., AZ)

**Cleonis** Dejean, 1821 (= *Geomorus* Schonherr, 1823; *Cleonus* S., 1826) Curculionidae beetles in Subfamily Cleoninae, Tribe Cleonini (45 species in US or Canada)

*Cleonis* sp. nr. *quadrilineatus* = *Cleonidius q.*

**Cleonis** undet. sp. (12,000 to 12,300 yrs.BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM)

**Conotrachelus** Dejean, 1835 - Curculionidae beetles in Subfamily Cryptorhynchinae, Tribe Ithyporini (59 species in US or Canada)

**Conotrachelus invadens** Fall, 1907 (0 to 1,000 & 3,200 to 4,000 yrs.BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM)

**Conotrachelus** undet. sp. or species (3,200 to 4,000 yrs.BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM; 21,800. years old in *Neotoma* woodrat nest, Ajo Mts., Pima Co., AZ)

**Curculio** Linnaeus, 1758 - Curculionidae beetles in Subfamily Curculioninae (also put in Curculioninae) (30 species in US or Canada)

**Curculio proboscoides** (*Curculio p.* Fabricius, 1775) (Tx in Crawford Co., KY) Bibl.: Sullivan 1962

**Dichoxenus** Horn, 1876 - Curculionidae beetles in Subfamily Curculioninae, Tribe Leptopiini (4 species in US or Canada)

**Dichoxenus setiger** Horn, 1876 (2,000 to 500 year old *Neotoma* woodrat nest in Big Bend Natl. Park, wTX)

***Eucyllus*** Horn, 1876 - Curculioninae beetles in Subfamily Brachycerinae, Tribe Peritelini (8 species in US or Canada)

***Eucyllus echinus*** Van Dyke, 1936 (21,800 years old in *Neotoma* nest, Ajo Mts., Pima Co., AZ)

***Hylastes*** Erichson, 1836 - Curculionidae beetles, Subfamily Scolytinae, Tribe Hylastini (also put in Scolytidae beetles, Subfamily Hylesininae) (13 species in US or Canada)

***Hylastes*** undet. sp. (<26,000 yrs.BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM/ 16,000 to 14,000 year old woodrat nest in Big Bend Natl. Park, wTX)

***Hypera*** Germar, 1817 (= *Phytonomus* Schonherr, 1823) Curculionidae beetles in Subfamily Hyperinae, Tribe Hyperini (16 species in US or Canada)

***Hypera postica*** (*Rhynchaenus* Gryllenthal, 1813) (epigeal in TX,CA,ID,NY,FL/ Ac in one cave in Hays Co., TX)

***Lymantes*** Schonher, 1838 (= *Typhloglymma* Dury, 1901) - Curculionidae beetles in Subfamily Hylobiinae, Tribe Anchonini (also put in Curculioninae)(4 species in US or Canada)

***Lymantes*** prob. *puteolatum* (Drury, 1901) (MO/Tx or Ac?)

***Micromastus*** LeConte, 1876 - Curculionidae beetles in Subfamily Cryptorhynchinae, Tribe Ithyporini (1 species in US or Canada) (also put in Curculioninae)(1 species in US or Canada)

***Micromastus gracilis*** Boheman, 1859 (confined to CA non-cave *Neotoma fuscipes* woodrat nest)

***Mitostylus*** Horn, 1876 (= *Derosomus* Sharp, 1891) - Curculionidae beetles in Subfamily Brachycerinae, Tribe Brachyderini (4 species in US or Canada)

***Mitostylus setosus*** Sharp, 1891 (Tp? in cave in Eddy Co.,NM)

***Onychobaris*** LeConte, 1876 - Curculioninae beetles, Subfamily Cossoninae, Tribe Onycholipini (34 species in US or Canada)

***Onychobaris mystica*** Casey, 1892 (Ac in one cave in Presidio Co., TX)

***Ophryastes*** Say, 1831 - Curculioninae beetles, Subfamily Brachycerinae, Tribe Ophryastini (36 species in US or Canada)

***Ophryastes argentatus*** LeConte, 1853 (4,200 to 19,700 yrs.BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM) 12,500 to 9,000 year old woodrat nest in Big Bend Natl. Park, wTX))

***Ophryastes*** undet. sp. or species (Ac or Tx remains in woodrat nest in one cave in Grand Canyon, Coconino Co.,AZ; fossil in *Neotoma* woodrat midden, Puerto Blanco Mts.,Pima Co., sAZ; 7,530 years old in *Neotoma* woodrat nest in Butler Mts., Yuma Co,AZ/ 3,200 to 4,000 and

9,400 to 10,300 yrs.BP in *Neotoma* woodrat nest in wTX (El Paso Co.); 9,120+- 500 years old in scNM)

**Ophryastes** *tuberosus* LeConte, 1853 (3,200 to 15,300 yrs.BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM)

**Ophryastes** *varius* LeConte, 1853 (3,200 to 4,000 yrs.BP in *Neotoma* woodrat nest in scNM)

**Orimodema** Horn, 1876 - Curculioninae beetles, Subfamily Brachycerinae, Tribe Leptopiini (1 species in US or Canada)

**Orimodema** *protracta* Horn, 1876 (Ac or Tx remains in woodrat nest in one cave in Grand Canyon, Coconino Co.,AZ)

**Otiorrhynchus** Germar, 1824 (once put in own family) - Curculionidae beetles in Subfamily Otiorrhynchinae, Tribe Otiorrhinini (also put in Brachycerinae) (16 species in US or Canada)

**Otiorrhynchus** *ovatus* Linnaeus, 1758 (NE/ Strawberry Root Weevil/Tx or Ac in sON; 2,000 year old remains in entrance pit in AB cave)

**Pantomorus** Schonherr, 1840 - Curculionidae beetles in Subfamily Brachycerinae, Tribe Polydrusini (10 species in US or Canada)

**Pantomorus** *elegans eximus* Horn, 1876 (3,200 to 4,000 yrs.BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM)

**Piscatopus** Sleeper, 1960 - Curculioninae beetles, Subfamily Brachycerinae, Tribe Tanymecini (1 species in US or Canada)

**Piscatopus** *griseus* Sleeper, 1960 (2,000 to 3,000 yrs.BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM)

**Pityophthorus** Eichhoff, 1864 - Subfamily Scolytinae in Curculionidae (also put in Scolytidae, Subfamily Scolytinae) (105 species in US or Canada)

**Pityophthorus** undet. sp. (9,120+- 500 years old in scNM *Neotoma* woodrat nest)

**Polydrusus** Germar, 1817 - Curculionidae beetles in Subfamily Brachycerinae (5 species in US or Canada)

**Polydrusus** *impressifrons* Gyllenhal, 1834 (MB, PQ, NB, NS epigeal/ Tx or Ac in sON)

**Sapotes** Casey, 1888 Curculionidae beetles in Subfamily Brachycerinae, Tribe Leptopiini (2 species in US or Canada)

**Sapotes** *longipilis* Van Dyke, 1934 (3,200 to 10,300 yrs.BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM)/ 29,000 to 500 year old in *Neotoma* woodrat nest in Big Bend Natl. Park, wTX))

**Sapotes** undet. sp. (Ac or Tx in woodrat nest in one cave in Grand Canyon, Coconino Co.,AZ)

**Sciaphilus** Schonherr, 1823 - Curculionidae beetles in Subfamily Brachycerinae, Tribe Brachyderini (1 species in US or Canada)

**Sciaphilus** *asperatus* Bonsdorff, 1785 (eCanada & BC/Tx or Ac in sON)

**Scyphophorus** Schonherr, 1838 - Curculionidae beetles in Subfamily Rhynchophorinae, Tribe Sphenophorini (once in Dryophthorinae) (2 species in US or Canada)

**Scyphophorus** undet. sp. (Ac or Tx in woodrat nest in one cave in Grand Canyon, Coconino Co.,AZ)

**Smicronyx** Schonherr, 1843 - Curculionidae beetles in Subfamily Curculioninae, Tribe Smicronychini (also put in Eirrhiniini, subTribe Smicronychina) (70 species in US & Canada)

**Smicronyx** *imbricatus* Casey, 1892 (= *Synertha hornii* Dietz, 1894) (CA to SE except FL/ Ac in AZ)

**Smicronyx** undet. sp. (32,000 years old in Neotoma nest, Ajo Mts., Pima Co., AZ)

**Steremnius** Schonherr, 1836 - Curculionidae beetles in Subfamily Curculioninae (3 species in US or Canada)

**Steremnius** *carinatus* Boheman, 1842 (soil epigeal assoc. with Doug-fir tree roots/ Ac, Tx or Tp in Vancouver Island, BC)

**Trichalophus** LeConte, 1876 - Curculionidae beetles in Subfamily Brachycerinae, Tribe Leptopiini (9 species in US or Canada)

**Trichalophus** *alternatus* Say, 1831 (2,000 year old remains in entrance pit in AB cave)

**Tychius** Germar, 1817 - Curculionidae beetles in Subfamily Prionomerinae, tribe Tychiini (also put in Curculioninae) (14 species in US or Canada)

**Tychius** *tectus* LeConte, 1876 (2,000 years old in Neotoma nest, Ajo Mts., Pima Co., AZ) year old remains in entrance pit in AB cave)

Darkling beetles family - See Tenebrionidae

**DASCILLIDAE** Guerin-Meneville, 1843 (=Dascyllidae) (incl. Karumiidae) (soft-bodied plant beetles)

*Macropogon* - now in Armatopodidae

**DERMESTIDAE** Latreille, 1802 (dermestid, (dry) skin or larder beetles) (incl. Thorictidae). About 48 sp. & ssp. n. of Mex. Usually found on flowers, dried carcasses, in social Hymenoptera, bird & mammal nests, museums, houses. They eat pollen, feathers, hair, fur or insect remains.

**Attageninae**

Tribe Attagenini (*Attagenus*, *Novelsis*)

**Dermestinae** L., 1804

Tribe Dermestini (*Dermestes*)

**Megatominae** Leach, 1815

Tribe Anthrenini (*Anthrenus*, *Trogoderma*)

*Anthrenus* I.C. Schaeffer, 1776 - Dermestidae beetles in Subfamily Megatominae, Tribe Anthrenini (12 species in US or Canada)

*Anthrenus* prob. *verbasci* (= *Byrrhus* v. Linneaus, 1767) (NA epigeal / buffalo or varied carpet beetle/ Tx guanobic/ Tp in one cave in Edwards Co., TX)

*Attagenus* Latreille, 1802 - Dermestidae beetles in Subfamily Attageninae, Tribe Attagenini (5 species in US or Canada)

*Attagenus* *elongatus* (*Caenoscelis elongata* Casey, 1900) (in CA non-cave *Neotoma fuscipes* woodrat nest)

*Attagenus* *megatoma* (*Dermestes m.* Fabricius, 1798; *D. piceus* Olivier, 1790 (Homo.); *D. unicolor* Brahm, 1791; *A. sordidus* Heer, 1841; *A. fulvipes* Mulsant & Rey, 1867; *A. obliquus* Rey, 1889; *A. deficiens* Casey, 1900; *A. canadensis* C.1916)) (black carpet beetle/ guanobic Tp in Bracken Bat Cave, Comal Co., TX) Bibl.: Burkholder 1967; L. Butler 1968; Dunkel 1969

*Attagenus* undet. sp. or species (guanobic Tp in San Saba & Val Verde Cos., TX; fungivore on ON bat guano)

*Dermestes* Linne', 1758 (larder beetles) - Dermestidae beetles in Subfamily Dermestinae, Tribe Dermestini (23 species in US or Canada)

*Dermestes* *ater* De Geer, 1774 (*D. domesticus* Germar, 1824; *D. cadaverinus* Fabricius, 1775; *D. piceus* Thunberg, 1781; *D. felinus* F., 1787; *D. hispidulus* Montrouzier, 1860; *D. chinensis*



Motschulsky, 1866; *D. subcostatus* Murray, 1867; *D. noxius* Mulsant & Rey, 1867) (epigeal in NA/ black larder beetle/ Tp in TX)

**Dermestes** (*Dermestinus*) *carnivorus* Fabricius, 1775 (= *D. carniforus*) (E to BC/ Tx or Tp gaunobic in Mex., TX)

**Dermestes** *nubilis* Say, 1832 (*D. caninus* Germar, 1824 (Homo.)(guanobic)(Tp in one cave in Edwards Co. & one in Sutton Co., TX)

**Novelsis** Casey, 1900 (= *Paranovelsis* C., 1900; *Genattus* Sharp, 1902) - Dermestidae beetles in Subfamily Attageninae, Tribe Attagenini (9 species in US or Canada)

**Novelsis** *versicolor* (*Attagenus* v. Jayne, 1882) (SW, Mex./Tx or Ac in CA)

**Trogoderma** Berthold, 1827 (= *Macropirion* Hope, 1840; *Eurhopalus* Solier, 1849; *Psacus* Opascoe, 1866; *Asidora* Mulsant & Rey, 1868; *Acolpus* Jayne, 1882; *Eucnocerus* Sharp, 1902; *Entomotrogus* Ganglbauer, 1904) Curculionidae beetles in Subfamily Megatominae, Tribe Anthrenini (also put in Megatomini) (15 species in US or Canada)

**Trogoderma** undet. sp. or species (Ac in cave in Travis Co., TX; in 2,000 to 500 year old in *Neotoma* woodrat nest in Big Bend Natl. Park, wTX))

Drive beetles family - See Elmididae

**DRYOPIDAE** Billberg, 1820 (longtoed water beetles or long-toed beetles). **Bibl.:** H. Brown, 1972, 1976.

**Stygoparnus** Barr & Spangler, 1992 - Dryopidae beetles (1 species in US)

**Stygoparnus** *comalensis* Barr & Spangler, 1992 (\*Comal Spr. 2 & run, New Braunfels, Comal Co., TX/Tb/ Federally endangered T&E) C. Barr, 1993

**DYTISCIDAE** Leach, 1815 (water beetles or (predaceous) diving beetles). About 270 sp. n. of Mex., 147 genera, 3,000 sp. in world. Most St. in a beetle family. Many shallow-water habitats, esp. in emergent plant zone. Some in springs and cold pools. All larvae predaceous, some scavengers among adults. Univoltine or semivoltine. Most overwinter as adults. **Bibl.:** Young 1967.

**Copelatinae** Van den Branden, 1885 (once a tribe in Colymbetinae)  
Tribe Copelatini (*Copelatus*)

**Colymbetinae** Erichson, 1837  
Tribe Agabini (*Agabinus*, *Agabus*)

**Dytiscinae** Leach, 1815

Tribe Dytiscini (*Dysticus*, *Phytobius*)

**Hydaticinae**

Tribe Hydaticini (*Acilius*) (once in Dytiscinae)

**Hydroporinae** Aube, 1836 (*Comaldessus*, *Stygoporus*)

Tribe Bidessini (*Bidessonotus*, undet. Ac or Tx genus in TX)

Tribe Hydroporini (*Deronectes*, *Haideoporus*, *Hydroporus*, *Hygrotus*, *Lioporeus*)

Tribe Hydrovatini (*Hydrovatus*)

**Laccophilinae** Gistel, 1856

Tribe Laccophilini (*Laccodytes*, *Laccophilus*)

**Agabinus** Crotch, 1873 - Dytiscidae beetles in Subfamily Colymbetinae, Tribe Agabini (82 species in US or Canada)

**Agabinus** *sculpturellus* Zimmermann, 1919 (Ac, Tx or Tp in Vancouver Island, BC)

**Agabus** Leach, 1817. Bibl.: Fall, 1922 - Dytiscidae beetles in Subfamily Columbetinae (87 species in US or Canada)

**Agabus** *larsoni* H. Ferry & Nilsson, 1993 (Tx or Ac in one cave in NS)

**Agabus** *semivittatus* LeConte, 1851 (epigean in NE,SE,SW US, Canada/ Tx or Ac in one cave in NS)

**Agabus** undet. sp. #1 (*seriatus* Say, 1823 group or species complex/ Tp? in one cave in OR Co.,MO)

**Agabus** undet. sp. #2 (Tp in Adams #2, OR Co.,MO)

**Acilius** (s. str.) Leach, 1817 (= *Homaeolytrus* Gobert, 1874) (small flat diving beetles) Dytiscidae beetles in Subfamily Dytiscinae (7 species in US or Canada)

**Acilius** *fraternus* (*Dytiscus* f. Harris, 1828) (E/sinkholes in FL)

**Bidessonotus** Regimbart, 1895 - Dytiscidae beetles in Subfamily Hydroporinae, Tribe Bidessini (4 species in US or Canada)

**Bidessonotus** *longovalis* (*Bidessus* l. Blatchley, 1919) (epigean, sinkhole ponds in FL)

**Bidessus** Sharp, 1882 - Dytiscidae beetles in Subfamily Hydroporinae, Tribe Bidessini (19 species in US or Canada)

**Bidessus** undet. sp. (Ac in cave in Uvalde Co., TX)

**Comaldessus** Spangler & Barr, 1995 - Dytiscidae beetles in Subfamily Hydroporinae (1 species in US)

**Comaldessus stygius** Spangler & Barr, 1995 (\*Comal Spr., New Braunfels, Comal Co.,TX/ Pb)

**Copelatus** Erichson, 1832 (= *Liopterus* Stephens, 1835) - Dytiscidae beetles in Subfamily Copelatinae, Tribe Copelatini (8 species in US or Canada)

**Copelatus** undet. sp. (Ac in one cave in Val Verde Co., TX) & 1 seAK cave)

**Deronectes** Sharp, 1882 - Dytiscidae beetles in Subfamily Hydroporinae, Tribe Hydroporini (21 species in US or Canada)

**Deronectes** undet. sp. (MI lake benthic)

**Dysticus** Linnaeus, 1758 - Dytiscidae beetles in Subfamily Dytiscinae, Tribe Dytiscini (12 species in US or Canada)

**Dysticus** undet. sp. (Ac or Tx in one cave? in NS)

**Graphoderus** Dejean, 1833 - Dytiscidae beetles in Subfamily Dytiscinae, Tribe Aciliini (5 species in US or Canada)

**Graphoderus** undet. sp. (Ac in 1 seAK cave)

**Haideoporus** Young & Longley, 1976 - Dytiscidae beetles in Subfamily Hydroporinae, Tribe Hydroporini (1 species in US)

**Haideoporus texanus** Y.& L., 1976 (type locality in artesian well; cave in Hays Co. +Comal Spr. (Comal Co.) & Hill Country,TX/St G1G2?) Longley & Spangler, 1977

*Hydaticus* = *Phytobius*

**Hydroporus** Clairville, 1806 (*Graptodytes* Seidlitz, 1887; *Nebrioporus* Regimbart; *Heterosternus*, *Stictotarsus*, *Stictonotus* Zimmermann, 1919; *Neoporus* Guignot, 1931; *Circinoporus* G., 1945 *Heterosternuta* Strand, 1935) - Dytiscidae beetles in Subfamily Hydroporinae, Tribe Hydroporini

**Hydroporus** (*Sternoporus*) *cimicoides* Sharp, 1882 (NJ & VA to FL/TTx? in FL sinkhole ponds)

**Hydroporus** *cocheconis* Fall, 1917 (PQ St. Lawrence sandy marine interstitial)

**Hydroporus** (*Neoporus*) *clypealis* Sharp, 1822 (eUS from MA to GA, w to IL,AL/ Ac or Tx in FL)

**Hydroporus** (s.str.) *falli* Blatchley, 1925 (peninsular Fl/Tx? in sinkhole ponds)

*Hydroporus pilatei* = *Lioporeus p.*

**Hydroporus** (*Sanfilippodytes*) *planiusculus* Fall, 1923 (PQ to BC, NH to NM,NF/Tp? in IA)

**Hydroporus** undet. sp. or species (Tx or Ac in nAL, nMS; PA (prob.) hyporheic)

**Hydroporus** (*S.*) *uniformis* Batchely, 1925 (s.FL sinkhole ponds)

**Hydrovatus** Motschulsky, 1855 (*Axynoptilus* Schaum, 1868; *Hydatonychus* Kolbe, 1883; *Vathydrus* Guignot, 1954) Dytiscidae beetles in Subfamily Hydroporinae, Tribe Hydrovatini (8 species in US or Canada)

**Hydrovatus** undet. sp. (Ac in 1 seAK cave)

**Hygrotus** Stephens, 1828 (= *Coelambus* Thomson, 1869)- Dytiscidae beetles in Subfamily Hydroporinae, Tribe Hydroporini (47 species in US or Canada)

**Hygrotus** *sayi* Balfour-Browne, 1944 (*Laccophilus punctatus* Say, 1824) (all Canada/Tx or Ac in sON),

**Laccodytes** Regimbart, 1895 - Dytiscidae beetles in Subfamily Laccophilinae, Tribe Laccophilini (1 species in US or Canada)

**Laccodytes** *pumilio* LeConte, 1878 (NB to FL epigeal/ NB St. Lawrence sandy marine interstitial)

**Laccophilus** Leach, 1817 - Dytiscidae beetles in Subfamily Laccophilinae, Tribe Laccophilini (14 species in US or Canada)

**Laccophilus** *maculosus* L., 1817 (= *L. californicus* Motschulsky, 1859; *L. descipiens* LeConte, 1851; *L. fuscus* Sharp, 1882; *L. shermani* Leech, 1944; *L. truncatus* Mannerheim, 1853) (s to GA, TX, NM, CA; eCanada w. to MB/ Tx or Ac in sON)

**Laccophilus** undet. sp. (Ac in one cave in Comal Co., TX)

**Lioporeus** Guignot, 1905 (= *Falloporus* Wolfe & Matta, 1981) - Dytiscidae beetles in Subfamily Hydroporinae, Tribe Hydroporini (2 species in US or Canada)

**Lioporeus** *pilatei* (*Hydroporus p.* Fall, 1917 (epigeal in TX & most of US e. of Great Plains/ TTx? in Blue Springs, FL),

**Phytobius** Schonherr, 1833 (*Hydaticus* Schonherr Homo.) - Dytiscidae beetles in Subfamily Dytiscinae, Tribe Dysticini (11 species in US or Canada)

**Phytobius** undet. sp. (Ac in 1 seAK cave)

**Rhantus** Dejean, 1833 - Dytiscidae beetles in Subfamily Columbinae, Tribe Columbini (13 species in US or Canada)

**Rhantus** (*Rhantus?*) undet. sp. or species (Ac in 1 seAK cave; PQ Gulf of St. Lawrence sandy marine interstitial)

**Stygoporus** Larson & LaBonte, 1994 - Dytiscidae beetles in Subfamily Hydrophorinae (1 species in US)

**Stygoporus oregonensis** Larson & LaBonte, 1994 (\*shallow well near Dallas, Polk Co., OR/hyporheic).

**ELATERIDAE** Leach, 1815 (=Agrypnidae) (click beetles or wireworms). Most click when lying on back. Adults in low plants, rotting wood; they fast or feed on tender plant tissue. Larvae predaceous; soil ones mostly feed on roots.

Agrypninae Candeze, 1857 (*Agrypnus, Conoderus, Colaulon, Danosoma*) (all now in Pyrophorinae)

Cardiophorinae C., 1859 (*Cardiophorus, Esthesopus, Horistonotus*)

Denticollinae Stein & Weise, 1877 (*Limonius*) or in Pyrophorinae  
Tribe Athoini (*Limonius*) (now in Elaterinae)

Subfamily Elaterinae  
Tribe Denticollini (*Limonius*)  
Tribe Elaterini (*Ampedus, Elater*)

Pyrophorinae  
Tribe Agrypnini (= Adelocerini) (*Agrypnus, Danosoma*)  
Tribe Conoderini (*Colaulon, Conoderus*)

**Ampedus** Germar, 1844 (=*Ectamenogonus* Buysson, 1893) Elateridae beetles, Subfamily Elaterinae, Tribe Ampedini (60 species in US or Canada)

**Ampedus** sp. nr. *impolitus* (*Elator i.* Melsheimer, 1844) (Ac in one cave in Bexar Co., TX)

**Ampedus** undet. sp. (Ac in cave in Bexar Co., TX)  
*Agrypnus rectangularis* = *Colaulon r.*

**Cardiophorus** Eschscholtz, 1829 - Elateridae beetles in Subfamily Cardiophorinae (42 species in US or Canada)

**Cardiophorus** undet. sp. (Tx in MO; Tx or Tp in Coryell, Uvalde Cos., TX)

**Colaulon** Arnett, 1951 - Elateridae beetles in Subfamily Agrypninae (1 species in US or Canada)

**Colaulon** *rectangularis* (*Agrypnus r.* Say, 1825) *Adelocera curtus* Le Conte, 1853) (Tp guanobic in two caves in Val Verde Co.,TX)

**Conoderus** Eschscholtz, 1829 (= *Monocrepidius* E.1829; *Oophorus* Melsheimer, 1844) (wireworms)- Elateridae beetles in Subfamily Pyrophorinae, Tribe Conoderini (once in Agrypninae) (20 species in US or Canada)

**Conoderus** undet. sp. (Ac in one cave in Bexar Co., TX)

**Danosoma** Thomson, 1859 - Elateridae beetles, Subfamily Agrypninae (2 species in US or Canada)

**Danosoma** *obtectus* (*Elater o.* Say, 1836; *Lepidotus o.*) (Tx or Ac in Carter Co., MO (tentative ID))

**Elater** Linnaeus, 1758 (*Ludius* Berthold, 1827; *Steatoderus* Dejean, 1835) - Elateridae beetles in Subfamily Elaterinae, Tribe Elaterini (4 species in US or Canada)

**Elater** undet. sp. (Ac in one cave? in Travis Co., TX)

**Esthesopus** Eschscholtz, 1829 - - Elateridae beetles in Subfamily Cardiophorinae (11 species in US or Canada)

**Esthesopus** *praeditus* Horn, 1885 (Ac in Kinney Co., TX)

**Esthesopus** undet. sp. (Ac in Brewster, Terrell Cos., TX)

**Horistonotus** Candeze, 1860 - Elateridae beetles in Subfamily Cardiophorinae (53 species in US or Canada)

**Horistonotus** *curiatus* (Elater Say, 1839) (Ac in one cave in Williamson Co., TX)

**Horistonotus** *simplex* LeConte, 1863 (NM epigeal/ Ac in one cave in Edwards Co.,TX)

**Hypolithus** Eschscholtz, 1829 (considered as *Agonum*/*Rhadine* subgenus) - Elateridae beetles in Subfamily Denticollinae (17 species in US or Canada)

**Hypolithus** undet. sp. or species (Ac in 1 seAK cave; 4,200 to to 5,500 yrs.BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM))

*Lepidotus obtectus* = *Danosoma o.*

**Limonius** Eschscholtz, 1829 (= *Gambrinus* LeConte, 1853; *Nothodes* L.1861; *Cidnopus* Thomson, 1859; *Pheletes* Kiesenwetter, 1863) (wire worms) Elateridae beetles in Subfamily Elaterinae, Tribe Denticollini (also put Denticollinae or in Pyrophorinae) (69 species in US or Canada)

*Limonius flavomarginatus* Knull, 1938 (epigean in OH,NC,VA/Tp or Tx in MO bat guano)  
Martin, 1980)

*Limonius mirus* Le Conte, 1853 (Tx in CA)

*Limonius* undet. sp. (Tx or Ac in CA) & (Ac in one cave in Travis Co., TX)

*Limonius* undescr. sp.? (Tp or Tx? in MO)

**ELMIDAE** Schuckard, 1839 (drive or riffle beetles) Bibl.: H. Brown, 1983, 1987

Undet. genus rarely found in hyporheic of SC coastal blackwater stream

Undet genus in sON groundwater and rarely in hyporheic

Subfamilies incl.

Eliminae

Tribe Elmini

(*Ancyronyx*, *Dubiraphia*, *Heterelmis*, *Macrelmis*, *Macronyssus*, *Microcylloepus*,  
*Neoelmis*, *Opitoservus*, *Stenelmis*)

Larainae (*Lara*)

*Ancyronyx* Erichson, 1847 - Elmidae beetles, Subfamily Elminae, Tribe Elmini (1 species in US)

*Ancyronyx variegata* (*Macronychus variegatus* Germar, 1824) (epigean in neUs, w. to OK, TX,  
KS, MO/ IL, seVA hyporheic)

*Dubiraphia* Sanderson, 1954 - Elmidae beetles, Subfamily Elminae, Tribe Elmini (10 species in  
US or Canada)

*Dubiraphia quadrinotata* (*Elmis q.* Say, 1825) (seVA hyporheic)

*Dubiraphia* undet. sp. (Ac or Tx in TN; rare Virginian marine infauna)

*Heterelmis* Sharp, 1882 - Elmidae beetles, Subfamily Elminae, Tribe Elmini (4 species in US)

*Heterelmis comalensis* Bosse, Tuff & Brown, 1988 (Comal (Comal Co.) & San Marcos (Hays  
Co.) Spr.,TX/ Federally endangered T&E/Pb) H. Brown & Barr, 1988

*Lara* LeConte, 1852 - Elmidae beetles, Subfamily Larainae (2 species in US)

*Lara* undet. sp. (hyporheic in OR)

*Macrelmis* Motschulsky, 1859 (= *Elsianus* Sharp, 1882) - Elmidae beetles, Subfamily Elminae  
(3 species in US or Canada)

*Macrelmis texana* (*Elsianus* Schaeffer, 1911) (hyporheic in Medina Co., TX)

*Macronychus* Muller, 1806 - Elmidae beetles, Subfamily Elminae, Tribe Elmini (1 species in  
US or Canada)

**Macronychus** *glabratus* Say, 1835 (IL, PQ, seVA hyporheic)

**Microcylloepus** Hinton, 1935 - Elmidae beetles, Subfamily Elminae, Tribe Elmini (4 species in US or Canada)

**Microcylloepus** *pusillus* (*Stenelmis* p. LeConte, 1852; *Elmis similis* Hon, 1870; *E. foveata* L. 1874; *Helmis apta*, *loedingi*, *perdita* Musgrae, 1933) (Tp in Barton Springs & cave in Travis Co., TX; seVA hyporheic)

**Neoelmis** Musgrave, 1935 - Elmidae beetles, Subfamily Elminae, Tribe Elmini (1 species in US)

**Neoelmis** *caesa* (*Elmis* c. LeConte, 1874) (epigean in TX, OK/ hyporheic in Medina Co., TX)

**Optioservus** Sanderson, 1954 - Elmidae beetles, Subfamily Elminae, Tribe Elmini (13 species in US or Canada)

*Optioservus ampliatus* (Fall) = *O. ovalis*

**Optioservus** *ovalis* (*Limnius* o. LeConte, 1863) (ON hyporheic)

**Optioservus** undet sp. (nCA hyporheic)

**Stenelmis** Dufour, 1835 - Elmidae beetles, Subfamily Elminae, Tribe Elmini (28 species in US or Canada) **Bibl.:** M. Sanderson 1937; Schmude 1992; W. Shepard 1980

**Stenelmis** *bicarinata* LeConte, 1852 (*S. maerkelii* Motschulsky, 1854; *S. vittipennis* Zimmermann, 1869; *S. convexula* Sanderson, 1938) (East to PQ/ TX hyporheic)

**Stenelmis** *calida* Chandler, 1949 (type locality cave, Indian Spr. & Point of Rocks Spr., Nye Co., NV/ Tx? or Tp)

**Stenelmis** *cheryl* H. Brown, 1987 (TX hyporheic)

**Stenelmis** *crenata* (*Elmis* m. Say, 1824; *S. sordida* Motschulsky, 1859) (Tx? in MN; ON hyporheic)

**Stenelmis** *exigua* Sanderson, 1938 (hyporheic in KY) Farmer 1978

**Stenelmis** *occidentalis* Schmude & Brown, 1991 (= *S. mexicanus*) (TX hyporheic)

**Stenelmis** undet. sp. or species (Ac or Tx in sON) (hyporheic in IL?, PQ, PA, Bexar, Travis Cos., TX; Tp in cave in Medina Co. & cave in Travis Co., TX; MI lake benthic; rare Virginian marine infauna)

EUGLENIDAE = ADERIDAE

GLARISIDAE (glaresid beetles)



**Glareis** Erichson, 1848 (also put in Trogidae) (9 species in US or Canada)

**Glareis** undet. sp. (16,000 to 8,000 year old in Neotoma woodrat nest in Big Bend Natl. Park, wTX)

**GYRINIDAE** Latreille, 1810 (whirligig beetles)

Subfamily Gyrininae

Tribe Gyrinini (*Gyrinus*)

**Gyrinus** Geoffroy, 1762 (*Gyrinulus* Zaitzer, 1907; *Oreogyrinus* Ochs, 1935) Gyrinidae beetles, Subfamily Gyrininae, Tribe Gyrinini (40 species in US or Canada)

**Gyrinus plicifer** LeConte, 1851 (*G. marginiventris* Motschulsky, 1859) (Tx or Ac in CA)

**Gyrinus pachysomus** Fall, 1922 (SC,VA,AL/sinkhole ponds in FL)

**HALIPLIDAE** Aube, 1836 (crawling water beetles)

**Haliphus** Latreille, 1802 (= *Cnemidotus* Illiger, 1802; *Hoplitus* Clairville, 1806; *Paraliaphlus*, *Liaphlus* Guignot, 1928) Haliplidae beetles (46 species in US or Canada)

**Haliphus annulatus** Roberts, 1913 (sinkhole ponds in FL),

**Haliphus** undet. sp. or species (Ac in 1 seAK cave; PQ Gulf of St. Lawrence sandy marine interstitial))

**Peltodytes** Regimbart, 1872 - Haliplidae beetles (18 species in US or Canada)

**Peltodytes muticus** (*Cnemidotus m.* LeConte, 1853) (sinkhole ponds in FL)

**HELODIDAE** (marsh beetles) - subsumed into Scirtidae

**HISTERIDAE** Gyllenhal, 1808 (clown, hister, or blister beetles). About 120 sp. n. of Mex. Mostly prey on insects assoc. with decaying organics. Some in animal burrows or commensal with ants.

### **Abraeinae**

Tribe Abraeini (*Abraeus*) (once in Dendrophilinae)

### **Dendrophilinae** Reitter, 1909

Tribe Anapleini (*Anapleus*)

Tribe Bacaniini (*Geocolus*)

Tribe Dendrophilini (*Dendrophilus*)

Tribe Paromalini (*Carcinops*, *Xestipyge*)

**Histerinae** Gyllenhal, 1808

Tribe Histerini (*Hister*, *Margarinotus*)

**Saprininae** Blanchard, 1845

(*Euspilotus*, *Geomysaprinus*, *Gnathoncus*, *Neosaprinus*, *Saprinus*)

**Abraeus** Leach, 1817 (*Habraeus* Agassiz, 1846 Emend.) Histeridae beetles in Subfamily Abraeinae, Tribe Abraeini (once in Dendrophilinae) (1 species in US)

**Abraeus** *bolteri* LeConte, 1880 (epigean CA, n. to WA, e. to TX/ Tp in one cave in Irion Co., TX)

**Anapleus** Horn, 1873 - idae beetles in Subfamily Dendrophilinae, Tribe Anapleini (2 species in US or Canada)

**Anapleus** *marginatus* LeConte, 1853 (Tp in cave in Kendall Co.,TX),

**Anapleus** undet. sp. (NM/Tp?,twigs)

**Carcinops** Marseul, 1855 (= *Carcinus* M.1855 (homo.); *Carcinopsiada* Casey, 1916) - Histeridae beetles in Subfamily Dendrophilinae, Tribe Paromalini (14 species in US or Canada)

**Carcinops** (*Carcinops*) *pumilio* (*Paromalus* p. Erichson, 1834; *Dendrophilus* *quaatuordecimstriatus* Stephens, 1835; *Hister nanus* Dejean, 1837 (Unav.); *Epiurus krujanensis* Mader, 1921) (Tp guanobic in one cave in Medina co., TX) **Bibl.:** Geden 1984

**Carcinops** undet. sp. (Tp guanobic in one cave in Comal Co., TX)

**Dendrophilus** Leach, 1817- Histeridae beetles in Subfamily Dendrophilinae, Tribe Dendrophilini (5 species in US or Canada)

**Dendrophilus** undet. sp. (Ac or Tx in cave in Carter Co., KY)

**Euspilotus** Lewis, 1907 (also put in Buprestidae) (= *Neosaprinus* Bickhardt, 1909; *Platysaprinus* B., 1914; *Platysaprinus* B., 1916, *Hesperosaprinus* Wenzel, 1962) - Histeridae beetles in Subfamily Saprininae (28 species in US or Canada)

**Euspilotus** undescr. sp. near *agricus* Curtis, 1825 (Tp in one cave in Jackson Co.,AL/Ed in nearby area) &

**Euspilotus** undet. sp. (guanobic Tp in one cave in Burnet Co. & Menard Co., TX)

**Geocolus** Wenzel, 1944 - Histeridae beetles in Subfamily Dendrophilinae, Tribe Bacaniini (2 species in US or Canada)

**Geocolus** undescr. sp. (AL,GA/Tb,Ed),

**Geomysaprinus** Ross, 1940 (= *Priscosaprinus* Wenzel, 1962) Histeridae beetles in Subfamily Sapriniinae (4 species in US or Canada)

**Geomysaprinus** (*Priscosaprinus*) *laramiensis* (*Saprinus l.* Casey, 1893) (BC & AB to CA/Ac or Tx in CA)

**Geomysaprinus** undet. sp. (Tp in one cave in Kinney Co., TX)

**Geomysaprinus** (*P.*) undescr.? sp. (Tp in Mitchell C., San Bernadino)  
*Geomysaprinus umbilicatus* = *Margarinotus u.*

**Gnathoncus** Jacquelin du Val, 1859 - Histeridae beetles in Subfamily Sapriniinae (5-8 species in US or Canada)

*Gnathoncus deletus* = *G. rotundatus*.

**Gnathoncus** *interceptus* (*Saprinus i.* LeConte, 1851) (in CA non-cave *Neotoma fuscipes* woodrat nest)

**Gnathoncus** *rotundatus* (*Hister r.* Kugelanin; *Saprinus deletus*; LeConte, 1845) (Tx? or Ac in one cave in Eddy Co., NM & Nickajack C., Marion Co., TN)

**Hister** Linneus, 1758 - Histeridae beetles in Subfamily Histerinae, Tribe Histerini (33-58 species in US or Canada). Bibl.: Caterino 1998

*Hister interrruptus* = *Margarinotus i.*

**Hister** *foedatus* Leconte, 1844 (in CA non-cave *Neotoma fuscipes* woodrat nest)

**Hister** undet. sp. or species (Ttp? In NM carrion, fungi, burrows; (Tp in one cave in Kinney Co., TX; Tx or Ac in MN/ 100 and 10,500 to 10,800 yrs. in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM))

**Margarinotus** Marseul, 1853 (= *Grammostethus* Lewis, 1906; *Eucalohister* Reitter, 1909; *Paralister* Bickhardt, 1917; *Ptomister* Houlbert & Monnot, 1922; *Stenister* Reichardt, 1926; *Promethister* Kryzhanovskij, 1966) Histeridae beetles in Subfamily Histerinae, Tribe Histerini (30 species in US or Canada)

**Margarinotus** *egregius* (*Hister e.* Casey, 1916) (Tx or Ac in GA (Dade Co.))

**Margarinotus** (*Ptomister*) *interruptus* (*Hister i.* Beauvois, 1805) (E to ON,PQ,NB/Tx in MO)

**Margarinotus** undet. sp. (Ac or TTx in MO)

**Margarinotus** *umbilicatus* (*Hister u.* Casey, 1893; *Geomysaprinus u.*) (Tx or Ac in CA)

**Neosaprinus** (= *Agricus* in BUPRESTIDAE?) Histeridae beetles in Subfamily Sapriniinae

**Saprinus** Erichson, 1834 (*Plesioprinus* Houlbert & Monnot, 1923 (Univ.); *Phaonius* Reichardt, 1941; *Hemisaprinus*, *Microsaprinus* Kryzhanovskij, 1976) - Histeridae beetles in Subfamily Sapriniinae (9-103 species in US or Canada)

***Saprinus discoidalis*** LeConte, 1851 (*S. amplus* Casey, 1916; *S. latifrons* C.1918; *S. mayhewi* Papp, 1962; *S. latiformis* Casey) (BC to CA/Occasional Tx in CA)

***Saprinus*** undet. sp. (Tp, guanobic in three caves in Irion Cos., TX)

***Spilodiscus*** Lewis, 1906 - Histeridae beetles in Subfamily Histerinae, Tribe Histerini (19 species in US or Canada) **Bibl.:** Caterino 1998

***Spilodiscus*** undet. sp. (Tp, guanobic in one cave in Edwards Co., TX)

***Xestipyge*** Marseul, 1862 - Histeridae beetles, Subfamily Dendrophilinae, Subtribe Paromalini (2 species in US or Canada)

***Xestipyge conjunctum*** (*Hister conjunctus* Say, 1825) (Tx or Ac in one cave in Stone Co., MO)

**HYBOSORIDAE** Erichson, 1847 (scarab, lamellicorn, or Hybosorine beetles)

***Hybosorus*** MacLeay, 1819 - put in Scarabaeidae)

**HYDROPHILIDAE** Latreille, 1802 (water scavenger beetles). About 150 sp. n. of Mex.; terrestrial ones (Sphaeridiinae) not known from caves

**Berosinae** (*Berosus*) (put in Hydrophilinae)

**Helophorinae** (*Helophorus*)

**Hydrobiinae** (also used for subfamily of snail) (or subsumed in Hydrophilinae)

Tribe Helocharini

Subtribe Acidocerina (*Enochrus*, *Cymbiodyta*)

Tribe Hydrobiini (*Paracymus*) (put in Hydrophilinae)

**Hydrophilinae** Latreille, 1802

Tribe Anacaenini (*Paracymus*) (also put in Hydrobiinae)

Tribe Berosini (*Berosus*) (also put in Berosinae)

Tribe Hydrophilini

Subtribe Hydrophilina (*Tropisternus*)

***Berosus*** Leach, 1817 (= *Enoplurus* Hope, 1838) Hydrophilidae beetles in Hydrophilinae, Tribe Berosini (also put in Berosinae) (17-29 species in US or Canada)

***Berosus*** undet. sp. or species (Tx or Ac in nMS; IL?, TX hyporheic)

**Cymbiodyta** Bedel, 1881 (= *Hydrocombis* Sharp, 1882) Hydrophilidae beetles in Subfamily Hydrobiinae, Tribe Helocharini, Subtribe Acidocerina (22 species in US or Canada)

**Cymbiodyta** undet. sp. (Tx or Ac in TX, IN (or *Enochrus*))

**Cymbiodyta** *semistriata* (*Philhydrus* s. Zimmermann, 1869; *C. semistriata* Smetana, 1974; *P. fimriatus* LeConte, 1855 or 1845 (nec M.1846) (E n.to NB, s. to SC, w. to CO/ Tp or Tx in cave each in Travis & Williamson Co., TX & Camden Co., MO)

**Cymbiodyta** *punctatostriata* (*Philhydrus* p. Horn, 1873) (CA/Tx or Ac in CA),

**Cymbiodyta** *vindicata* Fall, 1924 (Canada, US except SW,OR,CA/ Tx in cave in Culberson Co., TX)

**Enochrus** Thomson, 1859 (= *Methydrus* Rey, 1885; *Lunetus* Zaitzev, 1908; *Hugoscottia* Knisch, 1922; *Philhydrus*) Hydrophilidae beetles in Subfamily Hydrobiinae, Tribe Helocharini, Subtribe Acidocerina (20 species in US or Canada)

**Enochrus** *carinatus* (*Philhydrus* c. LeConte, 1855 (Sycamore Cr. (AZ) hyporheic)

**Enochrus** undet. sp. (Tx or Ac in IN)

**Helophorus** Illiger, 1801 - Hydrophilidae beetles, Subfamily Helophorinae (43 species in US or Canada)

**Helophorus** undet. sp. (Ac in 1 seAK cave)

**Paracymus** Thomson, 1867 Hydrophilidae beetles in Subfamily Hydrobiinae, Tribe Anacaenini (15 species in US or Canada)

**Paracymus** undet. sp. (Ac in cave in Edwards Co., TX)

**Tropisternus** Solier, 1834 (= *Pleurhomus* Sharp, 1883; *Cyphostethus* Orchymont, 1919; *Homostethus* O.1921, *Pristoternus* O., 1936) Hydrophilidae beetles in Subfamily Hydrophilinae, Tribe Hydrophilini, Subtribe Hydrophilina (14-17 species in US or Canada)

**Tropisternus** *lateralis* Leech, 1948 (ex parte, nec Fab.1775) (*H. dorsalis* Brulle, 1838; *Tripisternus sellatus* Laporte, 1840; *T. limbalis* LeConte, 1855; *T. marginatus*, *humeralis* Motschulsky, 1859; *T. binotatus* Walker, 1866) (Canada to FL, w. to Rockies)

**Tropisternus** *lateralis nimbatus* (= *T.n.* Say, 1823) (E to MB, ON, PQ, NS epigean/ Ac in Dead Horse Sink, Comal Co., TX)

Lamellicorn beetles family - See Scarabaeidae

**LAMPYRIDAE** Latreille, 1817 (lightning bug or firely; fire flies, glowworms).

Lampyrinae L.1817

Lampyrini (*Lampyris*, *Microphotus*)

**Lampyris** Linnaeus, 1758 (= *Pleotomodes* Green, 1948) Lampyridae beetles in Subfamily Lampyrinae, Tribe Lampyrini (2 species in US or Canada)

**Lampyris** undet. sp. (Tx or Ac in CA),

**Microphotus** LeConte, 1866 - Lampyridae beetles in Subfamily Lampyrinae, Tribe Lampyrini (7 species in US or Canada)

**Microphotus** undet. sp. (Ac in one cave in Irion Co., TX)

**LANGURIIDAE** Crotch, 1873 (lizard beetles)

Langurinae C., 1873

Tribe Languriini (*Languria*)

**Languria** Latreille, 1802 - Languriidae beetles in Subfamily Langurinae, Tribe Lampyrini (15 species in US or Canada)

**Languria laeta** LeConte, 1854 (stem borer/Tx in swallow nests in one cave in Edwards Co., TX)

Larder beetles family - See Dermestidae

**LATRIDIIDAE** Erichson, 1842 (=Lathridiidae) (minute brown scavenger beetles). About 60 sp. n. of Mex. Habitat & feeding similar to Histeridae. Unidentified genus & sp. in LAVA, Siskiyou Co., CA)

Corticariinae Curtis, 1829 (*Corticaria*)

Latridiine Erichson, 1842 (*Akalyptoischion*, *Enicmus*, *Latridius*, *Metophthalmus*)

**Akalyptoischion** Andrews, 1976 - Latridiidae beetles in Subfamily Latridinae (8 species in US or Canada)

**Akalyptoischion** undescr. sp. (Mitchell C., San Bernardino, CA/Habitual Tx)

**Corticaria** Marshall, 1902 - Latridiidae beetles in Subfamily Corticariinae (35 species in US or Canada)

**Corticaria pubescens** Gyllenhal, 1827 (Ac, Tx or Tp guanophile in one cave? in NS)

**Corticaria** undet. sp. or species (Ac in Williamson Co., TX & Mammoth C. (KY)/ 24,000 to 7,000 year old in *Neotoma* woodrat nest in Big Bend Natl. Park, wTX))

**Enicmus** C.G.Thomson, 1859 (22 sp.) - Latridiidae beetles in Subfamily Latridinae (12 species in US or Canada)

**Enicmus** undet. sp. (TTP or TTx in nAZ)

**Latridius** Herbst, 1793 (= *Lathridius* of authors, 1793 (missp.)) (square-nosed fungus beetles) Latridiidae beetles in Subfamily Latridinae (8 species in US or Canada)

**Latridius** undet. sp. (Ac in cave in Kerr Co., TX)

**Metopthalmus** Wollaston, 1854 - Latridiidae beetles in Subfamily Latridinae (6 species in US or Canada)

**Metopthalmus** *rudis* Fall, 1899 (Tp in Mitchell C., San Bernardino, CA)

**LEIODIDAE** Fleming, 1821 (round fungus or small scavenger beetles) (=Anisotomidae, incl. Catopidae, Colonida, Leptodiridae, Leptinidae) (most genera also put in Catopidae or Leptodiridae). All have a nearly enclosed gutter incircling antennal articulation on dorsal antennae segments 7, 9 & 10 or 8-10 in 11-segmented antennae & segments 7-9 in 10-segmented antennae, with internal sensory vesicles in some segments. About 130 sp. n. of Mex. Most scavenge decaying organics in most forests or fields. Many cave ones eat fungi. **Bibl.:** R. Anderson, 1985; Gounot, 1967-9; Peck 1981a, 1990, 1997b; Horn, 1880, 1888; LeConte & Horn, 1883.

**Agathidiinae** (*Anisotoma*) (also put in Leiodinae)

**Bathysciinae**

Tribe Leptodirini? (*Bathyscia*)

**Catapocerinae** Hatch, 1927

Tribe Catopocerini (*Catopocerus*)

Tribe Glacicavicolini (*Glacicavicola*) (also put in Glaciaricolinae)

**Cholevinae** Kirby, 1837 (= Catopidae, Leptodiridae) **Bibl.:** Giachino & Peck 1998

Tribe Catopini (*Catops*, *Catoptrichus*, *Prionochoeta*) (all also put in Cholevini)

Tribe Cholevini (*Sciodrepoides*) **Bibl.** Peck 1981a

Tribe Anemadini (=Nemadini) (*Dissochaetus Nemadus*) (all also put in Cholevini)

Tribe Ptomaphagini (*Ptomaphagus*)

**Coloninae** Horn, 1880 (*Colon*)

**Glaciaricolinae** (*Glacicavicola*) (put in Catapocerinae)

**Leiodinae** Fleming, 1821

Tribe Agthidiini (*Anisotoma* (also put in Agathidiinae))

Tribe Leiodini (*Leiodes*)

Tribe Pseudoliadini (*Colenis*)

Tribe Sogdini (*Triarthron*)

*Adelopsis* Portevin, 1907

*Adelopsis cumberlanda* = *Ptomaphagus c.*

*Adelopsis loedingi* = *Ptomaphagus l.*

**Anisotoma** Panzer, 1797 - Leiodidae beetles, Subfamily Leiodinae, Tribe Agthidiini (also put in Agathidiinae) (15 species in US or Canada)

**Anisotoma** *errans* W.J. Brown, 1937 (2,000 year old remains in entrance pit in AB cave)

**Bathyscia**. Schiodte, 1849 - Leiodidae beetles, Subfamily Bathysciinae?, Tribe Leptodirini?

**Bathyscia** *thoracica* Motschulsky, 1854 (Tx or Ac in Mammoth C., KY)

**Catopocerus** Motschulsky, 1869 (= *Homaeosoma* Austin, 1880, *Pinodytes* Horn, 1880, *Typhloleiodes* Hatch, 1935) Leiodidae beetles in Subfamily Catopocerinae, Tribe Catopocerini Glacicavicolini (also put in Leptodiridae) (14 species in US or Canada) **Bibl.:** Peck, 1974a

**Catopocerus** *alabamae* Peck, 1974 (\*type locality cave in Madison Co., AL/Tp, Ed)

**Catopocerus** *appalachianus* Peck, 1974 (AL to WV Appalachia, NC, TN, IL; Ed/Tp in AL, TN, WV)

**Catopocerus** *jonesi* Peck, 1974 (type locality cave in Marshall Co., 2 caves in Morgan Co., & one cave in Jackson Co., AL/ Tp, Ed)

**Catopocerus** *pusio* (*Pinodytes* Horn, 1892) (Tx or Ac in CA)

**Catopocerus** undescr. sp. (Tp or Tx in \*OR C., OR)

**Catopocerus** *subterraneous* (*Typhloleiodes* s. Hatch, 1953) (Ac, Tx or Tp in Vancouver Island, BC)

**Catops** Paykull, 1798 (also put in Leptodiridae) (= *Sciodrepa* Thomson, 1862; *Sciodrepoides*) (10 sp., 6 undescribed) In US or Canada) Leiodidae beetles in Subfamily Cholevinae, Tribe Cholevini

**Catops** *alsiosus* (= *Choleva a.* Horn, 1885) (NA/Tx or Ac in KY, IN)

**Catops** *americanus* Hatch, 1928 (*Choleva americana*) (14,300 yrs. in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM))

**Catops** *basilaris* Say, 1823 (= *C. cadaverinus* Mannerheim, 1853; *C. spencianus* Kirby, 1837) (N, NC, SW/ Ttp? in WA; Tx or Ac in NWT; Tx or Tp in BC)

**Catops** *egenus* (*Choleva a.* Horn, 1880) (AK to CA & ON/Ac or Tx in WA)



*Catops (fumatus) terminans* = *Sciodrepoides t.*,

**Catops** *gratiosus* (= *holeva* g. Blanchard, 1915; *Choleva alsiosa* Blatchley (not Horn), 1910) Hatch, 1928 (VA to AB & BC(disjunct),ME,ON,NS,PQ,WA disjunct/Tp in Al (DeKalb Co.), BC, GA (Dade & Walker Cos.), IL, IN (Monroe, Crawford, 4 cos. (S2/G4)), KY (Mammoth C., Carter,FAyette, Barren Cos.),sON,TN (Stewart, Dickson Cos.), WA, WV) Peck, 1974

**Catops** (= *Sciodrepoides*) undet. sp. or species (faculative Tp in SE; Tx or Ac in AK,CA,MN; (2,000 year old remains in entrance pit in AB cave)

**Catops** *terminans* = *Sciodrepoides t.*

**Catoptrichus** Murry, 1856 (= *Sciodrepa* (in part) C.G. Thomson, 1862) Leiodidae beetles in Subfamily Cholevinae, Tribe Cholevini (1 species in US and Canada)

**Catoptrichus** *frankenhaeuseri* (*Catops f.* Mannerheim, 1852) (epigeal AK to OR/ Tp? in BC, OR, WA)

*Choleva* (also placed in Silphidae) = *Catops*

**Colenis** Erichson, 1845 - Leiodidae beetles, Subfamily Leiodinae, Tribe Pseudoliodini (4 species in US or Canada)

**Colenis** *impunctata* LeConte, 1853) (epigeal from MI s. to FL,LA/ from dead Tx bat in Carter Co., MO)

**Colon** Herbst, 1977 (= *Curvimanon* Fleischman, 1807; *Myloechus* Latreille, 1807) Leiodidae beetles in Subfamily Coloninae

**Colon** undescr. sp. (Tx or TP in OR C.,OR)

**Dissochaetus** Reitter, 1884 (also put in Leptodiridae) Leiodidae beetles in Subfamily Cholevinae, Tribe Nemadini or Cholevini (3 species in US or Canada) S. Peck 1999

**Dissochaetus** *oblitus* (*Catops o.* LeConte, 1853) (Tx, Tp or Ac in Nickajack C., TN)

**Dissochaetus** undescr. sp. (\*?cave in Eddy Co.,NM/Tp?)

**Glacicavicola** Westcott, 1968 - Leiodidae beetles in Subfamily Catopocerinae, Tribe Glacicavicolini (also put in Glacicaricolinae)(1 species in US) **Bibl.:** Peck, 1974

**Glacicavicola** *bathyscioides* Westcott, 1968 (type locality cave in Clark Co. & one cave each in Power & Fremont Co., +Craters of the Moon Natl. Monument (Butte Co., ID) & adjacent WY/ Tb/ ID T&E S1S3, global G3G4 rank). **Bibl.:** Larsen, Booth & Perkes, 1984; Larsen, Booth, Perks & Gundersen 1979; Peck 1970, 1974, 1981c

*Leiodes* Latreille, 1796 - Leiodidae beetles in Subfamily Leiodinae, Tribe Leiodini (72 species in US or Canada)

*Leiodes* undet. sp. (15,000 to 13,000 year old in *Neotoma* woodrat nest in Big Bend Natl. Park, wTX)

*Leptinus* Muller, 1818 - Leiodidae beetles in Subfamily Platypsyllinae (once in Leptinidae) (3 species in US and Canada)

*Leptinus testaceus* Muller, 1817 (*L. americanus* LeConte) (in BC *Neotoma* woodrat nest/ mouse-nest beetle)

*Nemadus* Thompson, 1867 Leiodidae beetles in Subfamily Cholevinae, Tribe Anemadini (also put in Nemadini & Leptodiridae). (11 species in US or Canada) Bibl.: Fall 1937

*Nemadus horni* Hatch, 1933 (E to PA/ Tp guanobic in AL, nFl, GA(Dade, Decatur & Walker Cos.), KY, VA)

*Nemadus* undescr. sp(p). (Dickson, Robertson & Bedford Cos.,TN/ Tb)

*Nemadus* maybe undescr. sp. (Tp guanobic in one cave each in Alachua & Jackson Cos., FL/ SE epigeal?)

*Prionochaeta* Horn, 1880 (also put in Leptodiridae) Leiodidae beetles in Subfamily Cholevinae, Tribe Cholevini (1 species in US and Canada)

*Prionochaeta opaca* (*Catops opacus* Say, 1825) (AR,nFL, to sON,PQ,NS, w.to IA, KY, OK, TN, VA/ facultative Tp guanobic in AR, nFL, GA, sON, IA, KY, OK, TN, VA) Peck 1977a

*Ptomaphagus* Illiger, 1798 (*Adelops* Telkampf, 1844; *Catopsimorphus* Aube, 1850) (also put in Leptodiridae) (52 species in US or Canada) Leiodidae beetles in Subfamily Cholevinae, Tribe Ptomaphagini. **Bibl.:**Barr 1963d, Carmody, Murphy & Peck 1972; Cohen & Poulson 1982; Peck 1973a, 1976a, 1977, 1978, 1982a, 1983, 1984, 1986a, 1997; Carmody & Peck 1973; Peck 1967, 1998

*Ptomaphagus abditus* = *P. cavernicola*

*Ptomaphagus appalachiana* Peck, 1978 (type locality cave in De Kalb Co.,AL)/neAL, nwGA/ Tp)

*Ptomaphagus barri* Peck, 1975 \*\* (type locality & one other cave in Cannon Co.,TN/Tb/ S1S2 G1G2)

*Ptomaphagus* (*Adelops*) *californicus* (*Catops c.* LeConte, 1853; *P. latior* Hatch, 1933) (saprophilein CA,CO,NV/Tp & burrows, ant nests in CA,NV) MacKay 1980

**Ptomaphagus cavernicola** Schwarz, 1898 (= *P. abditus* Peck, 1973) (type locality cave in Stone Co., MO or Talneah C., Morgan Co., AL/one SC epigeal site/ Tp in AR (Fulotn, Searcy Cos.), AL, AR, nFL, GA (Decatur & Grady Cos.), IN(questionable record), IA, neMexico, MO, OK, TX/former candidate T&E/Tp, rare epigeal in IL, KY, TN). **Bibl.:** Peck 1973, 1982b

**Ptomaphagus chromolithus** Peck, 1984 (Jackson Co.(AL) & Franklin Co.(TN), \*upper Paint Rock River Valley/Tb G3G4)

**Ptomaphagus cocytus** Peck, 1973 (type locality cave in Coconino Co.(AZ)/Tb/round fungus beetle)

**Ptomaphagus (Adelops) consobrinus** Leconte, 1853 (saprophile in NC, FL/ Tx in cave in Madison Co., AL)

**Ptomaphagus cumberlandia** Peck, 1978 (= *Adelopsis c.*) (Ep, Tp in one cave in Jackson Co. & 2 in Marshall Co., AL)

**Ptomaphagus episcopus** Peck, 1973 (\*\*type locality & 1 other cave in Marshall Co., AL/ Tb)

**Ptomaphagus fecundus** (= *P. hatchi* f. Barr, 1963) Peck, 1973 (\*type locality cave in Franklin Co., seTN/ Tb/ S1S2 G1G2) Peck 1984

**Ptomaphagus fiskei** Peck, 1973 (type locality & at least six other caves in e. & w. flanks of Pigeon Mt., Walker Co., GA/ red leiodid beetle/ Tb)

**Ptomaphagus fesus** Horn, 1885 (= *P. inermis* Jeannel, 1933) (CA, W, Mex/Tp & hypogean nests & burrows in CA, TX)

**Ptomaphagus fumosa** Peck, 1978 (Ed in Great Smokies Natl. Park/Tp in nwGA)

**Ptomaphagus (Adelops) hatchi** Jeannel, 1939 (*P. henroti* h. & *P. laticornis* J., 1949) (type locality cave in Grundy Co. & other caves in Franklin Co., seTN & Jackson & Marshall Co., neAL/Tb G3G4T3T4) Peck 1973, 1984

**Ptomaphagus hazelae** Peck, 1973 (type locality cave & 2 other caves in Jackson Co., AL/ Tb/ G1G2)

**Ptomaphagus henroti ellipticus** Jeannel, 1949 (type locality cave in Madison Co., Huntsville, AL/ Tb/ G1)

*Ptomaphagus henroti henroti* = *P. hatchi*

**Ptomaphagus (Adelops) hirtus** (*Adelops h.* Tellkamp, 1844) Jeannel, 1936 (Mammoth C. (Type locality) /Edmonson, Barren, Warren & Hart Cos., KY/Tb G3). **Bibl.:** Caccione 1985; Laing, Carmody & Peck 1976a; Peck 1975c; J. Cohen 1985-6; Hoey 1979

**Ptomaphagus** (*Adelops*) *hubrichti* Barr, 1958 (type locality cave in sDe Kalb Co. +Cannon & Wilson Cos.,TN/Tb/ S3G3) Peck 1975

**Ptomaphagus** (*Adelops*) *inyoensis* Peck & Gnaspini, 1997 (\*type locality cave in Inyo Co.,CA/Tp)

*Ptomaphagus inermis* = *P. fesus*

**Ptomaphagus** *jonesi* Jeannel, 1949 (junior? syn. of *P. loedingi*) (type locality & 2 other caves in Colbert Co., AL/ Tp,Ep)

**Ptomaphagus** *julius* (*P. loedingi j.* Peck, 1973; also treated as = *P. loedingi*) P.1984 (type locality & 1 other cave in Jackson Co.,AL/Tb) Peck 1984

**Ptomaphagus** *laticornis* Jeannel, 1949 (also syn. of *P.hatchi*) (type locality & one other cave in Madison Co., AL/Tb G3) Peck 1984

*Ptomaphagus latior* = *P. californicus*

**Ptomaphagus** *loedingi* (*Adelopsis l.* Hatch, 1953; *A. valentinei jonesi*, *P.v.j.*; *P. ellipticus, jonesi, longicornis* Jeannel, 1949; *P. julius & solanum* Peck, 1973) Jeannel, 1936 (type locality & one other cave in Madison Co. +Jackson Co.,AL/Tb G1G2). Bibl.: Peck 1975c, 1978; Peck 1968

**Ptomaphagus** *longicornis* (*P.valentinei l., loedingi longicornis* Jeannel, 1949; junior? syn. of *P. loedingi*) Peck, 1984 (type locality cave in Madison Co.,\*w.outliers of Cumberland Plateau w. of Flint R.,Madison & Jackson Cos.,AL/Tb G3)

**Ptomaphagus** (*Adelops*) *nevadicus* Horn, 1880 (*P. piperi* Hatch 1933; *P. densus & thomomysi* H. 1957) (BC to MB & CA/Tp in Calaveras & Tuolumne Cos.,CA)

*Ptomaphagus nicholasi* Barr, 1963 = *P. hirtus*

**Ptomaphagus** *scottsboroensis* Peck, 1978 (type locality in limestone cracks near cave in Jackson Co., \*headwaters of Mud & Coon Cr./Tp)

**Ptomaphagus** *shopardi* Sanderson, 1939 (type locality cave in Cherokee Co.,OK/Eb/Tp in AR, MO?, OK, TX) Peck, 1982a

**Ptomaphagus** *solanum* (*P.loedingi solanum* Peck, 1973) P., 1984 (type locality cave in Jackson Co. , AL/ Tb G1G2)

**Ptomaphagus** undet. sp. (Ac or Tx in 1 seAK cave)

**Ptomaphagus** *torodei* Peck, 1984 (type locality & one other cave in Jackson Co.,AL/Tb G1G2)

**Ptomaphagus** *valentinei* v. Jeannel, 1933 (type locality cave in Jackson Co. & other caves in Madison Cos.,AL/Tb G3) Peck 1973, 1984

*Ptomaphagus valentinei jonesi* = *P. loedingi*  
*Ptomaphagus valentinei longicornis* = *P. l.*

**Ptomaphagus** *walteri* Peck, 1973 (type locality & two other caves in Blount Co., AL/ Tb G1G2)

**Ptomaphagus** *whiteselli* Barr, 1963 (type locality & at least 4 other caves Dade Co., nwGA + at least two caves in De Kalb Co., AL/ Tb / G3G43) Peck 1973

**Sciodrepoides** Hatch, 1933 (= *Catops* in part) Leiodidae beetles in Subfamily Cholevinae, Tribe Cholevini (2 species in US or Canada)

**Sciodrepoides** *fumatus terminans* (*C.t.* LeConte, 1850) (epigean n. half of NA/ TX? in GA)

**Triarthron** Maerkel, 1840 - Leiodidae beetles, Subfamily Leiodinae, Tribe Sogdini (2 species in US or Canada)

**Triarthron** undet. sp. (Ac or Tx in NS cave)

**LEPTINIDAE** (mammal nest beetles) (genera now in Leiodidae).

**LEPTODIRIDAE** (small carrion beetles) (genera now in Leiodidae).

Long-toed (water) beetles family - See Dryopidae

**MELANDRYIDAE** (false darkling beetles)

Subfamily Melandryinae

Tribe Serropalpini (*Xylita*)

*Allopoda*, *Anaspis* & *Scraptia* - all now in Scaptidae)

**Xylita** Paykull, 1798 - Melandryidae beetles in Subfamily Melandryinae, Tribe Serropalpini (4 species in US or Canada)

**Xylita** undet. sp. (Ac in 1 seAK cave)

**MELOIDAE** (blister beetles)

**Meloinae**

Tribe Lyttini

Subtribe Eupomphina (*Megetra*, *Pyrota*)

Subtribe Epicautina (*Epicauta*)

**Nemognathinae**

Tribe Nemognathini

Subtribe Nemognathina (*Nemognatha*)

**Epicauta** Dejean, 1836 (= *Causima* D. 1836; *Henous* Halderman, 1852; *Macrobasis*, *Apterospasta* LeConte, 1858; *Isopentha* Mulsant, 1858; *Pleuropompha* L. 1862; *Nomaspis* L. 1866; *Gnathopasta* Horn, 1875; *Anomalonyx* Denier, 1935; *Anomalonychus* Saylor, 1940; *Maculicauta* Dillon, 1952) blister beetles in Meloidae, Subfamily Meloinae, Tribe Lyttini, Subtribe Epicautina (111 species in US or Canada)

**Epicauta** *nigritarsus* (*Lytta n.* LeConte, 1853; *E. hesitata* Dillon, 1952) (?Ac in one cave in Sutton Co., TX)

**Epicauta** undet. sp. (?Ac in cave in Uvalde Co., TX)

**Megetra** LeConte, 1859 (also put in Scarabaeidae) Meloidae beetles, Subfamily Meloinae, Tribe Lyttini, Subtribe Eupomphina (8 species in US or Canada)

**Megetra** *cancellata* (*Meloe c.* Brandt & Erichson, 1832; *Megetra hoegei* Duges, 1889; *Megetra championi* Van Dyke, 1928) (Ac in one cave in Culberson Co., TX)

**Nemognatha** Illiger, 1807 (= *Nematognatha* Gemminger & Harold, 1870 Emend.; *Pronemognatha*, *Pauronemognatha*, *Meganemognatha* Enns, 1956) Meloidae beetles, Subfamily Nemognathinae, Tribe Nemognathini, Subtribe Nemognathina (28 species in US or Canada)

**Nemognatha** *lurida l., apicaulis* LeConte, 1853; *N. bicolor* Walker, 1866; *N. hurdi* MacSwain, 1951; *N. rufa* Duges, 1899) (epigeal in CA, AZ, TX, BC, WA, OR, NV, UT, AB, CO/ nectar sucking blister beetle/ ?Ac in one cave in Sutton Co., TX)

**Pyrota** Dejean, 1833 - Meloidae beetles, Subfamily Meloinae, Tribe Lyttini, Subtribe Eupomphina (27 species in US or Canada)

**Pyrota** *postica* LeConte, 1866 (*Cantharis lacordairei* Berg, 1881) (epigeal in AZ, NM, TX/ creosote bush beetle/ Ac in John's Guano Mine, Presidio Co., TX)

**MELYRIDAE** Leach, 1815 (= Malalchiidae) (soft-winged flower beetles)  
undet. sp. (8,970 years old in *Neotoma* woodrat nest in Tinajas Mts., Yuma Co, AZ)

Subfamily Dasytinae (*Mecomyceter*)

Subfamily Malachiinae Fleming, 1821 (*Attalusinus*, *Callops*)

**Attalusinus** Leng, 1918 - Melyridae beetles, Subfamily Melachiinae (1 species in US)

**Attalusinus** *submarginatus* (= *Ebaeus s.* LeConte, 1852) (CA, AZ, TX epigeal / Occasional Tx in CA)

**Callops** Erichson, 1840 - Melyridae beetles, Subfamily Melachiinae (48 species in US or Canada)

*Collops balteata* LeConte, 1852 (*C. oklahomensis* Brown, 1928) (Ac in one cave in Uvalde Co., TX)

*Mecomyceter* Horn, 1882 Melyridae beetles, Subfamily Dasytinae (4 species in US or Canada)

*Mecomyceter* undet. sp. (Ac in 1 seAK cave)

**MICROMALTHIDAE** (telephone-pole or micromalthid beetles)

*Micromalthus* Leconte, 1878 - Micromalthidae beetles (1 species in US)

*Micromalthus debilis* L. 1878 (Ac in one cave in Bexar Co., TX)

**MYCETOPHAGIDAE** Leach, 1815 (hairy fungus or sap beetles).

Subfamily Mycetophaginae L., 1815

Tribe Mycetohagini (*Litargus*, *Typhaea*)

*Litargus* Erichson, 1846 (*Tilargus*, *Alitargus*, *Litargellus*, *Paralitargus* Casey, 1900)

Mycetophagidae beetles, Subfamily Mycetophaginae, Tribe Mycetohagini (6 species in US or Canada)

*Litargus balteatus* LeConte, 1856 (*L. transversus* & *infulatus* L., 1856) (Tp? In IA)

*Typhaea* Curtis, 1839 - Mycetophagidae beetles in Subfamily Mycetophaginae, Tribe Mycetohagini (1 species in US and Canada)

*Typhaea stercorea* Linnaeus, 1758 (cosmopolitan epigeal/ hairy fungus beetle/ >26,000 yrs. BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM/ 15,000 to 14,000 & 2,000 to 500 year old in *Neotoma* woodrat nest in Big Bend Natl. Park, wTX)

marsh beetles - See Scirtidae

**NITIDULIDAE** Latreille, 1802 (sap(-feeding) & fungus beetles; sap-feeding & dried fruit beetles. Undet. genera (OK Tx? on organics; Late Pleisto. To middle Holocene in *Neotoma* woodrat nest in Tinajas Mts., Yuma Co, AZ))

Cillaeinae Kirejtshuk & Audison, 1986 (*Conotelus*) (also put in Carpophilinae)

Cryptarchinae Thomson, 1859 (*Glischrochilus*)

Carpophilinae (*Eपुरaea*) (now in Nitidulinae)

Nitidulinae Latreille, 1802 (*Eपुरaea*, *Stelidota*)

*Conotelus* Erichson, 1843 - Nitidulidae beetles, Subfamily Cillaeinae (4 species in US or Canada)

*Conotelus stenoides* Murray, 1864 (> 26,00 yrs. BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM)

*Eपुरaea* Erichson, 1843 - Nitidulidae beetles, Subfamily Carpophilinae (34 species in US or Canada)

*Eपुरaea avara* Randall, 1838 (Ac, Tx or Tp in Vancouver Island, BC)

*Glischrochilus* Reitter, 1873 (= *Librodor* R., 1884) (9 sp.) Nitidulidae beetles, Subfamily Cryptarchinae (9 species in US)

*Glischrochilus fasciata* (*Nitidula f.* Olivier, 1790; *Ips quadrimaculosa* & *geminatus* Melsheimer, 1846; *I. cylindricus* LeConte, 1863) (epigeal in NE/ red-spotted sap beetles/Tx or Ac in 2 KY caves)

*Carpophilus* Stephens, 1830 - Nitidulidae beetles, Subfamily Carpophilinae (35 species in US or Canada)

*Carpophilus* undet. sp. (fossil in *Neotoma* woodrat midden, Puerto Blanco Mts., Pima Co., sAZ)

*Stelidota* Erichson, 1843 - Nitidulidae beetles, Subfamily Nitidulinae (4 species in US)

*Stelidota* undet. sp. (Ac in TX)

**NOTERIDAE** Thomson, 1860 (burrowing water beetles)

Undet. genera (OK/on organics)

Noterinae T., 1860

Tribe Notomicrini (*Notomicrus*,

Tribe Suphisini (*Suphisellus*)

*Notomicrus* Sharp, 1882 - Noteridae beetles, Subfamily Notorinae, Tribe Notomicrini (2 species in US or Canada)

*Notomicrus* undet. sp. (Ac in Valdina Farms Sinkhole, Medina Co., TX)

*Suphisellus* Crotch, 1873 (5 sp.) - Noteridae beetles, Subfamily Notorinae (6 species in US or Canada)

*Suphisellus puncticollis* (*Suphis p.* C., 1873) (MA to MI, s.to FL/FL sinkhole pond)

*Suphisellus insularis* (*Canthydrus i., simplex, similaris* Sharp, 1887; *C. floridanus* Blatchley, 1914) (FL to Caribbean/ FL n. to Alachua Co. in sinkholes)

**OMOPHRONIDAE** - subsumed into Carabidae

**OTHNIIDAE** (false tiger beetles) - See Staphylinidae

Predacious diving beetle family - See Dytiscidae



**PHALACRIDAE** (shining flower or shining mold beetles)

*Litochropus* Casey, 1893 - Phalacridae beetles (2 species in US or Canada)

*Litochropus* undet. sp. (Ac in 1 seAK cave)

**PHENGODIDAE** LeConte, 1861 (glow-worm beetles)

(unidentified genus & sp. in Calaveras Co.,CA; Menard Co., TX)

**PSEPHENIDAE** (water penny beetles)

*Psephenus* Haldeman, 1853 - Psephenidae (1 species in US)

*Psephenus herricki* (Fluvicola h. DeKay, 1844) (epigean in E, w. to OK, KS/ water penny beetle/  
PA hyporheic)

**PSELAPHIDAE** Latreille, 1802 (((ant-like litter beetles or (short-winged) mold beetles) (also subsumed in Staphylinidae as Pselaphinae L., 1802 (ant-loving beetle subfamily). Antennae with apical antennomere(s) enlarged, body generally stouter & more rigid than in Staphylinidae, 2-3 tarsomeres, vertexal foveae. Mainly in wet organic substrates (leaf litter, logs, low plants).

Adults prey on small invertebrates such as nematodes, mites & springtails. About 100 sp. n. of Mex

**Bibl.:** J. Bowman 1934; Chandler 1990; Engelmann 1956; LeConte 1950; Park 1951, 1953a,b, 1956, 1958, 1960; Reitter, 1881; Newton & Chandler 1989; Peck 1974; Park 1951; **NA:** Chandler 1990; **SE:** Park 1956; **TN:** Park 1951; **TX:** Chandler 1992; Carlton 1990;. Antennae with apical antennomere(s) enlarged, body generally stout & rigid, two to three tarsomeres & vertexal foveae. **incl.** 3 unidentified genera & sp. in Calaveras Co.,CA) **General taxonomy:** Bowman 1934; Park 1953; Chandler 1990; Chandler 1997; **Cave biology:** Park 1951, 1956, 1960. **Keys:** **AL+TN** Park 1951; **e.US** Park 1960; **TX:** Chandler 1992.

Subfamily Batrisinae

SuperTribe Batrisitae

Batrisini (*Batrisodes*, *Batriasymmodes* (also put in Pselaphinae & Staphalinidae)

*Texamaurops*)

Subfamily Goniacerinae

Tribe Bythinini (*Subterrochus*, *Speleochochus*, *Tychobythinus*)

Tribe Speleobamini (*Speleobama*)

Subfamily Pselaphinae (*Arianops*, *Pselaptrichus*)

Super Tribe Batrisitae

Tribe Batrisini (*Batriasymmodes*) (also put in Batrisinae & Staphalinidae)

Tribe Amauropsini (*Arianops*)

SuperTribe Euplectitae  
Tribe Euplectini (*Biblopectus*)

SuperTribe Pselaphitae  
Tribe Tmesiphorini (*Tmesiphorus*)

***Arianops*** Brendel, 1893; (syn. *Arispeleops* Park), Barr 1974, revision) - Pselaphidae beetles, Subfamily Pselaphinae, Super Tribe Batrisitae, Tribe Amauropsini (also put in Staphylinidae, Subfamily Pselaphinae, Tribe Amauropsini or in Tribe Batrisini, Subtribe Amauropsina) (31 species in US)

***Arianops cavernensis*** Park, 1951 (\*type locality cave in Marshall Co., AL). AL/Tb)

***Arianops jeanneli*** Park, 1956 (\*type locality cave in Lee Co., VA). VA/Tb/VA T& E S1 G1 rank.

***Arianops pecki*** Barr, 1974 (type locality & two other caves in Cannon Co., TN/ Tb/ G1)

***Arianops*** undescr. sp. (Tb? in AL)

***Arianops steevesi*** Barr, 1974 (type locality & one other caves in Jackson Co., AL/ Tb)

***Arianops stygica*** Park, 1960 (type locality Cumberland Cave, Warren Co., TN/ Tp)

*Arispeleops* = *Arianops*  
*Babnormodes* = subgenus of *Batrisodes*

***Batriasymmodes*** Park, 1951 (as subgenus); Park 1965, as genus, revision) Pselaphidae beetles, Subfamily Pselaphinae, SuperTribe Batrisitae, Tribe Batrisini (also put in Batrisinae, Staphylinidae (Subfamily Pselaphinae, Tribe Batrisini, Subtribe Batrisina) or in Omaliinae) (6-8 species in US)

***Batriasymmodes (B.) greeveri*** Park, 1965 (type locality cave in Sullivan Co., TN/ Tb/ TN S1S2 G1G2, less than six caves)

***Batriasymmodes (B.) monstrosus*** (LeConte, 1849 (type locality cave in Lee Co., VA; Barr 1987). IL to NJ to FL/myrmecophile, epigeal Tx)

***Batriasymmodes (B.) parki*** Barr, 1987. (\*type locality cave in Mercer Co., WV/ Tb)

***Batriasymmodes (B.) quisnamus*** (*Batrisodes q.* Park 1951) (= *Batrisodes jeanneli* Park, 1951; *P reduncus* Park, 1956) (type locality cave in Pickett Co., TN); + caves in Clay, Davidson, DeKalb, Jackson, Maury, Lawrence, Macon, Overton, Pickett, Putnam, Rutherford, Smith, Sumner & Wayne Cos., TN (S3); Edmonson (Mammoth C.), Wayne & Simpson Cos., KY) /Tb/ S3G3)

**Batriasymmodes** (*B.*) *spelaeus* (Park, 1951) (type locality cave in Blount Co., AL). (++) caves in Blount, DeKalb, Lauderdale, Lawrence, Marshall, Morgan, St. Clair & Winston Cos., AL; Clay, Grainger, Jefferson, Van Buren & White Cos., TN/ Tb)

**Batriasymmodes** (*Speleodes*) *troglodytes* (Park), 1951 (\*type locality cave in Butler Co., AL/ Tb)

**Batriasymmodes** undescribed sp.#1 (cave in Colbert Co. & one other cave in Winston Co., AL/ Tp)

**Batriasymmodes** undescribed sp.#2 (2 caves in Jackson Co. & one cave in Marshall Co., AL)/Tp)

**Batriasymmodes** undet. sp. (Tp in Dade Co., GA)

**Batrisodes** Reitter, 1882 (subgenera *Babnormodes* Park, 1951, *Excavodes* Park, 1951) Pselaphidae beetles in Subfamily Batrisinae, Tribe Batrisini (also put in Staphylinidae, Subfamily Pselaphinae, Tribe Batrisini, Subtribe Batrisina) (73 species in US or Canada) **Bibl.:** Park 1947, 1956, 1958, 1960

**Batrisodes** (*Babnormodes*) *barri* Park, 1958 (type locality & one other cave in Dickson Co., TN/ Tb/ S1S2 G1G2)

**Batrisodes** (*Excavodes*) *cavernosus* Park, 1951 (\*\*type locality & one other cave in Butler Co., AL/ Tb/ G1)

**Batrisodes** (*Excavodes*) *clypeonotus* (Brendel, 1893). (type locality cave in Menard Co., TX/ MO, AL, TX epigeal myrmecophile/epigeal Tx in TX)

**Batrisodes** (*Bbnormodes*) *clypeospecus* Park, 1960 (type locality & two other caves in Overton Co., TN/ Tb/ S1S2 G1G2)

**Batrisodes** (*Babnormodes*) *ferulifer* Park, 1960 (\*type locality cave in Maury Co., TN/ Tb/ S1S2 G1G2)

**Batrisodes** (*Babnormodes*) *gemmae* Park, 1960 (\*type locality cave in Dickson Co., TN/ Tb/ S1S2 G1G2)

**Batrisodes** (*Babnormodes*) *gemmae* Park, 1956. (\*type locality cave in Dickson Co., TN/ Tb/ S1S2 G1G2)

**Batrisodes** (*Excavodes*) *globosus* LeConte, 1849) (caves in TX; Chandler 1992; Tx in AL, GA (possibly in Walker Co.), IN (Harrison Co.(S3/G4)), VA, TX). (Eastern US to CO, AB and WA, in ant nests in n. range/ Epigeal Tx)

**Batrisodes** (*Excavodes*) *grubbsi* Chandler, 1992 (\*type locality cave in Hays Co., TX/ Tb)

**Batrisodes** (*Babnormodes*) *henroti* Park, 1956 (type locality cave in Barren Co. & other caves in Barren & Edmonson Cos., KY + Hart Co., KY/ Tb/ G3)

**Batrisodes** (*Babnormodes*). *hubrichti* Park, 1958 (type locality cave in Barren Co. & Mammoth C., Edmonson Co., KY / Tb)

*Batrisodes jeanneli* = *Batriasymmodes quisnamus*

**Batrisodes** (*Babnormodes*) *jocueustus* Park, 1960 (\*type locality cave in Madison Co., AL). AL/Tb.

**Batrisodes** (*Babnormodes*) *jonesi* Park, 1951 (type locality cave in \*eColbert Co., AL/ Tb)

**Batrisodes** (*Babnormodes*) *krekeleri* Park, 1960 (\*type locality cave in Clark Co., IN / Tb/ IN T & E/ G1 )

**Batrisodes** (*Babnormodes*) *pannosus* Park, 1960 (\*type locality cave in Putnam Co., TN/ Tb/ S1S2 G1G2)

**Batrisodes** (*Babnormodes*) *profundus* Park, 1956(\*type locality cave in Conecuh Co., AL/ Tb)

*Batrisodes quisnamus* - see *Batriasymmodes*

*Batrisodes reduncus* = *Batriasymmodes quisnamus*

**Batrisodes** (*Excavodes*) *reyesi* Chandler, 1992 (\*\*\*\*\*type locality & 4 other caves in Burnet Co., TX/ Tb/ G3)

**Batrisodes** *rossi* Park, 1947 (epigean & Tx or Tp in IL)

*Batrisodes schneiderensis* = *Batrisodes uncicornis*

**Batrisodes** undescribed sp.#1 (\*?cave in Marshall Co., AL/Tb)

**Batrisodes** undescribed sp.#2 (\*cave in Conecuh Co., AL/Tb)

**Batrisodes** undescribed sp.#3 (2 caves in Madison Co., AL/ Tb/ G1)

**Batrisodes** undescribed? sp.#4 (cave in Big Mouth Cave, Harrison Co., IN/Tb)

**Batrisodes** undescribed sp.#5-8 (KY/Tb)

**Batrisodes** (*Babnormodes*) undescribed sp.#9 (\*cave in Coryell Co., TX/Tb) Reddell 1994)

**Batrisodes** undescribed sp. #10 (\*?Caverns of Sonora, Sutton Co.,TX/Tb)

**Batrisodes** undescribed sp. #11 (Bello Co.,TX/Tb)

**Batrisodes** undescribed sp. #12 (subgenus Excavadoes) (Williamson Co.,TX/Tb?)

**Batrisodes** undetermined sp. (OK/Tx)

**Batrisodes** undescr. sp. (\*\*cave in Harrison Co. & one cave in Crawford Co.,IN/ S1/G1)

**Batrisodes** (*Babnormodes*) *specus* Park, 1951 (type locality cave & caves in Madison & (Marshall Cos., AL & 2 caves in Jefferson Co.,TN /Tb/ G3)

**Batrisodes** *spretus* (*Batrisus* s. LeConte, 1850) (Ac, Tx or Tp in Mammoth C.,KY)

**Batrisodes** (*Babnormodes*) *subterraneus* Park, 1951 (\*type locality cave in Marshall Co., AL/Tb)

**Batrisodes** (*Excavodes*) *texanus* Chandler, 1992 (type locality & three other caves in Williamson Co.), TX / US T&E/ Cof. C. mold b./ Tb/ G1)

**Batrisodes** (*Babnormodes*) *tumoris* Park, 1960 (\*type locality cave in Colbert Co.,AL). AL/Tp or epigean Tx)

**Batrisodes** (*Babnormodes*) *uncicornis* (Casey), 1897 (syn. *B. schneiderensis* Park 1960) type locality cave in Kendall Co. + other TX caves/ epigean in MA, FL, TX/ Tp)

**Batrisodes** (*Babnormodes*) *valentinei* Park 1951 (type locality & other caves in Madison Co., one cave in Jackson Co.) & one cave in Morgan Co. AL & one cave in Grundy Co.,TN/ Tb/ G3)

**Batrisodes** (*Excavodes*) *venyivi* Chandler, 1992. (type locality cave + 3 nearby caves, Bexar Co.,TX/ Tb/ Helotes mold beetle/ Proposed federal endangered T&E)

**Biblopectus** Reitter, 1881 (=Acolonia Casey) - Pselaphidae beetles, Subfamily Pselaphinae, SuperTribe Euplectitae, Tribe Euplectini (also put in Staphylinidae, Subfamily Pselaphinae, Tribe Euplectini, Subtribe Euplectina) (5 species in US or Canada)

**Biblopectus** sp. nr. *ruficeps* (*Euplectus* r. LeConte, 1863) (Ac in cave in Travis Co. & cave in Williamson Co., TX)

**Biblopectus** undescr. sp. (Ac in cave in Bell Co. & cave in Coryell Co., TX)

*Bythinopsis* = *Tychobythinus*

**Cylindrarctus** Schaufuss, 1887 - Pselaphidae beetles (also put in Staphylinidae, Subfamily Pselaphinae, Tribe Tychini) (5 species in US or Canada)

**Cylindrarctus** *bicornis* Chandler, 1988 (Tx or Tp in cave in San Saba Co., TX). TX/epigean Tx)

*Excavodes* = subgenus of *Batrisodes*

*Hamotoides* = subgenus of *Hamotus*

**Hamotus** Aube, 1844 Pselaphidae beetles (also put in Staphylinidae, Subfamily Pselaphinae, Tribe Harnotini) (4 species in US or Canada)

**Hamotus** (*Hamotoides*) *electrae* Park, 1942 (Mex./TX). (Tx in caves in Kinney, Hays, Medina & Uvalde Cos.,TX/epigean Tx)

**Hamotus** undescr. sp. (\*?cave in Medina Co., TX/ extinct?)

**Leptoplectus** Casey, 1908 - Pselaphidae beetles (also put in Staphylinidae, Subfamily Pselaphinae, Tribe Euplectini, Subtribe Euplectina) (1 species in US)

**Leptoplectus** *pertenuis* (*Euplectus p.* Casey, 1884; *L. insolens*, *exilissimus* Casey 1908) (Tx in Harrison Co.,IN (S3/G4))

*Machaerites* - see *Speleochus* or *Subterrochus*

**Pselaptrichus** Brendel, 1899 - Pselaphidae beetles (also put in Staphylinidae, Subfamily Pselaphinae, Tribe Bythinini) (33 species in US or Canada)

**Pselaptrichus** undet. sp. (15,000 to 13,000 year old in Neotoma woodrat nest in Big Bend Natl. Park, wTX)

**Rhexius** LeConte, 1850 - Pselaphidae beetles (also put in Staphylinidae, Subfamily Pselaphinae, Tribe Euplectini, Subtribe Rhexina) (8 species in US)

**Rhexius** *stephani* Chandler, 1990 (Ac in cave in Travis Co., TX)

**Speleobama** Park, 1951 - Pselaphidae beetles, Subfamily Goniacerinae, Tribe Speleobamini (also put in Staphylinidae, Subfamily Pselaphinae, Tribe Speleobamini) (1 species in US)

**Speleobama** *vana* Park, 1951 (\*type locality cave in Jefferson Co.,AL). AL/Tb)

**Speleochus** Park, 1951 (as subgenus of *Machaerites*; as own genus Park, 1960) Pselaphidae beetles, Subfamily Goniacerinae, Tribe Bythinini (also put in Staphylinidae, Subfamily Pselaphinae)

**Speleochus** *croceus* Park, 1960. (= *Subterrochus c.*) (\*\*type locality & one other cave in Madison Co., AL/ Tb)

**Speleochus** *eurous* (Park), 1960 (= *Subterrochus e.*) (\*type locality cave in Jackson Co., AL/ Tb)

**Speleochus** *ferus* (Park), 1951 (= *Subterrochus f.*) (type locality cave & one nearby cave in Madison Co. & 4 caves or sinkholes in Jackson Co., AL/ Tb/ G3)

**Speleochus** undescribed sp. #1 (\*cave in Walker Co, GA/ Tb)

**Speleochus** undescribed sp. #2 (\*cave in Walker Co., GA/ Tb?) **Bibl.:** Buhlmann 2000  
**Speleochus steevesii** (Park), 1960. (\*type locality cave in Marshall Co., AL/ Tb)

**Speleochus stygicus** (Macherites s. Park, 1951) (type locality & other caves in \*Madison Co.,AL/ Tb)

**Speleochus synstygicus** (Park), 1956. (\*type locality cave in Madison Co., AL/ Tb)

*Speleodes* = subgenus of *Batriasymmodes*

**Texamaurops** Barr, 1963e - Pselaphidae beetles, Subfamily Batrisinae, SuperTribe Batrisitae, Tribe Batrisini (also put in Staphylinidae, Subfamily Pselaphinae, Tribe Batrisini (3 species in US)

**Texamaurops reddelli** Barr & Steeves, 1963. (type locality & at least 4 other caves in Travis Co., TX). (US T&E as Kr. C. mold beetles). TX/Tb/T&E/ G3).

**Tmesiphorus** LeConte, 1849 - Pselaphidae beetles, Subfamily Pselaphinae, SuperTribe Pselaphitae, Tribe Tmesiphorini (also put in Staphylinidae, Subfamily Pselaphinae, Tribe Tmesiphorini) (2 species in US)

**Tmesiphorus costalis** LeConte, 1849. (Eastern US epigeal / Tp or Tx in AL, TX; Tx in TX, sON/ epigeal in TX)

**Tmesiphorus** new sp.? (\*?cave in Travis Co., TX/ Tp?)

**Trimioarcus** Park, 1952 - Pselaphidae beetles (also put in Staphylinidae, Subfamily Pselaphinae)

**Trimioarcus musamator** Chandler, 1992. (2 caves in Travis Co., + Coryell & Bell Cos., TX). TX/ epigeal Tx)

**Trimiopectus** Brendel, 1890 - Pselaphidae beetles (also put in Staphylinidae, Subfamily Pselaphinae) (3 species in US or Canada)

**Trimiopectus** undet. sp. (Ac in 1 seAK cave)

**Tychobythinus** Ganglbauer, 1896 (=Bythinopsis) (Key, Besuchet, 1982) Pselaphidae beetles, Subfamily Goniacerinae, Tribe Bythinini (also put in Staphylinidae, Subfamily Pselaphinae) (4 species in US or Canada)

**Tychobythinus bythinoides** (=Machaerodes & Tychus b. Brendel, 1865) (Tx in Orange Co.,IN (S2/G3))

**Tychobythinus hubrichti** (Park), 1960 (\*type locality cave in Hart Co., KY/ Tb/ G1G2)

**Tychobythinus jonesi** (Park), 1951. (\*type locality cave in Colbert Co., AL/ Tb/ G1G2)

*Tychobythinus strinatii* Besuchet, 1982. (Cumberland C., Warren Co., TN/ rare epigeal/ Tb/ S1S2 G1G2)

**PTILIIDAE** Erichson, 1845 (feather-winged or featherwing beetles). Contain the smallest known beetles; most <1mm. long. Wings normally folded out of site, thought to be used largely for passive flotation. About 23 genera & 120 known species n. of Mexico. Mainly in wet organic substrates (leaf litter, logs, dung). Dybas 1966

**Acrotrichinae** Reitter, 1909  
Tribe Acrotrichini (*Acrotrichis*)

**Ptiliinae**  
Tribe Ptilinini (*Ptenidium*)

*Acrotrichis* Motschulsky, 1850 (= Acrotrichis) Ptilidae beetle, Subfamily Acrotrichinae, Tribe Acrotrichini (43 species in US or Canada)

*Acrotrichis* undet. sp. (Tp? guanophile in cave in NS)

*Acrotrichis horni* Mathews, 1872 (in CA non-cave *Neotoma fuscipes* woodrat nest)

*Ptenidium* Erichson, 1845 (*Trichopteryx* Kirby, 1826; *Ctenopteryx* Flach, 1889; *Acatrichis* Arnett, 1971) Ptiliidae beetles, Subfamily Ptiliinae, Tribe Ptilinini (13 species in US or Canada)

*Ptenidium* undet. sp. (Occasional Tp in KY in streambank detritus in cave in Carter Co.)

**PTILODACTYLIDAE** Laporte, 1836 (toed-winged or ptilodactylid beetles) Bibl.: Stribling 1986

Subfamily Ptilodactylinae (*Lachnodactyla*, *Ptilodactyla*)

Subfamily Anchytarsinae (*Anchytarsus*)

*Anchytarsus* Guerin-Meneville, 1843 - Ptilodactylidae beetles, Subfamily Anchytarsinae (once in Curculionidae)(1 species in US or Canada)

*Anchytarsus bicolor* (*Atopa b.* Melsheimer, 1846) (seVA hyporheic)

*Lachnodactyla* - Ptilodactylidae beetles, Subfamily Ptilodactylinae (2 species in US or Canada)

*Lachnodactyla* sp. cf. *texana* Schaeffer, 1906 (Tp? in cave in Medina Co., TX)

*Ptilodactyla* Illiger, 1807 - Ptilodactylidae beetles, Subfamily Ptilodactylinae (4 species in US or Canada)

*Ptilodactyla equilobata* Chapin, 1927 (Tp? in cave in Uvalde Co., TX)

*Ptilodactyla serricollis* (*Ptilinis s.* Say, 1823) (much of eU.S./Tp (probably) in Cascade C., Kendall Co., TX)



***Ptilodactyla*** undet. sp(p). (Tx? in MO; Tp in Bexar, Medina, Val Verde Cos.,TX)

**PTINIDAE** - subsumed in Anobiidae  
Round fungus beetles family - See Leiodidae  
Savage beetles family - See Carabidae

**PYROCHROIDAE** Latreille, 1807 (fire-colored beetles)  
Subfamilies incl. Agnathinae (*Cononotus*) - put in Salpingidae

**SALPINGIDAE** Leach, 1815 (narrow waisted bark beetles).  
Agleninae Horn, 1878 (*Aglenus*)  
Cononotinae (*Cononotus*)

***Aglenus*** Erichson, 1845 (also put in Staphylinidae & once in Colydiidae) Salpingidae beetles,  
Subfamily Agleninae (1 species in US or Canada)

***Aglenus brunneus*** (*Hypophloeus b.* Gyllenhal, 1813; *A. major & rugipennis* Schaufuss, 1882; *A. longior* Pic, 1923; *Anommatus obsoletus* Shuckard, 1939) (NA/mushroom beetles/Tp guanobic in KY (Carter Co.) Bibl.: Woodroffe, 1967

***Cononotus*** LeConte, 1851 (also put in Pyrochroidae) Salpingidae beetles, Subfamily  
Cononotinae (6 species in US or Canada)

***Cononotus bryanti*** Van Dyke, 1939 (fossil in *Neotoma* woodrat midden, Puerto Blanco Mts., Pima Co., sAZ; 10,950 years old in *Neotoma* woodrat nest in Tinajas Mts., Yuma Co.,AZ; 14,500 years old in *Neotoma* nest, Ajo Mts., Pima Co., AZ)

***Cononotus macer*** Horn, 1868 (2,000 to 3,000 yrs. BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM))

**SCAPHIDIIDAE** (shining fungus beetles)  
***Baeocera*** - put in Staphylinidae

**SCARABAEIDAE** LeConte, 1858 (scarabs or scarab beetles; June & lamellicorn beetles, cockchafers) **Bibl.:** J. Cooper 1983

Many of the Scarabs are economically important. Larvae of most of the injurious species live in soil where they feed on roots; they are called white grubs. Adults usually eat leaves or fruit. Most adults of this family tunnel and form a dung ball underground for larvae; some larvae live in soil where they feed on organic matter or roots of plants. Aphodius species feed on humus or dung

of higher animals and are abundant in cow dung. They are usually black, often with brown, yellow or red markings.

By far the most important amulet in ancient Egypt was the scarab, symbolically as sacred to the Egyptians as the cross is to Christians. Scarabs were already known in the Old Kingdom, and in the First Intermediate Period the undersides were decorated. They were probably sacred in the Prehistoric Period and had a role in the early worship of animals, judging from the actual beetles that were found stored in jars buried with the deceased and from those found in graves during the time of King Den of Dynasty I. A scaraboid-shaped alabaster box from Tarkhan seems to confirm that the scarab was already venerated at the beginning of Dynasty I. Scarabs are the most numerous amulets and were produced well beyond the dynastic periods.

Undet. genus 10,300 to 8970 years old in *Neotoma* woodrat nest in Tinajas Mts., Yuma Co., AZ)

**Aphodiinae** Leach, 1815 (aphodiine dung beetles)

Tribe Aphodiini (*Aphodius*, *Ataenius*, *Dialytes*, *Rhyssemus*)

Tribe Eupariini (*Martinezia*)

**Cetoniinae** L., 1815 (flower beetles & others)

Tribe Cetoniini (*Euphoria*)

Tribe Cremastochilini (*Cremastocheilus*)

**Hybosorinae** (*Hybosorus*) (also put in own family)

**Melolonthinae** MacLeay, 1819 (may beetles and June bugs; June beetles, chafers & others) ()

Tribe Melolonthini (*Diplotaxis*, *Dichelonyx*, *Serica*, *Phyllophaga*)

**Scarabaeinae** Latreille, 1802 (dung beetles & tumblebugs)

Tribe Coprini (*Ateuchus*, *Copris*, *Dichotomius*, *Phanaeus* (also put in Scarabini))

Tribe Onthophagini (*Onthophagus*)

Tribe Scarabaeini (*Canthon*)

Tribe Scarabini (*Phanaeus*) (now in Coprini)

**Aphodius** Illiger, 1798 (>100 syns.) (aphodiine dung beetles) (189 sp.) Scarabaeidae beetles in Subfamily Aphodiinae, Tribe Aphodiini (211 species in US, Canada)

**Aphodius** *aleutus* Eschscholtz, 1822 (Tp? guanophile in cave in NS)

**Aphodius** *aemulus* Horn, 1887 (burrow/ Tp or Tx in NM, TX NS/ 18,000 to 19,700 yrs. BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM))

**Aphodius** *congregatus* Mannerheim, 1853 (2,000 year old remains in entrance pit in AB cave)

**Aphodius** *davisi* Fall, 1930 (confined to CA non-cave *Neotoma fuscipes* woodrat nest)

*Aphodius granarius* (*Scarabaeus* g. Linnaeus, 1767; *A. niger* Creutzer, 1799; *A. carbonarius* Sturm, 1805; *A. ater* Thunberg, 1818; *A. haemorrhous, lucens, emarginatus, melanopus* Stephens, 1830; *A. elongatus* Menetries, 1832; *A. retusus* Waltl, 1834; *A. aterrimus* Melsheimer, 1846; *A. adelaidae* Hope, 1847; *A. metallicus* Haldeman, 1848; *A. pereyi* Harold, 1870; *A. inutilis* Horn, 1887; *A. nama* Kolbe, 1908) (US/Tp in cave in Sutton Co.,TX) **Bibl.:** Johaningsmeier 1999

*Aphodius neotomae* Fall, 1907 (confined to CA non-cave *Neotoma fuscipes* woodrat nest)

*Aphodius precursor* (Pleistocene fossil in Port Kennedy C., Montgomery Co., PA)

*Aphodius* undescr.? sp. (3 caves in MO/ Tp?)

*Aphodius ruficlarus* Fall, 1932 (Ac or Tx in woodrat nest in cave in Grand Canyon, Coconino Co.,AZ)

*Aphodius rusicola* Melsheimer, 1845; *A. rusicola* Haldeman, 1848 Emend.; *A. curtus* H., 1848; *A. aurelianus* Harold, 1863)) (/Tx? in MO)

*Aphodius* undet. sp. or species (Tx? in 2 caves in DE Co.,OK; undet. sp. (*Neotoma* woodrat midden in Canyonlands, UT; 2,000 year old remains in entrance pit in AB vcave/ NS/ 100 to >26,000 yrs. BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM; 13,500 years old in *Neotoma* nest, Ajo Mts., Pima Co., AZ)

*Aphodius sparsus* LeConte, 1878 (*A. blaisdelli* Fall, 1905; *A. sheldoni* Barrett, 1932) (TTP in WA; Tx woodrat nests in CA; confined to CA non-cave *Neotoma fuscipes* woodrat nest)

*Aphodius tuberosus* Barrett, 1932 (confined to CA non-cave *Neotoma fuscipes* woodrat nest)

*Aphodius vandykei* Barrett, 1931 (confined to CA non-cave *Neotoma fuscipes* woodrat nest)

*Ataenius* Harold, 1867 (*Oxyomus* Blanchard, 1842 (Homo.); *Euparia* Erichson, 1847; *Hexalus* Mulsant & Rey, 1870; *Brancoataenius* Paulian, 1979; *Stenataenius* Chalumeau, 1982) (63 sp.) Scarabaeidae beetles in Subfamily Aphodiinae, Tribe Aphodiini (66 species in US or Canada)

*Ataenius desertus* Horn, 1871 (2,000 to 14,300 yrs. BP in *Neotoma* woodrat nest in wTX (El Paso Co.) & 9,120+- 500 & 4,340+- 2,260 years old late Quaternary fossil in scNM *Neotoma* woodrat nest)

*Ataenius* undescr.? sp. (near *spretulus* (*Aphodius* s. Haldeman, 1848; *Ataenius consors* Fall, 1930; *A. falli* Hinton, 1934))) \*(cave in Crawford Co.,MO/ Tp)

*Ataenius* undet. sp. or species (Tx in OK,TX; *Neotoma* woodrat midden in cave in UT) & Cochise Co.,AZ),

*Ateuchus* Weber, 1801 (*Choeridium* Serville, 1828) Scarabaeidae beetles in Subfamily Scarabaeinae, Tribe Coprini (3 species in US, Canada)

**Ateuchus ebeninum** Horn, 1876 (= *Choeridium e.*) (Pleistocene fossil in Port Kennedy C., Montgomery Co. PA)

**Ateuchus lecontei** Harold, 1868 (= *Onthophagus l.*) (3,000 to >3,000 yrs. BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM)

**Ateuchus texanus** (*Choeridium t.* Robinson, 1948) (Tp? in cave in Medina Co. & cave in Uvalde Co., TX)

**Ateuchus** sp. prob. *lecontei* Harold, 1868 (Tp? in cave in Comal Co., TX)

**Canthon** Hoffmannsegg, 1817 (tumblebugs). Scarabaeidae beetles in Subfamily Scarabaeinae (8 species in US or Canada) **Bibl.:** Halffiter, 1961

**Canthon granulifera** Schmidt, 1921 (*Absolus mexicana m.* Champion, 1892)? (TTx in TX) & **Canthon imitator** Brown, 1946 (NE, SE, TX epigeal/ western tumblebug/ Tx or Ac in Carlsbad (Eddy Co., NM) & cave in King Co., TX)

**Canthon** undet. sp. (?Ac in cave in Uvalde Co., TX)

**Canthon viridis** (*Copris v.* Beauvois, 1805; *Ateuchus obsoletus* Say, 1823; *Onthophagus viricatus* Say, 1835; *Canthon globiforme* Harold, 1868) (?Ac in Medina, Uvalde Cos., TX)

**Copris** Geoffroy, 1762 (*Litocopris* Waterhouse, 1891) (dung beetles) Scarabaeidae beetles in Subfamily Scarabaeinae, Tribe Coprini (10 species in US or Canada)

**Copris arizonensis** Schaeffer, 1906 (in AZ *Neotoma* woodrat nest)

**Copris minutus** (*Scarabaeus m.* Drury, 1773; *S. silenus* Fabricius; *S. ammon* F., 1781 (Homo.); *S. lar* F., 1987) (NE, SE, TX, OK, IA, MO epigeal/ small black dung beetle/Tx in MO)

**Cotinus** Burmeister, 1842 (*Balsameda*, *Latemnis* Thomson, 1880; *Cotinorrhina* Schoch, 1895; *Criniflava* Goodrich, 1966; Cotinis) Scarabaeidae beetles in Subfamily Cetoniinae, Tribe Gymnetini (also put in Scarabaeinae) (4 species in US or Canada)

**Cotinus** sp. prob. *maclevei* Warner, 1990 (obligate rodent nest inquiline, esp. AZ *Neotoma* woodrat nests)

**Cotinus** sp. prob. *mutabilis* (*Gymnetis m.* Gory & Percheron, 1833; *C. texana* Casey, 1915) (green June beetle/ Ac in cave in Bexar Co., TX)

**Cremastocheilus** Knoch, 1801 - Scarabaeidae beetles, Subfamily Cetoniinae, Tribe Cremastochilini (32 species in US, Canada)

**Cremastocheilus** undet. sp. (fossil in *Neotoma* woodrat midden, Puerto Blanco Mts., Pima Co., sAZ)

**Dichelonyx** Harris, 1826 (*Dichelonycha* K., 1837 Emend.) Scarabaeidae beetles in Subfamily Melolonthinae, Tribe Melolonthini (29 species in US or Canada)

**Dichelonyx** *vicina* Fall, 1901 (*D. deserta* & *columbiana* Hopping, 1931) (Tx or Ac in WA)

**Dichotomius** Hope, 1838 Scarabaeidae beetles in Subfamily Scarabaeinae, Tribe Coprini (3 species in US or Canada)

**Dichotomius** *carolinus* (*Scarabaeus c.* Linnaeus, 1758) (epigean in NE, KS, MO, TX, OK, SD, MA, FL/ 12,00 - 12,300 yrs. in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM/)

**Dialytes** Harold, 1869 - Scarabaeidae beetles in Subfamily Aphodiinae, Tribe Aphodiini (5 species in US or Canada)

**Dialytes** undet. sp. (9,120+- 500 years old in scNM *Neotoma* woodrat nest)

**Diplotaxis** Kirby, 1837 (= *Orsonyx*, *Alobus* LeConte, 1856; *Diazus* L. 1859) Scarabaeidae beetles in Subfamily Melolonthinae, Tribe Melolonthini (104 species in US or Canada)

**Diplotaxis** undet. sp. (?Tx in Edwards, Travis Cos., TX; Ac or Tx in woodrat nest in cave in ave, Grand Canyon, Coconino Co., AZ & *Neotoma* woodrat midden in Canyonlands, UT; extant in *Neotoma* nest in Cochise Co., AZ / 2,000 to 15,500 yrs. BP in *Neotoma* woodrat nest in wTX (El Paso Co.); 4,340 to 2,260 in scNM *Neotoma* woodrat nest; 15,680 years old in *Neotoma* woodrat nest in Tinajas Mts., Yuma Co, AZ)

**Euphoria** Burmeister, 1842 (= *Eriirhipis* B., 1842; *Eriirhipidia*, *Euphorhipis*, *Haplophoria*, *Isohipina*, *Parisorhipis*, *Rhipiphoria*, *Euphoriaspis* Casey, 1915) (flower beetles) (once put in Staphylinidae) Scarabaeidae beetles in Subfamily Cetoniinae, Tribe Cetoniini (28 species in US or Canada)

**Euphoria** *fulgidus* (= *Cetonia f.* Fabricius, 1775; *E. fuscocyanea* Casey, 1915; *Quedius f.*; or if in Staphylinidae: *Gauropterus* Thomson, 1869) (Europe, nAfrica, NA/alien TP in AL, GA, IL, IN, KY (Mammoth C.), MO, VA, WV)

**Hybosorus** MacLeay, 1819 - Scarabaeidae beetles, Subfamily Hybosorinae (also put in Hybosoridae) (1 species in US)

**Hybosorus** *illigeri* Reiche, 1853 (epigean in SE, n. to IN/ Ac in cave in Edwards Co., TX)

**Hybosorus** MacLeay, 1819 - MacLeay, 1819 - (also put in Hybosoridae)

**Hybosorus** *illigeri* Reiche, 1853 (Ac in cave in Edwards Co., TX)

**Martinezia** Chalumeau, 1893 - Scarabaeidae beetles in Subfamily Aphodiinae, Tribe Eupariini (1 species in US or Canada)

***Martinezia dutertrei*** (Chalumeau, 1893) (= *Myrmecaphodius excavaticollis*) (Blanchard) (Tx, fire ant associate, in cave in Bexar Co., TX)

*Megetra cancellata* - put in Meloidae

*Myrmecaphodius excavaticollis* (Blanchard) = *Martnezia dutertrei*

*Omorgus* Erichson, 1848 - put in Trogidae

***Onthophagus*** Latreille, 1802 (*Chalcoderus*, *Manapus*, *Psilax* Erichson; *Monapus* E., 1848; *Proagoderus*, *Gonocyphus*, *Diastellopalpus* Lansberge, 1886; *Pauronthophagus*, *Tauronthophagus* Shipp, 1895; *Eremophagus*, *Furcothophagus*, *Palaeonthophagus*, *Parentius*, *Trichonthophagus* Zunino, 1979; *Hyalonthophagus* Palestrini et al., 1988) Scarabaeidae beetles in Subfamily Scarabaeinae, Tribe Onthophagini (dung beetles: 34 species in US or Canada).  
**Bibl.:** Howden & Cartwright, 1982

***Onthophagus brevifrons*** Horn, 1881 (TTP? in NM, TX/ 100 to >26,000 yrs. BP in *Neotoma* woodrat nest in wTX (El Paso Co.); 14,920+1360 years old in scNM *Neotoma* woodrat nest; 20,500, 8,500 & 1,200 years old in *Neotoma* nest, Ajo Mts., Pima Co., AZ)

***Onthophagus browni*** Howden & Cartwright, 1963 (Tp in cave in Culberson Co., TX; Ac in CO/ in AZ *Neotoma* woodrat nest; 100 to >26,000 yrs. BP in *Neotoma* woodrat nest in wTX (El Paso Co.); 9,120+- 500 years old in scNM *Neotoma* woodrat nest)

***Onthophagus cavernicollis*** Howden & Cartwright, 1963 (type locality cave in Harrison Co., AR/ Tp guanophile in AR, MO, OK, TX)

***Onthophagus cochisus*** Brown, 1917 (10,000 to >12,300 yrs. BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM)

***Onthophagus hecate h.*** (*Scarabaeus h.* Panzer, 1794; *Copris hastator* & *latebrosus* Fabricius, 1801; *C. obtectus* Beauvois, 1805; *O. furcicollis* & *lama* Dejean, 1836; *O. scabricollis* Kirby, 1837; *O. sayi* Laporte, 1840; *O. blatchleyi* Brown, 1929)) (Tx in MO)

***Onthophagus lecontei*** (2,000 to 3,000 yrs. BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM)

***Onthophagus orpheus o.*** (*Scarabaeus o.* Panzer, 1794; *C. canadensis* Fabricius, 1801; *O. pseudorpheus* Howden & Cartwright, 1963)) (Tx in MO, Tx or Tp in TN/ *Neotoma* woodrat nest in FL)

***Onthophagus*** undet. sp. or species (MO/Tx in MO; (Ac or Tx in woodrat nest in Bida Cave, Grand Canyon, Coconino Co., AZ; fossil in *Neotoma* woodrat midden, Puerto Blanco Mts., Pima Co., sAZ)

***Onthophagus subopacus*** Robinson, 1940 (3,200 to 10,300 yrs. BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM)

**Onthophagus** *velutinus* Horn, 1875 (CA, TX/habitual Tx, woodrat dung; in woodrat nest in TX; 14,500 to 1,200 years old in *Neotoma* nest, Ajo Mts., Pima Co., AZ)

**Phanaeus** MacLeay, 1819 - Scarabaeidae beetles in Subfamily Scarabaeinae, Tribe Coprini or Scarabini (10 species in US or Canada)

**Phanaeus** *antiquus* Horn, 1876 (Pleistocene fossil in Port Kennedy C., Montgomery Co., PA)

**Phyllophaga** Harris, 1827 (= *Rhizotrogus* Berthold, 1827; *Lachnosterna*, *Holotrichia*, 1837; *Ancylonycha* Blanchard, 1845; *Trichesthes*, *Phytalus* Erichson, 1847; *Listrochelus*, *Tostegoptera*, *Chlaenobia*, B., 1850; T. B. 1850 *emend.*; *Endrosa*, *Eugastra*, *Gymnis* LeConte, 1856; *Chirodines* Bates, 1888; *Triodonyx* Saylor, 1942) Scarabaeidae beetles in Subfamily Melolonthinae, Tribe Melolonthini (or not placed in tribe) (217 species in US or Canada)

**Phyllophaga** *ignava* (*Lachnosterna i.* Horn, 1887) (?Ac in cave in, Val Verde Co., TX)

**Phyllophaga** *rubiginosa* (L.r. LeConte, 1856) Ac in cave in Travis Co., TX)

**Phyllophaga** undet. sp. or species (Ac or Tx in woodrat nest in Bida Cave, Grand Canyon, Coconino Co., AZ/ NS/ 2,000 to 19,700 yrs. BP in *Neotoma* woodrat nest in wTX (El Paso Co.) & Big Bend Natl. Park)

**Rhyssemus** Mulsant, 1842 (= *Banacardius* Petrovitz, 1967) Scarabaeidae beetles in Subfamily Aphodiinae, Tribe Aphodiini (4 species in US or Canada)

**Rhyssemus** undet. sp. (Ac in cave in Coryell Co., TX)

**Serica** MacLeay, 1819 - Scarabaeidae beetles in Subfamily Melolonthinae, Tribe Melolonthini (109 species in US or Canada)

**Serica** undet. sp. (Ac or Tx in woodrat nest in Bida Cave, Grand Canyon, Coconino Co., AZ & *Neotoma* woodrat midden in Canyonlands, UT/ NS/ 2,000 to 10,800 yrs. BP in *Neotoma* woodrat nest in Big Bend Natl. Park, El Paso Co., wTX)

**Trox** - now in Trogidae

**SCIRTIDAE** Fleming, 1821 (marsh beetles)  
Subfamily Helodinae (Cyphon, Elodes)

**Cyphon** Paykull, 1799 - Scirtidae beetles, Subfamily Helodinae (14 species in US or Canada)

**Cyphon** *concinus* (*Helodes c.* LeConte, 1853) (Tx or Ac in CA)

**Elodes** Latreille, 1796 (*Sacodes* LeConte, 1853; *Hemicyphon* LeConte, 1866; *Helodes* Duval, 1861 (Emend.) - Scirtidae beetles, Subfamily Helodinae (10 species in US or Canada)

**Elodes** *emarginata* Hatch, 1962 (CA to BC/Ac? in WA)

**SCOLYTIDAE** (bark beetles; bark, cone & ambrosia beetles)  
(now subsumed at least in part as Subfamily Scolytinae in Curculionidae  
Hylesininae (crenulate bark beetles) (*Hylastes*, *Pityophthorus*)

*Hylastes* Erichson, 1836 - Now in Subfamily Scolytinae in Curculionidae  
*Pityophthorus*- Scolytidae beetles, Subfamily Scolytinae - Now in Scolytinae in Curculionidae

**SCRAPTIDAE** (false darkling beetles) (also subsumed in Melandryidae)  
Anaspidinae Mulsant, 1856 (*Allopoda*, *Anaspis*, *Diclidia*)  
Scraptiinae (*Scraptia*)

*Allopoda* LeConte, 1866 - Scaptidae beetles in Subfamily Anaspidinae (3 species in US or Canada)

*Allopoda* *lutea* Halderman, 1848 (Ac in cave in Real Co., TX)

*Anaspis* Geoffroy, 1762 - Scaptidae beetles in Subfamily Anaspidinae (13 species in US or Canada)

*Anaspis* *rufa* Say, 1826 (Ac or Tx in cave in Grand Canyon, Coconino Co., AZ)

*Diclidia* LeConte, 1862 - Scaptidae beetles in Subfamily Anaspidinae (9 species in US or Canada)

*Diclidia* *laetula* (*Anaspis l.* LeConte, 1858) (Tx? In CO,wTX).

*Scraptia* Latreille, 1807 - Scaptidae beetles in Subfamily Scraptiinae (3 species in US or Canada)

*Scraptia* undet. sp. (Ac in cave in Medina Co., TX)

**SCYDMAENIDAE** (antlike stone beetles)

Tribe Euconnini (*Euconnus*)

Tribe Scydmaenini (*Scydmaenus*) (both also put in Scydmaeninae, Tribe Euconnini)

*Euconnus* Thomson, 1862 (= *Tetramelus* Motschuslky, 1869; *Napochus* Reitter, 1881; *Euconophron* R.1884; *Microcydmus* Sauley, 1893; *Smicorphus* Casey, 1893; *Xestophus*, *Scapophus*, *Psomophus* C.1897; *Napoconnus* Franz, 1957; *Magellanoconnus* F.1967; *Nudatoconnus* F.1980) Scydmaenidae beetles, Tribe Euconnini (also put in Subfamily Scydmaeninae) (26 species in US or Canada)

*Euconnus* undet. sp. (TTp in cTX)

*Euconnus* (*Connophron*) undet. sp. (TTp in Bexar, Travis Cos.)



**Scydmaenus** Latreille, 1802 - Scydmaenidae beetles, Tribe Scydmaenus (11 species in US or Canada) (also put in Subfamily Scydmaeninae)

**Scydmaenus** undet sp. (Tx or Ac in stream-bank detritus in cave in Carter Co., KY)

**SILPHIDAE** Latreille, 1807 (carrion or burying beetles). About, 180 sp. n. of Mex., 230 species globally. Mainly feed on vertebrate carcasses; some scavenge or feed on plants. **Bibl.:** Peck, 1990; Peck & Miller, 1989 Horn, 1880; Jennel, 1922

Subfamily Nicrophorinae Kirby, 1837  
Tribe Nicrophorini (*Nicrophorus*)

Subfamily Silphinae L., 1807 (*Thanatophilus*) (also put in Necrophilini)  
Tribe Necrophilini  
(*Necrophilus* (also put in Agyrtae, Subfamily Necrophilinae), *Thanatophilus*)

*Choleva* - placed in Leiodidae

**Necrophilus** Latreille, 1829 Silphidae beetles, Subfamily Silphinae, Tribe Necrophilini (also placed in Elateridae & Agyrtae, Subfamily Necrophilinae) (2 species in US or Canada)

**Necrophilus** *hydrophiloides* Guerin-Meneville, 1835 (*N. ater* Motschulsky, 1845) (AK to CA/TTx or Ac in CA)

**Necrophilus** *pettitti* Horn, 1880 (sON to nFL, w. to KY, TN/high elev. Ed/ Ttp in AL, KY, TN; TTx in MO; Tx in IN (WA Co.(S2/G4)) **Bibl.:** Peck 1981

**Nicrophorus** Fabricius, 1775 (*Nicrophorus* Thunberg, 1798 (Emend.); *Cyrtoscelis* Hope, 1840; *Acanthopsilus* Portevin, 1914; *Neochrocharis* P., 1923; *Eunicrophorus*, *Necrocleptes*, *Necropter*, *Semenov*, *Stictonecropter*, 1933; *Neonicrophorus* Hatch, 1946) Silphidae beetles in Subfamily Nicrophorinae, Tribe Nicrophorini (15 species in US or Canada)

**Nicrophorus** *investigator* Zetterstedt, 1824 (epigeal in AZ, CA, NM, NW, MN/ 2,000 year old remains in entrance pit in AB cave)

**Nicrophorus** *marginatus* Fabricius, 1801 (= *N. Requiescator* Gistel, 1848; *N. montezumae* Matthews, 1888; *N. cordiger* Portevin, 1924; *N. sanjuanae*, *engelhardti*, *leachi* Hatch, 1927; *N. mckittricki* Pierce, 1949 (Unav.))(Ac in cave in Pecos Co., TX)

**Nicrophorus** *nigrita* Mannerheim, 1843 (*N. ruficornis* Motschulsky, 1869) (CA to TX/black burying beetles/Tx or Ac in CA)

**Thanatophilus** Leach, 1815 - Silphidae in Subfamily Silphinae, Tribe Necrophilini (6 species in US or Canada)

*Thanatophilus lapponicus* (*Silpha l.* Herbst, 1793) (2,000 year old remains in entrance pit in Rat's Nest Cave, AB)

*Thanatophilus* undet. sp. (Ac or Tx in woodrat nest in cave in Grand Canyon, Coconino Co.,AZ)

**SILVANIDAE** ((silvanid) flat bark beetles) (also subsumed in Cucujidae)

*Cathartus* Reiche, 1854 (once put in Cucujidae) (grain beetles) Silvanidae beetles in Subfamily Silvaninae (1 species in US)

*Cathartus quadricollis* (*Sylvanus q.* Guérin-Meneville, 1844) (cosmopolitan epigeal/ square-necked grain beetle/ Tx or Ac in 1 IL cave)

Skin beetles family - See Dermestidae

Small carrion beetles family - See Leptodiridae

small scavenger beetles - See Leiodidae

Soldier beetles family - See Cantharidae

Spider beetles family - See Ptinidae

**SPONDYLIDAE** - subsumed in Cerambycidae

**STAPHYLINIDAE** Latreille, 1902 (rove beetles).

**Bibl.:** Blackwelder 1952; Jarrige 1960; Jeannel & Jarrige 1949; Klimaszewski & Peck 1986; Moore & Legner 1974-5, 1979.

Adult rove beetles can often be found running on the soil surface, on plants or under leaf litter, but many of them are also able to fly. Most of the species have three larval stages, which prefer living in the litter layer and the upper soil layers but appear on the soil surface from time to time. Some specialists inhabit the burrows of small mammals like moles or live in nests of ants while others are parasitoids of flies. Staphylinids occur in a variety of habitats including seashore and riversides, but do not live in the water itself. Adults and larvae of a lot of species are predators who prey on eggs, larvae and adults of other arthropods; but many of them are not exclusively carnivorous. They may feed additionally on dead organic material and fungi.

Rove beetles are among the most proficient fliers of all beetles. Many species run with the tips of the abdomen raised, but none can actually sting. Larvae usually occur in the same habitat as the adults. Most prey on small animals such as other insects while a few eat decaying vegetable matter. The genus *Quedius* are most common on organic debris, such as ground litter, moss, grass piles, compost, carrion and dung. A few occur in very moist areas, such as marshes, swamps or in wet moss. A few live in animal nests. Adults and larvae most common on fungi but also live on slime molds (*Myxomycetes*), in decaying vegetation, or under bark. Certain species of this family are able to roll up into a tight ball.

Unidentified genus & sp. in Calaveras & Tulare Cos., CA & Kazumura C., HI.

**Aleocharinae** Fleming, 1821 (obscure rove beetles) **Bibl.:** Seevers 1978

Undet. genus & sp. (Santa Cruz & Shasta Cos., CA)

Tribe Aleocharini Fleming, 1821

Subtribe Aleocharina (*Aleochara*, *Deinopsis*?)

Tribe Athetini Casey, 1910 (*Aloconata*, *Xenota*)

Subtribe Dimetrotina *Dimetrota*,

Subtribe Athetina (*Atheta*)

Tribe Deinopsini (*Deinopsis*)

Tribe Falagriini Mulsant & Rey, 1873 (*Lissagria*, *Myrmecocephalus*)

Tribe Hoplandriini Casey, 1910 (*Hoplandria*, *Tetrallus* (also put in Athetini))

Tribe Lomechusini Fleming, 1821

Subtribe Lomechusina (*Zyras*)

Tribe Myllaenini Ganglbauer, 1895 (*Baryodma*, *Myllaena*)

Tribe Oxypodini

Subtribe Blepharhymenina

(*Blepharhymenus*, *Ilyobates*, *Ocalea*, *Oxypoda* (all 3 now in Subtribe Oxypodina))

Subtribe Oxypodina

(*Ilyobates*, *Ocalea*, *Oxypoda* (all also put in Subtribe Blepharhymenina))

Subtribe Tachyusina (*Tachyusa*)

**Empelinae** (*Empelus*)

**Euaesthetinae** Thomson, 1859 (pselaphid-like rove beetles) (*Euaesthetus*)

**Habrocerinae** (*Habrocerus*)

**Lispinae** (*Clavilispinus*) (put in Subfamily Osoriinae, Tribe Thoracophorini, Subtribe Clavilispinina, also put in Oxytelinae)

**Omaliinae** MacLeay, 1825 (ocellate rove beetles)

(Ac, Tx or Tp undet. genus in Vancouver Island, BC)

Tribe Anthophagini Thomson, 1859 (*Brathinus*, *Deinopteroloma*, *Deleaster* (now in Oxytelinae), *Geodromicus*, *Lesteva*, *Microedus*, *Olophrum*, *Orobanus*, *Phlaeopterus*, *Xylodromus* (now in Omaliini)), Undet. genus or genera (2,000 year old remains in entrance pit in Rat's Nest Cave, AB)

Tribe Eusphalerini (*Eusphalerum*) (once in Anthophagini)

Tribe Omaliini MacLeay, 1825 (*Xylodromus*) (once in Anthophagini)

**Osoriinae** Erichson, 1839 (unmargined rove beetles) (*Cylindropsis*) (also put in Lispininae & Osoriinae)

Subfamily Osoriinae, Tribe Thoracophorini, Subtribe Clavilispinina (*Clavilispinus*) (also put in Oxyporinae (cross-toothed rove beetles) (*Oxyporus*))

**Oxytelinae** Fleming, 1821 (spiny-legged rove beetles) Bibl.: Herman 1967 (*Ochtheophilus*)  
Tribe Coprophilini (*Carpelimus*, *Clavilispinus*, *Deleaster* (now in Tribe Deleasterini))

Tribe Deleasterini (*Deleaster*) (once put in Coprophilini & Omaliinae)  
Tribe Oxytelini (*Oxytelus*)

**Paederinae** Fleming, 1821 (Paederine rove beetles)  
Ac, Tx or Tp undet. genera in Vancouver Island, WA)

Tribe Paederini Fleming, 1821

Subtribe Cryptobiina Casey, 1905 (*Biocrypta*, *Homaetarsus*)  
Subtribe Echiasterina Casey, 1905 (*Echiaster*, *Myrmecosaurus*)

Subtribe Lathrobiina Laporte, 1835 (*Lathrobium*, *Lobrathium*),  
Subtribe Medonina Casey, 1905 (*Lithocharis*, *Medon*, *Sunius*)  
Subtribe Paederina (*Paederus*)

Subtribe Scopaeina Mulsant & Rey, 1878  
(*Orus*, *Scopaeus*, *Stamnoderus* (also put in Xantholininae))

Subtribe Stilicopsina Casey, 1905 (*Stilicolina*)  
Subtribe Stilicina (*Eustilicus*, *Rugilis*)

**Piestinae** (*Asemobius*) (now in Pseudopsinae)

**Proteininae** Erichson, 1839 (=Pteroniinae Moore, 1964):  
Proteinini (*Proteinus*)

**Pseudopsinae** (*Asemobius*) (also put in Piestinae)

**Quediinae** (*Hemiquedius*) (put in Staphylininae)

**Scaphidiinae** Latreille, 1807 (shining fungus beetles)  
Tribe Scaphisomatini (*Baeocera*)

**Staphylininae** Latreille, 1802 (large rove beetles)  
Tribe Diochini Casey, 1906 (*Diochus*)

Subtribe Philonthina Kirby, 1837

(*Belonuchus*, *Beeria*, *Bisnius*, *Erichsonius*, *Gabrius*, *Hemiquedius* (put in Quediinae), *Hesperus*, *Neobisnius*, *Philonthus*, *Quedius*) **Bibl.:** Smetana 1995

Subtribe Quidiina Kraatz, 1857 (*Heterothops*)

Tribe Staphylinini Latreille, 1802 (*Flohria*)

Subtribe Staphylinina Latreille, 1802 (*Staphylinus*, *Platydracus*)

Subtribe Quediina (*Hemiquedius*) (also put in Quediinae)

Tribe Xantholini ( (*Hesperolinus* (also put in Xantholininae))

**Steninae** M. MacLeay, 1825 (water skaters) (*Dianous*, *Stenus*),

**Tachyporinae** Macleay, 1825 (crab-like rove beetles) (*Ischnosoma*)

Deropini Smetana, 1983 (*Derops*)

Mycetoporini Thomson, 1859 (*Lordithon*, *Mycetoporus*)

Tachyporini MacLeay, 1825

(*Coproporus*, *Nitidotachinus*, *Rimulincola*, *Sepedophilus*, *Tachinus*, *Tachyporus*)

**Trichophyinae** Thomson, 1858 (*Trichophya*)

**Xantholininae** (*Hesperolinus* (also put in Staphylininae), *Stamnoderus*) (put in Paederinae)

# - not known from North America

**Aleochara** Gravenhorst, 1802 (*Polystoma* Stephens, 1833; *Ceranota* Stephens, 1839; *Ceronota* Agassiz, 1846, emend., 1840; *Mecorhopalus* Solier, 1849; *Coprochara*#, *Heterochara*, *Dyschara*, *Homoeochara*, *Polychara*, *Xenochara*# Mulsant & Rey, 1874; *Metalea* Mulsant & Ray, 1875; *Maseochara*# Sharp, 1883; *Emplenota*#, *Tithanis* Casey, 1884; *Polistoma* Casey, 1893; *Ophiochara*, *Isochara*, *Megalogastrina*, *Palaeochara*, *Triochara* Bernhauer, 1901; *Calochara*#, *Echochara*#, *Polystomota*, *Eucharina* (homo.), *Aidochara*#?, *Ctenochara*, *Notiochara*, *Oreochara*, *Pinalochara*, *Rheobioma*, *Rheocharella* Casey, 1906; *Copiata*, *Polycharina*, *Polystomaria* Reitter, 1909; *Arybodma*, *Funda* Blackwelder, 1952) (93 species in US or Canada). **Bibl.:** Klimaszewski, 1984) Staphylinidae beetles in Subfamily Aleocharinae, Tribe Aleocharini, Subtribe Aleocharina (93 species in US or Canada)

**Aleochara** (*Xenochara*) *angusticeps* Sharp, 1883 (Guatemala/Tx or Ac in one TN cave)

**Aleochara** (*Coprochara*) *bimaculata* Gravenhorst, 1802 (CO/Tx or Tp in Carlsbad C., NM) K. 1984

**Aleochara** (*Xenochara*) *castaneipennis* Mannerheim, 1843 (= *Baryodma acomana*, *robustula*, *glenorana*, *insulana*, *mannerheimi*, *rotundicollis* Casey, 1906; *B. eludens*, *concurrans* Casey, 1911; *A. oregona* Hatch, 1957) (AK to CA, PQ, SE/ Tx in AL, IL, KY, MO, PA, TN)

**Aleochara** (*Calochara*) *cavernicola* Klimaszewski, 1984 (\*type locality cave in Calaveras Co., CA/ Tp or Tb)

**Aleochara** (*X.*) *fumata* Gravenhorst, 1802 (= *A. languida* Sachse, 1852; *A. mycetophaga* Kraatz, 1856; *A. lata* Thomson, 1860; *Baryodma affluens* & *defecta* Casey, 1906;) (Tx or (Tp) in AL, MO, OK)

**Aleochara** (*Echochara*) *lucifuga* Casey, 1893 (*Echochara* & *Rheochara l.*; *Calodera cavicola* Garman, 1894) (NA epigean / Tx in CA,OH; Tp in AL, IL, IA, IN, KY (Mammoth C.) MD, MO, PA, TN, VA, WV)

**Aleochara** (*A.*) *lustrica* Say, 1836 (*A. pauper*, *serrata* Sharp, 1883; *A. algonquina*, *fusicornis*, *sternalis*, *medialis*, *texana* Casey, 1906) (Tp or Tx in cave in TN)

*Aleochara* (*Coprochara*) *minuta* = *A. verna*

**Aleochara** (*Echochara*) *ocularis* Klimaszewski, 1984 (s. Canada to IA,KY & MO/Tx in IA,KY(1 cave),MO (1 cave))

**Aleochara** *quadrata* Sharp, 1883 (= *Baryodma uvidula*) (in CA *Neotoma fuscipes* woodrat nest)

**Aleochara** (*Xenochara*) *taeniata* Erichson, 1839 (= *A. lapidicola* Sahlberg, 1844; *A. oxypodia* Sharp, 1883) (Tx? in NM?)

**Aleochara** undet. sp.#1 (2 caves in MO/Tx)

**Aleochara** undet. sp.#2 (cave in MO./Tx)

**Aleochara** undet. sp.#3? (= *Emplenota*) (cave in MO/ Tp?)

**Aleochara** undet. sp.#4-5? (caves in MO/ Tx)

**Aleochara** undet. sp.#6 (OR C., Josephine Co., OR)

**Aleochara** undet. sp. #7? (cave in Edwards Co., TX)

**Aleochara** undet. sp.#8? (Tp in IN (Clark Co.), ,KY(Warren, Adair Cos.),TN)

**Aleochara** *verna* Say, 1836 (*Baryodma tolerata* Casey, 1911; *B. pumilio* Casey, 1911; *A. tecumsehi* Muona, 1977; *A. cedari* Likovsky, 1984; *A. alticola* Sharp, 1883; *A. longula* Heer, 1839; *A. binotata* Kraatz, 1858; *Baryodma incrassata* Thomson, 1860; and *B. subtilis* J. Sahlberg, 1876; *Baryodma m.* Casey, 1906; *A. tanumi* Likovsky, 1984) (AL,IA,PA,WI epigean / guanobic Tp in KY, TN, WV, VA; TTp or TTx in CA),

**Aloconota** Thomson, 1858 (*Taphrodota*, *Terasota* Casey, 1906) (often treated as a subgenus of *Atheta*, though as a genus by Ashe in American Beetles staph chapter) Staphylinidae beetles in Subfamily Aleocharinae, Tribe Athetini (8 species in US or Canada)

**Aloconota** *diversiseta* Klimaszewski & Peck, 1986 (no epigean sites/Tp in Marshal & Madison Cos.,AL/Tp?)

**Aloconota** (*Aloconota*) *insecta* (*Homalota insecta* Thomson, 1856; *Atheta i.*) (circumboreal, MA epigeal/ Tp in AL, IL, KY (Mammoth C.), MO, NY (Peck), TN, VA, WV)

**Aloconota** (*Echochara*) *lucifuga* (Casey, 1893) (Tp in East)

**Aloconota** *neospelea* Klimaszewski & Peck, 1986 (\*type locality cave in Madison Co.,AL/Tp?)

**Anotylus** Thomson, 1859 - Staphylinidae beetles in Subfamily Oxytelinae, Tribe Corophilini (18 species in US or Canada)

*Anotylus exiguus* = *Clavilispinus e.*

**Anotylus** *insignitus* (Oxytelus i. Gravenhorst, 1806) (widespread epigeal in eCanada, eUS & much of tropic and subtropic America, common on guano or rotting material/ Ac in TN (Nickajack C., Marion Co.)

**Anotylus** *tetracarinatus* (*Staphylinus t.* Block, 1799) (Palearctic now widespread alien in eCan and e,nUS/ Ac in AL (Jackson Co.)

*Anthobium* Leach, 1819; Samouelle (in part) = *Deinopteroloma* & *Mathrileum*

**Asemobius** Horn, 1895 - Staphylinidae beetles in Subfamily Pseudopsinae (also put in Piestinae) (1 species in US and Canada)

**Asemobius** *caelatus* Horn, 1895 (epigeal CA, WA, sBC/ Ac in 1 seAK cave)

**Atheta** Thomson, 1858 (*Amidobia*#, *Dilacra*# Thomson, 1858; *Solenia*, *Ceritaxa*#, *Aglypha*, *Thinoecia*, *Ouralia*, Mulsant & Rey, 1873; *Megista*, *Hemitropia*, *Polyota*, *Dralica*#, *Hypnotadelete*, *Heteronoma*, *Pelurga* (homo.), *Phryogora* I, *Traumoecia*# M.&R., 1874; *Pseudosipalia* Seidlitz, 1889; *Oreostiba*# Ganglbauer, 1895; *Elytrusa* Casey, 1906; Casey, 1910; Tottenham, 1939; *Brundinia*# T., 1949) Staphylinidae beetles in Subfamily Aleocharinae, Tribe Athetini, Subtribe Athetina (7-536 species in US or Canada)

**Atheta** (*Atheta*) *alabama* Klimaszewski & Peck, 1986 (\*type locality cave in Morgan Co.,AL/ Tb or Tp)

*Atheta* (*A.*) *annexa* = *Xenota a.*

*Atheta fenyesei* Casey, 1911 = *Tetrallus f.*

*Atheta* (*Dimetrota*) *lucifuga* = *Dimetrota l.*

*Atheta occidentalis* = *Xenota o.*

**Atheta** undescr. sp.(s) (FL,GA,IN,IA,KY,MO,PA,VA/Tp)

**Atheta** undescr. sp.#2 (\*?cave in MO/Tp)

**Atheta** undescr. sp.#3 (IL/Tp)

**Atheta** undescr. sp.#4 (caves in Barry, Franklin, Howell & Ripley Co.s, MO,AL,IN,VA/ Tp)

**Atheta** undescr. sp.#5 (AL,FL,GA,KY,MO,TN/Tp),

**Atheta** undet.species (Tp guanobic in IL, MO, GA, KY (on guano & stream-bank detritus in cave in Carter Co., se & nwNM (Carlsbad & Malpais); Tp or Tx in CA)

**Atheta** (*Dimetrota*) *troglophila* Klimaszewski & Peck, 1986 (type locality cave in De Kalb Co.,TN/ Tp in AL, AR, FL, GA (Dade & Walker Cos.), IA, IL, IN, KY (Mammoth C.), MO, PA, VA/ VA T&E)

**Baeocera** Erichson, 1845 (*Sciatrophes* Blackburn, 1903; *Cyparella* Achard, 1924; *Amaloceroschema* Loebli, 1967; *Eubaeocera* Cornell, 1967) (also put in Scaphidiidae) Staphylinidae beetles in Subfamily Scaphidiinae, Tribe Scaphisomatini (39 species in US or Canada)

**Baeocera** undet. sp. (Ac in Burnet, Travis Cos., TX)

**Baryodma** Thomson, 1858(= *Aleochara* in part or in whole) Staphylinidae beetles in Subfamily Aleocharinae, subTribe Myllaenini (21? species in US or Canada)

*Baryodma uvidula* Casey = *Aleochara quadrata*

**Beeria** Hatch, 1957 - Staphylinidae beetles in Subfamily, Staphylininae, Tribe Diochini, subTribe Philonthina (1 species in US & Canada)

**Beeria** *nematocera* (*Philonthus n.* Casey, 1915; *B. punctata* Hatch, 1957) (seAK to wOR/ Tp in WA; Tp or Tx in BC) **Bibl.:** Smetana 1977-8, 1981b

**Belonuchus** Nordmann, 1837 - Staphylinidae beetles in Subfamily, Staphylininae, Tribe Diochini, subTribe Philonthina (11 species in US or Canada) **Bibl.:** Mank 1923; Silvestri 1945; Smetana 1995

**Belonuchus** *aphaobius* Smetana, 1995 (type locality in Travis Co.?, TX/ Tp in c,wTX (Bexar, Sutton, Kendall, Travis Cos.)

**Belonuchus** undescr. sp.? (near *B. moquinus*, may = *B. aphaobius*) (Tp in seNM, wTX (San Saba Co.))

**Belonuchus** undet. sp. (Tp in Johnston & Woodward Cos.,OK)

**Belonuchus** *rufipennis* (*Staphylinus r.* Fabricius, 1801) (e,swUS/ frequent Tp in TX (Edwards, Hays, Lampasas, Travis, Williamson, Val Verde Cos.)

**Belonuchus** *troglophilus* Smetana, 1995 (type locality cave in Cochise Co., AZ/ known only from caves/ Obligate Tp in sAZ (Cochise Co.), wTX (Brewster, Val Verde Cos.) & OK (Woodward, Johnston Cos.)



***Biocrypta*** Casey, 1905 - Staphylinidae beetles in Subfamily Paederinae, Tribe Paederini, subTribe Cryptobiina (2 species in US or Canada) Larvae: Newton 1990a.

***Biocrypta magnolia*** Blatchley, 1917 (epigean FL/ Tp in cave in San Saba & Travis Cos.,TX +Mex.)

***Biocrypta*** undet. sp. (Tp in Bell, Bexar, Coryell, Travis Cos., TX)

***Bisnius*** Stephens, 1829 (*Gefyrobius* Thomson 1859) Staphylinidae beetles in Subfamily, Staphylininae, Tribe Diochini, subTribe Philonthina (34 species in US or Canada) Bibl.: Smetana 1995

***Bisnius parvus*** Sharp, 1874 (epigean in most of US (except south) & sCanada/ Tx or Tp in MO & OK (Woodward Co.))

***Bisnius sordidus*** (*Staphylinus s.* Gravenhorst, 1802; *Philonthus pachycephalus* Nordmann, 1837; *P. placidus* Erichson, 1840; *P. niger* Melsheimer, 1844; *P. chilensis*, *chloropterus* Solier, 1849; *P. longipennis* Provancher, 1877; *P. brouni* Duvivier, 1883; *P. testaceipennis* Roubal, 1948) (Tp or Tx in MO)

***Blepharhymenus*** Solier, 1849 (*Echidnoglossa* Wollaston, 1864; *Blepharhymenus* Gemminger & Harold, 1868 emend.; *Colusa* Casey, 1885) Staphylinidae beetles in Subfamily Aleocharinae, Tribe Oxypodini, Subtribe Blepharhymenina (25 species in US or Canada)

***Blepharhymenus illectus*** (*Echidnoglossa illecta* Casey, 1911) ( Tp in AL, MO, TN)

***Brathinus*** LeConte, 1852 - Staphylinidae beetles in Subfamily Omaliinae, Tribe Anthophagini.(3 species in US or Canada) **Bibl.:** Hubbard 1894; Peck 1975d

***Brathinus nitidus*** LeConte, 1852 (Newfoundland & NS w. to Lake Superior & s.along Appalachia to n.AL/ infrequent Tp in AL (DeKalb Co.), KY, NS, NY, OK, TN (Grundy Co.), seVA, epigean or Tx? in north) **Bibl.:** Frank, Habeck & Peck 1987,1975d: Peck 1975; Thayer 1985

***Carpelimus*** Leach, 1819 (= *Trogophloeus*, *Taenosoma* Mannerheim, 1830; *Batychrus* Gistel, 1834; *Troginus* Mulsant & Rey, 1878; *Boopinus* Klima, 1904; *Corynocerus* Eichelbaum, 1915; *Oxytrogus* Wendeler, 1930; *Nanolobus* Cameron, 1933; *Bucephalinus* Koch, 1934; *Myopinus*, *Paraboopinus*, *Paracarpelimus*, *Thoracoplatynus* Scheerpeltz, 1937; *Paratrogophloeus* Hatch, 1957; *Typhlopinus* Coiffait, 1967) Staphylinidae beetles in Subfamily Oxytelinae, Tribe Coprophilini (79 species in US or Canada)

***Carpelimus*** undet. sp. or species (Tp in Bexar,Culberson,Edwards Cos.,TX; Tp or Tx in MO)

*Ceuthophagus* - See *Geodromicus*

***Clavilispinus*** Bernhauer, 1926 Thomson, 1859 Staphylinidae beetles in Subfamily Osoriinae, Tribe Thoracophorini, Subtribe Clavilispinina (also put in Lispininae & Oxytelinae, Tribe Coprophilini) (6 species in US or Canada)

***Clavilispinus exiguus*** (*Lispinus* Erichson, 1840; *Anotylus exiguus*) (epigean in SW, SE US/ infrequent troglophile in AL (DeKalb, Marshal Cos.), IA (Clayton, Jackson Cos.), IL (Monroe Co.) & TN (Cannon & Grundy Cos.)

*Conosoma velocipes* = *Sepedophilus* v.

***Coproporus*** Kraatz, 1857 - Staphylinidae beetles in Subfamily Tachyporinae, Tribe Tachyporini (9 species in US or Canada)

***Coproporus laevis*** LeConte, 1863 (epigean in eUS, NY w. to AR, s. to TX, FL/ Ac in KY (Boyle Co.)

***Coproporus*** undet. sp. (Wonder C., TN)

***Cylindropsis*** Fauvel, 1885 - Staphylinidae beetles in Subfamily Osoriinae) (1? species in US, may not be found north of Mexico)

***Cylindropsis*** (or related genus) undescr.? sp. (\*cave in Travis Co., TX/ Tb)

***Deinopsis*** Matthews, 1838 (= *Dinopsis* Agassiz, 1846) Staphylinidae beetles in Subfamily Aleocharinae, Tribe Deinopsini (once in Aleocharini) (11 species in US or Canada)

***Deinopsis*** undet. Sp. (Tx in IL)

***Deinopteroloma*** Jansson, 1946 (= *Mathrilaenum* Moore, 1966) - Staphylinidae beetles in Subfamily Omaliinae, Tribe Anthophagini (2 species in US or Canada) **Bibl.:** Jansson, 1946; Smetana 1985

***Deinopteroloma pictum*** (*Lathrimaenum p.* Fauvel, 1878) (Epigean CA to WA/ Ac or Tx in cave in Skagit Co., WA)

***Deinopteroloma subcostatum*** (*Anthobium s.* Maklin, 1853; *Mathrilaenum s.* Moore, 1966) Jansson, 1946 (epigean CA to AK/ Ac, Tx or Tp in Vancouver Island, BC)

***Deleaster*** Erichson, 1839 - Staphylinidae beetles in Subfamily Oxytelinae, Tribe Deleasterini (also put in Tribe Coprophilini) (3 species in US or Canada)

***Deleaster trimaculatus*** Fall, 1910 (epigean in CO, NM, AZ, nwMex./ Ac in AZ (Gila Co.)

***Derops*** Sharp, 1889 (= *Rimulincola* Sanderson, 1947) Tachyporinae Macleay, 1825 (crab-like rove beetles) Staphylinidae beetles in Subfamily Tachyporinae, Tribe Deropini (1 species in US) **Bibl.:** Smetana 1985

***Derops divalis*** (*Rimulincola d.* Sanderson, 1947) (type locality in deep rock crevices, Devils' Den State Park (near Winslow), AR/ frequently in very deep litter in rock cracks in Ozarks region in to IL/ infrequent Tp in AR, IL (Monroe, Pike Cos.), MO (Barry, Crawford, Phelps Cos.)) **Bibl.:** Smetana 1983

***Dianous*** Leach, 1819 - Staphylinidae beetles, Subfamily Steninae (2 species in US or Canada)  
***Dianous chalybaeus*** LeConte, 1863 (epigean across Canada & in neUS/ Ac in NY (Warren Co.)

***Dimetrota*** (= *Rheocara l.* Casey; *Echochara l.* Casey; *Dalotia*, *Engamota* Casey, 1910; *Dimetrotina* Casey 1911; *Coproceramius* Gistel, 1857) Staphylinidae beetles in Subfamily Aleocharinae, Tribe Athetini, Subtribe Dimetrotina (43 species in US or Canada)

***Dimetrota lucifuga*** Klimaszewski & Peck, 1986 (type locality cave in Marshall Co.(AL)/caves only/ Tp in AL, FL, GA, KY, MO, TN, TX)

***Dimetrota prudhoensis*** Lohse, 1990 (Ac, Tx or Tp in Vancouver Island, BC)

***Diachus*** Erichson, 1839 (large rove beetles) Staphylinidae beetles in Subfamily Staphylininae, Tribe Diochini (1 species in US or Canada)

***Diachus schauumi*** Kraatz, 1860 (*D. brevipennis*, *pallidiceps*, *thoracicus* Casey, 1906)(epigean eUS, n. to sON & PQ/ Tp in Bell, Coryell, Travis, Williamson Cos., TX) **Bibl.:** Smetana 1982; Newton 1990a)

***Echiaster*** Erichson, 1840 (*Leptogenius* Casey, 1886) Staphylinidae beetles in Subfamily Paederinae, Tribe Paederini, subTribe Echiasterina (2 species in US or Canada)

***Echiaster brevicornis*** (*L.b.* Casey, 1886; *L. virginicus* Fall, 1901) (epigean IN, TX, seUS/ Ac in cave in Travis Co., TX)

***Echiaster*** undet. sp. (?Ac in Bexar, Williamson Cos., TX)

*Echochara* (see *Aleochara*),  
*Echochara lucifuga* (= *Aleochara l.*),

***Empelus*** LeConte, 1862 - Staphylinidae beetles in Subfamily Empelinae (1 species in US or Canada)

***Empelus brunnipennis*** (Mannerheim, 1852) (epigean sAK to CA/ Ac, Tx or Tp in Vancouver Island, BC) **Bibl.:** Newton & Thayer 1992, 1995

***Erichsonius*** Fauvel, 1874 (= *Actobius* Fauvel, 1876; *Sectophilonthus* Tottenham, 1949 (subgenus)) Staphylinidae beetles in Subfamily Staphylininae, Tribe Diochini, subTribe Philonthina.(19 species in US or Canada) **Bibl.:** Frank, 1975, 1981

*Erichsonius nanus* (*A.n.* Horn, 1884) (epigean from AK to Canada, MidWest, NE/ Ac in cave in IL (Hardin Co.)

*Erichsonius patella* (*Actobius p.* Horn, 1884) (epigean across most of Canada, nUS/ Ac St. Claire Co. (AL)), GA (Chatooga Co.), KY (Hart Co.), MO (Howell Co.), TN (Claiborne Co.) & VA (Montgomery Co.)

*Erichsonius pusio* (*Actobius p* Horn, 1884) (sCanada, nUS from UT to NC/ Ac in cave in IL (Hardin Co.)

*Erichsonius* undet. sp. or species (Tx in cave each in Howell & McDonald & OR Cos., MO; Tp in Bell, Bexar, Coryell, Kendall, Travis Cos., TX)

*Euaesthetus* Gravenhorst, 1806 (*Eristhetus* Leach, 1819; *Evaesthetus*, *Eristethus* Agassiz, 1856 Emend.) Staphylinidae beetles in Subfamily Euaesthetinae (12-18 species in US or Canada)

*Euaesthetus* undet. sp. (Ac in cave in Bell Co., TX)

*Eusphalerum* Kraatz, 1858 Staphylinidae beetles in Subfamily Omalinae, Tribe Eusphalerini (27 species in US or Canada)

*Eusphalerum fenyesei* Bernhauer, 1912 (Ac, Tx or Tp in Vancouver Island, BC)

*Eusphalerum pothos* Mannerheim, 1843 (Ac, Tx or Tp in Vancouver Island, BC)

*Eusphalerum* undet. sp. (Ac or Tx in 1 seAK cave)

*Eustilicus* Sharp, 1886 (= *Trochoderus* Sharp, 1886; *Omostilicus*, *Stilicolina* Casey, 1905) Herman, 1970) Staphylinidae beetles in Subfamily Paederinae, Tribe Paederini, subTribe Stilicina (may belong in Medonina) (6 species in US or Canada) **Bibl.:** Frania, 1986; M.Sanderson 1947

*Eustilicus condei* (*Stilicolina c.* Jarrige, 1960) (type locality cave in Kerr Co., cTX +11 TX cos. & seNM, Mex./ Tp,caves only) **Bibl.:** Frania 1990; Herman 1970

*Eustilicus tristis* (*Lathrobium t.* Melsheimer, 1844; *Stilicolina t.*) (ne to c,swUS epigean/ Infrequent Tp in CA, AL, KY (Adair; Co.), MO (Howell Co.)) I. Moore 1964

*Falagria* Leach, 1819 - see *Lissagria*

*Flohria* Sharp, 1884 - Staphylinidae beetles in Subfamily Staphylininae, Tribe Staphylinini, Subtribe Philonthina? (1 species in US or Canada)

*Flohria subcoerulea* (*Trigonophorus s.* LeConte, 1863; *Trigonopselaphus s.*) (Ttx or Ac in Cot Cave, Kickapoo Caverns State Park, Kinney Co., TX)

*Gabrius* Curtis, 1829 - Staphylinidae beetles in Subfamily, Staphylininae, Tribe Diochini, subTribe Philonthina (42 species in US or Canada)

***Gabrius microphthalmus*** (*Philonthus m.* Horn, 1884) (across sCanada, eUS from SD to NC/ Ac in IL (Hardin Co.))

*Gastrolobium* - See *Homaeotarsus*

***Geodromicus*** Redtenbacher, 1856 (= *Psephidonus* Gistel, 1856) Staphylinidae beetles in Subfamily Omaliinae, Tribe Anthophagini (12 species in US or Canada)

***Geodromicus brunneus*** (= *Anthophagus b.* Say, 1823; *Ceuthophagus b.* Packard, 1896; *Anthophagus caesus* Erichson, 1840; *A. verticalis* Say, 1834) (E to PQ epigean / frequent Tp in **AL** (Peck: Beanfield Cave, Jackson Co.), **AR** (Peck: Brewer (Boone Co.) & Blanchard Sprg. (Stone Co.) Cave), **GA** (Peck: Bible Spr. & Mt. Cove Farm Cave, Walker Co.), **IL** (Hardin Co.), **IN** (Jefferson Co.), **KY** (Edmondson, Peck: Gerrard, Hart, Metcalf, Scott, Warren Cos.), **MO** (Peck: Crawford & Perry Cos.), **NY** (Peck); **OH** (Adams Co.), **TN** (Cannon Co.), **VA** (Smyth & Tazewell Cos.), **WV** (Greenbrier, Monroe & Pocahontas Cos.) TTx in **OK** (prob.); **IL**, **KY** (Mammoth C.))

***Geodromicus*** undet. sp. or species (Tx in AR; Tx or Ac in cave in Carter Co., KY)

***Habrocerus*** Erichson, 1829 Staphylinidae beetles in Subfamily Habrocerinae (3 species in US or Canada)

***Habrocerus*** undet. sp. (Ac in 1 seAK cave)

***Hemiquedius*** Casey, 1915 Staphylinidae beetles in Subfamily Staphylininae, Tribe Staphylinini, Subtribe Quediina (also put in Quediinae & Tribe Diochini, subTribe Philonthina) (3 species in US or Canada)

***Hemiquedius campbelli*** (*Heterothops c.* Smetana, 1971) (eUS from MI, TX to FL epigean/ Ac in KY (cave in Edmonson Co.))

***Hemiquedius carbonatus*** Fall, 1901 (cf. remains of 12,900 yrs. BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM))

***Hesperolinus*** Casey, 1906 - Staphylinidae beetles in Subfamily Staphylininae, Tribe Xantholini (also put in Xantholininae) (1 species in US or Canada)

***Hesperolinus parvus*** (*Leptolinus p.* LeConte, 1863) (epigean in CA non-cave *Neotoma fuscipes* woodrat nest)

***Hesperus*** Fauvel, 1874 - Staphylinidae beetles in Subfamily Staphylininae, Tribe Diochini, subTribe Philonthina (6 species in US or Canada)

***Hesperus baltimorensis*** (*Staphylinus b.* Gravenhorst, 1802; *Philonthus b.*) (epigean most of eUS/ Tx? in MO (cave in Crawford Co.))

**Hesperus** *stehri* Moore, 1958 (\*type locality cave in Hocking Co.,OH/ Tp) Smetana 1995

*Heterothops* Stephens, 1829 = *Trichophya* &/or *Trichopygus* Nordmann, 1837

*Heterothops campbelli* = *Hemiquedius* c.

*Heterothops caronatus* = *Hemiquedius* c.

*Heterothops pilicornis* = *Trichophya* p.

**Homaeotarsus** Hochhuth, 1851 (= *Spirosoma* Motschulsky, 1857; *Hesperobium*# Casey, 1886; *Gastrolobium* Casey, 1905; *Homoeobium*, *Nemoeotus* Blackwelder, 1939) Staphylinidae beetles in Subfamily Paederinae, Tribe Paederini, subTribe Cryptobiina

**Homaeotarsus** *badius* (*Lathrobium* b. Gravenhorst, 1902) (eUS epigean/ Ac in cave in MO (Franklin Co.)

**Homaeotarsus** *bicolor* (*Lathrobium* b. Gravenhorst, 1902) (widespread eUS epigean/ Ac in cave in IL (Hardin Co.)

**Homaeotarsus** *capito* (*Cryptobium* c. Casey, 1884) (widespread eUS epigean/ Ac in IL (cave in Hardin Co.)

**Homaeotarsus** *carolinus* (*Cryptobium* c. Erichson, 1840) (c,eUS epigean/ Ac in AL (2 caves in Jackson Co.), KY (one cave in Barren Co.) & TN (cave in Grundy Co.)

**Homaeotarsus** *cinctum* (*Lathrobium* c. Say, 1834) (widespread US? epigean/ Ac in VA (cave in WA Co.)

**Homaeotarsus** (*Gastrolobium*) sp. nr. *pimerianus* LeConte, 1863 (c. to wUS epigean/ Ac in AZ (cave in Gila Co.) & NM (one cave each in Chaves & Lincoln Cos.)/ sp. nr. *pimerianus* – Tp? in cave in Edwards Co., TX)

**Homaeotarsus** undet. sp. or species (Tp in cTX; Tx in 1 cave each in Logan Co. & Carter Cos., KY)

**Hoplandria** Kraatz, 1857 (= *Genosema*#, *Lophomucter*# Notman, 1920; *Arrhenandria*# Genier, 1989) Staphylinidae beetles in Subfamily Aleocharinae, Tribe Hoplandriini (12 species in US or Canada)

**Hoplandria** (*H.*) *lateralis* (*Gyrophaena* l. Melsheimer, 1844; *H. ochracea* Kraatz, 1857; *H. arizonica*, *carinata* & *texana* Casey, 1910) (epigean E to ON,PQ/ Ac in IL (2 caves)

**Ilyobates** Kraatz, 1856 (= *Gennadota* Casey, 1906) Staphylinidae beetles in Subfamily Aleocharinae, Tribe Oxypodini, Subtribe Oxypodina (once in Blepharhymenina) (2 species in US or Canada)

**Ilyobates** *canadensis* (*G.c.* Casey, 1906) (eCanada to PA epigean/Tx or Ac in 2 PA caves)

***Ilyobates puberulus*** (*G.p.* Casey, 1893; *Callicerus p.* Casey) (ON to PA epigeal/ Tp in IA, NY, MW, IL, MO)

***Ischnosoma*** Stephens, 1829 - Staphylinidae beetles in Subfamily Tachyporinae (13 species in US or Canada)

***Ischnosoma splendidus*** (*Tachinus s.* Gravenhorst, 1806) (in CA non-cave *Neotoma fuscipes* woodrat nest)

***Lathrobium*** Gravenhorst, 1802 (=Lathrobium Billberg, 1820; *Glyptomerus* Mueller, 1856; *Typhlobium* Kraatz, 1856; *Centrocnemis* Joseph, 1868 Homo.; *Hypophylladobius* Fauvel, 1885; *Tetartopeus*# or treated as genus Czwalina, 1888; *Litolathra*, *Abletobium*#, *Apteralium*#, *Deratopeus*, *Lathrobioma*#, *Lathrobiopsis*#, *Lathrolepta*# Casey, 1905; *Centrocnemiella* Strand, 1934; *Madecalobrathium* Scheerpeltz, 1961; *Glyptomerodoschema* Scheerpeltz, 1976) Staphylinidae beetles in Subfamily Paederinae, Tribe Paederini, subTribe Lathrobiina (71 species in US or Canada)

***Lathrobium*** (*Tetartopeus*) *angulare* LeConte, 1863 (seCanada, eUS epigeal, NH to AR, TN/ Ac in FL (cave in Alachua Co.))

***Lathrobium*** (*Apteralium*) *brevipenne* LeConte, 1863 (swUS epigeal/ Ac in MO (1 cave each in Boone & OR Cos.) & NC (cave in Jackson Co.?)

***Lathrobium*** undet. sp. (Ac? in cave in San Saba Co., TX)

***Lesteva*** Latreille, 1796 (*Pseudolesteva* & *Tevales* Casey, 1893; *Paralesteva* C., 1905; *Lesta* Blackwelder, 1952) - Staphylinidae beetles in Subfamily Omaliinae, Tribe Anthophagini (2 species in US or Canada) Steel 1970

***Lesteva cribratulus*** (*Trevalis c.* Casey, 1893) (infrequent Tp in AL (Jackson & St.Claire Cos.), Y (Carter Estill & Meniffee Cos.) & NC (Transylvania Co.))

***Lesteva pallipes*** LeConte, 1863 (*L. biguttata* & *picescens* LeConte, 1863) (Tp in AL (DeKalb, Franklin, Jackson, Madison, Marshal Cos.), AR (Boone Co), GA (Bartow, Chatooga & Walker Cos.), IA (Winneshiek Co.), IL (Hardin Co.), IN (Harrison, Lawrence & Crawford Cos.), KY (Edmonson Co. (Mammoth Cave), Estill, Garrard, Hart, Jackson, Larue, Meade, Metcalf, Rockcastle, Taylor, Westford, Woodford Cos.), MD (Allegeny Co.?), MO (Boone, Camden, Carter, Stone Cos.), TN (Cannon, Davidson, DeKalb, Franklin, Giles, Grundy, Rutherford Cos., TTX?) & VA (Montgomery, Roanoke & Smyth Cos.))

*Leucorus* - see *Orus*

***Lissagria*** Casey, 1906 (*Omoschema* Notman, 1920) Staphylinidae beetles in Subfamily Aleocharinae, Tribe Falagriini (2 species in US or Canada)

**Lissagria** *laeviuscula* (*Falagria l.* LeConte, 1866; *L. impressifrons, fissilis, longicollis, minuscula, robusta* Casey, 1906) (epigean in CA/ TTx in CA)

**Lithocharis** Dejean, 1833 (= *Pseudomedon* Mulsant & Rey, 1878; *Metaxyodonta* & Ramona Casey, 1886) Staphylinidae beetles in Subfamily Paederinae, Tribe Paederini, subTribe Medonina (9-10 species in US or Canada) **Bibl.:** Frank 1991; Paulian 1941

**Lithocharis** undescr. sp. (cave each in Kiowa Co.(OK) + Childress, Hardeman & Wheeler Co., nwTX/ prob. Tp)

**Lithocharis** undet. sp. (Tp? in Bexar, Williamson Cos., TX)

**Lobrathium** Mulsant & Rey, 1878 (= *Bathrolium* Gozis, 1886; *lathrobiella, Eulathrobium, Lathrotropis, Pseudolathra, Linolathra, Microlathra, Paralathra* Casey, 1905; *Ponthrobium* Korge, 1971; *Allobrathium* Coiffait, 1972) Staphylinidae beetles in Subfamily Paederinae, Tribe Paederini, subTribe Lathrobiina (70 species in US or Canada)

**Lobrathium** *gnomum* (*Lathrotropis g.* Casey, 1905) (swUS epigean/ Ac in CA, Mariposa & Tuolumne Cos.)

**Lobrathium** (*Eulathrobium*) *subseriatum* (*Lathrobium s.* LeConte, 1880; *Lathrotropis ustulatum* Casey, 1905) (BC to CA/ Tp in CA)

**Lobrathium** undet. sp. (?Ac in cave in Comal Co., TX)

**Lordithon** Thomson, 1859 (= *Bobitobus* Tottenham, 1939) Tachyporinae Macleay, 1825 (crab-like rove beetles) Staphylinidae beetles in Subfamily Tachyporinae, Tribe Mycetoporini (23-29 species in US or Canada)

**Lordithon** *obsoletus* (Tachinus o. Say, 1834) (epigean in eCanada, eUS, NS to NY to KS, s. to TX & FL/ Ac in cave in GA (Chatooga Co.)

**Lordithon** (*L.*) *thoracicus* (= *Oxyporus t.* Fabricius, 1776; *Tachinus cincticollis & trimaculatus* Say, 1834; *Oxyporus pygmaeus* Fabricius, 1776; *Boletobius binotatus & venustus* Melsheimer, 1844; *Bolitobius occiduus* Casey, 1884) (epigean in all Canada, NE to CA/TTx in CA)

**Lordithon** *poecilus* (*Bolitobius p.* Mannerheim, 1852) (Ac, Tx or Tp in Vancouver Island, BC)

**Lordithon** undet. sp(s). (?Ac in cave in Bell Co., TX; Ac 1 seAK cave)  
*Mathrilaenum* Moore, 1966 = *Deinopteroloma*

**Medon** Stephens, 1833 (= *Platymedon* Casey, 1889; *Oxymedon, Medonodonta, Paramedon & Tetramedon* Casey, 1905) Staphylinidae beetles in Subfamily Paederinae, Tribe Paederini, subTribe Medonina (also put in Lathrobiini) (51 species in US or Canada)



**Medon** *consanguineum* (*Lithocharis c.* Casey, 1886) (in CA non-cave *Neotoma fuscipes* woodrat nest)

**Medon** undet. sp. (TTx or Ac in CA, TX)

*Microsaurus* - see *Quedius*

**Microedus** LeConte, 1874 - Staphylinidae beetles in Subfamily Omalinae, Tribe Anthophagini (10 species in US or Canada)

**Microedus** *austinianus* LeConte, 1874 (epigean AK to CA, AB to AZ/ Tx or Tp in Vancouver Island, BC)

**Microedus** *fenderi* Hatch, 1957 (or undescr. sp.) (epigean AK to CA, AB to AZ/ Tx or Tp in Vancouver Island, BC)

**Mycetoporus** Mannerheim, 1831 - Staphylinidae beetles in Subfamily Tachyporinae, Tribe Mycetoporini (22 species in US or Canada)

**Mycetoporus** *neotomae* Fall, 1910 (in CA non-cave *Neotoma fuscipes* woodrat nest)  
*Mycetoporus splendidus* = *Ischnosoma s.*

**Myllaena** Erichson, 1837 (*Centroglossa* Matthews, 1838) Staphylinidae beetles in Subfamily Aleocharinae, Tribe Aleocharini Myllaenini (9-22 species in US or Canada)

**Myllaena** *arcana* Casey, 1911 (*M. immunda* C.1911) (ON, NB & PQ s. to AL, w. to AB, IA, AL, sMex./ Ac in 1 AL cave)

**Myllaena** undet. sp. (in CA non-cave *Neotoma fuscipes* woodrat nest)

**Myrmecocephalus** MacLeay, 1873 (*Stilicioides* Broun, 1880; *Stenagria* Sharp, 1883; *Lorinota* Casey, 1906) Staphylinidae beetles in Subfamily Aleocharinae, Tribe Falagriini (8 species in US or Canada)

**Myrmecocephalus** *cingulatus* (*Falagria c.* LeConte, 1866; *M. tenuicornis* Casey, 1906; *L. sinuosa* C., 1911) (Ac in 1 IL cave)

**Myrmecosaurus** Wasmann, 1909 - Staphylinidae beetles in Subfamily Paederinae, Tribe Paederini, subTribe Echiasterina (1 species in US or Canada)

**Myrmecosaurus** *ferrugineus* Bruch, 1932 (epigean in FL, AL, LA/ alien, fireant associate/ Tx in cave in Travis Co., TX)

**Neobisnius** Ganglbauer, 1895 - Staphylinidae beetles in Subfamily Staphylininae, Tribe Diochini, subTribe Philonthina (14-17 species in US or Canada)

**Neobisnius paederoides** (*Philonthus p.* LeConte, 1863) (e,sUS epigean/ Ac in IL (cave in Hardin Co.)

**Neobisnius sobrinus** (*Philonthus s.* Erichson, 1863) (seCanada, most of US (except AK, sFL) epigean/ infrequent Tp in KY (Adair, Green, Meade, Metcalf, Woodward Cos.), MO (Crawford Co.) & TN (Rutherford Co.)

**Neobisnius** undet. sp. or species (cave each in Taney Co.,MO & Bexar Co., TX)

**Nitidotachinus** Campbell, 1993 - Staphylinidae beetles in Subfamily Tachyporinae, subTribe Tachyporini (5 species in US or Canada)

**Nitidotachinus scrutator** (= *Tachinus s.* Gemminger & Harold, 1868; *T. discoideus* Melsheimer, 1844, Homo.; *T. repandus* Horn, 1877)(Tp or Tx in MO)

**Nitidotachinus** undescr. sp.#1 (Tp in MO,TN)

**Nitidotachinus** undescr. sp.#2 (\*cave in Crawford Co.,MO/ Tp)

**Nitidotachinus tachyporoides** (*Tachinus t.* Horn, 1877) (type locality? cave in Lawrence Co., IN/ Tx, Ac or Tp)

**Ocalea** Erichson, 1839 (= *Isoglossa* Casey, 1893; *Rheobioma* Casey, 1906) Staphylinidae beetles in Subfamily Aleocharinae, Tribe Oxypodini, Subtribe Oxypodina (7 species in US or Canada)

**Ocalea vancouveri** Casey, 1893 (Ac, Tx or Tp in Vancouver Island, BC)

**Ochtheophilus** Mulsant & Rey, 1856 (*Ancyrophorus* Kraatz, 1858) - Staphylinidae beetles in Subfamily Oxytelinae (3 species in US or Canada)

**Ochtheophilus biimpressus** (*Phloeonaeus b.* Maklin, 1852) (Ac, Tx or Tp in Vancouver Island, BC)

**Olophrum** Erickson, 1839 - Staphylinidae beetles in Subfamily Omaliinae, Tribe Anthophagini (7-9 species in US or Canada)

**Olophrum obtectum** Erickson, 1839 (epigean in eCanada, neUS, s. to KS, TN, NC/ Ac in TN (Anderson Co.)

**Ontholestes** Ganglbauer, 1895 - Staphylinidae beetles in Subfamily Staphylininae (2 species in US or Canada)

**Ontholestes cingulatus** (*Staphylinus c.* Gravenhorst, 1802) (epigean E, NW/ Ac or Ttx in Newton Co., AR)

**Orobanus** LeConte, 1878 - Staphylinidae beetles in Subfamily Omaliinae, Tribe Anthophagini (7 species in US or Canada)

**Orobanus falli** Mank, 1934 (Tx? in Vancouver Island, BC)

**Orobanus rufipes** Casey, 1886 (Tx? in Vancouver Island, BC)

**Orobanus tarsalis** Hatch, 1957 (Tx? in Vancouver Island, BC)

**Orobanus** undet. sp. or species (TTx or Ac? in CA & 5 seAK cave)

**Orus** Casey, 1884 (*Leucorus*#, *Pycnorus*# Casey, 1905; *Nivorus*# Herman, 1965)

Staphylinidae beetles in Subfamily Paederinae, Tribe Paederini, subTribe Scopaeina (16-18 species in US or Canada)

**Orus** (*Leucorus*) *rubens* (= *L. r.* Casey, 1905) (AZ, IO, IL, KS/ infrequent Tp in seNM, cTX (Collingsworth, Travis, Williamson, Val Verde Cos.) Herman, 1964, 1965)

**Oxypoda** Mannerheim, 1830; *Sphenoma* Mannerheim, 1830; *Disochara* Thomson, 1858; *Bessopora*, *Demosoma* Thomson, 1859; *Baeoglana* Thomson, 1867; *Podoxya* Mulsant & Rey, 1874; *Paroxypoda* Ganglbauer, 1895; *Hylota* Casey, 1906) Staphylinidae beetles in Subfamily Aleocharinae, Tribe Oxypodini, Subtribe Oxypodina (102 species in US or Canada)

**Oxypoda** undet. sp. or species (Tx in GA, seNM, MO)

**Oxyporus** Fabricius, 1775 - Staphylinidae beetles in Subfamily Oxyporinae (14 species in US or Canada)

**Oxyporus** undet. sp. (2,000 year old remains in entrance pit in AB caves)

**Oxytelus** Gravenhorst, 1802 (= *Epomotylus*, *Tanycraeus* Thomson, 1859 (both now treated as subgenera) Staphylinidae beetles in Subfamily *Oxytelinae*, Tribe Oxytelini (9 species in NA, 2? N US or Canada)

**Oxytelus nimius** (epigean in eCanada, eUS/ Ac in cave in TN (Franklin Co.)

**Oxytelus oxiguus** Erichson, 1840 (Tx or Ac in 1 IL cave),

**Oxytelus** undet. sp. (Tx or Ac in Nickajack C., Marion Co., TN)

**Paederus** Fabricius, 1777 (= *Leucopaederus*, *Pauderillus* Casey, 1905) Staphylinidae beetles in Subfamily Paederinae, Tribe Paederini, Subtribe Paederina (15 species in US or Canada)

**Paederus littorarius** Gravenhorst, 1806 (across Canada, nUS epigean/ Ac in cave in KY (Lawrence Co.)

**Philonthus** Stephens, 1829 (*Laxobates* Gistel, 1834; *Spatulonthus* Tottenham, 1955; *Paragabrius* Coiffait, 1963; *Palaeophilonthus* Coiffait, 1972) (112 for US + Canada) - Staphylinidae beetles in Subfamily Staphylininae, Tribe Diochini, subTribe Philonthina. (112-143 species in US or Canada)

**Philonthus** *ceruleipennis* (Mannerheim, 1830) (sCanada, eUS epigean, frequent on decaying mushrooms/ Ac in cave in GA (Walker Co.)

**Philonthus** *consanguineum* (*Lithocaris c.* Casey, 1886) (in CA non-cave *Neotoma fuscipes* woodrat nest)

**Philonthus** *fuscipennis* (Mannerheim, 1830 nec Block, 1799) (Tx? in Vancouver Island, BC)  
*Philonthus microphthalmus* = *Gabrius m.*

**Philonthus** *nigritulus* (*Staphylinus n.* Gravenhorst, 1802; *Gabrius n.*) (in CA non-cave *Neotoma fuscipes* woodrat nest)

*Philonthus sordidus* = *Bisnius s.*

**Philonthus** undescr. sp.#1(IA/Tp)

**Philonthus** undescr. sp.#2(IA/Tp)

**Philonthus** undescr. sp.#3(seNM,wTX/Tp)

**Philonthus** undescr. sp.#4(Crawford,WA Cos.,MO/Tb or Tp)

**Philonthus** undescr. sp.#5? (one cave each in Kiowa Co., OK & Williamson Co., TX)

**Philonthus** undet. sp. or species (Tp or Tx in cave in Walker Co.,GA; Tp in Grady Co., GA; Tx? in TN; Tp in TX; 2,000 year old remains in entrance pit in AB cave)

**Philonthus** *thoracicus* (*Staphylinus t.* Gravenhurst 1802) (sCanada, most of US epigean/ Ac in cave in MO (Crawford Co.)

**Phlaeopterus** Motschulsky, 1852 - Staphylinidae beetles in Subfamily Omaliinae, Tribe Anthophagini (14 species in US or Canada)

**Phlaeopterus** *cavicollis* Fauvel, 1878 (Ac, Tx or Tp in Vancouver Island, BC)

**Phlaeopterus** undet. sp. (Ac in 1 seAK cave)

**Platydracus** Thomson, 1858 (= *Staphylinus auctorum* (in part)) Staphylinidae beetles in Subfamily Staphylininae, Tribe Staphylinini, subTribe Staphylinina (27 species in US or Canada) **Bibl.:** A. Newton 1973

**Platydracus** (*Platydracus*) *cinnamopterus* (*Staphylinus c.* Gravenhorst, 1802) (Tp in Onondaga C.,Crawford Co.,MO)

**Platydracus** undet. sp. (Ac in Coryell, Travis Cos., TX)

**Proteinus** Latreille, 1796 (= *Protinus* Agassiz, 1846 Emend.; *Pteronius* Blackwelder, 1952) Staphylinidae beetles in Subfamily Proteininae, Tribe Proteinini (10 species in US or Canada)

**Proteinus** *basilis* Maklin, 1852 (Ac, Tx or Tp in Vancouver Island, WA)

**Proteinus** *limbatus* Maklin, 1852 (= *P. maeklini* Fauvel, 1869) (AK to WA, ON/Ac? in WA)

*Psephidonus* Gistel, 1856 = *Geodromicus*

**Quedius** Stephens, 1829 (*Raphirus*# Stephens, 1829; *Microsaurus*# Dejean, 1833; *Aemulus* Gistel, 1834; *Thanatomanes* G., 1856; *Arphirus* Tottenham, 1945; *Ediquus*#, *Sauridus* Mulsant & Ray, 1876; *Quedionuchus*# Sharp, 1884; *Distichalius*, *Megaquedius*#, *Quediochrus*, *Anastictodera*, *Paraquedius*#, *Quediellus* Casey, 1915) - Staphylinidae beetles in Subfamily Staphylininae, Tribe Diochini, subTribe Philonthina (also put in Quediinae) (91 species in US or Canada) **Bibl.:** Smetana 1971, 1973, 1976, 1981b.

**Quedius** (*Distichalius*) *capucinus* (*Staphylinus* c. Gravenhorst, 1806; *Philonthus ater* Ziegler, 1846; *Q. bardus* Melsheimer, 1846; *S. inversus* Say, 1834; *Q. seeversi* Korge, 1962), (E to ON, PQ for *Q.c.*/ Tp guanobic in KY (Edmonson (Mammoth C., Warren Cos.), MO (Boone Co.), TN (Dickson, Perry, Wayne, Smith, Warren, Grundy Cos.)

**Quedius** *caseyi* Scheerpeltz, 1933 (2,000 year old remains in entrance pit in AB cave)

**Quedius** (*Microsaurus*) *erythrogaster* Mannerheim, 1852 (*Q. neotomae* Hatch, 1957) (epigean in NA to BC, MB, ON, SK/ Tp in AL (Colbert, Jackson, Madison, Marshal Cos.), AR (Newton, Independence, Wa Cos.), CA (Amador, Calaveras, Mariposa Cos.), GA (Dade Co.), IL (Jersey, Johnson, Monroe Cos.), KY (Mammoth C. (Edmonson Co.), Fayette, Hart Cos.)), **MO** (Barry, Boone, Calaway, Camden, Carter, Crawford, Franklin, Howell, Iron, Madison, McDonald, Miller, Oregon, Phelps, Pike, Pulaski, Shannon, Taney, Texas, WA Cos.), **OK** (Adair, Seminole Cos.), OR (Barney Co.), PA (Berks Co.), TN (Cannon, DeKalb, Franklin, Marion, Rutherford, Smith, Warren Cos.), VA (Bath, Lee, Giles, Pulaski, Rockbridge, Rockingham, Scott, Shenandoah, Tazewell, WA Cos.), WV (Greenbrier, Monroe Cos.); TTx or TTp in AB, CA (Calaveras Co.) & NY (Schoharie Co.); in CA non-cave *Neotoma fuscipes* woodrat nest; 2,000 year old remains in entrance pit in Rat's Nest Cave, AB) **Bibl.:** P. Richards 1992; Smetana 1971

**Quedius** (*Microsaurus*) *fulgidus* (*Staphylinus* f. Fabricius, 1787) (epigean in Germany, alien epigean in AZ, BC, CA, CO, DC, ID, KS, MA, MI, MN, MO, NC, NJ, NM, NY, OR, PA, VA, WA, WI/ non-native Tp in AL (Calhoun, Jackson, Madison, Marshal Cos.), AR (Washington Co), GA (Dade, Walker Cos.), IL (Adams, Calhoun, Monroe, Pike, Union Cos.), IN (Lawrence & Crawford Cos.), KY (Adair, Edmonson, Fayette, Hart, Warren, Wayne Cos.), PA (Hobo Cave, Berks Co.), TN (Cannon, Coffee, DeKalb, Franklin, Marion, Wilson Cos.), VA & WV (Greenbrier, Monroe Cos.)

**Quedius** *laticollis* (*Staphylinus* l. Gravenhorst, 1802) (Ac in KY (Boyle & Woodford Cos.) & TN (cave in Overton Co.)

**Quedius** (*M.*) *limbifer* Horn, 1878 (/TTx or Ac in CA; in CA non-cave *Neotoma fuscipes* woodrat nest)

**Quedius** (M.) *mesomelinus* (*Staphylinus* m. Marsham (non-native epigean in AK, CA, CO, CT, FL, GA, IL, IN, IA, ME, MA, MI, MO, MV, NJ, NY, NC, OH, OR, PA, UT, VA, WA, WV, WI/ alien Tp in IA, MN, NB, sON, PA, VA)

*Quedius neotomae* = *Q.e.*,

**Quedius** (M.) *pellax* Smetana, 1971 (BC to CA/Tp in Calaveras Co.,CA)

**Quedius** undet. sp. #1 (Tp or Tx in PA, WV)

**Quedius** undet. sp. #2 sp.#2 (Tp in IL)

**Quedius** undet. sp. #3 (Tx in AR)

**Quedius** undet. sp. #4 (Tp in Bexar, Culberson, San Saba, Williamson Cos., TX)

**Quedius** undet. sp. #5 (16,000 to 16,300 yrs. BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM))

**Quedius** (M.) *spelaeus spelaeus* (*Q.(M.)s.* Horn, 1871; *Q. spelaeus* Smetana, 1971 (described as a subspecies of *spelaeus*); *Quediochrus quadriceps* Casey, 1915) (epigean in AB, BC, CA, CO, IA, MO, MT, NE, NW, sCanada, US, WA, WI/ Tp in nCA, ID, IA, IL (4 caves or mines), IN (Monroe, Lawrence, & Crawford Cos.), KY (Mammoth C.), MN (Peck), NS, NY (one cave), OR, UT, WV, VA, WA; 2,000 year old remains in entrance pit in Rat's Nest Cave, AB)

*Rheochara lucifuga* = *Aleochara (Echiochara) l.*

**Rimulincola** Sanderson, 1947 - Staphylinidae beetles in Subfamily Tachyporinae, subTribe Tachyporini (1 species in US or Canada)

*Rimulincola divalis* Sanderson, 1947 = *Derops divalis*

**Rugilis** Leach, 1819 - Staphylinidae beetles in Subfamily Paederinae, Tribe Paederini, subTribe Stilicina (12 species in US or Canada)

**Rugilis dentatus** Say, 1834 (eUS epigean/ Ac in MO (Perry Co.)

**Rugilis opaculus** (*Stilicus o.* Say, 1880) (eUS epigean/ Ac in VA (cave in Montgomery Co.)

**Scopaeus** Erichson, 1839 (= *Polyodontus* Solier, 1849; *Scoponeus* Motschulsky, 1858; *Leptorus*, Casey, 1886; *Scopaeoma*, *Scopaeopsis* Casey, 1905; *Pseudorus* Casey, 1910) Staphylinidae beetles in Subfamily Paederinae, Tribe Paederini, subTribe Scopaeina (42 species in US or Canada)

**Scopaeus** undet. Sp (Tx or Ac in 1 IL cave)

**Sepedophilus** Gistel, 1856 (= *Conurus* Stephens, 1829 (Homo.); *Conosomus auctorum* Motschulsky, 1857; *Conosoma auctorum* Roger, 1856 (all 3 misidentifications) Staphylinidae beetles in Subfamily Tachyporinae, subTribe Tachyporini (30-22 species in US or Canada)

**Sepedophilus castaneus** (*Conosoma c.* Horn, 1877) (Tx or Ac in CA)

**Sepedophilus** *crassus* (*Tachyporus* c. Gravenhorst, 1802) (eUS, eCanada epigean/ Ac in !IA (cave in Jackson Co.)

**Sepedophilus** *littoreus* (*Staphylinus* l. Linnaeus, 1758) (eUS, eCanada epigean/ Ac in !IA (cave in Jackson Co.; Tp in Dade Co., GA)

**Sepedophilus** *opicus* (*Tachyporus* o. Say, 1834) (Ac in TX (Coryell, Travis Cos.) & MO (Wright Co.)

**Sepedophilus** *velocipes* (*Conosoma* v. Casey, 1895; *C. virginiae* C., 1895) (NE,se Canada to NS/Ac or Tx in sON)

**Sepedophilus** sp. nr. *basalis* (*Conurus* *basalis* Erichson, 1839; *C. pulicarius* Sachse, 1852; *C. setifer* Casey, 1884) (Ac in cave in Travis Co., TX)

**Sepedophilus** undet. sp. (Tp? in cTX)

**Stamnoderus** Sharp, 1886 Staphylinidae beetles in Subfamily Paederinae, Tribe Paederini, subTribe Scopaeina (also put in Xantholininae) (3 species in US or Canada)

**Stamnoderus** undet. sp. (Tp in Bandera, Edwards (or undescr. sp. in one \*cave), Medina, Val Verde Cos.,TX)

*Staphylinus* Linnaeus, 1758 - See *Platyhydracus*

**Stenus** Latreille, 1796 (*Eyryops* Gravenhorst, 1802; *Zolmaenus* Stephens, 1829; *Laestris* Melsheimer, 1844; *Hemistenus* Motschulsky, 1860; *Mesostenus* Rey, 1884; *Nestus*, *Hypostenus*, *Tesnus* Rey, 1884; *Areus*, *Mutinus* Casey, 1884; *Astenus*, *Stenosidotus* Lynch, 1884; *Parastenus* Heyden, 1905; *Systemus* Eichelbaum, 1913; *Metastenus* Adam, 1987) Staphylinidae beetles in Subfamily Steninae (197-167 species in US or Canada)

**Stenus** (*Tesnus*) *alacer* Casey, 1884 (epigean in eUS/ Ac in MO (Perro Co.)

**Stenus** (*Stenus*) *bilentigatus* Casey, 1884 (epigean in eUS/ Ac in MO (WA Co.)

**Stenus** (*Stenus*) *renifer* LeConte, 1863 (epigean in swUS/ Ac in KY (Barren Co.)

**Stenus** undet. sp. or species (Tx in sON, CA, KY, NY)

*Stilicolina* Casey, 1905 = *Eustilicus*

*Stilocharis* - see *Lithocharis*

**Sunius** Stephens, 1829 (= *Hypomedon* Mulsant & Rey, 1878; *Chloecharis* Lynch, 1884; *Caloderma*, *Lena*, *Oligopterus*, *Trachysectus* Casey, 1886; *Asteria* Fauvel, 1889; *Hemimedon*, *Medonella*, *Micromedon* (Homo.) Casey, 1905; *Euastenus* Fiori, 1915; *Xenocharis* Bierig, 1934) Staphylinidae beetles in Subfamily Paederinae, Tribe Paederini, subTribe Medonina (27 species in US or Canada)

**Sunius** (*Caloderma*) *luculentus* (*Caloderma m.* Casey, 1886) (eUS epigeal/ Ac in KY (Marrion & Woodford Cos.)

**Sunius** (*Caloderma*) *mollis* (*Caloderma m.* Casey, 1905) or undescr. sp. (Tp in Mitchell C., San Bernadino, CA)

**Tachinus** Gravenhorst, 1802 (*Tachinoderus* Motschulsky, 1857 (now as subgens) (see *Nitidotachinus*) Staphylinidae beetles, Subfamily Tachyporinae, Tribe Tachyporini (42 species in US or Canada)

**Tachinus** *canadensis* Horn, 1877 (epigeal in seCanada, neUS, s. to NC/ Ac in MO (Boone Co.)

**Tachinus** *contortus* Hatch, 1957 (2,000 year old remains in entrance pit in AB cave)

**Tachinus** *fimbriatus* Gravenhorst, 1802 (epigeal in seCanada, eUS, s. to AR, GA/ Ac in MO (Boone Co.)

**Tachinus** *frigidus* Erichson, 1839 (epigeal in nNA, s. To CO/ Ac in IA ( Jackson Co.)

**Tachinus** *fumipennis* (*Tachyporus f.* Gravenhorst, 1802) (epigeal in sCanada, eUS, s. to FL, TX/ Ac in MO (Barry Co.) & IA (Jackson Co.)

**Tachinus** *horni* Campbell, 1973 (epigeal in seCanada, neUS, s. to NC/ Ac in IN (Harrison Co. & WA Cos.)

**Tachinus** *maculicollis* Maklin, 1852 (Ac, Tx or Tp in Vancouver Island, WA)

**Tachinus** *mexicanus* Campbell, 1873 (4,340 to 2,260 years old in scNM *Neotoma* woodrat nest)

**Tachinus** *scrutator* Gemminger & Harold, 1868 (epigeal in sc, eCanada, neUS, s. to AR, TN/ Ac in MO (Carter, Crawford, Phelps Cos.)

**Tachinus** undet. sp. (Tx or Ac in cave in Carter Co., KY)

**Tachyporus** Gravenhorst, 1802 (*Trachyopus* Rey, 1882; *Palporus*# Campbell, 1979) Staphylinidae beetles, Subfamily Tachyporinae, subTribe Tachyporini (30 species in US or Canada)

**Tachyporus** *californicus* Horn, 1877 (in CA non-cave *Neotoma fuscipes* woodrat nest)

**Tachyporus** *jocosus* Say, 1834 (*T. acaudus* Say, 1834; *T. arduus* Erichson, 1839; *T. maculipennis* LeConte, 1866; *T. infuscatus* Bernhauer, 1917; *T. snyderi* Blackwelder, 1936) (Tx or Ac in 1 IL cave (Hardin Co.) & KY (Woodford Co.)

**Tachyporus** undet. sp. (?Ac in cave in Williamson Co., TX)



**Tachyusa** Erichson, 1837 (*Tachyusota* Casey, 1906; *Ischnopoda* Stephens, 1835; *Thinonoma* Thomson, 1859; *Leucopus* Bertolini, 1872; *Caliusa*, *Cathusya* Mulsant & Rey, 1874; *Calischnopoda* Reitter, 1909; *Pischnopoda* Tottenham, 1939; *Chyusata* Tottenham, 1945; *Ischnopoderona* Scheerpeltz, 1974) (frequently treated as subgenus of *Ischnopoda*)  
Staphylinidae beetles in Subfamily Aleocharinae, Tribe Oxypodini, Subtribe Tachyusina (21 species in US or Canada)

**Tachyusa** *gracillima* LeConte, 1863 (epigean Lake Superior, NY, VA/Tx or Ac in MO cave)

**Tetrallus** Bernhauer, 1905 Staphylinidae beetles in Subfamily Aleocharinae, Tribe Hoplandriini (also put in Athetini) (5 species in US or Canada)

**Tetrallus** *fenyesi* Bernhauer, 1905 (= *Atheta f.* Casey, 1911) (epigean CA/ CA non-cave *Neotoma fuscipes* woodrat nest)

**Trichophya** Mannerheim, 1830 (= *Eumitocerus* Casey, 1886) Staphylinidae beetles in Subfamily Trichophyinae (4 species in US or Canada)

**Trichophya** *pilicornis* (Gyllenhal, 1810) (*Trichopygus p.* Stephens, 1832) adventive European species in caves as well as above-ground litter/ epigean BC to OR, e. to NF, VA/ Ac or Tx alien in MN (Fillmore Co.), MO (Camden Co.), & VA (Frederick Co.)

**Trichophya** or *Trichopygus* (= *Heterothops*) undet. sp. (Tp? in Travis, Val Verde, Williamson Cos., TX)

*Trigonopselaphus subcoeruleus* = *Flohria* s.

**Xenota** Mulsant & Rey, 1874 (*Mycota*, *Tetropla* M. & R., 1874; *Halobrecthina* Bernhauer, 1909; *Nemota*, *Rovalida*, *Delphota*, *Donesia*, Casey, 1910) Staphylinidae beetles in Subfamily Aleocharinae, Tribe Athetini, Subtribe Athetina (167-176 species in US or Canada)

**Xenota** *annexa* (= *Atheta (Atheta) annexa* Casey, 1910) (Tp in FL, IA, AL, GA (Bartow, Dade, Decatur, Walker Cos.), IL, IN, KY (Mammoth C.), MO, WV, VA/ VA T&E S1 rank; global G2G4 rank)

**Xenota** *occidentalis* (*Atheta o.* Bernhauer, 1906) (in CA non-cave *Neotoma fuscipes* woodrat nest)

**Xenota** undet. sp. or species (Ac or Tx in NS cave; Tp in Dade & Walker Cos., GA)

**Xylodromus** Heer, 1839 Staphylinidae beetles in Subfamily Omalinae, Tribe Omaliini (3 species in US or Canada)

**Xylodromus** undet. sp. (Ac in 1 seAK cave)

**Zyras** Stephens, 1835 (*Myrmoecia* Mulsant & Rey, 1873; *Platyusa* Casey, 1885; *Nototaphra* Casey, 1893) Staphylinidae beetles in Subfamily Aleocharinae, Tribe Lomechusini, Subtribe Lomechusina (19 species in US or Canada)

**Zyras obliquus** (*Myrmedonia o.* Casey, 1893) (PQ, MI, NY epigeal /Ac in 1 MO cave)

SYNCALYPTIDATE (subsumed in Byrrhidae)

**TENEBRIONIDAE** Latreille, 1802 (darkling (ground) beetles). Over 1200 sp. InNA, >80% restricted to swUS. Adults & larvae eat fungi & plants, esp. seeds. Adults have defensive glands with openings between 7<sup>th</sup> & 8<sup>th</sup> sternites. Ac, Tx or Tp undet. genera in Vancouver Island, BC).  
**Bibl.:** Triplehorn 1965

Subfamilies incl.

**Alleculinae** Laporte, 1840 (comb-clawed bark beetles) (=Alleculidae (Latreille, 1802)

Tribe Alleculini (*Capnochroa*, *Hymenorus*, *Lobopoda*)

Tribe Gonoderini (*Pseudocistela*)

**Coelometopinae** Lacordaire, 1859 (*Cibdelis*) (now in Tenebrioninae)

Tribe Coelometopini (*Xylopinus*) (now in Tenebrioninae)

**Diaperinae** (*Platydema*) (now in Tenebrioninae)

**Opatrinae**

Eleodini (*Eleodes* - see Tenebrioninae),

**Pimeliinae** Latreille, 1802

Tribe Adesmiini (*Edrotes*)

Tribe Asidini (*Glyptasida*)

Tribe Coniontini (Coniontis, Eusattus) (both once in Tenebrioninae)

Tribe Cryptoglossini (*Cryptoglossa*, *Schizillus*)

Tribe Nyctoporini (*Nyctoporis*)

Tribe Stenosini (*Araeoschizus*,

Tribe Trimytini (*Trimytis*)

Tribe Triorophini (*Eschatomoxys*, *Stibia*, *Triorophus*)

Tribe Typhiusechini (*Typhlusechus*)

**Tenebrioninae** L., 1802 (typical darkling beetles)

Tribe Eleodini (*Eleodes* (also put in Opatrinae: Eleodini), *Embaphion*)

Tribe Helopini (*Helops*)

Tribe Pedinini (*Blapstinus*, *Nocibiotes*)

Tribe Platydemini (*Platydema*) (once put in Diaperinae)

Tribe Scaurini (*Argoporis*)

Tribe Tenebrionini (*Cibdelis*, *Tenebrio*, *Xylopinus*)

Tribe Ulomini (*Alphitobius*, *Tribolium*)

*Absolus* (put in Scarabaeidae)

**Alphitobius** Stephens, 1829 (*Heterophagus* Redtenbacher, 1845; *Cryptops* Solier, 1851)  
Tenebrionidae beetles in Subfamily Tenebrioninae, Tribe Ulomini (2 species in US or Canada)

**Alphitobius** *diaperinus* (*Tenebrio d.* Panzer, 1797; *Uloma opatroides* Brulle, 1838; *Crypticus longipennis* Walker, 1858; *Phaleria rufipes* Walker, 1858) (BC to NF,E/ lesser mealworm/ Tp guanobic in Blanco, Comal, Mason, Medina, Uvalde, Val Verde Cos.,TX) **Bibl.:** Castrillo 1997; Falomo 1986; Preiss 1969

**Alphitobius** *laevigatus* (*Opatrum l.* Fabricius, 1781) (black fungus beetle) (Tp guanobic in Blanco, Burnet, Menard, Uvalde Cos.,TX)

**Araeoschizus** LeConte, 1851 - Tenebrionidae beetles in Subfamily Pimeliinae, Tribe Stenosini  
12 species in US or Canada)

**Araeoschizus** undet. sp. or species (Tx? in cave in Val Verde Co.,TX/ 15,680 & 10,300 to 10,070 years old in *Neotoma* woodrat nest in Tinajas Mts., Yuma Co,AZ))

**Argoporis** Horn, 1870 - Tenebrionidae beetles in Subfamily Tenebrioninae, Tribe Scaurini (4 species in US or Canada)

*Argoporis oxypoda* = *Aleocara taeniata*? in Staphylinidae,

**Argoporis** *rufipes* Champion, 1885 *nitida* (A.n. Casey, 1890) (TTx in cave in Pecos Co., TX)

**Argoporis** undet. sp. (14,100 - 7,600 year old fossil in *Neotoma* woodrat midden, Puerto Blanco Mts.,Pima Co., sAZ; 15,680, 11,600 to 10,000 & 8,000 to 7,000 years old in *Neotoma* woodrat nest in Tinajas & Butler Mts., Yuma Co,AZ; 20,500 to 14,500 years old in *Neotoma* nest, Ajo Mts., Pima Co., AZ)

**Blapstinus** Sturm, 1826 (*Pedonoeces* Waterhouse, 1845; *Tessarome* Boheman, 1858; *Lachnodere* Mulsant & Rey, 1859) - Tenebrionidae beetles in Subfamily Tenebrioninae, Tribe Pedinini (28 species in US or Canada)

**Blapstinus** *fortis* LeConte, 1878 (TTx in Bexar, Val Verde Cos., TX)

**Blapstinus** (*E.*) *hispiabris* (*Blaps h.* Say, 1824; *E. sulcata* Leconte, 1852 Homo.; *E. connexa* L.1857; *E. lecontei* Gemminger, 1870; *E. compositus* Casey, 1891; *E. laevis*, *elongata*, *sculptilis*, Blaisdail, 1909 Unav.; *E. attenuata*, *imitabilis* B., 1918; *E. immunda* B.1925)

**Blapstinus** (*E.*) *hispidibris nuptus* (*E.n.* LeConte, 1858) (Tx in cave in Pecos Co., TX)

**Blapstinus** nr. *metallicus* Fabricius, 1801 (4,200 to 11,400 yrs. BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM)

**Blapstinus**.*pratensis* LeConte, 1859 ( 2,000 to 4,000 and 10,900 to 11,900 yrs. BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM)

**Blapstinus**.undet. sp. (10,950 years old in *Neotoma* woodrat nest in Tinajas Mts., Yuma Co,AZ))

**Capnochroa** LeConte, 1862 - Tenebrionidae beetles in Subfamily Alleculinae, Tribe Alleculini (1 species in US & Canada)

**Capnochroa** *fuliginosa* (= *Cistela f.* Melsheimer, 1846) (ON, PQ, NB epgiean /Tx in MO),

*Centrioptera* Horn, 1870 - put in Carabidae

**Cibdelis** Mannerheim, 1843 - Tenebrionidae beetles in Subfamily Tenebrioninae, Tribe Tenebrionini (also put in Coelometopinae) (5 species in US or Canada)

**Cibdelis** *blaschkii* Mannerheim, 1843 (in CA non-cave *Neotoma fuscipes* woodrat nest)

**Coniontis** Eschscholtz, 1829 - Tenebrionidae beetles in Subfamily Pimeliinae, Tribe Coniontini (once in Tenebrioninae) .(48 species in US or Canada)

**Coniontis** undet sp. (Ac or Tx in woodrat nest in Kaetan Cave, Grand Canyon, Coconino Co.,AZ; *Neotoma* woodrat midden in Canyonlands, UT/ 10,900 to 11,440 and 18,000 to 19,700 yrs. BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM))

**Coniontis** *subpubescens* LeConte, 1851 (in CA non-cave *Neotoma fuscipes* woodrat nest)

**Eleodes** Escholtz, 1829 (*Amphidora* Eschscholtz, 1829; *Cratidus*, *Promus* LeConte, 1862; *Discogenia* L.1866; *Blapyllis* Horn, 1870; *Melaneleodes*, *Litheleodes*, *Tricheleodes*, *Pseudeleodes*, *Heteropromus*, *Metablapyllis*, *Steneleodes* Blaisdell, 1909; *Trichderulus* B., 1923; *Arpeleodes*, *Holeleodes* B., 1937; *Eleodopsis* B., 1939; *Caverneleodes* Triplehorn, 1975) - Tenebrionidae beetles in Subfamily Tenebrioninae, Tribe Eleodini (121 species in US or Canada). **Bibl.:**Krehoff 1975; Somerby 1972; V. Tanner, 1961; Triplehorn, 1975; Whicker 1983

**Eleodes** *armata* LeConte, 1851 (7,530 years old in *Neotoma* woodrat nest in Butler Mts., Yuma Co,AZ)

**Eleodes** *californica* Blaisdell, 1929 (Tp in CA)

**Eleodes** (*Melaneleodes*) *carbonaria* (*Blaps c.* Say, 1824; *E. glabra* Blaisdell, 1909 (Unav.)) (SW,CO,ID/carbon beetles/Tx in TX),

*Eleodes caudata* LeConte, 1870 (740 years old in *Neotoma* woodrat nest in Butler Mts., Yuma Co.,AZ)

*Eleodes contractum* = *Embaphion c.*?

*Eleodes* (*Blapyllis*) *consobrinus* LeConte, 1851 (Tx or Ac in CA),

*Eleodes* *delicata* Blaisdell, 1929 (Tx or Ac in Coconino Co.,AZ)

*Eleodes* (*E.*) *dentipes* Eschscholtz, 1833 (*E. elegans*, *prominens* Casey, 1890; *E. confinis* Blaisdell, 1895; *E. sublitorialis*, *elongata* (Unav.), *punctata* (Unav.), *laevis* (Unav.); *pertenuis* (Unav.); *robustus* (Unav.) B., 1909; *E. percunctata* B., 1918; *E. montana* B., 1925; *E. paradoxa* B., 1931; *E. sordida* B., 1935) (dentate eleodes/W epigeal /Tx? in CA)

*Eleodes* (*Caverneleodes*) *easterlai* Triplehorn, 1975 (\*cave in Big Bend Natl.Park, Brewster Co.,TX/bat guano Tp or Tb)

*Eleodes* *eschsoltzei* Solier, 1848 (*E. lucae* LeConte, 1866; *E. wickhami* Horn, 1901; *E. ecaudata* & *grandis* Blaisdell, 1909 (Unav.)) (Carlsbad C.,NM/TTx?)

*Eleodes* (*Litheleodes*) *extricata* (*Blaps* Say, 1824; *E. cognata* Haldeman, 1852; *E. arizonensis*, *convexicollis*, *elongata*, *punctata* Blaisdell, 1909; *E.utahensis* B., 1921; *E. frigida* La Rivers, 1943) (TTx in Culberson Co., TX)

*Eleodes* (*Blapyllis*) *fuchsi* Blaisdell, 1909 (Tx? in CA)

*Eleodes* (*Promus*) *fusiformis* LeConte, 1858(Tp, guanobitic in Edwards Co., TX)

*Eleodes* (*Promus*) *goryi* Solier, 1848 (*E. seriata* LeConte, 1858) (Tx in TX/ 18,000 to 19,700 yrs. BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM)

*Eleodes* (*E.*) *grandicollis* Mannerheim, 1843 (*E. valida* Boheman, 1859) (Tx or Ac in CA)

*Eleodes* (*E.*) *hispidabris* (*Blaps h.* Say, 1824; *E. sulcata* LeConte, 1852 (Homo.); *E. connexa* L.1857; *E. nupta* L.1858; *E. lecontei* Gemminger, 1870; *E. compositus* Casey, 1891; *E. laevis*, *elongata*, *sculptilis* Blaisdell, 1909; *E. attenuata*, *imitabilis* B., 1918; *B. immunda* B., 1925)) (BC to TX/Tx in TX; Tx or Ac in AZ (1cave)

*Eleodes* (*Blapyllis*) *horni* Blaisdell, 1909 (*E. monticola* B., 1918; *E. fenyesi* B., 1925) (Tx or Ac in CA)

*Eleodes* *knaussi* Blaisdell, 1909. (9,400 to 16,300 yrs. BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM)

*Eleodes* (*Promus*) *knollorum* Triplehorn, 1971 (Tx in Brewster, Kinney, Travis Cos., TX)

*Eleodes* (*Caverneleodes*) *labialis* Triplehorn, 1975 (deep limestone cracks,Santa Elena Canyon,Big Bend Natl.Park,TX/Tp or Tb)

**Eleodes** (*Caverneleodes*) *leptoscelis* Triplehorn, 1975 (\*\*\*type locality & 2 other caves in Grand Canyon Natl. Park, Coconino Co., AZ/Tp or Tb)

**Eleodes** cf. *nigrina* LeConte, 1858 (Ac or Tx in woodrat nest in cave in Grand Canyon, Coconino Co., AZ)

**Eleodes** (*Melaneleodes*) *omissus* LeConte, 1858 (*E. interrupta* Blaisdell, 1902; *E. borealis, catalinae, communis, emarginata, peninsularis, pygmaea* B., 1909 (Unav.); *E. borealis* B., 1925; *E. tumida* B., 1933) (Tx or Ac in CA)

**Eleodes** (*Blapyllis*) *parvicollis* Eschscholtz, 1829 (*E. planatra* E., 1829; *E. farallonica* Blaisdell, 1909 (Unav.); *E. squalida* B., 1918; *E. farallonica* B., 1925) (Tx or Ac in CA; in CA non-cave *Neotoma fuscipes* woodrat nest)

**Eleodes** (*Blapyllis*) *productus* Mannerheim, 1843 (*E. constricta* LeConte, 1858; *E. trita* Blaisdell, 1917; *E. alticola* B., 1925) (BC to CA/Tx or Ac in CA)

**Eleodes** *quadricollis* Eschscholtz, 1833 (in CA non-cave *Neotoma fuscipes* woodrat nest/ 0 to 16,300 yrs. BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM)

**Eleodes** undet. sp. or species (Tx in El Malpais Natl. Monument, nNM; Ac or Tx in woodrat nest in Kaetan Cave, Grand Canyon, Coconino Co., AZ; *Neotoma* woodrat midden in Canyonlands, UT; 15,680 & 19,950 years old in *Neotoma* woodrat nest in Tinajas Mts., Yuma Co., AZ; 9,120+-500 & 4,340 to 2,260 years old in scNM *Neotoma* woodrat nest)

**Eleodes** *suturalis* (*Blaps s.* Say, 1824; *E. texana* LeConte, 1858) (Tx in TX)

**Eleodes** (*Melaneleodes*) *tricostata* (*Blaps t.* Say, 1824; *Pimelia alternata* Kirby, 1837; *E. planata* Solier, 1848; *E. robusta* LeConte, 1858; *E. costata* & *ovalis* Blaisdell, 1909) (E to AB, SK, MB/Tx in TX/ *E. cf. tricostata* - 25,000 to 23,000 year old in *Neotoma* woodrat nest in Big Bend Natl. Park, wTX)

**Eleodes** *ventricosa* v. (*E.v.* LeConte, 1858) & v. *falli* (*E.f.* Blaisdell, 1909) (Tx in TX)

**Embaphion** Say, 1824 Tenebrionidae beetles in subfamily Tenebrioninae, Tribe Eleodini (7 species in US or Canada)

**Embaphion** *contractum* Blaisdell, 1909 (Carlsbad C., seNM/Tp)

**Embaphion** sp. nr. *contractum* Blaisdell, 1909 (Tx in TX),

**Embaphion** *contractum blaisdelli* (*E.b.* Benedict, 1927) (TTx in cave in Culberson Co., TX & Tx in Carlsbad Caverns, Eddy Co., NM)

**Embaphion** *contusum* LeConte, 1858 (*E. laminatum* Casey, 1890; *E. grandis* Blaisdell, 1909 (Unav.)) (Ac or poss. TTx in NM; Tx in TX)

**Embaphion** *easterlai* (*Eleodes e.* Triplehorn, 1975) (type locality cave in Big Bend Natl.Park, Brewster Co., TX) & Carlsbad(NM)/Tp in bat (*Leptonycteris*) guano)

**Embaphion** *glabrum* Blaisdell, 1909 (*E. blaisdelli* Benedict, 1927) (type locality in Carlsbad C.,seNM/ Tp)

**Embaphion** *planum* Horn, 1870 (1,400 to 1,700 yrs. BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM)

**Embaphion** undet. sp. or species (NM/Tx; near *muricatum m.* (Say) (TX/Tx/ 7,500 to 6,500 year old in *Neotoma* woodrat nest in Big Bend Natl. Park, wTX)))

**Embaphion** *muricatum* (*Akis muricata* Say, 1824; *E. concavum* LeConte, 1853)) Tp, guanobic & Tp in TX),

**Edrotes** LeConte, 1851 (=Endrotes) Tenebrionidae beetles in Subfamily Pimeliinae, Tribe Adesmiini (4 species in US or Canda)

**Edrotes** *rotundus* (*Pimelia rotunda* Say, 1824) (1,400 to 1,700 & 14,300 yrs. BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM)

**Eschatomoxys** Blaisdell, 1935 - Tenebrionidae beetles in Subfamily Pimeliinae, *Eschatomoxys* (12 species in US)

**Eschatomoxys** undescr. sp. (\*?cave in Grand Canyon, Coconino Co.,AZ)

**Eschatomoxys** *wagneri* Bleisdell, 1935 (non-disjunct Tp in Grand Canyon, Coconino Co.,AZ)

**Eusattus** LeConte, 1851 - Tenebrionidae beetles in Subfamily Pimeliinae, Tribe Coniointini (once in Tenebrioninae) (14 species in US or Canada)

**Eusattus** *phreatophilus* Doyen, 1984 (phreatophile)

**Eusattus** undet. sp. 9 (18,000 to 19,700 yrs. BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM)

**Glyptasida** Casey, 1912 - Tenebrionidae beetles in Subfamily Pimeliinae, Tribe Asidini (12 species in US or Canda)

**Glyptasida** *sordida* (*Pelecyporus s.* LeConte, 1853) (Tx or Ac in Coconino Co.,AZ (1cave)),

**Helops** Fabricius, 1775 - Tenebrionidae beetles in Subfamily Tenebrioninae, Tribe Helopini (39 species in US or Canada)

**Helops** *convexus* LeConte, 1861 (*Steriphanus c.*) (Tx or Ac in Coconino Co.,AZ (1cave))

**Helops** undet. sp. (Ac in cave in Travis Co., TX)

**Hymenorus** Mulsant, 1851 -Tenebrionidae beetles in Subfamily Alleculinae, subTribe Alleculini (100 species in US or Canada) **Bibl.:** Fall, 1931

**Hymenorus** *prolixus* Casey, 1891 (Tp in Comal, Kimble, Val Verde Cos.,TX)

**Hymenorus** undet. sp. (Tp in Bexar, Uvalde, Val Verde Cos., TX)

**Lobopoda** Solier, 1835 - Tenebrionidae beetles in Subfamily Alleculinae, Tribe Alleculini (6 species in US & Canada) **Bibl.:** J. Campbell 1964

**Lobopoda** *opacicollis* Champion, 1888 (= *L. subcuneata* Casey, 1891) (Tp in Edwards, Uvalde Cos., TX)

**Nocibiotes** Casey, 1895 - Tenebrionidae beetles in Subfamily Tenebrioninae, Tribe Pedinini (6 species in US or Canada)

**Nocibiotes** undet. sp. (10,300 years old in *Neotoma* woodrat nest in Tinajas Mts., Yuma Co,AZ)

*Noserus* (put in Zopheridae)

**Nyctoporis** Eschscholtz, 1831 Tenebrionidae beetles in Subfamily Pimeliinae, Tribe Nyctoporini (8 species in US or Canada)

**Nyctoporis** *carinata* LeConte, 1851 (in CA non-cave *Neotoma fuscipes* woodrat nest)

*Phloeodes* (put in Zopheridae)

**Platydema** Laporte & Brulle, 1831 (*Typhobia* Paascoe, 1869; *Hyisteropsis* Chevrolat, 1878) Tenebrionidae beetles in Subfamily Tenebrioninae, Tribe Platydemini (once in Diaperinae) (23 species in US or Canada)

**Platydema** *micans* Horn, 1870 (TTx in Hays, Medina, Val Verde Cos., TX)

**Pseudocistela** Crotch, 1873 (= *Chromatia* LeConte, 1861; *Cistela* Fabricius; *Telacis* Poey) Tenebrionidae beetles in Subfamily Alleculinae, Tribe Gonoderini (7 species in US or Canada)

**Pseudocistela** *brevis* (*Cistela b.* Say, 1824; *P. erythroptera* (Ziegler)) (ON, PQ epigean/Tx in MO)

**Schizillus** Horn, 1874 - Tenebrionidae beetles in Subfamily Pimeliinae, Tribe Cryptoglossini (6 species in US or Canada)

**Schizillus** *laticeps* H., 1874 (CA/Tp?,epigean)

**Schizillus** *nunenmacheri* Blaisdell, 1921 (NV/CA Tp on woodrat dung?)

*Steriphanus convexulus* = *Helops c.*



**Stibia** Horn, 1870 (*Eutriorophus* Casey, 1924) - Tenebrionidae beetles in Subfamily Pimeliinae, Tribe Triorophini (5 species in US or Canada)

**Stibia imperialis** Blaisdell, 1936 (occasional Tx in CA)

**Tenebrio** Linnaeus, 1758 (= *Menedrio* Motschulsky, 1872; *Tenebrionellus* Crotch, 1873) Tenebrionidae beetles in Subfamily Tenebrioninae, Tribe Tenebrionini (2 species in US or Canada)

**Tenebrio molitor** L., 1758 (cosmopolitan epigeal/ yellow mealworm/ Ac? in Uvalde Co., TX)

**Tenebrio** undet. sp. (fungivore on ON bat guano)

**Tribolium** Macleay, 1825 - Tenebrionidae beetles in Subfamily Tenebrioninae, Tribe Ulomini (2 species in US or Canada)

**Tribolium** undet. sp. 9 (18,000 to 19,700 yrs. BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM)

*Trichophya* Mannerheim, 1831 - Now = *Staphylinus* in Staphylinidae

**Trimyctis** LeConte 1851 - Tenebrionidae beetles in Subfamily Pimeliinae, Tribe Trimyctini (8 species in US or Canada)

**Trimyctis pruinosa** LeConte, 1851 (0 to 10,800 years BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM; 27,000 to 500 year old in *Neotoma* woodrat nest in Big Bend Natl. Park, wTX)

**Triorophus** LeConte, 1851- Tenebrionidae beetles in Subfamily Pimeliinae, Tribe Triorophini (21 species in US or Canada)

**Triorophus** cf. *politus* Casey, 1907 (18,000 to 19,000 years BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM)

**Triorophus** undet. sp. (9,120+- 500 years old in scNM *Neotoma* woodrat nest)

**Triorophus** cf. *terebratulus* Casey, 1907 (10,000 to 8,000 year old in *Neotoma* woodrat nest in Big Bend Natl. Park, wTX)

**Typhlusechus** Linell, 1897 - Tenebrionidae beetles in Subfamily Pimeliinae, Tribe Typhlusechini (3 species in US or Canada)

**Typhlusechus chemehuevii** Aalbu & Andrews, 1985 (type locality cave in Mitchell C., San Bernardino Co., CA/Tp, endogean, pholeophile)

**Typhlusechus** undet. sp. (Tp in cave in Val Verde Co.,TX)

**Xylopinus** LeConte, 1862 (*Taenobates* Motschulsky, 1872) Tenebrionidae beetles in Subfamily Tenebrioninae, Tribe Tenebrionini (also put in Coelometopinae, Tribe Coelometopini) (2 species in US or Canada)

**Xylopinus** undet. sp. (Tp or Tx in Terrell Co.,TX)

*Zopherus* - put in Zopheridae

**TETRATOMIDAE** (also subsumed in Melandryidae) (polypore fungus or false darkling beetles)

Subfamily Tetratominae

Tribe Tetratomini (*Tetratoma*)

**Tetratoma** Fabricius, 1790 - Tetratomidae beetles in Subfamily Tetratominae, Tribe Tetratomini (2 species in US or Canada)

**Tetratoma** *concolor* LeConte, 1879 (2,000 year old remains in entrance pit in AB cave)

Tiger beetle family - See Cincidelidae

Toed-winged beetle family - See Ptilodactylidae

**TROGIDAE** MacLeay, 1819 (also subsumed in Scarabaeidae as Subfamily Troginae) (skin or hide beetles) **Bibl.:** C.Scholtz 1980

*Glaresis* - Now put in Glaresidae

**Trox** Fabricius, 1775 (= *Omorgus* Erichson, 1848; *Pseudotrox* Robinson, 1949) (also put in Scarabaeidae) Trogidae beetles (46 species in US or Canada)

**Trox** *aequalis* Say (Tp gaunobic in *Myotis grisescens* bat guano in Walker Co., GA)

**Trox** *atrox* LeConte, 1854 (AB, W, MI, IN, Mex., IL/ Tx or Tp in Ward Co., TX)

**Trox** *carinatus* Loomis, 1922 (NM, TX/ Ttp?, bird nests)

**Trox** *punctatus* Germar, 1824 (= *O. morsus & integer* LeConte, 1854) (East/Tx in MO vulture nest), Tp in guano in cave each in Medina & Sutton Cos., TX)

**Trox** *scabra* (*Silpha s.* Linnaeus, 1767; *T. barbosus* Laicharting, 1781; *T. arenarius* Fabricius, 1787; *T. arenosus* Gmelin, 1788; *T. hispidus* Paykull, 1798; *T. trisulcatus* Curtis, 1845; *T. niponensis* Lewis, 1895)) (East/Tx in MO vulture nest)

**Trox** *spinulosus* Robinson, 1940 (= *T. dentibivus*, *simi* R.1940) (NJ s.to VA, w. to AZ,nMex./Tp? in cave in Medina Co., TX)

**Trox** *suberosus* Fabricius, 1775 (= *T. gibbus* Olivier, 1789; *T. crenatus* O., 1790; *T. denticulatus* Beauvois, 1805; *T. nobilis* Wollaston, 1807; *T. alternatus* Say, 1835; *T. tuberosus* Laporte, 1840; *Omorgus punctatus* LeConte, 1854) (NA except NW, nNew England,Canada/Tp, guanobic, in scTX)

**TROGOSSITIDAE** (bark gnawing or trogossitid beetles) Bibl.: Barron 1971

Subfamily Trogossitinae (*Temnochila*, *Tenebrioides*)

**Temnochila** Westwood, 1830, emend. By Erichson, 1844 - Trogossitidae beetles, Subfamily Trogossitinae (10 species in US or Canada)

**Temnochila** undet. sp. (Ac? in Blanco Co., TX)

**Tenebrioides** Piller & Mitterpacher, 1783 - Trogossitidae beetles, Subfamily Trogossitinae (18 species in US or Canada)

**Tenebrioides** undet. sp. (Ac? in cave in Bandera Co., TX)

Toed-winged beetles family - See Ptilodactylidae

Tiger beetles family - See Cincidelidae

True weevil family - See Curculionidae

Water scavenger beetles family - See Hydrophilidae

**ZOPHERIDAE** Solier, 1834 (ironclad beetles) (also subsumed into Tenebrionidae)

**Zopherinae** Solier, 1834

Tribe Zopherini (*Noserus*, *Phloeodes*, *Zopherus*)

**Noserus** LeConte, 1862 Zopheridae beetles in Subfamily Zopherinae, Tribe Zopherini (6 species in US or Canada)

**Noserus** *emarginatus* Horn, 1878 (Ac? in cave in Edwards Co., TX)

**Phloeodes** LeConte, 1866 Zopheridae beetles in Subfamily Zopherinae, Tribe Zopherini (8 species in US or Canada) (also put in Tenebrionidae, Subfamily Asidinae)

**Phloeodes** *pustulosus* (*Nesoderma* p. LeConte, 1859) (CA/ironclad beetle/Tx or Ac in CA)

**Zopherus** Gray, 1832 (*Zopherodes*, *Megazopherus*, *Zopherinus* Casey, 1907) (also put in Tenebrionidae) Zopheridae beetles in Subfamily Zopherinae, Tribe Zopherini (11 species in US or Canada)

**Zopherus** *nodulosus* Solier, 1841 (*Z. variolosus* Haldeman, 1852; *Z. haldemani* Salle, 1870; *Z. verrucosus* & *sallaei* Champion, 1884) (Tx? In Bexar, Blanco, Williamson Cos., TX)

behavior (see also adaptations, dispersal, feeding, reproduction) –

Breder 1943; Dickson 1978; Dickson & Kirk, 1975; Nixon, 1974; Parzefall 1991, 1986

agonistic (see also competition)

Bechler 1980, 1981, 1981a, 1983, 1985; Heckenlively 1970; Parzefall 1982

burrowing - Grow 1981

chaetotaxy - Crow & Christiansen 1977

comparisons between troglobites & non-troglobites –

Banta 1910; Bechler, 1977; Bosnak, 1984; Caine (1974, 1978; Franz 1978; Hadley et al. 1981

cryptic - Dickson 1977

effects of abiotics (see abiotics) - Williams & Moore 1982

evasive - Mason 1989; Studier et al 1988b

home range - Hazlet et al 1974

jumping - Mason, Studier & Lavoie 1988

light aversion - Noble & Pope 1928; Vawter, Fong, & Culver 1987;

Reynierse 1967, 1967a; Walter 1907; Wells 1957, 1959; Williams 1958

maternal-offspring - Bechler 1981

benthic - Bottom-dwelling **area type** species who live on the bed of rivers, lakes, or seas. Incl. Epipsammon, endopsammon & mesopsammon (interstitial).

Bibliographies - Blatchley 1897; Cooper & C. 1975; Dickson & Kirk 1976; Hart & Clark 1987; Maa 1971; T. Miller & Waldron 1988; Reddell & Mitchell 1969; Suman 1964; J. Thompson 1970; R. Thompson 1979; Wolf, 1934-7

biochemical (see genetics) - Luiszer 1991; Palmer, J. 1975; Steiner, et al. 1977; Swofford 1982; Thurow 1962

biochemical oxygen demand - Abbrev. BOD. The amount of oxygen removed by metabolism.

biodiversity - The variety of lifeforms. Polluted caves can have large numbers of earthworms or rotifers but with low biodiversity overall while less polluted caves may be isopod dominated yet

have high biodiversity. Incl. indices of biologic integrity, persistence, species richness, resilience & Shannon-Wiener index. See also biogeography, speciation. Culver (1986, 1992, 1995-7; Culver & Holsinger (1992, 1995; Elliot (1992a, 1995; Fong, 1997; Haugen & Culver 1998; Holsinger (1995; Longley (1981a; Marmonier & Vervier (1993; Northup, Hardy & Ingham (1991; Hobbs, III 1992, 1995; Marmonier, P., Vervier, et al. 1993; Northup 1989; N., Hardy & Ingham 1991; N. & Welbourn 1991; Peck 1997a; Poulson (1978, 1992a, 1997, 1997a; P. & Culver (1969; Poulson & Kane (1981; Stoch 1995; Sweet (1978, 1979

cave entrances - Culver & Poulson 1970; Olson, R. 1973; Poulson & Culver 1981

genetic - Cockley, Gooch & Weston 1977

indices of biological integrity - T. Jones 1997; Poulson 1992

seasonality - Northup & Welbourn (1991;

bioenergetics (see also biomass, feeding, metabolism) - Barr & Stoneburner; Bashor (1974; A. Brown, Pierson & Brown 1994; Crawford (1975; Hobbs III (1977; Poulson, 1978-a, 1987; Poulson, Griffith & Schmidt (1992; Streever, 1996; Studier & Lavoie (1991; Studier, Lavoie & Linn (1985; Studier, Lavoie, Wares & Linn (1986, 1987, 1987a; Turquin & Bouvet,

**bighorn sheep** - See **mammal**

**bioerosion** - Includes **organic** boring, scraping, chewing, clawing by bats, & secretion of algae acids that dissolve speleothems. Incl. **bedrock (biokarst)**. See also trace, biokarst & bioerosion.

**biogeography** (see also dispersal, habitat, microclimate, twilight zone) - Barr & Holsinger 1971; Carpenter 1973; Chippindale 1992; Christiansen & Culver 1968, 1969, 1987; Crawford 1981; Culver 1971a; Culver & Ehlinger 1980; Culver, Holsinger, & Baroody 1973; Culver, Jernigan, O'Connell & Kane 1994; Culver, Kane & Fong 1995; Deeleman-Reinhold 1981; Fong & Culver 1994; Franz et al. 1977; Geluso 2000; Gooch 1980; Hobbs III 1994; Holsinger 1966b, 1983, 1985, 1986b, 1994a, 1995a; Holsinger, Hubbard & Bowman 1994; Howarth 1980a, 1982; Hutchison 1958; Kane 1991; Kane & Brunner 1986a; Merkle & Guttman 1977; Ortmann 1905; Peck 1981; Pennack 1958; Poulson & White 1971; Richards 1968; Russell 1976; Wagner 1988, 1990; Culver, Holsinger & Baroody 1973;

adaptive shift theory – Howarth 1986, 1987, 1987a, 1991; Stone 1991; Stone & Howarth 1991

allopatry - Badaracca 1986; Peck 1975

comparisons

deep sea - Poulson 1971

troglobite vs other types - Culver & Fong 1994; Stone 1991a; Sweet, 1982

entrances: Lavoie, Helf & Poulson 1996;

glacial effects (see relicts) - Chauvin 1992; Campbell & Peck 1990; Holsinger 1981

island analogy - Crawford 1981; Culver 1970a, 1987/8; May 1977; Culver 1985

marine - Harmelin et al. 1985; Iliffe 1986; Iliffe et al 1984; Notemboom, J. 1991

Parzefall 1986a; Pennak, R.W. 1950; Stock, Illife & Williams 1986

microclimate - Poulson 1984a  
parapatry - Beachy 1990

refugia - Barr, 1973, 1977; Holsinger 1980, 1981; Autrey & Baichtal, 1992;  
Ball, 1963; Clifford & Bergstrom, 1976; Harmelin et al., 1985; Noonan 1985;  
Peck 1974; Smith, D., 1984; Peck 1967-8; Rouch & Danielopol 1987

relicts & relict theory - Reddell 1985; Stone 1991; Westcott 1968  
species concept - Christiansen & Culver 1967.  
sympatry - Steiner et al. 1977

**biokarst** - Karst produced by **organic** agents. Incl. **phytokarst**. Cunningham, Northup, Pollastro, Wright & Larock 1995

**bilateria** – A clade of Eumetazoa animals that differ from the coelenterate eumetazoans in that their bodies are bilaterial. Divided into Protostomia and Deuterostomia.

**biological clock** - See temporal

**biomonitoring** - See monitoring, protocols

**bioluminescence** - Barr 1949, 1949a, 1951; Bamber 1975; Slacik 1977, 1977a

**biomass** (see bioenergetics) - Feldhake & Vestal 1984/5; Hobbs III 1977

**biospeleology** - See history, terminology

**biothem** - A biologically assisted speleothem.

**biolithites** - Syn: boundstone.

**biological clock** - Inherited time-measuring process which governs a species' responses to certain externalities.

**biomass** - The total weight of living matter, whether in an entire community, at a particular trophic level, or of a particular kind of organism in the community. A measure of **production**. Incl. microbial. Findlay, Meyer & Smith 1984, 1986

**biomicrite** - A limestone with bedrock **fossils** as grains.

**biosparite** - A limestone with bedrock **fossils** as cement.

**biospeleology** - The study of subterranean lifeforms, particularly in caves.

**biota** - Species in a particular biotope.

**biothem** - Speleothems associated with or in part formed by biological activity.

**biotope** - A region characterized by a certain community and abiotic conditions.

## Birds

**Vertebrate** of Class Aves, subclass Neornithes (the only surviving subclass out of eight), superorders Neognathae & Palaeognathae. Have feathers & hollow bones. Owls: Grady 1988a; **Areas:** **AZ:** S. Swift et al. 2000; **ID:** Arvey 1947; **TX:** Fedduccia 1971; R. Peterson 1960; W. Thonrton 1951; Van Tyle & Sutton 1937; **OR:** Brogan 1976; **TX:** Biaggi 1942; **US:** Anon. 1957a; **World:** Clements 1974. **WV:** Grady 1988a

Superorder Neognathae

Order **Anseriformes** (waterfowl)

Suborder Anseres

Anatidae (ducks & geese)

Subfamily Anserinae (*Aix*)

Order **Galliformes**

Suborder Galli

Superfamily Cracoidea

Meleagrididae (Megapodes) (*Meleagris*)-now in Phasianidae

Superfamily Phasianoidea

Phasianidae (grouse, pheasants, quail)

Subfamily Phasianinae (*Meleagris*)

Series 3: Cranes, rails, gulls, herons, and pigeons

Order **Charadriiformes**

Suborder Alcae

Alcidae (auks, murre, puffins & guillemots)

Subfamily Alcinae (*Alca*, *Alle*, *Cephus*)

Order **Apodiformes**

Suborder Apodi

Apodidae (black swifts; swifts)

Subfamily Cypseloidinae (*Cypseloides*)

Order **Columbiformes** (pigeons & doves)

Suborder Columbae

Columbidae (pigeons & doves)

Subfamily Columbinae (*Columba*)

Series 5: diurnal birds of prey, and owls

Order **Falconiformes** (= Accipitres) (diurnal birds of prey; diurnal raptors)

Suborder Falcones

Accipitridae (Old World vultures, eagles, hawks, buzzards, kites, harriers)

Subfamily Buteoninae (*Buteo*)

Falconidae (falcons & caracaras)

Subfamily Falconinae (*Falco*)

Suborder Cathartae

Superfamily Cathartoidea

Vulturidae (=Cathartidae) (American vultures)

Subfamily Vulturinae? (=Cathartinae) (*Breagyps*, *Cathartes*, *Coragyps*, *Gymnogyps*)

Order **Strigiformes** (owls) **AZ:** S. Swift et al. 2000

Strigidae (typical owls)

Subfamily Buboninae (typical owls) (*Bubo*, *Otus*)

Subfamily Striginae (wood owls) (*Strix*)

Tytonidae (barn owls)

Subfamily Tytoninae (barn & grass owls) (*Tyto*)

Series 7: kingfishers, woodpeckers & perching birds

Order **Passeriformes** (perching birds)

Parvorder Passerida

Suborder Oscines (= Passeriformes, Passeri)

Superfamily Muscicapoidea

Cinclidae (dippers) (*Cinclus*) :

Subfamily Drepanidinae (Hawaiian honeycreepers)

(*Chloridops*, *Ciridops*, *Hemignathus*)

Subfamily Carduelinae (Cardueline finches)

(*Leucosticte*) (also put in Ploceidae), *Telespiza* (now in Falconidae)

Muscicapidae (Old World flycatchers & allies) (*Sayornis*, *Turdus* (now in Turdidae))

Turdidae (thrushes)

Subfamily Turdinae (*Catharus*, *Turdus*)

Superfamily Passeroidea

Fringillidae (Old World finches & allies)

(*Aidemia*, *Orthospiza*, *Xestospiza*, *Vangulifer*)

Subfamily Drepanidinae: *Himatione*, *Junco*, *Pipilo* (both once in Emberizidae)

Subfamily Certhiinae (Certhiine finches)

(*Leucosticte*, *Petrochelidon* (also put in Hirundinidae, Tyrannidae), *Pipilio*)

Superfamily Sylvioidea

Paridae (chickadees, titmice)

Subfamily (*Parus*)

Suborder Tyranni

Superfamily Tyrannoidea

Hirundinidae (swallows)



Subfamily Hirundininae (*Hirundo*, *Petrochelidon*, *Progne*)

Troglodytidae (Thrashers, mockingbirds, catbirds, wrens)

Subfamily Troglodytinae (wrens) (*Catherpes*, *Salpinctes*, *Troglodytes*)

Tyrannidae (tyrant flycatchers)

(*Petrochelidon* (now in Hirundinidae), *Salpinctes* (now in Troglodytidae))

Subfamily Fluvicolinae (flycatchers, peewees, phoebes) (*Empidonax* & *Sayornis*)

**Aix** Boie, 1828 (wood ducks) - Anatidae birds (1 species in US or Canada)

**Aix sponsa** (Linnaeus, 1758) (East, seCanada, NW, s. to CA Sierras/ wood duck/ Ttx in MN)

**Bibl.:** Gilmer et al. 1978

**Alca** Linnaeus, 1758 - Alcidae birds (1 species in US or Canada)

**Alca torda** Linnaeus, 1758 (razorbill/ sGreenland to e.New England along coastal cliffs/ TTX in NB),

**Alle** Link, 1806 - Alcidae birds (7 species in US or Canada)

**Alle alle** (*Plautus a.* Linnaeus, 1758) (dovekie/ sGreenland to e.New England along coasts in summer/TTX in NB)

**Bubo** (Dume'ril, 1806) (horned owls) Strigidae birds (1 species in US |& Canada)

**Bubo virginianus** (Gmelin, 1788) (great horned owl/ NA/ TTx in NM,OK, PA, TX, WA, WV)

**Bibl.:** Guilday 1976e; Caire & Ports 1981

**Buteo** Lacepede, 1799 - Accipitridae birds (12 species in US or Canada)

**Buteo jamaicensis** (*j.*) (Gmelin, 1788) (Red-tailed hawk/ NA except nCanada & nAK/ TTx? in CA)

**Cathartes** Illiger, 1811 - Cathartidae birds (1 species in US or Canada)

**Cathartes aura** (Linnaeus, 1758) (turkey vulture/NA except nCanada,AK/ TTx in CA, KY, OH, OK, TX, WV) Coles 1944

**Catharus** Bonaparte, 1851 (verry's) - Turdidae birds, Subfamily Turdinae (4 species in US or Canada)

**Catharus ustulatus** (*Hylocichla u.* Nuttall, 1840) (NA except nCanada & nAK/ Swainson's thrush/ rare TTx in WA)

**Catherpes** Baird, 1858 (canyon wrens) - Troglodytidae birds (1 species in US or Canada)

**Catherpes mexicanus** (Swainson, 1829) (wUS, Mex., n. to sBC/ Swainson or canyon wren/TTx in CA,TX; TTx or Ac in NM)

**Cephus** Pallas, 1769 (guillemots) Alcidae birds (2 species in US or Canada)

**Cephus grylle** (Linnaeus, 1758) (Arctic coasts & nAtlantic coasts/ black guillemot/ TTx in NB)

**Cinclus** Borkhausen, 1797 (dippers) Cinclidae birds (7 species in US & Canada)

**Cinclus mexicanus** Swainson, 1827 (AK to wMex./ dipper or ouzel/TTx in BC, CA)

**Columba** Linnaeus, 1758 (pigeons) - Columbidae birds (4 species in US or Canada)

**Columba livia** Gmelin, 1789 (NA except AK, nCanada/ rock dove/TTx in AR,OK)

**Coragyps** Geoffroy, 1853 (black vultures) Cathartidae birds (1 species in US or Canada)

**Coragyps atratus** (Bechstein, 1793) (black vulture/ SE, Mex., n. to MD, w. to sSW/ TTx in FL, PA, TX, WV) **Bibl.:** Grube 1953

**Cypseloides** Streubel, 1848 (black swifts) Apodidae birds (1 species in US & Canada)

**Cypseloides niger** (Gmelin, 1789) (nBC to sCA, Great Basin/ black swift/ Ttx in one sCA cave)

**Bibl.:** M. Marin 1997

**Empidonax** Cabanis, 1855 (empidonax flycatchers) - Tyrannidae birds (9 species in US or Canada)

**Empidonax difficilis** Baird, 1858 (extreme seAK to nMex, e. towTX, wSD/ western flycatcher/ Ttx in NV)

**Falco** Linnaeus, 1758 (falcons) Falconidae, Subfamily Falconinae birds (8 species in US or Canada)

**Falco mexicanus** Schlegel, 1851 (w.of Rockies, BC,AB to Mex./ prairie falcon/ Ac or TTx in TX, WA)

**Falco peregrinus** Tunstall, 1771 (NA/ peregrine falcon/ Ac in TX; prey on *Tadarida b.* bats)

**Gymnogyps** Lesson, 1842 (condors) Cathartidae birds (1 species in US or Canada) **Bibl.:** Emslie 1987

**Gymnogyps californianus** (*Cathartes c.* Shaw, 1798) (Pleistocene fossil in Howell's Ridge C., nNM; Vulture, Shrine, Skull (12,210 B.P.), Tse'an Kaetan (16,290 B.P.), Sandblast (13,110-9,580 B.P.), Stevens (12,540 B.P.), Five Windows, Bridge (11,140 B.P.), Midden (22,180 B.P.) Skylight (11,345 B.P.), Luka, Three Springs, Tooth & Stanton C., AZ) & Mule Ears Peak C. #1 (12,580 B.P.), & Burnet C. (both in TX)/ now in cCA & nAZ(reintroduced)/ CA condor/ Ttx in AZ, CA) **Bibl.:** Wetmore 1931a.

**Himatione** Cabanis, 1851 ('apapanes) Fringillidae birds, Subfamily Drepanidinae (1 species in US)

**Himatione sanguinea** (Gmelin, 1788) ('Apapane/TTx in HI)

**Hirundo** Linnaeus, 1758 (barn swallows) Hirundinidae birds (2 species in US or Canada)

**Hirundo fulva** Vieillot, 1807 (= *Petrochelidon f.*) (cave swallow/ sCA,seNM,scTX,nMex./ TTx in CA, NM, TX; TTx or Ac in TN?) **Bibl:** Anon. 1956; J. Baker 1966a,b,e,d; Martin et al (1977; Kincaid & Prasil 1956; Oberholser (1974; O'Brien & Taitt (1974; Selander & Baker 1957; West 1986; R.Eads 1956; R. Johnston 1960; R. Martin 1983; R. Martin & Martin 1978; R. Martin, Miller et al. 1977; S. West 1983, 1986, 1990-1; West, Poole & Gill 1995

*Hirundo pyrrhonota* = *Petrochelidon p.*

**Hirundo rustica** Linnaeus, 1758 (NA except nAK,neCanada/ barn swallow/ TTx in CA, AR, OR, PA, WV),

**Junco** Wagler, 1831 (juncos) Fringillidae birds (5 species in US or Canada)

**Junco hyemalis** (Linnaeus, 1758) (NA except sSW, Mex.,ncCanada, sFL/ slate-colored junco/ Ac or TTx in WA)

**Leucosticte** Swainson, 1832 - Fringillidae birds, Subfamily Carduelinae (3 species in US or Canada)

**Leucosticte arctoa** (Pallas, 1811) (incl. *L. tephrocotis*, *L. atrata*, *L. australis*) (NW to cCanada,sRockies/gray-crowned rosy finch/TTx in CA)

**Meleagris** Linnaeus, 1758 (turkeys) Phasianidae birds (1 species in US or Canada)

**Meleagris gallopavo** L.1758 (turkey/ sNA/ TTx in PA)

**Otus** Pennant, 1769 (scops-owls) Strigidae birds (3 species in US or Canada)

**Otus asio** (Linnaeus, 1758) (eastern screech-owl/NA/ TTx in MN (preys on *Eptesicus fuscus* bats), WV; TTx or Ac in PA, KY)

**Otus kennicottii** (= *O. asio k.*, *O.o.k.*) (seAK to cen.Mex./screech owl/TTx in AZ) **Bibl.:** Beer 1953; Duguay et al. 1997

**Parus** Linnaeus, 1758 (chickadees, titmice) - Paridae birds (11 species in US or Canada)

**Parus bicolor** Linnaeus, 1766 (SE, n. to sPA, sON, sMI/ tufted titmouse/ Ac in TX)

**Petrochelidon** Cabanis, 1850 - Hirundinidae birds (2 species in US or Canada)

**Petrochelidon pyrrhonota** (*Hirundo p.* Vieillot, 1817) (cliff swallow/ NA except nAK, neCanada/ TTx in CA, ME, nwTX,WV(one cave)) **Bibl.:** Anon.1956; Kohls & Ryckman 1962; Thayer 1915

**Pipilo** Vieillot, 1816 (towhees) Fringillidae birds (3 species in US or Canada)

**Pipilo fuscus** Swainson, 1827 (brown towhee/ SW, coast from Baja to nOR/ Ac in TX)

**Progne** Boie, 1826 (purple martins) Hirundinidae birds (1 species in US or Canada)

**Progne subis** (Linnaeus, 1758) (US(except AK,Great Basin,noncoast NW),scCanada, Mex./ purple martins/TTx in CA,TX) **Bibl:** Prescott 1977; Martin 1982

**Salpinctes** Cabanis, 1847 (rock wrens) Tyrannidae birds (1 species in US or Canada)

**Salpinctes** *obsoletus* (Say, 1823) (swBC,wUS (except AK)/ rock wren/ TTx in CA, NV, OK, TX, WA)

**Sayornis** Bonaparte, 1854 (phoebes) Tyrannidae birds (1 species in US or Canada)

**Sayornis** *nigricans* (Swainson, 1827) (CA, SW/ black phoebe/ TTx in CA, KY, TX; AC or TTx in TN, PA)

**Sayornis** *phoebe* (Latham, 1790) (eastern phoebe/ eUS & Mex. to scCanada/ TTx in AL, AR, CA, KY, MS, MO (Carter Co.), OH, OK, PA, TN, TX, WV)

**Sayornis** *saya* (Bonaparte, 1825) (W to scAK/ Say's phoebe/ TTx in OK, PA, TX)

**Strix** Linnaeus, 1758 (earless owls) Strigidae birds (3 species in US or Canada)

**Strix** *occidentalis* (Xantus de Vesey, 1860) (coastal W,seBC to eMex.,scAZ,swNM/ spotted owl/ TTx in CA,wTX)

**Troglodytes** Vieillot, 1808 (house wrens) Troglodytidae birds (3 species in US or Canada)

**Troglodytes** *aedon* Vieillot, 1808 (house wren/US to sCanada/TTx in TX)

**Troglodytes** *troglodytes* Linnaeus, 1758 (winter wren/E,CA to seAK/ TTx in OR, WA)

**Turdus** Linnaeus, 1758 (robins) Turdididae birds, Subfamily Turdinae (1 species in US or Canada)

**Turdus** *migratorius* Linnaeus, 1758 (NA except far nCanada /robin/ Ac or TTx in WA)

**Tyto** Billberg, 1828 (barn-owls) Tytonidae birds (1 species in US or Canada)

**Tyto** *alba* (Scopoli, 1769) (s,cUS,coastal NW/ barn owl/ TTx in OK,TX; w.mines; prey on *Tadarida m.* bats/ Ttx or Ac in PA).

**Bird Fossils** - Brodkorb 1964; Parmalee 1992, 1993; Parmalee & Klippel 1982; Wetmore 1927, 1931b, 1959a, 1962. **Areas:** **AZ:** Miller 1960; **CA:** Howard 1962; Miller & DeMay 1942; **FL:** 1959; **GA:** S. Olson 1984a; **HI:** James 1987, J.et al (1982, 1982a, 1987, Olson & J. 1991; Paxinos 1998; Pratt 1979; **ID:** Sadek 1965; **NM:** Howard 1971; **VA:** Eshelman & Grady 1986; **NV:** Grayson 1985; **TN:** Parmalee & Klippel 1982; **TX:** McKusick 1983; Wetmore & Friedmann 1933; Feduccia 1972; **HA:** Giffin 1993

Subclass Anseres

Order **Anseriformes** (screamers & waterfowl; ducks, geese & swans)

Anatidae (magpie geese) (*Anabernicula*)

Subfamily Anatinae (*Anas*, *Ptaiochen*, *Thambetochen*)

Subclass Neornithes

Order **Galliformes** (gallinaceous birds)

Odontophoridae (New World quails)

Subfamily Odontophorinae (*Colinus*)

Phasianidae (pheasants, grouse & quail)

(*Colinus* (now in Odontophoridae), *Neortyx*)

Subfamily Tetraoninae (*Bonasa*, *Centrocerus*, *Dendragapus*, *Lagopus*, *Tympanuchus*)

Series 2: Pelicans and albatrosses

Order Pelecaniformes (totipalmate swimmers)

Phalacrocoracidae (cormorants) (*Phalacrocorax*)

Order Procellariiformes (tube-nosed swimmers)

Procellariidae (shearwaters, fulmars & petrels) (*Pterodroma*)

Series 3: Cranes, rails, gulls, herons, and pigeons

Order Charadriiformes (shorebirds, gulls & auks)

Suborder Charadrii

Superfamily Burhioidea

Burhinidae (thick-knees) (*Burhinus*)

Superfamily Charadrioidea

Order Columbiformes (pigeons & doves)

Suborder Columbae

Columbidae (pigeons & doves)

Subfamily Colubinae (*Ectopistes*)

Order Gruiformes (rails, cranes & allies)

Suborder Grues

Rallidae (rails, gallinules & coots; rails, cranes, coots & moorhens or gallinules)

125 species in 41 genera) (*Porzana*, *Laterallus*)

Series 4: Storks and allies

Order Ciconiiformes (herons, ibises & storks)

Plataleidae (ibises & spoonbills) (*Apteribis*: also put in Threskiornithidae)

Teratornithidae (teratorns) (*Teratornis*)

Threskiornithidae (ibises & spoonbills) (*Apteribis*: also put in Plataleidae))

Charadriidae (*Dorypaltus*)

Series 6: Nighthawks and swifts

Order Apodiformes

Suborder Apodi

Apodidae (typical swifts)

Subfamily Cypseloidinae (*Cypseloides*)

Order Caprimulgiformes (goatsuckers & allies)

Superfamily Caprimulgoidea

Caprimulgidae (night jars)  
Subfamily Chordeilinae (nighthawks) (*Chordeiles*)

Series 5: diurnal birds of prey, and owls  
Order Falconiformes (diurnal birds of prey)

Suborder Accipitres

Accipitridae (hawks, kites & eagles) (also put in Suborder Falcones)  
*Neogyps* (also in Catharidae), *Neophrontops* (also in Embenizidae) *Spizaetus*  
Subfamily Pandioninae (*Buteogallus*, *Caracara* (put in Falconidae))

Catharidae (*Cathartes*, *Coragyps*, *Gymnogyps*, *Neogyps*, *Teratornis*  
(in Teratornithidae))

Falconidae (falcons & caracaras)  
Subfamily Polyborinae (= Daptriinae) (caracaras, laughing & forest falcons)  
(*Caracara* (also in Accipitridae) *Polyborus*)

Subfamily Falconinae (caracaras & falcons) (*Buteogallus* (now in Accipitridae))

Order Strigiformes (owls)  
Strigidae (typical owls) (*Grallistrix*)

Series 7: kingfishers, woodpeckers & perching birds  
Order Coraciiformes (rollers, kingfishers & allies)  
Suborder Alcedines (= Alcedini)

Infraorder Alcedinides  
Superfamily Alcedionoidea  
Alcedinidae (*Megaceryle*)

Superfamily Ceryloidea  
Cerylidae (*Ceryle*)

Order Cuculiformes (cuckoos & allies) (not placed in series)  
Suborder Cuculi  
Parvorder Neomorphida  
Superfamily Cuculoidea  
Cuculidae (cuckoos & allies) (*Geococcyx* - now in Neomorphidae)  
Neomorphidae (roadrunners & ground-cuckoos) (*Geococcyx* (once in Cuculidae))

Order Passeriformes (perching birds)

Suborder Oscines (= Passeres)  
Corvidae (jays, magpies & crows)  
Subfamily Corvinae (*Corvus*, *Protocitta*)

Drepanididae (also subsumed in Fringillidae) (Hawaiian honeycreepers)  
Subfamily Drepanidinae (in Fringillidae) (Hawaiian honeycreepers)  
Tribe Hemignathini (*Hemignathus*, *Telespiza*) (both put in Fringillidae)

Emberizidae (*Cremaster*, *Neophrontops*)  
Subfamily Icterinae (*Euphagus*, *Pandanaris*)

Fringillidae (Old World finches & allies) (*Aidemia*, *Orthospiza*, *Xestospiza*, *Vangulifer*),  
Drepanidiane (Hawaiian honeycreepers)  
Tribe Hemignathini (*Chloridops*, *Ciridops*, *Hemignathus*, *Telespiza*),

Carduelinae (Cardueline finches) (*Leucosticte*) (also put in Ploceidae), *Telespiza*  
(now in Falconidae)

Hirundinidae (swallows) (*Tachycineta*)

Families incl.

Anatidae (swans, geese & ducks)  
(*Anabernicula*)  
Subfamily Anatinae (*Anas*, *Ptaiochen*, *Thambetochen*)

Accipitridae (hawks, kites & eagles)  
(*Buteogallus*, *Caracara*, *Neogyphs*, *Neophrontops*, *Spizaetus*)

Alcedinidae (kingfishers) (*Megaceryle*)  
Apodidae (*Cypseloides*)  
Burhinidae (thick-knees) (*Burhinus*)  
Caprimulgidae (night jays) (*Chordeiles*)

Cathartidae (American vultures)  
(*Cathartes*, *Coragyps*, *Gymnogyps*, *Neogyphs*, *Teratornis* (now in Teratornithidae))

Charadriidae (plovers) (*Dorypaltus*)  
Columbidae (pigeons & doves) (*Ectopistes*)

Corvidae (jays, magpies & crows) (*Corvus*, *Protocitta*)  
Cuculidae (cuckoos & allies) (*Geococcyx* - now in Neomorphidae)  
Drepanididae  
(=Drepanidinae in Fringillidae) (Hawaiian honeycreepers) (*Hemignathus*, *Telespiza*)

Falconidae (falcons & caracaras)  
Subfamily Polyborinae (= Daptriinae) (*Polyborus*)

Fringillidae (Old World finches & allies) (*Aidemia*, *Orthospiza*, *Xestospiza*, *Vangulifer*),

Drepanidiae (*Hawaiian honeycreepers*) (*Chloridops*, *Ciridops*, *Hemignathus*),  
Carduelinae (Cardueline finches) (*Leucosticte*) (also put in Ploceidae), *Telespiza*  
(now in Falconidae)

Hirundinidae (swallows) (*Tachycineta*)  
Icteridae (now in Emberizidae Subfamily Icterinae)  
Neomorphidae (*Geococcyx* - once in Cuculidae)

Odontophoridae (*Colinus*)  
Phalacrocoracidae (cormorants) (*Phalacrocorax*)

Phasianidae (pheasants, grouse & quail)  
(*Colinus* (now in Odontophoridae) *Neortyx*)  
Subfamily Tetraoninae (*Bonasa*, *Centrocercus*, *Dendragapus*, *Lagopus*, *Tympanuchus*)

Procellariidae (shearwaters, fulmars & petrels) (*Pterodroma*)  
Plataleidae (ibises & spoonbills) (*Apteribis*: also put in Threskiornithidae)

Rallidae (rails, gallinules & coots; rails, crakes, coots & moorhens or gallinules) 125 species in  
41 genera) (*Porzana*, *Laterallus*)

Strigidae (typical owls) (*Grallistrix*)  
Teratornithidae (teratorns) (*Teratornis*)

Threskiornithidae (ibises & spoonbills) (*Apteribis*: also put in Plataleidae))  
Tetraonidae (grouse) = Tetraoninae in Phasianidae (*Bonasa*)

**Aidemia** James & Olson, 1991 - Fringillidae birds

**Aidemia** *chascax* Olson & James, 1991 (extinct/ cave or sink at Barber's Point, Oahu)

**Aidemia** *lutetiae* Olson & James, 1991 (extinct/cave or sink at Barber's Point, Oahu)

**Aidemia** *zanclops* Olson & James 1991 (extinct/cave or sink at Barber's Point, Oahu)

**Anabernicula** Ross, 1935 - Anatidae birds, Subfamily Anatinae

**Anabernicula** *gracilentata* Ross, 1935 (extinct/ 2 caves in Dona Ana Co. NM & cave in White  
Pine Co., NV)

**Anabernicula** cf. *oregonensis* Howard, 1964 (Extinct Sheldgoose/Dark Canyon C., NM)

**Anabernicula** undet. sp. (extinct in Pleist. caves in Grant & Dona Ana Cos., NM)

**Anas** Linnaeus, 1758 (dabbling ducks) Anatidae birds (12 species in US or Canada)

**Anas** *schneideri* Emslie, 1985 (extinct teal/\*type locality cave in WY)

**Apteribis** Olson & Wetmore, 1976 - Threskiornithidae birds

**Apteribis** *brevis* O. & W., 1976 (type locality cave in Maui, HI)



*Apteribis glenos* O. & W., 1976 (paratype from cave in Maui, HI),

*Bonasa* Stephens, 1819 (ruffed grouse) Phasianidae birds, Subfamily Tetraoninae (1 species in US or Canada)

*Bonasa umbellus* (Linnaeus, 1766) (nUS to cAK,cCanada/ruffed grouse/extralimital in Cumberland C.,MD)

*Branta* Scopoli, 1769 (brent geese) Anatidae birds (4 species in US or Canada)

*Branta hylobadistes* Olson & James, 1991 (type locality cave in Maui, HI)

*Breagyps* L. Miller & Howard, 1938 - Cathartidae birds. **Bibl.:** Emslie, 1987

*Breagyps clarki* L. Miller, 1910 (extinct condor in cave in White Pine Co., NV)

*Bubo* (Dume'ril, 1806) (horned owls) Strigidae birds (1 extant species in US or Canada)

*Bubo sinclair* L. Miller, 1911 (extinct in Upper Pleistocene Potter Cr. (type) & Samwell C.,CA)

*Buteogallus* Lesson, 1830 (black-hawks) Accipitridae birds (1 extant species in US or Canada)

*Buteogallus* undescr. sp. (\*cave in Big Horn Co.,WY)

*Buteogallus anthracinus* (Ddeppe, 1830) (now in n.Mex., extreme sSW/ Black Hawk/ Pleist, extralimital? in Dry Cave?, NM)

*Burhinus* Illiger, 1811 (thick knees) Burhinidae birds

*Burhinus* undescr. sp. (extinct thick-knee sp./Thicknee/ cave in Eddy Co., NM)

*Caracara* Merrem, 1826 (= *Polyborus*) (caracaras) Falconidae birds, Subfamily Polyborinae

*Caracara plancus* (Miller, 1777) (*Caracara p.*) (now in Mexico, s. to SA/ Pleist. extralimital in Eddy Co., NM)

*Cathartes californianus* = *Gymnogyps c.*

*Catharista Vieillot* = *Coragyps*

*Ceryle* Boie, 1828 (kingfishers) Cerylidae birds

*Ceryle alcyon* = *Megaceryle a. a*

*Centrocerus* Swainson, 1832 (sage grouse) Phasianidae birds (1 species in US or Canada)

*Centrocerus urophasianus* (Bonaparte, 1827) (NW(except coast),sAB & BC/sage grouse/extralimital in Stanton C.,AZ) Parmalee 1969

*Chloridops* Wilson, 1888 (kona finches) Fringillidae birds, Subfamily Drepanidinae

*Chloridops regiskongi* Olson & James, 1991 (extinct/cave or sink at Barber's Point, Oahu)

cf *Chloridops* or *Psittirostra* undescr. sp. (Holocene extinct in Puu Naio Cave, Maui, HI)

*Chloridops wahi* Olson & James, 1991 (extinct/ type locality in cave or sink in Oahu/ cave in Maui)

**Chordeiles** Swainson, 1832 (nighthawks) Caprimulgidae birds (2 species in US or Canada)  
**Chordeiles minor** (Forster, 1771) (NA except AK & far nCanada/ nighthawk/ Pleist. extralimital in Llano Co.,TX)

**Ciridops** Newton, 1892 (Ciridopses) Fringillidae birds, Subfamily Drepanidinae  
**Ciridops** undescr. sp. (extinct/c. or sink in HI)

**Colinus** Goldfuss, 1820 (bobwhites) Odontophoridae birds (once put in Phasianidae)  
**Colinus silium** Brodkorb, 1959 (extinct quail in Pleist. (latest Blancan or earliest Irvingtonian) Haile filled-in FL sinkhole or cave)

**Coragyps** Geoffroy, 1853 (=Catharista) (black vultures; carrion crows) Cathartidae birds (1 extant species in US or Canada)

**Coragyps occidentalis mexicanus** (C.o. L. Miller, 1909) Howard, 1968 (extinct Pleist. western black vulture in Potter Cr. & Samwel (Shasta Co., CA), Smith Cr. (White Pine, NV), Conkling (Dona Ana Co.,NM), Lower Sloth (wTX), Howells Ridge (Grant Co.,NM) & Friesenhahn (CA) & San Josecito (Mexico) C. & FL Haile filled-in sink or cave)

**Coragyps shastensis** (Catharista s Miller, 1911) (extinct black vulture in Potter Cr. Cave (type locality), Samwel? & Hawver? C.,CA)

**Corvus** Linnaeus, 1758 (crows) Corvidae birds (5 extant species in US or Canada)  
**Corvus impluviatus** Olson & James, 1991 (extinct Holocene in flooded cave near Barber's Point, Oahu, HI)

**Corvus viriosus** Olson & James, 1991 (extinct Holocene in cave at Barber's Point, Oahu)

**Cremaster** Brodkorb, 1959 - Emberidae bird (once in Icteridae)  
**Cremaster tythus** Brodkorb, 1959 (hangnest/ extinct Pleist. Fossil in Haile sink or cave)

**Dendragapus** Elliot, 1864 (= Dendrogapus) (blue grouse) Phasianidae birds (2 extant species in US or Canada)

**Dendragapus gilli milleri** Jehl, 1969 (extinct Upper Pleistocene type fossil in Shasta Co.,CA),

**Dorypaltus** Brodkorb, 1959 (plovers) Charadriidae birds  
**Dorypaltus prosphatus** Brodkorb, 1959 (mid- to late Pleist./ extinct Pleist. lapwing in Haile sinkhole, FL)

**Ectopistes** Swainson, 1827 (passenger pigeons) Columbidae birds  
**Ectopistes migratorius** (Linnaeus, 1766) (extinct passenger pigeon/ cave in Bighorn Co., (WY), Jaguar (TN), Trout (WV), Dark Canyon (NM) & Charlie Lake (10K in BC: Driver 1996) Caves)

**Euphagus** Cassin, 1867 (American blackbirds) Icteridae (=Emberizidae, Subfamily Icterinae) birds (2 extant species in US or Canada)

**Euphagus magnirostris** L.H. Miller, 1929 (extinct blackbird/\* cave in Bighorn Co., WY)

**Falco** Linnaeus, 1758 (falcons) Falconidae birds, Subfamily Falconinae (6 extant species in US or Canada)

**Falco sparverius** Linnaeus, 1758 (*F.s.s.*) (NA except nAK, nCanada/ American Kestrel or Sparrow Hawk/ Wisconsinian fossil in cave in Llano Co.,TX)

**Falco swarthi** Miller, 1927 (extinct/ CA Pleisto. tar pits, & 2 caves in Eddy Co.,NM)

**Geococcyx** Wagler, 1831 (roadrunners) Neomorphidae birds (1 extant species in US or Canada)

**Geococcyx californianus conklingi** (*G. conklingi* Howard, 1931) (extinct Conkling's roadrunner; Conkling (type locality) & Dark Canyon (NM) & Pratt C. (TX))

**Geococcyx conklingi** Howard, 1931 (see above) (extinct Pleistocene Shelter (type locality) & Conkling C., NM)

**Grallistrix** Olson & James, 1991 - Strigidae birds

**Grallistrix erdmani** O. & J., 1991 (extinct Holocene "long-legged owl" in cave in Maui, HI)

**Grallistrix orion** O. & J., 1991 (extinct Holocene in cave or sink, Oahu, HI),

**Gymnogyps** Lesson, 1842 (condors) Cathartidae birds (1 extant species in US or Canada)

**Gymnogyps amplus** Miller, 1911 (= *G. californianus a.*) (extinct condor in cave (type locality) in Shasta Co., CA, Stanton (AZ), 3 caves in Eddy Co. (seNM) & cave in Grant Co.,NM) Parmalee 1969

**Gymnogyps californianus** (*Cathartes c.* Shaw, 1798) (CA condor/extralimital in Stanton (AZ) Emslie, 1986, Smith Cr.(NV) & Burnet C.(NM)) Bibl.: McMillan, 1968

**Hemignathus** Lichtenstein, 1839 ('amakihi) Fringillidae birds, Subfamily Drepanidinae

**Hemignathus upuipirostris** Olson & James, 1991 (cave or sink, Barbers Point, Oahu, HI)

**Honocitta** Holman, 1959 - Corvidae birds, Subfamily Garrulinae

**Honocitta brodkorbi** Holman, 1959 (Extinct in filled sinkhole or cave in Williston area, Levy Co.,FL)

**Lagopus** Linnaeus, 1758 – Phasianidae birds, Subfamily Tetraoninae subfamily (1 species in US or Canada)

**Lagopus** undet. sp. (ptarmigan/>10,000BP extralimital in Clark's C.,VA)

**Laterallus** Gray, 1855 (black rails) Rallidae birds (1 extant species in US or Canada)  
**Laterallus guti** Brodkorb, 1952 (Pleist. Extinct black rail in filled-in Haile sink or cave, FL)  
**Bibl.:** Brodkorb 1954

**Megaceryle** Kaup, 1848 – Cerylidae birds (2 species in US or Canada)  
**Megaceryle alcyon** (Linneaus, 1785) (= *Ceryle. a. a.*) (belted kingfisher, Pleist. extralimital in Miller C., Llano Co., TX)

**Neogyys** L. Miller, 1916 - Cathartidae birds  
**Neogyys errans** L. Miller, 1916 (extinct, Smith Cr. C.(NV))

**Neophrontops** L. Miller, 1916 - Embenizidae birds  
**Neophrontops americanus** L. Miller, 1916 Little Box Elder (WY) & Dark Canyon (NM) C.)

**Neortyx** Holman, 1961 - Phasianidae birds  
**Neortyx peninsularis** Holman, 1961 (Extinct quail in Pleist. Haile sinkhole, FL)

**Orthospiza** Olson & James, 199 - Fringillidae birds  
**Orthospiza howarthi** Olson & James, 1991 (type & two other caves of extinct bird in Maui)

**Pandanaris** Miller, 1947 - Embenizidae birds (also put in Icteridae)  
**Pandanaris floridana** Brodkorb, 1957 (mid- to late Pleist./ extinct Pleist. in FL sinkhole at Haile)

**Phalacrocorax** Brisson, 1760 (cormorants) Phalacrocoracidae birds (5 extant species in US or Canada)

**Phalacrocorax auritis** H. Howard, 1958 (Pleist. extinct in Crypt C., NV)

**Polyborus** Vieillot, 1816 (caracaras) Falconidae birds, Subfamily Polyborinae  
*Polyborus plancus* = *Caracara p.*

**Polyborus prelutosus** Howard, 1935 (= *Caracara p.*) (Mex./extinct caracara/Conkling & prob. Shelter C.(NM) & Haile FL sinkhole or cave)

**Porzana** Vieillot, 1816 (soras) Rallidae birds (7 species in US or Canada)  
**Porzana keplerorum** Olson & James, 1991 (Holocene extinct in Maui, HI),  
**Porzana auffenbergi** Brodkorb, 1954 (sinkhole near Haile, Alachua Co., FL/ Extinct Pleist. rail)

**Porzana ralphorum** Olson & James, 1991 (Holocene extinct in cave or sink, Barbers Point, Oahu, HI)

**Porzana severnsi** O. & J., 1991 (Holocene extinct in \*cave in Maui, HI)  
**Porzana ziegleri** O. & J., 1991 (Holocene extinct in cave or sink, near Barbers Point, Oahu, HI)

**Protocitta** Brodkorb, 1957 - Corvidae birds  
**Protocitta dixi** Brodkorb, 1957 (extinct jay, Pleist. in Miller's C., TX) Weigel 1967

**Psittirostra** Temminck, 1820 ('o'us) Fringillidae birds  
cf **Psittirostra** undescr. sp. (sinkhole near Barber's Point, Oahu, HI)  
cf **Psittirostra** or Chloridops undescr. sp. (Holocene extinct in Puu Naio Cave, Maui, HI)

**Ptaiochen** Olson & James, 1991 - Anatidae birds  
**Ptaiochen** pau O. & J., 1991 (Holocene extinct in \*cave in Maui, HI)

**Pterodroma** Bonaparte, 1856 - Procellariidae birds  
**Pterodroma** jugabilis Olson & James, 1991 (cave at Barber's point, Oahu/extinct)

**Rhodacanthis** Rothschild, 1892 (koa-finches) Fringillidae birds  
**Rhodacanthis** aff. *flaviceps* Rothschild, 1892 (extinct (last seen in 1891) /Puu Naio C. Maui) & c. or sink, Barber's Point, Oahu)

**Rhodacanthis** aff. *palmeri* Rothschild, 1892 (extinct/ type locality cave in Maui, HI)

**Spizaetus** Vieillot, 1816 - Accipitridae birds  
**Spizaetus** willetti Howard, 1935 (extinct in Smith Cr. C. (Type locality), NV & cave in Little Hatched Mts, Grant Co., NM)

**Tachycineta** Cabanis, 1850 (tree swallows) Hirundinidae birds (1 extant species in US or Canada)

**Tachycineta** *speleodytes* Brodkorb, 1957 (mid- to late Pleist./ extinct Pleist. swallow in FL sinkhole)

**Telespiza** Wilson, 1890 (laysan finches) Fringillidae birds  
**Telespiza** *persecutrix* Olson & James, 1991 (extinct/cave or sink at Barber's Point, Oahu)  
**Telespiza** *ypsilon* Olson & James, 1991 (extinct/ cave or sink at Barber's Point, Oahu)

**Teratornis** L. Miller, 1909 - Teratornithidae birds  
**Teratornis** *incredibilis* Howard, 1952 (early to late Pleist./extinct, type in Smith Cr. C., NV)

**Teratornis** *merriami* L. Miller, 1909 (early to late Pleist./extinct Pleist. teratorn in CA, FL, NM (Dry C.))

**Thambetothen** Olsen & Wetmore, 1976 - Anatidae birds  
**Thambetothen** *xanion* Olson & James, 1991 (extinct in cave? at Barbers Point, Oahu, HI)

**Titanis** Brodkorb, 1963 - Phorushacidae, Subfamily Phorushacinae  
**Titanis** *walleri* Brodkorb, 1963 (phorushacid/ early Irvingtonian in Inglis sinkhole, Citrus Co., FL)

**Tympanuchus** Gloger, 1841 (prairie-chickens) Phasianidae birds, Subfamily Tetraoninae (3 species in US or Canada)

*Tympanuchus* *cupido* (Linnaeus, 1758) (Greater Prairie Chicken/Pleist. extralimital s. in FL sinkhole)

*Vangulifer* James & Olson, 1991 - Fringillidae birds

*Vangulifer* *mirandus* Olson & James, 1991 (type locality & one other cave in Maui, HI)

*Vangulifer* *neophasis* Olson & James, 1991 (type locality & 1 other cave in Maui, HI)

*Xestospiza* James & Olson, 1991 - Fringillidae birds

*Xestospiza* *fastigialis* Olson & James, 1991 (extinct/ type locality & 1 other cave Maui, HI)

**bison** - See **mammal, ungulate.**

**bivalve** (= Lamellibranchia(ta), Pelecypoda) - Class Bivalvia of the **mollusk** phylum. Incl. cephalopods, **clams** and **mussels, limpets, rock borers, cockles, scallops, & oysters.** > 20,000 species. Shells have two valves. Fairly common as fossils in cave bedrock.

Bivalvia (clams or bivalves)

**blastoids** - Fossils in Bilbo Baggins C.(GA)

**blastomycosis** - Airborn **fungus** disease contacted by breathing spores in dirt. Not know from caves. Symptoms vary from colds, exhaustion & flu-like symptoms to problems with bones & other organs.

**blindcat** - See fish.

**blindfish** - Syn: **cavefish.**

**bobcat** - See cat.

bone beds - Small geologic formations consisting largely of bone breccia and usually formed by shallow flowing water in fissures, etc.

bonitation - A scale of ecological success from I to V in which V is the lowest.

**booklice** - See Psocoptera

**bottleneck**, (biologic) - A drop in population size and, therefore, in the genetic variability of a population.

**bottleneck**, (energy) - Where energy flow is restricted at some point in the energy pathways.

**Bovidae** - See **mammal (antelope, bison, goat, musk-ox, & sheep).**

## **Brachiopods**

Lamp shells. Of the animal phylum Brachiopoda, typified by a lophophore (feeding frame also found in Bryozoa & Phronida) & by two bilaterally symmetrical valves that may be calcareous or of chitinophosphate. Salvini-Planen 1986. About 300 living species and 12,000 fossil ones esp. in Paleozoic bedrock, incl. Bilbo Baggins C.(GA) & cave in Bath Co.,VA (*Rhipidomella*, *Leptaena*, *Stenochisma* genera) & Paxton C., VA (*Spirifer concinnus*, *Atrypa reticularis*, *Meristella cata*, *Rennsedaeria marlandica*, *Spirifer purchisom*, *Edriocrinus sacculus*. Bibl.: Dowell 1967.

## Phylum Brachiopoda

### Class or Suborder Articulata

Family Crisiidae (*Crisia*, *Bicrisia*)

### Subphylum Rhynchonelliformea

#### Class Rhynchonellata

##### Order Orthida

##### Suborder Orthidina

Superfamily Enteletacea (*Rhipidomella*)

##### Order Atrypidida or Spiriferida

Superfamily Atrypacea

Atrypidae (*Atrypa*)

##### Order Spiriferida

##### Suborder Spiriferidina

Superfamily Spiriferacea

Spiriferidae (*Neospirifer*, *Spirifer*)

#### Class Strophomenata

##### Order Strophomenida

Oldhaminidae (*Leptodus*)

Superfamily Strophomenoidea

Leptaenidae (*Leptaena*)

##### Order Terebratulida

##### Suborder Terebratellidina

Superfamily Cancellothridacea

Cancellothyrididae (*Terebratulina*)

Superfamily Terebratellacea

Family Laqueidae (*Terebratalia*)

Class Inarticulata  
Order Lingulida

Suborder Lingulacea  
Family Lingulidae (*Glottidia*)

*Atrypa* Dalman, 1828 – Atrypidae brachiopod Order Atrypidida or Spiriferida  
*Atrypa reticulatris* (extinct Paleozoic fossil in bedrock in Paxton C., VA)

*Glottidia* Dall, 1870 - Lingulidae brachiopods  
*Glottidia albida* (Hinds, 1844) (CA marine infauna)  
*Glottidia pyramidata* (Stimpson, 1860) (wFL Gulf of Mex. marine infauna)

*Leptaena* Dalman, 1828 – Leptaenidae brachiopod  
*Leptaena* undet. sp. (extinct fossil in Bilbo Baggins C.(GA) & Clark's C.,Bath Co.,VA)

*Leptodus* – Oldhaminidae brachiopods  
*Leptodus* undet. sp. (extinct Permian fossil in Lechuguilla C., Eddy Co., NM)

*Meristella* Hall, 1859 – Atrypidae brachiopod Order Atrypidida or Spiriferida  
*Meristella cata* (extinct Paleozoic fossil in bedrock in Paxton C., VA)

*Neospirifer* – Spiriferidae brachiopods  
*Neospirifer* undet. sp. (Permian fossil in Lechuguilla C., Eddy Co., NM)

*Rennsedaeria marlandica* (extinct Paleozoic fossil in bedrock in Paxton C., VA)

*Rhipidomella* - Superfamily Enteletacea undet. sp. (extinct Permian fossil in Lechuguilla C., Eddy Co., NM)

*Spirifer* – Spiriferidae brachiopods  
*Spirifer concinnus* (extinct Paleozoic fossil in bedrock in Paxton C., VA)  
*Spirifer murchisom* (extinct Paleozoic fossil in bedrock in Paxton C., VA)

*Stenochisma* undet. sp. (extinct fossil in Bilbo Baggins C.(GA) & Clark's C.,Bath Co.,VA)

*Terebratalia* Beecher, 1893 - Laqueidae brachiopods  
*Terebratalia transversa* (Sowerby, 1846) (AK marine infauna)

*Terebratulina* D'orbigny, 1847 - Cancellothyrididae brachiopods  
*Terebratulina unguicula* (Carpenter, 1864) (WA marine infauna)

## **Branchiopods**



Primitive, aquatic **crustacean** of aquatic Class Branchiopoda (or as subclass). Mostly closely aligned with the Remidipedia. Mostly a few mm. long. Segments many or few (Cladocera). About 600 species. Carapace of two shell valves. Movement by large antennae. Mostly freshwater, a few marine. Mostly in small, freshwater pools globally. Lay desiccation-resistant eggs. Larvae turn into adults in two days to several weeks. Hermaphroditic to clonal or non-sexual reproduction. Often parthenogenic. First fossils in Devonian. Syn.: Phyllopoda.

Subclass or Superorder Diplostraca

Order Anomopoda (=Cladocera) (water fleas) (few segments) (400 species)

Bosminidae (*Bosmina*, *Eubosmina*),

Daphniidae (*Daphnia*, *Ceriodaphnia*, *Simocephalus*)

Chydoridae (Stebbing) (*Eurycercus* (now in own family)

Subfamily Chydorinae

(*Alona*, *Alonella*, *Monospilus*, *Picripleuroxus*, *Pleuroxus*)

Subfamily Aloninae

(*Acroperus*, *Alona* (see above), *Camptocercus*, *Chydorus*, *Leydigia*, *Pseudochydorus*)

Macrothricidae - now in Radopoda

Moinidae (*Moinodaphnia*)

Superfamily Sidoidea (once in order Ctenopoda)

Holopedidae (*Holopedium*) (also put in order Ctenopoda)

Sedidae (also put in order Ctenopoda) Baird (*Latona*)

Order Ctenopoda

Holopedidae (*Holopedium*) (now in order Anomopoda)

Sididae (*Latona*) (now in order Anomopoda)

Order Radopoda

Superfamily Eurycercoidea

Chydoridae (once in order Anomopoda/Cladocera)

Undet. Genus in AZ shallow hyporheic)

Eurycericidae (*Eurycercus*) (once in Chydoridae)

Superfamily Macrothricoidea

Acantholeberidae (*Acantholeberis*) (once in Macrothricidae),

Macrothricidae (once in Anomopoda) (*Drepanothrix*, *Ilyocry'ptus*, *Macrothrix*),

Orphryoxicae (*Orphryoxus*) (also put in Macrothricidae)

***Acantholeberis*** Lilljeborg, 1835 (*Acanthocereus* Schoedler, 1846) Acantholeberidae  
branchiopods

*Acantholeberis curvirostris* (O. F. Mueller, 1776) (epigean in US littoral, esp. Sphagnum bogs/  
CO hyporheic)

*Acroperus* Baird, 1843 - Chydoridae branchiopods, Subfamily Alolinae

*Acroperus harpae* (Baird, 1834) (epigean in US aquatic vegetation/ Tx? in MN)

*Alona* Baird, 1843, emend. N.N. Smirnov - Chydoridae branchiopods, Subfamily Aloninae or  
Chydorinae

*Alona affinis* (Leydig, 1860) (MI lake benthic)

*Alona circumfimbriata* Megard, 1967 (AB lake benthic; OK hyporheic)

*Alona guttata* Sars, 1862 (epigean in aquatic vegetation in US/ hyporheic in MN),

*Alona quadrangularis* (O. F. Miller, 1785) (epigean in benthic and littoral vegetation in US/  
hyporheic in NY; MI, MN, Europe interstitial, burrower in stream silt in MN)

*Alona rustica* Scott, 1895 (epigean in US/ NY, OK hyporheic)

*Alona rustica americana* Flossner & Frey, 1970 (NY hyporheic)

*Alona setulosa* Megard, 1967 (epigean in WI, IN, FL, GA, MN/ NY hyporheic)

*Alonella* Sars, 1862 - Chydoridae branchiopods, Subfamily Chydorinae

*Alonella excisa* (Fischer, 1854) (OK hyporheic)

*Alonella* undet. or undescr. sp. (Fischer, 1854) (TX, NY hyporheic; Tx? in MN; MI lake benthic)

*Bosmina* Baird, 1845 - Bosminidae branchiopods

*Bosmina (B.) longirostris* (Muller, 1785) (AB, TX lake benthic, aquatic epigean in US/ Ac in  
IN/S5G5/water flea)

*Bosmina* undet. sp. or species (interstitial in VA freshwater tidal marsh; MN hyporheic)

*Camptocercus* Baird, 1843 - Chydoridae branchiopods, Subfamily Alolinae

*Camptocercus oklahomensis* Mackin (OK hyporheic)

*Camptocercus* undescr. (MI interstitial; Tx? in MN?),

*Ceriodaphnia* Dana, 1855 - Daphniidae branchiopods

*Ceriodaphnia* undet. sp(s). (CO/hyporheic in CO; Tx in IN)

*Chydorus* Leach, 1843 - Chydoridae branchiopods, Subfamily Alolinae

*Chydorus faviformis* Birge, 1893 (epigean in NE, ON/MI interstitial),

*Chydorus piger* Sars, 1861 (Holarctic/hyporheic in NY; interstitial in MI),

*Chydorus* undet. sp(s). (hyporheic in CO, NY)

*Chydorus sphaericus* (Mueller, 1785) (epigean in US/ AB lake benthic; OK hyporheic; Tx in IN)

*Chydorus unispinus* Henry, 1922 (MS marine interstitial)

*Daphnia* Muller, 1785 - Daphniidae branchiopods

*Daphnia parvula* Fordyce, 1901 (lakes & ponds in US except Rockies/Tp in cave in Sutton Co.,TX; MT hyporheic)

*Daphnia pulex* Leydig, 1860, Emend. Richard, 1896 or undet. sp. (Tx or Ac in IN; interstitial in MI,MT; AB lake benthic)

*Daphnia* undet. sp. or species (hyporheic, Pb, Tp? in CO; interstitial in MI; NC marine infauna; Ac, Tp or Tx in GA caves)

*Drepanothrix* Sars, 1862 - Macrothricidae branchiopods

*Drepanothrix dentata* (Eure'n, 1861) (Holarctic,lake bottoms/MI interstitial?)

*Eubosmina* Seligo, 1900 - Bosminidae branchiopods

*Eubosmina* undet. sp. (Tx? in MN)

*Eurycercus* Baird, 1843 - Eurycericidae branchiopods (once put in Chydoridae)

*Eurycercus lamellatus* (O.F. Muller, 1785) (shallow silt benthic & hyporheic? in MN; MI lake benthic) **Bibl.:** Burchsted 1980

*Holopedium* Zaddach, 1855 - Holopedidae branchiopod. **Bibl.:** Montvilo 1978; Hegyi 1973

*Holopedium amazonicum* Stigelin, 1904 (E,SE/Tx or Tp in NM?)

*Ilyocryptus* Sars, 1862 - Macrothricidae branchiopods

*Ilyocryptus sordidus* (Lievin, 1848) (MI? interstitial; Tx? in MN; MN lake infauna; MI lake benthic; mostly epibenthic burrowers through the surface of muddy bottoms),

*Latona* Straus, 1820 - Sididae branchiopods

*Latona setifera* (O.F. Muller, 1785) (weed beds in lakes & ditches/ MI interstitial)

*Leydigia* Kurz, 1874 - Chydoridae branchiopods, Subfamily Alolinae

*Leydigia quadrangularis* (Leydig, 1860) = *L. leydigi*

*Leydigia leydigi* (Schoedler, 1863) (AB lake benthic silt/Tx? in MN; MI, OK interstitial; MI lake benthic; seVA hyporheic)

*Macrothrix* Baird, 1843 - Macrothricidae branchiopods

*Macrothrix laticornis* (Fisher, 1851) (Jurine) (Europe, aquatic epigeal in US/ hyporheic in NY?; MN lake interstitial ; epibenthic burrowers through the surface of muddy bottoms)

*Moinodaphnia* Herrick, 1887 - Moinidae branchiopods

*Moinodaphnia* undet. sp. (sandy hyporheic in TX),

*Monospilus* Sars, 1861- Chydoridae branchiopods, Subfamily Chydorinae

*Monospilus dispar* Sars, 1862 (bare littorial/MI interstitial),

*Orphryoxus* Sars, 1862- Orphryoxicae branchiopods

*Orphryoxus gracilis* Sars, 1861 (benthic/MI interstitial; MT aquatic),

*Picripleuroxus* Frey, 1993 - Chydoridae branchiopods, Subfamily Chydorinae

*Picripleuroxus striatus* (*Pleuroxus s.* Schoedler, 1863) (vegetation/hyporheic in NY?; epibenthic burrowers through the surface of muddy bottoms)

*Pleuroxus* Baird, 1843 - Chydoridae branchiopods, Subfamily Chydorinae

*Pleuroxus denticulatus* Birge, 1877(OK hyporheic)

*Pleuroxus striatus* = *Picripleuroxus s.*

*Pseudochydorus* Fryer, 1968 - Chydoridae branchiopods, Subfamily Alolinae

*Pseudochydorus globosus* (Baird, 1893) (epigeal in aquatic vegetation in US/ shallow silt hyporheic in MN)

*Simocephalus* Scho(e)dl(er), 1858 - Daphniidae branchiopods

*Simocephalus vetulus* (O.F. Mueller, 1776) (Europe, uncommon but widespread in US/ shallow silt hyporheic in MN) **Bibl.:** Frank 1952; W. Green 1919

breeding season - The season beginning with courtship and ending with weaning. See mating, parturition.

bristletail - See **thysanurans**.

**brittle star** - **Echinoderm** of Subclass or Class Ophiuroidea (ophiuroids, brittle stars, serpent stars). Bodies with compressed central disk and five long arms. No hindgut or anus. About 1,900 species in Ophiuroidea. Common in submarine caves but no cavernicoles known.

**bryophyte** - Incl. **mosses & liverworts**.

## **Bryzoans and allies**

Of phylum Entoprocta (formerly included in Phylum Bryozoa), typified chiefly by colonial growth, a calcareous skeleton, & a U-shaped alimentary canal with mouth & anus) & corals. **Bibl.:** Dehashti & Blinn 1986.

Phylum Entoprocta (4,000 species)

Order Pedicellinida

Family Pedicellinidae (*Pedicellina*, *Barentsia*) (also put in Barentsiidae)

Class Gymnolaemata

Order Cheilostomatida

Candidae (*Scrupocellaria*)

Class Stenolaemata

Order Cyclostomata

Suborder Rectangulata

Family Lichenoporidae (*Disporella*)

Suborder Tubuliporina

Family Tubuliporidae (*Tubulipora*)

Subclass Alcyonaria

Order Cheilostomata

Suborder Anasca

Family Alderinidae = Calloporidae

Family Beaniidae (*Beania*)

Family Bicellariellidae (*Dendrobaeania*)

Family Bugulidae (*Bugula*, *Caulibugula*)

Family Calloporidae (= Alderindae) (*Callopora*, *Tegella*)

Family Cellariidae (*Cellaria*)

Family Chaperiidae (*Chapperia*)

Family Cupuladriidae (*Discoporella*)

Family Membraniporidae (*Conopeum*, *Membranipora*)

Family Scrupocellariidae (*Scrupocellaria*)

Suborder Ascophora

Family Celleporidae (Celleporina)

Family Hippothoidae (*Celleporella*, *Hippothoa*)

Family Microporellidae (*Microporella*)

Family Savigneyellidae (*Savigneyella*)

Family Schizoporellidae (*Schizoporella*)

Family Smittinidae (Porella)

Class Gymnolaemata

Order Ctenostomida (=Ctenostomata) (once in Class Phylactolaemata)

Suborder Carnosa

Superfamily Paludicelloidea

Family Nolellidae (*Anguinella*, *Nolella*)

Family Victorellidae (*Sundanella*)

Superfamily Vesicularioidea

Family Vesiculariidae (*Amathia*, *Bowerbankia*)

Suborder Stolonifera

Family Valkeriidae (*Aeverillia*)

Family Alcyonidiidae (*Alcyonidium*)

Family Triticellidae (*Triticella*)

Superfamily Arachnidoidea

Monobryozoontidae (*Monobryozoon*)

Class Phylactolaemata

Order Plumatellida

Plumatellidae (*Plumatella*)

*Alcyonidium* Lamouroux, 1913 - Alcyonidiidae bryozoans

*Alcyonidium diaphanum* (Hudson, 1788) (PQ Gulf of St. Lawrence sandy marine interstitial)

*Alcyonidium gelatinosum* var. *Pachydermatum* Kluge, 1962 (PQ Gulf of St. Lawrence sandy marine interstitial)

*Alcyonidium polyoum* (WA marine infauna)

*Aeverillia* – Valkeriidae bryozoan

*Aeverillia setigera* (Carolinian marine infauna)

*Amathia* Lamouroux, 1812 – Vesiculariidae

*Amathia alternata* Lamouroux, 1812 (Carolinian marine infauna)

*Amathia distans* Busk, 1886 (Carolinian marine infauna)

*Amathia vidovici* (Carolinian marine infauna)

*Anguinella* Van Beneden, 1845 - Nolellidae bryozoans

*Anguinella palmata* Van Beneden, 1845/ Virginian marine infauna)

*Archimedes* – Fenestellidae bryozoan

*Archimedes* undet. sp. (bedrock fossil in Mississippian Pitkin & PA Hal Fm., Buffalo National River, AR)

*Barentsia* Hincks, 1880 – Pedicellinidae entoprocta (also put in Barentsiidae)

*Barentsia* undet. sp. (WA marine infauna)

*Beania* Johnston, 1840 - Beaniidae bryozoans

*Beania klugei* (Carolinian marine infauna)

*Bicrisia* D'orbigny, 1853 – Crisiidae bryozoans

*Bicrisia* undet. sp. (WA marine infauna)

*Bowerbankia* Farre, 1837 - Vesiculariidae bryozoans

*Bowerbankia gracilis* Leidy (Carolinian marine infauna)

*Bowerbankia imbricata* (Adams, 1899) (Carolinian marine infauna)

***Bowerbankia maxima*** (Carolinian marine infauna)

***Bowerbankia*** undet. sp. (WA marine infauna)

***Bugula*** Oken, 1815 Bugulidae bryozoans (also put in Scrupocellariidae)

***Bugula neritina*** (Linnaeus, 1758) (Carolinian marine infauna)

***Caberea*** Lamouroux, 1816 – Candidae bryozoans

***Caberea*** undet. sp. (WA marine infauna)

***Callopora*** Gray, 1848 – Calloporidae bryozoans (once in Alderinidae)

***Callopora*** undet. sp. (WA marine infauna)

***Cellaria*** Ellis & Solander, 1986 – Cellariidae bryozoans

***Cellaria diffusa*** (Robertson, 1905) (WA marine infauna)

***Costazia*** – Celleporidae bryozoans

***Costazia costazi*** (WA marine infauna)

***Celleporella*** Gray, 1848 – Crisiidae bryozoans

***Celleporella hyalina*** (Linnaeus, 1767) (WA marine infauna)

***Chaperia*** Jullien, 1881 – Chaperiidae bryozoans

***Chaperia patula*** = *Chaperiopsis p.*

***Chaperiopsis*** Jullien, 1881 – Chaperiidae bryozoans

***Chaperiopsis patula*** (Hincks, 1881) (WA marine infauna)

***Conopeum*** Gray, 1848 - Membraniporidae bryozoans

***Conopeum tenuissimum*** (Canu, 1928) (Carolinian marine infauna)

***Dendrobeatia*** Levinsen, 1909 – Bicellariellidae bryozoans (also included in Bugulidae)

***Dendrobeatia murrayana*** (Johnston, 1847) (WA marine infauna)

***Crisia*** Lamouroux, 1912 – Crisiidae bryozoans

***Crisia*** undet. sp. (WA marine infauna)

***Discoporella*** d'Orbigny, 1852 – Cupuladriidae bryozoans

***Discoporella*** undet. sp. (FL Gulf of Mex. marine infauna)

***Discoporella umbellata*** (Carolinian marine infauna)

***Disporella*** Gray, 1848 - Lichenporidae bryozoans

***Disporella fimbriata*** (Busk, 1875) (WA, HA (cf *D.f.*) marine infauna)

***Hippothoa*** Lamouroux, 1821 – Hippothoidae bryozoans

***Hippothoa hyalina*** (Linnaeus, 1867) (WA marine infauna)

*Loxosoma* Keferstein, 1862 – Loxosomatidae entoprocta

*Loxosoma davenporti* Nickerson, 1898 (WA marine infauna)

*Membranipora* de Blainville, 1830 - Membraniporidae bryozoans

*Membranipora arborescens* (Canu & Bassler, 1928) (Carolinian marine infauna)

*Membranipora membranacea* (Linnaeus, 1767) (WA marine infauna)

*Membranipora* undet. sp. (wFL Gulf of Mex. marine infauna)

*Membranipora tuberculata* (Bosc, 1802) (Carolinian marine infauna)

*Microporella* Hincks, 1877 – Microporellidae bryozoans

*Microporella* undet. sp. (Carolinian marine infauna)

*Monobryozoon* Remane, 1936 - Monobryozoontidae bryozoans

*Monobryozoon bulbosum* Remane, 1936 (NC marine interstitial)

*Monobryozoon sandersi* d'Hondt J.L. & P.J. Hayward, 1981 (Atlantic marine interstitial)

*Nolella* Gosse, 1855 – Nolellidae bryozoans

*Nolella* undet. sp. (Carolinian marine infauna)

*Pedicellina* Sars, 1835 - Pedicellinidae entoprocta

*Pedicellina cernua* (WA marine infauna)

*Pedicellina* undet. sp. (PQ Gulf of St. Lawrence sandy marine interstitial)

*Plumatella* Lamark, 1852 - Plumatellidae bryozoans

*Plumatella repens* (Linnaeus, 1758) (epigean in MI/ Tp in Montezuma Well, AZ) **Bibl.:**  
Bushnell 1961

*Porella* Gray, 1848 – Smittinidae bryozoans (also put in Mucronellidae)

*Porella* undet. sp. (WA marine infauna)

*Savignyella* - Savignyellidae bryozoans

*Savignyella lafontii* (Audouin, 1826) (Carolinian marine infauna)

*Schizoporella* Hincks, 1877 - Schizoporellidae bryozoans

*Schizoporella unicornis* (Johnston, 1874) (Carolinian, WA marine infauna)

*Scrupocellaria* Van Beneden, 1845 – Scrupocellariidae bryozoans (also put in Candidae)

*Scrupocellaria* undet. sp. (Carolinian marine infauna)

*Sundanella* Victorellidae bryozoans

*Sundanella sibogae* (Carolinian marine infauna)

*Tegella* Levinsen, 1909 – Alderinidae bryozoans

*Tegella* undet. sp. (WA marine infauna)



*Tricellaria* Fleming, 1828 – Candidae bryozoans  
*Tricellaria* undet. sp. (WA marine infauna)

*Triticella* Dalyell, 1847 – Triticellidae bryozoans  
*Triticella pedicellata* (Alder, 1857) WA marine infauna)

*Tubulipora* Lamarck, 1916 – Tubuliporidae bryozoans  
*Tubulipora* undet. sp. (WA marine infauna)

*Umbonula* Hincks, 1880 – Umbonulidae bryozoans  
*Umbonula* undet. sp. (WA marine infauna)

**bubonic plague** - Sometimes carried by Ttx rodents. Kartman, 1962;

## Bugs

**Insect**, true bugs of Order Hemiptera (= Heteroptera). Of Subdivision Pareneoptera, Division Neoptera, Subdivision Acercaria, Section Condylgnatha. Some authors combine Hemiptera and Homoptera into one order with two suborders. The name from hemi, “half” and pteron, “wing|,” referring to the basal part of the wing being thickened as a wing cover and the apical part thin, membranous and usually transparent. The triangular part of the body exposed between the wing bases is shared with beetles. Mouth is bent down and mouthparts are beaked for piercing and sucking mostly plant juice but sometimes blood and body fluids. Mostly on land but many species aquatic. 1-50 mm (rarely larger in tropics). Soft to hard bodied with many colors but mostly dark. Antennae short and slender, with at most 4-5 segments. Slender legs with front ones sometimes raptorial and hind ones sometimes enlarged for jumping. Larvae resemble adults except for lack of wings. They are paurometabolous, with terrestrial eggs, larvae and adults. Tridecane from glands in abdomen of larvae and metathorax of adults can dissolve waxy cuticles of predators. Male “penis” inserted into female’s genital opening except in Cimicidae, Polycetenidae, and Anthocoridae where males puncture the female’s abdomen. About 3834 species and 677 genera in US and Canada, >50,000 worldwide. For other groups called bugs, see **beetles, caddisfly, hellgrammites, Homoptera**. Mouthparts adapted for piercing & sucking & no true pupal stage).

**Bibl.:** Botosaneanu (1986a; Henry & Foreschner 1988; Hungerford 1959; Slater & Baranowski 1978; Areas: **CT** Britton et al. 1923; **NA** Blatchley 1926; de la Torre-Buenop 1939, 1941; Slater & Baranowski 1978; **World:** Carvalho 1957

Suborder Cimicomorpha

Superfamily Cimicoidea

Cimicidae (red bugs or bedbugs; bat, bed & bird bugs) (undet. genus & sp. (Tx? In MO)

Subfamily Cimicinae (*Cimex*, *Oeciacus*)

Subfamily Haematosiphoninae (*Haematosiphon*, *Hesperocimex*)

Polycetenidae (bat bugs) (*Hesperoctene*)

Superfamily Reduvioidea

Reduviidae (assassin and thread-legged bugs; assassin, ambush, wheel, soldier, kissing, pirate & thread-legged bugs)

Undet. Tx genus & sp. in Coconino Co.,AZ

Subfamily Emesinae (*Microvelia*, *Nesidiolestes*, *Rhagovelia*) (put in Veliidae)

Tribe Metapterini (*Barce*, *Emesaya*)

Subfamily Harpactorinae (*Arilus*, *Sinea*, *Zelus*)

Subfamily Peiratinae (*Melanolestes*)

Subfamily Reduviinae (*Reduvius*)

Subfamily Triatominae **Bibl.:** Usinger 1944

Tribe Triatomini (*Paratriatoma*, *Triatoma*)

Suborder Dipsocoromorpha

Superfamily Dipsocoroidea

Ceratocombidae (= Cryptostemmatidae) (ceratocombids) (also subsumed in Dipsocoridae)

Subfamily Ceratocombinae (also subsumed in Dipsocoridae)

Tribe Ceratocombini (*Ceratocombus*)

Dipsocoridae (incl. Ceratocombidae according to some authors) ((jumping) ground bugs)

(= Cryptostemmatidae) (Undet. genus & sp. (Tx or Ac in MO)

Subfamily Ceratocombinae

Tribe Ceratocombini (*Ceratocombus*)

Suborder Gerromorpha (= Amphibiocorisae) (all three orders combined into Geocorisae (terrestrial bugs)

Superfamily Gerroidea

Gerridae (= Hermatobatidae) (water striders; pond skaters)

Undet. genera (OK/Tx). Hungerford & Matsuda, 1960

Subfamily Gerrinae

Tribe Gerrini (*Gerris*)

Subfamily Rhagodotarsinae (*Rheumatobates*)

Mesoveliidae (now in Mesoveliioidea)

Veliidae (now in Hebroidea)

Superfamily Hebroidea

Velidae (once in Gerroidea) (ripple bugs, smaller water striders; shortlegged striders) ]  
(also put in Reduviidae)

Subfamily Microveliinae  
Tribe Microveliini (*Microvelia*)

Subfamily Rhagoveliinae (*Rhagovelia*)

Superfamily Hydrometroidea  
Macrovelidae (subsumed in Mesovelidae)

Superfamily Mesovelioidae  
Mesovelidae (once in Gerroidea) (water treaders; water treader bugs)  
Subfamily Mesoveliinae (*Cavaticovelia*)

Subfamily Mesoveliinae  
(*Macrovelia* (also put in Mesovellidae & Lygaeidae), *Mesovelia*)

Suborder Nepomorpha (= Cryptocerata; Hydrocorisae) (aquatic bugs)  
Superfamily Corixoidea  
Corixidae

Superfamily Nepoidea  
Belostomatidae (giant water bugs; electric light bugs)  
Subfamily Belostomatinae (*Belostoma*)

Nepidae (water scorpions)  
Subfamily Ranatrinae (*Ranatra*)

Suborder Pentatomomorpha  
Superfamily Coreoidea  
Coreidae (squash bugs; leaf-footed bugs)  
Subfamily Coreinae

Tribe Acanthocephalini (*Acanthocephala*)  
Tribe Anisoscelini (=Anisoscelidini) (*Leptoglossus*, *Narnia*)

Tribe Coreini (*Scolopocerus*)  
Tribe Nematopodini (*Mozena*)

Rhopalidae (scentless plant bugs)  
Subfamily Rhopalinae  
Tribe Harmostini (*Harmostes*)

Subfamily Serinethinae (*Jadera*)

Superfamily Lygaeoidea  
Lygaeidae (seed bugs; chinch, plant bugs)

Undet. Genus (>15,680 years old in *Neotoma* woodrat nest in Tinajas Mts., Yuma Co, AZ)

Subfamily Lygaeinae (*Lygaeus*, *Oncopeltus*)

Subfamily Orsillinae

Tribe Nysiini (*Nyseus*)

Subfamily Rhyparochrominae (elevated to family by Henry 1997)

Tribe Drymini (*Eremocoris*)

Tribe Gonianotini (*Atrazonotus*)

Tribe Myodochini (*Cnemodus*)

Tribe Ozophorini (*Ozophora*)

Rhyparochromidae (once Rhyparochrominae in Lygaeidae) (elevated to family; Henry 1997)

Tribe Drymini (*Eremocoris*)

Tribe Gonianotini (*Atrazonotus*)

Superfamily Pentaomoidea

Cydnidae (cydnid, burrower or shield bug; negro & burrower bugs)

Subfamily Cydninae (*Dallasiellus*, *Ectinopus*, *Pangaeus*, *Rhytidoporus*, *Tominotus*)

Pentatomidae (stink bugs; shield bugs)

Subfamily Pentatominae

Tribe Halyini (*Brochymena*)

Tribe Mediceini (*Mecidea*)

Tribe Pentatomini (*Hymenarcys*, *Moromorpha*, *Prionosoma*, *Thyanta*)

Subfamily Scutellerinae (also put in own family)

Genus 10.3K to 8.97K years in *Neotoma* woodrat nest in Tinajas Mts., Yuma Co, AZ)

Scutelleridae

Thyreocoridae

Superfamily Pyrrhocoroidea

Largidae (red bugs and ant mimic bugs; largid bugs) (also put in Pyrrhocoridae)

Subfamily Larginae (*Largus*)

Pyrrhocoridae (see Largidae) (red bugs or stainers)

Undet. Genus. (9,790 yrs. in *Neotoma* woodrat nest in Tinajas Mts., Yuma Co, AZ)

**BELOSTOMATIDAE** (giant water bugs; electric light bugs)

Subfamily Belostomatinae (*Belostoma*)

**CERATOCOMBIDAE** Fieber, 1861 (= Cryptostemmatidae) (ceratocombids) (also subsumed in Dipsocoridae)

Subfamily Ceratocombinae

Tribe Ceratocombini (*Ceratocombus*)

**CIMICIDAE** Latreille, 1802 (red bugs or bedbugs; bat, bed & bird bugs).

Undet. genus & sp. (Tx? In MO) **Bibl.:** Usinger 1966

Subfamily Cimicinae (*Cimex*, *Oeciacus*)

Subfamily Haematosiphoninae (*Haematosiphon*, *Hesperocimex*)

**DIPSOCORIDAE** ((jumping) ground bugs) (= Cryptostemmatidae)

Undet. genus & sp. (Tx or Ac in MO)

Subfamily Ceratocombinae

Tribe Ceratocombini (*Ceratocombus*)

**COREIDAE** (squash bugs; leaf-footed bugs)

Subfamily Coreinae

Tribe Acanthocephalini (*Acanthocephala*)

Tribe Anisoscelini (=Anisoscelidini) (*Leptoglossus*, *Narnia*)

Tribe Coreini (*Scolopocerus*)

Tribe Nematopodini (*Mozena*)

**CORIXIDAE** (water boatmen)

Subfamily Corixinae

Tribe Corixini (*Arctocorisa*, *Trichocorixa*) **Bibl.:** Hungerford 1948, 1977

CRYPTOSTEMMATIDAE Mcatee & Malloch, 1925 = Dipsocoridae

**CYDNIDAE** Mulsant & Rey, 1866 (cydnid, burrower or shield bug; negro & burrower bugs)

Subfamily Cydninae (*Dallasiellus*, *Ectinopus*, *Pangaeus*, *Rhytidoporus*, *Tominotus*)

**Bibl.:** Froeschner 1960

**GERRIDAE** (water striders; pond skaters)

Undet. genera (OK/Tx). Hungerford & Matsuda, 1960

Subfamily Gerrinae

Tribe Gerrini (*Gerris*)

Subfamily Rhagodotarsinae (*Rheumatobates*)

**LARGIDAE** (red bugs and ant mimic bugs; largid bugs) (also put in Pyrrhocoridae)

Subfamily Larginae (*Largus*)

**LYGAEIDAE** (seed bugs; chinch, plant bugs)

Undet. Genus in (>15,680 years old in *Neotoma* woodrat nest in Tinajas Mts., Yuma Co, AZ)

Subfamily Lygaeinae (*Lygaeus*, *Oncopeltus*)

Subfamily Orsillinae

Tribe Nysiini (*Nyseus*)

Subfamily Rhyparochrominae (elevated to family by Henry 1997)

Tribe Drymini (*Eremocoris*)

Tribe Gonianotini (*Atrazonotus*)

Tribe Myodochini (*Cnemodus*)

Tribe Ozophorini (*Ozophora*)

**MACROVELIIDAE** (macrovelioid shore bugs) (subsumed in Lygaeidae or Mesovellidae)

**MESOVELLIDAE** (water treaders; water treader bugs) Douglas & Scott, 1852

(*Cavaticovelia*)

Subfamily Mesovelliinae (*Macrovelia* (also put in Mesovellidae & Lygaeidae), *Mesovelia*)

**NEPIDAE** (water scorpions)

Subfamily Ranatrinae (*Ranatra*)

**PENTATOMIDAE** (stink bugs; shield bugs)

Subfamily Pentatominae

Tribe Halyini (*Brochymena*)

Tribe Mediceini (*Mecidea*)

Tribe Pentatomini (*Hymenarcys*, *Moromorpha*, *Prionosoma*, *Thyanta*)

Subfamily Scutellerinae (also put in own family)

Genus 10.3K to 8.97K years in *Neotoma* woodrat nest in Tinajas Mts., Yuma Co, AZ)

**POLYCTENIDAE** (bat bugs) (*Hesperoctene*)

**PYRRHOCORIDAE** (see Largidae) (red bugs or stainers)

Undet. Genus. (9,790 years old in *Neotoma* woodrat nest in Tinajas Mts., Yuma Co, AZ)

**REDUVIIDAE** Latreille, 1807 (assassin and thread-legged bugs; assassin, ambush, wheel, soldier, kissing, pirate & thread-legged bugs) (Readie (1927)

Undet. Tx genus & sp. in Coconino Co., AZ

Subfamily Emesinae (*Microvelia*, *Nesidiolestes*, *Rhagovelia*) (put in Veliidae)

Tribe Metapterini (*Barce*, *Emesaya*)

Subfamily Harpactorinae (*Arilus*, *Sinea*, *Zelus*)

Subfamily Peiratinae (*Melanolestes*)

Subfamily Reduviinae (*Reduvius*)

Subfamily Triatominae **Bibl.:** Usinger 1944

Tribe Triatomini (*Paratriatoma*, *Triatoma*)

**RHOPALIDAE** (scentless plant bugs) **Bibl.:** Chopra 1967

Subfamily Rhopalinae  
Tribe Harmostini (*Harmostes*)

Subfamily Serinethinae (*Jadera*)

**RHYPAROCHROMIDAE** (once subfamily Rhyparochrominae in Lygaeidae)  
(elevated to family by Henry 1997)  
Tribe Drymini (*Eremocoris*)  
Tribe Gonianotini (*Atrazonotus*)

SCUTELLERIDAE (jewel bugs) (subsumed in Pentatomidae, Subfamily Scutellerinae)

THYREOCORIDAE (negro bugs) = Corimelaenidae

**VELIIDAE** Amyot & Serville, 1843 (ripple bugs, smaller water striders; shortlegged striders)  
(also put in Reduviidae). **Bibl.** Smith & Polhemus 1978  
Subfamily Microveliinae  
Tribe Microveliini (*Microvelia*)

Subfamily Rhagoveliinae (*Rhagovelia*)

***Acanthocephala*** Laporte, 1811 - Coreidae bugs, Subfamily Coreinae, Tribe Acanthocephalini (5 species in US or Canada)

***Acanthocephala*** undet. sp. (1,400 to 10,300 & >26,000 years BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM)

*Acantholomidea* Sailer, 1945 - Scutelleridae bugs, Subfamily Pachycorinae (also put in Pentatomidae, Subfamily Pachycorinae)

*Acantholomidea porosa* = *Camirus p.*

***Arctocorisa*** Wallengren, 1894 (= *Arctocorixa*) Corixidae bugs, Subfamily Corixinae, Tribe Corixini (5 species in US or Canada)

***Arctocorisa*** undet. sp. (PQ Gulf of St. Lawrence sandy marine interstitial)

***Arilus*** Hahn, 1831 - Reduviidae bugs, Subfamily Harpactorinae (1 species in US or Canada)

***Arilus*** *cristatus* (*Cimex c.* Linnaeus, 1763; *Reduvius novenarius* Say, 1825; *A. denticulatus* Westwood, 1837)) (NJ to FL, SW/Tx in Comal Co., TX)

***Atrazonotus*** Slater & Ashlock, 1966 - Rhyparochromidae bugs (formerly in Lygaeidae, Subfamily Rhyparochrominae, Tribe Gonianotini (1 species in US or Canada)

**Atrazonotus** *umbrosus* (*Aphanus u.* Distant, 1893) (ON to FL, w. to SW,KS,CO/Ac in cave in Sutton Co., TX)

**Barce** Stal, 1866 - Reduviidae bugs, Subfamily Emesinae, Tribe Metapterini (6 species in US or Canada)

**Barce** Banks, 1909 (*Metapterus uhleri*) (Ac in Edmonson Co., KY) Sullivan 1962

**Belostoma** Latreille, 1807 - Belostomatidae bugs, Subfamily Belostomatinae (10 species in US or Canada)

**Belostoma** undet. sp. (MI lake benthic)

**Brochymena** Amyot & Serville, 1843 - Pentatomidae bugs, Subfamily Pentatominae, Tribe Halyini (21 species in US or Canada)

**Brochymena** *quadripustulata* (*Cimex q.* Fabricius, 1775; *Halys serrata* Beauvois, 1818; *H. pupillata* Herrich-Schaffer, 1839; *B. quadrinotata* Provancher, 1872)) (PQ to NC, KS, CO, SW/Ac in John's Guano Mine, Presidio Co., TX)

**Brochymena** undet. sp. (Ac in Devil's Sinkhole, Edwards Co., TX)

**Camirus** Stal, 1862 - Scutelleridae bug, Subfamily Pachycorinae (once in Pentatomidae) (2 species in US or Canada)

**Camirus** cf. *moestus* (*Zophoessa m.* Stal, 1862) (epigean in AZ,Mex./ >43,300 years old in *Neotoma* woodrat nest in Tinajas Mts., Yuma Co,AZ)

**Camirus** cf. *porosus* (*Pachycoris p.* Germar, 1839; *Acanthlomidea p.* Dallas, 1851) (epigean in AZ & Mex./ 1,200 years old in *Neotoma* nest, Ajo Mts., Pima Co., AZ)

**Cavaticovelia** N.M. Andersen & Polhemus, 1980 - Mesovellidae bugs

**Cavaticovelia** *aaa* (*Speovelia a.* Esaki, 1929) M.A & P.1980 (cave bug, aaa water treater bug/ type locality in Kazamura C./ cave in HI Volcanoes Natl. Park/Tb/ HI & federal Species of Concern, S1S2, global G1G3 rank) Gagne & Howarth, 1975,

**Ceratocombus** Signoret, 1852 (= *Xylonannus* Reuter, 1891) Ceratocombidae bug, Subfamily Ceratocombinae, Tribe Ceratocombini (also subsumed in Dipsocoridae) (3 species in US or Canada)

**Ceratocombus** (*Ceratocombus*) poss. undescr. sp.#1 (Tx in two caves in Crawford Co. & one in WA Co.),WA)

**Cimex** Linneaus, 1785 (= *Acanthia* Fabricius, 1771; *Clinocoris* Fallen, 1829; *Klinophilos* Kirkaldy, 1899; *Clinophilus* Blanford, 1903)) Cimicidae bugs, Subfamily Cimicinae (7 species in US or Canada, all (except *C. lectularius*) bat ectoparasites)



**Cimex adjunctus** Barber, 1939 (epigean in AL, CO, DE, FL, GA, IA, IN, KY, MD, MO, NM, NY, NJ, NE OH, PA, SC, TX, VA, WV/ ectoparasite on SC *Myotis austroriparius*, OH *Myotis sodalis* (rare), MI, MN, ND, PA *Myotis lucifugus*; IA *Nycticeius humeralis*; IN (rare), OH (rare), IN, NH *Myotis septentrionalis* (probably), MI, MN, ND *Eptesicus fuscus* & IN *Myotis keeni* & *Lasionycteris noctivagans* bats)

**Cimex antennatus** Usinger & Ueshima, 1965 (ectoparasite on CA *Antrozous pallidus* & NV bats)

**Cimex brevis** Usinger & Ueshima, 1965 (ectoparasite on IL, MI, MN bats)

**Cimex incrassatus** Usinger & Ueshima, 1965 (*C. pilosellus* Bradshaw & Ross, 1961; *C. p.* strain B U. 1963) (Guatemala to UT/ ectoparasite on CA (Tx) *Antrozous pallidus* *Corynorhinus r.* & AZ *Eptesicus f.*, *Myotis velifer*, *M. yumanensis* & NV, UT bats)

**Cimex latipennis** Usinger & Ueshima, 1965 (ectoparasite on CA, ID, MT, OR bats)

**Cimex pilosellus** (*Clinocoris p.* Horvath, 1910) (NA, incl. AB, AZ, BC, CA, CO, ID, MT, NB, NV, OR, WA/ ectoparasite on NC *Nycticeius humeralis*, AZ, sNM, OR, wTX *Pipistrellus hesperus*; BC *Myotis californicus* & *M. septentrionalis*, OR *Myotis volans*; BC *Myotis volans longicrus*; AZ, BC, CA *Myotis yumanensis*; BC, IN, ON *Myotis lucifugus*; AZ (Tx), wTX *Myotis velifer incautus*; TN, WI *Lasiurus borealis*; AZ, AR, BC, KS, NY *Eptesicus fuscus*; IN, BC *Lasionycteris nivalis*; BC, NB, ON *Lasionycteris noctivagans*, AZ, CA (accidental), CA, NM, TX *Antrozous pallidus*, & AZ (Tx) *Myotis thysanodes* bats/ bat bug)

**Cimex** undet. sp. or species (Tx *Myotis* bat ectoparasite in WA; ectoparasite on ON bat guano))

**Cnemodus** Herrich-Schaeffer, 1850 - Rhyparochromidae bugs (formerly in Lygaeidae, Subfamily Rhyparochrominae, Tribe Myodochini) (6 species in US or Canada)

**Cnemodus mavortius** (*Astemma m.* Say, 1832; *C. brevipennis* Herrich-Schaeffer, 1850; *Thaumastopus alacris* Walker, 1872; *Cnemodus mavortus* Davis & Leng, 1912 (missp.); *C. inflatus* Van Duzee, 1915) (ME to FL, w.to TX, IN, MO/Ac in Edwards Co., TX)

**Dallasiellus** Berg, 1901 - Cydnidae bug, Subfamily Cydninae (5 species in US or Canada)

**Dallasiellus** (*Pseudopangaesus*) *californicus* (*Pangaesus c.* Blatchley, 1929) (epigean in AZ, CA, NM, Mex.?! 1,200 years old in *Neotoma* nest, Ajo Mts., Pima Co., AZ)

**Dallasiellus** (*Pseudopangaesus*) *discrepans* (*Pangaesus d.* Uhler, 1877) (epigean in AZ, CA, CO, ID, NM, OK, OR, PA?, TX, UT, WA/ 9,400 to 10,300 years BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM)

**Ectinopus** Dallas, 1851 - Cydnidae bug, Subfamily Cydninae (also put in Pentatomidae)

**Ectinopus** undet. sp. (Ac or Tx in TX)

**Emesaya** McAtee & Malloch, 1925 - Reduviidae bugs, Subfamily Emesinae, Tribe Metapterini

(5 species in US or Canada)

***Emesaya brevipennis*** (*Ploiaria b.* Say, 1828; *Cimex longipes* De Geer, 1773 (Homo.); *Emesaya pia* Amyot & Seville, 1843; *Emesaya australis* & *occidentalis* McAtee & Malloch, 1925) (MA,CT to FL,SW/ thread-legged bug/ ?Tx in Edwards Co., TX)

***Eremocoris*** Fieber, 1860 - Lygaeidae bugs, Subfamily Lygaeinae, Tribe Drymini (12 species in US or Canada)

***Eremocoris inquilinus*** Van Duzee, 1914 (epigeal in CA/ probable woodrat parasite in CA non-cave *Neotoma fuscipes* woodrat nest)

***Galgupha*** Amyot & Serville, 1843 (= *Gyrocnemis* & *Nothocoris* McAtee & Malloch, 1928; *Orocoris* M.& M., 1933) Thyreocoridae bugs (4 species in US or Canada)

***Galgupha*** undet. sp. (Tp? in Valdina Farms Sinkhole, Medina Co., TX)

***Gerris*** Fabricius, 1794 (= *Limnotrechus* & *Hydrotrechus* Stal, 1868; *Aquarius* Schellenberg, 1800; *Macrogerris* Andersen, 1993) Gerridae bugs, Subfamily Gerrinae, Tribe Gerrini (15 species in US or Canada)

***Gerris*** (*Aquarius*) *remigis* Say, 1832 (*Gerris orba* S.1859; *Hydrotrechus robustus* Uhler, 1871; *G. calaregon* Calabrese, 1974)(NA,Central Amer./common water strider, skater, Jesus Bugs/Tx in CA,AR,MO,TX)

***Gerris*** undet. sp. or species (TTx or Ac in TN (1cave); PQ Gulf of St. Lawrence sandy marine interstitial)

***Haematosiphon*** Champion, 1900 - Cimicidae bugs, Subfamily Haematosiphoninae (1 species in US or Canada)

***Haematosiphon inodorus*** (*Acanthia i.* Duges, 1892) (OK to CA,nMex, AZ, KS,NM,TX./ Tx in Socorro, NM/ on condors, barn & horned owls & golden eagles)

***Harmostes*** Burmeister, 1835 - Rhopalidae bugs, Subfamily Rhopalinae, Tribe Harmostini (7 species in US or Canada)

***Harmostes*** (*Harmostes.*) *reflexulus* (*Syromates r.* Say, 1832; *H. costalis* Herrich-Schaffer, 1851; *H. virescens* Dallas, 1852; *H. bicolor* Distant, 1881; *H. bruesi* Bergroth, 1913; *H. mirificus* & *caurus* Bliven, 1956)) (US/Ac in cave in Sutton Co., TX)

***Hesperocimex*** List, 1925 Cimicidae bugs, Subfamily Haematosiphoninae (2 species in US or Canada)

***Hesperocimex coloradensis*** List, 1925 (epigeal in AZ, CA, KS, NM, OK, TX, Mex.?! in AZ *Neotoma* woodrat nest)

**Hesperoctenes** Kirkaldy, 1906 - Polyctenidae bugs (2 species in US or Canada)

**Hesperoctenes eumops** Ferris & Usinger, 1939 (= *H. longiceps*) (ectoparasite on CA *Eumops californicus* & CA, wTX *Eumops perotis* bats)

**Hesperoctenes hermsi** Ferris & Usinger, 1939 (ectoparasite on TX *Tadarida macrotis* bats)

**Hesperoctenes longiceps** Waterhouse, 1880 (ectoparasite on Guatemala *Eumops californicus* & Guatemala, Brazil, CA *E. perotis* bats)

**Hymenarcys** Amyot & Serville, 1843 - Pentatomidae bugs, Subfamily Pentatominae, Tribe Pentatomini (4 species in US or Canada)

**Hymenarcys nervosa** (*Pentatoma n.* Say, 1832) (PQ to FL, w. to TX,SD,NB,OK/Ac in cave in Edwards Co., TX)

**Jadera** Stal, 1862 - Rhopalidae bugs, Subfamily Serinethinae (2 species in US or Canada)

**Jadera haematoloma** (*Leptocoris h.* Herrich-Schaeffer, 1847) (FL to KS,SW/Ac in Devil's Sinkhole, Edwards Co., TX)

**Largus** Hahn, 1831 (= *Euryopthalmus*) Largidae bugs, Subfamily Larginae (= Euryophtalminae)(12 species in US or Canada)

**Largus cinctus** (*Euryopthalmus c.* Herrich-Schaeffer, 1842)(SW to OR, Neotropics/Tx or Ac in CA)

**Leptoglossus** Guerin-Meneville, 1831 (= *Theognis* Stal, 1862) Coreidae bugs, Subfamily Coreinae, Tribe Anisoscelini (11 species in US or Canada)

**Leptoglossus clypealis** Heidemann, 1910 (SW to IA, OR, CO epigeal/ Ac in cave in Hays Co., TX)

**Ligyrocoris** Stal, 1872 - - Rhyparochromidae bugs (formerly in Lygaeidae, Subfamily Rhyparochrominae, Tribe Myodochini) (12 species in US or Canada)

**Ligyrocoris** undet. sp. (Ac in Sutton Co., TX)

**Lygaeus** Fabricius, 1794 (= *Graptolomus* Stal, 1868) Lygaeidae bugs, Subfamily Lygaeinae (6 species in US or Canada)

**Lygaeus kalmi** (= *L. (Graptolomus) k.* Stal, 1874; *L. malanmodermus* Montandon, 1893; *L. angustomarginatus* Parshley, 1919) (NA epigeal/ Ac in Edwards Co., TX)

**Macrovelia** Uhler, 1872 - Mesoveliidae bugs (also put in Lygaeidae & Macroveliidae) (1 species in US or Canada)

**Macrovelia** *hornii* Uhler, 1872 (epigeal in SW/ TTx or TTp in Kings Canyon Natl. Park, Tuolumne Co., CA) **Bibl.:** V. Lee 1985

**Mecidea** Dallas, 1851 - Pentatomidae bugs, Subfamily Pentatominae, Tribe Mediceini (2 species in US or Canada)

**Mecidea** *minor* Ruckes, 1946 (Ac in Edwards Co., TX)

**Melanolestes** Stal, 1866 - Reduviidae bugs, Subfamily Peiratinae (3 species in US or Canada)

**Melanolestes** *abdominalis* (*Pirates a.* Herrick-Schaefer, 1846) (epigeal in CT, s. to NC, w. to SD, TX/ Tx? in Edwards & Medina Co.s, TX)

**Mesovelia** Mulsant & Rey, 1852 - Mesovellidae bugs, Subfamily Mesoveliinae. (3 species in US or Canada) **Bibl.:** Hoffmann 1932; C. Richmond 1932

**Mesovelia** *amoena* Uhler, 1894 (= *M. douglasensis* Gungerford, 1924) (HI Volcanoes Natl. Park/ Tp)

**Microvelia** Westwood, 1898 (= *Hydroessa* Burmeister, 1835; *Kirkaldya* Torre-Bueno, 1910) (pond bug). Veliidae bugs, Subfamily Microveliinae, Tribe Microveliini (once put in Reduviidae, Subfamily Emesinae) (19 species in US or Canada) **Bibl.:** Smith 1980; Drake & Hussey 1955

**Microvelia** (*Kirkaldya*) *americana* (Uhler, 1884) (E, w. to CO, NB, SW, TX/ American veliid/ Tx or Ac in AR, MO; Ac in GA (Dade Co.))

**Microvelia** (*Microvelia*) *austrina* Torre-Bueno, 1924 (= *M. parallela* Blatchley, 1925) (Tx or Ac in AR)

**Microvelia** (*Kirkaldya*) *beameri* McKinsty, 1937 (AK, SW, CA, Canada, FL?/ Tx or Ac in TX),

**Microvelia** undet. sp. or species (Tx in nMS, MO, TX)

**Moromorpha** Rolston, 1978 - Pentatomidae bugs, Subfamily Pentatominae, Tribe Pentatomini (1 species in US or Canada)

**Moromorpha** *tetra* (*Mormidea t.* Walker, 1868) (7,300 to 15,500 years BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM)

**Mozena** Amyot & Serville, 1843 (= *Rhombogaster* Dallas, 1852) Coreidae bugs, Subfamily Coreinae, Tribe Nematopodini (7 species in US or Canada)

**Mozena** (*M.*) *lunata* (*Archimerus* l. Burmeister, 1835; *M. rufescens* Ruckes, 1955 ) (epigean in Mex., NM, AZ/ Ac in Edwards Co., TX)

**Narnia** Stal, 1862 (= *Xerocoris*) - Coreidae bugs, Subfamily Coreinae, Tribe Anisoscelini (7 species in US or Canada)

**Narnia femorata** S.1862 (SW, OK, Mex./Ac in cave in Edwards Co., TX)

**Nesidiolestes** Kirkaldy, 1902 (wingless thread bugs) Veliidae bugs (once put in Reduviidae, Subfamily Emesinae)

**Nesidiolestes ana** Gagne & Howarth, 1975 (type locality & one other caves HI Volcanoes Natl. Park/ Ana wingless thread bug/ Tb/HI Species of Concern, S1S3, global G1G3 rank)

**Nysius** Dallas, 1852 - Lygaeidae bugs, Subfamily Orsillinae, Tribe Nysiini (12 species in US or Canada)

**Nysius raphanus** Howard, 1872 (epigean in most of US & sCanada, s. to Mex./ 20,500 & 13,500 years old in *Neotoma* nest, Ajo Mts., Pima Co., AZ)

**Oeciacus** Stal, 1873 - Cimicidae bugs, Subfamily Cimicinae (1 species in US or Canada)

**Oeciacus vicarius** Horvath, 1912 (swallow bug/ ectoparasite on TX *Myotis velifer* bats)

**Oncopeltus** Stal, 1868 (= *Erythriscius* Stal, 1874) Lygaeidae bugs, Subfamily Lygaeinae

**Oncopeltus** (*Erythriscius*) *fasciatus* (*Lygaeus f.* Dallas, 1852) (MA to IN, SW/ Ac in Sutton Co., TX)

**Ozophora** Uhler, 1871 (= *Davila* Distant, 1893 (Homo.); *Peggichisme* Kirkaldy, 1904) Lygaeidae bugs, Subfamily Rhyparochrominae, Tribe Ozophorini (14 species in US or Canada)

**Ozophora** undeter. sp. (Ac or Tx in CA)

**Ozophora** sp. nr. *depicturata* Barber, 1928 (epigean in AZ, CA/ Ac in Val Verde Co., TX)

**Pangaesus** Stal, 1862 - Cydnidae bugs, Subfamily Cydninae (5 species in US or Canada)

**Pangaesus** (*Homaloporus*) *bilineatus* (*Cydnus b.* Say, 1825) (epigean in PQ to FL, w. to Midwest, SW, s. to Guatemala/ 2,000 to 19,700 years BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM/ 8,000 to 3,000 year old woodrat nest in Big Bend Natl. Park, wTX)

**Pangaesus** (*Homaloporus*) *congruus* (*Homaloporus c.* Uhler, 1877) (epigean in AZ, CA, CO, KS, N M, TX, Mex./ 2,000 to 19,700 years BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM)

**Pangaesus** undet. sp. (Ac in El Malpais Natl. Monument, nNM)

***Paratriatoma*** Barber, 1938 - Reduviidae bugs, Subfamily Triatominae, Tribe Triatomini (1 species in US or Canada)

***Paratriatoma hirsuta hirsuta*** Barber, 1938 (obligate ectoparasite on AZ, CA, NV *Neotoma lepida* woodrats)

***Paratriatoma hirsuta kamiensis*** Ryckman, 1967 (obligate ectoparasite on CA *Neotoma fuscipes macrotis* woodrats)

***Paratriatoma hirsuta papagoensis*** Ryckman, 1967 (obligate ectoparasite on sAZ, nMex. *Neotoma* woodrats)

***Paratriatoma hirsuta pima*** Ryckman, 1967 (obligate ectoparasite on cAZ. *Neotoma* woodrats)

***Primicimex*** Barber, 1941 - Cimicidae bugs, Subfamily Primicimicinae (1 species in US or Canada)

***Primicimex cavernis*** Barber, 1941 (type locality in cave in Medina Co., TX / epigeal from TX to Guatemala/ Tp in TX, Guatemala & Mex. c.). Bibl.: Ueshima, 1968.

***Prionosoma*** Uhler, 1863 (= *Neurohalys* Bliven, 1960) Pentatomidae bugs, Subfamily Pentatominae, Tribe Pentatomini (1 species in US or Canada)

***Prionosoma podopioides*** Uhler, 1863 (= *P. villosum* Provancher, 1888; *N. buculatus* B. 1960) (BC to SW/Ac in Presidio Co., TX)

***Ranatra*** Fabricius, 1790 - Nepidae bugs, Subfamily Ranatrinae

***Ranatra montezuma*** Poolhemus, 1976 (\*Montezuma well and adjoining submerged cave/ Ttx)  
Bibl.: Blinn 1982; Runck & Blinn 1990

***Reduvius*** Fabricius, 1775 (assassin bugs) Reduviidae bugs, Subfamily Reduviinae (4 species in US or Canada)

***Reduvius*** undet. sp. (NY to NC, w. to SW, OK, CA/ Tx in Val Verde Co., TX; predator on ON bat guano)

***Rhagovelia*** Mayr, 1865 - Veliidae bugs, Subfamily Rhagoveliinae (once put in Reduviidae, Subfamily Emesinae) (9 species in US or Canada)

***Rhagovelia*** undet. sp. (Tx or Ac in Comal Co., TX)

***Rheumatobates*** Bergroth, 1892 - Gerridae bugs, Subfamily Rhagodotarsinae (8 species in US or Canada)

***Rheumatobates*** undet. sp. (Tx in OH; IL river benthic)

**Rhytidoporus** Uhler, 1877 - Cydnidae bugs, Subfamily Cydninae (2 species in US or Canada)

**Rhytidoporus** (*Rhytidoporus*) *indentatus* Uhler, 1877 (s. from CA to FL, Mex./ rare Ac or Tx alien in Kazumura C., HI Island, HI)

**Scolopocerus** Uhler, 1875 - Coreidae bugs, Subfamily Coreinae, Tribe Coreini (3 species in US or Canada)

**Scolopocerus** *granulosus* Barber, 1914 (epigean in AZ, TX/ Ac in Presidio Co., TX)

**Sinea** Amyot & Serville, 1843 - Reduviidae bugs, Subfamily Harpactorinae (11 species in US or Canada)

**Sinea** undet. sp. (Ac or Tx in Edwards Co., TX)

*Speovelia* (see *Cavatocovelia*)

**Thyanta** Stal, 1860 - Pentatomidae bugs, Subfamily Pentatominae, Tribe Pentatomini (7 species in US or Canada)

**Thyanta** *pallidovirens* (*Pentaloma p.* Stal, 1859; *T. setosa* Ruckes, 1857)) (CT to NC, TX/Ac in cave in Sutton Co., TX)

**Tominotus** Mulsant & Rey, 1866 (= *Trichocoris* Uhler, 1876; *Psectrocephalus* Van Duzee, 1922) - Cydnidae bugs, Subfamily Cydninae (4 species in US or Canada)

**Tominotus** undet. sp. (Tx or Tp in cave in Williamson Co., TX)

**Triatoma** Laporte, 1832 - Reduviidae bugs, Subfamily Triatominae, Tribe Triatomini (11 species in US or Canada)

**Triatoma** *gerstaeckeri* (*Conorhinus g.* Stal, 1859) (epigean in TX, Mex./ Ttx in TX)

**Triatoma** *indictiva* Neiva, 1912 (TTx in San Saba Co., TX)

**Triatoma** *neotomae* Neiva, 1911 (*Neotoma* ectoparasite in *Neotoma* woodrat nests in AZ, CA, NM, TX)

**Triatoma** *protracta* (Uhler, 1894) (epigean in SW/ woodrat ectoparasite in CA non-cave *Neotoma fuscipes* woodrat nest/ western bloodsucking conenose)

**Triatoma** undet. sp. (TTx in TX; *Neotoma* woodrat midden in cave in Glen Canyon area, UT; *Neotoma lepida* nest (Toole Co., UT); (fossil in *Neotoma* woodrat midden, Puerto Blanco Mts., Pima Co., sAZ)

*Trichocorixa* Kirkaldy, 1908 - Corixidae bugs, Subfamily Corixinae, Tribe Corixini (11 species in US or Canada)

*Trichocorixa verticalis* (Fieber, 1851) undet. sp. (PQ Gulf of St. Lawrence sandy marine interstitial)

*Trichocorixa verticalis fenestrata* Walley, 1930 (PQ Gulf of St. Lawrence sandy marine interstitial)

*Zelus* Fabricius, 1803 (= *Pindus* Stal, 1862; *Diplacodus* Kirkaldy, 1900) Reduviidae bugs, Subfamily Harpactorinae (7 species in US or Canada)

*Zelus* (*Pindus*) *tetracanthus* Stal, 1862 (= *P. Socius* Uhler, 1872; *Z. audax* Banks, 1910; *Z. occiduus* Torre-Bueno, 1913; *Z. angustatus* Hussey, 1925) (US/Ac or Tx in Presidio Co., TX)

**burrow** - See trace fossil

## Caddisflies

Insect of Order Trichoptera (=Phryganoidea), Subclass Pterygota, Division Neoptera, Subdivision Endopterygota (=Holometabola), Section Panorpidia, Subsection Amphimesenoptera. Name from *trichos*, “hair” and *pteron* “wing. From Cretaceous or possibly Jurassic (ancestral form to both Trichoptera & Lepidoptera?).

Large wings in adults are held tentlike over the abdomen. Both wing pairs are similar (vestigial or absent in a few rare females) but the hind one is frequently wider. Legs are slender and often long, with rather long and stout spurs on the tibia. No cerci on the abdomen. No scales on antennae or wings. Mouthparts are fly-like (lapping, sponging) but are poorly developed.

Only holometabolous insects (complete metamorphosis: egg, larvae, pupae, adults) with totally aquatic larvae (a few live in streamside mosses). Larvae are somewhat caterpillar like but with terminal hooklike prolegs. True legs used for walking under water, or in some species for swimming. Some species have external gills. Some larvae are filter feeders and scavengers; others are predators. Most live in cases made from wood, leaves, stones, sand, or shells and held together by silk from salivary glands. They spin a net to trap food particles, form a silken tube from which they rush out to gather prey, or carry their case with them. Mating may be preceded by a mating dance centered around a log, stump, rock, etc. Females lay eggs in aquatic substrates, drop egg balls into water or by forming an egg mass over or beside water. 7,000 named species, with 1,261 species in 141 genera in the U.S. Adults are rare in caves; larvae are more common, especially as epigeic and hyporheic in cave streams.

**Bibl:** Betten, 1934; McCafferty & Provonsha 1981; Merritt & Cummins 1978; Schmid, 1980; Ross, 1944; Wiggins 1996; **Areas:** AR: Moulton 1994; **MTs.:** H. Ross 1956; **IL:** H. Ross 1972; MO: Moulton 1994; OK: Moulton 1994; **NA:** Wiggins 1977; **NY:** Betten 1934; **OR:** N. Anderson 1976



Suborder Annulipalpia (grub-like larvae) (Glossosomatidae, Hydroptilidae, Rhyacophilidae)

  Infraorder Curvipalpia

    Superfamily Hydropsychoidea (net makers)

      (Hydropsychidae, Philopotamidae, Polycentropodidae, Psychomyiidae)

Suborder Interpalpia (caterpillar-like larvae) (now subsumed in Integripalpia)

Suborder Integripalpia (tube-case makers)

  Infraorder Brevitentoria

    Superfamily Leptoceroidea (purse makers)

      (Leptoceridae) (once put in Interpalpia), Melannidae)

    Superfamily Sericostomatoidea (Helicopsychidae, Sericostomatidae)

  Infraorder Planitentoria

    Superfamily Limnephiloidea (saddle makers, changeable larvae & free living forms)

      (Brachycentridae, Lepidostomatidae, Limnephilidae, Uenoidea) (once put in Interpalpia)

APATANIIDAE (*Allomyia*) (put in Limnephilidae, Subfamily Apataniinae)

BORBORIDAE (*Limosina*) (now in Leptoceridae)

**BRACHYCENTRIDAE** (humpless case makers or brachycentrids) (*Brachycentrus*,  
*Micrasema*)

**ECNOMIDAE** (in NA?) (*Austrotinodes*)

**GLOSSASOMATIDAE** (tortoise-case or saddle-case makers)

  Subfamily Agapetinae (*Agapetus*, *Cheumatopsyche* (now in Hydropsychidae),

  Subfamily Glossosomatinae *Glossosoma* (once in Polycentropodidae)

  Subfamily Protoptilinae (*Protoptila*)

**HELICOPSYCHIDAE** (snail casemaker caddisflies) (*Helicopsyche*)

**HYDROPSYCHIDAE** ((common) net-spinning caddisflies; common net-spinners)

  Bibl.: Rhame 1973 (*Ceratopsyche*)

  Subfamily Diplectroninae (*Diplectrona*)

  Subfamily Hydropsychinae *Cheumatopsyche*, *Hydropsyche*, *Potamyia*)

**HYDROPTILIDAE** (Micro caddisflies, purse-case makers or microcaddis flies)

  Ac undet. genus & sp. in OH

  Subfamily Hydroptilinae

    Tribe Hydroptilini (*Hydroptila*)

    Tribe Ochrotrichini (*Ochrotrichia*)

**LEPIDOSTOMATIDAE** (lepidostomatids (bizzare caddisflies; case makers))

(*Clostoea, Ecclisomyia, Lepidostoma, Psychoglypha, Theliopsyche*) **Bibl.:** Weaver 1988

Lepidostomatidae eggs are laid in masses or strings of several hundred in the water or on objects near water. Larvae are aquatic, caterpillarlike, with abdomen bearing filamentous gills. Most species are case makers and many build nets under water. Few are free-living. They undergo a complete metamorphosis. Most larvae pupate in their case after they have completed their growth. Pupae are usually attached to some object in the water. When they are fully developed, they leave their cases, swim to the surface, crawls out of the water onto a stone or other objects and emerge as adults. Larvae construct their cases by fastening rock or plant fragments with silk. Adults are mostly nocturnal, often attracted at light. Larvae live in any kind of aquatic habitat, from rivers, lakes to marshes. Adults are found flying around these habitats.

**LEPTOCERIDAE** (longhorned caddisflies or case makers)

Subfamily Leptocerinae

(*Ceraclea, Leptocera, Leptocerus, Limosina* (both in Sphaeroceridae **flies**), *Mystacides, Oecetis, Triaenodes*)

**LIMNEPHILIDAE** (northern caddisflies; northern casemaker caddisflies) **Bibl.:** Flint 1960

(*Allomyia* (now in Apataniidae)

Subfamily Limnephilinae

Tribe Chilostigmini (*Frenesia*)

Tribe Limnephilini (*Hesperophylax, Limnephilus*)

Tribe Stenophylacini (*Pycnopsyche*)

**MOLANNIDAE** (elevated from subfamily status Dipseudopsinae) (hood casemakers)

(*Molanna*)

**ODONTOCERIDAE** (mortarjoint casemakers)

Subfamily Odontocerinae (*Nerophilus, Parthina*)

**PHILOPOTAMIDAE** (fingernet caddisflies)

(*Chimarra, Dolophilodes, Wormaldia*; undet. genera (Tp in cave in AR)

**PHRYGANEIDAE** (giant casemaker caddisflies; cased caddis)

Subfamily Phryganeinae (*Ptilostomis*)

**POLYCENTROPODIDAE** (tubemaking & trumpet-net or nettube caddisflies)(*Cheumatopsyche* (put in Hydropsychidae),

Subfamily Dipseudopsinae (*Phylocentropus*)

(also put in Dipseudopsidae, Subfamily Hyalopsychinae)

Subfamily Polycentropodinae

(*Cyrnellus*, *Neureclipsis* (also put in Hydropsychidae), *Imania* (= *Allomyia* in Limenphilidae), *Glossosoma* (now in Glossosomatidae), *Hydroptila* (now in Hydroptilidae), *Neophylax* (now in Uenoidea) (once = *Limnephilus* in Limenphilidae), *Nyctiophylax*, *Polycentropus* (also put in Psychomyiidae), *Polyplectropus*, *Psychomyia* (now in Psychomyiidae)

**PSYCHOMYIIDAE** (tube-net or nettube caddisflies)

Subfamily Hyalopsychinae (*Phylocentropus*)

Subfamily Psychomyiinae (*Lype*, *Polycentropus* (now in own family) *Psychomyia*)

**RHYACOPHILIDAE** (primitive or freeliving caddisflies)

Subfamily Rhyacophilinae

(*Agapetus* & *Glossosoma* (both now in Glossosomatidae), *Rhyacophila*)

**SERICOSTOMATIDAE** (bushtailed caddisflies; cased caddis)

Subfamily Sericostomatinae (*Agarodes*)

**UEONOIDAE** (*Neophylax*) (once put in Polycentropodidae & = *Limnephilus* in Limenphilidae)

*Agapetus* Dejean, 1834 (*Synagapetus*, *Pseudagapetus* MacLachlan, 1879; *Myspoleo* Barnard, 1934; *Tagapetus* Ross, 1951) Glossosomatidae caddisflies, Subfamily Agapetinae (31 species in US or Canada)

*Agapetus* undet. sp. (Tx in MO)

*Agarodes* Banks, 1899 - Sericostomatidae Trichoptera (caddisflies), Subfamily Sericostomatinae (11 species in US or Canada)

*Agarodes libalis* Ross & Scott, 1974 (seVA hyporheic)

*Allomyia* Banks, 1916 (*Imania* Martynov, 1935) Limnephilidae caddisflies, Subfamily Apataniinae (also put in Apataniidae) (12 species in US or Canada)

*Allomyia* *acanthis* (= *Imania a.* Ross, 1950) (Tx in Paradise Ice C., WA)

*Austrotinodes* F. Schmid, 1955 - Ecnomidae caddisflies

*Austrotinodes* undescr. sp. (Edwards Plateau, TX/Pb?)

*Brachycentrus* Curtis, 1834 (*Pogonostoma*, *Dasystema* Rambur, 1842; *Hydronautia* Kolenati, 1848; *Oligoplectrum* MacLachlan, 1868; *Sphinctogaster* Provancher, 1877; *Oligoplectrodes* Martynov, 1909; *Brachycentriella* Iwata, 1927) Brachycentridae caddisflies (14 species in US or Canada)

*Brachycentrus* undet. sp. or species (Tx in BC (Vancouver Island), sON & VA; CO & NC? hyporheic; NC stream benthic)

***Ceraclea*** Leach, 1815 – Leptoceridae caddisflies, Subfamily Leptocerinae (39 species in US or Canada)

***Ceraclea*** undet. sp. VA, MD brackish benthic

***Ceratopsyche*** Ross & Unzicker, 1977 - Hydropsychidae caddisflies (27 species in US or Canada)

***Ceratopsyche bronta*** (Hydropsyche b. Ross, 1938) (PA hyporheic)

***Ceratopsyche slossonae*** (*Hydropsyche s.* Banks, 1905) (IL karstic sprs.; PA hyporheic)

***Cheumatopsyche*** Wallengren, 1891 (*Ulmeria* Navas, 1918; *Cheumatopsychodes*, *Achirocentra*, *Abacarioides*, *Ethiopsyche*, Marlier, 1961; *Hydrocheumatopsyche* Marlier, 1962)  
Hydropsychidae caddisflies, Subfamily Hydropsychinae (also put in Polycentropodidae) (44 species in US or Canada) **Bibl.:** A. Gordon 1973; R. Miller 1965; Moulton 1994

***Cheumatopsyche flinti*** (Gordon, 1974 (Edwards Plateau, TX/Pb?))

***Cheumatopsyche minuscula*** (*Hydropsyche m.* Banks, 1907; *C. montrealensis* Nimmo, 1966) (nCanada to VA, MO/Ac or Tx in sON),

***Cheumatopsyche*** undet. sp. or species (CO, IL, ON, PA, PQ, TX, seVA hyporheic larvae; VA, MD brackish benthic)

***Chimarra*** Stephens, 1929 emend. Burmeister, 1839 (*Curgia* Walker, 1860; *Chimarrhodes* Muller, 1887) Philopotamidae caddisflies (20 species in US or Canada). **Bibl.:** Trivette 1969

***Chimarra obscura*** (*Beraea o.* Walker, 1852) (E/TX hyporheic)

***Chimarra*** undet. sp. (Ac or Tx in sON; IL river benthic)

***Clostoeca*** Banks, 1943 - Lepidostomatidae caddisflies (2 species in US or Canada)

***Clostoeca*** undet. sp. (Ac or Tx in Vancouver Island, BC)

***Cyrnellus*** Banks, 1913 - Polycentropodidae caddisflies, Subfamily Polycentropodinae (1 species in US or Canada)

***Cyrnellus fraternus*** (*Cymus f.* Banks, 1905) (PA hyporheic; Carolinian, Virginian marine infauna)

***Cyrnellus*** undet. sp. (VA, MD brackish benthic)

***Diplectronea*** Westwood, 1840 (= *Aphelocheira* Stephens, 1836) Hydropsychidae caddisflies, Subfamily Diplectroninae (4 species in US or Canada)

***Diplectronea modesta*** Banks, 1908 (ON phreatic larvae.)

***Diplectronea marianae*** Reeves, 1999 in Reeves & Paysen, 1999 (\*type locality cave in Dade Co., GA/ Tx)

**Dolophilodes** Ulmer, 1909 - Philopotamidae caddisflies (9 species in US or Canada).

**Dolophilodes** undet. sp. or species (Ac or Tx in Vancouver Island, BC; NC hyporheic? & stream benthic & meiofauna)

**Ecclisomyia** Banks, 1907 - Lepidostomatidae caddisflies (1 species in US and Canada)

**Ecclisomyia** *scylla* (*Ecclisomyia* s. Milne, 1935) (Ac or Tx in Vancouver Island, BC)

**Frenesia** Betten & Mosely, 1940 - Limnephilidae caddisflies, Subfamily Limnephilinae, Tribe Chilostigmini (2 species in US or Canada)

**Frenesia** *missa* Milne, 1935 (PQ to VA,MO/ AR,PA spr.)

**Glossosoma** Curtis, 1834 (once in Polycentropodidae) (*Mystrophora* Klapalek, 1892 (homo.) *Diploglossa*, *Eomystra* Martynov, 1934; *Mystrophorella* Kloet & Hincks, 1944; *Klapalekia* Botosaneanu, 1955; *Anseriglossa*, *Ripaeglossa*, *Muroglossa*, *Protoglossa*, *Sinoglossa* Ross, 1956; *Mystroglossa* Kobayshi, 1982) Glossosomatidae caddisflies, Subfamily Glossosomatinae (23 species in US or Canada)

**Glossosoma** *intermedia* (*Mystrophora* i. Klapalek, 1892) (Holarctic, E to Yukon, AK/IL,PA spr.)

**Glossosoma** undet. sp. or species (CO, PA hyporheic)

**Helicopsyche** von Siebold, 1856 (= *Pikea*, *Thelidomus*) Helicopsychidae caddisflies(4 species in US or Canada)

**Helicopsyche** (*Feropsyche*) *borealis* H.A.Hagen, 1861 (ON fall hyporheic)

**Helicopsyche** *borealis* H.A. Hagen, 1861 (PQ hyporheic)

**Helicopsyche** *mexicana* Banks, 1901 (AZ hyporheic)

**Helicopsyche** undet. sp. (MI lake benthic)

**Hesperophylax** Banks, 1916 - Limnephilidae caddisflies, Subfamily Limnephilinae, Tribe Limnephilini (6 species in US or Canada)

**Hesperophylax** *designatus* (*Limnephilus* d. Walker, 1852) (IL sprs.),

**Hydropsyche** Pictet, 1834 - Hydropsychidae caddisflies, Subfamily Hydropsychinae (48 species in US or Canada). **Bibl.:** G.Shuster 1977

**Hydropsyche** *betteni* (*Goerita* b. Ross, 1962) (IL, PA hyporheic)

**Hydropsyche** *delrio* (Edwards, 1973) Ross (Edwards Plateau, TX/Pb?),

*Hydropsyche kansensis* = *Potamyia flavum*

**Hydropsyche** *skissibae* (Banks) (valid species?) (PA hyporheic)

**Hydropsyche** undet. sp(p). (Ac or Tx in sON,TN; CO,TX hyporheic),

**Hydroptila** Dalman, 1819 (*Phrixocoma* Eaton, 1873; *Hydropneuma* Enderlein, 1929; *Hydroptilina*, Martynov, *Oxydroptila* M., 1935; *Oeceotrichia*, *Pasirotrichia*, *Sumatranotrichia* Ulmer, 1951) Hydroptilidae caddisflies, Subfamily Hydroptilinae, Tribe Hydroptilini (61 species in US or Canada)

**Hydroptila** *icona* Mosely, 1957 (wTX hyporheic)

**Hydroptila** undet. sp. or species (CO, IL, ON, TX hyporheic; TTx in nests of *Hirundo fulva* in cave in Edwards Co., TX; MI lake benthic; MD, VA brackish benthic) Bibl.: Keiper

**Lepidostoma** Rambur, 1842 (= *Mormonia* Curtis, 1834 (Homo.); *Nosopus* MacLachlan, 1871; *Olemira* Banks, 1897; *Pristosilo* Banks, 1899; *Atomyia*, *Notiopsyche* B., 1905; *Mormomyia* B., 1907; *Alepomyia* B., 1908; *Phanopsyche* B., 1911; *Alepomyiodes* Sibley, 1926; *Arcadopsyche* Banks, 1930; *Neuropsychyche*, *Oligopsyche* Carpenter, 1933; *Jenortha*, *Flura* Milne, 1936) Lepidostomatidae caddisflies (69 species in US or Canada)

**Lepidostoma** *aporna* Denning, 1949 (TTx in nAZ),

**Lepidostoma** *astaneum* Denning, 1949 (= *L. goedeni* D.1971) (Tx or Ac in OR)

**Lepidostoma** *liba* Ross, 1941 (karstic spr. in IL), &

**Lepidostoma** undet. sp. or species (Tx in BC, MO; CO, WV hyporheic; PA spr.; MI lake benthic)

**Leptocerus** Leach, 1815 (= *Leplocerus*) – Leptoceridae (1 species in US or Canada)

**Leptocerus** *americana* (*Setodes a.* Banks, 1899) (rare hyporheic in PQ)

**Limnephilus** W.E. Leach, 1815 (= *Neophylax* in Uenoidae) Limnephilidae caddisflies, Subfamily Limnephilinae, Tribe Limnephilini (93 species in US or Canada)

**Limnephilus** undet. sp. (rare PQ hyporheic)

**Limnephilus** *tarsalis* (Banks, 1920) (PQ Gulf of St. Lawrence sandy marine interstitial)

**Lype** McLachlan, 1878 - Psychomyiidae caddisflies, Subfamily Psychomyiinae (1 species in US)

**Lype** *diversa* (*Psychomyia d.* Banks, 1914 (seVA hyporheic)

**Micrasema** MacLachlan, 1876 (= *Micrasemodes* Lestage, 1936) Brachycentridae caddisflies (17 species in US or Canada)

**Micrasema** *onisca* Ross, 1947 (TTx in nAZ)

**Micrasema** undet sp. (nCA hyporheic)

**Molanna** Curtis, 1834 – Molannidae caddisflies (6 species in US or Canada)

**Molanna** *blenda* Sibley, 1926 (shallow VA (rare) hyporheic)

**Molanna** undet. sp. (Virginian marine infauna)

**Mystacides** Berthold, 1827 - Leptoceridae caddisflies, Subfamily Leptocerinae (3 species in US or Canada)

**Mystacides sepulchealis** (=Leptocerus s. Walker, 1852) (N,E/Tx in TX)

**Mystacides** undet. sp. (MI lake benthic)

**Neophylax** MacLachlan, 1871 (once put in Polycentropodidae & = *Limnephilus* in Limenphilidae) (=Acronopsyche Banks, 1939) Ueonoidae caddisflies (25 species in US or Canada)

**Neophylax aniqua** Ross, 1947 (PA spr.)

**Neophylax** undet. sp. or species (Tx in MO; PA hyporheic)

**Nerophilus** Banks, 1899 - Odontoceridae Trichoptera (caddisflies), Subfamily Odontocerinae (1 species in US or Canada)

**Nerophilus californicus** (*Silo c.* Hagen, 1861) (nCA hyporheic)

**Neureclipsis** Wallengren, 1891 (also put in Hydropsychidae) Polycentropodidae caddisflies, Subfamily Polycentropodinae (6 species in US or Canada)

**Neureclipsis** undet. sp. or species (Ac or Tx in sON; IL river benthic)

**Nyctiophylax** Brauer, 1865 - Polycentropodidae caddisflies, Subfamily Polycentropodinae (10 species in US or Canada)

**Nyctiophylax** undet. sp. or species (PA? hyporheic)

**Ochrotrichia** Mosely, 1934 (*Polytrichia* Sibley, 1926 (Homo.); *Metrichia* Ross, 1938; *Argentritrichia* Jacquemart, 1963) Hydroptilidae caddisflies, Subfamily Hydroptilinae, Tribe Ochrotrichini (6 species in US or Canada)

**Ochrotrichia felipe** Ross, 1944 E. (Edwards Plateau, TX/Pb?),

**Ochrotrichia riesi** Ross, 1944 (IL sprs.),

**Ochrotrichia spinosa** (*Polytrichia s.* Ross, 1938) (MB,NT to PA,MO/Tx in AR),

**Ochrotrichia** undet. sp. (MI lake benthic)

**Oecetis** MacLachlan, 1877 (=Aetesis, *Allotrigametis*, *Pleurograpta* Wallengren, 1891; *Oecetina* Banks, 1899; *Pseudosetodes*, 1905; *Oecetodes* Ulmer, 1909; *Firga*, *Yrula* Milne, 1934; *Potamoryza* Barnard, 1934) Leptoceridae caddisflies, Subfamily Leptocerinae (20 species in US or Canada). Bibl. Floyd 1994

**Oecetis inconspicuus** (*Leptocerus i.* Walker, 1852) (Virginian (rare), Carolinian freshwater infauna)

*Oecetis* undet. sp. or species (CO, PQ (rare) hyporheic; MI lake benthic; MD, VA brackish infauna)

*Parthina* Denning, 1954 – Odontoceridae Trichoptera (caddisflies), Subfamily Odontocerinae (1 species in US or Canada)

*Parthina* undet. sp. (CA hyporheic(seasonal resident),)

*Phylocentropus* Banks, 1907 – Psychomyiidae caddisflies, Subfamily Dipseudopsinae (also put in Dipseudopsidae, Subfamily Hyalopsychinae)

*Phylocentropus* undet. sp. (Virginian marine infauna)

*Polycentropus* Curtis, 1835 - Polycentropodidae caddisflies, Subfamily Polycentropodinae (42 species in US or Canada). **Bibl.:** S. Hamilton 1986

*Polycentropus* *barri* Ross & Yamamoto, 1965 (Tx or Tp in cave in Jackson Co., AL)

*Polycentropus* *elarus* Ross, 1944 (Tx or Ac in KY)

*Polycentropus proditus* = *Polyplectropus p.*

*Polyplectropus* Ulmer, 1905 - Polycentropodidae caddisflies, Subfamily Polycentropodinae (2 species in US or Canada)

*Polyplectropus* *proditus* (Edwards, 1973 *Polycentropus p.*) (Edwards Plateau, TX/Pb?)

*Polyplectropus* undet. sp. (MD, VA brackish benthic)

*Potamyia* Banks, 1900 - Hydropsychidae caddisflies, Subfamily Hydropsychinae (1 species in US)

*Potamyia* *flavum* Hagen, 1861 (*Hydropsyche kansensis* Banks, 1905) (E to SD, TX/Tx or Ac in nMS)

*Protoptila* Banks, 1904 - Glossasomatidae caddisflies, Subfamily Protoptilinae (23 species in US or Canada)

*Protoptila* *arca* Edwards & Arnold, 1961 (Edwards Plateau, TX/Pb?)

*Ptilostomis* Banks, 1907 - Phryganeidae caddisflies, Subfamily Phryganeinae (5 species in US or Canada)

*Ptilostomis* undet. sp. (Ac or Tx in Vancouver Island, BC)

*Psychoglypha* Ross, 1944 - Lepidostomatidae caddisflies (14 species in US or Canada)

*Psychoglypha* undet. sp. (Ac or Tx in Vancouver Island, BC)



**Psychomyia** Latreille, 1829 (once in Polycentropodidae) (= *Anticyra* Curtis, 1834; *Quissa* Milne, 1936) Psychomyiidae caddisflies, Subfamily Psychomyiinae (3 species in US or Canada)

**Psychomyia** *flavida* Hagen, 1861 (= *P. pullchella* Banks, 1899; *P. moesta* B., 1907) (NA to edge of Arctic/CO, PA hyporheic; IL sprs.),

**Pycnopsyche** Banks, 1905 (*Allegophylax*, *Eustenace* Banks, 1916) Limnephilidae caddisflies, Subfamily Limnephilinae, Tribe Stenophylacini (15 species in US or Canada) . Bibl.: Wojtowicz 1982

**Pycnopsyche** *antica* (*Neuronia a.* Walker, 1852), (MI,IL sprs.),

**Pycnopsyche** *gentilis* (*Stenophylax g.* MacLachlan, 1871) (E/PA spr.),

**Pycnopsyche** undet. sp. or species (MO Tx/ PA, TX, seVA, WV hyporheic)

**Pycnopsyche** *scabripennis* (*Limnephila s.* Rambur, 1842) (hyporheic in seVA)

**Rhyacophila** Pictet, 1834 (= *Polycentropus* in Polycentropodidae) (= *Crunophila* Kolenati, 1859; *Doliocypta* Banks, 1939; *Hyporhyacophila*, *Pararhyacophila* Doehler, 1943; *Hyperrhyacophila*, *Metarhyacophila*, *Prosrhyacophila* D., 1950; *Hyporhyacophila*, *Metarhyacophila*, *Pararhyacophila* Fischer, 1971) Rhyacophilidae caddisflies, Subfamily Rhyacophilinae (124 species in US or Canada)

**Rhyacophila** *carolina* Banks, 1911 (shallow hyporheic (top 5 cm.) in seVA)

**Rhyacophila** *nigrita* Banks, 1907 complex (Tx or Ac in KY)

**Rhyacophila** undet. sp. or species (Ac or Tx in sON/ WV, CO(rare) hyporheic larvae; NC hyporheic? & stream benthic)

**Theliopsyche** Banks, 1911 (= *Quisilo* Milne, 1936) Lepidostomatidae caddisflies (5 species in US or Canada)

**Theliopsyche** undet. sp. (MO/Tx);

**Triaenodes** MacLachlan, 1865 (= *Triaena* M.1865 Homo.; *Triaenodella* Mosely, 1932) Leptoceridae caddisflies, Subfamily Leptocerinae (25 species in US or Canada)

**Triaenodes** *baris* Ross, 1938 (IL sprs.)

**Triaenodes** undet. sp. (MI lake benthic)

**Wormaldia** MacLachlan, 1865 (*Dolophilus* M.1868; *Paragapetus* Banks, 1914; *Dolophiliella* B., 1930) Philopotamidae caddisflies (15 species in US or Canada).

**Wormaldia** *moestus* (= *Paragapetus m.* & *Dolophilus breviatus* Banks, 1914) (E/Tx or Ac in WV, KY)

Calcicoles – Plants that prefer or are restricted to high carbonate soils. Chalk or limestone improves soil crumb structure, drainage and warming although carbonates with very high calcite content may leave little soil after solution and what soil is produced may be lost to cave systems, thus increasing soil aridity. Syn.: alkali plants.

**Camel** - See **mammal, camel**

**campodeiform larva** - Insect larva with long abdomens, well developed legs, biting mouthparts, antennae and cerci. Named for resemblance to *Campodea*, a genus of dipluran]. Incl. larva of various beetles (staphylinids, carabids, tiger beetles).

**canine** - **Carnivora** of family Canidae. Incl. coyotes, dogs, foxes, & wolves.

**capacity, carrying** - Limit of **human** activities beyond which the system irreversibly changes.

**carapace** - A shell of many crustaceans, formed of a dorsal, chitinized skin fold coming from the back border of the head.

**carbon dioxide** - Howarth, 1983

**caribou** - See **mammal**

**Carnivora** - **Mammal** order. J. White et al., 1984. Incl. **bear**, canines (**dog & fox**), **cat** (bobcat, mt. lion, & lynx), insectivores, mustilids (**badger, ferret** (fossil only), **fisher, marten, mink** (fossil only), **otter, skunk, weasel & wolverine**), pinnipeds, procyonidae (**raccoon & ringtail**). Cf. carnivores.

**carnivore** - Meat eaters, incl. carnivora, certain insects, etc.

**carrying capacity** - See **capacity**.

**Castoridae** - See **beaver**.

**cast** - Infilling of a natural mold, esp. of a fossil. See trace fossil.

**casual** - **Population** absent in some years, but a low number present several times each decade. cave slime (see microbe) - Crawford, 1975a; Lavoie & Northrup 1994; Staley & Crawford, 1975.

**cat** - See **mammal, Carnivora**.

catharobionts - inhabitants of low organic water as in high mountain streams or some caves.

**cavefish** - Syn. for U.S. troglobitic **fish**. Some may be relicts from Mississippian marine transgressions.

**cavernicole** - 1. Referring to a species in a cave without implying any dependence on, association with or % of time spent in such a habitat. Incl. obligate & facultative (Def.#1). 2. Any animal that can complete its life cycle in a cave, ie. a stygobite, troglobite, troglophile or stygophile.

**cavernicolous** - The habit of living in a cave. (in title) - Baldwin & Beatty 1941; Bareth 1974; Barnard 1977; Barnett D. 1970; Barr 1959e, 1960, 1963a-c, 1981; Barr & Lawrence; Beatty 1941 1949; Bellinger & Christiansen. 1975; Benedict & Malcolm 1973-a, 1974; Besuchet 1982; Bonet 1931; Bourne, 1977-8; Bousfield & Howarth 1976; Brandon & Rutherford 1967; Briggs & Hom 1972; Briggs & Ubick; 1981; Brindle 1980; Buckett & Gardner 1967; Carlson K.R. 1994; Carmody et al. 1972; Causey 1959, 1964, 1973; Chamberlin, J. & Malcolm 1960; Chapman 1988; Chappuis 1929; Christiansen 1962; Clergue-Gazeau 1974-5; Conde' 1948-9; Cooper, M. 1969; Crabill 1952; Cyr et al. 1991; Decu et al. 1978; Deharveng 1988; Delamare-Deboutteville 1949; Dresco-Derouet 1969; Elliott 1976a; Fennah 1973; Ferguson 1974-a; Gagne & Howarth 1975-a; Gertsch 1973; Gittleston & Hoover 1969; Gurney & Rentz 1978; Hamilton-Smith 1971; Henrot 1949; Hobbs Jr. 1975, 1981; Hobbs, III 1975, 1987; Hoff, C. 1956a; Holsinger 1963b, 1965a, 1975a, 1976a; Howarth 1972-3; Hyman 1945; Jarrige 1960; Jeannel 1928; Jeannel & Henrot 1949; Kamp 1970; Klimaszewski & Peck 1986; Krejca et al. 1994; Krekeler 1959; Lamprecht et al. 1985; Larimer 1966; L. et al. 1966; Magniez 1981; Maguire 1960; Matilde 1970; Mitchell R. 1970; Muchmore 1962-3, 1965, 1968-70a, 1973-4a, 1976, 1979c, 1980-1a, 1983-4, 1989, 1992; Muegge 1992; Nicholas 1962a, 1963, 1979; Park 1951, 1953a, 1960; Peck 1966, 1975, 1982-b, 1983-4, 1986, 1997; Reddell 1982; Relyea 1976-7; Robaux et al. 1976; Schultz G. 1973; Scott W. & Holland 1958; Shoemaker 1942; Stiner 1989; Strandtmann 1962; Studier & Lavoie 1990-1a; Thibaud 1986; Thines 1969; Valentine J. 1931, 1945; Vandel, Albert 1965-a; Vial 1975; Warren R. 1961; Wiley 1973; Wolfe & Cornwell 1964; Yeatman 1964; Zacharda 1980

**cavernophile** - Syn: troglophile.

**cavernophobe** - One who shuns caves or other dark/enclosed spaces.

**cavesnail** - See snail.

cecophagy - The passing of food twice through the digestive system. Syn.: cecophagy. Cf. coprophagy.

**center of diversity** - Area of highest genetic diversity. Due to it being the center of origin of the taxon, a refugium or to other cases where speciation is high and/or extinction is low. Allopatric speciation is more likely to occur at the edges & not at the center of diversity.

## Centipedes

("100-legged" worms) Carnivorous myriapodous arthropods of Class Myriaploda (or Class Chilopoda), subclass Chilopoda, characterized by a terminal genital opening, one pair of legs per pedal segment and pincer-like forcipules, or prehensors, with poison ducts that underly the head and are actually appendages of the first segment. They retain the second maxillae as paired organs, and not as a fused labium (as in insects). Mostly closely aligned with symphylids. From 19-181 segments, each with a pair of spiracles but absent in some segments in some species. The sternite of the first segment and the large coxae of the forcipules form a plate beneath the mouthparts. More or less wormlike with a flattened body and distinct head with a pair of long antennae. All species have jaws containing poison glands located on the first body segment immediately behind the head. Occasionally, humans may be bitten by centipedes, but the poison in the US or Canada usually produces only a moderate reaction similar to a bee sting. 3 mm to 27 cm when mature. Most species of centipedes feed on small creatures such as insects. Centipedes

are found in a variety of habitats, but prefer dark, moist, protected areas such as under stones, rotted logs, leaves and bark. They overwinter as adults and lay eggs in the soil during the spring and summer. A few species give birth to living young. Centipedes are relatively long-lived; some species have been known to live up to 6 years. About 2,900 species known in about 20 families. First known from Pennsylvanian. **Bibl.:** CO: Reams 1985

Subclass Pleurostigmophora (= Anamorpha in part)

Order Lithobiomorpha (stone centipedes; alternating long and short plates, 20-50 antennal segments, 15 pairs of legs (hatchlings with 6-8) & only 6-7 sets of spiracles)

(Undet. family (\*0-9 Well, Crockett Co.,TX/Tb; unidentified Tp genus & sp. or genera & species in Amador, Calaveras & Mariposa Cos.,CA; Tb in cave in Tuolumne Co.,CA; Ttx? in Pima Co.,AZ)

Family **Henicopidae** (*Lamyctes*)

Family **Lithobiidae** -Undet. Tx or Ac genera & sp. In El Capitan area cave, Prince of Wales Island, seAK, *Bothropolys*, *Ethopolysn*, *Eulithobius*, *Garibius*, *Gosibius*, *Lithobius* Leach, *Nadabius*, *Nampabius*, *Neolithobius*, *Nuevobius*, *Oabius*, *Paitobius*, *Pampibius*, *Sozibius*, *Tidabius*, *Typhlobius*

Order Craterostigmomorpha - absent from North America.

Order Scolopendromorpha (also put in Subclass Epimorpha)

(tropical centipedes; plate segments more or less uniform; 21 or 23 pairs of legs & 17-30 antennal segments)

(unidentified genus & sp. in Calaveras & Tuolumne Cos.,CA/poss. Tb)

Family **Cryptopidae** - *Cryptops* Leach, *Theatops* Newport.

Family **Scolopendridae** - *Hemiscolopendra* Kraepelin, *Scolopendra* Linnaeus.

Family **Scolopocryptopidae** - *Scolopocryptops* Newport, *Thalkethops* Crabill.

(Undet. Genus in Kartchner C., Cochise Co., AZ)

Order Geophilomorpha (also put in Subclass Epimorpha) (snail centipedes; >29 pairs of legs, 14 segments in the antennae & a spiracles on every segment except the first & last) (Dignathodontidae, Geophilidae, Himantariidae, Schendylidae), Himantariidae (sp.#1 (\*cave in San Saba Co.), sp. #2 (\*?cave in Williamson Co., TX/Tb?; sp. #3 (\*?cave in Williamson Co., TX/Tb?) Crabill 1959

Family **Chilenophilidae** - *Pachymerium* C. L. Koch, *Taiyuna* Chamberlin.

Family **Dignathodontidae** - *Strigamia* Gray.

Family **Geophilidae** - *Arctogeophilus*, *Arenophilus* Chamberlin, *Geophilus* Leach.

Family **Himantariidae** - *Empherzoster* Crabill, *Gosiphilus* Chamberlin, *Meinertophilus*.

Family **Mecistocephalidae** - no cave representatives.

Family **Schendylidae** - *Escaryus* Cook and Collins, *Nyctunguis* Chamberlin.

Family **Watobiidae** - *Watobius*

Subclass Notostigmophora (= Anamorpha in part)

Order Scutigermorpha

(house centipedes; 15 pairs of legs (hatchlings with 4) & spiracles on the first 7 segments only; only group with compound eyes; very long legs and antenna, fusion of plates (tergites) resulting in <15 plates)

Family Scutigerae - introduced) (*Scutigera* Lamarck)

**Arctogeophilus** Attems, 1909 - Geophilidae centipedes

**Arctogeophilus** undet. sp. (Tx or Ac in CA)

**Arenophilus** Chamberlin, 1912 - Geophilidae centipedes

**Arenophilus bipuncticeps** (Wood, 1862) (Tx in GA (Chatooga Co.) & MO (Pettis and Phelps Cos.) Holsinger and Peck 1971

**Arenophilus pседnus** Crabill, 1969. (type locality cave in Boyle Co., KY/ Tb)

**Arenophilus** undet. sp. (Tx in Calaveras & Tuolumne Cos.,CA)

**Bothropolys** Wood, 1862 - Lithobiidae centipedes

**Bothropolys multidentatus** (Newport, 1845). (Tx in AR & MO (Barry, Christian, Howell, Ozark, Pulaski, Shannon, & St. Louis Cos.) Gardner 1986

**Cryptops** Leach, 1815 - Cryptopidae centipedes

**Cryptops leucopodus** (Rafinesque, 1820) (*C.hyalinus*) (Ac or Tx in cave in WV)

**Cryptops** undet.or undescrib. sp. (\*?Tb cave in Travis Co., TX)

**Cryptops leucopodus** (Rafinesque, 1820). (Ac or Tx in MO (Barry & Howell cos.) & TX (Bell, Blanco, Travis, & Williamson Cos.)

**Empherozoster** Crabill, 1959 - Himantariidae centipedes

**Empherozoster antaeus** Crabill, 1959 (\*\*type locality cave & Carlsbad C. in Carlsbad Caverns Nat. Pk., Eddy Co., NM) Barr & Reddell 1967

**Escaryus** Cook & Collins, 1891- Schendylidae centipedes

**Escaryus missouriensis** Chamberlin, 1942. (Tp in cave in IN) Crabill 1953; Pereira and Hoffman 1993

**Ethopolys** Chamberlin, 1955 - Lithobiidae centipedes

**Ethopolys** undet. sp. (Ac or Tx in WA)

**Ethopolys bipunctatus insulatus** Chamberlin, 1955 (\*cave in Toole Co., UT/ ?Tb)

**Eulithobius** Stuxberg (originally treated as subgenus of *Lithobius*) - Lithobiidae centipedes

**Eulithobius sphactes** Crabill 1958a (type locality cave in Muskogee Co., OK & cave each in Burnet & Irion Cos., TX/ S1G1?/Tb?)

**Garibius** Chamberlin, 1913. - Lithobiidae centipedes

**Garibius georgiae** Chamberlin, 1913 (Ac in OH)

**Garibius opicolens** Chamberlin, 1913 (= *G. pagoketes*). (Ac or Tx in Shannon & Washington Cos., MO) Gardner 1986

**Geophilus** Leach, 1814 - Geophilidae centipedes

**Geophilus mordax** Meinert, 1886. (Ac in MO)

**Geophilus** undet. sp. (Ac in Barry Co., MO) Gardner 1986

**Gosibius** Chamberlin 1912. - Lithobiidae centipedes

**Gosibius** undet. sp. (Ac in Calaveras Co., CA)

**Gosiphilus** Chamberlin, 1922 - Gosibiidae centipedes

**Gosiphilus laticeps** (Wood, 1862) (Tp in Uvalde Co., TX)

**Hemiscolopendra** Kraepelin, 1903 - Scolopendridae centipedes

**Hemiscolopendra marginata** (Say, 1821) (Tp in Bell, Comal Co. & Coryell Cos., TX)

**Lamyctes** Meinert, 1868 - Henicopidae centipede

**Lamyctes fulvicornis** Meinert, 1868 (alien Ac or Tx in NS)

**Himantarium** Koch, 1847 - See *Meinertophilus*

**Lithobius** R. Chamberlin 1925a - Lithobiidae centipedes

**Lithobius atkinsoni** Bollman, 1887. (Ep in NC, SC; Tp in TN, GA (Randolph Co.) FL (Jackson Co.) & 5 caves in AL) **Bibl.:** Peck 1970; Holsinger and Peck 1971

**Lithobius** undescr. sp. (\*c. in Kamalo Quad., Molokai, HI, /Tb?)

**Lithobius** undet. sp. (Mauis & Kazumura Lava Tube (Hawaii Island), HI)

**Meinertophilus** Silvestri, 1897 - Himantariidae centipedes

**Meinertophilus californicus** Chamberlin, 1930 (\*type locality cave in Shasta Co., CA/Tb?)

**Meinertophilus superbis** (*Himantarium s.* Meinert, 1879) (Tp or Tx or Ac in Shasta Co., CA)

**Nadabius** Chamberlin, 1944- Lithobiidae millipedes

**Nadabius ameles** Chamberlin, 1944. (Tp? in MO (Camden, Carter, and Ste. Genevieve cos.) Peck and Lewis 1977; Gardner 1986).

*Nadabius iowensis* (Meinert, 1886) (Ac in Pulaski Co., MO) Gardner 1986

*Nadabius pullus* (Bollman, 1887) (Tx in IN (Harrison & Jennings Cos./S4/G4)

*Nadabius* undet. sp. (Ac or Tx in IL (Hardin, Monroe cos.), MO (Barry, Carter, and Phelps cos.) & CA (Calaveras Co.) Bibl.: Peck and Lewis 1977; Gardner 1986

*Nadabius* poss. undescr. sp. ( 1 cave each in Hardin & Monroe Co.s, IL/Tp?/ G1?)

*Nampabius* Chamberlin, 1913 - Lithobiidae centipedes

*Nampabius parienus* Chamberlin, 1913. ( Tp in Atwell's Tunnel Cave, Smythe Co., VA)

Hoffman 1995

*Nampabius turbator* Crabill, 1952 \*( type locality & one other cave in Alleghany Co.,VA/Tb?/T&E VA S1, global G1). **Bibl.:** Hoffman 1995

*Nampabius* undet. sp. (sON/Tx or Ac)

*Neolithobius* Stuxberg, 1875 (originally treated as subgenus of *Lithobius*) - Lithobiidae centipedes. **Bibl.:** Chamberlin, 1925a

@*Neolithobius suprenaus* (\*type locality cave in Menard Co.,TX/Tb)

*Neolithobius* undet. sp. (Tp in Burnet, Coryell, Mason, Cos., TX)

*Neolithobius voracior* (Chamberlin, 1912) (Ac or Tx in GA (Decatur Co.), MO (Phelps Co.), MS) **Bibl.:** Holsinger & Peck 1971, Gardner 1986

*Nuevobius* Crabill, 1960- Lithobiidae centipedes

*Nuevobius cottus* Crabill, 1960. (\*Tuckaleechee Caverns, Blount Co., TN/ Tb)

*Nyctunguis* Chamberlin, 1914 - Schendylidae centipedes

*Nyctunguis pholeter* Crabill, 1958 (\*type locality cave in De Kalb Co.,AL/Tb or Tp) Crabill 1961

*Oabius* Chamberlin, 1917 - Family Lithobiidae

*Oabius patonius* (Chamberlin, 1911) (Ac in >4 caves in Calaveras Co.,CA)

*Pachymerium* C.L. Koch, 1847 - Family Chilenophilidae

*Pachymerium ferrugineum* (C. L. Koch, 1835). (Ac in MO (Phelps Co.) Gardner 1986

*Paitobius* Chamberlin, 1912b - Lithobiidae centipedes

*Paitobius adelus* Chamberlin, 1922 (Ac or Tx in AL, GA(prob.))

*Paitobius juvenus* (Bollman, 1887). MO, Carter Co., Ac (Gardner, 1986).

*Paitobius* undet. sp. or species (Ac or Tx in GA (Dade Co.) & TN (Warren Co.) Holsinger & Peck 1971; Barr 1957

*Pampibius* Chamberlin, 1922 - Lithobiidae centipedes

*Pampibius* undet. sp. (Ac in GA (Walker Co.) Holsinger and Peck, 1971)

*Scolopendra* Linnaeus, 1759 - Scolopendridae centipedes

*Scolopendra polymorpha* Wood, 1861 (Ac in Sutton, Val Verde Cos., TX)

*Scolopendra subspinipes* Leach, 1815 (Ac in Kazumura C., HI Island, HI)

*Scolopendra viridis* Say, 1821 (Ac in Hays Co.,TX) Chamberlin, 1944; Reddell, 1970

*Scolopendra* undet. sp. or species (Ac or Tx in Bexar & Burnet Cos., TX & El Malpais Natl. Monument, nNM)

*Scolopendra viridis* Say, 1821 (Ac in Hays Co., TX).

*Scolopocryptops* Newport, 1844 - Scolopocryptopidae centipedes

*Scolopocryptops sexspinus* (Say, 1821) (Tx in AL; GA (Dade & Walker cos.); TN (Grundy, DeKalb & Claiborne Cos.); MO (Oregon, Ozark, Pettis, Shannon, & WA cos) **Bibl.:** Shelley 1997; Holsinger & Peck 1971; Gardner 1986

*Scutigera* Lamarck, 1801 Scutigeridae centipedes

*Scutigera* undet. sp. or species (Tp? in cave in Seminole Co.,OK & cave in Wagoner Co.,OK; Tx? in 1 IL cave)

*Scutigera coleoptrata* (Linnaeus, 1758). (Tx in IL, Hardin Co. , MO, Camden, Crawford, Pettis, and Phelps cos.) OH, OK, TX/ house centipede) **Bibl.:** Peck and Lewis 1977; Gardner, 1986

*Sozibius* Chamberlin, 1912 - Lithobiidae centipedes

*Sozibius pennsylvanicus* Chamberlin, 1922 (Ac in OH)

*Sozibius proridens* (Bollman, 1887). (Ac in Washington Co., MO) Gardner 1986

*Strigamia* Gray, 1847 - Dignathodontidae centipedes

*Strigamia bothriopa* Wood, 1862 (Ac in Washington Co., MO) Gardner 1986

*Strigamia branneri* (Bollman, 1888) (Ac or Tx in MO (Laclede and Texas cos.) & IA)

*Strigamia* undet. sp. (Tx or Ac in MO (Carter and Pulaski cos.) & sON) Gardmer 1986

*Taiyuna* Chamberlin, 1912 - Chilenophilidae centipedes

*Taiyuna* undet. sp. (Ac in Calaveras Co.,CA)

*Thalkethops* Crabill, 1960b - Scolopocryptopidae centipedes

*Thalkethops grallatrix* Crabill, 1960b. (Carlsbad Caverns (TL) and other caves in Carlsbad Caverns National Park, Eddy Co., NM/ Tb) **Bibl.:** Barr & Reddell 1967; Crabill 1960; Shelley in press).

*Theatops* Newport, 1844 - Cryptopidae centipedes

*Theatops phanus* Chamberlin, 1951 complex? (type locality cave in Sutton Co.,+



Bexar, Burnet, Crockett, Menard, Terrell, Travis, Williamson Cos., seTX/ Tb in this 3-5 apparent sp. complex; also known from epigean in eTX) Shelley 1997

*Theatops spinicaudus* (Wood, 1862) (Ac or Tx in MO (Camden, Dent, Howell, Ozark, and Phelps cos.) Gardner, 1986

*Tidabius* Chamberlin, 1913 - Lithobiidae centipedes

*Tidabius* undet. sp. (Tx or Tp in KY (Mammoth C.) & TN (Hamilton Co.); Ac in MO (Carter & Phelps Cos.), Tx? in AR)

*Tidabius tivius* (Chamberlin, 1909) (*Typhlobius t.*) (Ac or Tx in Mammoth Cave System, Edmondson Co., KY)

*Typhlobius* Chamberlin 1922 - Lithobiidae centipedes

*Typhlobius coecus* (Bollman, 1888) (Ep in AL, NC, TN; Tp in cave (or related undescr. species), in Walker Co., GA & in cave in Lee Co., VA)

*Typhlobius tivius* = *Tidabius t.*

*Watobius* Chamberlin, 1911 - Watobiidae centipedes

*Watobius anderisus* Chamberlin, 1911 (Tx or Tp in DeKalb Co., TN)

**centrifugal speciation** - Occurring at the center of range of the present species. Primitive species often occur at the edges of a species-group or genus range.

## Cephalocarids

Of Subphylum Crustacea, Class or Order or Subclass Cephalocarida. Included in Phyllopora by Meglitsch & Schramm. Most primitive order of crustaceans. No carapace or eyes. Elongated, worm-like body with head, 19 body segments and the telson with a caudal furca. Thorax segments (1-8) with appendages. Limb rudiments present on the first pleomere and used for carrying eggs. 4 known species.

Order or Suborder Brachypoda

Family Hutchinsoniellidae (*Hutchinsoniella*)

Family Lightiellidae (*Lightiella*)

*Hutchinsoniella* Sanders, 1955 - Hutchinsoniellidae cephalocarid crustaceans

*Hutchinsoniella macracantha* Sanders, 1955 (NY, VA marine interstitial)

*Lightiella* Jones, 1961 - Lightiellidae cephalocarid crustaceans

*Lightiella serendipita leiti* (CA marine soft bottom interstitial)

**cephalopod** - Marine **mollusk** with a definite head, with the mouth surrounded by a part of the foot modified into lobelike processes with tentacles or armlike processes with hooklets or suckers or both. Incl. **ammonoid & nautiloid**.

**Cestoda** - See **worm**, tapeworm.

cercus - Paired appendage of the last segment of the abdomen. Plural - cerci.

chaetotaxic – Referring to how bristles are positioned.

chasmoliths - Species that live inside preformed cavities within rock. Cf. endoliths & epiliths.

**chelation** - Chemical reaction in which a complexing agent (usually organic) combines with metallic ions & remove them from the system. Chelation of hydrochloric acid with carbonates may be harmful to cave life.

Chelicerata (= Cheliceriformes of Meglitsch & Schramm) – A subphylum of Arthropoda. Includes Pycnogonida, Merostomata, & Arachnida.

**chemotaxis** - Change in locomotion due to changes in amounts of certain chemicals in the environment.

chemolithotroph - An organism which obtains its energy from oxidation of inorganic compounds.

chemoorganotroph - An organism which obtains its energy from oxidation of organic compounds  
**chemo-autotrophs** - Syn: chemotroph.

**chemo-autotroph**, chemoorganotrophic, chemotroph - See bacteria, microbe

chemoheterotrophs – Organisms which derive energy from oxidation/reduction reactions and use organic electron donors.

chemolithoautotrophs – Organisms which derive energy from oxidation/reduction reactions and use inorganic electron donors.

**chemolithotrophic** - Chemotroph that gets its food oxidizing inorganics.

**chemoorganotrophic** - Organism that gets its food by oxidizing organic compounds. Incl. decomposer.

**chemotroph** - Organism which gets metabolic energy from chemical reduction or oxidation of inorganics, such as sulphur or iron. Syn.: chemoautotrophs. Incl. chemolithotrophic.

**chemosynthesis** - Synthesis of complex organic molecules from simpler molecules using chemical energy.

## **Chitons**

Class Polyplacophora (= Amphineura), Order Neoloricata. **Mollusk** shell of which consists of eight (sometimes seven) overlapping calcareous valves or plates. Mantle is thick and fleshy and extends beneath the plate all around to form a girdle; and in many groups the girdle extends back over the edge of the plates or even covers them entirely. They have a radula, many ctenidia (with six to more than 80 pairs) but have only a pair of nephridia and have no eyes, tentacles or crystalline styles. About 600 species. Rare in sea caves or as cave bedrock

Order Neoloricata

Suborder Acanthochitonina

Acanthochitonidae (*Acanthochitona*)

Suborder Ischchitonina

Ischnochitonidae (*Lepidozona*)

*Acanthochitona* Gray, 1821 – Acanthochitonidae chitons

*Acanthochitona* pygmaea (Pilsbry, 1893) (striate glass-hair chiton/ wFL Gulf of Mexico infauna)

*Lepidozona* – Ischnochitonidae chitons

*Lepidozona* *interstinica* (AK marine infauna)

## Chordates

Phylum Chordata

Subphylum **Vertebrata** (=Craniata)

(See mammals, birds, alligators, frogs, toads, snakes, lizards, turtles, salamanders)

Subphylum Urochordata (lancelets)

Subphylum Cephalochordata (cephalochordates) (about 25 species)

(Sister group to Chordates, but asymmetry in juveniles indicate they are not direct ancestors)

Family Branchiostomidae (*Branchiostoma*)

*Branchiostoma* Costa, 1834 (= *Amphioxides*; *Amphioxus*) Branchiostomidae chordates

*Branchiostoma* *caribaeum* (LA, MA, NC, VA marine infauna)

*Branchiostoma* *floridae* (Florida Lancelet/ FL marine infauna)

*Branchiostoma* undet sp. (FL marine benthic)

*Branchiostoma* *virginiae* Hubbs, 1922 (Virginian marine infauna)

chorology - The study of the factors that influence where species live.

**circadian** (Relating to a period of approx. 24 hours) - See temporal

**cladocera** - See branchiopod

cladogram - A classification system usually in the shape of a branching diagram with the closest species having the most shared characteristics and presumably the closest evolutionary relationships.

## **Clams & Allies (Cockles, Conchs, Mussels & Oysters, etc.)**

Bivalves (= Pelecypoda or Lamellibranchaita) of Phylum Mollusca, Class Bivalvia (=Pelecypoda)

About 8,000 species.

Class Bivalvia

Subclass Anomalodesmata

Subclass Anomalodesmata

Order Pholadomyoidea

Superfamily Pandoroidea

Family Lyonsiidae (*Lyonsia*)

Family Pandoridae (pandoras) (*Pandora*)

Order Pholadomyoidea

Superfamily Thracioidea

Periplomatidae (*Periploma*)

Thraciidae (thracias) (*Asthenothaerus*, *Thracia*)

Superorder or Subclass Cryptodonta

Order Arcoidea

Superfamily Limopsoidea

Family Glycymerididae (*Glycymeris*)

Subclass Palaeoheterodonta

Order Myoidea

Superfamily Myoidea

Corbulidae (*Corbula*)

Myidae (*Cryptomya*, *Myia*, *Sphenia*, *Paramya*)

Superfamily Hiatelloidea

Family Hiatellidae (*Hiatella*)

Superfamily Pholadoidea

Pholadidae (*Barnea*)

Order Veneroidea

Superfamily Astartoidea

Astartidae (*Astarte*)

Superfamily Carditoidea

Cardiidae (*Laevicardium*, *Nemocardium*, *Serripes*)

Carditidae (*Carditamera*, *Cyclocardia*)

Superfamily Crassatelloidea

Crassatellidae (*Crassicardia*, *Crassinella*)

Superfamily Galeommatoidea

Lasaeidae (*Kellia*, *Mysella*, *Naeromya*)

Superfamily Lucinoidea

Cyrenoididae (*Cyrenoida*)

Lucinidae (*Lucina*, *Lucinoma*, *Parvilucin*)

Thyasiridae (*Axinopsida*, *Thyasira*)

Ungulinidae (*Diplodonta*)

Superfamily Corbiculoidea

Corbiculidae (*Corbicula*, *Polymesoda*)

Dreissenidae (*Mytilopsis*)

Superfamily Corbiculacea

Pisidiidae (fingernailclams) (*Pisidium*, *Musculium*) (both still placed in Sphaeriidae)

Sphaeriidae (fingernailclams)

(*Pisidium*, *Musculium*, *Sphaerium*) (put into Pisidiidae by Burch 1991)

Superfamily Mactroidea

Mactridae (*Anatina*, *Mulinia*, *Mactra*, *Rangia*, *Spisula*, *Tresus*)

Superfamily Tellinacea

Psammobiidae (*Tagelus*) (also put in Solecurtidae)

Pteronchidae (undet. genus in brackish beach sediment at Lake Pontchartrain, LA)

Superfamily Tellinoidea

Donacidae (*Donax*)

Pharidae (*Ensis*, *Siliqua*)

Psammobiidae (*Gari*)

Semelidae (*Abra*, *Cumingia*, *Ervilia*, *Semele*, *Semelina*)

Tellinidae - (*Macoma*, *Tellina*, undet. genus in LA brackish beach sediment)

Superfamily Veneroidea  
Petricolidae (*Petricola*)  
Turtoniidae (*Turtonia*)

Veneridae  
(*Agriopoma*, *Anomalocardia*, *Compsomyax*, *Dosinia*, *Humilaria*, *Macrocallista*,  
*Mercenaria*, *Parastarte*, *Pitar*, *Protothaca*, *Psephidia*, *Saxidomus*, *Transennella*)

Subclass Protobranchia (= Nuculoidea)  
Order Nuculoida

Superfamily Nuculoidea  
Family Nuculidae (nutclams) (*Nucula*)

Superfamily Nuculanoidea  
Family Nuculanidae (nutclams) (*Nuculana*) (once in Nuculidae)

Family Sareptidae (yoldias) (*Yoldia*) (also put in Yoldiidae)  
Family Yoldiidae (yoldias) (*Yoldia*) (put in Sareptidae)

Superorder Filibranchia (= Superorder or Subclass Pteriomorphia)  
Order Mytiloida  
(also put in Subclass or Superorder Eulamellibranchia (=Heterodonta) (mussels))

Superfamily Veneroidea (also put in Superorder Isofilibranchia)  
Mytilidae (also put in Mytiloidea)  
(*Amygdalum*, *Brachidontes*, *Geukensia*, *Ischadium*, *Modiolus*, *Musculus*,  
*Mytilis*, *Villosa*, *Vilasina*, undet. genus in brackish LA beach)

Subclass Palaeoheterodonta  
Order Unionoida (naiads, clams, mussels)

Superfamily Unionacea  
Unionidae (freshwater mussels) (*Uniomerus*, *Villosa*)

Subclass Pteriomorphia  
Superorder Eupteriomorphia  
Order Ostreoida

Suborder Ostreina

Superfamily Ostreoidea  
Ostreidae (*Crassostrea*)

Suborder Pectinina  
Superfamily Anomioidea

Anomiidae (*Anomia*)

Superfamily Pectinoidea

Pectinidae (*Chlamys*)

Superorder Prionodonta

Order Arcoida

Superfamily Arcoidae

Arcidae (*Anadara*]

Macluridae (*Anatina*, *Mulinia*, *Maclura*, *Rangia*, *Spisula*)

Semelidae (*Abra*, *Cumingia*, *Ervilia*, *Semele*, *Semelina*)

*Abra* Lamarck, 1818 – Semelidae clams

*Abra aequalis* (Say, 1822) (Atlantic abra/ Carolinian, Gulf of Mexico (wFL, TX) infauna)

*Agriopoma* Dall, 1902 - Veneridae clams

*Agriopoma* texasiana (Dall, 1892) (Texas venus/ wFL Gulf of Mexico infauna)

*Aligena* I. Lea, 1843 – Lasaeidae clams (also put in Kelliidae)

*Aligena elevata* (Stimpson, 1851) (eastern aligena/ Virginian, Carolinian marine infauna)

*Aligena texasiana* Harry, 1969 (Texas aligena/ Virginian marine infauna)

*Amygdalum* Megerle von Muhfeld, 1811 – Mytilidae clams

*Amygdalum papyrium* (Conrad, 1846) (Carolinian, Virginian, wFL, TX Gulf of Mex. marine infauna)

*Anadara* Gray, 1847 (= *Arginarca*) – Arcidae clams or mussels

*Anadara ovalis* (Bruguiere, 1789) (blood ark/ TX Gulf of Mexico, Carolinian infauna)

*Anadara transversa* (Say, 1822) (transverse ark/ Carolinian, Virginian, wFL Gulf of Mexico infauna)

*Anatina* Schumacher, 1817 Macluridae snails

*Anatina anatina* (Spengler, 1802) (smooth duckclam/ wFL Gulf of Mexico infauna)

*Anomalocardia* Schumacher, 1817 - Veneridae clams

*Anomalocardia auferiana* (d'Orbigny, 1842) (pointed venus/ Carolinian, wFL, TX infauna)

*Anomalocardia cunemeris* (wFL marine infauna)

*Anomia* Linnaeus, 1758 – Anomiidae clams

*Anomia simplex* D'Orbigny, 1842 (Virginian, wFL Gulf of Mex. marine infauna)

*Astarte* J. Sowerby, 1816 – Astartidae clams

*Astarte castanea* (Say, 1822) (smooth astarte/ Carolinian, Virginian marine infauna)

*Astarte nana* Dal, 1886 (dwarf astarte/ Carolinian, Virginian marine infauna)

*Asthenothaerus* Carpenter, 1864 – Thraciidae clams

*Asthenothaerus hemphilli* Dall, 1886 (square thraciid/ wFL Gulf of Mex., Carolinian marine infauna)

*Asthenothaerus* undescr. sp. (wFL Gulf of Mex. marine infauna)/ wFL Gulf of Mexico infauna)

*Axinopsida* Keen & Chavan, 1951 – Thyasiridae clams

*Axinopsida serricata* (Carpenter, 1864) (East Pacific/ silky or lenticular axinopsis/ AK, BC marine infauna)

*Barnea* Risso, 1826 – Pholadidae clams

*Barnea truncata* (Say, 1822) (Atlantic mud-piddock/ Virginian marine infauna)

*Brachidontes* Swainson, 1840 - Mytilidae mussels. **Bibl.:** Kenk Y Blanco 1967

*Brachidontes exustus* (Linnaeus, 1758) (Ttp in anchialine cave in Pinellas Co.,FL/ scorched mussel/ wFL, TX Gulf of Mex ., Carolinian marine infauna)

*Carditamera* Conrad, 1838 – Carditidae clams

*Carditamera floridana* Conrad, 1838 (broad-ribbed carditid/ wFL , LAGulf of Mex. marine infauna)

*Chlamys* Roding, 1798 –Pectinidae clams

*Chlamys rubida* (Hinds, 1845) (AK marine infauna)

*Clinocardium* Keen, 1936 – Cardiidae cockles

*Clinocardium californiense* (Aleutian or California cockle/ AK, BC, CA, OR, WA marine infauna?)

*Clinocardium ciliatum* (Fabricius, 1780) (hairy cockle/ AK marine infauna)

*Clinocardium nuttallii* (Conrad, 1837) (Nuttall cockle/ AK, BC, OR, WA marine infauna)

*Compsomyax* Stewart, 1930 - Veneridae clams

*Compsomyax subdiaphana* (Carpente, 1864) (East Pacific/ milky venus) (AK marine infauna)

*Congeria* Partsch, 1835 - Dreissenidae mussels

*Congeria leucophaeta* (Conrad, 1831) (/ dark false mussel)

*Corbicula* Megerle, 1811- Corbiculidae clams

*Corbicula fluminea* (O.F.Muller, 1774) (WA,epigeal/ alien Tp? in cave each in Columbia, Lafayette & Suwanee Cos., FL; Tp or Tx in nAL (one cave); hyporheic in MD, OK; rarely found in hyporheic of SC coastal blackwater stream; Virginian marine infauna/ Asian clam). **Bibl.:** Bell-McCaulou 1993; Doherty 1986; Foe 1985; Hakenkamp 1997; Lauritsen 1985; Streever, 1992b

*Corbicula manilensis* Philippi (OR, WA, Virginian (rare) marine infauna)

*Corbicula* undet. sp. (likely in a OK cave & OK hyporheic)



***Corbula*** Bruguiere, 1797 – Corbulidae clams

***Corbula barattiana*** C.B. Adams, 1852 (truncate corbula/ Carolinian marine infauna)

***Corbula contracta*** Say, 1822 (contracted corbula/ wFL, TX Gulf of Mex., Carolinian marine infauna)

***Corbula swiftiana*** C.B. Adams, 1852 (radial-ridged corbula/ wFL Gulf of Mex. , Carolinian marine infauna)

***Crassicardia*** Conrad, 1838 – Carditidae clams

***Crassicardia crassidens*** (Broderip & Dowerb, 1829) (thick carditid/ AK marine infauna)

***Crassinella*** Guppy, 1874 - Crassatellidae clams

***Crassinella dupliniana*** (Dall, 1903) (pointed crassinella/ Carolinian infauna)

***Crassinella lunulata*** (Conrad, 1834) (lunate crassinella/ wFL, TX Gulf of Mexico, Carolinian infauna)

***Crassinella martinicensis*** (d'Orbigny, 1842) (Martinique crassinella/ Carolinian infauna)

***Crassostrea*** Sacco, 1897 – Ostreidae oysters

***Crassostrea virginica*** (Gmelin, 1791) (eastern oyster/ TX, LA Gulf of Mexico, Pacific States (alien), Carolinian infauna)

***Cryptomya*** Conrad, 1848 – Myidae clams

***Cryptomya californica*** Conrad, 1848 (East Pacific/ California softshell clam/ AK, CA marine infauna)

***Cumingia*** G.B. Sowerby I, 1833 – Semelidae clams

***Cumingia tellinoides*** (Conrad, 1831) (telling semele/ wFL Gulf of Mex. marine infauna)

***Cumingia tellinoides vanhyningi*** Rehder, 1939 (telling semele/ wFL Gulf of Mex. marine infauna)

***Cyclinella*** Dall, 1902 - Veneridae clams

***Cyclinella tenuis*** (Recluz, 1852)(thin cyclinella/ Carolinian marine infauna)

***Cyclocardia*** Conrad, 1867 - Carditidae clams

***Cyclocardia crassidens*** (Broderip & G.B. Sowerby I., 1829) (thick cyclocardia/ AK marine infauna)

***Cyrenoida*** Joannis, 1835 –Cyrenoididae clams

***Cyrenoida floridana*** (Dall, 1896) (wFL marine infauna)

***Cyrtoleura*** Tryon, 1862 - Pholadidae clams

***Cyrtoleura costata*** (Linnaeus, 1758)(anglewing/ Carolinian marine infauna)

***Diplodonta*** Bronn, 1831 – Ungulinidae clams

***Diplodonta orbella*** (Gould, 1851) (BC marine infauna)

***Diplodonta punctata*** (Say, 1822) (Atlantic diplodon/ LA, NC marine infauna)

***Diplodonta semiaspera*** Philippi, 1836 (pimpled diplodon/ East Pacific & wFL, LA Gulf of Mex. marine infauna)

***Donax*** Linnaeus, 1758 – Donacidae coquina or bean clam

***Donax fossor*** Say, 1822 (fossor coquina/ Virginian marine infauna)

***Donax variabilis*** Say, 1822 (variable coquina/ Virginian, Carolinian marine infauna)

***Dosinia*** Scopoli, 1777 - Veneridae clams

***Dosinia discus*** (Reeve, 1850) (disk dosinia/ wFL Gulf of Mexico, LA, VA, Carolinian infauna)

***Ensis*** Schumacher, 1817 – Pharidae clams

***Ensis directus*** Conrad, 1843 (Virginian, NC marine infauna)

***Ensis minor*** Dall, 1900 (wFL, TX Gulf of Mex. marine infauna)

***Ervilia*** Turton, 1822 – Semelidae clams

***Ervilia concentrica*** (Holmes, 1860) (cocentric ervilia/ wFL Gulf of Mex. marine infauna)

***Gari*** Schumacher, 1817 – Psammobiidae clams

***Gari californica*** (Conrad, 1849) (California sunsetclam/ AK, BC, CA, OR marine infauna))

***Gemma*** Deshayes, 1853 - Veneridae clams

***Gemma gemma*** (Totten, 1834) (amethyst gemclam/ Virginian, MA marine infauna)

***Glycymeris*** Da Costa, 1778 - Glycymerididae clams

***Glycymeris subobsoleta*** (Carpenter, 1864 (AK, WA marine interstitial)

***Geukensia*** Van de Poel, 1959 – Mytilidae mussels

***Geukensia demissa*** (Dillwyn, 1817) (ribbed or marsh mussel/ wFL, MA, TX, Virginian marine infauna))

***Hiatella*** Bosc, 1801 - Hiatellidae clams

***Hiatella arctica*** (Linnaeus, 1767) (Arctic rock borer/ ME sea cave; AK, TX, Carolinian marine infauna)

***Humilaria*** Grant & Gale, 1931 - Veneridae clams

***Humilaria kennerleyi*** (Reeve, 1863) (Kennerly's venus/ AK marine infauna)

***Ilyanassa*** Stimpson, 1865 = *Nassarius*

***Ischadium*** Jukes-Browne, 1905 – Mytilidae mussels

***Ischadium recurvum*** (Rafinesque, 1820) (hooked mussel/ MD, wFL Gulf of Mex. marine infauna)

***Kellia*** Turton, 1822 – Lasaeidae clams

***Kellia suborbicularis*** (*Chironia s. Montagu*, 1803; *K. laperousii*) (AK marine infauna)

***Laevicardium*** Swainson, 1840 Cardiidae cockles

***Laevicardium mortoni*** (Conrad, 1830) (Morton or yellow eggcockle/ wFL, TX marine infauna)

***Lucina*** Lamarck, 1799 – Lucinidae clams

***Lucina nassula*** (Conrad, 1846) (woven lucine/ wFL Gulf of Mex. marine infauna)

***Lucinoma*** Dall, 1901 – Lucinidae clams

***Lucinoma annulatum*** (Reeve, 1850) (East Pacific/ western ringed lucina/ AK marine infauna)

***Lyonsia*** Turton, 1822 – Lyonsiidae clams

***Lyonsia californica*** Conrad, 1837 (California lyonsia/ AK, CA, Virginian marine infauna)

***Lyonsia hyalina*** Conrad, 1831 (glassy lyonsia/ Virginian marine infauna)

***Lyonsia hyalina floridana*** (L.f. Conrad, 1849) (TX, wFL marine infauna)

***Macoma*** Leach, 1819 (= *Cydippina*) - Tellinidae clams

***Macoma balthica*** (Linnaeus, 1758) (AK, BC, Virginian (rare), Labrador, MA, MD, OR, WA marine infauna)

***Macoma brevifrons*** (Say, 1834) (short macoma/ TX, wFL marine infauna)

***Macoma calcarea*** (Gmelin, 1791) (AK marine infauna)

***Macoma carlottensis*** Whiteaves, 1880 (AK, BC marine infauna)

***Macoma constricta*** (Bruguere, 1792) (wFL marine infauna)

***Macoma inquinata*** (DeShayes, 1855) (Irus clam; pointed macoma/ AK, BC, OR, WA marine infauna)

***Macoma lama*** (Bartsch, 1929) (Aleutian macoma/ AK marine infauna)

***Macoma mitchelli*** Dall, 1895 (MD, MA, NC, Virginian (rare) marine infauna)

***Macoma nasuta*** (Conrad, 1837) (bent-nose macoma or clam/ AK, BC, WA marine infauna)

***Macoma obliqua*** (J. Sowerby, 1817) (oblique or oval macoma/ AK marine infauna)

***Macoma secta*** (Conrad, 1837) (BC, OR, WA, CA marine infauna)

***Macoma tenta*** (Say, 1834) (Virginian (rare), MA, wFL, TX infauna)

***Macoma yoldiformis*** Carpenter, 1864 (yoldi macoma/ AK marine infauna)

***Macrocallista*** Meek, 1876 – Veneridae clams

***Macrocallista nimbosa*** (Lightfoot, 1786) (sunray venus/ wFL Gulf of Mex. marine infauna)

***Mactra*** Linnaeus, 1767 – Mactridae clams

***Mactra fragilis*** Gmelin, 1791 (fragile surfclam/ wFL, TX Gulf of Mex. marine infauna)

***Mercenaria*** Schumacher, 1817 – Veneridae clams

***Mercenaria campechiensis*** (Gmelin, 1791) (southern quahog/ Virginian marine infauna)

***Mercenaria mercenaria*** Linnaeus, 1758 (northern quahog/ Virginian, RI marine infauna)

***Modiolus*** Lamarck, 1799 – Mytilidae clams

***Modiolus flabellatus*** (Linnaeus, 1758) (East Pacific/ fan horse mussel/ BC marine infauna)

*Modiolus modiolus* (Gould, 1850) (Linnaeus, 1758) (East Pacific/ northern horse mussel/ AK, BC, OR, WA, CA marine infauna)

*Mulinia* Gray, 1837 – Mactridae clams

*Mulinia lateralis* (Say, 1822) (dwarf surf clam; coot clams/ Virginian, MA, NC, RI, wFL, TX Gulf of Mex. marine infauna)

@*Mulinia maculata* (Virginian marine infauna)

*Musculium* Link, 1807 (fingernail clam) Sphaeriidae clams (also put in Pisidiidae)

*Musculium* undet. sp. or species (2 caves on Monroe Co., MO/Tp?; Virginian marine infauna)

*Musculium securis* (Prime, 1852) (= *S. securis*) (E/Ac or Tx in sON/ pond fingernail clam)

*Musculium transversum* (Say, 1829) (= *M. (Sphaerium) t.*; *Sphaerium (M.) t.*) (long fingernail clam/ hyporheic in Great Lakes; Tp in MO)

*Musculus* Roding, 1798 - Mytilidae mussels

*Musculus lateralis* (Say, 1822) (LA marine infauna)

*Mya* Linnaeus, 1758 – Myidae clams

*Mya arenaria* Linnaeus, 1758 (softshell clam/ AK, BC, Labrador, MD, MA, OR, WA marine infauna)

*Mya pseudoarenaria* Schless, 1931 (false softshell clam; soft softshell/ AK marine infauna)

*Mya truncata* Linnaeus, 1758 (truncate softshell clam/ AK marine infauna)

*Mysella* Angas, 1877 – Lasaeidae mussels

*Mysella planulata* (Stimpson, 1851) (plate mysella/ Virginian, FL, TX Gulf of Mex. marine infauna)

*Mysella tumida* (Carpenter, 1864) (robust mysella/ AK marine infauna)

*Mytilis* Whitelegge, 1889 undet. sp. (CA marine caves)

*Mytilis edulis* Linnaeus, 1758 (ME sea cave/ blue mussel/ marine infauna)

*Mytilis trossulus* (blue mussel/ AK marine infauna)

*Mytilopsis* Conrad, 1857 - Dreissenidae mussels

*Mytilopsis leucophaeata* (Conrad, 1831) (Ttp in anchialine cave in Pinellas Co., FL; MA, Virginian marine infauna/ dark false mussel)

*Naeromya* Gabe, 1873 – Lasaeidae clams

*Naeromya compressa* (Dall, 1899) (AK marine infauna)

*Nemocardium* Meed, 1876 – Cardiidae cockles

*Nemocardium centifilosum* (Carpenter, 1864) (hundred-line cockle/ AK marine infauna)

*Noetia* Gray, 1857– Noetiidae clams (once in Arcidae)

*Noetia ponderosa* (Say, 1822) (ponderosa arc; , Carolinian marine infauna)

*Nucula* Lamarck, 1799 - Nuculidae clams

*Nucula crenulata* A. Adams, 1856 (LA, wFL marine infauna)

*Nucula proxima* Say, 1822 (Virginian, MA marine infauna)

*Nucula tenuis* (Montagu, 1908) (AK, BC marine infauna)

*Nuculana* Link, 1807 - Nuculanidae clams (once in Nuculidae)

*Nuculana acuta* (Conrad, 1832) (LA, TX, wFL Gulf of Mex. marine infauna)

*Nuculana concentrica* Say, 1824 (TX Gulf of Mex. marine infauna)

*Nuculana fossa* (Baird, 1863)(AK marine infauna)

*Nuculana minuta* (Muller, 1776)(AK marine infauna)

*Pandora* Chemnitz, 1795 - Pandoridae clams

*Pandora grandis* Dall, 1877 (AK marine infauna)

*Pandora trilineata* Say, 1822 (threeline Pandora/ AK, TX marine infauna)

*Panopea* Menard, 1807 – Hiatellidae clams

*Panopea abrupta* (Conrad, 1849) (geoduck/ BC, WA marine infauna)

*Paramya* Conrad, 1860 – Myidae clam

*Paramya subovata* (Conrad, 1845) (sobovate softshell clam/ NC, TX marine infauna)

*Parastarte* Conrad, 1862 Veneridae clams

*Parastarte triquetra* (Conrad, 1846) (brown gemclam/ wFL Gulf of Mex. marine infauna)

*Parvilucina* Dall, 1901 – Lucinidae clams

*Parvilucina multilineata* (Tuomey & Holmes, 1857) – Lucinidae many-lined lucine/ rare Virginian, FL & Gulf of Mex. marine infauna)

*Parvilucina tenuisculpta* (Carpenter, 1864) (fine-lined lucine/ AK marine infauna)

*Periploma* Schumacher, 1817 – Periplomatidae clams

*Periploma fragile* (Totten, 1835) (fragile spoonclam/ Virginian marine infauna)

*Periploma margaritaceum* (Lamarck, 1801) (unequal spoonclam/ TX marine infauna)

*Periploma orbiculare* Guppy, 1878( / TX marine infauna)

*Petricola* Lamarck, 1801 – Petricolidae clams

*Petricola pholadiformis* Lamarck, 1818 (Virginian, NC marine infauna)

*Pisidium* Pfeiffer, 1821 (pill clams) Sphaeriidae clams (also put in Pisidiidae)

*Pisidium casertanum* (Poli, 1791) (ND,sON to BC/Ac or Tx in sON/ ubiquitous peaclam/ PA spr.)

*Pisidium compressum* Prime, 1852 rare Virginian marine infauna

*Pisidium* undet. sp. (CO, seVA hyporheic/ Virginian marine infauna)

*Pitar* Romer, 1857 – Veneridae clams

*Pitar* undet. sp. (pitar/ wFL Gulf of Mexico infauna)

*Pleuromeris* Conrad, 1867 – Carditidae clams

*Pleuromeris tridentata* (Say, 1826) threetooth carditid/ Carolinian marine infauna)

*Polymesoda* Rafinesque, 1820 – Corbiculidae clams

*Polymesoda caroliniana* (wFL marine infauna)

*Protothaca* Dall, 1902 - Veneridae clams

*Protothaca straminea* (Conrad, 1837) (East Pacific/ Pacific littleneck/ AK, BC, WA marine infauna)

*Protothaca tenerrima* (Carpente, 1857) (Thin-shelled or native littleneck; steamer clam/ BC, CA, OR, WA marine infauna)

*Psephidia* Dall, 1902 – Veneridae clams

*Psephidia lordi* (Baird, 1863) (lord dwarf-venus/ AK, BC marine infauna)

*Rangia* Desmoulins, 1832 – Mactridae clams

*Rangia cuneata* (G.B. Sowerby I., 1831) (Atlantic rangia/ Virginian (rare), MA, NC, TX marine infauna)

*Saxidomus* Conrad, 1837 – Veneridae clams

*Saxidomus giganteus* DeShayes, 1839 (butter clam/ AK, OR, BC, CA, WA marine infauna)

*Semele* Schumacher, 1817 - Semelidae clams

*Semele nuculoides* (*Semelina n.* Conrad, 1841) (nut semele/ wFL Gulf of Mexico infauna)

*Semele bellastrata* (*Semelina b.* Conrad, 1837) (cancelate semele/ wFL Gulf of Mexico infauna)

*Semele proficua* (Pulteney, 1799) (Atlantic semele/ Carolinian infauna)

*Semelina* Dall, 1900- Semelidae clams

*Semelina nuculoides* (Conrad, 1841) (*Semele n.*) (nut semele/ wFL Gulf of Mexico infauna)

*Serripes* Gould, 1841 – Cardiidae cockles

*Serripes groenlandicus* (Mohr, 1786) (AK marine infauna)

*Serripes laperousii* (Deshayes, 1839) (AK marine infauna)

*Siliqua* Megerie von Muhlfield, 1811 – Pharidae clams

*Siliqua patula* (Dixon, 1789) (northern or Pacific razor/ AK, BC marine infauna)

***Solemya*** Lamarck, 1818 – Solemyidae clams

***Solemya occidentalis*** Seshayes, 1857 (West Indian awningclam/ wFL Gulf of Mex.marine infauna)

***Solemya velum*** Say, 1822 (Atlantic awningclam/ NC, Virginian marine infauna)

***Solen*** Linnaeus, 1858 – Solenidae clams

***Solen sicarius*** (Gould, 1850) (sickle jackknife clam/ AK marine infauna)

***Solen viridis*** (Say, 1822) (green jackknife; green jackknife clam/ GA, NC, TX marine infauna)

***Sphaerium*** Scopoli, 1777- Sphaeriidae clams (also put in Pisidiidae)

***Sphaerium securis*** = *Musculium s.*,

***Sphaerium simile*** (Say, 1817) (epigean in NA/ grooved fingernailclam/ Ac or Tx in Manitoba,TN)

***Sphaerium*** undet. sp. (OK hyporheic)

***Sphaerium*** undescr. sp.#1 (\*cave in Kendall Co., TX). See snail.

***Sphaerium*** undet. sp. (Tx or Ac in MN?; Tx in OH; Tx or Ac in IN; ON hyporheic)

***Sphaerium (Musculium) transversum*** = *Musculium transversum*

***Sphenia*** Turton, 1822 – Myidae clams

***Sphenia antillensis*** Dall & Simpson, 1901 (Antillean sphenia/ wFL Gulf of Mexico, Carolinian infauna)

***Spisula*** Gray, 1837 – Mactridae clams

***Spisula polynyma*** (Stimpso, 1860) (AK marine infauna)

***Spisula solidissima*** Dillwyn (Virginian, NC marine infauna)

***Tagelus*** Gray, 1847 – Psammobiidae clams (also put in Solecurtidae)

***Tagelus divisus*** (Spengler, 1794) (purplish tegelus/ Virginian, TX marine infauna)

***Tagelus plebius*** (Lightfoot, 1786) (stout tegelus / rare Virginian, wFL, TX marine infauna)

***Tapes*** Muhlfield, 1811 – Veneridae clams

***Tapes philippinarum*** (Adams & Reeve, 1850) (Manila clam; Japanese littleneck/ BC, CA, OR, WA marine infauna)

***Tellidora*** Morch, 1856 – Tellinidae clams

***Tellidora tampaensis*** = *Tellina t.*

***Tellina*** Linnaeus, 1758 – Tellinidae clams

***Tellina aequistriata*** Say, 1824 (striate tellin/ LA marine infauna)

***Tellina agilis*** Stimpson, 1857 (northern dwarf tellin/ MA, NC marine infauna)

*Tellina alternata* Say, 1822 (alternate tellin/ wFL, LA Gulf of Mex., Carolinian marine infauna)  
*Tellina carpenteri* Dall, 1900 (carpenter tellin/ AK marine infauna)

*Tellina iris* Say, 1822 (rainbow tellin/ wFL Gulf of Mex., Carolinian marine infauna)  
*Tellina modesta* (Carpenter, 1864) (East Pacific/ plain tellin/ AK marine infauna)

*Tellina symbaritica* Say, 1881 (sybaritic tellin/ Carolinian marine infauna)  
*Tellina tampaensis* Conrad, 1866 (Tampa tellin/ wFL, TX Gulf of Mex. , Carolinian marine infauna)

*Tellina tenella* A.E. Verrill, 1874 (delicate tellin/ wFL Gulf of Mex. marine infauna)  
*Tellina tenera* Say, 1822 = *T. agilis*

*Tellina texana* Dall, 1900 (Texas tellin/ wFL Gulf of Mex. , Carolinian marine infauna)  
*Tellina versicolor* (man-colored tellin/ FL Gulf of Mex. , Carolinian marine infauna)

*Thracia* Blainville, 1824 - Thraciidae clams  
*Thracia trapezoides* Conra, 1849 (AK marine infauna)

*Thyasira* Lamarck, 1818 – Thyasiridae clams  
*Thyasira flexuosa* (Montagu, 1803) (BC marine infauna)  
*Thyasira gouldi* (Philippi, 1845) (AK marine infauna)

*Transennella* Dall, 1883 - Veneridae clams  
*Transennella conradina* Dall, 1884 (colorful transennella/ LA, wFL Gulf of Mexico infauna)

*Tresus* Gray, 1853 - Mactridae snails  
*Tresus nuttallii* (Conrad, 1837) (fat gaper/ WA infauna)  
*Tresus capax* (Gould, 1850) (fat gaper; horse or gapper clam/ AK, OR, CA, WA infauna)

*Turtonia* Alder, 1848 – Turtoniidae clams  
*Turtonia minuta* (Fabricius, 1780) (minute turton/ AK marine infauna)

*Unio* Conrad, 1853 - Unionidae mussels  
*Unio carolinianus* (Bosc, 1801) (=U. obesus) (Lea, 1831) (fossil in Little Salt Spr., swFL; Tx? in FL)

*Vilasina* Bartsch, 1960 – Mytilidae clams  
*Vilasina vernicosa* (Middendorff, 1849) (AK marine infauna)

*Villosa* Frierson, 1927 - Unionidae mussels  
*Villosa iris* (Lea, 1829) (rainbow or rainbow mussel/ East/ Tx in Lee Co., VA)

*Yoldia* Moller, 1842 – Sarpetidae clams (also put in Yoldiidae)  
*Yoldia amygdalea* Valenciennes, 1846

*Yoldia beringianus* (AK marine infauna)



*Yoldia hyperborean* (Gould, 1841) (NE Pacific/ northern yoldia/ AK marine infauna)  
*Yoldia limatula* (Say, 1831) (rare Virginian marine infauna)

*Yoldia myalis* (Couthouy, 1838) (AK marine infauna)  
*Yoldia thraciaeformis* (Storer, 1838) (AK, BC marine infauna)

**class** - 1. See **protection**. 2. The taxonomic group ranked above family.

**claustrophobia** - Abnormal fear of being in confined spaces. Likely accentuated by rapid breathing caused by high CO<sub>2</sub> in caves.

**climate** (see also biogeography, weather) - Durrant 1970; B. Gilbert et al. 1980; Grayson 1977a, 1979; Guilday 1967; Howarth 1980a, 1982; Keith 1984; Peck 1980; Poulson 1992c; Rouse 1996

clinal speciation - **Allopatric speciation** in which geography separates a species already with some variation. The populations continue to diverge but are now isolated one from another.

cline - A geographic gradation in traits.

Clubmosses – These pteridophytes, unlike mosses, are sporophytes. About 400 species.  
Incl. **spikemosses**.

## Cnidaria

Most ancient phylum of the eumetazoan animals (= Coelenterata) and simplest in body form. **Syn:** coelenterate. From late Precambrian. Basic body form is a simple sac, a stomach (= coelenteron) with walls 2 cells thick and tentacles around opening that serves as both mouth and anus. See also anemone (8-9,000 species). This mostly marine **animal** phylum incl. hydroid pseudomets, Hydroida, jellyfish, sea anemones, & corals. Rare as bedrock fossils or as live species except in sea caves. Fossil corals on cave walls & live freshwater colonial corals. They and the phylum Ctenophora (comb jellies) are both radially symmetrical and thus are differentiated from the other group of eumetazoans, the bilaterians. See also **anemones & corals**.

### Phylum Cnidaria

Class (or Phylum) Anthozoa

Subclass or Class Zoantharia (= Hexacorallia)

Subclass Nynantheae (anemones):

Order Actiniaria (= Thenaria)

Suborder Endomyaria: Actiniidae (*Aulctinia*, *Tealia*)

Subclass Athecatae-Anthomedusae (Gymnoblastera)

(or in Hydroidomedusae):

Order Capitata (=Scleractinia)

Superfamily Tubularioidea

Corymorphidae (*Euphysa*)

Superclass Tesserazoa

Class Hydrozoa

Order Anthoathecata (Gymnoblastea)

Suborder or Order Filifera (see also corals)

Bougainvilliidae (*Garveia*, *Perigonimus*, *Bougainvillia*)

Order Hydroida (hydroids)

Suborder Anthomedusae (Tx? in CO)

Eudendriidae (*Eudendrium*)

Tubulariidae (*Tubularia*)

Pandeidae (*Stomotoca*)

Corynidae (*Coryne*, *Sarsia*)

Clavidae (*Cordylophora*, *Pelmatohydra*) & Eudendriidae (*Eudendrium*)

Corymorphidae (*Corymorpha*, *Thecatae*)

Suborder Hydrida

Hydriidae (*Hydra*)

Protohydriidae (*Protohydra*)

Suborder Leptomedusae

Aglaopheniidae (*Aglaophenia*)

Calycellidae (*Calycella*)

Campanulinidae (*Cladonema*, *Clytia*, *Cuspidella*, *Obelia*, *Orthopyxis*, *Phialidium*)

Haleciidae (*Halecium*)

Sertularidae

(*Abietinaria*, *Diphasia*, *Hydrallmania*, *Selaginopsis*, *Sertularella*, *Thularia*)

Lafoeidae (*Lafoea*)

Plumulariidae (*Plumularia*)

Subclass Actinulidae

Order Halammohydrida

Halammohydriidae (*Halammohydra*)

Phylum or Class Myxozoa (once considered protozoans)

Class Myxosporea

Order Myxosporida

Myxidiidae (*Myxidium*)

Order Pelobiontida  
Pelomyxidae (*Pelomyxa*)

*Abietinaria* Kirchenpauer, 1884 – Sertularidae cnidaria

*Abietinaria* undet. sp. (WA marine infauna)

*Aglaophenia* Mamouroux, 1812 – Aglaopheniidae hydrozoan

*Aglaophenia* undet. sp. (WA marine infauna)

*Aulactinia* Verill, 1864 - Actiniidae anemones

*Aulactinia stella* (Patella s. F.C. Muewcher, 1987) (silver spotted anemone/ TTp in ME)

*Bougainvillia* Lesson, 1836 – Bougainvilliidae hydrozoan

*Bougainvillia* undet. sp. (WA marine infauna)

*Calycella* Hincks, 1864 - Calycellidae hydrozoans

*Calycella syringa* (Linnaeus, 1867) (WA marine infauna)

*Cladonema* Dujardin, 1843 - Campanulinidae hydrozoan

*Cladonema* undet. sp. (WA marine infauna)

*Clytia* Lamouroux, 1812 - Campanulinidae hydrozoan

*Clytia* undet. sp. (WA marine infauna)

*Corymorpha* Sars, 1835 - Corymorphidae hydrozoan

*Corymorpha* undet. sp. (sCA marine infauna)

*Coryne* Gaertner, 1774 – Corynidae hydrozoan

*Coryne* undet. sp. (WA marine infauna)

*Cordylophora* Allman, 1844 - Clavidae cnidarians

*Cordylophora lacustris* Allman, 1844 in Little River Spring, FL/Pp?)

*Cuspidella* Schornikov & Michailova, 1990 Campanulinidae cnidarians

*Cuspidella grandis* (Hincks, 1868) (WA marine infauna)

*Diphasia* Agassiz, 1862 – Sertularidae cnidaria

cf *Diphasia* undet. sp. (WA marine infauna)

*Eutonina* - Eirenidae hydrozoan

*Eutonina* undet. sp. (WA marine infauna)

*Eudendrium* Ehrenberg, 1834 - Eudendriidae cnidarians

*Eudendrium* cf. *carneum* Clarke, 1882 (red stickhydroid/ Crystal Beach Spr., near Crystal Beach, FL/Tb)

*Eudendrium* undet. sp. (WA marine infauna)

*Euphysa* Forbes, 1848 - Corymorphidae Hydrozoan

*Euphysa ruthae* Norenburg & Morse, 1983 (interstitial marine in San Juan Islands, WA)

*Garveia* Wright, 1859 – Bougainvilliidae hydrozoan

*Garveia franciscana* (Torrey, 1902) (in brackish cave, Pinellas Co, FL)

*Grammaria* Stimpson, 1854 – Lafoeidae hydrozoan

*Grammaria* undet. sp. (WA marine infauna)

*Halammohydra* Remane, 1927 - Halammohydridae hydrozoan

*Halammohydra schulzei* Remane, 1927 (MA marine sublittoral interstitial)

*Halecium* Oken, 1815 – Haleciidae cnidaria

*Halecium* undet. sp. (WA marine infauna)

*Hydra* Kubbaeys, 1758 - Hydridae cnidarians

*Hydra* undet. sp. (TX hyporheic & TX Tx or Ac; common in submarine caves)

*Hydrallmania* – Sertularidae cnidaria

*Hydrallmania distans* Nutting, 1899 (WA marine infauna)

*Lafoea* Lamouroux, 1821 – Lafoeidae hydrozoan

*Lafoea fruticosa* (Sars, 1851) (WA marine infauna)

*Obelia* Peron & Lesueur, 1810 - Campanulinidae hydrozoan

*Obelia bidentata* Clarke, 1875 (WA marine infauna)

*Obelia dichotoma* (Linnaeus, 1758) (WA marine infauna/ sea thread hydrod)

*Orthopyxis* Agassiz, 1862 - Campanulinidae hydrozoan

*Orthopyxis* undet. sp. (WA marine infauna)

*Pelmatohydra* Schulze, 1914 - Clavidae cnidarians

*Pelmatohydra* undet. sp. (MI benthic)

*Pelomyxa* Greef, 1874 - Pelomyxidae cnidarian or protist

*Pelomyxa palustris* (Greef, 1870) (MI benthic)

*Perigonimus* Sars, 1846 – Bougainvilliidae hydrozoan

*Perigonimus* undet. sp. (WA marine infauna)

*Phialidium* Leuckart, 1856 - Campanulinidae hydrozoan

*Phialidium gregarium* (WA marine infauna)

*Plumularia* Lamarck, 1816 - Plumulariidae hydrozoan

*Plumularia* undet. sp. (WA marine infauna)

*Protohydra* Greef - Protohydridae cnidaria

*Protohydra leuckarti* Greef (East Coast intrstitial marine sands)

*Sarsia* Lesson, 1843 – Corynidae hydrozoan

*Sarsia* undet. sp. (WA marine infauna)

*Selaginopsis* Allman, 1876 – Sertularidae cnidaria

*Selaginopsis mirabilis* (Verrill, 1872) (WA marine infauna)

*Sertularella* Gray, 1848 – Sertularidae cnidaria

*Sertularella tenella* (Adler, 1857) (WA marine infauna)

*Stomotoca* L. Agassiz, 1862 – Pandeidae hydrozoan

*Stomotoca* undet. sp. (WA marine infauna)

*Tealia* Gosse, 1858 (= *Urticina* Marenzeller, 1977) - Actiniidae anemones

*Tealia felina* (Linnaeus, 1767) (dahlia anemone/ME sea cave)

*Thecatae* - Corymorphidae hydrozoan

*Thecatae* undet. sp. (sCA marine infauna)

*Tubularia* Linnaeus, 1758 – Tubulariidae hydrozoan

*Tubularia* undet. sp. (WA marine infauna)

coati(mundi) - See **mammal, procyonid**

coccidiomycosis - **Microbe** hazard. See *Coccidioides immitis* in fungi. Incl. CA: Inyokern C. **Bibl.:** Lewis 1992; Lacy & Swatek, 1974. See valley fever

## Cockroaches & Mantids

Of Insect Order Dictyoptera, (once put in Order Orthoptera (=Blattodea), Superorder (or Division) Neoptera, Subdivision Exopterygota) About 3,500 species, mostly tropical. **Bibl.:** Cornell 1968; Helfer 1963; McKittrick, 1964; Rehn 1950; Roth, 1970; Stone, 1991a.

Suborder Mantodea (mantids) none known from US or Canadian caves  
(also put in Order Mantoptera)

Suborder Blattaria (cockroaches)

Undet. genus, species (Tx in OK, WI)

Superfamily Blattoidea

**Blattidae** (=Blattoptera) (American cockroaches)

Subfamily Blattinae (*Periplaneta*)

Superfamily Blaberoidea

**Blattellidae**

Subfamily Plectopterinae (*Euthlastoblatta*)

Subfamily Blattellinae (*Parcoblatta*, *Pseudomops*)

**Polyhagidae** (desert cockroaches) (=Corydiidae)

Subfamily Polyphaginae (*Arenivaga*)

*Arenivaga* Rehn, 1903 (= *Psammoblatta*, *Heterogamisca* Bey-Bienko, 1950; *Homoeogamia*)  
Polyhagidae cockroaches, Subfamily Polyphaginae (7 species in US or Canada)

*Arenivaga bolliana* (*Homoeogamia b.* Saussure, 1893) (Boll's sand cockroach/ woodrat nests)

*Arenivaga erratica* (*Homoeogamia e.* Rehn, 1903) (SW, Mex. epigeal/erratic roach/TTx in TX)

*Arenivaga tonkawa* Hebard, 1920 (TTx in TX)

*Arenivaga* undet. sp. (TTx in OK, TX; 20,500, 14,500 & 1,200 years old in *Neotoma* woodrat nest, Ajo Mt., Pima Co, AZ)

*Euthlastoblatta* Hebard, 1917 (= *Aglaopteryx* H., 1917) Blattellidae cockroaches, Subfamily Plectopterinae (2 species in US or Canada)

*Euthlastoblatta* undet. sp. (Ac or Tx in Bexar Co., TX)

*Parcoblatta* Hebard, 1917- Blattellidae cockroaches, Subfamily Blattellinae (12 species in US or Canada)

*Parcoblatta americana* (*Loboptera a.* Scudder, 1900) (in CA non-cave *Neotoma fuscipes* woodrat nest)

*Parcoblatta* undet. sp. or species (Ac in Kendall, Medina Cos., TX; Ac or Tx in Mammoth C., KY)

*Periplaneta* Burmeister, 1838 (*Cacerlaca* Saussure, 1864) Blattidae cockroaches, Subfamily Blattinae (4 species in US or Canada)

*Periplaneta australasiae* (Fabricius, 1775) (NA alien/ Tx in FL (preys on baby bats/ Australian cockroach)

*Periplaneta americana* (Linnaeus, 1758) (NA/ Tx alien in HI; Tx in FL (preys on baby bats))

*Periplaneta* undet. sp. (Ac in Robber cave in Bexar Co., TX)

*Pseudomops* Seville, 1831- Blattellidae cockroaches, Subfamily Blattellinae (1 species in US or Canada)

*Pseudomops septentrionalis* Hebard, 1917 (Ac in cave in Hays Co., TX)

**coendou** - see **mammal, rodent**

**cohort** - 1. A group of individuals of the same age. 2. A group of animal orders.

cohort life table - A life table constructed from a mortality schedule of individuals that started life together.

cold water bacteria - Ones that grow optimally between 0 and 10° C.

**colonization** - See dispersal

Colorado Tick Fever - Virus caused & transmitted by **ticks**. Symptoms include acute fever with remission. Second bout of fever 2-3 days later. Not known from caves.

Cometabolism - The process by which certain compounds are degraded by microbes but which are not a sole source of energy or carbon.

**commensalism** (see branchiopod, branchiobdellid, ostracod) - Allen, S. 1933; Hart & Hart 1966; Hart & Hobbs 1961; Hobbs, Jr. 1955, 1975; Hobbs, III 1973c/d, 1975; Sprague & Couch 1971

**communication** (see senses) - Bechler 1986; Howarth, Hoch & Asche 1990

**community structure** (see also competition, population structure) - Bechler 1985; Brown, B. 1976; Culver 1968; Gooch & Hetrick 1979; Howarth 1981; Jones, Thomas G., et al. 1995; Keith 1975, 1977; Martin, B. 1980a, 1981; Northup 1988; N. et al. 1988; Pimm 1979; Poulson 1978; P. & Kane 1981; Richards, Paul 1991; Rudolph 1979; Starr 1968

**community classification** - Culver 1991.

compartiment souterrain superficial - Syn.: superficial underground compartment.

**comparisons** between troglobites & non-troglobites

behaviour - Banta 1910; Caine 1978

genetic - Bechler, 1977

habitat - Caine 1974, 1974a; Franz, 1978

**competition/niche separation** - Bechler 1985; Culver 1970, 1970a, 1971, 1973, 1974; 1975, 1976, 1981/a; Culver & Ehlinger 1980; Culver, Fong, & Jernigan 1987; Eberly 1958; 1960; Hairston 1951; Heaton & Grady 1994; Highton 1971; Howarth 1981; Jaeger 1972; Kane & Van Zant 1977; Laing, Carmody & Peck 1976; Lee & Poulson 1989; Levins & Culver 1971; McKinney 1975; Poulson, Griffith & Schmidt 1992; Penn et al. 1973; Rudolph 1979, 1980, 1981. Absence in caves can lead to high population densities if food is not limited.

complexity - Poulson & Helf 1998

**commensal - Ecological type** where the relationship between two organisms is such that the first benefits from the second & the second is neither benefited nor harmed.

comminution - Breakdown of organisms into smaller particles. Largely done by earthworms and macro-arthropods such as diplopods & isopods.

community - All the plants & animals in a particular habitat & bound together by food chains & other interrelations.

conchology - The study of shells

conservation/ mitigation/ restoration (see also endangered, human impact(s)) - D. Anderson 1977; Anon 1980; Barr 1954; Benedict 1976h; Crawford 1976b; Benedict 1976d; Byers, A 1983; Culver 1986, 1992; Culver & Fong 1991; De Broyer 1994; Edwards & Longley et al 1989; Elliott 1979, 1992a/b, 1993/a; Gehlbach 1971; Grady & McEachern 1977; C. Hall 1997a; Hamilton-Smith 1999; Holsinger 1995; Howarth 1981; Howarth & Stone 1982; Northrup & Wellbourn 1995; Poulson 1976; P.&. Kane 1977; Proudlove 1997; Ko 1987; J. Roth 1993; Sasowsky, Fong & White 1997; Tercaps 1988a; Kay 1991; Nicholas 1955-6.

**Areas:** **AL:** Hobbs III & Bagley 1991; Van Sweaeringen 1997; **AR:** USFWS 1989; **AZ:** Snow et al. 1996; **CA:** Brode 1978; Elliott 1978-9; ; **Canada:** C.Taylor et al. 1996; **HI:** Howarth 1981b; H. & Stone 1982; Howarth 1991; **IN:** Lewis 1993a; Lewis & Lewis 1995; Pender 1986, 1990; **KY:** R. Wilson 1981b; **MA:** Plante 1983, 1991;; **MO:** Missouri Dept. 1992; Nordstrom et al. 1977; **NA:** Elliott 1995; **NM:** Northrup, Beck & Mallory, 1997; **NV:** Howells & Pister 1972; Pister 1972, 1974, 1985, 1991; Poulos 1981; **OZARKS:** Koppleman & Figg 1995; **TX:** Bowles & Arsuffi 1993; Chambers & Jahrsdoerfer 1988; Davis 1971; Elliott 1992a/b, 1993a; Elliott & Reddell 1989; McCann 1988-9; Pease & Grzybowski 1991; **US:** Hall, C. 1997; Powell 1970; C.Taylor et al. 1996; Lenz 1990; **WV:** Bradshaw 1992

cave diving - Bozanic 1992

transplants - Briggs 1975; Elliott 1978a; Rudolph 1979; Hendrickson & Brooks 1991

collecting - See protocols

gating - Powers 1991; Tuttle 1977

conserved name - Name which must be used instead of all earlier synonyms and homonyms. Abbrev. as nom. cons. (nomina conservanda)

**consumer** - Any species unable to make food from non-living matter, but depends instead on energy stored in organics. See feeding

**convergent evolution** - The independent evolution of similar traits in two or more genetically distinct taxa by different genetic & developmental pathways.

## Copepods

**Crustacean** of Subclass or Order Copepoda or class if crustaceans are a subphylum) & Class Maxillopoda, typified by lack of both a carapace & compound eyes. About 5,600 described species. Most marine but some freshwater interstitial or in wet mosses. Head fused with first segment in thorax and sometimes with second one. Filter feeders in plankton. Thorax up to six segments; 5 in abdomen. Telson with two caudal rami. First pair of thorax limbs modified to maxillipeds. Biramous limbs cause jerky movements.



**Bibl.:** T. Bowman, 1986; Chappuis 1929, 1931, 1932; Rouch 1968; Schminke 1981; Strayer 1988a, 1989a; M. Wilson & Yeatman 1959; Yeatman 1969; Evolution: Huys & Boxshall 1991; **Areas:** CO: Pennak & Ward 1985a; **FL:** Furtos 1936; **IL:**Hoff 1942; **IN:** Kiefer 1929, 1931; M. Wilson & Yeatman 1959; **KY:** Geiling 1962; M. Wilson & Yeatman 1959; **MS:** Harris 1973, 1978; **NC:** Coker 1938; Furtos 1936; **NA:** Chappuis 1933; **NC:** J. Reid 1970; **NY:**Strayer 1989, 1989a; **OH:** Furtos 1933; **ON:** Crocker & Barr 1968; **TN:** Green 1933; **TX:** Kiefer, 1929; **VA:**Palmer 1990, 1990a; **WA:**Dobbin 1941; **WI:** Marsh, 1893; **US:** Chappuis 1929; C. Wilson 1944; **World:** Lescher-Moutoue' 1986; Rouch 1986; **WV:** Starr 1968. Orders incl.

Order **Calanoida** (or Suborder if Copepoda is an order)

(anterior part of body much broader than posterior, first antennae long with 22-5 segments)

Diaptomidae (*Arctodiaptomus*, *Diaptomus*, *Leptodiaptomus*, *Skistodiaptomus*)  
Pseudodiaptomidae (*Pseudodiaptomus*)

Suborder Amphascandira

Calanidae (*Eurytemora*) **Bibl.:** Mauchline 1998

Suborder Heterarthrandria

Centropagidae (*Osphranticum*)

Order **Cyclopoida** (or Suborder if Copepoda is an order) ((anterior part of body much broader than posterior, first antennae with no more than 17 segments)

Clausiididae (*Clausidium*, *Hemicyclops*, *Saphirella*)

Cyclopidae

(*Halicyclops*, *Graeteriella*; *Thermocyclops*, undet. copepodite genus in LA brackish beach) **Bibl.:** ; J. Price 1955

Cyclopinidae (undet. family in hyporheic and parafluvial in AZ;  
undet genus rarely found in sON hyporheic & groundwater)

Subfamily Cyclopininae (*Cyclopina*, *Metacyclopina*)

Order **Gelyelloida** (order previously only known from Switzerland & France)

undet. genus & family in hyporheic of SC coastal blackwater stream

Order **Harpacticoida** Sars, 1903 (anterior part of body not much wider than posterior part, antennae short) undet genus rarely found in sON hyporheic & groundwater

Ameiridae (*Ameira*, *Nitocra*, *Nitocrella*, *Interleptomesochra*, *Nitocrellopsis*, *Praeleptomesochra*, *Protosammotopa*, *Psammotopa*. *Pseudoleptomesochra*, *Pseudoleptomesochrella*, *Parapseudoleptomesochra*, *Stygonitocrella*; undet. genus in AZ shallow phreatic & parafluvial)

Arenopontiidae (*Arenopontia*)

Canthocamptidae (*Attheyella*, *Bryocamptus*, *Canthocamptus*, *Elaphoidella*, *Epactophanes*, *Maraenobiotus*, *Mesochra*, *Moraria*, *Psammonitocrella*; undet. genus in brackish beach sediment at Lake Pontchartrain, LA & in OK hyporheic)

Canuellidae (*Scottolana*)

Cletodidae

(*Cletocamptus*, *Enhydrosoma*, *Heteropsyllus*, *Huntemannia*, *Nannopus*, *Rhizothrix*, *Tryphoema*, undet. genus in LA brackish beach)

Cylindropsyllidae (*Arenopontia* (now in Arenopontiidae); undet. genus in brackish LA beach  
Subfamily Cylindropsyllinae

*Cylindropsyllus*, *Evansula*, *Leptastacus*, *Paraleptastacus*, *Stenocaris*

Subfamily Leptopontinae: *Arenopontia*, *Leptopontia*

Darcythompsoniidae (*Goffinella*, *Leptocaris*)

Diosaccidae

(*Amphiascus*, *Pseudostenhelia*, *Robertsonia*, *Schizopera*, *Stenhelia*, *Typhlamphiascus*)

Ectinosomidae

(*Arenosetella*, *Halectinosoma*, *Hastigerella*, *Pseudobrayda*, undet. genus in LA brackish beach)

Harpacticidae (*Harpacticus*, *Zausodes*, *Tigriopus*)

Laophontidae (*Arenolaophonte*, *Asellopsis*, *Heterolaophonte*, *Laophonte*, *Laophontina*, *Normanella*, *Novolaophonte*, *Paralaophonte*, *Onychocamptus*, *Paronychocamptus*, *Stygolaophonte*; undet. genus in LA brackish beach)

Lernaeopodidae (also put in own order) **Bibl.:** C. Wilson 1910 (*Cauloxenus*)

Longipedidae (*Longipedia*)

Paramesochridae

(*Apodopsyllus*, *Diarthrodella*, *Kliopsyllus*, *Paramesochra*, *Remanea*, *Scottopsyllus*)

Parastenocarididae (undet. genus in nonkarst hyporheic in NM; *Parastenocaris*)

Phyllognathopodidae (*Phyllognathopus*).

Tachidiidae (*Microarthridium*, *Thompsonula*)

Tegastidae (*Parategastes*)

Thalestridae (undet. genus in LA brackish beach. *Dactylopodia*, *Diarthrodes*)

Tetratgonicepsidae (*Phyllopodopsyllus*)

Tisbidae (*Tisbe*)

Order Lernaepodoidae **Bibl.:** C. Wilson 1910

Spiophanicolidae (*Spiophanicola*)

Families incl.

**Ameiridae** Monard, 1927 (*Ameira, Nitocra, Nitocrella, Interleptomesochra, Nitocrellopsis, Praeleptomesochra, Protosammotopa, Psammotopa, Pseudoleptomesochra, Pseudoleptomesochrella, Parapseudoleptomesochra, Stygonitocrella*; undet. genus in AZ shallow phreatic & parafluvial)

**Arenopontiidae** (*Arenopontia*)

**Calanidae** (*Eurytemora*)

**Canthocamptidae** Sars, Monard, Lang, 1906 (*Attheyella, Bryocamptus, Canthocamptus, Elaphoidella, Epactophanes, Maraenobiotus, Mesochra, Moraria, Psammonitocrella*; undet. genus in brackish beach sediment at Lake Pontchartrain, LA & in OK hyporheic) (likely Pangean origin; most primitive genera & highest diversity is Holarctic-Laurasian)

**Canuellidae** (*Scottolana*)

**Centropagidae** (*Osphranticum*)

**Clausidae** (*Clausidium, Hemicyclops, Sapphireella*)

**Cletodidae** - (*Cletocamptus, Enhydrosoma, Heteropsyllus, Huntemannia, Nannopus, Rhizothrix, Tryphoema*, undet. genus in brackish beach sediment at Lake Pontchartrain, LA)

**Cyclopidae**

(*Halicyclops, Graeteriella, Thermocyclops*; undet. copepodite genus in brackish LA beach)

**Bibl.** E. Forbes, 1897; J. Price 1955

Subfamily Cyclopinae

(*Acanthocyclops, Cyclops, Diacyclops, Macrocyclops, Megacyclops, Mesocyclops, Microcyclops, Orthocyclops, Stolonicyclops, Tropocyclops*)

Subfamily Eucyclopinae Kiefer, 1927) (*Eucyclops, Paracyclops*)

**Cyclopinidae** (undet. family in hyporheic and parafluvial in AZ; undet. genus rarely found in sON hyporheic & groundwater)

Subfamily Cyclopininae (*Cyclopina, Metacyclopina*)

**Cylindropsyllidae** (*Arenopontia* (now in Arenopontiidae); undet. genus in brackish beach at Lake Pontchartrain, LA)

Subfamily Cylindropsyllinae

(*Cylindropsyllus, Evansula, Leptastacus, Paraleptastacus, Stenocaris*)

Subfamily Leptopontiinae (*Arenopontia*, *Leptopontia*)

**Darcythompsoniidae** (*Goffinella*, *Leptocaris*)

**Diaptomidae** (*Arctodiaptomus*, *Diaptomus*, *Leptodiaptomus*, *Skistodiaptomus*)

**Diosaccidae**

(*Amphiascus*, *Pseudostenhelia*, *Robertsonia*, *Schizopera*, *Stenhelia*, *Typhlamphiascus*)

**Ectinosomidae**

(*Arenosetella*, *Halectinosoma*, *Hastigerella*, *Pseudobrayda*, undet. genus LA brackish beach)

**Harpacticidae** (*Harpacticus*, *Zausodes*, *Tigriopus*)

**Laophontidae** (*Arenolaophonte*, *Asellopsis*, *Heterolaophonte*, *Laophonte*, *Laophontina*, *Normanella*, *Novolaophonte*, *Paralaophonte*, *Onychocamptus*, *Paronychocamptus*, *Stygolaophonte*; undet. genus in LA brackish beach)

**Lernaeopodidae** (*Cauloxenus*)

**Longipediidae** (*Longipedia*)

**Paramesochridae** (*Apodopsyllus*, *Diarthrodella*, *Kliopsyllus*, *Paramesochra*, *Remanea*, *Scottopsyllus*)

**Parastenocarididae** Chappuis, 1933 (undet. genus in nonkarst hyporheic in NM; (*Parastenocaris*) **Bibl.:** Schminke 1981

**Phyllognathopodidae** Gurney, 1932 (*Phyllognathopus*). **Bibl.:** Dumont & Maas, 1988.

**Pseudodiaptomidae** (*Pseudodiaptomus*)

**Spiophanicolidae** (*Spiophanicola*)

**Tachidiidae** (*Microarthridium*, *Thompsonula*)

**Tegastidae** (*Parategastes*)

**Tetratgonicepsidae** (*Phyllopodopsyllus*)

**Thalestridae** (undet. genus in LA brackish beach. *Dactylopodia*, *Diarthrodes*)

**Tisbidae** (*Tisbe*)

**COPEPOD** species incl.:

*Acanthocyclops* Kiefer, 1927 - Cyclopidae copepods, Subfamily Cyclopinae

*Acanthocyclops brevispinosus* (Herrick, 1884) (Tp? in NS; hyporheic in MI, ON) **Bibl.:** Dahms & Fernando 1997

*Acanthocyclops exilis* (*Cyclops e.* Coker, 1934) (hyporheic in AL, OK, & Mammoth C., KY),

*Acanthocyclops capillatus* (Sars, 1892) (Pp? in 1 seAK cave)

*Acanthocyclops montana* Reid & Reid, 1991 (MT/nonkarst stygophile; Pb)

*Acanthocyclops parasensitivus* J.W. Reid, 1998 (hyporheic in KY)

*Acanthocyclops parvulus* Strayer, 1988a (hyporheic in NH, NY, OH, PA/ eurytopic),

*Acanthocyclops pennaki* Reid, 1992 (hyporheic in South Platte River, CO)

*Acanthocyclops plattensis* Pennak & Ward, 1995 (hyporheic & Pb in South Platte River, CO)

*Acanthocyclops robustus* (*Cyclops r.* Sars, 1863; *A. vernalis r.*) (East/ Tx or Tp in Harrison & WA Cos., IN & NS; Tp in GA (Bartow Co., assoc. with mammal feces)/ robust copepod)

*Acanthocyclops* undet. sp. or species (Tx or Ac in Crawford & WA Cos., IN; shallow, deep, & dry channel hyporheic in Sycamore Cr. 32 km ne of Phoenix (Maricopa Co.), AZ))

*Acanthocyclops* undescr. sp.# (A. ■C• hyporheic in VA)

*Acanthocyclops* sp.#2 (A. ■D• hyporheic in TN)

*Acanthocyclops* sp.#3 (A. ■F• hyporheic in TN)

*Acanthocyclops* sp.#4 (A. ■E• hyporheic in AL)

*Acanthocyclops* sp.#5 or more (OK hyporheic)

*Acanthocyclops* sp.#6 or more (Vancouver Island, BC/ Tb &/or Pb)

*Acanthocyclops venustoides* (= *Bryocamptus v.* Coker, 1934) (hyporheic, eurytopic in NY; Tx? in Harrison Co., IN (Harrison Co.) & NS)

*Acanthocyclops (Acanthocyclops) vernalis* (*Cyclops v.* Fischer, 1853) (hyporheic in CO, Europe, GA (cf.), KY (Mammoth C.), MT, NY, OK (*vernalis* group), PA, TN, TX, se, neVA; Tx? in MN; Tp in Culberson & Sutton Cos., TX) **Bibl.:** Chen 1988; Fryer 1985; Aycok 1942

*Ameira* Boeck 1865 - Ameiridae copepods

*Ameira parvuloides* Lang, 1965 (SC interstitial salt marsh)

*Amphiascus* G.O. Sars, 1905 - Diosaccidae copepods

*Amphiascus debilis* (Giesbrecht, 1881) (PQ Gulf of St. Lawrence sandy marine interstitial)

*Apodopsyllus* Kunz, 1962 - Paramesochridae copepods

*Apodopsyllus unguiformis* Coull & Hogue, 1978 (SC marine sublittoral interstitial)

*Apodopsyllus vermiculiformis* Lang, 1965 (CA, France marine sublittoral interstitial; BC tidal pool interstitial; CA marine beach interstitial)

*Arctodiaptomus* Kiefer, 1932 – Diaptomidae copepods

*Arctodiaptomus floridanus* (Marsh, 1926) (seFL stigoxene)

*Arenolaophonte* Lang, 1965 - Laophontidae copepods

*Arenolaophonte arenophila* Lang, 1965 (CA marine beach interstitial)

*Arenolaophonte* Lang, 1965 - Laophontidae copepods

*Arenolaophonte stygia* Lang, 1965 (CA marine beach interstitial)

*Arenopontia* Kunz, 1937 - Arenopontiidae copepods (also put in Cylindropsyllidae, Subfamily Leptopontinae)

*Arenopontia* (*Neoleptostacusa*) *acantha acantha* Chappuis, 1954 (Atlantic & Mediterranean Europe, India, CA, NC marine beach interstitial)

*Arenopontia* (*Arenopontia*) *arenarida* (Pennak, 1942) (MA, NC sublittoral & marine beach interstitial)

*Arenopontia* (*Arenopontia*) *dillonbeachia* Lang, 1965 (Japan, CA marine beach interstitial)

*Arenopontia* (*Arenopontia*) *riedli* Lindgren, 1976 (NC marine beach interstitial)

*Arenopontia* (*Arenopontia*) *stygia* Noodt, 1965 (Atlantic & Mediterranean Europe, NC sublittoral & marine beach interstitial)

*Arenopontia* (*Arenopontia*) *subterranea* Kunz, 1937 (Atlantic, Indian, NC brackish, sublittoral & marine beach interstitial)

*Arenosetella* Wilson, 1932 (= *Ectinosoma*) Ectinosomatidae copepods

*Arenosetella fissilis* Wilson, 1932 (WA, MA marine beach interstitial)

*Arenosetella kaiseri* Lang, 1965 (CA marine beach interstitial)

*Arenosetella spinicauda* Wilson, 1932 (SC, MA, Bermuda marine beach & sublittoral interstitial)

*Arenosetella* undet. sp. or speciesb (TX estuary benthic; SC marine infauna)

*Asellopsis* Brady & Robinson, 1873 - Laophontidae copepods

*Asellopsis* undet. sp. (marine episammonic and endopsammonic)

*Attheyella* Brady, 1880 - Canthocamptidae copepods

*Attheyella americana* Herrick (VA hyporheic)

*Attheyella* (*Mrazekiella*) Holarctic & prob. among most primitive in family **Bibl.:**Chappuis 1932

*Attheyella* (*Mrazekiella*) *carolinensis* Chappuis, 1932 (NA epigeal/Tp or Tx on WV crayfish) Prins, 1964

*Attheyella* *idahoensis* Marsh, 1903 (CO hyporheic)

*Attheyella* (*Brehmiella*) *illinoisensis* (nec S.A. Forbes, 1882) Chappuis, 1927 (*Canthocamptus i.*) (eUS to GA, MI, MN, DC, NY/ hyporheic,eurytopic, Tx or Tp in GA (WA Co.), IN, VA, WV; hyporheic? & benthic in NC streams; OK hyporheic)

**Attheyella** *nordenskioldi* (Lilljeborg, 1900) (NY, ON epigeal/ hyporheic, eurytopic in NY, OK, VA; ON groundwater interstitial/ Tx or Ac in Crawford & Harrison Cos., IN; Ac in GA (Dade, Walker Cos.))

**Attheyella** *northumbricoides* Willey, 1925 (= *A. (Brehmiella) northumbrica americana* (Herrick)) (MN/ MI interstitial groundwater)

**Attheyella** *obatoamensis* (Willey, 1925) (NY, NC? hyporheic, eurytopic; benthic in NC streams)

**Attheyella** (*Brehmiella*) *pilosa* Chappuis, 1929 (Mammoth C., KY (type locality/ GA, IN, KY, TN epigeal/ commensal on Tp *Cambarus* crayfish in GA, IN (Crawford, Harrison & WA Cos.) & KY (Mammoth C.; OK hyporheic)

**Attheyella** undet. sp. (OK hyporheic)

**Bryocamptus** Chappuis, 1929 (= *Limocamptus*) - Canthocamptidae copepods

**Bryocamptus** (*Artiocamptus*) *cuspidatus* (B.C. Schmeil, 1893) Chappuis, 1929 (NY hyporheic)

**Bryocamptus** (*Limocamptus*) *hiemalis* Pearse, 1905 (OK hyporheic)

**Bryocamptus** (*L.*) *hiemalis brevifurca* (DC epigeal; MI lake interstitial)

**Bryocamptus** (*Limnocamptus*) *morrisoni m.* (*B.m.* Chappuis, 1928; *Echinocamptus* (*Limnocamptus*) *m. C.*, 1929) (type locality cave in Lawrence Co., IN/ Mammoth C., KY?/ St/ OK hyporheic/ IN T&E)

**Bryocamptus** *morrisoni elegans* (*Echinocamptus* (*Limnocamptus*) *m. ssp. e.* Chappuis, 1929) (\*type locality cave in Hart Co., KY/Tb?/KY State T&E/subsumed under *B.m.m.*?)

**Bryocamptus** (*Limnocamptus*) *nivalis* Willey, 1925 (Europe, E, NY hyporheic, eurytopic, Tx or Tp in WV; Tx in Harrison Co., IN)

**Bryocamptus** (*Bryocamptus*) *pygmaeus* (Sars, 1833) (NC hyporheic? & stream benthic)

**Bryocamptus** undescr. sp. #1 near *B.morrisoni* (\*\*\*) Tp? in Organ C. (Greenbrier Co.)/Tp),

**Bryocamptus** undescr. sp. (hyporheic of SC coastal blackwater stream)

**Bryocamptus** undet. sp. or species (CO, OK hyporheic; Pp? In stream below seAK cave; interstitial in VA freshwater tidal marsh; MI lake benthic)

**Bryocamptus** *typhlops* Mrazek, 1893 (hyporheic)

**Bryocamptus** *vejdovskyi* Mrazek, 1893 (Tx in WV/ MN, NY hyporheic, eurytopic)

**Bryocamptus** *vejdovskyi* forma *minutiformis* OK hyporheic)

*Bryocamptus venustoides* = *Acanthocyclops v.*

**Bryocamptus** (*B.*) *zschokkei* z. (Schmeil, 1893) (hyporheic in GA, MN, NC, NY, PQ, VA; AB lake benthic)

**Bryocamptus** (*B.*) *zschokkei alleghaniensis* Coker (DC epigeal/Tx in WV)

**Bryocamptus** (*B.*) *zschokkei frigidus* Will (hyporheic? in Canada)

**Canthocamptus** Westwood, 1836 (Holarctic & prob. among the most primitive genus in the family) Canthocamptidae copepods

**Canthocamptus** *assimilis* Kiefer, 1929 (NY/hyporheic,eurytopic),

**Canthocamptus** *cavernarum* Packard, 1879 (Mammoth C.,KY), (*incertae sedis*, may = *Attheyella pilosa*)

*Canthocamptus illinoisensis* = *Attheyella i.*

**Canthocamptus** *staphylinoides* Pearse, 1905 (MI,NY hyporheic,eurytopic; MI lake benthic)

**Canthocamptus** undet. sp. or species (interstitial in VA freshwater tidal marsh; MI lake benthic)

**Canthocamptus** *vagus* Coker et Morgan, 1940 (DC,NC,NF epigeal; CO hyporheic)

**Cauloxenus** Cope,1872 - Lernaeopodidae copepods

**Cauloxenus** *stygius* (Cope, 1872) (type locality cave in Crawford Co. & caves in Harrison & Orange Cos., IN)/ S1G1/ Tb /commensal on cavefish *Amblyopsis spelaea*)

**Clausidium** Kossmann, 1875 – Clausidiidae copepods

**Clausidium** *vancouverense* (*Hersilia v.* Haddon, 1912) (CA marine infauna?)

**Cletocamptus** Schmankevitch, 1875 (= *Godetella*, *Marshia*) Cletodidae copepods

**Cletocamptus** *dietersi* (Richard, 1897) (sporadic in top 1 cm of sediment in LA estuarine pond; Salton Sea (CA) benthic; FL freshwater infauna)

**Cletocamptus** *helobius* J.W.Fleeger, 1980 (LA, SC marine infauna)

**Cyclopina** Claus, 1863 - Cyclopinidae ostracods, Subfamily Cyclopininae

**Cyclopina** *gracilis* Claus, 1863 (PQ Gulf of St. Lawrence sandy marine interstitial)

**Cyclops** O.F. Muller, 1785 sensu Kiefer, 1939 - - Cyclopidae copepods, Subfamily Cyclopininae

*Cyclops agilis* = *Eucyclops a.* (= *C. serrulatus?*),

*Cyclops albidus* = *Macrocyclus a.*

*Cyclops (Diacyclops) bicuspidatus* = *D. b.*

*Cyclops (Diacyclops) bicuspidatus thomasi* = *Diacyclops t.*

*Cyclops bicuspidatus nanus* = *D. n.*

**Cyclops** *cavernarum* Ulrich, 1902 - *incertae sedis* - not currently a recognized sp. (Edwards Aquifer, scTX/ Pb)



**Cyclops** *chrisae* Reid, 1992 (Wye Isl.,MD/well,Pb)  
*Cyclops crassicaudis brachycercus* = *Diacyclops c. b.*  
*Cyclops (Megacyclops) donanldsoni* - See *Megacyclops*

*Cyclops edax* - see *Mesocyclops*  
*Cyclops elegans* = *Eucyclops e.*  
*Cyclops exilis* = *Acanthocyclops e.*

*Cyclops jeanneli putei* = *Diacyclops j. p.*  
*Cyclops learii* Ulrich, 1902 - incertae sedis - not recognized sp. TX/Tx or Tp)  
*Cyclops nearcticus* = *Diacyclops n.*

**Cyclops** *prasinus* S. Fischer , 1860 (= *Eucyclops p.*) (Tx or Ac in KY(Mammoth C.),IN)  
*Cyclops robustus* = *Acanthocyclops robustus*

**Cyclops** undescr. sp.1-2 (\*Artesian well at San Marcos, TX/Tb/may be = *C. cavernarum* &/or *learii*)

**Cyclops** *serrulatus* (*Eucyclops s.* S. Fischer, 1851; *C. macruroides* & *varius* Lilljeborg; *C. anophthalmus*) (Tx in Europe,IN,KY(Mammoth C.); MI lake benthic)

**Cyclops** *varicans* G.O. Sars, 1863

**Cyclops** *varicans* var. *rubellus* Lilljeborg (Pb/Tp in Edwards Aquifer,scTX)

**Cyclops** (*Acanthocyclops*) *vernalis* (= *Diacyclops v.* Fischer, 1853) (epigean in GA,VA; AB lake benthic; Tp in KY (Mammoth C.), NM, TX , Europe) **Bibl.:** Aycock 1942; Dupraw 1958; Rio 1971

*Cyclops viridis* = *Megacyclops v.*

**Cylindropsyllus** Brady, 1880 - Cylindropsyllidae copepods, Subfamily Cylindropsyllinae  
**Cylindropsyllus** *laevis* Brady, 1889 (Atlantic Europe, ME brackish, marine sublittoral & beach interstitial)

**Dactylopodia** Lang, 1948 - Thalestridae copepods

**Dactylopodia** *paratisboides* Lang, 1965 (CA marine benthic)

**Diacyclops** Kiefer, 1927 (see also *Cyclops*) - Cyclopidae copepods, Subfamily Cyclopinae

**Diacyclops** *alabamensis* Reid, 1992 (well near Gadsen,AL/Pb?)

**Diacyclops** *albus* Reid, 1991 (hyporheic in Goose Cr. (TL), Loudon Co., nVA + NY & OH)

**Diacyclops** *bicuspidatus* (*Cyclops (D.) b.* Claus, 1857 (Tp in IN,KY(Mammoth C.),Europe; MN lake interstitial burrower) **Bibl.:** P. Patrick 1984; Stemberger 1982

*Diacyclops clandestinus* = *D. yeatmani*

*Diacyclops crassicaudis* (G.O. Sars, 1863) (MT/nonkarst stygophile in MT; Tp? In NS) **Bibl.:** Reid 1992

*Diacyclops crassicaudis brachycercus* (Kiefer, 1927) (hyporheic in eCanada, CO, NY, OK, ON, VA; Tp in TX; Tx in Harrison Co.,IN) Reid, 1992

*Diacyclops dimorphus* Reid & Strayer, 1994 (hyporheic in nFL)

*Diacyclops harryi* Reid, 1992 (hyporheic in DC, MD, NY, NC, PA, VA)

*Diacyclops jeanneli j.* (*Cyclops (D.) j.* Chappuis, 1929) (type locality in Marengo C., Crawford Co., IN/ well,Floyd Co., + one cave each in WA, Harrison & Orange Cos.,IN/ IN T&E; G1S1 Pb)

*Diacyclops jeanneli putei* (*Cyclops j. p.* Yeatman, 1943) (NC,Orange Co./well, Pb in NC; OK hyporheic /NC T&E NC S1?, NC & Federal Species of Concern),

*Diacyclops* nr. *jeanneli* (hyporheic in AL; seFL stigobiotic; Pb)

*Diacyclops languidoides l.* (Lilljeborg, 1901) (MT/nonkarst stygophile), cf.

*Diacyclops languidus* LeBlanc, Sutherland & Aubin, 1981 (NE to PQ/Tx in NY, hyporheic, eurytopic)

*Diacyclops nanus* (Sars, 1862) (LA/bottom debris/NC well)

*Diacyclops nearcticus* (*Cyclops n.* Kiefer, 1934) (NY streaml/ Pb?/ hyporheic & stygophile in AL, CO, FL, NY, OH, OK, ON, TN, VA/ phreatobia, wells, stygophile)

*Diacyclops sororum* Reid, 1992 (hyporheic in KY, TX, VA/ Pb? in Crawford Co.,IN/S4G4)

*Diacyclops* undet. sp. (Tp in Crawford Co.,IN; Pp? In 1se AK cave)

*Diacyclops* undescr. sp. #1 (*D. ■H■* hyporheic in PA)

*Diacyclops* undescr. sp sp. #2 (*D. ■G■* hyporheic in AL)

*Diacyclops* undescr. sp. #3-4 (OK hyporheic)

*Diacyclops thomasi* (S.A. Forbes, 1897) (= *Cyclops bicuspidatus thomasi*) (NA/ Ac, Tx or Tp in IN, KY (Mammoth C.),TX; MI interstitial; CO hyporheic; AB lake benthic; epigeic in Manitoba, MI, MN, ON) **Bibl.:** Allison 1995; M. Graham 1997; Leblanc 1992

*Diacyclops yeatmani* (*D. clandestinus* Yeatman, 1964) (type locality cave in Grundy Co.,TN +drain tile (Vermillion Co.,IL) & cave in St.Charles Co.,MO; OK hyporheic / Pb)

*Diacyclops* nr. *yeatmani* (hyporheic in AL, OK)

*Diacyclops virginianus* Reid, 1993 (Goose Cr.,Loudon Co.,VA/hyporheic)

*Diaptomus* Westwood in Partington, 1830 - Diaptomidae copepods

*Diaptomus* (*Diaptomus*) undet. sp. or species (Mammoth C.,KY/MI interstitial; MT nonkarst stygobite; NC hyporheic? & stream benthic)

*Diarthrodella* Klie, 1949 - Paramesochridae copepods  
*Diathrodella secunda pacifica* Kunz, 1954 (HI marine beach interstitial)

*Diarthrodes* Thompson, 1883 - Thalestridae copepods  
*Diarthrodes dissimilis* (Lang, 1965) (CA marine benthic)  
*Diarthrodes aegideus* (Brian, 1927) SC marine infauna

*Ectinosoma* = *Arenosetella*

*Ectocylops* - Brady, 1904 - Cyclopidae copepods  
*Ectocylops agilis* (Koch, 1838) (NC epigeal; AB lake benthic)  
*Ectocylops phaleratus* (Koch, 1838) (NC epigeal; AB lake benthic; FL freshwater infauna)

*Echinocamptus* (*Limnocamptus*) *morrisoni* = *Bryocamptus m.*  
*Echinocamptus* (*L.*) *morrisoni* ssp. *elegans* = *Bryocamptus e.*

*Elaphoidella* Chappuis, 1928 - Canthocamptidae copepods  
*Elaphoidella bidens* (C.B. Schmeil, 1894) (global, VA, MN, FL, NC, PA, LA, OH hyporheic;  
Tx or Tp in cave in Orangeburg Co., SC; Ac, Tx or Tp in GA (WA Co.))

*Elaphoidella bidens* var. *coronata* (Sars) (epigeal in DC; hyporheic, eurytopic in NY)  
*Elaphoidella marjoryae* (Bruno & Reide, 2000) (seFL stigoxene)

*Elaphoidella shawangunkensis* Strayer, 1988a (hyporheic & eurytopic in NY)  
*Elaphoidella* undet. sp. (OK hyporheic)

*Epactophanes* Mrazek, 1893 - Canthocamptidae copepods  
*Epactophanes richardi* Mrazek, 1893 (VA hyporheic)

*Enhydrosoma* Boeck, 1873 - Cletodidae copepods  
*Enhydrosoma baruchi* Coull, 1975 (burrower? in SC marine muds)

*Enhydrosoma curticauda* Boeck, 1872 (PQ Gulf of St. Lawrence sandy marine interstitial)  
*Enhydrosoma propinquum* (Brady & Robertson, 1876) (interstitial? or burrower in LA, SC  
marine muds)

*Enhydrosoma* undet. sp. (TX estuary benthic)  
*Enhydrosoma woodini* Thistle, 1980 (in top 1 cm of sediment in LA estuarine pond)

*Epactophanes* Mrazek, 1893 - Canthocamptidae copepods  
*Epactophanes richardi* M., 1893 (AK, PQ epigeal /hyporheic, eurytopic in MN, NY)

*Eucyclops* Claus, 1893 - Cyclopidae copepods, Subfamily Eucyclopinæ

***Eucyclops agilis*** Koch, 1838 (= *Cyclops a.*) (East/ hyporheic in KY, NH, MI, NY, OH, OK, ON, TN, TX, VA/ AB, MI lake benthic; Tp in NS, SC (Orangeburg Co.) & Europe)

***Eucyclops agilis*** var. or ssp. *montanus* (Brady) (hyporheic in MI, NC, ON/ Tp in NM, KY, IN),

***Eucyclops conrowae*** Reid, 1992 (Tx in Harrison & Orange Cos., IN; Ac, Tp or Tx in GA (Bartow Co.) /Congrow's copepod/S4G4)

***Eucyclops (Eucyclops) elegans (E. serrulatus* var. *elegans* Herrick, 1884) (Mammoth C., KY (type locality)/ Tx? in MN; Tx in IN, KY; Tx or Tp in SC (Orangeburg Co.); Tp in GA (Dade Co.)/ hyporheic in MI, VA & OH)**

*Eucyclops (Tropocyclops) prasinus* = *T.p.*

***Eucyclops (E.) serrulatus*** (Fischer, 1851) (Tx? in Mammoth C.(KY) & Europe),

***Eucyclops speratus*** (Lilljeborg, 1901) (= *E. serrulatus* var. *speratus*) (MT nonkarst stygobite; TX hyporheic)

***Eucyclops*** undet. sp. or species (hyporheic in CO, NY; Tx in IN; shallow, deep, & dry channel hyporheic in Sycamore Cr. 32 km ne of Phoenix (Maricopa Co.), AZ)

***Eurytemora*** Giesbrecht, 1881 - Calanidae copepods

***Eurytemora affinis*** (Poppe, 1880) (Europe, cosmopolitan, estuarine /hyporheic in NY) **Bibl.:** R. Davis 1986; C. Lee 1993; Roddie 1988; Tepper 1986

***Evansula*** T. Scott, 1906 - Cylindropsyllidae copepods, Subfamily Cylindropsyllinae

***Evansula arenicola*** Nicholls, 1939 (PQ marine sublittoral interstitial)

***Evansula incerta*** (T. Scott, 1892) (Atlantic Europe, Baltic, NC brackish, beach & marine sublittoral interstitial)

***Graeteriella*** Brehm, 1926 - Cyclopidae copepods (freshwater specis derived from marine ancestors)

***Graeteriella*** undet sp. (freshwater mesopsammon)

***Halicyclops*** Norman, 1903 - Cyclopidae copepods

***Halicyclops coulli*** Herbst (SC salt marsh infauna)

***Halicyclops fosteri*** Wilson, 1958 (most abundant in top 1 cm of sediment in LA estuarine pond)

***Halicyclops*** undet. sp. (TX estuary benthic)

***Harpacticus*** Milne-Edwards, 1838 - Harpacticidae copepods

***Harpacticus*** undet. sp. (TX estuary benthic)

***Hastigerella*** Nicholls, 1935 - Ectinosomatidae copepods

*Hastigerella leptoderma* (Klie, 1924) (interstitial in SC marine sands)

*Halectinosoma* Lang, 1965 - Ectinosomatidae copepods

*Halectinosoma winonae* Coull, 1975 (interstitial in SC marine sands & burrower? in SC marine muds)

*Hemicyclops* Claus, 1893 – Clausidiidae copepods

*Hemicyclops thysanotus* Wilson, 1935 (CA marine infauna?)

*Heteropsyllus* T. Scott, 1894 - Cletodidae copepods

*Heteropsyllus nunni* Coull, 1975 (interstitial in SC marine sands)

*Heterolaophonte* Lang, 1948 - Laophontidae copepods

*Heterolaophonte capillata* (*Lalophonte c.* Wilson, 1932; *H. noncapillata* Lang, 1948) (MA, SC marine interstitial)

*Huntemannia* Poppe, 1885 - Cletodidae copepods

*Huntemannia jadensis* Poppe, 1885 (WA marine infauna)

*Heterolaophonte stromi* (Baird) (SC marine interstitial)

*Interleptomesochra* Lang, 1965 - Ameiridae copepods

*Interleptomesochra reducta* Lang, 1965 (CA marine beach interstitial)

*Kliopsyllus* Kunz, 1962 - Paramesochridae copepods

*Kliopsyllus californicus* Kunz, 1962 (CA marine beach interstitial)

*Kliopsyllus constrictus constrictus* Noodt, 1958 (Mediterranean & Atlantic Europe, NC, SC marine beach, sublittoral & brackish estuary interstitial)

*Kliopsyllus debilis* Kunz, 1981 (HI marine beach interstitial)

*Kliopsyllus gracilis* (Wilson, 1932) (MA marine beach interstitial)

*Kliopsyllus laurenticus* (Nicholls, 1939) (PQ, England marine beach & sublittoral interstitial)

*Kliopsyllus spiniger ornatus* Kunz, 1981 (HI marine beach interstitial)

*Laophonte* Philippi, 1840 - Laophontidae copepods

*Laophonte* undet. sp. (TX estuary benthic)

*Laophontina* Norman & T. Scott, 1905, emended - Laophontidae copepods

*Laophontina reducta* Coull & Zo, 1980 (GA, SC marine sublittoral interstitial)

*Laophontina triarticulata* Coull & Zo, 1980 (GA, SC marine sublittoral interstitial)

*Laophontina variabilis* Coull & Zo, 1980 (GA, SC marine sublittoral interstitial)

*Leptastacus* T. Scott, 1892 - Cylindropsyllidae copepods, Subfamily Cylindropsyllinae

*Leptastacus aberrans* Chappuis, 1954 (France, FL?, NC marine sublittoral & beach interstitial)  
*Leptastacus constrictus* Lang, 1965 (WA & CA marine sublittoral & tidal pool interstitial)

*Leptastacus incurvatus* Lang, 1965 (CA marine sublittoral interstitial)  
*Leptastacus jenneri* Lindgren, 1975 (Panama, NC marine beach interstitial)

*Leptastacus laticaudatus laticaudatus* Nicholls, 1935 (Atlantic Europe, NC marine sublittoral & beach interstitial)

*Leptastacus macronyx* (T. Scott, 1892) (Atlantic Europe, Mediterranean, Bermuda, SC, MA, SC brackish, marine sublittoral & beach interstitial)

*Leptastacus wieseri* Chappuis, 1957 (WA marine beach interstitial)

*Leptocaris* T. Scott, 1899 - Darcythompsoniidae copepods  
*Leptocaris doughertyi* Lang, 1965 (CA marine beach interstitial)  
*Leptocaris doughertyi* Lang, 1965 (CA marine beach interstitial)

*Leptocaris kunzi* (Fleeger & Clark, 1980) (LA marine interstitial)  
*Leptocaris macronyx* (Scott) (SC marine interstitial)  
*Leptocaris pori* Lang, 1965 (CA marine beach interstitial)

*Leptopontia* T. Scott, 1902 - Cylindropsyllidae copepods, Subfamily Leptopontinae  
*Leptopontia* T. Scott, 1902 (Atlantic & Mediterranean Europe, NC brackish, sublittoral & marine beach interstitial)

*Leptodiptomus* Light, 1938 - Diaptomidae copepods  
*Leptodiptomus sicilis* (Forbes) (AB lake benthic)  
*Limocamptus* - see *Bryocamptus*

*Longipedia* Claus, 1863 - Longipediidae copepods  
*Longipedia americana* Wells, 1980 (TX estuary marine benthic)

*Longipedia helgolandica* Klie (SC marine infauna)  
*Longipedia minor* (T. Scott & A. Scott, 1893) (CA marine benthic)

*Macrocyclus* Claus, 1893 - Cyclopidae copepods, Subfamily Cyclopinae

*Macrocyclus albidus* (Jurine, 1820) (NA epigeal/ hyporheic in AL, CO, KY, NY, OK, TN, TX, VA / Tp in GA (Bartow Co.), KY (Mammoth C.), NS, TX; AB lake benthic)

*Macrocyclus fuscus* (Jurine, 1820) (Mammoth C., KY (type?) & Harrison Co., IN/S4G4),  
*Macrocyclus fimbriatus poppei* = *Paracyclus poppei*

*Macrocyclus* undet. sp. (CO hyporheic)

*Maraenobiotus* Mrazek, 1893 - Canthocamptidae copepods

*Maraenobiotus brucei* (Mosochra b. Richard, 1898) (NY/hyporheic,eurytopic; AB lake benthic)

*Maraenobiotus brucei b.* Borutzky, 1950 (epigean, Holarctic, Russia, AK,Europe)

*Maraenobiotus insignipes* (Lilljeborg, 1902) (CO,VA hyporheic)

*Megacyclops* Kiefer, 1927 - Cyclopidae copepods, Subfamily Cyclopinae. Bibl. Reid 1995

*Megacyclops donaldsoni d.* (*Cyclops (M.) d.* Chappuis, 1929; *C. gigas* Claus, 1857; *C. latipes* Lowndes, 1927; *C. mangnus* Marsh; *C. viridis* Jurine, 1820) \*\*\*\*( type locality cave in Lawrence Co. & one cave in Crawford Co.,IN +Mammoth C.(KY) & small cave in McMinn Co,TN?/ Tb/IN T&E) Delorme 1969

*Megacyclops* undescr. sp. (*M.* ■B•/ hyporheic in AL, TN, VA)

*Megacyclops viridis viridis* (*Cyclops viridis* Jurine, 1920; *Acanthocyclops (Megacyclops) viridis v.*) (hyporheic in NH, OH; Tx in Vancouver Island, BC)

*Megacyclops viridis* var. *americanus* (Marsh, 1910) (= *C. robustus* G.O. Sars; *C.a.* Marsh, 1893; *C.v.* var. *brevispinosa* Herrick; *C.b.*; *C.r. f. setiger* Thallwitz) (Tx in Germany,IN, KY(Mammoth C.); MI interstitial)

*Mesochra* Boeck, 1865 - Canthocamptidae copepods -Canthocamptidae copepods

*Mesochra mexicana* Wilson, 1971 (TX marine infauna; SC interstitial salt marsh)

*Mesochra pygmaea* (Claus, 1863) (SC meiofauna marine infauna)

*Mesocyclops* G.O. Sars, 1863 - Cyclopidae copepods, Subfamily Cyclopinae

*Mesocyclops edax* (S.A. Forbes, 1891) (*Cyclops e.*; *M.(M.) leuckarti* ssp. *edax*) Coker, 1943 (hyporheic in eUS from NH, KY, OH to VA, FL/ epigean in hyporheic/Tx in IN(Crawford Co.),KY (Mammoth C.); MN lake interstitial burrower),/S4?/G4) **Bibl.:** Wyngaard 1981; C. Williamson 1981

*Mesocyclops (M.) leuckarti* (Claus, 1859) (Tx or Tp in Mammoth C.,KY),

*Mesocyclops (M.) leuckarti* ssp. *edax* = *M. e.*

*Mesocyclops longisetus* (Thie'baud, 1915) (Tp in Sutton Co, TX)

*Mesocyclops* undet. sp. (shallow, deep, & dry channel hyporheic in Sycamore Cr. 32 km ne of Phoenix (Maricopa Co.), AZ)

*Metacycllopina* Lindberg, 1953 - Cyclopinidae ostracods, Subfamily Cyclopininae

*Metacycllopina improvisa* Herbst & Zo, 1981 (SC, GA marine sublittoral interstitial)

*Microarthridion* Lang, 1948 - Tachidiidae copepods

**Microarthridion** *littorale* (*Tachidus l.* Poppe, 1881) (interstitial? in SC marine & salt marsh muds; most abundant in tp 1 cm of sediment in LA estuarine pond)

**Microarthridion** undet. sp. or species (hyporheic? in stream near seAK cave; TX estuary benthic)

**Microcyclops** Claus, 1893 - Cyclopidae copepods, Subfamily Cycloppinae

**Microcyclops** *pumilis* Pennak & Ward, 1995 (hyporheic & Pb in South Platte River, CO)

**Microcyclops** *rubellus* (Lilljeborg, 1900) (*M. varicans r.*) (East/hyporheic in AL, KY, PA, TN, VA/ Tp in Ezell's Cave, Hays Co., TX; Pb in Crawford Co.,IN; FL freshwater infauna /S4G4)

**Microcyclops** undescr. sp.#1 or more (OK hyporheic)

**Microcyclops** *varicans* (Sars, 1863) (weedy ponds, hypogean; FL freshwater infauna)

*Microcyclops varicans rubellus* = *M.r.*

**Microcyclops** undet. sp. or species (hyporheic in CO, OK; Tx in Harrison Co.,IN)

**Moraria** T. & A. Scott, 1893 (Holarctic) - Canthocamptidae copepods

**Moraria** *affinis* Chappuis, 1927 (AK meltwater?/hyporheic & eurytopic in NY)

**Moraria** (*Moraria*) *cristata* Chappuis, 1931 (type locality cave in Lawrence Co., IN/ OK hyporheic/ Pp? in Yucatan/ DC, OH, ON epigean)

**Moraria** *laurentica* Willey, 1927 (hyporheic in NY; DC, GA epigean; NY, NC? hyporheic; benthic & meiofauna in NC streams)

**Moraria** *mrazeki* (Scott, 1903) (Europe, MN stream hyporheic)

**Moraria** undet. sp. or species (Tx in WV; OK hyporheic)

**Nitocra** Boeck, 1865 - Ameriridae copepods

**Nitocra** *lacustris* (*Transfuga lacustris* Schmankevitsch, 1875) (LA, SC marine infauna; OK hyporheic (rare))

**Nitocra** *typica* (Boeck, 1865) (SC marine infauna)

**Nitocrella** Chappuis, 1924 - Ameriridae copepods

**Nitocrella** *aestuarina* Coull & Bell, 1979 (SC interstitial salt marsh)

**Nitocrella** *incerta* (Chappuis, 1933) (CO hyporheic)

**Nitocrellopsis** Petkovski, 1976 - Ameriridae copepods

**Nitocrellopsis** *texana* Fiers & Iliffe, 2000 (\*type locality cave in Comal Co.,TX/ Pb)

**Nannopus** Brady, 1880 - Cletodidae copepods

**Nannopus** *palustris* Brady, 1880 (LA, SC marine mud interstitial?)



*Normanella* Brady, 1880- Laophontidae copepods  
*Normanella bolini* (Lang, 1965) (CA marine benthic)  
*Normanella* undet. sp. (SC marine interstitial? infauna)

*Novolaophonte* V. Cottarelli, P.E. Saporito & A.C. Puccetti, 1983 - Laophontidae copepods  
*Novolaophonte viatorum* V. Cottarelli, P.E. Saporito & A.C. Puccetti, 1983 (MA marine beach interstitial)

*Onychocamptus* Daday, 1903 - Laophontidae copepods  
*Onychocamptus mohammed* (*Laophonte m.* Blanchard & Richard, 1891) (LA marine infauna)

*Osphranticum* S.A. Forbes, 1883? - Centropagidae copepods  
*Osphranticum labronectum* S.A. Forbes, 1882 (epigean in AL swamp/ CO hyporheic; seFL stigoxene; AR crayfish burrows) D. Anderson 1995

*Orthocyclops* Forbes, 1893 - Cyclopidae copepods, Subfamily Cyclopinae  
*Orthocyclops modestus* (Herrick, 1883) (epigean in DC/ Pb? in Crawford Co.,IN/S4/G4)

*Paracyclops* Claus, 1893 - Cyclopidae copepods, Subfamily Eucyclopinae  
*Paracyclops canadensis* (Willey) (Tx in Crawford Co.,IN/S4/G4)

*Paracyclops chiltoni* (*P. fimbriatus c.* Thomson, 1882) (Europe,NA/ Tx in Harrison & WA Cos.,IN/ hyporheic in OH, PA, KY,TN; FL freshwater infauna / S4/G4)

*Paracyclops fimbriatus* (S. Fischer, 1853) (NA,Europe/hyporheic in CO, NY, ON; MI lake benthic; Tp? in ON; Tp in KY (Mammoth C.), TX)

*Paracyclops fimbriatus poppei* (*P.f.* Rehberg, 1880) (eurytopic/NY hyporheic; Tp in KY, TX; Ac or Tx in NS)

*Paracyclops fimbriatus finitimus* Kiefer, 1929 (*P. finitimus*) (Tx or Tp in Europe, Mammoth C.(KY)

*Paracyclops finitimus* = *P. fimbriatus finitimus*  
*Paracyclops poppei* = *P. fimbriatus poppei*

*Paracyclops smileyi* Strayer, 1988a (NY/hyporheic,eurytopic)  
*Paracyclops* undescr. sp. (*P. ■A●* hyporheic in nFL)  
*Paracyclops* undescr. sp.#2 or more (OK hyporheic)

*Paralaophonte* Lang, 1944 - Laophontidae copepods  
*Paralaophonte pacifica* Lang, 1965 (CA marine benthic)  
*Paralaophonte* undet. sp. (SC marine interstitial? infauna)

*Paraleptastacus* Wilson, 1932 - Cylindropsyllidae copepods, Subfamily Cylindropsyllinae  
*Paraleptastacus brevicaudatus* Wilson, 1932 (MA marine beach interstitial)

*Paraleptastacus katamensis* Wilson, 1932 (MA marine beach interstitial)

*Paraleptastacus laurenticus* Nicholls, 1939 (PQ marine beach interstitial)

*Paraleptastacus longicaudatus* Nicholls, 1939 (PQ marine beach interstitial)

*Paraleptastacus spinicauda spinicauda* (T. & A. Scott, 1895) (Atlantic & Mediterranean Europe, SC brackish, marine beach & sublittoral interstitial)

*Paramesochra* T. Scott, 1892 - Paramesochridae copepods

*Paramesochra acutata hawaiiensis* Kunz, 1981 (HI marine beach interstitial)

*Parastenocaris* Kessler, 1913 - Parastenocarididae copepods (freshwater species derived from saltwater ancestors)

*Parastenocaris brevipes* Kessler, 1913 (nVA hyporheic)

*Parastenocaris delamarei* Chappuis, 1957 (lakeshore interstitial groundwater)

*Parastenocaris palmerae* Reid, 1991 (Goose Cr., Loudon Co., nVA/nonkarst meiofauna)

*Parastenocaris* undet. sp. or species (nonkarst stygobite/ hyporheic in AZ (also parafluvial & phreatic), CO (uncommon), MT, NY, SC (coastal blackwater); TX; hyporheic? & benthic in NC streams)

*Parastenocaris* undet. sp. or species (AZ, OK hyporheic)

*Parastenocaris starretti* Pennak, 1939 (groundwater interstitial in WI sandy WI beach; PQ hyporheic)

*Parastenocaris texana* Whitman, 1984 (interstitial sandy hyporheic in TX stream)

*Parastenocaris wilsoni* Borutzky, 1952 (MA lakeshore & brackish groundwater interstitial)

*Parategastes* Sars, 1904 - Tegastidae copepods

*Parategastes* undet. sp. (SC marine interstitial? infauna)

*Paronychocamptus* Lang, 1948 - Laophontidae copepods

*Paronychocamptus huntsmani* (Willey) (most abundant in top 1 cm of LA estuarine pond)

*Paronychocamptus wilsoni* Coull, 1976 (interstitial? or burrower in SC marine muds)

*Phyllognathopus* Mrazek, 1893 - Phyllognathopodidae copepods

*Phyllognathopus* undet. sp. (NY hyporheic)

*Phyllognathopus viguieri* (Maupas, 1892) (common CO hyporheic; Tx? in MN; seFL stigoxene or stygophile)

*Phyllognathopus viguieri coelomomyiasis*. (Pb, groundwater in WA) **Bibl.:** G. Mueller 1990

*Phyllopodopsyllus* T. Scott, 1906 - Tetratgonicepsidae copepods

*Phyllopodopsyllus* undet sp.(interstitial in marine shell gravels)

*Praeleptomesochra* Lang, 1965 - Ameiridae copepods

*Praeleptomesochra similis* Lang, 1965 (interstitial in CA tidal pools)

*Protosammotopa* Geddes, 1968 - Ameiridae copepods

*Protosammotopa wilsoni* Wells, 1977 (MA, NC, England, Israel marine beach interstitial; SC marine interstitial)

*Psammotopa* Pennak, 1942 - Ameiridae copepods

*Psammotopa* Pennak, 1942 *vulgaris* (MA, NC, England, Israel marine beach interstitial)

*Psammonitocrella* Rouch, 1992 - Canthocamptidae copepods

*Psammonitocrella boultoni* Rouch, 1992 (\* Sycamore Cr. 32 km ne of Phoenix (Maricopa Co.), AZ/ hyporheic)

*Pseudobrayda* Sars, 1904 - Ectinosomatidae copepods

*Pseudobrayda pulchella* Sars, 1920 (interstitial in SC marine sands)

*Pseudodiaptomus* Herrick, 1884 - Pseudodiaptomidae copepods

*Pseudodiaptomus* undet. sp. (TX estuary benthic)

*Pseudoleptomesochra* Lang, 1965 - Ameiridae copepods

*Pseudoleptomesochra typica* Lang, 1965 (CA marine beach interstitial)

*Pseudoleptomesochrella* Lang, 1965 - Ameiridae copepods

*Pseudoleptomesochrella bisetosa* Lindgren, 1975 (NC marine beach interstitial)

*Pseudostenhelia* Wells, 1967 - Diosaccidae copepods

*Pseudostenhelia wellsii* Coull & Fleeger (most abundant in top 1 cm of sediment in LA estuarine pond)

*Remanea* Klie, 1929 - Paramesochridae copepods

*Remanea plumosa* Pennak, 1942 (MA marine beach interstitial)

*Rheocyclops* Reid & Strayer, 1999 - Cyclopidae copepods, Subfamily Cyclopinae.

*Rheocyclops carolinianus* Reid 1999 (hyporheic in AL)

*Rheocyclops hatchiensis* Reid & Strayer 1999 (hyporheic in AL)

*Rheocyclops indiana* Reid, 1999 (Ladder C., WA Co., IN & epigeal? In Great Smoky Mountains Natl.Park, TN /Pb, S1G1)

*Rheocyclops hatchiensis* Reid & Strayer 1999 (hyporheic in Blount Co., AL)

*Rheocyclops talladega* Reid & Strayer 1999 (hyporheic in Cleburne Co.,AL)

*Rhizothrix* Brady & Robertson, 1865 - Cletodidae copepods

*Rhizothrix curvata* Brady & Robertson, 1880 (Atlantic & Mediterranean Europe, WA marine beach & sublittoral interstitial)

*Rhizothrix gracilis* (T. Scott, 1903) (Atlantic Europe, NC brackish, marine beach & sublittoral interstitial)

*Rhizothrix minuta* (T. Scott, 1903) (Atlantic Europe, ME, PQ brackish, marine beach & sublittoral interstitial)

*Rhizothrix scotti* (T. Scott, 1903) (NC marine sublittoral interstitial)

*Rhizothrix spinosa* Coull, 1971 (NC marine sublittoral interstitial)

*Rhizothrix tenella* (Wilson, 1932) (MA, SC marine beach interstitial)

*Robertsonia* Brady, 1880 Diosaccidae copepods

*Robertsonia glomerata* Fliers, 1996 (NC estuary interstitial?)

*Robertsonia propinqua* (T. Scott, 1894) (LA, SC marine infauna)

Saphirella T. Scott, 1894 - Clausiidae copepods

Saphirella undet. sp. (TX estuary benthic)

*Schizopera* (G.O. Sars, 1805) Diosaccidae copepods

*Schizopera knabeni* Lang, 1965 (mesopsammon in SC salt marsh; LA marine infauna)

*Scottolana* Por, 1967 - Canuellidae copepods

*Scottolana canadensis* (*Canuella c.* Willey, 1923; *C. elongata*) (most abundant in top 1 cm of sediment in LA estuarine pond; TX estuary benthic; SC meiofauna infauna)

*Scottopsyllus* Kunz, 1962 - Paramesochridae copepods

*Scottopsyllus minor* (T. & A. Scott, 1895) (PQ, NC, Atlantic & Mediterranean Europe marine beach & sublittoral interstitial & brackish (Baltic) interstitial)

*Scottopsyllus pararobertsoni* Lang, 1965 (CA, Bermudae marine sublittoral interstitial)

*Scottopsyllus robertsoni* (T. & A. Scott, 1895) (SC, Atlantic & Mediterranean Europe marine beach & sublittoral interstitial)

*Skistodiptomus* Light, 1939 - Diaptomidae copepods

*Skistodiptomus* (*Diaptomus*) *pallidus* (Herrick, 1879) (Europe, E, BC/Tx in two caves in Harrison Co., IN/pallid copepod/S4/G4)

*Spiophanicola* Ho, 1984 – Spiophanicolidae copepods

*Spiophanicola spinulosus* Ho, 194 (CA marine infauna?)

*Stenhelia* Boeck, 1864 - Diosaccidae copepods

*Stenhelia* (*Delavelia*) *bifida* Coull, 1976 (SC salt marsh benthic & LA, SC marine infauna)

*Stenhelia* (*Delavelia*) *longipilosa* (Lang, 1965) (CA marine benthic)

*Stenhelia* (*Stenhelia*) *proxima* (G.O. Sars, 1907) (CA marine benthic)  
*Stenhelia* undet. sp. (TX estuary benthic)

*Stenocaris* Sars, 1909 - Cylindropsyllidae copepods, Subfamily Cylindropsyllinae  
*Stenocaris arenicola* Wilson, 1932 (MA marine sublittoral interstitial)

*Stenocaris kliei* Kunz, 1936 (Great Britain, NC marine sublittoral interstitial)  
*Stenocaris minor* (T. Scott, 1892) (Atlantic ocean & NC marine sublittoral & beach interstitial)

*Stolonicyclops* Reid & Spooner, 1998 - Cyclopidae copepods, Subfamily Cycloppinae  
*Stolonicyclops heggiensis* Reid & Spooner, 1998 (Pb & interstitial in GA, TN)

*Stygonitocrella* Petkovski, 1976 - Ameriridae copepods  
*Stygonitocrella* undescr. sp. or species (Pb in WA; hyporheic in OK)

*Thermocyclops* Kiefer, 1927 – Cyclopidae copepods  
*Thermocyclops parvus* (Reid, 1989) (seFL stigophile)

*Thompsonula* T.Scott, 1905 - Tachidiidae copepods  
*Thompsonula hyaenae* (J.C. Thompson, 1889) (interstitial? or burrower in SC marine muds)

*Tigriopus* Norman, 1868 - Harpacticidae copepods  
*Tigriopus brevicornis* (O.F. Muller, 1776) (PQ Gulf of St. Lawrence sandy marine interstitial)

*Tisbe* Lilljeborg, 1853 - Tisbidae copepods  
*Tisbe holothuriae* Humes, 1957 (SC marine infauna)

*Tropocyclops* Kiefer, 1927 (also = subgenus of *Eucyclops*) Cyclopidae copepods, Subfamily Cycloppinae

*Tropocyclops extensus* Kiefer, 1929 t (Tx in Harrison Co., IN/S4/G4)  
*Tropocyclops prasinus* (Fischer, 1860; *Eucyclops* (*T.*) *p.*) (Europe, East US/Tx in KY (Mammoth C.)/ hyporheic in NH, Europe)

*Tropocyclops prasinus mexicanus* (Kiefer, 1931) (East/ Tp in cave in Hays Co., TX; Tx in WA Co., IN; nVA hyporheic)

*Tropocyclops* undet. sp. (OK hyporheic)

*Tryphoema* Monard, 1926 - Cletodidae copepods  
*Tryphoema ramabula* (Pennak, 1942) (MA marine beach interstitial)  
*Tryphoema riedli* Coull, 1971 (NC marine sublittoral interstitial)

*Typhlamphiascus* Lang, 1965 - Diosaccidae copepods  
*Typhlamphiascus* undet sp. (CA marine benthic)

*Zausodes* Wilson, 1932 - Harpacticidae copepods

*Zausodes arenicolus* Wilson, 1931 (TX estuary benthic; SC marine infauna)

*Zausodes sextus* (Lang, 1965) (CA marine benthic)

**coprocenosis** - Bone assemblage from feces or pellets.

coprolite - **Organic trace**, Fossil dung of ground sloths (Guadalupe Mts Natl. Park (wTX), Carlsbad C.(NM) & Gypsum C. (NV: Hofreiter et al. 2000)), humans (Big Bone C. (TN)), pronghorns, raccoon (Mammoth C.), & woodrats. Human dung in TX smells foul compared to other dung of similar age. Mammoth C. ones indicate cultivation of chenopodium, knotweed, sunflowers, & possibly may grass & sumpweed. **Human** - Blair 1991; Faulkner 1989, 1991; Fry, 1985; Heizer & Knapton 1969; Holloway 1983; Murry 1980; Poovalah et al. 1977; Sobolik 1988, 1991; Sobolik & Gerick 1992. See trace fossil

**coprophage** - Detritivore feeding on animal feces. Incl. guanobia. Cf. cecotrophy.

## Corals and Sea Pens

Phylum or Class Anthozoa (sea anemones, true corals, black corals, tube anemones).

Some members in both groups produce external skeletons of CaCO<sub>3</sub>. See also **Cnidaria** and **anemone**.

Subclass Alcyonaria (= Octocorallia) (sea fans, sea whips, sea pens, sea pansies)

Order Pennatulacea (sea pens & pansies)

Suborder Sessiliflorae

Renillidae (*Renilla*)

Suborder Subselliflorae

Pennatulidae (*Pennatulacea*, *Ptilosarcus*)

Virgulariidae (*Acanthoptilum*, *Stylatula*, *Virgularia*)

Subclass Ceriantipatharia (sister to all other hexacorallians)

Order Ceriantharia (also put in Subclass Zoantharia)

Cerianthidae (*Ceriantharia*, *Pachycerianthus*)

Subclass Hexacorallia (=Zoantharia) (sea anemones, true corals, black corals, tube anemones)

Order Actiniaria ('true' sea **anemones**)

Suborder Athenaria

Edwardsiidae (*Edwardsia*)

Halcampidae (also put in Suborder Nynantheae)

(*Athenaria*, *Halcampa*, *Halcampoides*)

Suborder Thenaria

Actiniidae (=Cribrinidae) (*Actinaria*, *Urticina*)  
Diadumenidae (*Diadumene*)  
Metridiidae (*Metridium*)

Order Rugosa

Lithostrotionidae (*Lithostrotion*)  
Streptelasmataceae (*Streptelasma*)

Order Zoanthidea (zoanthids) or Scleractinia ('true' or stony corals)  
Suborder Filifera

Superfamily Hydractinioidea  
Hydractiniidae (*Stylactis*, *Hydractinia*)

Suborder Dendrophylliina  
Dendrophyllidae (*Balanophyllia*)

*Acanthoptilum* Kolliker, 1870 - Virgulariidae sea pen  
*Acanthoptilum* undet. sp. (CA marine infauna/ trailtip sea pen)

*Athenaria* Carlgren, 1899 – Halcampidae corals  
*Athenaria* undet. sp. (WA marine infauna)

*Balanophyllia* Wood, 1844 - Dendrophyllidae corals  
*Balanophyllia* undet. sp. (solitary cup coral/CA marine)

*Campophyllum gasperence* (Mississippian wallrock fossil perhaps in Russel C., AL)

*Ceriantharia* Perrier, 1893 – Cerianthidae corals  
*Ceriantharia* undet. sp. (WA marine infauna)

*Diadumene* Stephenson, 1920 - Diadumenidae corals  
*Diadumene* undet. sp. (WA marine infauna)  
*Diadumene leucolena* (Verrill, 1866) (rare Virginian marine infauna)

*Edwardsia* de Quatrefages, 1841 – Edwardsiidae corals  
*Edwardsia californica* (McMurrich, 1913) (WA marine infauna)

*Edwardsia elegans* (Verrill, 1869) (rare Virginian marine infauna)  
*Edwardsia sipunculoides* (Stimpson, 1853) (AK, WA marine infauna)

*Glyptophora punctipora* (Mississippian wallrock fossil in Russel C., AL)

*Halcompa* – Halcampidae corals  
*Halcompa decemtentaculata* Hand, 1954 (WA marine infauna)

*Hydractinia* van Beneden, 1844 – Hydractiniidae corals  
*Hydractinia* undet. sp. or species (wFL, WA marine infauna)

*Halcampoides* Danielssen, 1890 – Halcampidae corals  
*Halcampoides purpurea* (Studer, 1878) (WA marine infauna)

*Lithostrotion* Fleming, 1828 - Lithostrotionidae cerioid corallum, Order Rugosa  
*Lithostrotion prolifera?* (Carboniferous AL fossil in Madison Co. caves)

*Metridium* Oken, 1815 – Metridiidae corals  
*Metridium senile* (Linnaeus, 1767) (WA marine infauna)

*Pachycerianthus* – Cerianthidae corals  
*Pachycerianthus fimbriatus* McMurrich, 1910 (WA marine infauna)

*Renilla* Lamarck, 1816 Renillidae corals  
*Renilla reniformis* (Pallas, 1766) (Carolinian marine infauna)

*Streptelasma* Hall, 1847 - Streptelasmataceae rugose or horn coral  
*Streptelasma strictum* (Devonian fossil in Porter C., VA)

*Stylatula* - Virgulariidae sea pen  
*Stylatula elongata* Verrill, 1864 (WA marine infauna)

*Stylactis* Allman, 1871 – Hydractiniidae hydrozoan  
*Stylactis* undet. sp. (WA marine infauna)

*Urticina* Ehrenberg, 1834 – Actiniidae corals  
*Urticina coriacea* (WA marine infauna)

*Virgularia* Lamarck, 1816 - Virgulariidae sea pen  
*Virgularia bromleyi* (WA marine infauna)

**coyote** - See **mammal, carnivore**.

CPOM –Abbrev. For coarse particulate organic matter such as twigs and large pieces of leaves.  
Cf. FPOM.

## **Crabs**

Kingdom Animalia

Phylum Arthropoda

Subphylum Crustacea

Class Malacostraca

Superorder Eucarida

Order Decapoda



Suborder Pleocyemata (=Natantia)  
  Infraorder Brachyura (true crabs)  
    Superfamily Majoidea  
      Majidae (*Libinia*, *Pelia*, *Pitho*)  
  
    Superfamily Ocypodoidea  
      Ocypodidae (*Uca*)  
  
    Superfamily Portunoidea  
      Portunidae (*Callinectes*, *Ovalipes*, *Portunus*)  
  
    Superfamily Raninoidea  
      Leucosiidae (*Persephona*)  
  
    Superfamily Xanthoidea  
      Xanthidae (mud crabs)  
      (*Dyspanopeus*, *Eurypanopeus*, *Hexapanopeus*, *Lophopanopeus*,  
      *Neopanope*, *Panopeus*, *Rhithropanopeus*)  
  
  Section Cancridea  
    Superfamily Crancoidea  
      Cancridae (*Cancer*)  
  
  Section Brachyrhynca  
    Superfamily Grapsidoidea  
  
      Family Grapsidae (shore, marsh & talon crabs)  
      (*Hemigrapsus*, *Geograpsus*)  
  
      Family Parthenopidae (*Heterocrypta*)  
  
    Superfamily Pinnotheroidea  
      Family Pinnotheridae (*Dissodactylus*, *Pinnixa*, *Pinnotheres*, *Scleroplax*)  
  
  Infraorder Anomura (also put in Suborder Reptantia)  
    (hermit, porcelain, mole & sand crabs; crab-like decapods)  
  
    Superfamily Galattheoidea  
      Family Galatheidae (squat lobsters) (*Pleuroncodes*)  
      Family Porcellanidae (*Eucramus*, *Petrolisthes*, *Polyonyx*)  
  
    Superfamily Paguroidea  
      Diogenidae (*Paguristes*)  
      Family Paguridae (*Pagurus*)

Superfamily Thalassinidea  
Upogebiidae (*Upogebia*)

*Callinectes* Stimpson, 1960 – Portunidae crabs

*Callinectes sapidus* Rathbun, 1896 (blue crab/ Virginian, MA marine infauna)

*Cancer* Linnaeus, 1758 – Cancridae crabs

*Cancer gracilis* Dana, 1852 (AK, CA marine infauna)

*Dispanopeus*

*Dispanopeus texanus* (Texas mud crab/ LA, TX marine infauna)

*Dissodactylus* Smith, 1870 - Pinnotheridae crabs

*Dissodactylus mellitae* (Rathbun, 1900) (sand-dollar pea crab/ FL Gulf of Mex. marine infauna)

*Dyspanopeus* J.W. Martin & L.G. Abele, 1986 – Xanthidae crabs

*Dyspanopeus sayi* (Smith, 1869) (Virginian marine infauna)

*Dyspanopeus texanus* (Stimpson, 1859) (rare Virginian, FL & Gulf of Mex. marine infauna)

*Euceramus* Stimpson, 1860 – Porcellanidae crabs

*Euceramus praelongus* Stimpson, 1860 (rare Virginian, FL & Gulf of Mex. marine infauna)

*Eurypanopeus* Milne-Edwards, 1880 – Xanthidae crabs

*Eurypanopeus depressus* (Smith, 1869) (Flatback mud crab/ wFL, Virginian marine infauna)

*Geograpsus* Stimpson, 1858 - Grapsidae crabs

*Geograpsus* undet. sp. (exoskeletons in HI cave)

*Hemigrapsus* Dana, 1851 - Grapsidae crabs

*Hemigrapsus estellinensis* Creel, 1964 (TX/extinct?/\* type locality gypsum cave & spr. in Hall Co.,TX/G1G2). **Bibl.:** Reddell, 1988; W. Russell & Elliott, 1994

*Heterocrypta* Stimpson, 1871 - Parthenopidae crabs

*Heterocrypta granulata* (Gibbes, 1850) (smooth elbow crab/ wFL Gulf of Mexico infauna)

*Hexapanopeus* Rathbun, 1898 – Xanthidae crabs

*Hexapanopeus angustifrons* (Benedict & Rathbun, 1891) smooth mud crab/ wFL Gulf of Mexico infauna)

*Libinia* Leach, 1815 – Majidae crabs

*Libinia dubia* H. Milne-Edwards, 1834/ Virginian marine infauna)

*Lophopanopeus* Rathbun, 1898 – Xanthidae crabs

*Lophopanopeus* undet. sp. (AK marine infauna)

*Neopanope* Milne-Edwards, 1880 – Xanthidae crabs  
*Neopanope* sayi (Smith, 1869) Virginian marine infauna)

*Ovalipes* – Rathbun, 1898 – Portunidae crabs  
*Ovalipes* ocellatus/ Virginian marine infauna)

*Paguristes* Dana, 1851 – Diogenidae crabs  
*Paguristes hummi* Wass, 1955 wFL Gulf of Mexico infauna)

*Pagurus* Fabricius, 1775 – Paguridae crabs  
*Pagurus aleuticus* (Benedict, 1892) (WA marine infauna)  
*Pagurus armatus* (Dana, 1851) (WA marine infauna)

*Pagurus beringanus* (Benedict, 1892) (WA marine infauna)  
*Pagurus capillatus* (Benedict, 1892) (WA marine infauna)  
*Pagurus caurinus* Hart, 1971 (WA marine infauna)

*Pagurus dalli* (Benedict, 1892) (WA marine infauna)  
*Pagurus gymnodactylus* Lemaitre R., 1982 (wFL Gulf of Mex. marine infauna)

*Pagurus longicarpus* Say, 1817 (NC, rare Virginian marine infauna)  
*Pagurus maclaughlinae* Garcia-Gomez, 1982 (wFL Gulf of Mex. marine infauna)

*Pagurus ochotensis* (Brandt, 1851) (New England marine benthic)  
*Pagurus pollicaris* Say, 1817 (New England, Virginian (rare) marine infauna)

*Pagurus setosus* (Benedict, 1892) (WA marine infauna)  
*Pagurus stevensae* Hart, 1971 (WA marine infauna)

*Panopeus* Milne-Edwards, 1834 - Xanthidae crabs  
*Panopeus bermudensis* Benedict & Rathbun, 1891 (strongtooth mud crab/ wFL Gulf of Mex. marine infauna)  
*Panopeus herbstii* Milne-Edwards, 1834 (Virginian marine infauna)

*Pelia* Bell, 1836 – Majidae crabs  
*Pelia mutica* (Gibbes, 1850) (cryptic teardrop crab/ LA, wFL Gulf of Mexico infauna)

*Persephona* Leach, 1817 - Leucosiidae crabs  
*Persephona mediterranea* (Herbst, 1794) (mottled purse crab/ wFL Gulf of Mexico marine infauna)

*Petrolisthes* Stimpson, 1858 – Porcellanidae lobsters  
*Petrolisthes armatus* (Gibbes, 1850) (wFL Gulf of Mexico marine infauna)

*Pinnixa* White, 1846 – Pinnotheridae crabs  
*Pinnixa chaetoptera* Stimpson, 1860 (rare Virginian, wFL Gulf of Mex. marine infauna)  
*Pinnixa cristata* Rathbun, 1900 (NC marine infauna)

*Pinnixa* cf. *floridana* Rathbun, 1918 (wFL Gulf of Mex. marine infauna)

*Pinnixa schmitti* Rathbun, 1918 (AK, CA marine infauna)

*Pinnotheres* Latreille, 1802 – Pinnotheridae crabs

*Pinnotheres* undet. sp. (/ wFL Gulf of Mexico infauna)

*Pitho* Bell, 1836 – Majidae crabs

*Pitho* undet. sp. (/ wFL Gulf of Mexico infauna)

*Pleuroncodes* Stimpson, 1860 (pelagic red crab) Galatheididae crabs

*Pleuroncodes* undet. sp.(Ttx? in CA marine)

*Polyonyx* Stimpson, 1858 – Porcellanidae crabs

*Polyonyx gibbesi* Haig, 1956 (Eastern tube crab/ wFL Gulf of Mexico infauna)

*Portunus* Weber, 1795 – Portunidaecrabs

*Portunus* undet. sp. wFL Gulf of Mex. marine infauna)

*Rhithropanopeus* Rathbun, 1898 – Xanthidae crabs

*Rhithropanopeus harrisi* (Gould, 1841) (MA, Virginian (rare) & FL Gulf of Mex. marine infauna)

*Scleroplax* Rathbun, 1893 - Pinnotheridae crabs

*Scleroplax granulata* Rathbun, 1893 (East Pacific/ burrow pea crab/ AK marine infauna)

*Uca* Leach, 1814 – Ocypodidae crabs

*Uca* undet. (NC marine infauna)

*Uca panacea* Novak & Salmon, 1974 (wFL marine infauna)

*Uca speciosa* (Ives, 1891) (wFL marine infauna)

*Upogebia* Leach, 1814 – Upogebiidae crabs

*Upogebia affinis* (Say, 1818) (Virginian, wFL Gulf of Mex. marine infauna)

*Upogebia pugettensis* (CA, OR, WA marine infauna)

## **Crayfish**

Phylum Arthropoda

Subphylum Crustacea

Class Malacostraca

Subclass Eumalacostraca

Superorder Eucarida

Order Decapoda

Suborder Pleocyemata (= Dendrobranchiata) (see also shrimp)

Infraorder Astacidea (=Stenopodidea)  
Superfamily Astacoidea

Family Cambaridae.

Subfamily Cambarellinae (*Cambarellus*)

Subfamily Cambarinae

(*Cambarus*, *Orconectes*, *Procambarus*, *Troglocambarus*)

Freshwater **decapod** crustacean resembling a lobster but much smaller. Assoc. with **ostracods** & **branchiobdellid** annelids. Bouchard 1976, 1977; Brown 1961; Burbanck, Edwards & Burbanck 1948; Caine 1974; Cooper 1969, 1975, 1977; Cooper & Cooper 1978; Dickson & Giesey 1981; Dickson, Briese, & Giesey 1981; Erichson 1846; Faxon 1884, 1885a-b, 1889, 1890, 1914; Fingerman & Mobberly 1969; Fitzpatrick 1983a; Galeano 1976; Girard 1852; Hagen 1870; Hay 1893, 1899; Hobbs, Jr. 1973, 1968, 1988; Hobbs III 1972, 1973, 1987; Hobbs, Hobbs, & Daniel 1977; Hobbs & Barr 1960, 1972; Hobbs & H. 1977; Hobbs & Barr 1960; Hobbs, Jr. & Bursdall 1973; Holthuis 1964, 1986; Jegla 1963-5, 1969; Jegla & Poulson 1968; Mellong 1977; Mellon & Lnenicka 1980; Momot et al 1978; Nemeth & Tracey 1979; Ortmann 1902; Parker 1890; Ricker, 1959; Tierney & Dunham 1984; Weingartner 1979; Wilkens 1986; Wolfe & Cornwell 1964.

**Growth, longevity, reproduction:** J. Cooper & Cooper 1979;

**Biogeography:** Hobbs III 1994;

**Biorhythms:** F. Brown 1965; Jegla 1968; Chemical response: Bell 1906

**Conservation:** Bouchard 1978; C.Taylor et al. 1996; Convergence: Hobbs Jr. 1975;

**Energetics:** A.G.Anon et al. 1999; Weingartner 1979;

**Genetics:** Creaser 1962;

**Eyes:** Mellon 1977a

**Physiology:** Wells 1959; Burbanck et al. 1947; Crandall & Hillis 1997; Vison: D. Thompson 1974; Welsh 1934;

**Population dynamics:** Hobbs III 1973d

**Areas:** **AR:** Williams 1954; **AL:** Cooper 1975; Cooper & C. 1977-8; Rhoades 1941; Wells, 1952, 1957, 1959; Welsh 1934 Rhoades 1962; **Americas:** Hobbs, Jr. 1972, 1974a; Hobbs III 1994; Hobbs, Hobbs & Daniel 1977; **Allgeghanies:** Ortmann 1931; **s.Appalachian:** Ortmann 1931; **CA:** Riegel 1959; **Canada:** C.Taylor et al. 1996; **FL:** Caine 1974; Franz 1978, 1982b; Franz & Houha 1977a; Franz & Hobbs, Jr. 1945, 1983, Franz & Lee 1982; Hobbs Jr. 1937, 1940-2, 1945; Hobbs & Hart 1959; Hobbs & Means 1972; Relyea et al 1976; Hobbs Jr. 1963, 1975; Hobbs & Hart 1959; Villalobos 1982; **GA:** Hobbs Jr. 1981a; Lee et al. 1977; Ortmann 1931; **IL:** Anon. 1978; P. Brown 1955; Forbes 1886, Jegla 1964; Rietz 1912; **IN:** Hay 1896; Eberly 1954a, 1960; Hobbs III 1971, 1972a-d, 1973d, 1975, 1975a, 1976, 1984; Hobbs III & Burdsall 1972; Weingartner 1977; Fage 1931; Hagen, 1872; W. Hay, 1892, 1894, 1896; Kingsley, 1888; Ortmann 1902; D. Thompson 1974; **KS:** Faxon 1885b; A. Williams & Leonard 1954; Fage 1931; A. Williams & Leonard 1952; **KY:** Glasco 1992; Rhoades 1944; Ortmann 1931; F. Brown

1965; Calman 1928; Hagen, 1872; Hovey 1904; Kingsley, 1888; Ortmann 1902; Wyman, 1851; **LA:**Penn 1959; **MD:** Meredith & Schwartz 1960; **MI:** Creaser 1931; Pearce 1910; **MO:** Anon. \*1999; Faxon 1889; Steele 1902; Pflieger 1996; Burbanck et al. 1947; Hershey 1964; Larimer 1966; **MS:** Lyle 1938; **New England:** Crocker 1979; **NA:** Hobbs, Jr. 1976; **NY:** Crocker 1957; **OH:** Rhoades 1944a; Turner 1926; Williamson, 1899; **OK:** Creaser & Ortenburger 1933; Mehlhop-Cifelli 1990; Oklahoma Dept. 1990-a; Reimer 1969a; A. Williams 1954; **Ozarks:** A.W.1954; Bedinger & Hobbs 1965; **ON:** Crocker & Barr 1968; Guiasu 1997; Huntsman 1915; **PA:** Ortmann 1906; F. Schwartz 1962; **SC:** Hobbs II, Throp & Anderson 1976; **SE:** S. Smith, 1873; **TN:** Hay 1899; Fleming 1938-9; **TX:** Penn & Hobbs 1958; Villalobos 1982; **US:** C.Taylor et al. 1996; J. Cooper & Cooper 1978-9; Faxon, 1886; **WI:** Creaser 1932; Hobbs II & Jass 1988; **WV:** Van Luik 1981; Van Luik & Holsinger 1979; Ortmann 1931; F. Schwartz 1962

***Aviticambarus*** - subgenus of *Cambarus* but recommended by Cooper for elevation to genus level to incl. *C. hamulatus*, *C. jonesi*, *C. sheltae*, *C. veitchorum*

***Cambarellus*** Ortman, 1905 - Cambaridae crayfish, Subfamily Cambarellinae. **Bibl.:** Hobbs 1942; Fitzpatrick 1983

***Cambarellus*** (*Pandicambarus*) *schmitti* Hobbs, 1942 (AL,FL/Tp?) Fitzpatrick, Jr. 1983a,

***Cambarellus*** (*Dirigicambarus*) *schufeldtii* (*Cambarus s.* Faxon, 1884) (U.S./Tp?) **Bibl.:** Fingerman 1955, 1957; Lowe 1956

***Cambarus*** Erichson, 1846 - Cambaridae crayfish, Subfamily Cambarinae.

**Bibl.:** Aley & A. 1990; Bouchard 1973; K. Brown 1981; Faxon 1884, 1885; Fitzpatrick 1983; Guiasu 1997; Harris 1902-4; Hobbs Jr. 1942, 1969; Hobbs Jr. & Barr 1960; Koppleman 1990; Mehlhop-Cifelli 1990; Ortmann 1905; Turner 1935; Vaugh & Certain 1992; J. Harris 1903; Mehlhop-Cifelli 1990; W. Miller, 1895; Ortmann 1902; Reimer 1966

***Cambarus*** (*Jugicambarus*) *aculabrum* Hobbs, Jr. & A. Brown, 1987 (\*\*\*type locality & 2 other caves in Benton Co.,AR/T&E Tb federally listed as endangered). **Bibl.:** Jacobson 1995; USFWS 1993, 1995, 1995a; US Fish & Wildlife 1995a

***Cambarus*** (*Puncticambarus*) *acuminatus* Faxon, 1884 (Ac, Tx or Tp in cave in Orangeburg Co.,SC)

***Cambarus*** (*Cambarus*) *angularis* H.H. Hobbs, Jr. & R. W. Bouchard, 1994 (stygophile, surface waters/ stygophile in cave in Russell, Co., VA)

*Cambarus ayersii* = *C. setosus*

***Cambarus*** *barbatus* (*Astacus b.* Le Conte, 1856) (epigean/Tx? in IN?,KY)

***Cambarus*** (*C.*) *bartonii b.* (Fabricius, 1798) (MS R.e.except FL/stygophile in AL, GA (Dade Co.), MD, OH, VA, WV; Tp or Tx in MD/spr.,cr./Appalachian brook crayfish/ harmed by copper and zinc) **Bibl.:** Cox & Beauchamp 1982; Meredith 1967; Merrill 1977; Mwangi 1990; W.Reid 1977; VanLuik 1981; Zipf 1959

*Cambarus* (*C.*) *bartonii carinirostris* Hay, 1902 (surface streams, springs/ stygophile in WV)

*Cambarus* (*C.*) *bartonii cavatus* Hay, 1902 (surface streams, springs/ stygophile, Tp in GA, OH, KY, TN, VA)

*Cambarus cahni* Rhoades, 1941 = *C. tenebrosus*

*Cambarus* (*Jugicambarus*) *cryptodytes* Hobbs, 1941 (well 2mi.s of Graceville; \*15 caves in nc.Jackson Co.+WA Co. in Apalachicola-Chattahoochee-Flint hydrologic subregion, FL & adjacent cave in Decatur Co.,GA/ Tb,Tm/ Dougherty Plain cave or Apalachicola cave crayfish/ T&E special concern; federally threatened, FL T&E, G3G4)

*Cambarus* (*Lacunicambarus*) *diogenes d. (C.(L.)d.* Girard, 1852) (E of Rockies/ Tp in IL(prob.)/ devil crayfish) **Bibl.:** Grow 1981; Marlow 1959

*Cambarus* (*Jugicambarus*) *dubius* Faxon, 1884 (epigean in KY, MD, NC, PA, TN, VA, WV/burrows; stygoxene? & Tx or Ac in VA,WV)

*Cambarus* (*Avitacambarus*) *hamulatus (Orconectes h.* Cope in Cope & Packard, 1881) Faxon, 1884 (*O.h.*) (type locality in Nickajack C.,Marion Co. & caves in Blount, Jackson & Marshall Cos.,AL +Bledsoe & Franklin Cos.,TN/ Tb,Tm/ AL Species of Concern, G3G4)

*Cambarus* (*Erebicambarus*) *hubbsi* Creaser, 1931 (neAR,seMO/epigean, surface burrows; stygoxene? in neAR, seMO)

*Cambarus* (*E.*) *hubrichti* Hobbs, 1952 (type locality cave in Ripley Co. + caves in Carter, Dent, Oregon, Phelps, Pulaski, Reynolds, Ripley, Shannon, Texas Cos., mostly in upper Eleven Point, Current & Meramec R. drainages (incl. Carter Co.) +Colbert Co.,OK/ Tb,Tm/ Salem Cave Crayfish/ MO T&E watchlist) **Bibl.:** Wells 1957a; P. Wells & Witt 1957

*Cambarus* (*Avitacambarus*) *jonesi* Hobbs & Barr, 1960 (type locality cave in Morgan Co. +Colbert, Limestone, Marshall Cos.,\*TN R. basin, neAL/Tb,Tm/AL Species of Concern, G3/Alabama cave crayfish) **Bibl.:** Cooper & C. 1978

*Cambarus* (*Erebicambarus*) *laevis* Faxon, 1914 (lotic epigean & Tp in sIL,IN (Crawford, Harrison, Orange,WA Cos.), nKY, swOH/ S3(IN)/G4)

*Cambarus* (*Depressicambarus*) *latimanus* (Le Conte, 1856) (surface burrows and streams /Tp? or Tx in AL, FL, GA (Chatooga, Dade, Walker Cos.)

*Cambarus* (*Puncticambarus*) *nerterius* Hobbs, 1964 (type locality cave in \*Greenbrier & Elk R.? basins (Pocohontas & Greenbrier Cos.),WV/Tb,Tm/WV T&E S1 rank & global G2G3 rank) **Bibl.:** VanLuik 1981

*Cambarus* (*Erebicambarus*) *ornatus* Rhoades, 1944 (sIL,KY/ lotic,Tp)

*Cambarus punctimanus* = *Orconectes p.*

**Cambarus** (*Puncticambarus*) *robustus* Girard, 1852 (ON,NY to IL, s.to TN,NC,VA,MI/ stygoxene? & Tx or Ac in NY/ IN T&E G5)

**Cambarus** (*Cambarus*) undet. sp. (stygoxile? in seVA) **Bibl.:** Holsinger 1964

**Cambarus** undet. sp. (Ac or Ttx in 1 NY cave)

**Cambarus** (*Jugicambarus*) *setosus* (= *C. ayersii* Faxon in Garman, 1889) (type locality cave in Barry Co.,MO/ swMO (Barry, Christian, Dade, Greene, Jasper, Lawrence, McDonald, Newton, & Stone Cos.), Breakdown C.(AR?), & Delaware & Mayes Cos.,neOK/ St, Tb, Tm/ OK T&E; MO T&E R, G3G4/ Bristly Cave Crayfish) **Bibl.:** Figg & Lister 1990; Fingerman et al 1964; F. & Mobberly 1960; Hobbs et al. 1977; Spurgeon 1915; Steele, Hobbs & Barr 1960; P. Wells 1952

*Cambarus shufeldtii* = *Cambarellus s.*

**Cambarus** (*Depressicambarus*) *striatus* (*C.latimanus s.* Hay, 1902) Hobbs, 1956a (nAL,sKY,cTN/ stygoxene? in nAL, nGA (Tp in Chattooga, Walker Cos.)

**Cambarus** (*Jugicambarus*) *subterraneus* Hobbs III, 1993 \*\*\* ( type locality cave in Delaware Co.,OK/stream Tb/OK T&E, G1G2)

**Cambarus** (*J.*) *tartarus* Hobbs & Cooper, 1972 (type locality & 2 other caves in Delaware Co.,OK/Tb/OK T&E,G1G2/Oklahoma cave crayfish) **Bibl.:** Hobbs & Cooper 1972; Looney 1974-5

**Cambarus** (*Erebicambarus*) *tenebrosus* (*C.bartoni t.* Hay, 1902; *C. cahni* Rhoades, 1941) Garman, 1920 (Mammoth C., KY (type locality) +IL,Ohio R. below Salt R. s.to TN R. in AL & e. to Cumberland Plateau in KY (Rockcastle Co.), GA (Dade Co.), TN (Marion & Franklin Cos.) & IL/lotic epigeal,Tp) **Bibl.:** Cooper & C.1978; Dickson & Giesey 1981; Hobbs 1969a; Prins 1965, 1968; Wolfe & Cornwell 1964

**Cambarus** (*Aviticambarus*) *veitchorum* Cooper & Cooper, 1997 (\*type locality cave in Limestone Co., AL/ AL Species of Concern/ Tb,Tm)

**Cambarus** (*Jugicambarus*) *zophonastes* Hobbs & Bedinger, 1964 (\*type locality cave in Stone Co.,AR/ Federal T&E, G1G2/ Tb/ Hell Cr. cave crayfish) **Bibl:** Aley & Aley 1985; Hobbs 1987; K. Smith 1984; J. Stewart 1988; US Fish & Wildlife 1984c, 1987, 1988f

*Faxonius* (not currently recognized as a genus; see *O.l.*),

**Orconectes** Cope, 1872 - Cambaridae crayfish, Subfamily Cambarinae

**Bibl.:** Bechler 1979a; Dickson, Gary & Giesey 1982; Fitzpatrick 1987; Hobbs 1948, 1972; Hobbs & Barr 1972; Rhoades 1962 Rhoades 1962



**Orconectes** (*Orconectes*) *australis a.* (= *O. pellucidus australis* Rhoades, 1941) Barr, 1967 (*O. pellucidus a.*) (type locality cave in Madison Co.+Jackson CO.,AL ne.to near KY(Wayne Co.) & TN(Coffee, Fentress, Franklin, Gundy, Overton, Putnam, Warren, White, Van Buren Cos.) line/ St/ KY State T&E, G3G4T3T4/ Tm,Tb)

**Bibl:** Cooper & C.1978; Dickson & Giesey 1981; Fetzner 1996; Fitzpatrick 1987; Larimer, Trevino & Ashby 1966; R. Matthews et al 1975, 1977; R. Matthews et al. 1977

**Orconectes** (*O.*) *australis packardii* (*O.pellucidus packardii* Rhoades, 1944) Barr, 1967 (type locality cave in Pulaski Co. + Rockcastle, McCreary & Wayne Cos., KY; intergrades with *a.a.* near KY/TN line/ St/ KY Species of Concern, G3G4T3) **Bibl.:** Fitzpatrick 1987

**Orconectes** (*Procericambarus*) *hylas* (*C.h.* Faxon, 1890; *C. (Faxonius) h.* Ortmann, 1905b, *F.h.* Creaser, 1933; *O.h.* Hobbs, 1941) Fitzpatrick, 1987 (MO/Tx)

**Orconectes** (*Gremicambarus*) *immunis* (*C. i.* Hagen, 1870; *C. signifer* Herrick, 1882; *C. (Faxonius) i.* Ortmann, 1905; *F.i.* Williamson, 1970; *O.i.i.* Hobbs, 1942; *O.i.* Penn, 1950; *O.(O.)i.* Hobbs, 1959; *O. (Gremicambarus) i.* Fitzpatrick, 1987) (also put in subgenus *Trisellescens*) Bouchard & Bouchard 1995 (MA to WY, MT, ON to AL/ stygoxene? & Tx or Ac in IN (Lawrence Co.) & Canada/ calico crayfish) **Bibl.:** Bovbjerg 1952; Crawshaw 1974; Goellner 1943; Tack 1941; Wiens & Armitage 1961; Suppl.: Wiens & Armitage 1961

**Orconectes** (*O.*) *incomptus* Hobbs & Barr, 1972 (\*\*type locality & 1 other cave in Jackson Co. + possibly in cave or caves in Putnam Co.,TN/ Pb/ TN cave crayfish/ TN State T&E, S1 G1G2/ Tb,Tm) **Bibl.:** F. Price 1900; Fitzpatrick 1987

**Orconectes** (*O.*) *inermis i.* Cope, 1872 (type locality cave in Crawford Co.,IN/ IN (Crawford, Harrison, Lawrence, Martin, Orange, Washington Cos.) to Hart, Breckenridge, Meade & Green Cos.,KY, intergrades with *i.t.* n. to Monroe Co.,IN/Tb/KY Threatened T&E; IN T&E S3 G5T4/ TN or northern cave crayfish)

**Bibl.:** Bechler 1981a; Fitzpatrick 1987; Hobbs, III 1976, 1976a-b, 1977a, 1978, 1978b,c,d, 1980, 1981a; Jegla 1966; D. Morris, Wilson & Jegla 1977

**Orconectes** (*O.*) - distinct Tb subgenus suggests monophyly. **Bibl.:** Fetzner 1996

**Orconectes** (*O.*) *inermis testii* (*C. pellucidus i.* Hay, 1891, 1893; *O.i.t.* Hobbs, 1942) Fitzpatrick, 1987 (type locality cave in Monroe Co.,IN/ IN (Greene, Monroe & Owen Cos.)Tb/IN T&E) **Bibl.:** Hobbs III 1976, 1976a, 1977a, 1981b

**Orconectes** (*Procericambarus*) *luteus* (*Faxonius l.* Creaser, 1933a) Fitzpatrick 1987 (surface lotic/ stygoxene? & Tp, Tx or Ac in KS, MO)

**Orconectes** (*Buannulifictus*) *meekei brevis* (*O.m.b.* Williams, 1952; *O.(O.) m.b.* Hobbs, 1959; *Faxonius m.b.* Creaser, 1962) Fitzpatrick, 1987 (Tp or Tx in AR,OK/ *O.m.* - MO State T&E)

**Orconectes** (*Gremicambarus*) *nais* (*Cambarus n.* Faxon, 1885; *C. pilosus* Hay, 1899; *C. (Faxonius) n.* Ortmann, 1905; *F.n.* Creaser, 1933; *O.(O.) n.* Hobbs, 1942) Fitzpatrick, 1987 (Tx in MO)

**Orconectes** (*Procericambarus*) *neglectus n.* (Faxon, 1885; *O.n.n.* Williams, 1954) Fitzpatrick 1987 (CO, KS, NE surface rocky-bottomed streams/ stygophile in AR (Benton Co.), swMO, OK (Delaware Co.) /CO T&E S2, global G4 rank)

**Orconectes** (*P.*) *neglectus chaenodactylus* (*O.n.c.* Williams, 1952) Fitzpatrick, 1987 (Tx or Tp in AR,MO) **Bibl.:** Price 1982; Price & Payne 1984

**Orconectes** (*P.*) *ozarkae* (*O.o.* Williams, 1952) Fitzpatrick, 1987 (AR epigeal/ Tx in MO)

**Orconectes** (*Buannufluctus*) *palmeri longimanus* (*O.p.l.* Faxon, 1884 Fitzpatrick, 1987 (stygoxene?, Tp & stygophile in OK & TX Tx/*O.p.* T&E in KY)

**Orconectes** (*Orconectes*) *pellucidus* (*Astacus p.* Tellkampff, 1845; *C.p.* Girardf, 1852) Hobbs, 1942 (Mammoth C. (type locality) /nKY(Baren, Christian Edmonson, Hart, Logan, Trigg, Warren Cos.), TN(Montgomery Co.)/ Tb/ KY Special Concern T&E, TN S3G3)

**Orconectes pellucidus** **Bibl:** Bechler 1981a; Eberly 1958; Hobbs & Barr 1972; Jegla, Poulson & Cooper 1965; Price 1900; Putnam, 1874a, 1875, 1875a-b; Spurgeon 1915; Wolfe & Cornwell 1964; O. Park, Roberts & Harris 1941

*Orconectes pellucidus packardi* = *O. australis packardi*

**Orconectes** (*Crockerinus*) *propinquus* (Girard, 1852) Fitzpatrick, 1987 (Great Lakes, NY, ON, IL, MI, OH/ stygoxene? & Tp, Tx or Ac in IN (Lawrence Co.), WI & MN?/ rare in WI) **Bibl.:** Capelli 1975

**Bibl:** Berrill, et al. 1985; Bovbjerg 1952; Budd et al 1979; Corey 1987; Fitzpatrick 1967; Gillespie, Reisine & Massaro 1977; Roldman & Shivers 1987; Tierney, Thompson & Dunham 1984; Van Deventer 1937; R. Wright 1884

**Orconectes** (*Procericambaus*) *punctimanus* (Creaser, 1933; *O.p.* Hobbs, 1942) Fitzpatrick, 1987 (stygophile in AR (Benton Co.), MO; Ttx or Ac in MO (Carter Co.))

**Orconectes** (*Orconectes*) *sheltae* Cooper & Cooper, 1997 (\*type locality cave in Madison Co.,nAL/ Tb,Tm/ AL T&E)

**Orconectes** undescr. sp. (\*cave in Ozark Co.,MO/ Tb)

**Orconectes** (*Gremicambarus*) *validus* (Faxon, 1914 (Tx or Ac in 2 caves, Madison Co.,nAL)

**Orconectes** (*Gremicambarus*) *virilis* Hagen, 1870 (NE,CA,MT,ON, & SE(alien)/stygoxene or Tp in AL, IN (Lawrence Co.),. MO; Tx? in MN?/virile crayfish/ harmed by cadmium, zinc & DDT) **Bibl.:** Aiken 1967; Caldwell 1969; Gorell 1970; W. Reid 1977; Somers 1967

**Bibl.:** Dake 1996; Diggins 1971; Gorell 1970; Headon 1994; Mirenda 1985; W. Reid 1977; Aiken 1967-8; Anderson 1968; Bovbjerg 1953, 1970; Burggren & McMahon 1983; Chambers et al 1990; Claussen 1980; I. Davies 1984, 1989; France 1984, 1985, 1985a; France & Graham 1985; Guyselman 1957; Hanson et al 1990; Hazlet 1985; H.& Rittschoff 1985; Hazlett et al. 1974; Heckenlively 1970; Larimer, Trevino & Ashby 1966; McMahon, Burggren & Wilkens 1974; McWhinnie & O'Connor, 1967; Momot & Gowing 1972, 1977, 1977a; Peck 1985; T. Roberts 1944; Tierney & Atema 1986, 1988; Vermeer 1972; Threinen 1958,

**Procambarus** Ortmann, 1905 (once treated as subgenus of *Cambarus*) Cambaridae crayfish, Subfamily Cambarinae

**Bibl.:** K. Brown 1981; Caine 1974, 1974a, 1975; Busack 1989; Hobbs, Jr. 1947, 1962; Hobbs III 1972a; Huner 1988; Hobbs Jr. 1984

**Procambarus** (*Lonnbergius*) *acherontis* (= *Cambarus a.* Lonnberg, 1894) Hobbs 1972  
\*\*(underground rivulet (near Lake Brantley, Seminole Co.) & cave \*by Wekiva R. in Orange & Seminole Cos., Orange Co., FL/ Pb, spr., sinks, caves/ Orange-Seminole Crayfish; Orlando or Palm Springs cave crayfish / Federal T&E review status; FL T&E S1 global G3 (six sites)). **Bibl.:** Hobbs 1942, 1972; Hobbs et al. 1977

**Procambarus** (*Ortmannicus*) *acutus a.* (*C.a.* Girard, 1852) Hobbs, 1967; Tierney & Atema (1986), (ME to FL, MN to TX/lentic,lotic; Tp or Tx in TX/intergrades with *P.a.c.* in swTX & n.Mexico) **Bibl.:** Allbaugh 1962; Dickson & Giesey 1981

**Procambarus** (*O.*) *acutus cuevachicae* Hobbs, 1941 (n.Mexico,TX/surface lentic, stygoxene?)

**Procambarus** (*Leonticambarus*) *alleni* (Faxon, 1884) (Tx in FL) Hobbs 1972

**Procambarus** (*O.*) *attiguus* Hobbs III & Franz, 1992 (type locality cave in \*Marion Co.,\*St. Johns R. Basin,FL/ Tb?, Pb? /Silver Glen Sprs. Cave Crayfish/FL T&E S1 global G1G2)

*Procambarus blandingii* (Harlan, 1830) = *P.(O.) acutus a.*

**Procambarus** (*Scapulicambarus*) *clarkii* (*Cambarus c.* Girard, 1852) Hobbs, 1972 (IL to TX,alien in CA, ID, NV, OR, VA, UT/ lentic, lotic, Tp or stygoxene? in TX/ red swamp crayfish) **Bibl.:** Ameyaw-Akumfi & Hazlett 1975; Lusk 1993; Mellon 1977; Penn 1943; Okada 1948; Pollard & Latimer 1977; Takahata, Masakazu & Hisada 1981

**Procambarus** (*Ortmannicus*) *delicatus* Hobbs Jr. & Franz, 1986 (type locality spring and Lake Co.,Fl/ St/ Big Cheek(ed) or Ale. Spr. Cave Crayfish/ FL T&E S1 global G1/Tb,Tm)

**Procambarus** (*O.*) *erythropros* Relyea & Sutton, 1975 (type locality cave & 4 other caves in s.Suwannee Co., in Aucilla-Suwannee hydrologic subregion, +ncFl/ Tb, Pb, Tm/ Santa Fe, Red-

eyed or Sim Sink Cave Crayfish/ Federal T&E special concern; FL Species of Special Concern S1, state listed, global G1 5 sites))

***Procambarus*** (*O.*) *fallax* (*C. f.* Hagen, 1870; *P. f.* Hobbs, 1942) Hobbs, 1972 (GA surface; burrows/ Tx, stygoxene? in FL)

***Procambarus*** (*O.*) *franzi* Hobbs & Lee, 1976 (type locality cave in n.Marion Co., St. Johns hydrologic subregion, neFL/Pb near \*Orange Lake/ Orange Lake Cave Crayfish/ Federal T&E special concern; FL T&E S1 global G1 (4 sites)/ Tb,Tm)

***Procambarus*** (*O.*) *horsti* Hobbs & Means, 1972 (type locality cave in Jefferson Co. + caves I Leon & Wakulla Cos.,\*St. Marks Fm. In Ochlockonee & Aucilla-Suwannee hydrologic subregions, ncFL/ well, spr.,Pb/ Big Blue Sprs. or Horst's Cave Crayfish/ Federal T&E special concern; FL T&E S1 global G1 or G3 (4 sites?) /Tb,Tm) **Bibl.:** Caine 1975

***Procambarus*** (*O.*) *leitheuseri* Franz & Hobbs, 1983 (type locality cave in wHernando Co. + wPasco Co., west coastal hydrologic subregion, wcFL/ Tb,Tm/ Coastal Lowland(s) cave crayfish/ FL T&E S1 global G2 or G3 (8 sites))

***Procambarus*** (*O.*) *lucifugusalachua* (*Cambarus l. a.* Hobbs, 1940; *P. l. a.* Hobbs, 1942) Hobbs, 1972 (type locality cave in wAlachua Co.)+w.Gilchrist, ne.Levy & Marion Cos., Aucilla-Suwannee hydrologic subregion, ncFL/ (Alachua) Light Fleeing Cave Crayfish/ St/ T&E special concern; G2G3 T3 (13 sites))

***Procambarus*** (*O.*) *lucifugus l.* (Hobbs, 1940) (*C. acherontis* Faxon, 1898; *C. l. l.* Hobbs, 1940; *O.l.l.*) Hobbs, 1942 (type locality cave in Citrus Co. +Hernando, Gilchrist & Marion Cos., west coastal hydrologic subregion, FL/Tb/ (Withlacoochee) light-fleeing or Florida cave crayfish/ TL T&E G2G2, S2S3)

***Procambarus*** (*O.*) *lucifugus l.* X *P. (O.) lucifugusalachua* (integrate population) (16 sites in Aucilla-Suwannee & St. Johns hydrologic subregions, neFL)

***Procambarus*** (*Leonticambarus*) *milleri* (*P.m.* Hobbs, 1971) Hobbs, 1972 (5 wells or other locations in or near Miami & Homestead, Dade Co.,FL/ Pb,Tm,Tb/ Miami or golden cave crayfish/ Federal T&E species of concern; FL T&E S1 global G1) **Bibl.:** Hobbs & Franz 1992; Franz 1994; Radice & Loftus 1995

***Procambarus*** (*L.*) *morrissi* Hobbs, III & Franz, 1991 (\*Devil's Sink,Putnam Co. in St. John's hydrologic subregion, neFL/ Tb, Tm/ Putnam Co. Crayfish/ G1S1)

***Procambarus*** (*Ortmannicus*) *orcinus* Hobbs & Means, 1972 (type locality cave in Leon Co. & 2 caes in Wakulla Co.,\*w.Woodville Karst,St Marks Fm., Ochlockonee hydrologic subregion, western FL Panhandle/ St Woodville Karst cave crayfish/ T&E special concern, G1 or G3 (15 sites)/ Tb, Tm) **Bibl.:** Caine 1975

**Procambarus** (*Scapulicambarus*) *paeninsulanus* (*C.clarki* p. Faxon, 1914; *P.c.p.* Hobbs, Jr., 1937) Hobbs, 1972 (GA epigeal/ FL Tx or stygophile?) **Bibl.:** Caine 1975

**Procambarus** (*O.*) *pallidus* (Hobbs, 1940) (*C. acherontis* Hobbs, 1937) Hobbs, 1942 (type locality cave in nw.Alachua & other caves in sw.Columbia, w.Suwannee, Gilchrist, Hamilton, Lafayette, Levy, Madison & Suwannee Cos., Aucilla-Suwannee hydrologic subregion, ncFL/ St, Tb, Tm/ Pallid Cave Crayfish/ state T&E special concern, S2S3, global G2G3 (>20 sites)) **Bibl.:** Lonnberg, 1895a; Relyea & Sutton 1973a, 1974

**Procambarus** (*Remoticambarus*) *pecki* Hobbs, 1967 (type locality cave in Colbert Co. & cave each in Morgan & Lauderdale Cos. +Lauderdale & Morgan Cos., nAL/ St/ AL Special Concern)

**Procambarus** (*Giardiella*) *simulans* (*G.s.* Faxon, 1884; *P.(G.) s.s.* Hobbs, 1972) Hobbs & Robison, 1988 (AR, CO, KS, LA, NM epigeal; stygophile in OK (Greer, Major, Murray, Washita, Woodward Cos.) & TX (Burnet Co.) **Bibl.:** Koepp 1973; Larimer, Trevino & Ashby 1966

**Procambarus** undescr.? sp. (*lucifugus* group) (\*cave in Pinellas Co.,FL/ Tb)  
*Puncticambarus nerterius* (see *Cambarus n.*)

**Procambarus** undescr.? sp. (one site in St. John's hydrologic subregion, ncFL/ "Hawthorne Cave Crayfish")

**Troglocambarus** Hobbs, 1942 - Cambaridae crayfish, Subfamily Cambarinae. **Bibl.** Bouchard 1978

**Troglocambarus** *baveri* (\*type locality cave in , Orange Co.,FL/FL T&E/Orlando Spider Cave Crayfish or Apo. Cave Crayfish) **Bibl.:** Deyrup & Franz 1994. **Bibl.:** Mike Wisenbaker -

**Troglocambarus** *maclanei* Hobbs, 1942 (type locality cave in (Alachua Co.,FL +s.Suwannee Co. sw to Pasco Co.+Citrus, Hernando, Levy, Marion Cos., Aucilla-Suwannee, St. Johns & west coastal area hydrologic subregions, nc, cFL/ Tb,sinks/ (Northern (Florida)) Spider or MacLane's Cave crayfish/ Federal T&E Special Concern Species, FL T&E,G3). **Bibl.:** D. Jackson & Muller 1984

**Troglocambarus** undescr. sp.#1 (\*cave in Pinellas Co., FL/ Tb)

**crenobiology** - The study of the biology of springs and spring brooks.

crevicular – Referring to finer cracks and crevices in bedrock or semi-consolidated sediment.

## **Crickets, Grasshoppers & Katidids**

Part of Order Orthoptera (grasshoppers, locusts) (=Saltatoptera, Saltatoria), phylum Arthropoda, subphylum Chelicerata, class Insecta, Subclass Pterygota, Division Neoptera, Subdivision Exopterygota.

Order name derived from Greek orthos and pteron, meaning “straight wings. About 15,500 species, 1222 species and 256 genera in the US and Canada.

**Bibl.:** R. Alexander & Otte; Benedict 1976d; Caccone 1988; H. Garman, 1894, 1893; Hand 1995; J. Helfer 1963; Karny 1930, 1937; Lavoie, Hoey & Poulson 1998; Nicholas 1974; Barr & Stoneburner; Hubbell 1978; Nicholas 1969; Nielermyer 1967; Park & Barr 1961; Princis 1961-7; Simms 1993; Studier & Lavoie 1990. : Blatchley 1920; Caudell 1916; Otte 1979; Packard, 1889; Ragge 1955; Rehn & Hebard 1912;: **Areas:** **AZ:** E. Ball et al. 1942; **FL:** Blatchley 1920; **HI:** Gurney & Rentz 1978; Perkins, 1899; Stone 1991a; Otte 1990; **IA:** Froeschner 1954; **IL:** Hebard 1934; **IN:** Blatchley 1920; Richards 1965-6; 1969; **KS:** Hebard 1931; **KY:** Helf 1998; Helf & Lavoie 1998; Lavoie et al.; Leja & Poulson 1985; **NA:** D. Otte 1997; **NE:** Blatchley 1920; **TN:** Matthews 1979; **US:** Scudder, 1859; Leroy 1967;. E. Walker 1922. For ice cricket, see **grylloblattid**.

5-150 mm. (most 10-50 mm, a few under 5 mm). Leathery bodied, sometimes hard, elongate and cylindrical. They are paurometabolous, with terrestrial eggs, larvae and adults. Antennae usually long. Biting mouthparts; most species are plant eaters but some are predators. The sometimes thickened front wings cover the hind wings and may have scrapers and files, spines or teeth used for making sounds. Some are wingless as adults. Front legs may have scooplke spines used in digging. Back legs are enlarged. Female ovipositor may be greatly elongated. Most larvae resemble adults except for lack of wings. Males attach a spermatophore to the female’s body. Grasshoppers hear on the first tergum of the abdomen while katydids and crickets have auditory organs on the anterior tibiae near the tibial-femoral joint.

Crickets represent an intermediate stage in the evolution of insects. They do not show the complicated development shown by a more advanced group known as Neoptera, which includes flies, beetles, ants, bees, lacewings and wasps. The first neoptera, the scorpion flies and the lacewings, first appear on earth about 260 million years in the middle Permian. Cave crickets may even show regressive evolution, a return to a moist life characteristic of the earliest insects to appear on land. Camel and cave crickets are the more primitive members of the order and hunt at night.

Suborder Caelifera (short-horned grasshoppers, grouse locusts and others)  
Superfamily Acridoidea

Acrididae - undet. genus (2,000 to 3,000 & 9,400 to 10,300 years BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM; Undet. Genus 7,530 years old in *Neotoma* woodrat nest in Butler Mts., Yuma Co, AZ)

Suborder Ensifera (=Order Grylloptera) (cave crickets, katydids and true crickets)  
Infraorder Grylloptera

Superfamily Stenopelmatoidea (=Gryllacridoidea)  
Gryllacrididae (=Subfamily Gryllacridinae) (leaf-rolling crickets)  
(*Hemiudeopsylla*, *Tachycines*) (now in Rhabdophoridae)  
**Bibl.:** Crawford 1977; Niedermayer 1967, 1974

Superfamily Rhaphidophoroidea:

Rhaphidophoridae (camel cricket family)

Subfamily Ceuthophilinae (= Tribe Ceuthophhilinii)

(*Ceuthophilus*, *Pristoceuthophilus*, *Styracosceles*)

Subfamily Dolichopodinae (= Tribe Dolichopodini) (true cave crickets)

(*Euhadenoecus*, *Hadenoecus*, *Farallonophilus*)

Subfamily Tropidischinae (stone crickets) (*Tachycines*, *Tropidischia*)

Camel crickets are wingless and have a noticeable hump-backed appearance. Their hind legs are long and they are excellent jumpers (as they would have to be, without wings to depend on!). They have long antennae sometimes up to six inches long. They are called cave crickets because they are often found in dark and damp locations, and are common in caves. In fact, there are eyeless cave crickets known only from the depths of some caves in North America. They spend their entire life in darkness—depending on their long antennae and sense of smell to get about and feed. Cave or camel crickets feed on decaying organic matter, and prefer damp and dark locations. Camel Crickets are commonly parasitized by Horse-hair Worms (Nematomorpha )

Infraorder Tettigoniidea

Superfamily Tettigonioidea (= Prothalangopsoidea)

(katydid, bush crickets) & long-horned grasshoppers) **Bibl.:** D. Otte (in prep.)

Tettigoniidae (long-horned grasshoppers; katydids)

Subfamily Tettigoniinae (shield-backed katydids) (*Algothorax*, *Pediocetes*)

Haglidae (hump-winged crickets; primitive katydids)

(= Prothalangopsidae) (*Cyphoderris*)

Order Saltatoria or Infraorder Gryllidea

Superfamily Gryllotalpoidea (= Grylloidea) **Bibl.:** D. Otte 1994

Gryllidae (=Achetidae) (mole (& ant) crickets)

Subfamily Gryllinae (field and house crickets) (*Gryllus*, *Cycloptiloides*)

Subfamily Nemobiinae (ground crickets)

Thetellini (*Caconemobius*)

Subfamily Oecanthinae (=Eneopterinae)? (white tree, bush or tree crickets)

(*Oecanthus*) Forms complex of species largely differentiated by mating calls

Tribe Xabini (*Thaumatogryllus*)

*Aglaothorax* Caudell, 1907 - Tettigoniidae crickets, Subfamily Tettigoniinae (7 species in US or Canada)

*Aglaothorax* *ovatus* (*Tropizaspis o.* Scudder, 1899) (Tx or Ac in Tuolumne Co.,CA)

*Caconemobius* Kerby, 1906 - Gryllidae crickets, Subfamily Nemobiinae, Tribe Thetellini

*Caconemobius* *albus* Otte, 1994 (\*type locality cave in Big Island, HI/Tx?)

*Caconemobius* *fori* A.B.Gurney & D.C. Rentz D. C., 1978 (Tx in lava tubes, HI)

*Caconemobius* *sandwichensis* Otte, 1994 (Ac or Ttx in lava tube coast caves, HI)

*Caconemobius* *schauinslandi* (*Paranemobius s.* Alfken, 1901) Kirby, 1906 (Schauinsland's bush cricket) (type locality uncertain, Molakai, HI/ Schauinsland's bush cricket/ federal Species of Concern/ Tb?)

*Caconemobius* *howarthi* Gurney & Rentz, 1978 (type locality & 1 other cave in Maui, HI/ Howarth's cave cricket; blind cricket Tb/ HI & federal Species of Concern (C2), S1S2, global G1G3 rank)

*Caconemobius* undescr. sp. (HI/Tb) **Bibl.:** Stone 1991a

*Caconemobius* *paralbus* Otte, 1994 (\*type locality cave in Big Island, HI/Tx?)

*Caconemobius* *uuku* Otte, 1994 (Kazumura & one other cave in Big Island, HI/Tx?/ G1?)

*Caconemobius* *varius* Gurney & Rentz, 1978 (Kaumana cave cricket/ type locality & other nearby cave, & caves at 300-1200 m. elevation on Mauna Loa & Kilauea, HI Volcanoes Natl. Park + Kazumura C. & nearby cave /Tb/HI & federal Species of Concern, S1S2, global G1G3 rank) **Bibl.:** Stone 1991a; Stone & Howarth 1991

*Ceuthophilus* Scudder, 1862 (= *Rhaphidophora*, *Ceuthophilus*) Rhaphidophoridae crickets, Subfamily Ceuthophilinae, Tribe Ceuthophilini. (89 species in US or Canada) **Bibl.:** Crampton 1923; Hubbell 1934; Leja & Poulson 1985; Northrup, Hardy & Ingham 1991; Robaux, et al. 1976, 1977

Mating may be helped by a chemical substance on the female antennae and by the setae on the cerci of the male touching the female abdomen. The males of some species touch the females with their antennae as a preliminary to copulation. After this exchange, males turn around and waggle their posteriors at the female. If she is receptive she will turn around, and presumably by feeling with his cerci, the male fuses to the female after turning his abdomen over 180 degrees. The matings observed last approximately 3-5 minutes. Transfer of sperm is by means of a spermatophore, a glutinous ball of sperm (Northrup, 1988). Where crickets deep in the cave get their food is still somewhat puzzling. Cricket remains occur in cricket stomachs but this can only account for part of the food supply. Bacteria such as actinomycetes may consume organic material in rainwater entering the cave. Bacteria on sand grains may in turn become food for the crickets.

*Ceuthophilus* (*Geotettix*) *alpinus* Scudder, 1894 (= *C. Vinculatus* S., 1894) (BC to NB,IA, s. to CO/ TTx in SD)

*Ceuthophilus californianus* = *Hemiudeopsylla c.*

*Ceuthophilus* *baboquivariae* Hubbell, 1936 (epigeal & Tx in Baboquivari Mts, AZ)



**Ceuthophilus brevipes** Scudder, 1862 (= *C. terrestris* S., 1891)(forests from Ontario to Newfoundland, s. to VA, w. to MI/ short-legged camel cricket/ Tx in IN (Crawford, Harrison, Monroe, WA Cos.(S2/G4)), KY, NS, OH, VA, seON)

**Ceuthophilus (Geotettix) carlsbadensis** Caudell, 1924 (Carlsbad C./seNM +adjacent TX to Fort Davis) . **Bibl.:** Bouley 1928; Northup 1991; N., Lavoie, & Studier 1991; Northup & Kuper 1987, Northup, Hardy & Ingham 1989

**Ceuthophilus chiricahuae** Hubbell, 1936 (Chiricahua & Graham Mts.,AZ epigeal/ Tx in C. Mts.,AZ)

**Ceuthophilus conicaudus** H., 1936 (Carlsbad C.(NM)/epigeal in wOK,Edwards Plateau & trans-Pecos; TX/ Tx in nwTX, wTX, seNM) **Bibl.:** Northup, Lavoie et al.1991 Northup 1991; Northup & Kuper 1987; Northup, Hardy & Ingham 1989,

**Ceuthophilus conicaudatus** H., 1936 (Tx in seNM,OK,wTX) **Bibl.:** Campbell 1976, 1976a; Northup 1991; Northup & Kuper 1987

**Ceuthophilus (Geotettix) cunicularis** H.1936 (scTX epigeal/ Tx in TX (Kimble & San Saba Cos.)) **Bibl.:** Elliott 1997

**Ceuthophilus divergens** Scudder, 1862 (*C. bicolor*, *caecus*, *sallei* S., 1894) (MS Valley, AL, GA, n.to MI/ Tx in Mammoth C. (KY), MN?)

**Ceuthophilus elegans** Hubbell, 1934 (IA, IN, WI epigeal/ Tx in IL,MO)

**Ceuthophilus ensifer e.** (*C. e.* Packard, 1881; *C. saxicola* Hubbell, 1936 (now a subspecies)) (Nickajack C.,Marion Co.(s.Cumberland Plateau & Sequatchie Valley,TN) +nGA/ Tx, talus, cliffs)

**Ceuthophilus ensifer** n. ssp. *ap* Hubbell MS (Tx in AL,GA,TN)

**Ceuthophilus ensifer saxicola** Hubbell, 1936 (Cumberland Plateau, nTN/ Tx in cave each in Cumberland, Marion, Warren, Grundy Cos. & poss. cave in Fentress Co.),TN)

**Ceuthophilus gracilipes g.** (*Phalangopsis g.* Haldeman, 1850 & *scabripes* H.1853; *C. grandis* & *heros* Scudder, 1894) S.1863 (New England to sIL & Ozarks, s. n Appalachians & central lowlands to wFL/ Tx in AL, AR, FL, GA (Walker Co.), IL, KY (1 cave), MA, MD, MO, MS, NJ, OH, ON, OK, PA, TN, VA, WV). **Bibl.:** Cockley, Gooch & Weston 1977; Hubbell 1936

**Ceuthophilus gracilipes apalachicola** Hubbell, 1936 (nFL incl. Alachua Co./Tx)

**Ceuthophilus guttulatus** Walker, 1869 (*C. nigricans* Scudder, 1894; *C. thomasi* Hubbell, 1936; *C. angulosus* Eades, 1962)

*Ceuthophilus guttulatus* g. Hubbell, 1936 (Tx in NS)

*Ceuthophilus guttulatus nigricans* (*C.n.* Scudder, 1894) (New England to VA, w.across Alleghenies to IN,KY/Tx in IL)

*Ceuthophilus* cf. *hebardei* Hubbell, 1936 (Tx in cave in Inyo Co.,CA/ *C.h.* in Salt Lake region, UT to sNV) (see undescr. sp.)

*Ceuthophilus inyo* Hubbell, 1936 (Tx in CA,NW)

*Ceuthophilus* cf. *inyo* (Tx or Ac in Mariposa & Santa Cruz Cos.,CA)

/

*Ceuthophilus isletae* Hubbell, 1936 (NM/Tx in TX)

*Ceuthophilus latens* Scudder, 1862 (epigean in NE to IO, IN, MI, MN, TN, VA/ Black-sided camel cricket/ Tx in AL, IL, IN, KY, OH, TN) **Bibl.:** C. Turner 1915

*Ceuthophilus latibuli* Scudder, 1894 (epigean,Tx in Fl (n.& c.peninsular) & sGA)

*Ceuthophilus longipes* Caudell, 1924 (Carlsbad (NM) caves/Tx). **Bibl.:** Northup 1991; N. L.& S. 1991, Northup, Hardy & Ingham 1989; Northup & Kuper 1987

*Ceuthophilus maculatus* (*Rapidophora m.* Harris, 1841; *C.latebricola* & *bicolor* Scudder; *Machamala armata*, *C. scriptus* Walker, 1869) S.1862 (epigean in prairie region (incl. IA, Manitoba, eNM, SD, s.along MS bluffs to AR), e. north of OH R. to e.Canada & neUS/ spotted camel cricket/ Tx in IN, KS, MA, MN, NY, PQ, VA)

*Ceuthophilus meridionalis* Scudder, 1894 (MI to sON, e.to OH, NY, ePA, s.to OH River, sIN/ striped camel cricket/ Tx in IN (Crawford, Harrison, Orange, WA Cos.(S3/G4)), OH)

*Ceuthophilus mescalero* Hubbell, 1936 (epigean & Tx or Tp? in White Mts., Lincoln Co.,NM)

*Ceuthophilus nigricans* = *C.guttulosus n.*

*Ceuthophilus nitens* Hubbell, 1936 (Tx in Hickman, Perry & Wayne Cos.,TN)

*Ceuthophilus oregonensis* = *Styracosceles o.*

*Ceuthophilus ozarkensis* H., 1936 (epigean in AR, MO, OK, Ozark Highlands/ Tx in MO?)

*Ceuthophilus pallescens* Bruner, 1891 (epigean from Alberta to Manitoba s.to neCO, MT, wNB, ND, Sask., WY) Tx? in well, NB)

*Ceuthophilus pallidipes* E.M. Walker, 1905 (ON & Great Lakes to ME & ePA, s. in Appalachians to GA/ pale-legged camel cricket/ Tx in KY, OH, VA)

*Ceuthophilus* (*C.*) *pallidus* Thomas, 1872 (= *C. bruneri*, *discolor*, *inquinatus* Scudder, 1894; *C. tuckeri* Rehn, 1907) (epigean from Great Plains (IA,NB,W, Sask. & Manitoba), s. to NM,TX, W except CA, OR, WA/ Tx in NM, KS, KY(Barren, Edmonson, Rockcastle Cos.), OK, TX)

*Ceuthophilus palmeri* Scudder, 1894 (Tx in 2 caves in Hays Co. & cave in Williamson Co.,TX)

*Ceuthophilus papago* Hubbell, 1936 (Tx in Huechuca Mts., AZ)

*Ceuthophilus paucispinosus* Rehn, 1905 (NM/Tx in Huachuca, Santa Rita & Catalina Mts.,sAZ)

*Ceuthophilus perplexus* Hubbell, 1936 (Tx & epigean in Williamete Valley,wOR/G1S2 OR T&E tracked)

*Ceuthophilus pima* Hubbell, 1936 (Santa Rita, Whetstone & Catalina Mts, AZ/(new poss. ssp. Tx in Kartchner C., AZ)

*Ceuthophilus pinalensis* Hubbell, 1936 (epigean & Tx in mine in Pinal Mts, Gila Co.,AZ)

*Ceuthophilus rehni* Hubbell, 1936 (mts. of trans-Pecos TX/Tx? in wTX)

*Ceuthophilus seclusus* Scudder, 1894 (Tx in AR, IL, MO, OK/ Ep (IN to IA, s. to AR,OK, w. to KS, NB)

*Ceuthophilus secretus* Scudder, 1894 (Ep, Tx in TX) **Bibl.:** Elliott 1997

*Ceuthophilus* (*Geotettix*) *silvestris* Bruner, 1885 (= *C. marshallii* Caudell 1926) (epigean in MN to MI, s. to AR,KS/ woodland came cricket/ Tx in AR, MO, OH)

*Ceuthophilus sloanii* = *C. stygius*

*Ceuthophilus* undescr. sp.#1 (Tx/cTX) **Bibl.:** Shasy & Biesele 1968

*Ceuthophilus* "undescr." sp.#2 (*ph*) MS Hubbell (sides of TN R.,Marshall Co.,AL/Tx)

*Ceuthophilus* undescr sp.#3 (*di*) MS Hubble (nAL/Tx)

*Ceuthophilus* undescr. sp.#4 (cave in Terrell Co., +other parts of Balcones Fault Zone, cTX/ Tx)

*Ceuthophilus* undescr sp.#5 (\*?cave in Pima Co.,AZ/ closely allied with *C. pinalensis*)

*Ceuthophilus* undescr sp.#6 or #6-7 (cave (cf. *C. hebardii*?) & cave (cf. *C.utahensis*) in Inyo Co.,CA/Tp or Tx) **Bibl.:** Ubick & B.1992

*Ceuthophilus* undescr sp.#8 (\*?cave in Utah Co., UT)

*Ceuthophilus* undet. sp. or species (Tx (cf. *apache* H.) in TX; Tx in NC (Blount Co.) & NS (one cave); Ttx or Ac in AZ; Tx in 1 OK cave)

*Ceuthophilus stygius* (*R. stygia* Scudder, 1859; *C. sloani* Packard, 1873) (type locality cave in Barren Co., KY/Tx in AL, KY (Barren, Edmonson (Mammoth C.), Rockcastle Cos.), IN (Crawford, Harrison, Orange, WA Cos.(S4/G4)), MI, MO, OH,TN/ caves & talus from s.Oh & sIN to cKY & n.Cumberland Plateau & Highland Rim in nTN)

**Bibl.:** Poulson & Lavoie 1990; Poulson, Lavoie & Chandler 1990; Studier & Lavoie 1990, 1990a, 1991a; S., L.& Chandler 1991 Studier, Lavoie, Wares & Linn 1987, 1988a; Studier, Wares, Lavoie & Linn 1987; Studier et al. 1991; Gerace 1994

*Ceuthophilus tenebrarum* Scudder, 1894 (epigean in sOH, sIN?, NC/ Tx in nMS & cave in, KY)

*Ceuthophilus uhleri* Scudder, 1862 (= *C. blatchleyi* Scudder, 1894; *C. latusulcus* Blatchley, 1894) (MI ,ON, s. of nIL, OH, sNY to MS, FL/ Ttx in MO) **Bibl.:** Hubbell 1963

*Ceuthophilus umbratilis* Hubbell, 1936 (epigean in sOK, nTX/ Tx in MO, nOK)

*Ceuthophilus utahensis* Thomas, 1876 (*C. uniformis* & *valgus* Scudder, 1894) (epigean in Rockies (nAZ,CO,sID,NM,eUT) to wOK & transPecos TX/ Tx in CO, nwOK (Murray Co.), nNM (El Malapis Natl. Monument) & UT) **Bibl.:** Simon 1973

*Ceuthophilus* cf. *utahensis* (see undescr. sp.#4-5)

*Ceuthophilus variegatus* Scudder, 1894 (*C. mexicanus*, *pinguis* S.1894)(Tx in TX)

*Ceuthophilus virgatipes* Rehn, 1904 (epigean in nFL(e. of Apalachicola R.),sGA/Tx or Ac in nFL)

*Ceuthophilus wasatchensis* Hubbell, 1936 (Tx & epigean in Wasatch Mts, UT)

*Ceuthophilus wichitaensis* Hubbell, 1936 (epigean in Wichita Mts,OK/Tx in mines)

*Ceuthophilus williamsoni* Hubbell, 1934 (Onondaga C.,MO/epigean in Prairie & Ozarks, n. to IA, e. to sIL/ common Tx in AR, IL, IA, MI, MN, MO, OH, OK, ON),

*Ceuthophilus yavapai* Hubbell, 1936 (epigean in sCO Plateau, AZ/ Tx in Coconino Co., AZ)

*Cycloptiloides* Sjoestedt, 1909 - Gryllidae crickets, Subfamily Gryllinae (16 species in US or Canada)

*Cycloptiloides americanus* (Saussure, 1870) (alien & Tx or Ac in HI (one cave))

*Cyphoderris* Uhler, 1864 - Haglidae katydids (2 species in US or Canada)

*Cyphoderris monstrosus* Uhler, 1864 (WA to OR/Tx or Ac in WA)

*Euhadenoecus* Hubbell, 1978 - Rhaphidophoridae crickets, Subfamily Dolichopodinae (3 species in US or Canada). **Bibl.:** Caccone & Sbordoni 1987; Lamb & Willey 1987

*Euhadenoecus adelphus* Hubbell, 1978 (sAppalachians & rocky epigean incl. neGA,swNC,eTN/ Tx in NC (Henderson, Macon Cos.))

*Euhadenoecus barri* = *Hadenoecus b.*

*Euhadenoecus cumberlandicus* = *Hadenoecus c.*

*Euhadenoecus fragilis* Hubbell & Norton, 1978 (type locality cave in Giles Co.) + Bath, Lee Cos., VA; neTN (Claiborne & Hancock Cos.) + eKY (5cos.) & seWV (Greenbrier Co.)/Tx, no epigeans)

*Euhadenoecus insolitus, jonesi, opilionides, puteanus, subterraneus* = *Hadenoecus i., j., o., p., s.*  
*Euhadenoecus utahensis* = *Ceuthophilus u.*,

*Farallonophilus* Rentz, 1972 - Raphidophoridae crickets, Subfamily Dolichopodinae (1 species in US)

*Farallonophilus cavernicolus* R., 1972 (sea cave, Farallon Islands, San Francisco Co., CA/Tp/one site under a rock near cave) **Bibl.:** Steiner 1989

*Gryllus* Linnaeus, 1758 (*Homaloblemmus* Saussure, 1877; *Lenigryllus* Chopard, 1961) Gryllidae crickets (16 species in US or Canada)

*Gryllus assimilis* (*Acheta a.* Fabricius, 1775; *G. aztecus* Saussure, 1859; *G. neglectus* Scudder, 1862; *G. pallida* S., 1897; *G. collocatus* Walker, 1869) (Central Amer. to TX epigean/ field cricket/ Ac in cave in Hays Co., TX)

*Gryllus* undet. sp. or species (Tx in Calaveras & Tuolumne Cos., CA; Ac in Bexar & Culberson Cos., TX)

*Hadenoecus* Scudder, 1862 (= *Euhadenoecus* in part) Raphidophoridae crickets, Subfamily Dolichopodinae (6 species in US or Canada) **Bibl.:** Caccone & Sbordoni 1987; Lamb & Willey 1987

*Hadenoecus barri* Hubbell & Norton, 1978 (*E.c.*) (Tx in Warren, Franklin, Grundy & Marion Cos., cTN)

*Hadenoecus cumberlandicus* Hubbell & Norton, 1978 (*E.c.*) (Milk C., Wayne Co., eKY/Tx in 13 cos., KY). **Bibl.:** Caccone 1985; Hubbell & Norton 1978; Norton 1978

*Hadenoecus insolitus* Hubbell & Norton, 1978 (type locality cave in Jefferson Co. (AL) + caves in scKY, cTN (Macon, D3Kalb, Sumner Cos./ Tx) **Bibl.:** Lamb & Willey 1986, 1989

*Hadenoecus jonesi* Hubbell & Norton, 1978 (type locality cave in Jackson Co., AL) + Madison & Marshall Cos., neAL, + Franklin, Lincoln & Marion Cos., sTN/Tx) **Bibl.:** Cooper & C. 1978

*Hadenoecus opilionides* Hubbell & Norton, 1978 (cave in Buffalo Cove (Fentress Co.) + Clay, Fentress, Overton, Pickett, Putnam, Van Buren & White Cos., ncTN/Tx)

*Hadenoecus opilionides* ssp. *australis* Hubbell & Norton, 1978 (type locality cave in White Co. (\*w. edge of Cumberland Plateau & Highland Rim in n&cTN)/Tx)

*Hadenoecus opilionides* ssp. *o.* Hubbell & Norton, 1978 (Tx in TN)

**Hadenoecus puteanus** (= *Raphidophora p.* Scudder, 1877) Hubbell & Norton, 1978 (epigeal in eastern Appalachian & Interior Lowland Plateau), sLA, sGA/ Tx (mostly Ttx) in neAL, nGA (Walker, Dae & Polk Cos.), eKY (Carter, McCreary, Rockcastle, Russell, Wayne Cos.), neLA, wMD, wNC, NJ, w, sNY, seOH (Hocking Co.), PA (Fayette, Meigs, Centre Cos.), eTN, wVA, WV (Grant, Pendleton Cos.) Caccone 1985,

**Hadenoecus** undet. sp. (Tp? in VA, WV; Tx in NC (Blount Co.),

**Hadenoecus subterraneus** (*Raphidophora s.* Scudder, 1861) (type locality in Mammoth Cave, Edmonson Co.+ caves and epigeal in \*?Pennyroyal Plateau, scKY (Simpson, Warren, Hart, Bulter, Barren, Logan Cos.)) +AR? & MI?/ HTx)

**Bibl:** Barr 1967; Barr & Kuehne 1971; Caccone 1985; Call 1897; Cyr 1989; Cyr et al. 1991; DeLong 1989; Downing 1989; Downing & Kurt 1989; Griffith 1988-a; Helf & Lavoie 1996; Helf, Poulson & Lavoie 1996; Hellman 1989; Hubbell & Norton 1978; Husson 1964a; Kane 1981; Lamb 1973; Lavoie et al 1988; Lavoie, Cyr et al. 1991; Lavoie, Phillipotts, et al. 1991; Lavoie, Studier & Cyr 1990; Lavoie, Studier, Edwards & Apgar 1985; Lavoie, Studier & Kennedy 1988; Leja & Poulson 1985; Levy 1976, 1977, 1981a; Norton 1984; Studier, Lavoie, Wares & Linn 1986; Levy 1976, 1981; Mason 1989; Neilson 1989; Nicholas 1962, 1974; N. & Reichle 1963, 1964; Norton 1978; N., Kane & Poulson 1975; Park 1964; P. & Reichle 1963; Phillipotts 1989; Poulson & Lavoie 1990; Poulson, Lavoie & Chandler 1990; Poulson, Lavoie & Helf 1995; Reichle 1963; R., Palmer & Park 1965; Simon 1973; Studier & Lavoie 1988b, 1990, 1990a-b, 1991a; Studier, Lavoie & Linn 1985; Studier 1996; Studier, Lavoie, Nevin & McMillin 1988-a; Studier, Lavoie, Wares & Linn 1986, 1987, 1987a, 1988a; Studier et al. 1988, 1988a, 1988b; W. Thompson 1844; Tucker 1963; White 1989; Wildfang 1989; Lavoie, King & Simonovic 1985; Lavoie, Studier & Kennedy 1988; Mason, Studier & Lavoie 1988; Nicholas 1964; A. Palmer 1980; O. Park & Barr 1960; O. Park & Reichle 1964; Riley, 1884

**Hemiudeopsylla** Saussure, 1897 - Rhaphidophoridae crickets (7 species in US or Canada).

**Hemiudeopsylla californianus** (*Ceuthophilus c.* Scudder, 1862; *C. castaneus* Thomas, 1872; *C. denticulatus* S., 1896) (epigeal from BC to CA, UT, AZ/ TTx in CA, OR)

**Oecanthus** Serville, 1831 (= *Acanthus* Brulle, 1835; *Gryllomyia* Seidl, 1837) (tree crickets) Gryllidae crickets (14 species in US or Canada)

**Oecanthus exclamationis** Davis, 1907 (ON to FL/ Ac in OH)

**Pediectes** Rehn & Hebard, 1916 - Tettigoniidae crickets, Subfamily Tettigoniinae (7 species in US or Canada)

**Pediectes stevensonii** (*Anbrus s.* Thomas, 1870) (Ac in cave in Hays Co., TX)

*Raphidophora* = See *Hadenoecus*

**Pristoceuthophilus** Rehn, 1903 - Rhaphidophoridae crickets, Subfamily Ceuthophilinae, Tribe Ceuthopilini.(12 species in US or Canada)

**Pristoceuthophilus** *gaigei* Hubbell, 1925 (epigean in BC/ Tx in WA)

**Pristoceuthophilus** *celatus* (*Ceuthophilus c.* Scudder, 1894; *C. henshawi* S.1891; *Hemiudeopsylla californiana* Saussure, 1897)) (epigean from BC, AB s. to OR/Tx in OR, WA)

**Pristoceuthophilus** *cercalis* Caudell, 1916 (Tx in WA)

**Pristoceuthophilus** *pacificus* (*Ceuthophilus p.* Thomas, 1872) Caudell, 1916 (BC s. to NV,CA/Tx in BC, CA, WA)

**Pristoceuthophilus** undescr. sp. #1 (\*?cave in Plumas Co.,CA/Tx)

**Pristoceuthophilus** undescr. sp. #2 (\*?cave in Tulare Co.,CA/Tx)

**Pristoceuthophilus** undescr. sp. #3 (\*?cave in Plumas Co.,CA/prob. Tp)

**Pristoceuthophilus** undescr. sp. #4 (\*?cave in Plumas Co.,CA/prob. Tp)

**Pristoceuthophilus** undet. sp. or species (Tx in Skamania Co., WA & OR C.,OR)

**Styracosceles** Hubbell, 1936 - Rhaphidophoridae crickets, Subfamily Ceuthophilinae, Tribe Ceuthopilini.(4 species in US or Canada)

**Styracosceles** *oregonensis* (= *Phryxocnemis o.* Caudells, 1916; *Ceuthophilus o.*) Tx in OR C.,OR)

**Tachycines** Adelung, 1902 - Rhaphidophoridae crickets, Subfamily Tropidischinae (1 species in US or Canada)

**Tachycines** *asynamorous* Adelung, 1903 (MW, MI to NE, Europe/ greenhouse came cricket/ alien Tx in IL, IN (Harrison, Co.(SE/G5), OH)

**Thaumatogryllus** Perkins, 1899 (common name: thaumat)- Gryllidae crickets, Subfamily Oecanthinae Tribe Xabini (Common name: xabine(s)) (also put in Subfamily Eneopterinae)

**Thaumatogryllus** *cavicola* Gurney & Rentz, 1978 (type locality cave & Thurston Lava Tube, Volcanoes Natl.Park & 2 other caves; intervening caves between HI Volcanoes & Kealakekua Ranch/ Tb/HI & federal Species of Concern, S1S2, global G3 rank/ volcanoes cave cricket)

**Thaumatogryllus** undescr. sp. (\*cave in HA/Tb)

**Tropidischia** Scudder, 1869 - Rhaphidophoridae crickets, Subfamily Tropidischinae (1 species in US or Canada)

***Tropidischia xanthostoma*** (*Rhaphidophora x.* Scudder, 1861) (BC to CA epigeal, especially coastal/ yellow camel cricket/Tx in BC, OR C.(OR) & Mt.St. Helens area, Skamania Co., WA; Tp or Tx in Trinity, Santa Cruz & Tulare Cos. (CA)) **Bibl.:** Fulton 1928

## **Crinoids** (sea lilies & feather stars)

Class Crinoidea of the Phylum Echinodermata - Fossils in Bilbo Baggins C.(GA) & *Agassizocrinus coniens* in Mississippian wallrock in Russell C., AL. **Bibl.:** Keeler 1983. Oral side upwards like an upside-down starfish (but gutcoils back on itself and anus also is upwards) and the side opposite the mouth attached to the sea bottom by a stalk (lost in feather stars and some sea lilies). Feather stars walk on the tip of their arms or by moving arms alternately during swimming. About 625 living species.

***Edriocrinus*** Hall, 1859

***Edriocrinus sacculus*** (extinct Paleozoic fossil in Paxton C., VA)

**crocodylid** - Irvingtonian fossil in Cumberland C., MD.

**Crustacea** - The only class of the subphylum Branchiata. Arthropods with two pairs of antennae and 3 pairs of mouth appendages (chewing mouthparts in primitive forms). <1mm to 60 cm. Head, thorax and abdomen (or pleon). Head fused, nonsegmented with presegmental region (acron). Usually 1 or more thoracic segments included in the head, which then is a cephalothorax). Rear of the abdomen is a telson, which may have jointed appendages or caudal rami (furca). Most have a shell or carapace. Breathing by gills. About 32,000 species. Mostly marine, but incl. **amphipods, branchiopods, cephalocarida, copepods, decapod (shrimp, crabs, crayfish), isopods, mystacocarids, ostracods, remipedia, & syncarid.** KY: Cole 1959; TX: Elliot 1971; Elliott & Mitchell 1973; US: Underwood, 1886

**cryophilic** - Adjective applied to a **type** of organism which is adapted to cold conditions, is unable to tolerate warm conditions, & which therefore actively seeks out a cool microclimate. See temperature.

**cryptobiont** - Species living beneath stones, rotten logs, tree bark, caves, etc. Incl. cryptozoa.

cryptobiosis - A latent or dormant state in which metabolism has slowed down but can be reversed. Syn.: anabiosis, abiosis.

**cryptococcosis** - **Fungus hazard** contacted by breathing spores in the dirt. Symptoms resemble those of **blastomycosis**. Pulmonary infection is common. See microbe.

**cryptozoa** - 1. Epedaphic litter & soil invertebrates visible to the unaided eye and which live in daylight concealed beneath stones, bark or in the soil. 2. Syn: animal cryptobiont.

culture of microorganisms - Microbes grown or maintained in a nutrient medium.

**Cumacean** - See **Syncarids**



An order of marine malacostracan crustaceans, superorder Syncarida

**current - LIFE** presently living in caves. Incl. **fungi, macroinvertebrate, microbe, plant,** population, **substrate** , type, & **vertebrate**.

**cyanobacteria** - See bacteria. Non-nucleated, single cell bacteria species of Phylum. The most common green or black **microbe** near lights. Syn: blue-green **algae**. Some species can synthesize their pigments without light. Various Chroococceae help form moonmilk & tufa.

cyobionts - Species who live in or on snow or ice. Mostly dinoflagellates, green algae, and bacteria.

cytology - The study of relationships of a cell with its intraspecies environment.

**cytology** - The study of cells. Bibl.: Veshima 1968

cytostatic agents - Substances that inhibit the growth of cells.

daily energy budget (DEB) - Amount of energy assimilated or expended daily to sustain free-living existence.

**danselfly & darner** - See Odonata.

dark zone – Part of cave in perpetual darkness.

**Decapoda** - Order of crustaceans of Class Malacostraca. About 8,650 known species, about 33% of all known crustaceans. Incl. **crab, crayfish, lobster, & shrimp**.

**decomposer - Chemoorganotroph**, usually a microbe, that breaks down organic matter. Generally syn.: microconsumer. See guano.

deep (zone) cave environment – Part of cave with a constant temperature within a timespan of years and humidity close to or at 100%. Many troglomorphs are restricted to this zone and/or associated crevices.

**deer** - See **mammal, ungulate** .

**degenerate** - Form or life stages that have been reduced in size or duration during evolution.

delayed development - A condition where the blastocyst implants without delay after entering the uterus but subsequent embryonic development ceases temporarily or proceeds slowly.

delayed implantation - A condition where the blastocyst remains in the uterine lumen for a variable period before it implants.

delayed ovulation - A condition in which ovulation is postponed for a period of time following copulation and where spermatozoa are stored in the female reproductive tract. In temperate regions this period is prolonged by hibernation. Syn. delayed fertilization.

**deme** - A local randomly breeding population.

**demic** - Pertaining to demes. A suffix may indicate a cause, such as topodemic referring to one isolated by topography.

**demography** - See population & biogeography

**denitrification** - Change of nitrate or nitrite to gases, mainly nitrogen or nitrous oxide.

**depigmentation** - Loss of coloured pigment from the body surface due to genetic change.

**dermatophytes** - Fungi which can cause skin lesions ('ringworm' type) in man & bats. Ten species found in U.S. bat guano caves but not yet reported as hazard.

**detritivore** - Species which feeds on detritus (decaying organics): the dead bodies & waste products of animals, & the dead tissues of plants. Incl. coprophage (guanobia) & scavenger.  
**Bibl.:** A. Brown; & Schram 1982

**Deuterostomia** – One of the two clades of Bilateria animals. All animal embryos form a hollow gastrula with an indentation (blastophore) that sometimes becomes the mouth in Protostomia but never in Deuterostomia. Includes Pterobranchia, Echinodermata, Enteropneusta (acorn worms) and chordates.

deutonymph - The second nymphal instar and the only active, free-living nymphal instar in the life cycle of a water mite.

**diapause** - Genetically determined period of greatly decreased metabolism and development in the life cycle of some insects. May be critical for normal development. **Bibl.:** Kambysellis & Heed 1974

Diatoms – See algae

dichopatric - Referring to two populations or species that are separated geographically such that gene flow does not occur.

Dicondylia - Subclass of Insecta that includes Infraclass Thysanura and Infraclass Pterygota (most insects). The other subclass of Insecta is Archaeognatha.

Dictyoptera - A Subdivision of Division Neoptera of Class Insecta. Incl. Orders Blattodea (cockroaches), Isoptera (termites) and Mantodea (mantids)

**dimorphic** - Adj. for morphologic differences between groups within a species, as in sexual differences.

**dinoflagellates** - Of order Dinoflagellida. Heterotrophic **protozoans (diatoms)** closely related to brown algae & diatoms.

**diplopod** - See millipede.

## Diplurans

Order Diplura, (from *diplo*, two or double, and *ura*, tail) of Superclass Hexapoda, Class Entognatha (= Entotrophi) (from *ento*, within and *trophi*, food, in reference to the mouthparts) Wingless, ectognathus apterygote **hexapod** or (less often) insect of Class Elliplura, with bristlelike posterior cerci or forceps (2 in entotrophs, 3 in bristletails). Viewed by a few authors as an order of the Class Insecta.

Diplurans are small (2-50 mm, usually less than 10 mm), eyeless arthropods considered to be among the most primitive of all hexapods. They are soft-bodied shape elongate, slender, slightly fattened, without scales. Pale brown, with the end of the abdomen of some species darkened. Head large; antennae longer than the head and stout, with an indefinite number of segments. Eyeless. They have a pair of long, beaded antennae on the head and a pair of segmented sensory structures (cerci) that protrude like tails at the rear. In one common family (Japygidae), these cerci are developed into strong pincers. The cerci (tails) of some diplurans are designed to break off near the base if they are mishandled. This spontaneous autotomy is probably an adaptation for avoiding predation.

Diplura are tiny, cryptozoic animals that live in moist soil, leaf litter, or humus. About 659 described species are widely distributed throughout the world. Only about 64 species in 19 genera have been found in the U.S. and Canada. They have small, eversible vesicles on the ventral side of most abdominal segments that seem to help regulate the body's water balance, perhaps by absorbing moisture from the environment.

Most Diplura are predators; their diet probably includes a wide variety of other soil-dwellers, including collembola, mites, symphyla, insect larvae, and even other diplurans. They may also survive on vegetable debris and fungal mycelia, but most species seem to prefer animal prey.

Diplurans are common inhabitants of forest leaf litter. They are part of the community of decomposers that help break down and recycle organic nutrients. A few species are reported as minor economic pests in gardens.

The sexes are separate and fertilization is external. Like springtails, males produce sperm packets (spermatophores) and glue them to the substrate on the end of little stalks. Females use their genital opening to gather spermatophores and then lay their eggs on little stalks inside a crevice or small cavity in the ground.

Male Diplura produce large numbers of spermatophores — up to 200 per week. This large number is probably necessary because sperm only remain viable in the spermatophore for about two days. Diplura and some walkingsticks (Phasmatodea) are the only terrestrial arthropods known to be able to regenerate lost body parts. Legs, antennae, and cerci can be regenerated over the course of several molts. Some crustaceans (e.g. crabs and lobsters) can also regenerate missing legs or claws. The oldest fossil considered as Archaeognatha is from the Devonian (390 million years old) from Gaspé, Québec (Labandeira et al., 1988). However, there is little evidence

that this fossil is a member of Archaeognatha; it may instead be a member of the stem-group of insects or of stem-Dicondylia.

**Bibl.:** Ferguson 1990; Pacit 1957; **Areas: Appalachia:** Conde' 1949, 1956.1973; Hoffman 1969; **CA:** Conde' & Thomas, 1957; Pages, 1964; **IN:** Chandler 1956; **KY:** Packard, 1886; Pages, 1964; **NV:** Ferguson 1995-6; **SE:** Conde 1955; North America: Reddell 1983; **TX:** Muegge 1992; **VA:** Ferguson 1974, 1981, 1981a, 1997, 1999; **West:** Ferguson 1992; **World:** Baret 1994; Botosaneanu 1986; Palct 1957; Remington 1954

Suborder Dicellurata (= Japygoidea)

Superfamily Campodeoidea

Campodeidae (slender entotrophs or diplurans)) **Bibl.:** R. Allen 1994

Undet. genus or genera (IA/Tp & CA)

Undescr. sp. (neOK/Tb)

Undescr. Genus A/ seNM, swTX/ Tb)

Undescr. genus C

(Tuckaleechee Cave & two other caves in Blount Co., TN/ Tb)

Subfamily Campodeinae (*Allocampa*, *Condeicampa*, *Eumesocampa*, *Haplocampa*, *Litocampa*, *Metriocampa*, *Plusiocampa*) **Bibl.:** R. Allen 1994

Subfamily Plusiocampinae (*Plusiocampa*)- subsumed in Campodeinae

Superfamily Japygoidea

Japygidae (earwiglike entotroph or diplurans; forcipate dipluran).

Ed & Tp? undet. genus or genera in (AL (Jefferson Jackson Cos.) KY (Hart Co.), GA & (Comal Co.,TX)

poss. 2 undescr. Tb sp. (Culberson, Menard, Medina Cos. (extirpated?) & 2 caves in Travis Co.) TX);

Subfamily Evalljapyginae (*Evalljapyx*) **Bibl.:** Conde 1953, 1956, 1962

Subfamily Japyginae (*Japyx*, *Metajapyx*, *Occasjapyx*) (last 2 also put in Evalljapyginae)

Subfamily Parajapyginae (*Mixojapyx*)(also put in Evalljapyginae)

Parajapygidae (*Parajapyx*) **Bibl.:** L. Smith 1960

*Allocampa* Silvestri, 1931 - Campodeidae diplurans. in Subfamily Campodeinae (1 species in US)

*Allocampa?* undescr. sp. (cTX/Tb)

*Campodea* Westwood, 1842 - Campodeidae diplurans, Subfamily Campodeinae.. (27 species in US) **Bibl.:** Allen 1994, 1995; Conde 1949; Conde & Thomas 1957; Hilton 1932, 1936

*Campodea cookei* = *Litocampa c.*

*Campodea plusiochaeta* Silvestri, 1912 (epigean in nUS, Europe, nAfrica/ prob. Ac or poss. Tp in cave in Lee Co., VA)

*Campodea* undescr. sp.#1 (Jewel C., Custer Co., SD/Tb?)

*Campodea* sp.#2 (2 caves in IA)

*Campodea* (*Podocampa*) - see *Podocampa*

*Condeicampa* Ferguson, 1996 - Campodeidae diplurans, Subfamily Campodeinae. (1 species in US)

*Condeicampa langei* Ferguson, 1996 (\*cave type locality in Lincoln Co., NV/ Tb)

*Eumesocampa* Silvestri, 1933 - Campodeidae diplurans, Subfamily Campodeinae..(3 species in US or Canada) **Bibl.:** Ferguson 1978, 1989

*Eumesocampa* undescr. sp.#1 (\*?cave in Monroe Co., WV+ NY?, PA?, OH?/ Tb or Tp, syntopic with *Litocampa fieldingi*)

*Eumesocampa* undescr. sp.#2 (ncCO/ epigean, Tx?)

*Eumesocampa* undescr.sp.#3? (Pike, Monroe & Union Cos.,(IL) & Jefferson, St. Genevieve & Perry Cos.(MO)/ Tb)

*Eumesocampa* undescr. sp.#4? (\*?cave in Harrison Co., IN)/ Tb)

*Evalljapyx* Silvestri, 1949 - Japygidae dipluran, Subfamily Evalljapyginae (4 species in US or Canada)

*Evalljapyx* apparently undescr. sp. (\*?cave in Val Verde Co., TX/ Tp)

*Haplocampa* Silvestri, 1912 - Campodeidae diplurans, Subfamily Campodeinae..(4 species in US or Canada) **Bibl.:** Ferguson 1983

*Haplocampa* (*Haplocampa*) *chapmani* Silvestri, 1933 (WA endogean/Tp or Tx (probable) in Skagit Co., WA)

*Haplocampa* (*H.*) *drakei* Silvestri, 1933 (epigean in Alberta/ Tx or Tp in Alberta)

*Haplocampa* (*H.*) *rugglesi* Silvestri, 1933 (NW endogean/Tx or Tp, poss. in Snowpatch (Klickitat Co., WA) & Lava River C. (cOR))

*Haplocampa* undescr. sp. #1 (Ape & at least 4 other caves in Skamania Co.seWA & possibly in Horne Lake Caves, BC/ Tb/ G1?)

*Haplocampa* undescr. sp. #2 (Monroe (one cave), Crawford (2 caves) & WA (2 caves) Co.s , MO/ Tb) Craig 1977/Tb)

*Haplocampa* undescr sp.#3 (Crawford & WA Cos.,MO/Tb/ G1)

*Haplocampa* undescr sp.#4? (\*?cave in Uinta Mts., Duchesne Co., UT/Tb)

*Haplocampa* undescr sp.#5 (\*cave in Uinta Mts., Duchesne Co., UT/Tp)

*Haplocampa* undescr sp.6 (Klickitat (3 caves) & Skamania (7 ayes) Cos., scWA & possibly in , BC/ Tb)

*Haplocampa* undescr sp.#7 (\*cave type locality in Siskiyou Co.,CA/Tb)

*Haplocampa* undescr sp.#8 (\*cave in Plumas Co., ncCA/ Tb)

*Haplocampa* undescr sp.#9 (\*cave in Lake Co.,ecOR/Tb)

*Haplocampa* undescr sp.10-11 (\*cave in Deschutes Co., cOR/ Tb)

*Haplocampa* undet. sp. (BC?)

*Japyx* Meinert, 1865 (See isopod: *Ligidium k*) - Japygidae diplurans, Subfamily Japyginae (5 species in US or Canada)

*Japyx* undet.sp. (Ac or Tx in Kazumura C., HI)

*Japyx subterraneus* = *Metajapyx s.*

*Litocampa* Silvestri, 1933 - Campodeidae dipluran in Subfamily Campodeinae (5 species in US or Canada) **Bibl.:** Ferguson 1981, 1991, 1997

*Litocampa* (L.) *▀barringerorum*• in Ferguson, 1981 (= *undescr. sp. D2*) (type locality & four other caves in \*Tazewell Co.,VA/Tb/VA S1 T&E rank/ G1)

*Litocampa* (L.) *▀barryi*• in Ferguson, 1981 (type locality cave in Unicoi Co. one other cave in Carter Co.,TN / Tb/ G1)

*Litocampa* (L.) *▀bifurcata*• in Ferguson, 1981 (type locality & 1 one other cave in Pulaski Co. + WA Co. (7 caves in \*area se of Walker Mt, nw of IronMTs & other foothills of Blue Ridge Mts. to the n.), VA/Tb)

*Litocampa* (*Litocampa*) D3 (*▀cherokeensis*• in Ferguson, 1981) (type locality cave in Maury Co., TN + Colbert, Dekalb, Jefferson Cos., AL, Dade & Walker Cos., nwGA/ Tb)

*Litocampa* (*Campodea*) *cookei* (*Campodea c.* Packard, 1871; *Plusiocampa nearctica* Conde, 1949; *P. & L. (Litocampa) n.* Silvestri, 1934; *C. staphylinus* var. *c.* Packard, 1871; *P.c.* (Packard) Chandler, 1956; *Campodea c.*) (Nickajack (type) (Marion Co.), Anderson, Bledsoe, Campbell, Cannon, Claiborne, Coffee, Cumberland, Grainger, Grundy, Hancock, Marion , Rutherford Cos., TN +AL (Jackson Co.) + Edmonson (Mammoth C.), Barren, Green, Hart,

Rockcastle, Pulaski, Warren & Wayne Cos.(KY) & wVA (Lee, Scott, Wise Cos.)/ Tp or Tb)  
**Bibl.:** Packard 1874a

*Litocampa* (*Litocampa*) F1 (*■davisi*• in Ferguson, 1981) (Cumberland C., Warren Co. + Bedford Co.,TN & Blount, DeKalb, Jackson Cos., AL & Dade & Walker Cos., GA/ Tb or Tp)

*Litocampa* (*Plusiocampa*) *fieldingi* (*Plusiocampa* f. Conde', 1949) (type locality & > 7 other caves in Greenbrier Co., >3 caves in Pocahontas Co. & > 3 caves in Monroe Co. , all WV /Tb/ WV T&E S2 rank & global G3)

*Litocampa* (*Litocampa*) *■hawksleyi*• in Ferguson, 1981 (type locality cave in Taney Co. + Pulaski & TX Cos., MO + Boone, Newton, Searcy & Stone Cos., neAR/ \*White & Gasconada River drainages/ Tb)

*Litocampa* (*L.*) *henroti* Conde', 1949 (*Tychocampa* & *P.h.*) (type locality & 2 other caves in Madison Co.,AL/ Tb/ G1)

*Litocampa* (*L.*) *■holleri*• in Ferguson, 1981 (type locality + probably 2 other caves in Swain Co. & one cave in Hederson Co., both NC / Tb)

*Litocampa* (*L.*) undesc. Sp. E4 *■holsingeri*• in Ferguson, 1981 (type locality & 2 other caves in Scott Co.,VA + one cave in Letcher Co.,KY/ Tb/VA S1S2 T&E rank)

*Litocampa* (*L.*) C1 (*■inexpectata*• in Ferguson, 1981) (\*type locality cave in Hancock Co.,neTN/ Tb)

*Litocampa* (*L.*) *jonesi* Conde, 1949 (type locality cave in Montgomery Co. & one cave in Christian Co., both TN / Tb)

*Litocampa* (*L.*) *■keithi*• in Ferguson, 1981 (type locality cave in Orange Co. + Crawford, Harrison, WA Cos.,Blue River area, IN/ Tb)

*Litocampa* (*L.*) *■ozarkensis*• in Ferguson, 1981 (type locality cave in Newton Co. + Boone, Independence & Searcy Cos.,AR/ Tb)

*Litocampa* (*L.*) *■pecki*• in Ferguson, 1981 (type locality in Chattooga Co. & other cave in Walker Co. + Dade Co.?, GA/ Tb/ G1)

*Litocampa* (*L.*) *pucketii* Conde & Bareth 1996 (= *Plusiocampa* p.) (\*\*\*type locality & 1 other cave in Tazwell Co. & cave in Bland Co.,VA/Tb?) **Bibl.:** Bareth 1974

*Litocampa* undesc.. sp? (\*cave in Wythe Co.,VA/Tb/VA S1 T&E rank)

*Litocampa* undesc. sp. C2 or two sp. (<10 caves in Blue and Lost river basins of & single cave in eastern edge of Crawford Upland, sIN)

*Litocampa* undescr. sp.#D1 (cave in Mercer Co.,WV & cave in Giles Co., both sw VA/ Tb/ WV & VA S1 T&E, G1 global rank)

*Litocampa* undescr. sp. (\*?cave in Eddy Co.,NM/ G1)

*Litocampa* undescr. #G2 (part of *valentinei* group) (near streams which drain into Coosa River, AL/ Tb?)

*Litocampa* undescr. sp. #P (6 caves in Walker Co. & one in Chattooga Co., GA/ Tb)

*Litocampa* undet. sp.? (cave in Jackson Co.,AL/Tb)

*Litocampa* (L.) *msperkai* in Ferguson, 1981 (type locality cave in Pulaski Co. + cave or caves in Rockcastle Co.,VA/Tb)

*Litocampa* (L.) *valentinei* (*Plusiocampa* v. Conde, 1949; *Cocytocampa* v.) (type locality cave in Madison Co. + caves in Marshal, DeKalb (only cave not in Cumberland Plateau n.of TN River) & Jackson Cos.,neAL & Franklin & Grundy Cos.(sTN), sCumberland Plateau/ Tb)

*Litocampa* (L.) *welbourni* in Ferguson, 1981 (\*type locality cave in San Miguel Co.,NM/ Tb)

*Metajapyx* *Silvestrii*, 1932 - Japygidae diplurans, Subfamily Japyginae (8 species in US or Canada) **Bibl.:** L. Smith & Bolton 1964

*Metajapyx* undescr. sp. or undescr. genus = *Mixojapyx reddelli*

*Metajapyx* undet. sp. (cave in DeKalb Co.,TN)

*Metajapyx* (*Japyx*) *subterraneus* (= *Japyx* s. Packard, 1874a) Silvestri, 1947 (type locality & 1 other cave in Edmonson Co.,KY +IN/ Ac or TTx ) **Bibl.:** Young 1951

*Metriocampa* Silvestri, 1933 - Campodeidae diplurans, Subfamily Campodeinae. (9 species in US or Canada)

*Metriocampa* (*Metriocampa* or *Tricampa*) *remingtoni* = *Tricampa remingtoni* Conde & Geeraert, 1962)

*Metriocampa* (*Metriocampa* or *Tricampa*) *rileyi* = *Tricampa rileyi*

*Metriocampa* undescr. sp.#1 (\*Wind Cave,Black Hills,SD/Tb)

*Metriocampa* undescr. sp.#2 (near *Tricampa remingtoni*) (cave each in Adams, Hardin & Saline Cos., IL/ Tb/ G1)

*Metriocampa* undet. sp.1-4 (ice caves in Malpais Natl Monument,nwNM/ Tp)

*Metriocampa* (*Tricampa*) undet. sp. #5 (Tx or Tp in 1 seAK cave)

*Metriocampa* undet. sp.#6 (OR C.,OR?/Tb or Tp)



*Mixojapyx* Silvestri, 1933 - Japygidae dipluran, Subfamily Parajapyginae (also put in Evalljapyginae) (2 species in US or Canada)

*Mixojapyx reddelli* Muegge, 1992 (type locality cave in Uvalde Co. + caves in Kimble, Travis, Menard, Bexar & Comal Cos.,TX/ Tb)

*Mixojapyx* undescr. sp. (cave in Rockingham Co.,VA/prob. Ac Edaphobite)

*Occasjapyx* Silvestri, 1948 - Japygidae dipluran, Subfamily Evalljapyginae. (5 species in US or Canada)

*Occasjapyx (Japyx) kofoidi (Japyx k. Silvestri, 1928)* was misidentified as to taxon & = isopod *Ligidium kofoidi*

*Parajapyx* Silvestri, 1903 - Parajapygidae diplurans, Subfamily Parajapyginae (3 species in US or Canada)

*Parajapyx (Parajapyx or Japyx.) isabellae (Japyx I. Grassi, 1886)* (Tp in Burnet & Travis Cos., TX)

*Plusiocampa* Silvestri, 1912 (= *Troglocampa* Denis, 1930; *Stygiocampa* Silvestri, 1934; *Paratachycampa* Wygodzinsky, 1944; *Didymocampa* Paclt, 1957) (see *Litocampa*) - Campodeidae diplurans in Subfamily Plusiocampinae (4? species in US)

*Plusiocampa (Campodea) cookei (Campodea c. Packard, 1871; P. nearctica Silvestri, 1934)* (type locality cave in Mammoth Cave, Edmonson Co., & caves in Barren, Warren, Green, Hardin, Hart, Edmonson Cos., KY & Campbell, Claiborne, Cannon, Coffee Cos. TN, sIN & VA (Lee,Scott & Wise Cos.)/Tb G4G5) **Bibl.:** Packard, 1874a

*Plusiocampa fieldingi* = *L. f.*; *Plusiocampa jonesi* = *Litocampa j.*

*Plusiocampa nearctica* = *Litocampa cookei*; *Plusiocampa pucketti* = *Litocampa p.*

*Plusiocampa* undet. sp. or species. (caves in Skamania Co., WA (Tb) & Siskiyou Co., CA/Tb?)

*Plusiocampa* undescr. sp.#1 (or undescr. genus) (Carlsbad & 1-4 other caves in Eddy Co.,NM/Tb)

*Plusiocampa* undescr. sp.#2 (\*cave in Butte Co., CA)

*Plusiocampa* undescr. sp#3-? (Tb? in AL,GA, sAppalachians; Tb in Mercer Co.,WV; Tb in MO +Newton Co., AR & Major Co., OK (Youngsteadt & Y.1978); Tb possibly in Lancaster Co., PA)

*Plusiocampa* undet. sp. or species (6 cos. in eKY; Taney Co. in MO; Tb in Kartchner C., Cochise Co., AZ)

**Podocampa** Silvestri, 1932 (= subgenus of *Campodea* Silvestri, 1932) Campodeidae diplurans (6 species in US or Canada) **Bibl.:** Conde, 1956

**Podocampa** undet. sp. (OK, TX)

**Podocampa** undescr. sp.#1 (Tb or Tp in MO)

**Podocampa** undescr. sp.#2 (TX/ Tx)

**Tricampa** Silvestri, 1949 (= subgenus of *Metriocampa*) - Campodeidae diplurans in Subfamily Campodeinae (4 species in US or Canada) **Bibl.:** Bareth & Conde, 1958; Conde' & Geeraert, 1962; Paclt 1957

**Tricampa remingtoni** (= *Metriocampa r.* Conde & Geeraert, 1962) (Tp in CO)

**Tricampa rileyi** (*M. r.* Silvestri, 1933) (W, Alberta, IA to LA/Tp)

**Tricampa** undescr. sp. or species (Tb near *rileyi*, *remingtoni* in \*\*\*IL); Tp in IL, OK, NM)

*Tychocampa* - see *Litocampa*

directional selection - Where a population moves towards one phenotypic extreme, usually due to steady change in environmental conditions.

disjunct distribution - Where taxa occur in geographically separated areas. Syn.: Discontinuous distribution. If the areas are of very different size, the largest is an exclave.

dispersal - Active or passive geographic extension of a species. See also biogeography. **Bibl.:** Belles 1992; Butler & Hobbs 1982; Downing 1989; Downing & Kurt 1989; Fong 1991; Hobbs, Jr. 1973; Krekeler 1959, 1961; Lewis 1996; Liebherr 1988; Mason 1989; Peck 1978; Pederson 1990; Plafkin 1975; Waters 1981

barriers - Badaracca 1986; Barr 1988; Veni 1991

recolonization - Hobbs III 1989; Lewis 1996

dispersion - The distribution of a species in space or on a surface. The dispersion number is the difference between the actual and a uniform distribution.

distribution - The geographic area that a species occurs in.

distrophic – Referring to caves whose biomass is largely supplied by vegetation washed in during floods.

divergence - 1. A measure of how dissimilar in species composition are two communities. 2. Where dissimilar traits develop in different species with a common ancestor.

divergent evolution - Syn: divergence.

divide - Boundary between separate catchment areas of drainage basins.

**DO** - A **water quality** measurement of dissolved oxygen (DO). Incl. BOD, respiration, water column, & intergravel. Higher temperatures usually decrease solubility & increase BOD.

DOM – Abbrev. For dissolved organic matter, often less than one milligram per liter in groundwater not impacted by humans.

**dobsonfly** - See **Neuroptera**.

**dog** - See **mammal, carnivore**.

Dollo's law - Complex structures, once lost, are not regained in their original form.

dominance (see competition) - Bovbjerg 1953; Lowe, M.E. 1956

**dragonfly** - See Odonata.

**drift** - Bibl.: Pederson 1990;

**dwarf fauna** - A fossil grouping with many small individuals. Can result from environmental/genetic conditions (such as low food supplies on islands) and/or selective sorting of bones or corpses.

dysaerobic – Environments in which oxygen is between .1 and 1 milliliters per liter. Cf. anaerobic & aerobic.

**earthworm** - Oligochaeta annelids. See **worm**.

## **Earwigs**

**Insect** of Order Dermaptera, Infraclass Pterygota, Division Neoptera Abdomen ends with pair of hardened, curved pincers. “Wig”, short for perwig .means “to scold” and refers to the untrue folklore that earwigs enter people’s ears. Dermaptera refers to the thickened or “skinlike” front wings. Species in the US are omnivorous. Body leathery to hard, shape elongate and somewhat flattened. Brown to black, sometimes with reddish markings. Simple antennae about half the length of the body, with 6-15 segments. Biting mandibles. Some are wingless but most have short front wings that do not cover the abdomen. When not in use, the hind wings fold fanlike beneath the front pair. Some females tend their egg clutches and young larvae in small ground nests and repel all intruders, including their mates. They lick the eggs, presumably to prevent fungus. They are paurometabolous, with terrestrial eggs, larvae and adults. Most of the 2,000 known species in the world are tropical but 20 species in 12 genera occur in the U.S. A few cave-evolved species in the tropics. Bibl.: Helfer 1963; Reichardt 1968; Steinmann 1989.

Suborder Forficulina

Superfamily Labiduroidea

Carcinophoridae

Subfamily Carcinophorinae

(*Anisolabis*, (also put in Anisolabididae, Subfamily Anisolabidinae) *Euborellia*)

Labiduridae (striped or long-horned earwigs)

Subfamily Psalinae

(*Anisolabis*, *Euborellia* (both now in Carcinophoridae, Subfamily Carcinophorinae))

***Anisolabis*** Fieber, 1853 (*Forcinella* Dohrn, 1862; *Labiduroides* Dubrony, 1879; *Lagicolabis*, *Horridolabis*, *Gelotolabis* Zacher, 1911; *Homoeolabis* Borelli, 1911; *Spondox*, *Apolabis*, *Paralabis* Burr, 1915; *Placolabis* Bey-Bienko, 1959) Carcinophoridae earwigs, Subfamily Carcinophorinae (once placed in Labiduridae; also put in Anisolabididae, Subfamily Anisolabidinae) (2 species in US) ('aha (HI name))

***Anisolabis*** *howarthi* Brindle, 1980 (\*\*type locality cave & Kazumura C., Big Island, HI / Tb/ G1G2)

***Euborellia*** Burr, 1910 (= *Borellia* Burr, 1909; *Landex* Burr, 1915) Carcinophoridae earwigs, Subfamily Carcinophorinae (also put in Labiduridae) (3 species in US or Canada)

***Euborellia*** *annulipes* (*Forficesila* Lucas, 1847; *F. equestris* Gene, 1837; *F. annulicornis* Blanchard, 1852; *F. variicornis* Smidt, 1876; *A. antennata* Kirby, 1891; *A. bormansi* Scudder, 1993; *A. fallax* Shiraki, 1905; *A. tripolitana* Werneer, 1908; *A. nana* Boeseman, 1954) L., 1847 (CA, AZ, NM, S/ ring-legged earwig/ Tx or Ac in AL, TX)

**Ecdysozoa** – See **worms** and Loricifera. Division of Protostomia Bilateria animals that undergoes ecdysis (shedding of exoskeletons all at once). Includes Kinorhyncha, priapulids, **Loricifera**, hair worms (Nematomorpha), nematodes, velvet worms (Onychophora), tardigrades, and arthropods.

**ecdysis** - Periodic entire shedding of an exoskeleton or outer skin.

## Echinoderms

(Starfish and brittle stars, sea urchin and sand dollars, sea lilies, sea daisies, and sea cucumbers)

Phylum Echinodermata of the Deuterostomia. Solitary marine floor (rarely free-swimming) invertebrates. Radially symmetrical as adults, usually with five radii (pentameral symmetry) and may be cup-, star-, spherical, disk or cylinder shaped. Incl. fossils (**blastoid** & **crinoid**) & current species (**brittle star**, **sea stars**, **sea cucumber**, & sea **urchin**). Kier & Grant, 1965

Kingdom Animalia

Clade Metazoa

Clade Eumetazoa

Clade Bilateria

Clade Deuterostomia

Phylum Echinodermata

Class Holothuroidea

Order Molpadiida

Family Mopadiidae (*Molpadia*)

Class Ophiuroidea

Order Ophiurida

Suborder Chilophiurina

Family Ophiactidae or Orphiuridae (*Ophiopholis*)

***Molpadia*** Risso, 1826 - Molpadiidae echinoderms

***Molpadia intermedia*** (AK, BC marine infauna)

***Ophiopholis*** – Ophiactidae echinoderms

***Ophiopholis aculeata*** (Linnaeus, 1767)(daisy brittle star/ AK marine infauna)

**echolocation** - Emitted sound & the intercepting of the reflected echoes to detect obstacles (and sometimes food items). Ultrasonic clicks used by bats, *Aerodramus* swiftlets, & the oilbird (*Steatornis caripensis*).

**eco-ethology** - The study of the behaviors that determine the relationships between individuals and those determined or regulated by the abiotic environment.

**ecocline** - A gradual boundary between two ecosystems.

**ecological amplitude** - Tolerance range of a species. **Indicator species** often have narrow ecological amplitudes.

**ecological equilibrium** - The long term stable state of an ecosystem that is self-regulating. When environmental influences exceed this capacity (as is often the case) then a new equilibrium may be established with different species distributions.

**ecological site equivalence** - Similar niches in structured ecosystems that are similar.

**ecological valency** - The intensity range of factors (usually abiotic) within which an species can survive.

**ecology** (see also behavior, population ecology/structure) - Ashley 1996; Baichtal et al. 1995; Barnett 1970; Barr 1953b, 1963c, 1967b; Benedict 1967g, 1980a; B. & Gruber 1981; Berry 1943; Bouvbjerg 1951, 1970; Brenner & Kane 1981; Brigmon et al 1994; B., Martin & Zame 1994; Brunner & Kane 1981; Calder & Bleakney 1965, 1967; Carlson 1994; Carpenter 1970; Christiansen 1971; C., Willson, & Tecklin 1961; Claus 1963; Clifford 1966; Crowell, R.L. 1981; Crowell, R.M. 1961; Danielopol, Dan L. 1978; Conrads 1969; Cooper 1974, 1975; C. & C. 1971, 1974; Culver 1971c, 1982; Decu 1978; Davis, G. & Lopez 1988; Dearolf 1948; Des Marais et al. 1980/1; Dickson & Kirk 1975; Dowdy, W.W. 1968; Eberly 1954a; Edler & Dodds 1990; Elliott 1986, 1995a, 1993, 1997; Findley 1958; Fletcher 1984; Fliermans et al. 1974; Franz 1978; Gibert et al. 1994; Green et al. 1968; Greer 1985; Griffith 1988, 1990; Grove 1974; G. & Harvey 1977; Harris 1904; Hairston, N.G. 1949; Hart 1973; Hobbs, III. 1969, 1973b; Hoff 1959; Holsinger

1963b; H. & Bowman 1973; Holsinger, Hubbard & Bowman 1994; Howarth 1980; H. & Culver 1985; H., Hubbard, & Bowman 1994; H. & Leitheuser 1983; Howarth 1982a, 1983, 1987a; Husmann 1971; Hutchison 1956; Ives 1927, 1934; Jenio 1980; Job & Simons 1994; Juberthie, Christian & Delay 1981; Kane 1978, 1983; K., Norton, & Poulson 1975; Kane, Poulson & Ryan 1983; Keith 1979; Kuehne 1963; Lamprecht, Gunther & Weber 1985; Lee, G.F, et al. 1977; Leitheuser & Holsinger 1983; Lewis & Lewis 1980, 1983, 1993; Lisowski 1978; MacAlpine & Reynolds 1977; Marchant 1981; Marsh 1969; Michelbacher A.E. 1959; Minckley 1963; M. & Cole 1963; Muchmore 1973a; Nelson & Smith 1976; Newcombe 1929; Nixon 1975; Norton, R. 1984; N., Kane & Poulson 1975; Mitchell 1965; Mohr 1948; Olson 1995; Park & Reichle 1964; Parzefall 1991, 1986; Peck 1966. 1974c, 1988; P. & Richardson 1976; Pennak 1950; Poulson 1976, 1984b; P. & Kane 1977; Prins 1968; Reichle, Palmer & Park 1965; Reisen 1975; R. et al. 1976; Relyea & Sutton 1973; Resetarits 1986. R. & Aldrige 1988; Relsen et al. 1976; Reynolds 1959; Scott 1909; Seidenberg 1973; Simmons 1975; Stanford & Simons 1992; Stanford, Ward & Ellis 1994; Story & Bryant 1966; Tack 1941; Taylor, D.W. 1988; Thibaud 1970, 1975; Thorp & Covich 1991; Turanchik & Kane 1979; Van Luik 1981; Weingartner 1977; Weise 1953; Welch 1973; Wong 1975; Zacharda 1979, 1980

**paleoecology** - Barnosky et al. 1988; Benton 1991; Coats 1996; Duffield 1970; Eshelman, R. E. 1971; Estes 1978; Foley & H.A. Semken 1992; Griffin & Semken 1976; Guilday, Cotter et al. 1984; A. Harris 1985; Heaton 1985; Logan 1983; Martin, Sabels & Shutler 1961; Mead, Bell & Murray 1992; Morlan 1989; Robbins et al. 1984; Schubert 1996; Semken 1969, 1984; Smartt 1977; Van Devender & Worthington 1977; Wang 1988

**ecology type** - See commensal, inquilism, mutualism, parasite (hyperparasite), phoretic, predator & symbiosis.

**ecomorphology** - Inferential relationships between morphology and ecology. Study of how the environment affects the shape and structure of organisms.

**ecotone** - (Narrow) boundary between two communities or habitats.

**ecotope** - A species' habitat.

**ecotype** - A species' genetic variant adapted to a local habitat, especially climatic or edaphic. Syn.: ecological race.

**ectognathus** - Mandibles & maxillae fully exposed & labium is a free appendage.

**edaphic** - Ecology affected by local soils or substrate.

**edaphobite** - Abbrev. as Eb. 1. Deep soil inhabitant. 2. Species restricted to microcaverns such as small crevices around tree roots & in talus piles. See soil animals.

edaphon – Biota living within soil or substrate. Cf. psephan, edaphobite, infauna.

**edaphophile** - Abbrev. as Ed. Species adapted for euedaphon (deep soil) conditions such as low O<sub>2</sub> & high CO<sub>2</sub>. May lack eyes & pigment but tend to be more compact, with less attenuated appendages than cave species. Abbrev. as Ep. Cf. hemiedaphon. Syn: euedaphophile. See **springtail** & Catopidae & Carabidae **beetles**.

**edaphophytes** - Microscopic soil flora.

Edentata - **Mammal** order; incl. **armadillo**, **glyptodonts** (fossil), & **ground sloths** (fossil).

**edge effect** - Ecologic conditions, such as higher biodiversity in a particular area, resulting from the interaction of two ecotopes.

Ediophthalma – Order by Meglitch & Schramm that includes amphipods & isopods.

**ehrlichiosis** - Gram-negative intracellular rickettsia disease. More common in south, east, south-central states than Rocky Mountain spotted fever. Symptoms incl. Fever, headache, vomiting. Usually no rash. Death in 1% of cases. Suspected transmission by *Ixodes scapularis*, a tick known from caves.

elephants - See **mammal**, **elephants**.

elk - See **mammal**, **ungulate**.

**Elliplura** - Class of Insecta or Hexapoda that includes proturans (Order Protura) and springtails (Order Collembola)

embryonic genesis – Development from an ovum. Syn.: embryogenesis.

Embryophyta - A phylum of Plantae that includes all land plants.

**emendation** - Abbrev. is emend. If an alteration of the diagnostic characters or of the circumscription of a taxon modifies the nature of the taxon, the author responsible may be indicated by the addition to the author citation of the abbreviation **emend.**: (emendavit) followed by the name of the author responsible for the change.

**endangered** - A **T&E** defined in the ESA as any species in danger of extinction throughout all or a significant portion of its range. Aley & Aley 1979a; Anon 1977; C.Belson 1999; Bouchard 1976; Culver & Holsinger 1995; Elliott 1989, 1998, 1990; Hobbs III 1987a; Holsinger 1979; McFarlane 1988, 1992, 1992a, 1993; McReynolds 1976; McFarlane 1988; Wilson 1984; **AL**: Mount 1976; Ramsey 1976; Stein 1976;; Byers 1983; J. Cooper 1979; Thorne 1988; **AR**: Buchanan 1974; Hobbs III 1987; H. Robinson & Smith 1982; **CA**: Elliot 1978a; Gray 1975; Muchmore & Cokendolpher 1995; **FL**: Humphrey 1978-a, 1992a; D. Wood 1993; **HI**: McCormick 1978; **IN**: J. Lewis 1993b; Whitaker & Gammon 1988; **MO**: Aley & Aley 1979; Nordstrom, Gary R., W.L. Pflieger, Kenneth C. Sadler & Lewis. 1977; Wilson 1984; **MO** Dept. 1991; **NC**: Cooper, 1977a; Cooper & Cooper 1977; Coyle 1977; Holsinger & Cooper 1977; Martof 1977; **NV**: Benedict 1976, 1978; Dudley & Larson 1975; Fiack 1976; Sharpe et al 1973;

**OH:** H. Smith et al. 1973; **OK:** Canaday & Vitello 1996; **TN:** Simmons 1976; **TX:** Chambers & Jahrsdoefer, 1988; J. Clark 1998; Edwards & Longley et al 1989; Elliott, 1984b; 1989, 1990, 1991, 1992a. 1993, 1993a; Reddell 1995; Reddell & Elliot 1995 Karnei 1978, 1979; Longley 1978; O'Donnel & Elliott 1994; Veni 1991; Chambers 1993; Chambers & Jahrsdoefer 1988; Croteau 1992-3; Crumley 1989; Drewry 1985; W. Elliott 1985. Golz 1994; 1989; Haurwitz 1993, 1995-6; McCann 1988-9; Tazik et al. 1992; Texas Parks 1993; Tilton & Johnston 1990; Todd 1993; USFWS 1992; Veni 1991; **US:** Ashton 1976; Lera 1981; USFWS 1970, 1974-80, 1983, 1990-1; **VA:** Linzey 1979; **WV:** Buckelew, 1990

**endemic** - Population only from a particular area. Paleoendemics once had more extensive distribution. See diverse, rare, endangered, threatened. Due to genetic drift & high extinction rates, small, isolated carbonates tend to have a small number but high % of cave endemics. Larger carbonate areas tend to have a larger number but lower % of endemics. Large populations & migrations tend to dampen genetic drift & so reduce the number of new/endemic species.

endemism - See **evolution**

endobenthos – Species living within the substratum as in rock or sediment.

**endobiosis** - Symbiosis in which one species lives inside of another.

**endogean** - Pertaining to the soil or rock extending to the limit of epigean roots and sediment under epigean bodies of water.

**endogean, endogena, edaphobite** (see soil, troglodite) - Aalbu & Andrews, 1985; Peck, 1997b; Reddell, 1986a, 1992

**endogena - Meiofauna** in soil or rock just below Earth's surface. Usually sporadic in caves. Partial syn: edaphobite. Incl. edaphophile (Ep).

**endogenous** - Occurring inside a species, as in synthesized rather than being acquired from outside the organism.

endogenous zone – Area immediately beneath the Earth's surface.

**endoliths** - Species that actively bore their own tunnels into rock. Cf. **chasmoliths & epiliths**.

endopsammic – Referring to biota of water-saturated sand.

**Endopterygota** - A subdivision of Class Insecta that includes orders Strepsiptera, Megaloptera, Raphidioptera, Neuroptera, & Coleoptera (beetles) & Superorders Antliophora (Orders Mecoptera, Siphonaptera (fleas), Diptera (flies) & Amphiesmenoptera (Orders Trichoptera (stoneflies), Lepidoptera (moths and butterflies) and Hymenoptera (wasps, bees and kin)

**endopsammon** - Benthic burrowing species that are too large to live in interstitial spaces.



**endosymbiosis** - Internal symbiosis, as in cyanobacteria taking up residence within certain eukaryote cells, making food in return for a home.

energetics - See **metabolism**.

**energy** - Concerning energy flow among **current** species. Incl. decomposition rates, nutrient pools, productivity, & trophic structure. Bibl. - See bioenergetics, feeding, metabolism.

**energy budget** - Ratio of energy input/output of a taxon or trophic level.

**Entognatha** - Superorder of insects with eversible mouthparts contained within a small pouch or pocket. Incl. **springtails**, **proturans** and **diplurans**.

**entomophagus** - Feeding on the tissues of an insect. Bibl. - See feeding

Entoprocta - Phylum of marine animals (see bryozoa)

entrance zone of cave – Area where outside influences such as light, weathering, and organics dominate the physical and biological environment. Cf. **twilight zone**.

entropy - The increase in disorder in a system. Species are a temporary decrease in entropy at the expense of increasing entropy in the larger system.

**environmental variance** - The amount of phenotypic variety due to differences in the environment of a taxon.

Ep - Syn: **edaphophile**

**epedaphic** - Adj. for species living on the soil surface.

epibenthic –Living on the surface of the floor of a body of water or an area periodically flooded by water, as in a tidal flat.

epibionty & epibiont - Syn.: **paleoendemic**.

**epibiosis** - Symbiosis in which one species lives on another. Cf. endobiosis.

**epidemiology** - The study of how diseases are transmitted.

**epigean** - The land surface, including plants and bodies of water. Syn: epigeic. Cf. endogean, hypogean.

**epigean, epigeic, epizooic** - Barr, 1967a, 1968a; Bechler, 1977; Bosnak, 1984; Caine, 1974, 1978; Hadley et al., 1981; Holt, 1973a; Loomis, 1943; Minckley, 1961; Parzefall, 1985; Sweet, 1982; Williams, W.D. 1970.

**epigenetic** - The interaction of genetic and developmental factors that lead to the expression of the genotype.

**epilithon** - A biofilm that converts organics into food for larger species.

**epiliths** - Species that live purely on the surface of rocks. Cf. chasmoliths & endoliths.

**epineuston** – Species which live just above the surface film of water.

**epipsammon** - Benthic surface-dwelling, generally motile macrofauna.

**epizoic** - Most common **substrate** is the outer surface of an animal. Often applied only to non-parasites. Incl. algae, mites, fungi, etc.

**E.P.T** - Three groups that indicate relative health in streams. Generally the more Ephemeroptera (**mayflies**), Plecoptera (**stoneflies**) and Trichoptera (**caddisflies**) the better the water quality and the less challenging the environment.

**equilibrium density** - When factors promoting and limiting population growth are balanced.

**equilibrium species** - Where competition rather than dispersal, maintenance, or high-reproduction is the main survival strategy. Common in environments with stable resources.

ermine - See **mammal, Mustelid**.

**estrus** - A period when females allow males to mate with them (specifically near the time of ovulation, except in temperate zone hibernators- but excluding *Miniopterus* bats)

**eubacteria** - True bacteria, essentially all bacteria with a single cell and a rigid cell wall.

eucladioliths - See **organic sinter**.

**eucenic** or eucoenic - Species who have low ecological amplitude tolerances.

**eucrenon** - The spring source zone.

**euedaphobite** - 1. Syn: endogean. 2. Species in cave litter or humus.

**euedaphon** - Of the interior soil layer. Cf. hemiedaphon.

**euedaphic** - Referring to living inside soil.

euedaphophile - Syn: **edaphophile**.

**Eumetazoa** – A clade that includes all animals except the Porifera and Placozoa. Unlike the latter two groups, eumetazoan cells tightly coordinate functions. Divided into the Cnidaria, Ctenophora and Bilateria.

euzyce – Inhabiting a wide range of habitats.

**euzyceic** - Species which can tolerate a wide range of habitats.

**eutroglobionts** - European term for troglobionts that are largely or entirely unpigmented and which often have reduced eyes or wings and well-developed touch organs.

**eutrophic** - Refers to nutrient rich areas, especially an adj. for a body of water characterized by a high level of plant nutrients, with correspondingly high primary productivity and/or where productivity is no longer limited by nutrient levels. Most eutrophic waters in NA karst are human-caused. **Bibl.** - See **human impacts**.

**eutrophication** - An increase in the amount of plant nutrients.

**evenness** - The relative abundance of a species.

**evolution**, (biologic) - Change in gene frequencies over time. Incl. convergent, divergent, punctuated & regressive. **Bibl.** - see also natural selection, speciation, taxonomy. Acorn & Ball 1991; Barr 1963b, 1968-9, 1985b, 1990; Bechler, 1983a; Breder 1943, 1953; Brown, 1976, 1979; Caccone, 1985a, 1988; Calow & Read 1986, Christiansen 1963, 1965, 1971, 1992; Christiansen & Culver 1968, 1969, 1987; Culver 1970, 1971, 1976, 1978, 1982, 1985a, 1987a; Culver, Holsinger & Baroody 1973; Culver, Kane & Fong 1995; G. Davis, 1989; Deeleman-Reinhold 1981; Ebbets, 1986; Elliott 1976, 1986; Eberly 1958, 1960; Fage 1931; Ferguson, 1974, 1981a; Fleming 1972a, 1973; Fong 1989, 1995; Foster 1980; Franz & Lee 1982; de Gama 1973; Goodnight & G., 1981; Griffith, 1988a, 1990; Grubbs & Chippendale, 1995; Hart & Hart 1969; Hobbs, Jr., 1958, 1988; Hobbs & Barr 1972; Hoch & Howarth, 1993; Holsinger 1966b, 1988; Howarth 1982, 1986-7, 1987, 1991; Hueppop, 1985; Hurst 1976, 1977; Iliffe, 1986; Jernigan et al., 1994; Kane 1978; Kane & Culver, 1991; Kane & Richardson, 1990-1; Laing, Carmody & Peck 1976a; Lamb & Riley 1986, 1989; L. Martin 1984; Martin & Prince, 1990; Milstead, 1959; Mitchell & Smith, 1972; Nicholas & Peters, 1973; Notenboom 1991; Park 1953a-b; Peck 1973b, 1978a, 1980, 1981a,b,e, 1981a 1984, 1986a, 1997b; Peck & Christiansen, 1990; Peck & Lewis, 1978; Poulson, 1973, 1985; W. Richards 1968; Rosen 1962; Simmons, 1975; Sbordoni 1982; Strenth 1991; Steeves 1966; D. Thompson & Jones, 1996; Wake, 1966; Wegele 1990; Westcott, 1968; Wilkins 1987; : Huys & Boxshall 1991

**adaptive radiation** - Stone & Howarth 1991

**climate** - Barnosky 1994a; Toomey 1993a; Howarth 1980;

**co-evolution** - Griffith 1988

**convergence** - Christiansen 1961, 1963; Culver & Fong 1986; Davis, G.M. 1989; Eigenmann 1903; Hobbs Jr. 1976; Langecker & Longley. 1993

**divergence** - Eigenmann 1903; Badaracca, 1986; Caccone, 1988; C. & Powell, 1987; C. & Sbordoni, 1987; Hoch, 1992; Hoch & Howarth, 1993.

**evolutionary history** see also biogeography)

Holsinger 1995a; Jernigan & Fong 1994; Jernigan, Culver & Fong 1994; Kane 1985

**geology** - Howarth 1980;

**macroevolution** - Christiansen 1987.

**marine comparisons** - Parzefall 1986a

**metabolism** - Huppopp 1985

**molecular** - Caccone & Powell, 1987; C. & Sbordoni, 1987; Carson & Chippindale, 1993; Chippindale 1992;

**non-relictual** - Howarth 1988

**punctuation** - Culver 1987;

**rates** (gradualism & punctuation) - Culver 1987; Sbordoni, 1987

**regressive** (see also senses) - Bartkowiak, Tschardt & Weber 1991; Chapman 1988; Charlton 1933; Christiansen 1985; Culver 1985; Eigenmann 1909; Fong 1983, 1985; Fong & Culver 1985; Ghaffar 1984; Green & Romero 1997; Heuts 1953; John 1957; Kane 1986; Kane & Richardson 1985; Langecker 1992; Lisowski 1979; Lundberg 1982; McNulty 1978; Maguire 1961, 1969; Parker 1890; Peters 1988, 1990; Poulson 1985, 1985a; Reddell, 1985; Romero 1985; Thibaud 1970; Thines 1960, 1969; Vandel 1961; Wilkens 1973, 1980-1, 1986-7; Christiansen 1985-6; Maguire 1961; Poulson 1985a, 1986;

**eyes** - Besharse & Brandon 1973, 1974, 1974a; Besharse & Hollyfield 1976, 1977; Brandon 1968; Detwiler & Laurens 1921; Eigenmann 1899, 1903, 1905; Galeano 1976; Green & Romero 1997; Kane 1986b; Larimer et al. 1966; Mellon 1977; Mellon & Lnenicka 1980; Peters 1990; Stone 1964; Thibaud 1967, 1976; Thibaud & Massoud 1973; Wells 1952, 1959; Kane & Culver 1986, 1991; Larimer 1966; Loeb 1915

**phylogeny** - Aalbu, 1985; Andersen & Polhemus 1980; Ball, 1974; Beier, 1940; Bousfield, 1978, 1983-4; Brusca & Wilson, 1991; Calow & Read, 1986; Chippindale, 1995; Coates, 1990; Cokendolpher & Reddell, 1992; Conde', 1953; Culver, Chang et al. 1995; Gelder, & Brinkhurst, 1990; Herman, 1970; Holsinger, 1989, 1992, 1995; Jones, C. A. et al., 1984; Kane & Chang, 1995; Kosswig, 1960; Lundberg, 1982; Northup et al., 1997; Peck, 1997b; Rowland, 1975; Thompson, D. & Jones, 1996; Tihen, 1958; Wilkens 1973, 1981;

**non-selection** - N. Peters 1990

**pigmentation** - Baldwin & Beatty 1941; Barret & Benjamin 1977; Beatty 1941, 1949; Chapman 1988; Kane 1986; Kosswig 1960; Lisowski 1979; Noble & Pope 1928; Williams & Howell 1979; Wolfe & Cornwell 1964

**punctuated vs. gradualism** - David 1987; Sbordoni 1987

**selection** - Jones 1990; Jones & Culver 1989

**stress** - Howarth 1993a

**exogenous** - Influence or effect originating from outside of a species.

**evolutionary lineage** - Line of descent of a taxon from its ancestors.

**evolutionary niche** - A way of life.

**evolutionary tradeoff** - The genetic elaboration or acquisition of a trait made possible by a loss or reduction of another trait.

**evolutionary trend** - A steady change in a evolutionary lineage or trait, as in attenuation in cave species.

**exaptation** - A trait that allows a taxon to occupy a habitat once unavailable to it. Loss of pigments, wings & eyes may help soil animals adapt to caves. Syn.: preadaptation.

**excess baggage hypothesis** - Active selection (rather than genetic drift) against form no longer needed.

**exclave** - A small disjunct area.

**exogenous** - Originating outside a species.

**exoskeleton** - An external skeleton. The hard body covering or shell of molluscs or other invertebrates.

exploitative competition – An interaction between biota in which one species benefits at the expense of the other.

**extinct** - **Population** of a particular species no longer present anywhere.

**extinction** - See conservation, endangered. Guilday 1967a

**extirpation** - Loss of a species from a particular area. See biogeography. Lewis 1996

**extralimital** - A fossil found in an area beyond the current range of that species.

**facultative** - Adj. For organisms able to adopt alternative lifestyles.

**f. sp.** - forma specialis. Taxonomic order below that of subspecies or variety.

**facultative aerobe** - An organism which is normally anaerobic but can also grow in the presence of oxygen.

**facultative anaerobes** - Bacteria that can grow in the presence or absence of free oxygen.

**facultative cavernicoles** - Incl. troglophile & troglaxene.

**facultative troglaphiles** - Normal epigean not uncommon in caves but showing no special modifications associated with cave life. Cf. habitual.

false scorpions - Syn: **pseudoscorpions**.

**feeding/predation** - Acorn & Ball 1991; Allison et al., 1992; Anderson & Martino 1967; Bechler 1981b, 1985; Brandon 1967; A. Brown, Pierson & Brown 1994;; Budd et al., 1979; Caine, 1975; Childester, 1908; Christiansen, 1970b; Crowell, 1981; Culver 1973a, 1985; Culver, Fong, & Jernigan 1987; Cummins & Klug, 1979; Dickson 1978, 1978a-b, 1979; Dyer 1975; Engelmann, 1956; Griffith 1988; Griffith & Gates 1985; Hansen, 1978, 1980; L. Hill 1969; Jaeger, 1972; Kane 1974, 1981, 1984a; Kane, Norton & Poulson 1975; Kane & Poulson 1976; Lavoie, 1988; L., King & Simonovic, 1985, 1988; D.S. Lee, 1969, 1969b, 1979; Leja & Poulson 1985; Levy 1976, 1981a; Martin 1977; Man & Fong 1991; Mitchell 1968, 1971; Northup, Lavoie, & Studier 1991; Norton, Kane & Poulson 1975; Peck, 1973, 1974b; Peck & Richardson, 1976; Poulson, 1973, 1978, 1983, 1984a; Poulson & Kane, 1981; Poulson & Jegla 1966; Simon & Buikema, 1995; P.W. Smith 1948; Studier & Lavoie 1991; Uiska et al., 1994; Vuckem 1988; V. & Studier, 1990; White 1989; Wildfang 1989; Wratherred & Harvey 1971; Poulson 1979, 1981

## Ferns

Filicopsida (= Filicatae), a class of Pteridophyta (vascular cryptograms). Unlike other pteridophytes, conspicuous sporophytes have monopodial, usually branched stems, mostly with large, abundantly veined, pinnate leaves (fronds). About 10,000 species. Rarely found as alien **plants** far in caves but common at cave entrances. Spores of extirpated sp. in Carlsbad C.(NM).  
Bibl.: J. Peck 1982; A. Smith 1993; C. Richard, Smith & MacNeill 1995; . Incl. fern allies.

Division Polypodiophyta

Class Filicopsida

Subclass Polypoditae

Order Aspidiales

Aspleniaceae (also put in Order Polypodiales & Aspleniales) (Spleenwort Family)  
(*Asplenium*, *Phyllitis*)

Order Dryopteridales (also put in Order Polypodiales)

Dryopteridaceae (Wood Fern Family)  
(*Ctenitis*, *Cystopteris*, *Dryopteris*, *Lomariopsis*, *Notholaena*, *Polystichum*, *Tectaria*)

Subclass Pteriditae

Order Dennstaedtiales

Dennstaedtiaceae (or in Order Polypodiales) (Bracken Family)  
(*Odontosoria*, *Pteridium*)

Subclass Schizaeatae

Order Polypodiales (may also include families listed above & below)

Polypodiaceae (Polyploidy Family) (*Polypodium*, *Woodsia*)

Order Pteridales

Pteridaceae (or in Order Polypodiales) (Brake)

(*Argyroschisma*, *Aspidotis*, *Cheilanthes*, *Cryptogramma*, *Pellaea*

(also put in Polypodiaceae), *Pentagramma*, *Pteris*)

Vittariaceae (or in Order Polypodiales) (shoestring ferns) (Incl. *Vittaria*)

**Adiantum** Linnaeus, 1754 - Pteridaceae ferns

**Adiantum** *capillus-veneris* Linnaeus, 1753 (Cave entrances in nCA, likely entrances in BC, AB, AZ, AK, CA, CO, FL, GA, KY, MS, NV, VA, Mex. To Peru, epigeal in LA/ Venus-hair fern, southern maidenhair (fern))

**Adiantum** *jordani* Muller Halle, 1864 (likely in cave entrances in OR, CA)

**Adiantum** *ternerum* Swartz, 1788 (cave entrances in FL)

**Argyroschisma** (J. Smith) Windham, 1987 (= *Notholaena* R. Brown sect. *Argyroschisma* J. Smieth, 1841) Pteridaceae ferns

**Argyroschisma** *dealbata* (Cheilanthes d. Prush, 1814) Windham, 1987 (calciphile likely at cave entrances in AR, IL, KS, KY, MO, NB, OK, TX)

**Argyroschisma** *fendleri* (*Notholaena fendleri* Kunze, 1851) Windham, 1987 (likely in lava tube entrances in CO, NM, WY, Mex.)

**Argyroschisma** *jonesi* (*Notholaena j.* Maxon, 1917) Maxon, 1917 (calciphile on ledges and cliffs in AZ, CA, NV, UT to Mex.)

**Argyroschisma** *limitanea* (Maxon) Windham, 1993 ssp. *limitanea* Windham, 1993 (rocky ledges and cliffs, usually on calcareous or volcanic rock, in AZ, CA, NM, UT to Mex.)

**Argyroschisma** *limitanea* (Maxon) Windham, 1993 ssp. *mexicana* Windham, 1993 (rocky slopes and cliffs, usually on calcareous or volcanic rock, in AZ, NM, TX to Mex.)

**Argyroschisma** *microphylla* (*Pellaea m.* Mertenius ex Kuhn, 1869) Windham, 1987 (calciphile on rocky hillsides and cliffs in NM, TX to Mex.)

**Aspidotis** (Nuttall ex Hooker & Baker) Copeland, 1947 - Pteridaceae ferns

**Aspidotis** *californica* (Hooker) Nuttall ex Copeland, 1947 (likely in cave entrances in CA)

**Aspidotis** *densa* (*Brakenridge* in Wilkes) Lellinger, 1968 (likely in cave entrances in CA, BC, ID, MT, NV, OR, PQ, UT, WA, WY)

**Asplenium** Linnaeus, 1754 (*spleenwort*; spleenworts) - Aspleniaceae ferns

**Asplenium** *abscissum* (*Firmum a.* Willdenow, 1810.) (Calciphilie and likely in cave entrances in Appalachian Mts., wBC, PQ, s. to TN/ TTx in AL)

**Asplenium** *adulterinum* J. Milde, 1865 (limestone crevices in BC,Europe/ adulterated spleenwort)

**Asplenium** *x bicayneanum* A. rhizophyllum Linnaeus var. B. D.C.Eaton, 1887) (in sinks & likely in cave entrances, sFL/ Biscayne spleenwort)

**Asplenium** *cristatum* Lamark in Lamarck et al., 1786 (calciphile on moist limestone outcrops, cliffs & on boulders, likely in cave entrances in FL/ hemlock spleenwort)

**Asplenium** *x curtissii* L. Underwood, 1906 (calciphile on moist limestone boulders, likely in cave entrances in FL/Curtiss's spleenwort)

**Asplenium** *heterochroum* Kunz, 1834 (sinks & limestone rocks in FL,GA, Mexico, Caribbean/ varicolored spleenwort)

**Asplenium** *heteroresiliens* W.H. Wagner, 1966 (limestone rocks in FL, NC, SC, likely in cave entrances/ Morzenti's spleenwort)

**Asplenium** *x palmeri* Maxon, 1909) (likely in cave entrances in sAZ, sNM, wTX/ Palmer's spleenwort)

**Asplenium** *pinnatifidum* Nuttall, 1818 (cliffs,ledges and boulders of sandstone and other acidic rocks, possible in rockshelter and cave entrances in AL, AR, DC, GA, IL, IN, KY, MD, MS, MO, NJ, NC, OH, OK, PA, SC, TN, VA, WV, WI/ lobed spleenwort)

**Asplenium** *x platyneuron* (*Acrostichum p.* Linnaeus, 1753) Britton, Sterns and Poggenburg 1888 (likely in cave entrances in east to ON,PQ & w. to eTX,NM/ Ebony spleenwort)

**Asplenium** *plenum* E.P. St. John ex Small, 1938 (calciphile on moist limestone boulders, likely in cave entrances in nFL/ ruffled spleenwort)

**Asplenium** *pumilum* Swartz, 1788 (calciphile on moist limestone boulders, likely in cave entrances in nFL/ hairy or triangle spleenwort)

**Asplenium** *x resiliens* Kunz, 1844 (SC sinks & cave entrances; likely in cave entrances in east US, w. to AZ/ black-stemmed spleenwort)

**Asplenium** *ruta-muraria* (Linnaeus, 1801 (*A. cryptolepis* Fernald; *A. cryptolepis* Fernald var. *ohionis* Fernald; *A.r.* var *c.* (Fernald) Wherry) (calciphile likely in cave entrances in AL, AR, CT, IN, KY, MD, MA, MI, MO, NJ, NY, NY, OH, ON, PA, PQ, RI, TN, VT, VA, WV, Europe, e Asia/ wall rue)



*Asplenium* undet. sp. (NV near cave lights)

*Asplenium rhizophyllum* (calciphile possible in cave entrances in AL, AR, CT, DC, GA, IA, IL, IN, KS, KY, MD, MA, ME, MI, MN, MO, NH, NJ, NC, NY, OH, OK, ON, PA, PQ, RI, TN, VT, VA, WI, WV/ walking fern)

*Asplenium scolopendrium* var. *americanum* (*Phyllitis s.*(Linneaus) var. *a.* Fernald, 1935; *Scolopendrim vulgare*) Kartesz & Gandhi, 1991 (calciphile in cave entrances in AL,ON,MI,NY,TN,Mex./ American hart\* tongue) (Fernald, 1935) **Bibl.:** C. Richard et al. 1993; Cressler 1989; McGilliard 1936; J. Peck 1982

*Asplenium septentrionale* (cliffs, likely in cave entrances in AZ, CA, CO, NM, OK, OR, SD, TX, UT, WV, WY, Europe/ forked spleenwort)

*Asplenium trichomanes* (*Cheilanthes t.* Linnaeus, 1753) (Now east of MT to NY, PA,wNC,nGA/ disjunct Ttx in NM/ maidenhair spleenwort)

*Asplenium trichomanes-dentatum* (in sinks, likely in cave entrances in sFL)

*Asplenium trichomanes-ramosum* Linneaus, 1753 (= *A. viride*) (calciphile likely in cave entrances in AB, AK, BC, CA, CO, ID, ME MI, MT,NB, NF, NS, NV, NWT, NY, ON, OR, SD, PQ, UT, VT, WA, WI, WY,Yukon/ green spleenwort)

*Asplenium trichomanes* subsp. *quadrivalens* Meyer, 1962 (calciphile likely in cave entrances in BC, CT, DL, IL, ME, MD, MA, MI, NH, NJ, NY, OH, ON, OR, PA, PQ, VT, VA, WA, WV, WI/ maidenhair spleenwort)

*Asplenium trichomanes* subsp t. Linneaus, 1753 (*A. melanocaulon* Willdenow) (likely in cave entrances in BC and most of US/ maidenhair spleenwort)

*Asplenium vespertinum* Maxon, 1900 (mosit, shaded canyon walls and beneath overhanging rocks, likely in cave entrances in sCA,Mex./ western spleenwort)

*Asplenium verecundum* Chapman ex L. Underwood, 1906 (*A. scalifolium* E.P. St.John; *A. suare* E.P. St.John; *A. subtile* E.P. St. John) (calciphile on limestone outcrops, grottoes, cliffs & on boulders, likely in cave entrances in FL)

*Cheilanthes* Swartz, 1806 (lip ferns, lipferns) Pteridaceae ferns

*Cheilanthes bonariensis* (Willdenow) Proctor, 1953 (likely at lava tube entrances in AZ, NM, TX./ Bonaire lip fern)

*Cheilanthes cooperae* D.C. Eaton, 1857 (calciphile likely in cave entrances in CA/ Cooper\*s lip fern)

**Cheilanthes** *covillei* Maxon, 1918 (likely at lava tube entrances in AZ, CA, NV, UT, Mex./ Coville's lip fern)

**Cheilanthes** *eatonii* Baker in Hooker & Baker, 1867 (likely in cave entrances in AZ, AR, CO, NM, OK, TX, UT, VA, WV, Mex./ Eaton's lip fern)

**Cheilanthes** *feei* Moore, 1857 (calciphile likely in cave entrances in AB, BC, AZ, AR, CA, CO, ID, IL, IA, KS, KY, MN, MO, MT, NB, NV, NM, OK, OR, SD, TX, UT, VA, WA, WI, WY, nMex./ slender lip fern)

**Cheilanthes** *gracillima* D.C. Eaton in Emory, 1859 (nCA twilight zone; likely in lava tube entrances in AB, BC, MT, NV, OR, UT, WA/ lace fern)

**Cheilanthes** *horridula* Maxon, 1918 (calciphile likely in cave entrances in OK, TX, nMex./ prickly lip fern)

**Cheilanthes** *intertexta* (Maxon) Maxon in Abrams, 1923 (likely at lava tube entrances in CA, NV, OR/ Coville's lip fern)

**Cheilanthes** *lanosa* Maxon, 1918 (likely in cave entrances in AL, AR, CT, FL, GA, IL, IN, KS, KY, LA, MD, MN, MS, MO, NJ, NY, NC, OH, OK, PA, SC, TN, TX, VA, WV, WI./ hair lip fern)

**Cheilanthes** *lendigera* (Cavanilles) Swartz, 1806 (likely at lava tube entrances in AZ, TX, Mex./ beaded lip fern)

**Cheilanthes** *leucopoda* Link, 1841 (calciphile likely at cave entrances in wTX, Mex./ white-footed lip fern)

**Cheilanthes** *lindheimeri* Hooker, 1852 (likely at cave entrances in AZ, NM, TX, Mex./ fairy swords)

**Cheilanthes** *microphylla* (Swartz) Swartz, 1806 (calciphile likely at cave entrances in FL / southern lip fern)

**Cheilanthes** *parryi* (D.C.Eaton) Domin, 1915 (likely in cave entrances in AZ, CA, NV, UT, Mex./ Parry's lip fern)

**Cheilanthes** *tomentosa* Link, 1833 (likely in cave entrances in AL, AZ, AR, GA, KS, MO, NM, NC, OK, PA, SD, TN, TX, VA, WV, Mex./ wooly lip fern)

**Cheilanthes** *villosa* Davenport ex Maxon, 1918 (calciphile, likely in caves in AZ, NM, TX, nMex./ villous lip fern)

**Cheilanthes** *wootonii* Maxon, 1918 (likely at lava tube entrances in AZ, CA, CO, NV, OK, UT, Mex./ Wooton's lip fern)

**Cheilanthes** *yavapensis* T.Reeves ex Windham, 1993 (likely at lava tube entrances in AZ, NM, TX/ Yavapai lip fern)

**Cryptogramma** R. Brown in Franklin, 1832 - Pteridaceae ferns

**Cryptogramma** *sitchensis* (*Allosorus* s. Ruprecht, 1845) T. Moore, 1857 (likely in caves in Yukon, AK,BC,NWT)

**Cryptogramma** undet sp. (AK freshwater pond interstitial)

**Cryptogramma** *stelleri* (*Pteris stelleri* S.G. Gmelin, 1768) (likely in cave entrances in Canada & nUS)

**Ctenitis** (C. Christensen) C. Christensen in Verdoorn et al. 1938 (laceferns) Dryopteridaceae ferns

**Ctenitis** *sloanei* (*Polypodium* s. Peoppig ex Sprengel, 1827) C.V.Morton, 1969 (wooded limestone ledges, likely in cave entrances from sFL to Peru)

**Cystopteris** Bernhardt, 1806 (bladder fern, bladderfern, brittle fern) Dryopteridaceae ferns

**Cystopteris** *fragilis* (Linnaeus, 1806) (Tx near lights in Lehman C.,NV; near entrances in nCA; Ttx in Mariposa Co.,CA)

**Cystopteris** *reevesiana* Lellinger, 1981 (possible in lava tube or carbonate caves entrances in AZ, CO, NM, TX, UT, Mex/ southwestern brittle fern)

**Cystopteris** *tennesseensis* Shaver, 1950 (likely in cave entrances in AL, AR, GA, IL, IN, IA, KS, KY, MD, MS, MO, NC, OH, OK, PA, TN, VA, WV, WI/Tennessee bladder fern)

**Cystopteris** *tenuis* (*Nephrodium tenue* Michaux, 1803; *C. fragilis* (Linnaeus) Bernhardt var. Mackayi G. Lawson) R.C. Moran, 1983 (likely in cave entrances in IA, IL, IN, MN, NV, OH, PA, UT, WI/ Mackay's brittle fern)

**Dennstaedtia** Bernhardt, 1802 - Dennstaedtiaceae ferns

**Dennstaedtia** *globulifera* (*Polypodium globuliferum* Poiret in Lamarck et al., 1804) Hieronymus, 1904 (most caves or sinks in TX, West Indies, to South America/ beaded cuplet fern)

**Dryopteris** Adanson, 1763 (shield or wood fern, woodfern) Dryopteridaceae ferns

**Dryopteris** *arguta* (*Aspidium argutum* Kaulfuss 1824 ) Maxon, 1921 (Disjunct Near cave entrances in nCA/ coastal woodfern)

**Dryopteris** *expansa* (*Nephrodium expansum* C. Presl, 1825) Fraser-Jenkins & Jermy, 1977 (= *D. assimilis*) (Near cave entrances in nCA/ spreading woodfern)

**Dryopteris** *felix-mas* (L.) Schott (male fern/ twilight zone)

**Lomariopsis** Fee, 1845 (climbing holly fern) Dryopteridaceae ferns

**Lomariopsis** *kunzeana* (*Stenochlaena* k. C. Presl ex. L. Underwood) Holttum, 1939

**Notholaena** R. Brown, 1810 (Cloak fern) Pteridaceae ferns

**Notholaena** *aschenborniana* Klotsch, 1847 (likely in cave entrances in AZ, TX, Mex.)

**Odontosoria** Fee, 1852 - Dennstaedtiaceae ferns

**Odontosoria** *clavata* (*Adiantum* c. Linnaeus, 1753) J. Smith, 1875 (in sinks in southern FL/  
wedgelet fern)

**Pellaea** Link, 1841 (cliffbrakes; cliff brakes; cliff-brakes) Pteridaceae ferns (also put in  
Polypodiaceae)

**Pellaea** *andromedifolia* (*Pteris* a. Kaulfuss, 1824) Fee, 1852 (rocky slopes and ledges on  
basalts in CA, OR to Mex.)

**Pellaea** *atropurpurea* (*Pteris* a. Linnaeus, 1753) Link, 1841 (calciphile (usually) on cliffs and  
ledges in most of US to ON, CA, WY, SD)

**Pellaea** *gastonyi* Windham, 1993 (calciphile on cliffs and ledges in AB, BC, SK, MO, SD, WY)

**Pellaea** *glabella* Mettenius ex Kuhn ssp. *glabella* (*P. atropurpurea* (Linnaeus) Link var. *bushii*  
Mackenzie (calciphile (usually) on cliffs and ledges in AR, CT, IL, IN, IA, KS, MD, MA, MI,  
MN, MO, NB, NY, OH, OK, PA, TN, TX, VT, VA, WV, WI)

**Pellaea** *glabella* Mettenius ex Kuhn ssp. *simplex* (Butters) A. Love & D. Love, 1977  
(*P. atropurpurea* (Linnaeus) Link var. *bushii* Mackenzie (calciphile (usually) on cliffs and ledges  
in AB, BC, AZ, CO, ID, MT, NM, UT, WA, WY)

**Pellaea** *glabella* Mettenius ex Kuhn ssp. *missouriensis* (G.J. Gastony) Windham, 1993  
(calciphile on cliffs and ledges in MO)

**Pellaea** *glabella* Mettenius ex Kuhn ssp. *occidentalis* (E.E. Nelson) Windham, 1993 (calciphile  
(usually) on cliffs and ledges in AB, Manitoba, NWT, SK, MT, ND, SD, UT, WY)

**Pellaea** *intermedia* (*P. intermedia* var. *pubescens* Mettenius ex Kuhn, 1869) (rocky slopes and  
ledges on granite and limestone in TX)

**Pellaea** *ovata* (*Pteris* o. Desvaux, 1827) Weatherby, 1936 (rocky slopes and ledges on granite  
and limestone in TX)

**Pentagramma** Yatskievych, Windham & E. Wollenweber, 1990 (silverback or goldback fern)  
Pteridaceae ferns

**Pentagramma** *triangularis* (*Gymnogramma t.* Kaulfuss, 1824) Yatskievych, Windham & E. Wollenweber, 1990 (Cave entrances in nCA)

*Phyllitis scolopendrium* = *Asplenium s.* Linnaeus, 1754)

*Phyllitis scolopendrium* var. *americana* = *Asplenium s.* var. *americana*

**Polypodium** Linnaeus, 1754 - Polypodiaceae ferns

**Polypodium** *vulgare* (twilight zone)

**Polystichum** Roth, 1799 - Dryopteridaceae ferns

**Polystichum** *lonchitis* (L.) Roth (northern hollyfern/ twilight zone)

**Polystichum** *munitum* (*Aspidium m.* Kaulfuss, 1824) K.Presl., 1836 (Cave entrances in nCA/ western swordfern)

**Pteridium** Gleditsch ex Scop., 1760 - Dennstaedtiaceae ferns

**Pteridium** *aquilinum* (Linnaeus) (Ttx in MO)

**Pteridium** undet. sp. or species (HI Volcanoes, Carlsbad (NM))

**Pteris** Linnaeus, 1754 (brake ferns) Pteridaceae ferns

**Pteris** *bahamensis* (*Pteris diversifolia* Swartz var. *b.* J. Agardh, 1839; *Pteris longifolia* var. *b.*) (likely in sFL caves/Bahama brake)

**Pteris** *cretica* Linnaeus, 1767 (non-native from Asia/ in cave entrances in FL/ epigean in LA/ Cretan brake)

**Pteris** *cretica* Linnaeus, 1767 var. *albolineata* Hooker, 1860 (non-native in cave entrances in nFL/ White-lined Cretan brake)

**Pteris** *vittata* Linnaeus, 1753 (non-native likely in caves in AL, CA, FL, GA, MS, SC/ epigean in DC, LA/ ladder brake, Chinese (ladder) brake)

**Tectaria** Cavanilles, 1799 (halberd ferns) Dryopteridaceae ferns

**Tectaria** *coriandrifolia* (*Aspidium coriandrifolium* Swartz, 1801) Underwood, 1906 (in sFL sinkholes, likely in cave entrances/ hairy halberd fern)

**Tectaria** *fimbriata* (*Aspidium fimbriatum* Willdenow, 1810) Proctor & Lourteig, 1990 (in sFL sinkholes, likely in cave entrances/ least halberd fern)

**Tectaria** *hieracleifolia* (*Aspidium hieracleifolium*, 1810) Underwood, 1906 (broad halberd fern) (cave entrances in FL, Mex., Caribbean)

**Thelypteris** Schmidel, 1703 - Thelypteridaceae ferns

**Thelypteris** *kunthii* (*Nephrodium k.* Desvaux, 1827) C.V. Morton, 1967 (sinks and cave entrances in SC)

**Thelypteris** *phegopteris* (*Dryopteris* & *Lastrea p.*) (Marsh fern Twilight zone)

*Trichomanes* Linnaeus, 1754 - Hymenophyllaceae ferns

*Trichomanes boschianum* Sturm, 1861 (on noncalcite rock in crevices, grottoes and/or caves entrances in AL, AR, GA, IL, IN, KY, NC, OH, SC, TN, VT, VA to Mex./ Appalachian filmy fern; Appalachian bristle fern)

*Trichomanes intricatum* Farrar, 1992 (on noncalcite rock in crevices, grottoes and/or caves entrances in AL, CT, GA, IL, IN, KY, MD, MA, NH, NJ, NY, NC, OH, PA, SC, TN, VT, VA, WV/ Appalachian trichomanes, weft fern)

*Trichomanes krausii* Hooker & Greville, 1830 (in limestone sinks in sFL/ Kraus's bristle fern)

*Trichomanes lineolatum* (Didymoglossum l. Bosch, 1863) Hooker in Hooker & Baker, 1867 (on rock in limestone sinks in sFL to South America/ lined bristle fern)

*Trichomanes petersii* Farrar, 1992 (on noncalcite rock in deep, narrow gorges in AL, AR, FL GA, LA, MS, NC, SC, TN to Mex./ dwarf bristle fern; Peter's bristle fern)

*Trichomanes punctatum* Poiret ssp. *floridanus* Wessels, 1962 (on rock in limestone sinks in sFL/ Florida bristle fern)

*Vittaria* Smith, 1793 (shoestring ferns) Vittariaceae ferns

*Vittaria appalachiana* Farrar & Mickel, 1991 (dark, moist cavities and rock shelters in noncalcite rocks in AL, GA, IN, KY, NY, NC, OH, PA, SC, TN, VA, WV)

*Woodsia* R. Brown, 1810 (cliff fern, woodsia, woodsia fern)- Polypodiaceae ferns

*Woodsia oregana* D.C. Eaton, 1865 (Cave entrances in nCA/ Oregon woodsia)

*Woodsia scopulina* D.C. Eaton, 1865 (Cave entrances in nCA/ Rocky Mountain woodsia)

fern ally - Bryophyte Lycopodiophyta Incl. club-moss, quillwort, spike-moss & horsetails.

ferret, black footed - - See **mammal, carnivore**

fetalization - The presence of embryonal or juvenile characters of an ancestral form in evolutionarily more recent species.

## **Fish**

Aquatic vertebrates of Class Pisces, Phylum Chordata, Subphylum Craniata. **Bibl.** Barr 1956b; Greenwood 1967. Biogeography: Hocutt & Wiley 1986; Robinson 1986; Blindness; Loeb 1915 Conservation: Echelle 1991; Echelle & Echelle 1993; Echelle & Dowling 1992; Genetics: Echelle 1991; Echelle & Echelle 1993; Echelle & Dowling 1992; **agonistic behavior:** Bechler 1979c; **circadian:** Poulson & Jegla 1966; **colonization:** Romero 1985a; **evolution:** Bechler 1983a; Gren & Romero 1997; MacFarlane 1923; Thines 1956; Thines & Durand 1973;

**Areas:** **AK:** M. Bryant et al. 1998; **CA:** Catton, 1885; Hubbs 1927; **AL:** Cooper 1971; Boschung 1961; Smith-Vaniz 1968;; Mayden 1987; **Alberta:** Nelson & Paetz 1974; **AR:** Buchanan 1974; Robison & Buchanan 1988; F. Cross et al. 1986; **Canada:** Robins et al. 1991; **FL:** Carr & Goin 1955; Pruitt 1995; Relyea & Sutton 1972, 1974; **GA:** Cooper 1971; Dahlberg & Scott 1971; **ID:** Plew 1980; **IL:** S. Forbes & Richardson 1908; **IN:** Keith 1988; Eigenmann & Beeson, 1894; **KY:** Barr 1956b, 1963b; Burr 1980; Clay 1995; Cooper & Beiter 1972; Keith 1988; Kuehne 1965; J. Taylor, 1873; Wyman 1854; Packard, 1886; Putnam, 1872a, 1874a;; Clay 1975; Girard, 1859; Greenwood 1967; O. Hay, 1894; Jordan, 1888; Tellkamp, 1844a-b, **MO:** Jones 1983; Pfeiffer 1971, 1975; F. Cross et al. 1986; Greenwood 1967; Mason 1989; Ozarks: Sutton 1995a; **NA:** Eigenmann, 1892, 1897-8, 1900; Hocutt & Wiley 1986; Robinson 1986; **NV:** Deacon & Williams 1984; Jordan & Evermann, 1896; Jordan & Copelan, 1876-7; Jordan & Gilbert, 1882; Joprdan, Ebvermann & Clark 1930; **NV:** LaRivers 1962; **OK:** Hall 1956; Robinson, Moore & Miller 1974; Suppl. Bibl: Branson 1967; **SW:** Deacon & Minckley 1973; **TN:** Armstrong & Williams 1971; Etnier & Starnes 1993; D. Lee et al. 1980; **TX:** Anon. 1948; Hubbs 1971; Jones & Hetler, 1959; W. Brown 1959; F. Cross et al. 1986; Hubbs 1958; J. Nelson 1976; **US:** Benedict 1976c; Coe 1904; J. Cooper 1978; Robins et al. 1991; Conner & Suttkus 1986; J. Cooper 1978-9; Eddy 1957, 1969; Jordan, 1877; Jordan & Brayton, 1878; Knapp 1953; **UT:** fossil: J. Broughton et al. 2000; **World:** Proudlove 1989; Weber, Proudlove & Nalbant 1998; Weber et al. 1998; **WV:** Williams & Howell 1979. Agassiz 1851; Dana 1976; Hubbs 1934, 1941, 1971; Poly & Boucher 1996; Zjinnd & Bailey 1947; Peters 1990; Tellkamp 1844a, 1845; Thines 1960; Wilkens 1973.

#### Subphylum Vertebrata

Superclass Osteichthyes (or as subclass) (teleosts or bony fish)

Class Actinopterygii

Subclass Neopterygii

Order Semionotiformes

Lepisosteidae (*Lepisosteus*)

Infraclass Teleostei

Superorder Acanthopterygii

Order Gasterosteiformes

Suborder Gasterosteioidei

Gasterosteidae (sticklebacks) (*Culaea*)

Order Cyprinodontiformes

Suborder Cyprinodontoidei

Cyprinodontidae (killifishes, pupfishes, toothcarps)

(*Cyprinodon*, *Fundulus* (now in Fundulidae))

Fundulidae (top minnows) (*Fundulus*)

Poeciliidae (*Gambusia*)

Order Perciformes

Centrarchidae (sunfishes)

(*Ambloplites*, *Centrarchus*, *Chaenobryttus*, *Lepomis*, *Micropterus*)

Suborder Gobioidae

Eleotridae (*Eleotris*)

Gobiidae (gobies) (*Lethops*, *Typhlogobius*)

Suborder Labroidei

Cichlidae (cichlids) (*Cichlasoma*)

Suborder Percoidei

Echeneidae (*Echeneis*)

Lutjanidae (*Lutianus*)

Percidae (perches) (*Etheostoma*, *Perca*, *Percina*)

Sciaenidae (*Cynoscion*, *Leiostomus*, *Sciaenops*)

Sparidae (*Lagodon*)

Superorder Pleuronectiformes

Suborder Pleuronectoidei

Achiridae (*Trinectes*)

Cynoglossidae (*Symphurus*)

Superorder Elopomorpha

Order Elopiformes (tarpons & tenpounders)

Suborder Elopoidei

Megalopidae (tarpons) (*Megalops*) (or put in Elopidae)

Superorder Ostariophysii (or in Superorder Paracanthopterygii)

Order Characiformes

Suborder Characoidei (or in Order Cypriniformes)

Characidae (characins) (*Astyanax*)

Order Cypriniformes (minnows and suckers)

Suborder Cyprinoidei

Catostomidae (suckers) (*Catostomus*)

Cyprinidae (carps & minnows)

(*Campostoma*, *Chrosomus*, *Clinostomus*, *Cyprinella*, *Erimystax*, *Gila*,  
*Hesperoleucus*, *Hybognathus*, *Hybopsis*, *Luxilus*, *Margariscus*, *Nocomis*,  
*Notropis*, *Phoxinus*, *Rhinichthys*, *Richardsonius*, *Semotilus*)

(undescribed Mid-Holocene sp. in Cheek Bend C., TN)



Order Percopsiformes  
Suborder Aphrederoidei  
Superfamily Aphrederoidea  
Amblyopsidae  
(*Amblyopsis*, *Chologaster*, *Speoplatyrhinus*, *Typhlichthys*, *Trogloglanis*)  
  
Aphredoderidae (pirate perches) (*Aphredoderus*)

Order Siluriformes  
Suborder Siluropidei  
Ariidae (hardhead catfishes) (*Arius*, *Bagre*)  
Ictaluridae (bullhead catfishes) **Bibl.:** Lundberg 1970  
(*Ameiurus*, *Ictalurus*, *Noturus*, *Satan*)

Superorder Elopomorpha  
Order Anguilliformes  
Suborder Anguilloidei  
Anguillidae (freshwater or river eels) (*Anguilla*)

Superorder Paracanthopterygii (subsumed? in Superorder Ostariophysii)  
Order Percopsiformes (in Superorder Ostariophysii)

Superorder Protacanthopterygii  
Order Salmoniformes  
Suborder Esocoidei  
Esocidae (pikes & pickerels) (*Esox*)  
  
Suborder Salmonoidei  
Salmonidae (*Oncorhynchus*, *Prosopium*, *Salmo*, *Salvelinus*)

Class Chondrichthyes (or as subclass) (elasmobranchs or cartilaginous fish)  
Subclass Cephalaspidomorpha  
Order Petromyzontiformes  
Petromyzontidae (Tx or Ac lamprey in one Al cave)

Subclass Elasmobranchii (= Selachimorpha) (**sharks & rays**)  
(elasmobranchs or cartilaginous fish)

Superorder Selachimorpha  
Order Pleurotremata (= Order Carcharhiniformes)  
  
Suborder Galeiformes (= Scyliorhinoidei) (sharks or bullhead sharks)  
Family Scyliorhinidae(=Atelomycteridae) (*Cephaloscyllium*)  
  
Suborder Heterodontiformes (bullhead sharks) (or placed as Order)

Family Heterodontidae (*Heterodontus*)

**Amblyopsidae** (*Amblyopsis, Chologaster, Speoplatyrhinus, Typhlichthys, Troglolagnis*)

**Bibl.:** Bechler 1980, 1981a; Breder 1943; Cope, 1867; Eigenmann 1899, 1909; Forbes 1892; John 1957; Loeb 1915; Packard 1888; Palunas 1989; Parzefall 1986; Poulson 1958, 1961, 1964, 1967, 1969, 1985; Putnam 1872; Rosen 1962; Suttkus 1961; Swofford 1982; S., Branson & Sievert 1980; Wilson 1974; Woods & Inger 1957; Poulson 1959

**Anguillidae** (freshwater or river eels) (*Anguilla*)

**Aphredoderidae** (pirate perches) (*Aphredoderus*)

**Ariidae** (hardhead catfishes) (*Arius, Bagre*)

**Catostomidae** (suckers) (*Catostomus, Hypentelium*)

**Centrarchidae** (sunfishes) (*Ambloplites, Centrarchus, Chaenobryttus, Lepomis, Micropterus*)

**Characidae** (characins) (*Astyanax*)

**Cichlidae** (cichlids) (*Cichlasoma*)

**Cottidae** (sculpins) (*Cottus*)

**Cynoglossidae** (*Symphurus*)

**Cyprinidae** (carps & minnows) (*Campostoma, Chrosomus, Clinostomus, Cyprinella, Gila, Erimystax, Hesperoleucus, Hybognathus, Hybopsis, Luxilus, Margariscus, Nocomis, Notropis, Phoxinus, Rhinichthys, Richardsonius, Semotilus*) (undescribed Mid-Holocene sp. In Cheek Bend C., TN)

**Cyprinodontidae** (killifishes, pupfishes, toothcarps) (*Cyprinodon, Fundulus* (now in Fundulidae))

**Eleotridae** (*Eleotris*)

**Esocidae** (pikes & pickerels) (*Esox*)

**Fundulidae** (top minnows) (*Fundulus*)

**Gasterosteidae** (sticklebacks) (*Culaea*)

**Gobiidae** (gobies) (*Lethops, Typhlogobius*)

**Ictaluridae** (bullhead catfishes) (*Ameiurus, Ictalurus, Noturus, Satan*) **Bibl.:** W. Taylor 1969; H. Smith 1956.

**Lepisosteidae** (*Lepisosteus*)

**Lutjanidae** (*Lutianus*)

**Petromyzontidae** (Tx or Ac lamprey in one Al cave)

**Percidae** (perches) (*Etheostoma, Perca, Percina*)

**Poeciliidae** (*Gambusia*)

**Salmonidae** (*Oncorhynchus, Prosopium, Salmo, Salvelinus*)

**Sciaenidae** (*Cynoscion*, *Sciaenops*)

**Sparidae** (*Lagodon*)

***Amblyopsis*** DeKay, 1842 (cavefishes) Amblyopsidae fish

**Bibl.:** Delamare-Deboutteville 1971; Eigenmann 1902; Jones 1983; Poulson 1961, 1969

***Amblyopsis rosae*** (*Typhlichthys r.* Eigenmann, 1898; *Troglichthys r.* Eigenmann, 1899) (Ozark cavefish/ type locality & 1 other caves in Jasper Co., & one cave in Newton Co., swMO (Boone, Barry, Dade, Greene, Jasper, Lawrence, Newton, Polk, Stone Cos., & three sites in James River Basin) + 2 caves in DE Co. & caves in Delaware, Ottawa, Mayes Cos., neOK & Benton & WA Co.(nwAR)<20 sites, Springfield Plateau & Neosha Cos.,KS/ Federal T&E;OK T&E; MO watch list T&E/ 5-7 cm long, white, with broad flattened head, small scales and eyeless. Postcleithrum are absent and sensory papillae on anal fin are in four to six rows. Anus migrates forward in adults. Unlike *A. spleaea*, pelvic fins are present/ Tb; G3G4)

***Amblyopsis rosae*** **Bibl:** T. Aley 1982; T. Aley & C.Aley 1979; A. Brown et al 1982, 1984; Bechler 1981; A. Brown 1991; Brown & Todd 1987; Canaday & Vitello 1996; J. Cooper 1980; Eigenmann 1898, 1899, 1903; 1905; G. Hall 1956; Jones 1983; Jones & Taber 1985; Mason 1989; Sutton 1995; USFWS 1989; Willis 1984; 1986; Willis & Brown 1985; A. Brown 1991; A. Brown & Schram 1982; A. Brown & Willis 1984; J. Cooper 1978-9; Eigenmann 1901-2; S. Jones & Rimbach 1983; Means 1993; R. Miller 1969; Ramsey 1901; Species Cavefish; Tafanelli & Russell 1972; U.S.Fish and Wildlife Service 1989

***Amblyopsis spelaea*** (*Typhlichthys s.* DeKay, 1842) (type locality in Mammoth C., Edmonson Co., KY/ scIN (Harrison, Lawrence, Orange & WA Cos.), Crawford & Barry Co.,MO/ Tb/ cave livebearer, blindfish, northern cavefish, Mammoth Cave blindfish/ Federal & KY Special Concern T&E; OK T&E; MO T&E Watch list; IN T&E S1G3)

***Amblyopsis spelaea*** **Bibl:** Agassiz; Alt 1910; C. Baker 1987; Barr & Kuehne 1962; Cooper 1980; Eigenmann 1900; Eigenmann & Denny, 1898; Frank 1984a; Green & Romero 1997; Keith 1988; Lonnberg 1894; Louis 1999; Mocquard 1908; Poulson 1967; Romero & Dennis 1998; J. Taylor 1873; Tellkamp 1844; Welch 1973; Whittaker & Zober 1978; Wyman, 1850-4, 1856; Zober 1976

***Ameiurus*** Rafinesque, 1820 (bullhead and catfish) Ictaluridae fish

***Ameiurus catus*** (Linnaeus, 1758) (white catfish/PA to FL, w. to CA, introduced in AR/Tx in FL),

***Ameiurus melas*** (*Ictalurus m.* Rafinesque, 1820; *Ictalurus natalis n.* R., 1820) (black bullhead/Tx or Ac in AL(1 cave), KY(prob.), OK, TX)

***Ameiurus meridionalis*** Gunther, 1864 (= *Potmocottus* & *Ictalurus m.*) (common blob/ Ttx or Ac in TN & Mammoth C., KY)

*Ameiurus natalis* (*Ictalurus natalis* n. LeSueur, 1819) (ON to FL, w. to OK, seNB, eKS, MN, IA, eTX/ yellow bullhead/Tx or Ac in OK, PA (Lancaster Co.); Tp in FL & Valdina Farms Sinkhole, Medina Co., TX). **Bibl.:** J. Jackson 1996; McCreedy 1996; Relyea & Sutton 1974a-b.

*Ameiurus nebulosus* (LeSueur, 1819) (se Canada to FL, w.to eOK, neTX, seOK, eND, eSD, eNB/ brown bullhead/Ac or Tx in FL,WV (one cave))

*Ambloplites* Rafinesque, 1820 - Centrachidae fish

*Ambloplites* *repestris* (Rafinesque, 1817) (E, seCanada to VT, nGA,nAL, eAR/ rock bass/ Tx or Ac in WV)

*Anguilla* Schrank, 1798 (American eel) Anguillidae fish

*Anguilla* *rostrata* (LeSueur, 1817) (Prince Edward Island s. to sFL, w. to sTX, SD, NB/ American eel/Tx or Tp in nFL),

*Aphredoderus* LeSueur in Cuvier & Valenciennes, 1831 (pirate perch) Aphredoderidae fish

*Aphredoderus* *sayanus* (Gilliams, 1824) (nFL to TX/ Tp or Tx in FL/pirate perch) **Bibl.:** Boltz 1988

*Arius* Valenciennes in Cuvier & Valenciennes, 1840 - Ariidae fish

*Arius* *felis* (*Galeichthys* f. Linnaeus, 1766) (hardhead or Gaff-topsail catfish/ Tx in FL (Homosassa Springs) & ocean connections)

*Astyanax* Baird & Girard, 1854 (tetra) - Characidae fish

*Astyanax* *mexicanus* (Filippi, 1853) (= *A. fuscatus* m.) (nMex. to scOK, neOK, w.cTX,e NM/ Tp in San Antonio Spring, Bexar Co. & Valdina Farms Sinkhole, Medina co., TX)

*Bagre* Cloquet, 1816 (gafftopsail catfishes) Ariidae fish

*Bagre* *marinus* (Mitchill, 1815) (gafftopsail catfishes)/ Tx in FL (Homosassa Springs) & ocean connections)

*Campostoma* Agassiz, 1855 (stoneroller) Cyprinidae fish

*Campostoma* *anomalum* (Rafinesque, 1820) (E to sNY, cAL w. to wTX, neNM, sUT, eMT, eWY/ central stoneroller/ Tx or Ac in cave in Madison Co.,AL)

*Catostomus* *ardens* Jordan & Gilbert, 1881 (Utah sucker/ extralimital latest Pleist. Lake Bonneville fossil in Homestead Cave, Tooele Co., UT)

*Catostomus* LeSueur, 1817 (suckers) Catostomidae fish

*Catostomus* *commersonii* (Lacepede, 1803) (N(except AK) to MT, UT, cNM, neOK, nAL, GA/ white sucker/ Tx or Ac in AL(1 cave), KY)

*Catostomus* *discobolus* Cope, 1872 (bluehead sucker/ extralimital latest Pleist. Lake Bonneville fossil in Homestead Cave, Tooele Co., UT)

**Catostomus** *teres* DeKay, 1842 (= *Clupea micropus*) (East, to Pit River, CA?/ sucker; red-eyed round herring/TTx or Ac in TN & Mammoth C.,KY)

**Centrarchus** Bailey, 1938 - Centrarchidae fish

**Centrarchus** *macropus* (Lacepede, , 1801) (e.toMN,eNB,AR,eNM, ON to FL/Tx or Ac in FL)

**Cephaloscyllium** Gill, 1861 or 1862 (swell shark) Scyliorhinidae fish

**Cephaloscyllium** undet. sp. (Ac or TTx in CA marine)

**Chaenobryttus** Gill, 1864 1820 - Centrarchidae fish

**Chaenobryttus** *coronarius* (*Cyprinus c.*Bartram, 1791) (warmouth bass/Ac or Tx in TX),

**Chaenobryttus** *gulosus* (*Lepomis g.* Cuvier in Cuvier & Valenciennes, 1829) (warmouth sunfish; robalo) (FL to AZ/ Ac in TX)

**Chologaster** Agassiz, 1853 (swampfishes) - Amblyopsidae fish

**Chologaster** *agassizi* (= *Forbesichthys a.* Putnam, 1872; *C. papilliferus* Forbes, 1882) Cooper 1980 (spring cavefish or springfish) (type locality cave in Wilson Co.,TN/Tp,spr.,sink ponds in sIL, seMO (single site), scTN & sw,sc,wKY (Mammoth Cave) / MO State T&E)

*Chologaster agassizi* **Bibl.:** Bechler 1981; Eigenmann, 1898; Forbes 1881; L. Hill 1969, 1971; Packard, 1880; Page et al. 1974; Weise 1953; J. Cooper 1979; L. Hill 1966, 1968; P. Smith & Welch 1978

**Chologaster** *cornuta* Agassiz, 1853 (swampfish/ Ac or TX in TN)

*Chrosomus eos* = *Phoxinus e.* (American cichlids) - Cyprinidae fish

**Cichlasoma** Swainson, 1839 (American cichlids) - Cichlidae fish

**Cichlasoma** *cyanoguttatum* (Baird & Girard, 1854) (Rio Grande perch or cichlid; mojarra del norte) (Mex.,swTX, introduced to cTX/ probable Ac in TX)

**Clinostomus** Girard, 1856 – Cyprinidae fish

**Clinostomus** *funduloides* Girard, 1856 (rosy dace; rosy side dace/ Tx or AC in VA)

**Cottus** Linnaeus, 1758 (sculpins) ■ Cottidae fish

**Cottus** *bairdi* Girard, 1850 (*C. b. punctulatus* (Gill); *C. semiscaber* (Cope); *C. ictalops*) (mottled sculpin; blob, Miller's Thumb & Bull-head/ c,s.Appalachia/ Tx or Ac in KY, MD, MO, PA, VA, WV; Tx in IN; extralimital Pleist. Lake Bonneville fossil in Homestead Cave, Tooele Co., UT )

**Cottus** *carolinae* (Gill, 1861) (banded sculpin/Tx in AR, IN, KY, MO (cave adapted in Perry Co.), TN, VA, WV; Tp in nAL/Banded Sculpin) **Bibl.:** G.Adams 2000; Greenberg & Holtzman 1987; Krejca et al. 1994

*Cottus echinatus* Bailey & Bond, 1963 (Utah Lake sculpin/ extralimital Pleist. Lake Bonneville fossil in Homestead Cave, Tooele Co., UT)

*Cottus cognatus* (Richardson, 1836) (slimy sculpin/Tx? in VA/VA Species of Concern)

*Cottus marginatus* Bean, 1881 (= *Semotilus m.*) (margined sculpin/Tx? in VA/VA Species of Concern)

*Cottus pygmaeus* J. Williams, 1968 (pygmy sculpin) (cAL springs/threatened/Ac or Tx in AL)

*Cottus* undet. sp. Or speices (sculpins/central US/Tp?; Tx or Ac in AL, GA (Walker Co.), NY)  
**Bibl.:** Buhlmann 2000

*Culaea* Whitley, 1950 - Gasterosteidae fish (sticklebacks)

*Culaea inconstans* (Kirtland, 1841) (brook stickleback/ Ac or Tx in Wood Buffalo Natl. Park, NWT, Canada)

*Cynoscion* Gill, 1861 (sea trout, weak fishes, seatrouts) Sciaenidae fish

*Cynoscion nebulosus* (Cuvier in Cuvier & Valenciennes, 1830) spotted squeteague or seatrout/ Tx in FL (Homosassa Springs) & ocean connections)

*Cyprinella* Girard, 1856 (shiners) Cyprinidae fish

*Cyprinella analostana* (*Notropis spilopterus* s. Cope, 1868) (spotfin or satinfin shiner/ Tx or Ac in KY)

*Cyprinodon* Lacepede, 1803 (pupfish) Cyprinodontidae fish. **Bibl.:** J.. Brown & Feldsmith 1971; Deacon & Minckley 1973; Deacon 1969; Deacon & Bunnell 1970; Dudley & Larson 1976; Echelle 1991; Echelle & Echelle 1993; Echelle & Dowling 1992; Lui 1969; McLane 1971; R. Miller 1950, 1964; Pister 1972; Poulos 1981

*Cyprinodon diabolis* (Wales, 1930) (Devil's Hole pupfish/T&E/\*Devils Hole,NV)

**Bibl.:** Anon 1980; Baugh & Deacon 1983; Benedict 1976i, 1978a; J. Brown 1971; Deacon & Deacon 1975; Dudley & Larson 1975; Dudley 1976; Fiack 1976; Howells & Pister 1972; McLane 1971; Sharpe et al 1973; Trusso 1972; Gruber 1976-7; A. Heller 1975; C. James 1969; Litton 1970; McNulty 1986; R. Miller 1948, 1968; Minckley & Deacon 1973; Minckley & Douglas 1991; Minckley, Hendrickson & Bond 1986; Mixon 1971; H. Rolston 1991; B. Turner 1974; Wales 1930

*Cyprinodon rubrofluviatilis* Fowler 1916 (Red River pupfish/ Tx or Ac in TX)

*Echeneis* Linnaeus, 1758 - Echeneidae fish

*Echeneis naucrates* Linnaeus, 1758 ( shark remora; sharksucker/ Tx in FL (Homosassa Springs) & ocean connections)

*Eleotris* Bloch & Schneider, 1801 (spinycheek sleepers) Eleotridae fish

*Eleotris sandwicensis* Vaillant & Sauvage, 1875 (HI anchialine caves)

*Erimystax* Jordan, 1882 undet. sp. (Tx or Ac in US)

**Esox** Linnaeus, 1758 (pike, pickerel & muskellunge) Esocidae fish

**Esox** undescr. sp. (extinct pike-like fish in Pleist. in Baker Bluff C.,TN)

**Esox masquinongy** Mitchill, 1824 (NE, Great Lakes to Upper MS Basin/ muskellunge/ extralimital Pleist. fossil in Cheek Bend C.,Maury Co.,TN),

**Etheostoma** Rafinesque, 1819 (perch) Percidae fish

**Etheostoma caeruleum** Storer, 1845 (Great Lakes & Mississippi River basins from sON, wNY to MN, s.to nAL,AR, disjunct in swMS,eLA,upper Potomac River in WV/ rainbow darter/ Tx or Ac in cave in AL)

**Etheostoma (Oligocephalus) nuchale** Howell & Caldwell, 1965 (cAL/watercress darter/ endangered/ Tx or Ac in karstic sprs.)

*Forbesichthys agassizi* Putnam, 1872 = *Chologaster a.*

**Fundulus** Lacepede, 1903 (topminnow, studfish and killifish) Fundulidae fish

**Fundulus kansae** Garman, 1895 (= *F.zebrinus k.*?) (NB, KS, WY, eNM, introduced into UT, AZ/ plains killifish/ Tx or Ac in TX)

**Fundulus** undet. sp. (Tx in nAL (abundant in one cave))

*Galeichthys Valenciennes*, 1840 - Ariidae fish

*Galeichthys felis* = *Arius f.*

**Gambusia** Poey, 1854 (mosquito fish) Poeciliidae fish

**Gambusia affinis** (Baird & Girard, 1853) (Mississippi River basin from cIN, IL s.to Gulf of Mexico and Gulf Slope west to Mexico/ western mosquito fish, guayacon mosquito/ Tx or Ac in nAL)

**Gambusia holbrooki** Girard, 1859 (= *G. affinis h.*) (eastern mosquitofish/ Tx in FL)

**Gila** Baird & Girard, 1853 (chub) Cyprinidae fish 1963

**Gila atraria** Girard, 1856 (extralimital latest Pleist. Lake Bonneville fossil in Homestead Cave, Tooele Co., UT)

**Gila bicolor** (Girard, 1856) (wID, eOR, neCA, nNV/ High Rock Springs tui chub/Tx? in CA/ *G.b. vaccaceps* candidate T&E/spr.)

**Hypentelium** Rafinesque, 1818 (hog suckers) – Catostomidae fish

**Hypentelium nigricans** (Lesueur, 1817) (hogmolly; northern hog sucker/ Ac or Tx in TN)

**Hesperoleucus** Snyder, 1913 (California roaches) Cyprinidae fish

**Hesperoleucus** *symmetricus* (Baird & Girard in Girard, 1854) (sOR, nw, e,nCA/ CA roach/Tx or Ac in CA)

**Heterodontus** Blainville, 1816 - Heterodontidae sharks

**Heterodontus** undet. sp. (spiny dog shark) (CA marine caves)

**Hybognathus** Agassiz, 1855 - Cyprinidae fishes

**Hybognathus** *placitus* Girard, 1856 (wMT se. to sIL, wAR, NN, nTX; introduced into sNM, wTX /plains minnow/Tx or Ac in TX)

**Ictalurus** Rafinesque, 1820 (forktail catfishes) - Ictaluridae fish

**Ictalurus** *furcatus* (LeSueur, 1840) (blue catfish) (Tp in Valdina Farms Sinkhole, Medina Co., TX) **Bibl.:** Whitehead 1994

*Ictalurus melas* = *Ameiurus m.*

*Ictalurus natalis n.* = *Ameiurus n.*

**Ictalurus** *nebulosus* (Lesueur, 1819) (ME and Great Lakes to FL, Mex., widely introduced elsewhere/ brown bullhead catfish/ Tx in FL)

**Ictalurus** (*Ameiurus*) *punctatus* (Rafinesque, 1818) (E w. to eMT,eNM; introduced to SW,CA/channel catfish/Tx in FL; Tx or Ac in TX) **Bibl.:** Simce & Cross 1966

**Lagodon** Holbrook, 1855 - Sparidae fish

**Lagodon** *rhomboides* (Linnaeus, 1766) (pinfish/ Tx in FL (Homosassa Springs) & ocean connections)

**Leiostomus** Lacepede, 1802 - Sciaenidae fish

**Leiostomus** *xanthurus* Lacepede, 1802 (spot/ NC marine infauna)

**Lepisosteus** Lacepede, 1803 (slender gars) Lepisosteidae fishes

**Lepisosteus** *osseus* (Linnaeus, 1758) (longnose gar/Tx or Ac in FL)

**Lepomis** Rafinesque, 1819 (common & eared sunfishes) Centrarchidae fishes

**Lepomis** *cyanellus* R., 1819 (Green Sunfish; Ac or Tx in AL(1 cave), IN, MO; Tp in TX (preys on *Tadarida mexicana* bats; Tx in WV)

*Lepomis gulosus* = *Chaenobryttus g.*

**Lepomis** *macrochirus* R., 1819 (MW, SE; introduced to NE, W/ Blue Gill or bluegill/Tx in FL,WV; Ac in AL,TX)

**Lepomis** undet. sp. (Ac or Tx in KY)



**Lethops** Hubbs, 1926 Gobiidae fishes

**Lethops connectens** Hubbs, 1926 (halfblind goby/marine rock crevices & crustacean burrows in sCA)

**Luhanus** Bloch, 1790 - Lutjanidae fish

**Lutjanus apodus** (Linnaeus, 1758) (schoomaster; schoolmaster snapper/ Tx in FL (Homosassa Springs) & ocean connections)

**Lutjanus griseus** (Walbaum in Artedi, 1792) (gray snapper/ Tx in FL (Homosassa Springs) & ocean connections)

**Luxilus** Rafinesque, 1820 (shiners) Cyprinidae fishes

**Luxilus cornutus** (Mitchell, 1817) (common shiner / TTx or Ac in NY)

**Margariscus** Cockerell, 1909 - Cyprinidae fish

**Margariscus margarita** (Cope, 1868) (pearl dace/ BC to NF, s.to nNB, nVA/ Ac or Tx in Wood Buffalo Natl. Park, NWT, Canada)

**Megalops** Lacepede, 1803 – Megalopidae fish (or put in Elopidae)

**Megalops** undet. sp. (WA marine infauna)

**Micropterus** Lacepede, 1802 (black basses) - Centrarchidae fish

**Micropterus salmoides** (Lacepede, 1802) (sFL to wNY, w. to eAZ/ introduced to most of rest of US/ largemouth bass

**Nocomis** Girard, 1856 (hornyhead chubs) Cyprinidae fish

**Nocomis biguttatus** (Kirtland, 1841) (NY to MB, s. to upper MS Basin, nOH Basin, ON, AR, MO/ redspot or horn(e)yhead chub extralimital Pleist. fossil in Cheek Bend C.,Maury Co.,TN)

**Notropis** Rafinesque, 1818 (eastern shiners) Cyprinidae fishes. **Bibl.:** Maurakis 1989

**Notropis atherinoides** R., 1818 (emerald shiner/Tx or Ac in KY)

*Notropis cornutus* = *Luxilus c.*

**Notropis harperi** Fowler, 1941 (= *Erimystax h.*) (redeye chub/Tx or Tp in FL)

*Notropis spilopterus* s. = *Cyprinella analostana*,

**Noturus** Rafinesque, 1818 (madtoms) Ictaluridae fishes. **Bibl.:** W. Taylor 1969.

**Noturus flavus** Rafinesque, 1818 (stonecat or stone cat or madtom/ MS river drainage, VA,NC/ undescr. form as Pleist. fossil in Cheek Bend C.,TN)

**Noturus flavater** Taylor, 1969 (checkered madtom now in MO & AR Ozarks/ extralimital mid-Holocene. fossil in Cheek Bend C.,Maury Co.,TN)

**Oncorhynchus** Suckley, 1861 (Pacifiuc salmon) Salmonidae fishes

**Oncorhynchus** *clarki* Richardson, 1936 (cf. *O.c.* extralimital latest Pleist. Lake Bonneville fossil in Homestead Cave, Tooele Co., UT)

**Oncorhynchus** *mykiss* (Walbaum, 1792) (= *Salmo gairdneri* Richardson, 1836) (rainbow trout/ alien? Tx? in MD; Tx or Ac in WV (one cave))

**Perca** Linnaeus, 1758 (perches) Percidae fish

**Perca** *flavescens* Mitchell, 1814 ((NE, Great Lakes to Upper MS Basin/ yellow perch extralimital Pleist. fossil in Cheek Bend C., Maury Co., TN)

**Percina** Haldeman, 1842 (roughbelly darters) - Percidae fishes

**Percina** cf. *caprodes* (Rafinesque, 1818) (St. Lawrence River & Great Lakes, Hudson Bay & Mississippi River basins from Quebec to Saskatchewan in Canada south to Gulf of Mexico and Atlantic and Gulf Slope drainages/ logperch/ Tx or Ac in nAL (one cave)

**Percina** undet. sp. (Tx or Ac in nAL (one cave))

**Phoxinus** Rafinesque, 1820 - Cyprinidae fish

**Phoxinus** *eos* (Cope, 1862) (Atlantic, Great Lakes, Hudson Bay, upper MS; MO & Peace-Mackenzie River drainages from NS w. to NW Territories, BC, s. to nPA, WI, NB, CO/ ninespine stickleback/ Tx or Ac in 1 NS cave)

**Phoxinus** *neogaeus* Cope, 1868 (finescale dace/ Ac or Tx in Wood Buffalo Natl. Park, NWT, Canada)

*Pot(a)mocottus meridionalis* = *Amiurus m.*

**Prosopium** Jordan, 1878 – Salmonidae fish

**Prosopium** *gemmifer* Snyder, 1919 (Bonneville cisco/ extralimital latest Pleist. Lake Bonneville fossil in Homestead Cave, Tooele Co., UT)

**Prosopium** *spilonotus* Snyder, 1919 or *P. abyssicola* Snyder 1919 (Bonneville or Bear Lake whitefish/ extralimital latest Pleist. Lake Bonneville fossil in Homestead Cave, Tooele Co., UT)

**Pungitius** Coste, 1848 - Gasterosteidae fish

**Pungitius** *pungitius* (Linnaeus, 1758) (Circumpolar, nEurasia: Atlantic drainages across Canada s. to Great Lakes, NJ, w. to BC, AK/ ninespine stickleback (Tx or Ac in 1 NS cave & Wood Buffalo Natl. Park, NWT, Canada)

**Rhinichthys** Agassiz, 1849 (daces) Cyprinidae fishes

*Rhinichthys atronotus* = *R. atratulus*

**Rhinichthys** *atratus* (Hermann, 1844) (epigeal in Atlantic, Great Lakes, Hudson Bay, Mississippi & upper Mobile Bay drainages from Nova Scotia to Manitoba, s. to nGA, nAL/ blacknose dace/ Tx or Ac in VA, cave each in AL & WV)

***Rhinichthys cataractae*** (Valenciennes in Cuvier & Valenciennes, 1842) (longnose dace; minnow) (black-nosed dace/ Tx or Ac in WV)

***Rhinichthys osculus*** (Girard, 1856) (Columbia R. in BC to CO River in AZ, NM/ speckled dace/ Tx or Ac in cave in Harney Co., OR)

***Richardsonius*** Girard, 1856 - Cyprinidae fish

***Richardsonius balteatus*** Richardson, 1836 (reidside shiner/ extralimital latest Pleist. Lake Bonneville fossil in Homestead Cave, Tooele Co., UT)

***Salmo*** Linnaeus, 1758 - Salmonidae fishes

***Salmo gairdneri*** Richardson, 1836 = *Oncorhynchus mykiss*

***Salvelinus*** Richardson, 1836 - Salmonidae fishes

***Salvelinus confluentus*** Suckley, 1858 (bulltrout/ cf. *S.c.* extralimital latest Pleist. Lake Bonneville fossil in Homestead Cave, Tooele Co., UT)

***Satan*** Hubbs & Bailey, 1947 (widemouth blindcats) Ictaluridae fishes. **Bibl.:** W. Brown 1959; W. Taylor 1969

***Satan eurystomus*** Hubbs & Bailey, 1947 (widemouth blindcat or blind catfish) (T&E/artesian well near San Antonio/swTX/Pb) **Bibl.:** Anon, 1948; Karnei 1978, 1979; Lambert & Ambler 1961; Longley & Karnei 1979; Moravec & Huffman 1988; R. Miller 1969

***Sciaenops*** Gill, 1863 (red drums) Sciaenidae fish

***Sciaenops ocellatus*** (Linnaeus, 1766) (sea catfish/ Tx in FL (Homosassa Springs) & ocean connections)

***Semotilus*** Rafinesque, 1820 (creek chubs) Cyprinidae fishes

***Semotilus atromaculatus*** (Mitchill, 1818) (eCanada to nwFL, etTX, eNM, MT, WY/ creek chub/ Ac or Tx in AL, KY, MO, TN; Tx in WV)

*Semotilus marginata* = *Cottus marginatus*

***Speoplatyrhinus*** Cooper & Kuehne, 1974 (Alabama cavefishes) Amblyopsidae fishes

***Speoplatyrhinus poulsoni*** Cooper & Kuehne, 1974 (Alabama cavefish/federal T&E/\* type locality cave in Lauderdale Co., AL/ Eyeless. Fins, integument, part of cranial skeleton relatively transparent (skin contains microscopic, widely scattered melanophores, which are few in number). Fish's head and branchial chamber are very large, comprising >33% of standard length. Snout is dorsoventrally depressed and laterally constricted, giving the back of the head a bill-like look. Nostils have short tubular projections. Pectoral fins long and delicate /most Tb of U.S. cavefish/ Key Cave National Wildlife Refuge established 1997 on 1040 acres to protect fish & gray bats) **Bibl.:** J. Cooper 1980, 1982, 1985-a; Kuhajda & Mayden 1996; J. Orr 1934; J. Cooper 1978; USFWS 1990, 1996

*Symphurus* Rafinesque, 1810 – Cynoglossidae fish

*Symphurus* undet. sp. (straightmouth tonguefishes/ wFL Gulf of Mexico infauna)

*Trinectes* Rafinesque, 1832 – Achiridae fish, Suborder Pleuronectoidei, Order Pleuronectiformes

*Trinectes maculatus* (Bloch & Schneider, 1801) (hogchoker/ NC marine infauna)

*Trogloglanis* Eigenmann, 1919 (toothless blindcats) Amblyopsidae fishes

*Trogloglanis pattersoni* Eigenmann, 1919 (Toothless or Widemouth blindcat or blind catfish)

(artesian well 2mi. ne of San Antonio, \*Bexar Co.,scTX/Pb T&E). **Bibl:** Anon, 1948; Karnei 1978, 1979; Lambert & Ambler 1961; Langecker & Longley 1993, 1993a; Longley & Karnei 1979a; Lundberg 1982; Moravec & Huffman 1988; R. Miller 1969,

*Typhlogobius* Steindachner, 1879 (blind gobies) Gobiidae fishes

*Typhlogobius californiensis* Steindachner, 1879 (blind goby/marine rock crevices & crustacean burrows in sCA)

*Typhlichthys* Girard, 1859 (southern cavefishes) Amblyopsidae fishes

*Typhlichthys subterraneus* Girard, 1859 (= *T. osborni* Eigenmann 1905; *T. wyandotte* Eigenmann, 1905; *T. eigenmanni* Hubbs, 1938) (Southern cavefish/ type in Corydon, IN (type locality destroyed) (new type? from Bowling Green, Warren Co.,KY) + c+seMO (OR & Ripley Cos.),cKY, nwGA (Dade Cos.), cTN (Decatur,Overton, Van Buren & Wayne Cos.), OK(Ottawa Co.), neAR (Stone, Fulton & Randolph Cos.), nAL(Colbert, De Kalb, Jackson, Lauderdale, Lawrence, Limestone, Madison, Marshall, Morgan Cos.)/ AL state T&E, KY Special Concern T&E, GA,TN & MO state T&E; IN T&E S1G3) /Tb)

**Bibl.:** Bechler 1975, 1976, 1981; Cooper 1971, 1974, 1980; Cooper & Beiter 1972; Frank 1984a; Mayden & Cros 1983; Green & Romero 1997; S. Jones & Taber 1985a; McNulty 1978; Mayden & Cross 1983; Orr 1934; Paige, Tumilson & McDaniel 1981; A. Schubert 1996; Schubert, Nielsen & Noltie 1993; Schubert & Noltie 1995; Simmons 1976; J.Cooper 1971, 1978

**fisher** - See **mammal, carnivore, mustelid.**

Fissipedia (terrestrial carnivores) – A suborder of the Carnivora (see **Mammal**)

**flatworm** – Refers to Phylum Platyhelminthes. See worms (**Turbellaria** (incl. planarians) & parasitic classes of **trematodes & tapeworms**)

## **Fleas**

**Insect** of order (or class) Siphonaptera (=Aphaniptera, Suctoria), Subclass Pterygota, Division Neoptera, Subdivision Endopterygota (=Holometabola), Section Panorpida, Subsection Anthophora, Superorder Antliophora. Usually endoparasites associated with mammals & nests. Flattened from side to side, flightless, eyes with 2 simple ocelli, antennae short and stout. Piercing or sucking. Larvae caterpillar like. Ecotoparasites; itch from bites from anti-blood clotting saliva.. From Lower Cretaceous. Males have the most complex genital armature of any

known animal. **Bibl.:**R. Eads 1950; R. Eads et al. 1979; Jameson 1985; R. Lewis 1993a-b, 1996; **Areas:** **CA:** Haas & Tomich 1983; **Canada:** Holland 1949; **East:** Benton 1980; Fox 1940; **FL:** Layne 1971; **KS:** El-Wailly 1960; **NA:** Ewing 1940; Ewing & Fox 1943; **IL:** Layne 1958; **NM:** Traub & Hoff 1951; **NV:** Nelson 1972; **West:** C. Hubbard 1947; **World:** Beaucournu, Suciú & Decu 1998; Hubbard 1947; **SW:** Augustson 1943; Incl. Suborders Suborder Fracticipita (broken-headed fleas) (also subsumed in Ceratophylloidea

## Superfamily Ceratophylloidea

### Ceratophyllidae

#### Subfamily Ceratophyllinae

(*Aetheca*, *Amalareus*, *Amaradix*, *Ceratophyllus*, *Eumolpianus*, *Jellisonia*, *Malaraeus*, *Megabothris*, *Monopsyllus* *Nosopsyllus*, *Odontopsyllus*, *Opisodasys*, *Orchopeas*, *Oropsylla*, *Thrassis*, *Traubella*)

#### Subfamily Dactylopsyllinae (*Foxella*)

### Ctenophthalmidae (also put in Hystrichopsylloidea) (also subsumed in Hystrichopsyllidae)

#### Subfamily Anomiopsyllinae

##### Tribe Anomiopsyllini

(*Anomiopsyllus*, *Callistopsyllus*, *Megarhroglossus*, *Stenistomera*)

#### Subfamily Ctenophthalminae

##### Tribe Ctenophthalmini (*Ctenophthalmus*)

##### Tribe Neotyphloceratini (*Carteretta*)

#### Subfamily Neopsyllinae

##### Tribe Phalacropsyllini (*Catallagia*, *Delotelis*, *Epitedia*, *Meringis*, *Phalacropsylla*)

#### Subfamily Rhadinopsyllinae

##### Tribe Rhadinopsyllini (*Rhadinopsylla*)

### Hystrichopsyllidae (also put in Hystrichopsylloidea) (hystrochopsyllid fleas)

#### Subfamily Hystrichopsyllinae

##### Tribe Hystrichopsyllini (*Atyphloceras*, *Conorhinopsylla*, *Hystrichopsylla*)

### Ischnopsyllidae (bat fleas)

#### Subfamily Ischnopsyllinae

##### Tribe Nycteridopsyllini (*Nycteridopsylla*)

##### Tribe Sternopsyllini (*Hormopsylla*, *Ptilopsylla*, *Sternopsylla*)

### Leptopsyllidae (leptopsyllid fleas)

#### Subfamily Amphipsyllinae

##### Tribe Amphipsyllini (*Ctenophyllus*)

##### Tribe Leptopsyllini (*Peromyscopsylla*)

Rhopalopsyllidae (marsupial or rodent fleas)  
Subfamily Rhopalopsyllinae (*Polygenis*)

Superfamily Hystrichopsylloidea (also subsumed in Ceratophylloidea)  
Ctenophthalmidae  
Hystrichopsyllidae

Suborder Integricipita (=Pulicoidea) (unbroken-headed fleas)  
Superfamily Pulicoidea  
Pulicidae pulicid or common fleas)

Subfamily Pulicinae  
Tribe Archaeopsyllini (*Ctenocephalides*)

Tribe Pulicini (*Echidnophaga*, *Pulex*)  
Tribe Spilopsyllini (*Euhoplopsyllus*, *Hoplopsyllus*, *Spilopsyllus*)

Subfamily Tunginae  
Tribe Hectopsyllini (*Rhynchopsyllus*)

Tungidae(subsumed in Pulicidae)

**CERATOPHYLLIDAE** Dampf 1908 (ceratophyllid or rodent fleas)

Subfamily Ceratophyllinae (*Aetheca*, *Amalareus*, *Amaradix*, *Ceratophyllus*, *Eumolpianus*,  
*Jellisonia*, *Malaraeus*, *Megabothris*,  
*Monopsyllus* *Nosopsyllus*, *Odontopsyllus*, *Opisodasys*, *Orchopeas*, *Oropsylla*, *Thrassis*,  
*Traubella*)

Subfamily Dactylopsyllinae (*Foxella*)

**CTENOPHTHALMIDAE** Rothschild, 1915 (also subsumed in Hystrichopsyllidae)

Subfamily Anomiopsyllinae  
Tribe Anomiopsyllini (*Anomiopsyllus*, *Callistopsyllus*, *Megarhroglossus*, *Stenistomera* )

Subfamily Ctenophthalminae  
Tribe Ctenophthalmini (*Ctenophthalmus*)  
Tribe Neotyphloceratini (*Carteretta*)

Subfamily Neopsyllinae  
Tribe Phalacropsyllini (*Catallagia*, *Delotelis*, *Epitedia*, *Meringis*, *Phalacropsylla*)

Subfamily Rhadinopsyllinae  
Tribe Rhadinopsyllini (*Rhadinopsylla*)

**DOLICHOPSYLLIDAE** (subsumed in Leptopsyllidae);

**HECTOPSYLLIDAE** (*Rhynchopsyllus* - in Pulicidae fleas, Tunginae, Tribe Hectopsyllini )

**HYSTRICHOPSYLLIDAE** Tiraboschi, 1904 (hystrochopsyllid fleas)

Subfamily Hystrichopsyllinae

Tribe Hystrichopsyllini (*Atyphloceras*, *Conorhinopsylla*, *Hystrichopsylla*)

**ISCHNOPSYLLIDAE** Tiraboschi, 1904 (bat fleas) **Bibl.:** Jameson 1985

Subfamily Ischnopsyllinae

Tribe Nycteridopsyllini (*Nycteridopsylla*)

Tribe Sternopsyllini (*Hormopsylla*, *Ptilopsylla*, *Sternopsylla*)

**LEPTOPSYLLIDAE** Baker, 1936 (leptopsyllid fleas)

Subfamily Amphipsyllinae

Tribe Amphipsyllini (*Ctenophyllus*)

Tribe Leptopsyllini (*Peromyscopsylla*)

**PULICIDAE** Billberg, 1820 (pulicid or common fleas)

Subfamily Pulicinae

Tribe Archaeopsyllini (*Ctenocephalides*)

Tribe Pulicini (*Echidnophaga*, *Pulex*)

Tribe Spilopsyllini (*Euhoplopsyllus*, *Hopllopsyllus*, *Spilopsyllus*)

Subfamily Tunginae

Tribe Hectopsyllini (*Rhynchopsyllus*)

**RHOPALOPSYLLIDAE** (marsupial or rodent fleas)

Subfamily Rhopalopsyllinae (*Polygenis*)

TUNGIDAE (subsumed in Pulicidae) (jiggers & sticktight) in superfamily Pulicoidea

**Aetheca** Smith, 1983 - Ceratophyllidae fleas, Subfamily Ceratophyllinae (2 species in US or Canada)

**Aetheca** *wagneri* (*Ceratophyllus w.* Baker, 1904; *C. peromyscia* Stewart, 1928; *C. systaltus* & *ophidius* Jordan, 1929; *Monopsyllus kylei* Hubbard, 1949; *M.w.*) (ectoparasite on AB, CO, ID, ND, NM, OR, SD, UT *Neotoma cinerea*, NM *Neotoma micropus*; NW *Neotoma fuscipes*; BC *Neotoma*; NV *Neotoma* & OR *Neotoma lepida* woodrats),

**Amalareus** Ioff, 1936 - Ceratophyllidae fleas, Subfamily Ceratophyllinae (2 species in US or Canada)

**Amalareus** *d. dissimilis* Jordan, 1938 (ectoparasite on BC *Neotoma cinerea* woodrat)

**Amaradix** Smith, 1983 - Ceratophyllidae fleas, Subfamily Ceratophyllinae (3 species in US or Canada)

**Amaradix** *b. bitterrootensis* (= *Ceratophyllus b.* Dunn, 1923; *C. isus* Jordan, 1925; *Malareus b.*) (parasite on CA, CO, ID, MT, OR, UT, WA, WY *Neotoma cinerea* woodrats)

**Amaradix** *euphorbi* (*Ceratophyllus euphorbae* Rothchild, 1905; *Malareus euphorbi*) (ectoparasite *Neotoma mexicana*; UT, WY *Neotoma lepida* & CO, OR *Neotoma cinerea* woodrats)

**Amaradix** *vonfintelis* Prince, 1959 (*A. bitterrootensis* v.) (ectoparasite on NM *Neotoma cinerea* woodrat),

**Anomiopsyllus** Baker, 1905 (parasite on CA *Neotoma cinerea*) Ctenophthalmidae fleas, Subfamily Anomiopsyllinae, Tribe Anomiopsyllini (once subsumed in Hystrichopsyllidae) (9 species in US or Canada)

**Anomiopsyllus** *amphibolus* Wagner, 1936 (ectoparasite on ID, NV, OR, UT, WY *Neotoma cinerea*, AZ, NV, UT *N. albigula*, *fuscipes*, AZ, NV, UT, WY *Neotoma lepida* & UT *Neotoma desertorum*, woodrats)

**Anomiopsyllus** *falcicalifornicus* Fox, 1929 (ectoparasite on OR *Neotoma cinerea* & *fuscipes* & CA *Neotoma* woodrats)

**Anomiopsyllus** *falcicalifornicus congruens* (*A. c.* Stewart 1940) Hopkins, 1952 (ectoparasite on CA *Neotoma fuscipes macrotis* woodrats)

**Anomiopsyllus** *falcicalifornicus f.* (*A. californicus* Fox, 1926) (ectoparasite on CA *Neotoma fuscipes* woodrats)

**Anomiopsyllus** *hiemalis hiemalis* Eads & Menzies, 1948 (ectoparasite on OK, TX *Neotoma micropus* woodrats)

**Anomiopsyllus** *martini* Holland, 1965 (= *A. princei* Barnes, 1965) (NM *Neotoma c.* woodrat nest)

**Anomiopsyllus** *montanus* Collins, 1936 (ectoparasite on AB, MT *Neotoma cinerea* woodrat)

**Anomiopsyllus** *nidiophilus* Tipton & Mendez, 1968 (ectoparasite on CA *Neotoma albigula* & *Neotoma lepida* woodrats)

**Anomiopsyllus** *novomexicanensis* Williams and Hoff, 1951 (on NM *Neotoma micropus canescens* & AZ *Neotoma lepida* woodrats)

**Anomiopsyllus** *nudatus hiemalis* (A.h. Eads & Menzies, 1948) Barnes, Tipton & Wilde, 1977 (ectoparasite on AZ, CO, NM, TX *Neotoma albigula*, CA *Neotoma fuscipes macrotis* & *N. lepida intermedia*, TX *Neotoma micropus*, *floridana* & *mexicana*; & OK, KS *N. micropus* woodrats)

**Anomiopsyllus** *nudatus mexicanus* (*A. hiemalis m.* Holland, 1965) Barnes, Tipton & Wilde, 1977 (on AZ *Neotoma lepida*, *mexicana*, *micropus*, *albigula* & *cinerea* & UT *Neotoma* woodrats)



**Anomiopsyllus** *n. nudatus* (*Typhlopsylla n.* Baker, 1898; *A. californicus* Baker, 1904; *A. mexicanus* Holland, 1965 (= *A. nudatus mexicanus*)) ectoparasite on AZ, CO, MT, UT, WY *Neotoma cinerea*, AZ *Neotoma albigula*, *fuscipes*, *mexicana* & *lepida*; on CA *Neotoma*; in AB *Neotoma* nest)

**Anomiopsyllus** *walkeri* Barnes, 1965 (on CA *Neotoma fuscipes* woodrats)

*Aptilopsylla* Ewing, 1940 - Ischnopsyllidae fleas

*Aptilopsylla carlsbadensis* Ewing, 1940 = *Sternopsylla d.*

**Atyphloceras** Jordan & Rothschild, 1915 (= *Saphiopsylla* J., 1931) Hystrichopsyllidae fleas, Subfamily Hystrichopsyllinae, Tribe Hystrichopsyllini (4 species in US or Canada)

**Atyphloceras** *echis echis* Jordan & Rothschild, 1915 (Tx in rodent nests (likely from *Neotoma* woodrats) in Twin Dig Pit, Travis Co., TX; ectoparasite on AZ, NM, NV, UT *Neotoma* woodrats),

**Atyphloceras** *felix* Jordan, 1933 (ectoparasite on CA *Neotoma fuscipes macrotis* and *N. lepida intermedia* & *N.l. gilva* woodrats)

**Atyphloceras** *longipalpus* (*A. echis l.* Stewart, 1940) (ectoparasite on *Neotoma fuscipes*; KS *Neotoma floridana osagensis* & CA coastal belt *Neotoma lepida gilva* & *N. lepida intermedia* woodrats)

**Atyphloceras** *multidentatus* (*Ceratophyllus m.* Fox, 1909; *A. felix* & *artius* Jordan, 1933) (ectoparasite on nCA, OR, UT *Neotoma cinerea* & OR *Neotoma fuscipes*)

**Callistopsyllus** Jordan & Rothschild, 1915 - Ctenophthalmidae fleas, Subfamily Anomiopsyllinae, Tribe Anomiopsyllini (once subsumed in Hystrichopsyllidae) (3 species in US or Canada)

**Callistopsyllus** *t. terinus* Rothschild, 1905 (ectoparasite on ID, OR *Neotoma cinerea* woodrat),

**Carteretta** Fox, 1927 - Subfamily Ctenophthalminae, Tribe Neotyphloceratini (2 species in US or Canada)

**Carteretta** *carteri* Fox, 1927 (ectoparasite on CA *Neotoma fuscipes* woodrats),

**Catallagia** R. 1915 (also put in Hystrichopsyllidae) Ctenophthalmidae fleas, Subfamily Neopsyllinae, Tribe Phalacroscyllini (14 species in US or Canada)

**Catallagia** *chamberlini* Hubbard, 1940 (ectoparasite on AB, BC, OR *Neotoma cinerea* woodrats)

**Catallagia** *charlottensis* (*Typhlopsylla c.* Baker, 1898; *C. motei* Hubbard, 1940) (ectoparasite on AB, BC, CO, WA *Neotoma cinerea* woodrat),

**Catallagia** *decipiens* Rothschild, 1915 (ectoparasite on AB, BC, CO, Manitoba, MT, NM, OR, SK, YT *Neotoma cinerea* woodrats (in nest in UT),

**Catallagia** *jellisoni* Holland, 1954 (ectoparasite on AB, BC, YT *Neotoma cinerea* & BC *Neotoma occidentalis* woodrats)

**Catallagia** *mathesoni* Jameson, 1950 (on BC, CA *Neotoma cinerea* woodrats)

**Catallagia** *sculleni* Hubbard, 1940 (= *C. vonbloekeri* Augustson, 1941) (on CA, OR *Neotoma cinerea*; on CA *Peromyscus maniculatus* & *crinitus*),

**Catallagia** *sculleni* s. (ectoparasite on BC, CA, OR *Neotoma cinerea* woodrats),  
*Catallagia sculleni chamberlini* = *C. chamberlini*

**Catallagia** undet.sp. (ectoparasite on WA, Tx CA *Neotoma cinerea* woodrats)

**Ceratophyllus** Curtis, 1831 (= *Ctenopsyllus* Kolenati, 1856 (emend.)) Ceratophyllidae fleas, Subfamily Ceratophyllinae (18 species in US or Canada)

*Ceratophyllus agilia* = *Orchopeas agilis*

**Ceratophyllus** *canadensis* = *Nosopsyllus* (*N*) *fasciatus* (ectoparasite on CO *Neotoma cinerea* *orolestes* woodrats)

**Ceratophyllus** *celsus* Jordan, 1926 (TTx parasite on NV, TX *Petrochelidon pyrrhonota* & TX TTX on TX *P. fulva* swallow)

**Ceratophyllus** *ciliatus* Baker, 1904 (= *Monopsyllus* *c.*) (Tx on *Neotoma* in OR, WA; on CA *Neotoma* woodrats)

**Ceratophyllus** *ciliatus protinus* (*M.c.p.* Jordan, 1929) (ectoparasite on OR *Neotoma cinerea* woodrat),

**Ceratophyllus** *coahuilensis* Eads, 1956 (TTx on TX *Petrochelidon fulva* cliff swallow),

**Ceratophyllus** *petrochelidoni* Wagner, 1936 (parasite on NV TTx *Petrochelidon pyrrhonota* swallow)

*Ceratophyllus terribilis* = *Ctenophyllus armatus*

**Ceratophyllus** undet. sp. or species (Tp or Tx in NM, TX)

**Conorhinopsylla** Stewart, 1930 - Hystrichopsyllidae fleas, Subfamily Hystrichopsyllinae, Tribe Hystrichopsyllini (2 species in US or Canada)

**Conorhinopsylla** *nidicola* Jellison, 1945 (ectoparasite on KS, OK, MO *Neotoma* woodrats)

**Ctenocephalides** *Stiles & Collins, 1930* (*Ctenocephalus* Kolenati, 1957 (homo.) Pulicidae fleas, Subfamily Pulicinae, Tribe Archaeopsyllini (13 species in US or Canada)

**Ctenocephalides** *felis* (*Pulex f.* Bouche, 1835; *P. Canis* Duges, 1832 (homo.); *P. serraticeps* Gervais, 1844; *Ctenocephalus enneodus* K.1859; *P. cati* Megnin, 1880; *Ceratophyllus rufulus*; *P. Nasuae*, *P. obscurus*, *concoloris* Weyenbergh, 1881; *Ctenocephalus murina* Tiraboschi, 1904; *C. musculus* Sugimoto, 1933) (Tx in cave in Hays Co., TX)

**Ctenophthalmus** Kolenati, 1856 - Ctenophthalmidae fleas, Subfamily Ctenophthalminae, Tribe Ctenophthalmini (1 species in US or Canada)

**Ctenophthalmus** *pseudagyrtes* Baker, 1904 (ectoparasite on *Neotoma pennsylvanicus* & IN *Neotoma floridana* woodrats & in cave in Walker Co., GA)

**Ctenophyllus** Wagner, 1927 - Leptopsyllidae fleas, Subfamily Amphipsyllinae, Tribe Amphipsyllini (1 species in US or Canada)

**Ctenophyllus** *armatus* (*Ceratophyllus a.* Wagner, 1901 & *terribilis* Rothschild, 1903 & *rigidus* Darskaya, 1949) (on CO *Neotoma cinerea orolestis* woodrat)

**Delotelis** Jordan, 1937 (also put in Hystrichopsyllidae) Ctenophthalmidae fleas, Subfamily Neopsyllinae, Tribe Phalacropsyllini (2 species in US or Canada)

**Delotelis** *telegoni* (*Ceratophyllus t.* Rothschild, 1905) (WA parasite),

**Echidnophaga** Oliff, 1886 (= *Argopsylla* Enderlein, 1903; *Xestopsylla* Baker, 1904) Pulicidae fleas, Subfamily Pulicinae, Tribe Pulicini (21 species in US or Canada)

**Echidnophaga** *gallinacea* (*Sarcopsyllus gallinaceus* Westwood, 1875; *Pulex pullulorum* Johnson, 1890; *Sarconpsylla erinacea* Weiss, 1911) (TTx on TX vulture; ectoparasite on NM *Neotoma micropus* & CA *Neotoma* woodrats)

**Epitedia** Jordan, 1928 - Ctenophthalmidae fleas, Subfamily Neopsyllinae, Tribe Phalacropsyllini (7 species in US or Canada)

**Epitedia** *cavernicola* Traub, 1957 (type locality in cave in Alleghany Co., VA/ ectoparasite on *Neotoma floridana* woodrats in caves (mostly) or rock crevices in AL (Tx), IN (Tx), KY, NY?, PA, TN (Tx?), VA (Tx), WV (Tx))

**Epitedia** *neotomae* Jameson, 1946 (ectoparasite on KS, OK, MO *Neotoma* woodrats)

**Epitedia** *stanfordi* Traub, 1944 (ectoparasite on BC *Neotoma cinerea* & UT, WY *Neotoma lepida* woodrats)

**Epitedia** *wenmanni testor* (Neopsylla t. Rothschild, 1915; E. t. I. Fox, 1940) Benton, 1955  
ectoparasite on KS, OK *Neotoma floridana osagensis* & GA, KY (Tx in Mammoth C.) *Neotoma floridana* woodrats)

**Epitedia** *wenmanni w.* (*Ctenophthalmus w.* Rothschild, 1904; *Neopsylla testor* R.1915; *N. similis* Chapin, 1919)) (ectoparasite on AB, BC, CO, KS, ID, Manitoba, NB, NF, NS, NWT, ON, PQ, SK, YT *Neotoma cinerea* woodrats)

**Euhoplosyllus** Ewing, 1924 - Pulicidae fleas, Subfamily Pulicinae, Tribe Spilopsyllini (2 species in US or Canada)

**Euhoplosyllus** *affinis* (*Pulex a.* Baker, 1904) (= *Pulex glacialis affinis*) (ectoparasite on NM *Neotoma micropus* woodrats)

**Eumolpianus** Smit, 1983 - Ceratophyllidae fleas, Subfamily Ceratophyllinae (6 species in US or Canada)

**Eumolpianus** *cyrturus* Jordan, 1929 (= *E. emolpi c.*) (ectoparasite on OR *Neotoma cinerea* woodrat),

**Eumolpianus** *eumolpi cyrturus* (*Monopsyllus e. c.* Jordan, 1929) (ectoparasite on OR *Neotoma cinerea* & UT, WY *Neotoma lepida* woodrats)

**Eumolpianus** *eumolpi e.* (*Ceratophyllus e.* Rothschild, 1905; *Monopsyllus canadensis*, *charlestonensis* Hubbard, 1950; *M.e.*) (ectoparasite on BC, OR *Neotoma cinerea* & NW *Neotoma fuscipes* woodrats)

**Foxella** Wagner, 1929 - Ceratophyllidae fleas, Subfamily Dactylopsyllinae (18 species in US or Canada)

**Foxella** *ignota* (*Pulex ignotus* Baker, 1895) (ectoparasite on OR *Neotoma cinerea* woodrats)

**Foxella** *ignota recula* Jordan & Rothchild, 1905) (ectoparasite on OR *Neotoma cinerea* woodrats)

**Foxella** *longa* (not a valid species) (ectoparasite on OR *Neotoma cinerea* woodrat)

**Hoplopsyllus** Baker, 1905 - Pulicidae fleas, Subfamily Pulicinae, Tribe Spilopsyllini (1 species in SW)

**Hoplopsyllus** (*Hoplopsyllus*) *anomalus* (*Pulex a.* Rothschild, 1905) Ewing & Fox, 1943  
(ectoparasite on UT *Neotoma cinerea* & NM *Neotoma* woodrats)

**Hormopsylla** Jordan and Rothschild, 1921 - Ischnopsyllidae fleas, Subfamily Ischnopsyllinae, Tribe Sternosyllini (1 species in US or Canada)

**Hormopsylla** *trux* Jordan, 1950 (Peru, Mex./ectoparasite on TX *Eumops perotis* (Tx) & *Nyctinomops macrotis* bats)

**Hystrichopsylla** Taschenberg, 1880 - Hystrichopsyllidae fleas, Subfamily Hystrichopsyllinae, Tribe Hystrichopsyllini (11 species in US or Canada)

**Hystrichopsylla** *dippiei* Rothschild, 1902 (= *H. gigas dippiei*) (ectoparasite on WA, OR, CA, NM *Neotoma cinerea* & CO *Neotoma fuscipes* woodrats/ woodrat flea/Tx? in WA)

**Hystrichopsylla** *dippiei neotomae* Holland, 1957 (ectoparasite on CA *Neotoma fuscipes* woodrats)

**Hystrichopsylla** *dippiei spinata* (H.s. Holland, 1949) (epigean in BC/ on woodrat in 2 WA caves)

**Hystrichopsylla** *dippiei truncata* Holland, 1957 (CO *Neotoma cinerea* parasite/woodrat flea; in CA non-cave *Neotoma fuscipes* woodrat nest)

**Hystrichopsylla** *linsdalei* Holland, 1957 (ectoparasite on UT (poss. Tx) *Neotoma cinerea* woodrat)

**Hystrichopsylla** *occidentalis* Holland, 1941 (WA parasite) Hystrichopsyllidae fleas

**Hystrichopsylla** *occidentalis sylvaticus* Campos & Stark, 1979 (ectoparasite on BC (Tx) mammal, UT (poss. Tx) *Neotoma cinerea* woodrat; Ttx ectoparasite on poss. *Peromyscus* mouse)

**Jellisonia** Traub, 1944 (*Pleochaetoides* Augustson, 1944) - Ceratophyllidae fleas, Subfamily Ceratophyllinae (2 species in US or Canada)

**Jellisonia** *bullisi* (P.b. Augustson, 1944) Tx in cave in Kerr Co., TX)

**Malaraeus** Jordan, 1933 (= *Trichopsylla* Ewing & Fox, 1943) - Ceratophyllidae fleas, Subfamily Ceratophyllinae (8 species in US or Canada)

*Malaraeus bitterrootensis* = *Amaradix b.*

*Malaraeus euphorbi* = *Amaradix e.*

**Malaraeus** *sinomus* Jordan, 1925 (parasite on UT, WA *Neotoma cinerea* woodrats)

**Malaraeus** *telchinum* (= *Ceratophyllus t.* Rothschild, 1905) (parasite on BC, CA, ID, MT, NM, OR, WA *Neotoma cinerea* & CA *Neotoma fuscipes macrotis* & *N.f. intermedia* woodrats)

**Megabothris** Jordan, 1933 - Ceratophyllidae fleas, Subfamily Ceratophyllinae (11 species in US or Canada)

**Megabothris** *abantis* (*Ceratophyllus a.* Rothschild, 1905) (ectoparasite on BC, ID, MT *Neotoma cinerea* & CA *N. fuscipes macrotis* & *N. lepida intermedia* woodrats)

**Megabothris quirini** (*Ceratophyllus q.* Rothschild, 1905) (ectoparasite on AB, BC, Manitoba, ON, NS, NWT, PQ, SK, YT *Neotoma cinerea* woodrats)

**Megarhroglossus** Jordan & Rothschild, 1915 - Ctenophthalmidae fleas, Subfamily Anomiopsyllinae, Tribe Anomiopsyllini (once subsumed in Hystrichopsyllidae) (13 species in US or Canada)

**Megarhroglossus becki** Tipton & Allred, 1952 (type locality in Buckley's Mine, Utah Co., UT, from *Neotoma cinerea* nest/ ectoparasite on UT *Neotoma cinerea* woodrats)

**Megarhroglossus bisetus** Jordan & Rothchild, 1915 (type locality in Buckley's Mine near Provo, Utah/ ectoparasite on UT *Neotoma cinerea acraia* & NM *Neotoma cinerea* & *Neotoma micropus* woodrats)

**Megarhroglossus cavernicolus** Mendez & Haas, 1972 (Type locality in cave in South Mt., Jemex Mts., Sandoval Co., NM/ Tx ectoparasite on NM *Neotoma cinerea* woodrats)

**Megarhroglossus divisus divisus** (*Pulex divisus* Baker, 1898; *Ceratophyllus d.* C.Fox, 1914) Jellison & Good, 1915 (ectoparasite on AB, BC, ID, MB, MT, NM, OR, UT, WY *Neotoma cinerea* & NM *Neotoma albigula* woodrats)

**Megarhroglossus divisus exsecatus** (*M.e.* Wagner, 1936) (ectoparasite on BC *Neotoma cinerea* & CO *Neotoma mexicana* woodrats)

**Megarhroglossus jamesoni** Smit, 1953 (ectoparasite on CA, NV, UT *Neotoma cinerea* woodrats)

**Megarhroglossus procus p.** Jordan & Rothschild, 1917 (ectoparasite on BC, OR, UT *Neotoma cinerea* woodrats)

**Megarhroglossus procus oregonensis** Hubbard, 1946 (ectoparasite on OR *Neotoma cinerea* woodrats)

**Megarhroglossus pygmaeus** Wagner, 1936 (ectoparasite on BC *Neotoma* woodrats)

**Megarhroglossus sicamus** Jordan & Rothschild, 1915 (ectoparasite on BC, UT *Neotoma cinerea* woodrats)

**Megarhroglossus similis** Wagner, 1936 (ectoparasite on BC *Neotoma* woodrats)

**Megarhroglossus smiti** Mendez, 1956 (ectoparasite on UT *Neotoma cinerea* & *N. lepida* woodrats)

**Megarhroglossus** undet. sp. (ectoparasite on CA (Tx) *Neotoma cinerea* woodrats & *Peromyscus maniculatus* mice)

**Megarhroglossus** undescr. sp.(ectoparasite on UT, WY *Neotoma lepida* woodrats)

*Megarthroglossus spenceri* Wagner, 1936 (ectoparasite on BC, CA, OR, UT *Neotoma cinerea* woodrat)

*Megarthroglossus weaveri* Eads & Campos 1977 (ectoparasite on CO *Neotoma mexicana* woodrats)

*Megarthroglossus wilsoni* Mendez & Haas, 1973 (ectoparasite on CO *Neotoma mexicana* woodrats)

*Meringis* Jordan, 1937 (= *Atheropsylla* Stewart, 1940) Ctenophthalmidae fleas, Subfamily Neopsyllinae, Tribe Phalacropsyllini (17 species in US or Canada)

*Meringis arachis* (*Phalacropsylla* a. Jordan, 1929) Jordan, 1937 (ectoparasite on AZ *Neotoma lepida harteri* woodrats)

*Meringis bilsingi* Eads & Menzies, 1949 (ectoparasite on NM *Neotoma micropus* woodrats)

*Meringis dipodomys* Kohls, 1938 (ectoparasite on NM *Neotoma micropus* woodrats)

*Meringis hubbardi* Kohls, 1938 (ectoparasite on NW *Neotoma fuscipes* woodrats)

*Meringis jamesoni* Hubbard, 1943 (ectoparasite on UT, WY *Neotoma lepida* woodrats)

*Meringis parkeri* Jordan, 1937 (ectoparasite on OR *Neotoma cinerea* & TX *Neotoma micropus* woodrats)

*Meringis rectus* Morlan, 1953 (ectoparasite on NM *Neotoma micropus* woodrats)

*Meringis shannoni* (*Phalacropsylla* s. Jordan, 1929) (ectoparasite on Tx WA *Neotoma cinerea* woodrats)

*Monopsyllus ciliatus* = *Ceratophyllus* c.

*Monopsyllus eumolpi* = *Eumolpianus* e.

*Monopsyllus wagneri* = *Aetheca* w.

*Myodopsylla* Jordan & Rothschild, 1911 (= *Myodopsylloides* Augustson, 1941) - Ischnopsyllidae fleas, Subfamily Ischnopsyllinae (6 species in US or Canada)

*Myodopsylla borealis* Lewis, 1978 (ectoparasite on MN, KY *Myotis* & BC, IL, MT, NW *Eptesicus fuscus* bats)

*Myodopsylla collinsi* Kohls, 1937 (*M. diasi* Costa Lima, 1938) (ectoparasite on OK (Tx) *Corynorhinus townsendii*, AZ *Idionycteris phyllotis* (one bat) & *Tadarida mexicana* (one bats), AZ (Tx) *Myotis californicus*; AZ (Tx), CA, KS, OK, TX *Myotis velifer*; AZ (Tx), Mex., OK, TX, *Eptesicus fuscus*; CA, TX *Antrozous pallidus*; CA, wTX *Myotis yumanensis*; KS *Myotis grisescens*, CA *M. lucifugus*, & AZ (Tx), ID, KS, NV, TX *Myotis thysanodes* & *Eptesicus fuscus* bats),

*Myodopsylla crosbyi* (*Ceratopsyllus* c. Baker, 1905) (OK to South America/ ectoparasite on OK *Myotis velifer*, *Pipistrellus subflavus* (rare) & *Corynorhinus townsendii*, NW *Macrotis californicus*, CA *Myotis yumanensis* & IN *Myotis lucifugus* bats)

***Myodopsylla gentilis*** Jordan & Rothschild, 1921 (ectoparasite on *Leptonycteris nivalis*, AB, BC, CA, MT, ON, OR, PQ *Myotis lucifugus*, BC *Myotis leibii*, CA *M. l. occultus*; BC, SD, NW *Myotis volans*, OK (Tx) *Myotis velifer* (rare), WA *Corynorhinus rafinesquii*, *Eptesicus fuscus*, *Myotis californicus*, CA, WA *Myotis evotis*; NW, wTX *Lasionycteris noctivagans*, CA, wTX *Tadarida brasiliensis*, BC, CA, OR, wTX *Myotis yumanensis*; CA *Myotis thysanodes*, CA, TX *Antrozous pallidus*, *Nyctinomops macrotis* & *Mormoops megalophylla* bats & NW *Neotoma fuscipes* woodrats)

***Myodopsylla insignis*** (*Ceratopsylla i.* Rothschild, 1903; *M. subulata* Chapin, 1919; *Ceratopsyllus crosbyi* Baker, 1905) (ectoparasite on AB, BC, IA, IL, IN (Tx), KY (Tx in Mammoth C.), MA, MD, MI, MN, MO, NB, ND, NY, OH, ON, PA, PEI, PQ, SK, TX(Tx), VT, YT *Myotis lucifugus*, AB, KS, NS, OH, ON, PQ, YT *Eptesicus fuscus*, CT, NY *Myotis subulatus*; AB, BC, ON, SK *Myotis septentrionalis*, BC *M. volans*; IN *Myotis grisescens*; KS, OK (Tx) *Myotis velifer* & IN, OK (rare) *M. sodalis* bats; in buildings in much of E; likely Tx in AB, BC, CO, SK, Yukon; ectoparasite on KY (Tx in Mammoth C.) *Neotoma* woodrats) **Bibl.:** Smith & Clay 1985

***Myodopsylla nordina*** Traub & Hoff, 1951 (Tx in CA, CO, NV)

***Myodopsylla palposa*** (*Ceratopsyllus p.* Rothschild, 1904; *Myodopsylloides piercei* Augustson, 1941) (ectoparasite on CA, BC, KS, Mex., MT, OK (Tx), NW, TX *Antrozous pallidus*; CA *Antrozous pallidus pacificus*, *Myotis yumanensis*, *M. thysanodes*, *Corynorhinus rafinesquii intermedius* & CA, BC *Eptesicus fuscus* bats)

***Myodopsylla piercei*** (*Myodopsylloides p.* Augustson, 1941) (not likely a valid species) (ectoparasite on CA *Antrozous pallidus* & *Corynorhinus rafinesquii intermedius* bats)

***Myodopsylla*** undet. sp. or species (ectoparasite on NM (Tx) & CA *Myotis californicus* bats; TX bat guano (Tx); ectoparasite and detritivore or fungivore on ON bat guano)

*Myodopsylla subulata* = *M. insignis*

*Myodopsylla sexdentatus pennsylvanicus* = *Orchopeas s.p.*

***Nosopsyllus*** Jordan, 1933 - Ceratophyllidae fleas, Subfamily Ceratophyllinae Tribe Sternosyllini (2 species in US or Canada)

***Nosopsyllus fasciatus*** (*Pulex f.* Bose, 1800) (ectoparasite on CO *Neotoma cinerea orolestis*; PA *Netoma* & CA *Neotoma* woodrats/ northern rat flea)

***Nycteridopsylla*** Oudemans, 1906 (= *Eptesopsylla* Fox, 1940; *Anepptesopsylla*, *Dinycteridopsylla*, *Hexanycteridopsylla* Ioff, 1953) (also put in Pulicidae) - Ischnopsyllidae fleas, Subfamily Ischnopsyllinae, Tribe Nycteridopsyllini (3 species in US or Canada)

***Nycteridopsylla chapini*** Jordan, 1929 (*Eptesopsylla c.* (Jordan, 1929)) (ectoparasite on on *Lasiurus borealis* (occasional), KY (Green Co. & Colossal Cave in Mammoth Cave Natl. Park)



*Myotis sodalis*, IN, KY, NY, OH, VA *Pipistrellus subflavus*, IN *M. lucifugus*, & *Lasionycteris noctivagans* & AR, DC, IN, KY, NY, MD, MO, OH, OK, WV, VA *Eptesicus fuscus* bats)

**Nycteridopsylla** *intermedia* Lewis & Wilson, 1982 (type locality cave in Brewster Co., TX/ ectoparasite on CO, TX *Corynorhinus townsendii* & UT *Euderma maculatum* bats; likely Tx in CO, NV)

**Nycteridopsylla** undet. sp. (ectoparasite on TN *Lasiurus borealis* bats)

**Nycteridopsylla** *vancouverensis* Wagner, 1936 (*Eptesicopsylla* v. (Wagner) Ewing & Fox, 1943) ectoparasite on BC, CA, OR, WA *Myotis californicus caurinus* & *M. californicus*, CO, CA *Corynorhinus townsendii pallescens*, CA *Eptesicus fuscus* & *Eumops perotis*, NV *Euderma maculatum*, OR *Myotis lucifugus* & BC, IL (rare) *Lasionycteris noctivagans* bats)

**Odontopsyllus** Baker, 1905 - Ceratophyllidae fleas, Subfamily Ceratophyllinae (2 species in US or Canada)

**Odontopsyllus** *dentatus* (*Ceratophyllus* d. Baker, 1904) (ectoparasite on CA *Neotoma fuscipes* woodrats)

**Opisodasys** Jordan, 1933 - Ceratophyllidae fleas, Subfamily Ceratophyllinae (6 species in US or Canada)

**Opisodasys** *keeni* (*Pulex* k. Baker, 1896) (ectoparasite on AB, BC, CA, UT, WA *Neotoma cinerea* & NW *Neotoma fuscipes* woodrats & NW *Antrozous pallidus* bats)

**Opisodasys** *nesiotus* Augustson, 1941 (ectoparasite on CA *Neotoma fuscipes macrotis* woodrats)

**Orchopeas** Jordan, 1933 (= *Bakerella* Wagner, 1930 (unav.)) - Ceratophyllidae fleas, Subfamily Ceratophyllinae (18 species in US or Canada)

**Orchopeas** *agilis* (*Ceratophyllus* a. Rothschild, 1905; *O. sexdentatus* a.) (ectoparasite on AB, BC, CA, CO, MT, OR, SD, UT, WA, WY, YC *Neotoma cinerea*, NW, WA *Neotoma cinerea* & UT. WY *Neotoma lepida* woodrats)

**Orchopeas** *caedens* c. (*Ceratophyllus* c. Jordan, 1925; *C. durus* Jordan, 1929) (ectoparasite on CA *Neotoma c.*; BC *Neotoma cinerea* & CA *Neotoma fuscipes macrotis* woodrats)

**Orchopeas** *howardi* (*Pulex* h. Baker, 1895) (= *O. h. h.*) (ectoparasite on GA *Neotoma floridana* & UT *Neotoma* woodrats)

**Orchopeas** *illinoiensis* Lewis, 1998 (ectoparasite on IL *Neotoma floridana* woodrats)

**Orchopeas** *leucopus* (*Ceratophyllus* l. Baker, 1904; *C. aeger* Rothschild, 1905)) (ectoparasite on MO (Tx) *Pipistrellus subflavus* bats & in sON & ectoparasite on UT, WY *Neotoma lepida* woodrats)

**Orchopeas** *nepos* Rothchild, 1904 (ectoparasite on OR *Neotoma cinerea*, UT *Neotoma* & NW *Neotoma cinerea* woodrats)

*Orchopeas sexdentatus agilis* = *O.a.*

**Orchopeas** *sexdentatus cascadenis* Jordan, 1929 (ectoparasite on CA, OR, WA *Neotoma cinerea* & NW *Neotoma fuscipes* woodrats & NW *Myotis californicus* & *Myotis yumanensis* bats)

**Orchopeas** *sexdentatus* ssp. *cascadenis* (= *O.c.* Jordan, 1939; *O. reevesi* Vargas, 1960) (ectoparasite on WA (Tx) & AB,MT,OR (all likely Tx or Ac) *Neotoma cinerea* woodrats)

**Orchopeas** *sexdentatus nevadensis* Jordan, 1929 (ectoparasite on ID *Neotoma cinerea*, OR *Neotoma cinerea* & NW *Neotoma fuscipes* & *N. lepida* woodrats)

**Orchopeas** *sexdentatus intermedius* Hubbard, 1943 (ectoparasite on *Neotoma* woodrats)

**Orchopeas** *sexdentatus neotomae* Augustson, 1943 (= *O. a.*) (ectoparasite on NM *Neotoma cinerea* & *Neotoma micropus* & AZ *Neotoma* woodrats)

**Orchopeas** *sexdentatus nevadensis* Jordan, 1929 (ectoparasite on NV *Neotoma* woodrats)

**Orchopeas** *sexdentatus pennsylvanicus* Jordan, 1928 (= *Myoxopsylla s.p.* Wagner) (ectoparasite on PA, KS *Neotoma cinerea*, SC *Neotoma floridana* & PA *Neotoma magister* woodrats/ Tx or Ac in KY, WV; Tx or rock crevices in AL, GA,IL, KY, IN, MD, NY, PA, TN, VA)

**Orchopeas** *sexdentatus schisintus* (Jordan, 1929) (ectoparasite on CA *Neotoma albigula albigula* & AZ *Neotoma* woodrats)

**Orchopeas** *sexdentatus sexdentatus* (*O.s.* Baker, 1904) (ectoparasite on CA (Tx), CO, ID, NM, OR, SD, UT, WY *Neotoma cinerea*, CA, TX *Neotoma fuscipes*, CA *Neotoma fuscipes macrotis* AL, GA, IN, KY (Tx in Mammoth C.), MD, NY, PA *Neotoma floridana*; CA, OR, UT, WY *Neotoma lepida*; CA *Neotoma lepida lepida*, *N.l. gilva* & *N.l. intermedia* & OK *Neotoma micropus* woodrats; 1,200 years old in *Neotoma* woodrat nest, Ajo Mt., Pima Co, AZ)

**Orchopeas** undet. sp. or species (Tx in cave each in Kerr Co., TX & Crater Co., KY)

**Oropsylla** Wagner & Ioff, 1926 (= *A etheopsylla* Stewart & Holland, 1940) - Ceratophyllidae fleas, Subfamily Ceratophyllinae (5 species in US or Canada)

*Oropsylla* (*Thrassis*) *f.* = *Thrassis f.*

*Oropsylla* (*Thrassis*) *petiolata.* = *Thrassis p.*

**Oropsylla** *idahoensis* (*Ceratophyllus i.* Baker, 1904; *C. poeantis* Rothschild, 1905; *C. bertholffi* Fox, 1927) (ectoparasite on MT,OR *Neotoma cinerea* woodrat),

**Oropsylla** *labis* (*Ceratophyllus l.* Jordan & Rothschild, 1922; *Opisocrostis l.*) (ectoparasite on CO *Neotoma cinerea* woodrat),

**Oropsylla** *montana* (= *Pulex montanus* Baker, 1895, *Ceratophyllus acutus* Baker, 1904; *C. mandarinus* J.&R., 1911; *Diamanus hopkinsi* Vargas, 1955; *Diamanus m.*) (CA/ground squirrel flea/ ectoparasite on CA, CO, OR, UT *Neotoma cinerea* & CA. *N. fuscipes macrotis* woodrats),

**Oropsylla** (*Diamanus*) *tuberculata* (*Ceratophyllus tuberculatus* Baker, 1904; *O. ornatus* Fox, 1940; O.t.) (ectoparasite on WA *Neotoma cinerea* woodrats)

**Peromyscopsylla** Fox, 1939 (also put in Ceratophyllidae) - Leptopsyllidae fleas, Subfamily Amphipsyllinae, Tribe Leptopsyllini (12 species in US or Canada)

**Peromyscopsylla** *ebrighti* C. Fox, 1925 (ectoparasite on CA *Neotoma* woodrats)

**Peromyscopsylla** *hamifer* Rothschild, 1906

**Peromyscopsylla** *hamifer vigenis* Jordan, 1937 (ectoparasite in MT *Neotoma cinerea* woodrat nest),

**Peromyscopsylla** *hesperomys* (*Ctenopsyllus h.* Baker, 1904; *P. spinifrons* Fox, 1939) (sON & parasite on *Peromyscus crinitus* & *maniculatus*; ectoparasite on ID, OR *Neotoma cinerea*, UT *Neotoma* & IN *Neotoma floridana* woodrats)

**Peromyscopsylla** *ravalliensis* (*Ctenopsyllus r.* Dunn, 1923) (ectoparasite on AB, BC, ID, MT, OR, UT *Neotoma cinerea* woodrats)

**Peromyscopsylla** *selenis* (*Ctenopsyllus s.* Rothschild, 1906; *P. duma* Traub, 1944) (parasite on *Peromyscus crinitus* & *maniculatus*)

**Phalacropsylla** Rothschild, 1915 - Ctenophthalmidae fleas, Subfamily Neopsyllinae, Tribe Phalacropsyllini

**Phalacropsylla** *allos* Wagner, 1936 (*P. monticola* Augustson, 1942) (ectoparasite on BC, CA (Tx), CO, ID, MT (Tx), NM, OR, UT (Tx), WY *Neotoma cinerea* woodrats)

**Phalacropsylla** *oregonensis* Lewis & Maser, 1978 (ectoparasite on OR *Neotoma lepida nevadensis* woodrats)

**Phalacropsylla** *paradisea* Rothschild, 1915 (ectoparasite on Mex., AZ *Neotoma* & NM *Neotoma mexicana* woodrats)

**Polygenis** Fox, 1914 - Rhopalopsyllidae, Subfamily Rhopalopsyllinae (2 species in US or Canada)

**Polygenis** *gwyni* Fox, 1914 (ectoparasite on NW *Neotoma micropus* & GA *Neotoma floridana* woodrats)

**Ptilopsylla** Jordan & Rothschild, 1923 - Ischnopsyllidae fleas, Subfamily Ischnopsyllinae, Tribe Sternosyllini

**Ptilopsylla** undet. sp. (Tx in Carlsbad C., Eddy Co., NM)

**Pulex** Linnaeus, 1758 - Pulicidae fleas, Subfamily Pulicinae, Tribe Pulicini (6 species in US or Canada)

**Pulex irritans** Linnaeus, 1758 (= *P. vulgaris* De Geer, 1778; *P. hominis* Duges, 1832; *P. conepati*, *bahiensis* Cunha, 1914; *P. fulva* Ioff, 1929; *P. orientalis* Kishida, 1939) (cosmopolitan epigeal/ human flea/ Tx in Culberson, Irion Cos., TX)

**Pulex simulans** Baker, 1895 (= *P. dugesii* B. 1899) (SE, NW, SW epigeal/ Tx prob. on goats or raccoons in TX (San Saba Co.))

**Pulex** undet. sp. (Tx in TX)

**Rhadinopsylla** Jordan & Rothschild, 1912 - Ctenophthalmidae fleas, Subfamily Rhadinopsyllinae, Tribe Rhadinopsyllini (12 species in US or Canada)

**Rhadinopsylla arborea** Smit, 1957 (ectoparasite on AB, BC *Neotoma cinerea* woodrats)

**Rhadinopsylla difficilis** Smit, 1957 (ectoparasite on BC *Neotoma cinerea* woodrats)

**Rhadinopsylla fraterna** (*Typhlopsylla f.* Baker, 1895; *Neopsylla hamiltoni* Dunn, 1923) (ectoparasite on AB, BC, MT, NM, SK *Neotoma cinerea* woodrat (in nest in UT))

**Rhadinopsylla goodi** (*Micropsylla g.* Hubbard, 1941; *R. sectilis g.*) (ectoparasite on OR *Neotoma cinerea* & *N. fuscipes* woodrats)

**Rhadinopsylla heiseri** (*Ctenophthalmus h.* McCoy, 1911) (ectoparasite on UT, WY *Neotoma lepida* woodrats)

**Rhadinopsylla linta** Smit, 1957 (ectoparasite on BC, NWT, YT *Neotoma cinerea* woodrats)

**Rhadinopsylla multidenticulatus** Morlan & Prince, 1954 (ectoparasite on NM *Neotoma micropus* woodrats)

**Rhadinopsylla orama** Smit, 1957 (ectoparasite on TN, VA *Neotoma magister* woodrats)  
*Rhadinopsylla sectilis goodi* = *R.g.*

**Rhadinopsylla** (*Micropsylla*) *sectilis s.* Jordan & Rothschild, 1923 (ectoparasite on BC, CA, ID, NM *Neotoma cinerea* & UT *Neotoma lepida* woodrats)

**Rhynchopsyllus** Haller, 1880 (= *Maxillopsylla* Schreiter & Shannon, 1927) (stick-tight fleas) Pulicidae fleas, Subfamily Tunginae, Tribe Hectopsyllini (also put in Hectopsyllidae) (1 species in US or Canada)

**Rhynchopsyllus pulex** Haller, 1880 (= *Maxillopsylla lilloi* Schreiter & Shannon, 1927; *R. megastigmata* Traub & Gammons, 1950) (sticktight flea) (ectoparasite on TX *Tadarida brasiliensis* (Tx in Frio Bat Cave), *Eumops perotis* & *Nyctinomops macrotis* (rare) bats)

**Spilopsyllus** Baker, 1905 (= *Cediopsylla* Jordan, 1925; *Acediopsylla* Ewing, 1940) Pulicidae fleas, Subfamily Pulicinae, Tribe Spilopsyllini (2 species in US or Canada)

**Spilopsyllus inaequalis** (*Pulex i.* Baker, 1895)

**Spilopsyllus inaequalis interrupta** Jordan, 1925 (ectoparasite on OR *Neotoma cinerea* woodrat & NW *Antrozous pallidus* bats),

**Stenistomera** Rothschild, 1915 (*Miochaeta* Good, 1942) Ctenophthalmidae fleas, Subfamily Anomiopsyllinae, Tribe Anomiopsyllini (once subsumed in Hystrichopsyllidae) (3 species in US or Canada)

**Stenistomera** (*Stenistomera*) *alpina* (*Typhlopsylla a.* Baker, 1895; *Delotelis mohavensis* Augustson, 1942) (ectoparasite on AB, CO, ID, MT, NM, OR, UT, WY *Neotoma cinerea*, NW *Neotoma fuscipes*, CO, NM *Neotoma mexicana* & *N. albigula* & AZ, CA, UT, WY *Neotoma lepida* woodrats (also in nest in AB,OR)),

**Stenistomera macrodactyla** Good, 1942 (= *Miochaeta (S.) m.*) (ectoparasite on UT, WY *Neotoma lepida* woodrats)

**Stenistomera mohavensis** (*Delotelis m.* Augustson, 1942) (may not be currently accepted species) (ectoparasite on CA *Neotoma lepida lepida* & ID *Neotoma cinerea* woodrats)

**Sternopsylla** Jordan & Rothschild, 1921 (= *Aptilopsylla* Ewing, 1940) Ischnopsyllidae fleas, Subfamily Ischnopsyllinae, Tribe Sternopsyllini (1 species in US or Canada)

**Sternopsylla distincta** (*Ceratopsylla d.* Rothschild, 1903)

**Sternopsylla distincta texana** (*Ischnopsyllus t.* C.Fox, 1914; *Aptilopsylla carlsbadensis* Ewing, 1940) (ectoparasite on OK (Tx) *Tadarida brasiliensis*, TX *Leptonycteris nivalis*, FL *Myotis austroriparius*, AZ *Antrozous pallidus*, CA, SW *Eumops perotis californicus* & CA, GA, KS, NM, NV, OK, SC, TX, UT *Tadarida brasiliensis* bats)

*Sternopsylla texana* = *S. distincta t.*

**Thrassis** Jordan, 1933 (*Thrassoides* Hubbard, 1947; *Pandoropsylla*, ?*Nomadopsylla* Stark, 1970) Ceratophyllidae fleas, Subfamily Ceratophyllinae (29 species in US or Canada)

**Thrassis acamantis** Rothschild, 1905 (ectoparasite on ID *Neotoma cinerea* woodrats)

*Thrassis acamantis utahensis* (ectoparasite on MT,UT *Neotoma cinerea* woodrat)

*Thrassis aridis* (*Thrassoides aridis* Prince, 1944) (ectoparasite on AZ *Neotoma* woodrats)

*Thrassis campestris* Prince, 1944 (*T. aridis campestris*) (ectoparasite on NM *Neotoma micropus* woodrats)

*Thrassis fotus* Jordan, 1925 (*T. aridis campestris*) (ectoparasite on NM *Neotoma micropus* woodrats)

*Thrassis francisi* f. (*Ceratophyllus p.* Fox, 1927; *Oropsylla (t.) f.* ) (ectoparasite on OR *Neotoma cinerea* woodrat)

*Thrassis gladiolis gladiolis* Jordan, 1925 (ectoparasite on NV *Neotoma* woodrats)

*Thrassis petiolata* (*Ceratophyllus petiolatus* Baker, 1904; *Oropsylla (t.) p.*) (ectoparasite on MT, UT, WA *Neotoma cinerea* woodrats)

*Thrassis setosis* Prince, 1944 (ectoparasite on AZ *Neotoma* woodrats)

*Thrassis howelli* (*Ceratophyllus h.* Jordan, 1925) (ectoparasite on ID,OR *Neotoma c.* woodrat)

*Thrassis stanfordi* Wagner, 1936 (ectoparasite on CO *Neotoma cinerea* woodrat)

*Thrassoides aridis* = *Thrassis aridis*

*Traubella* Prince, Eads & Barnes, 1976 - Ceratophyllidae lice, Subfamily Ceratophyllinae (29 species in US or Canada)

*Traubella neotomae* (Fox, 1940) Prince, Eads & Barnes, 1976 (ectoparasite on *Neotoma lepida* woodrats)

## Flower

1. Uncommon **plant** beyond twilight, even around showcave lights. Many seeds brought in esp. by rodents germinate but rarely flower. Incl.

*Litsea* Lamarck, 1792 – Lauraceae plants

*Litsea aestivalis* (*Laurus a.* Linnaeus, 1753) Fernald, 1945 (pond spice/ (sinks and cave entrances in SC)

*Scirpus* Linnaeus Cyperaceae sedges, Order Cyperales, Subclass Commelinidae, Class Liliopsida, Division Magnoliophyta

*Scirpus ancistrochaetus* Schyler (barbed bristle, northeastern or barbedbristle bulrush/ MD,WV sinkhole ponds/ endangered) Bartgis 1992

Poaceae (Grass Family)

*Andropogon* Linneaus  
*Andropogon* *gua* (HI Volcanoes Natl. Park)

Amaranthaceae

*Chenopodium* Linneaus (goosefoot)  
*Chenopodium* undet. sp.(fossil domesticated seeds in Mammoth C.,KY) Bibl.: Smith, 1984. See pollen.

Asteraceae (Composite or Aster Family)

*Solidago* Linneaus (goldenrod)  
*Solidago* *albopilosa* E.L. Braun (white-haired or whitehair goldendrod in KY rockshelters & cave entrances)

Caryophyllaceae (Pink Family)

*Silene* Linneaus (catchfly)  
*Silene* *rotundifolium* in KY rockshelters & cave entrances)

Ranunculaceae (Buttercup Family)

*Thalictrum* Linneaus (meadowrue)  
*Thalictrum* *mirabile* Small (Little mountain meadowrue in KY rockshelters & cave entrances)

Ericaceae (Heather Family)

*Rhododendrum*  
*Rhododendrum* undet. sp. (in KY rockshelters & cave entrances)

Saxifragaceae (Saxifrage Family)

*Heuchera* Linneaus (alumroot)  
*Heuchera* *parviflora* Bartl. (In KY rockshelters & cave entrances)

fluke - See trematode

## Flies

Diptera & orders **Hymenoptera** (sawflies), Ephemeroptera (**mayfly**), Plecoptera (**stonelives**), **Neuroptera** (spongillaflies), Megaloptera (antlion, dobsonfly, lacewing, hellgrammites, mantispid), & **Odonata** (damselflies, dragonfly).

## Diptera

**Insects** order of true flies, Subclass Pterygota, Division Neoptera, Subdivision Endopterygota, Section Neuropterida, Subsection Anthophora, Superorder Antiliophora. Name from di, “two” & pteron, “wing” referring to the group having only one pair of wings, unlike most other insects.

The second pair either are absent or have been modified into small balancing organs called halteres.

5-40 mm (rarely up to 75 mm). Usually soft-bodied or leathery; surface with spines, setae and sometimes scales. Head more or less rounded. Thorax more or less oval and humped; abdomen is elongate, cylindrical or oval. Most dull in color, black, brownish or pale with a few metallic blue or green. Compound eyes and often ocelli. Some mouthparts greatly elongated for blood sucking, others short for sponging, others for stabbing, sucking nectar or nonfunctional. Varied antennae; Small prothorax, large mesothorax (winged). Metathorax smaller. Distinctive wing veins. Legs of moderate size except greatly elongated in mosquitoes and crane flies and in others fitted for grasping prey. Tarsi of most flies have 5 segments. Tarsal claws and pads in many shapes and sizes.

Complete metamorphosis (holometabolism: egg, larvae, pupae, adults). Many pupae live in a protective case, the puparium. Larvae usually < 14 segments, often with head or with dark mouth-hooks at one end. Many groups are predators, scavengers, pollinators, parasites, aquatic, some are marine; Fairly common fungus flies/**gnats**, some Tbs) & larvae in decaying meat & dung in caves.

**Bibl.:** Crampton 1934; McAlpine 1987; Natilde 1994; Oldroyd 1965; Senger 1990; B. Travis et al. 1969; **Area:** **CA:** C. Alexander 1974; **GA:** Reeves 1998-9; **HI:** Evenhuis 1989; **IL:** Lisowski 1994; **IN:** Aldrich, 1896; Lisowski 1994; Mertins 1976; Vaillant & Botosaneanu 1966; **KY:** D. Conn & Marshall 1991; Lisowski 1994; Mertins 1976; **MO:** Ashley 1995; **nNA:** G. Griffiths 1996; **NA:** Crampton 1934; Curran 1934; McAlpine, 1981, 1987, 1989; Poole & Gentili 1996; Stone et al. 1965; S. Williams, 1886-8; **TN:** Barr 1949b, 1949e; Ives 1949, 1951; **US:** Say, 1823-6; **West:** F. Cole 1960; **WI:** Mertins 1976; **Yukon:** Danks & Downes 1997; **World:** : Bezzi 1911; Matilde, 1970.

Suborder Netamtoera

Infraorder Tipulomorpha

Tipulidae (sON undet genus in groundwater & rare in hyporheic\_

Subfamily Cyndrotominae (*Cyndrotoma*)

Subfamily Limoniinae

Tribe Eriopterini

(*Chionea*, *Cryptolabis*, *Empedomorpha*, *Erioptera*, *Esperoconopa*, *Gnophomyia*, *Molophilus*, *Ormosia*)

Tribe Hexatomi

(*Austrolimnophila*, *Dactylolabis*, *Hexatoma*, *Limnophila*, *Pilaria*, *Polymera*)

Tribe Limoniini (*Antocha*, *Dicranoptycha*, *Limonia*, *Megarhina*)

Tribe Pediciini (*Dicranota*, *Pedicia*, *Ula*)

Subfamily Tipulinae



Tribe Tipulini (*Dolichozeza*, *Tipula*)

Infraorder Bibionomorpha

Superfamily Bibionoidea

Bibionidae (March or march flies)

Subfamily Bibioninae (*Bibio*)

Pleciidae (incl. Parapleciidae & Paraxymyiidae; also subsumed in Bibionidae) (*Plecia*)

Sciaroidea (=Mycetophiloidea)

Cecidomyiidae (gall midges or gnats; cecidomyiids) (about 4,000 species)

(Ac, Tx or Tp undet. genera in Vancouver Island, BC)

Subfamily Cecidomyiinae

Tribe Cecidomyiini (*Clinodiplosis*, *Diadiplosis*)

Subfamily Lasiopteridi

Tribe Cecidomyiini (*Karshomyia*)

Subtribe Lestodiplosini (*Lestodiplosis*)

Tribe Oligotrophini (*Janetiella*)

Subfamily Lestremiinae (*Aprionus*)

Tribe Campylomyzini (*Campylomyza*) (now put in Micromyini)

Tribe Lestremiini (*Lestremia*)

Tribe Micromyini (*Campylomyza*, *Corinthomyia*, *Monardia*, *Mycophila*)

Subfamily Porricondylinae

Tribe Asynaptini (*Camptomyia*)

Tribe Heteropezini (*Henria*)

Tribe Winnertziini (*Winnertzia*)

Keroplastidae (also subsumed in Mycetophilidae)

Subfamily Keratoplatinae (*Euceroplatus*, *Keroplatus*, *Macrocera*, *Orfelia*)

(also treated as subfamily of Mycetophilidae)

Mycetophilidae

undet. Ac or TTx genera in NWT & Tx in OH

undet. sp. (Ac, Tx or Tp in Vancouver Island, BC))

Subfamily Bolitophilinae (*Bolitophila*)

Subfamily Keratoplatinae (put in own family)

Subfamily Mycetophilinae

Tribe Exechiini

(*Anatella*, *Exechia*, *Exechiopsis*, *Pseudobrachypeza*, *Rymosia*, *Tarnania*)

(also in Tarnanii)

Tribe Mycetophilini (*Cordyla*, *Mycetophila*, *Phronia*)  
Tribe Tarnanii (Ac or Tx in 1 seAK cave; Tarnania (put in Exechiini))

Subfamily Sciophilinae

Tribe Gnortistini (*Boletina*, *Speolepta*, *Synapha*)

Tribe Sciophilini (*Allocotocera*, *Leptomorphus*, *Monoclona*, *Mycomya*, *Neuratelia*)

Tribe Leiini (*Docosia*, *Leia*)

Sciaridae

Undet. Tx? sp. & genus in MO & NV *Nothrotheriops shastensis* ground sloth dung)

*Bradysia*, *Corynoptera*, *Lycoriella*, *Pnyxia*, *Phytosciara*, *Sciara*

Oligotrophini (*Dasineura*, *Boletina* (now in Mycetophilidae))

Infraorder Psychomorpha

Superfamily Psychoidea

Psychodidae (moth & sand flies; owl midges)

Subfamily Phlebotominae (*Lutzomyia*)

Subfamily Psychodinae (*Maruina*, *Pericoma*, *Psychoda*, *Telematoscopus*)

Superfamily Trichoceroidea

Scatopsidae (= Cordyluridae) (also subsumed in Anthomyidae & put in Muscoidea-Schizophora-Calypttrata (dung flies)

Subfamily Delininae (or as Tribe Delinini) (*Americina*)

Subfamily Scathophaginae (*Scatophaga*)

Trichoceridae (= Petauristidae, Melusinidae)(winter crane flies or Trichocerid gnats)

(*Diazosma*, *Trichocera*, Undet. genus on domestic cat in WA)

Infraorder Ptychopteromorpha

Superfamily Ptychopteroidea

Tanyderidae (*Protanyderus*)

Ptychopteridae (*Bittacomorpha*)

Infraorder Culicomorpha

Superfamily Culicoidea

Chaoboridae (phantom midges)

Undet. genera & sp. in seAK.

Subfamily Chaoborinae (*Chaoborus*, *Mochlonyx*)

Subfamily Eucorethrinae (*Eucorethra*)

Corethrellidae

Subfamily Corethrellinae (*Corethrella*)

Culicidae (mosquitoes)

Subfamily Anophelinae. (*Anopheles*)

Subfamily Culicinae

Tribe Culicini (*Aedes*, *Culex*, *Culiseta*, *Mansonia*, *Uranotaenia*)

Dixidae (dixid midges)

(Undet genus rarely found in sON hyporheic & groundwater; *Dixa*, *Dixella*)

Thaumaleidae (*Trichothaumalea*)

Superfamily Chironomoidea

Ceratopogonidae (=Heleidae) ((biting) midges, no-see-ums, punkies)

(Tx? undet. genus in MN; undet genus rarely found in sON hyporheic & groundwater)

Subfamily Ceratopogoninae

Tribe Ceratopogonini (*Alluaudomyia*, *Ceratopogon*, *Monohelea*)

Tribe Culicoidini (*Culicoides*)

Tribe Palpomyiini: (*Bezzia*, *Palpomyia*)

Tribe Sphaeromiini (*Probezzia*)

Subfamily Forcipomyiinae (*Atrichopogon*, *Forcipomyia*, undet. genera (Tx or Ac in sON))

Chironomidae (=Tendipedidae)(midges)

Undet. genera & sp. (Tx? In MO,AK) & undet. genus in LA brackish beach sediment;

Undet genus in sON hyporheic & groundwater

Subfamily Chironominae

(*Paramerina* (now in Tanypodinae), *Stempellinella*, *Robackia*, *Saetheria*, *Sublettea*)

(all now in Telmatogetoninae)

Tribe Chironomini (*Cladoplema*, *Cryptochironomus*, *Chironomus*,

*Demicryptochironomus*, *Dicrotendipes*, *Endochironomus*, *Einfeldia*,

*Glyptotendipes*, *Harnischia*, *Lauterborniella*, *Lipiniella*, *Microtendipes*,

*Nilothauma*, *Parachironomus*, *Paracladopelma*, *Paralauterborniella*,

*Paratendipes*, *Pagastiella*, *Phaenopsectra*, *Polypedilum*,

*Stenochironomus*, *Stictochironomus*)

Tribe Coelotanypodini (*Coelotendipes*)

Tribe Tanytarsini

(*Cladotanytarsus*, *Micropsectra*, *Nimbocera*, *Paratanytarsus*, *Rheotanytarsus*

*Stempellina*, *Tanytarsus*; Undet genus in sON hyporheic & groundwater)

Subfamily Diamesinae (*Diamesa*, *Pagastia*, *Prodiamesa*, *Potthastia*)

Tribe Boreochlini (*Lasiodiamesa*)

Subfamily Orthoclaadiinae

(*Brillia*, *Cardiocladius*, *Chaetocladius*, *Clinotanypus*, *Corynoneura*, *Cricotopus*, *Diplocladius*, *Epoicocladius*, *Eukiefferiella*, *Heleniella*, *Halocladius*, *Heterotrissocladius*, *Hydrobaenus*, *Krenosmittia*, *Limnophyes*, *Lappodiamesa*, *Lopescladius*, *Metriocnemus*, *Microcricotopus*, *Nanocladius*, *Orthocladius*, *Parachaetocladius*, *Paraphaenocladius*, *Parakiefferiella*, *Parametriocnemus*, *Psectrocladius*, *Pseudorthocladius*, *Pseudosmittia*, *Psilometriocnemus*, *Rheocricotopus*, *Rheosmittia*, *Smittia*, *Synorthocladius*, *Tethymyia*, *Thalassosmittia*, *Thienemanniella* (now put in Tanypodinae), *Trichocladius*, *Tvetenia*)

Undet. genus in AZ shallow hyporheic (Maricopa Co.)

Undet genus in sON hyporheic & groundwater

Undet. genus (Ac, Tx or Tp in Vancouver Island, BC;)

Tribe Metriocnemini (*Parakiefferiella*)

Subfamily Podonominae

Tribe Boreochlini (*Boreochlus*, *Paraboreochlus*)

Subfamily Prodiamesinae (*Monodiamesa*)

Subfamily Tanypodinae (*Aspectrotanypus*, *Conchapelopia*, *Denopelopia* (now in Telomatogetoninae), *Procladius*)

Undet. genus in AZ shallow hyporheic

Undet genus in sON hyporheic & rarely in sON groundwater

Tribe Coelotanypodini (*Coelotanypus*)

Tribe Macropelopiini (*Alotanypus*, *Natarsia*, *Psectrotanypus*)

Tribe Pentaneurini

(*Ablabesmyia*, *Nilotanypus*, *Larsia*, *Labrundinia*, *Pentaneura*, *Trissopelopia*, *Zavrelimyia*, *Paramerina* (also put in Chironominae) *Thienemannimyia*, undet. genus in AZ shallow hyporheic)

Tribe Tanypodini (*Tanypus*)

Subfamily Telomatogetoninae

(*Denopelopia*, *Stempellinella*, *Robackia*, *Saetheria*, *Sublettea*, *Zavreliella*)

Simuliidae (black flies)

sON undet genus in sON groundwater & hyporheic (rare). Incl. Subfamilies:

Subfamily Parasimuliinae Smart, 1945

Tribe Gymnopaadini (*Gymnopais*) (now in Simuliinae)

Tribe Parasimulini (*Parasimulium*)

Subfamily Simuliinae Newman, 1834

Undet. Ac or Tx genus in Vancouver Island, BC  
(*Gymnopais*) (once in Parasimuliinae)

Tribe Prosimuliini Enderlein, 1921

(*Cnephia*, *Prosimulium* (subgenus *P.* Rouchard, 1906 s.str.), *Stegopterna*)

Tribe Simuliini Newman, 1834 (*Simulium* (subgenus *S.* Latreille, 1802 s.str.)

## Suborder Brachycera

### Infraorder Stratiomyomorpha

Stratiomyidae: undet. genus rarely found in hyporheic of SC coastal blackwater stream

#### Subfamily Clitellariinae

Tribe Clitellariini (*Cyphomyia*)

#### Subfamily Stratiomyinae

Tribe Oxycerini (*Euparyphus*)

### Infraorder Tabanomorpha

Athericidae (watersnipe or athericid flies) (incl. Rhagionidae)(=Leptidae  
(*Atherix*)

Rhagionidae (snipe flies)

(*Ptiolina*, undet. genus (Ac, Tx or Tp in Vancouver Island, BC)

Tabanidae (=Larvaevoridae)

(horse & deer flies; peer & horse flies; gadflies, breezeflies, clegs & deerflies)

(*Chrysops*, *Tabanus*, undet. genus in LA brackish beach; TX sandy hyporheic)

### Infraorder Muscomorpha

#### Superfamily Asiloidea

Scenopinidae (window flies) (= Omphralidae) flies)

(*Pseudatrachia*, undet. genus (Ac in cave in Edwards Co., TX)

Therevidae

#### Superfamily Empidoidea

Empididae (dance flies)

Undet. AC, Tx or Tp genus in Vancouver Island caves, BC)

Subfamily Clinocerinae (*Roederiodes*, *Trichoclinocera*)

Subfamily Empidinae (*Hilara*, *Oreogeton* (also put in Oreogetoninae), *Rhamphomyia*)

Subfamily Hemerodromiinae

Tribe Hemerodromiini (*Chelifera*, *Hemerodromia*)

Subfamily Tachydromiinae (*Charadrodromia*, *Crossopalpus*, *Platypalpus*, *Tachypeza*)

Dolichopodidae (long-legged flies)

Undet. Genera & species in 1se AK cave

Subfamily Aphrosylinae (*Aphrosylus*) (once in Diaphorinae)

Subfamily Diaphorinae (*Aphrosylus* (now in Aphrosylinae), *Chrysotus*)

Subfamily Dolichopodinae (*Dolichopus*)

Subfamily Hydrophorinae (*Liancalus*, *Thinophilus*)

Subfamily Nuerigoninae (*Neurigona*, *Neurigonella*)

Hybotidae (once part of Empididae) (*Charadrodromia*, *Leptopeza*)

Superfamily Muscoidea-Aschiza

Lonchopteridae (pointedwinged or spear-winged flies) (*Lonchoptera*)

Phoridae (humpbacked flies)

Undet. Tp sp. in MO; undet. Tx or Ac in NWT; undet. Ac, Tx or Tp in Vancouver Isl., BC)

Subfamily Metopininae

Tribe Metopinini (*Gymnophora*, *Megaselia*, *Puliciphora*, *Woodiphora*)

Subfamily Phorinae

(*Anevrina*, *Borophaga*, *Conicera*, *Diplonevra*, *Spiniphora*, *Triphleba*)

Pipunculidae (big-headed or big-eyed flies)

Undet. genus (Ac in cave in Irion Co., TX)

Syrphidae (syrphid, flower, sweat, drone or hover flies; rattailed maggots)

Subfamily Eristalinae

Tribe Eristaliini

Subtribe Eristaliina (*Eristalis*)

Tribe Chrysogastrini (*Chrysogaster*)

Subfamily Syrphinae

Tribe Syrphini (*Dasysyrphus*, *Eupeodes*, *Syrphus*)

Superfamily Muscoidea-Schizophora-Acalyptrata

Anthomyzidae (anthomyiid flies; dung flies; root maggots) (see also Scatophagidae)

Ac, Tx or Tp undet. genera in Vancouver Island, BC) **Bibl.** Griffiths, 1982-1996.

Subfamily Anthomyiinae

Tribe Anthomyiini (*Anthomyia*, *Eutrichota*, *Pegomya*, *Pegoplata*)

Subfamily Pegomyina

Tribe Pegomyini

(*Eutrichota*, *Pegomya*, *Pegoplata*) (all now subsumed in Anthomyiini)

Carnidae (carnid flies) (*Hemeromyia*)

Chloropidae (frit flies)

Subfamily Oscinellinae (*Gaurax*, *Hippelates*, *Liohippелates*)

Curtonotidae (humpbacked flies) (*Curtonotum*)

Drosophilidae ((small) fruit flies; pomace flies, vinegar flies)

Undet. AC, Tx or Tp genus in Vancouver Island caves, BC)

Subfamily Drosophilinae (*Drosophila*, *Mycodrosophila*)

Subfamily Steganinae (*Leucophenga*, *Stegana*)

Dryomyzidae (dryomizid or seabeach & barnacle flies) (*Dryomyza*)

Ephydridae (shore flies)

Undet. Tx genera in Malpais Natl. Monument, nNM)

Subfamily Psilopinae

Tribe Altisinni (*Allotrichoma*, *Pelignellus*)

Subfamily Ephydrinae

Tribe Ephydrini (*Ephydra*)

Tribe Scatellini (*Lamproscatella*, *Scatela*, *Scatophila*)

Subfamily Psilopinae

Tribe Altisinni (*Allotrichoma*)

Heleomyzidae

Undet. Ac, Tx or Tp genus in Vancouver Island, BC

Subfamily Heleomyzinae (*Schroederella*, *Tephrochlamys*)

Tribe Heleomyzini

(*Acantholeria*, *Amoebaleria*, *Heleomyza*, *Pseudoleria*, *Scoliocentra*)

Tribe Oecotheini (*Aecothea*)

Subfamily Suilliinae (*Suillia*)  
Subfamily Trixoscelidinae (*Trixoscelis*)

Lonchaeidae (lonchaeid flies)  
(new genus? in WA caves)

Milichiidae (=Phyllomyzidae) (milichid flies)  
Subfamily Madizinae (*Desmometopa*, *Leptometopa*)

Oestridae (sheep bot flies; bot and warble flies)  
Subfamily Cuterebrinae (*Cuterebra*)

Sarcophagidae (=Stephanostomatidae, Metopiidae) (*Sarcophaga*)

Sphaeroceridae (=Borboridae) ((small) dung flies)  
(Tx undet. genera & sp. in OH)

Subfamily Copromyzinae (*Crumomyia*)  
Subfamily Limosininae  
(*Apteromyia*, *Leptocera*, *Limosina*, *Pseudocollinella*, *Rufolfina*, *Sclerocoelus*,  
*Spelobia*, *Terrilimosina*, *Xenolimosina*)

Muscoidea-Schizophora-Calyptrata  
Anthomyiidae (put in above Superfamily0  
Calliphoridae (blow flies)  
(Ac, Tx or Tp undet. genera in Vancouver Island, BC)

Subfamily Calliphorinae  
Tribe Calliphornii (*Lucilia*)  
Tribe Luciliini (*Calliphora*)

Fanniidae (*Fannia*)

Hippoboscidae (louse flies, flat flies)  
Undet. CA ectoparasite genera on *Corynorhinus townsendii* bats)

Subfamily Nycteribiinae (also put in own family, see below)  
Tribe Nycteribiini (*Basilina*)

Muscidae (house & stable flies or muscid flies)  
Subfamily Cyrtoneurinae (*Neomuscina*)

Subfamily Muscinae  
Tribe Muscini (*Limnophora*, *Musca*)  
Tribe Reinwardtiini (*Muscina*, *Synthesiomyia*)



Subfamily Phaoniinae  
Tribe Phaoniini (*Phaonia*)

Nycteribiidae (*Basilina* (put in Hippoboscidae, *Nycteribia* = *Basilina*  
*Nycterophilia* - put in Streblidae)

Scatophagidae (now in Infraorder Psychomorpha, Superfamily Trichoceroidea)  
Streblidae (batflies; webworms)  
(also subsumed as Subfamily Streblinae in Hippoboscidae)

Undet. genera: Tx in AR  
Subfamily Trichobiinae (*Nycterophilia*, *Paratrachobius*, *Trachobius*)

Tachinidae (parasitic flies; tachinid or tachina flies) Subfamily Dexiinae  
Tribe Eriothrixini (*Paradidyma*)

Subfamily Goniinae  
Tribe Siphonini  
Subtribe Siphonia (*Actia*)  
Subtribe Nearina *Phytomyptera*)

Subfamily Tachininae  
Tribe Voriini (*Cyrtophleba*)  
Tribe Tachinini (*Peleteria*)

**ANTHOMYIIDAE** (anthomyiid flies, incl. dung flies; root maggots) (see also Scatophagidae)  
Suborder Brachycera, Infraorder Muscomorpha.

Members of the Anthomyiidae, commonly called root-maggot flies, occur worldwide and are comprised of approximately 1,100 described species in 50 or so genera. Adults of living species are primarily found in moist or wooded habitats where they feed on nectar and pollen of flowers. Others are predaceous on small flies. Larvae eat living and decaying plant matter and live in stems, roots, and other living or decaying plant matter. Other larvae are inquilines, commensals, or parasitic on hymenopterous insects, reptiles, and burrowing mammals. The fossil record of the family in the original 1994 version of the fossil Diptera catalog included twelve described species in two genera, all of Tertiary origin.

This group comprises several destructive pests including the onion fly (*Delia antiqua*), the wheat bulb fly (*D. coarctata*), the turnip root fly (*D. floralis*), the bean seed fly (*D. platura*) and the cabbage root fly (*D. radicum*).

Ac, Tx or Tp undet. genera in Vancouver Island, BC) **Bibl.** Griffiths, 1982-1996.

Subfamily Anthomyiinae

Tribe Anthomyiini (*Anthomyia*, *Eutrichota*, *Pegomya*, *Pegoplata*)

Subfamily Pegomyina

Tribe Pegomyini (*Eutrichota*, *Pegomya*, *Pegoplata*) (all now subsumed in Anthomyiini)

**Anthomyia** Meigen, 1803 - Anthomyiidae flies, Subfamily Anthomyiinae, Tribe Anthomyiini (3 species in US or Canada)

**Anthomyia** undet. sp. (OR C.,OR/Tx)

**Eutrichota** Kowartz, 1893 (= *Eremomyia* Stein, 1898; *Pegomyza* Schnabl & Dziedzicki, 1911; *Eremomyioides* Malloch, 1918; *Hervebazinia* Seguy, 1923; *Arctopegomyia* Ringdahl, 1938) Anthomyiidae flies, Subfamily Anthomyiinae, Tribe Anthomyiini (also put in Pegomyinae, Tribe Pegomyini) (51 species in US or Canada)

**Eutrichota** *affinis* (*Pegomya a.* Stein, 1898) (WA to PQ, s.to SW, VA/Tx in AR, IN, NM, sON, TX)

**Eutrichota** undet. sp. (MO/Tx)

**Eutrichota** *tarsata* Wulp, 1867 (*Pegomya chrysidea* & *cresca* H.1939) (OH, CA to SW/Tx in AR, OK)

**Pegomyia** Robineau-Desvoidy, 1830 in part; Mackquart, 1835 Emend. (= *Zabia*, *Phoraea*, *Chlorina*, *Phyllis* Robineau-Desvoidy; *Carduophila* Hendel, 1925; *Chaetopegomyia* Ringdahl, 1938; *Petrmyia* Albuquerque, 1954) Anthomyiidae flies, Subfamily Anthomyiinae, Tribe Anthomyiini (also put in Pegomyinae, Tribe Pegomyini) (96 species in US or Canada)

*Pegomyia affinis* = *Eutrichota a.*

*Pegomyia dissecta* = *Pegoplata infirma*

**Pegoplata** Schnabl & Dziedzicki, 1911 - Anthomyiidae flies, Subfamily Anthomyiinae, Tribe Anthomyiini (also put in Pegomyinae, Tribe Pegomyini) (19 species in US or Canada)

**Pegoplata** *infirma* (= *Pegomya dissecta*; *Anthomyia d.* Meigen, 1826) (circumboreal/Tx or Ac in sON),

**ATHERICIDAE** (watersnipe or athericid flies) (incl. Rhagionidae)(=Leptidae)) Suborder or Group Brachycera, infraorder Tabanomorpha. Incl.

**Atherix** Meigen, 1803 - Athericidae flies (4 species in US or Canada)

**Atherix** *pachypus* Bigot, 1887 (WA/CO hyporheic) (also put in Rhagionidae)

**BIBIONIDAE** (March or march flies) Suborder or Group Nematocera, infraorder  
Bibionomorpha  
Subfamily Bibioninae (*Bibio*)

***Bibio*** Geoffroy, 1762 (= *Pullata* Harris, 1776; *Hirtea* Fabricius, 1798; *Bibiophus* Bollow, 1954)  
Bibionidae flies, Subfamily Bibioninae (55 species in US or Canada)

***Bibio xanthopus*** Wiedemann, 1828; *B. canadensis* Macquart, 1838; *B. humeralis*, *scita* Walker, 1848; *B. obscurus*, *lugens* Loew, 1864; *B. palliatus* McAtee, 1922; *B. macateei* James, 1936; *B. signatus* Hardy, 1937) (NA/Tx or Ac in sON)

***Plecia*** Wiedeman, 1828 - now in Pleciidae

**BOLITHOPHILIDAE** - Suborder Nematocera, Infraorder Bibionomorpha  
*Bolitothila* Meigen, 1818 (now in Mycetophilidae)  
**BORBORIDAE** = Sphaeroceridae

**CALLIPHORIDAE** (blow flies) suborder Brachycera, infraorder Muscomorpha. **Bibl.:** R. Hall & Townsend 1977

(Ac, Tx or Tp undet. genera in Vancouver Island, BC)  
Subfamily Calliphorinae  
Tribe Calliphornii (*Lucilia*)  
Tribe Luciliini (*Calliphora*)

Calliphoridae, commonly called blow flies, blue bottles, or green bottles, consist of fairly large, robust, often metallic-colored calypterate flies found worldwide. Adults of living forms have been reported from flowers, decaying plant and animal matter, and vegetation. Larvae are varied in their feeding habits with some omnivorous, carnivorous, or parasitic. They can be scavengers and feed on carrion, excrement, or garbage waste, or parasitic or predaceous on various invertebrates. Blow flies have gained medicinal notoriety through their use in Maggot Debridement Therapy (MDT), the medical use of live maggots (fly larvae) for cleaning non-healing wounds. Historically, maggots have been known for centuries to help heal wounds. Many military surgeons noted that soldiers who's wounds became infested with maggots did better, and had a much lower mortality rate, than did soldiers with similar but non-infested wounds. William Baer, at Johns Hopkins University in Baltimore, Maryland, was the first physician (an orthopedic surgeon) in the U.S. to actively promote maggot therapy; his results were published posthumously by his colleagues in 1932. MDT was successfully and routinely performed in over 300 hospitals, until the mid-1940's, when its use was supplanted by the new antibiotics and surgical techniques that were believed to be superior to maggot therapy. Maggot therapy was occasionally used during the 1970's and 1980's, when antibiotics, surgery, and other modalities of modern medicine failed. In 1989, physicians at the Veterans Affairs Medical Center in Long Beach, CA, and at the University of California, Irvine,

reasoned that if maggot therapy was effective enough to treat patients who otherwise would have lost limbs, despite modern surgical and antibiotic treatment, then we should be using maggot therapy BEFORE the wounds progress that far, and not only as a last resort. Thus was seen the rebirth of maggot debridement therapy, or MDT. Use of blowfly maggots continues with clinical studies, which began in 1989 at the Veterans Affairs Medical Center and the University of California, are still underway. Results thus far demonstrate that maggot therapy is more efficient at debriding (cleaning) infected and gangrenous wounds than any other non-surgical treatment prescribed by the hospital's wound care team. Additionally, wounds treated with MDT healed more quickly (by several-fold) than they had been healing

The size of the species vary between 1 mm to more than 3.5 cm. Together with their often long and tall body shape and their great agility, they might be confused with larvae of different insects, with midges (Diptera) or especially with earwigs (Dermaptera).

**Calliphora** Robineau-Desvoidy, 1830 (= *Abonesia* Villeneuve, 1927; *Acronesia* Hall, 1948; *Aldrichiella* Rohdendorf, 1931; *Aldrichina* Townsend, 1934; *Steringomyia* Kokorny, 1889; *Neocalliphora* & *Arcrophaga* Brauer & Bergenstamum, 1891; *Eucalliphora* T., 1908; *Paracalliphora* T., 1916; *Stobbeola* Enderlein, 1933; *Australocalliphora*, *Papuocaliphora* Kurahashi, 1971; *Oceanocalliphora* K., 1972) Calliphoridae flies, Subfamily Calliphorinae, Tribe Calliphorini (16 species in US or Canada)

**Calliphora** *terraenovae* Macquart, 1851 (= *C. nigribarba* Hough, 1899; *C. vomitoria* n.; *C. nigribucca* Shannon, 1923) (epigeal AK to Greenland, s. to CA, CO, nFL/ Tx or Ac in IN, NM, NWT)

**Calliphora** *vicina* Robineau-Desvoidy, 1830 (*Musca carnivora* Fabricius, 1794 (Unav.), *M. erythrocephala* Meigen, 1826 (Homo.); *C. littoralis*, *spitzbergensius*, *monspeliaca*, *musca*, *nana* R., 1830; *C. scutellata* Macquart, 1834; *M. thuscia* Walker, 1849; *M. aucta* W., 1853; *C. insidiiosa* R., 1863; *C. turanica* Rohdendorf, 1926) (global/Tx in TX & GA (Dade & Walker Cos.); Tx or Ac in one cave each in IL & Camden Co., MO)

**Calliphora** *vomitoria* (*Musca* v. Linnaeus, 1758; *M. carnaria* Scopoli, 1763; *M. caerulea* DeGeer, 1776 (Univ.); *M. minimus* Harris, 1780; *M. obscoena* Eschscholtz, 1823; *Calliphora brunibarbis* & *fulvibarbis* Robineau-Desvoidy, 1830; *C. affinis* Macquart, 1835; *C. rubrifrons* Townsend, 1908; *C. pseudovomitoria* Baranov, 1943) (Greenland s. along coast to VA, sw to Mex, n. to AK/blue bottle fly/Tx egg laying on mammal carcass in NM & GA (Dade Co.); Tx or Ac in NWT)

**Calliphora** *lilaea* Walker, 1849 (= *C. latifrons* Hough, 1899; *Musca ilerda* Walker, 1849; *Eucalliphora l.*) (AK to ON, s. to nMex.,CO/ Tx in OR)

**Calliphora** undet. sp. (Tx in TX)

*Eucalliphora* Townsend, 1908 = *Calliphora*

***Lucilia*** Robineau-Desvoidy, 1830 (*Phaenicia* R.1863; *Phumonesia* Villeneuve, 1914; *BufoLucilia* Townsend, 1919; *Francilia* Shannon, 1924; *Viridinsula* Shannon, 1926; *Roubaudiella* Sewguy, 1925; *DasyLucilia*, *Caesariceps* Rohdendorf, 1926; *Luciliella* Malloch, 1926; *Chgaetophaenicia* Enderlein, 1936; *Acrophagella* Ringdahl, 1942; *Sinolucilia* Fan, 1965) Calliphoridae flies Subfamily Calliphorinae, Tribe Luciliini (12 species in US or Canada)

***Lucilia*** undet. sp. (Tx or Ac in cave in Grundy Co., TN)

***Lucilia*** *serricata* (*Musca* s. Meigen, 1826; *Chrysomya capensis*, *modesta*, *pubescens* Robineau-Desvoidy, 1830; *Musca tegularia* Wiedemann, 1830; *M. chloris* Haliday, 1833; *L. pruinoisa* Meigen, 1838; *L. flavipennis* Macquart, 1843; *L. fulgida* Zetterstedt, 1845; *L. galyra* Walker, 1849; *L. latrifrons* Schniner, 1862; *Phaenicia concinna* R.1863; *L. sayi* Jaennicke, 1867; *L. barberi*, *griraulti* Townsend, 1908) (global/Tx in cave in Val Verde Co., TX)

*Phaenicia* = *Lucilia*

**CARNIDAE** (carnid flies) suborder Brachycera, infraorder Muscomorpha

***Hemeromyia*** Coquillett, 1902 (*Paramadiza* Melander, 1913) Carnidae flies (2 species in US or Canada)

***Hemeromyia*** undet. sp. (Ac in cave in Culberson Co., TX)

**CECIDOMYIIDAE** (gall midges or gnats; cecidomyiids) Suborder Nematocera, Infraorder Bibionomorpha (about 4,000) (Ac, Tx or Tp undet. genera in Vancouver Island, BC)

Subfamilies:

Cecidomyiinae

Tribe Cecidomyiini (*Clinodiplosis*, *Diadiplosis*)

Lasiopteridi

Tribe Cecidomyiini (*Karshomyia*)

Subtribe Lestodiplosini (*Lestodiplosis*)

Tribe Oligotrophini (*Janetiella*)

Lestremiinae (*Aprionus*)

Tribe Campylomyzini (*Campylomyza*) (now put in Micromyini)

Tribe Lestremiini (*Lestremia*)

Tribe Micromyini (*Campylomyza*, *Corinthomyia*, *Monardia*, *Mycophila*)

Porricondylinae

Tribe Asynaptini (*Camptomyia*)

Tribe Heteropezini (*Henria*)

Tribe Winnertziini (*Winnertzia*)

*Alluaudomya* (in Ceratopogonidae)

***Aprionus*** undet. sp. (Ac in 1 seAK cave) Cecidomyiidae flies, Subfamily Lestremiinae (or Micromyidi, Tribe Micromyini (4 species in US or Canada)

***Bremia*** Rondani, 1860 - Cecidomyiidae flies, Subfamily Lasiopteridi, Tribe Cecidomyiini (8 species in US or Canada)

***Bremia caricis*** (*Mycodiplosis c.* Felt, 1907) (NE epigeal/ Tx or Ac in sON)

***Bremia*** undet. or undesr. Sp. (\*Tx, Tp or Tb in cave in Dade Co., GA)

***Camptomyia*** Kieffer, 1894 (= *Prodirhiza* K., 1913; *Cecidophila rubsaamen*, 1916) Cecidomyiidae flies, Subfamily Porricondyliinae, Tribe Asynaptini (8 species in US or Canada)

***Camptomyia*** undet. sp. 1-2? (sON/Tx or Ac)

***Campylomyza*** Meigen, 1818 - Cecidomyiidae flies, Subfamily Micromyidi, Tribe Micromyini (16 species in US or Canada)

***Campylomyza*** undet. sp. (Ac, Tx or Tp in Vancouver Island, BC)

***Clinodiplosis*** Kieffer, 1895 - Cecidomyiidae flies, Subfamily Cecidomyiinae, Tribe Cecidomyiini (48 species in US or Canada)

***Clinodiplosis*** undet. sp. (Tx or Ac in sON, 1 seAK cave)

***Corinthomyia*** Felt, 1911 - Cecidomyiidae flies, Subfamily Lestremiinae, Tribe Micromyini (also put in Tribe Campylomyzini) (1 species in US or Canada)

***Corinthomyia brevicornis*** (*Campylomyza b.* Felt, 1907; *C. bryanti*, *luna*, *curreyi*, *hirsuta* Felt, 1908; *C. gracilis* Felt, 1912; *C. tumida* & *cocinna* Felt, 1913) (BC to NF, s. to MN, nFL/TTx or Ac in NWT (prob.))

***Dasyhelea*** Kieffer, 1911 Cecidomyiidae flies (once in Ceratopogonidae, Subfamily Dasyheleinae (46 species in US or Canada)

***Dasyhelea mutabilis*** (Coquillett, 1901) (epigeal in entire NA/ hyporheic in KS)

***Dasyhelea*** undet. sp. or species (AZ, CO, OK, PA hyporheic; Tx in AR)

***Diadiplosis*** Kieffer, 1898 - Cecidomyiidae flies, Subfamily Cecidomyiinae (5 species in US or Canada)

***Diadiplosis*** undet. sp. (Tx or Ac in IN?)

**Henria** Wyatt, 1959 (= *Barnesina* Pritchard, 1960) - Cecidomyiidae flies, Subfamily Porricondylinae, Tribe Heteropezini (2 species in US or Canada)

**Henria** undet. sp. (TTx in nests of *Hirundo fulva* in cave in Edwards Co., TX)

**Janetiella** Kieffer, 1898 - Cecidomyiidae flies, Subfamily Lasiopteridi, Tribe Oligotrophini (14 species in US or Canada)

**Janetiella** undet. sp. (Ac in 1 seAK cave)

**Karshomyia** Felt, 1908 (= *Metadiplosis*, *Lobodiplosis* Felt, 1908; *Plesiobremia* Kieffer, 1912; *Tristephanus* K., 1913; *Hiastatus* Marikovskij, 1956) - Cecidomyiidae flies, Subfamily Lasiopteridi, Tribe Cecidomyiini (6 species in US or Canada)

**Karshomyia** *viburni* (*Mycodiplosis* v. Felt, 1907) (NY/Tx or Ac in sON)

**Lestodiplosis** Kieffer, 1894 (= *Leptodiplosis* & *Coprodiplosis* K., 1894) - Cecidomyiidae flies, Subfamily Lasiopteridi, Tribe Cecidomyiini, subTribe Lestodiplosini (47 species in US or Canada)

**Lestodiplosis** *grassator* (*Diplosis* g. Fyles, 1883) (PQ/Tx or Ac in sON)

**Lestodiplosis** *satiata* Felt, 1920 (NY/Tx or Ac in sON)

**Lestodiplosis** undet. sp. (Tx or Ac in TX)

**Lestremia** Macquart, 1826 - Cecidomyiidae flies, Subfamily Lestremiidi, Tribe Lestremiini (3 species in US or Canada)

**Lestremia** *cinerea* M. 1826 (= *L. fusca* Meigen, 1830; *Catocha sylvestris* Felt, 1907; *S. dyari*, *franconiae*, *kansensis* F. 1908; *L. floridana* F. 1915; *L. garretti* F., 1926; *Zygoneura fenestrata* Malloch, 1914 (Europe, BC to NH, s. to FL/Tx or Ac in CA)

**Lestremia** undet. sp. (TTX in nests of *Hirundo pallida* in Edwards Co., TX)

**Monardia** Kieffer, 1895 - Cecidomyiidae flies, Subfamily Micromyidi, Tribe Micromyini (4 species in US or Canada)

**Monardia** undet. sp. (Tx or Ac in CA, 1 seAK cave)

**Mycophila** Felt, 1911 - Cecidomyiidae flies, Subfamily Micromyidi, Tribe Micromyini (4 species in US or Canada)

**Mycophila** undet. sp. (Ac 1 seAK cave)

**Winnertzia** Rondani, 1861 (= *Clinorhiza* Kieffer, 1861; *Prowinnertzia* K., 1911; *Winnertzia* K., 1913; *Parawinnertzia* Curran, 1934 Emend.; *Xylowinnertzia*, *Bolowinnertzia* & *Mycowinnertzia*

Mamaev, 1963) - Cecidomyiidae flies, Subfamily Porricondylinae, Tribe Winnertziini (2 species in US or Canada)

Winnertzia undet. sp. (Tx or Ac in sON)

**CERATOPOGONIDAE** Suborder Nematocera, infraorder Culicomorpha  
(=Heleidae) ((biting) midges, no-see-ums, punkies). **Bibl.:** Atchley et al. 1981; Wirth 1988  
(Tx? undet. genus in MN; undet genus rarely found in sON hyporheic & groundwater)

Subfamily Ceratopogoninae

Ceratopogonini (*Alluaudomyia*, *Ceratopogon*, *Ceratopogonida*, *Monohelea*)

Culicoidini (*Culicoides*)

Palpomyiini: (*Bezzia*, *Palpomyia*)

Sphaeromiini (*Probezzia*)

Subfamily Forcipomyiinae (*Atrichopogon*, *Forcipomyia*, undet. genera (Tx or Ac in sON)

Subfamily Leptoconopinae (*Leptoconops*)

Alluaudomyia Kieffer, 1913 (= *Neoceratopogon* Malloch, 1915; *Prionognathus* Carter, Ingram & MacFie, 1921 (homo.); *Thysanognathus* Ingram & MacFie, 1922; *Isoecacta* Garrett, 1925)  
Ceratopogonidae flies, Subfamily Ceratopogoninae, Tribe Ceratopogonini (8 species in US or Canada)

Alluaudomyia undet. sp. (CO hyporheic)

Atrichopogon Kieffer, 1906 (*Gymnohelea* K., 1921; *Dolichohelea* Edwards, 1929; *Lophomyidium* Cordero, 1929; *Psilokempia* Enderlein, 1936; *Melohelea* Wirth, 1956; *Psammopogon*, *Rostropogon* Remm, 1979) Ceratopogonidae flies, Subfamily Forcipomyiinae (3 species in US or Canada)

Atrichopogon (*Ceratopogon*) *jacobsoni* de Meijere, 1907 (*A. immaculatus* Kieffer, 1917; *A. cavernarum* Edwards, 1942; *C. rarus* Johannsen, 1946 (seAsia, Pacific Islands/TTx? in HA)

Bezzia Kieffer, 1899 - Ceratopogonidae flies, Subfamily Ceratopogoninae, Tribe Palpomyiini. (42 species in US or Canada) **Bibl.:** Dow 1975

Bezzia undet. sp. or species (IL? hyporheic; dry channel hyporheic & shallow hyporheic in Sycamore Cr. 32 km ne of Phoenix (Maricopa Co.), AZ; VA, MD brackish benthic)

Bezzia or Palpomyia Meigen, 1814 undet. sp. (CO, IL?, OK hyporheic; Ac or Tx in 2 seAK cave; NC marine infauna)

Bezzia or Probezzia Kieffer, 1906 undet. sp. or species (IL?, PQ hyporheic; PQ Gulf of St. Lawrence sandy marine interstitial)



**Ceratopogon** Kieffer, 1895 - Ceratopogonidae flies Subfamily Ceratopogoninae, Tribe Ceratopogonini (22 species in US or Canada)

**Ceratopogon** undet. sp. (Tx or Ac in CA, 1seAK cave)

**Ceratopogonida** - Ceratopogonidae flies, Subfamily Ceratopogoninae, Tribe Ceratopogonini  
**Ceratopogonida** undet. sp. (NC marine infauna)

**Dasyhelea** Kieffer, 1911 (now in Cecidomyiidae)

**Culicoides** Latreille, 1809 Ceratopogonidae flies Subfamily Ceratopogoninae, Tribe Culicoidini (sand flies) (116 species in US or Canada) **Bibl.:** Blanton & Wirth 1979

**Culicoides** undet. sp. or species (AZ (nr. *Culicoides*), CO, WV hyporheic; Ac or Tx in 1 seAK cave & Lehman C., NV; Ac, Tx or Tp in Vancouver Island, BC; Virginian & PQ Gulf of St. Lawrence sandy marine interstitial & infauna)

**Forcipomyia** Meigen, 1818 - Ceratopogonidae flies, Subfamily Forcipomyiinae. (73 species in US or Canada) **Bibl.:** Bystrak & Wood 1978

**Forcipomyia pholeter** Wirth & Howarth, 1982 (biting midge/Kazumura C., \*lava tubes in e.HI/Tp)

**Forcipomyia** undet. sp. or species (HI/alien TP), (Tp in Bexar, Travis Cos., TX; Tx in 2 WA caves in Skamania Co.; Ac, Tx or Tp in Vancouver Island, BC)

*Holoconops* = *Leptoconops*

**Leptoconops** Skuse, 1889 - Ceratopogonidae flies, Subfamily Leptoconopinae (23 species in US or Canada)

**Leptoconops** undet. sp. (rare KS hyporheic)

**Monohelea** Kieffer, 1917 - Ceratopogonidae flies, Subfamily Ceratopogoninae, Tribe Ceratopogonini (15 species in US or Canada)

**Monohelea** undet. sp. (CO hyporheic)

**Palpomyia** Meigen, 1814 - Ceratopogonidae flies, Subfamily Ceratopogoninae, Tribe Palpomyiini (31 species in US or Canada). **Bibl.:** Grogan 1977

**Palpomyia** undet. sp. or species (PA, TX, seVA hyporheic; NC marine infauna)

**Probezzia** Kieffer, 1906 - Ceratopogonidae flies, Subfamily Ceratopogoninae, Tribe Palpomyiini. (23 species in US or Canada)

**Probezzia** undet. sp. or species (CO hyporheic; dry channel hyporheic & shallow hyporheic in Sycamore Cr. 32 km ne of Phoenix (Maricopa Co.), Santa Maria & Bridle Cr., AZ; VA, MD brackish benthic; Virginian marine infauna)

**Probezzia** Kieffer, 1906 or *Bezzia* undet. sp. (PQ Gulf of St. Lawrence sandy marine interstitial)

**CHAOBORIDAE** (phantom midges) Suborder Nematocera, infraorder Culicomorpha.

Undet. genera & sp. in seAK.

Chaoborinae (*Chaoborus*, *Mochlonyx*)

Eucorethrinae (*Eucorethra*)

**Chaoborus** Lichtenstein, 1800 (= *Corethra* Meigen, 1803; *Culicites* Heyden, 1862; *Sayomyia* Coquillett, 1903; *Corethrina* Giles, 1904; *Schadonophasma* Dyar & Shannon, 1924; *Neochaoborus* Edwards, 1930; *Edwardsops* Lane, 1942; *Peusomyia* Saether, 1970) Chaoboridae flies, gnats in Subfamily Chaoborinae (10 species in US or Canada)

**Chaoborus** (*Sayomyia*) *albatus* Johnson, 1921 (epigeal in MN to PQ, s. to LA/ Tx or Ac in sON; NC marine infauna; VA, MD brackish benthic)

**Chaoborus** *punctipennis* (Say, 1823) (freshwater Carolinian infauna; VA, MD brackish benthic)

**Chaoborus** undet. sp. or species (Tx on porcupine dung in Frenchmen's Cave #2?, NS; NC marine infauna)

**Eucorethra** Underwood, 1903 - Chaoboridae flies, Subfamily Eucorethrinae (1 species in US or Canada)

**Eucorethra** *underwoodi* Underwood, 1903 (Tx or Ac in seAK cave)

**Mochlonyx** Loew, 1844 - Chaoboridae flies, Subfamily Chaoborinae (3 species in US or Canada)

**Mochlonyx** *cinctipes* (= *Corethra* c. Coquillett, 1903; *C. obscura* Dyar & Shannon, 1924) (WA,OR, e. to PQ, s. to AL/Tx or Ac in sON)

**CHIRONOMIDAE** (=Tendipedidae) (midges) **Bibl.:** Ferrington 1987; J. Ford 1962

Undet. genera & sp. (Tx? In MO,AK) & undet. genus in LA brackish beach sediment;

Undet genus in sON hyporheic & groundwater

Subfamily Chironominae (*Paramerina* (now in Tanypodinae), *Stempellinella*, *Robackia*, *Saetheria*, *Sublettea* (all now in Telomatogetoninae)

Tribe Chironomini (*Cladoplema*, *Cryptochironomus*, *Chironomus*, *Demicryptochironomus*, *Dicrotendipes*, *Endochironomus*, *Einfeldia*, *Glyptotendipes*, *Harnischia*, *Lauterborniella*, *Lipiniella*, *Microtendipes*, *Nilothauma*, *Paracladopelma*,

*Paralauterborniella, Paratendipes, Pagastiella, Parachironomus, Phaenopsectra, Polypedilum, Stenochironomus, Stictochironomus*)

Tribe Coelotanypodini (*Coelotendipes*)

Tribe Tanytarsini (*Cladotanytarsus, Micropsectra, Nimbocera, Paratanytarsus, Rheotanytarsus, Stempellina, Tanytarsus*; Undet genus in sON hyporheic & groundwater

Subfamily Diamesinae (*Diamesa, Pagastia, Prodiamesa, Potthastia*)

Tribe Boreochlini (*Lasiodiamesa*)

Subfamily Orthocladiinae (*Brillia, Cardiocladius, Chaetocladius, Clinotanypus, Corynoneura, Cricotopus, Diplocladius, Epoicocladius, Eukiefferiella, Heleniella, Halocladius, Heterotrissocladius, Hydrobaenus, Krenosmittia, Limnophyes, Lappodiamesa, Lopescladius, Metriocnemus, Microcricotopus, Nanocladius, Orthocladius, Parachaetocladius, Paraphaenocladius, Parakiefferiella, Parametriocnemus, Psectrocladius, Pseudorthocladius, Pseudosmittia, Psilometriocnemus, Rheocricotopus, Rheosmittia, Smittia, Synorthocladius, Tethymyia, Thalassosmittia, Thienemanniella* (now put in Tanypodinae), *Trichocladius, Tvetenia*)

Undet. genus in AZ shallow hyporheic (Maricopa Co.)

Undet genus in sON hyporheic & groundwater

Undet. genus (Ac, Tx or Tp in Vancouver Island, BC;)

Tribe Metriocnemini (*Parakiefferiella*)

Subfamily Podonominae

Tribe Boreochlini (*Boreochlus, Paraboreochlus*)

Subfamily Prodiamesinae (*Monodiamesa*)

Subfamily Tanypodinae

(*Aspectrotanypus, Conchapelopia, Denopelopia* (now in Telomatogetoninae), *Procladius*)

Undet. genus in shallow hyporheic, Sycamore Cr. 32 km ne of Phoenix (Maricopa Co.), AZ

Undet genus in sON hyporheic & rarely in sON groundwater

Tribe Coelotanypodini (*Coelotanypus*)

Tribe Macropelopiini (*Alotanypus, Natarsia, Psectrotanypus*)

Tribe Pentaneurini (*Ablabesmyia, Nilotanypus, Larsia, Labrundinia, Pentaneura,*

*Trissopelopia, Zavrelimyia, Paramerina* (also put in Chironominae) *Thienemannimyia,*

Undet. genus in AZ shallow hyporheic)

Tribe Tanypodini (*Tanypus*)

Subfamily Telomatogetoninae

(*Denopelopia*, *Stempellinella*, *Robackia*, *Saetheria*, *Sublettea*, *Zavreliella*)

**Ablabesmyia** Johannsen, 1905 - Chironomidae flies, Subfamily Tanypodinae, Tribe Pentaneurini (18 species in US or Canada)

**Ablabesmyia** *annulata* (*Tanypus a.* Say, 1823) (Carolinian, Virginian freshwater infauna)  
*Ablabesmyia auriensis* Roback = *A. mallochi*

**Ablabesmyia** *mallochi* (*Tanypus m.* Walley, 1925; *A. auriensis* Roback; *A. ornata* Beck & Beck; *A. tarella* Roback) (VA, MD brackish benthic; seVA hyporheic)

**Ablabesmyia** *peleensis* (*Tanypus p.* Waley, 1926) (Carolinian freshwater infauna)

**Ablabesmyia** *rhamphe* Sublette, 1964 (Carolinian, Virginian freshwater infauna)  
**Ablabesmyia** undet. sp. or species (Tx or Ac in sON, seAK; ON riffle hyporheic; IL river benthic)

**Alotanypus** Roback, 1971 - Chironomidae flies, Subfamily Tanypodinae  
**Alotanypus** undet. sp. (Tx or Ac in seAK cave)

**Apsectrotanypus** Fittkau, 1962 - Chironomidae flies, Subfamily Tanypodinae  
**Apsectrotanypus** undet. sp. (Ac in 1 seAK cave)

**Axarus** *festivus* (*Chironomus f.* Say, 1823) (VA, MD brackish benthic)

**Boreochlus** Edwards, 1938 - Chironomidae flies, Subfamily Podonominae, Tribe Boreochlini  
**Boreochlus** undet. sp. (Ac in 1 seAK cave)

**Brillia** Kieffer, 1913 - Chironomidae flies, Subfamily Orthoclaadiinae (6 species in US or Canada)

**Brillia** cf. *flavifrons* (Joh.) (PA hyporheic)  
**Brillia** undet. sp. or species (Ac in 1 seAK cave; AZ, BC, OR hyporheic; NC marine infauna)

**Cardiocladius** Kieffer, 1912 - Chironomidae flies, Subfamily Orthoclaadiinae (4 species in US or Canada)

**Cardiocladius** undet. sp. or species (Ac? in seAK cave resurgences; NC marine infauna)

**Chaetocladius** Kieffer, 1911 - Chironomidae flies, Subfamily Orthoclaadiinae  
**Chaetocladius** *piger* Kieffer (valid species?) (nVA hyporheic)  
**Chaetocladius** undet. sp. (Tx or Ac in sON)

**Chironomus** Meigen, 1803 - Chironomidae flies, Subfamily Chironominae, Tribe Chironomini (50 species in US or Canada)

**Chironomus anthracinus** Zetterstedt, 1860 (epigeal in CA to AB, e. to MA, Europe; interstitial larvae in NH lake sediment)

**Chironomus decorus** group Johannsen, 1905 (Tx or Ac in GA (WA Co.))

**Chironomus plumosus** (*Tipula plumosa* Linnaeus, 1758; *C. annularis* De Geer, 1776; *C. cristatus* Fabricius, 1805; *C. prasinus* Meigen, 18181; *C. ferrugineovittatus* Zetterstedt, 1850; *C. imperator* Walley, 1926)) (Europe, BC to Greenland, s. to CA,NC,Bermuda/ hyporheic in NY; Carolinian infauna) **Bibl.:** A. Johnson 1955; Stoltz 1970

**Chironomus** undet. sp.#1 (Ezell's Cave & artesian well at San Marcos, Hays Co.,TX/ Tp(maybe), Pb?)

**Chironomus** undet. species (Tx or Ac in IN, KY, sON, TN; hyporheic CO, KS, OK; interstitial or infaunal in SC salt marsh, NC marine & AB freshwater lakes; PEI & PQ Gulf of St. Lawrence sandy marine interstitial)

**Chironomus stigmaterus** Say, 1823 (Virginian (rare), Carolinian marine infauna)

**Cladopelma** Kieffer, 1921 - Chironomidae flies, Subfamily Chironominae, Tribe Chironomini (7 species in US or Canada)

**Cladopelma lateralis** Kieffer (valid species?) (nVA hyporheic)

**Cladopelma** undet. sp. or species (VA, MD brackish benthic; Virginian marine infauna)

**Cladotanytarsus** Kieffer, 1921 - Chironomidae flies, Subfamily Chironominae, Tribe Tanytarsini (11 species in US or Canada)

**Cladotanytarsus mancus** (Walker, 1856) (larvae in NH, Carolinian lake sediments; (VA, MD brackish & marine infauna))

**Cladotanytarsus** undet. sp. (larvae in AB, NH lake sediments & CO, Great Lakes, KS, OK, PQ, OK, ON, TX,VA hyporheic; IL river benthic)

**Cladotanytarsus viridiventris** Malloch, 1915 (Carolinian freshwater infauna)

**Clinotanypus** Kieffer, 1913 - Chironomidae flies, Subfamily Orthocladiinae

**Clinotanypus pinguis** (*Tanypus p.* Loew, 1869; *C. thoracicus* Loew, 1866) (TX hyporheic; VA, MD brackish benthic)

**Coelotanypus** Kiefer, 1913 - Chironomidae flies, Subfamily Tanypodinae, Tribe Coelotanypodini (5 species in US or Canada)

***Coelotanypus concinnus*** Coquillett, 1895 (Carolinian freshwater infauna)

***Coelotanypus*** undet. sp. or species (TX, Great Lakes sandy hyporheic; NC, Virginian marine infauna; VA, MD brackish benthic)

***Conchapelopia*** Fittkau, 1957 - Chironomidae flies, Subfamily Tanypodinae

***Conchapelopia*** undet. sp. (MO/ Tx? or Ac in MO, sON)

***Corynoneura*** Winnertz, 1846 - Chironomidae flies, Subfamily (10 species in US or Canada)

***Corynoneura celeripes*** Winnertz, 1852 (Europe, Greenland n.NA/ CO, PA hyporheic)

***Corynoneura*** undet. sp. or species (hyporheic in TX, VA sand & BC detritus; Ac in 1 seAK c.; shallow hyporheic in Sycamore Cr. 32 km ne of Phoenix (Maricopa Co.), AZ; IL river benthic)

***Corynoneura taris*** Roback, 1957 (seVA hyporheic)

***Corynoneura valdicornis*** (Winn.-Kieff. ) (valid species?) (PA hyporheic)

***Cricotopus*** van der Wulp, 1874 - Chironomidae flies, Subfamily Orthoclaadiinae (subgenera: *Isocladius* Kieffer, 1909; *Nostococladius* Ashe & Murray, 1980; *Pseudocricotopus* Nishida, 1987) (63 species in US or Canada)

***Cricotopus* (*C.*) *bicinctus*** (= *Chronomus b.* Meigen, 1818) group (Europe, MI to ON, NY, s.to IL, FL/ AZ, CO hyporheic; Tx in KY, TN, MN; VA, MA, MD brackish infauna)

***Cricotopus* (*Cricotopus*)** undet. sp. or species (KS, ON hyporheic; IL river benthic)

***Cricotopus*** or *Orthocladius* undet. sp.(p). (Tx in IL, KY ,s.ON, TN; CO, ON, PA, TX hyporheic larvae)

***Cricotopus* (*Isocladius*) *sylvestris*** J.C. Fabricius, 1794 (PQ Gulf of St. Lawrence sandy marine interstitial)

***Cryptochironomus*** Kieffer, 1918 - Chironomidae flies, Subfamily Chironominae, Tribe Chironomini (13 species in US or Canada)

***Cryptochironomus fulvus*** (*Chironomus f.* Johannsen, 1905; *Cryptochironomus parvilamellatus* (Malloch), 1919, *Cryptochis mallochi* (Kieffer), 1919, new name for *Chronomus abbreviatus* Malloch, 1915, prescc. Kieffer, 1913) (MT to MB, PQ, s. to CA, FL/ Tx or Ac in sON, KY, TN; hyporheic in OK; Virginian marine infauna)

***Cryptochironomus fulvus*** Johannsen, 1905 (Carolinian marine infauna)

***Cryptochironomus*** undet. sp. or species (CO, IL?, KS, ON, TX & OK hyporheic; Ac in 1 seAK cave; NC marine infauna; VA, MD brackish infauna)

**Demicryptochironomus** Lenz, 1941 Chironomidae flies, Subfamily Chiromomini  
**Demicryptochironomus** undet. sp. (Virginian marine infauna)

**Denopeloplia** Roback & Rutter, 1988 - Chironomidae flies, Subfamily Telomatogetoninae (once in Tanypodinae) (1 species in US or Canada)

**Denopeloplia** *atria*.Roback & Rutter,1988 (Ac in 1 seAK cave)

**Diamesa** Meigen, 1835 - Chironomidae flies, Subfamily Diamesinae (30 species in US or Canada)

**Diamesea** *nivicavernicola* Hansen & Cook, 1976 (AK to NH s.to NM,MD/ US hyporheic)  
**Diamesa** undet. sp. (CO hyporheic)

**Dicrotendipes** Kieffer, 1913 (= *Limnochironomus* Kieffer, 1920) - Chironomidae flies, Subfamily Chironominae, Tribe Chironomini (16 species in US or Canada). **Bibl.:** J. Epler 1987-8

**Dicrotendipes** *leucoscelis* (*Tendipes l.* Townes, 1945)(ID to ON, s. to FL/ Tx? in MN?,ON?)  
**Dicrotendipes** *modestus* (*Chironomus m.* Say, 1823) (Virginian marine infauna)

**Dicrotendipes** *neomodestus* Malloch, 1915 (SD to PQ, s. to TX,VA/Tx or Ac in sON; CO, PA hyporheic)

**Dicrotendipes** *simpsoni* Epler, 1987 (Virginian (rare), Carolinian freshwater infauna)  
**Dicrotendipes** undet. sp. or species (OR, VA hyporheic; VA, MD brackish benthic; NC marine infauna)

**Diplocladius** Kieffer in K. & Thienemann, 1908 - Chironomidae flies, Subfamily Orthocladiinae (1 species in US or Canada)

**Diplocladius** *cultriger* Kieffer, 1908 (= *D. bilobatus* Brundin, 1956) (Germany, NY to VA/ seVA hyporheic)

**Einfeldia** Kieffer, 1924 - Chironomidae flies, Subfamily Chironominae, Tribe Chironomini (5 species in US or Canada)

**Einfeldia** undet. sp. VA, MD brackish benthic

**Endochironomus** Kieffer, 1918 - Chironomidae flies, Subfamily Chironominae, Tribe Chironomini (3 species in US or Canada)

**Endochironomus** undet. sp. or species (Tx or Ac in KY, TN/ TX, VA sandy hyporheic/ Virginian marine infauna)

**Endochironomus** *subtendens* (*Tanytarsus* s. Townes, 1945) (VA, MD brackish benthic)

**Epicocladius** Zavrel, 1924 Chironomidae flies, Subfamily Orthoclaadiinae

**Epicocladius** *flavens* (Malloch, 1915) (Carolinian freshwater infauna)

**Epicocladius** undet. sp. (Virginian marine infauna)

**Eukiefferiella** Thienemann, 1926 (= *Adactylocladius* Saether, 1968) - Chironomidae flies, Subfamily Orthoclaadiinae (5 species in US or Canada)

**Eukiefferiella** *brehmi* group Thienemann (valid species?) (ON riffle hyporheic)

**Eukiefferiella** *brevicalcar* (Kieff.) gr. sp. cf. *brevinervis* (*Orthocladus* b. Mall., 1915; *Nannocladus* b.) (PA hyporheic)

**Eukiefferiella** *devonica* (*Spaniotoma* d. Edwards, 1929) group (VA, MD brackish benthic)

**Eukiefferiella** *gracei* group Thienemann (valid species?) (ON riffle hyporheic)

**Eukiefferiella** *rectangularis* Thienemann (valid species?) (nVA hyporheic)

**Eukiefferiella** undet. sp. or species (Ac in 1 seAK cave & 5 caves resurgences/ CO, ON, TX (sandy) hyporheic/ VA, MD brackish benthic)

**Glyptotendipes** Kiefer, 1913 - Chironomidae flies, Subfamily Chironominae, Tribe Chironomini

**Glyptotendipes** undet. sp. or species (TX sandy hyporheic; IL river benthic/ VA, MD brackish infauna)

**Halocladus** Hirvenoja, 1973 - Chironomidae flies, Subfamily Orthoclaadiinae (2 species in US or Canada)

**Halocladus** (*Halocladus*) *variabilis* Stagger, 1839 (PQ Gulf of St. Lawrence sandy marine interstitial)

**Harnischia** Kieffer, 1921 - Chironomidae flies, Subfamily Chironominae, Tribe Chironomini

**Harnischia** undet. sp. or species (Carolinian, Virginian infauna/ VA, MD brackish benthic)

**Heleniella** Gowin, 1943 - Chironomidae flies, Subfamily Orthoclaadiinae (3 species in US or Canada)

**Heleniella** *parva* Saether, 1969 (KS hyporheic)

**Heleniella** undet. sp. (CO hyporheic)

**Heterotrissocladus** Spark, 1923 - Chironomidae flies, Subfamily Orthoclaadiinae (9 species in US or Canada)

**Heterotrissocladus** undet. sp. (CO hyporheic)



**Heterotrissocladius** *marcidus* (Chironomus m. Walker, 1856) (PA hyporheic)

**Heterotrissocladius** *subpilosus* (*Dactylocaldius* s. Kieffer in Kieffer and Lundbeck, 1911)  
(interstitial larvae in NWT lakes)

**Heterotrissocladius** undet. sp. (hyporheic in Great Lakes)

**Hydrobaenus** Fries, 1830 - Chironomidae flies, Subfamily Orthoclaadiinae (14 species in US or Canada)

**Hydrobaenus** undet. sp. or species (Tx in OR; Tp? in WA; Tx in WA/ VA, MD brackish benthic)

**Krenosmittia** Thienemann & Kruger, 1939 - Chironomidae flies, Subfamily Orthoclaadiinae (3 species in US or Canada)

**Krenosmittia** undet. sp. or species (CO, KS, seVA hyporheic; seAK sink, cave resurgence; shallow hyporheic in Sycamore Cr. 32 km ne of Phoenix (Maricopa Co.), Bridle Cr. & Santa Maria River, AZ)

**Labrundinia** - Chironomidae flies, Subfamily Tanypodinae, Tribe Pentaneurini (6 species in US or Canada)

**Labrundinia** *pilosella* (*Tanypus* p. Loew, 1866) (PA hyporheic)

**Lappodiamesa** Serra-Tosio, 1968 - Chironomidae flies, Subfamily Orthoclaadiinae  
**Lappodiamesa** undet. sp. (PA hyporheic)

**Larsia** Fittkau, 1962 - Chironomidae flies, Subfamily Tanypodinae, Tribe Pentaneurini (6 species in US or Canada)

**Larsia** undet. sp. or species (Tx in KY, TN; IL river benthic)

**Larsia** *decolorata* (*Tanypus decoloratus* Malloch, 1915) (Carolinian freshwater infauna)

**Lasiodiamesa** Kieffer, 1924 - Chironomidae flies, Subfamily Diamesinae, Tribe Boreochlini  
**Lasiodiamesa** undet. sp. (Tx or Ac in sON)

**Lauterborniella** Bause, 1913 - Chironomidae flies, Subfamily Chironominae, Tribe Chironomini  
**Lauterborniella** *agraylloides* (*Tanytarsus* a. Kieffer, 1911) (VA, MD brackish benthic)

**Limnophyes** Eaton, 1875 - Chironomidae flies, Subfamily Orthoclaadiinae (18 species in US or Canada)

**Limnophyes** undet. sp. or species (Tx or Ac in KY, TN/ VA, MD brackish benthic)

***Lipiniella*** Shilova, 1961 - Chironomidae flies, Subfamily Chironominae, Tribe Chironomini  
***Lipiniella*** undet. sp. (VA, MD brackish benthic)

***Lopescladius*** Oliveira, 1967 - Chironomidae flies, Subfamily Orthocladiinae  
***Lopescladius*** (*Cordelia*) *hyporheicus* Coffman & Roback, 1984 (hyporheic)

***Lopescladius*** *inermis* Saether O., 1983 (hyporheic in KS)  
***Lopescladius*** undet. sp. (FL, CO & OK hyporheic)

***Metriocnemus*** van der Wulp, 1874 - Chironomidae flies, Subfamily Orthocladiinae (16 species in US or Canada)

***Metriocnemus*** undet. sp. (OR C.; Ac? in WA, 2seAK caves)  
***Metriocnemus*** possibly undescr. sp. (\*?in cave in NS)

***Microcricotopus*** Thienemann & Harnisch, 1932 - Chironomidae flies, Subfamily Orthocladiinae  
***Microcricotopus*** cf. *bicolor* (Zett.) (PA hyporheic)

***Micropsectra*** Kieffer, 1909 (= *Opeklandia* Kieffer 1922) Chironomidae flies, Subfamily Chironominae, Tribe Tanytarsini (19 species in US or Canada)

***Micropsectra*** *polita* (Tanytarsus p. Malloch, 1915) (*M.* cf. *p.*- PA hyporheic)  
***Micropsectra*** undet. sp. or species (Tx or Ac in sON, seAK/ AZ, BC, CO, PQ, TX, seVA hyporheic/ VA, MD brackish benthic)

***Microtendipes*** Kieffer, 1915 - Chironomidae flies, Subfamily Chironominae, Tribe Chironomini (4 species in US or Canada)

***Microtendipes*** *caducus* Townes, 1945 (seVA hyporheic)

***Microtendipes*** *pedellus* (*Tipula* p. De Geer, 1776) (rare Virginian marine infauna; *M.* cf. *p.* - PA hyporheic)

***Microtendipes*** undet. sp. or species (CO, ON, PQ, seVA hyporheic; larvae in NH lake sediments; IL river benthic; VA, MD brackish benthic / Tx in KY, MN, ON, TN)

***Monodiamesa*** Kieffe, 1921 – Chironomidae flies, Subfamily Prodiamesinae  
***Monodiamesa*** undet. sp. (rare in ON sandy hyporheic)

***Natarsia*** Fittkau, 1962 - Chironomidae flies, Subfamily Tanypodinae, Tribe Macropelopiini (2 species in US or Canada)

***Natarsia*** *baltimoreus* (Macquart) (PA hyporheic)  
***Natarsia*** undet. sp. (CO, TX hyporheic)

**Nanocladius** Kieffer, 1913 (= *Microcricotopus* Thienemann & Harnisch, 1932; *Plecopteracoluthus* Steffan, 1965) Chironomidae flies, Subfamily Orthocladiinae (3 species in US or Canada)

**Nanocladius** (*N.*) *balticus* (Palmer, 1959) (VA, MD brackish benthic; rare Virginian marine infauna)

**Nanocladius** *crassicornus* Saether, 1977 (rare Virginian marine infauna)

**Nanocladius** *bicolor* (Zetterstedt, 1838) group (VA, MD brackish benthic)

**Nanocladius** *distinctus* (*Orthocladius d.* Malloch, 1915; *Trichocladius d.*; *O.d. basilis* & *bicolor* M., 1915) (IL, FL river benthic/ CO hyporheic?)

**Nilotanypus** Kieffer, 1923 - Chironomidae flies, Subfamily Tanypodinae, Tribe Pentaneurini (3 species in US or Canada)

**Nilotanypus** undet. sp. (Ac in 1 seAK cave; IL river benthic)

**Nilothauma** Kieffer, 1921 - Chironomidae flies, Subfamily Chironominae, Tribe Chironomini

**Nilothauma** undet. sp. or species (Carolinian freshwater interstitial; rare Virginian marine infauna)

**Nimbocera** Reiss, 1972 - Chironomidae flies, Subfamily Tanypodinae, Tribe Tanytarsini

**Nimbocera** undet. sp. (Carolinian freshwater interstitial)

**Orthocladius** van der Wulp, 1874 - Chironomidae flies, Subfamily Orthocladiinae. (51 species in US or Canada) **Bibl.:** Soptonis 1975

**Orthocladius** undet. sp. (Ac in 1 seAK cave; OR, ON, PQ hyporheic larvae; O. sensu strictu - nVA hyporheic)

**Orthocladius** or *Cricotopus* undet. sp. or species (Tx in IL, KY, s.ON, PQ, TN, BC, CO hyporheic/ (VA, MD brackish benthic))

**Orthocladius** undescr. sp. (\*?cave in Jackson Co.,AL/Tx) Peck, 1995

**Pagastia** Oliver, 1959 - Chironomidae flies, Subfamily Diamesinae

**Pagastia** undet. sp. (CO hyporheic)

**Pagastiella** Brundin, 1949 - Chironomidae flies, Subfamily Chironominae, Tribe Chironomini

**Pagastiella** undet. sp. (rare Virginian marine infauna)

**Paraboreochlus** Thienemann, 1939 - Chironomidae flies, Subfamily Podonominae, Tribe Boreochlini

**Paraboreochlus stahli** Coffman, Ferrington & Seward 1988 (KS, NY, PA, NC hyporheic)  
**Paraboreochlus** undet. sp. (KS, NY hyporheic larvae)

**Parachaetocladius** Wulker, 1959 - Chironomidae flies, Subfamily Orthoclaadiinae (3 species in US or Canada)

**Parachaetocladius hudsoni** (*Hydrobaenus h.* Saether, 1977) (KS hyporheic)

**Parachironomus** Lenz, 1921-1941 - Chironomidae flies, Subfamily Chironominae, Tribe Chironomini

**Parachironomus directus** (*Tendipes d.* Dendy & Sublette, 1960) (Carolinian freshwater interstitial; Virginian marine infauna)

**Parachironomus** undet. sp. (VA, MD brackish infauna)

**Paracladopelma** Harnish, 1923 - Chironomidae flies, Subfamily Subfamily Chironominae, Tribe Chironomini (11 species in US or Canada)

**Paracladopelma** undet. sp. or species (VA, MD marine infauna; seVA hyporheic)

**Parakiefferiella** Thienemann, 1936 - Chironomidae flies, Subfamily Orthoclaadiinae, Tribe Metriocnemini (5 species in US or Canada)

**Parakiefferiella** undet. sp. or species (n,seVA hyporheic)

**Paralauterborniella** Lenz, 1941 - Chironomidae flies, Subfamily Chironominae, Tribe Chironomini

**Paralauterborniella** undet. sp. or species (TX sandy hyporheic; IL river benthic; VA, MD brackish benthic; Virginian marine infauna)

**Paramerina** Fittkau, 1962 - Chironomidae flies, Subfamily Chironominae, Subfamily Tanypodinae, Tribe Pentaneurini (5 species in US or Canada)

**Paramerina** undet. sp. (Ac? in 1 seAK cave insurgences)

**Parametriocnemus** Goetghebuer, 1932 - Chironomidae flies, Subfamily Orthoclaadiinae (5 species in US or Canada)

**Parametriocnemus lundbeckii** (*Metriocnemus l.* Johannsen, 1905) (Greenland to MI,FL/Tx or Ac in sON)

**Parametriocnemus** undet. sp. or species (BC, CO, ON, PA hyporheic; Tx or Ac in seAK cave, resurgences, insurgences VA, MD brackish benthic)

*Paraphaenocladius* Thienemann, 1926 - Chironomidae flies, Subfamily Orthoclaadiinae

*Paraphaenocladius* undet. sp. (streams below seAK cave)

*Paratanytarsus* Thienemann & Bause, 1913 - Chironomidae flies, Subfamily Chironominae, Tribe Tanytarsini (12 species in US or Canada)

*Paratanytarsus* undet sp. or species (CO, se,nVA hyporheic; IL river benthic)

*Paratendipes* Kieffer, 1911 - Chironomidae flies, Subfamily Chironominae, Tribe Chironomini (8 species in US or Canada) **Bibl.:** Hayford 1998

*Paratendipes albimanus* Meigen, 1818 (OH likely hyporheic)

*Paratendipes basidens* Townes, 1945 (NJ, IA, AL/ Tx or Ac in KY?,TN?; hyporheic in KS)

*Paratendipes* undet. sp. (CO, OK, OH, TX, seVA hyporheic/Tx in TN; IL river benthic/ VA, MD brackish benthic)

*Paratendipes subaequalis* Malloch, 1915 (KS hyporheic) **Bibl.:** Goldhammer 1995

*Pagastiella* Brundin, 1949 - Chironomidae flies, Subfamily Chironominae Tribe Chironomini (2 species in US or Canada)

*Pagastiella ostansa* Webb, 1969 (nVA hyporheic)

*Pentaneura* Philippi, 1865 - Chironomidae flies, Subfamily Tanypodinae, Tribe Pentaneurini (4 species in US or Canada)

*Pentaneura* undet. sp. or species (E, esp. SE/Tx in MO; AK cave resurgences)

*Phaenopsectra* Kieffer, 1921 - Chironomidae flies, Subfamily Chironominae, Tribe Chironomini (9 species in US or Canada)

*Phaenopsectra dyari* (= *Tanytarsus d.* Townes, 1945) (CA, FL, MT/ prob. in CO hyporheic)

*Phaenopsectra flavipes* (*Chironomus f.* Meigen, 1818) (seVA hyporheic larvae)

*Phaenopsectra* undet. sp. (VA, MD brackish benthic)

*Polypedilum* Kieffer, 1912 (*Pentapedilum* Kieffer, 1913; *Tripodura* Townes, 1945) Chironomidae flies, Subfamily Chironominae, Tribe Chironomini (40 species in US or Canada)

**Bibl.:** Maschwitz 1976

*Polypedilum convictum* (*Chironomus c.* Walker, 1856) group (Europe, WI to NY, s. to KS, FL/ Tx or Ac in TN; CO hyporheic; rare Virginian marine infauna)

**Polypedilum fallax** (*C. f.* Johannsen, 1905) group (MI to PQ, s. to TX, FL/ CO hyporheic/ VA, MD brackish benthic)

**Polypedilum halterale** (= *C. halteralis* Coquillett, 1901) group (CA,AZ, WI to NY, s. to OK,FL/ Tx or Ac in KY,TN; Carolinian freshwater infauna/ VA, MD brackish infauna; MA marine infauna)

**Polypedilum illinoensis** Malloch, 1915 (Virginian marine infauna)

**Polypedilum scalaenum** (*Tipula scalaena* Schrank, 1803) (Carolinian freshwater infauna; Virginian marine infauna)

**Polypedilum** undet. sp. or species (Tx in AL; BC (subgenus *Polypedilum*) ON, (2 species), TX(sandy), se,nVA hyporheic; larvae in AB, NH lake sediments; IL river benthic/ seVA hyporheic/ VA, MD, NC brackish infauna (subgenus *Polypedilum*))

**Polypedilum tritum** (*Chironomus tritus* Walker, 1856) (Virginian (rare), Carolinian freshwater infauna)

**Potthastia** Kieffer, 1922 - Chironomidae flies, Subfamily Diamesinae *longimana* Kieffer, 1922  
**Potthastia** undet. sp. (CO hyporheic)

**Procladius** Skuse, 1889 (Subgenera *Psilotanypus* Kieffer, 1906; *Holotanypus* Roback, 1982)  
Chironomidae flies, Subfamily Tanypodinae

**Procladius bellus** (*Tanypus b.* Loew, 1866) (Virginian (rare), Carolinian marine infauna; Tx in GA (Dade Co.))

**Procladius** undet. sp. or species (Tx in KY, PQ, TN; Ac in WA, AK insurgences & sinks; PQ Gulf of St. Lawrence sandy marine interstitial; PA,. nVA hyporheic; IL river benthic; NC marine infauna/ VA, MD, NC brackish benthic)

**Procladius sublettei** rRoback, 1971(rare Virginian marine infauna)

**Prodiamesa** Kieffer, 1906 - Chironomidae flies, Subfamily Diamesinae  
**Prodiamesa** undet. sp. (ON, PQ hyporheic)

**Psectrocladius** Kieffer, 1906 - Chironomidae flies, Subfamily Orthoclaadiinae (20 species in US or Canada)

**Psectrocladius** undet. sp. or species (hyporheic in OR; PQ Gulf of St. Lawrence sandy marine interstitial)

**Psectrotanypus** Kieffer, 1909 - Chironomidae flies, Subfamily Chironominae, Tribe Macropelopiini (3 species in US or Canada)

*Psectrotanypus* undet. sp. (PA? hyporheic)

*Psilometriocnemus* Saether, 1969 - Chironomidae flies, Subfamily Orthocladiinae (1 species in US or Canada)

*Psilometriocnemus triannulatus* Saether, 1969 (KS hyporheic)

*Pseudorthocladius* Goetghebuer, 1939 - Chironomidae flies, Subfamily Orthocladiinae (18 species in US or Canada)

*Pseudorthocladius* undet. sp. (PA hyporheic)

*Pseudosmittia* Goetghebuer, 1932 - Chironomidae flies, Subfamily Orthocladiinae (7 species in US or Canada)

*Pseudosmittia* undet. sp. (rare KS hyporheic)

*Rheocricotopus* Thienemann & Harnisch, 1932 - Chironomidae flies, Subfamily Orthocladiinae

*Rheocricotopus clavicornis* Thienemann (nVA hyporheic)

*Rheosmittia* Brundin, 1986 - Chironomidae flies, Subfamily Orthocladiinae

*Rheosmittia* undet. sp. or species (CO, KS, ON?, seVA hyporheic)

*Rheotanytarsus* Bause, 1913 - Chironomidae flies, Subfamily Chironominae, Tribe Tanytarsini (5 species in US or Canada)

*Rheotanytarsus* *exiguus* (*Tanytarsus e.* Johannsen, 1905) (PA hyporheic)

*Rheotanytarsus* undet. species (Tx or Ac in ON; CO, ON & OK hyporheic; seAK insurgences & resurgences; IL river benthic/ VA, MD brackish benthic)

*Robackia* Saether, 1977 - Chironomidae flies, Subfamily Telmatogetoninae (once in Chironominae) (3 species in US or Canada)

*Robackia* *claviger* Townes, 1945 (Virginian marine infauna)

*Robackia* *demeijerei* (Kruseman, 1933) (TX sandy hyporheic)

*Robackia* undet. sp. or species (CO hyporheic; IL river benthic)

*Saetheria* Jackson, 1977 - Chironomidae flies, Subfamily Telmatogetoninae (once in Chironominae) (3 species in US or Canada)

*Saetheria* *reissi* Jackson 1977 (KS hyporheic)

*Saetheria* undet. sp. (CO, KS, ON hyporheic)

**Saetheria** *tylus* (*Harnischia t.* Townes, 1945) (KS, seVA hyporheic)

**Smittia** Holmgren, 1869 - Chironomidae flies, Subfamily Orthoclaadiinae

**Smittia** undet. sp. or species (Tx on porcupine dung in NS/ VA, MD brackish benthic)

**Stempellina** Thieneman in Bause, 1913 - Chironomidae flies, Subfamily Tanypodinae, Tribe Tanytarsini (3 species in US or Canada)

**Stempellina** undet. sp. or species (TX, CO, seVA hyporheic/ VA, MD brackish benthic)

**Stempellina** *montivaga* Goetghbuer group (ON riffle hyporheic)

**Stempellina** undet. sp. (seVA hyporheic)

**Stempellinella** Brudin, 1947- Chironomidae flies, Subfamily Telmatogetoninae (once in Chironominae) (3 species in US or Canada)

**Stempellinella** undet. sp. (nVA hyporheic)

**Stenochironomus** Kieffer, 1919 (Subgenera *Petalopholeus* Borkent, 1984; *Stenochironomus* Kieffer, 1922) Chironomidae flies, Subfamily Chironominae, Tribe Chironomini (8 species in US or Canada)

**Stenochironomus** undet. sp. or species (Tx or Ac in sON)

**Stictochoironomus** Kieffer, 1919 - Chironomidae flies, Subfamily Chironominae, Tribe Chironomini (13 species in US or Canada)

**@Stictochoironomus** *caffrarius* (Virginian (rare), Carolinian freshwater infauna)

**Stictochoironomus** *devinctus* Say, 1829 (Virginian marine infauna)

**Stictochoironomus** *flavicingulus* (*Chironomus flavicingula* Walker 1848) (Tx or Ac in cave in VA)

**Stictochoironomus** undet. sp. or species (CO, nVA hyporheic; PQ Gulf of St. Lawrence sandy marine interstitial/ VA, MD brackish benthic)

**Sublettea** Roback, 1975 - Chironomidae flies, Subfamily Telmatogetoninae (once in Chironominae)(3 species in US or Canada)

**Sublettea** *coffmani* (*Tanytarsus c.* R., 1975) (Tx? in MN?)

**Synorthocladus** Thienemann, 1935 - Chironomidae flies, Subfamily Orthoclaadiinae

**Synorthocladus** *semivirens* (*Dactylocladius* Kieffer, 1909) (PA hyporheic)

**Synorthocladus** undet. sp. or species (BC., CO hyporheic)



***Tanypus*** Meigen, 1803 - Chironomidae flies, Subfamily Tanypodinae, Tribe Tanypodini  
Tribe Tanypodini (*Tanypus*)

***Tanypus neopunctipennis*** Sublette, 1964 (Virginian, MA marine infauna)

***Tanypus stellatus*** Coquillett, 1902 (Carolinian infauna/ VA, MD brackish benthic)

***Tanytarsus*** van der Wulp, 1874 (*Calopsectra* Kieffer, 1909) (green midges) Chironomidae flies,  
Subfamily Chironominae, Tribe Tanytarsini (34 species in US or Canada)

***Tanytarsus*** near *recurvatus* Brundin, 1947 (European epigeal/ alien? Tx in GA (Bartow Co.))

***Tanytarsus*** undet. sp. or species (CO, OK, ON, PA, TX, se,nVA hyporheic; AB lake infauna;  
seAK insurgences; PQ Gulf of St. Lawrence sandy marine interstitial; Carolinian, NC marine  
infauna; VA, MD brackish benthic)

Undescribed genus near ***Tethymia***? Wirth, 1949 (marine genus) Chironomidae flies,  
Subfamily Orthoclaadiinae (6 species in US or Canada) (TTx in WA)

***Thalassosmittia*** Strenzke & Remmert, 1857 - Chironomidae flies, Subfamily Orthoclaadiinae  
(3 species in US or Canada)

***Thalassosmittia clavicornis*** (*Camptocladus c.* Saunders, 1928) (nVA hyporheic)

***Thalassosmittia*** undet. sp. (Ac in 1 seAK cave)

***Thienemanniella*** Kieffer, 1911 - Chironomidae flies, Subfamily Orthoclaadiinae

***Thienemanniella*** undet. sp. or species (CO (prob.), PA & ON hyporheic/ Tx? in MN; Ac or TTx  
in 1seAK cave; Carolinian freshwater infauna/ VA, MD brackish benthic)

***Thienemannimyia*** Fittkau, 1957- Chironomidae flies, Subfamily Tanypodinae, Tribe  
Pentaneurini (3 species in US or Canada)

***Thienemannimyia norena*** (*Pentaneura n.* Roback, 1957) (PA hyporheic)

***Thienemannimyia*** undet. sp or species (BC, CO, ON, seVA hyporheic; Ac or TTX in 1 seAK  
cave; IL river benthic)

***Tribelos*** Townes, 1945 - Chironomidae flies, Subfamily Chironominae, Tribe Chironomini

***Tribelos*** (*Tribelos*) *jucundus* (*Chironomus j.* Walker, 1848) (AB to PQ, s. to OK, FL/ seVA  
hyporheic; rare Virginian marine infauna)

***Tribelos*** undet. sp. or species (shallow hyporheic in Sycamore Cr. 32 km ne of Phoenix  
(Maricopa Co.), AZ/ VA, MD brackish benthic)

***Trichocladus*** Kieffer, 1906 - Chironomidae flies, Subfamily Orthoclaadiinae

*Trichocladius* undet. sp. (Tx or Ac in 1 IL cave)

*Trissopelopia* Kieffer, 1923 - Chironomidae flies, Subfamily Tanypodinae, Tribe Pentaneurini (6 species in US or Canada)

*Trissopelopia* ogemawi Roback, 1971 (Ac in 1 seAK cave)

*Tvetenia* Kieffer, 1922 - Chironomidae flies, Subfamily Orthoclaadiinae

*Tvetenia* *discoloripes* Kieffer, 1922 gr.(CO hyporheic)

*Zavreliella* Kieffer, 1920 - Chironomidae flies, Subfamily Telomatogetoninae (also put in Tanypodinae) (1 species in US or Canada)

*Zavreliella* *varipennis* (*Chironomus* v. Coquillett, 1902) (seVA hyporheic)

*Zavreliella* undet. sp. or species (VA, MD brackish benthic; seVA hyporheic))

*Zavreliomyia* Fittkau, 1962 - Chironomidae flies, Subfamily Tanypodinae, Tribe Pentaneurini (3 species in US or Canada)

*Zavreliomyia* undet. sp. or species (Ac in 1 seAK cave; seVA hyporheic)

*Zavreliomyia* *sinuosa* (*Tanypus* s. Coquillett, 1905) (PA hyporheic)

**CHLOROPIDAE** (frit flies) suborder Brachycera, infraorder Muscomorpha. About 1,200 small, hairless black, yellow or green species

Subfamily Oscinellinae (*Gaurax*, *Hippelates*, *Liohippелates*)

*Gaurax* Loew, 1863 - Chloropidae flies, Subfamily Oscinellinae (25 species in US or Canada)

*Gaurax* undet. sp. (Tx or Ac in sON)

*Hippelates* Loew, 1863 (once in Chironomidae) Chloropidae flies, Subfamily Oscinellinae (6 species in US or Canada)

*Hippelates* *impressus* Becker, 1912 (AZ, CO, NM, Mex./ Tx in Irion Co., TX)

*Liohippелates* Duda, 1929 (= *Hippelates*) Chloropidae flies, Subfamily Oscinellinae (10 species in US or Canada)

*Liohippелates* undet. sp.(rare KS hyporheic)

**CORETHRELLIDAE** (once put in Chaoboridae, Subfamily Corethrellinae)

*Corethrella* Coquillett, 1902 (once put in Chaoboridae, Subfamily Corethrellinae) (4 species in US or Canada)

*Corethrella* undet. sp. (shallow hyporheic in Sycamore Cr. 32 km ne of Phoenix (Maricopa Co.), Bidle & Santa Maria River, AZ)

CORYLURIDAE = Scatophagidae

**CULICIDAE** (mosquitoes). **Areas:** NA: Carpenter & LaCasse, 1955; IL: H. Ross & Horsfall 1965; S: Gerhardt 1966; SE: W. King et al. 1939; TN: Breeland et al. 1961.

Subfamily Anophelinae. (*Anopheles*)

Subfamily Culicinae

Tribe Culicini (*Aedes*, *Culex*, *Culiseta*, *Mansonia*, *Uranotaenia*)

*Aedes* Meigen, 1818 (most Tx in sON) Culicidae flies, Subfamily Culicinae, Tribe Culicini (67 species in US or Canada)

*Aedes* (*Ochlerotatus*) *abserratus* (= *Culex a.* Felt & Young, 1904; *A. centrotus* Howard, Dyar & Knab, 1917; *A. dysanor* Dyar, 1921) (Labrador, NS, s. to IL, MN/ Tx in sON)

*Aedes* (*O.*) *atropalpus* (Coguiwett, 1902) (PQ Gulf of St. Lawrence sandy marine interstitial)

*Aedes* (*O.*) *aurifer* (*Culex a.* Coquillett, 1903), (Tx in sON)

*Aedes* *canadensis* (*Culex c.* Theobald, 1901) (N forests/Tx in sON)

*Aedes* (*Aedes*) *cinereus* (*Aedes c.* Meigen, 1818; *A. fuscus* Osten Sacken, 1877) (nNA/ TTx or Ac in NWT; Tx in sON)

*Aedes* (*Ochlerotatus*) *communis* (*Culex c.* DeGeer, 1776) (N forests/common snow m./Tx in sON)

*Aedes* (*O.*) *fitchii* (*Culex f.* Felt & Young, 1904) (AK to Labrador, s. to CA, IL, NY/Tx in sON)

*Aedes* (*O.*) *provocans* (*Culex p.* Walker, 1848; *C. trichurus* Dyar, 1904; *C. cinereoboredalis* Felt & Young; *A. pagetonotum* Dyar & Knab, 1909; *A. poliochros* Dyar, 1919; maybe junior syn. Of *A. punctor* (*Culex p.* Kirby, 1837) (eCanada/Tx in sON)

*Aedes* (*O.*) *punctor* (*Culex p.* Kirby, 1837; *C. implacabilis* Walker, 1848; *C. fuscus* Zetterstedt, 1850; *Culicelsa auroides* Felt, 1905; *Culex wahlgreni* Theobald, 1910; *Culicada alineata* & *haplolineata* Schneider, 1913) (N forests circumboreal to UT/ Tx/ Tx in sON)

*Aedes* (*O.*) *sticticus* (floodwater m.) (*C. s.* Meigen, 1838) (Eurasia, NA/ Tx in sON)

*Aedes* (*O.*) *stimulans* (*C. s.* Walker, 1848) (AK to PQ, s. to MS/ Tx in sON)

*Aedes* (*Aedimorphus*) *vexans* (*C. s.* Meigen, 1830) (global/vexatious m./Tx in TX(poss.))

*Aedes* undet. sp. (TTx in nests of *Hirundo fulva* in cave in Edwards Co., TX; Ac or Ttx in 1 seAK cave)

*Anopheles* Meigen, 1818 - Culicidae flies, Subfamily Anophelinae. (14 species in US or Canada)  
. **Bibl.:** G. Bradley & King, 1941

*Anopheles* (*A.*) *earlei* Vargas, 1943 (Tx in AB, sON)

*Anopheles* (*A.*) *punctipennis* (*Culex p.* Say, 1823) (E, NW, NM, sCanada, Mex./ woodland malaria mosquito /Tx in GA (Dade & Walker Cos.), IL, IN (4 cos., S5/G5), KY (Warren & Edmonson Cos.), MO (Carter Co.), NJ, OH, sON, TN)

*Anopheles* (*A.*) *quadrimaculatus* Say, 1824 (common malaria mosquito/ NA except far W/Tx in IL, IN, sON, TN)

*Anopheles* undet. sp. or species (Tx or Ac in nMS; Tx in NS; IL river benthic)

*Culex* Linnaeus, 1758 (=>50 genera) - Culicidae flies, Subfamily Culicinae, Tribe Culicini (23 species in US or Canada)

*Culex* (*Melanoconion*) *erraticus* (*Mochlostyrax e.* Dyar & Knab, 1906; *C. egberti*, *leprincei* Dyar & Knab, 1907; *C. invocator* Pazos, 1908; *C. trachycampa* D&K, 1909; *C. peribleptus*, *pose* D&K, 1918; *D. degustator* D, 1921; *C. homoepas* D & Ludlow, 1921; *C. borinqueni* Root, 1922; *C. tovari* Evans, 1924) (Labrador to Brazil/ TTx in MO (Carter Co.))

*Culex impatiens* = *Culiseta i.*

*Culex* (*C.*) *pipiens* (*Culex p.* Linnaeus, 1758; *C. consobrinus* Rob.-Desvoidy, etc.) (Europe, NA/ (European or northern) house mosquito/ Tx In IL, IN (3 cos., S5/G5), NJ, NS, OH, TX)

*Culex* *quinquefasciatus* (Say, 1823) (Alien Tx or Ac in Kazumura C., HI/southern house mosquito)

*Culex* (*C.*) *restuans* (*Culex r.* Theobald, 1901) (E & BC to Mex./little black or white dotted m./Tx in sON, NS; Tx or Ac in 1 PA cave)

*Culex* undet. sp. (nMS/Tx or Ac in nMS; most species Tx in sON)

*Culex* (*C.*) *tarsalis* Coquillett, 1904 (*C. kelloggi* Theobald) (North/common m./HTx in AB, WA)

*Culex* (*C.*) *territans* Walker, 1856 (Tx in GA (Walker Co.) & NS (probable))

*Culiseta* Felt, 1904 (= *Theobaldia* Neveu-Lemaire, 1902 (homo.); *Culicella* F.1904; *Theobaldinella* Blanchard, 1905; *Pseudotheobaldia* Theobald, 1907; *Climacura* Howard, Dyar & Knab, 1915; *Allotheobaldia* Broelemann, 1919; *Theomyia* Edwards, 1930; *Austratheobaldia* Dobrotwrosky, 1954; *Neotheobaldia* D.1958) Culicidae flies, Subfamily Culicinae, Tribe Culicini (9 species in US or Canada)

***Culiseta impatiens*** Walker, 1848 (= *Culex impatiens* Walker, 1848; *Culex pinguis* W.1866; *Culex absorbrinus* Felt, 1904) (N/snows mosquito/Tx in sON; HTx in WA; TTx in cave (prob.), Bexar Co., TX)

***Culiseta inornata*** (*Culex i.* Williston, 1893; *Culex magnipennis* Felt, 1904; *Theobaldia i.*), (NA to nMex./ broad winged or unmarked slender m./ Tx in sON)

***Culiseta pipiens*** Linnaeus, 1758 (= *Culex consobrinus*) (Circumpolar epigeal/ northern house mosquito/ Tx larvae in cave in Hart Co., KY)

***Culiseta*** undet. sp. (Tx or Ac in CA)

***Mansonia*** Blanchard, 1901 - Culicidae flies, Subfamily Culicinae, Tribe Culicini

***Mansonia perturbans*** Walker, 1856 (sON/Tx or Ac)

*Theobaldia* = *Culiseta*

***Uranotaenia*** Lynch Arribalzaga, 1891 - Culicidae flies, Subfamily Culicinae, Tribe Culicini (3 species in US or Canada)

***Uranotaenia sapphirina*** (*Aedes s.* Osten Sacken, 1868) (winter Tx in Carter Co, MO)

crane flies - See Ptychopteridae, Trichoceridae & Tipulidae. **Bibl.:** **Areas:** AZ, NM, TX - C. Alexander, 1946b; **CO:** A.1943a; **Nearctic A. NC:** A., 1941; **TN:** A., 1940; **UT:** A., 1949. **WA:** A., 1949a; **WY:** A., 1943

**CURTONOTIDAE** (humpbacked flies) (*Curtonotum*)

***Curtonotum*** Macquart, 1843 - Curtonotidae flies (1 species in US or Canada)

***Curtonotum helvum*** (*Diplocentra h.* Loew, 1862) (Ac, Tx or Tp in Vancouver Island caves?, BC)

**CUTEREBRIDAE** (Bot Fly Fly Family) (now subsumed in Oestridae)

*Cuterebra* (now in Oestridae)

deer flies - See Phoridae

**DIXIDAE** (dixid midges) suborder Nematocera, infraorder Culicomorpha.

Undet genus rarely found in sON hyporheic & groundwater

***Dixa*** Meigen, 1818 (= *Paradixa*) - Dixidae flies (22 species in US or Canada)

***Dixa*** undet. sp(p). (Tx in AR,MO; WV hyporheic)

**Dixella** Dyar & Shannon, 1924 (also treated as subgenus of *Dixa*)- Dixidae flies (19 species in US or Canada)

**Dixella** undet. sp. (Tx or Ac in sON)

**DOLICHOPODIDAE** (long-legged flies) suborder Brachycera, infraorder Muscomorpha. **Bibl.:** Hurley, 1985, 1995.

Undet. Genera & species in 1se AK cave

Subfamily Aphrosylinae (*Aphrosylus*) (once in Diaphorinae)

Subfamily Diaphorinae (*Aphrosylus* (now in Aphrosylinae), *Chrysotus*)

Subfamily Dolichopodinae (*Dolichopus*)

Subfamily Hydrophorinae (*Liancalus*, *Thinophilus*)

Subfamily Nuerigoninae (*Neurigona*)

**Aphrosylus** Haliday, 1851(= *Paraphrosylus*) Dolichopodidae flies, Subfamily Aphrosylinae (once in Diaphorinae) (6 species in US or Canada)

**Aphrosylus** undet. sp. (Tx or Ac in Hamiton Co., TN & Monroe Co., WV)

**Chrysotus** Meigen, 1824 - Dolichopodidae flies, Subfamily Diaphorinae (107 species in US or Canada)

**Chrysotus** undet. sp. (rare KS hyporheic)

**Dolichopus** Latreille, 1796 - Dolichopodidae flies, Subfamily Dolichopodinae (311 species in US or Canada)

**Dolichopus fulvipes** Loew, 1861 (AB to NS, s. to IL,NJ/Tx or Ac in sON)

**Dolichopus pencillatus** Van Duzee, 1921 (= *Hygroceleuthus ciliatus* Aldrich, 1893) (BC to ME, s.to CA,NY,SD/ Tx or Ac in sON)

**Dolichopus** undet. sp. (MS tidal marsh epifauna)

**Liancalus** Loew, 1857 (= *Anoplomerus*, 1856 (homo.); *Anoplopus* R.1857 (homo.)

Dolichopodidae flies, Subfamily Hydrophorinae (5 species in US or Canada)

**Liancalus genualis** Loew, 1861 (= *Orthocerathium* g.) (MN to PQ, s. to GA/Ac in IN; Tx in GA (Bartow Co.))

**Liancalus** undet. sp. (MO/Tx)

**Neurigona** Rondani, 1856 (*Saucropus* Loew, 1857; *Dactylomyia* Aldrich, 1894)

Dolichopodidae flies, Subfamily Nuerigoninae (40 species in US or Canada)

*Neurigonella* Robinson, 1964 - Dolichopodidae flies, Subfamily Nuerigoninae  
*Neurigonella sombrea* (*Neurigona* s. Harmston & Knowlton. 1945) (Ac, Tx or Tp in GA (Dade Co.))

*Neurigona* undet. sp. (Ac or TTx in IN)

*Orthocerathium* - See *Liancalus*  
*Paraphrosylus* Becker, 1922 = *Aphrosylus*

*Thinophilus* Wahlberg, 1844 - Dolichopodidae flies, Subfamily Hydrophorinae (24 species in US or Canada)

*Thinophilus* undet. sp. (rare KS hyporheic)

**DROSOPHILIDAE** ((small) fruit flies; pomace flies, vinegar flies) Suborder Brachycera, infraorder Muscomorpha.

Undet. AC, Tx or Tp genus in Vancouver Island caves, BC)

Subfamily Drosophilinae (*Drosophila*, *Mycodrosophila*).  
Subfamily Steganinae (*Leucophenga*, *Stegana*)

*Drosophila* Fallen, 1823 - Drosophilidae flies, Subfamily Drosophilinae (106 species in US or Canada)

*Drosophila* undet. sp. (TX in MO, TN)

*Leucophenga* Mik, 1886 Drosophilidae flies, Subfamily Steganinae (7 species in US or Canada)

*Leucophenga* undet. sp. (TX/Tx)

*Mycodrosophila* Oldenberg, 1914 - Drosophilidae flies, Subfamily Drosophilinae (3 species in US or Canada)

*Mycodrosophila dimidiata* (*Brachydeutera d.* Loew, 1862) (ID to ME, s. to IL, TX, FL/ TTx in TN)

*Stegana* Meigen, 1830 - Drosophilidae flies, Subfamily Steganinae (5 species in US or Canada)

*Stegana* (*Steganina*) *coleoprata* (*Musca c.* Scopoli, 1763) complex (NWT to WA, MI, TN, PQ, VA/ Tx or Ac in sON)

**DRYOMYZIDAE** (dryomyzid or seabeach & barnacle flies) suborder Brachycera, infraorder Muscomorpha

*Dryomyza* Fallen, 1820 - Dryomyzide flies, Subfamily Dryomyzinae (7 species in US or Canada)

*Dryomyza anilis* Fallen, 1820 (AK to Labrador, s. to OR, IL, WV/Tx or Ac in sON)

dung fly - See Sphaeroceridae.

**EMPIDIDAE** (dance flies) suborder Brachycera, infraorder Muscomorpha

Undet. AC, Tx or Tp genus in Vancouver Island caves, BC)

Subfamily Clinocerinae (*Roederiodes*, *Trichoclinocera*)

Subfamily Empidinae (*Hilara*, *Oreogeton* (also put in Oreogetoninae), *Rhamphomyia*)

Subfamily Hemerodromiinae

Tribe Hemerodromiini (*Chelifera*, *Hemerodromia*)

Subfamily Tachydromiinae (*Charadrodromia*, *Crossopalpus*, *Platypalpus*, *Tachypeza*)

***Charadrodromia*** Melander, 1928 - Empididae flies (also put in Hybotidae, Subfamily Tachydromiinae) (3 species in US or Canada)

***Charadrodromia*** undet. sp. (Ac in 1 seAK cave)

***Chelifera*** Macquart, 1823 - Empididae flies, Subfamily Hemerodromiinae, Tribe Hemerodromiini (22 species in US or Canada)

***Chelifera*** undet. sp. or species (CO, OR hyporheic; AK resurgences; IL river benthic)

***Crossopalpus*** Bigot, 1857 - Empididae flies, Subfamily Tachydromiinae (also treated as subgenus of *Drapetis*)

***Crossopalpus*** undet. sp. (rare KS hyporheic)

*Drapetis* (*Crossopalpus*) = *Crossopalpus*

***Hemerodromia*** Meigen, 1822 - Empididae flies, Subfamily Hemerodromiinae, Tribe Hemerodromiini (16 species in US or Canada)

***Hemerodromia*** undet sp. or species (CO, OR, PA hyporheic; IL river benthic; VA, MD brackish benthic)

***Hilara*** Meigen, 1822 - Empididae flies, Subfamily Empidinae (50 species in US or Canada)

***Hilara*** undet. sp. (sON/Tx or Ac)

*Leptopeza* Macquart, 1827 - now in Hybotidae,



**Oreogeton** Schiner, 1860 - Empididae flies, Subfamily Empidinae or Oreogetoninae (8 species in US or Canada)

**Oreogeton** undet. sp. (Ac in 1 seAK cave resurgences & insurgences)

**Platypalpus** Macquart, 1827 - Empididae flies, Subfamily Tachydromiinae (100 species in US or Canada)

**Platypalpus** undet. sp. (Ac, Tx or Tp genus in Vancouver Island caves, BC)

**Rhamphomyia** Meigen, 1822 - Empididae flies, Subfamily Empidinae (150 species in US or Canada)

**Rhamphomyia** undet. sp. (Tx or Ac in sON)

**Roederoides** Collin, 1941 - Empididae flies, Subfamily Clinocerinae (5 species in US or Canada)

**Roederoides** undet. sp. (Ac in 1 seAK cave resurgence)

**Trichoclinocera** Collin, 1941 - Empididae flies, Subfamily Clinocerinae (16 species in US or Canada)

**Trichoclinocera** *cummingsi* Sinclair, 1994 (\*type locality cave in Latimer Co.,OK/ Tx?)

**Tachypeza** Meigen, 1830 (= *Cormodromia* Zetterstedt, 1838) - Empididae flies, Subfamily Tachydromiinae (also put in Hybotidae, Subfamily Tachydromiinae) (17 species in US or Canada)

**Tachypeza humeralis** Melander, 1928 (PQ to DC/Tx or Ac in sON)

**Tachypeza** undet. sp. (Ac or Tx in Eddy Co.,NM),

## **EPHYDRIDAE** (shore flies) **Bibl.:** Mathis & Zarwarnicki 1995

Undet. Tx genera in Malpais Natl. Monument, nNM

Subfamily Psilopinae

Tribe Altisinni (*Allotrichoma*, *Pelignellus*)

Subfamily Ephydrinae

Tribe Ephydrini (*Ephydra*)

Tribe Scatellini (*Lamproscatella*, *Scatela*, *Scatophila*)

Subfamily Psilopinae

Tribe Altisinni (*Allotrichoma*)

*Allotrichoma* Becker, 1896 - Ephydridae flies, Subfamily Psilopinae, Tribe Altisinni (10 species in US or Canada)

*Allotrichoma* undet. sp. (rare KS hyporheic)

*Ephydra* Fallen, 1810 - Ephydridae flies, Subfamily Ephydrinae, Tribe Ephydrini (16 species in US or Canada)

*Ephydra riparia* Fallen, 1813 (Salton Sea benthic, CA)

*Lamproscatella* Hendel, 1917 - Ephydridae flies, Subfamily Ephydrinae, Tribe Scatellini.(5 species in US or Canada) Bibl.: Olafsson 1991

*Lamproscatella* undet. sp. (rare KS hyporheic)

*Pelignellus* Sturtevant & Wheeler, 1954 - Ephydridae flies, Subfamily Psilopinae, Tribe Altisinni

*Pelignellus* undet. sp. (rare KS hyporheic)

*Parydra* Stenhammar, 1844 - Ephydridae flies, Subfamily Parydrinae, Tribe Parydrini .(34 species in US or Canada)

*Parydra* undet. sp. (rare KS hyporheic)

*Scatella* Robineau-Desvoidy, 1830 - Ephydridae flies, Subfamily Ephydrinae, Tribe Scatellini. .(15 species in US or Canada) Bibl.: Olafsson 1991

*Scatella* undet. sp. (rare KS hyporheic)

*Scatophila* Becker, 1896 - Ephydridae flies, Subfamily Ephydrinae, Tribe Scatellini.(24 species in US or Canada)

*Scatophila* undet. sp. or species (Ac in 1 seAK; rare KS hyporheic)

**FANNIIDAE** (also put in Muscidae) suborder Brachycera, infraorder Muscomorpha

*Fannia* Robineau-Desvoidy, 1830 (= *Philinta*, *Aminta* R.1830; *Homalomyia* Bouche, 1834; *Coelomyia* Haliday, 1840; *Rhizomyia* Zetterstedt, 1849; *Myantha* Rondani, 1856; *Eriopoda* Lioy, 1864; *Parmalomyia* Bigot, 1882; *Gymnochoristomma* Strobl, 1898; *Gymanchoristomma* S.1900; *Steinomyia* Malloch, 1912; *Faniosoma Ringdahl*, *Beckerinella* Enderlein, 1936; *Ivalomyia* Riensuu, 1938; *Hennigomyia* Mihalyi, 1973) (once in Muscidae, Subfamily Fanniinae) Fanniidae flies (101 species in US or Canada)

**Fannia** near *canicularis* (*Musca c.* Linnaeus, 1761) (Europe, AK to Greenland, s. to CA,FL,global/ little house fly/ Tx in TN,MO),

**Fannia** undet. sp. (Tx or Ac in 1 IL cave & 1 cave in Adair Co.,OK)

**gnats** - See gonidae (black gnats)

**HELEIDAE** = Ceratopogonidae

**HELEOMYZIDAE** Aldrich & Darlington, 1908 (=Helomyzidae). Suborder Brachycera, Infraorder Muscomorpha.

**Bibl.:** Gill 1962, 1965; Lisowski 1995; Garnett & Foote, 1966

There are over 500 described species of Heleomyzidae in about 65 genera and 22 tribes distributed throughout the world; the greatest number occur in the Holarctic Region (McAlpine 1985b).

Little is known of the biology of these flies. Adults of Diplogeomyza and related genera (McAlpine 1967) are frequently encountered in wet forest country, some being most prevalent in mountainous areas. Adults of *Borboroides* and *Heleomicra* are attracted to carcasses and feces. *Austroleria extensa* has been reared from the fungus *Boletus granulatus* (Polyporaceae). The larvae of the Holarctic *Suillinae* occur principally in fungi, as do those of *Tapeigaster*, whereas larvae of *Cairnsimyia* live in borer tunnels in trees.

Fungal infections are common among these insects and can take on spectacular forms. *Hirsutella guignardii* forms long white synnemata hanging down from dead flies attached to the ceiling of the cave. In addition to those fungi causing disease in cave insects there are a variety using insects to transport their spores. Many of the fungi isolated from heleomyzid flies and from beetles of the genus *Speonomus* belonged to the genus *Mortierella*.

Undet. Ac, Tx or Tp genus in Vancouver Island, BC

Subfamily Heleomyzinae (*Schroederella*, *Tephrochlamys*)

Tribe Heleomyzini (*Acantholeria*, *Amoebaleria*, *Heleomyza*, *Pseudoleria*, *Scoliocentra*)

Tribe Oecotheini (*Aecothea*)

Subfamily Suilliinae (*Suillia*)

Subfamily Trixoscelidinae (*Trixoscelis*)

**Acantholeria** Garrett, 1921- Heleomyzidae flies, Subfamily Heleomyzinae, Tribe Heleomyzini (3 species in US or Canada)

**Acantholeria** undet. sp. (Tx or Ac in NWT),

**Aecothea** Haliday, 1838 (= *Leria*) - Heleomyzidae flies, Subfamily Heleomyzinae, Tribe Oecotheini (3 species in US or Canada)

*Aecothea fenestralis* (*Heleomyza f.* Fallen, 1820; *Blepharoptera specus* Aldrich, 1896)  
(Europe,N/Tx in TN (cave in Grundy Co.); Tp in IN; Tp or Tx 4 caves in KY, 3 caves in WV,  
one cave in GA & 1 in VA)

*Aecothea specus* (*Blepharoptera s.* Aldrich, 1897; *A. canadensis* Garrett, 1921) (AK to ON, s.to  
GA,CA/ Tp or Tx in Alberta, AK, AL, CA, GA (Bartow & Dade Cos.), IA, KY, Manitoba, MO,  
OH, sON, OR, WA,WI; Tx in AR,IL,IN (6 cos., S4/G4)KY, MO, NC, OK; TTx or Ac in CA; Tp  
or Tx in CO,TN),

*Amoebaleria* Garrett, 1921 (= *Chaetomus* Czerny, 1924) Heleomyzidae flies, Subfamily  
Heleomyzinae, Tribe Heleomyzini (15 species in US or Canada)

*Amoebaleria brachypterna* = *Heleomyza b.*

*Amoebaleria caesia* (Meigen) (*Helomyza c.* Meigen, 1830) (Europe,NA/Tx? in CA),

*Amoebaleria defessa* (= *Leria d.* Osten Sacken; *Blepharoptera d.* Osten Sacken, 1877; *A.sackeni*  
Garret, 1925) (MI to PA, s. to MO,AL/ Tp or (T)Tx in AL, AR (Stone Co.), GA (Bartow &  
Walker Cos.), IL, IN, KY (Mammoth C., Edmonson, Pulaski Cos.), MD, MI, MO, NS (2 caves),  
OK, TN, VA, WI, WV; Tx in NC(prob.), MO, NS, PA; Tp in OH),

*Amoebaleria flavotestacea* (*Heleomyza f.* Zetterstedt, 1838) (circumboreal, s. to CA,NC/Tx or  
Ac in OR; Ac in WA)

*Amoebaleria gigas* = *Scolioentra g.*

*Amoebaleria gonea* Garrett, 1925 (BC,UT,IL/Tp in cave in Eddy Co., NM)

*Amoebaleria helvola* Loew, 1862 (SD to PQ, s. to AR,GA/Tx in IL)

*Amoebaleria sackeni* Garrett, 1925 (= *A. defessa*?) (E/Tx in AL, IL, NE, MO (Carter Co.), sON,  
TN (DeKalb, Lincoln Cos.); Tp? in Ar),

*Blepharoptera* - See *Oecothea*, *Heleomyza*,

*Heleomyza* Fallen, 1810 (= *Leria* Robineau-Desvoidy, 1830; *Blepharoptera* Macquart, 1835)-  
Heleomyzidae flies, Subfamily Heleomyzinae, Tribe Heleomyzini (13 species in US or Canada)

*Heleomyza brachypterna* (*Blepharoptera b.* Loew, 1873; *B.latens* Aldrich, 1897; *Leria*  
*caccabata* Rucker, 1909; *L. serrataria* Garrett, 1924) (NA/Tp or Tx in AR,GA,IA,IL,IN  
(Crawford, Harrison cos., S3/G4),KY (Mammoth C.), MO (Carter Co.), OK, TN (Dickson  
Co.),WI; Tp in AL; Tx in NS?)

*Heleomyza fenestralis* - see *Aecothea*

*Heleomyza flavotestacea* = *Amoebaleria f.*

*Heleomyza pectinata* = *Pseudoleria p.*

**Heleomyza** *serrata* (Musca s. Linnaeus, 1758) (*Leria* & *Blepharoptera* s.; *Leria nigricana* & *vinus* Garrett, 1922; *Helomyza fuscana* Meigen, 1838; *Heleomyza tristissima* Garrett, 1921) (Europe, N/Tp or Tx in IN, MD, OR, sON, WA, WI; Tx in NS)

**Heleomyza** undet. sp. (Tp in PA)  
**Heleomyza** *tincta* (see *Scoliocentra*),

*Leria defessa* - see *Amoebaleria*; *Leria fraterna* - see *Scoliocentra*  
*Leria serrata* - see *Heleomyza*; *Leria tincta* = see *Scoliocentra*  
*Leria specus* - see *Aecothea*; *Musca* - see *Heleomyza*, *Fannia*

*Neoeothea specus* = *Aecothea* s.; *Oecothea* = *Aecothea*  
*Parodinia* = *Trixoscelis* in part

**Pseudoleria** Garrett, 1921 - Heleomyzidae flies, Subfamily Heleomyzinae, Tribe Heleomyzini (12 species in US or Canada)

**Pseudoleria** *parvitarisus* G. 1925 (prob. Tx in NM)  
**Pseudoleria** *pectinata* (*Blepharoptera* p. Loew, 1872; *P. pectinerata* Garrett, 1921; *Heleomyza* p.) (BC to DC, s. to CA, GA/Tx in NM)

**Schroedella** Enderlein, 1921 (= *Schroederia* E. 1914; *Edioamoeba* Garrett, 1925) - Heleomyzidae flies Subfamily Heleomyzinae (2 species in US or Canada)

**Schroedella** *fuscopicea* Gill., 1962 (WA, ID, MD, VA/Tp or Tx in KY)

**Scoliocentra** Loew, 1862 (= *Achaetomus* Coquillett, 1907) - Heleomyzidae flies, Subfamily Heleomyzinae, Tribe Heleomyzini (3 species in US or Canada)

**Scoliocentra** *fraterna* (= *Scoliocentra* f. Loew, 1863; = *Leria* f.) L., 1872 (AK to Greenland, s. to CO, MN, NY/ Tx in IN & Frenchmen's Cave, NS)

**Scoliocentra** undet. sp(p). (TTP in AR; Tx in IA),

**Scoliocentra** *tincta* (*Helomyza* t. Walker, 1849; *Actora ferruginea* Walker, 1849; *Helomyza* p. & t. (Loew), *Leria*, *Helomyza* & *Blepharoptera pubescens* Loew, 1862; *Amoebaleria gigas* Garrett, 1921; *Achaetomus pilosus* Coquillett, 1907) (AK to NS, s. to CA, PA/Tx in IN, sON, WI)

**Suillia** Robineau-Desvoidy, 1830 - Heleomyzidae flies, Subfamily Suillinae (8 species in US or Canada)

**Suillia** undet. sp. (Ac, Tx or Tp in Vancouver Island, BC)

**Tephrochlamys** Loew, 1862 - Heleomyzidae flies, Subfamily Heteromyzinae (2 species in US or Canada)

**Tephrochlamys rufiventris** (Meigen, 1830) (Tp in 2 NS caves)

**Trixoscelis** Rondani, 1856 - Heleomyzidae flies, Subfamily Trixoscelidinae

**Trixoscelis frontalis** Fallen, 1823 (in CA non-cave *Neotoma fuscipes* woodrat nest)

**HIPPOBOSCIDAE** (louse flies, flat flies) suborder Brachycera, infraorder Muscomorpha (See also Streblidae)

Undet. genera in CA on *Corynorhinus townsendii* bats

Subfamily Nycteribiinae

Tribe Nycteribiini (*Basilina*)

**Basilina** Miranda Ribeiro, 1903 (once put in Nycterbiidae) Hippoboscidae flies, Subfamily Nycteribiinae, Tribe Nycteribiini (5-8 species in US or Canada). **Bibl.:** Collins, 1931

**Basilina antrozoi** (*Nycteribia* & *Penicillidia a.* Townsend, 1893) (OR to KS, s.to CA, CO, LA, NM, Mex./ectoparasite on TX *Corynorhinus townsendii pallescens*, AZ, BC, CA, NM, OK (Tx), TX *Antrozous pallidus*, LA *Tadarida brasiliensis cynocephala* & AZ (Tx) & CA, Mex. *Myotis californicus* bats)

**Basilina boardmani** Rozenboom, 1934 (ectoparasite on GA (Tx) *Myotis lucifugus*, IN *Myotis sodalis*, & FL (Tx), GA (Tx), IL(Tx) *M. austroriparius*)

**Basilina calverti** Fox & Stabler, 1953 (ectoparasite on CO *Myotis volans* bats)

**Basilina corynorhini** (*Pencillidia c.* Ferris, 1916) F., 1924 (CA, UT, TX/ ectoparasite on OK (Tx), AZ (Tx) *Corynorhinus townsendii pallescens*; CA *Corynorhinus townsendii pallescens* & TX *Leptoncyteris nivalis* bats/ VA T&E S1 rank & global G3 rank)

**Basilina durni** Curran, 1935 (cf. *B. d.* - ectoparasite on CA *Antrozous pallidus* bats)

**Basilina forcipata** Ferris, 1924 (*B. calverti* Fox & Stabler, 1933) (BC to CA, CO, WA, LA, Mex., NM, OR/ ectoparasite on LA, SK *Lasionycteris nivalis*; AZ, NM *Euderma maculatum*, SD *Tadarida brasiliensis*, LA *Tadarida brasiliensis cynocephala*; wTX *Myotis velifer*; AZ, BC, CA (Tx?), Mex. *M. californicus*, CA, NM, AZ (Tx), LA, Mex. *Myotis thysanodes*; BC *Myotis evotis*, CA, BC *M. lucifugus*; BC, LA, MT, OR, SD (Tx?) *Myotis volans*, & AZ *Eptesicus fuscus* (Tx) bats)

**Basilina (B.) jellisoni** Theodor & Peterson, 1964 (on MT *Myotis yumanensis*)

**Basilina rondanii** Guimaraes & D'Andretta, 1956 (TX to Honduras/ ectoparasite on TX *Tadarida brasiliensis*; CA?, TX *Myotis yumanensis*; TX *M. thysanodes* and less often on TX *Pipistrellus hesperus*, *Antrozous pallidus*, *Eptesicus fuscus* & *Myotis volans*)

***Basilia*** undet. sp. (bat parasite in WA; ectoparasite on CO *Myotis evotis*, CA *Antrozous pallidus minor* & GA *Tadarida brasiliensis cynocephala* bats)

HYBOTIDAE (once part of Empididae) Suborder Brachycera, infraorder Muscomorpha  
(*Charadrodromia*, *Leptopeza*)

*Charadrodromia* Melander, 1928 - put in Empididae flies

***Leptopeza*** Macquart, 1827 (once in Empididae) Hybotidae flies, Subfamily Ocydromiinae, Tribe Ocydromiini

***Leptopeza compta*** Coquillett, 1895 (ID, WI to PQ, s.to TN/Tx or Ac in sON)

*Tachypeza* Meigen, 1830 - put in Empididae

horse flies - See Phoridae

**KEROPLATIDAE** - Suborder Nematocera, Infraorder Bibionomorpha  
Subfamily Keratoplatinae (*Euceroptatus*, *Keroptatus*, *Macrocera*, *Orfelia*)  
(also treated as subfamily of Mycetophilidae)

***Euceroptatus*** Edwards, 1929 (also used as subgenus of *Keroptatus* & once placed in Mycetophilidae) Keroplatidae, Subfamily Keratoplatinae (1 species in US & Canada)

***Euceroptatus fasciatus*** (*Cerotelion* f. Garrett, 1925) (Ac, Tx or Tp in Vancouver Island, BC)

***Keroptatus*** Bosc, 1792 (once put in Mycetophilidae flies) Keroplatidae flies, Subfamily Keratoplatinae (8 species in US or Canada)

***Keroptatus clausus*** Coquillett, 1901 (Tx or Ac in Nickajack C., TN),

***Macrocera*** Meigen, 1803 (once in Mycetophilidae) (= *Euphrosyne* M., 1800) Keroplatidae flies  
Subfamily Keratoplatinae (24 species in US or Canada)

***Macrocera hirsuta*** Loew, 1869 (IN to ME, s.to NC/Tx, Tp or Ac in IN),

***Macrocera nobilis*** Johnson, 1922 (= *Euphrosyne n.* Shaw & Fisher, 1952) (epigeal in AB, ON, ME s. to seUS; MA, NH epigeal/Tp in AR, KY (Mammoth Cave), IN (prob. In 3 cos.; S4/G4), MA, MO, NH, OK, ON, TN, WV) **Bibl.:** Peck & Russell 1976; Vockeroth 1977

***Macrocera*** undet. sp. (HTx in BC, WA, IN (fairly common))

***Orfelia*** Costa, 1857 (once in Mycetophilidae) (= *Zelmira* Meigen, 1800; *Proceroptatus* Edwards, 1925; *Rutylapa* E. 1929; *Calliplatyura* & *Neoplastyura* Malloch, 1928) (darkwinged fungus gnats) Keroplatidae flies, Subfamily Keratoplatinae (34 species in US or Canada)

***Orfelia elegans*** (*Platyura e.* Coquillett, 1895) (PQ to IA, TN & FL/Tx in sON)

***Orfelia*** undet. sp. (Tx or Ac in 1 IL cave)

LARVAEVORIDAE = Tachinidae

no-see-ums - See gonidae

**LONCHAEIDAE** (lonchaeid flies)

new genus? in WA caves

**LONCHOPTERIDAE** (pointedwinged or spear-winged flies)

***Lonchoptera*** Meigen, 1803 - Lonchopteridae flies (4 species in US or Canada)

***Lonchoptera*** undet. sp. (Tp in NM)

long-legged flies - See *Dolichopodidae*

**MILICHIIDAE** (=Phyllomyzidae) (milichid flies) Suborder Brachycera, Infraorder

Muscomorpha

Subfamily Madizinae (*Desmometopa*, *Leptometopa*)

***Desmometopa*** Loew, 1866 (= *Platophrymyia* Williston, 1896; *Liodesmometopa* & *Liodesma* Duda, 1935) Milichiidae flies, Subfamily Madizinae (10 species in US or Canada)

***Leptometopa*** Becker, 1903 (once in Phyllomyzidae) (= *Macrurus* Lioy, 1864 Homo.; *Hypapistomnyia* Hendel, 1907; *Prodesmometopa* H.1914; *Paramadiza* Malloch, 1913; *Cnemoplegas* Enderlein, 1927; *Desmometopina* Curran, 1930; *Dicraeoptera* Duda, 1932) Milichiidae flies, Subfamily Madizinae (2 species in US or Canada)

***Leptometopa latipes*** (= *Agromyza l.* Meigen, 1830; *Mallochiella orillia* Curran, 1927) (Europe, AK to NS, s. to Cuba/Tp guanobic in TN, TX (Kimble Co.))

***Leptometopa*** undet. sp. (2 caves in Edwards Co., TX/Tp)

**MUSCIDAE** (house & stable flies or muscid flies) Suborder Brachycera, infraorder

Muscomorpha

Subfamily Cyrtoneurinae (*Neomuscina*)

Subfamily Muscinae

Tribe Muscini (*Limnophora*, *Musca*)

Tribe Reinwardtiini (*Muscina*, *Synthesiomyia*)

Subfamily Phaoniinae

Tribe Phaoniini (*Phaonia*)



*Fannia* (put in Fanniidae)

***Limnophora*** Robineau-Desvoidy, 1830 (placed by some authors in Chironomidae) (= *Cuculla* R.1830; *Melanochelia* Rondani, 1866; *Pseudolimnophora* Strobl, 1893; *Stroblia* Pokorny, 1893; *Calliophrys* Kowarz, 1893; *Limnophorites* Schnabl & Dzedzicki, 1911) CO & OK hyporheic) - Muscidae flies, Subfamily Coenosiinae, Tribe Limnophorini

***Musca*** - Muscidae flies, Subfamily Muscinae, Tribe Muscini (3 species in US or Canada)

***Musca domestica*** Linnaeus, 1758 (global/ house fly/ Ac in cave in Uvalde co., TX),

***Muscina*** Robineau-Desvoidy, 1830 (*Blissonia* R.1863; *Pararicia* Brauer & Bergenstamm, 1891; *Steelea* Emden, 1965) - Muscidae flies, Subfamily Muscinae, Tribe Reinwardtiini

***Muscina prolapsa*** (*Musca p.* Harris, 1780) (Tx in GA, Dade Co.)

***Muscina stabulans*** (*Musca s.* Fallen, 1817; *Musca prodeo* Harris, 1780 (Unav.); *Anthomyia cinerascwens* Wiedemann, 1817; *Muscina grisea, picaena* Robineau-Desvoidy, 1830; *Mydaea vomiturionis* R.1849) (circumboreal, s. to GA,AZ/Ac in cave in Uvalde Co., TX)

***Neomuscina*** Townsend, 1919 (= *Spilopteromyia* Malloch, 1921) - Muscidae flies, Subfamily Cyrtoneurinae

***Neomuscina tripunctata*** (*Muscina t.* Wulp, 1896; *M. texana* Hough, 1899; *N. cavicola* Townsend, 1919) (SW,nMex./Tx in AZ),

***Phaonia*** Robineau-Desvoidy, 1830 (= *Fellaea, Trennia, Euphemia, Rohrella, Stagnia* R., 1830; *Wahlgrenia* Ringdahl, 1929; *Dialytina* R., 1945)- Muscidae flies, Subfamily Phaoniinae, Tribe Phaoniini (82 species in US or Canada)

***Phaonia soccata*** (*Anthomyia s.* Walker, 1849) (Alberta to VT/Tx or Ac in sON)

***Phaonia*** undet. sp. (Carlsbad C.,NM).

***Synthesiomysia*** Bauer & Bergenstamm, 1893 - Muscidae flies, Subfamily Muscinae, Tribe Reinwardtiini (1 species in US)

***Synthesiomysia nudiseta*** Van der Wulp, 1883 (sUS, tropics, HA/Tx in Edwards Co., TX & Alachua Co.,FL)

**MYCETOPHILIDAE** (fungus gnats, webworms (larvae)) Suborder Nematocera, Infraorder Bibionomorpha. **Areas:** US: G. Davis, 1966; Fisher (1937, 1938); Johannsen (1910, 1910a, 1912, 1912a); TN: Barr, 1949a,b, 1951b.

undet. Ac or TTx genera in NWT & Tx in OH

undet. sp. (Ac, Tx or Tp in Vancouver Island, BC))

Subfamily Bolitophilinae (*Bolitophila*)

Subfamily Mycetophilinae

Tribe Exechiini (*Anatella*, *Exechia*, *Exechiopsis*, *Pseudobrachypeza*, *Rymosia*, *Tarnania*  
(also in Tarnanii))

Tribe Mycetophilini (*Cordyla*, *Mycetophila*, *Phronia*)

Tribe Tarnanii (Ac or Tx in 1 seAK cave; Tarnania (put in Exechiini))

Subfamily Sciophilinae

Tribe Gnortistini (*Boletina*, *Speolepta*, *Synapha*)

Tribe Sciophilini (*Allocotocera*, *Leptomorphus*, *Monoclona*, *Mycomya*, *Neuratelia*)

Tribe Leiini (*Docosia*, *Leia*)

**Allocotocera** Mik, 1886 - Mycetophilidae flies, Subfamily Sciophilinae, Tribe Sciophilini

**Allocotocera** undet. sp. (Ac in 1 seAK cave),

**Allodia** Winnertz, 1863 (*Brachycamta* W. 1863; *Parallodia* Plassmann, 1969)- Mycetophilidae flies, Subfamily Mycetophilinae, Tribe Exechiini

**Allodia** undet. sp. (Tx in Kerr Co., TX)

*Anaclinea* = *Neuratelia*

**Anatella** Winnertz, 1863 - Mycetophilidae flies, Subfamily Mycetophilinae, Tribe Exechiini  
(5 species in US or Canada)

**Anatella** undet. sp. (Tx in sON, BC)

**Boletina** Staeger, 1840 - Mycetophilidae flies, Subfamily Sciophilinae, Tribe Gnortistini

**Boletina** undet. sp. #1-? (Tp? or Tx in WA/ Tx or Tp in OR C.; parietal Tx in NS)

**Bolitophila** Meigen, 1818 - Mycetophilidae, Subfamily Bolitophilinae (also put in olithophilidae)

**Bolitophila** undet. sp. (parietal Tx in sON & NS)

**Brachypeza** Winnertz, 1863 - Mycetophilidae flies, Subfamily Mycetophilinae, Tribe Exechiini

**Brachypeza** undet. sp. (Ac in WA),

*Cerotelion* - See *Euceropolatus*

**Cordyla** Meigen, 1800 - Mycetophilidae flies, Subfamily Mycetophilinae, Tribe Mycetophilini  
(10 species in US or Canada)

**Cordyla** undet. sp. (Ac, Tx or Tp in Vancouver Island, BC)

**Docosia** Winnertz, 1863 - Mycetophilidae flies, Subfamily Sciophilinae, Tribe Leiini

**Docosia** *paradichroa* Fisher, 1937 (Tx in NY,sON)

**Euceroplatus** Edwards, 1929 (also used as subgenus of *Keroplatus* & now placed in Keroplatidae

**Euceroplatus** undet. sp. (Ac, Tx or Tp in Vancouver Island, BC)

**Exechia** Winnertz, 1863 - Mycetophilidae flies, Subfamily Mycetophilinae, Tribe Exechiini (48 species in US or Canada)

**Exechia** *atritra* Johannsen, 1912 (epigean in sON,PQ,neUS/ Tx in sON)

**Exechia** *auxiliaria* Johannsen, 1912 (epigean in ON to SC,WI/ Tx in sON)

*Exechia bifurcata* = *Exechiopsis b.*

*Exechia nugax* = *Exechiopsis n.*

**Exechia** *obediens* Johannsen, 1912 (Alberta,CA,sON,OR/Tx)

**Exechia** undet. sp. or species (Tx in BC, NS (2 sp. in 4 caves) ,CA,. seAK (one cave), IL & Unita Mts (UT); 3 Tx sp. in WA; Tx or Tp 2 sp. in AR (Fulton Co.)

**Exechia** *umbratica* = *Mycetophila u.*

**Exechiopsis** Tuomikoski, 1966 - Mycetophilidae flies, Subfamily Mycetophilinae, Tribe Exechiini  
(4 species in US or Canada)

**Exechiopsis** *bifurcata* (*Exechia b.* Fisher, 1934) (Tx in AR, KY, NY, sON),

**Exechiopsis** *umbraticus* (*Mycetophila u.* Aldrich, 1897; *Exechia umbratica*) (BC to OR, NY to SC/Tx in IN; Tx or Ac in 1 PA cave)

**Exechiopsis** *nugax* (Johannsen, 1912) (BC to PQ, s.to NY/Tx in sON)

**Exechiopsis** undet. sp.1-7? (Tx in AR, BC, CA, NC (2 caves), UT (Unita Mts.); Tx or Tp in OK (near *nugax* (= *Exechia n.* Johannsen, 1912))

*Exechiopsis umbraticus* = see *Mycetophila u.*

*Keroplatus* Bosc, 1792 - now in Keroplatidae flies

**Leia** Meigen, 1818 (= *Neoglaphyoptera* Osten Sacken, 1878; *Lejomya* & *Lejosoma* Rondani, 1856; *Glaphyoptera* Winnertz, 1863) Mycetophilidae flies, Subfamily Sciophilinae, Tribe Leiini

**Leia** *cuneola* (N.c. Adams, 1903) (CO,ID/Tx in AL,GA)

**Leia** *striata* Williston, 1893 (Tx in KY (Rockcastle Co.), TN Pickett, Putnam,Coffee, Bedford & Lincoln Cos.) & AL (Marshall Co.))

**Leptomorphus** Curtis, 1831 - Mycetophilidae flies, Subfamily Sciophilinae, Tribe Sciophilini

**Leptomorphus** undet. sp. (Ac, Tx or Tp in Vancouver Island, BC)

*Macrocera* Meigen, 1803 - now in Keroplatidae

***Monoclona*** Mik, 1886 - Mycetophilidae flies, Subfamily Sciophilinae, Tribe Sciophilini  
***Monoclona*** undet. 2 species (Ac, Tx or Tp in Vancouver Island, BC)

*Monardia* - put in Cecidomyiidae

***Mycetophila*** Meigen, 1803 (= *Fungivora* M., 1800; *Mycetiina* Rondani, 1856; *Mycozetaea* R. 1861; *Mycothera* Winnertz, 1863; *Opistholoba* Mik, 1891) Mycetophilidae flies, Subfamily Mycetophilinae, Tribe Mycetophilini

***Mycetophila analis*** (= *Exechia a.* Coquillett, 1901) Adams in Banta, 1907 (Tx or Ac in IN)

*Mycetophila discoida* Say, 1826 = *M. unipunctata*  
*Mycetophila exigua* = *Phronia e.*

***Mycetophila fisherae*** (*Fungivora f.* Laffoon, 1957) (epigean sCanada to CO, GA, TX/ Tx in sON)

***Mycetophila ichneumonea*** Say, 1823 (sCanada to MT, NC/ TTx or Ac in IN)  
*Mycetophila incerta* Adams in Banta, 1907 = *Phronia i.*

***Mycetophila obscura*** Walker, 1848 (Tx in IN) (listed by Laffoon as unrecognized)  
***Mycetophila sordida*** Wulp, 1874 (Europe, AK to nCA & PA/Tx in CA, PA, sON)

***Mycetophila*** undet. sp(p). (Tx in sON; Tx in Uinta Mts.(UT), AZ; Tp or Tx in CA; HTx in WA; Ac, Tx or Tp in OR C.,OR; group D in CA; cf. *fungorum* (*Tipula f.* DeGeer, 1776) (AK to Mex./ Tx in nAZ)

*Mycetophila umbratica* = *Exechiopsis u.*

***Mycetophila unipunctata*** (= *M. discoida* Say, 1826) (Europe, MN to sPQ, s. to LA,SC/ Tx in IN),

***Mycomya*** Rondani, 1856; emend. by Edwards, 1913 (= *Cnephaeophila* Philippi, 1865; *Mycomyopsis*, *Calomycomya*, *Cymomya*, *Tlingitmyia*, *Myacymo*, *Neomycomya*, *Lycomya*, *Mycoleia*, *Coheromyia* Vaisanen, 1984) Mycetophilidae flies, Subfamily Sciophilinae, Tribe Mycomyiini

***Mycomya nitida*** (= *Sciophila n.* Zetterstedt, 1852; *S. exigua* Winnertz, 1863) (epigean in AK, BC, CO, sON, SK, PQ, ME, s to NY/ Tx)

***Mycomya*** undet. sp. (TTx in BC, WA)

***Neuratelia*** Rondani, 1856 (= *Anaclinia* Winnertz, 1863; *Odontopoda* Aldrich, 1897) Mycetophilidae flies, Subfamily Sciophilinae, Tribe Sciophilini

***Neuratelia*** undet. sp. or species (Tx in AR (Izard Co.), IN, BC (2 species))

*Odontopoda* = *Neuratelia*

*Orfelia* Costa, 1857 - now in Keroplatidae

**Phronia** Winnertz, 1863 (= *Telmaphilus* Becker, 1908) Mycetophilidae flies, Subfamily Mycetophilinae, Tribe Mycetophilini. **Bibl.:** Gagne 1975

**Phronia** *exigua* (*Mycetophila e.* Zetterstedt, 1852; *P. rustica & longipes* Winnertz, 1863; *P. venusta* Johannsen, 1912) (nNA, Europe/ Tx in AK, AR, CA, sON, PA, PQ; TTx in WA (near *exigua*))

**Phronia** *flavipes* Winnertz, 1863 (= *P. flabellata* Van Duzee, 1928) (BC to CA, Europe, ME, NC/ Tx in sON)

**Phronia** *incerta* (Mycetophila i. Adams, 1907) (Tx in IN)

**Phronia** undet. sp. or species (Tx in BC, IL; sON)

**Pseudobrachypeza** Tuomikoski, 1966 - Mycetophilidae flies, Subfamily Mycetophilinae, Tribe Exechiini (1 species in US or Canada)

**Pseudobrachypeza** *bulbosa* (*Allodia b.* Johannsen, 1912)

**Pseudobrachypeza** undet. sp. (Tx in sON)

*Rhymosia* Winnertz, 1863 = *Rymosia*

**Rymosia** (*Rhymosia* Winnertz, 1863) Mycetophilidae flies, Subfamily Mycetophilinae, Tribe Exechiini (22 species in US or Canada)

**Rymosia** *filipes* Loew, 1869) (BC to NH epigeal/ Tx in IN)

**Rymosia** *inflata* Johannsen, 1912 (NY epigeal/ Tx in TN)

**Rymosia** *triangularis* Shaw, 1935 (NY, PA/ Tx in IL, sON, TX; Tx or Ac in PA)

**Rymosia** undet. species (Tp in mine near Hutchings Mine (Jo Daviess Co.), IL; Tx or Tp in GA (Walker Co.), Tx in BC, CA, TN, IL, MO, NM, sON, UT, TX; TTx in TN)

**Speolepta** Edwards, 1925 - Mycetophilidae flies, Subfamily Sciophilinae, Tribe Gnortistini

**Speolepta** *leptogaster* (*Polylepta l.* Winnertz, 1863) or new sp(p). (Europe, nNA/ Tx in CA, NH, ON, OR, WA)

**Speolepta** 2-3 undescr. species (TTx or TTp in Vancouver Island caves, BC)

**Synapha** Edwards, 1925 - Mycetophilidae flies, Subfamily Sciophilinae, Tribe Gnortistini

**Synapha** undet 2 species (Tx in BC)

**Tarnania** Tuomikoski, 1966 - Mycetophilidae flies, Subfamily Mycetophilinae, Tribe Exechiini (1 species in US or Canada)

**Tarnania** *tarnanii* (Dziedzicki, 1910) (Tx in AK, BC, NS, NWT, sON, PQ)

**NYCTERIBIIDAE** (wingless bat flies; bat spider or bat tick flies). **Bibl.:** Eads & Menzies , 1948; Eads, 1956; Maa, 1962; B. Peterson, 1963; Wenzel, 1965

*Basilia* Ribeiro, 1903 - put in Hippoboscidae

*Nycteribia* Latreille, 1976 = *Basilia*

*Nycterophilia* - put in Streblidae

**OESTRIDAE** (sheep bot flies; bot and warble flies)

Subfamily Cuterebrinae (*Cuterebra*)

***Cuterebra*** Clark, 1815 - Oestridae flies, Subfamily Cuterebrinae (26 species in US or Canada)

***Cuterebra*** *approximata* Walker, 1866 (ectoparasite in AZ *Neotoma albigula* woodrats)

***Cuterebra*** *austeni* Sabrosky, 1986 (in AZ, NM *Neotoma albigula* & NM *Neotoma micropus* woodrats)

***Cuterebra*** *buccata* (*Oestrus b.* Fabricius, 1776; *Bogeria scudderii*; *C. purivora*) (ectoparasite in CA (probably) *Neotoma fuscipes* woodrats)

***Cuterebra*** *latifrons* Coquillett, 1898 (in AZ *Neotoma albigula* & CA *Neotoma fuscipes* woodrats)

***Cuterebra*** undet. sp. (ectoparasite in IN (rare), OK *Neotoma floridana*, CO *Neotoma mexicana fallax* & WV *Neotoma magister* woodrats)

***Cuterebra*** *tenebrosa* Coquillett, 1898 (in CA *Neotoma fuscipes* woodrats)

phantom craneflies - See Ptychopteridae

**PHORIDAE** (humpbacked or coffin flies) Suborder Brachycera, infraorder Muscomorpha.

**Bibl.:** Borgemeir 1968, 1971; Peterson 1987; Brues, 1903; Malloch, 1912. Larvae mostly feed upon decayed vegetable or animal matter, but some are parasitic on ants, bees, beetles, snails and so on. A few are myrmecophilous (live with ants)

Undet. Tp sp. in MO; undet. Tx or Ac in NWT; undet. Ac, Tx or Tp in Vancouver Isl., BC)

Subfamily Metopininae

Tribe Metopinini (*Gymnophora*, *Megaselia*, *Woodiphora*)

Subfamily Phorinae (*Anevrina*, *Borophaga*, *Conicera*, *Diplonevra*, *Spiniphora*, *Triphleba*)

***Anevrina*** Lioy, 1864; Emend. by A. Scudder, 1882 (= *Chaetoneura* & *Stenophora* Malloch, 1909 Homologue; *Pseudostenophora* & *Chaetoneurophora* M.1912) Phoridae flies, Subfamily Phorinae (11 species in US or Canada)

*Anevrina olympiae* (= *Phora o.* Aldrich, 1903 in Brues, 1904; *Aneurina o.* Brues, 1950; *Chaetoneurophora aureiventris* Brues, 1913) Borgmeier, 1963 (E/Tp in IL, sON)

*Borophaga* Enderlein, 1924 - Phoridae flies, Subfamily Phorinae (5 species in US or Canada)

*Borophaga verticalis* Borgmeier, 1962 (epigean AB to PQ, s.to AZ, DC, MO/ Tp or Tx in IL)

*Conicera* Meigen, 1830 (*Hypocerina* Malloch, 1913; *Tritoconicera* Schmitz, 1953) Phoridae flies, Subfamily Phorinae (6 species in US or Canada)

*Conicera dauci* (*Phora d.* Meigen, 1830; *C. atra*, *P. albipennis* M., 1830; *P. nickerli* Kowarz, 1894) (Europe, Japan, OR to MA, s. to CA, TN/ Tp in Irion Co., TX; Ttx or Ttp in Edmonson Co., KY) **Bibl.:** Sullivan 1962

*Diplonevra* Lioy, 1864, (= *Diploneura*, Emend. by Enderlein, 1924 (= *Tristoechia* Schmitz, 1927) Phoridae flies, Subfamily Phorinae (6 species in US or Canada)

*Diplonevra nitidula* (*Phora n.* Meigen, 1830) Schmitz, 1926 (Tp or Tx in Europe, US)

*Diplonevra peregrina* (Wiedemann, 1830) (Tp in Kazumura C., HI Island, HI)

*Gymnophora* Macquart, 1835 (= *Capraeophora* Bezzi, 1922; *Cerocratia* Schmitz, 1929) Phoridae flies, Subfamily Metopininae, Tribe Metopinini (6 species in US or Canada)

*Gymnophora luteiventris* Schmitz, 1952 (WI to NH, s.to TX, GA/ Tx or Ac in sON)

*Megaselia* Rondani, 1856 (= *Obelosia* Lioy, 1864; *Aphiochaeta* Brues, 1903; *Plastophora* Brues, 1905; *Megaselidia* Becker & Alii, 1907 Emend.; *Byrsophrys* Enderlein, 1912; *Lioyella* & *Pogonopleura* E., 1924; *Stirocnemia* E. 1927; *Mallochina* Schmitz, 1918; *Epimegaselia* & *Quasipseudacteon* Beyer, 1959; *Hemiplastophora*, *Metaplastophora* & *Tarsophromyia* Beyer, 1965) 1929) Phoridae flies, Subfamily Metopininae, Tribe Metopinini. (187 species in US or Canada) **Bibl.:** Borgmeier 1965; Robinson 1970-1

*Megaselia (Aphiochaeta) breviterga* (*Aphiochaeta b.* Lundbeck, 1921; *A. similata* L. 1921) Schmitz, 1929 (Europe, US/ Tp in IL)

*Megaselia (A.) cavernicola* (*A. c.* Brues, 1906; *Phora, M.* & *Aphiochaeta nigriceps* Loew) (epigean in MO to MA, s. to NM, AL/ (type locality in Wyandotte C., Crawford Co., IN/ Tp habitat generalist in AL, AR, CT, GA (Dade & Walker Cos.), IL, IN (all s.cos. with caves), IA, KY (Mammoth (Edmonson Co.) & Carter & Hart Cos.), MD, NC, OK (potentially), NM, PA, VA, WA, WV; Tx? in MA & MD) **Bibl.:** Conn & Marshall 1991

*Megaselia (Megaselia) glabrifrons* (Wood, 1909) (Tx in Europe, US)

*Megaselia (Aphiochaeta) inornata* (*A. i.* Malloch, 1912) Brues, 1950 (nUS/ Tp or TTx in OR; TTp? in WA)

*Megaselia (A.) nigriceps* (Loew, 1866) (Augur Hole, IN/ Tp?)

*Megaselia (Aphiochaeta) meconicera* Speiser, 1925 (Tp? in NS)

**Megaselia** (*Aphiochaeta*) *rufipes* (= *Trineura* r. Meigen, 1804; *T. annulata* M. 1804; *Phora pallipes* Latreille, 1809; *T. vulgaris* Fallen, 1823; *Phora heracleellae* & *sphingicides* Bouche, 1834; *Phora semiflava* Hartig, 1837; *Phora coleopterorum* Brischke, 1869; *Phora omnivora* Hudson, 1892; *Lioiyella juanfernandezica* Enderlein, 1938) (cosmopolitan/Tp or Tx in Carlsbad (NM) & Mammoth (KY) C.)

**Megaselia** *spelunciphila* Disney & Reeves, 1999 (Tp in GA ((Dade & Walker Cos.) & SC)

**Megaselia** undescr. sp. or species (Tp in WV)

**Megaselia** undet. species (Tp or Tx in GA, MO (raccoon feces), TN, Uinta Mts (UT), Kings Canyon Natl. Park (CA), Camden Co., MO, Lehman C. (NV) & Eddy Co. (NM); Tx or Ac in NWT; Tp in BC, TX)

**Megaselia** *spelophila* Borgmeier, 1966 (Tx or Tp in US)

**Megaselia** *spelunciphila* Disney, 1999 in Reeves & Disney, 1999 (type locality cave in Dade Co. & 2 caves in Walker Co., both GA & cave in Oconee Co., SC/ Tp or Tb/ G1)

*Phytosciara* Frey, 1942 - now in Sciaridae

**Puliciphora** Dahl, 1897 – Phoridae flies, , Subfamily Metopininae, Tribe Metopinini

**Puliciphora** *virginiensis* Malloch, 1912 (epigeal in VA, NS, SC, GA; Tp in GA (Walker Co.)

**Spiniphora** Malloch, 1909 - Phoridae flies, Subfamily Phorinae (5 species in US or Canada)

**Spiniphora** undet. sp. (Ac, Tx or Tp in Vancouver Island, BC)

**Triphleba** Rondani, 1856 (= *Palpimega* R., 1856; *Trupheoneura* Malloch, 1909; *Woodia* M., 1909 Homo.; *Parastenophora* M. 1910; *Citrago* Schmitz, 1924; *Paraneurina* & *Psilotriphleba* Enderlein, 1936; *Tonnoirina* Schmitz, 1939) Phoridae flies, Subfamily Phorinae (22 species in US or Canada)

**Triphleba** *fumipennis* Borgmeier, 1963 (US/TTp? in WA; Ac? in MO)

**Triphleba** *laticosta* Borgmeier, 1962 (Canada, US/Tp or Tx in OR C., OR)

**Triphleba** undescr. sp. (Tx in OR C., OR)

**Woodiphora** Schmitz, 1925 (= *Triemisticha* s., 1927) Phoridae flies, Subfamily Metopininae, Tribe Metopinini (1 species in US or Canada)

**Woodiphora** *magnipalpis* (*Phora* m. Aldrich, 1896; *Aphiochaeta pilosa* Malloch, 1914; *A. velutinipes*, *opaciventris* Brues, 1924)) (MO/ Tp in cave in Kendall Co., TX)

## PHYLLOMYZIDAE

*Leptometopa* (now in Milichiidae)

## PIPUNCULIDAE (big-headed or big-eyed flies)

Undet. genus (Ac in cave in Irion Co., TX)



**PLECIIDAE** (incl. Parapleciidae & Paraxymyiidae)- Suborder Nematocera, infraorder Bibionomorpha (*Plecia*)

***Plecia*** Wiedeman, 1828 (once in Bibionidae) Pleciidae flies (2 species in US or Canada)

***Plecia nearctica*** Hardy, 1940 (sUS to Central Amer./ love bug/ Ac in cave in Uvalde Co., TX)

**PSYCHODIDAE** (= Liriopeidae) (moth & sand flies; owl midges) Suborder Nematocera, infraorder Psychodomorpha. Bibl.: Quate (1955). Undet. Tx? genus in BC, MO, AK )

Moth flies are commonly called Drain Flies because they are often observed lingering around the drains in kitchen and bathroom sinks. Adults are black with the body and wings densely covered with hairs thus giving them the appearance of a moth. Adults are small, usually not becoming much larger than the zeros (0) on this page. They are weak fliers, and are generally seen crawling on walls or other surfaces rather than flying. When they do fly, their flight is in short, jerky lines and for only a few feet at a time. They are attracted to lights, and are so small that they can penetrate ordinary fly screens. Eggs are tiny, brown or cream-colored and are laid in irregular masses of 10 to 200. Larvae are legless, about 3/8 inch long, wormlike and gray, with both ends somewhat darker. The life cycle can be completed in one to three weeks. Adults live about two weeks, with old ones dying and new ones emerging. The adult diet consists of flower nectar and polluted water. Bronchial asthma can be caused by inhaling hair fragments and dust of living and dead moth flies.

Midges are a family of minute to moderately large species, the adults of which superficially resemble mosquitoes. The smaller species are believed by some people to be “young” mosquitoes. However, midges differ from mosquitoes in that the wings are not scaled and the mouthparts are short and not adapted for biting. Adult midges are slender, seldom more than 10 mm long, but usually less than 5 mm.

Midges oviposit on water in the same manner as mosquitos. The midge larvae are scavengers, and are aquatic or rarely terrestrial. Terrestrial species live in and on decayed vegetation, dung, fungi, mosses, under bark, and in the soil. Aquatic larvae are found in quiet or flowing water, and may become abundant in lakes, ponds, reservoirs, and tanks. Most are bottom-feeders, and are sometimes found at depths of nearly 1,000 ft (300 m). For most species, the food is thought to be particulate matter consisting of algae, other plant cells, and miscellaneous detritus. They possess a closed (apneustic) respiratory system and, unlike mosquito larvae, need not come to the surface for air. They absorb oxygen dissolved in the water by means of small “gills.” Some larvae are freelifing, and others make mud tubes or cases on stones, leaves, and pieces of wood.

Subfamily Phlebotominae (*Lutzomyia*)

Subfamily Psychodinae (*Maruina*, *Pericoma*, *Psychoda*, *Telematoscopus*)

***Lutzomyia*** Franca, 1924 - Psychodidae flies, Subfamily Phlebotominae (13 species in US or Canada)

***Lutzomyia*** undet. sp. (Ac or Tx in CA)

**Maruina** Mullerr, 1895 - Psychodidae flies, Subfamily Psychodinae (4 species in US or Canada)

**Maruina** undet. sp. (Ac in 1 seAK cave)

**Pericoma** Walker, 1856 (= *Phalaenula meigen*, 1800; *Clytocerus* Eaton, 190-4; *Desmioza*, *Synmormia*, *Syntomolaba*, *Didicrum*, *Podolepria*, *Mecysmia* Enderlein, 1937; *Leptopericoma* & *Pachypericoma* Vaillant, 1978; *Botosaneanuiella* V.1979) Psychodidae flies, Subfamily Psychodinae (24 species in US or Canada)

**Pericoma** *minuta* (*Psychoda m.* Banks, 1894) (Europe, MN to ME, s.to TX, MD/ Tx in IN)

**Pericoma** *signata* (*Psychoda s.* Banks, 1901) (Tx in in cave in Edmonson Co., KY) **Bibl.:** Sullivan 1962

**Pericoma** undet. sp. (MO/Tx; CO hyporheic)

**Psychoda** Latreille, 1796 (= *Trichoptera* Meigen, 1803) (sewer flies) - Psychodidae flies, Subfamily Psychodinae

**Psychoda** *cinerea* Banks, 1894 (= *P. prudens* Curran, 1924) (global/E Tx on rotting veg. & feces/ Tp in IN; Tp or Tx in KY (Edmonson Co.) & TN (Dickson, Smith, Grundy Cos.)

*Psychoda minuta* = *Pericoma m.*

**Psychoda** *phalaenoides* (*Tipula p.* Linnaeus, 1758; *P. pacifica* Kincaid, 1897; *P. horizontala* Haseman, 1907; *P. tonnoiri* Dyar, 1926; *P. angustafona* Rapp, 1944) (Tx or Ac in sON)

**Psychoda** *pusilla* Tonnoir, 1922 (epigeal Europe, WA to NY, s. to CA, TX, AL/ Tp in GA (Walker Co.))

**Psychoda** *reevesi* Quate, 2000 (type locality & 1 other cave in Dade Co. & cave? in Walker Co., nGA/ Tp (known only from caves))

**Psychoda** *satchelli* Quate, 1955 (Europe, US, Canada/ Tx in sON, OR; Tx? in WA)

**Psychoda** undet. sp(p). (Tp? in AL; Tp or Tx in GA, NM; Tx in MO, NS, NV, WV; Tp in IL, IA, MO; TTx or Ac in sON, NWT)

**Psychoda** *umbracula* Quate, 1955 (WA to CA, MN to NH, s. to TN/ Tp or Tx in IL, sON)

**Telematoscopus** Eaton, 1904 (*Xenapates* Eaton, 1904; *Sciria*, *Seoda* Enderlein, 1935; *Clogmia* E.1937; *Oroescopus* Quate & Q., 1967; *Krekiella* Vaillant, 19672; *Oscoreopus* Zezek, 1989) Psychodidae flies, Subfamily Psychodinae (17 species in US or Canada)

**Telematoscopus** undet. sp. (Tp in Burnet Co.?, TX)

**PTYCHOPTERIDAE** (phantom crane flies) suborder Nematocera, infraorder  
Ptychopteromorpha, Superfamily Ptychopteroidea .

***Bittacomorpha*** Westwood, 1835 - Ptychopteridae flies, Subfamily Bittacomorphinae (4 species  
in US or Canada)

***Bittacomorpha clavipes*** (*Tipula c.* Fabricius, 1781) (Manitoba to NF, s. to AZ,FL/phantom crane  
fly/ Tx or Ac in sON)

**RHAGIONIDAE** (snipe flies)

(*Ptiolina*, undet. genus (Ac, Tx or Tp in Vancouver Island, BC)

***Ptiolina*** Zetterstedt, 1942 - Rhagionidae flies, Subfamily Rhagioninae (11 species in US or  
Canada)

/

***Ptiolina*** undet. sp. (Ac, Tx or Tp in Vancouver Island, BC)

**SARCOPHAGIDAE** (=Stephanostomatidae, Metopiidae) (*Sarcophaga*)

Suborder Brachycera, infraorder Muscomorpha

***Sarcophaga*** Meigen, 1826 - Sarcophagidae flies, Subfamily Sarcophaginae, Tribe Sarcophagini  
(82 species in US or Canada)

***Sarcophaga quadrisetosa*** (*Helicobia q.* Coquillett, 1901; *Ravinia derelicta*) (Tx or Ac in cave  
in Alachua Co., FL)

**SCATOPHAGIDAE** (= Cordyluridae) (also subsumed in Anthomyidae) (dung flies) Suborder  
Brachycera, infraorder Muscomorpha.

Subfamily Delininae (or as Tribe Delinini) (*Americina*)

Subfamily Scathophaginae (*Scathophaga*)

***Americina*** Malloch, 1923 - Scatophagidae flies, Subfamily Delininae (1 species in US or  
Canada)

***Americina adusta*** (*Cordilura a.* Loew, 1863)(cON, s.to GA,KS/Tx or Ac in sON)

***Scathophaga*** (= *Scopeuma* Meigen, 1800 (Unav.); *Scatophaga* (missp.) M., 1803; *Pyropa*  
Illiger, 1807; *Scatomyza* Fallen, 1810; *Amina*, *Scatina* Robineau-Desvoidy, 1830; *Scatophagella*  
Szilady, 1926) Scatophagidae flies, Subfamily Scathophaginae (29 species in US or Canada)

***Scathophaga furcata*** (*Pyropa f.* Say, 1823; *Cleigastra suisterci* Townsend, 1891; *S. bicolor*,  
*pubescens* Walker, 1849; *S. canadensis* W.1858 *S.* & *Cordylura fuscineris* Zetterstedt; & *S.*  
*postilena* Harris, 1835 (unav.), *S. squalida* Meigen) (circumboreal, s. to CA, Mex.,GA, MS/ Tx  
or Ac in NWT)

**SCATOPSIDAE** (minute black scavenger flies; dung-midges) suborder Nematocera, infraorder Psychodomorpha

**Scatopse** Geoffroy, 1762 (= *Ceria* Scopoli, 1763) Scatopsidae family, Subfamily Scatopsinae, Tribe Scatopsini (11 species in US or Canada)

**Scatopse** *notata* (= *Tipula* Linnaeus, 1758; *S. nitida* Harris, 1835 (Unav.); *S. femoralis* Meigen, 1838; *S. nitens* Walker, 1848) (global/Tx or Ac in IL)

**Scatopsciara** Edwards, 1927 - Scatopsidae flies (also put in Sciaridae)

**Scatopsciara** undet. sp. (Tx in BC & on porcupine dung in 2 NS caves)

**SCENOPINIDAE** (window flies) (= Omphralidae) flies) Suborder Brachycera, infraorder Muscomorpha.

Undet. genus (Ac in cave in Edwards Co., TX)

**Pseudatrichia** Osten Sacken, 1877- Scenopinidae flies, Subfamily Scenopininae (24 species in US or Canada)

**Pseudatrichia** *unicolor* Coquillett, 1900 (in CA non-cave *Neotoma fuscipes* woodrat nest)

**SCIARIDAE** (darkwinged fungus flies; (darkwinged) fungus or root gnats) Suborder Nematocera, infraorder Bibionomorpha. The term, fungus gnat, applies to a number of species in the insect order Diptera, family Sciaridae. Fungus gnat adults are a nuisance to greenhouse operators, interiorscapers as well as consumers. The larval stages can damage healthy roots, stunting or killing young plants even where there is no fungal food source (Lindquist 1994). Prolonged infestations may cause stunted, off-colored plants or foliage (Cole 1985). Adult fungus gnats are small (1/8 inch long), fragile grayish to black flies with long, slender legs and thread-like antennae. The adults are often confused with mosquitoes because of their long, slender dangling legs. Females can lay up to 200 small whitish eggs in the soil. Upon hatching, larvae will begin to feed immediately on the roots of plants. As soon as the larvae are mature, they pupate in the soil. In about four to seven days, the adults emerge and will live about one week. Larvae have the ability to damage plants by feeding on roots and root hairs. Seedlings and young plants are extremely vulnerable to this feeding. Fungus gnats develop through complete metamorphosis: egg; larva; pupa; and adult. Development occurs in 2 to 4 weeks. Larvae feed primarily on fungi, decaying organic matter and plant roots, particularly in very moist environments. Larval and pupal stages can also, however, survive periods of drought. Fungus gnats normally follow a predictable cycle of population development: The first two generations are the largest, followed by a leveling off or decline in numbers.

Undet. sp. And genus in MO & in NV cave *Nothrotheriops shastensis* ground sloth dung)

*Bradysia*, *Corynoptera*, *Lycoriella*, *Pnyxia*, *Phytosciara*, *Sciara*

Oligotrophini (*Dasineura*, *Boletina* (now in Mycetophilidae)

**Bradysia** Winnertz, 1867 (= *Neosciara* Pettey, 1918; *Fungivorides* Lengersdorf, 1926 & *Heterosciara* L. 1930; *Semnomomyia* Frey, 1942; *Lamprosciara* Frey, 1948) Sciaridae flies (65 species in US or Canada)

**Bradysia** *coprophila* (*Sciara c.* Lintner, 1895) (Tx or Ac in cave in Grundy Co., TN)  
**Bradysia** *forciculata* (*Sciara f.* Lundbeck, 1898) (epigean NJ/ Tx or Tp in GA, Dade Co.)  
*Bradysia* near *globosa* = *Sciaria*

**Bradysia** *luravi* (*Sciaria l.* Johannsen, 1929) (PA/Tx or Ac in Page Co., VA & Jefferson Cp., WV)

**Bradysia** undet. sp(p). (3 sp. in NS caves; Tp or Tx in BC, NM, NV, sON, WA; Tp in AR, IL, KY, MO, TN, TX?; TTx or Ac in NWT; seAK sink),

**Corynoptera** Winnertz, 1867 (= *Psilosciara* Kieffer, 1909; *Geosciara* K.1919; *Orinosciara* Legersdorf, 1941) Sciaridae flies (5 species in US or Canada)

**Corynoptera** near *subtrivialis* (*Neosciara s.* Pettey, 1918; *Bradysia s.*) (CA/Tx in IL)

**Corynoptera** undet. sp. or species (Tx in IL; Tx or Tp in GA, Dade Co.)

**Dasineura** Rondani, 1840 (gall mides) Sciaridae flies, Subfamily Oligotrophini

**Dasineura** *mali* (*Molobrus m.* Fitch, 1856; *Perrisia m.* Kieffer; *Lycoriella pauciseta* Felt, 1898) (NY/ Ttp in WA; Ac, Tx or Tp in KY)

**Lycoriella** Frey, 1942 (= *Hemineurina* Frey, 1942; *Niadina* Rapp, 1946; *Bradysiopsis* & *Coelostylina* Tuomikoski, 1960) (mushroom flies) Sciaridae flies (14 species in US or Canada)

*Lycoriella mali* = *Dasineura m.*

**Lycoriella** undescr. sp. (Tx or Tp in GA, Dade, Walker & Bartow Cos.)

**Lycoriella** undet. sp. (TTx? in IL, MO; Tx or Tp in BC (2 species), UT (Uinta Mts.); Tp in WA; 3 sp. TTx? sp. in WA; on porcupine dung in 2 NS caves)

*Molobius* - See *Sciara*

**Pnyxia** Johannsen, 1912 (= *Allostoomma* Schmitz, 1915) Sciaridae flies

**Pnyxia** *scabiei* (*Epidapus s.* Hopkins, 1895) (Europe, MA to OH, MO/ potato scab gnat/ Tx in KY; Ac in 1 seAK cave)

**Phytosciara** Frey, 1942- Sciaridae flies (once put in Phoridae)

**Phytosciara** *vulcanata* Steffan, 1973 (Tp in Kazumura C., HI Island, HI)

**Platosciara** Berg, 1899- Sciaridae flies

**Platosciara** undet. sp. (rare KS hyporheic)

*Scatopsiara* Edwards, 1927 - put in Scatopscidae

**Sciara** Meigen, 1803 (= *Lycoria* M.1800; *Molobrus* Latreille, 1805; *Planetes* Walker, 1836; *Planatella* Westwood, 1840; *Nowickia* Kjellander, 1943) - Sciaridae flies

*Sciara coprophila* = *Bradysia c.*

**Sciara** near *globosa* Pettey, 1918 (*S.c.* in CA/Tx in AR, MO)

**Sciara** *inconstans* (*Molobius i.* Fitch, 1856) (sCanada to CA,VA/fickle midge/Tx or Tp in KY)

**Sciara** undescr. sp.1? (Carlsbad C.(NM) & sp. #2 (IN))

**Sciara** undet. species (Tp or Tx in AZ, IL, IA, IN, MN, NJ, sON, TN, TX, WI; Tp in AL, GA)

**shore flies** - See Ephydriidae

**SIMULIIDAE** Newman, 1834 (black flies) Crosskey, 1990; C. & Howard, 1996; Kim & Merritt, 1986

sON undet genus in sON groundwater & hyporheic (rare). Incl. Subfamilies:

Subfamily Parasimuliinae Smart, 1945

Tribe Gymnopauidini (*Gymnopais*) (now in Simuliinae)

Tribe Parasimulini (*Parasimulium*)

Subfamily Simuliinae Newman, 1834 - Undet. Ac or Tx genus in Vancouver Island, BC (*Gymnopais*) (once in Parasimuliinae)

Tribe Prosimuliini Enderlein, 1921

(*Cnephia*, *Prosimulium* (subgenus *P.* Rouchard, 1906 s.str.), *Stegopterna*)

Tribe Simuliini Newman, 1834 (*Simulium* (subgenus *S.* Latreille, 1802 s.str.)

*Boophthora venustum* = *Prosimulium v.*

**Cnephia** Enderlein, 1921 (= *Astega* E., 1930) (buffalo gnat)

Simuliidae flies, Subfamily Simuliinae, Tribe Prosimuliini. (4 species in US or Canada)

*Cnephia mutata* = *Stegopterna m.*

**Cnephia** *ornithophilia* Davies, Peterson & Wood 1962 (MD hyporheic)

**Gymnopais** Stone, 1949 - Simuliidae flies, Subfamily Simuliinae (also put in Parasimulunae, Tribe Gymnopauidini) (5 species in US or Canada)

**Gymnopais** undet. sp. (Canada hyporheic)

**Parasimulium** Malloch, 1914 (= *Astoneomyia* Peterson, 1977) Simuliidae flies, Subfamily Parasimulunae, Tribe Parasimulini (3 species in US or Canada)

**Parasimulium** *crosskeyi* Peterson, 1977 (OR, WA/Tx in WA; obligate hyporheic in OR, WA)

**Parasimulium** *esselbaughi* Sommerman, 1964 (occasional hyporheic in OR)

**Parasimulium** (*Astoneomyia*) *melanderi* Stone, 1963 (Tx? in Vancouver Island, BC) Bibl.: Borkent & Currie 2001

**Parasimulium** (*Parasimulium*) *stonei* Peterson, 1977 (CA, WA & OR hyporheic/Tx in WA)

**Prosimulium** Roubaud, 1906 - Simuliidae flies, Subfamily Simuliinae, Tribe Prosimuliini. **Bibl.:** Peterson 1970. Hyporheic retreat during hostile conditions

**Prosimulium** (*P.*) *esselbaughi* Summerman, 1964 (Canada, AK,OR,WA/ outlets of hyporheic zone)

**Prosimulium** *hirtipes* (Fries, 1824) (considered by some authors as not Nearctic) (PA hyporheic)

**Prosimulium** (*P.*) *mixtum* Syme & Davies, 1958 (AK, eCanada, neUS to SC/ Tx or Ac in sON)  
*Prosimulium mutatum* = *Stegopterna m.*

**Prosimulium** (*Helodon*) *onychodactylum* Dyar & Shannon, 1927 (epigeal in CO, AK, s. to nCA,CO/ Canada stream hyporheic)

**Prosimulium** (*Nevermanni*) *pugetense* (Dyar & Shannon, 1927) (Canada, AZ, CA, ID, ME, MI, NH, NM, OR, UT, WA, WY/ OR hyporheic)

**Prosimulium** *saltus* Stone & Jamnback, 1955 (epigeal in WV, NY/ Tx in GA cave stream, Dade Co.)

**Prosimulium** undet. sp. or species (CO, PA hyporheic; AK resurgence)

**Prosimulium** (*Helodon*) *susanae* Peterson, 1970 (likely hyporheic in BC for stationary, non-feeding stages)

*Prosimulium tuberosum* = *Simulium t.*

**Prosimulium** (*Parahelodon*) *vernale* Shewell, 1952 (epigeal in ON/ MD hyporheic) **Bibl.:** Tarshish & Stuht 1970

**Prosimulium** (*Boophthora*) *venustum* (= *Simulium v.* Say, 1823; *S. moletum* Harris, 1841; *S. minutum* & *irritatum* Lugger, 1897; *Boophthora rileyana* Enderlein, 1922) (complex) (likely all US & Canada/Tx or Ac in sON)

**Simulium** Latreille, 1802 (=>40 syns.) (Riffle Smut; gnats) (66 species in US or Canada) Simuliidae flies, Subfamily Simuliinae, Tribe Simuliini.

**Simulium** *arcticum* Malloch, 1914 (= *S. brevicercum* & *nigresceum* Knowlton & Rowe, 1934) (Tx in AK)

**Simulium** *parnassum* Malloch, 1914 (epigeal in mts. of eNA/ Tx in GA cave stream, Dade Co.)

**Simulium** *pugetense* Dyar & Shannon, 1927 (occasional hyporheic in OR)

**Simulium** *tuberosum* (= *Melusina t.* Lundstrom, 1911; *Parasimulium t.*; *S. perissum* & *vandalicum* Dyar & Shannon, 1927; *S. turmale* Twinn, 1938; *S. twinni* Stains & Knowlton, 1940) (complex) (Canada, US, Europe/ Tx or Ac in sON)

*Simulium* (*S.*) *tuberosum* s.str. ("AB" Landau, 1962 cytoform (Finland, Norway, Canada, US))

*Simulium* undet. sp. or species (CO, KS & TX hyporheic; Tx? in MN; seAK resurgences, insurgences)

*Simulium venustum* = *Prosimulium* v.

*Stegopterna* Enderlein, 1930 - Simuliidae flies, Subfamily Simuliinae, Tribe Prosimuliini. (2 species in US or Canada)

*Stegopterna* *mutata* (complex) (*Prosimulium* m. Malloch, 1914; *Eusimulium permutatum* Dyar & Shannon, 1927; *Cnephia mutata*) (eCanada, eUS to LA/ Tx or Ac)

*Stegopterna* undet. sp. (Ac in se AK cave/insurgences),

## **SPHAEROCERIDAE** (=Borboridae) ((small) dung flies)

Suborder Brachycera, infraorder Muscomorpha.

**Bibl.:** Gapasin 1972; S. Marshall 1990; Marshall & Peck 1984; Marshall & Roha'ek 1986; O. Richards 1967

(Tx undet. genera & sp. in OH)

Subfamily Copromyzinae (*Crumomyia*)

Subfamily Limosininae (*Apteromyia*, *Leptocera*, *Limosina*, *Pseudocollinella*, *Rufolfina*, *Sclerocoelus*, *Spelobia*, *Telomerina*, *Terrilimosina*, *Xenolimosina*) **Bibl.:** S. Marshall 1982; Roha'ek & S. Marshall 1986

Sphaeroceridae (Guano or (small) dung Flies) are a worldwide family of small, usually dull-colored flies found in abundance wherever there is decomposing organic material in which larvae develop as microbial grazers. Some species, especially cavernicolous ones, are polysaprophagous, but most species appear to be associated with decaying plants or fungi. As the common name "small dung flies" suggests, many species are associated with various kinds of feces. Species that are necrophagous, though few, are extremely abundant and are important components of the carrion-insect community.

Despite their ubiquity and abundance, sphaerocerids have little direct economic impact. They have been implicated as the major means by which nematodes are disseminated among mushroom houses (Haglund & Milne 1973), and they occasionally reach nuisance levels in food-processing plants and other buildings. As their microbe-associated habits suggest, sphaerocerids carry many pathogenic microorganisms (Greenberg 1971), but their reclusive habits preclude a major role in disease transmission. One species listed here, *Poecilosomella angulata*, has been implicated in human intestinal myiasis (Micks & McKibbin 1956). Little work has been done on the importance of the sphaerocerids that abound in economically important decomposer communities such as compost and manure, but some decay cycles such as the wrack cycle (seaweed) are mediated by sphaerocerid-dominated insect communities.



**Apteromyia** Vimmer, 1929 (= *Aptilomyia* V.1929; *Vseteckiella* V.1931) Sphaeroceridae flies, Subfamily Limosininae (2 species in US or Canada)

**Apteromyia claviventris** (= *Limosina c.* Strobl, 1909) V. (Europe/Tx on NY fungi)

**Crumomyia** Macquart, 1835 (once placed as subgenus of *Copromyza*) - Sphaeroceridae flies, Subfamily Copromyzinae (9 species in US or Canada)

*Crumomyia maculipennis* (Spuler 1925) = *Spelobia m.*

**Crumomyia pilosa** Norrbom & Kim, 1985 (Ac or Tx in Vancouver Island, BC)

**Leptocera** Oliver, 1813 (= *Limosina* & *Heteroptera* Macquart, 1835; *Coproica*, *Elachisoma* & *Pteremis* Rondani, 1835; *Rachispoda* Lioy, 1864; *Collinella*, *Opacifrons*, *Stenhammaria*, *Scotophilella*, *Coprophila* Duda, 1924; *Paracollinella* D.1924; *Poecilosomella* D.1925; *Collinellula* Strand, 1928) Sphaeroceridae flies, Subfamily Limosininae. **Bibl.:** Marshall 1982, 1984 (48 species in US or Canada)

**Leptocera (Rachispoda) atra** (*Limosina a.* Adams, 1903) (WA to MD, s.to FL, Mex./ Tx or Ac in NM, TN)

**Leptocera (L.) caenosa** (*L. c.* Rondani, 1880) (epigeal in Europe, SK to MI & NS/ Tp detritivore in GA (Dade & Walker Cos.), IL, (Crawford, Harrison, WA cos., S4/G4), KY (Carter Co.) NM (Carlsbad C., Eddy Co.) & TX) **Bibl.:** Banta 1907; Conn & Marshall 1991; Marshall & Peck 1984)

**Leptocera (L.) fontinalis** (*Copromyza f.* Fallen, 1826) (circumboreal, US, Carib/Tx? in seNM)

**Leptocera (L.) pararoralis?** Duda, 1925 (ON/Tx? In Lee Co., VA)

*Leptocera sciaspidis* = *Pseudocollinella s.*

*Leptocera tenebrarum* - see *Speolobia*

**Leptocera** prob. undescr. sp. (OR C., OR/Tx or Ac)

**Leptocera** undet. sp. or species (Tp or Tx in AR, GA, NM (El Malpais), PA, TN?, UT (Uinta Mts.). VA, WV; Tp in IL, NS (2 caves), VA (cave in Rockcastle Co), KY (2 caves); Tx in Marion Co., TN (Marion Co.); Ac or Tx in 1 seAK cave; rare KS hyporheic)

**Limomyza** Marshall, 1997 - Sphaeroceridae flies, Subfamily Limosininae

**Limomyza cavernicola** Marshall, 1997 (epigeal type locality in Mammoth Cave Natl.Park, KY/ Tp in CO, KY, MO, OK) **Bibl.:** Marshall & Fitzgerald, 1997

*Limosina atra* = *Leptocera a.*

*Limosina stygia* = *Speolobia tenebrarum*

**Limosina** undet. sp. 1-? (Ac or Tx in TN, NWT)

*Limosina tenebrarum* = *Speolobia t.*

*Megaselia cavernicola* - see Phoridae

*Opalimosina sordipes* = *Sclerocoelus* s.

***Pseudocollinella*** Duda, 1924 (= *Spinotarsella* Richards, 1929)  
Sphaeroceridae flies, Subfamily Limosiniinae (14 species in US or Canada)

***Pseudocollinella sciaspidis*** (= *Leptocera* s. Spuler, 1924) (epigeal in WA, ID/ Tx or Ac in OR; Ac in WA)

***Rudolfina*** Rohacek, 1987 (*Rudolfia* R., 1982 Homo.)  
Sphaeroceridae flies, Subfamily Limosiniinae (1 species in US)

***Rudolfina cavernicola*** Marshall & Fitzgerald, 1997 (type locality cave in Larimer Co., CO/ Tp or Tx/Ep in AZ)

***Sclerocoelus*** Marshall, 1995 - Sphaeroceridae flies, Subfamily Limosiniinae (1 species in US or Canada)

***Sclerocoelus sordipes*** (*Limosina* s. Adams, 1904; *Opalimosina* s.) (Nearctic/ Tx in IA, NY, TX)

***Spelobia*** Spuler, 1924 (= *Leptocera*; *Eulimosina* & *Bifronsia* Rohacek, 1983)  
Sphaeroceridae flies, Subfamily Limosiniinae. (37 species in US or Canada) **Bibl.:** Marshall, 1985a

***Spelobia bumamma*** Marshall, 1985 (Tx or Tp in Vancouver Island caves, BC)

***Spelobia clunipes*** (*Borborus* c. Meigen, 1830; *Limosina crassimana* Haliday, 1836; *Copromyza pygmaea* Zetterstedt, 1838; *Limosina negrinervis* Dahl, 1909) (Tx in NA)

***Spelobia maculipennis*** (*Leptocera* m. Spuler, 1925; *Crumomyia* m.) (AK to CA/ Tx or Ac in CO; Ac or Tx in Vancouver Island, BC)

***Spelobia semioculata*** (*Leptocera* s. Richards, 1964) (surface in Alberta, e.Canada, Manitoba, nIN, NE/ Tp in Alberta, IA, IL, IN, Manitoba, MO, NY, sON, VA, WI)

***Spelobia pseudosetaria*** (*Limosina* p. Duda, 1918; *L. penetralis* Collin, 1925) (Tp or Tx in CO)

***Spelobia tenebrarum*** (*Limosina* t. Aldrich, 1897; *L. stygia* Coquillett, 1897) (type locality in Wyandotte C., Crawford Co., IN/ Tb in AL (Jackson, Madison Cos.), AR (Washington Co.), GA (Chattooga, Dade & Walker Cos.), IL (Calhoun, Clark, Jackson, Monroe, Pope, Saline, Union Cos.), IN (all s.cos. with caves, incl. Crawford, Jennings, Monroe, Orange Cos. - S5/G5 or G4G5), KY (Carter, Edmonson (Mammoth C.), Hart, Todd, Warren Cos.), MO (Barry, Carter, Franklin, Howell, Jefferson, Laclede, Oregon, Perry, St. Louis, Stone, Taney, Sullivan, NY, OH, PA (Mifflin Co.), TN (De Kalb, Dickson, Van Buren Cos.), VA (Lee Co.), WV (Greenbrier Co.)/ Tb guanobic) **Bibl.:** Conn & Marshall 1991; Marshall & Peck 1984, 1985; Peck, 1976

***Spelobia tuberculosa*** Marshall, 1985 (Tp in CO)

***Spelobia*** undet. sp. (Tp or Tx in Kings Canyon Natl. Park, CA; (subgenus *Spelobia*) Tx or Ac in Tulare Co., CA)

**Terrilimosina** Rohacek, 1983 - Sphaeroceridae flies, Subfamily Limosininae. (3 species in US or Canada) **Bibl.:** Marshall 1987; Marshall & Peck, 1985

**Terrilimosina** *pexa* Marshall, 1985 (Tp in ON, AR, OK)

**Terrilimosina** *racovitzai* (*Limosina r. Bezzi*, 1911) (Europe, NE, Mid-West/ Tp in IL, IA, NY, ON, PA, WI)

**Telomerina** Rohacek, 1983 - Sphaeroceridae flies, Subfamily Limosininae (8 species in US or Canada) **Bibl.** Marshall & Rohacek 1984.

**Telomerina** *cana* Marshall & Rohacek, 1984 (type locality cave in Marshall Co., AL/ Tp in AL, GA, OK, TN)

**Telomerina** *chillcotti* Marshall & Rohacek, 1984 (Tx in TN, TX)

**Xenolimosina** Rohacek, 1983 - Sphaeroceridae flies, Subfamily Limosininae. (2 species in US or Canada) **Bibl.:** Marshall 1985, 1999

**Xenolimosina** *phoba* Marshall, 1985 (Ontario, PQ/ Tp?)

**Xenolimosina** *sicula* Marshall, 1985 (CA, Ontario, PQ, AR/ Tp? in 1 cave each in CA & CO)

**STRATIOMYIDAE** (soldier flies) Suborder Brachycera, Infraorder Stratiomyomorpha

undet. genus rarely found in hyporheic of SC coastal blackwater stream

Subfamily Clitellariinae

Tribe Clitellariini (*Cyphomyia*)

Subfamily Stratiomyinae

Tribe Oxycerini (*Euparyphus*)

**Cyphomyia** Wiedemann, 1819 - Stratiomyidae flies, Subfamily Clitellariinae, Tribe Clitellariini (2 species in US or Canada)

**Cyphomyia** undet. sp. (fossil in *Neotoma* woodrat midden, Puerto Blanco Mts., Pima Co., sAZ)

**Euparyphus** Gerstaecker, 1857 Stratiomyidae flies, Subfamily Stratiomyinae, Tribe Oxycerini (23 species in US or Canada)

**Euparyphus** undet. sp. (uncommon AZ hyporheic)

**STREBLIDAE** (batflies; webworms) (also subsumed as Subfamily Streblinae in Hippoboscidae) Wingless, red, & flat bodied. Eads et al, 1957; Kessel, 1925; Maa, 1965, 1971; Jobling, 1949; Ma, 1962.

undet. genera: Tx in AR.

Subfamily Trichobiinae (*Nycterophilia*, *Paratrichobius*, *Trichobius*)

***Brasilia*** (put in Nycteribiidae)

***Nycterophilia*** Ferris, 1916 (also put in Nycteribiidae or Subfamily Streblinae in Hippoboscidae)) Streblidae flies, Subfamily Trichobiinae (2 species in US or Canada)

***Nycterophilia*** *coxata* Ferris, 1916 (CA to Mex. (Tx), Brazil, Antilles/ ectoparasite on AZ, CA *Macrotus californicus* (Tx, normal host) & *Macrotus waterhousi* & AZ *Leptonycteris nivalis* bats)

***Nycterophilia*** *mormoopsis* Wenzel, 1976 (on TX, Central America, SA *Mormoops megalophylla*)

***Nycterophilia*** undet. sp. or species (Tx? on AZ bats; ectoparasite on wTX *Mormoops megalophylla* bats)

***Paratrichobius*** Costa Lima, 1921 (also put in Nycteribiidae or Subfamily Streblinae, Tribe Trichobiini in Hippoboscidae)) Streblidae flies, Subfamily Trichobiinae (2 species in US or Canada)

***Paratrichobius*** *americanus* B. Peterson & Ross, 1972 (\*cave in Pima Co., AZ/ Tx ectoparasite on AZ *Choeronycteris mexicana* bats)

***Paratrichobius*** *longicrus* (Ribiero, 1907) (Tx ectoparasite on AZ *Choeronycteris mexicana* bats)

*Penicillidia antrozoi* = *Nycterophilia a.*

***Trichobius*** Gervais, 1844 (= *Kolenatia* Rondani, 1876; *Kesselia* Curran, 1934) (also put in Nycteribiidae or Subfamily Streblinae in Hippoboscidae)) Streblidae flies, Subfamily Trichobiinae (9 species in US or Canada)

Bibl.: Ross 1961; Jobling, 1938; H. Smith 1934; Whitaker 1957; Wilson 1946; Zeve 1958, 1959; Zeve & Howell 1962, 1963, 1963a; Overall 1980; Zeve & Howell 1963; **Areas:** **AZ:** Ross 1960; **E:** Whitaker & Easterla 1974; **OK:** Zeve 1954, 1958; **IN:** Busacca 1975; **TX:** Kohls & Jellison 1948; Whitaker & Easterla 1975.

***Trichobius*** *adamsi* Augustson, 1943 (AZ, CA, Mex./Tx? on ectoparasite on *Tadarida brasiliensis* (accidental) & AZ (Tx), CA, Mex. *Macrotus californicus* (normal host) bats) **Bibl.:** Ross 1959

***Trichobius*** *corynorhini* (Cockrell, 1910) (= *T. quadrisetosus* Kessel, 1925; *T. major* q. Kessel, 1925) ( WA to Mex., CO, OK to WV/ obligate ectoparasite on AR, AZ, CA, MT, OR, wTX, WA?, WV on *Antrozus pallidus*; WV, UT on *Myotis evotis*, AR, AZ (Tx), CA, CO, KS, KY (Tx), Mex., MO (Tx), MT OK, OR, WV (Tx) on *Corynorhinus rafinesquii*; occas. on man, AZ, AR, CA, CO, KS, KY, Mex., MO, OK, OR, wTX, UT, WV(Tx) *Corynorhinus townsendii* (major/ normal host), AR (Tx), KS, KY (Tx), NM (Tx): OK (Tx, accidental), WV (Tx) on *Tadarida b.*; TX *Myotis volans* ; KS (Tx), OK (Tx) *Myotis velifer* bats; Tx in VA) **Bibl.:** Ressel, 1952; A. Ross 1960, 1961

**Trichobius leionotus** Wenzel, 1976 (ectoparasite on wTX *Mormoops megalophylla* bats)

**Trichobius longipes** (Rudow). (Tx ectoparasite on AZ *Choeronycteris mexicana*, non-US bats in Caribbean, Central Amer., nSA )

**Trichobius major** Coquillett, 1899 (FL, CA to KS, s. to Guatemala, TX, FL/ ectoparasite on Tx FL, KS, Mex., NM, OK (Tx) (also on cave walls), TX (also on cave walls) *Myotis velifer incautus* (major host), FL (Tx), KS *Myotis grisescens*; FL (Tx, one bats) *M. austroriparius*; KS (Tx) ,OK (Tx) ,TX(Tx) *Corynorhinus townsendii* & *Tadarida b.*; Tx on AR, CO, KY, TX *Corynorhinus rafinesquii* & AZ bats) **Bibl.:** Caire & Hornuff 1986; Caire & Sohrabi, 1985; Caire & Hornuff 1982; Caire, Hornuff & Ports 1981

**Trichobius major quadrisetosus** (=T. q.) (Tx ectoparasite on TX *Myotis velifer* bats)

**Trichobius mixtus** Curran, 1945 (=Xylota m. & Heliophilus m. Curran, 1941? in Syrphidae?) (Tx on AZ *Choeronycteris mexicana* bats) Bradshaw & Ross, 1961

**Trichobius parasiticus** Gervais, 1844 (Tx on CA *Macrotis californicus* bats)

**Trichobius sphaeronotus** Jobling, 1939 (Tx ectoparasite on AZ, NM, OK (also on cave walls), Mex., TX *Leptonycteris nivalis* (normal host), AZ, NM, Mex. *L. sanborni*, KS, OK *Myotis velifer*, KS, Mex.,OK,TX (also cave walls) *Tadarida b.*, TX *Mormoops m.* & Mex. *Macrotus californicus* bats)

**Trichobius truncatus** Kessel, 1925 (valid sp.?) (AZ,TX/ Tx ectoparasite on AZ,TX *M. calif.* bat, other bats in PR, Cuba)

**Trichobius** undet. sp. or species (ectoparasite on BC bats)

## **SYRPHIDAE** (syrphid, flower, sweat, drone or hover flies; ratted maggot)

Subfamily Eristalinae

Tribe Eristaliini, subtribe Eristaliina (*Eristalis*)

Tribe Chrysogastrini (*Chrysogaster*)

Subfamily Milesiinae

Tribe Volucellini (*Copestylum*)

Subfamily Syrphinae

Tribe Syrphini (*Dasysyrphus*, *Eupeodes*, *Syrphus*)

***Chrysogaster*** Meigen, 1803- Syrphidae flies, Subfamily Eristalinae, Tribe Brachyopini (also put in Chrysogastrini (12 species in US or Canada)

***Chrysogaster*** undet. sp. (MI lake benthic)

***Copestylum*** Macquart, 1846 - Syrphidae flies, Subfamily Milesiinae, Tribe Volucellini

***Copestylum*** (*Volucella*) *vesicularium* (*Volucella vesiculana* Curran, 1947) (epigeal Tx in GA, Grady Co.)

***Dasysyrphus*** Enderlein, 1938 (= *Conosyrphus* Matsumura, 1918 (Homo.); *Syrphella* Goffe, 1944; *Dendrosyrphus* Dusek & Laska, 1967) Syrphidae flies, Subfamily Syrphinae, Tribe Syrphini (17 species in US or Canada)

***Dasysyrphus*** undet. sp. (sON/Tx or Ac)

***Eristalis*** Latreille, 1804 (= *Tubifera* Meigen, 1800; *Elophilus* M. 1803; *Elophila* M. 1904; *Helophila* & *Helophilus* Fabricius, 1805 (misspelled); *Eristaloides* Rondani, 1844; *Eristalomya* R. 1857; *Erliops* Lioy, 1863; *Lathrophthalmus* Mik, 1897; *Eoseristalis* Kanervo, 1938) Syrphidae flies, Subfamily Eristalinae, Tribe Eristaliini, Subtribe Eristaliina (23 species in US or Canada)

***Eristalis*** *tenax* (*Musca t.* Linnaeus, 1758) (= *Conops vulgaris* & *fuscus* Scopoli, 1763; *M. procina* DeGeer, 1776; *M. obfuscata* Gmelin, 1790; *Eristalis campestris*, *vulpinus*, *sylvaticus*, *hortorum* Meigen, 1822; *E. sinensis* Wiedemann, 1824; *E. alpinus* Strobl, 1894) (NA, Europe/Tx or Ac in PA)

***Eupeodes*** Osten Sacken, 1877 (= *Metasyrphus*, *Macrosyrphus* Matsumura, 1917; *Posthonia* Enderlein, 1938; *Scaevosyrphus* Dusek & Laska, 1967; *Beszella* Hippa, 1968) Syrphidae flies, Subfamily Syrphinae, Tribe Syrphini (27 species in US or Canada)

***Eupeodes*** *volucris* Osten Sacken, 1877 (*Syrphus perpallidus* Bigot, 1884; Snow, 1892 (Homo.); *E. braggii*, *weldoni* Jones, 1917 (BC to ON, s. to CA, Mex., LA/ Ac in Irion Co., TX)

***Eupeodes*** undet. sp. (Tx or Ac in sON)

***Syrphus*** Fabricius, 1775 (= *Syrphidis* Goffe, 1933) Syrphidae flies, Subfamily Syrphinae, Tribe Syrphini (13 species in US or Canada)

***Syrphus*** *rectus* Osten Sacken, 1875 (= *S. transversalis* Curran, 1921) (MB to PQ, s. to CO, NC, MO/ Tx or Ac in sON)

**TABANIDAE** (=Larvaevoridae) (horse & deer flies; peewee & horse flies; gadflies, breezeflies, clegs & deerflies) Suborder Brachycera, infraorder Tabanomorpha  
(undet. genus in brackish beach sediment at Lake Pontchartrain, LA)

***Chrysops*** Meigen 1803 (deer flies) Tabanidae flies, Subfamily Chrysopsinae, Tribe Chrysopsini (101 species in US or Canada)

***Chrysops*** undet. sp. (TX sandy hyporheic)

***Tabanus*** Linnaeus, 1758 (horse flies) - Tabanidae flies, Subfamily Tabaninae, Tribe Tabanini (101 species in US or Canada)

*Tabanus atratus* Fabricius, 1775 (MS tidal marsh epifauna)

*Tabanus dorsifer* Walker, 1860 (*T. intensivus* Townsend, 1897; *T. hyalinipennis* Hine, 1903)  
(Rare as dry channel hyporheic in Sycamore Cr. 32 km ne of Phoenix (Maricopa Co.), AZ)

*Tabanus* undet. sp. or species (TX, seVA hyporheic; seAk insurgence)

**TACHINIDAE** (parasitic flies; tachinid or tachina flies) **Bibl.:** Arnaud 1978

Subfamily Dexiinae

Tribe Eriothrixini (*Paradidyma*)

Subfamily Goniinae

Tribe Siphonini

Subtribe Siphonia (*Actia*)

Subtribe Nearina (*Phytomytera*)

Subfamily Tachininae

Tribe Voriini (*Cyrtophleba*)

Tribe Tachinini (*Peleteria*)

*Actia* Robineau-Desvoidy, 1830 (= *Thryptocera* Macquart, 1834; *Gymnophthalma* Lioy, 1864; *Gymnopareia* Brauer & Bergenstamm, 1889; *Actiopsis* Townsend, 1917 & *Setasiphona* T., 1934) Tachinidae flies, Subfamily Goniinae, Tribe Siphonini, Subtribe Siphonia (9 species in US or Canada)

*Actia diffidens* Curran, 1933 (BC to NS, s.to MI, NY/ Tx or Ac in sON)

*Cyrtophleba* Rondani, 1856 (= *Eucyrtophloeoba* Townsend, 1916)

Tachinidae flies, Subfamily Tachininae, Tribe Voriini (3 species in US or Canada)

*Cyrtophleba* undet. sp. Townsend (Ac in cave in Irion Co., TX)

*Elfia* = *Phytomytera*,

*Eucyrtophloeoba* = *Cyrtophleba rhois*,

*Paradidyma* Brauer & Bergenstamm, 1891 (= *Ceratomyiella* Townsend, 1891; *Atrophopampus*, *Lachnomma* T., 1892; *Phytoadmontia* T., 1916; *Micromintha* T., 1919) Tachinidae flies, Subfamily Dexiinae, Tribe Eriothrixini (16 species in US or Canada)

*Paradidyma apicalis* Reinhard, 1934 (NC, FL, SW to Guatemala/Ac in cave in Culberson Co., TX)

*Paradidyma* undet. sp. (Ac in cave in Sutton Co., TX)

*Peleteria* Robineau-Desvoidy (*Faurella* R. 1830; *Cuphocera* Macquart, 1845; *Palpibraca* Rondani; *Cyphocera* R., 1856; *Sphyricera* Lioy, 1864 *Sphyromyia* Bigot, 1884; *Chaetopeleteria* Mik, 1894; *Popelia* Bezzi, 1894; *Tetrachaeta* Brauer & Berg., 1894; *Tessarochaeta*, *Peletieria* B.,

1906; *Panzeriopsis* Townsend, 1915; *Pedeteriopsis* T., 1916; *Oxydosphyria* T., 1926; *Aphriosphyria* T., 1927; *Paracuphocera* Zimin, 1935 *Hemipeletieria* Zimin, 1961) Tachinidae flies, Subfamily Tachininae, Tribe Tachinini (38 species in US or Canada)

***Peleteria*** undet. sp. (Ac in cave in Irion Co., TX)

***Phytomyptera*** (*Elfia* Robineau-Desvoidy, 1850; *Schizotachina* Walker, 1852; *Craspedothrix* Brauer & Bergenstamum, 1893; *Phytomyzoptera* Bezzi, 1906; *Acronarista* Townsend, 1908; *Phasiostoma* T., 1915; *Phytomyzoneura* Stein, 1924; *Schizactia* T., 1926; *Procraspedothrix* T., 1932; *Apheloglutus* Greene, 1934; *Lispideosoma* Reinhard, 1943) Tachinidae flies, Subfamily Goniinae, , Tribe Siphonini, Subtribe Nearina (23 species in US or Canada)

***Phytomyptera*** undet. sp. (Ac in cave in Hays Co., TX),

**TANYDERIDAE** (primitive crane flies) Suborder Nematocera, infraorder Ptychopteromorpha, Superfamily Ptychopteroidea

***Protanyderus*** Handlirsch, 1909 - Tanyderidae flies

***Protanyderus margarita*** Alexander, 1948 (BC to ID,OR,UT, live in wet sandy soil along larger streams /CO hyporheic) (3 species in US or Canada)

***Protanyderus vanduzeei*** (*Protoplasia* v. Alexander, 1918) (CA hyporheic & epigeal)

***Protanyderus vipio*** (*Protoplasia* v. Osten Sacken, 1877) (CA & OR hyporheic & epigeal)

**TENDIPEIDAE** (subsumed in Chironomidae)

**THAUMALEIDAE** (= Orphnephilidae) (solitary midges) Infraorder Culicomorpha, Superfamily Culicoidea

***Trichothaumalea*** Edwards 1929 - Thaumaleidae flies (3 species in US or Canada)

***Trichothaumalea*** undet. sp. (Ac or Tx in Vancouver Island, BC)

**TIPULIDAE** (crane flies)

Suborder Nematocera, infraorder Tipulomorpha. CA: C.Alexander 1967. sON undet genus in groundwater & rare in hyporheic

Subfamilies incl.:

Cylindrotominae (*Cylindrotoma*)

Limoniinae

Eriopterini (*Chionea*, *Cryptolabis*, *Empedomorpha*, *Erioptera*, *Esperoconopa*, *Gnophomyia*, *Molophilus*, *Ormosia*)

Hexatomini (*Austrolimnophila*, *Dactylolabis*, *Hexatoma*, *Limnophila*, *Pilaria*, *Polymera*)

Limoniini (*Antocha*, *Dicranoptycha*, *Limonia*, *Megarhina* )

Pediciini (*Dicranota*, *Pedicia*, *Ula*)



## Tipulinae

### Tribe Tipulini (*Dolichozeza*, *Tipula*)

Tipulids are confined to temperate and cool climates. Adults are on the wing in spring and/or autumn and, especially in temperate and warm-temperate regions, during winter or, in colder regions, in summer. Adults often occur in caverns, mine shafts, cellars, hollow trees, and other dark places, but they attract more attention by their habit of swarming. They commonly form swarms in mid-winter when there is generally low activity among other insects. They may even swarm in cold conditions when snow is on the ground. In fact, winter gnats are active throughout the year, but are least conspicuous during the summer when they typically seek out cool, shady areas. The swarms are a communal courtship display performed by the males: females are attracted by the same conditions that stimulate swarming behaviour and will be present nearby, each trying to pair up with a male for mating. Their pronounced activity during the winter is why this group of flies are commonly known as winter gnats.

Larvae are scavengers in moist or wet terrestrial biotopes such as decaying leaves and vegetables, manure, fungi, stored roots and tubers, and burrows of rodents. From the southern islands of New Zealand, larvae have been reported from penguin droppings and bird nests.

There are over 200 species of crane flies and over 1500 of them live in North America. Crane flies have one set of wings, unlike dragonflies. Crane flies are usually brown or grey, some have dark markings on their wings. Crane flies have big compound eyes, small short antennae and small structures on their sides called halteres. Crane flies are common near water where vegetation is plentiful. Often times they are mistaken for giant mosquitoes as you can see if you see my picture below, but they really don't bite at all. In England crane flies are called "daddy-long-legs," which is the name we give a long-legged arachnid. Most crane flies grow to 10mm.-25mm. long. Crane flies belong in the class Insecta, the order Diptera, and several families including Tipulidae.

***Antocha*** Osten Sacken, 1859 - Tipulidae flies, Subfamily Limoniinae, Tribe Limoniini (7 species in US or Canada)

***Antocha saxicola*** Osten Sacken, 1859 (Ac or Tx in Franklin Co., PA)

***Antocha*** undet. sp. or species (se AK cave exsurgence; PA, PQ hyporheic)

*Archilimnophila* = *Austrolimnophila*

***Austrolimnophila*** Alexander, 1920 (= *Archilimnophila* A.1934; *Limnophilaspis* A.1950; *Mediophragma* A.1954; *Phragmocrypta* A.1956) Tipulidae flies, Subfamily Limoniinae, Tribe Hexatomini (3 species in US or Canada)

***Austrolimnophila*** undet. sp. (TTx in WA)

***Chionea*** Dalman, 1816 - Tipulidae flies, Subfamily Limoniinae, Tribe Eriopterini (16 species in US or Canada) **Bibl.:** Bitsch 1955; Byers 1960

***Chionea alexandriana*** Garrett, 1922 (BC to Alberta/Tx or Tp in OR, WA; Tx in CA)

*Chione cancellata* Linnaeus, 1767 (wFL Gulf of Mexico infauna)

/

*Chionea macnabeana* Alexander, 1946 (epigeanin OR/ Tx or Ac in OR)

*Chionea scita* Walker, 1848 (= *C. primitiva* Alexander, 1917) (E/ TTp or Tx in KY, WV)

*Cryptolabis* Osten Sacken, 1859 - Tipulidae flies, Subfamily Limoniinae, Tribe Eriopterini

*Cryptolabis* undet. sp. (shallow hyporheic in Sycamore Cr. 32 km ne of Phoenix (Maricopa Co.), AZ)

*Cylindrotoma* Macquart, 1834 - Tipulidae flies, Subfamily Cylindrotominae (3 species in US or Canada)

*Cylindrotoma* undet. sp. (Ac in se AK cave/insurgences)

*Dactylolabis* Osten Sacken, 1859 (= *Rhincnoptila* Nowicki, 1867; *Eudatylolabis* Alexander, 1950; *Coenolabis* Savchenko, 1969; *Bothrophorus* S. & Plyushch, 1984) Tipulidae flies, Subfamily Limoniinae, Tribe Hexatomini (20 species in US or Canada)

*Dactylolabis* (*D.*) *hudsonica* Alexander, 1931 (NF to TN, SC/Tx in sON)

*Dactylolabis* (*D.*) *montana* (*Limnophila m.* Osten Sacken, 1859) (NF s. to SC, sw. to IL, MO/ Tp or Tx in MO, sON)

*Dactylolabis* (*D.*) *postiana* Alexander, 1944 (OR to ID/ Tx in CA)

*Dactylolabis* (*D.*) *supernumaria* Alexander, 1929 (NF to NY/ Tx in sON)

*Dicranoptycha* Osten Sacken, 1859 - Tipulidae flies, Subfamily Limoniinae, Tribe Limoniini

*Dicranoptycha* cf. *occidentalis* Alexander, 1927 (WA to CA/Tx in Santa Cruz Co., CA)

*Dicranoptycha* undet. sp. (Tx in Shasta Co., CA)

*Dicranota* Zetterstedt, 1838 (= *Astrolabis* Osten Sacken, 1865; *Plectromyia*, *Rhaphidolabis* O.S., 1869; *Polyangaeus* Doane, 1900; *Claduroides* Brunetti, 1911; *Amalopina* B. 1912; *Rhaphidolabina* Alexander, 1916; *Eudicranota*, *Paradicranota* A. 1934; *Amalopinodes*, *Euamalopina*, *Dicranotella* A. 1949) - Tipulidae flies, Subfamily Limoniinae, Tribe Pediciini (61 species in US or Canada)

*Dicranota* (*Rhaphidolabina*) *flaveola* (*Rhaphidolabis f.* Osten Sacken, 1869) (NF to NC, MI/ Tx in sON)

*Dicranota* undet. sp. or species (ON, OR, PA, WV hyporheic/ Tx or Ac in MN, seAK; seAK insurgences, resurgences)

*Dolichozepe* Curtis, 1825 (= *Apeileis* Macquart, 1846; *Orozepe* Needham, 1908; *Megistomastix* Alexander, 1912; *Nesozepe* A. 1914; *Mitopeza* Edwards, 1916; *Trichodolichozepe* A. 1917; *Eunesozepe* A. 1934; *Sinorozepe* A. 1935; *Afrodolichozepe*, *Eudolichozepe* A. 1956; *Prodolichozepe* A., 1963 Byers, 1961) - Tipulidae flies, Subfamily Tipulinae, Tribe Tipulini. (2 species in US or Canada) **Bibl.:** G. Byers 1952

**Dolichozepe** (*Orozepe*) *dorsalis* (O.d. Johnson, 1909; *O. rogersi* Alexander, 1922; *D. sessilis* A.19410) (ME, YT to NS, s.to BC, FL/ Tx in sON)

**Dolichozepe** undet. sp. (CO hyporheic)

**Dolichozepe** (*Orozepe*) undet. or undescr. sp. (TTxc in cave in Edmonson Co., KY) **Bibl.:** Sullivan 1962

**Dolichozepe** *tridenticulata* Alexander, 1931 (MB to PQ, ME to MO, GA epigeal/ Tx in GA (Dade Co.) & sON)

**Dolichozepe** *venosa* (*Orozepe* v. Johnson, 1909) (BC to NF, s. to SC/ Tx in sON)

**Dolichozepe** *walleyi* (*Orozepe* w. Alexander, 1931) (epigeal AB to PQ, NS, s. to MO, FL; Tx in GA (Bartow Co.) )

**Empedomorpha** Alexander 1917 - Tipulidae flies, Subfamily Limoniinae, Tribe Eriopterini  
*Empedomorpha empedoides* = *Erioptera e.*

**Erioptera** Meigen, 1803 (= *Polymeda* Meigen, 1800 (Unav.); *Polyraphia* M.1818; *Helobia* Lepeletier & Serville, 1828; *Symplecta* M.1830; *Psiloconopa* Zetterstedt, 1838; *Octavia* Bigot, 1854; *Ilisia*, *Chemalida*, *Ilisophila*, *Limnoea* Rondani, 1856; *Trimicra* Osten Sacken, 1861; *Limnoica* R.1861; *Idioneura* Philippi, 1865; *Mesocyphona*, *Hoplolabis*, *Acyphona* O.1869; *Podoneura* Bergroth, 1888; *Empedomorpha* Alexander, 1916; *Hespereriptera* A.1927; *Eripterella* A.1929; *Teleneura* A.1931; *Meterioptera* A.1934; *Tasiocerodes* A.1957; *Ctenerioptera* A.1961; *Teucheriptera*, *Lepidocyphona* A.1972; *Pseuderioptera* A.1975; *Lunaria* Savchenko, 1982) - Tipulidae flies, Subfamily Limoniinae, Tribe Eriopterini (29 species in US or Canada)

**Erioptera** *empedoides* Alexander, 1916 (Ac in El Malpais Natl. Monument, nNM)

**Erioptera** undet. sp. or species (CO hyporheic; Tx or Ac in cave in VA; VA, MD brackish benthic)

**Gnophomyia** Osten Sacken, 1859 (= *Eugnophomyia* Alexander, 1947; *Idiognophomyia* A.1956)  
Tipulidae flies, Subfamily Limoniinae, Tribe Eriopterini

**Gnophomyia** (*G.*) *tristissima* Osten Sacken, 1859 (NWT to ME, WI, s. to FL, TX/ Tx in IL)

*Helius* = *Megarhina*

**Hesperoconopa** Alexander, 1948 - Tipulidae flies, Subfamily Limoniinae, Tribe Eriopterini

**Hesperoconopa** undet. sp. (CO hyporheic)

**Hexatoma** Latreille, 1809 (= *Anisomera*, *Nematocera* Meigen, 1818; *Caloptera* Guerin-Meneville, 1831; *Peronocera* Curtis, 1836; *Eriocera* Macquart, 1838; *Pterocosmus* Walker, 1848; *Oligomera* Doleschall, 1857; *Arrhenica* Osten Sacken, 1859; *Physecrania* Bigot, 1859; *Penthoptera* Schiner, 1863; *Cladolipes* Loew, 1865; *Androselosma* Enderlein, 1912; *Globericera* Matsumura, 1916; *Euhexatoma* Alexander, 1936; *Trimacromera*, *Corezelia* E.1936)  
Tipulidae flies, Subfamily Limoniinae, Tribe Hexatomini (35 species in US or Canada)

**Hexatoma** undet. sp. (nCA, CO, OR, TX, WV hyporheic)

**Limnophila** Macquart, 1834 (= *Idioptera* M.1834; *Phylidorea* Bigot, 1854; *Eloeophila* Rondani, 1856; *Lasiomastix*, *Prionalabis*, *Dicranophragma* Osten Sacken, 1859; *Ephelia* Schiner, 1863; *Eutonia* Wulp, 1874; *Idiolimnophila* Alexander, 1934; *Trichephelia* A.1938; *Dendrolimnophila* A.1949; *Dasylimnophila* A.1965; *Hesperolimnophila*, *Brachylimnophila*, *Arctolimnophila* A.1966; *Habrolimnophila*, *Indolimnophila* A.1968; *Atopolomnophila*, *Euphylidorea* A.1972; *Microlabina* Savchenko, 1986; *Paraphylidorea* Savchenko, 1986) Tipulidae flies, Subfamily Limoniinae, Tribe Hexatomini (93 species in US or Canada)

**Limnophila pilosella** Osten Sacken, 1859 (*Ulomorpha p.*) (Tx in IN; TTP in KY)

**Limnophila** undet. sp. (CO, TX hyporheic/ TTx in TN)

**Limonia** Meigen, 1803 (=>45 syns.) Tipulidae flies, Subfamily Limoniinae, Tribe Limoniini (111 species in US or Canada)

**Limonia (Discobola) annulata** (*Tipula a.* Linnaeus, 1758) (Eurasia s. to New Guinea, BC To NF, s. to OR, TN, VA/ Tx in sON)

**Limonia (Metalimnobia) annulus** (*Limnobia a.* Meigen, 1818; *L. cinctipes* Say, 1823; *L. triphaea* Alexander, 1954) ssp. *cinctipes* (= *L. a.* Say, 1823) (AB to NF, s. to MS, FL, MO/ Tx in NS (one cave), sON)

**Limonia (Limonia) badia** (*Limnobia b.* Walker, 1848; *L. humidicola* (authors, not Osten Sacken)) (NS/ Tx in sON; Tx or Ac in PA)

*Limonia cinctipes* = *L. annulus*

**Limonia (Lanatipula) grahamina** Alexander, 1963 (Tx in Plumas, Shasta & Trinity Cos., CA)

**Limonia (Lanatipula) gertschi** Alexander, 1963 (Tx in Calaveras Co., CA)

**Limonia humidicola** (*Dicranomyia h.* Osten Sacken, 1859) (BC to NS, s. to CT, TN, Central Amer., CA/ Tx in sON)

**Limonia (L.) indigena i.** (*Limnobia i.* Osten Sacken, 1859; *L. jacksoni* Alexander, 1917; *Limonia loloensis* A.1958)) (NF s. to SC, sw to IA, WI, TN/ Tx in sON)

**Limonia** cf. *jacoba* (Alexander, 1919) (endemic to Kauai, Oahu, Maui, HI/ Tp in Kazumura C., HI Island, HI)

**Limonia (L.) maculicosta** (*Limnobia m.* Coquillett, 1905) (Japan, AK to CA, e. to VT, VA/ Tx in sON)

**Limonia neobeculosa** Alexander, 1924 (Tx in NA, Europe)

**Limonia (L.) nubeculosa** Meigen, 1804 ssp. *sciophila* (= *L. s.* Osten Sacken, 1877) (AK to CA, CO/ Tx in Kings Canyon Natl. Park, CA)

**Limonia** undet. species (TTx in AZ, BC (subgenus *Dicranomyia*), CA, OR, KY, WA, WV; Tp in HI)

**Limonia perkinsi** (Grimshaw, 1901) (adventive in Kauai, Oahu, Molokai, Lanai, Maui, HI/ rare Ac or Tx in Kazumura C., HI)

**Limonia** (*Dicranomyia*) *stulta* (*Dicranomyia* s. Osten Sacken, 1859; *Furcomyia monticola* Alexander, 1911)) (PQ to GA, WI/ TTx in AR, sON)

**Megarhina** (= *Helius* Lepeletier & St. Fargeau et Serville, 1828; *Prohelius* Alexander, 1975)- Tipulidae flies, Subfamily Limoniinae, Tribe Limoniini (2 species in US or Canada)

**Megarhina flavipes** (= *Rhamphidia* f. Macquart, 1855; *Limnobia prominens* Walker, 1856) Li), (NS to FL/ Tx in sON)

**Molophilus** Curtis, 1833 (= *Eumolophilus* Alexander, 1921; *Trichomolophilus* A.1936; *Archimolophilus* A.1940; *Rhynchomolophilus* A.1965; *Promolophilus* A.1966; *Austromolophilus*, *Lyriomolophilus*, *Superbomolophilus* Theischinger, 1988) Tipulidae flies, Subfamily Limoniinae, Tribe Eriopterini (40 species in US or Canada)

**Molophilus** (*Molophilus*) undet. sp. CO hyporheic)

**Ormosia** Rondani, 1856 (= *Illisomyia* Rondani, 1856; *Rhypholophus* Kolenati, 1860; *Gonomyiella* Meunier, 1899; *Oreophila* Lackschewitz, 1935; *Scleroprocta* Edwards, 1938; *Neserioptera* Alexander, 1956; *Paraormosia* A.1965) Tipulidae flies, Subfamily Limoniinae, Tribe Eriopterini

**Ormosia** (*Scleroprocta*) *manicata* (*R. manicatus* Doane, 1900) (Japan, WA to NF, s. to ID, CA, PA/ CO, WV & OK hyporheic)

**Ormosia** nr. *romanovichiana* Alexander, 1953 (*Erioptera nubila* Osten Sacken, 1859 Homo.) (Ac, Tx or Tp in Mammoth C., KY)

**Ormosia** undet. sp. (CO, WV & OK hyporheic)

**Pedicia** Latreille, 1809 (*Amalopsis* Haliday, 1856; *Daimiotipula* Matsumura, 1916; *Oleranopelma* Enderlein, 1936; *Eucyphona* Alexander, 1949; *Pentacyphona* A.1968; *Ludicia* Hutson & Vane-Wright, 1969; *Tricyphona* Zetterstedt, 1837) Tipulidae flies, Subfamily Limoniinae, Tribe Pediciini (11 species in US or Canada)

**Pedicia** undet. sp. or species (Tx or TTx in AK, ILL, IA, MO, OR, WA)

**Pilaria** Sintenis, 1889 (= *Eulimnophila* A.1919) Tipulidae flies, Subfamily Limoniinae, Tribe Hexatomini (11 species in US or Canada)

**Pilaria** undet. sp. (CO hyporheic)

**Polymera** Windemann, 1820 (= *Polymerodes* Alexander, 1920)  
Tipulidae flies, Subfamily Limoniinae, Tribe Hexatomini

**Polymera** undet. sp. (CO hyporheic)

*Pterelachisus* = *Tipula*

**Tipula** Linnaeus, 1758 (=>50 syns.) - Tipulidae flies, Subfamily Tipulinae, Tribe Tipulini. (323 species in US or Canada)

**Tipula** (*Nippotipula*) *abdominalis* Say, 1823 (PA, WI to NF, s. to KS, FL/ seVA hyporheic; TTx in GA (Walker Co.))

**Tipula** (*Bellardina*) *albimacula* Doane, 1901 (AZ epigeal/ TTx in TX)

**Tipula** (*Trichotipula*) *algonquin* Alexander, 1915 (MI to ON, s. to TN, NC/ TTx in AR)

**Tipula** (*Yamatotipula*) *caloptera* Loew, 1863 (WI to Nfl, s. to MO, FL/Tx in sON; (hyporheic? in NB)

**Tipula** near (*Lunatipula*) *dorsimacula* d. Walker, 1848 (*T. nubilis* Harris, 1835; *T. angustipennis* Loew, 1863; *T. breaulieui* Dietz, 1921) (epigeal in BC to NS, s. to CA, NJ/ Tx in KY?)

**Tipula** (*Trichotipula*) *gertschi* Alexander, 1963 (\*\*?type locality & 1 other cave in Calaveras Co., CA/ Tx or Tp/ G1)

**Tipula** (*Trichotipula*) *grahamina* Alexander, 1963 (type locality & 1 other cave in Plumas Co. & one cave in Shasta Co., CA/ Tx or Tp/ G1)

**Tipula** (*B.*) *rupicola* Doane, 1912 (Tx in CA, OR, AZ)

**Tipula** (*B.*) *schizomera* Alexander, 1940 (AZ, CA, Mex., UT/ TTx in cave in Edwards Co., TX)

**Tipula** undet. sp. or species (PA, PQ (rare), WV hyporheic; TTx in CA, MO, NM, OR, TN, TX, UT, WA)

**Ula** Haliday, 1833 - Tipulidae flies, Subfamily Limoniinae, Tribe Pediciini (3 species in US or Canada)

**Ula** *elegans* Osten Sacken, 1869 (AK to NS, s. to WY, SC/ Tx in sON)

*Ulomorpha* - see *Limnophila*

*Yamatipula* = *Tipula*

**TRICHO CERIDAE** (= Petauristidae, Melusinidae) (winter crane flies or Trichocerid gnats)  
Suborder Nematocera, infraorder Psychodomorpha..

(*Diazosma*, *Trichocera*, Undet. genus on domestic cat in WA)

*Archilimnophila* = *Austrolimnophila* in Tipulidae

**Diazosma** Bergroth, 1913 (= *Trichoptera* Strobl, 1880 (homo.); D.Wallengren, 1881 (homo.)  
Trichoceridae flies (1 species in US or Canada)

**Diazosma** *hirtipennis* (= *Trichocera h.* Siebke, 1863; *T. subsinuatum* Alexander, 1916) (BC to sCA, e. to NB, NY/Tx in CA, OR),

*Gnophomyia* - Now in Tipulidae

*Pedicia* - Now in Tipulidae

*Simulium* - Now in Simuliidae

**Trichocera** Meigen, 1803 (= *Petaurista*, *Melusina* Meigen, 1800; *Atractocera* M. 1803;  
*Paleopetaurista* Seguy, 1940; *Metatrachocera* Dahl, 1966) Trichoceridae flies (27 species in US or Canada)

**Trichocera** *colei* Alexander, 1919 (AK, BC, OR, WA/ Tx? in WA?),

**Trichocera** *columbiana* Alexander, 1927 (AK to CA/ TTx in OR, Tx in CA, WA)

**Trichocera** *fattigiana* Alexander, 1927 (epigean in GA, IL, TN; Tx in GA (Dade Co.))

**Trichocera** *hiemalis* (*Tipula h.* DeGeer, 1776) (Europe, ME, BC, Greenland/ TTx in sON, NS?)

**Trichocera** *maculipennis* Meigen, 1818 (Tp in NS, larvae rely on porcupine dung)

**Trichocera** *regelationis* (*Tipula r.* Linnaeus, 1758) (Sweden, Canada, nUS/Tp or Tx in IL, IA, sON; Tp in WA)

**Trichocera** undet. species (Tx in BC, IL, IN, MO/ 2 Tx or Tp sp. in OR C., OR; Tx in GA (Dade & Walker Cos.)

**moth flies** - See **Diptera**: Psychodidae.

**mosquito** - See **Diptera**: Culicidae.

**flora** - Cox & Marchant, 1977; Cubbon, 1976. See palynology.

**food** (see feeding, human impacts, succession)  
storage - Lavoie, King & Simonovic (1988)

**food chain** - A series of species linked by their food relationships; the passage of energy & materials from producer through a succession of consumers. Green plants, plant-eating insects, & an insect-eating bat can form a simple food chain. Most food chains in low-energy caves are simple & short compared to those on the surface.

**food pyramid** - The normally diminishing number of individuals & amount of organic material produced at each successive level along a **food chain**. The declining productivity at each level results from the constant loss of energy in metabolism as the energy passes along the chain. Biomagnification of toxins up the food pyramid can occur in polluted caves. See trophic level.

**food web** - An interlocking system of **food chains**. Since few animals rely on a single food source & since no food source is consumed exclusively by a single species of animals, the separate food chains in any natural community usually interlock & form a web.

**foraging** - see feeding

foul air zone – Area of cave where low air flow keeps the concentration of carbon dioxide, hydrogen sulfide or sulfur dioxide high enough to effect cavers and/or cavernicoles.

FPOM - fine particulate organic matter. Important as food for aquatic sp. due to large numbers of bacteria and fungi associated with FPOM

**Foraminifera** (see protists) - Any protist of order Foraminiferida (=Foraminifera) in Rhizopodea. One or two chambers of calcite (rarely silica or aragonite) or of agglutinated particles. Average size is .5mm but fossil forms reach 19 cm. Cambrian to present. Current species in brackish drilled wells in Turkmenistan. Occur as fossils in Carlsbad C.(NM) & as marine infauna. Incl. fusulinid.

**forest floor** - Highly organic surface layer of a forest soil, including litter, **duff**, & leaf mold. Use **duff**.

fossil - Word search for Pleist. & fossil, esp. taxa such as fish, mammals, bacteria, bryozoans, Foraminifera, ostracods, sponges, . See **trace** fossil. Pleist. Insects (see beetles): J.Mead, Hevly & Agenbroad 1990.

**fox** - See **mammal, carvinore, canine**.

## Frogs

Adapted for jumping with long, muscular legs and an elongated ankle to give a 'five-cranked' limb, a front end adapted to absorb the shock of landing: a shortened body – with as few as four vertebrae in the trunk, no ribs and the posterior vertebrae fused to form a rod called the urostyle and an elongated pelvis. About 20 families. May be the only amphibians to survive the Mesozoic.

Amphibian of Class Lisamphibia  
Subclass Apsidospondyli

Superorder Salientia

Order Anura (about 3,500 species, first frog from early Triassic)

Suborder Neobatrachia

Superfamily Bufonoidea (= Hyloidea)

Hylidae (hylid frogs & treefrogs) (*Acris, Hyla, Hylactophryne, Pseudacris*)

Superfamily Microhyloidea

Microhylidae (microhylid frogs & narrow-mouth frogs) (*Gastrophryne*)



Superfamily Ranoidea

Ranidae (ranid & true frogs) (*Rana*)

**Bibl.:** Barr, 1953b; CA: Lange, 1951; **OH:** C. Walker, 1946.

Hylidae (hylid frogs & treefrogs) (*Acris*, *Hyla*, *Hylactophryne*, *Pseudacris*)  
Leptodactylidae (*Eleutherodactylus*, *Syrrophus*)

Microhylidae (microhylid frogs & narrow-mouth frogs) (270 species in 61 genera)  
(*Gastrophryne*)

Ranidae (ranid & true frogs) (*Rana*) **Paleo:** Holman 1966. See also **Toad**.

**Acris** Dumeril & Bibron, 1841 (cricket frogs) Hylidae frogs (2 species in US or Canada)

**Acris** *crepitans* Baird, 1854 (US e.of Rockies (except extreme se part), sON & nMex./ TTx in OK; Ac in TX)

**Acris** *crepitans blanchardi* Harper, 1947 (= *Acris gryllus* of some authors) (S, MW/ northern cricket frog/Ac in TX; Ttx or Ac in cave in Seminole Co.,OK)

**Acris** *gryllus* g. (Le Conte, 1825) (seVA through inland GA to LA/ US/ southern cricket frog/ Tx or Ac in nMS)

**Eleutherodactylus** Dumeril & Bibron, 1841 (eleuths, coquis (and robber frogs)) (= *Syrrophus*)  
Leptodactylidae frogs (18 species in US or Canada)

*Eleutherodactylus angusti latrans* = *Hylactophryne a.*

**Eleutherodactylus** *latrans* (Cope, 1878) (TTx in TX). **Bibl.:** D. Jameson, 1949

**Eleutherodactylus** *planirostris* p. (*Hylodes* p. Cope, 1862) (Cuba, Bahamas, alien in Mex., FL, LA/ Tx in FL/ greenhouse frog)

**Gastrophryne** Fitzinger, 1843 - Microhylidae frogs (2 species in US or Canada)

**Gastrophryne** *olivacea* (*Engystoma o.* Hallowell, 1857 "1856") (Great Plains narrow-mouthed Frog/eNb & wMO through OK & TX to n.Mex & sAZ/ Tx in TX)

**Hyla** Laurenti, 1768 - Hylidae frogs Hylidae (13 species in US or Canada)

**Hyla** undescr. sp. (Rancholabrean extinct in Arrendondo Site, Alacua Co.,FL),

**Hyla** *cinerea* (*Calamita c.* Schneider, 1792) (DE s. along coastal plain into FL, w. To s TX & n. to cAR & wTN to IL / green treefrog/ Tx or Ac in nMS)

**Hyla** *crucifer* Wied-Neuwied, 1838 (E to nFL & sCanada / spring peeper/ Ac in MD, NJ (1cave), OK )

**Hyla** *eximia* Baird, 1854 (mts. of cAZ & NM/ mountain treefrog/ Ac in nNM)

**Hyla** *gratiosa* LeConte, 1856 (coastal plain from seVA to sFL & LA; disjunct in nGulf states, TN & KY, introduced into sNJ/ barking treefrog/ Ac or TTx in FL)

*Hyla pacifica* & *regilla* = *Pseudoacris r.*

***Hyla versicolor*** LeConte, 1825 (sON, ME to nFL, w. to cTN, n. to MB/common gray tree frog/Ac in TX; Tx or Ac in TN)

***Hylactophryne*** Lynch, 1968 - Hylidae frogs (1 species in US)

***Hylactophryne augusti*** (*Hylodes a.* Duge's in Brocchi, 1879) (se US to sMex./barking frog/ Tx in seTX) **Bibl.:** McAlister, 1954,

***Pseudacris*** Fitzinger, 1843 (chorus frogs (and spring peepers)) (Limnaeodius) - Hylidae frogs (7 species in US or Canada)

***Pseudacris brachyphona*** (Cope, 1889) (seOH, swPA to eKY, eTN, WV (except extreme e.), cAL, disjunct in WV, MS/ mountain chorus frog/ TTx or Ac in PA; Ac in OH)

***Pseudacris maculata*** (*P. triseriata m.* Agassiz, 1850; *P. nigrita septentrionalis*, *Chrophilus s.*) (nwCanada near Great Bear Lake to nON, s. to nMI & nNM, w. to cUT, eIT, eCO to BC/ boreal chorus frog/ Ac or Tx in nCO (1cave))

***Pseudacris regilla*** (*Hyla r.* & *H. pacifica* Baird & Girard, 1852) (sBC to wMT to sBaja/Pacific treefrog or chorus frog/ Tx? in CA; TTX in Vancouver Island, BC) **Bibl.:** Graham, 1961-3

***Pseudacris streckeri*** H.Wright & Wright, 1923 (discontinuous in scUS, wcIL, seMO, OKs.to Gulf/ Pleist. in Miller's C.,TX; Ac in cave in Williamson Co., TX) **Bibl.:** Holman,1966

***Pseudacris triseriata*** (Wied-Neuwied, 1838) (ncOK, wAR s.to Gulf ,disjunct IL, seMO,neAR/(western) chorus frog/Wisconsinan w. extralimital in Dry C., NM/ Ac or Ttx in cave in Seminole Co., OK)

*Pseudacris triseriata maculata* = *P. m.*

***Rana*** Linnaeus, 1758 (true frogs) Ranidae frogs (26 species in US or Canada) **Bibl.:** Barr, 1953a; D.Brown, 1984

***Rana aurora*** Baird & Girard, 1852 (coastal BC, s. to Baja CA/ red-legged frog/ TTX in WA)

***Rana berlandieri*** Baird, 1854 (Rio Grande leopard frog) (seTX, sAZ,s eNM & adjacent Mex./Ttx in cTX)

***Rana boylei*** Baird, 1854 (sBC to Baja/yellow-legged frog/ w.OR to n.Baja CA/TTx or Ac in CA)

***Rana catesbeiana*** Shaw, 1802 (E (except sFL), n. to s.Canada, w. to central Plains, s. to Mex., / bullfrog/ cosmopolitan alien/ Tx or Ac in FL, IL, MO, TN, PA, SC, TN, TX, VA; Ac in AR, MO)

***Rana clamitans*** Latreille, 1801

***Rana clamitans clamitans*** Latreille, 1801 (green frog/ E to s.Canada, s. to c.FL & eTX, alien in BC, UT, HI/ Tx or Ac in MO (possibly), nMS, NJ (1cave), PA; TTx in IL, TX; Ac in AR, FL, GA (Walker Co.), IL, IN, KY) **Bibl.:** Buhlmann 2000

***Rana clamitans melanota*** (Rafinesque, 1820) ((northern) green frog/ TTx in MD; TTx or Ac in PA,WV(one cave); Ac in GA)

***Rana grylio*** Stejneger, 1901 (SC & eTX along coastal plain to peninsular Fl/ pig frog/ Pleist. fossil in FL (Haile Pit; Tx or Ac in cave in Alachua Co.,FL)

***Rana palustris*** Le Conte, 1825 (E from Quebec to AL,eTX/ pickerel frog/ Tx in AL, AR (Baxter Co.), KY, MS; TTx in AR, GA (Walker Co.), MD, MO, NY, OK, PA, TN, VA(1 cave), WV; Ac or TTx in GA, IL/ OK T&E) **Bibl.:** Brode 1960a; D.Brown 1984; Buhlmann 2000; Resetaritis & Aldridge 1988; J. Brown & Boschung 1954; Resetaritis & Aldridge 1981

***Rana pipiens*** Schreber, 1782 (northern leopard frog /n.AZ, wNV & WA to s.Canada, e.to seCanada, NJ/ TTx in AL, FL (feed on bats), IN, MS, NJ, OK, TX; TTx or Ac in AR, KY, MD, MO, OH, PA/ KY T&E Species of Concern). **Bibl.:** Creel 1963; Rand 1950

***Rana sphenoccephala*** Cope, 1889 (sNY to sFL, w.to TX, eOK, n. to eKS/ southern leopard frog/ Tx or Ac in cave in Alachua Co.,FL)

***Rana sylvatica s. (R.s.*** LeConte, 1825) (AK & Labrador s. to n.ID, MN, nGA, MD/ wood frog/ Tx or Ac in AR, IN, KY, MD, NJ, NY, PA, WV; Ac in MD)

***Rana utricularia u.*** Harlan, 1825 (=R. *sphenoccephala* Cope, 1889) (sNY to Atlantic coastal plain to sFL, w.to eTX, n.to eKS,sIL,sOH (excludes most of Appalachians)/ Tx in AR, FL, MS/ southern leopard frog)

***Syrrophus*** Ciope, 1878 (chirping frogs) - Leptodactylidae frogs (3 species in US or Canada)

***Syrrophus marnocki*** Cope, 1878 (cliff (chirping) frog/ Edwards Plateau to edge of Stockton Plateau/ TTx in seTX) **Bibl.:** D. Jameson, 1952, 1955

fulvic - Mix of colourless organic acids that are soluble in weak acid, alcohol or water.

## Fungi

(see also coccidiomycosis, histoplasmosis) - **Current** species of the Kingdom Mycophyta, Mycota (or Fungi). All fungi have cell walls with chitin (also found in animals) and have a distinct group of enzymes to metabolize the amino acid lysine; fungus-like kingdoms have cellulose cell walls more like that of plants and lack that group of enzymes. About 56,500 known species. Fewer than 2% aquatic, mostly freshwater. Main body usually made up of mass of threads(hyphae) that form the mycelium that penetrates its host (as a parasite or symbiot) or organics (as a saprophyte, the most common lifestyle) and secretes enzymes that digest its food. Some fungi are single celled and reproduce by budding ('yeasts'), especially 'true yeasts' in the Ascomyocota. Most species of Ascomycota and Basidiomycota produce epigeous fruiting bodies (toadstools). Others are hypogeous (fruiting underground, like truffles). The 'lower fungi'

include the presumably primitive chytridiomycetes and basidiomycetes. They lack hyphae cross-walls found in the 'higher fungi' (Ascomycota and Basidiomycota).

Cave microfungi usually are more important as macroinvertebrate food than are bacteria. Some are epizotic or parasitic. Bat guano fungi can support mites & flies with pseudoscorpions as main predator. Incl. **mushroom**, mold, **mycelium**. Barlocher & Kendrick, 1973; R. Crawford, 1976c; Cohen, 1985; Coumartin, 1963; Cunningham, et al., 1995; Griffiths, 1978; Hasselbring et al., 1975; Hunter & Thomas, 1975; Keith, 1973; Lavoie, 1981c; Scott & Holland, 1961; Hunter & Thomas 1977; Thaxter, 1893;. **Areas:** **BC:** A. Griffiths; **CO:** Hament 1996; **KY:** Brashear et al., 1967; Lavoie 1981c; Maheu, 1926-a ; Trepasso & Kaletsky 1994; **MI:** Volz & Yao, 1991; B. Patterson 1974; **VA:** G. Dickson & Kirk, 1976; Rutherford & Huang, 1994; W. Scott & Holland, 1958; **WA:** Crawford 1976c. Incl. Phylums/Divisions/groups incl.

Class Myxomycetes ((true, acellular or plasmodial) slime molds) (primitive fungi in which naked cells are amoeboid in vegetative state but during reproduction either fuse into multinucleate mass of protoplasm (plasmodium) or aggregate without fusing (aggregation plasmodium). Some cells become spores formed in sporangia.

Phylum or Division Ascomycota (=Eumycota, Ascomycotina)  
(true yeasts, moulds, morels & truffles)

Subdivision or Subphyllum Ascomycotina (sac fungi)

Class Euascomycetes (=Perithecial Ascomycetes?)

Subclass Pyrenomycetes

Order Laboulbeniales Laboulbeniaceae (*Rhachomyces*)

Order Hypocreales

Hypocreaceae (*Gibberella*)

Niessliaceae (*Monocillium*)

Class Ascomycetes

Subclass Hemiascomycetidae

Order Endomycetales (yeasts)(or in Subclass Plectomycetidae)

Endomycetaceae (*Byssochlamys*)

Melaconiaceae (once in Melaconiales) (*Aureobasidium*,)

Subphyllum Pezizomycotina

Class Eurotiomycetes

Subclass Plectomycetes

Order Eurotiales (blue molds) (*Gymnoascus*) (now in Onygenales)

Cephalothecaceae (*Cephalosporium*)

Order Onygenales (also put in Class Euascomycetes & Subclass Plectomycetes)

Anthrodermataceae (*Trichophyton*)

Gymnoascaceae (*Gymnoascus*)

Onygenaceae (*Coccidiodes*, *Histoplasma*)

Order Sordariales  
Chaetomiaceae (*Chaetomium*)

Class Leotiomycetes  
Order Helotiales (also put in Class Euascomycetes, Subclass Discomycetes)  
Sclerotiniaceae (*Botrytis*)

Class Pezizomycetes  
Subclass Hymenoascomycetidae

Order Pezizales (morels & saddle fungi)  
(also put in Class Euascomycetes, Subclass Discomycetes)  
Pezizaceae (*Plectania*)

Class Sordariomycetes (=Pyrenomycetes, = Zygomycete in part)  
Subclass Hypocreomycetidae

Order Microascales (also put in Class Euascomycetes & Subclass Plectomycetes)  
Microascaceae (*Microascus*)

Order Sphaeriales (also put in Class Pyrenomycetes)  
Amphisphaeriaceae (*Pestalotia*)  
Sphaeriaceae (*Xylaria*)

Phylum or Division Basidiomycota (club fungi; smuts, rusts, jellies, mushrooms & brackets)  
Subdivision Basidiomycotina

Class Basidiomycetes (or Class Homobasidiomycetes)  
Subclass Phorianaes

Order Fomitopsidales  
Fomitaceae (*Fomes*)  
(also put in Order Aphyllophorales, Family Polyporaceae)

Subclass Holobasidiomycetidae  
Order Agaricales (or in Subclass Agaricanaes)

Agaricaceae (*Coprinus* (now in Coprinaceae), *Cunninghamella*, *Hypholoma*)  
Clavariaceae - now in Cantharellales  
Corticaceae (*Merulius*)

Coprinaceae (*Coprinus*)  
Entolomataceae (*Entoloma*)

Subclass Cantharellanaes  
Order Cantharellales  
Clavariaceae (*Pistillaria*)

Class Urediniomycetes  
Order Sporidiales  
Sporidiaceae  
(*Rhodotorula*) (once put in Blastomycetes)

Chromista Group (or Division Phycomycetes) (algal fungi, lower fungi) incl. Chtridomycetes, Oomycetes and Zygomycetes)

Class Zygomycetes  
Order Mucorales  
Family Mucoraceae (*Phycomyces*)

Phylum Eumycota or Omycota  
Subdivision Mastigomycotina  
Class Chytridiomycetes (or as Phylum Chytridiomycota)

Order Chytridiales  
Series Inoperculatae  
Achlyogetonaceae (also put in Oomycetes) (*Achyla*)

Class Oomycetes (also put in Chromista Group)  
Order Peronosporales  
Pythiaceae (*Pythium*)

Order Saprolegniales  
Saprolegniaceae: *Saprolegnia*)

Fungi Imperfecti (= Deuteromycota) (sometimes treated as a phylum but is a grab bag of asexual species with uncertain relationships)

Order Agonomycetales  
Agonomycetaceae (*Papulospora*)

#### Division Coelomycota

Class Coelomycetes  
Section Peyronellaea  
Order Sphaeropsidales (= Sordariales?)  
Phomaceae (also subsumed in Sphaerioidaceae) (*Phoma*)  
Sphaerioidaceae (*Peyronellaea*, *Phoma* (also put in Phomaceae))

Class Deuteromycetes  
Subclass or Division Deuteromycotina  
Torulopsidaceae (*Candida*, *Cryptococcus*, *Rhodotorula*)

Order Eutremellales  
Auriculariaceae (*Drechslera*)

Order Hyphomycetales

Family Dematiaceae (put in Class Hyphomycetes, Order Moniliales)  
Family Onygenaceae (now in Subphylum Pezizomycotina, Class Eurotiomycetes)

Family Moniliaceae (now put in subclass Hyphomycetidae)  
Family Stilbaceae (*Papulospora*)

Order Moniliales  
Family Monilaceae  
Subfamily Hyalosporae (*Doratomyces*)

Order Tuberculariales  
Tuberculariaceae (*Fusarium*, *Epicoccum*)

Class Hyphomycetes

Order Moniliales  
Dematiaceae (*Alternaria* (once put in Dothideales), *Cladosporium*, *Curvularia*,  
*Gliomastix*, *Helminthosporium*, *Humicola*, *Nigrospora*, *Rhynchosporium*,  
*Scopulariopsis*, *Tichocladium*, *Ulocladium*)

Moniliaceae (also put in Order Hyphomycetales  
(*Cylindrocladium*, *Gliocladium*, *Hormiactis*, *Paecilomyces*, *Penicillium*,  
*Pithomyces*, *Sporotrichum*, *Trichoderma*, *Verticillium*)

Subfamily Hyalosporae: *Doratomyces*

Class Dothideomycetes

Order Dothideales (*Alternaria*) (see above)

Class Hyphomycetes (*Gliomastix*, *Alternaria* (now in Dothideomycetes),

Balansieae (*Acremonium*)

Lasiophaeriaceae (*Aspergillus*, *Gliomastix*, *Microsporium*)

Order Bacillariophyceae

Suborder Raphidineae

Nitzshiaceae

(*Chrysosporium*, *Cylindrocladium*, *Curvularia*, *Doratomyces*, *Drechslera*,  
*Gliocladium*, *Humicola*, *Hormiactis*, *Monocillium* (now in Niessliaceae), *Nigrospora*,  
*Paecilomyces*, *Penicillium*, *Pithomyces*, *Scopulariopsis*, *Trichophytum*)

Order Myxosporidia

Superfamily Myxosporidea

Alatasporidae (*Alataspora*)

Class Pneumocystidomycetes

Order Pneumocystidales

Saccharomycetaceae (*Saccharomyces*)

Division or Phylum Zygomycota (pin molds & allies; terrestrial fungi)

(appears polyphyletic and mixed up with chytrids)

Class Trichomycetes (<200 species, all parasites or commensals in arthropod guts)

Order Eccrinales

Eccrinaceae (*Enterobryus*)

Class Zygomycetes (900 species)

Order Entomophthorales (mostly parasites of insects)

Entomophthoraceae (*Basidiobolus*)

Order Mucorales (mostly saprophytes)

Cunninghamellaceae (*Cunninghamella*)

Mortierellaceae (*Mortierella*) (once placed in Mucoraceae)

Mucoraceae (*Mucor*, *Rhizopus*)

Syncephalastraceae (*Syncephalastrum*)

***Achyla*** Nees, 1823 (water mold fungi) Achlyogetonaceae fungi in Subdivision Mastigomycetes, Class Oomycetes or Chytridiomycete (*Achyla* once put in Saprolegniaceae, subfamily Saprolegniae in Order Vaucheriales)

***Achyla*** undet. sp. (TX)

***Acremonium*** Link, 1809 ex E. M. Fries, 1832 - Balansieae fungi, Class Hyphomycetes

***Acremonium*** *cerealis* (Karst.) W. Gams, 1971 (WV cave)

***Acremonium*** *strictum* W. Gams, 1971 (*Cephalosporium acremonium* Auct. Non Corda) (cosmopolitan epigeal/ in WV cave)

*Actinomyces* - Harz, 1877 - Actinomycetaceae - put in bacteria

***Alataspora*** Ingold, 1942 - Alatasporidae - Myxosporidia, Myxosporidea - Aquatic hyphomycetes Ingoldian - mitosporic fungi

***Alataspora*** undet. sp. (hyporheic biofilm in NB?)

***Alternaria*** Nees, 1816 (1817) - Dematiaceae fungi, Class Dothideomycetes

***Alternaria*** *alternata* (Fr.) Kreissler or Keissl. (cosmopolitan epigeal/ in TX cave)

***Alternaria*** undet. sp. or species (cave in WV (Jefferson Co.) & VA (Bath Co.))

***Aspergillus*** Fries, 1832 (mitosporic fungi) - Class Hyphomycetes, Lasiophaeriaceae fungi

***Aspergillus*** *aureolatus* Munt.-Cvetk. & Bata 1964 (in WV cave)

***Aspergillus*** *caespitosus* Raper & Thom (SW epigeal/ in WV cave)

***Aspergillus*** *candidus* Link (Cave near Victoria, BC)

***Aspergillus*** *cremeus* Kwon-Chung & Fenell, 1965 (Cave near Victoria, BC)

***Aspergillus*** *flavus* Link (Cave near Victoria, BC)

***Aspergillus*** *fumigatus* Fresen., 1863 (Cave near Victoria, BC)



*Aspergillus glaucus* Fries, 1832 (Cave near Victoria, BC)

*Aspergillus niger* Van Tiegh. (cosmopolitan epigean/ in MI, TX, WV, VA caves)

*Aspergillus ochraceus* G. Wilh., 1877 (Cave near Victoria, BC)

*Aspergillus sclerotiorum* Huber, 1933 (= *A. fumigatus* var. *s.*) (Global epigean/ in WV cave),

*Aspergillus* undet. sp. or species (caves in MN, NY, VA, WV)

*Aspergillus ustus* (Bainier) Thom & Church (global, esp. (sub)tropics/ in TX cave)

*Aspergillus versicolor* (Vuill.) Tiraboschi (cosmopolitan epigean/ in WV cave)

*Aspergillus wentii* Wehmer (cosmopolitan epigean/ in TX cave)

*Aureobasidium* Viala & G. Boyer, 1891 (black yeast) Melaconiaceae fung in in Order Endomycetales (once in Melaconiales)

*Aureobasidium pullulans* (de Bary) Arnaud, 1918 (MI, VA, WV caves)

*Basidiobolus* Eidam, 1886 - Entomophthoraceae fungi, Order Entomophthorales

*Basidiobolus ranarum* Eidam, 1886 (in *Typhlotriton speleus* cavefish, many salamanders, frogs sp.)

*Botrytis* E.M.Fries, 1832 - Sclerotiniaceae fungi, Order Helotiales

*Botrytis* undet. sp. (cave in Bath Co., VA)

*Byssochlamys* R. Westling, 1909 (holomorph of Paecilomyces) Endomycetaceae fungi in Order Endomycetales

*Byssochlamys fulva* Oliver & Smith, 1933 (WV caves)

*Candida* Berkhout, 1923 - Torulopsidaceae fungi, Division Deuteromycotina

*Candida albicans* (C.P. Robin) Berkhout, 1923 (on dead *Hadenoeus subterraneus* crickets and *Neotoma magister* woodrats in Mammoth Cave, KY) **Bibl.:** Brashear, Wiseman and Barr 1967.

*Candida* undet. sp. (bat guano in seNM caves)

*Cephalosporium* Corda, 1839 - Cephalothecaceae, Class Hyphomycetes

*Cephalosporium lamellaecola* Smith (Lehman C., NV)

*Cephalotrichum* Link, 1809 (= *Stysanus* F.J.Morton & G.Smith, 1963 ) (uncertain family placement)

*Cephalotrichum* undet. sp. (cave in Jefferson Co., WV)

*Chaetomium* Kunze, 1817 - Chaetomiaceae, Order Sordariales:

*Chaetomium distortum* L.M. Ames, 1963 (TX cave)

*Chrysosporium* Corda, 1833 - Onygenaceae? Similar to *Trichopyton* in Class Hyphomycetes

*Chrysosporium indicum* (H.S. Randhawa & Sandhu (?)) Garg, 1966 (MI cave)

*Chrysosporium pannorum* (Link) Hughes (= *Geomyces p.* Singler & Carmichael) (MI, WV)

*Chrysosporium* undet. sp. (caves in WV (Jefferson Co.) & VA (Bath Co.))

*Cladosporium* Link, 1816 - Order Moniliales, Dematiaceae fungi, Subfamily Didymosporae

*Cladosporium cladosporioides* (Fres.) de Vries (WV cave)

*Cladosporium* undet. sp. or species (VA, WV caves; bat guano in TX; bat guano in seNM caves)

*Coccidioides* G.W. Stiles in Rixford & Gilchris, 1896 - Onygenaceae fungi

*Coccidioides immitis* Rixford & Gilchr., 1896 (CA to Argentina/ in Indian middens in CA; in bat guano in TX; NM caves). One of the most common cause of serious pericarditis and coccidioidomycosis (incidences of coccidioidomycosis increased after dust storms in dry areas).

**Bibl.:** Lacy & Swatek, 1974

*Coprinus* (Persoon ex E.M. Fries, 1797) S.F. Gray, 1821 Coprinaceae fungi in Agaricales

*Coprinus micaceus* (Bull ex. Fries) Fries (PA, WV caves)

*Cryptococcus* Kuetzing, 1969 - Torulopsidaceae fungi, Division Deuteromycotina

*Cryptococcus* undet. sp. or species (bat guano in TX cave)

*Cryptococcus neoformans* (Sanfelice) Vuillemin (bat guano in NM caves)

*Cunninghamella* Matr., 1903 - Cunninghamellaceae fungin in Muscorales

*Cunninghamella echinulata* var. *elegans* (C.e. Lendn.) Lunn & Shipton, 1983 (TX cave)

*Curvularia* Boedijn, 1933 (mold, filamentous fungi) Dematiaceae fungi in Class Deuteromycetes

*Curvularia senegalensis* (Speg.) Subram, 1956 (TX cave)

*Curvularia* undet. sp. (caves in WV (Jefferson Co.) & VA (Bath Co.))

*Cylindrocarpon* H.W. Wollenweber, 1913 - Hypocreales

*Cylindrocarpon* undet. sp. (cave in Jefferson Co., WV)

*Cylindrocladium* Morgan, 1982 - Moniliaceae fungi in Class Hyphomycetes

*Cylindrocladium* undet. sp. (Lechuguilla C., NM)

*Dictyostelium* Brefeld, 1869 (dictyostelid cellular slime molds) (put in protists in Dictyoseliomycota)

*Doratomyces* Corda, 1837 - Monilaceae fungi in Class Hyphomycetes

*Doratomyces* undet. sp. (VA cave)

*Drechslera* S. Ito, 1930 - Auriculariaceae fungi, Class Hyphomycetes, Order Eutremellales

*Drechslera australiensis* (Bugnicourt) M.B. Ellis, 1971 (TX cave)

*Drechslera* ex M. Ellis, 1971 (TX cave)

*Drechslera halodes* (Drechsler) Subram. & Jain, 1966 (TX cave)

*Drechslera teres* (Sacc.) Shoemaker (TX cave)

*Enterobryus* Leidy, 1850 – Eccrinaceae fungi in Order Eccrinales

*Enterobryus oxidi* Lichwardt (in GA cave in Tp *Oxidus gracilis* millipedes)

*Enterobryus* undescr. (probably) (in GA caves in Tb *Cambala annulata*, *C. hubrichti*, *C. ochra*, *Pseudotremia eburnea* and *Scoterpes austrinus* millipeds & TB *Caecidotea richardsonae* isopod)

*Entoloma* Fr., 1836 Entolomataceae fungi in Agaricales

*Entoloma commune* Murrill (PA cave)

*Epicoccum* Link in Willdenow, 1825 Ex Schlechtendahl - Tuberculariaceae fungi, Order Tuberculariales, Class Hyphomycetes

*Epicoccum nigrum* Link (MI, TX caves)

*Epicoccum* undet. sp. or species (Lechuguilla C., NM; cave in Jefferson Co., WV)

*Flagellospora* - Ingold, 1942 - Aquatic hyphomycetes fungi

*Flagellospora?* undet sp. (hyporheic biofilm in NB)

*Fomes* (Fr.) Fries, 1849 (= *Polyporus*) Fomitaceae fungi in Order Fomitopsidales (also put in Order Aphyllophorales, Family Polyporaceae)

*Fomes applanatus* (Pers.) Wallr. (KY cave)

*Fusarium* Link, 1809 - Tuberculariaceae fungi in Moniliales

*Fusarium moniliforme* J. Sheld., 1904 (IN, NV caves)

*Fusarium* undet. sp. or species (VA, NM, WV caves)

*Fusarium oxysporum* Schltdl., 1824 emend. Sny. & Hans. (MI, WV caves)

*Gibberella* Saccardo, 1877 - Hypocreaceae fungi in Class Hypocreales

*Gibberella fujikuroi* (J. Sawada) Wollenweber, 1931 (IN cave)

*Gliocladium* Corda, 1840 - Moniliaceae fungi in Class Hyphomycetes

*Gliocladium roseum* Bainier, 1907 (caves in WV & Bath Co., VA)

*Gliomastix* Gueguen, 1905 - Dematiaceae fungi, Class Hyphomycetes

*Gliomastix murorum* (Corda) Hughes, 1958 (WV cave)

*Gymnoascus* Baran., 1872 Onygenales: Gymnoascaceae fungi in Class Onygenales

*Gymnoascus setosus* Eidam, 1880 (KY cave)

*Gymnoascus uncinatus* Eidam, 1880 (WV cave)

*Helminthosporium* Link & Fries 1821 - Dematiaceae fungi, Class Hyphomycetes

*Helminthosporium* undet. sp. (Cave near Victoria, BC)

*Herpomyces* Thaxter - Hyalodidymae fungi in Class Ascomycetes

*Herpomyces arietinus* Thaxter (parasite on *Parcoblatta* cockroach in Mammoth C., KY)

***Histoplasma*** Darling, 1906 – Onygenaceae fungi in Hyphomycetes

***Histoplasma capsulatum*** Darling, 1906 (see histoplasmosis) (caves in AR, AZ, CA, FL, GA, MO, OK, NC, NM, TN, TX, VA, WV)

***Hormiactis*** Preuss, 1851 - Moniliaceae fungi in Class Hyphomycetes

***Hormiactis candida*** Hohn. (WV cave)

***Humicola*** Traaen, 1914 - Dematiaceae fungi, Class Hyphomycetes

***Humicola fuscoatra*** Traaen (MI cave, a mycoparasite of *Aspergillus flavus sclerotia*)

***Humicola grisea*** Traaen (WV cave)

***Hypholoma*** (Fr.) P. Kumm., 1871 - Agaricaceae fungi in in Agaricales

***Hypholoma perplexum*** (Peck) Sacc.(PA cave)

***Isaria*** Pers., 1797 (= *Spototrichum*) Stilbaceae fungi in Order Moniliales

***Isaria densa*** Link (KY cave)

***Isaria flavissima*** (*S. flavissimum*) Link (KY cave)

***Merulius*** E.M.Fries, 1821 - Corticiaceae fungi in Class Basidiomycetes

***Merulius lacrymans*** (Jacq.) Fr. (WV cave)

***Microsporium*** Coemans, 1863 - Class Hyphomycetes, Lasiophaeriaceae fungi

***Microsporium gypseum*** (one cause of dermatophytosis (ringworm skin disease)) (bat guano in NM caves)

***Microascus*** Zukal, 1885 - Sphaeriaceae fungi in Order Sphaeriales

***Microascus longirostris*** Zukal, 1885 (KY cave)

***Monocillium*** S.B. Saksena, 1955 – Niessliaceae fungi, Order Hypocreales

***Monocillium*** undet. sp. (WV cave)

***Mortierella*** E. Coemans, 1863 - Mortierellaceae fungi, Order Mucorales

***Mortierella alpina*** Peyronel (WV cave)

***Mucor*** Micheli ex E. Fries, 1832 - Mucoraceae fungi in Class Mucorales

***Mucor*** undet. sp. (Lechuguilla C., NM cave)

***Mucor globosus*** Fischer (*M. plumbeus* var. *g.*?) (TX cave)

***Mucor pyriformis*** Fischer (TX cave)

***Mucor racemosus*** Fresenius, 1850 (MI cave)

***Mucor*** undet. sp. or species (MO, NV caves)

"***Mycelia***" (unknown generic name) Phylum Deuteromycota fungi

"***Mycelia sterilia***" undet. genus (WV, NM caves)

***Nigrospora*** Zimmerman, 1902 - Dematiaceae fung in in Class Hypomycetes

***Nigrospora sphaerica*** (Sacc.) E.W.Mason, 1927 (TX cave)

**Paecilomyces** Bainier, 1907 - Moniliaceae fungi in Class Hypomycetes

**Paecilomyces** undet. sp. or species (Lechuiguilla C.,NM; caves in VA (Bath Co.) & WV (Jefferson Co.))

**Paecilomyces** *variotti* Bainier, 1907 (WV cave)

**Papulospora** Preuss, 1851 - Agonomycetaceae fungi in Agonomycetales (also put in Stilbaceae)

**Papulospora** undet. sp. (TX caves)

**Penicillium** Link, 1809 ex Fries, 1832 - Moniliaceae fungi in Class Hypomycetes

**Penicillium** *charlesii* G.Smith, 1933 (TX caves)

**Penicillium** *chrysogenum* Thom, 1910 (TX caves)

**Penicillium** *lanthinellum* (Cave near Victoria, BC)

**Penicillium** undet. species (13 species. in Lechuguilla C.,NM) (one in VA; 2 in WV caves)

**Penicillium** *verrucosum* var. *cyclopium* (P.c. Westling, 1911) Samson, Stolk & Hadlok, 1976 (Lehman C.,NV)

**Penicillium** *frequentans* Westling, 1911 (TX cave)

**Penicillium** *notatum* Westling, 1911 (WV cave)

**Penicillium** *purpurogenum* Stoll, 1923 (MI cave)

**Penicillium** *roqueforti* Thom (WV cave)

**Penicillium** *steckii* Zalewski, 1927 (WV cave)

**Penicillium** *verrucosum* var. *cyclopium* (P.c. Westling, 1911) Samson et al. (NV cave)

**Pestalotia** De Not., 1841 – Amphisphaeriaceae fungi

**Pestalotia** undet sp. (TX caves)

*Peyronellaea* Goidanich, 1952 = *Phoma*

**Phycomyces** Kze. & Schm., 1823 - Mucoraceae fungi of Order Mucorales, class Zygomycetes

**Phycomyces** undet. sp. (cave in VA)

**Phoma** Fr., 1846 em. Desm. Or Saccardo, 1880 - Sphaerioidaceae fungi, Order Sphaeropsidales  
Fr., 1821 (Ascomycota) or Sacc., 1880 Coelomycetes: Phomaceae (mitosporic)

**Phoma** undet. sp. (TX cave)

**Pistillaria** Fries, 1821 - Clavariaceae fungi in Cantharellales

**Pistillaria** undet. sp. (HI cave)

**Pithomyces** Berkeley et Broome, 1875 - Moniliaceae fungi, Class Hyphomycetes

**Pithomyces** *chartarum* (Berk. & M.A. Curtis) M.B. Ellis, 1960 (TX cave)

**Pithomyces** undet. sp. (cave in Jefferson Co., WV)

**Plectania** Fuckel, 1870 - Pezizaceae fungi in Order Pezizales

*Plectania coccinea* (Jacq. Or Scop.) Fuckel (= *Sarcoscypha c.* (Scop.) Sacc.)(PA cave entrance)

*Polysphondylium* Olive (cellular slime molds) (now placed in protists)

*Pythium* Nees, 1823 - Phythiaceae fungi in Peronosporales

*Pythium* undet. sp. (WV cave)

*Rhachomyces* Thaxter – Laboulbeniaceae fungi in Laboulbeniales

*Rhachomyces speluncalis* Thaxter (parasite on WV *Pseudanopthalmus grandis* & *P. pusio* beetles)

*Rhizopus* Ehrenb., 1821- Mucoraceae fungi in Class Mucorales

*Rhizopus oryzae* G. Winter, 1895 (TX cave)

*Rhizopus* undet. sp. (Lechuguilla C.,NM)

*Rhodotorula* F.C. Harrison, 1927 - Torulopsidaceae fungi, Order Urediniomycetes, Sporobolomycetacea

*Rhodotorula* undet. sp. (WV cave)

*Rhynchosporium* E.Heinsen & A.B.Frank, 1897 – Dematiaceae fungi in Hyphomycetales

*Rhynchosporium* undet. sp. (cave in Jefferson Co., WV)

*Saprolegnia* Nees in Carus, 1823 - Saprolegniaceae fungi in Saprolegniales

*Saprolegnia* undet. sp. (TX cave)

*Scopulariopsis* Bainier, 1907 - Dematiaceae fungi in Class Deuteromycetes

*Scopulariopsis brumptii* Salvanet-Duval, 1935 (MI cave)

*Sporotrichum* Link, 1809 - Moniliaceae fungi, Order Hyphomycetales

*Sporotrichum* undet. sp. (bat guano in NM caves)

*Stysanus* F.J.Morton & G.Smith, 1963 = *Cephalotrichum*

*Syncephalastrum* J. Schrot., 1886 - Syncephalastraceae fungi in Order Mucorales

*Syncephalastrum racemosum* E. Cohn ex Schroter (TX cave)

*Trichocladium* Harz, 1871- Dematiaceae fungi in Class Deuteromycetes

*Trichocladium* undet. sp. (cave in Jefferson Co., WV)

*Trichoderma* Pers., 1797 - Moniliaceae fungi in Order Hyphomycetales

*Trichoderma harzianum* Rifaei, 1969 (MI, TX, VA caves)

*Trichoderma* undet. sp. (cave in Jefferson Co., WV)

*Trichoderma viride* Pers., 1829 (TX, VA caves)

*Trichophyton* Malmsten, 1848 (= *Arthroderma*, *Trichomyces*) – Anthrodermataceae fungi in Onygenales

*Trichophyton mentagrophytes* (C.P. Robin) Sabouraud, 1895 (bat guano in NM caves)

*Trichophyton rubrum* (Castellani) Sabouraud, 1911 (bat guano in NM caves)

*Trichophyton terrestre* Durie & Frey, 1957 (MI, TX caves; bat guano in NM caves)

*Ulocladium* Preuss, 1851 - Dematiaceae fungi in Class Deuteromycetes

*Ulocladium botrytis* Preuss, 1851 (TX, WV caves)

*Verticillium* Nees, 1816 - Moniliaceae fungi in Moniliales

*Verticillium cinnabarinum* Ravenel & Berk. (TX cave)

*Verticillium* undet. sp. (cave in Bath Co., VA)

*Verticillium tenuissimum* Corda (TX cave)

*Xylaria* Hill ex Schrank, 1789 - Sphaeriaceae fungi in Sphaeriales

*Xylaria polymorpha* (Persoon) Greville, 1824 (PA cave?)

*Xylaria* undet. sp. (VA cave)

*Zasmidium* Fries, 1849 - Physcomycetes or Mucoraceae, Order Antennariei

*Zasmidium cellare* (*Rhacodium c.* Persoon ex. Fries) Fries, 1849 (TX cave)

**fungivore** - A **guild** type in which an animal feeds on fungi.

Bibl. - See fungi

**fungus hazard** - Incl. blastomycosis, cryptococcosis, dermatophytes, histoplasmosis, mycormycosis, & valley fever.

**fusulinid** - Extinct suborder (Fusulinidea) of large **forams** with a multichambered calcareous test commonly shaped like a grain of wheat and from .5 to a few cm. long.

**gastropod** - A **mollusk** of the Subphylum Conchifera, Class Gastropoda, typified by a distinct head with eyes & tentacles &, in most, by a single CaCO<sub>3</sub> shell closed at the top. About 10,000 species. Incl. **abalone**, **slug** & **snail**. Wallrock fossils - Porter's C., VA; *Bellerophon* sp. (Bellerophonacea) in Lechuguilla C., NM (Kues & DuChene 1990)

*Platyceras* - *Platyceratacea* gastropod

*Platyceras trilobatum?* (fossil in Porter's C., VA)

**Gastrotricha** (=Gastrotrichicha) - Aschelminth worms in the psammon and hyporheos. An animal phylum most closely related to nematodes and usually thought to be a phylum of their own or a class of the phylum Aschelminthes or Nematelminthes. They lack a gut, vary from 2 mm. to almost 1 m. long. About 430 species. The two orders include the Macrodasyida (nearly all marine) and the Chaetonotida (some fresh).

Clade Bilateria

Clade Protostomia

Clade Lophotrochozoa

Phylum Gastrotricha

Order Macrodisida

Family Lepidodasyidae (*Cephalodasys*) (once in Macrodisidae)

Family Macrodisidae

(*Cephalodasys* (now in Lepidodasyidae), *Macrodasys*, *Mesodasys*, *Pleurodasys*,  
*Urodasys*)

Family Thaumastodermatidae

Subfamily Thaumastodermatinae

(*Platydasys*, *Pseudostomella*, *Tetranchyroderma*, *Thaumastoderma*)

Subfamily Diplodasyinae (*Diplodasys*)

Family Turbanellidae (*Turbanella*)

Order Chaetonotida

Family Xenotrichulidae (*Xenotrichula*)

***Cephalodasys*** Remane, 1926 - Lepidodasyidae Gastrotricha (once in Macrodisidae)

***Cephalodasys littoralis*** Renaud-Debyser, 1964 (Atlantic Europe, NC marine beach interstitial)

***Diplodasys*** Remane, 1927 - Thaumastodermatidae Gastrotricha, Subfamily Diplodasyinae

***Diplodasys ankei ankei*** Wilke, 1954 (Atlantic Europe, NC marine beach & sublittoral interstitial)

***Macrodasys*** Remane, 1924 - Macrodisidae Gastrotricha

***Macrodasys cunctatus*** Wieser, 1957 (NA Pacific marine subtidal interstitial)

***Mesodasys*** Remane, 1951 - Macrodisidae Gastrotricha

***Mesodasys laticaudatus*** (Remane, 1951) (Atlantic & Mediterranean Europe, FL marine beach interstitial)

***Platydasys*** Remane, 1927 (= *Pseudostomella*) Thaumastodermatidae Gastrotricha, Subfamily Thaumastodermatinae

***Platydasys cataphracta*** (*Pseudostomella c.* Ruppert, 1970) (NC marine sublittoral interstitial)

***Platydasys plumosa*** (*Pseudostomella plumosa* Ruppert, 1970) (India, Atlantic Europe, NC marine sublittoral interstitial)

***Platydasys roscovita*** (*Pseudostomella r.* Swedmark, 1956) (India, Atlantic Europe, NC marine beach interstitial)

***Platydasys*** undet. sp. (CA marine beach interstitial)



***Pleurodasys*** Remane, 1927 - Macrodisidae Gastrotricha  
***Pleurodasys*** undet sp. (CA marine beach interstitial)

*Pseudostomella* Swedmark, 1956 = *Platydasys*

***Tetranhyroderma*** Remane, 1926 - Thaumastodermatidae Gastrotricha, Subfamily  
Thaumastodermatinae

***Tetranhyroderma apus*** Remane, 1927 (Atlantic, Mediterranean Europe, FL marine beach  
interstitial)

***Tetranhyroderma bunti*** (Thane-Fenchel, 1970) (FL, NC marine beach interstitial)  
***Tetranhyroderma pappi*** Gerlach, 1953 (Mediterranean, MA, NC marine beach interstitial)  
***Tetranhyroderma pugetensis*** Wieser, 1957 (WA marine beach interstitial)

***Tetranhyroderma*** undet. sp. (CA marine beach interstitial)  
***Tetranhyroderma swedmarki*** Rao & Ganapati, 1968 (India, NC marine beach interstitial)

***Tetranhyroderma thysanogaster*** Boaden, 1965 (Mediterranean, FL marine beach & sublittoral  
interstitial)

***Thaumastoderma*** Remane, 1926 - Thaumastodermatidae Gastrotricha, Subfamily  
Thaumastodermatinae

***Thaumastoderma heideri*** Remane, 1927 (Indian, Atlantic Europe, NC marine beach &  
sublittoral interstitial)

***Turbanella*** Schultze, 1853 - Turbanellidae Gastrotricha  
***Turbanella*** undet sp. (CA marine beach interstitial)

***Urodasys*** Remane, 1926 - Macrodisidae Gastrotricha  
***Urodasys calicostylis*** Schoepfer-Sterrer, 1974 (NC marine subtidal interstitial)  
***Urodasys cornustylis*** Schoepfer-Sterrer, 1974 (FL, NC marine subtidal interstitial)

***Urodasys remostylis*** Schoepfer-Sterrer, 1974 (FL marine subtidal interstitial)  
***Urodasys spirostylis*** Schoepfer-Sterrer, 1974 (NC marine subtidal interstitial)

***Xenotrichula*** Remane, 1927 - Xenotrichulidae Gastrotricha  
***Xenotrichula*** undet. sp. (CA marine beach interstitial)

**gecko** - See lizard.

**gene flow** - The transfer of genes from one population to another.

**genetic drift** - Changes due to neutral mutations. Random changes in gene frequencies in a population. Most likely in small populations where such changes are not diluted as they might be in larger populations.

**genetic load** - The sum of disadvantageous genetics in a population.

**genetics** (see also adaptation, speciation & evolution) - Bechler 1977; Brenner & Kane 1981; Bruce 1976; Caccone 1985; Cockley, Gooch & Weston 1977; Davis & Lopez 1988; Dickson et al. 1979; Edward 1992, 1994; Fong 1983, 1985, 1989; Giuseffi, Kane & Duggley 1978; Gooch 1980; Gooch & Golladay 1981; Gooch & Hetrick 1979; Hetrick 1972-3, 1975; H. & Gooch 1981; Jernigan et al. 1994; H. Johnston 1972; J. & Carmody 1977; Jones 1989; Kane 1982, 1991; Kane, Barr & Badarraca 1992; Kane, Barr & Stratten; Kane & Culver 1991; Kane & Turanchik, 1981; Koppelman & Figg 1995; Laing, Carmody & Peck 1976a; Lamb 1975; Liebherr & Ross 1988; Lisowski 1978, 1992; Nicholas & Peters 1973; Parzefall 1985; Potter & Sweet 1981; Weet 1977; Swofford 1982; S. Branson & Sievert 1980; Sweet 1977; Turanchik & Kane 1979; Wilkens 1987

**allopatrism** - Badaracca 1986; Peck 1975

**amino acids** - Sperka 1974

**biochemical** - Swofford 1982; Thurow 1962

**DNA** - McCormick & Sarbu 1991

**electrophoretics** - Carmondy, 1974; C. Murphy & Peck 1972; Howard, J. et al. 1984

**gene flow** - Caccone 1985, 1985a; Caccone 1983

**genetic/morphologic comparisons** - Bechler 1977; Lisowski 1995; Kane & Culver 1991; Kane, Culver & Jones 1992

**genotype** - The genes possessed by an organism, all of the information as opposed to its expression. Cf. phenotype.

**geology** - Baichtal 1995; Bradley 1870; Euler 1984; Franz 1977; Haynes & Agogino 1960; Hendry et al. 1993; Howarth 1982; Jenkins 1972; Jones & Varnedoe 1968; Kane, Barr & Badaracca 1992; LaSalle 1984; McGill 1933; Malde & Schick 1964; Mangin 1994; Matthews 1971; Meek 1989; Peck 1981b; Powell 1961; Price & Heck 1939; Stovall & McAnulty 1950; Veni 1991; W. White 1976; Wilson 1974. See also **bacteria**.

**gestation** - Length of time from fertilization until birth.

**glyph** - An **art** & symbolic figure usually incised or engraved. Incl. mud & rock. Bibl.: Faulkner & Simek 1996

**glyptodont** - See **mammal, edentate**.

**gnats** (see **flies**, Chironomidae, Mycetophilidae, Sphaeroceridae)

**goat** - Artiodactyla **ungulate**.

**gopher**, (pocket) - See **mammal, rodent**.

**Gordian** (round) worms - Syn: horsehair **worms**.

**ground sloth** - See **mammal, edentate**.

**groundwater** - Water that occurs below ground level. See hyporheic. **Bibl.:** P. Wallis & Ladd 1983; J. Ward and Voelz 1994

**ground water fauna** - Species that habitually live in the groundwater. Partial syn.: stygobiont. See also hyporheic. **Bibl.:** Balkwill, D.L. and Ghiorse 1984;

**graffiti - Vandalism** by way of non-historic & non-archeological art, glyphs, etc. Pencil marks on smooth carbonates can be removed early on with water. Paint & smoke smudges (carbide lamps) can be removed with %5 sulfuric acid, crayon with grease emulsifiers. Difficult to remove if on igneous; blowtorch will remelt bedrock.

**groundhog or marmot** - See **mammal, rodent**

**growth** - Cooper & Cooper 1976, 1978a; Dickson 1978; Hazlett & Rittschoff 1985  
metamorphosis - Brandon et. al. 1986  
molting - Hobbs, III 1976a; Jegla 1964;  
neoteny - Mitchel & Smith 1972  
seasonality - Poulson 1969

## **Grylloblattids**

(= ice insect or cricket; cricket-roach) - Of family Grylloblattidae (=Notoptera) (grylloblattid or rockcrawlers), Order Grylloblattodea. Phylum Arthropoda, Subphylum Chelicerata, Class Insecta, Subclass Pterygota, Division Neoptera, Subdivision Exopterygota. Large, wingless, predaceous, primitive. **Bibl.:** Benedict 1974c; Caudell 1923-4; J.Chapman 1953; Gurney 1953, 1961; Henson 1957-a; Kamp 1963, 1970, 1973; Crawford 1991; Nieland 1978-9, 1993; Walker 1914.

The first Grylloblattid discovered in 1914 was given the genus and species name of *Grylloblatta campodeiformis* to imply its comparison with three other insects: crickets, cockroaches and bristletails. In comparison with crickets of the genus *Gryllus*, they are similar because they have a six-part ovipositor. In comparison with cockroaches (*Blatta*) they have five-segmented legs and segmented caudal cerci (tails), both of which are also characteristics of primitive insects. In comparison with the diplurans (bristletails) of the family Campodea, they share attributes of blindness, lack of wings and fragile skin all of which are adaptations to living under stones. They are primitive insects and some paleontologists consider them to be surviving members of the Protorthoptera making them most closely related to crickets.

In outside environments, the *Grylloblatta* are dark brown to black. In caves this coloration has been lost due to adaptations to living in darkness and hence they appear cream-colored to white. Their foods include both small invertebrates and plants. Their preferred habitat temperatures of 39°F (4°C) is unusually low and in mountainous habitats where winters are long and temperatures low, they may remain frozen for most of the year. It is for this reason they are often referred to as “Ice Insects” and it is because of their unusual need for icy conditions that these creatures escaped discovery until 1914 when several were found under rocks in the icy regions of the Canadian Rocky Mountains. The sensitivity of some species to heat is so delicate, they may perish in a few minutes if held for too long on a human hand. The nymph does not

emerge from the egg for a year and larval development, comprising of eight molts, takes more than five years. As an imago (adult) it commonly lives for two years so the the animal enjoys altogether six to eight years of life, an exceptionally long time for an insect.

Other members of the grylloblattidae are found in the United States. They have also been found in Japan and Russia. There are only twelve species of *Grylloblatta* known worldwide. Grylloblattids are sometimes described as a “cockroach-cricket,” These insects were once thought to be extremely rare. Cave biologists have since found that they are more common than was first thought. Grylloblattids have body fluids that act as antifreeze. Most of the species may have moved into caves as the world’s climate became drier and warmer. These insects now live underground most of the year. They go outside only during the winter and early spring. They look for insects which have been numbed or killed by the cold and have fallen on the snow.

**Grylloblatta** Walker, 1914 - Grylloblattidae grylloblattids (10 species in US or Canada) **Bibl.:** Crawford, Edwards & Senger 1988

**Grylloblatta** *chandleri* Kamp, 1963 (\*type locality cave in Lassen Co.,CA/ Ttx or Tp/ G1?)

**Grylloblatta** *chirurgica* Gurney, 1961 (\*\*type locality & 2 other caves in Skamania Co.,WA/ obligate Tx/ G1?)

**Grylloblatta** *gurneyi* Kamp, 1963 (type locality & 3 other caves in Siskiyou (or 1 cave in Modoc Co.),CA/ Tp or Tx/ G1?)

**Grylloblatta** *rothi* Gurney, 1953 (subalpine & cave near near Bend, Deschutes Co., OR/Tx?)

**Grylloblatta** undescr. sp.#1 (OR C.,OR/Tx)

**Grylloblatta** undescr. #2 (near *sculleni* Gurney/ 2 caves near Bend, Deschutes Co.,OR/Tx)

**Grylloblatta** undescr.sp.#3 (cave on w.Mt. St. Helens)

**Grylloblatta** undescr. sp.#4 (2 caves in Siskiyou Co.,CA & poss. undescr. in epigeal in Marble Valley, Shasta Co.,/Tx)

**Grylloblatta** undescr. sp.#5 (cave each in Lassen & Plumas Cos,CA)

**Grylloblatta** undescr. sp.#6 (\*Mary's Peak, Benton Co.,OR/Tx or rock crevices/G?S2 OR T&E tracked)

**Grylloblatta** undescr. sp.#7 (epigeal & Tx from Mt Baker s. to Mt Rainier,WA),

**Grylloblatta** undet. sp. (Kings Canyon Natl. Park,CA/Tp or Tx).

**guanine - Phosphate** from the reaction of bat feces & urine.

**guano** - 1. Syn: **scat.** Scat piles from bats, birds, & crickets. The most important organics in many caves are bat guano & carrion, cricket guano & eggs, or pack rat nest litter & feces. **bat:**

Bashor, 1974; Bingham, 1986; Des Marais, 1980; E. Franklin, 1978; Gnaspini, 1992; Horst, 1972; B. Martin, 1977, 1980a; Northup & Welbourn, 1991; W. Phillips, 1901; Strinati, 1982; D. Ward, 1983; **raccoon**: Grady, 1991; **woodrat**: Lavoie, 1981; Poulson & Lavoie, 1983. Def.#2. Phosphate or nitrate deposit from leaching of bird feces in arid areas.

**guano mineral** - See **phosphate**. See also urea (NH<sub>2</sub>)CO & uricite, both from Australian caves.

**guanobia** - **Coprophages** which feed on piled feces of bats, crickets, rodents, or birds. Syn: gaunobious.

guanobite – Biota whose entire life cycle takes place on or immediately adjacent to guano. The guano equivalent of troglobite and phreatobite.

**gaunobic** - The association of cave life largely dependent on guano.

guanophages – Biota that feeds on guano or species growing on guano.

**guanophile** – 1. Biota that may reproduce both in guano or other cave habitats. The guano equivalent of troglophile and phreatophile. 2. An animal, like guano moths, ultimately dependent during at least part of its life cycle on guano. See **fill & fungi**.

**guanoxene** – 1. Biota that may reproduce both in guano but which requires other cave or non-cave habitats to complete its life cycle. The guano equivalent of troglaxene.

**guild** - What a **type** of animal does. Incl. **bandit, detritivore (guanobia & scavenger), fungivore, heterotroph, parasite (hyperparasite), phoretic, predator, & xylophage.**

**gymnosperm** - A **plant** with seeds commonly in cones & never enclosed in an ovary, Incl. ginkgo, conifers, & cycads.

**gypsum caves** - Black, 1970; Harrington, 1933; Lauderhick & Munz, 1934; Reddell 1986; Stock, 1931

**habitat & microhabitat** - Bell, 1978; Benedict & McEvoy 1995; Brandon 1971; Caine 1974; Canaday & Vitello 1995; Clark, C. & Leslie 1994; Conn & Demoss 1984; Crowell 1981; Culver & Fong 1994; Culver, Fong & Jernigan 1987; Dickson 1975-6, 1977-a, 1978, 1981-2; Dickson & Holsinger 1981; Herrington & Larsen 1989; Fong & Culver 1994; Hobbs Jr. 1937; Howarth 1979a; Kane & Poulson 1976; Keith 1977; Lieberr 1988; Lisowski 1983; Maguire 1961; Marshal 1947; Miller 1974; Mitchell 1968; Page 1974; Peck 1975d; Schubert et al. 1993; Schubert & Noltie 1995; Sheps 1972; Stark 1969; Ward & Holsinger 1981; Willis & Brown 1985

entrances - Lavoie, Cyr et al. 1990; Olsen 1973; Peck 1976

microhabitat - Culver & Ehlinger 1980; Hemerly 1967; Holler 1992; Miller 1974; Olyslager & Williams 1997

**Habitual Tp** - Troglophile known only from caves but with comparatively large eyes (Barr 1960). Partial syn: Tb.

**Habitual Tx** - Troglaxene which enters a cave at some point in its life cycle. Syn: Obligate Tx.

haematophagy – Feeding on blood, as in most lice and some mites and flies.

halocline – Abrupt change in salinity with depth in water column.

**halotolerant** - A species capable of growing in the absence of table salt (NaCl) but not requiring it.

**hantavirus** - Rare **microbe** hazard of Family Bunyaviridae. Not yet known from caves. Carriers for Muerto Canyon Hantavirus in 1993 in SW incl. deer mice, chipmunk, cotton rat (SE), & woodrat. The airborne virus enters via lungs, skin, & eyes but can be killed by most household disinfectants. Fatal infections from this virus family in Asia, Eastern Europe, Africa, & the US. Other genera include *Bunyavirus*, *Phlebovirus*, & *Nairovirus*.

**hantavirus pulmonary syndrome (HPS)** - A serious, often deadly, respiratory disease found mostly in rural western U.S. Contracted by exposure to rodent scat, saliva or urine, especially from deer mice. Breathing in the virus is the most common way of becoming infected but infection from touching the mouth or nose after handling materials with hantavirus can occur. Symptoms usually appear within 2 weeks of infection but can appear as early as 3 days or as late as 6 weeks. Main symptoms are breathing difficulty, headache, abdominal, joint, & lower back pain, & sometimes nausea & vomiting.

**hare** - **Lagomorph** of Family Leporidae (see **mammal**).

## Harvestmen

**Arachnid** of Order Opiliones (=Phalangida). Order divided into three suborders: Cyphophthalmi, Laniatores, and Palpatores. The Cyphophthalmi are small and have a mite-like appearance. Many species occur in caves and some show varying degrees of troglomorphy; but none of the species known from the USA have been observed in caves. The long-legged Opiliones commonly observed in cave entrances are members of the Palpatores and the smaller short-legged species found deeper in the caves are often members of the Laniatores. Some of the Palpatores found in caves also have shorter legs and smaller body size like the Laniatores. The common name of daddy-long-legs correctly belongs only to the long-legged species of the Palpatores. Harvestmen is a common name applied to all members of the order. Unlike spiders, harvestmen have no venom or silk. The body is generally egg-shaped, about 1 to 12 mm long, and divided into a prosoma and a broad, segmented opisthosoma. Legs short or long (up to 120 mm). Ovipositor of female and penis of male often very long in Palpatores and shorter in Laniatores. About 7,000 described species. Prey upon or scavenge small insects, mites, spiders, and some plants. Defend by feigning death, shedding legs which often continue to twitch, and releasing repugnatory chemicals. A few species overwinter in caves.

Harvestmen become most prevalent in the fall (around October) when they migrate into the cave and gather in large cluster that can be seen throughout the winter and into the late spring (May).

About 1900 species of harvestmen are distributed over the world in forests, fields and other land habitats, although they can and do walk on water. Some of those in the tropics and our southern states do not have such long legs. Of the 60 or more American kinds, adults of all but one of these die with the coming of winter. They mate in late summer and autumn. While the smaller male drives away rivals, the female lays a few eggs at a time in the soil, some crevice, or rotten wood. This is repeated until she becomes merely an empty shell. In spring the newly-hatched young are white miniature editions of the adults. They soon darken and, as they grow, shed their skins like many insects do. They eat a wide variety of animal food, both dead and alive, as well as vegetable matter and juices.

Unlike the spiders, the abdomen of the harvestman is divided into segments and it has no "waist". Instead, the head, thorax and abdomen are grown together into a compact oblong body. Neither do they spin webs or build nests. On top of the head is a black dot which, under a lens, is seen to be a knob with a little shiny eye on each side. Apparently these primitive eyes can detect a moving object several feet away. Underneath is a pair of little lobster-like pincers used to grasp, tear and stuff food into its mouth, to fight other harvestmen, and to frequently clean its legs.

Although all legs of a harvestman are sensitive, the second pair of legs is so vital that the loss of one is a serious matter, and the loss of both is quickly fatal. These legs, and to a lesser degree all the others, are the animal's main sources of information, serving as ears, nose, tongue, and perhaps even as supplementary "eyes." In other words, the legs are loaded with nerves and literally thousands of tiny sense organs that lie inside microscopic slits which open to the outside world. When there is motion nearby, a harvestman energetically waves its second pair of legs in the air, picking up scent and vibration, or taps nearby surfaces, sampling the "taste." And instead of elaborate courtship rituals found in spiders, harvestmen touch each other gently with the same two legs, exchanging chemical messages unknown to us. Even the male sex organ is uniquely associated with the legs, having a location found in no other arachnid.

Daddy-long-legs are often thought to be spiders, while in fact they are only distant cousins. Like spiders they have eight legs, but where a spider has a pair of "fangs," a harvestman has a pair of minute pincer-like claws and no venom. A pair of short, spiny leglike appendages extending out in front help with the feeding process. So even with feeble jaws, harvestmen are able to pick up food and pluck it apart into smaller pieces. Local species feed mostly on dead insects, but will kill very small insects and mites whenever possible. They also suck juice from soft berries and fruits.

Harvestmen are vulnerable and have only a few effective means of protecting themselves. Speed and detachable legs are obvious advantages. Detached legs usually twitch for several minutes, an adaptation that may distract a predator while the Harvestman escapes. Detached legs are known to twitch spasmodically for up to 21 minutes. Legs of these spiders are believed to regenerate.

Another defense is the secretion of an odorous fluid. This substance, described as smelling like walnuts or horse radish, emerges from a pair of pores on each side of the front of the body, just above the first pair of legs.

There is a common untrue rumor concerning the venom of Harvestmen. Some people claim this venom to be one of the most lethal in the world but no one has actually been killed by this

venom because the “fangs” of the Harvestmen are too small to penetrate human skin. The opiliones do not possess poison glands nor do they possess fangs. Many people observe “fang-like” structures on the Sabacon of Oregon Caves but these are actually pinchers, similar to crab pinchers, that are used to grasp and hold prey. Their strategy for capturing prey is to position themselves over their prey with their widely displaced legs helping them to escape detection by insects that use sensors to detect air movement or ground vibrations of approaching predators. Essentially, they attack from above, grasping victims with their pinchers in much the same way crabs grasp their prey.

In the tropics, some species of Harvestmen gather in great enough numbers to cover a small bush. If disturbed, all the daddy longlegs will shake violently, causing the entire bush to move. In England, craneflies are called daddy longlegs.

It is common to find other insects riding on Harvestmen. Often, small, red colored mites can be seen as minute clinging to legs and body parts. These mite are parasites on Harvestmen and attack the host in the same way as ticks, their close relative, attacks mammal hosts. Other insects found on Harvestmen include pseudoscorpions. They hitch hike a ride by grasping the legs of the Harvestmen with one of their claws.

**Bibl.:** Angerilli & Homberg 1985; Banks, 1892, 1894b; Bragg 1972; Briggs 1975; Crosby & Bishop 1924a, 1924b, 1928; Elliott 1978a, 1979; Goodnight & Goodnight 1945, 1960, 1963, 1966; McConnel 1976; Rambla 1994; Roewer 1917, 1923, 1930, 1931, 1957, 930, 1952; Rudolph 1979; Ubick & Briggs, 1992; Causey 1973. Parasites: Cokendolpher 1993

**Areas:** **AL:** Banks 1900; **CA:** Banks 1911; Briggs 1974a; Rudolph 1979b; **IL:** Weed, 1889; **ID:** Benedict 1974a; **IN:** Edgar 1966; Kingsley, 1888; **IN:** Banks, 1893a; **KY:** Banks, 1893a; **NA:** Cokendolpher & Lee 1993; **NW:** Briggs 1971a; **OH:** Walker 1928; **TX:** Goodnight 1967, 1969; **US:** Banks, 1893b; **VA:** Banks, 1893a; **WA:** Banks, 1894c; Benedict 1974a; Crawford 1974a;

Kingdom Animalia

Clade Metazoa

Clade Eumetazoa

Clade Bilateria

Clade Protostomia

Clade Ecydsozoa

Phylum Arthropoda

Subphylum Chelicerata

Class Archnida

Subclass Dromopoda

Superorder Cryptoercolata

Order Opiliones

Suborder Laniatores

Superfamily Trauvunioidea

Cladonychiidae

(*Erebomaster* (once in Erebomastridae), *Speleomaster* (once in Travuniidae),  
*Theromaster*)



Travuniidae (*Speleomaster* (now in Cladonychiidae))  
Trienonychidae (*Cryptobunus*, *Paranonychus*, *Sclerobunus*, *Zuma*)

Superfamily Gonyleptoidea  
Cosmetidae (put in Superfamily Ischyropsalidoidea)

Suborder Palpatores  
Superfamily Caddoidea  
Caddidae (*Caddo*)

Superfamily Ischyropsalidoidea  
Ceratolasmatidae (*Crosbycus* (misidentification), *Hesperonemastoma*)

Cosmetidae (also in Superfamily Gonyleptoidea) (*Vonones*)  
Ischyropsalidae (*Sabacon*, *Taracus* (now in Sabaconidae))  
Nemastomatidae (*Ortholasma*, some other species now in Ceratolasmatidae)

Sabaconidae (*Sabacon*, *Taracus*)  
Stygnopsidae (*Hoplobunus*)

Superfamily Phalangioidea  
Phalangiidae (*Mitopus*, *Odiellus*, *Oligolophus*, *Opilio*, *Phalangium*, *Scotolemon*)  
(some other genera put in Protolophidae & Sclerosomatidae)

Phalangodidae (*Banksula*, *Bishopella*, *Calicina*, *Phalangodes*, *Phalangomma*, *Sitalcina*, *Texella*, *Tolus*, *Wespus* (*Hoplobunus* put in Stygnopsidae), *Crosbyella* now uncertain as to family status))

Protolophidae (*Protolophus*)  
Sclerosomatidae  
(*Dalquestia*, *Eumesosoma*, *Eurybunus*, *Globipes*, *Hadrobunus*, *Leiobunum*, *Leuronychus*, *Mesosoma*, *Nelima*, *Trachyrhinus*)ncertain family (*Crosbyella*)

Superfamily Troguloidea  
Nemastomatidae

Suborder Cyphophthalmi  
(no representatives recorded from caves north of Mexico in North America)

**Caddidae** (*Caddo*)  
**Ceratolasmatidae** (*Crosbycus* (misidentification), *Hesperonemastoma*)

**Cladonychiidae** (*Erebomaster* (once in Erebomastriidae), *Speleomaster* (once in Travuniidae), *Theromaster*)

**Cosmetidae** (*Vonones*)

Erebomastriidae = Cladonychiidae

**Family Uncertain (*Phalangodoidea*)** (*Crosbyella*)

**Gagrellidae** (species now in Sclerosomatidae)

**Ischyropsalidae** (*Sabacon*, *Taracus* (now in Sabaconidae))

**Leiobunidae** (species now in Sclerosomatidae)

**Leptobunidae** (*Leuronychus* (now in Sclerosomatidae), *Protolophus* (now in Protolophidae))

**Nemastomatidae** (*Ortholasma*, some other species now in Ceratolasmatidae)

**Phalangiidae** (*Mitopus*, *Odiellus*, *Oligolophus*, *Opilio*, *Phalangium*, *Scotolemon*) (some other genera moved to Protolophidae & Sclerosomatidae)

**Phalangodidae** (*Banksula*, *Bishopella*, *Calicina*, *Phalangodes*, *Phalangomma*, *Sitalcina*, *Texella*, *Tolus*, *Wespus* (*Hoplobunus* moved to Stygnopsidae, *Crosbyella* moved to Family Uncertain))

**Protolophidae** (*Protolophus*)

**Sabaconidae** (*Sabacon*, *Taracus*)

**Sclerosomatidae** (*Dalquestia*, *Eumesosoma*, *Eurybunus*, *Globipes*, *Hadrobunus*, *Leiobunum*, *Leuronychus*, *Mesosoma*, *Nelima*, *Trachyrhinus*)

**Stygnopsidae** (*Hoplobunus*)

Travuniidae (*Speleonychia* (now in Cladonychiidae))

**Triaenonychidae** (*Cryptobunus*, *Paranonychus*, *Sclerobunus*, *Zuma*)

**Travuniidae** (*Speleomaster* (now in Cladonychiidae))

#### Genera & species Incl.

*Acanthocheir* Lucas, 1861 (see *Phalangodes*)

*Acanthocheir armata* (= *Phalangodes armata*)

*Acanthocheir armatum* (= *Phalangodes armata*)

*Banksula* Roewer, 1949 (some species formerly in *Scotolemon* & *Phalangodes*) Phalangodidae  
harvestmen

*Banksula californica* (*Scotolemon californica* Banks, 1900) (*Phalangodes californica*, Roewer 1912) Roewer, 1949; Goodnight & Goodnight, 1960, 1981; Briggs, 1974, 1987; Briggs & Ubick, 1981; Rambla & Juberthie, 1994 (Alabaster Cave (type locality) (cave was quarried) El Dorado Co., CA / Tb, Tm- eyes missing)

*Banksula ellioti* Briggs & Ubick, 1981 (type locality cave in Tuolumne Co. & 3 caves in Calaveras Co., CA / Tb, Tm- retinae missing or reduced)

***Banksula galilei*** Briggs, 1974 (type locality & 1 other cave in Placer Co., CA / Tb) **Bibl.:** Briggs & Ubick, 1981; Goodnight & Goodnight, 1981; Arnett, 1983; Rambla & Juberthie, 1994

***Banksula grahami*** Briggs, 1974 (Moaning Cave (type locality), & 2 other caves in Calaveras Co., + 6 caves & 3 mines, Tuolumne Co. CA / Tb, meiofauna- specimens moved in interstitial spaces to enter mines) **Bibl.:** Briggs, 1974, 1987; Briggs & Ubick, 1981; Goodnight & Goodnight, 1981; Elliott, 1985; Rambla & Juberthie, 1994

***Banksula grubbsi*** Briggs & Ubick, 1981 (\*type locality cave in Amador Co., CA / Tb, Tm-retinae missing/ G1G2)

***Banksula martinorum*** Briggs & Ubick, 1981 (\*type locality cave in Calaveras Co., CA / Tb, Tm- eyes missing/ G1G2) **Bibl.:** Rambla & Juberthie, 1994

***Banksula melones*** Briggs, 1974 (type locality cave in Calaveras Co. + 10 caves, Tuolumne Co. + 11 caves + transplanted to mine, Calaveras Co., CA / Tb/ S2G2/ VUA2c) **Bibl.:** Arnett, 1983; Briggs, 1974, 1987; Goodnight & Goodnight, 1981; Elliott, 1978a; 1979a, b; 1981; 1985; Gray, 1975; Briggs & Ubick, 1981; Arnett, 1983

***Banksula rudolphi*** Briggs & Ubick, 1981; Rambla & Juberthie, 1994 (\*type locality cave in Amador Co., CA / Tb)

***Banksula tuolumne*** Briggs, (type locality cave & one surface site in Tuolumne Co., CA / Tb, Tm- retinae usually reduced) **Bibl.:** Briggs & Ubick, 1981; Goodnight & Goodnight, 1981; Rambla & Juberthie, 1994

***Bishopella*** Roewer, 1927 (one species formerly in *Phalangodes*) Phalangodidae harvestmen

***Bishopella jonesi*** Goodnight & Goodnight, 1942; (\*type locality cave in Jackson Co., AL / Tp or Tb – caves only) **Bibl.:** Peck, 1978, 1998

***Bishopella laciniosa*** (*Phalangodes laciniosa* Crosby & Bishop, 1924a; *Phalangodes* (*Bishopella*) *laciniosa*: (AL, FL, GA, NC, SC, TN epigeal/ Tp in nAL (Walker Co.), FL, nwGA (Bartow, Dade & Walker Cos.), cTN; Tb? - Tm long legs, lighter color, reduced eyes in cave in Mt. Eagle, TN) **Bibl.:** Peck 1970); Goodnight & Goodnight, 1942, 1960; Barr, 1961; Holsinger & Culver, 1988; Peck, 1989; Holsinger & Peck, 1971; Franz, Bauer & Morris, 1994; Rambla & Juberthie, 1994

***Bishopella*** undet. sp. (cave in Newton Co., AR; >1 Tp species in Walker & Dade Cos., GA) **Bibl.:** Youngsteadt & Youngstedt, 1985; Buhlmann, 1992

***Bishopella*** undescr.? sp. (Tb in GA (Dade Co.))

***Caddo*** Banks, 1892 - Caddidae harvestmen

***Caddo agilis*** Banks, 1892 (CT, DC, MA, ME, NC, NJ, NY, OH, PA, TN, VI, VT, WI, WV, NB, ON, PQ / Tx in cave in Pickett Co., TN) **Bibl.:** Shear, 1975; Cokendolpher & Lee, 1993

***Calicina*** Ubick & Briggs, 1989 (some species formerly in *Sitalcina*) Phalangodidae harvestmen

***Calicina cloughensis*** (*Sitalcina cloughensis* Briggs & Hom, 1967) (\*type locality cave in Sequoia National Park, Tulare Co., CA / Tb, Tm- pale coloration, complete loss of eyes, high tarsal count) **Bibl.:** Briggs, 1968; Goodnight & Goodnight, 1981; Ubick & Briggs, 1989; Rambla & Juberthie, 1994; Peck, 1998

***Calicina digita*** (*Sitalcina digitus* Briggs & Hom, 1967) (Mariposa, Fresno, Tulare Cos., CA / Tp? in Fresno Co.) **Bibl.:** Briggs, 1968; Ubick & Briggs, 1989

***Calicina serpentina*** (*Sitalcina serpentina* Briggs & Hom 1966) (southern Bay area from San Mateo and Contra Costa to San Benito counties, CA / Tp? in Santa Cruz Co.) **Bibl.:** Briggs, 1968; Ubick & Briggs, 1989

***Calicina sierra*** (*Sitalcina sierra* Briggs & Hom, 1967; *Sitalcina sierra sierra* Briggs, 1968) (Amador, Calaveras, Tuolumne Cos., CA / Tp? & epigeal) **Bibl.:** Ubick & Briggs, 1989

*Cladonychium* Hadzi 1935 (see *Erebomaster*)  
*Cladonychium corii* = *Erebomaster acanthina*

*Crosbycus* Roewer, 1914 (misidentification)

*Crosbycus goodnighti* Roewer, 1951; Shear, 1986; Holsinger & Culver, 1988; Cokendolpher & Lee, 1993 (species and genus of uncertain identification and locality; sp. et gen. inquirenda) (reported in error from Fountain Cave, Augusta Co., VA; possibly from Europe / Tx or Tp)

***Crosbyella*** Rower, 1927 (= *Goodnightiella*, some species formerly in *Phalangodes*)  
Phalangodoidea superfamily, uncertain family of harvestmen

***Crosbyella distincta*** Goodnight & Goodnight 1942 (*Goodnightiella distincta*: Roewer, 1949); Goodnight & Goodnight, 1960; Rambla & Juberthie, 1994 (\*cave type locality in Boone Co., AR / Tb, Tm- eyes lacking, longer appendages, greater number of tarsal segment)

***Crosbyella roeweri*** Goodnight & Goodnight 1942 (\*cave type locality in Benton Co., AR / Tp or Tb/ caves only) **Bibl.:** Soares & Avram 1981; Rambla & Juberthie, 1994

***Crosbyella spinturnix*** (*Phalangodes spinturnix* Crosby & Bishop, 1924a; *Phalangodes* (*Crosbyella*) *spinturnix* Peck, 1970); (LA, AR, FL, AL, GA, MS / Endogean & Tp in AL, AR, FL, GA (Bartow Co.), LA, MS, OK, Tx in MO) **Bibl.:** Black, 1971; Holsinger & Peck, 1971; Goodnight & Goodnight 1942; Peck, 1970; Youngsteadt & Youngsteadt, 1978; McDaniel, et al., 1979; Peck & Peck, 1982; Gardner, 1986; Peck, 1989; Franz, Bauer & Morris, 1994

***Crosbyella*** undescr.? sp.(AR / Tb)

***Cryptobunus*** Banks, 1905 (one species formerly in *Sclerobunus*) Triaenonychidae harvestmen

***Cryptobunus cavicolens*** Banks, 1905 (*Sclerobunus cavicolens*: Goodnight & Goodnight, 1943; *Sclerobunus robustus* (in part) Crosby & Bishop, 1924b); (Lewis & Clark (=Morrison's) Cave

(type locality), Jefferson Co., MT / Tb) **Bibl.:** Goodnight & Goodnight 1960; Briggs 1971; Peck 1973

*Cryptobunus* undescr. sp. (\*?Tongue River Cave, WY)

*Cryptobunus* undet. sp. Briggs, 1974 (cave in Clark Co., ID / Tb, Tm- lack of pigmentation)  
**Bibl.:** Peck, 1973

*Cryptobunus unguulatus madhousesensis* Briggs 1971 (\*type locality cave in UT Co., UT / Tb, Tm- cornea small, retinae displaced medially) **Bibl.:** Rambla & Juberthie, 1994

*Cryptobunus unguulatus unguulatus* Briggs, 1971 (\*?type locality cave in White Pine Co., NV / Tb/ G1 or G3G4 T1T2 NV S1S2) **Bibl.:** Rambla & Juberthie, 1994

*Dalquestia* Cokendolpher, 1984 (some species formerly in *Eurybunus*) Sclerosomatidae harvestmen

*Dalquestia formosa* (*Eurybunus formosus* Banks, 1910) Cokendolpher, 1984; Cokendolpher pers, comm, 1999 (NL (Mexico), TX / Accidental Tx in Burnet, Kendall, Travis, Uvalde Cos., TX) **Bibl.:**

*Erebomaster* Cope, 1872 (= *Cladonychium* & some species formerly in *Phalangodes*, *Scotolemon*) Cladonychiidae harvestmen

*Erebomaster* (?) undet. species or sp. (caves in Alleghany, Bath, Bland Cos., VA / Tp?) Holsinger & Culver, 1988

*Erebomaster acanthina* (= *Phalangodes acanthina* Crosby & Bishop, 1924a; *Cladonychium corii* Hadzi, 1935) Goodnight & Goodnight, 1942, Holsinger, 1961; Briggs, 1969; Franz & Slifer, 1971; Cokendolpher, 1985; Murphree, 1987; Holsinger & Culver, 1988 (epigean NC, DC, MD / Endless Caverns (type locality of *Cladonychium corii*), Rockingham Co. + numerous caves in Augusta & Frederick cos., VA; MD / Tp? Augusta Co.; Tb, Tm- blind in Endless Caverns; reduced eyes and pigment in some other caves)

*Erebomaster flavescens coecum* (*Phalangodes flavescens coecum* Packard, 1888; *Scotolemon flavescens caecum*: Banks, 1893) (Bat Cave (type locality), Carter Caves, Carter Co., Kentucky / Tp or Tb/ S2 G1G2) **Bibl.:** Conn, 1981; Rambla & Juberthie, 1994

*Erebomaster flavescens flavescens* Cope, 1872 (= *Phalangodes flavescens*: Simon, 1879; *Scotolemon flavescens*: Packard, 1877); (Wyandotte Cave (type locality), Crawford Co., IN (S2) + VA, OH, NY?, WV, KY, MO, VA/ Tp? & epigean in IN; Accidental or Tx? in MO, VA/ Tm- light coloration, reduced eyes, longer legs in Wyandotte Cave/ G1G2?) **Bibl.:** Bishop, 1949; Goodnight & Goodnight, 1960, 1981; Holsinger, 1962, 1967; Briggs, 1969; Gardner, 1986; Rambla & Juberthie, 1994; Peck, 1998

*Erebomaster flavescens weyerensis* (*Phalangodes flavescens weyerensis* Packard, 1888; *Scotolemon flavescens weyerensis*: Banks, 1893) Holsinger, Baroody & Culver, 1976; Rambla & Juberthie, 1994 (type locality cave in Augusta Co., VA; & caves in Grant, Jefferson, Pendleton,

Pocahontas & Tucker Cos., WV / Tp or Tb, Tm - reduced or missing eyes, reduced pigmentation)

**Erebomaster** undet. sp. (cave in Taney Co., MO / Tp?)

**Eumesosoma** Cokendolpher, 1980 (= *Mesosoma* Weed, 1892) Sclerosomatidae harvestmen

**Eumesosoma** *roeweri* (*Mesosoma roeweri* Goodnight & Goodnight, 1943 = *Mesosoma texanum* Goodnight & Goodnight, 1943 (AR, IA, KS, KY, LA, MN, NB, ND, OK, SD, TX / accidental Tx in cTX) **Bibl.:** Elliott & Reddell, 1975; Elliott, 1979; Cokendolpher, 1980; Cokendolpher & Lee, 1993

**Eurybunus** Banks, 1893 (see also *Dalquestia*) Sclerosomatidae harvestmen  
*Eurybunus formosus* (= *Dalquestia formosa*)

**Eurybunus** n. sp. (misidentified as *Eurybunus brunneus* Banks, 1893) (w TX, se NM / Tx in NM) **Bibl.:** Welbourn, 1978; Cokendolpher & Lee, 1993; Cokendolpher pers.comm., 1999

**Globipes** Banks, 1893 - Sclerosomatidae harvestmen

**Globipes** *spinulatus* Banks, 1893; Cokendolpher & Lee, 1993 (CA, NV / Tx in Calaveras & Tuolumne Co., CA)

*Goodnightiella* Roewer, 1949; not Soares & Soares, 1945 (see *Crosbyella*)  
*Goodnightiella distincta* = *Crosbyella distincta*

**Hadrobunus** Banks, 1900 (some species formerly in *Phalangium* & *Liobunum*) Sclerosomatidae harvestmen

**Hadrobunus** *grandis* (*Phalangium grandis* Say, 1821; *Liobunum similis* Weed, 1890, nomen nudum; *Liobunum grande* var. *simile* Weed, 1892) (GA, OH, NC, OK, VA / Accidental or Tx in MO ) **Bibl.:** Gardner, 1986; Cokendolpher & Lee, 1993

**Hesperonemastoma** Gruber, 1970 (some species formerly in *Nemastoma*) Ceratolasmatidae harvestmen

**Hesperonemastoma** *inops* (*Nemastoma inops* Packard, 1896) Gruber, 1970 (\*?type locality cave in Carter Co., KY / Tb/ G1G2) **Bibl.:** Goodnight & Goodnight, 1960, 1981; Gruber, 1970; Conn, 1981; Cokendolpher & Lee, 1993; Rambla & Juberthie, 1994

**Hesperonemastoma** *modestum* (*Nemastoma modesta* Banks, 1894) Gruber, 1970 (epigeal in BC, WA, OR, CA / Tx in BC & Calaveras & Tuolumne Cos., CA ) **Bibl.:** Gruber, 1970; Cokendolpher & Lee, 1993

**Hesperonemastoma** *packardi* (*Nemastoma packardi* Roewer, 1914 (= *Nemastoma troglodytes* Packard, 1877, not Wankel, 1861) (type locality cave in Tooele Co., UT + surface in ID / Tp? in UT/ G1G2) **Bibl.:** Goodnight & Goodnight, 1960, 1981; Gruber, 1970; Cokendolpher & Lee, 1993

**Hesperonemastoma pallidimaculosum** (*Nemastoma pallidimaculosa* Goodnight & Goodnight, 1945) (\*\*type locality & one other cave in Morgan Co., AL / Tb, Tm- eyes lacking, relatively weak sclerotization of the integument, elongation of the appendages) **Bibl.:** Goodnight & Goodnight, 1960; Gruber, 1970; Peck, 1989; Cokendolpher & Lee, 1993; Rambla & Juberthie, 1994

*Hesperonemastoma troglodytes* = *Hesperonemastoma packardi*

**Hesperonemastoma** undescr. sp. (ID,UT / Tb)

**Hesperonemastoma** undet. sp. Lee, 1985 (Kings Canyon Natl. Park, CA / Tp or Tx)

**Hoplobunus** Banks, 1900 - Stygnopsidae harvestmen

**Hoplobunus madlae** Goodnight & Goodnight, 1967 (type locality cave in Uvalde Co. + Bandera, Bexar, Comal, Edwards, Kendall, Kinney, Medina, Real, Uvalde, Val Verde Cos.), Balcones Fault Zone & Edwards Plateau, TX / Tb, Tm- elongate appendages, no eyes, reduced pigmentation/ G3) **Bibl.:** 1967, 1981; Reddell, 1981; Rambla & Juberthie, 1994

**Hoplobunus russelli** Goodnight & Goodnight 1967, 1981; Elliott, 1979a (type locality & 1 other cave in Val Verde Co., 1 cave each in Medina, Uvalde Cos., TX / Tb, Tm- large size, elongate appendages, reduced eyes, reduced pigmentation/ G3) **Bibl.:** Goodnight & Goodnight 1981; Elliott, 1979a

**Hoplobunus** undet. spp. (Tb in Bandera, Bexar, Comal, Kendall, Kinney, Terrell, Uvalde Cos., TX) **Bibl.:** Cokendolpher & Reddell 1998 pers. comm.

**Leiobunum** C.L. Koch, 1839 (= *Liobunum*) (see *Nelima*) Sclerosomatidae harvestmen

**Leiobunum aldrichi** (Weed, 1893) (*Liobunum longipes aldrichi* Weed, 1890; *Liobunum longipes* Weed, 1890, not of Menge in C.L.Koch & Berendt, 1854) (AL, AR, BC?, DC, GA, IL, IN, KY, LA, MA, MD, ME, MI, MO, NH, NY, NC, OH, ON, PA, SD, TN, VA, VT, WA?, WI, WV / TTx in Mammoth & Cathedral (Edmonson Co.) & Lone Star (Hart Co.), KY; Rockport Cave, MO; Salt Petre Cave, IN; sON; PQ) **Bibl.:** Davis, 1934; Conn, 1981; Cokendolpher, 1984; Gardner, 1986; Peck, 1988; Cokendolpher & Lee, 1993; Cokendolpher, pers. comm., 1999  
*Leiobunum bicolor* = *Leiobunum elegans*

**Leiobunum calcar** (*Phalangium calcar* Wood, 1868; *L. brunnea* Walker, 1928; *L. serratipalpe* Roewer, 1910) (FL to NF, w.to AR, IL, MI, ND, OH / Ttx in MO) **Bibl.:** Davis, 1934; Gardner, 1986; Cokendolpher & Lee, 1993

*Leiobunum cavernarum* (= *Leiobunum politum*)

**Leiobunum elegans** Weed, 1889 (*Phalangium bicolor* Wood, 1868, not of Fabricius, 1793; *Liobunum annulatum* Walker, 1928) (FL to NF, w. to sON & SD, s. to LA / TTx in KY, MO, NS, sON, PA, TN, VA, WV; TTx in MD; Tx in IN (Crawford, Harrison, Orange Cos.), OH; Tx

(overwinters) NS) **Bibl.:** Davis, 1934; ; Bishop, 1949; Cokendolpher, 1984; Gardner, 1986; Peck, 1988; Cokendolpher & Lee, 1993; M. Moseley, pers. commun. 1998

***Leiobunum exilipes*** (*Phalangium exilipes* Wood, 1868; *Leuronychus gertschi* Schenkel, 1951, *Nelima goodnighti* Schenkel, 1951); Davis, 1934; Briggs & Ubick, 1988; Cokendolpher & Lee, 1993 (AK to CA, MT / Tx in CA) **Bibl.:**

***Leiobunum flavum*** (*Liobunum flavum*, in part, Banks, 1894; *Leiobunum supracheliceralis* Roewer, 1957) (AL to MA, w. to LA, OH, OK, MI, WS, TN / TTx in OH, MO, TX) **Bibl.:** Davis, 1934; Gardner, 1986; Cokendolpher & Lee, 1993

*Leiobunum longipes* = *Leiobunum aldrichi*

***Leiobunum nigripes*** Weed, 1887 (FL to ON, w. to AR, ND / Tx or Ac in sON; Tx in OH) **Bibl.:** Walker, 1928; Davis, 1934; Peck, 1988; Cokendolpher & Lee, 1993

*Leiobunum oregonense* = *Nelima paessleri*  
*Leiobunum paessleri* = *Nelima paessleri*

***Leiobunum politum*** (*Liobunum politus* Weed, 1889; *Liobunum politum magnum* Weed, 1893; *Leiobunum cavernarum* Roewer, 1952) (NC, FL to ON, w.to AR, ND, OK, TN, WI / Tx in AR, NC; Tx or Ac in ON) **Bibl.:** Davis, 1934; Peck, 1988; Cokendolpher & Lee, 1993

*Leiobunum supracheliceralis* = *Leiobunum flavum*

***Leiobunum townsendi*** Weed, 1893; (AZ, CO, NM, NV, UT, Chihuahua & Durango (Mexico) / TTx in NM, TX, AZ, Mexico) **Bibl.:** Davis, 1934; McAlister, 1962; Mitchell & Reddell, 1971; Elliott & Reddell, 1975, 1985; Elliott, 1978b, 1979a; 1987; Peck, 1980; Cokendolpher, 1982; Ekpa et al., 1985; Cokendolpher & Lee, 1993; Rambla & Juberthie, 1994; Cokendolpher & Polyak, 1996; Cokendolpher, pers. comm, 1999

***Leiobunum*** undet. sp(p). (Tx or Ac in OK, PA / Tx in MO, GA (Walker Co.) & AR; TTx or Ac in AZ)

***Leiobunum vittatum*** (*Phalangium vittatum* Say, 1821 = *Phalangium dorsatum* Say, 1821; *Liobunum vittatum minor* Weed, 1893) (FL, DC, CT, to NB, ON, w. to TX, OK, SD, ND / Tx in AB, ON) **Bibl.:** Davis, 1934; Peck, 1988; Cokendolpher & Lee, 1993

***Leuronychus*** Banks, 1900 (one species formerly in *Liobunum* & *Microgyas*) Sclerosomatidae harvestmen

*Leuronychus gertschi* = *Leiobunum exilipes*

***Leuronychus pacificus*** (*Liobunum pacificum* Banks, 1894; *Microgyas banksi* Schenkel, 1951) (AK to CA, Baja California (Mexico) / Tx in Tuolumne Co., CA) **Bibl.:** Cokendolpher, 1980; Cokendolpher & Lee, 1993



**Liobunum** Agassiz, 1846 (see *Hadrobunus*, *Leiobunum*, *Leuronychus* & *Nelima*)  
Sclerosomatidae harvestmen

*Liobunum annulatum* = *Leiobunum elegans*; *Liobunum brunnea* = *Leiobunum calcar*  
*Liobunum grande* var. *simile* = *Hadrobunus grandis*; *Liobunum longipes* = *Leiobunum aldrichi*  
*Liobunum longipes aldrichi* = *Leiobunum aldrichi*; *Liobunum pacificum* = *Leuronychus pacificus*

*Liobunum paessleri* = *Nelima paessleri*; *Liobunum politum magnum* = *Leiobunum politum*  
*Liobunum politus* = *Leiobunum politum*; *Liobunum serratipalpe* = *Leiobunum calcar*  
*Liobunum similis* = *Hadrobunus grandis*; *Liobunum vittatum minor* = *Leiobunum vittatum*

**Mesosoma** Weed, 1892; not Otto, 1821 (see *Eumesosoma*, *Trachyrhinus*) Sclerosomatidae  
harvestmen

*Mesosoma roeweri* = *Eumesosoma roeweri*  
*Mesosoma texanum* = *Eumesosoma roeweri* (see also *Trachyrhinus dicropalpus*)

*Microgyas* Schenkel, 1951 - See *Leuronychus*  
*Microgyas banksi* = *Leuronychus pacificus*

**Mitopus** Thorell, 1876 (some species formerly in *Phalangium*, *Oligolophus* & *Opilio*)  
Phalangiiidae harvestmen

**Mitopus** *morio* (*Phalangium morio* Fabricius, 1779; *Oligolophus montanus* Banks, 1893; *Opilio scabripes* Walker, 1860) (AK e.to Greenland, NS, NF, NH, NY, MT or WY/ Tx in MO - almost certainly misidentified (specimens from out of species range and based on juveniles) **Bibl.:** Gardner, 1986; Cokendolpher & Lee, 1993; Cokendolpher, pers. comm., 1999

**Nelima** Roewer, 1910 (some species formerly placed in *Liobunum* & *Leiobunum*)  
Sclerosomatidae harvestmen

*Nelima goodnighti* = *Leiobunum exilipes*

**Nelima** *paessleri* (*Liobunum paessleri* Roewer, 1910; *Leiobunum oregonense* Goodnight & Goodnight, 1943) Crawford, 1977; Cokendolpher, 1982; Holmberg, Angerilli & LaCasse, 1984; Cokendolpher & Lee, 1993; Rambla & Juberthie, 1994 (AK to CA, e. to AB, MT, WY? / TTx in AB, BC, CA, OR, WA) **Bibl.:**

*Nemastoma* C. L. Koch, 1836 - See *Hesperonemastoma*;  
*Nemastoma inops* = *Hesperonemastoma inops*)  
*Nemastoma modesta* = *Hesperonemastoma modestum*

*Nemastoma packardi* = *Hesperonemastoma packardi*  
*Nemastoma pallidomaculosa* = *Hesperonemastoma pallidomaculosum*;  
*Nemastoma troglodytes* = *Hesperonemastoma packardi*

**Odiellus** Roewer, 1923 (some species formerly placed in *Phalangium* & *Oligolophus*)  
Phalangiidae harvestmen

**Odiellus pictus** (*Phalangium pictum* Wood, 1868; *Oligolophus ohioensis* Weed, 1889); Peck, 1988; Cokendolpher & Lee, 1993; Cokendolpher, pers. comm, 1999 (LB south to GA, west to MB, WI, IL, TN / Tx or Ac in sON) **Bibl.:**

**Oligolophus** C. Koch, 1871 (some species formerly placed in *Opilio*, see also *Mitopus*, *Odiellus*)  
Phalangiidae harvestmen

*Oligolophus montanus* = *Mitopus morio*  
*Oligolophus ohioensis* = *Odiellus pictus*

**Oligolophus tridens** (*Opilio tridens* C. L. Koch, 1836) Cokendolpher & Lee, 1993; M. Moseley, pers. comm. 1998 (native to Europe, introduced to VT, NF, NS / Ac in 2 caves in NS) **Bibl.:**

**Opilio** Herbst, 1798 (some species formerly placed in *Phalangium*, see also *Mitopus*, *Oligolophus*) Phalangiidae harvestmen

*Opilio angulatichelis* = *Phalangium opilio*

**Opilio parietinus** (*Phalangium parietinum* DeGeer, 1778; *Phalangium cinereum* Wood, 1868) (NA (except SE, Far West, AZ), Europe / Tx in MO - probably misidentification of *Phalangium opilio* females or juveniles) **Bibl.:** Gardner, 1986; Cokendolpher & Lee, 1993

*Opilio scabripes* = *Mitopus morio*  
*Opilio tridens* = *Oligolophus tridens*

**Ortholasma** Banks, 1894 - Nemastomatidae harvestmen

**Ortholasma levipes** Shear & Gruber, 1983 (CA epigeal / Tx in Calaveras & Tuolumne Cos., CA) **Bibl.:** Cokendolpher & Lee, 1993

**Ortholasma pictipes** Banks, 1911 (s BC, w WA, w OR, nw CA / Tx? in BC, WA) **Bibl.:** Shear & Gruber, 1983; Cokendolpher & Lee, 1993

**Paranonychus** Briggs, 1971 (some species formerly placed in *Sclerobunus*) Triaenonychidae harvestmen

**Paranonychus brunneus** (*Sclerobunus brunneus* Banks, 1893) (AK, BC, WA, OR, CA / TTp in BC, WA) **Bibl.:** Briggs, 1971; Bragg & Leech, 1972

**Phalangium** Linnaeus, 1761 (some species formerly placed in *Opilio*; see also *Hadrobunus*, *Mitopus*, *Odiellus*) Phalangodidae harvestmen

*Phalangium bicolor* = *Leiobunum elegans*; *Phalangium calcar* = *Leiobunum calcar*  
*Phalangium cinereum* = *Opilio parietinus*; *Phalangium dorsatum* = *Leiobunum vittatum*

*Phalangium exilipes* = *Leiobunum exilipes*; *Phalangium grandis* = *Hadrobunus grandis*

*Phalangium longipalpis* = *Phalangium opilio*; *Phalangium morio* = *Mitopus morio*

**Phalangium** *opilio* Linneaus, 1761 (*Phalangium longipalpis* Weed, 1890; *Opilio angulatichelis* Roewer, 1952) (Europe, NA (except SE, far SW, Great Basin) / brown daddy-long-legs / Tx in OK) **Bibl.:** Black, 1971; Edgar & Yuan, 1968; Cokendolpher & Lee, 1993

*Phalangium parietinum* = *Opilio parietinus*; *Phalangium pictum* = *Odiellus pictus*  
*Phalangium vittatum* = *Leiobunum vittatum*

**Phalangodes** Tellkampff, 1844 (= *Acanthocheir*, *Phrixis*. See also *Banksula*, *Bishopella*, *Crosbyella*, *Erebomaster*, *Scotolemon*, *Theromaster*, *Tolus*) Phalangodidae harvestmen

*Phalangodes appalachius* = *Tolus appalachius*  
*Phalangodes acanthina* = *Erebomaster acanthina*  
*Phalangodes archeri* = *Theromaster archeri*

**Phalangodes** *armata* Tellkampff, 1844 (*Acanthocheir armata* Lucas 1861, *Phrixis longipes* Cope, 1872; *Acanthocheir armatum*: Kingsley, 1884) (Mammoth Cave (type locality), & caves in Edmonson & Warren Cos., KY / +nAL, cKY, wTN / Tb, Tm - long, slender appendages, reduced ocularium, no eyes; considered Tp by Sullivan 1962 as it leaves the dark zone in June & July/ G3G4) **Bibl.:** Goodnight & Goodnight, 1960, 1981; Briggs, 1974; Rambla & Juberthie, 1994

*Phalangodes brunnea* = *Theromaster brunnea*; *Phalangodes californica* = *Banksula californica*  
*Phalangodes flavescens* = *Erebomaster flavescens*; *Phalangodes flavescens coecum* = *Erebomaster flavescens coecum*

*Phalangodes flavescens weyerensis* = *Erebomaster flavescens weyerensis*  
*Phalangodes laciniosa* = *Bishopella laciniosa*

**Phalangodes** *spinifera* Packard, 1888 (Tx in Mammoth C.,KY) (from FL?) (considered by most authors as no longer a valid species)

**Phalangodes** *spinturnix* = *Crosbyella spinturnix*  
**Phalangodes** undet. sp. (Tx or Tp in AR)

**Phalangomma** Roewer, 1949 – Phalangodidae harvestmen

**Phalangomma** *virginicum* Roewer, 1949 (\*type locality cave in Augusta Co., VA / Tp/ see comments under *Crosbycus goodnighti*, another species supposedly found in Foun.Cave. Neither species has been recollected and probably originated from another region) **Bibl.:** Peck, 1998; Rambla & Juberthie, 1994; Cokendolpher, pers. comm, 1999

*Phlegmacera* Packard, 1884 - See *Sabacon*  
*Phlegmacera cavicolens* = *Sabacon cavicolens*  
*Phlegmacera occidentalis* = *Sabacon occidentalis*

**Phrixis** Cope, 1872 (see *Phalangodes*)

*Phrixis longipes* = *Phalangodes armata*

*Protolophus* Banks, 1893 - Protolophidae harvestmen

*Protolophus* undet. sp. (Tx in Amador & Tuolumne Cos., CA)

*Sabacon* Simon, 1879 (= *Phlegmacera*) Ischyropsalidae harvestmen

*Sabacon cavicolens* (*Phlegmacera cavicolens* Packard, 1884; *Sabacon crassipalpe* (not of L. Koch, 1879) Roewer 1914; *Sabacon spinosus* Weed, 1893)(widespread in eastern North America, from NB, PQ, ON to SC & AK / Tx in Bat Cave (type locality), Carter Co., KY, TTx in KY (Mammoth Cave); Tp or Tx in Washington (prob.), Searcy & Stone Cos., AR + IL (prob.), IN (Harrison Co.), MO, sON, PQ, SC; Tp in GA (probably) (Walker Co.)) **Bibl.:** Shear, 1975; Peck & Lewis, 1977; Youngstedt & Youngstedt, 1978; McDaniel, et al., 1979; Conn, 1981; Peck & Peck, 1982; Gardner, 1986; Peck, 1988, 1989; Cokendolpher & Lee, 1993

*Sabacon jonesi* Goodnight & Goodnight, 1942; Shear, 1975; Peck, 1989; Cokendolpher & Lee, 1993 (\*?type locality in cave in Madison Co., AL / Tp; (known only by single juvenile and species may not be valid, adults need to be collected and studied/ G1?) **Bibl.:**

*Sabacon* near *occidentalis* (Tx in Trinity Co., CA)

*Sabacon occidentalis* (*Phlegmacera occidentalis* Banks, 1894) Shear, 1975; Cokendolpher & Lee, 1993 (BC, WA, OR, CA / Tp or Tx in BC, OR Caves & WA) **Bibl.:**

*Sabacon siskiyou* Shear, 1975 (CA / Tp in OR Caves, OR)

*Sabacon spinosus* = *Sabacon cavicolens*

*Sabacon* undet. sp. (2 caves in Skamania Co., WA / Tx?) Peck, 1973

*Sabacon* undet. sp.#1 Crawford, 1974 (cave in Skagit County, WA / TTp?)

*Sabacon* undet. sp. or species (Tp or Tx in BC, IL)

*Sclerobunus* Banks, 1893 (see also *Cryptobunus*, *Paranonychus*) Triaenonychidae harvestmen

*Sclerobunus brunneus* = *Paranonychus brunneus*

*Sclerobunus cavicolens* = *Cryptobunus cavicolens*

*Sclerobunus nondimorphicus* Briggs, 1971 (BC, WA, OR / Tx in WA)

*Sclerobunus robustus* Crosby & Bishop, 1924 (epigean in SE, NM/ Tp in Baker Cr. System, White Pine Co., NV) Epka et al. 1984

*Sclerobunus* undescr. sp. (MT, NV, UT / Tb)

*Sclerobunus* undet. sp. (Tp in Whestone, Huachuca, Santa Rit & Catalina Mts., sAZ)

*Scotolemon* Banks, 1901 (see *Banksula*, *Erebomaster*, *Phalangodes*, *Theromaster*)  
Phalangodidae harvestmen

*Scotolemon brunnea* = *Theromaster brunnea*; *Scotolemon californica* = *Banksula californica*

*Scotolemon flavescens* = *Erebomaster flavescens*; *Scotolemon flavescens caecum* = *Erebomaster flavescens coecum*; *Scotolemon flavescens weyerensis* = *Erebomaster flavescens weyerensis*

**Sitalcina** Banks, 1911 (= *Sitalces*, see also; *Calicina*, *Texella*) Phalangodidae harvestmen  
*Sitalcina bifurcata* = *Texella bifurcata*

**Sitalcina** *californica* (Banks, 1893) Briggs, 1967, 1968; Briggs & Hom 1968 (west central counties, CA / Tp or Tx in Santa Cruz Co., CA)

**Sitalcina** *cloughensis* = *Calicina cloughensis*

**Sitalcina** *cockerelli* Goodnight & Goodnight, 1942)(OR, CA / epigeal & Tp in CA) **Bibl.:**  
Briggs & Hom 1966, Briggs, 1968; Briggs & Ubick, 1989

*Sitalcina digitus* = *Calicina digita*  
*Sitalcina serpentina* = *Calicina serpentina*  
*Sitalcina sierra* = *Calicina sierra*

**Sitalcina** *sura* Briggs, 1968 (Monterey Co., CA/epigeal & Tx)

**Speleomaster** Briggs, 1974 - Cladonychiidae harvestmen

**Speleomaster** *lexi* Briggs, 1974 (*Cryptomaster* sp. Briggs, 1973); (type locality & one other lava tube cave in Lincoln Co., ID +Mt. Adams caves, WA / Tb, Tm - reduced ocularium, no eyes, elongate appendages, reduced pigmentation/ G1G2) **Bibl.:** Briggs, 1983, 1986; Peck, 1973; Benedict, 1974a; Goodnight & Goodnight, 1981; Briggs, 1986; Rambla & Juberthie, 1994

**Speleomaster** *pecki* Briggs, 1974 (\*type locality cave in Craters of the Moon National Monument, Butte Co., ID/ G1G2 / Tb, Tm - reduced ocularium, no eyes, elongate appendages, reduced pigmentation) **Bibl.:** Briggs, 1974, 1983, 1986; Peck, 1973; Benedict, 1974; Goodnight & Goodnight, 1981; Briggs, 1986; Rambla & Juberthie, 1994

**Speleomaster** undescr. sp. (\*cave in ID / Tb?/ G1)

**Speleonychia** Briggs, 1974 - Cladonychiidae harvestmen

**Speleonychia** *sengeri* Briggs, 1974(\*\*\*\*? type locality & 3 other caves in Skamania & Klickitat Cos., WA/ G3G4 / Tb, Tm - reduced ocularium, no eyes, elongate appendages, reduced pigmentation; greater number of segments in tarsi) **Bibl.:** Briggs, 1974, 1983, 1986; Peck, 1973, 1998; Benedict, 1974a; Crawford, 1974a; Goodnight & Goodnight, 1981; Rambla & Juberthie, 1994

**Taracus** Simon, 1879 - Sabaconidae harvestmen (genus in Asia and NA)

**Taracus** *malkini* Goodnight & Goodnight, 1945; (Manzanita Lake & cave, both in Shasta Co. + caves in Lassen Co., CA / Tb or Tp?/ G1G2) **Bibl.:** Peck, 1973; Cokendolpher & Lee, 1993

**Taracus** *silvestrii* Roewer, 1930; Cokendolpher & Lee, 1993 (\*Oregon Cave (type locality), Josephine Co., OR / Tb)

*Taracus* undescr. sp. #1 (\*cave in White Pine Co., eNV / Tp or Tb, Tm- large size) **Bibl.:** Briggs 1969

*Taracus* undescr. sp. #2 (\*?cave in Tulare Co., Sequoia-Kings Canyon Natl.Park, CA / Tp or Tb, Tm- large size) **Bibl.:** Briggs 1969; Lee 1985

*Taracus* undet. sp. or species Crawford, 1973; Crawford & Senger, 1985 (Tx or Tp in BC & Skamania & Skagit Cos., WA ) **Bibl.:**

*Taracus* undet. (s)sp. (TTx or Tp in Siskiyou & Tulare Cos.,CA)

*Taracus* undet. sp Benedict, 1982 (cave near Bend, OR/ Tx or Tp)

*Texella* Goodnight & Goodnight 1967 (one species formerly placed in *Sitalcina*) Phalangodidae harvestmen

*Texella bifurcata* (*Sitalcina bifurcata* Briggs, 1968) (nw CA, Jackson Co., OR / Tp or Tx in Shasta Lake Cave, Shasta Co., CA, Tm- depigmentation) **Bibl.:** Ubick & Briggs, 1992

*Texella brevidenta* Ubick & Briggs 1992 (Honey Creek Cave (type locality), Comal Co., TX / Tp, Tm- depigmentation/ caves only?/ G1G2)

*Texella brevistyla* Ubick & Briggs 1992 (type locality & 1 other cave in Uvalde Co., TX / Tp, Tm- depigmentation/ caves only?/ G1 or G1G2)

*Texella cokendolpheri* Ubick & Briggs 1992 (= *Texella watersi* nomen nuda Ubick & Briggs 1992) (type locality & 1 other cave? in Bexar Co., TX / Tb, Tm- elongation of legs and palps, increased tarsal count, eye and eyemound reduction, depigmentation/ Robber Baron cave harvestman/ Federal endangered T&E/ G1)

*Texella diplospina* Ubick & Briggs 1992 (\*type locality cave in Hays Co.,TX / Tp, Tm- depigmentation/ caves only/ G1G2)

*Texella fendi* Ubick & Briggs 1992 (KY (Fayette Co.) epigeal / Tp in cave in Coryell Co., TX) **Bibl.:** Reddell & Ubick 1998 pers. comm.

*Texella grubbsi* Ubick & Briggs 1992 (\*type locality cave in Hays Co., TX / Tp or Tb, Tm- depigmentation/ caves only?/ G1G2)

*Texella hardeni* Ubick & Briggs 1992 (type locality & 1 other cave in Bandera Co., cave? in Kerr Co., TX / Tb, Tm- elongation of legs and palps, increased tarsal count, eye and eyemound reduction, depigmentation/ G1 or G1G2)

*Texella kokoweef* Ubick & Briggs 1992 (\*type locality cave in San Bernardino Co.,CA / Tp or Tb, Tm- depigmentation/ G1G2)

*Texella longistyla* Ubick & Briggs 1992 (epigeal in Culberson Co., TX / type locality & 1 other cave in Eddy Co., NM / Tp, Tm- depigmentation/ G1G2)

*Texella mulaiki* Goodnight & Goodnight 1942 (Ezell's Cave (type locality) + possibly 6 other caves, Hays Co. and possibly 3 caves, Travis Co., TX / Tb, Tm- elongation of legs and palps, increased tarsal count, eye and eyemound reduction, depigmentation/ G3) **Bibl.:** Goodnight & Goodnight 1942, 1960, 1967, 1981; Elliott, 1979; Ubick & Briggs 1992

*Texella reddelli* Goodnight & Goodnight 1967, 1981; Ubick & Briggs, 1992; Elliott, 1979a, 1982, 1985, 1989 (\*\*\*\*type locality & 3 other caves in Travis Co., TX / Tp, Tm- depigmentation / Bee Creek Harvestman / Endangered- Federally Listed/ G1G2)

*Texella renkesae* Ubick & Briggs 1992 (\*type locality cave in Hays Co.,TX / Tp, Tm- depigmentation/ G1G2)

*Texella reyesi* Ubick & Briggs 1992 (type locality + numerous other caves in Williamson Co., +numerous caves in Travis Co., both in TX / Tb, Tm- elongation of legs, increased tarsal count, eye reduction, depigmentation / B. Cave Harvestman (= Tooth Cave harvestman) / Endangered- Federally Listed/ )

*Texella shoshone* Ubick & Briggs 1992 (\*type locality cave in Inyo Co., CA / Tp, Tm- depigmentation/ caves only/ G1G2)

*Texella spinoperca* Ubick & Briggs 1992 (\*type locality cave in Travis Co.,TX / Tp, Tm- depigmentation/ caves only)

*Texella* undescr. sp. #1 Ubick & Briggs 1992 (\*?cave in Medina Co.,TX / Tb, Tm- elongation of legs and palps, increased tarsal count, eye and eyemound reduction, depigmentation)

*Texella* undescr. sp. #2 Reddell 1998 pers. comm. (\*?cave in Bexar Co., TX / Tp?)

*Texella* undescr. sp. #3 Reddell 1998 pers. comm. (\*?cave in Bexar Co., TX/ Tp?)

*Texella* undescr. sp. #4 Reddell 1998 pers. comm. (\*?cave in Williamson Co., TX / Tp?)

*Texella* undescr. sp. #5 Reddell 1998 pers. comm. (Long Joint Sink, Bell Co., TX / Tp?)

*Texella watersi* nomen nudum Ubick & Briggs 1992 = *Texella cokendolpheri* Ubick & Briggs 1992)

*Texella welbourni* Ubick & Briggs 1992 (\*type locality cave in Eddy Co., NM / Tb) Tm- elongation of legs, eye reduction, depigmentation/ G1G2)

*Thermomaster* = misspelling of *Theromaster*

*Theromaster* Briggs, 1969 (sometimes misspelled *Thermomaster*, some species formerly placed in *Scotolemon*, *Phalangodes*) Cladonychiidae harvestmen

*Theromaster archeri* (*Phalangodes archeri* Goodnight & Goodnight, 1942(type locality & 1 other cave in Jackson Co. & one cave in Madison Co., AL / Tp?/ G1) **Bibl.:** Briggs, 1969; Rambla & Juberthie, 1994

**Theromaster** *brunnea* (*Scotlemon brunnea* Banks, 1902; *Phalangodes brunnea*: Roewer, 1912); Goodnight & Goodnight, 1960; Briggs, 1969; Peck, 1989 (AL, GA, NC, TN / Tx? in 2 Jackson Co. caves + cave in Madison Co., AL)- *Theromaster archeri* is probably the female of this species. The above record from Mc. Cave is that of a male. This cave is also the type locality of *Bishopella jonesi*.

**Tolus** Goodnight & Goodnight 1942 (one species formerly placed in *Phalangodes*)  
Phalangodidae harvestmen

**Tolus** *appalachius* Goodnight & Goodnight 1942 (*Phalangodes* (= *Tolus*) *appalachius*) (Wonder Cave (type locality), Grundy Co. + 11 caves (Marion, Overton, Putnam, Van Buren, White Cos.), TN; cave in Jackson Co., AL / Tb/ G3G4) **Bibl.:** Peck, 1989); Goodnight & Goodnight, 1960; Rambla & Juberthie, 1994

**Trachyrhinus** Weed, 1892 - Sclerosomatidae harvestmen

**Trachyrhinus** *dicropalpus* Cokendolpher, 1981 (misidentified as *Mesosoma texanum* by Rowland & Reddell, 1976) (Kerr Co., TX / Ac or Tx in cave in Medina Co., TX) **Bibl.:** Cokendolpher & Lee, 1993

**Vonones** Simon, 1879 - Cosmetidae harvestmen  
*Vonones ornata* (Say, 1821) (*Gongyleptes* & *Libitiodes ornatus*) = often misidentification of *Vonones sayi*

**Vonones** *sayi* (*Cynorta Sayi* Simon, 1879; often misidentified as *Vonones ornata*) (AL, IL, IN, KN, KY, LA, MS, OK, TX, NC, NE Mexico/ Ac or Tx in MO, IL, TX, KY (Mammoth Cave) **Bibl.:** Gardner, 1986; Jones & Cokendolpher, 1985; Cokendolpher & Jones, 1991; Cokendolpher, pers. comm., 1999

**Vonones** *sp.* (= *Vonones sayi*) (Ac or Tx in cave in Johnson Co., IL) **Bibl.:** Peck & Lewis, 1978; Cokendolpher, pers. comm., 1999

**Wespus** Goodnight & Goodnight, 1942 - Phalangodidae harvestmen  
**Wespus** undet. *sp.* (cave in Taney Co., MO)

**Zuma** Goodnight & Goodnight, 1942 - Triaenonychidae harvestmen

**Zuma** *acuta* Goodnight & Goodnight, 1942 (Monterey, San Mateo, Santa Cruz Cos., CA / Tp in 2 caves in Cruz Co., CA, Tm- reduction of pigmentation in Empire Cave population). **Bibl.:** Briggs, 1967, 1971; Rambla & Juberthie, 1994

**hazard, caving** - Incl. histoplasmosis, insect (spider, tick), microbe (coccidiomycosis, coccidiomycosis fungus (blastomycosis, cryptococcosis, dermatophytes, histoplasmosis, mycormycosis, & valley fever), gas (CO<sub>2</sub>, ammonia), hantavirus, leptospirosis, lyme, plague, rabies, rat bite fever, tetanus, ticks, tularemia)

**hellgrammites** - Insect of Order Megaloptera. See Neuroptera



helminthology – The study of parasitic worms.

helminths – Inclusive term for various parasitic worms (trematodes, tapeworms, round worms, leeches, acanthocephalans)

**helocrene** - Area where a spring percolates into a marshy holding area.

**hemiedaphon** - Of upper soil layer. Cf. euedaphon

**helminths** - Various parasitic worms that incl. **trematodes**, tape **worms**, round **worms**, acanthocephalans (see **worms**) and leeches.(see **worm**, **Hirudinoidea**)

**helocrene** - Area of spring seepage through bryophytes, litter & detritus. Cf. rheocrene..

**Hemiptera** - See **bug**.

**herbivore** - An animal that eats plants.

**herbivore & heterotroph** - Bibl. - See feeding

**heritability** - The proportion of the variance among individuals for a trait that is attributable to differences in genotype.

herpobethos - Animals living on or in mud and moving through it.

**heterochrony** - Developmental dissociation in time of shape, size or maturity. Usually refers to changes in timing or rate of development relative to the same even in an ancestor, as in the appearance of neoteny.

**Heteroptera** - See bug.

**heterothermy** - The ability to regulate body temperature physiologically, but temperature is not regulated precisely or at the same level at all times.

**heterotroph** - A **type** of organism that uses organic material to synthesize its own living matter.  
Syn: consumer.

**heterozygosity** - The presence of different **alleles** at a gene locus.

**Hexapoda** - Superclass Incl. **dipluran, insects, springtail, thysanuran.**

**hibernation** - Method of surviving periods of low food availability by prolonged inactivity. Various bats control their temperature by choosing areas of the cave with an appropriate microclimate.

**Hirundinea** - Syn. leech. See **worm, Hirudinoidea**

**histoplasmosis** – Ascomycote fungus (*Histoplasma capsulatum*) hazard usually contracted from airborne bat or poultry guano, rarely from ingestion. Types range from asymptomatic to fevers & breathing difficulty. Largely restricted to river valleys in warm temperate to tropics. **Bibl.:** Al-Doory & Rhoades, 1969; Anon, 1968; Anon, 1963, 1973; Barton 1996; Baum 1960; Breisch & Foxman 1974; Elliott 1981; Emmons, 1958; E. et al. 1966; Gordon 1993; Halliday 1949; Huppert 1981; Kabli 1986; Kwon-chung & Bennett 1992; Locklear 1994; Lottenberg et al. 1979; McMurray & Russell 1982; Richards 1975; Sacks & Crockett 1986; Schacklette & Hasenclever 1968; Washburn et al. 1948 Grayston & Furcolow 1953, 1956; Halliday 1959; Riege 1965, 1974; Tesh & Schneidau 1966; Waldspurger 1964; Wisener 1976;

Areas: **AR** (Rocky Comfort C.); **AZ**: Disalvo et al. 1969; Negroni 1965; **FL** (7 caves), **GA** (1 cave); **MO** (Shannon Co.) & Pulaski Co., **OK** (c. near Reed). Bryles & Robinson 1969; Furcolow & Horr 1956; **NM** (Carlsbad, 2 others), **TN** (1 cave), **TX** (5 caves) Al-Doory & Rhoades, 1968; Anon. 1961a; W. Elliott 1978; **WV**: Emmons 1956; Gilleo 1960; Locklear 1994

**history** - Barr 1966, 1966a; Bocking, 1966; Dexter 1966, 1970, 1979, 1984; Grady 1986-7; Hobbs, III & Krantz 1976, 1978; Matthews 1986; Reddell 1976.

Holarctic – Biogeographic area that includes Europe, Asia and North America

Holarctic region or realm – Zoogeographic area of the Arctic, North America, Europe and a large part of Asia.

**Holocene** - The latest division of the Quaternary. It begins about 10,000 years ago, the end of the Ice Age in large parts of Europe and North America.

**holophyly** - When one taxon has completely evolved into a new taxon, leaving no individuals of the original taxon.

**holotype** - The one individual, etc. designated by the author as the type used in describing a new species. An existing holotype establishes the use of the name. Syn.: type specimen.

**homeomorph** - Resemblance between taxon due to convergent evolution, as in attenuation of limbs in cave species.

homoeotic mutation – One in which a structure exists in a series of states, such as the evolution of gills into jaw bone and then into inner ear structures. Syn.: homeotic.

**homeostasis** - The tendency of a biosystem to resist change.

**homeothermic** - Referring to animals that maintain their own constant body temperature.

**homing** - Refers to the return of individuals to their place of birth or origin.

**homosymbiosis** - Symbiosis between individuals of the same species.

**homolog(ue)** - A species or one of its parts with homology.

**homologous** - Referring to traits evolved from a common ancestor.

**homology** - Similarity but not identity between parts or species with differences due to evolutionary divergence.

**homonymy** - Similarity of structures in the same individual.

**homonym** - One of two or more separately published names for the same taxon or identical names from different taxa. The first published name is known as the senior homonym and any later published name as a junior homonym.

**homoplasy** – Possession of >one species of a similar trait that has not been derived by both species from their common ancestor. Causes may be convergence, parallelism, or evolutionary reversal.

## Homoptera

Order of insects of cicadas & allies (hoppers, whiteflies, aphids, scales). Of Subclass Pterygota, Division Neoptera, Subdivision Acercaria, Section Condylgnatha. Name from *homo*, "same]" and *pteron*, "wing," in reference to the more or less uniform thickness of the front wings, unlike the Hemiptera.. Wing venation. Long, coiled, sucking mouthparts for piercing plants and feeding on their juices. Bodies soft or thickened and leathery, sometimes with spines, setae or with a waxy covering. Most species brown or green but some (esp. tropical) brightly colored. Head bent down (except scale insects). Antennae mostly 3-10 segments by some 11-13, bristlelike and mostly short, absent in some female scale insects. Wings folded when at rest. Hind pair of scale insects greatly reduced. Legs often spiny Tarsi with 1-3 trasomeres only. No cercie although basal segment of cicadas modified for making sounds in mating. Cornicles or siphunculi on 5<sup>th</sup> or 6<sup>th</sup> abdominal segment are short, tube-like structures secrete a defensive liquid. They are paurometabolous, with eggs (some ovoviviparous), larvae and adults. Approx. 23,000 species with 6,359 species and 894 genera in US and Canada. **Bibl.:** Goulet & Huber 1993; Krombein et al. 1979. Incl.

### Suborder Auchenorrhyncha (=Cicadinea)

#### Superfamily Cicadoidea

Cicadidae (cicadas) (*Magicicada*; undet. genus  
(2,000 to 3,000 & 9,400 to 10,300 years BP  
in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM)

#### Superfamily Fulgoroidea

Achilidae (achilid planthoppers) Undescribed species and/or genera (CA Tx, Tb or Tp on roots) (*Synecdoche*)

Cixiidae (cixiid planthoppers) (family also put in Hemiptera)  
(*Apache* (now in Derbidae), *Cixius*, *Oliarus*, *Stegocixius*)

Derbidae (derbid planthoppers) (*Apache* (once in Cixidae), *Cedusa*)

Fulgoridae (fulgorid planthopper; lanternflies, flugorids, delphacids)  
(new sp.? in 2 caves in Tuolumne Co., CA/ Tp, Tb)

#### Superfamily Cicadelloidea

Cicadellidae (=Jassidae) (leafhoppers; sharpshooters)  
Subfamily Deltocephalinae (*Exitianus*)

Subfamily Typhlocybinae (*Typhlocyba*,  
Subfamily Xestocephalinae (*Xestocephalus*)

#### Membracidae (treehoppers)

Subfamily Smiliinae  
Tribe Micrutalini (*Micrutalis*)

### Suborder Sternorrhyncha

Superfamily Aphidoidea

Aphididae (aphids and plantlice) (*Prociphilus*, *Rhopalosiphoninus*)

Superfamily Coccoidea

Ortheziidae (ensign scales; root scales) (*Arctorthezia*)

Pseudococcidae (mealy bugs) (*Geococcus*)

**ACHILIDAE** (achilid planthoppers) Undescribed species and/or genera (CA Tx, Tb or Tp on roots) (*Syneccoche*)

**APHIDIDAE** (aphids and plantlice) **Bibl.:** C. Smith & Parron 1978  
(*Prociphilus*, *Rhopalosiphoninus*)

**CICADELLIDAE** (=Jassidae) (leafhoppers; sharpshooters) **Bibl.:** DeLong 1948; Oman 1949  
Subfamily Deltocephalinae (*Exitianus*)  
Subfamily Typhlocybinae (*Typhlocyba*,  
Subfamily Xestocephalinae (*Xestocephalus*)

**CICADIDAE** (cicadas)

(*Magiccicada*; undet. genus (2,000 to 3,000 & 9,400 to 10,300 years BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM)

**CIXIDAE** Spinola, 1839 (cixiid planthoppers) (family also put in Hemiptera) (*Apache* (now in Derbidae), *Cixius*, *Oliarus*, *Stegocixius*)

**DERBIDAE** (derbid planthoppers) (*Apache* (once in Cixidae), *Cedusa*)

**FULGORIDAE** (fulgorid planthopper; lanternflies, flugorids, delphacids)  
(new sp.? in 2 caves & 1 mine in Tuolumne Co., CA/ Tp, Tb/ G1)

**MEMBRACIDAE** (treehoppers) **Bibl.:** Deitz 1975

Subfamily Smiliinae

Tribe Micrutalini (*Micrutalis*)

**ORTHEZIIDAE** Green, 1896 (ensign scales; root scales) **Bibl.:** H. Morrison 1952  
(*Arctorthezia*)

**PSEUDOCOCCIDAE** (mealy bugs) (*Geococcus*)

*Apache* Kirkaldy, 1901 - Derbidae homoptera (once in Cixidae) (2 species in US or Canada)  
*Apache degeeri* (*Otiocerus* g. Kirby, 1821) (widely distributed epigeal/ Tx or Ac in Conecuh Co., KY)

*Arctorthezia* Cockerell, 1902 - Ortheziidae homoptera (3 species in US or Canada)  
*Arctorthezia occidentalis* (*Orthezia o.* Douglas, 1891; *O. californica* Erhorn, 1906) (Tp root feeding in Mt. St. Helens caves (WA) & OR C.(OR)).

*Cedusa* - put in Derbidae,

*Cedusa* Fowler, 1904 (also put in Fulgoroidae) Derbidae homoptera (35 species in US or Canada)

*Cedusa* undet. sp. (Tx? in AR),

*Cixius* Latreille, 1804 (*Vincentia* Uhler, 1895; *Pseudocixius* Caldwell, 1950) - Cixidae homoptera (also put in Hemiptera) (25 species in US or Canada)

*Cixius lochites* = *Stegocixius l.*

*Cixius* undet. sp. (cave in Santa Cruz Co./Tp)

JASSIDAE = Cicadellidae

*Exitianus* Ball, 1929 (= *Mimodrylix* Zachvatkin, 1935) Cicadellidae homoptera, Subfamily Deltocephalinae (3 species in US or Canada)

*Exitianus* undet. sp. (Ac in cave in Irion Co., TX)

*Geococcus* Green, 1902 - Pseudococcidae homoptera (1 species in US or Canada)

*Geococcus coffeae* Green, 1933 (alien in Kauia, Oahu, Maui, HI/ Tx or Ac in Kazumura Lava Tube, HI)

*Magiccada* – Cicadellidae bugs (four species in US & Canada)

*Magiccada* undet. sp. (Edaphic &/or Ac in cave in Walker Co., GA)

*Melanaethus* Uhler, 1876 (= *Lobonotus* Uhler, 1877) - Cydnidae bugs, Subfamily Cydninae (11 species in US or Canada)

*Melanaethus* undet. sp. (9,100 year old fossil in *Neotoma* woodrat midden, Puerto Blanco Mts., Pima Co., sAZ)

*Microtalis* Fowler, 1895 - Membracidae homoptera, Subfamily Smiliinae, Tribe Microtalini (5 species in US or Canada)

*Microtalis* undet. sp. (21,800 years old in *Neotoma* woodrat nest in Ajo Mt., Pima Co, AZ)

*Oliarus* Stal, 1862 (= *Pentastriidius* & *Pentastira* Kirschbau, 1868) - Cixidae homoptera (51 species in US or Canada, endemic to HI but with affinities to NA taxa). **Bibl.** Hoch 1997; Howarth, 1987b; F. Mead 1968

*Oliarus gagnei* Hoch & Howarth, 1999 (\*Ulupalakua Cave #2, east Maui, HI/ Tb/ G1)

*Oliarus kalaupapae* Hoch & Howarth, 1999 (\*\*type locality & 1 other cave (both part of same lava tube system) in Molokai Island, HI/ Tb/ G1)

*Oliarus koanoa* Kirkaldy, 1902 (Tp in HI Island caves)

*Oliarus lorettae* Hoch & Howarth, 1999 (\*\*type locality & one other cave in HI Island, HI/ Loretta Lynn's blind planthopper/ Tb?/G1 or G1G2? HA T&E)

*Oliarus makaiki* Hoch & Howarth, 1999 (\*type locality cave on Hualalai Mt., HI Island, HI/ Tb/ HI Species of Concern, S1S2, global G1 or G1G3 rank) **Bibl.** Howarth, Hoch & Asche, 1987

*Oliarus polyphemus* Fennah, 1973 (type locality cave in HI Volcanoes Natl. Park/ priolan oliarus planthopper/ Tb/ G1G2) **Bibl.** Hoch 1993, 1996; Hoch & Howarth, 1993; Howarth, Hoch & Asche, 1987, 1988, 1990; Wessell & Hoch 1999

*Oliarus priola* Fennah, 1973 (\*?type locality cave in Maui, HI/ Maui blind planthopper/ Tb/ G1 or G1G3 S1S3)

*Oliarus waikau* Hoch & Howarth, 1999 (\*type locality cave in Waikamoli Nature Reserve, East Maui, HI/ Tb/ G1)

*Otiocerus* Kirby, 1821 = *Apache*

*Prociphilus* Koch, 1857 (= *Pulvius* Sanborn, 1904; *Paraprociophilus* Mordvilko, 1923; *Neoparaclctus* Strom, 1942) Aphididae Homoptera (11 species in US or Canada)

*Prociphilus* undet. sp. (Ac in cave? in Travis Co., TX)

*Rhopalosiphoninus* Baker, 1920 - Aphididae Homoptera (5 species in US or Canada)

*Rhopalosiphoninus* *latysiphon* (*Amphorophora* l. Davidson, 1912) (TTx on roots in CA)

*Stegocixius* Kramer, 1983 - Cixidae homoptera (1 species in US or Canada)

*Stegocixius* *lochites* K.1983 (= *Cixius* l.) (root feeding Tx in WA)

*Synecdoche* O'Brien 1971 - Achilidae planthoppers (21 species in US or Canada)

*Synecdoche* *nemoralis* (*Catonia* n. Van Duzee 1916) (Tx? in WA)

*Typhlocyba* Germar, 1833 (= *Empoa* Fitch, 1851; *Anomia* Fleber, 1866; *Edwardsiana* Zachvatkin, 1929; *Eupterycyba* Diabola, 1858; *Ficocyba* Vidano, 1960; *Empoides* Vilbaste, 1968; *Eupterycyba* Kirejtschuk, 1977 (misspelling) Cicadellidae homoptera, Subfamily Typhlocybinae (69 species in US or Canada)

*Typhlocyba* undet. sp. (TTx or Ac on rotting log in cave in Rockcastle Co., KY)

*Xestocephalus* Van Duzee, 1892 (= *Myrmecophryne* Kirkaldy, 1906; *Nesotettix* Lindberg, 1936 (Homo.); *Lindbergana* Metcalf, 1952) Cicadellidae homoptera, Subfamily Xestocephalinae (5 species in US or Canada)

*Xestocephalus* undet. sp. (Ac in cave in Travis co., TX)

**homozygosity** - The same alleles at more or more locations in homologous chromosomal sections.

**horse** - See **mammal, ungulate**

## **Horseshoe Crabs**

Phylum Chelicerata

Class Merostomata

Subclass or Order Xiphosura

Order Xiphosurida

Suborder Limulina

Superfamily Limuloidea

Limulidae (*Limulus*)

*Limulus* – Limulidae horseshoe crabs

*Limulus polyphemus* (Linnaeus, 1758) (horseshoe crabs/ MA, Virginian marine infauna)

**human** - See **mammal, human**

**human impacts** (see also endangered, pollution) - Brandon, 1971; Duchon & Lisowski, 1980; Gamble, 1981; Gardiner, 1971; Hobbs II United States, Army Engineer District, 1973 I, 1995b, 1996a; Simon 1991; Steever 1995

**alien species introductions** –

Dobat 1998; Elliott 1992b, 1993a; Howarth 1985; Reeves 1967, 1974; Veni 1991;

**acidification** - Allison, et al., 1992; Berrill, et al. 1985; Davies, I., 1984, 1989;

Distefano et al., 1991; France, 1984-5a, 1992; France & Graham. 1985; Keenan & Alikhan, 1991; J. Lewis 1995a; Tierney, & Atema, 1986; Uiska et al., 1994

**ammonium nitrate** - Bechler, 1983; Krukilton 1984; Crunkilton 1982;

**chlorination** - Mathews et al 1975, 1977

**climate change** - Poulson 1992

**dam flooding/base level changes** - Craig 1977; Elliott 1979a-b, 1981a; Eraso 1981;

McEachern & Grady 1978; Smyre 1977; W. Elliott 1981; Poulson & Smith 1964; Poulson 1981; United States, Army Engineer District 1973

**entrance modifications** - J. Fry 1996; Hellman 1989

**fish kills** - Streever 1992

**exotics** - Aley 1972b; Aley & Aley 1984a, 1985a; Elliot 1992a; Reeves 1999

**food** - Northup, Hardy & Ingham 1989; Viele 1989; Viele & Studier 1990 ; Trepasso & Kaletsky 1994

**highway construction** - Klawitter 1992;



**lights** - Aley 1972, 1976, 1984, 1985; Aley, Aley & Rhodes 1984; Claus 1963; Maguire 1960-a

**logging** - Hedstrom 1992

**military operations** - Tazik et al. 1992

**overpumping and/or salinization** –

Dudley & Larson, 1976; Longley 1991a, 1992; Dudley & Larson 1976

**oxygen consumption** - Hakenkamp 1997

**restoration** - J.Lewis 1991, 1993a

**traffic** - Carlson 1991, 1994; Crawford & Senger 1988; Northup, Hardy & Ingham 1989; Carlson 1993; Quick 1972

**urbanization** - Reddell 1995; Reddell & Elliot 1995; Russell, K. 1983; Sheps 1971; Pride et al. 1991;

**humate** - organic acids that occur as brown-black coatings on cave ceilings and walls. May result from evaporation of thin films composed of solutions of humic acid in water. The humic acid is probably derived by seepage of an organic accumulation from a swamp or possibly a sinkhole pond. Mammoth and Salts C., KY. **Bibl.** Quinlan and Traverse 1967.

**humidity** (see habitat) - Bull & Mitchell 1970, 1972; Davis, R., & Harris. 1936.

**humins** - Polymeric, structurally varied, dark-colored organics

**humus** - The sum of dead organics in or on the soil. More broadly, the transformations of dead animals, plants and microbes in the soil. Cf. humate, humins, humic acids.

**humification** - All changes in dead organics in or on the soil., especially the formation of humins.

**hybridization** - See reproduction

**hydra, hydroidea & hydrozoa** - See Cnidaria

**hydrobiology** - The study of species who live in water and their ecologic and environmental relationships.

**hydrophytes** - Non-planktonic plants which live in water all their lives.

**Hydrozoa** - A class of **Cnidaria**.

**hygrophilic** - **Type** of terrestrial species adapted to moist conditions, are unable to tolerate dry conditions, & which therefore actively seek out a humid microclimate. Common in caves.

**hygrophytes** - Plants living in permanently damp soils and high humidity.

## Hymenoptera

(wasps, ants and bees) Order of Class **Insecta**, Subclass Pterygota, Division Neoptera, Subdivision Endopterygota (=Holometabola), Section Panorpidia, Superorder Neoptera or Amphiesmenoptera. Name from Greek hymen, “membrane” & pteron, “wing” in reference to the membranous wings of most species. Third largest insect order (after beetles and flies). Soft-bodied, leathery to very hard; shape usually elongate, sometimes compressed, color brown or dark, often with yellow markings. Antennae moderately long (long in some parasites), with 13 segments in the male and 12 in most females (as few as 3 in some parasites). Mandibulate mouthparts but modified tongue for lapping nectar in main pollinators. Two wing pairs with hind one smaller. Distinctive few cross wing veins angled to form closed cells. Many wingless in one or both sexes, especially in social castes. Tarsi with 5 tarsomeres. Legs may be modified for pollination. End of female abdomen modified into an ovipositor, especially in parasites or, in most bees, predatory wasps and some ants, modified into a stinger. Larvae may be caterpillar like but most lack legs. Pupae are in silken or parchmentlike cocoon or naked, either in an isolated cell or, among social species, in constructed cell complexes cared for by workers. Males produced from unfertilized eggs; likely the reason for complex social systems. Complete metamorphosis (holometabolism: egg, larvae, pupae, adults). Most larvae are parasitic, with the abdomen of most adults constricted. Most adults are predators but many are plant feeders or pollinators. About 105,000 species in the world, with 18,000 and 2040 genera in the US and Canada.

**Bibl.:** Goulet & Huber 1993; Krombaine et al. 1979; Poole & Lewis 1996a; Pease & Grzybowski 1991; W. Wilson 1971; **Areas: CT:** Viereck et al. 1916; **World:** Goulet & Huber 1993

Suborder Apocrita (members have a “wasp waist” (narrowly constricted))

Section Terebrantes

Series or Section Parasitica

Superfamily Chalcidoidea

Trichogrammatidae (*Oligosita*)

Superfamily Ichneumonoidea (put in Series Apiformes)

Braconidae - now in Aculeata

Superfamily Proctotrupeoidea

Diapriidae - now in Aculeata

Superfamily Sphecoidea

Sphecidae (sphecid wasps; digger wasps; sand wasps; cicad killers; mud daubers

Undet. genus (740 yrs. old in woodrat nest in Butler Mts., Yuma Co, AZ)

Subfamily Sphecinae

Tribe Sceliphronini (*Chalbion*, *Sceliphron*)

Series Aculeata (sting-bearing)

Superfamily Apoidea (put in Apiformes)

Series Apiformes

Superfamily Apoidea (also put in Series Aculeata)

Andrenidae (andrenid bees)

Subfamily Panurginae (*Perdita*)

Apidae (bumble bees and honey bees; bumble bees; euglossine(s); honeybees;  
stingless bees) (*Apis*)

Superfamily Ichneumonoidea (sawflies) (once in Series Parasitica)

Braconidae (=Aphidiidae) (braconid sawflies; braconids) **Bibl.:** Wharton et al. 1997

Subfamily Alysiinae

Subfamily Alysiinae

Tribe Alysiini (*Aspilota*, *Phaenocarpa*)

Ichneumonidae (=Paxylommatidae) (Ichneumon wasps)

Subfamily Ichneumoninae

Tribe Alomyini (*Heterischnus*)

Tribe Ichneumonini

Subtribe Amblytelina (*Diphysus*)

Subtribe Gyrodontina (*Melanichneumon*)

Superfamily Proctotrupeoidea (also put in Parasitica)

Diapriidae (undet. genus in Tulare Co., CA)

Scelionidae

Subfamily Scelioninae (*Baeus*)

Superfamily Scolioidea

Formicidae (put in Vespoidea)

Mutillidae (velvet ants) Undet. Genus (9.400-10.3 K years BP in *Neotoma* woodrat  
nest in wTX (El Paso Co.) or sNM))

Superfamily Vespoidea

Formicidae (once put in Formicoidea & Scolioidea) (ants)

Subfamily Dolichoderinae

Tribe Tapinomini (*Liometopium*, *Tapinoma*)

Subfamily Dorylinae

Tribe Ecitonini (also put in own subfamily) (*Labidus*, *Neivamyrmex*)

Subfamily Ecitoninae (*Labidus*, *Neivamyrmex*) (subsumed as tribe in Dorylinae))

Subfamily Formicinae

Tribe Camponotini (*Camponotos*)

Tribe Formicini (*Formica*)  
Tribe Lasiini (*Lasius*, *Prenolepis*),

Subfamily Myrmicinae (*Novomessor*, *Pachycondyla*,)  
Tribe Attini (*Acromyrmex*, *Atta*, *Trachymyrmex*)  
Tribe Crematogastrini (*Crematogaster*)

Tribe Leptochoracini (*Leptothorax*)  
Tribe Myrmecini (*Myrmicina*)  
Tribe Myrmicini (*Myrmica*, *Pogonomyrmex*)

Tribe Pheidolini (*Aphaenogaster*, *Pheidole*)  
Tribe Solenopsidini (*Monomorium* *Oligomyrmex*, *Solenopsis*,)

Subfamily Ponerinae  
Tribe Ectatommini (*Proceratium*)  
Tribe Odontomachini (*Odontomachus*)  
Tribe Ponerini (*Hypoponera*, *Leptogenys*)

Pompilidae (spider wasps)  
Subfamily Pepsinae  
Tribe Ageniellini (*Ageniella*)  
Tribe Pepsini (*Pepsis*)

Subfamily Pompilinae  
Tribe Pompilini (*Agenioideus*, *Anoplius*)

**ANDRENIDAE** (andrenid bees) Hymenoptera of Superfamily Apoidea  
Subfamily Panurginae (*Perdita*)

**APIDAE**  
(bumble bees and honey bees; bumble bees; euglossine(s); honeybees; stingless bees) (*Apis*)

**BRACONIDAE** (=Aphidiidae) (braconid sawflies; braconids) **Bibl.:** Wharton et al. 1997  
Subfamily Alysini: Subfamily Alysini  
Tribe Alysini (*Aspilota*, *Phaenocarpa*)

Subfamily Microgastrinae  
Tribe Microgastrini (*Apanteles*)

**DIAPRIIDAE** (also put in Diaprioidea) (undet. genus in Tulare Co.,CA)

**FORMICIDAE** (ants)  
Mostly Ac near entrances & aliens deep in show caves. **Bibl.:** Bolton, 1995; Holldobler & E.O. Wilson 1990; Iwata 1976; Trager 1988; **Areas:** NA Creighton 1950; Krombein et al. 1979; **TX:** Cockendolpher & Francke, 1990; US: M. Smith 1943, 1947

Dolichoderinae

Tribe Tapinomini (*Liometopium*, *Tapinoma*)

Dorylinae

Tribe Ecitonini (also put in own subfamily) (*Labidus*, *Neivamyrmex*)

Ecitoninae (*Labidus*, *Neivamyrmex*) (subsumed as tribe in Dorylinae))

Formicinae

Tribe Camponotini (*Camponotus*)

Tribe Formicini (*Formica*)

Tribe Lasini (*Lasius*, *Prenolepis*),

Myrmicinae (*Novomessor*, *Pachycondyla*,)

Tribe Attini (*Acromyrmex*, *Atta*, *Trachymyrmex*)

Tribe Crematogastrini (*Crematogaster*)

Tribe Leptochoracini (*Leptothorax*)

Tribe Myrmecini (*Myrmica*)

Tribe Myrmicini (*Myrmica*, *Pogonomyrmex*)

Tribe Pheidolini (*Aphaenogaster*, *Pheidole*)

Tribe Solenopsidini (*Monomorium* *Oligomyrmex*, *Solenopsis*,)

Ponerinae

Tribe Ectatommini (*Proceratium*)

Tribe Odontomachini (*Odontomachus*)

Tribe Ponerini (*Hypoponera*, *Leptogenys*)

**ICHNEUMONIDAE** (=Paxylomatidae) (Ichneumon wasps) of Superfamily Ichneumonoidea .

**Bibl.:** Gupta 1988; Spradbery 1973; Townes 1944-5.

Subfamily Ichneumoninae

Tribe Alomyini (*Heterischnus*)

Tribe Ichneumonini

Subtribe Amblytelina (*Diphysus*)

Subtribe Gyrodontina (*Melanichneumon*)

**MUTILLIDAE** (velvet ants) Undet. Genus (9,400 to 10,300 years BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM))

**POMPILIDAE** (spider wasps) hymenoptera wasps of Superfamily Vespoidea

Subfamily Pepsinae

Tribe Ageniellini (*Ageniella*)

Tribe Pepsini (*Pepsis*)

Subfamily Pompilinae

Tribe Pompilini (*Agenioideus*, *Anoplius*)

**SCELIONIDAE** (scelionid wasps; scelionids)

Subfamily Scelioninae (*Baeus*)

**SPHECIDAE** (sphecid wasps; digger wasps; sand wasps; cicad killers; mud daubers)

**Bibl.:** Bohart & Menke 1976

Undet. genus (740 years old in *Neotoma* woodrat nest in Butler Mts., Yuma Co., AZ)

Subfamily Sphecinae

Tribe Sceliphronini (*Chalbion*, *Sceliphron*)

**TRICHOGRAMMATIDAE** (trichogrammatid wasps; trichogrammatids) hymenoptera wasps of superfamily Chalcidoidea (*Oligosita*)

*Acromyrmex* Mayr, 1865 - Formicidae hymenoptera, Subfamily Myrmicinae?, Tribe Attini (2 species in US or Canada)

*Acromyrmex versicolor* (*Atta* v. Pergande, 1893) (epigeal in AL, CA, Mex./ fossil in *Neotoma* woodrat midden, Puerto Blanco Mts., Pima Co., sAZ; 10,800 & 8,970 years old in *Neotoma* woodrat nest in Tinajas Mts., Yuma Co, AZ)

*Ageniella* Banks, 1917- Pompilidae hymenoptera wasps, Subfamily Pepsinae, Tribe Ageniellini (38 species in US or Canada)

*Ageniella* (*Ageniella*) *evansi* Townes, 1957 (AZ, NM, Mex. epigeal/Tx in AZ)

*Agenioideus* Ashmead, 1902 (*Aaporioideus* Ashmead, 1902; *Ridestus* Banks, 1912; *Gymnochaeres* Banks, 1917) Pompilidae hymenoptera wasps, Subfamily Pompilinae, Tribe Pompilini (3 species in US or Canada)

*Agenioideus humilis* (*Pompilus h.* Cresson, 1867) (NB, BC to FL, CA s.to Panama/ Ac in cave in Travis Co., TX)

*Anoplius* Dufour, 1834 - Pompilidae hymenoptera wasps, Subfamily Pompilinae, Tribe Pompilini (36 species in US or Canada)

*Anoplius* (*Notiochaeres*) *amethystinus a.* (*Sphex a.* Fabricius, 1793) sFL, AZ, CA s. to Panama/Ac in Devil's Sinkhole, Edwards Co., TX)

*Anoplius* (*N.*) *lepidus atromentarius* (*Pompilus a.* Dahlbom, 1843)) (sNew England, OH, NB to FL, Mex./Ac in cave in Edwards Co., TX)

*Anoplius* undet. sp. (Ac in cave in Irion Co., TX)

*Apanteles* Forster, 1862 (= *Pseudapanteles*, *Urogaster* Ashmead, 1898; *Xestapanteles* Cameron, 1910; *Stenopelura* Viereck, 1911; *Allapantales* Brethes, 1915) Braconidae hymenoptera, Subfamily Alysiinae, Tribe Microgastrini (65 species in US or Canada)

**Apanteles** undet. sp. (TTx in nests of *Hirundo fulva* in Edwards Co.; Tx in Uvalde Co.; Ac? in CO)

**Aphaenogaster** Mayer, 1853 (*Deromyrma* Forel, 1913; *Planimyрма* Viehmeyer, 1914; *Attomyrma*, *Novomessor* Emery, 1915; *Nystalomyrma* Wheeler, 1916) (spine-waisted ants) Formicidae hymenoptera, Subfamily Myrmicinae, Tribe Pheidolini (30 species in US or Canada)

**Aphaenogaster** *boulderensis* Smith, 1941 (epigeal NV, TX?, AZ/ 1,200 years old in *Neotoma* woodrat nest in Ajo Mt., Pima Co, AZ)

**Aphaenogaster** *texana* t. Wheeler, 1915 (*Stenamma* t. Emery, 1895 (Unav.); *A. furvescens*, *carolinensis* Wheeler, 1915; *A. nana* W., 1932; *A. silvestrii* Menozzi, 1919; *A. punctithorax* Cole, 1938) Emery (NC, TN, s.to FL, w. to KS, AZ/ TTx in cave in Brewster Co., TX)

**Aphaenogaster** undet. sp. (TTx in cave in Coryell Co., TX/ 2,000 to 3,000 & >26,000 years BP in *Neotoma* woodrat nest in scNM; 21,800 to 9,600 years old in *Neotoma* woodrat nest in Ajo Mt., Pima Co, AZ)

**Apis** Linnaeus, 1758 (*Apicula* R., 1814; *Apiarus* Rafinesque, 1815; *Mellifera* L., 1758) Apidae hymenoptera, Subfamily Apinae, Tribe Apini (1 species in US or Canada)

**Apis** *mellifera* L.1758 (honey bee) (worldwide, introduced into Western Hemisphere/TTx in Edwards, Kinney Cos., TX)

**Apis** undet. sp. (Tx or Ac in CA)

**Aspilota** Forster, 1862 (*Dipiesta*, *Panerema*, *Spanomeris* F.1862; *Scotioneurus* Provancher, 1886) Braconidae hymenoptera, Subfamily Alysiinae, Tribe Alysiini (53 species in US or Canada)

**Aspilota** undet. sp. or species (Tx in AL (parasite of *Megaselia cavernicola* fly) & sON; Tp or Tx in GA (parasite of *Megaselia spelunciphila* fly))

**Atta** Fabricius, 1804 (*Oecodoma* Latreille, 1818; *Archeata*, *Neoatta* Goncalves, 1942; *Palaeatta*, *Epiatta* Borgmeier, 1950) Formicidae hymenoptera, Subfamily Myrmicinae, Subfamily Attini (2 species in US or Canada)

**Atta** *texana* (*Myrmica* t. Buckley, 1860) (LA,e.Mex./Ac in Bandera, Bexar Cos., TX)

**Baeus** Haliday, 1833 (= *Hyperbaeus* Foerster, 1856; *Psilobaeus* Kieffer, 1926) Scelionidae hymenoptera wasps, Subfamily Scelioninae (7 species in US or Canada)

**Baeus** undet. sp. (Ac in Persimon Sink, Burnet Co., TX)

**Belyta** Jurine, 1807 (B. Haliday, 1857 (emend.); *Tetrapsilus*, Kieffer, 1908; *Paraclista* K.1909; *Neobelyta* Hellen, 1964; *Balyta* Ashmead, 1893 (missp.) Diapriidae hymenoptera of Subfamily Belytinae (31 species in US or Canada)

**Belyta** undet. sp. (sON/Tx or Ac)

**Camponotus** Mayr, 1861; (= *Colobopsis* Mayr, 1861; *Tanaemyrmex* Ashmead, 1905; *Myrmoturba*, *Myrmothrix*, *Myrmetoma*, *Myrmobrachys* Forel, 1912; *Myrmaphaenus*, *Paracolobopsis* Emery, 1920; *Neomyrmamblys* Wheeler, 1921) Formicidae hymenoptera ants, Subfamily Formicinae, Tribe Camponotini (48 species in US or Canada)

**Camponotus** (*Myrmentoma*) *decipiens* Emery, 1893 (= *C. Rasilis* Wheeler, 1910; *C. nearcticus* Emery; *C. marginatus* var. *d.* Emery, 1893) (Ac in cave in Burnet Co., TX)

**Camponotus** *festinatus* (*Formica* f. Buckley, 1866; *C. pubicornis* Emery, 1893; *C. fragilis* Pergande, 1893; *C. spurcus* Wheeler, 1910) (Ac in cave in Sutton Co., TX)

**Camponotus** (*Myrmentoma*) *nearcticus* Emery, 1893 (= *Formica americana* Buckley, 1866 (Homo.); *C. minutus* E., 1893; *C. pardus*, *tanquaryi* Wheeler, 1910) (ON s.to FL, w.to ND, CO, BC s.to ID, CA/Ac in cave in Bexar Co., TX)

**Camponotus** (*Tanaemyrmex*) *semitestaceus* Emery, 1893 (*F. americana* B., 1866 (homo.); *C. minutus* E. 1893; *C. pardus*, *tanquaryi* W. 1910) (OK, TX w.to WA, OR, CA, Mex./ TTx in cave in Williamson Co., TX)

**Camponotus** (*Tanaemyrmex*) *sansabeanus* s. (F.s. Buckley, 1866; *C. bulimosus*, *torrefactus* W. 1910) (AR, LA w.to CO, UT, AZ, sCA/ Ac in Hays, Williamson Cos., TX)

**Camponotus** undet. sp. or species (Ac in cave in Coryell Co., TX; (fossil in *Neotoma* woodrat midden, Puerto Blanco Mts., Pima Co., sAZ & 9,120+- 500 years old in scNM))

**Camponotus** (*C.*) *texanus* Wheeler, 1903 (TX/Ac in Bexar Co., TX)

**Chalybion** Dahlbom, 1843 Sphecidae hymenoptera wasps, Subfamily Sphecinae, Tribe Sceliphronini (2 species in US or Canada)

**Chalybion** undet. sp. (Tx mud dauber wasp in AZ)

**Crematogaster** Lund, 1831 - Formicidae hymenoptera ants, Subfamily Myrmicinae, Tribe Crematogastrini (31 species in US or Canada)

**Crematogaster** (*C.*) *laeviuscula* Mayr, 1870 (LA, OK, TX, Mex. epigeal/ Ttx in Bexar, Edwards, Travis Cos., TX)

**Crematogaster** (*Acrocoelia*) undet. sp. (Epigeal in West /Ac in cave in Hardeman Co., TX)

**Crematogaster** undet. sp. or species (TTx in Edwards, Sutton, Travis, Williamson Cos., TX; 9,700 year old fossil in *Neotoma* woodrat midden, Puerto Blanco Mts., Pima Co., sAZ; 32,000 to 8,100 years old in *Neotoma* woodrat nest in Ajo Mt., Pima Co, AZ )



**Diphysus** Kriechbaumer, 1890 (= *Diphyses* K., 1890 Missp.; *Pseudamblyteles* Ashmead, 1900; *Physocoteles* Berthoumieu, 1904; *Antelca* Morley, 1914; *Aethiopischnus* Heinrich; *Posocentrus* Provancher, 1875; *Rhexidermus* Forster, 1868) Ichneumonidae hymenoptera wasps of Subfamily Ichneumoninae, Tribe Ichneumonini, Subtribe Amblytelina (30 species in US or Canada)

**Diphysus** undet. sp. (TTx winter hibernation in KY)

*Eciton* = *Labidus*

**Formica** Linnaeus, 1758 (= *Serviformica*, *Raptiformica* Forel, 1913; *Neoformica* Wheeler, 1913; *Coptoformica* Mueller, 1923; *Adformica* Lomnicki, 1925) Formicidae hymenoptera ants, Subfamily Formicinae, Tribe Formicini (97 species in US or Canada)

**Formica** *fusca* L., 1758 (*F. alpicola* Gredler, 1858; *F. cinereoides* Forel, 1874 (Unav.); *F. cinereofuscoides* F, 1892 (Unav.); *F. marcida* Wheeler, 1913; *F. 3333tombeuri* Bondroit, 1917; *F. maura* Santschi, 1929; *F. fuscolemani* Samsinak, 1951; *F. hyrcana* Arnoldi, 1968) (nCanada to nMex., CA, IL, NC, W/ fuscous or silky ant/TTx or Ac in woodrat nest, NWT)

**Formica** *lasioides* Emery, 1893. (epigean NS, PQ, w. to BC., s. to MA, MI, SD, CO, NM, AZ, CA/ Ac or Tx in Vancouver Island, BC)

**Formica** *moki* Wheeler, 1906 (*F. occidua* Wheeler, 1912 (Unav.), 1913 (Syn.)) (SW/Ac or Tx in CA)

**Formica** undet. sp. or species (Ac in cave in Hardeman Co., TX (*fusca* group); remains in *Neotoma* woodrat midden in Canyonlands, UT; 2,000 year old remains in entrance pit in Rat's Nest Cave, AB; 6,400 to 7,800 years BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM)

**Heterischnus** Wesmael, 1859 (ichneumons or ichneumon s) Ichneumonidae hymenoptera wasps of Subfamily Ichneumoninae, Tribe Alomyini (2 species in US or Canada)

**Heterischnus** *huardi* h. (*Posocentrus* h. Provancher, 1875) (PQ s. to NY, w.to AK, OR/ Tx or Ac in sON)

**Hypoponera** Santschi, 1938 Formicidae hymenoptera ants, subfamily Ponerinae, Tribe Ponerini (5 species in US or Canada)

**Hypoponera** *opacior* (*Ponera* o. Forel, 1893; *P. chilensis* F.1914) (West Indies, CO, VA s.to FL, CA to Chile/ Ttx in Bexar, Hays, Uvalde Cos., TX)

**Hypoponera** undet. sp. (TTx in Travis, Williamson Cos., TX)

**Labidus** Jurine, 1807 (*Nycteresia* Roger, 1861; *Pseudodictyhadia* Andre, 1855) Formicidae hymenoptera ants, Subfamily Dorylinae, Tribe Ecitonini (once in Ecitoninae) (1 species in US or Canada)

**Labidus** *coecus* (= *Formica c.* Latreille, 1802) (AR to LA, w. to TX & Mex., n. to OK epigeal/  
Tx in TX)

**Lasius** Fabricius, 1805 (= *Chthonolasius* Ruzsky, 1913; *Donisthorpea* Morice & Durrant, 1914;  
*Cautolasius* Wilson, 1955) Formicidae hymenoptera ants, Subfamily Formicinae, Tribe Lasiini  
(17 species in US or Canada)

**Lasius** *pallitarsis* (*Formica p.* Provancher, 1881; *L. sitkaensis* Pergande, 1900) (Canada, n.US/  
Tx or Ac in OR; TTx in WA)

**Leptogenys** Roger, 1861 (= *Lobopelta* Mayr, 1862; *Dorylozelus* Forel, 1915; *Microbolbos*  
*Donisthorpe*, 1948) Formicidae hymenoptera ants, Subfamily Ponerinae, Tribe Ponerini (6  
species in US or Canada)

**Leptogenys** (L.) *e. elongata* (*Ponera e. & texana* Buckley, 1866; *Lobopelta septentrionalis*  
Mayr, 1866) (LA/TTx in TX)

**Leptothorax** Mayr, 1855 (= *Dichothorax*, *Goniothorax* Emery, 1896; *Mychothorax* Ruzsky,  
1904; *Nesomyrmex* Wheeler, 1910; *Caulomyrma* Forel, 1914; *Limnomyrmex* Arnold, 1948;  
*Myrafant* Smith, 1950; *Macromischa* Roger, 1863) Formicidae hymenoptera, Subfamily  
Myrmicinae, Tribe Leptochoracini 6 species in US or Canada)

**Leptothorax** *nevadensis* n. Wheeler, 1903 (*L. edoradensis* W., 1915; *L. uvicensis* Blacker, 1992)  
(OR, WA, CA epigeal /Tx or Ac in OR; Ac in WA)

**Leptothorax** undet. sp. (Ac in cave in Coryell Co., TX)

**Liometopum** Mayr, 1861 - Formicidae hymenoptera, Subfamily Dolichoderinae, Tribe  
Tapinomini (3 species in US or Canada)

**Liometopum** *apiculatum*, 1870 Mayr (SW,nMex./Ac in cave in Brewster Co., TX)

**Liometopum** undet. sp. or species (Ac or Tx in CA; 14,500 years old in *Neotoma* woodrat nest in  
Ajo Mt., Pima Co, AZ ),

**Melanichneumon** Thomson, 1893 - Ichneumonidae hymenoptera wasps of Subfamily  
Ichneumoninae, Tribe Ichneumonini, Subtribe Gyrodontina (20 species in US or Canada)

**Melanichneumon** undet. sp. (Ac in cave in Uvalde Co., TX)

**Monomorium** Mayr, 1855 - Formicidae hymenoptera, Subfamily Myrmicinae, Tribe  
Solenopsidini (7 species in US or Canada)

**Monomorium** *minimum* (*Myrmica m.* Buckley, 1867; *M. atra* B.1867; *Mono. emersoni* Gregg,  
1945; *M. metoecus* Brown & Wilson, 1957) (PQ, ON, s. to FL, w. to MT, CA, Mex./ Ttx in San  
Saba, Travis, Williamson Cos., TX/ little black ant)

**Monomorium** undet.sp. (Ttx in Pima Co.,AZ)

**Myrmecina** Curtis, 1829 - Formicidae hymenoptera, Subfamily Myrmicinae, Tribe Myrmecini (1 species in US & Canada)

**Myrmecina americana** (*M. latreillei* ssp. *a.* Emery, 1895) (PQ, ON w. to MT, CO, CA, Mex./ Ac in Travis Co., TX; Tx in GA (Dade Co.))

**Myrmica** Latreille, 1804 - Formicidae ants in Subfamily Myrmicinae, Tribe Myrmicini (22 species in US or Canada)

**Myrmica** undet. sp. (2,000 year old remains in entrance pit in AB cave)

**Neivamyrmex** Borgmeier, 1940 (*Acamatus* Emery, 1894 (homo.); *Woitkowskia* Enzmann, 1952) Formicidae hymenoptera ants, Subfamily Dorylinae, Tribe Ecitonini (once in Ecitoninae) (24 species in US or Canada)

**Neivamyrmex fallax** Borgmeier, 1953 (LA, KS, NM, nMex, AZ, Guatemala epigeal /Ac in cave in Travis Co., TX)

**Neivamyrmex nigrescens** (*Labidus n.* Cresson, 1872) (epigeal WV, KS, VA, TN, CA, AL, MS, IL, IA, MO, AR, NB, KS, OK, TX, CO, NM, AZ, CA, Mex./ fossil in *Neotoma* woodrat midden, Puerto Blanco Mts., Pima Co., sAZ)

**Novomessor** Emery, 1915 Formicidae hymenoptera, Subfamily Myrmicinae

**Novomessor** undet. sp. (fossil in *Neotoma* woodrat midden, Puerto Blanco Mts., Pima Co., sAZ)

**Odontomachus** Latreille, 1804 - Formicidae hymenoptera ants, Subfamily Ponerinae, Tribe Odontomachini (4 species in US or Canada)

**Odontomachus clarus** Roger, 1861 (= *O. texana* Buckley, 1867; *O. coninodis, desertorum* Wheeler, 1915; *O. clarionensis* W., 1934) (LA, Mex, West Indies/Ac in Platypus Pit, Bexar Co., TX)

**Oligosita** Walker, 1851 (*Westwoodella* Ashmead, 1904; *Paroligosita* Kurdjumov, 1911; *Pseudoligosita* Girault, 1913; *Zorontogramma* Silvestri, 1915) Trichogrammatidae hymenoptera wasps (7 species in US or Canada)

**Oligosita** undet. sp. (Ac in cave in Irion Co., TX)

**Oligomyrmex** Mayr, 1867 - Formicidae hymenoptera ants, Subfamily Myrmicinae, Tribe Solenopsidini (1 species in US or Canada)

**Oligomyrmex longii** (*Erebomyrma l.* Wheeler, 1903) (OK, TX/Ac in cave in Coryell Co., TX)

**Pachycondyla** Smith, 1858 (= *Neoponera*, *Brachyponera* Emery, 1901; *Trachymesopus* E. 1911) Formicidae hymenoptera ants, Subfamily Ponerinae (4 species in US or Canada)

**Pachycondyla harpax** (*Formica h.* Fabricius, 1804)

**Pachycondyla** *harpax montezumia* (P.m. F. Smith, 1858) (LA s. to Brazil, West Indies/ Ac in cave in Medina Co., TX)

**Paratrechina** Motschulsky, 1863 (*Nylanderia* Emery, 1906) (crazy ants) Formicidae  
Hymenoptera ants, Subfamily Formicinae (15 species in US or Canada)

**Paratrechina** *terricola* (*Formica t.* Buckley, 1866; *Prenolepis melanderi* Wheeler, 1903; *P. vividual v.*) (*Formica v.v.* Nylander, 1846) (FL, MS introduced in greenhouses n. to Canada/ TTx in cave in Bexar Co., TX)

**Paratrechina** undescr. sp. (TTx in Travis, Williamson Cos., TX)

**Paratrechina** undet. sp. (TTx in cave in Kinney Co., TX)

**Pepsis** Fabricius, 1804 (*Gigantopepsis* Lucas, 1919; *Stenopepsis*, *Dinopepsis* Banks, 1945)  
Pompilidae hymenoptera wasps, Subfamily Pepsinae, Tribe Pepsini (18 species in US or Canada)

**Pepsis** undet. sp. (Ac in cave in Collingsworth Co., TX)

**Perdita** Smith, 1853 - Andrenidae hymenoptera, Subfamily Panurginae (607 species in US or Canada)

**Perdita** undet. sp. (Ac in mine in Presidio Co., TX)

**Phaenocarpa** Forster, 1862 - Braconidae hymenoptera, Subfamily Alysiinae, Tribe Alysiini (76 species in US or Canada)

**Phaenocarpa** undescr. sp.? (Tx? in cave in KY)

**Pheidole** Westwood, 1841 - - Formicidae hymenoptera ants, Subfamily Myrmicinae (68 species in US or Canada)

**Pheidole** *dentata* Mayr, 1886 (VA to FL, w.to IL, KS/ Ac in Bexar Co., TX)

**Pheidole** undet. sp. or species (Ac in TX; 9,700 year old fossil in *Neotoma* woodrat midden, Puerto Blanco Mts., Pima Co., sAZ; 11,250 to 9,900 years old in *Neotoma* woodrat nest in Tinajas & Butler Mts., Yuma Co, AZ; 8,600 to 1,200 years old in *Neotoma* woodrat nest in Ajo Mt., Pima Co, AZ; 2,000 to 3,000 & 18,000 to 19,700 years BP in *Neotoma* woodrat nest in scNM)

**Pogonomyrmex** Mayr, 1868 (harvester ants) Formicidae hymenoptera, Subfamily Myrmicinae, Tribe Myrmicini (22 species in US or Canada)

**Pogonomyrmex** (*P.*) *barbatus* (*Myrmica barbata* F. Smith, 1858; *M. molefaciens* Buckley, 1860; *P. nigrescens* Wheeler, 1902) (eAR, eLA, s., wKS, l OK, eCO, s., cNM, AZ, NV, Mex./ Texan or red harvester ant; Texan agricultural ant/ Ac in Edwards, Williamson Cos., TX)

**Pogonomyrmex** (*P.*) *comanche* Wheeler, 1902 (AR, wLA, sKS, OK, eTX, SW epigeal/ Ac in cave in Travis Co., TX)

**Pogonomyrmex** undet. sp. (fossil in *Neotoma* woodrat midden, Puerto Blanco Mts., Pima Co., sAZ)

*Posocentrus huardi* h. = *Heterischnus* h.

**Prenolepis** Mayr, 1861 - - Formicidae hymenoptera ants, Subfamily Formicinae, Tribe Lasiini (3 species in US or Canada)

**Prenolepis** *imparisi* (*Formica* i. Say, 1836; *P. americana* Forel, 1891; *P. arizonica*, *Pumila californica*, *coloradensis*, *colimana*, *veracruzensis* Wheeler, 1930; *F. wichita* Buckley, 1866; *T. polita* Smith, 1855) (epigeal CT, ON, s. to FL, w. to WI, CA, MO, OK, TX, NM, AZ/ Ac or Tx in CA)

**Proceratium** Rogers, 1863 (= *Sysphingta* R. 1863; *Sysphincta* Mayr, 1865) Formicidae hymenoptera ants, Subfamily Ponerinae, Tribe Ectatommini (5 species in US or Canada)

**Proceratium** *compitale* Ward, 1988 (Tp? in Val Verde, Sutton, Terrell, Uvalde Cos., TX + Cueva de los Lagos, Coahuila, Mexico)

**Proceratium** *pergandei* (*Sysphincta* p. Emery, 1895) (MA to FL, w. to IA, AR, LA/Tp? in cave/sinkhole in Val Verde Co., TX)

*Pseudamblyteles* = *Diphysis*

**Sceliphron** Klug, 1801 (= *Pelopoeus* Latreille, 1803) Sphecidae hymenoptera wasps, Subfamily Sphecinae, Tribe Sceliphronini (2 species in US or Canada)

**Sceliphron** undet. sp. (Tx mud dauber wasp in AZ)

**Solenopsis** Westwood, 1841 (*Diplorhoptrum* Mayr, 1855; *Synsolenopsis* Forel, 1918; *Diagyne*, *Lebauchena* Santschi, 1930; *Euophthalma*, *Oedaleocerus* Creighton, 1930; *Bisolenopsis* Kusnezov, 1953; *Lilidris*, *Granisolenopsis* Kusnezov, 1957) Formicidae hymenoptera, Subfamily Myrmicinae, Tribe Solenopsidini (18 species in US or Canada)

**Solenopsis** *aurea* Wheeler, 1906 (fossil in *Neotoma* woodrat midden, Puerto Blanco Mts., Pima Co., sAZ; 32,000, 13,500 & 1,200 years old in *Neotoma* woodrat nest in Ajo Mt., Pima Co, AZ)

**Solenopsis** (*S.*) *geminata* McCook (*Atta* m. Fabricius, 1804) (SC s. to FL, w. to TX, sCA, Mex, s. to Peru, West Indies/Tx(?extirpated) in Bexar, Williamson Cos., TX/ fire ant)

**Solenopsis** (*S.*) *wagneri* Santschi, 1916 (= *P. invicta* Buren, 1972; *P. invicta* Smith, 1979 (emend.) (red imported fire ant) (AL, FL, LA, MS, TX epigeal /Tx alien threat in FL, TX) Elliott, 1992c, 1993

**Solenopsis** (*S.*) *xyloni* McCook, 1879 (*Myrmica sabeana* Buckley, 1867; *S. maniosa* Wheeler, 1915) (NC s. to FL, w. to CO, CA, Mex./Ac or Tx in CA), (Tx(?extirpated) in Bexar, Val Verde, Williamson Cos., TX/ southern fire ant)

***Solenopsis*** undet. sp. (Tx or Ac in nMS)

***Tapinoma*** Forster, 1850 (= *Micromyrma* Dufour, 1857; *Tapinoptera* Santschi, 1925) Formicidae hymenoptera, Subfamily Dolichoderinae, Tribe Tapinomini (3 species in US or Canada)

***Tapinoma*** *sessile* (*Formica* s. Say, 1836; *F. gracilis* & *parva* Buckley, 1866; *T. boreale* Roger, 1863; *Bothriomyrmex dimmocki* Wheeler, 1915) (NS,PQ,s. toFL, w. to WA,CA,Mex./ odorous house ant/ Tx or Ac in CA)

***Trachymyrmex*** Forrel, 1893 - Formicidae hymenoptera ant, Subfamily Myrmicinae, Subfamily Attini (8 species in US or Canada)

***Trachymyrmex arizonensis*** (*Atta* a. Wheeler, 1907) (AZ epigeal/ 29,100, 13,500-8,600 & 1,200 years old in *Neotoma* woodrat nest in Ajo Mt., Pima Co, AZ)

**hyperparasitic** - Parasitic on a parasite. Syn.: secondary parasites; 2<sup>nd</sup> degree parasites

**hypocrenon** - The short part of a stream flowing directly from the spring. Syn.: springbrook.

**hypogean** - Adj. for subsurface environments, including the soil, rocks & any air- or water-filled spaces within them. In the case of any body of water (salt, fresh, or frozen) open to the sky, the hypogean realm begins at the top of whatever medium lies underneath the water mass. Cf. epigeal. **Incl. endogena** (incl. eudaphophile), **upper** (Syn: interstitial), & **lower** (Syn: cavernicoles). **Bibl.** (used in title) - Bartkowiak et al. 1991; Bechler 1977, 1981a, 1981b, 1985; Bechler, David & Fernandex 1981; Bosnak 1984; Bousfield & Holsinger 1989; Caine 1978; Clamp 1990; Goodnight & G. 1981; Hobbs, Jr. & Franz 1986; H. & Hart 1966; Kuschel 1991; Owen 1995; Proudlove 1997.

**hyponeuston** - Refers to species who live just below the air/water interface of a water body.

**hyporheic** - Area inhabited by **phreatobia** under & alongside streams & rivers. Dominated by midges (see **Diptera**), elmid **beetles**, **mites**, **cladocerans**, **ostracodes**, **amphipods**, **rotifers**, **snails**, **tardigrades**, **bacteria**, **protists**, **stoneflies**, **mayflies**, **caddisflies**, and **worms**. Different chemically & fauna wise from groundwater in epigeal areas & areas below & bordering the hyporheic zone. May extend up to 2 km from rivers, as in the case of the Flathead River in MT. Fauna usually abundant in streams unless the substratum is bedrock or where pore size is less than 50 microns.. Syn.: hyporheon. **Bibl.:** J. Anderson & Meadows 1969; Ferrington & Goldhammer 1992; ; **AL:** Hakenkamp 1997; **AZ:** Boulton et al. 1992; Boulton & Stanley 1996; D. Busch & Fisher 1981; S. Fisher et al. 1982; L. Gray 1980; L. Gray & Fisher 1981; Grimm 1987; Grimm & Fisher 1984, 1986, 1989; Grim, Fisher and Minckley 1981; Stanley & Fisher 1992; Stanley & Valett 1992; **CA:** Jackman et al. 1984; Triska et al., 1989; **CO:** J. Ward & Voelz 1994; J. Ward, Voelz & Harvey 1989; **IL:** L. Robinson et al, 1967; **KS:** Ferrington 1987; Goldhammer & Ferrington 1992; Rensner & Distler 1992; **MD:** Tarshish & Stult 1970; **MI:** Hendricks 1992; Hendricks & White 1991; D. White 1990-1; D. White, Elzinga & Hendricks 1987; **MN:** Triska, Avanzino et al. 1994; Triska, Duff & Jackman 1996; Triska, Duff & Avanzino 1990, 1993, 1995; Triska, Jackman et al. 1994, 1997-8; **MT:** Ellis, Stanford & Ward

1998; Stanford & Gaufin 1974; Stanford & Ward 1993; Stanford, Ward & Ellis 1994; **NM**: D. Carr 1989; **NY**: Strayer & Bannon-O'Connell 1988,1992; **NM?**: Morrice 1997; **OK**: D. Bass & Walker 1992; **ON**: B. Fraser et al. 1996; Giberson & Hall 1988; A. Hill 1982, 1991; Lush & Hynes 1978; M. Osgood & Boylen 1990; D. Williams 1972; **SC**: Stibbe 1995; **TX**: Poole & Stewart 1976; **VA**: Dahm, Carr and Coleman 1991;. **General** - Chafic 1998; Dahm, Grimm et al. 1998; Dahm, Carr & Coleman 1991; Dahm, Trotter and Sedell 1987; J. Duff & Triska 1990-1; D. Fiebig et al. 1990; S. Findlay et al. 1993; J. Ford 1962; T. Ford & Naiman 1989; Fortner & White 1988; Graf 1988; Kaplan & Bott 1983, 1985; G. Marshall, Cummins et al. 1985; J. Meyer 1988, 1990; J. Meyer, McDowell et al. 1988; Mickelburgh, Lock and Ford 1984; Mikell, Smith and Richardson 1996; E. Murphy, Davis et al. 1989; Naiman et al. 1987; J. Owen 1995; M. Palmer 1990, 1992; Palmer, Arensburger et al. 1996; Pennak & Ward, 1986; Pugsley & Hynes 1983; Rabeni & Minshall 1977; C. Richards & Bacon 1994; Sedell, Reeves et al. 1990; Statzner & Higler 1985; Strayer, 1989-a, 2000; S. & Bannon-O'Donnell, 1988; Strommer & Smock 1989; Thurman 1985; D.D. Williams 1984, 1989; Valett et al. 1993; J. Ward & Stanford 1983; D. White 1993; D. White, Hendricks & Fortner 1992; R. Whiteman & Clark 1982; D. Williams 1981, 1983-4

**hyporheos** - Hyporheic fauna especially **isopods, copepods, amphipods** and **worms**. Below a few cm. the abundance of hyporheos is generally inversely related to substratum depth and directly related to the amount of detritus input, with very few individuals much below 1 m

**hypoxia** - An environment with oxygen levels below that of the subsurface atmosphere but not necessarily anoxic.

Ichneumon flies - See **Homoptera**.

**ICZN** - International Commission of Zoological Nomenclature. The body who draws up the International Code of Zoological Nomenclature & supervises their application.

**imago** - The adult state of an insect.

**immature** - An animal which has attained adult dimensions but not sexual maturity.

**indices of biologic integrity** - Measures that determine the overall health of a community.

**infauna** - Species which live in sediment or which burrow and live inside another species.

**inquiline** - An arthropod living in the nest or burrow of another insect.

**inquilism** - See mutualism.

**insect** - Subclass Insecta (Class **Hexapoda**), having, as an adult, three pairs of legs, three-segmented & usually two pairs of wings. Incl. angel insects, barklice & booklice, **beetles, bugs, caddisflies, cockroaches, crickets, dragonflies & allies, earwigs, fishflies & allies, fleas, flies & keds, grylloblattids, Homoptera, Hymenoptera, lice, moths, Neuroptera, Orthoptera, scorpionflies & allies, silverfish, bristletails & allies, stylopids, termites, thrips, walkingsticks**

**Bibl.:** Arnett 2000; Arnett & Jackques 1981; Askew 1971; Borrer & White 1970; Borrer, Triplehorn & Johnson 1989; Brues, Melander & Carpenter 1964; de la Torre-Bueno 1957; Gillott 1995; Gullan & Cranston 1994; Powell & Hogue 1979; Henning 1981; Stehr 1987, 1991

**instar** - Any developmental stage between molts.

**interstitial** - Areas between sediment particles, usually at least partly filled with water, as within groundwater and hyporheos.

**interstitial fauna** - **Meiofauna** that lives between sediment pores. Aquatic interstitial fauna are hyporheic, psammon or phreatic.. Partial syns.: **meiofauna**, **mesofauna**, **microfauna**. Altherr & Deboutteville 1973; Bretschko & Klemens 1986; Hart 1973; Henning 1981; Kolasa et al. 1987; Kristensen 1981; Pennak 1950; P. & Ward 1985a 1986; Plenet 1995; Schminke 1981; Uhlig 1968.

**invertebrates** - Animals without backbones. Incl. **arthropods**, **echinoderms**

**iron bacteria** - Anaerobic bacteria that precipitate iron oxide from solution, either by oxidizing ferrous salts or by releasing oxidized metals from organic compounds.

**irregular** - **Population** common to abundant some years but absent in others.

**irruption** - A rapid but temporary increase in population usually as a result of increased food, reduced predation, favorable climate, etc.

**Irvingtonian faunas** - Early Pleist. (approx. 2 myrs to .6 myrs.) fauna in NA typified by the presence of mammoths & the absence of bisons.

**isolation** - **Barriers**, ecology or behavior that prevent interbreeding.

## Isopods

Isopoda is one of the largest crustacean orders of the class or subclass **Malacostraca**. Subclass Eumalacostraca: Superorder Peracarida (= Syncarida) (see also **syncarids**). Most 5-15mm. long. Most of the approx. 10,000 sp. dwell on the ocean floor or are parasitic. Generally elliptical, dorsoventrally flattened with a prominent pair of uniramous antennae, (usually) obvious uropods, seven pairs of legs & segments resembling plates of armor. No carapace. A pair of sessile, compound eyes present in non-trogglomorphs. Female carries eggs on bottom side of body. Often scavengers (esp. Asellidae & Oniscoidea) on dead or dying animals in caves. Syn: woodlice, sow or pill bugs, slaters.

**Bibl.:** Banta 1910; Crawford 1976a, 1977f; Culver & Ehlinger 1980; Holsinger 1979; Lewis 1984; Lisowski 1978; Lohmander, 1927; Mackin 1959; Manicasteri & Argano 1989; Minckley 1961; Muchmore 1990a; H. Richardson 1900; Schaik 1949; Schultz 1964, 1970, 1981; Steeves 1963, 1966; Steeves & Holsinger 1968; Taiti & Howarth 1998; Wegele 1990; Chappuis 1950; Packard, 1886 ; Rafi 1985; K. Williams 1990



**Behavioral adaptations:** Suppl. Bibl: Warburg 1968; pollution: A. Bosnak 1979;

**Areas:** **AR:** Causey 1952-3, Schram 1980, 1982; **CA:** Holmes 1904; **Canada:** Rafi 1985; **FL:** Schultz & Johnson 1984; **HI:** Schultz 1973; **IL:** J. Lewis & Bowman 1981, J. Lewis 1981c; **IN:** Eberly 1954; J. Lewis 1981c; Lohmander 1927; H. Richardson 1900; **s.Appalachia:** Steeves 1969; **KS:** Gurtz et al. 1982; Leonard & Ponder 1949; **KY:** Cole 1959; J. Lewis 1981a; H. Richardson 1900; **MI:** Hatchett 1947; **MN:** Sargent 1973; **NA:** Jass & Klausmeir 2000; Vandel 19654a-b; Suppl. Bib.: W. Williams 1972; **NC:** G. Schultz 1982a; **OK:** Mackin 1940; **ON:** Huntsman 1915; **OR:** Vandel 1952; **SC:** Wagele, Voelz & McArthur 1995; **TN:** M. Hatch 1939; : H. Richardson 1900 **US:** Van Name 1936; **VA:** Holsinger & Estes 1978; Vandel 1953; **TX:** Elliott & Mitchell 1973; Schultz 1965; Steeves 1968; Lohmander 1927; Magniez 1983; H. Richardson 1900; Tabacaru 1993; Vandel 1952-3, 1960 ; **WA:** Hatch 1947; **World:** Argaro 1994; Coineau 1994. Orders or suborders incl. Undescr. sp. in \*?cave in Kauai, HA

Phylum Arthropoda

Subphylum Crustacea

Class or Subclass **Malacostraca.**

Subclass Eumalacostraca

Superorder Peracarida (= Syncarida)

Order Isopoda

Suborder **Anthuridea**

Anthuridae

(*Amakusanthura*, *Apanthura*, *Apanthuretta*, *Cyathura*, *Horoloanthura*, *Mesanthura*, *Ptilanthura*)

Hyssuridae (*Kupellonura*, *Xenanthura*)

Suborder **Asellota** Latreille, 1803

(Dominates deep-sea crustaceans; arose in Mesozoic, early in radiation of order)

Santiidae (*Santia*)

Eurycopidae (*Acanthomunnopsis*)

Superfamily Janiroidea

Ilyarachnidae (*Ilyarachna*)

Janiridae – put in Suborder **Janiroidea**

Microparasellidae (*Microcharon*)

Munnopsidae (= Ilyarachninae) (*Eurycope*, *Munnopsurus*)

Pleurogoniidae (*Pleurogonium*)

Superfamily Aselloidea

Asellidae (*Asellus*, *Caecidotea*, *Lirceolus*, *Lirceus*, *Remasellus*, *Salmasellus*)

Microcerberidae (currently in Microcerberidaea)

Stenasellidae (*Mexistenasellus*)

Suborder **Epicaridea**

Bopyridae (*Argeia*, *Bopyroides*)

Suborder Cymothoidea (= cirolanoidea) or Flabellifera (see below)

Limnoriidae (*Limnoria*)

Sphaeromatidae (now put in own suborder)

Tecticipitidae (also put in with syncarids) (*Tecticeps*)

Superfamily Flabellifera (or treated as suborder)

Cirolanidae (*Antrolana*, *Cirolana*, *Cirolanides*, *Eurydice*, *Speocirolana*)

Suborder **Gnathiidea**

Gnathiidae (*Araphura* (now put in Syncarida), *Gnathia*)

Paranthuridae (*Califanthura*, *Paranthura*)

Suborder **Janiroidea**

Jaeropsididae (*Jaeropsis*)

Janiridae (*Caecianiropsis*, *Ianiropsis*, *Jaera*)

Munnidae (*Hawaiioscia* (now in Philosciidae in Suborder Oniscoidea), *Uromunna*)

Santiidae (*Santia*)

Suborder **Microcerberidea**

Microcerberidae) (also placed in Asellota) (old group likely present before separation of Europe and America in Jurassic) (*Coxicerberus*, *Microcerberus*)

Suborder **Oniscoidea** (pleopods adapted for breathing air, only terrestrial order)

Infraorder Ligiamorpha

Platyarthridae (*Trichorhina*)

Series Tylienae

Tylidae (*Tylos*)

Series Tylienae or Section Diplocheta

Ligiidae (*Ligia*, *Ligidium*)

Superfamily Trichoniscoidea

Trichoniscidae

(*Amerigoniscus*, *Brackenridgia*, *Causasonethes*, *Haplophthalmus*, *Miktoniscus*, *Protrichoniscus*, *Styloniscus*, *Trichoniscus* (once in Oniscoidea), *Venezillo*, new genera & sp.? in TX/Pb; undet. genera in San Bernardino & Tulare Cos., CA)

Section Crinochaeta:

Superfamily Atracheata

Oniscidae (wood lice/sow bugs)  
(*Cylisticus*, *Metoponorthus*, *Oniscus*, *Philoscia*, *Trachelipus*)

Superfamily Oniscidea

Philosciidae (also put under Superfamily Atracheata)  
(*Burmoniscus*, *Haplophiloscia*, *Hawaiioscia* (once put in Munnidae),  
*Littorophiloscia*, *Papuaphiloscia*, *Philoscia*, *Tropicana*)

Scyphacidae (*Alloniscus*)  
Scleropactidae (*Aulaconiscus*)

Superfamily Porcellionoidea

Porcellionidae (also put under Superfamily Atracheata & Pseudotracheata)  
(*Cyclisticus* (also put in Cyclisticidae), *Metoponorthus*), *Porcellio*, *Porcellionides*)

Superfamily Pseudotracheata

Armadillidae (pill bugs) (*Armadillidium*, *Reductoniscus*, *Venezillo*)  
Cylisticidae ((*Cyclisticus* (now in Porcellionidae))  
Porcellionidae (put in Superfamily Porcellionoidea)

Suborder Sphaeromatidea

Sphaeromatidae (also put in Suborder Flabellifera)  
(*Ancinus*, *Cassidinidea*, *Cymodoce*, *Dynamenella*, *Exosphaeroma*,  
*Gnorimosphaeroma*, *Harrieta*, *Paracerceis*, *Serolis* (or in Serolaoidea), ]  
*Sphaeroma*, *Thermosphaeroma*; undet. genus in LA brackish beach)

Suborder Valvifera

Arcturidae (*Arcturus*)  
Idoteidae (*Edotia*, *Erichsonella*, *Eusymmerus*, *Idotea*, *Synidotea*)

Families incl.

**Aegidae** (*Aega*, *Rocinela*)

**Anthuridae** (*Apanthura*, *Apanthuretta*, *Haliophasma*, *Mesanthura*, *Horoloanthura*, *Ptilanthura*)

**Arcturidae** (*Arcturus*)

**Armadillidae** Verhoeff, 1917 (pill bugs) (*Armadillidium*, *Reductoniscus*, *Venezillo*) **Bibl.:**  
Schultz, 1972

**Asellidae** Rafinesque-Schmaltz, 1815 (hog or water slater) (*Asellus*, *Caecidotea*, *Lirceolus*,  
*Lirceus*, *Remasellus*, *Salmasellus*) **Bibl.:** Mackin 1940; Steeves 1963

**Chaetiliidae** (*Chiridotea*, *Saduria*)

**Cirolanidae** Dana, 1852 (*Antrolana*, *Cirolana*, *Cirolanides*, *Eurydice*, *Speocirolana*). **Bibl.:**  
Botosaneanu, Bruce, & Notemboom 1986

Chaetiliidae (*Sadura*) Adams, 1852

Cylisticidae (see Porcellionidae)

**Idoteidae** (*Edotia*, *Erichsonella*, *Eusymmerus*, *Idotea*, *Synidotea*)  
**Gnathiidae** (*Araphura* (now put in *Synarca*), *Gnathia*)

**Ilyarachnidae** (*Ilyarachna*)  
**Jaeropsididae** (*Jaeropsis*)  
**Janiridae** (*Caecianiropsis*, *Jaera*)  
**Ligiidae** Brandt, 1883 (*Ligia*, *Ligidium*)

**Limnoriidae** (*Limnoria*)  
**Microcerberidae** (*Coxicerberus*, *Microcerberus*)  
**Microparasellidae** (*Microcharon*)

**Munnidae** G.O. Sars, 1899 (*Hawaiioscia* (now in *Philoscidae*), *Uromunna*)

**Oniscidae** Brandt, 1851 (wood lice/sow bugs) (*Cylisticus*, *Metoponorthus*, *Oniscus*, *Philoscia*, *Trachelipus*). **Bibl.:** Schultz 1981; Sket 1986; Vandel 1945, 1965a

**Paranthuridae** (*Califanthura*, *Paranthura*)  
**Platyarthridae** Verhoeff, 1949 (*Trichorhina*)

**Philoscidae** (*Burmoniscus*, *Haplophiloscia*, *Hawaiioscia* (once put in *Munnidae*), *Littorophiloscia*, *Papuaphiloscia*, *Philoscia*, *Tropicana*)

**Pleurogoniidae** (*Pleurogonium*)

**Porcellionidae** Verhoeff, 1918 (*Cyclisticus* (also put in *Cyclisticidae*), *Metoponorthus*), *Porcellio* *Porcellionides*)

**Santiidae** (*Santia*)

**Scleropactidae** (*Aulaconiscus*)  
**Scyphacidae** (*Alloniscus*)

**Sphaeromatidae** H. Milne Edwards, 1840 (*Cassidinidea*, *Cymodoce*, *Exosphaeroma*, *Gnorimosphaeroma*, *Harrieta*, *Paracerceis*, *Serolis* (or in *Serolaoidea*), *Sphaeroma*, *Thermosphaeroma*; undet. genus in LA brackish beach)

**Stenasellidae** Dudich, 1924 (*Mexistenasellus*) **Bibl.:** Cole & Minckley 1972; Magniez 1999

**Trichoniscidae** Sars, 1899 (*Amerigoniscus*, *Brackenridgia*, *Causasonethes*, *Haplophthalmus*, *Miktoniscus*, *Protrichoniscus*, *Styloniscus*, *Trichoniscus* (once in *Oniscoidea*), *Venezillo*, 2 new genera & sp.? in TX/Pb; undet. genera in San Bernardino & Tulare Cos., CA) **Bibl.:** Vandel 1965b

**Tylidae** (*Tylos*)

*Acanthomunnopsis* – Eurycopidae isopods  
*Acanthomunnopsis* undet. sp. (WA marine infauna)

*Aega* Leach, 1815 – Aegidae isopods

*Aega symmetrica* Richardson, 1905 (WA marine infauna)

*Alloniscus* Dana, 1852 – Scyphacidae isopods

*Alloniscus mirabilis* (Stuxberg, 1875) (= *A. conutus* Budde-Lund, 1885) (CA marine sandy beach infauna burrower)

*Alloniscus perconvexus* Dana, 1865 (CA marine sandy beach infauna burrower)

*Amakusanthura* – Nunomura, 1977- Anthuridae isopods

*Amakusanthura californiensis* (*Apanthura c.* Schultz, 1964) (CA marine benthic)

*Amakusanthura magnifica* (Menzies & Frankenberg, 1966) (Carolinian, LA & FL Gulf of Mex. marine infauna)

*Amerigoniscus* Vandel, 1950 (see *Caucasonethes*) Trichoniscidae isopods. **Bibl.:** Vandel 1977

*Amerigoniscus centralis* Vandel, 1977 (\*type locality cave in Murray Co.,AR/Tb)

*Amerigoniscus curvatus* Vandel, 1977 (\*type locality cave in Walker Co.,GA/Tb)

*Amerigoniscus georgiensis* Vandel, 1977 (\*type locality cave in Walker Co.,GA/Tb),

*Amerigoniscus gipsicolus* (= *Caucasonethes g.* Vandel, 1965) (\*type locality cave in King Co.,TX/Tb)

*Amerigoniscus henroti* = *Caecidotea h.*

*Amerigoniscus malheurensis* Schultz, 1982 (\*type locality cave in Harney Co.,OR/Tb/ critically imperiled in OR Natural Heritage list),

*Amerigoniscus nicholasi* (Vandel, 1965) (= *Caecidotea n.* & *Caucasonethes n.*) (\*\*?type locality cave in Dickson Co., + cave in Anderson Co.,TN/ Pb/ G3 or G1)

*Amerigoniscus paynei* (*C. p.* Muchmore, 1970b) (type locality & other cave in Anderson Co. & caves in Hancock Co.& Union Cos., TN +Roane Co.,TN/ Tb/ S2 G3G4)

*Amerigoniscus proximus* Vandel, 1977 (type locality cave in Chattooga Co. & cave in Dade Co.,GA/ Tb)

*Amerigoniscus* unidentified sp.#1 (SE/Tb) Bénédict & McEvoy 1995

*Amerigoniscus* unidentified sp.#2-3 (TX/ Tb)

*Amerigoniscus* poss. undescr. sp. (2 caves in Dade Co.,GA/Tp) **Bibl.:** Buhlmann 1996, 2000

*Ancinus* H. Milne-Edwards, 1840 - Sphaeromatidae isopods

*Ancinus depressus* (Say, 1818)(rare Carolinian, Virginian marine infauna)

*Antrolana* (see also *Caecidotea*) Cirolanidae isopods. **Bibl.:** Bowman, 1964; Collins & Holsinger 1981

*Antrolana* *lira* Bowman, 1964 (type locality & one other cave in Augusta Co. + caves in Rockingham & Warren Cos., VA/ Tb T&E G3/Madison Cave isopod) **Bibl.:** Holsinger 1979; Holsinger, Hubbard & Bowman 1994; Collins & Holsinger 1981; USFWS 1982

*Apanthura* Stebbing, 1900 - Anthuridae isopods  
*Apanthura inornata* Miller & Menzies, 1952 (HI anchialine caves)  
*Apanthura magnifica* = *Apanthuretta m*

*Apanthuretta* Wagele, 1981 - Anthuridae isopods  
*Apanthuretta magnifica* (*Apanthura m.* Menzies & Frankenberg, 1966) (FL marine benthic)

*Arcturus* Latreille, 1829 – Arcturidae  
*Arcturus beringanus* Benedict, 1898 (AK marine infauna)

*Argeia* Dana, 1852 – Bopyridae isopods  
*Argeia pugettensis* Dana, 1852 – (WA marine infauna)

*Armadillidium* Brandt in Brandt & Ratzeburg, 1831 - Armadillidae isopods

*Armadillidium* *nasatum* Budde-Lund, 1885 (E/Tp or Tx in MO; Tx in OH)  
**Bibl.:** Adamkewicz 1968

*Armadillidium* *vulgare* (*Asellus v.* Latreille, 1804) (common pillbug/ alien TTx in GA (Walker Co.)/ alien epigeal & Tx in CA, IL, MO, NM, TX, VA, TX)

*Asellus* Geoffroy St.-Hilaire, 1762 (see *Caecidotea*, *Calasellus*, *Lirceus*, *Mancasellus*) Asellidae isopods (freshwater and brackish marine species) **Bibl.:** Chappuis 1953-5; Fleming 1972a; Henry & Magniez 1968; Needham & Burnet 1957; Packard, 1885a.

*Asellus* *aquaticus* (*Oniscus a.* Linnaeus, 1758) Geoffroy, 1762 (Hog slater; water slater/ Europe/ (alien Tx? in sON,PQ; alien Ttx (occasional Tx) in NS)

*Asellus parvus* = *Remasellus p.*  
*Asellus pilus* = *Lirceolus p.*

*Bopyroides* Stimpson, 1864 – Bopyridae isopods  
*Bopyroides hippolytes* (Kroyer, 1838) (WA marine infauna)

*Aulaconiscus* Taiti & Howarth, 1997 - Scleropactidae isopods  
*Aulaconiscus* *caecus* Taiti & Howarth, 1997 (Tx in HI (Kauai,Oahu))

*Brackenridgia* Eigenmann & Ulrich, 1902 in Ulrich, 1902 (= *Protrichoniscus*) Trichoniscidae isopods

*Brackenridgia* *heroldi* (Arcangeli, 1932) (Tp in Calaveras & Tuolumne Cos.,CA)

**Brackenridgia cavernarum** Eigenmann & Ulrich, 1902 in Ulrich, 1902 (type locality & one other cave in Hays Co.,TX + caves on western edge of Edwards Plateau and along Balcones Fault Zone (Bexar, Comal, Hays, Kendall, Kinney, Terrell, Val Verde Cos.)/ Tb)

**Brackenridgia reddelli** (=Protrichoniscus r. Vandel, 1965) (Tb in Bandera, Medina, Real, Uvalde Cos., TX & Eddy Co.?, NM)

**Brackenridgia** undescr. sp.#1 (Carlsbad area (NM) & Culberson Co.,TX/Tb)

**Brackenridgia** undescr. sp.#2 (CA/epigean)

**Brackenridgia** undescr. sp.#3 (Tuolumne Co.,CA, quarried/mine transplant) Briggs 1987

**Brackenridgia** undescr. sp.#4? near *B. sphinxensis* Schultz G. A., 1984 (Kartchner C.,Cochise Co., AZ/ )

**Brackenridgia** undet. (Edwards Plateau, Balcones Fault Zone, TX).

**Burmoniscus** Collinge, 1914 - Philoscidae isopods

**Burmoniscus meeusei** (Holthius, 1947) (pantropical epigean/ Tp in Kauai, Molokai, Maui, Hawaii)

**Caecianiropsis** Menzies & Petit, 1956 - Janiridae isopods

**Caecianiropsis psammophila** Menzies & Petit, 1956 (CA, OR, WA marine interstitial & infauna)

**Caecidotea** Packard, 187 - Asellidae isopods. **Bibl.:** Collinge (see *Asellus*, *Lirceolus* Lewis, 1983, see *Remasellus*) Bosnak & Morgan 1981; Collinge 1944; J. Lewis 1980a, 1981c, 1982d, 1985; Lewis & Bowman 1981; Packard, 1885

**Caecidotea acuticarpa** Mackin & Hubricht, 1940 (= *A. acuticarpus*) (type locality cave in Pontotoc Co. + caves, springs & wells in Johnson, Murray & Seminole Cos.,OK/ Tp/ G2)

**Caecidotea adenta** Mackin & Hubricht, 1940 \*( type locality cave in Kiowa Co. (extirpated?) & small cave near Turner Falls (Murray Co.),OK/ Tb/ G1 or G1G2)

**Caecidotea alabamensis** (*Asellus (Prosellus) a.* Stafford, 1911; *A.bicrenatus* Steeves, 1963 & a. Maloney, 1939; *Conasellus a.* Henry & Magniez 1970) (\*well near Auburn/ Pb/ G1G2)

**Caecidotea ancyla** (*A. ancylus* Fleming, 1972) (type locality cave in Boone Co. + caves in Madison, WA, Camden, DE, Adair Cos.,AR/ Tb/ G2G3)

**Caecidotea antricola** (*A. antricolus* Fleming, 1972; *C. a.* Creaser, 1931b; *C. meisterae* & *whitei* Lewis & Bowman, 1981) (see *C. bicrenata whitei*) (type locality cave in Camden Co., MO +MO(Camden, Carter, Christian, Crawford, Douglas, Franklin, Greene, Howell, Iron, LaClede, Oregon, Ozark, Perry, Phelps, Pulaski, Shannon, St. Francois, St. Louis, Ste. Genevieve, Taney,Texas, Wright & Washington Cos), nAR (Baxter, Benton, Carroll, Independence, Izad, Madison, Newton, Searcy,Stone, Washington Cos.) & Delaware Co.,OK/ Pb/ G3G4)

**Caecidotea barri** Steeves, 1965 (\*type locality cave in Woodford Co.,KY/Tb/Cli. C. Isopod/ Federal Review Status T&E; KY T&E/ G1G3)

*Caecidotea beattyi* Lewis & Bowman, 1981 (runoff stream from wellouse, Dixon Spr. State Park, Pope Co.,sIL(5cos.)/ Pb/ G3G4)

*Caecidotea bicrenata b.* (*A. bicrenatus* Steeves, 1963; *A. alabamensis* Bresson, 1955; *Conasellus a.* Henry & Magniez, 1970) (type locality cave in Marshall Co.,AL/ caves and wells? And springs? in nAL (M.&Jackson Cos.) n Colbert, Limestone, Marshall, Lawrence, Morgan & Jackson Cos.(AL), 13Cos. in KY & 10 cos. in nc,ecTN (Clay, Davidson, Franklin, Maury, Putnam, Rutherford, White Cos./ Tb or Tp?, Pb/ TN SR, G3G4 T3T4) **Bibl.:** Bosnak 1979

*Caecidotea bicrenata whitei* (= *A. antricolus* Fleming, 1972; *C. a.* Creaser, 1931b; *C. meisterae* & *whitei* Lewis & Bowman, 1981) (type locality in Mammoth C.,KY/ Pb & caves in ncTN(Clay Co.) n.to Hart Co.(wKY: Barren, Caldwell, Christian, Crittenden, Edmonson, Hart, Lvingston, Logan, Metcalfe, Todd, Trigg Cos.), across Pennyroyal Plateau w. to sIL (Johnson & Union Cos.) & eTN(Clay Co.)/ TN SR, G3G4 T3T4)

*Caecidotea bilineata* J. Lewis & Bowman, 1996. (Tahuaya Springs, Bell Co., TX + springs & well in Dallas Co., TX/ Pb/ G3) **Bibl.:** J. Lewis 1985

*Caecidotea biseta* or *bisetus* = *Lirceolus bisetus*

*Caecidotea bowmani* (*A.b.* J. Lewis, 1980a) (\*drain tile near Natural Bridge,Rockbridge Co.,VA/ Pb/ T&E VA S1, global G1 or G2)

*Caecidotea brevicauda b.* (*A. b.* Forbes, 1876) (E epigean,spr.(-fed stream)/Tp? in AR, IL, KY, MO) **Bibl.:** Lisowski 1979

*Caecidotea brevicauda bivittatus* (*A.b.b.* Walker, 1961) (\*Doe Run, spr.fed cr., KY/ Pp?)

*Caecidotea californicus* (*A.c.* M. Miller, 1933 (Lake, Napa & Santa Clara Cos.,CA/ spr.,well, Pb?) **Bibl.:** M.iller 1939

*Caecidotea cannula* (*A.c.* Steeves, 1963a) (type locality & 1 other cave in Tucker Co. & 2 caves in Randolph Co., WV/ Tb/ S1 rank & global G2 or G3 rank) **Bibl.:** Culver & Ehlinger 1980, 1982; Culver 1981

*Caecidotea carolinensis* Lewis & Bowman, 1977 (type locality cave in McDowell Co.,NC & cave in Orangeburg Co.,SC/ Ben. M. Cave water slater/ Tb, St?/ G1) **Bibl.:** Holler 1991; Will Reeves 2000

*Caecidotea catachaetus* Fleming & Steeves, 1972 (seep, 1mi. ne of Adairsville (Baron Co.) & possibly cave in Walker Co, GA +AL, TN/ spr.,Pb, AL cave)

*Caecidotea circulus* (*A.c.* Steeves & Holsinger, 1968) (\*\*( type locality cave in Cumberland Co. Cave in Bledsoe Co.,TN/ Tb/ G1G2)

*Caecidotea communis* (*A.m.* Say, 1818; *A. militaris* Hay, 1878; *A. puebla* Coke & Minckley, 1968; *Consellus c.* Henry & Magniez, 1970) (epigean in NE to CO, AL/ Ac in NY, sON)



*Caecidotea condei* = *C. pricei*  
*Caecidotea conestogensis* - see *C. pricei*

**Caecidotea** *cyrtorhynchus* Fleming & Steeves, 1972 (type locality & 2 other caves in Walker Co.,GA/Tb/ G1 or G1G2) **Bibl.:** C. Buhlmann 1996

**Caecidotea** *dauphina* Modlin, 1986 (\*Audubon Sanctuary on Dauphin Island,Mobile Co.,AL/ Pb)

**Caecidotea** *dimorpha* Mackin & Hubricht, 1940 (*A. dimorphus*) (seep .5mi. s. of Greenville, MO (Barry & Wayne Cos.) +spr. 1.5mi.sw of Olyphant (Jackson Co.) & Searcy Co., AR/ Tp,Pb, seep, spr./MO T&E R/ G1G3)

**Caecidotea** *extensolinguala* Fleming, 1972 (seMO/ Pb)

**Caecidotea** *filicispelunca* Bowman & Hobbs III, 1983 (type locality cave in seAdams Co.,IL +OH/ Tb/ OH State Special Concern T&E/ G1 or G1G2)

**Caecidotea** *fonticulus* Lewis, 1983b (\*Abernathy Spr.,8mi.w. of Polk-Montgomery Co. line by Hw 8,Ouachita Mts./ Pb, Tb)

**Caecidotea** *forbesi* (*A. f.* Williams, 1970) (temporary ponds, epigean in E,VA/ Ac in OH)

*Caecidotea* "*forcipitus*" Dearwolf, 1953 - See undescr. sp.

**Caecidotea** *foxi* (A.f. Fleming, 1972) (type locality cave in Camden Co.,MO/ Tp)

**Caecidotea** *franzi* (*C. f.* Holsinger & Steeves, 1971) (type locality cave in Center Co.,PA + cave in Mineral Co.,WV (S1) & caves in Garrett & Allegany Cos., MD/ Tb/ Franz's cave isopod/ WV & MD S1; WV G3G4 & MD G2G3 rank)

**Caecidotea** *fustis* J.Lewis, 1981 (type locality cave in Franklin Co. +Crawford, Iron & WA Cos. (MO)/ Tb/ G3) **Bibl.:** Lewis 1981

**Caecidotea** *henroti* (*Asellus (Baicalasellus) henroti* Bresson, 1955) (type locality cave in Lee Co. +Pulaski Co.& 2 caves in Giles Co.,VA/ Tb/ Powell Valley Terrestrial Isopod)/ T&E VA S1S2, global G3 or G2G3/ Pb)

**Caecidotea** *hobbsi* (*A.h.* Maloney, 1939) Van Name, 1943 (type locality cave inAlachua Co. & groundwater & caves in Calhoun, Jackson & Marion Cos., Choctawhatchee-Yellow-Escambia, Aucilla-Suwanee & St. Johns hydrologic subregions + De Kalb Co.,GA/ Hobb's Cave Isopod/ Pb, burrows/ T&E species of concern, G2G3) **Bibl.:** Steeves 1964a,

**Caecidotea** *holsingeri* (*A.h.* Steeves, 1963a) (type locality cave in Greenbrier Co. + caves inMonroe, Pocahontas, & Randolph Cos.(eWV), cave in Bath Co.,VA & cave in Garrett Co., MD) /Tb/ Greenbrier Valley cave isopod/ T&E VA S1, global G3; WV T&E S3 rank & global G3 rank). **Bibl.:** Culver & Ehlinger 1980, 1982; Culver 1981; Melhem 1993

*Caecidotea incurva* (*A.i.* Steeves & Holsinger, 1968) (type locality cave in Cumberland Co.,TN & cave each in Smyth & Wythe Cos.,VA), cave in Blount Co.& single cave in Blount & Roane Cos.,TN/ Tb/ VA Species of Concern/ Incurved Cave Isopod TN SR, G2G3)

*Caecidotea intermedius* (*A .i.* Forbes, 1876) (epigean in IL,MT/ Ac in VA) **Bibl.:** R. Ellis 1961

*Caecidotea jordani* (*A. j.* Eberly, 1966) (\*spring at IN Univ/ Pb/ IN T&E, G1G2) **Bibl.:** Keith 1984b

*Caecidotea kendeighi* (*A. k.* Steeves & Seidenberg, 1971) (subsurface discharge 3mi. n.of Mayview, Champaign Co.,IL +IL (Bureau, Carroll, Champaign, Christian, Coles, Cook, Dewitt, Edgar, Edgar, Fulton, Hancock, Henderson, Henry, Iroquois, Kane, Kabankakee, Knox, LaSalle, Macon, McClean, McDonough, Ogie, Peoria, Piatt, Putnam, Saline, Stark, Stephenson, Tazewell, Unioln, Vermillin, Warren,Will,Winnebago Cos.), IN (Henry, Lake & Porter Cos.),IA (Des Moines, Henry & WA Cos.) & MO (St.Louis Co.)/ Pb/ G4G5)

*Caecidotea kenki* (*A.k.* Bowman, 1967) (DC, MD, PA, VA/ stream,spr.-fed cr./epigean,Pp?; Tp in PA)

*Caecidotea laticaudatus* Williams, 1970 (warm water epigean in SE, KY, LA; Ac or Tx in IL/ intermediate with *C. foxi* in Camden Co., MO)

*Caecidotea lesliei* Lewis & Bowman, 1981 (outlet of drain tile, 3mi.s.of Colmar, McDonough Co., IL/ Pb, interstitial in glacial drift or alluvium/State T&E, G4G5)

*Caecidotea macropropoda* (= *A. m.* Chase & Blair, 1937) (type locality 1-3 other cave in Adair Co., OK & cave & spring in Carroll & WA Cos., AR/ Tp or Tb, Pb?/ G1 or G2 or G1G2)

*Caecidotea meisterae* - see *C. bicrenatra w.*

*Caecidotea metcalfi* Fleming, 1972 (\*well, Cowley Co.,KS/ Pb/ G1G2)

*Caecidotea nickajackensis* (Packard, 1881) (Nickajack C. (type) +Marion, Hamilton & Thomas Cos., TN & Sanders Spr. & Hidden River C.?,KY/Tb/T&E TN, G3G4 or G2G3; TN rare)

*Caecidotea nortoni* (*A.n.* Steeves, 1966) (type locality cave in Greene Co. & cave in Carter Co. & seep off Tallapoosa Rd. in Johnson City (WA Co.),TN/ Pb/ SR G3)

*Caecidotea oculata* Mackin & Hubricht, 1940 (seep on or near Rich Mt, Polk Co.,AR +Latimer & Leflore Cos., OK/ spr.,stream, Tp?/ G2G3)

*Caecidotea ozarkana* Chase & Blair, 1937) (\*spr. 5mi. s. of Kansas,Adair Co.,OK/Pb)

*Caecidotea packardi* Mackin & Hubricht, 1940 (type locality cave in Monroe Co. + caves in Adams, Lincoln, Pike, St. Clair Cos.,IL/ Tb/ G3G4)

*Caecidotea paurotrigonus* Fleming, 1972 (\*ditch under river bridge, Adams Co.,MS/ Pb/ G1G2 S?)

*Caecidotea phreatica* Lewis & Holsinger, 1985 (drain pipe 5 km.n.of Cuckatuck, seVA (Chesapeake & Isle of Wight Cos.)/Pb/T&E VA S1, global G1 or G1G2)

*Caecidotea pilus* = *Lirceolus p.*

*Caecidotea pricei* (*A. p.* Levi, 1949) Chappuis, 1957; *A. conestogensis* Levi, 1949; *A. p.* Mackin, 1959; *Conasellus p. & condei* Henry & Magniez, 1970; *Caecidotea stygia* Richardson, 1905; *A. condei* Chappuis, 1957) (type locality cave in Lancaster Co.,SPA & wells, seeps, spr. & caves in wVA (Augusta, Fredeick, Page, Rockbidge, Rockingham, Shenandoah Cos.), cMD (Wa Co.), swPA (Berks, Cumberland, Dauphin, Lancaster, Lebanon, Mifflin, Montgomery, York, Westmorland), eWV (Berkeley & Jefferson Cos. – S1)/ Pb/ T&E VA S2; WV T&E S1, MD S3 & global G3G4 rank). **Bibl.:** Bechler 1986a

*Caecidotea racovitzai* *r.* (*A. r.* Williams, 1970) (epigean in NE, seCanada, MT, WA/ Tx or Ac in Tazwell Co.,VA; seVA hyporheic)

*Caecidotea recurvata* (*Asellus recurvatus* Steeves, 1963) (type locality cave in Lee Co. & caves in Russell, Scott, Smyth, Washington Wise Cos., VA +eTN (Campbell, Claiborne, Hancock, Knox, Union, Washington Cos.)/ Tb,hyorheic/ SW VA cave isopod/ Federal Special Concern T&E; VA Special Concern, TN SR G3) **Bibl.:** Culver 1976, 1981; Magniez 1981

*Caecidotea reddelli* (*Conasellus r.* Steeves, 1968) (type locality cave in Bell Co. + caves and groundwater in Coryell, Dallas, Hays, Henderson, Palo Pinto, Travis, Williamson Cos.,\*Edwards Aquifer,TX/G3/ Pb) **Bibl.:** J. Lewis 1985; Lewis & Bowman 1996

*Caecidotea richardsonae* (*A. r.* Mackin, 1959) Hay, 1901 (Nickajack C.,TN/sc + seTN (Bledsoe, Claiborne, Grainger, Hancock, Hawkins, Marion Cos.) + swVA (Marion, Lee & Scott Cos.), neAL (De Kalb, Jefferson, Lee,St. Clair, Talladega Cos.) & nwGA (Chattooga, Dade, Floyd, Walker Cos.)/Tb, Pb/ VA Species of Concern,T&E VA S2, global G3G5, TN SR/ TN Valley Isopod) **Bibl.:** Culver 1976

*Caecidotea rotunda* Bowman & Lewis, 1984 (\*\*\*?type locality cave in swPike Co., OH + cave in Decatur Co., OH & cave or caves in Jennings Co.,sIN/ northeastern cave isopod/ OH State Special Concern T&E, IN T&E/ Tb/ G1?)

*Caecidotea salemensis* Lewis, 1981 (= *L. tridentatus* in part) (deep cistern, Lawrence CO.(nAR) +MO(Boone, Camden, Carter, Dallas,Douglas, Franklin, Hickory, Oregon, Pettis, Phelps, Pulaski, Shannon, Texas, Washington Cos.)/ Pb, caves/ G3G4)

*Caecidotea scrupulosa* (*A. s.* Williams, 1970) (GA to VA,epigean/Tp in Greenbrier & Monroe Cos. (WV)) **Bibl.:** Culver 1976

*Caecidotea scyphus* (*A.s.* Steeves & Holsinger, 1968) (\*type locality cave in Cumberland Co., TN/ Tb/ G1G2)

*Caecidotea sequoiae* Bowman, 1975 (\*type locality cave in Sequoia Natl. Park, Tulare Co., CA/ Tb/ G1G2)

*Caecidotea serrata* (A.s. Fleming, 1972) (\*type locality cave in Shannon Co, MO/ Tb/ G1G2)

*Caecidotea simonini* (*Asellus (Baicalasellus)* s. Bresson, 1955) (\*type locality cave in Randolph Co.,VA & cave? in Pendleton Co.,WV/ S1G1; Federal Species of Concern/ Tb/ G1)

*Caecidotea simulator* Lewis, 1999 (Pb in Ozark Springfield Plain, neOK (Cherokee Co., Baxter Springs) & nWAR (WA Co. well)/ G3G4)

*Caecidotea sinuncus* Steeves, 1965 (type locality & 3 other caves in Pendleton Co., WV/ Tb/ S1 rank & global G1 rank; Federal Species of Concern)

*Caecidotea smithii* (L.s. Ulrich, 1902; *Conasellus* s. Bowman & Longley, 1976) (see *Lirceolus smithii*)

*Caecidotea* undescr. sp. #1 (\*cave in Dubuque Co.,IA/Tb)

*Caecidotea* undescr. sp.#2 (\*cave in Lee Co., VA/ Tb/ T&E VA S1, global G1)

*Caecidotea* undescr. sp.#3 (\*\*cave each in Smith & Wayne Co.,nMS/ Tb)

*Caecidotea* undescr.sp.#4 (\*cave in Orange Co., in St. John's hydrologic subregion in neFL/ Rock Springs Cave Isopod/ Tb/FL T&E S1, global G1 rank)

*Caecidotea* undescr.#5 (\*cave in Harney Co.,OR/Tb?) Benedict & McEvoy 1995

*Caecidotea* undescr. sp.#6 (\*cave in Skamania Co.,WA/Tb)

*Caecidotea* undescr. sp.#7 (Boone Co.,AR/ Tb)

*Caecidotea* undescr. sp.#8 (\*2 caves in Alleghany Co.,MD/ Pb/ S1G1 (sp. #1 in MD T&E)

*Caecidotea* undescr.sp.#10 (cave in Pasco Co.,FL/ Pb)

*Caecidotea* undescr. sp. #11? (\*\*?cave each in Walker & Dade Cos.,GA (&/or poss. *C. catachaetus*) **Bibl.:** Buhlmann 1996

*Caecidotea* undescr. #12 (\*cave in Culberson Co., TX/ Tb)

*Caecidotea* undescr. #13 (Ec. Bl. Sprs. Cave Isopod/ type locality cave in cave in WA Co. & likely other caves in Choctawhatchee-Yellow-Escambia hydrologic subregion in wFL Panhandle/ Cave isopod/ Tb)

*Caecidotea* undescr. #14 ("*forcipitus*" Dearwolf, 1953) (\*?cave in Claiborne Co.,TN)

*Caecidotea* undescr. #15? (sFL (Dade Co.) stygophile or stigobiotic)

*Caecidotea* undescr. #16-18 (caves &/or groundwater in MD/ S1G? (sp. #2, 4-5 in MD T&E)/ Pb?)

*Caecidotea* undescr. #19 (caves &/or groundwater in MD/ S1G3 (sp. #3 in MD T&E)/ Pb?)

*Caecidotea* undescr. #20 (caves &/or groundwater in MD/ S2G? (sp. #6 in MD T&E)/ Pb?)

*Caecidotea* undet. sp. or species (Tb in cave in Kendall Co. & cave in Williamson Co., TX/ Tb? in nFL; OK, seVA hyporheic) **Bibl.:** J. Lewis 1985

*Caecidotea* undet. sp(p). (near *C. brevicauda* & others in WA, Franklin & Crawford Cos.,MO/Tp; 9 cos. in KY/Pb; Blount Co.,TN/T b)

*Caecidotea spatulata* Mackin & Hubricht, 1940 (type locality & one other cave in Carroll Co. & caves in Williamson Co.,IL +St. Louis & Boone Cos. (MO)/ Pb,spr./IL State T&E, G3G4)

*Caecidotea sphinxensis* Schultz, 1984 (\*type locality cave in Cochise Co.,AZ/ Tb/ G1)

*Caecidotea steevesi* (A.s. Fleming, 1972) (type locality cave in Dade Co.,MO +OK (Adair, Benton, Carroll, Madison, Newton, WA Cos.) & seeps in Baxter Spr.,Cherokee Co.,KS/ Pb/ G2G4)

*Caecidotea stiladactyla* Mackin & Hubricht, 1940 (spr. (3.5mi.s of Jasper,Newton Co.) + Benton, Carroll, Madison, Newton Cos, AR; cave in Crawford Co.(MO) & cave in Delaware Co.,OK / spr.,Pb/ G2G4)

*Caecidotea stygia* (*Asellus (Proasellus) stygius* Packard, 1871; *Asellus s.* Forbes, 1876; *C. microcephala* Cope, 1872; also incl. in *C. pricei*) (Mammoth C.,KY(type locality) +sIN (Brown, Clark, Crawford, Greene, Harrison, Jefferson, Jennings, Lawrence, Martin, Monroe, Orange, Owen, WASHINGTON Cos), KY (many cos.), ecMO (Jefferson, Stone & St. Louis), swOH (Adams, Scioto & Hamilton Cos.) & neTN (Overton Co.)/ Pb/ G4G5) **Bibl.:** Bechler 1981, 1985-6; Bowman & Beckett 1978; Hobbs, III 1987; Racovitza 1950; Steeves 1963

*Caecidotea teresae* Lewis, 1982a \*\* (drain tiles at IN Univ. Southeast Campus,New Albany (Floyd Co.) & stream near base of escarpment (Clark Co.),IN/spring/Pb, extirpated in drain tiles?, refound in well near Univ./ G1G2)

*Caecidotea tridentata* Hungerford, 1922 (= *A. acuticarpa* Mackin & Hubricht, 1940; *Conasellus t.* Henry & Magniez, 1970) (cistern in Lawrence, Co.,AR/ Pb/ G3G4) **Bibl.:** Dexter 1954; Birstem, 1951; C. Edler & Dodds 1996

*Caecidotea vandeli* (*Asellus (Baicalasellus v.* Bresson, 1955; *Pseudobaicalasellus v.* Bresson, 1970) (type locality cave in Montgomery Co. +Bath, Botetourt, Giles & Roanoke Cos.,VA/ T&E VA S1S2, global G3 or G2G3/ Tb)

*Caecidotea whitei* = *C. bicrenata whitei*

*Calasellus* Bowman, 1981- Asellidae isopods

*Calasellus californicus* (*Asellus c.* Miller, 1933) (\*well near Kelseyville, Lake Co. + spr. in Napa & Santa Clara Cos. & Marin Co. hyporheic, all in CA/ Pb/ G3) **Bibl.:** Rosario & Resh 2000

*Calasellus longus* Bowman, 1981 (\*Shaver Lake,Fresno Co.,CA/ Pb/ G1G2)

*Calasellus* undet. sp. (cave in Santa Cruz Co.,CA/ Pb)

***Califanthura*** Schultz, 1977 – Paranthuridae isopods

***Califanthura squamosissima*** (*Colanthura s.* Menzies, 1951) (CA muddy or sandy marine infauna & kelp beds)

***Cassidinidea*** Hansen, 1905 - Sphaeromatidae isopods

***Cassidinidea lunifrons*** (Richardson, 1900) (Virginian (rare), TX estuary marine infauna)

***Cassidinidea ovalis*** (Say, 1818) (Virginian (rare), TX marine infauna)

***Caucasonethes*** Verhoeff, 1932 - Trichoniscidae isopods (genus may not be in NA)

*Caucasonethes gipsocolus* (see *Amerigoniscus* g.); *Caucasonethes henroti* = *Caecidotea h.*; *C. nicholasi* - see *Amerigoniscus*

***Caucasonethes*** undescr. sp.#1 (\*WV/Tb?)

***Caucasonethes*** undescr. sp.#2 (OR/epigean)

***Caucasonethes*** undescr. sp.#3 (2 caves in Taney Co.,MO/ Tb/ G1) Gardner 1986

***Caucasonethes*** undescr.sp.#4 (\*cave in King Co.,TX/Tb)

***Chiridotea*** Harger, 1878 - Chaetiliidae isopods

***Chiridotea almyra*** Bowman, 1955 (MD, NC, VA marine infauna)

***Chiridotea arenicola*** Wigley (= *C. stenops* Menzies & Frankenburg) (Virginian (rare), Carolinian marine infauna)

***Chiridotea caeca*** (Say, 1818) (GA, MD, NC, VA marine infauna)

***Chiridotea sabini*** (Kroyer) (Baffin Island (neCanada) marine infauna)

***Chiridotea tuftsi*** (rare Virginian, MA, NY marine infauna)

*Chiridotea stenops* Menzies & Frankenburg = *C. arenicola*

***Cirolana*** Leach, 1818 - Cirolanidae isopods

***Cirolana concharum*** (Stimpson, 1853) (VA, NC marine benthic)

***Cirolana diminuta*** Menzies, 1962 (CA marine benthic)

***Cirolanides*** Benedict, 1896 - Cirolanidae isopods

***Cirolanides texensis*** B., 1896 (artesian wells at San Marcos & cave each in Kerr & Uvalde Co. + 12 other cos. in TX/ Pb) J. Baker, 1960; Bowman 1964, 1992 Elliott 1973

*Conasellus* (subsumed in *Caecidotea*; see also *Lirceolus*, *Brackenridgia*),

*Conasellus smithii* = *Caecidotea s.*

***Coxierberus*** Wagele, Voelz & MacArthur, 1995 - Microcerberidae isopods

***Coxierberus abboti a.*** (*Microcerberus a.* Lang, 1960) (cCA marine beach interstitial, intertidal)

***Coxierberus abboti juani*** Coineau & Delamare, 1968 (WA marine beach interstitial)

*Cyathura* Norman & Stebbing, 1886 - Anthuridae isopods  
*Cyathura* (*C.*) *burbancki* Frankenberg, 1965 (GA, MA marine infauna)  
*Cyathura* (*C.*) *carinata* (Kroyer, 1847) (NC marine infauna)

*Cyathura munda* Menzies, 1951 (CA marine infauna)  
*Cyathura polita* (Stimpson, 1855) (w,eFL, LA, MD, VA, Carolinian marine sandy infauna)

*Cylisticus* Schnitzler, 1853 (= *Cyclisticus*) Porcellionidae isopods

*Cylisticus* *convexus* (DeGeer, 1778) (nNA, sCanada, AL, AZ, GA, IL, MO, VA epigeal/ Tp alien from Europe, now in GA (Bartow, Dade, Walker Cos.), IN, KY, MD, MO, OH, TN, TX, VA, WI caves)

*Cymodoce* Leach, 1814 – Sphaeromatidae isopods  
*Cymodoce faxoni* (Richardson, 1905) (wFL marine infauna)

*Dynamenella* Hansen, 1905 – Sphaeromatidae isopods  
*Dynamenella* undet. sp. (Carolinian marine infauna)

*Edotia* Guerin-Meneville, 1843 (= *Edotea*) - Idoteidae isopods  
*Edotia baltica* = *Idotea b.*

*Edotia montosa* (*Edotea m.* Stimpson, 1853; *Edotea acuta*) (FL, MA, TX, Virginian marine infauna)

*Edotia* undet. sp. or species (sCA, NC marine infauna)  
*Edotia sublittoralis* Menzies & J.L. Barnard, 1959 (CA, WA marine infauna)

*Edotia triloba* (*Edotea t.* Say, 1818) (FL, LA, MA, NC, NJ, VA common marine infauna; NB, PQ Gulf of St. Lawrence sandy marine interstitial)

*Erichsonella* Benedict in Richardson, 1901 - Idoteidae isopods  
*Erichsonella attenuata* (Harger, 1873) (e,wFL, LA, MD, VA marine infauna)

*Erichsonella filiformis* (Say, 1818) (LA marine infauna)  
*Erichsonella* undet. sp. (NC marine infauna)

*Erichthonius* Milne-Edwards – Ischyroceridae isopods  
*Erichthonius brasiliensis* (Dana, 1853) (Carolinian, Virginian, e,w FL, LA marine infauna)  
*Erichthonius rubricornis* (Carolinian marine infauna)

*Eurycope* Sars, 1864 – Munnopsidae isopods  
*Eurycope* undet. sp. (WA marine infauna)

*Eurydice* Leach, 1815 - Cirolanidae isopods  
*Eurydice caudata* Richardson, 1899 (sCA marine infauna)  
*Eurydice personata* Kensley, 1987 (wFL Gulf of Mex .marine infauna)

*Eusymmerus* Richardson, 1899 – Idoteidae

*Eusymmerus* undet. sp. or species (sCA, NC marine infauna)

*Exosphaeroma* Stebbing, 1900 - Sphaeromatidae isopods

*Exosphaeroma oregonensis* (WA, OR marine sandy interstitial)

*Exosphaeroma rhomburum* (Sphaeroma r. Richardson, 1899)(CA marine infauna?)

*Exosphaeroma* undet. sp. (FL marine benthic)

*Gnathia* Leach, 1814 - Gnathiidae isopods

*Gnathia coronadoensis* Schultz, 1966 (CA hydrogen sulfide mud marine infauna)

*Gnathia crenulatifrons* Monad, 1926 (sCA marine infauna)

*Gnathia productatridens* Menzies & J.L. Barnard, 1959 (sCA marine benthic)

*Gnathia sanctaecrucis* Schultz, 1972 (sCA marine benthic)

*Gnathia* undet. sp. (WA marine infauna)

*Gnathia tridens* Menzies & Barnard, 1959 (AK marine infauna)

*Gnathia trilobata* Schultz, 1966 (sCA marine benthic)

*Gnorimosphaeroma* Menzies, 1954 - Sphaeromatidae isopods

*Gnorimosphaeroma oregonensis* (Dana, 1853) (AK, OR, WA marine infauna)

*Gnorimosphaeroma rayi* Hoestlandt, 1969 (neAsia, CA, Kauai streams/ hypogean, anchialine cave/ ponds in Cape Kinau (Maui) & Lua o Palahemo & Pakini Iki (both HI Island), HI)

*Haliophasma* Haswell, 1881 - Anthuridae isopods

*Haliophasma geminatum* Menzies & Barnard, 1959 (sCA marine infauna)

*Haplophthalmus* Sars, 1898 - Trichoniscidae isopods

*Haplophthalmus danicus* Budde-Lund, 1885 (cosmopolitan/alien Tp or Tx in HI (Maui), IN, KY (Mammoth C.), MD, NM, TN, VA, WV; Tx in OH)

*Harrieta* Kensley, 1987 - Sphaeromatidae isopods

*Harrieta faxoni* (Richardson, 1906) (e,wFL marine infauna)

*Hawaiioscia* Schultz, 1973 - Philosciidae isopods

*Hawaiioscia microphtalma* Taiti & Howarth, 1997 (\*type locality cave in Oahu, HI/ Tb)

*Hawaiioscia paeninsulae* Taiti & Howarth, 1997 (\*\*?type locality and one other cave and possibly at least two other caves in Kalaupapa Peninsula on north shore of Maloki Island, HI/ Tb/ G1)

*Hawaiioscia parvituberculata* Schultz, 1973 (\*type locality cave in Maui, HI/ Pb/ G1)

*Hawaiioscia rotundata* Taiti & Howarth, 1997 (\*type locality cave in Kauai, HI/ Tb/ G1)



***Hawaiioscia*** undescr.? sp. (\*cave in Oahu, HI)

***Horoloanthura*** – Anthuridae isopods

***Horoloanthura irpex*** (wFL Gulf of Mexico infauna)

***Hyloniscus*** Verhoeff, 1908 - Trichoniscidae isopods

***Hyloniscus riparius*** (C.L. Koch, 1838) (Great Lakes, NE/ Tx in OH)

***Ianiropsis*** Sars, 1897 – Janiridae isopods

***Ianiropsis minuta*** Menzies, 1952 Menzies & Petit, 1956 (CA marine sand infauna)

***Idarcturus*** Barnard, 1914- Arcturidae isopods

***Idarcturus allelomorphus*** Menzies & Barnard, 1959 (sCA marine infauna)

***Idotea*** Fabricius, 1798 - Idoteidae isopods

***Idotea baltica*** (*Edotea b*/ Pallas, 1772) (NB, PQ Gulf of St. Lawrence & MA, NJ, VA sandy marine interstitial)

***Idotea fewkesi*** Richardson, 1905 (WA marine infauna)

***Idotea montereyensis*** (*Pentidotea m.* Maloney, 1933) (CA marine benthic)

***Idotea ochotensis*** Brandt, 1851 (WA marine infauna)

***Idotea resecata*** stimpson, 1957 (*Pentidotea r.*) (CA marine benthic)

***Ilyarachna*** Sars, 1870 - Ilyarachnidae isopods

***Ilyarachna acarina*** Menzies & Barnard, 1959 (sCA marine infauna)

***Jaera*** Leach, 1814 - Janiridae isopods

***Jaera albifrons*** Leach, 1814 (NB, PQ Gulf of St. Lawrence sandy marine interstitial)

***Jaera ischiosetosa*** Forsman, 1949 (NB, PQ Gulf of St. Lawrence sandy marine interstitial)

***Jaera praehirsuta*** Forsman, 1949 (NB, PQ Gulf of St. Lawrence sandy marine interstitial)

***Joeropsis*** Koehler, 1885 - Jaeropsididae isopods

***Joeropsis asellotaj*** (sCA marine infauna)

***Joeropsis concava*** Schultz, 1966 (sCA marine infauna)

***Joeropsis dubia*** Menzies, 1951 (sCA marine infauna)

***Joeropsis*** undet. sp. (WA marine infauna)

***Kupellonura*** Barnard, 1925 – Hyssuridae isopods

***Kupellonura*** undet. sp. (Carolinian marine infauna)

***Ligia*** Fabricius, 1798 - Ligiidae isopods

***Ligia hawaiiensis*** (Dana, 1853) (Nihoa, Kauai, Oahu, Maui, HI/Tx? In hypogean, anchialine cave)

***Ligia perkinsi*** (Dollfus, 1900) (Kauai, Oahu, HI/Tx? in HI hypogean, anchialine cave)

*Ligia* undet. sp. (Cape Kinau, Maui, HI/hypogean, anchialine cave, Pb) **Bibl.:** Schultz, 1973

*Ligidium* Brandt, 1833 - Ligiidae isopods. **Bibl.:** Schultz 1970

*Ligidium elrodii chatoogaensis* Schultz, 1970 (\*type locality cave in Chattooga Co., GA/Pb)

*Ligidium elrodii e.* (Packard, 1873) (= *L. longicaudatum* Stoller, 1902) (cave in Orleans, IN/Tp in AL, GA, MO, TN, VA, WV; Tx in AR, nMS) **Bibl.:** Schultz 1970

*Ligidium elrodii leensis* Schultz, 1970 (type locality cave in Lee Co. + Scott? & Craig? Cos., VA/ Pb/ G4G5T1T2)

*Ligidium elrodii hancockensis* Schultz, 1970 (type locality cave in Hancock Co., TN & 2 caves in Walker Co., GA/ Pb/ TN SR, G4G5T1T2)

*Ligidium elrodii scottensis* Schultz, 1970 (type locality cave in Scott Co., VA/ G4G5, T1T2/ Pb)

*Ligidium gracile* (Dana, 1852)

*Ligidium gracile flavum* (BC/ Tp?)

*Ligidium kofoidi* (= *Japyx kofoidi* Silvestri, 1928; *Occasjapyx k.*) Maloney, 1930 (originally identified as a dipluran) (\*type locality cave in Shasta Co., CA/ Pb, Tb or Tp/ G1G2)

*Ligidium longicaudatum* = *L. elrodii e.*

*Ligidium* undet. sp. (Pb? in Subway Cave, Shasta Co., CA; Tp in OH)

*Limnoria* Leach, 1814 - Limnoriidae isopods

*Limnoria algarum* Menzies, 1957 (WA marine infauna)

*Limnoria lignorum* (Rathke, 1799) (AK marine infauna)

*Lirceolus* Bowman & Longley, 1976. **Bibl.:** Lewis 1983

*Lirceolus bisetus* (*Caecidotea bisetus*; *A.b.* Steeves, 1968; *Conasellus b.* S.1968) Lewis & Bowman, 1996 (type locality cave in San Saba Co. + caves and groundwater in Travis & Blanco Cos., TX/ Pb/ G3)

*Lirceolus hardeni* Lewis & Bowman, 1996 (caves and groundwater in Travis, Blanco & Comal Cos., TX/ Pb)

*Lirceolus pilus* (= *Asellus paurotrigonus* Steeves, 1968) Lewis, 1983a (type locality cave in Medina Co. + Bandera Co., \*Edwards Aquifer, TX/ Pb)

*Lirceolus smithii* (*Caecidotea smithii* Ulrich, 1902; *Conasellus s.* Bowman & Longley, 1976) (\*nearby subterranean stream & artesian well at San Marcos (Hays Co.) + cave? in Kendall Co., TX/ Pb)

*Lirceolus* undescr. sp. (\*?cave in Jeff Davis Co., TX/ Pb)

*Lirceus* Rafinesque-Schmaltz, 1820 (= *Asellus*) Asellidae isopods

**Bibl.:** Holsinger & Bowman, 1973; H. & Estes 1978; Findlay, Meyer & Smith 1984, 1986

*Lirceus alabamiae* Hubricht & Mackin, 1949 (AL/spr,seep/ Pb?) Bosnak 1979

*Lirceus bidentatus* Hubricht & Mackin, 1949 (\*seep, Boston Mts., 9mi.s sw of Harrison, Boone Co.,AR/ Pb)

*Lirceus bicuspidatus* Hubricht & Mackin, 1949 (AR spr.,cr./Tp or Tx in AR)

*Lirceus brachyurus* (*Mancasellus b.* Harger, 1876) (nePA to nVA/Tx? in PA/ watercress sowbug)

*Lirceus culveri* Estes & Holsinger, 1976 (\*type locality cave in Scott Co., swVA/ Rye (Cove) Cave Isopod/VA T&E S1, Global G1/ Tb) Holsinger & Estes 1978

*Lirceus fontinalis* Rafinesque-Schmaltz, 1820 (E epigeal/ Tx in IL, OH, KY(Mammoth C.), TN) Porter 1995; Styron 1969

*Lirceus garmani* Hubricht & Mackin, 1949 (neAR, sIL, eKS, wMO, eOK epigeal/ spr., stream, pond, Tx in OK)

*Lirceus harger* Hubricht & Mackin, 1949 (Powell Valley (TN) & Holston Valley (VA)/ spr., Pb?)

*Lirceus hoppinae h.* (*A.h.* Faxon in Garman, 1889) (type locality cave in Jasper Co.(MO) & AR,\*sw Ozarks/ spr., Tx)

*Lirceus hoppinae ozarkensis* Hubricht & Mackin, 1949 (type locality cave in Pulaski Co. & caves in Taney Co.,MO +nAR,\*central Ozarks/ spr.,streams)

*Lirceus lineatus* (Say, 1818) (rare Virginian marine infauna)  
*Lirceus macrourus* = *Mancasellus m.*

*Lirceus megapodus* Hubricht & Mackin, 1949 (MO/spr.,Pb?/ MO State T&E)

*Lirceus richardsonae* Hubricht & Mackin, 1949 (\*drain 1.3mi.se of Perryville,Wood Co.,OH/Pb) **Bibl.:** Culver 1976

*Lirceus* undescr. sp. (\*\*?cave each in Independence & Stone Co., AR/ Tb or Pb)

*Lirceus* undescr. sp. (\*\*?2 caves in Tazewell Co., VA/ Tb or Pb)

*Lirceus usdagalun* Holsinger & Bowman, 1973 (Lee County cave isopod/ type locality & 2 other caves (all 3 part of same cave system, 2 springs near airport site & cave Lee Co.,swVA/ Tb/ federal T&E, VA Special Concern T&E & S1G1)

**Bibl.:** Culver 1976, 1981); Estes 1978); Estes & Holsinger 1981-2); Holsinger & Estes 1978); Springston 1997; USFWS 1992

*Littorophiloscia* Hatch, 1947 - Philoscidae isopods

*Littorophiloscia bifasciata* Taiti & Ferrara, 1986 (Tx in Oahu, HI/endemic?)

*Littorophiloscia culebrae* (Moore, 1901) (adventive alien in HI/ Tx in Oahu, HI)

*Littorophiloscia hawaiiensis* Taiti & Ferrara, 1986 (littoral under rocks of guano in Laysan Island, HI/ anchialine Tp in Oahu and Big Islands, HI)

*Mancasellus* Harger, 1876 - Asellidae isopods  
*Mancasellus brachyurus* = *Lirceus b.*

*Mancasellus macrourus* (*Lirceus m.* Garman, 1890) (TN/St? in Mammoth C.,KY),

*Mesanthura* Barnard, 1914 Anthuridae isopods  
*Mesanthura* undet. sp. or species (Carolinian, LA marine infauna)

*Metoponorthus* Budde-Lund, 1879 (= *Porcellionides* Miers) Porcellionidae isopods  
*Metoponorthus pruniosus* (Brandt, 1833) (Tp in HI & c,wTX)

*Mexistenasellus* Cole & Minckley, 1972 - Stenasellidae isopods  
*Mexistenasellus coahuila* C. & M., 1972 (Mexico, Bexar & Medina Cos.,TX/ spr.,hyporheic, Pb)

*Microcerberus* Karaman, 1933 - Microcerberidae isopods  
*Microcerberus abboti abboti* Lang, 1961 = *Coxicerberus a. a.*  
*Microcerberus abboti juani* Coineau & Delamare, 1968 = *Coxicerberus a. j.*

*Microcerberus carolinensis* Wagele, Voelz & McArthur 1995 (hyporheic of SC coastal blackwater (freshwater) stream)

*Microcharon* Karaman, 1934 - Microparasellidae isopods  
*Microcharon* undet. sp. or species (nonkarst stygobite in MT; hyporheic & parafluvial in AZ),

*Miktoniscus* Kesselyak, 1930 - Trichoniscidae isopods  
*Miktoniscus alabamensis* Muchmore, 1964 (E/Tp in nAL, nFL, nGA, wNC, cTN, seVA, WV) Cooper & Cooper, 1977) **Bibl.:** Buhlmann 1996

*Miktoniscus barri* Vandel, 1965 (type locality cave in Dickson Co.(TN) +3 counties in IN, incl. Marengo C./ Tp/ TN SR/ IN T& E S2 G3G4)

*Miktoniscus linearis* (Patience, 1908) (SE/Tp? in NC) Schultz 1964  
*Miktoniscus mammothensis* Muchmore, 1964 (Mammoth C. (type locality) +cKY/ Tp, sinks)

*Miktoniscus medcofi* (*Trichoniscus m.* Van Name, 1940) (= *M. alabamensis* in part) (E, incl. AL, FL, VA/ Tp or Tx in GA (prob. in Walker Co.), KY (Clark Co.), MO, IL(probable), IN (Clark Co.), OH, TN (Dickson, Smith, Grundy Cos.),VA; Tp in FL, GA) **Bibl.:** Buhlmann 1996

*Miktoniscus morganesis* Schultz, 1976 (\*type locality cave in Morgan Co.,AL/ Tp)

***Miktoniscus racovitzai*** r. Vandel, 1965 (*M.r.r.* Vandel, 1964) (type locality in Luray C., Page Co. + caves in Alleghany, Botetourt, Page, Rockbridge & Shenandoah Cos., seVA/ Tb/ VA T&E S2, Global G3G4T3/ Racovitza's Terrestrial Cave Isopod)

***Miktoniscus racovitzai oklahomensis*** Vandel, 1965 (\*type locality cave in Murray Co.,OK/ Tb/ G1)

***Miktoniscus*** undescr. sp.#1 (\*cave in Marshall Co.,AL/Tb?)

***Miktoniscus*** undescr. sp.#2 (Tb in GA (Bartow, Dade, Walker Cos. )

***Miktoniscus*** undet. sps. (Tx in PQ; Tb in AR, TX)

***Munna*** Kroeyer, 1839 – Munnidae isopods

***Munna fernaldi*** George & Stromberg, 1968 (WA marine infauna)

***Munna ubiquita*** Menzies, 1952 (WA marine infauna)

***Munnogonium*** George & Stromberg, 1968 - Paramunnidae isopods

***Munnogonium tillerae*** (*Austrosignum t.* Menzies & Barnard, 1959) (sCA, WA marine infauna)

***Munnopsurus*** Richardson, 1912 – Munnopsidae isopods

***Munnopsurus*** undet. sp. (WA marine infauna)

***Neastacilla*** Tattersall, 1921 - Arcturidae isopods

***Neastacilla californica*** (Boone, 1918) (sCA marine infauna)

***Oniscus*** Linnaeus, 1758 - Oniscidae isopods

***Oniscus asellus*** Linnaeus, 1758 = *Asellus aquaticus*

***Papuaphiloscia*** Vandel, 1970 - Philoscidae isopods

***Papuaphiloscia laevis*** (*Halophiloscia laevis* Schultz, 1973) (may be junior syn. of *P. insulana* Vandel, 1970) (type locality cave in Big Island & other caves in Kauai, HI/ epigeal on Oahu & Tawiwan/ Tp)

***Paracerceis*** Hansen, 1905 - Sphaeromatidae isopods

***Paracerceis caudata*** (Say, 1818) (e,wFL, LA, MD, VA marine infauna)

***Paracerceis cordata*** (*Cilicæa c.* Richradson, 1899) (CA marine benthic)

***Paracerceis sculpta*** (*Cilicæa s.* Say, 1818) (CA marine benthic)

***Paranthura*** Bate & Westwood, 1868 – Paranthuridae isopods

***Paranthura elegans*** Menzies, 1951 (CA marine benthic)

***Philoscia*** Latreille, 1817- - Philoscidae isopods

***Philoscia angusticauda*** Budd-Lund, 1885 (Tx or Tp in Oahu)

***Philoscia*** undescr. sp. #1 (caves in Maui, Oahu, & Kauia/ Tb)

***Philoscia*** undescr. sp.#2 (caves in Kauai, Hawaii & Maui,HI/ Tb)

***Pleurogonium*** G.O. Sars, 1864 - Pleurogoniidae isopods  
***Pleurogonium californiense*** Menzies, 1951 (sCA marine infauna)  
***Pleurogonium rubicundum*** (G.O. Sars, 1864) (AK, WA marine infauna)

**Porcellio** Latreille, 1804 - Porcellionidae isopods

***Porcellio laevis*** Latreille, 1804 (NA & HI I(all islands) alien from Europe/dooryard sowbug/ Tp in HI (Kauai, Oahu, Hawaii) (alien), CA caves & Bell, Childress, Hays & Williamson Cos., TX)

***Porcellio*** undet. sp. (Ttp or Tx in Kartchner C., Cochise Co., AZ)

*Porcellio rathku* = *Trachelipus rathkei*?

***Porcellio scaber*** Latreille, 1804 (BC to sCA/common wood louse; scabby or dooryard sowbug/ Tx in BC; alien Tx in HI (Maui & Hawaii), IN, OH, TX)

***Porcellio*** cf. *scaber* Latreille, 1804 (alien Tx in CA)

***Porcellio spinicornis*** Say, 1818 (CA,N/ spiny sowbug/Tx? in sON, PQ)

**Porcellionides** Miers, 1877 - Porcellionidae isopods

***Porcellionides pruinosus*** (Brandt, 1833) (SW, pantropical epigeic/Tx or Tp in HI (Maui, Hawaii, Kauai); Tx in Crawford Co., IN) **Bibl.:** R. Lane 1974; Garthwaite & Sassaman 1985

*Protrichoniscus* - see *Brackenridgia c.*, *Conasellus r.*

*Pseudobaicalasellus* - see *Caecidotea v.*

***Ptilanthura*** Harge, 1878 – Anthuridae isopods

***Ptilanthura tenuis*** - rare/ Virginian marine infauna)

***Remasellus*** Bowman & Sket, 1985 - Asellidae isopods

***Remasellus parvus*** (= *Asellus parvus* Steeves, 1964) Bowman & Sket, 1985 (type locality cave in Alachua Co. +Wakulla, Madison & Suwannee Cos., Wakulla & upper Suwannee Rivers in Ochlockonee and Aucilla-Suwannee hydrologic subregions, ncFL/ Pb/ Swimming Florida Cave Isopod/ FL T&E, G3)

***Reductoniscus*** Kesselyat, 1930 - Armadillidae isopods

***Reductoniscus costulatus*** Kesselyak, 1930 (epigeic in Kauai, Oahu, HI/ Tx or Tp in HI)

***Reductoniscus*** undet. sp?. (Tp or Tx in cave in Oahu, HI)

***Rocinela*** Leach, 1818 (= *Acherusia*) - Egidae isopods

***Rocinela*** cf. *americana* Schioedte & Meinert, 1879 (WA marine infauna)

***Rocinela angustata*** Richardson, 1904 (sCA marine infauna)

***Rocinela belliceps*** (Stimpson, 1864) (WA marine infauna)

***Rocinela*** cf. *propodialis* Richardson, 1905 (WA marine infauna)

*Saduria* Mills, 1962 - Chaetiliidae isopods

*Saduria entomon* (Linneaus, 1758) (OR, WA marine infauna)

*Salmasellus* Bowman, 1975 - Asellidae isopods

*Salmasellus steganothrix* Bowman, 1975 (cave spr. at Horseshoe Lake, Jasper National Park, Alberta +BC,MT,WA/ Pb glacial refugia in BC cave/ Pb?, hypogean) **Bibl.:** Clifford & Bergstrom 1976

*Santia* Sivertsen & Holthuis, 1980- Santiidae isopods

*Santia hirsuta* (Menzies, 1951) (= *Antias h.*) (CA marine infauna in rock and sand intertidal)

*Serolis* Leach, 1818 - Seroloidae or Sphaeromatidae isopods

*Serolis carinata* (sCA marine infauna)

*Serolis m'garyi* Menzies & Frankeberg (wFL Gulf of Mex. marine infauna)

*Speocirolana* Bolivar & Pieltain, 1959 - Cirolanidae isopods

*Speocirolana hardeni* Bowman, 1992 (type locality cave in Val Verde Co. & artesian wells & sprs. in Bexar Co., ,sprs.,TX/ Pb)

*Sphaeroma* Bosc, 1802 - Sphaeromatidae isopods

*Sphaeroma quaridentata* (FL, SC marine infauna)

*Sphaeroma quoyanum* H. Milne Edwards, 1840 (CA marine infauna mud borer)

*Styloniscus* Dana, 1853 - Trichoniscidae isopods

*Styloniscus mauritiensis* (Barnard, 1936) (Tp in Molakia, Kauai, Hawaii, HI)

*Synidotea* Harger, 1878 - Idoteidae isopods

*Synidotea angulata* Benedict, 1897 (WA marine infauna)

*Synidotea bicuspidata* (Owen, 1839) (AK, WA infauna & NB, PQ Gulf of St. Lawrence sandy marine interstitial)

*Synidotea calcarea* Schultz, 1966 (sCA marine infauna)

*Synidotea magnifica* Menzies & J. Barnard, 1959 (sCA marine infauna)

*Synidotea media* Iverson, 1972 (sCA marine infauna)

*Synidotea nebulosa* Benedict, 1897 (WA marine infauna)

*Synidotea nodulosa* (Kroyer, 1846) (WA marine infauna)

*Tecticeps* Richardson, 1897 – Tecticipitidae isopods

*Tecticeps pugettensis* Haatch, 1947 (WA marine infauna)

*Thermosphaeroma* Cole & Bane, 1978 – Sphaeromatidae isopods

*Thermosphaeroma thermophilum* (Richardson, 1897) (\*Sedillo Spring, NM/Pb?/Socorro Isopod/ NM & federal T&E) **Bibl.:** Schuster, 1981

*Trachelipus* Budde-Lund, 1908 - Oniscidae isopods

*Trachelipus rathkei* (Brandt, 1833) (*Tracheoniscus r.*) (E epigean/ TTx or Ac in IN,PQ,WV; TTx in OH)

*Trichoniscus* Brandt, 1833 - Trichoniscidae isopods

*Trichoniscus nearcticus* Arcangeli, 1932 (cave in Harney Co.,OR/ extirpated? or misidentified)

*Trichoniscus pusillus* Brandt, 1833 (East US/ alien Tx in sON, TX, VA, WV)

*Trichoniscus pygmaeus* Scars, 1899 (Tx in OH)

*Trichoniscus* undet. sp. (cave in Marion Co.,TN)

*Trichorhina* Budde-Lund, 1908 - Platyarthridae isopods

*Trichorhina heteropthalma* Lemos de Castro, 1964 (Tp or Tx in cave in Kauai, HI)

*Trichorhina tomentosa* (Budd-Lund, 1893) (Tx in OH?)

*Tropicana* Manicasteri & Taiti, 1987 - Philoscidae isopods

*Tropicana minuta* Manicasteri & Taiti, 1987 (pantropical epigean/ Ttx or Tp in Kauai, HI)

*Tylos* Audouin, 1826 – Tyliidae isopods

*Tylos punctatus* Holmes & Gay, 1909 (CA marine sandy beach infauna burrower)

*Uromunna* Menzies, 1962 – Munnidae

*Uromunna hayesi* Robertson, 1978 (wFL Gulf of Mexico infauna)

*Venezillo* Verhoeff, 1928 Trichoniscidae isopods

*Venezillo tanneri* (Mulaik & Mulaik, 1942) (Mex,TX/ Tp in 2 caves ni Val Verde Co.,TX)

*Xenanthura* Barnard, 1925 - Hyssuridae isopods (once in Anthuridae)

*Xenanthura brevitelson* Barnard, 1925 (e,wFL, LA, Virginian (rare)m, TX marine infauna)

## Isoptera

(Termites & white ants) **Insecta** Order of Superorder (or Division) Neoptera, Subdivision Exopterygota (also put in Subdivision Dictyoptera). The name refers to the equal size of both pairs of wings, unlike those of ants. 3-10 mm. Soft bodies elongated, cylindrical, with only a slight constriction between abdomen and thorax (unlike ants). Mostly pale in NA with darker wings and brownish heads. Antennae short, usually not much longer than the head, with 9-30 or more segments. Large biting mandibles, especially in soldier caste. Very short terminal cerci. Usually wingless except during reproduction when wings have long, slightly curved veins with no or very few cross veins (unlike ants). Worker and soldier abdomens are simple, cylindrical and somewhat oval. A queen's abdomen is huge when filled with eggs. They are paurometabolous, with terrestrial eggs, larvae and adults. Social hormones secreted by the queen prevent nymphs from changing into reproductives. About 19000 species known with 44 in 18 genera in the U.S, mostly in the south. **Bibl.** Arauja 1977; Helfer 1963; Krishna & Weesner 1969-70; Snyder 1949

Kalotermitidae (powder-post termites)

undet. genus (14,300 yrs. BP in *Neotoma* woodrat nest, El Paso Co.,wTX or sNM)



Rhinotermitidae (subterranean termites)

Subfamily Heterotermitinae (*Heterotermes*, *Reticulitermes*)

***Heterotermes***, Froggatt, 1897 - Rhinotermitidae termites, Subfamily Heterotermitinae (1 species in US or Canada)

***Heterotermes aureus*** (*Reticulitermes a.* Snyder, 1920) (>43,300 years old in *Neotoma* woodrat nest in Tinajas Mts., Yuma Co, AZ)

***Reticulitermes*** Holmgren, 1913 (*Frontotermes* & *Planifrontotermes* Tsai & Hwang, 1977) (subterranean termites) Rhinotermitidae termites, Subfamily Heterotermitinae (6 species in US or Canada)

***Reticulitermes*** undet. sp. (Tx or Ac in CA)

**isotropic** - Having the same shape or properties in all directions. Cf. anisotropic.

**jaguar** - see **mammal**, cat.

**karyotype** - A description of the size, number and shape of all chromosomes within a eukaryotic cell.

**Kinorhyncha** (spiny neck worms; mud dragons)

Marine animal Phylum of pseudocoelomates. About 150 species, all benthic & <1mm. long.

Clade Bilateria

Clade Protostomia

Clade Ecdysozoa

Phylum Kinorhyncha (also put as a class in Phylum Aschelminthes)

Class Homalorhagida (also put as an order under Class Kinorhyncha)

Family Pycnophyidae (*Pycnophyes*)

***Pycnophyes*** Zelinka, 1907 -: Pycnophyidae Kinorhyncha

***Pycnophyes parasanjuanensis*** Adrianov & Higgins 1996 (marine interstitial in San Juan Islands, WA)

**klinotaxis** - Movement (taxis) which compares stimulus intensity on each side of the body.

**K-selected** - Organisms in a relatively constant or predictable environment where populations reach densities at or near carrying capacities. Usually strong competitors with low reproduction rate and fairly stable populations. Common in caves. Cf. R-selected.

**lampenflora** - **Plants** growing around lights in showcaves.

**larvae** - An active immature stage in an animal's life history when its form usually differs from the adult form, such as the grub stage in the development of a beetle. **Fly** larvae has less than 14 segments (unlike earthworms) & often have a head or with dark mouth-hook at one end. Singular is larva.

**larvites** - Calcified mucus tubes formed by **fly** larvae.

**lava tubes** - Ahearn & Howarth 1982; Benedict 1977; Barnard 1977; Bellinger & Christiansen 1975; Benedict 1973-74a,d, 1976-7; Bousfield & Howarth 1976; Briggs 1973, 1982-3, 1986, 1992; Brindle 1980; Crawford 1975a,e, 1980, 1982, 1990, 1992; Fennah 1973; Ferguson 1982, 1992; Gagne & Howarth 1975-a; Gertsch 1974; Grady 1989c; Gurney & Rentz 1978; Howarth 1972-91; Iliffe et al 1984; Kashima & Ogawa 1995; Kensley & Williams 1986; Liebherr & Samuelson 1992; Muchmore 1979, 1983; Nelson & Smith 1976; Palmer, J. 1975; Peck 1973a-4, 1982; Popa 1997; Richard et al. 1993; Schultz 1973; Staley & Crawford 1975; Williams, D. 1992; Zacharda 1980.

lavicole – Biota that lives in lava tubes or other pores in lava rock.

**leafhopper** - See Homoptera.

**leaf mold** - A general term for an accumulation on the soil surface that is composed largely of partly decomposed plant matter. Cf. **duff**.

**leech** - See **worm**, **Hirudinoidea**

**lemming** - See **mammal**, **rodent**.

lentic- Habitats of standing water such as pools, lakes and ponds.

**Lepidoptera** - Insect Order (incl. butterfly, **moths**), Subclass Pterygota, Division Neoptera, Subdivision Endopterygota (=Holometabola), Section Panorpidia, Subsection Amphimesenoptera. A few cave-adapted species are tropical.

**Leporidae** - See **hare & rabbit**.

**leptospirosis** - **Microbe hazard** caused by *Leptospira interrogans*. Known from British cave (polluted by pig farm runoff) & possibly from West Indies & Sarawak (Mulu Fever). The most severe clinical form is Weil's disease.

## Lice

Division Neoptera **insect**, Subdivision Acercaria, Section Psocodea. Some consider the two orders to be one order, the Phthiraptera (= Pseudorhynchota) (animal or ectoparasitic lice). For book- & bark-lice, see Psocoptera.

Hemimetabolous (simple metamorphosis, no pupa) or paurometabolous with eggs, larvae and adults. Larvae resemble adults. Wingless (apterous).

Mallophaga .5-.6 mm (rarely up to 10 mm. Body flattened, shape oval or elongate; pale tan, some with yellowish markings, or with dark brown or black banding. Head > thorax; antennae short, not > half of head length. Legs reduced, modified for attachment to host. Simple abdomen. Unlike psocids, antennae short with <6 segments and eyes greatly reduced.

Anoplura similar but with much smaller heads, piercing, sucking mouthparts and confined to mammal hosts. Brown, sometimes brown or gray

Ectoparasites of mammals & birds. Eggs attached by water insoluble glue. Probably evolved from psocid(-like) ancestor. Small, flat-bodied, biting, or sucking. Some are eyeless. Some feed only on blood, others feed also on feathers, hair, skin, sebaceous fluids or even other parasites.

**Bibl.:** Kim & Ludwig 1978. Bibl.: Durden & Musser 1994; Emerson 1972; Kim & Ludwig 1978; Kim, Pratt & Stojanovich 1986; Price & Graham 1997

#### Subdivision Pareneoptera

Order **Mallophaga** (biting lice) (name from Greek mallos, “wool” and phagus, “to eat”, referring to the belief that they ate wool, being found on mammals. 5,000 known species, 864 in 115 genera in US & Canada

Philopteridae (feather chewing, bird sucking or bird lice))

#### Subdivision Siphunculata (sucking lice)

Order **Anoplura** (from *anoplos*, “unarmed” and *ura*, “tail” from the lack of tail structures. 500 known species, 56 in 17 genera in US & Canada

Linognathidae (=Solenopotes) (pale or body lice)

(*Linognathoides*) (once in Siphunculata, also put in Polyplacidae))

Haematopinidae (ungulate lice; mammal sucking or wrinkled sucking lice)

(*Hoplopleura*) (now in Hoplopleuridae)

Hoplopleuridae (armoured lice) ((*Hoplopleura*) (once in Haematopinidae)

Pediculidae (body lice) undet. genus (2,000 to 3,000 & 9,400 to 10,000 years BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM)

Polyplacidae (spiny rat lice)

(*Fahrenholzia*, *Linognathoides* (put in Linognathidae) *Neohaematopinus*, *Polyplax*)

**Fahrenholzia** Kellogg & Ferris, 1915 - Polyplacidae lice (7 species in US or Canada)

**Fahrenholzia** *pinnata* Kellogg & Ferris, 1915 (Tx or Ac on *Myotis lucifugus* bat; on *Neotoma cinerea* & *lepida* woodrat)

**Hoplopleura** Enderlein, 1904 - Hoplopleuridae lice (once in Haematopinidae) (15 species in US or Canada)

**Hoplopleura** *acanthopus* (Burmeister, 1839) (ectoparasite on AB, BC, NWT, ON *Neotoma cinerea occidentalis* woodrats)

**Hoplopleura** *hirsuta* Ferris, 1916 (ectoparasite on FL *Neotoma floridana* woodrat)

**Linognathoides** Cummings, 1934 - Linognathidae lice (also put in Polyplacidae) (3 species in US or Canada)

**Linognathoides** *inornatus* (*Neohaematopius i.* Kellogg & Ferris, 1915) (ectoparasite on CO *Neotoma mexicana fallax* & OR *N. cinerea* woodrats)

**Neohaematopinus** Mjoberg, 1910 - Polyplacidae Anoplura (lice) (9 species in US or Canada)

**Neohaematopinus** *inornatus* Kellogg & Ferris, 1915 (ectoparasite on AZ, BC, CA, CO, ID, MT, OR, UT, WY *Neotoma cinerea*)

**Neohaematopinus** *neotomae* Ferris, 1942 (ectoparasite on *Neotoma fuscipes*; UT, WY *Neotoma lepida* & *N. cinerea*; CA *N. lepida*; AZ, NM, TX *N. albigula* & NM *N. mexicana* & *N. micropus* woodrats)

**Neohaematopinus** undet. sp. (ectoparasite on UT *Neotoma lepida* woodrats)

**Polyplax** Enderlein, 1904 (= *Eremophthirius* Glinkiewicz, 1907) - Polyplacidae lice (5 species in US or Canada)

**Polyplax** undet. sp(p). (ectoparasite on CO *Neotoma cinerea orolestes* woodrats; parasite in WA caves)

**Solenopotes** Enderlein, 1904 - Linognathidae lice (4 species in US or Canada)

**Solenopotes** undet. sp. (ectoparasite on CO *Neotoma mexicana fallax* & CO *Cinerea orolestes* woodrats)

## LICHENS

Kingdom Fungi

Phylum Ascomycota (true yeasts, moulds, morels, truffles)

Order Lecanorales

Suborder Cladoniaceae

Acarosporaceae (*Acarospora*)

**Acarospora** .Massal., 1852 (cracked lichen) Acarosporaceae lichen

**Acarospora** *schleicheri* (*Urceolaria s.* Ach.,1810) Massal. (= *A. evoluta* H.Magn). (Schleicher's cracked lichen/ twilight zone in nNM caves)

**Gasparrinia** *elegans* (*Lichen e.* Fink, 1794; *Caloplaca e.* Fries, 1871)

*Gasparrinia elegans* var. *brachyloba* (Zahlbr., 1930) H. Magn. (twilight zone in nNM)

**life** - Incl. **current, fossil, & organic.** See also **human.**

**life cycle/history** - Bruce 1972; Peck 1975; VanLuik 1981

limnicoid – Adj. for biota that lives in lakes. Syn.: limnicole.

Limno – Prefix for things restricted to freshwater.

**limnocene** - A spring pool from which water tends to flow out more slowly into a channel.

limnostygobionts – Stygobionts restricted to freshwater.

**limnoplankton** - Freshwater plankton often composed of unicellular organisms, rotifers, & small crustaceans.

**lint** - **HUMAN sediment** of cloth, hair, & skin parts. Jeans are major source. Can be 1/100,000 of lb/hour/visitor & cause **paradox of enrichment** near trails. Concentrates on stairs, where air funnels into small passages & where these passages open up into larger rooms. Lint supports mites, ants, rhadine beetles & spiders. 1' high trail curbs can contain most lint.

**lithotroph** - Taxon that gets energy from oxidation of inorganics. Cf. organotroph & autotroph.

**lion** - See **mammal, carnivore.**

**litter** - 1. Syn: **trash.** 2. In forestry, a general term for the layer of loose organic debris, composed of freshly fallen or only slightly decayed material, that accumulates in wooded areas. Use **duff.**

## Liverworts

Of the Class Hepaticae, generally flat lying **bryophytes.** Most species have either a flat, lobed thallus or a vegetative body with a dorsiventrally winged stalk. Oil bodies present in most thalli. Most species have long, colorless, unicellular rhizoids that anchor the thallus and absorb water and minerals. The sporangium (capsule), which represents the sporohyte, is usually hidden by the archegonial wall. Sporangium has elaters, unique to liverworts. About 10,000 species in 5 orders

Phylum Embryophyta

Division Hepatophyta (= Marchantiopsida)

Class Bryopsida (= Bryophyta) or Hepaticae (incl. Pleurolepicoleaceae)

Subclass Metzgeriidae

Order Metzgeriales

Suborder Metzgeriineae

Aneuraceae (*Riccardia*)

Metzgeriaceae (*Metzgeria*)

Suborder Pelliineae  
Pelliaceae (*Pellia*)

Subclass Jungermanniae

Order Jungermanniales (=Hepaticopsida)

Suborder Cephaloziineae

Adelanthaceae  
Subfamily Odontoschismatoideae (*Odontoschisma*)

Suborder Cephaloziineae  
Cephaloziaceae  
Subfamily Cephalozioidae (*Cephalozia*)

Cephaloziellaceae (*Cephaloziella*)

Suborder Geocalycineae  
Geocalycaceae  
Subfamily Geocalycoideae (*Geocalyx*, *Harpanthus*)

Subfamily Lophocoleoideae (*Chiloscyphus*, *Lophocolea*)  
(both also put in Subfamily Takakiinae)

Plagiochilaceae (*Scapania* (also put in Scapaniaceae))  
Subfamily Plagiochiloideae (*Plagiochila*)

Lophocoleaceae (subsumed in Geocalycaceae)

Suborder Gymnomitriaceae  
Subfamily Gymnomitrioideae (*Marsupella*)

Suborder Jungermanniineae  
Jungermanniaceae (*Anastrophyllum*, *Jamesoniella*, *Nardia*)  
Subfamily Jungermannioidea (*Jungermannia*)

Suborder Lepidoziineae  
Subfamily Bazzanioidea  
Lepidoziaceae (*Bazzania*)

Suborder Porellineae  
Jubulaceae  
Subfamily Frullanioideae (*Frullania* (also put in Frullaniaceae))

Lejeuneaceae (= Bryopteridaceae)  
Subfamily Cololejeuneoidea (*Cololejeunea* (also put in Codoniaceae))

Subfamily Lejeuneoideae  
(*Leucolejeunea*, *Lejeunea*, *Rectolejeunea*, *Taxilejeunea*)

Porellaceae (*Porella*)

Superfamily Jubulacea  
Jubulaceae (= Frullaniaceae)

Subfamily Jubuloideae (*Jubula*)  
Subfamily Frullanioideae (*Frullania* (also put in Conocephalaceae))

Suborder Ptilidiineae  
Ptilidiaceae (*Ptilidium*)

Suborder Radulineae  
Radulaceae (*Radula*)  
Scapaniaceae (*Diplophyllum Scapania* (also put in Plagiochilaceae))

Suborder Leidoziineae  
Calypogeiaceae (*Calypogeia*)

Subclass Marchantiae

Order Marchantiales

Suborder Marchantiineae

Aytoniaceae (=Grimaldiaceae, Rebouliaceae) (*Reboulia*)  
Conocephalaceae (*Conocephalum*, *Dumortiera* (also put in M.),  
Marchantiaceae (*Dumortiera* (also put in Conocephalaceae), *Marchantia*)

*Anastrophyllum* (Spruce) Stephani, 1893 - Jungermanniaceae liverworts

*Anastrophyllum michauxii* (*Jungermannia m.* F. Weber, 1753) H.Buch. ex A. Evans, 1932  
(= *Sphenolobus m.*) (WV twilight zone)

*Bazzania* Gray, 1821 (= *Bazzanius*) Lepidoziaceae liverworts

*Bazzania nudicaulis* Evans, 1821 (= *B. tricrenata* according to T. Fry & L. Clark, 1943) (WV twilight zone)

*Bazzania tricrenata* (Wahlenb.) Trev., 1877 (*B. nudicaulis* A. Evans, 1821) (WV twilight zone)

*Bazzania trilobata* (*Jungermannia t.* Linnaeus) Gray, 1821 (WV twilight zone)

*Blepharostoma* (Dumort. emend. Lindb.) Dumort, 1835 - Pseudolepicoleaceae liverworts

*Blepharostoma trichophyllum* (*Jungermannia t.* Linnaeus) Dumort., 1835 (blepharostoma/ WV twilight zone)

*Calypogeia* Raddi, 1818 (= *Calipogeja*) Calypogeiaceae liverworts

*Calypogeia neesiana* (Massal. & Carest, 1880) K. Muller, 1905 (WV twilight zone)

*Calypogeia sullivantii* Austin, 1873 (WV twilight zone)

*Calypogeia trichomanis* (Mnium t. Linnaeus, 1753) Corda, 1818 (WV twilight zone)

***Cephalozia*** (Dumortier emend. Schiffn.) Dumortier, 1835 - Cephaloziaceae liverworts  
***Cephalozia bicuspidata*** (*Jungermannia b.* Linnaeus, 1835) Dumortier, 1835 (WV twilight zone)  
***Cephalozia catenulata*** (*Jungermannia c.* Huebener, 1872) Dumortier, 1835 (WV twilight zone)

*Cephalozia curvifolia* = *Jungermannia c.*  
*Cephalozia media* Lindb. = *C. lunulifolia*  
***Cephalozia lunifolia*** (Dumort) Dumort (= *C. media*) (WV twilight zone)

***Cephaloziella*** (Spruce) Schiffner, 1893 - Cephaloziellaceae liverworts  
***Cephaloziella divaricata*** (*Jungermannia d. Sm., 1800*) Schiffner, 1893 (cephaloziella/ WV twilight zone)

***Chiloscyphus*** Cordin, 1829 - Geocalycaceae liverwort, Subfamily Takakiinae  
***Chiloscyphus pallescens*** (Ehrh. Ex Hoffm., 1795) Dum. (AL)

***Cololejeunea*** (Spruce) Schiffn., 1893 - Lejeunaeacea liverworts  
***Cololejeunea biddlecomiae*** (*Lejeunea b.* Austin ex Pearson, 1890) Evans, 1902 (epigean in AR; Tp in AL; WV twilight zone)

***Cololejeunea minutissima*** (*Jungermannia m.* Smith, 1806) Schiffner, 1895 (AL)  
***Cololejeunea ornata*** Evans, 1938 (AL)

***Conocephalum*** J. Hill, 1773 - Conocephalaceae liverworts  
***Conocephalum conicum*** (*Marchantia c.* Linnaeus, 1780) Underwood, 1895 (Ozarks, AL, MO, WV twilight zone)

***Diplophyllum*** (Dumortier) Dumortier, 1835 - Scapaniaceae liverworts in Jungermanniales  
***Diplophyllum apiculatum*** (*Diplophylleia a.* A. Evans, 1902) (WV twilight zone)

***Dumortiera*** Nees in Reinwardt, Blume et Nees, 1824 - Marchantiaceae liverworts  
***Dumortiera hirsuta*** var. *h.* (Swartz) Nees, 1833 (Ozarks/ diplophyllum/ TTp in AL)

***Frullania*** Raddi, 1818 - Frullaniaceae liverworts  
***Frullania asagrayana*** Mont., 1842 (WV twilight zone)

***Frullania eboracensis*** Gottsche, 1818 ssp. *virginica* (G.) Schust. (Ozarks/TTp in AL)  
***Frullania inflata*** Gottsche, 1845 (MW/Tp in AL)

***Geocalyx*** Nees, 1833 - Geocalycaceae liverworts in Jungermanniales  
***Geocalyx graveolens*** (*Jungermannia g.* Schrad., 1797) Nees, 1836 (geocalyx/ WV twilight zone)

***Harpanthus*** Nees, 1836 - Geocalycaceae liverworts in Jungermanniales  
***Harpanthus scutatus*** (*Jungermannia scutata* F. Weber & D Mohr, 1807) Spruce, 1850 (WV twilight zone)

***Jamesoniella*** (Spruce, 1876) Carrington, 1881- Jungermanniaceae liverworts  
***Jamesoniella autumnalis*** (*Jungermannia a* DC., 1815) Stephani, 1901 (WV twilight zone)



***Jubula*** Dumort., 1822 - Jubulaceae liverworts in Jungermanniales

***Jubula pennsylvanica*** (*Frullania p. Stephani*, 1883) Dumort, 1883 (WV twilight zone)

***Jungermannia*** Linneaus, 1753 emend. Dumort - Jungermanniaceae liverworts

***Jungermannia curvifolia*** Dicks, 1790 (= *Cephalzia c.*) (WV twilight zone)

***Jungermannia exsecta*** (Schmidel ex Schrad., 1797 (*Sphenolobus exsectus* (Schmidel ex Schrad., 1797). Steph.) (*Jungermannia*/ WV twilight zone)

***Lejeunea*** Libert, 1820 - Lejeuneaceae liverworts

***Lejeunea cavifolia*** (*Jungermanni c.* Ehrh., 1789) Lindb., 1871 (WV twilight zone)

***Lejeunea laetivirens*** (Nees et Mont., 1820) (*Microlejeunea l.*) (Ozarks/TTp in AL)

*Lejeunea sharpii* = *Taxilejeunea sharpii*

***Lepidozia*** (Dumort., 1831 as *Pleuroschisma* sect. *Lepidozia*) Dumort., 1835

***Lepidozia sylvatica*** Evans., Dicks, 1904 (WV twilight zone)

***Leucolejeunea*** A.W. Evans, 1907 - Lejeuneaceae liverworts

***Leucolejeunea uncioloba*** (*Lejeunea u.* Lindenberg in Gottsche, Lindenberg & Nees, 1845) Evans (Ozarks/TTp in AL),

***Lophocolea*** (Dum.) Dumortier, 1835 - Geocalycaceae liverworts

***Lophocolea cuspidata*** (Nees) Limpricht, "1877" 1876 (AL)

***Lophocolea heterophylla*** (Schrader) Dumortier, 1835 (AL)

***Marchantia*** Linneaus, 1753 - Marchantiaceae liverworts

***Marchantia polymorpha*** Linnaeus, 1753 (Europe,NA/ AL, KY, MN, NM, NY, WV twilight zone)

***Marsupella*** Dumortier, 1822 - Gymnomitriaceae liverworts

***Marsupella emarginata*** (*Jungermannia e.* Ehrhart, 1894) Dumortier, 1835 (WV twilight zone)

***Metzgeria*** Raddi, 1818 - Metzgeriaceae liverworts

***Metzgeria conjugata*** Lindb., 1818 (marsupella/ WV twilight zone)

***Metzgeria myriopoda*** (Lindberg, 1818) (Ozarks/ marsupella/ TTp in AL),

***Nardia*** S. Gray, 1821 - Jungermanniaceae liverworts

***Nardia crenulata*** (Austin) Lindb., 1818 (nardia/ WV twilight zone)

***Nardia crenuliformis*** (Austin) Lindb., 1818 (nardia/ WV twilight zone)

***Odontoschisma*** (Dumortier) Dumortier, 1835 - Adelanthaceae liverworts

***Odontoschisma denudatum*** (*Jungermannia denudata* Nees, 1817) Dumortier, 1835 (WV twilight zone)

***Pellia*** Raddi, 1818 - Pelliaceae liverworts in Metzgeriales

***Pellia epiphylla*** (*Jungermannia e.* Linneaus, 1753) Corda, 1829 (WV twilight zone)

**Plagiochila** (Dumortier.) Dumortier, 1835 - Plagiochilaceae liverworts

**Plagiochila asplenioides** (Linnaeus) Dumortier, 1835 (*Plagiochila major* & *porelloides*) (WV twilight zone)

**Plagiochila asplenioides** ssp. *porelloides* (= *P. p* Torrey ex Nees) Lindenberg, 1840 (Ozarks/ AL twilight zone)

*Plagiochila invis*a = *Scapania i*.

**Plagiochila undata** Sullivant in Gray, 1846

**Plagiochila undata** ssp. *undata* Sullivant in Gray, 1846 (Ozarks/TTp in AL)

**Plagiochila virginica** A. Evans (AL)

**Porella** Linnaeus, 1753 - Porellaceae liverworts

**Porella pinnata** Linnaeus, 1753 (Ozarks/TTp in AL) &

**Porella platyphylloidea** (Schwein.) Lindberg. 1876 (Ozarks/TTp in AL)

**Ptilidium** Ness, 1833 - Ptilidiaceae liverworts

**Ptilidium pulcherrimum** (*Jungermannia pulcherrima* Weber, 1778) Hampe, 1836 (ptilidium/ WV twilight zone)

**Radula** Dumortier, 1822 - Radulaceae liverworts

**Radula australis** Austin, 1876 (TX/TTp in AL)

**Radula mollis** Lindenberg et. Gottsche, 1822 (AR/TTp in AL)

**Radula obconica** Sulliv. (epigean in CT,MA, ME, VT/ WV twilight zone)

**Reboulia** Raddi, 1818 - Aytoniaceae liverworts

**Reboulia hemisphaerica** (Linnaeus) Raddi, 1818 (Ozarks/TTp in AL)

**Rectolejeunea** Evans, 1906 - Lejeuneaceae liverworts

**Rectolejeunea maxonii** A. Evans, 1906 (Ozarks/ TTp in AL)

**Riccardia** Gray, 1821 nom. cons - Aneuraceae liverworts in Metzgeriales

**Riccardia chamedryfolia** (Withering) Grolle, 1969 (Ozarks/TTp in AL)

**Scapania** (Dumortier) Dumortier, 1835 - Scapaniaceae liverworts in Jungermanniales

**Scapania dentata** Dumortier (WV twilight zone)

**Scapania nemorosa** (*Jungermannia n.* Linnaeus, 1763) Dumortier, 1835 (illegitimate name) (WV twilight zone)

**Scapania** (*Scapaniella*) *invis*a Schuster, 1974) (= *Plagiochila invis*a) (AL)

**Scapania undulata** (*Jungermannia u.* Linnaeus, 1753) Dumortier, 1835 (WV twilight zone)

*Sphenolobus* (S.O. Lindberg, 1898) Berggren, 1951

*Sphenolobus exsectus* = *Jungermannia e.*

*Sphenolobus michauxii* = *Anastrophyllum m.*

*Taxilejeunea* (R. Spruce, 1983) Schiffner in Engler & Prantl. - Lejeuneacea liverworts  
*Taxilejeunea sharpii* R.M. Shuster, 1893 (= *Lejeunea sharpii*) (AL)

## Lizards

Reptile of Class Reptilia

Subclass Lepidosauria

Order Squamata (snakes, lizards, amphisbaenids)

Suborder Lacertilia (lizards & allies) (most primitive suborder)  
(rejected as suborder because it is paraphyletic)

Infraorder Anguimorpha

(monitors, anguids, gila monsters, mososaurs, etc.) (Anguidae)

Infraorder Gekkota (geckos and allies) (Gekkonidae)

Infraorder Iguania (iguanas & allies) (Iguanidae)

Infraorder Scincomorpha (skinks, (lacertids) & allies)

(Teiidae, Scincidae (also put in Lacertilia)) **Bibl.:** Gilmore 1928

**Anguidae** (anguids, galliwasp, alligator & glass lizards) (*Gerrhonotus*, *Ophisaurus*)

**Gekkonidae** (geckos) (*Coleonyx*)

**Iguanidae** (iguanids) (*Anolis*, *Crotaphytus*, *Phrynosoma*, *Sceloporus*)

**Scincidae** (skinks) (*Eumeces*, *Scincella*) about 600 sp. in 50 genera

**Teiidae** (whiptails, racerunners & ground lizards) (*Cnemidophorus*)

*Anolis* Daudin, 1809 - Anguidae lizards (21 species in US or Canada)

*Anolis carolinensis* Voigt, 1832 (green anole/ sVA to sFL, w. to cTX/ TTx in TX)

*Cnemidophorus* Wagler, 1830 - Teiidae lizards (whiptails & racerunners) (16 species in US or Canada)

*Cnemidophorus* undet. sp. ( Pleist. in Burnet and/or Dark Canyon C., NM)

*Coleonyx* Gray, 1845 - Gekkonidae lizards (4 species in US or Canada)

*Coleonyx brevis* (Stejneger, 1893) (Texas banded gecko/ seTX, scNM/ TTx in TX)

*Coleonyx variegatus* (Baird, 1859) (epigean swAZ, neAZ, swCA/ banded gecko/ late Pleistocene to early to middle Holocene extralimital west in Tse'an Bida C., AZ)

*Coleonyx variegatus brevis* = *C. brevis*

*Crotaphytus* Holbrook, 1842 - Iguanidae lizards (3 species in US or Canada)

**Crotaphytus** *collaris* Holbrook, 1842 (eUT, CO to swIL, s. to Mex., w. to cAZ/collared lizard/  
Pleist. in Burnet and/or Dark Canyon C., NM)

**Crotaphytus** cf. *collaris* Holbrook, 1842 (Irvingtonian extralimital sw. in Fryllan C., TX)

**Eumeces** Wiegmann, 1834 - Scincidae lizards (13 extant species in US or Canada)

**Eumeces** *curri* Meylan, 1982 (extinct Pleist. in Inglis sink, Citrus Co., FL)

**Eumeces** *fasciatus* (Linnaeus, 1758) (sNew England to nFL, w. to eTX, n.to KS, WI, sON/ five-lined Skink/ TTx or Ac in MD, NJ, PA/ cf. Rancholabrean extralimital in Reddick I Site, Marion Co., FL)

**Eumeces** *fasciatus* (se PA to cFL, along Gulf Coast to eTX, n. to KS, IL/ broad-headed skink/  
Tx in FL)

**Eumeces** *obsoletus* (Baird & Girard, 1852) (seWY,sNB,swIA to cAZ,Mex.,wcTX/ Great Plains  
Skink/ Tx in TX)

**Eumeces** *tetragrammus* (Baird, 1859) (four-lined skink) (c,s TX to Mex., n. to scAZ, swNM/  
north extralimital in C.Without A Name (13,000BP, TX) & cave in Kendall Co. (11,000yrs,  
cTX)

**Gerrhonotus** Wiegmann, 1828 - Anguidae lizards (5 species in US or Canada)

**Gerrhonotus** *liocephalus* (Wiegman, 1828) (Texas alligator lizard)

**Gerrhonotus** *liocephalus infernalis* (G.i. Baird, 1858) (Edwards Plateau to Big Bend, s. to  
Mex./TX alligator l./Ac or Tx in TX)

**Gerrhonotus** *multicarinatus* (Blainville, 1835) (swWA s.to nMex./southern alligator lizard/  
TTx? or Ac in CA)

**Ophisaurus** Daudin, 1803 (glass lizards) Anguidae lizards (3 species in US or Canada)

**Ophisaurus** undescr.? sp. (late Irvingtonian extinct? in Fryllan C., TX)

**Phrynosoma** Wiegmann, 1828 (horned lizards)\_Iguanidae lizards (7 species in US or Canada)

**Phrynosoma** *cornutum* (Harlan, 1825) (KS to TX, w.to seAZ, LA disjunct, alien in nFL/ Texas  
horned lizard/ extralimital in NM (Burnet &/or Dark Canyon C.,NM)

**Phrynosoma** *douglassi* (Bell, 1829) sBC to nCA, s.ID, UT, sSK, se to KS, s.to Mex., disjunct in  
wTX / short-horned lizard/ extralimital in late Wisconsinan NV (Smith Cr. C., NV, NM (Burnet  
&/or Dark Canyon C.,NM) & TX (Hall C.)

**Phrynosoma** undet. sp. (Pleist. fossil/w. extralimital in Conrad Fissure (AR))

**Sceloporus** Wiegmann, 1828 - Iguanidae lizards (16 species in US or Canada)

**Sceloporus** *magister* (Hallowell, 1854) (sNV s. to Baja, se to AZ,NM,w.TX/desert spiny lizards/  
extralimital in late Wisconsinan Smith Cr. C., NV)

*Sceloporus occidentalis* Baird & Girard, 1852 (wWA, OR, seID, NV, eUT, n,cCA/ western fence lizard/ Ttx? in CA)

*Sceloporus olivaceus* Smith, 1934 (Texas spiny lizard/ scOK to Mex./Ac in cave in Kinney Co., TX)

*Sceloporus undulatus* (Latreille, 1801)

*Sceloporus undulatus hyacinthinus* (Green, 1818) (eKS to NJ, s. to cSC, sw to eTX & n. to eOK/ northern fence lizard/ Ac in NJ?)

*Sceloporus variabilis* Wiegmann, 1834 (scTX to Costa Rica/rose-bellied lizard / 11,000BP north extralimital in Kendall Co., TX)

*Scincella* Mittleman, 1950 - Scincidae lizards (1 species in US or Canada)

*Scincella lateralis* (Say in James, 1823) (NJ s.to FL, w.to cTX, n.to NB,MO/ ground skink/ TTx in Travis Co., TX & Madison Co.,AL)

## **Limpets** - Class Gastropoda

Subclass Patellogastropoda (once an order) (=Diotocardia?)

Order Archaeogastropoda

Superfamily Lottioidea (once put in Subclass Prosobranchia)

Acmaeidae (also put in superfamilies Patellacea & Patelloidea) (limpets)

Subfamily Acmaeinae (*Acmaea*)

Lottiidae (also put in superfamily Patelloidea) (*Tectura*)

*Acmaea* Rathke, 1833 - Acmaeidae limpets, Subfamily Acmaeinae

*Acmaea testudinalis* (Muller, 1776) = *Tectura t.*

*Tectura* – Gray, 1847 - Lottiidae limpets (7 species in US or Canada)

*Tectura testudinalis* (Muller, 1776) (= *Acmaea t.*) (tortoiseshell limpet/ Tx in ME sea c.)

**llama** - Extinct Camelidae. See **mammal**.

**Lobster** – Phylum Arthropoda, Subphyllum Crustacea, Class Malacostraca, Subclass Eumalacostraca, Superorder Eucarida, Order Decapoda Suborder Pleocyemata, Infraorder Astacidea (lobsters) & Palinura (spiny or slipper lobsters)

*Panulirus* White in Gray, 1847 - Palinuridae lobster

*Panulirus* undet sp. (TTx in CA/ (spiny lobster)

**local - Population** not present throughout, but at least fairly common where present.

**locality, type** - Where a **type** species was collected.

**longevity** - Cooper & Cooper 1976, 1978, 1978a; Nicholas 1969; Nicholas 1974

Lophotrochozoa - Division of Protostomia Bilateria animals that does not undergo ecdysis. Includes various worms (chaetognathids, sipunculids, ascanthocephalids, gastrotrichs, platyhelminthes, ribbon worms, annelids), rotifers, cycliophorids, bryzoans, phoronids, brachiopods, and mollusks.

Lophophorates (= Lophophorata) – Lophotrochozoa that form a feeding structure (lophophore) that resembles a scope finged with cilia. Includes **phoronids, bryozoa** and **brachiopods**.

**Loricifera** - A phylum of microscopic marine animals with many Aschelminth characters. >100 species, mostly interstitial. In the US, found in marine sediments of TX, FL, NC and likely all other states)

Clade Bilateria

Clade Protostomia

Clade Ecdysozoa

Phylum Loricifera

Nanoloricidae (undetermined genus in FL/TX marine interstitial; *Nanoloricus*)

*Nanoloricus* Kristensen, 1983 - Nanoloricidae loriciferans

*Nanoloricus mysticus* Kristensen, 1983 (interstitial marine off Greenland, Denmark, FL)

**lotic** - running water habitat (see **crayfish**).

lucifuge – Refers to a species intolerant of light.

**luminescence** - See bioluminescence

**lyme disease** - Microbe hazard caused by bacterium *Borrelia burgdorferi* that is transmitted by humans by infected insects, usually in the NE by the deer **tick**, a reddish-brown **mite** (*Ixodes*) about the size of a pinhead. The lone star tick (*Amblyomma americanum*) may also carry it. Initial symptoms are usually mild, flu-like (fever, headache, fatigue, malaise & joint aches). A bulls-eye type rash at the bite site may be present in 60% of cases. The acute phase occurs weeks or even years later, with progressive fatigue, migrating arthritis & malaise, sometimes leading to irregular heartbeats, facial paralysis, meningitis, & death. Not known from caves.

**Ma** - Millions of years before the present.

**macro-evolution** - Above the species level.

**macrofauna** - 1. Soils animals visible to the naked eye. 2. **Current** or **fossil** animals visible to the naked eye. Cf. **microbe** & **mesofauna**.

**macrofossil** - A fossil large enough to be studied without microscopes.

**macroinvertebrate** - Invertebrates larger than meiobenthos and which are retained on coarse sieves with a mesh size greater or equal to 2 mm. Usually visible to the naked eye from one foot away. Incl. most **arachnids**, **crustaceans**, **bivalves**, **hexapods**, & **worms**.

**macromutation** - One with large phenotypic effects.

**macronutrient** - Organics or inorganics needed in rather large amounts by a lifeform. Incl. amino acids, carbohydrates & fats.

**macrophyte** - Macroscopic species that eats sunlight and grows in water.

**Malacostraca** - Chace et al., 1959. Aquatic **crustacean** Class incl. orders **Amphipoda**, **Decapoda** (see **shrimp** & **crayfish**), **Isopoda** & (less common) **Anaspidacea**, **Bathynellacea** (**syncarids**), **Mysida**, **Spelaeogriphocea**, & **Thermosboenacea**. **Bibl.:** Chace et al. 1959; Ortmann 1918; R. Pennak 1968

**mandible** - Hardened mouthparts. Incl. most anterior gnathal appendages.

**malacology** - the study of mollusks.

## Mammals

Of Kingdom Animalia, Phylum Chordata, Subphylum Vertebrata, Subclass Theria. All species listed here are in Infraclass Eutheria except opossum in Infraclass Metatheria, Superorder Marsupialia (or as order), Order Didelphimorphia). All young are fed by milk glands (mammary glands and all except Monotremata (incl. platypus) are viviparous (give birth to live, non-egg young). About 6,000 species.

Dasypodidae

Subfamily Pamphathiinae (*Holmesina*, *Dasypus*) (see armadillos)

Order Artiodactyla

Family Antilocapridae (*Antilocapra*, *Capromeryx*, *Stokocerus*, *Tetrameryx*)  
(see pronghorns)

Family Bovidae

Subfamily Bovinae (*Bison*) (see bison)

Subfamily Caprinae

(*Euceratherium* (see shrub-ox), *Oreamnos* (see mountain goats),

*Ovibos* (see musk-ox), (*Ovis*) (see sheep), ) *Symbos* (see musk-ox))

Family Camelidae

(undet. fossil genus in Papago Spr. C., AZ; *Camelops*, *Hemiauchenia*, *Palaeolama*))  
(see camels & llamas)

Family Cervidae

Subfamily Capreolinae (*Rangifer*) (see caribou)

Subfamily Cervinae (*Cervus*) (see elk)

Subfamily Odocoileinae

(*Blastocerus*, *Odocoileus*, *Navahoceros*, *Sangamona*) (see deer) (*Cervalces*)  
(see moose)

Family Tayassuidae (*Mylohyus*, *Platogonus*, *Tayassu*) (see peccary)

Undet. Genus - Irvingtonian in limestone fissures in Ozark Mts. of Newton Co., AR

Order Carnivora

Suborder Caniformia

Family Mephitidae

Subfamily Mephitinae (*Brachyprotoma*, *Conepatus*, *Mephitis*, *Spilogale*) (see skunk)

Superfamily Arctoidea

Family Mustelidae

Subfamily Mustelinae

(*Gulo* (see wolverine), *Mustela* (see ermine, ferrets, fishers, weasels), *Martes*  
(see martens), *Trigonictis* (see mink))

Subfamily Taxidiinae (*Taxidea*) (see badgers)

Family Otariidae (now in Order Pinnipedia)

Family Ursidae (see bears)

Subfamily Ursinae (*Arctodus*, *Tremarctos*, *Ursus*)

Infraorder Canoidea

Family Canidae

Subfamily Borophaginae (borophagines) (once in Simocyoninae)

(*Borophagus*, *Urocyon*, *Vulpes*) (see foxes)

Subfamily Caninae (3 extant species in US or Canada) (*Canis*)

(see dogs, coyotes, wolves)

Family Procyonidae (also put in Arctoidea) (*Bassariscus*) (see ringtails)

Subfamily Procyoninae (*Nasua*) (see coati) (*Procyon*) (see raccoons)

Suborder Fissipedia

Infraorder Feloidea

Suborder Feliformia

Superfamily Aeluroidea (= Feloidea)



Family Felidae

Subfamily Felinae (*Lynx*) (see bobcats) (*Felis*, *Homotherium*, *Smilodon*)  
(see cats), *Lynx* (see lynx), (*Acinonyx*, *Miracinox*) (see cheetahs)

Subfamily Pantherinae (*Panthera*) (see panthers)

Family Hyaenidae (hyaenas) (*Chasmaporthetes*) (= *Euryboas*) (see hyaenas)

Order Chiroptera (see bats)

Suborder Yinochiroptera (= Suborder Megachiroptera in part)

Infraorder Megachiroptera

Superfamily Pteropodoidea

Pteropodidae (flying foxes) (*Pteropus*)

Suborder Yangochiroptera (= Microchiroptera)

Superfamily Emballonuroidea (= Rhinopomatoidea in part)

Emballonuridae (sac-winged or sheath-tailed bats) (*Emballonura*)

Infraorder Noctilionida

Superfamily Noctilionoidea

Desmodontidae - subsumed in Phyllostomidae

Mormoopidae (moustached, naked-backed & ghost-faced bats  
(*Mormoops*, *Pteronopus*) **Bibl.:** J. Smith 1972;

Phyllostomidae (incl. Desmodontidae) (New World leaf-nosed bats)  
(*Desmodus*, *Diphylla*, *Leptonycteris* (Glossophaginae), *Macrotus*)

Infraorder Vespertilionida

Superfamily Vespertilionoidea

Molossidae (free-tailed bats; free-tailed, bulldog & mastiff bats)  
(also subsumed in Vespertilionidae)  
(*Eumops*, *Molossus*, *Nyctinomops*, *Tadarida*)

Vespertilionidae Gray, 1821 (plain-nosed or vespertilionid bats)  
(may include Molossidae)

Subfamily Vespertilioninae

(*Antrozous*, *Corynorhinus*, *Eptesicus*, *Euderma*, *Idionycteris*, *Lasionycteris*,  
*Lasiurus*, *Nycticeius*)

Order Edentata

Family Glyptodontidae (*Glyptotherium*) (see glyptodonts)

Family Megatheriidae (*Glossotherium*, *Nothrotheriops*, *Paramylodon*)

Family Megalonychidae (*Megalonyx*) (see ground sloths)

Order Insectivora (insectivores)

Family Talpidae (moles, desmans & shrew-moles)

Subfamily Talpinae

(*Neurotrichus* (see shrews), *Parascalops*, *Scalopus*, *Scapanus* (see moles))

Subfamily Soricinae (*Blarina*, *Cryptotis*, *Notiosorex*, *Sorex*) (see shrews)

Order Lagomorpha

Family Leporidae (see rabbits)

Subfamily Archaeolaginae (*Hypolagus*)

Subfamily Leporinae (*Aztlanolagus*, *Brachylagus*, *Lepus*, *Silvilagus*)

Family Ochotonidae

(pikas, pikas, whistling hares, calling hares, mouse hares, rock conies) (*Ochotona*)  
(see pikas)

Order Perissodactyla

Suborder Mesaxonia

Infraorder Hippomorpha

Superfamily Equoidea

Family Equidae (horses & zebras) (*Equus*) (see horses)

Infraorder Moropomorpha

Parvorder Ceratomorpha

Magnafamily Tapiridea

Superfamily Tapiroidea

Family Tapiridae (tapirs) (*Tapirus*) (see tapirs)

Superfamily Rhinoceroidea

Family Rhinocerotidea (true rhinoceroses)

Subfamily Rhinocerotinae (*Coelodonta*) (see rhinos)

Order Pinnipeda

Suborder Pinnipedia (seals, sealions & walruses)

Family Odobenidae (*Odobenus*) (see walrus)

Family Otariidae (*Zalophus*) (see sea lions)

Order Primates

Family Hominidae (*Homo*)

Order Proboscidea (Elephants, mammoths, mastodons)

Elephantidae (*Cuvieronius*, *Mammuthus*, *Mammuthus*) (see elephants)

Order Rodentia

Hydrochaeridae (capybara rodent)

Subfamily Hydrochoerinae (*Neochorus*)

Suborder Hystricognathis

Family Erethizontida (*Coendu*) (see coendu)

Suborder Hystricognathis

Family Erethizontidae (*Erethizon*) (see porcupines)

Suborder Sciurognathi

Family Castoridae (*Castor*, *Castoroides*, *Paradipoides*) (see beavers)

Family Aplodontiidae (1 extant species in US & Canada)

(*Aplodontia*) (see mountain beavers)

Infraorder Myomorpha

Family Heteromyidae (heteromyid rodents) (*Proheteromys*)

Subfamily Perognathinae (*Perognathus*)

Family Dipodidae (brich & jumping mice & jeroboas)

Subfamiliy Zapodinae (*Napaeozapus*, *Zapus*)

Family Muridae (Old World **rats** & mice) (see also rats and woodrats)

(*Allophaiomys*, *Dicrostonyx*, *Lemmus*, *Mictomys*, *Synaptomys*)(see lemmings, mice)

Subfamily Arvicolinae

(*Atopomys*, *Clethrionomys*, *Lagurus*, *Phenacomys* (see voles), *Microtus*  
(see mice), *Neofiber* (see rats), *Ondatra* (see rats))

Subfamily Murinae (*Mus* (see mice), *Rattus* (see rats)),

Subfamily Sigmodontinae (*Baiomys*, *Neotoma* (see rats), *Oryzomys* (see rats)

*Onychomys* (see mice), *Peromyscus* (see mice), *Reithrodontomy* see mice),  
*Sigmodon* (see rats))

Infraorder Sciuromorpha

Family Geomyidae (pocket gophers)

(*Geomys*, *Pappogeomys*, *Thomomys*) (see gophers)

Family Sciuridae

Subfamily Sciurinae

(*Cynomys* (see prairie dogs), *Eutamias*, *Tamias* (see chipmunks), *Marmot*  
(see marmots), *Ammospermophilus*, *Glaucomys*, *Sciurus*, *Spermophilus*,  
*Tamiasciurus*) (see squirrels)

antelope - See pronghorn

## ARMADILLOS

**Bibl.:** Guilday & McCrady 1966.

*Chlamytherium* = *Holmesina*

***Dasypus*** Linnaeus, 1758 - Dasypodidae mammal (one extant species in US) **Bibl.:** Klippel & P. 1984

***Dasypus bellus*** (*Tatu b.* Simpson, 1930) (Extinct Pleist. beautiful armadillo/ Peccary C. & cave in Ozark National Scenic Riverways (both in AR), Anderson Pit (IN), A-maze-in & Mammoth (both in KY), Organ-Hedrick & Cricket Maze (both WV), Medford (FL) Auffenberg 1957, Cave Acb-3 Unit E (Unit E – Sangamonian, 11.5-4k, average 11.8k yrs., Unit D – 172k +-10k, both in AL), Zoo, Crankshaft, Brynjulfson, Heinze, & Cherokee (40,000BP) & Little Beaver (11,000 +-60 BP) (MO), Baker Bluff & Peck C. (TN), & TX (C. Without a Name, Baker's Bluff, Moore Pit, Kinkaid Shelter & Inner Space C.; in latest Irvingtonian sink near Coleman, Sumter Co., FL, Pleist. (latest Blancan or earliest Irvingtonian) Haile filled-in FL sinkhole or cave), late Rancholabrean Reddick I Site fissure, (Marion Co.), & early Irvingtonian in Inglis sinkhole, Citrus Co., FL) & in Sabertooth Cave (Sangamonian or possibly Wisconsinan, FL))

***Dasypus novemcinctus*** Linnaeus, 1758 (nine-banded armadillo/ now in eTX, eOK, extreme se NB & sw MO, AR (except ne), sLA, sMS, sGA, & FL (except extreme s.)/ Tx in TX)

***Holmesina*** Simpson, 1930 - Dasypodidae mammal, Subfamily Pamphathiinae

***Holmesina floridanus*** (= *Kraglievichia f.* Robertson, 1976) (extinct in early Irvingtonian in Inglis sinkhole, Citrus Co., FL)

***Holmesina septentrionalis*** (*Glyptodon s.* Leidy, 1889; *Chlamytherium s.* Sellards, 1915) (giant armadillo/ extinct in Sabertooth Cave (Sangamonian or possibly Wisconsinan, FL & Pleist. Coleman (latest Irvingtonian in Sumter Co.) & Haile (latest Blancan or earliest Irvingtonian) filled-in FL sinkhole or cave, late Rancholabrean Reddick I Site fissure, (Marion Co.), FL)

***Dasypus novemcinctus*** Linnaeus, 1758 (c,eTX, adj.Mex., c,e,OK, AR, seNB, LA, wMS, seGA, wcAL, FL/ armadillo/ TTx in TX). See **glyptodont**.

**Artiodactyla** - Mammal order that incl. bighorn sheep, bison, camel, caribou, deer, elk, llama, mountain goat, musk-ox, peccary & pronghorn

## **BADGERS**

***Taxidea*** Waterhouse, 1839 - mammal Order Carnivora, Suborder Caniformia, Family Mustelidae, Subfamily Taxidiinae

***Taxidea taxus*** (Schreber, 1778) (W(except wWA,OR), MW to wOH, n.to cSK/Irvingtonian extralimital in Cumberland (MD) & Welch (KY) C./ Fossil **Bibl.:** F. Grady 1998; Long 1964.

**BATS** - Mammal of Order Chiroptera (bats, flying foxes and fruit bats)

Elongated fingers of the forelimb act as supports for two thin, elastic membranes extending from the sides of the body and legs (incl. tail in some species). In most a cartilaginous spur (calcar or

calcaneum) on the inner side of the ankle joint helps to spread the tail membrane. The third finger is very elongated (usually = body & leg length). Legs rotated to support wing membrane.

Order Chiroptera (see bats)

Suborder Yinochiroptera (= Suborder Megachiroptera in part)

Infraorder Megachiroptera

Superfamily Pteropodoidea

Pteropodidae (flying foxes) (*Pteropus*)

Suborder Yangochiroptera (= Microchiroptera)

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Vespertilionidae Gray, 1821 (plain-nosed or vespertilionid bats)

(may include Molossidae)

Subfamily Vespertilioninae

(*Antrozous*, *Corynorhinus*, *Eptesicus*, *Euderma*, *Idionycteris*, *Lasionycteris*,  
*Lasiurus*, *Nycticeius*)

**General:** W.F. Blair 1957, 1968; Pye 1966; Slaughter & Walton 1970

**activity patterns** (see emergence, seasonality) M. Adam, Lacki & Shoemaker 1994; R. Adams 1998; D. Audet 1987; L. Ball 1998; L. Beasley 1985-6; L. Beasley & Smith 1983-4; Beasley, Pelx & Zucker 1984; Brigham 1986, 1988; P. Brown 1982; Bruce & Wiebers 1969; Caceres 1998; Cockrum 1956; Cockrum & Cross 1964; Constantine 1967; P. Cryan 2000; De Coursey & de Coursey 1964; von Frneckell 1986; D. Griffin & Welsh 1937; Guthrie 1933; Hayes 1997; Hickey & Neilson 1995; Hickey, Palen et al. 1996; J. Horn 1999; J. Horn & Kunz 2000; Kirkwood & Cartwright 1994; Kunz 1969, 1973; Kunz & Anthony 1982; Kurta, Caryl & Lipps 1997; Kwiecinski 1982, 1984; McManus 1974; Menard 1997; P. Miller 1995; S. Murray 1997-8; Surprenant 1978; O'Farrel, Bradley 1970; O'Farrel, Bradley & Jones 1967; Rawson 1960;

Reith 1980; S. Robertson, Britzke et al. 1998; Ruffner, Poche et al. 1979; Rupprecht 1980-1; Schmidt 1999; Suprenant 1978; Thibault & Adams 1996; 1996; Tipton 1983; von Frenckel 1986; T. Walker et al. 2000; D. Waters & Walsh 1994; T. Weller, Seidman & Zabel 1998; D. Young & Scudday 1975; Wunder 1987; Wunder & Nash 1980

**adrenal gland** - Krutzsch & Hess 1961; F. Miller et al. 1972; Rudd & Beck 1969

**adrenal-cortical** - Widmaier, Harmer & Sulak 1994

**age & age determination** - (see longevity, development) - T. Baptista, Richardson & Kunz 2000; R. Barclay 1994-5; E. Anthony 1988; Hoying & Kunz 1981-2; Kazial, Burnett & Mitchell 1998; C. Phillips, Steinberg & Kunz 1982; Ramage, Anthony & Kunz 1978; Sealander 1964

**aging** - S. Austad & Fischer 1991

**albinism** - Setzer 1950; H. Walley 1974

**albumin** - Honeycutt & Sarich 1987

**allometry** - T. Strickler 1978

**altruism** - Wilkison 1988

**ammonia tolerance** - H. Mitchell 1963; Studier 1965, 1969; Studier & Fresquez 1969; Studier, Beck & Lindeborg 1967

**antitragus** - A small fleshy projection on the postero-ventral margin of the pinna of some bats.

**aspect ratio** - Forearm length (elbow to wrist) + wing tip (wrist to tip of digit III)/ length of fifth finger.

**arousal** (see hibernation) - Brenner 1973; J. Pagels & Jones 1974; Studier 1974

**ascorbic acid** - Krutzsch & Hess 1961

**asymmetry** - Gummer & Brigham 1995

**atrioventricular node** - Spoonamore 1978

**bachelor colony** - A group of pre- and post-pubertal males that roosts separately from females, usually during the reproductive period (includes non-harem males)

**bacula** - R. Brown 1967; W. Hamilton 1949; Krutzsch & Vaughan 1955; Rippy 1965

**banding**: (see surveying) L. Conrad 1962; E. Davis 1968; W. Davis 1960; Bonaccorso & Smythe 1972; H. Hitchcock 1978; Layne 1997; Paradiso 1968; E. Pierson 1993; E. Pierson & Fellers 1993

**basisphenoid pits** – Depressions in basisphenoid bones behind palates. May be involved in echolocation. DeBaeremaeker 2000.

**barometric pressures** - Paige et al. 1989; M. Scott & Vaughan 1997; M. Scott 1997

**basal metabolic rate** - Rate of energy expenditure while at rest, post-absorptive, and at thermoneutrality; express as  $\text{kJ} \cdot \text{g}^{-1} \cdot \text{h}^{-1}$  Cf. roosting metabolic rate.

**bat bombs** - Moore 1948; Couffer 1992; Gilnes 1990; McCracken, 1989, 1993; Mohr 1955; Pidgeon 1982-3

bat detector - Electronic device sensitivity to ultrasonic and audible sounds produced by bats - See **collecting**.

**bat houses** (see roosts, bridges, mines, caves and trees) - B. Baker, McDaniel et al. 1997; B. Baker, Wilhide et al. 1998; Belwood 1990; H. Black 1983; A. Cartwright 1990; Clawson 1989; Clawson & Gardner 1993; Dourson & MacGregor 1998; Finn 2000; Glover & Properzio 1997; Greenhall 1981; Hickey & Neilson 1995; Hickey, Palen et al. 1996; W. Kern & Belwood 1996; Kiser 1998; Monday 1993; Moriety & Davis 1984; Murphy 1991; Neilson & Fenton 1994; Noteman 1998; Onan 1991; Pavwoski & Lewis 1998; Rathbone 1997; Siders, Garcia de la Cadena et al. 1997; Thorsby & Barnard 1996; M. Tuttle & Hensley 1993, 1997; Vavrlick & Galli 1993; E. White 1982, 1997; L. Williams & Brittingham 1993

**bat pass** - One pass by one individual through air space as sample with a bat detector.

**behavior** - McNAb 1974; Dooley 1974; C. Gaudet 1981; L. Hill 1966; D. Howell 1981; Lande 1977; Norberg 1993-4; O'Shea & Vaughn 1977; D. Thomas, Fenton & Barclay 1979

beneficial use - see use

**bioamines** - Bauman, Hashim & Serphen 1989

**biochemistry** - Manwell & Kerst 1966

**biodiversity** - Burt & Gannon 1998; Cochran, Hoffman, et al. 1998; Kurta, Caryl & Lipps 1997; R. Mills, Barrett & Cope 1976; D. Connor & McCoy 1979; Gannon & Sexton 1996; P. Miller 1995; K. Murray, Britzke et al. 1998; Perkins, Peterson and Anderson 1997; Ramsey 1997; Remington 2000; Schum 1975, 1978, 1984; Singer 1995; R. Spears & Hagan 1994; Stelfox 1995; T. Walker et al. 2000; Willig & Lyons 1991, 1994, 1998; Willig & Seker 1989; Willig & Selcer 1984; D. Wilson, Cole et al. 1996

**biogeography** - D. Armstrong 1994; Schum 1975; L. Ball 1995; R. Barclay & Brigham 1998; ; Barclay, Fullard & Jacobs 1999; Bowles 1975; Brack 1979; Brack & Mumford 1984; Bradshaw 1995-6; Bradshaw & Brigham 1998; J. Brown & Gibson 1983; C. Burnett 1982-3; Burt & Gannon 1998; Burt, Gannon & Brown 2000; Choate 1996; B. Clark 1984; Cockrum 1960, 1981; C. & Ordway 1959; C. & Petrozyn 1986; C. & Musgrove 1964; L. Conrad 1963; De Jong 1994; Fenton, Tenannt & Wyszecski 1987, 1997; E. Cook, Gardner et al. 1988; P. Cryan, Bogan & Altenbach 2000; England 1999; Enright 1962; Fenton, Merriam & Holroyd 1983; Findley & Traut 1970; Gardner & McDaniel 1978; Geluso 2000; Glover 1933; Herrera Montalvo, Fleming & Findley 1991; LaVal, Clawson, et al. 1977; H. Jackson 1919; Legendre 1984; Long & Severson 1969; J. Jones & Carter 1979; Koopman 1981; S. Lyons 1995; Lyons & Willig 1997; McLaren & Kirkland 1979; R. Mills, Barrett & Cope 1977; Milstead & Tinkle 1959; R. Mumford 1958; G. Nelson & Platnick 1984; R. Owen 1989; I. Patterson 1961; J. Perkins & Peterson 1996; Ruffner et al. 1978; Tipton 1984; Tumilson 1990; Wethington et al. 1996-7; Whitaker & Mumford 1971-2; Fenton 1972; Knapp 1997; D. Owen et al. 1990, 1989; R. Owen 1989; J. Perkins 1995-6; Purdue 1980; Robbins 1983; Robbins, Engstrom et al. 1977; Sanchez-Brown et al. 1999; Schum 1978; Singer 1995; D. Thomas 1988; Tipton 1985; Tumilson 1990; T. Walker et al. 2000; Turmelle, Sorenson & Kunz 2000; Whitaker & Mumford 1972; B. Williams, Kunz et al. 1998

**bioerosion** - J. Hooper 1958

**biology**: Wimsatt 1977

**biological clocks** - Twente 1991; Twente & Twente 1989; Twente, Twente & Brack 1984;

**biomedical research**: W. Davis & Reite 1967

**birds** (see predation on bats) - Kurta & Foster 1995

**birthing** - Dixon, Foxworth et al. 1997; Kunz, Pierson & Kurta 1983; H. Lane 1946; Munyer 1967; Racey 1973; Sealy 1978;

blood and/or heart - see cardiovascular

**Boettchger cells** - Ramprashad, Money et al. 1983

**bones** - Bader & Hall 1960; Bruce & Wiebers 1969; D. Dawson 1975, 1980; Doty & Nunez 1985; ton & Crerar 1984; Krook, Wimsatt et al. 1977; W. Lancaster, Fenton & Eger 2000; Rumage, Anthony & Kunz 1978; K. Smith & Kier 1989; Swartz 1997; Swartz, Parker & Huo 1998; Tumilson 1995

**brain** (see echolocation, pituitary) - Barom & Jolicoeur 1980; Conover 1969; J. Cotter & Laemle 1987, 1990; Covey 1993; Covey & Casseday 1986; Covey, Lauer & Casseday 1996; Crowle 1974; Eisenberg & Wilson 1978; Esher, Wolfe & Koch 1980; Fenton 1989; B. Fowler & Zook 1982; Jen 1980, 1982; Kennedy & Fuzessery 1991; Jen & Chen 1988; Jen & Kamada et al. 1984; Jen, Sun & Kamada 1982; Jen, Sun & Lin 1989; Jen & Schlegel 1980, 1982, 1987; Jen, Vater et al. 1981; B. Jonson 1993; Jolicoeur, Pirlot et al. 1984; Kegeyama & Wong-Riley 1982; J. King, Anthony, Gustafson et al. 1984; J. King and Anthony 1983-4; J. King, Stenveld et al. 1994; Laemle, Coter & Feldman 1984; Legendre, Lapointe & Casgrain 1994; Mackawa, Wong & Paschal 1992; Oelschlaeger et al. 1998; Paschal 1994; Pirlot 1982; Pirlot & Jolicoeur 1982; Pirlot & Pottier 1977; H. Stephan, Frahm & Baron 1987; Stephan, Nelson & Fraham 1981; Studholme et al. 1987; Wenstrup & Suthers 1981; Winkelmann 1971; Zook & Dicaprio 1988

**breathing** - S. Thomas, Follete & Farabaugh 1991

**bridges** - Gore & Hovis 1997; Keeley & Keeley 1999; Keeley & Tuttle 1997; -Lance, Hardcastle & Tally 1998; McDonnell & Clark 1999; Perlmeter 1993, 1999; Perlmeter & Ormsby 1996

**calcar** - A cartilaginous process in the calcaneum bone that contributes to the support of the uropatagium. **Bibl.**: R. Adams & Briggs 1996; R. Adams & Thibault 1999, 2000; W. Schutt & Simmons 1997

**call structure** - Patter of frequency change over time in vocalizations; sonograph or peroid meter display.

**captivity** - See collecting, captivity

**cardiovascular**: Bassett & Wiederhielm 1982-3; Bohlem & Hankins 1983; Kallen 1977; Chen 1983; Chen, Fleming & Prewitt 1984; Cukierski 1986; Cukierski 1982, 1985; Cukierski & Hogan 1986; M. Davis & Sikes 1989; P. Dunaway & Lewis 1965; B Fleming 1983; B.



Fleming, McKinney & Knight 1982; B.Fleming & McKinney 1985; Fonda, Herbener & Cuddhee 1983; P. Harris et al. 1976; Kallen & Wimsatt 1962; Kleinschmidt, Koop & Braunitzer 1986; Kleinschmidt, Ruchnagle et al. 1987; Longnecker, Harris & Hodoval 1971; Manwell & Kerst 1966; K. Martin & Stehn 1977; F. Miller & Harris 1975; G. Mitchell 1969; O'Shea 1987; O'Shea and Evans 1985; Pucinelli & D'Agrosa 1982; Rasweiler 1993; Rauch 1972; Rauch & Beatty 1975, 1977; Rauch & Hayward 1970; Riedesel 1977; Sealander 1964; Soskic et al. 1987; Spoonamore 1978; Studier & Weing 1971; Tiller 1977-8; Van Riper 1981; Wible 1987

**carpal** - B. Stafford & Thorington 1998

**caves** - Bagley 1981; Belwood 1995; Conrad 1963; D. Buecher, B. Buecher, et al. 1997; D. Buecher, Sidner & Buecher 1990; Campbell, Tyson & Hall 1991; Cliburn & Middleton 1983; Delfino 1982; J. Dunn & Hall 1989; W. Elliott & Clawson 1999; Ezzell 1992; Ganter 1989; Goodpaster & Hoffmeister 1950; Gore & Hovis 1995; Griffin 1940; Guthrie 1933; J. Hart et al. 1992, 1997; Haynie et al. 1998; R. Henshaw 1961; Herreid 1957; J. Kennedy 1999; Loomis & McDaniel 1971; M. Looney 1971; Mahan 1973; Marcot 1984; McCracken 1993; McDaniel, Harvey et al. 1982; McDaniel, Paige & Tumilson 1979; McDaniel, Rick & Gardner 1977; McDaniel, Paige & Tumilson 1979; McGimsey 1995; Mumford 1953, 1958; Mumford & Whitaker 1975; Munson & Keitch 1984; Palmer-Ball 1996; Richter, Ward & Cope; Richter, Humphrey et al. 1993; Rodrigues & Palmeirim 1993; Rodriguez-Duran 1991; N. Rogers 1952; Rysgaard 1942; Sacks, Ajello & Crockett 1986; Sasse & Perkins 1995; A. Schmidt, Romme & Tyrell 1997; Schmidt, Salyers et al. 1997; Sidner 1986; D. Silver 1993; J. Skeen, Grigsby et al. 1990; Stafford 1993; Stihler 1996-8; D. Stihler, Dalton et al. 1996; Stihler, Jones & Wallace 1998; Stokes 1996; G. Swanson & Evans 1936; Thies 1993; D. Thompson 1997; Tipton 1985; Twente 1955-6; A. Werner 1984; Wethington, Leslie et al. 1996-7; Whitaker & Mumford 1971; Whitaker & Rissler 1993; Whitaker & Winter 1977

**cells** - Kniazeff, Constantine et al. 1967

**cerebellar vermis** - Jen, Vater et al. 1981

**cerebellum** - Jen 1982

**CF** - Constant frequency (pure tone) component of ultrasonic pulses produced by some echolocating bats (used for ranging and judging velocity and direction of movement).

**character displacement** - Gannon 1995

**chloesterol** - Kunz, Widmaier et al. 1996

**circumvallate papillare** - R. Murray 1993

**cochlear** - Novacek 1991

**colliculus**, inferior and superior - B. Johnson 1993; D Marsh 1981; D. Marsh, Pollak & Bodenhamer 1980; Pouissin & Schlegel 1984; Wenstrup & Suthers 1981; K. White 1997

**collecting**, sampling, census, inventory - Ad hock Committe 1987; Bagley & Jacobs 1985; Benedict 1973f; Bradbury, Morrison et al. 1979; Brigham & S. 1991; Elsea 19523; Lotz & Font 1990, 1991, 1994; O'Connor & Klompen 1988; Pistole 1983; Bonaccorso & Smythe 1972; Bonaccorso & Smythe & Humphrey 19726; Brahana & Walters 1994; Bretschko & Klemens 1986; Buchler 1976; Cooper & Poulson 1968; Crawford 1976b; Cross 1986; Danielpol 1979; Edwards & Fletcher 1971; Evans & Pagel 1986; French 1973; Furstenberg, Dye & de-Wet 1978;

P. Garcia & Barclay 1996; Griffiths 1978; Hooker & Whiles 1988; Hunter & Thomas 1977; Kethley 1991; Kirchengast 1979; Kunz & Kurta 1988; Kuschel 1991; Maries 1994, 1986; McCann 1982; Owen 1995; Radice & Loftus 1995; Pace 1994; Thompson 1976; Valentine 1941; Cooper 1980; R. Crawford 1983; J. Fowler 1948; Woods 1955; Ivey 1953; Muma 1945; Peck 1967; Shepard & Lambert 1995; Tangl & Jones 1987; Stohlgren et al. 1995; F. Thompson 1976; Tidemann & Woodside 1978; Tuttle 1975, 1982; D. Wilson, Cole et al. 1996

**Computers** - P. Watts 1992

**Curation** - Bhatnagar 1988; Binindaemonds & Russel 1993; L. Williams, Laubauch & Laubach 1979

**Captivity** (see netting) - Bear & Holguin 1971; Nave & James 1998; R.Orr 1958; D. Adams & Baer 1966; Adkins & Wasserman 1993; Barnard 1991, 1994; Bear & Holguin 1971; Coutts, Fenton & Glen 1973; Dickey 1922; Eford & Barnard 1991; Gates 1936, 1938; Gaudet 1982; Johnson 1932; Killpack & Goates 1963; Milam 1995; P. Morton 1998; Nellis 1969; Bear & Holguin 1971; Nave & James 1998; R.Orr 1958; Racey 1970; Rasweiler & Rasweiler 1979, S. Reynolds 1988; Ronsholt et al. 1998; R. Stones 1965; H. Taylor, Gould et al. 1974; S. Walker 1996; Waterstradt 1981

**Acoustic Detectors** (Anabat, etc.) - Blackburn & Gannon 2000; Bossi 1998; Britzke & Murray 2000; S. Burnett & Masters 2000; Corben, Gannon & O'Farrell 1998; Corben 1995-6; Corben, Gannon & O'Farrell 1998; J. Dawson & Fullard 1991; Delorme & Juras 2000; C. Downes 1982; Fenton 2000; Griffin 1973; Hadley, Britzke & Robbins 1998; J. Hooper 1969; Kuenzi & Morrison 1998; Kunz & Brock 1975; Lance, Bollich et al. 1995; Livengood & Drobney 1999; Livengood, Drobney & Corben 2000; McDonald 1997; B. Miller & M. O'Farrell 1998; K. Murray, Britzke et al. 1998-9; Neefus & Krusic 1995; M. Oliveira 1998; O'Farrell 1998-9; K. Paige, Mink & McDaniel 1985; Patriquin 2000; J. Pye 1979, 1983, 1985; H. Rice et al. 200; J. Ross 1997; Schwenk 1997; Szewczak 2000; M. Shepard & Lambert 1995; Tibbels 1999; Tibbels & Kurta 1999; A. Walker 1996; D. Waters & Walsh 1994; L. Watkins 1970; T. Weller, Seidman & Zabel 1998; J. Whiteman 1997

**Electrical conductivity** to assess fat content - D. Reynolds 1966

**GIS** - E. Cook, Gardner et al. 1988

**Infrared** - J. Frank 1997; J. Frank et al. 2000; Kunz & Frank 1997, 2000; W. Lancaster et al. 1997; Kirkwood & Cartwright 1994; Route 1998; Sabol & Hudson 1995; J. Simmons & O'Farrell 1999

**Lasers** and night vision - P. Farnsworth & Cox 1988

**Marking** - Griffin 1934, 1936; M. Gannon 1993

**Netting** & other traps- Blackburn & Gannon 2000; Cortelyou 1991; C. Francis 1987, 1989; J. Gardner, Hoffman, Garner & Cook 1987; Herder & Jackson 1998; Kuenzi & Morrison 1998; Kunz & Anthony 1977; Kunz & Brock 1975; Lacki & Bookhout 1982; K. Murray, Britzke et al. 1998; O'Farrell 1972; Tuttle 1974; G. White 1982

**Radar** - J. Horn et al. 2000; Westbrook, McCracken et al. 1998; S. Russ 1998; T. Williams, Ireland & Williams 1973

**Radio transmitters** - R. Barclay, Kalcounis et al. 1996; Berry 1999, 2000; P. Brown 1982; Constantine, Jensen & Tierkel 1959; E. Cook, Gardner et al. 1988; Dobkin, Kattel & Gettinger 1995; Hickey 1990, 1992; W. Lancaster, Keating & Henson 1992; Solberg et al. 1999; D. Stihler, Dalton et al. 1996

**Statistics** - Culver 1979; D. Connor & McCoy 1979; Elliott, J.M., 1977a; French 1977; Ghent 1971; Pimm 1979; G. White 1982

**Survey/aging /banding techniques:** Buecher 1993; Hassinger 1985; R. Clawson & Sheriff 1982 ; W. Davis 1961-3; Greenhall & Paradiso 1968; Humphrey 1971; Mohr 1979; Perry 1965; Perry & Beckett 1966; Perry & Herreid 1969; Trapido & Crowe 1946; Tuttle 1974; Warden 1981

**Video** - Dixon & Higginbotham 1998

**color** - See hair

**communication** (see echolocation) - Bloss & Kunz 1999; P. Brown; Balcombe 1988; Bradbury 1977; Kazial & Masters 1999; M. Leonard & Fenton 1984; Marsh 1981; C. Thompson, Fenton & Barclay 1985;

community - See social

**communal roost** - A roost used simultaneously by more than one individual.

**chiropterophily** - Mutualistic associations between flowers and flower-visiting bats. See pollination.

**competition** - S. Anderson & Koopman 1981; Freeman 1984; S. Humphrey 1978; Kurta & Foster 1995; J. Perkins 1995-6; Reith 1978; Shields & Bildstein 1979

**conservation** (see gating, endangered, mines, management, mortality, pollution, *Myotis sodalis* & *griseus*, *Leptonycteris*): Altenbach 1998; Belwood 1990; Christman 1984; Gore & Hovis 1998; F. Jonston 1981; Mohr 1976; Bowles, 1981; J. Brady, 1981-3; Brady, LaVal et al 1983; T. Brown 1997-8, 2000; W. Caire 1988; ; M. Clark 1995; W. Davis 1982; W. Davis 1965; Estes 1976; Ducummon 1997; Ducummon & Taylor 1996; Dusi 1976; Fenton 1997; M. Fletcher et al. 1979; Fletcher 1985; Ganter 1989; Genoways 1985; Glass 1976; Grigsby & Puckette 1982; J. Hart et al. 1992, 1997; Harvey 1976, 1989, 1991, 1993, 1998; Harvey, Cassidy & O'Hagen 1981; Henshaw 1970-2; Jordan 1986a; D. Howell 1997; C. Jones 1976; Keeley 2000; Lacki 1995; Ladd 1980; Laval 1978; Lera 2000; Luce & Priday 1996; Marquart 1997; McCracken 1986; Medellin 1994; Millsap et al. 1990; Mohr 1973, 1976; Myers 1975; Nold et al. 1997; Nold et al. 1997; Perkins 1980, 1985; Petit 1978; R. Martin; McCracken 1993; Moody 1989; P. Morton 1989; Noel, Snow & Castner 1995-6; E. Pierson & Brown 1992; Rissler; Sheffield et al. 1992; Saugey, England and Chandler-Mozisek 1993; Schmauch 1997; Schommer & Perkins 1993; Scott & Sims; Stebbings 1995; D. Taylor 1995-6; J. Taylor 1988; Tuttle 1984, 1986, 1990, 1992-3, 1996-5; Tuttle & Robertson 1988; Tuttle & Schmauch 1998; Twente 1960; Tyrell &

Black 1993 United States Fish & Wildlife Service 1976, 1993, 1995; B. Webb 1987; D. Wilson 1985; Wackenhut & McGraw 1996; Wooder 1998

**control:** Baumgartner 1983; Brigham & Fenton 1987; R. Brown 1995; Constantine 1982; J. Cope 1959; R. Corrigan & Bennett 1982; DePaepe et al. 1996; Finn 1996; S. Frantz 1984, 1986; H. J. Jones 1993; R. Marsh & Howard 1977; L. Martin 1979; Neilson & Fenton 1994; R. Patterson 1985; Sarell & Luoma 1994; H. Scott 1961; Silver 1935; Sterner, Shumake & Gaddis 1978

**cytochrome oxidase** - Kegeyama & Wong-Riley 1982

**dactylopatagium** - The part of the **wing** membrane between the 2<sup>nd</sup> and 3<sup>rd</sup> digits.  
**day roost** - A site or structure used by bats during the day.

**delayed development** - A condition where the blastocyst implants without delay after entering the uterus but subsequent embryonic development ceases temporarily or proceeds slowly.

**delayed implantation** - A condition where the blastocyst remains in the uterine lumen for a variable period before it implants.

**delayed ovulation** - A condition in which ovulation is postponed for a period of time following copulation and where spermatozoa are stored in the female reproductive tract. In temperate regions this period is prolonged by hibernation. Syn. delayed fertilization.

**development** (see also juveniles) - R. Adams 1992, R. Adams and Pederson 1997; Ahysen & Kunz 1993; T. Baptista & Kunz 1995; T. Baptista, Richardson & Kunz 2000; Boatright & Covery 1995; P. Brown & Grinnell 1980; P. Brown, Grinnell & Harrison 1978; Buchanan & Hagarfield 1990; J. Burns, Baker & Bleier 1972; J. Burns & Easley 1977; Case 1978; Hoying 1983; Drymond 1936; E. Evans & Miller 1968; Fujita 1982, 1986; Galli 1995; Greenhal & Frantz 1994; I. Hamilton 1995; Hoying 1983; Hoying & Kunz 1981-2; Koehler & Barclay 2000; Koopman 1974; Kunz & Allagier 1994; Kunz, Pierson & Kurta 1983; Kunz & Robson 1995; Kurta, Kunz & Nagy 1986; Kurta & Nagy 1986; A. Laird 1966; J. Pagels & Jones 1974; Short 1961; Sidner 1988, 1989; Stangl, Dalquest & Grimes 1996; Studier & Kunz 1995; Tiunov 1994; Tuttle & Stevenson 1982; Zullinger et al. 1984

**digestion** - R. Barclay et al. 1990; Buscholz 1958; Luckens, Van Eps & Davis 1971; Rouk 1968

**digits** (see limbs) - W. Schutt 1993; J. Simmons & Quinn 1994; Thewissen & Etnier 1995

**diseases** - see rabies, histoplasmosis, relapsing fever; J. Anderson 1975; Andreasen & Duimstra 1996; Eads 1952; Herbold 1981; Irons, Eads et al. 1957; LaMotte 1958; Lera 1980; McCracken 1994; Sulkin, Sims & Allen 1966; Tesh & Schneidau 1967;

**carcinoma** - Beck, Beck & Howard 1982

**cryptosporidiosis** - Dubey et al. 1998  
distribution - see biogeography

**disturbances:** Humphrey 1969; LaVal & LaVal 1980; Psyllakis 1999;

**doppler** - Altes & Reese

**ears** - deCarvalho, Gannon & Ruedas 1998; Fenton 1972; O. Henson 1965, 1970; B. Lawrence & Simmons 1982; Obrist, Fenton et al. 1993

**echolocation/communication** - Echolocation is the use of echos of sounds produced by animals for orientation and prey capture. See doplar, vocalizations, collecting: Alderidge, Aldrige & Rautenbach 1987; Altenbach 1978; Altes 1981, 1989; Arita & Fenton 1997; Balcombe 1986; J. Balcombe & Fenton 1988; Ballantyne & Sherwin 1999; R. Barclay 1981, 1999; Barclay, Fullard & Jacobs 1999; Belwood 1982; Belwood & Fullard 1984; Berkowitz & Suga 1989; Betts & Haynes 1994; Boatright 1999; W. Bogdanowicz et al. 1997; Brigham et al. 1989; Brigham, Grindal et al. 1997; Britzke, Bossi & Robbins 1998; P. Brown & Grinnell 1980; P. Brown, Grinnell & Narims 1985; C. Burnett 1983; Busnell & Fish 1980; Casseday & Covey 1985, 1992; Casseday, Covey & Grothe 1997; Casseday, Ehrlich & Covey 1994; Casseday, Kobler et al. 1989; Chase 1985; Condon 1994; Condon, White & Feng 1994; Covey & Casseday 1986; Covey, Lauer & Casseday 1996; Dear, Simmons & Fritz 1993; Koemel 1996; Dear 1995, 1998; Dear & Suga 1998; deCarvalho, Gannon & Ruedas 1998; Denzinger et al. 1991; Dunning 1968; Dunning, Miller & Futtrup 1997; Dunning, Acharya et al. 1992; Durrant 1988; Ehrlich, Casseday & Covey 1997; Everett & MacRury 1996; Fattu 1975; Fattu & Suthers 1981; Feng, Condon & White 1994; Fenton 1974, 1980-2, 1984-5, 1987-8, 1994, 1999; Fenton, Audet, et al. 1995; Fenton & Bell 1981; Fenton, Merriam & Holroyd 1983; Fenton & Pullard 1981; Fenton & Rydell 1999; Ferragamo 1994; Frederickson & Jen 1984; Fubara et al. 1996; Fullard 1984, 1988, 1994, 1997; Fullard & Dawson 1997; Fuzessery & Hall 1996; Fuzessery, Zoltan & Pollack 1994-5; Galambos 1942; Gannon & Burt 1998; Gannon, Burt & O'Farrell 1998; Gannon 1997; Gannon, Burt & O'Farrell 1998; Gannon, Scott et al. 1996; - Gourdy & Freeman 1999; Gould 1977; Gould, Cooley & Barnick 1981; D Griffin et al. 1960, 1965; A. Grinnell 1963, 1967, 1969; A. Grinnell & Grinnell 1965; Grinnell & Griffin 1961; Grothe, Covey & Casseday 1996; Grothe, Schweizer et al. 1994; Haplea, Covey & Casseday 1994; Harrison 1962; Hartley 1985-6, 1992; Hayes 1997; Hobson 1998; Horner, Fleming & Sahley 1998; J. Hutcheon et al. 1999; Jen et al. 1987, 1989; B. Johnson 1993; Kamada, Wu & Jen 1992; Kazial, Burnett & Mitchell 1998; Kazial & Masters 1999, 2000; Kennedy & Fuzessery 1991; Kick 1980; Kindlmann et al. 1973; J. King, Anthony, Gustafson et al. 1984; J. King and Anthony 1983-4; J. King, Stenveld et al. 1994; Kirk, Simmons et al. 1980; Koemel 1996; Koay 1997; Koay, Heffner & Heffner 1997; Kobler et al. 1985; Krusic, Neefus et al. 1995; Kuc 1994; Lancaster & Speakman 1996; W. Lancaster, Keating & Henson 1992; W. Lancaster, Fenton & Eger 2000; B. Lawrence, & James A. Simmons 1981-2; P. Lea, Wallsgrove & Mifflin 1978; MacDonald, Matsui & Fenton 1994; Leonard 1982; M. Leonard & Fenton 1984; Mackawa, Wong & Paschal 1992; Mackey & Barclay 1988; Masters & Jacobs 1981, 1984, 1988; Marsh 1981; Marsh, Polack & Bodenhamer 1980; Masters 1989; Masters et al. 1985, 1989, 1990, 1991; Masters & Jacobs 1981, 1984, 1988; F. Mayer 1988; McCarty & Jen 1982-3; McCue 1961; McDonald, Matsui, Matsui & Fenton 1994; Mein & Tupinier 1986; Meschede et al. 1994; L. Miller 1994; L. Miller & Degn 1981; Mirowsky 1998; Miraile & Masters 1993; Mogdans & Schnitzler 1990; Mogus 1990; Mohl et al. 1989; C. Moss 1996; C. Moss & Simons 1993; C. Moss & Valentine 1995; Morgenson & Bretel 1979; M. Morris 1995; Moss & Schnitzler 1989; H. Mueller & Mueller 1979; Murray, Heywood et al. 1999; Nader & Hoffmeister 1983; Neefus & Krusic 1995; Neuweiler 1981, 1983; Nitsche 1994; Norberg & Rayner 1987; Novacek 1980, 1991, 1985; Obrist 1989, 1995, Obrist & Wenstrup 1998; O'Farrell 1997, 1999; O'Farrell, Miller & Gannon 1999; S. Parsons, Thorpe & Dawson 1997; Paschal 1994; Pavey & Burwell 1998; Pearl 1992, 1994; Pearl & Fenton 1996;

Pederson 1990; 1991-2; 1995, 1998; Pinheiro, Wu & Jen 1991; G. Pollack 1993; Pollack et al. 1977; Poussin 1982; Pouissin, Drake & Simmons 1982; Pouissin & Schlegel 1984; J. Pye 1967, 1979, 1980, 1983, 1985; Raichel & Raichel 1996; Ramprashad et al. 1979; Rayner 1991; Roeder 1962; Roverud & Rabitos 1994; Saillant 1995; Schmidt & Joermann 1986; Schmidt & Thaller 1994; Shen, Chen & Jen 1997; Shannon-Hartman, Wong & Mackawa 1992; R. Shimozawa, Sun & Jen 1984; Simmons 1968, 1971, 1979, 1989, 1996, 1980, 1987, 1989, 1991, 1993; J. Simmons, Fenton, Ferguson et al. 1979; J. Simmons & Howell 1973; J. Simmons & Kalko 1998; J. Simmons & Kick 1982, 1984; J. Simmons, Kick et al. 1988; Simmons, Lavender et al. 1978; Simmons, Moss & Ferragamo 1990; Simmons & O'Farrell 1977; Simmons, Saillant et al. 1992, 1997; Simmons, Fenton & O'Farrell 1979; Simmons & Stein 1980; Spoonamore 1978; Suga 1965, 1970, 1990; Suga & Jen 1975; Suga, Olsen & Butman 1990; Suga & Schlegel 1973; W. Sullivan 1981-2, 1986; Sun & Jen 1987; Sun & Kamada 1983; Sun, Sun & Zhang 1987, 1989; Surlykke 1992; R. Suthers & Fattu; R. Suthers & Winstrup 1987; Tanaka & Wong 1993; H. Tanaka, Wong & Taniguchi 1992; J. Taylor 1989, 1990; Teng 1989, 1991; Teramino 1996; D. Thomas, G. Bell & Fenton 1987; Tougaard, Casseday & Covey 1998; A. Treat 1983; Tupinier, Biraud et al. 1980; D. Valentine 1995; D. Valentine & Moss 1998; Van Gelder 1956; Vater 1998; D. Waters 1994; D. Waters & Gareth Jones 1995-6; F. Webster & Brazier 1968; K. White 1997; D. Wong 1984; Winkelmann 1971; Wong & Shannon 1988; Woodsworth, Bell & Fenton 1981; Wotton, Haresign & Simmons 1995; Wotton 1994; Wotton & Simmons 1991; Wu 1993; Wu & Jen 1991, 1996; Wu, Jen & Kamada 1991; Zbiden 1985-6, 1994; Zhang & Jen 1982; Zhang, Sun & Jen 1987; Zook & Dicaprio 1988

**ecology** - Aldridge 1986; Jennings 1958; Kunz 1982; - R. Lance 1999; Bowles, 1981; LaVal & La Val 1980; C. Martin 1974; Neuweiler 1983; Norberg & Rayner 1987; D. Parker 1996; R. Spears & Hagan 1994; Twente 1956;(see individual species)

**ecomorphology** - Saunders & Barclay 1992; R. Warner 1982

**education:** Belwood 1995; Brown-Buescher & Brown 1995; A. Brown 1997; K. Campbell 1998; A. Cartwright 1990; Crowe 1996; Eidson, Keegan et al. 1997; L. Fawcett 1991; Glover & Properzio 1997; Kellner & Harestad 1998; Kunz 1982; Perlmeter, Hart et al. 1992; Rathbone 1997; Sakolsky 1991; J. Taylor 1998-9; K. Williams & Mies 1996

**elevation** (see biogeography): P. Cryan 1997; P. Cryan, Bogan & Altenbach 2000; Grindal et al. 1999;

**embryology** - Bleier 1975; J. Brown 1980; F. Carter 1987 ;F. Carter & Bleier 1988

**emergence** - Buecher 1996; J. Frank et al. 2000; Gould 1961; Kunz & Anthony 1996; Laborda et al. 1993; Lister 2000; T. Tanner & Baccus 1998

**encephalitis virus:** Allen, Stanley & Sulkin 1971; Corristan, Motte & Smith 1958; J. Daniels 1960

**endangered & threatened** (see conservation, *Myotis sodalis*, *griseus*; *Plecotus*, *Leptonycteris*). Bibl.: G. Allen 1942; Bergstrom 1979; H. Bryan & MacGregor 1987; Harvey 1975, 1993, 1997; J. Jones 1993; Layne 1978; LeGrand 1993; Lera 1981; McCracken 1988-9, 1993; McReynolds 1976; McReynolds, Whitaker & Gammon 1979; Mount 1986; Morgan; C.

Rice 1997;Roosa 1977; H. Smith et al. 1973; D. Stevenson, Oakleaf et al. 1996; R Stones 1980; R. Wilson 1980-1

**energetics** (see flying, metabolism, thermoregulation) - L. Ball 1998; Dodgen & Blood 1956; Horner, Fleming & Sahley 1998; Kunz & Norberg 1991; Kurta, Bell, Nagy & Kunz 1989; Kurta, Kunz & Nagy 1986; Kurta & Nagy 1986; Limz 1090; Neunauser & Brisbin 1969; Norberg 1993-4; Pagels & Blem 1973; Salcedo, Fenton et al. 1995; Speakman & Racey 1991; S. Thomas 1980; Stack & Kunz 1981; D. Thomas, Dorais & Bergeron 1990; Voight & Helversen 1994; Voight & Winter 1999; Winter & von Helversen 1998;

**enzymes** - Moon & Borgmann 1976;

**epipharyngeal closure** - Ramage, Anthony & Kunz 1978;

**escape response** - J. Chase 1981

**estrus** - A period when females allow males to mate with them (specifically near the time of ovulation, except in temperate zone hibernators- but excluding *Miniopterus* bats)

**evolution:** Adkins & Honeycutt 1991; Ando, Tagawa & Uichida 1977; Arita 1999;Arita & Fenton 1997; M. Arnold et al. 1982; R. Baker & Bickham 1980; B. Baker et al. 1989; R. Baker, Porter et al. 2000; R. Baker, Qumsiyeh & Hood 1987; Balch 1999; Bhatnagar 1980; R. Baker, Maltbie et al. 1991; R. Baker, Novacek & Simmons 1991; Bickham 1976, 1979a; Birch 1995; W. Bogdanowicz et al. 1995, 1997; Bravo, Dragoo & Yates 1998; Byrnes 1998; T. Case 1978; L. Conrad 1963; Dolan & Honeycutt 1978; E. Dumont 1997; Dunlop 1995-6; Fenton 1984; Freeman 2000; Garland 1999; Giesel 1972; Honeycutt 1981; Horavcek 1994; Honeycutt & Adkins 1993; Honeycutt & Sarich 1987; J. Hutcheon et al. 1999; Jepson 1970; Kirsch 1995; LaPointe 1992; LaPointe et al. 1999; Legendre, Lapointe & Casgrain 1994; C. Long, Zhang et al. 2000; Manning 1993; Mein & Tupinier 1986; Maltbie 1997; Mendel, Hicks et al. 1985; Novacek 1991; Nunez & Kilpatrick 1993; K. Padian 1982; Pettigrew 1991; Pettigrew, Jamieson et al. 1989; C. Phillips & Tandler 1987; C. Phillips, Tandle & Nagato 1984; Pine 1968; Reduker et al. 1983 Robbins 1983; Robbins & Sarich 1988; L. Ruedas 1991; Rydell & Speakman 1995; W. Schutt 1999; W. Schutt & Simmons 1997; Simmons 1979-80, 1993, 1994-5, 1998; N. Simmons & Geisler 1996; Simmons, Novacek & Simmons 1991; Simmons, Novacek & Baker 1991; J. Simmons & Quinn 1994; J. Smith 1976-7; J. Smith & Madkour 1980; Stephan, Nelson & Fraham 1981; A. Stock 1983; Suthers & Braford 1980; J. Thewissen & Babcock 1991-2; Van Den Bussche et al. 1999; Voleth & Heller 1994; R. Warner 1983; Wible 1987; D. Williams, Druecker & Black 1970; Willig & Hollander 1995;

**eyes** - Baron 1978; G. Bell & Fenton 1986; E. Buchler & Childs 1982; J. Chase 1981-2, 1985; Cotter 1985; Crowle 1974; Ellins et al. 1970; G. Hope & Bhatnager 1979; Kunz & Chase 1983; Layne, 1967; Masterson & Ellins 1974; Mistry & McCracken 1982; Mueller 1968; J. Pettigrew, Dreher et al. 1988; J.Simmons 1969, 1991; Suthers 1970; Suthers & Braford 1980; R. Suthers & Wallis 1970; D. Walton 1967

**face** - Gourdy & Freeman 1999; Peffley & Simmons 1993

**facial glands** - H. Werner n.d.; H. Werner & Dalquest 1952

**false nipples** - Supernumerary (pubic) nipples that function as “holdfasts”for suckling young, and which are present in several species of some Old World bat families.

**fat** (see hibernation) - W. Baker, S. Marshall & V. Baker 1968; D. Clark & Krynitsky 1983; N. Weber & Findley 1970; Rauch and Hayward 1969; Remillard 1954; D. Reynolds 1966; C. Richardson 1996; Teramino 1992, 1996

**fat index** - The ratio of grams of fat/grams of lean dry mass.

**fatty acids** - Schalk & Brigham 1995

**feces** – Ormsbee & Zinck 1999

feeding - See **food & predation**.

**feeding buzz** - A rapid series of pulses made by an **echolocating** bat in its final approach to a prey.

feeding **roost** - A site used by bats to consume prey too large to consume during flight and as a night refuge from predators. See night roost.

**femora** - D. Dawson 1975, 1980

**fire** - T. Carter, Menzel & Ford 2000; Mika, Sherwin & Stricklan 1999; Patriquin-Meldrum 1999

**fledging period** - Time when young bats begin to make foraging flights.

**flying** (see emergence, wings): M. Adam, Lacki & Shoemaker 1994; Aldridge 1986; Aldridge, Aldridge 1987; Aldridge, Aldridge & Brigham 1988; Altenbach & Hermanson 1985, 1989; Arganbright 1984; Arita 1999; Arita & Fenton 1997; R. Armstrong, Ianuzzo & Ku8nz 1977; Birch 1992, 1995; Brandon 1980; Brigham 1988; Craft, Edmonson & Agee 1958; Cueva, Fenton et al. 1994; R. Davis & Cockrum 1963-4; R. Davis 1969; W. Davis & Barbour 1965; Foehring & Hermanson 1984; Hermanson & Altenbach 1979; D. Dawson 1975, 1980; B. Forbes 1988; Gutierrez, De Burgos et al. 1974; Hassanloo, Fenton et al. 1995; Hermanson 1977, 1997; Herreid & Davis 1966; Kalcounis & Brigham; Kennedy & Best 1972; Kennedy & Engbretson 1974; Kunz & Norberg 1991; Kurta 1982; C. Long & Kamensyk 1967; C. Long, Zhang et al. 2000; Mohr 1948; Norberg 1985, 1988, 1998; Norberg & Rayner 1987; O'Farrell & Bradley 1977; K. Padian 1982; A. Patterson & Hardin 1969; Pettigrew & Robson 1986; Powers 1989; Powers 1989 et al. 1991; Rayner 1985; Reith 1982; S. Robertson, Britzke et al. 1998; J. Ryan, Baier et al. 1992; Sahley, Moirner & Fleming 1993; Salcedo, Fenton et al. 1995; Shutt et al. 1994; D. Stewart 1996-7; Stockwell 1998-9; Strickler 1980; Stuhsaker 1961; Swartz 1997; Swartz, Watts & Thomas 1999; J. Thewissen & Babcock 1992; T. Williams & J. Williams 1967, 1969; T. Williams, Ireland & Williams 1973; Winter & von Helversen 1998; S. Thomas 1980; M. Swartz & Watts 1996; Van Riper 1981; Vaughan & Bateman 1980; Vaughan 1966, 1970; P. Watts 1992; Y. Winter 1998; Zook & Fowler 1985-6

**FM** - Frequency modulated pulses produced by some **echolocating** bats and mostly used for the discrimination of size and shape).

**folklore** - Kunz 1984; Strohm 1982; Mahan 1982; B. Webster 1984;



**food, feeding & foraging** (see also location & predation by bats) - Achrya 1989, 1990, 1995; Balcombe & Fenton 1988; R. Barclay 1986, 1988; Barclay & Brigham 1991; G. Bell 1982; Best et al. 1997; H. Black 1972; Griffith & Gates 1985; Bonnell, 1967; Booth 1945; Borell 1942; Brack & LaVal 1985; Bradbury & Vehrencamp 1977; Brigham 1988; P. Brown, Berry & Hall 2000; W. Caire, J. Smith et al. 1984; B.Clark et al. 1993; Coutts, Fenton & Glen 1973; Dalton, Brack & McTeer 1986; Dalton, Brack & Williams 1989; Diehl 1993; Fascione et al. 1991; Faure & Barclay 1994; Fenton 1974, 1995; Fenton & Van Zyll de Jong et al. 1980; Fenton & Griffin 1997; Fenton, Cumming & Oxley 1977; Freeman 1979; Fullard 1982; Fullard & Barclay 1980; Fullard & Morrill 1989; Gannon, Burt & O'Farrell 1998; Geggie & Fenton 1985; Griffin & Thompson 1981; Griffin, McCue & Grinnell 1963; Grinevith et al. 1995; I. Hamilton & Barclay 1998; T. Harrison 1978; J.Hayes & Honihan 1993; Hickey 1988, 1989, 1992; Hobson & Holland 1995; Ingles 1949; D. Johnson 1997; Koehler, 1989; Lacki, Burford & Whitaker 1995; Leonard 1982; Masters, Raver et al. 1997; McCracken 1996; Mendonca et al. 1993; Murray & Kurta 1999; R. Myers & Hermanson 1994; Rabe, Siders et al. 1998; Nicolay, Dumont & Winter 2000; Rabinowitz & Tuttle 1982; Reith 1978; Robson & Kunz 1987; A. Ross 1961, 1964, 1967; Rouk & Glass 1970; Shields & Bildstein 1979; Solberg et al. 1999; R. Stones & Wiebers 1965; Teramino 1996; Tipton 1984; Tougaard, Casseday & Covey 1998; Vege 1999, 2000; S. Walker 1996; R. Warner 1985; D. Waters 1994; D. Waters & Gareth Jones 1995-6; Wethington 1994; Whitaker 2000; Whitaker, Maser & Keller 1977; Whitaker, Maser & Cross 1980-1; Whitaker & Rissler 1992-3; Whitaker, Rose & Poadgett 1997; J. White 1998; N. Wilson 1965; Wu 1993; Zinn & Humphrey 1981; Zinn & Humphrey 1981

forests - see trees

**forest succession/seral stages** (see also logging) - ; Burford, Lacki & Covell 1999; Erickson 1993; Erickson & West 1996; T. Jung et al. 1999; Hecker & Brigham 1999; Mazurek & Zabel 2000; Menze, Maness et al. 1999; Patriquin 2000; Tibbels 2000; Yamasaki 2000

**forelimb** - R. Adams 1987, 1991-2, 1994; Altenbach & Hermanson 1985; Sevick & Studier 1990, 1992;

**fossils** - G. Allen 1932; Balch 1999; K. Beard, Sige' & Krishtalka 1992; Choate & Hall 1967; Czaplewski 1990-1; ; Czaplewski et al. 1999; Dalquest 1981; S. Dorsey 1977; S. Emslie 1988; Handley 1955-6;; C. Hibbard; 1963; C. Hibbard & Taylor 1960; Krishtalka & Stucky 1984; B. Lawrence 1960; Legendre 1983; Lydekker 1891; Guthrie 1980 ; R. Martin 1972, 1974, 1977; Menard 1997 G. Morgan 1991; G. Morgan, Linares & Ray 1988; Munson & Keitch 1984; Novacek 1985; C. Ray, Olsen & Gut 1963; N. Simmons 1991; N. Simmons & Geisler 1996; J. Thewissen & Smith 1987; Toomey 1995; S. Webb & Wilkins 1984; Weigel 1962

**gates & gating** - Anon. 1985, 1989, 1996; Elliott 1993; J. Hathorn 1993; S. Henry et al. 1997; Hunt & Stitt 1981; MacGregor 1991, 1993; Navo et al. 1996; R. Powers 1993; R. Powers 1993; Senulis 2000; Sherwin, Haymond et al. 1996; Sherwin & Rogers 1996; J. Skeen, Grigsby et al. 1990; J. Taylor, Grandison et al. 1999; B. Thompson 1997; Tuttle 1978; D. White & Seginak 1987

**genetics** (see evolution): Ando, Tagawa & Uichida 1977; Anthony & Kitchin 1976; R. Baker 1965, 1967; R. Baker & Bickham 1980; R. Baker & Hsu 1970; R. Baker & Mascarello 1969; R. Baker, Matbie et al. 1992; R. Baker & Jordan 1970; R. Baker & Patton 1967; R. Baker, Patton,

Genoways & Bickham 1988; R. Baker, Qumsiyeh & Hood 1987; R. Baker, Maltbie et al. 1991; R. Baker et al. 1988; Bickham et al. 1986; Bickham 1987; Cadle 1992; T. Dewey 2000; Findley 1972; Gassel & McCracken 1988; R. Herd & Fenton 1983; Honeycutt & Adkins 1993; C. Hood & Baker 1986; Hooper & Van den Busche 1998-9; Horton, Anthony & Kitchin 1974; Hsu & Benirschke 1968; Hsu, Baker & Utakoji 1968; R. Lance 1999; R. Lance & Leberg 1999; McCracken 1988; McCracken et al 1994, 2000; J. Findley 1972; McCracken, McCracken & Vawter 1994; McCracken, Gustin & Vawter 1986; McCracken & Johansen 1982; M. Morrell, Shoults & Vann 1996; Nelson-Rees, Kniazeff et al. 1968; J. Morales 1992; Novacek & Norell 1989; Nunez & Kilpatrick 1993; Osborne 1965; T. Painter 1925; Pettigrew 1994; Pham 1997; E. Pierson 1986; Pizzimenti 1971; J. Pride 1996; Qumsiyeh & Bickham 1993; L. Ruedas 1991; A. Russell 2000; R. Russell, Suzanne et al. 1998; Saidak, McCracken & Currie 1998, 2000; Schum 1975, 1984; Shoshani & Mckenna 1998; N. Simmons 1994; Simmons, Novacek & Simmons 1991; P. Tucker & Bickham 1986; Turmelle, Sorenson & Kunz 2000; Vadonbossche et al; A. Stock 1983; Van Den Bussche 1992; Voeth & Heller 1994; J. Warner, Patton et al. 1974; R. Warner 1983; J. Warner, Patton et al. 1974; Watt 1990, 1995; Wilkinson & Chapman 1991; Wilkinson, Mayer et al. 1996; D. Williams, Druecker & Black 1970; Zima 1982; Zima & Horacek 1985

**Molecular** - Bravo, Drago & Yates 1998; R. Lance & Leberg 1999; D. Williams, Druecker & Black 1970;

**gestation** - Length of time from fertilization until birth.

**gland secretions** - Dapson et al. 1977

**gleaning** - A foraging tactic used by some bats whereby **food** items are taken from a surface (e.g. ground, leaves, tree trunk, etc.).

**glucose** - Widmaier & Kunz 1993

**grooming** - King 1990

**group stability** - S. Lewis 1996;

**growth** - See development

**guanophiles** - Bernath & Kunz 1981; D. Conn & Marshall 1991; Franklin 1978; B. Martin 1980-1, 1984; Whitaker, Clem & Munsee 1992

**guano**:- Fecal and urinary waste that accumulates within or below a roost. Rollin Baker 1993; Bernath & Kunz 1981; D. Clark, LaVal & Tuttle 1981; Hatnie et al. 1998; Kunz & Whitaker 1983; Lavoie 1981, 1981a; M'Murtrie 1874; Richards 1991. **Areas:** **AZ:** Cole & Mead 1981; Mead 1980; . Jackson 1920; J. Mitchell 1972; Petit & Altenbach 1973; Strinati 1982; Studier & Sevic et al. 1994; Studier & Viele et al. 1991; **AZ:** Huntoon 1989; **CA:** Mead, Van Devender, et al. 1985; Kartman 1962; **Central US:** Birney 1973; **CO:** Findley 1958; Fischbach 1994; Fletcher 1984; J. Harris 1970; Holman 1958; McAney, Shiel et al. 1991; F. Miller 1931; J. Pride 1996; **IN:** R.L. Richards 1973; Hahn 1909; **KS:** Hall 1955; **KY:** Barr 1955b; Goldman 1910; **MO:** Goldman 1910; **NA:** Kelson 1952; **NM:** Elias 1987; Petit & Altenbach 1973; Wellbourn 1977; **TX:** : Elias 1987; Elias & Devender

**habitat selection** & use (see thermoregulation, resource partitioning, roosts) Amelon et al. 2000; Barclay, Fullard & Jacobs 1999; G. Bell 1980; P. Brown 1991; Byrnes, Rowe et al. 1997; S. Carroll et al. 2000; B. Coleman, Sherwin & Rogers 1999; E. Cook, Gardner et al. 1988;

Crampton 1993; Crampton & Barclay 1996; P. Cryan 1996; Decher & Choate 1995, 1988; Duchamp 2000; Erickson 1993; Erickson & West 1996; J. Gardner, Hoffman, Garner & Cook 1987; Kalcounis, Hobson et al. 1999; Klaas 1986; Leonard 1982; Obrist, 1995; Patriquin 2000; Perkins & Levesque 1987; Poole 1938; Rabinowitz 1982; Romme, Tyrell & Brack 1995; Solberg et al. 1999; Simons, et al. 2000; Stelfox 1995; Wethington 1994; Wethington, Leslie et al. 1996-7; Vaughan, Jones & Harris 1997; Wethington, Leslie et al. 1996-7; Woodsworth, Bell & Fenton 1981; Zimmerman 1997; Zimmerman & Glanz 1998, 2000

**habitat heterogeneity** – Bradshaw 1997; Giesel 1972; Hecker & Brigham 1999; Leonard 1982

**hair** - Amman 1998, 2000; F. Benedict 1957; Caire & Thies 1988; Constantine 1958; Trapido & Crowe 1942; W.F. Blair 1948; Constantine 1958; R. Graham 1959; Hickey & Fenton 1987; Ling 1970; McCoy 1960; Nason 1948; Quammen 1989; Hassanloo, Fenton et al. 1995; Shump & McIntyre 1980; D. Thomas, Crawford et al. 1984; Timm 1989; Trapido & Crowe 1942, 1946; H. Walley 1974

**head size** - Fenton 1989; P. Freeman 1981; Pederson 1990; 1991-2; 1995, 1998

**hearing** (see also echolocation) - P. Brown, Grinnell & Harrison 1978; P. Brown, Grinnell & Narims 1985; E. Buchler & Childs 1981; Dalland 1965; Grinnell 1963, 1969; Koay, 1997; Koay, Heffner & Heffner 1997; Obrist, Fenton et al. 1993; D. Richards & Wiley 1980; Stones & Branick 1969; Tepaske 1965

**heart** (see cardiovascular): B. Harris 1976; Hilton et al. 1990

**heterothermy** - The ability to regulate body temperature physiologically, but temperature is not regulated precisely or at the same level at all times.

hibernaculum - See roosting

**hibernation** - The assumption of a state of greatly reduced core temperature for prolonged periods of time during cold seasons by an animal which has an active body temperature near 37 degrees centigrade, yet it retains the ability to spontaneously arouse without absorbing heat from the environment. See also **energetics, thermoregulation**. **Bibl.:** Borgman & Moon 1976; Brack 1985; : Brack & Twente 1985; D. Bruce & Wiebers 1966; Bruce, Tuggy & Pearson 1984; Burbank & Young 1934; W. Caire & Stevens 1990; Caire, Haines & McKenna 1982; Caire & Stevens 1990; G. Carmody, Fenton & Lee 1971; E. Christensen 1947; R. Clawson, LaVal et al. 1980; Cloutier 1987-8; Conover 1969; Cuddihee & Fonda 1981-2; Cukierski 1982, 1985; Cukierski & Hogan 1986; W. Davis 1970; W. Davis 1964-5; W. Davis, Cawein et al. 1967; Doty & Nunez 1985; R. Dryer & Palsrud 1966; Dryer et al. 1969; C. Evans 1934; Folk 1940; G. Folk et al. 1970; French 1988; Ginsburg 1969; Goehring 1954; J. Hall 1963-4; J. Harding 1967; Harding & Hassell 1970; Hardin & Hassell 1970; B. Harris 1976; B. Harris & Holting 1977; Hassell 1967; Hayward 1968; Hayward & Lyman 1967; Hayward & Ball 1966; Henshaw 1970, 1972; Henshaw & Folk 1963, 1966; Herman 1969; Horowitz & Nelson 1968; Jen 1980, 1982; Jen & Chen 1988; Jen & Kamada et al. 1984; Jen, Sun & Kamada 1982; Jen, Sun & Lin 1989; Jen & Schlegel 1980, 1982, 1987; Jen, Vater et al. 1981; Kallen & Kanthor 1967; Kirwan 1968, 1974; Koski 1970; Krook, Wimsatt et al. 1977; Krulin 1969; Lidicker & Davis 1955; R. Martin, Pawluk & Thomas B. Clancy 1966; Menaker 1960-2, 1964; Mendonca & Hopkins 1997; P.

Meyers 1976; Moon & Borgmann 1976; Napolitano, Krutzsch et al. 1963; E. Pearson 1962; Ploskey & Sealander 1979; Pucinelli & D'Agrosa 1982; Rabinowitz 1981; Rauch & Hayward 1970; Redmond 1939; Reeder 1949; K. Reynolds 1941; C. Richardson 1996; Rupprecht 1980-1; Schmidt, Salyers et al. 1997; Schowalter 1980; G. Swanson & Evans 1936; Sutter 1993; Szewczak 1992; D. Thomas, Dorais & Bergeron 1990; D. Thomas 1990, 1993, 1995; D. Thomas & Cloutier 1988; D. Thompson 1997; Tinkle & Patterson 1965; Trevor-Deutsch 1973; Veal Troyer 1959, 1965, 1968; Tuttle 2000; Twente 1954, 1960, 1991; Twente & Twente 1964, 1978, 1989; Twente, Twente & Brack 1985; Vincent, Whitaker & Koemer 1998; P. Webb, Speakman & Racey 1996; H. Wells et al. 1965; Yacoe 1982; T. Warner & Zar 1982; Wetmore 1936; Wimsatt 1960, 1969; Yacoe 1981-3

**hindlimb** - W. Schutt 1998;

**hippocampus** - Kegeyama & Wong-Riley 1982;

**histiochemistry**, histology & histiomorphology: Dalquest & Werner 1954; Foehring & Hermanson 1984; C. Hood & Smith 1983; Pinkstaff, Tandler & Cohan 1982; Strickler 1980;

**histoplasmosis** (see histoplasmosis) - Ajello 1960, 1965; August, Ajello & Week 1986; Bain 2000; W. Brown 1965; Bryles, Cozad & Robinson 1969; Burgess 1999; Choquette 1986; Christensen 2000; Furcolow & Horr 1956; Harrick, Lichtwardt & Lan 1986; Hasenclever et al. 1969; Histoplasmosis 1995; J. Johnson et al. 1970; McMurray, Stroud et al. 1982; Sacks, Ajello & Crockett 1986

**home range** - Krishon, Carter et al. 1996

**homeostasis** - Kwiecinski 1982

**homing** - Refers to the return of individuals to their place of birth or origin. - V. August 1984; M. Avery, Racey & Fenton 1984; J. Cope, Koontz & Churchwell 1960; Cockrum 1956; R. Davis 1963, 1966; R. Davis & Cockrum 1963; Mueller 1963; W. Davis & Barbour 1965; W. Davis & Hardin 1967; Gunier & Elder 1971; Hassell 1963; Hassell & Harvey 1964-5; Hitchcock & Reynolds 1942; H. Mueller 1963, 1957, 1966; K. Reynolds 1941; T. Williams & J. Williams 1967, 1969; D. Wilson & Findley 1972

**hormones** - E. Anthony 1982; E. Anthony & King 1984; E. Anthony, King, Gustafson & Damassa 1981; J. E. Anthony, King & Stopa 1984; Burns, Baker & Bleier 1972; J. Burns & Easley 1977; J. King et al. 1984; B. Richardson 1980

**Identification** (see sampling) - Corben, Gannon & O'Farrell 1998; Herreid 1957; Tipton 1985

**human impacts** (see also pollution)

**logging** – Bohn & Keller 1999; Busch 1994; Grindal 1995; Grindal & Adam 1995; Grindal & Brigham 2000; Hayes & Adam 1995; Hayes & Gruver 2000; Humes & Collopy 1996; Humes, Hayes & Collopy 1999; Kalcounis, Hobson et al. 1999; Mazurek & Zabel 2000; Menzel, Carter et al. 1998; D. Parker; Perkins & Anderson 1996; Patriquin-Meldrum 1999; Patriquin 2000; Racey & Swift 1986; Stokes 1996; Tibbels 2000; Vonhof 1993; H. Walker, Stelfox et al. 1995; Wethington, Leslie et al. 1996-7

**artificial lights** - Hickey, Acharya & Pennington 1996; Rydell & Baagoe 1996; Svensson & Rydell 1998

**carbon monoxide:**Hexter & Goldsmith 1971

**arousal/disturbance** - M.Bailey, Baccus & Welch 1995; Grindal & Brigham 1998; Lauziere & Thomas 1993; MacKay 1997; S. Johnson et al. 1998;

S. Johnson, Brack & Rolley 1993; Mann, Steidl & Dalton 1998; Moody 1989; D. Thomas, Dorais & Bergeron 1990; Twente 1960

**cave entrance modifications** - Bradley 1996; Richter, Ward & Cope; Richter, Humphrey et al.1993

**dams** - Lipps, Caryl & Kurta 1996

**eutrophication** - S. Murray 1996

**global warming** - Scheel, Vincent & Cameron 1996

**grazing** - Hovorka 1996

**habitat use** – Grindal & Brigham 2000; Tuttle 1995; Wonder & Carey 1994

**habitat fragmentation** (see also logging) B. Coleman, Sherwin & Rogers 1999;

**heavy metals** - D.Clark, Wenner & Moore 1986; D. Clark 1979; Massa & Grippo 1999; M. Petit 1977; Thies & Gregory 1994

**Land use** - Grindal & Brigham 2000; Wethington, Leslie et al. 1996-7

**Lights** - Svensson & Rydell 1998

**mining** - P. Brown & Berry 1996; D. Clark 1991; D. Clark, Hill & Henry 1991

**pesticides** & herbicides (see pollution) – Ahlstrand 1974; D. Clark & Krynitsky 1983; D. Clark & Stafford 1981;Constantine 1978; W. Fleming, Clark & Henny 1983; S. Frantz 1987; Henny et al. 1982; G. Kirkland 1978; Kunz, Anthony & Ramage 1977; O'Shea, Fleming & Chromartie 1980; A. Schmidt, Romme & Tyrell 1997; Streit, Winter & Nagel 1995; Thies 1993; Thies & McBee 1994; D.White & Krynitsky 1986

**sewage** - N. Vaughan, Jones & Harris 1996

**timber treatment** chemicals - Mitchell-Jones, Cooke et al. 1989

**traps, stick** - D. Constantine 1982

**urbanization** - Geggie 1983; J. Hubbell & miller 1995

visitation - see arousal

**wind turbines** - R. Osborn, higgins et al. 1996

**hydration** - R.Webster 1970

**hypoglycemia** - Bohlem & Hankins 1983

**hypothalamic lesions** - Koski 1970

**identification** - Mcdonald 1997; Schmidly 1977, 1983; Tipton 1985;

**immature** - An animal which has attained adult dimensions but not sexual maturity - See juvenile

**immune system** and immunoglobulin - J. Cotter & Laemle 1987, 1990; Laemle, Cotter & Feldman 1984; McMurray, Stroud et al. 1982; Mennone, Phillips and Pumo 1985; D. Murphy & Kwiecinski 1993; Studholme et al. 1987

**infanticide**: Kunz & Ebensperger 1999;

**insectivory** - The habit of eating insects. - See predation and food.

**intestines** - Payette, Gershon et al. 1987; Studier, Studier et al. 1977

**integument** - Quay 1970

**interactions with other bats** - Gannon 1997

**jaw** - Mendel, Hicks et al. 1985

**joints** - Schlosserstorm & Schliemann 1995

**juveniles** - An animal which has not reached adult physical dimensions; characterized by unfused epiphyses (see immature, development): D. Adams & Baer 1966; R. Adams 1996; R. Adams & Pedersen 1995; Bassett & Wiederhielm 1982; Beckett 1963; Brigham & Brigham 1989; P. Brown & Grinnell 1980; Dalton, Brack 1986; D. Gould 1971, 1975; Gustin & McCracken 1987; Orr 1970; R. Davis 1970; Easterla & Easterla 1974, 1976; G. Foster, Humphrey & H. 1978; Gustin 1985; Kunz & Ebensperger 1999; M. Lyon 1903; McCracken & Bradbury 1977; R. Hamilton & Stalling 1972; Kunz & Stern 1995; Herreid 1967; McCracken 1984-5; McCracken & Gustin 1987, 1991; B. Milligan 1993; Mohr 1933; R. Packard 1956; Rolseth, Koehler & Barclay 1994; Stains 1965; C. Thomson, Fenton & Barclay 1985; D. Turner, Shaughnessy & Gould 1972

**k-selection** - G. Kirkland & Kirkland 1979

karyotypes - See genetics

**kidneys** (see also water) R. Carpenter 1969; Lu & Blier 1981; Geluso 1978, 1980; Kusewitt, Wagner & Harris 1977

**kilohertz** - kHz (1,000 cycles per second)

**kilojoule** - kJ (4.10 x kcal)

**lactate dehydrogenase** - Cuddihee & Fonda 1981-2; Fonda & Cuddihee 1982;

**lactation** - Wilde, Kerr et al 1995

**laryngus** - Durrant 1988; Griffiths 1983

**learning** - R. Adams & Pedersen 1995; Gaudet & Fenton 1984; D. Johnston & Fenton 1997

**leptin** - Kronfeld, Noga et al. 1998;; Silvia, Kronfeld et al. 1998

**life history** - C. Martin 1974

**ligaments** - O'Connor, Cain & Zarrow 1966

**light-sampling** - Behavior associated with the onset of nightly emergence where one or more individuals fly in the vicinity of the exit before emergence.

**liver** - Fonda, Herbener & Cuddihee 1983; Leonard & Wimsatt 1959; Wimsatt 1983; Yacoe 1981-3

**longevity:** Cockrum 1949, 1952, 1956; David & Hitchcock 1995; W. Davis 1986; Duke, Bateman & Bateman 1979; E. Evans & Miller 1968; Griffin & Hitchcock 1965; J. Hall, Cloutier & Griffin 1957; Herreid 1966; Paradiso & Greenhall 1967; J. Perkins 1994; Schowalter, Harder & Treichel 1978; L. Summers et al. 1993; H. Walley 1971; H. Walley & Jarvis 1972

**lunar phobia** - Avoidance response to bright moonlight, where flight activity either becomes reduced or ceases.

**lek** - An assembly area used by adult males for courtship display and copulation with females.

**lung** - Maina & King 1985;

**lymph glands** - G. Forman 1974

**lysosomes** - Cukierski 1984

**magnetic orientation** - E. Buchler & Wasilewski

**management:** Altenbach 1998; M. Bailey, Baccus & Welch 1995; Brady 1985; LaVal & LaVal 1980; Cherry & Eichelberger 1996; Gilbert 1995; Greenhall 1981; Harding 1978; E. Hill 1970; Lera 1978-9; Lera & Fortune 1978-9, 1982; Marcot 1995; Noel 1995; Noel, Castner & Snow 1994; Nyberg 1995; Pritchard 1987; Racey, Hutson and Micklburgh 1995; Rabinowitz 1982; Stafford 1993; Tuttle & Smith 1992; R. Wilson 1984a; United States Fish & Wildlife Service 1995

**mastigation** - Kellen & Gans 1972; D. Reduker 1983;

**maternity** – Bloss & Kunz 1999; G. Buchanan & YoungLai 1988; T. Carter, S. Carroll & Feldhamer 2000; Dalton, Brack 1986; R. Garfield & Buchanan 1985; Kung 1989; Kunz & Allagier 1994; Kurta, Bell, Nagy & Kunz 1989; Kurta, Kunz & Nagy 1986; Kurta & Nagy 1986; Kurta, Nagy et al. 1987; Kurta & Stewart 1990; S Lewis 1991; McCracken 1987; McCracken & Gustin 1991; P. Miller 1995; B. Milligan 1993; Robson, Kunz & Offedal 1988; J. Rydell 1990; A. Schmidt, Romme & Tyrell 1997; Schmidt, Salyers et al. 1997; Sidner 1982; Silvia, Kronfeld et al. 1998; E. Smith 1956; C. Thompson, Fenton & Barclay 1985; 1996; Tipton 1983; D. Turner, Shaughnessy & Gould 1972; Tuttle & Heaney 1974; Watt 1995; L. Williams & Brittingham 1997; L. Williams & Brittingham 1993; Wunder 1987; Wunder & Nash 1980; Zeveloff & Boyce 1980

**maternity colony** - An aggregation of female bats during pregnancy and lactation.

**maternity roost** - A site used by females during pregnancy and lactation

**mating** (see reproduction) - The pairing of a male and female during courtship and copulation.

**melanism** - G. Buchanan 1985; F. Osgood 1936

**melatonin** - L. Beasley 1985-6; L. Beasley & Smith 1983-4

**memory** - H. Mueller & Mueller 1979

**metabolism** (see hibernation, flying): Bassett & Wiederhielm 1982; Buchler 1975; Menaker 1960; McNab 1974, 1982; Studier & Howell 1969; Thomas & Cloutier 1992; Thomas, Cloutier & Gagne 1990; Geluso 1975; Geluso & Studier 1979; Herreid 1959; Herreid & Schmid-Nielson 1966; H., Bretz & S. 1968; Dodgen & Blood 1956; Herreid 1966; Hock 1950, 1951;

Kallen 1961; Kurta 1986; Leitner 1966; C. Lyman 1970; McNab 1988; O. Pearson 1947-8 Stack 1985; Trune & Slobodchikoff 1976; Wakeham et al. 1988; Waterman & Maxwell 1963; H. Wells et al. 1965; T. Warner & Zar 1982; Winsatt 1983; Yacoe 1981-3

**migration** (regular seasonal movements): Barclay 1984; T. Carter 1950; McCracken et al 1994; Villa & Cockrum 1962; E. Christensen 1947; Cockrum 1969; D. Griffin 1939-40, 1945, 1970; Gunier 1971; J. Hall & Wilson 1966; Gassel & McCracken 1988; G. Miller 1897; J. Perkins & Cross 1988, 1991; O'Shea 1976; Rojas-Martinez et al. 1999; Rysgaard 1942; O. Thomas 1921; Timm 1989; Tuttle & Stevenson 1977; Van Gelder 1956; Zinn & Baser 1979

**milk** - W. Hood, Bloss et al. 1996; Hulbregtse 1966; R. Jenness & Studier 1976; Kurta, Bell, Nagy & Kunz 1989; Kunz, Stack & Jenness 1983; S Lewis 1991; S. Steele 1989

**mines** - Altenbach & Milford 1991; Barnwell 2000; Betts 1997; C. Brown & Brown 1993; C. Brown, P. Brown & Berry 1995; P. Brown & Berry 1996; Altenbach & Milford 1995; Belwood & Waigh 1991; P. Brown, Berry & Brown 1996; P. Brown et al. 1993; H. Bryan & MacGregor 1987; Burghardt 1997; Byrnes, Rowe et al. 1997; Ducummon 1997; Ducummon & Taylor 1996; Fegley, Brown et al. 1997; Griffin 1945, 1946, 1970; Heath et al. 1986; S. Henry et al. 1997; Hoffmeister; Lengas & MacMahon 1996; Luce & Priday 1996; Menzel, Monroe et al. 1997; Lengas & MacMahon 1996; Milford & Pierson 1995; Navo 1993; Navo et al. 1991, 1993, 1995-6; E. Pearson 1962; E. Pierson & Brown 1992; E. Pierson 1986; E. Pierson & Rainey 1991; M. Rhodes 1997; Rissler & Whitaker 1990; Senulis 2000; Senulis & Reinartz 1998; C. Snow, Castner & Noel 1996; Tuttle & Taylor 1994; Whitaker & Rissler 1992; Stihler & Hall 1993; Stolzenburg 1996; D. Taylor 1995-6; D. Taylor & Row 1999; Vincent, Whitaker & Koemer 1998; Whitaker & Winter 1977

**moon** – Hecker & Brigham 1999; Negraeff 1992

**morphology** (see ecomorphology) - Alderidge, Aldrige & Rautenbach 1987; Fenton & Wilson 1982; P. Freeman 1981; Palmeirim 1998; Stuhsaker 1961; Vaughan & Bateman 1980; Vaughan 1966; R. Warner 1982

**mortality**: G. Bell 1981; DeBlase et al. 1965; Denys 1972; Dunaway 1960; Gore & Hovis 1995; Gosnell; Grady 1991; Gunier 1970-1; Herreid 1963, 1967; Hexter & Goldsmith 1971; Hitchcock 1963; Hitchcock, Keen & Kurta 1984; Hodgkins 1985; Iwen 1958; Koopman 1974; Kurta 1980; Laduc 1993; Manville 1963; Mohr 1953-4; Pybus, Hobson & Onderka; Raun 1960; Rysgaard 1941; Saugey, Baber & McDaniel 1978; Sherwin & Gannon 1999; Turnblom 1992; Wahl 1984, 1986, 1993; Walley, Southern & Zar 1969; B. Webb 1987; T. Williams & J. Williams 1967, 1969; A. Wisely 1978;

**moths** and other insects (see predation by bats) - Acharya 1995; D. Bates 1987; D. Bates & Fenton 1990; Burford, Lacki & Covell 1999; Dunning 1968, 1992; Dunning & Acharya 1991-2; Fenton & Pullard 1981; Fenton & Roeder 1974; J. Fullard & Cardone 1986; Hamr 1978; Roeder 1962, 1965, 1967; Roeder & Treat 1957, 1961; J. Simmons 1996; Svensson & Rydell 1998; A. Treat 1983; Whitaker & Long 1989

**muscles** (see flying): Arganbright 1984; R. Armstrong, Ianuzzo & Kunz 1977; Cho, Sidie & Debrun 1972; Cukierski 1982, 1984-5; Cukierski & Hogan 1986; Foehring & Hermanson



1984; Fonda & Herbener 1983; Fonda, Herbener & Cuddhee 1983; Gutierrez, De Burgos et al. 1974; Hermanson 1995, 1997-8; Leonard & Wimsatt 1959; R. Myers & Hermanson 1994; Z. Nelson 1977; J. Ryan, Baier et al. 1992; W. Schutt 1991; K. Smith & Kier 1989; Strickler 1980; T. Strickler 1978; Studier 1974; Winsatt 1983; Yacoe 1981-3;

**mutation:** Herreid 1958

**myosin isoforms** - W. Schutt 1991

**natural selection** - Lande 1977

**nectarivory** - The habit of feeding on nectar. See **pollination**.

**nerves** - J. Brown 1980; Henson 1970; J. Ryan, Cushman and Baier 1997

**net nights** - The product of the number of mist nets and the number of nights that nets are employed for the purpose of capturing bats (the size of the nets should be designated)

**niche partitioning** - See resource partitioning

**night roost** - Roost site used at night for resting, consuming and digesting prey, and predator avoidance. See **roost**.

**noses:** Arita 1990; W. Bogdanowicz et al. 1997; Leach 1821; Suthers 1970

**nutrition** - E. Evans & Miller 1968

**odors:** Bhatnagar & Herreid 1960; Bloss, Acree & Kunz 1996; Bloss & Kunz 1999; Crosby & Humphrey 1939; Scully, Fenton & Saleuddin 2000; Studier & Lavoie 1984; Studier, Lavoie & Drake 1982; Tuttle & Stevenson 1977

**ontogeny** - Goebbel 1997

orientation – Sparks & Laborda 1999

**oxygen consumption** - Herreid & Schmidt-Neilson 1966; Riedesel & Williams 1976; Szewczak & Jackson 1992

**pancreatic insulin** and glucagon - Bauman 1990

**parasites** and commensals (see diseases, rabies): G. Adams & Morris 1971; P. Allan 1947; D. Allred & Beck 1966; Allred & Goates 1964; Anciaux de Faveaux 1971, 1976; J. Anderson 1975; Ando 1983; Audy, Radovsky & Vercammen-Granjean 1972; G. Augustson 1941; E. Baker & Strandtmann 1959; E. Baker 1949; N. Banks 1904, 1909-10; Beck 1966; A. Beck 1969; Brennan 1965; Brennan & Beck 1956; Pistole 1983; Radovsky 1964; J. White 1960; Bhatnagar & Lichtenfels et al. 1981; Blankespoor & Ulmer 1971; Blankespoor & Szymusiak 1974; Borland, 1956; Bower 1980; Bower & Woo 1981; Bradshaw & Ross, 1961; Burns & Farinacci 1955; B., F. & Shelton 1957; Cadena 1967; G. Cain 1966; G. Cain & Studier 1974; W. Caire, L. Hornuff & Ports 1981; Cockerell 1910; Cockrum 1970, 1997; Coggins et al. 1981-2; C. Curran 1930; R. Davis & Loomis 1971; Dood 1987; Dooley 1974; Dooley, Bristol & Canaris 1976; Dubbs 1968; Durden, Best et al. 1992; Dusabek 1973; Duszynski, Scott 1999; Duszynski, Reduker & Parker 1988; Eads 1950; Eads, Campos & Barnes 1979; Eads & Menzies 1948; E. Easton 1974-5; E. Easton & Wrenn 1988; Elsea 1953; Ewing 1920, 1933; Ewing & Stover 1915; Fain & Whitaker 1976, 1982, 1987; G. Ferris & Usinger 1939; W. Font & Lotz 1989; G.

Foster 1979; G. Foster & Mertins 1996; I. Fox 1940; R. Fox & Stabler 1953; Furman 1950, 1955; Furman & Tipton 1950; George & Strandtman 1960; Gittleson & Hoover 1969; Goater et al. 1987; Greenbaum & Phillips 1974; D. Gould 1956; Hansen 1964; Hassanloo, Fenton et al. 1995; Ho 1962; Hocking 1971; Holdenried, Evans & Longanecker 1951; Kunz 1976; Hedeem 1953; J. Herborld et al. 1983; D. Jameson 1959; E. Jameson & Chow 1952; Jobling 1929; J. Jones 1957; Judd 1953; Keeley 1995; Kusewitt, Wagner & Harris 1977; E. Jameson 1950; Jellison & Senger 1976; Keegan 1951; W. Kern 1991; La Motte 1958; R. Lewis 1978; Leadabrand 1992; R. Lewis & Wilson 1982; S. Lewis 1996; Lichtenfels & Bhatnagar 1981; Little, Patrick & Gannon 1998; Loomis 1956; Loomis & Bunnell 1962; Loomis & Wrenn; Lotz & Font 1985; Macy 1940, 1957; J. Jones 1998; Lotz & Font 1985, 1990, 1991, 1994; Mahunka 1982; Main et al. 1982; A. Marshall 1981; W. Marshall 1956; B. Martin 1980; D. Martin 1976; McDaniel & Tenorio 1979; Medvedev 1990; Meurer 1980; Miller, Jones & Kin 1973; C. Mitchell & Hitchcock 1965; O. Mitchell 1956; Mollagen 1991; O'Connor & Klompen 1988; O'Connor & Reisen 1978; O'Connor, Whitaker & Easterla 1977; Oldroyd 1964; W. Overal 1974; W. Patterson & Wood 1983-4; B. Wheat 1975; Pistole 1983, 1988; Pitts & Galloway 1993; B. Paterson, Ballard & Wenzel 1000; Poche & Keirans 1975; A. Price, McDaniel & Tumilson 1982; Prins & Loewen 1988; Radovsky 1964, 1969, 1979; Radovsky' & Poche 1975; Radovsky 1966-7, 1969, 1979, 1994; Radovsky & Beck 1971; Radovsky & Krantz 1998; Radovsky, Krantz & Whitaker 1997; Radovsky & Furman 1963; N. Randolph & Eads 1946; Rausch 1975; Rausch & Rausch 1983; Reisen et al. 1976; Ritzi, Dixon & Richerson 2000; Ritzi & Richerson 1998; A. Ross 1960-1; D. Scott & Duszynski 1997; H. Smith 1934, 1981; S. Smith 1981; Spears et al. 1995; Specian & Ubelaker 1976; Stiles 1931; Strandtmann 1949; Strandtmann & Allred 1956; Strandtmann & Hunt 1951; Studier & Lavoie 1984; Studier, Lavoie & Drake 1982; Theodor & Peterson 1964; Thies 1967; Tibbets 1957; Till & Evans 1964; Tipton & Boese, 1958; Tromba 1954; Sulkin 1974; C. Townsend 1893; Ubelaker 1971; Ubelaker & Dailey 1971; Uchikawa 1979; Uchikawa, Zhang, Oconnor and Klompen 1994; Usinger 1966; Veal 1983; Vercammen-Grandjean & Langston 1976; Vercammen-Grandjean, Watkins & Beck 1965; J. Webb & Loomis 1977; Wendell 1995; Wenzel, Patterson et al. 1998; Whitaker 1973, 1982, 1991; Whitaker, Deunff & Belwood 2000; Whitaker & Easterla 1974-5; Whitaker, Easterla & Fain 1987; Whitaker & Lukoschus 1982; Whitaker, Miller & Boyko 1968; Whitaker, Yunker & Maser 1983; Wilkinson, et al. 1980; N. Wilson 1961; R. Williams 1960, 1962; P. Wood, Baker & Selden 1984; Yunker 1958; Zanowiak et al. 1993; Zanowiak 1987; Zanowiak, Harison & Caire 1993; Zeve 1958; Zeve & Howell 1962

**parotid gland** - Pinkstaff, Tandler & Cohan 1982; Tandler & Cohan 1984

**pars distalis** - B. Richardson 1980

**parturition** - The act or process of giving birth to offspring - See maternity.

**parturition period** - The time of year when females give birth to young.

**patagium** - Membrane which forms the wings and uropatagium.

**patella** - B. Smith et al. 1995

**pelage** - Collective term pertaining to body hair. See **hair**.

**pelvis**: Crelin & Newton 1969; D. Walton & Walton 1968

**peruvate** - Cuddihee & Fonda 1981-2

**penis** - J. Smith & Madkour 1980; Wimsatt & Kallen 1952

**phenology** - see genetics

**philopatry** - The seasonal return of a bat to its place of birth or to the same hibernaculum. Kurta & Murray 2000;

**phototaxis** - Berra & Policello 1979

**phylogeny** - See evolution

**physiology** (see also hibernation, metabolism, thermoregulation): Herreid 1961; E. Anthony 1982; W. Caire, B. Cox & Levescy 1981; Cukierski 1985; R. Dryer & Palsrud 1966; Dryer et al. 1969; Dubbs 1968; J. Fitch 1966; J. Harriuson 1965; Hermanson et al. 1989; D. Howell 1974; Krutsch & Hughes 1959; Leitner & Ray 1964; Melman & Rosenbaum 1963; Mitchell 1963; O'Connor, Cain & Zarrow 1966; Quay 1969; Rouk & Glass 1970; Schackelford & Caire 1993; Suprenant 1978; Tewari & Thakar 1968; Troyer 1959, 1965, 1968; Walton 1967; H. Werner 1967; Wimsatt & Parks 1966

**pineal gland, pinealocyte nuclear and nucleolar** - Quay 1976, 1970

**pituitary** - E. Anthony 1982, 1985; E. Anthony & Gustafson 1995; E. Anthony & King 1984; E. Anthony & Gustafson 1984; E. Anthony, King, Gustafson & Damassa 1981; J E. Anthony, King & Stopa 1984; E. Anthony, Neel & Cicione 1992; B. Richardson 1981; Widmaier, Harmer & Sulak 1994.

**plagiopatagium** - Membrane which forms the part of the wing that extends laterally from the fifth digit of the wing to the ankle.

**pollination** (see *Choeronycteris*, *Leptonycteris*) Alcorn, McGregor & Olin 1961; H Baker 1977; Baron 1986; E. Dumont 1997; Eguiarte et al. 1994; Erickson 1989; T. Fleming 1985, 1993, 1995, 1997; Fleming et al. 1989, 1998 ; T. Fleming & Tuttle 1990; P. Freeman 1995; Griffin 1940; Helversen 1993; Herrera Montalvo 1997; Herrera Montalvo & Martinez del Rio 1998; Heyneman 1983; Hinman 1999, 2000; D. Howell 1979, 1980; D. Howell & Roth 1981; Koopman 1981; McGregor, Alcorn & Olin 1962; Sahley 1990; R. Sidner & Houser 1990; J. Smith 1983; J. Smith & Hood 1984; Stroo 1998; D. Thomas, Crawford et al. 1984; Tuttle 1991; R. Warner 1983; T. Wilson, Stanton & Rigney 1994; Winkelmann 1971

**pollution** (see human impacts): D. Clark 1978, 1981, 1988; D. Clark & Lamont 1975; D. Clark et al. 1983; D. Clark & Prouty 1976; D. Clark, LaVal & Tuttle 1981; D. Clark, Kunz & Kaiser 1978; D. Clark & Krol 1977; D. Clark & Krynitsky 1978; D. Clark, LaVal & Tuttle 1981; D. Clark & Prouty 1976-7, 1984; D. Clark & Ratner 1987 D. Clark & Stafford 1981; Cockrum 1969; Elliott 1993; Faegri & Van der Pijl 1966; Fulton 1985; Thies 1993; Thies & Thies 1997; Thies, Thies & McBee 1993; D. Thomas, Crawford n.d.; Braaksma & J. van der Drift, 1972; D. Clark 1981, 1982; D. Clark et al. 1981; D. Clark & Prouty 1976; D. Clark LaVal & Krynitsky 1980; D. Clark, LaVal & Swineford 1978; D. Clark, LaVal & Tuttle 1982; D. Clark & Lamont 1976; D. Clark, Martin & Swineford 1975; Eisler 1989; Esher, Wolfe & Koch 1980; Geluso, Altenbach & Wilson 1981; Luckens & Davis 1954-5; Reidinger 1972, 1976

**polydactyly** - Koford & Kruttsch 1948

**pontine nuclei** - Teng 1989, 1991

**population** (structure) (see sex ratios): R. Barclay 1991; Bowers & Matter 1997; Dunlap 1995; Ellison, Everette et al. 1996; Everett, Ellison et al. 1997; Mumford 1958a; Reidinger 1972; W. Davis 1966; Fenton 1970; Goehring 1957; Humphrey & Bonaccorso 1979; Krohne 1997; McCavit 1975; Nielson 1989, 1991; O'Shea & Vaughn 1997; Perry 1965; Ramsey 1998; Route 1998; D. Snyder 1976; Stevens & Willig 2000; Storz & Williams 1996; Whitaker & Gummer 1999;

**precipitation** - Brigham, Grindal et al. 1991; Syme 1991-2, 1994

**predation by bats** (see also feeding): Acharya 1990; R. Adams 1996, 1993; G.M. Anderson 1978; Anon. 1998; J. Baker 1962b; Barclay 1985-6; D. Bates 1987; D. Bates & Fenton 1990; Bauman, Hashim & Sershen 1989; G. Bell 1980-4; Belwood 1982; Belwood & Fullard 1984; Belwood & Fenton 1976; H. Black, 1974; W. Bogdanowicz et al. 1997; P. Brown 1982; P. Brown, R. Berry et al. 1999; E. Buchler, 1976; Burford & Lacki 1995; W. Caire & M. Ports 1981; S. Carroll et al. 2000; T. Carter, M. Menzel et al. 1998-9; R. Clawson, Gray & Gray 1981; Constantine 1948; DeCarvalho, Gannon et al. 1997-8; DeCarvalho, Gannon et al. 1997; Dunkle & Belwood; Dunning 1968, 1992; Dunning & Acharya 1991; Dunning, Miller & Futtrup 1997; Dunning, Acharya et al. 1992; Easterla & Whitaker 1972; Eisenberg & Wilson 1978; S. Ellis 1988; Engler 1943; P. Faure 1988, 1990; P. Faure, Fullard & Dawson 1991, 1993; Fenton 1972, 1974, 1982, 1985, 1995-6; Fenton & Morris 1976; Fenton & Pullard 1981; Folk 1940; ; P. Freeman 1981-2; J. Freeman 1946; J. Fries 1981; Fuzessery 1991; Gannon & Burt 1998; Gannon, Burt & O'Farrell 1998; J. Gardner, Hoffman, Garner & Cook 1987; Gould 1955; Griffin 1995; Griffin, Webster et al. 1960; J. Hall & Blewett 1964; W. Hamilton 1933; I. Hamilton 1995-6; Hamr & Bailey 1985; B. Harris & Holting 1977; Hassell M. Harvey & McDaniel 1986; Hatt 1923; Herrera Montalvo, Fleming & Findley 1991; Hickey 1986, 1990-3; Hough 1957; D. Howell 1974; D. Howell & Hart 1980; T. Hurst 1997; T. Hurst & Lacki 1997; J. Hutchinson & Lacki 1999; Kurta 1985; Kirwan 1968, 1974; Kiser & Elliott 1996; Kiser, Elliott & Whitaker 1998; Kunz 1973; Kunz & Whitaker 1983; Lesser et al. 1957; Y. Lee 1998; J. Lloyd 1989; McCracken, Lee et al. 1997; C. Merriman 1989; P. Miller 1995; K. Muller 1998; L. Miller & Treat 1993; S. Murray 1996; Oaten 1977; Obrist & Wenstrup 1998; S. Parsons, Thorpe & Dawson 1997; Pavey & Burwell 1998; Racey & Speakman 1990; Reidinger 1972; K. Roberts, Yancey & Jones 1997; Roeder & Fenton 1973; Roeder 1962; Rydell & Speakman 1995; Rydell & Waters 1995; Schalk & Brigham 1995; Schulter 1982; M. Scott 1994; Sih 1980; Simmons, Fenton & O'Farrell 1979; H. Smith 1981; K. Strong 1978; Studier, Sevick et al. 1991; Syme 1991-2, 1994; Svensson & Rydell 1998; Tejedor, Holland et al. 1998; Trevor-Deutsch 1973; Tuttle 1968, 1976; Van de Water & Peachey 1997; Vaughan 1980; L. Ward 1997; R. Warner 1982; F. Webster & Griffin 1962; Westbrook, McCracken et al. 1998; Wethington, Leslie et al. 1996-7; Whitaker 1992-3; Whitaker & Lawhead 1992; Whitaker & Quentin 1983; Whitaker, Neefus & Kunz 1996; Whitaker & Rissler 1992-3; Whitaker & Tomich 1983; Wilkinson 1993-4; Wilkinson & Barclay 1997; J. Williams 1983; N. Wilson 1958; Woodsworth, Bell & Fenton 1981;

**predation on bats**: P. Allan 1947; J. Baker 1962; H. Black 1976; D. Cary, Clawson & Grimes 1981; Church 1967; D. Clark & Bunck 1991; Clay 1959; Drake 1957; Duguay, Ritchison & Duguay 1997; Duncan & Sidner 1990; Elwell 1962; Fenton 1994; Fenton, Rautenbauch et al. 1994; Fenton, Cumming & Oxley 1977; Goodpaster & Hoffmeister 1950; Hoffmeister & Goodpaster 1964; R. Macy & R./ Macy 1939; R. Martin 1961; K. Martin & Fenton 1978; McCracken, Gustin & McKame 1986; Meritt 1989; Mueller 1990; H. Mueller 1969; Rydell &

Speakman 1995; Stagger 1941, 1948; J. Taylor 1964; Herreid 1960-2; R. Jones & Hettler 1959; Hickey, Acharya et al. 1996; C. Long 1971; R. Martin 1916; McIntosh & Gregory 1976; R. Mumford 1969; Munson & Keitch 1984; Nugent, Escobar et al. 1989; Perry & Rogers 1964; Simms 1977; Stager 1941-2; J. Taylor 1964; Vaughn 1982; Twente 1954; Wilks & Laughlin 1961; J. Wiseman 1963; Wroe & Wroe 1982; Yancey, Roberts & Jones 1996

**pressure changes** - Anon.1996

**prolactin** - B. Richardson 1980

**progesterone** - G. Buchanan & YoungLai 1988; W. Currie, Blake & Wimsatt 1988

**propatagium** - The membrane between the wrist and tebody that forms the leading edge of the wing.

**proteins** - D. Moore & Yates 1983; Wakecham, Bogenschutz & Caire 1988

**public health** - Tuttle & Kern 1981

**rainfall** - K.Howell 1990; Syme 1994

**rabies** - G. Rupprecht, 1990; Alder 1996; Anon. 1973a, 1977, 1980, 1883-4, 1986, 1996; G. Baer, 1975; G. Baer & Adams 1970; A. Harrison et al. 1980; Beauregard & Stewart 1964; A. Beck 1981; Becker 1983; J. Bell 1975; J. Bell, Moore & Raymond 1969; J. Bell & Moore 1960, 1971; J. Bell & Thomas 1964; Bigler, Hoff & Buff 1975; Bigony 1985; Birch 1997; Brass 1988, 1993; Burnett 1989; Burns & Farinacci 1955; Carey 1985; Casey et al. 1994; J. Childs, Krebs & Rupprecht 1997; Constantine 1962-3, 1966-7, 1978, 1982, 1986; Constantine, Humphrey & Herbenick 1979; Constantine & Woodall 1964; Constantine, Tierkel et al. 1968; Constantine, Emmons & Woodies 1968; J. Daniels 1960; W. Dean, Maddy et al. 1960; Delpietro et al. 1997; Dempster, Godrums et al. 1972; diSalvo, Parker & Doda 1978; Dorward, Showalter et al. 1977; Elmgren et al. 1997; Enrith 1956, 1962; Fischman & Young 1976; Brass, 1991, 1994; Constantine 1962, 1963, 1966-a, 1967, 1979; D. et al. 1969; Eads et al. 1955; H. Feder, Nelson & Reilher 1997; Fenton 1997; Fishbein et al. 1988; Fischman 1984, Fischman & Young 1976; Frantz 1997; Fredreickson & Thomas 1965; French 1997; Gibbons 2000; Girard 1955; Gordon 1965; Greenhall 1968; Heidt 1982; Held et al. 1967; G. Humphrey et al. 1960; Hunt & Bhatnagar 1997-8; Irons et al. 1954; Kaplan 1985; Kaplan & Koprowski 1981; Kough 1954; Kreindel 1997; Kurta 1979; Lemson 1998; Lera 1980; Lewis, W. 1990; MacInes 1996-8; Maddy, Cockrum & Crecelius 1958; Mahan 1973; Malaga-alba 1966; R. Martin 1961-2; Marr & Beck 1976; Medeiros & Heckmann 1971; Messenger, Smith et al. 1997; G. Moore & Raymond 1970; Morimoto et al. 1996; D. Murphy & Kwiecinski 1993; B. Perry 1987; Pool & Schlegel 1984; M. Pybus 1983; J. Richardson, Ramsey & Starr; Rosatte 1987; Rotz 1997; Rotz, Hensley et al. 1998; Rupprecht 1986, 2000; Rupprecht, Yager et al. 1993; Schaftenaar 1998; Sulliivan et al. 1954; Ritter & Follmann 1997; Ronsholt et al. 1998; Rupprecht 1986; Rupprecht, Yager et al. 1993; Sahley 1990; Saugey 1996; Schaftenaar 1998; N. Schneider, Scatterday et al. 1994; Schurrenberger, Beck & Burson 1964; J. Smith 1981, 1989, 1996; J. Smith & Orciari 1997; Steece & Calisher 1989; Steece, Erickson et al. 1982; Sulkin 1959, 1962, 1974-5; Sulkin & Greve 1954; Sutton 1984; Syme 1991, 1994; Tierkel 1954, 1966; Tierkel et al. 1960; Tinline, Ball et al. 1997; Trimarchi 1978, 1981-2, 1986-7, 1993, 1996-8; Trimarchi & Debbie 1977; Trimarchi & Rupprecht 2000; Trimarchi, Rudd & Abelseth 1986; Tuttle 1980, 1996, 1999; Tuttle & Kern 1981; Venters et al. 1954; Verts & Barr 1961; Wandeler 1993; R. Warner 1983; R. Warner & Czaplewaki 1981; J. Warner, Davis & Grimes 1962; Whitaker & Douglas 1979; Whitaker & Miller 1974; Witte 1954; Yancey, Raj et al. 1997

**refuging species** - Pertains to species in which members form roosting aggregations.

**relapsing fever:** Eads 1952;

**reproduction** (see maternity) R. Adams 1988; R. Allen, Sims & Sulkin 1964; Amir 1978; E. Anthony et al. 1984, 1987, 1989, 1995; Appley 1971; R. Barclay 1995-6; J. Belcher 1940; Berry & Brown 1995; Bleier 1975; Bradbury 1978; Brimley 1923; P. Brown 1985; P. Brown & Berry 1991; P. Brown, Grinnell & Narims 1985; G. Buchanan 1985, 1987; G. Buchanan, Garfield & YoungLai 1988; G. Buchanan & YoungLai 1987-8; G. Buchanan & Ryan 1983; Canney 1988; D. Carter 1970; F. Carter 1987; Cockrum 1955; Crichton, Hoyer & Krutzsch 1990; Crichton, Krutzsch et al. 1982, 1993; Cukierski 1982, 1987; W. Currie, Blake & Wimsatt 1988; A. Enders & Wimsatt 1968; French & Amanda 1998; Gustafson 1975; Gustafson & Shemesh 1976; Gustafson, Damassa & Kwiecinski 1995; Dixon, Foxworth et al. 1997; J. Findley 1954; Geluso 2000; Guthrie 1933; Hamlett 1935; Harman 1944; M. Henry 2000; Hirth 1960; L. Hoffman, Wimsatt & Olson 1987; Holroyd 1993; C. Hood & Smith 1983; Houghton; Koeler et al. 1990; Koehler & Barclay 2000; Koopman 1974; Kronfeld, Noga et al. 1998; Krutzsch 1979; Krutzsch & Crichton 1986, 1991; Krutzsch, Crichton, Lennon et al. 1984; Krutzsch, Crichton & Nagle 1981; Kurta, Kunz et al. 1987; Kwiecinski 1984; Lollar 1995; R. Miller 1938-9; Napolitano, Krutzsch et al. 1963; Nester 1993; Nicklaus & Keeley 1998; Oxberry 1979; Racey 1988; Racey & Speakman 1990; Racey, Uchida et al. 1986; Rasweiler & Rasweiler 1979, 1993, 1999; Rasweiler 1981; Rasweiler & Rasweiler & Badwaik 1979, E. Reeder 1938; D. Reynolds & Kunz 2000; K. Reynolds & Parker 1983; Saughey 1989; Schowalter 1980; Sidner 1988; E. Smith 1946; Ryan 1991, 1992; D. Sparks & Krochmal 2000; Stack 1985-6; Stack & Kunz 1981; Stuewer 1948; Syme 1991-2, 1994; Wai-Ping 1984, 1986; Wai-Ping & Fenton 1988; L. Ward 1997; Whitaker & Mumford 1972; Wilkinson 1993-4; Wilkinson & Barclay 1997; Wimsatt 1942, 1944-5, 1948-9, 1960, 1969, 1979, 1984; Wimsatt & Kallen 1952; Wimsatt & Parks 1966; Zveloff & Boyce 1980

**resource partitioning:** R. Adams 1990, 1996; Aldridge 1986; Aldridge, Aldrige & Rautenbach 1987; Brach, Taylor & Holmes 1984; Freeman 1985; R. Green 1974; Kunz & Fenton 1973; Hickey, Acharya & Pennington 1996; M. Saunders 1987; Wong & Fenton 1982; G. Woodsworth 1981

**resource patchiness** - Kunz, McCoy & Kosciusko 1978; Oaten 1977

**resource utilization** (see predation by bats, feeding)- Kunz 1973; Y. Lee 1998; Miner, Brown et al. 1996;

**riparian:** Brinson, Swift et al. 1981; Grindal et al. 1999; Holloway 1998; Holloway & Barclay 2000; Lacki & Bookhout 1982; A. Miller & Kessler 1980;

**roost** - Site used by bats when not in flight. (See **bat houses, caves, hibernation, mines, trees**): Altenbach 1998; Amelon et al. 2000; E. Arnett & Hayes 2000; M. Avery, Racey & Fenton 1984; L. Ball 1998; B. Baker, McDaniel et al. 1997; A. Barclay et al. 1988; R. Barclay 1982, 1984; R. Barclay & Brigham 2000; S. Barnard 1991; G. Bell 1981; Brack, Wilkinson & Mumford 1984; Bradshaw 1997; Brigham 1984-5; Broders 2000; P. Brown & Berry 1996; P. Brown, Berry et al. 1997; P. Brown, Berry & Hall 2000; T. Carter, S. Carroll & Feldhamer 2000; Chung-MacCoubrey 1996; M. Clark 1990; Herreid 1961; J. Miller 1955; Twente 1954; Dalquest & Walton 1970; W. Davis, Barbour & Hassell 1968; K. Campbell 1990; Carampton & Barclay

2000; Faure 1987; P. Cryan 1996; R. Foster 1997; R. Foster & Kurta 1999; R. Graham 1966; Gummer & Whitaker 1993; I. Hamilton & Barclay 1994; M. Harvey & McDaniel 1988; Hoffman, Cochran et al. 1998; Hutchinson & Lacki 1997-8; H. Johnson & Trapp 2000; Kurta & Foster 1998; Lacki, Adam & Shoemaker 1994; S. Lewis 1990; Mattson, Buskirk & Stanton 1996; ; Mika, Sherwin & Stricklan 1999; Mirowsky 1998; A. Parkinson 1981; Kunz 1982a; N. Miller 1996; Racey 1974; Crampton 1993; Crampton & Barclay 1996; Dalquest 1946; Dalquest & Walton 1970; W. Davis, Hassell & Harvey 1965; Downes 1964; Fassler 1975; Fenton & Crerar 1984; Findley 1954; Goad 1983; R. Foster 1996; J. Gardner, Gardner & Hoffman 1991; Hickey & Neilson 1995; Hickey, Palen et al. 1996; Hicks 1987; Higginbotham et al. 2000; Hirshfeld, Nelson & Bradley 1976-7; J. Hutchinson & Lacki 2000; Kurta 1994; Kurta & Foster 1998; Kurta & King 1991; Kurta & Murray 2000; Lausen 2000; S. Lewis 1997; S. Leis & Pavwoski 1999; Lengas & MacMahon 1996; Limpert & Bounds 1999; Lister 2000; Luce & Priday 1996; Luckens, Van Eps & Davis 1971; Lutch & Miller 1996; Menzel, Carter et al. 1998; Menzel, Chapman & Miller 1998; Menzel, Krishon et al. 1996; Moon & Borgmann 1976; Moorman, et al. 1999; Morrell, Green et al. 1994; Morrell, Rabe et al. 1996; Navo, Gore & Skiba 1990; Ormsbee 1995-7; Ormsbee & McComb 1997; J. Perkins & Lacki 2000; J. Perkins, Peterson & Anderson 1997; Perlmeter 1999; Perry & Bogan 1996; E. Pierson & Rainey 1991; Pitts & Scharninghausen 1986; Pruszek & Bowles 1986; Psyllakis 1999; Rabe, Siders et al. 1998; Raesly & Gates 1987; Raesly 1982; Ritzi, Walker & Honeycutt 1998; Rodriguez-Duran 1991; Roemer 2000; Romme, Tyrell & Brack 1995; Sandle et al. 1999; Sasse & Perkins 1995; Sheffield et al. 1992; Speakman & Racey 1989; Stihler, Jones & Wallace 1998; Stager 1943; J. Taylor & Wai-Ping 1987; Thibault 2000; Thibault & Adams 1998; D. Thompson 1997; ; Trombulak et al. 2000; Trune & Slobodchikoff 1976; Tuttle 2000; Vaughan & Oshea 1976; Veilleux 1999, 2000; Vonhof 1993, 1996; Vonhof & Barclay 1996; P. Webb & Jones 1952; Menzel, Johnson et al. 2000; Wenzel, Patterson et al. 1998; Whitaker 1998; Whitaker & Gummer 1999; Wilhide, Harvey et al. 1999; L. Williams & Brittingham 1997; K. Williams, Mies & Kurta 1996; L. Williams & Brittingham 1993; Wunder & Nash 1980

**roost fidelity** - The tendency of a bat to return repeatedly to a certain roost (e.g. cave, tree hollow, barn) or general area (foliage).

**roosting metabolic rate** - Rate of energy expended under natural or semi-natural conditions (incl. Costs associated with specific dynamic action, movements, clustering, grooming, social interactions, etc.)

**salivary glands** - C. Phillips, Tandle & Nagato 1984; Tandler & Phillips 1987, 1989

**sanguivory** - The habit of feeding on blood.

**seasonal**: - see behavior: Beasley 1986; L. Beasley 1982, 1985-6; L. Beasley & Smith 1983-4; Golden 1970, 1972; Menard 1997; Sealander 1964; Zinn & Humphrey 1981; Whitaker & Rissler 1993;

**sensory orientation** (see echolocation) E. Buchler & Childs 1982; E. Buchler & Wasilewski

**sex ratios**: R. Adams 1996; J. Bain & Humphrey 1986; W. Davis & Hitchcock 1964; Goad 1983; Hitchcock 1950; E. Hooper 1939; Kurta & Matson 1980; B. Milligan 1991; B. Milligan & Brigham 1993; Mohr 1945; Semanie 1996; Sherwin & Gannon 1999; Sidner 1982; E. Smith 1957

**sexual dimorphism:** Achary 1993, 1995; R. Adams 1996; C. Burnett 1983; Crelin & Newton 1969; Fujita 1984, 1986; J. Fullard & Cardone 1986; Giesel 1972; Herreid 1959; Kazial, Burnett & Mitchell 1998; D. Williams & Findley 1979; Grinevith et al. 1995; P. Myers 1978; Sealander 1964; P. Tucker 1985-6; P. Tucker & Bickham 1986; Wilkinson & Barclay 1997; D. Williams 1968; Willig & Hollander 1995; T. Wilson, Stanton & Rigney 1994

**sex steroids** - Crichton, Hoyer & Krutzsch 1990; Damassa, Gustafson & Chari 1983; Kusewitt, Wagner & Harris 1977

**shoulder** - Hermanson & Altenbach 1981; T. Strickler 1978

**sinoatrial** & sinu-atrial node - D'Agrosa & Laskowski 1982; Lakowski & D'agrosa

**silent heat** - The occurrence of ovulation without fertilization, prior to behavioral estrus and insemination.

**size differences:** Arita 1999; Barclay & Brigham 1991; ; Barclay, Fullard & Jacobs 1999; Fujita 1986; McLaren & Kirkland 1979; P. Patterson & Davis 1968; O. Pearson 1947-8; D. Reynolds & Kunz 2000; Sealander 1964; R. Stevens 2000;

skeleton - See bones

skull - see head

**social organization** - Baine & Humphrey 1986; Blackburn, Gannon & Little 1998; Bradbury 1977; Findley 1976; H. Black 1974; Brigham 1984; Krishon, Carter et al. 1996; Kurta & Teramino 1992; Lengas & MacMahon 1996; B. Miller & M. O'Farrel 1998; Pearl & Fenton 1996; Ramsey 1997; ; R. Russell, Suzanne et al. 1998; Tejedor, Holland et al. 1998; D. Thomas, Fenton & Barclay 1979; Trune & Slobodchikoff 1976

**social signals/communication** - Mirowsky 1998; D. Turner, Shaughnessy & Gould 1972;

**spatial memory** - Loughry et al. 1988

species composition - see biodiversity

**sperm** - Crichton, Krutzsch et al. 1981-2, 1993; G. Forman 1968; ; Napolitano, Krutzsch et al. 1963; M. Scott 2000

**spleen** - K. Martin & Fenton 1978; Lidicker & Davis 1955;

**steroids** - G. Buchanan & Ryan 1983;

**stress** - Widmaier, Harmer & Sulak 1994; Widmaier & Kunz 1993

**sudoriparous glands** - M. Sisk 1957.

**stomach** - G. Forman 1972, 1974; Mennone, Phillips and Pumo 1985; H. Park & Hall 1951; C. Phillips 1984; C. Phillips & Studholme 1982; C. Phillips, Mennone et al. 1985

**submandibular gland** - Pinkstaff, Tandler & Cohan 1982

**swarming** (The activity of bats (males and females) from mid-summer through early autumn at sites that ultimately are used as hibernacula (the latter part of this interval is coincident with



mating in temperate regions) Campbell, Tyson & Hall 1991; Cassidy et al. 1979; W. Davis 1965; Schowalter 1980; Tyson et al. 1990

**synanthropy** - The association of bats with man.

**tails** - Peffley & Simmons 1993

**swarming** - Sparks et al. 2000;

**taste** - See tongue

**taxonomy** - R. Baker, Porter et al. 2000; W. Bogdanowicz et al. 1995, 1997; Byrnes 1998; W. Davis 1959; De Jong & Van Zyll 1984; Dolan & Honeycutt 1978; Genoway & Jones 1969; Griffin 1940; Honeycutt & Adkins 1993; Hooper & Van den Busche 1998; J. Jones & Carter 1979; Koopman 1983-4, 1988, 1994; Manning 1993; Manwell & Kerst 1966; C. Martin 1974; Menu 1984, 1988; J. Morales 1992; R. Owen 1989; E. Pierson 1986; Peffley & Simmons 1998; Skilbins 1991; J. Smith 1972; Tumilson 1990; Van Den Bussche 1992; Van Zyll de Jong 1984; Van Zull de Jong & Nagorsen 1994; Walton 1967

**teaching** - see education

**teeth** - D. Clark 1980; Fenton 1970; P. Freeman 1981, 1995, 1998; C. Phillips 1971; C. Phillips, Steinberg & Kunz 1982; Schowalter, Harder & Treichel 1978; Slaughter 1970; H. Smith 1977; Strait 1993

**temperature** (see thermoregulation) R. Barclay, Kalcounis et al. 1996; Burbank & Young 1934; Cuddihee 1980; Cuddihee & Fonda 1981; W. Davis 1967; Doctor 1967; E. Dumont 2000; W. Elliott & Clawson 1999; Fonda & Cuddihee 1982; P. Freeman 1992; R. Henshaw 1961; Herreid & Schmidt-Neilson 1966; Hickey 1991; Hirshfeld & O'Farrell 1976; Hock 1950; Holt 1969; W. Lancaster et al. 1997; Milam & Best 1994; Z. Nelson et al. 1977; Pagels 1972, 1975; Senlius & Reinartz 1998; Suprenant 1978; Syme 1994; S. Thomas, Follete & Farabaugh 1991; Vincent, Whitaker & Koemer 1998; P. Webb & Jones 1952; P. Webb, Speakman & Racey 1996;

**tendons** - Quinn & Baumel 1992; N. Simmons & Quinn 1994; B. Smith et al. 1995;

**terminology** - Kunz & Gustafson 1983;

**testosterone** - L. Beasley 1985-6; L. Beasley & Smith 1983-4;

**thermoregulation:** D. Audet 1987; Brenner 1974; Carpenter & Graham 1968; McManus 1976; Pagels 1975; .: J. Harrison, Brown & Huang 1978; Heinrich 1977; Henshaw & Folk 1966; Herreid 1961, 1963; Hickey 1988, 1991, 1993; Hickey & Fenton 1996; Kurta 1986, 1991; Hock 1951; Holyoak & Stones 1971; Jujita & Kunz 1981; Kluger 1970; Kurta, Kunz & Williams 1994; Licht & Leitner 1967; Kurta 1982, 1984-6; Licht & Leitner 1967; Menaker 1960, 1962, 1969; McManus 1974; O'Farrell & Bradley 1977; Hitchcock & Keen 1989; Kunz & Frank 1997; Kurta & King 1991; Kurta & Williams 1994; Lausen 2000; C. Lyman 1970; K. Martin & Stehn 1977; McNab 1970; Menaker 1961-2; Moss, Redish et al. 1997; O'Farrell & Bradley 1977; Perkins 1976-7; Pistole 1989; Rabinowitz 1981; Racey & Speakman 1990; Reeder 1949; W. Reeder & Cowles 1951; Reite & Davis 1966; Remillard 1958; Rodriguez-Duran 1991; Shump & McIntyre 1980; R. Stones 1964; R. Stones & Wiebers 1965, 1967; Studier 1981; Studier, Studier et al. 1977; Studier 1974; S. Thomas, Follete & Farabaugh 1991; Twente & Twente 1964, 1978

**thyroid** - Novacek 1991; Nunez & Gershon 1982-3; Nunez, Payette et al. 1988

**tongue** - H. Park & Hall 1951; Rockman et al. 1996; K. Smith & Kier 1989; Suthers 1970

**torpor** (see hibernation) - R. Barclay, Kalcounis et al. 1996; Hollis 2000; Kurta 1989; K. Martin & Fenton 1978; Rauch & Beatty 1975, 1977; Szewczak & Jackson 1992

**training** - Gaudet 1982.

**transient roost** - Temporary roost used by bats enroute during migration.

**tragus** - The fleshy projection from the lower medial margin of the pinna in the most microchiropteran bats.

**trap-lining** - A foraging behavior characteristic of some nectarivorous bats wherein regular and repeated visits are made to flowers along a fixed route.

**Trees** (see forest and logging in human impacts) Bowles, Howell et al. 1996; T. Brown 1998, 2000; Crampton 1994; Findley 1954; Gehrt & Chelmsvig 1998; Gellman & Zielinski 1996; J. Hart 1992; Heady & Persson 1995; Hecker & Brigham 1999; Herder & Jackson 1999; Kalcounis 1996; Kalcounis & Brigham 1998; Kellner & Harestad 1998; Kiser & Elliott 1996; Kurta & King 1991; Kurta & Williams 1994; Lacki 1995; R. Lance 1999; Lance, Bollich et al. 1995; Luckens, Van Eps & Davis 1971; Mazurek & Zabel 2000; Morrell, Green et al. 1994; Morrell, Rabe et al. 1996; Nyberg 1995; Ormsbee 1996-7; Patriquin 2000; J. Perkins & Cross 1988; J. Perkins & Lacki 2000; J. Perkins, Peterson & Anderson 1997; J. Taylor 1998; D. Thomas 1991; Tibbels 2000; Van den Driessche & Chatwin 1997; Vonhof 1999; Wunder & Carey 1996; Zielinski & Gellman 1993

**tropic structure** – Tejedor et al. 1999

**trunk** - K. Smith & Kier 1989;

**urban** - Gehrt & Chelmsvig 1998; J. Hubbell & Miller 1995; Kurta & Teramino 1992

**ultrasonic** - Pertains to sound frequencies above the audible range (usually frequencies greater than 20 kHz). See **echolocation**.

**urine** & urinary system - Kallen & Kanthor 1967; Rosenbaum 1970; Studier & Rimle 1980; Wakeham, Bogenschutz & Caire 1988.

**uroptagium** - Membrane extending between the tail and hind legs. Syn.: interfemoral membrane.

**use** - Osborne 1939; S. Pedersen 1996; S. Pedersen & Siegfried 1996; S. Pedersen & Siegfried 1996; Poncavage 1996; R. Reynolds 1994

**value** of bats - R. Corrigan & Bennett 1982; Cutler et al. 2000; Long 1996; S. Lewis 1991; Whitaker 1993; T. Williams.

**vestibular end organ** - Ramprasad, Landolt et al. 1980

**videos** - P. Morton 1998;

vision - See eyes

**vocalization** - P. Brown 1976; P. Brown, Grinnell & Baker 1978; Erickson & West 1994; Fenton 1977, 1988; Fenton & Bell 1981; Fenton et al. 1976; Fenton, Belwood, Fullard & Kunz 1976; J. Fullard 1988; D. Gould 1971, 1975; Gould & Turner 1973; Koehler 1992; K. Martin & Fenton 1978; Rasmuson & Barclay 1992; Schereer & Wilkinson 1991; Stains 1965; C. Thomson 1982; C. Thomson, Fenton & Barclay 1985

**walking** - Dietz 1973

**water balance/loss/use** (see kidneys) R. Adams 1999, 2000; Bassett 1979; G. Bell 1981; R. Carpenter 1969; Chew & White 1960; Cloutier 1987-8; Herreid & Schmidt-Neilson 1966; Horst 1969; Kunz 1984; Kurta, Bell et al. 1989; D. Thomas 1990, 1992; von Frenckel 1986; P. Webb 1995; Wilhide, Harvey et al. 1996;

**water index** - The ratio of grams of water/grams of lean dry mass.

**weather** - R. Barclay 1994;

**weight** - P. Dunaway & Lewis 1965; G. Carmody, Fenton & Lee 1971; Drumm 1999; S. Johnson, Brack & Rolley 1993; Studier & Weing 1971; Studier, Proctor & Howell 1970; Sutter & Bakken 1992;

**whispering bat** - One who emits low intensity echolocation pulses, as in *Nycteris*.

**wing membranes** - Studier 1972;

**wings** - Binindamonds & Russel 1993 Brich 1992; Blood & mcFarlane 1988; M. Davis & Sikes 1989; 1972; J. Findley, Studier & Wilson 1972; B Fleming 1983; B. Fleming, McKinney & Knight 1982; B.Fleming & McKinney 1985; E. Harley & Miller-Butterworth 2000; Goslin 1942; C. Jones & Suttikus 1971; W. Lancaster et al. 1997; Poole 1936; S. Swartz 1998; Zook 1985

#### **Areas:**

**AB:** Alder 1996; Barclay 1986; Chruszcz 1998; Collister & Hunt 1990; Crampton 1994-5; Fujita 1986; Hollis 2000; Holloway 1998; Holloway & Barclay 2000; Holroyd 1991; Lausen 2000; Lister 2000; M. Saunders 1987; Schowalter 1979, 1980; Schowalter & Allen 1981; Schowalter, Dorward & Gunson 1978; Schowalter & Gunson 1979; Schowalter, Gunson & Harder 1979; H. Smith 1979, 1981, 1993; H. Smith & Schwalter 1979

**AK:** R. Baker 1951; Manville & Young 1965; K. Nolan & Pierce 1996; D. Parker 1996; D. Parker & Cook 1996; Patriquin 2000; W. Reeder 1965; Ritter & Follmann 1997; E. West 1991, 1993; E. West & Swain 1993; Whitaker & Lawhead 1992;

**AL:** Best et al 1991-2; Dorward, Showalter et al. 1977; Durden, Best et al. 1992; Dusi 1976; A. Howell 1920-1; Mohr 1932; J. White 1960; Chermock & White 1953; Kilburn, Best et al. 1990; LaVal. 1967; Linzey 1970; Mohr 1932; Mount 1986; B. Wheat 1975

**AR:** B. Baker, McDaniel et al. 1997; B. Baker, Wilhide et al. 1998; R. Baker & Ward 1967; J. Black 1934; D. Buecher, Sidner & Buecher 1990; R. Buecher & Sidner 1999; Hensley & Scott 1995; Czaplewski et al. 1979; W. Davis, Lidicker & Sealander 1955; Dellinger & Black 1938;

Disalvo et al. 1969; M. Fletcher 1985; Gardner 1978; Gardner & McDaniel 1978; M. Harvey 1987, 1996; M. Harvey & Barkley 1990; M. Harvey, Cassidy & O'Hagen 1979; Harvey 1976, 1989, 1991, 1993, 1998 M. Harvey & McDaniel 1986; M. Harvey, Cassidy & O'Hagen 1981; Heath et al. 1986; McDaniel, Paige & Tumilson 1979; Paige 1989; J. Palmer 1992; Saugey 1989; Saugey et al. 1989, 1990; Saugey, McDaniel et al. 1993; Paige & Steward et al. 1986; R. Pitts 1988; A. Price, McDaniel & Tumilson 1982; Saugey, Vaughn et al. 1998; Sealander 1951, 1960; Van Zyll de Jong et al. 1980; Wilhide, Harvey et al. 1996;

**AZ:** Reidinger 1972; McFarlane & Keeler 19?; J. Bain 1986; Baird 1859; Berry 1999, 2000; Bradshaw, & Ross 1961; P. Brown, R. Berry et al. 1999; P. Brown, Berry & Hall 2000; Buecher 1996; Cahalane 1939; B. Campbell 1934; Carothers & Ruffner 1971; Castner, Snow, Noel et al. 1996; D. Clark, Martin & Swineford 1975; D. Clark et al. 1981; Cockrum 1960-1, 1969, 1981; R. Baker 1956; Cockrum & Gardner 1960 C. & Ordway 1959; C. & Petrozyn 1986; Constantine 1961, 1966; Cross 1965; W. Dean, Maddy et al. 1960; Czaplewski et al. 1999; Erickson 1989; Fleming, Newton & Usieh 1999; Halfield 1942; B. Hayward & Johnson 1961; Hinman 1999, 2000; Hoffmesiter 1959. 1970-1, 1986; Hoffmeister & Krutsch 1955; Hoffmeister & Goodpaster 1954; D. Irwin & Baker 1967; R. Johnson & Johnson 1964; C. Jones 1965; J. Jorgensen 1994; Koopman 1963; Leitner & Ray 1964; C. Lowe 1974; Maddy, cockrum & Crecelius 1958; McKee 1932; Merriam 1889; Mohr 1932; Monday 1993; Morierity 1988; Morrell, Green et al. 1994; Morrell, Rabe et al. 1996; R. Mumford 1963; Noel 1995; Noel, Snow & Castner 1994-6; O'Shea 1976; O'Shea & Vaughn 1977, 1997; O'Shea, Fleming & Chromartie 1980; Osborne 1965; Peachey 1997; Peachey & Bethard 1997; Quinn & Petterson 1997; Rabe, Morrell et al. 1998; C. Ray & Wilson 1979; Reidinger 1972, 1976; E. Roth & Cockrum 1976; Ruffner et al. 1978; Schmidt 1999; Siders, Garcia de la Cadena et al. 1997; Siders, Rabe et al. 1997; Siders, Miller et al. 1996; Sidner 1986, 1988; C. Snow, Castner & Noel 1996; Stager 1956-7; Studier 1965, 1969; Tejedor et al. 1999; Tejedor, Holland et al. 1998; Van de Water & Peachey 1997; T. Vaughan 1954; Vorhies 1935; R. Warner 1982-3, 1985; R. Werner & Czaplewaki 1981;

**BC:** R. Barclay & Brigham 2000; Brigham, Grindal et al. 1991; Caceres 1998; Chatwin et al. 1997; K. Chapman, McGuinness & Brigham 1994; I. Cowan 1942, 1945; Cowan & Guiguet 1956; Fenton, Merriam & Holroyd 1983; P. Garcia & Barclay 1996; Getty & Barclay 1993; Grindal 1993; Grindal, Collard & Brigham 1991; Holroyd 1993; Kellner & Harestad 1998; Luckens, Van Eps & Davis 1971; Merriam 1895; B. Milligan 1993; Nyberg 1995; Prins & Loewen 1988; Psyllakis 1999; Racey 1933; Rand 1942; Schowalter 1980; Schowalter, Dorward & Gunson 1978; Schowalter 1980; Sheldon 1932, 1936; Shepard & Lambert 1995; Speakman & Fenton 1996; Stokes 1996; Thacker 1944; Van den Driessche & Chatwin 1997; Van Zull de Jong & Nagorsen 1994; Vonhof 1993, 1996; Vonhof and Barclay 1996;

**CA:** : G. Allen 1919; L. Arnold 1953; Ashcraft 1932; P. August & R. Digma 1973; G. Augustson 1941; Baird 1859; A. Beck 1969; Berry & Brown 1995; Benson 1954; Bolster 1997; Bond 1970; P. Brown & Berry 1996; P. Brown, Berry et al. 1997; P. Brown, Berry & Brown 1996; P. Brown 1979, 1991; W. Bryant 1891; J. Burns, Baker & Bleier 1972; J. Burns & Easley 1977; Cockrum & Petrozyn 1994; Constantine 1959; Constantine, Humphrey & Herbenick 1979; Dalquest 1946-7; B. Davis & Baker 1974; Gellman & Zielinski 1996; D. Gould 1956; R. Graham 1966; H. Grinnell 1914, 1918, 1933; Grinnell, Dixon & Linsdale 1930; Hatfield 1937; Holdenried, Evans & Longanecker 1951; Kunz A. Howell 1920; E. Jameson & Whitaker 1975; D. Johnson, Bryant & Miller 1948; D. Johnson 1997; H. Johnson & Trapp 2000; Keeley 1995; Koford & Koford 1948; Krutsch 1946, 1955; Leitner & Ray 1964; S Lewis 1991; R. Loomis

1964; Marcot 1984; W. Marshall 1956; Medeiros & Heckmann 1971; Merriam 1890, 1897; Miner, Brown et al. 1996; R. Orr 1950, 1958, 1956; H. Parker 1952; Perkins 1991; Pierson 1986, 1988; E. Pierson & Rainey 1991, 1996-7; Remington 2000; S. Rhoads 1895, 1902; Szewczak 2000; Silva 1988; Sillman & Bloeker 1938; Simons, et al. 2000; Stager 1942-3, 1957; F. Stephens 1906; Surprenant 1978; Szewczak & Szewczak 1998; J. Taylor & Wai-Ping 1987; W. Taylor 1919; Tenaza 1966; T. Vaughan 1954; Vaughan & Krutzsch 1954; von Blocker, Jr. 1932; D. Williams 1986;

**Canada:** G. Casey et al. 1994; Elmgren et al. 1997; M. Pybus 1983; Rosatte 1987; Van Zyll de Jong 1978-9

**CO:** R. Adams 1996-2000;; R. Adams & Thibault 1999; R. Adams, Thibault & Petru 1999; Amman 2000; S. Anderson 1959; D. Armstrong 1975; August, Ajello & Week 1986; Cary 1911; Colorado Division of Wildlife 1982; Constantine 1966; Ellinwood 1987; R. Finley & Creasy 1982; J. Fitzgerald & Taylor 1989; J. Fitzgerald, Meaney & Armstrong 1989; Goad, 1983; Graul 1979; Navo et al. 1992; J. Hubbell & Miller 1995; Ingersoll & Navo 1996; Svoboda & Choate 1987; R. Findley et al. 1983; Goad 1983; Hove et al. 1990, 1993; Meacham 1974; Navo 1993; Navo et al. 1991; Navo et al. 1995-6; Navo, Gore & Skiba 1990; Storz & Williams 1996; Svoboday 1983; Thibault & Adams 1996, 1998; Turnblom 1992; E. Warren 1906; E. White 1997; Wunder 1987; Wunder & Nash 1980; Zeveloff 1988

**CT:** Main et al. 1982

**DC:** H. Jackson 1922; D. Wilson 1998;

**DE:** Mohr 1976

**Eastern US:** Hamilton & Whitaker 1979

**FL:** Balir 1935; Balier 1935; Belwood 1990; Bigler, Hoff & Buff 1975; L. Brown 1985; Jennings 1958; D. Lee & Tuttle 1970; Rice 1955a, 1957; Tuttle 1976a; T. Carter, M. Menzel et al. 1998; W. Davis 1957; Finn 1995-7; G. Foster & Mertins 1996; Glover & Properzio 1997; Ivey 1959; W. Jennings 1958; Jennings & Layne 1957; W. Kern 1991; W. Kern & Belwood 1996; D. Koopman 1974; J. Layne 1974, 1978, 1992; P. Lazell & Koopman 1985; Lee 1976; R. Martin 1974, 1977; Means 1977; Millsap et al. 1990; J. Moore 1949; Morgan 1991; Neill 1953; P. Pearson 1960; ; C. Ray, Olsen & Gut 1963; S. Rhoads 1895, 1902; D. Rice 1955, 1957; Robson, Mazzotti & Parrott 1989; N. Schneider, Scatterday et al. 1994; A. Schwartz 1951; Sherman 1929, 1935-6, 1939, 1956; Venters et al. 1954; O. Webb & Wilkins 1984; Weigel 1962; A. Werner 1984; Zinn 1977; Zinn & Humphrey 1981

**GA:** W. Baker 1965; Constantine 1958; W. Davis 1963; F. Harper 1927; Krishon, Carter et al. 1996; Laerm 1996; Laerm, et al. 1980, 1982; R. Martin & Bearden 1990; R. Martin & Sneed 1990; Menzel, Krishon et al. 1996; Padgett 1988, 1990; J. Richardson, Ramsey & Starr; R. Spears & Hagan 1994

**Great Lakes Region - Kurta 1994**

**HA:** Belwood 1982; Belwood & Fullard 1984; Cabrera 1996; Fullard 1984, 1988, 1990-1; D. Jacobs 1991-3, 1999; C. Kepler & Scott 1990; McDaniel & Tenorio 1979; M. Reynolds, Cooper & Day 1997; M. Reynolds, Nielsen & Jacobi 1997; Menard 1997; Q. Tomich 1986, 1974; Whitaker & Quentin 1983; Whitaker & Tomich 1983; D. Worthington 1997; D. Worthington & Dwyer 1998

**IA:** Blakespoor & Ulmer 1971; J. Bowles 1981; Bowles, Howell et al. 1996; Kunz 1969; B. Clark 1984; B. Clark et al. 1993; B. Clark, Bowles & Clark 1987; Constantine 1996; Easterla & Watkins 1967, 1970; Klaas 1986; Kunz 1969, 1971, 1973; Kunz & Anthony 1996; Kunz & Schlitter 1968; Laubach et al. 1989; McClure 1942; Muir & Polder 1960; R. Patterson 1985; S. Peck 1958; Polder 1954; Pruszko & Bowles 1986; Roosa 1977; Ubelaker 1971; L. Watkins 1970

**ID:** Betts 1997; W. Davis 1939; Genter 1986; G. Jones 1948; Knapp 1997; J. Perkins & Peterson 1996; J. Perkins, Peterson & Anderson 1997; Singer 1995; Stager 1957; H. Tucker 1957; C. Vullo, Lewis et al. 1997; Wackenhut & Keller 1989; Wackenhut & McGraw 1996; Whitlow & Hall 1933

**IL:** Krejca 1993; E. Anderson 1951; Brack, 1979, 1983; Brack & Dunlap 1997; Brack & Twente 1985; Burnett & August 1981; S. Carroll et al. 2000; C. Cory 1912; Easterla & Watkins 1970; Fairman 198-1; J. Gardner et al. 1996; J. Gardner, Hoffman & Garner 1991; J. Gardner and Taft 1982-4; J. Gardner and Saugey 1989; J. Gardner & Gardner 1980; J. Gardner, Gardner & Hoffman 1991; Grady 1989; J. Hall & Davis 1958; J. Hoffman & Ducummon 1997; Hoffman & Gardner 1996; Hoffmeister & Mohr 1957; Kurta & Foster 1994; J. Layne 1958; Lera 1976; Marquart 1997; D. Miller 1990; R. Mumford 1967; Necker & Hatfield 1941; E. Pearson 1962; Provost & Kirkpatrick 1952; D. Rice 1955; Rissler & Whitaker 1990; Tuttle 2000; Verts & Barr 1961; Walley 1970-1, 1974; H. Walley & Jarvis 1972; D. Walton & Kimbrough 1970; Whitaker & Winter 1977

**IN:** A. Black 1996; Cope & Mumford 1955; LaVal 1966; Lindsay 1956; Mumford & Cope 1960; Mumford 1958a, 1953; Brack, Dunlap & Tyrell 1995; Brack, Wilkinson & Mumford 1984; A. Butler 1895; Commissaris 1961; Cagle & Cockrum 1943; T. Carter, S. Carroll & Feldhamer 2000; Collett 1890; Hahn 1909; J. Cope, Koontz & Churchwell 1960; Cope 1964; Cope & Humphrey 1972; Cope & Mills 1970; Gates 1983; S. Johnson et al. 1998; Kirkpatrick & Conaway 1948; J. Cope et al. 1991; Duchamp 2000; Dunlap 1995, 2000; J. Dunn & Hall 1989; C. Kirkpatrick & Conaway 1948; Laval 1966, 1969; Linsay 1956; 1992; Loomis & McDaniel 1971; M. Lyon 1936; R. Martin 1971; McReynolds, Whitaker & Gammon 1979; R. Mills, Barrett & Cope 1977; R. Mills, Barrett & Cope 1976; R. Mumford 1953, 1957-8, 1966, 1973; Mumford & Cope 1964; Mumford & Handley 1956; Mumford & Whitaker 1975; Mumford & Calvert 1960; Mumford & Whitaker 1982; Munson & Keitch 1984; Nold et al. 1997; Pistole 1983, 1988; Quick & Langdon 1882; D. Rice 1955; Richter et al. 1976, 1978, 1993; Rippy & Harvey 1965; Sparks et al. 2000; D. Sparks & Krochmal 2000; Whitaker & Gummer 1999; J. Whitaker & Mumford 1971-2; Whitaker & Rissler 1992-3; Pistole 1983; Provost & Kirkpatrick 1952; Rissler & Whitaker 1967, 1973, 1982, 1990-1; Tyrell, Black & Romme 1994; Veilleux 2000; Vincent, Whitaker & Koemer 1998; Whitaker 1972, 1992, 1998, 2000; Whitaker & Clem 1992; Whitaker, Clem & Munsee 1991; Whitaker & Douglas 1979; Whitaker & Gummer 1993, 2000; Whitaker & Miller 1974; Whitaker, Miller & Boyko 1968; Whitaker & Mumford 1971-2; Whitaker & Rissler 1992-3;

**KS:** Choate & Fleharty 1975; Choate & Decher 1996; R. Clawson 1987; R. Clawson 1987; Cockrum 1952; Crowle 1980; Choate, Dragoo et al. 1986; Choate & Fleharty 1975; Decher & Choate 1995, 1988; Dunnigan & Fitch 1967; Goslin 1964; E. Hall 1955; C. Hibbard; 1936, 1963; C. Hibbard & Taylor 1960; Hibbard, 1933, 1936, 1944; J. Jones, Fleharty & Dunigan 1967; J. rJones, Hoffmann & Kortlucke 1984; J. Jones, Loomis et al. 1952; Kellogg 1915; Knox 1875; Koopman 1974; Kunz 1971; Kunz, Choate & George 1980; Lantz 1918; C. Long 1961, 1976; Morse & Glass 1960; R. Myers 1965; W. Overall 1974; G. Phillips 1966; Robbins, Engstrom et al. 1977; D. Sparks & Choate 1995, 1998; Tinkle & Patterson 1965; Tinkle & Milstead 1965; Twente 1955; L. Watkins 1970

**KY:** R. Barbour 1957; MacGregor 1985; R. Wilson 1981b, 1984; Barbour 1963; Bee, Glass et al. 1981; H. Burke 1998; D. Conn & Marshall 1991; W. Davis, Hassell, Rippy 1965; W. Davis, Barbour & Hassell 1968; W. Davis 1965. 1969; W. Davis & Barbour 1970, 1979; R. Ewers & Vaughan 1965; Fessler 1971; Goodpaster & Hoffmeister 1950; J. Hall 1961, 1963-4; J. Hall & Wilson 1966; M. Harvey, Macgregor & Curre 1991; Hassell 1967; T. Hurst & Lacki 1997; T. Hurst 1997; J. Hutchinson & Lacki 1999; Kessler et al. 1981; Kirwan 1968, 1974; Kiser & Elliott 1996; Kiser, Elliott & Whitaker 1998; Lacki, Adam & Shoemaker 1994; Lacki, Burford & Whitaker 1995; Lacki & Hutcnhinson 1999; MacGregor 1987, 1993; MacGregor & Evans 1994; MacGregor & Westerman 1982; A. Miller 7 Kessler 1980; Palmer-Ball 1996; G. Phillips & Mumford 1957; Rabe, Robertson & Robbins 1999; Rabinowitz & Tuttle 1980; Tuttle 1997; Wethington 1996; N. Wilson 1997; R. Wilson 1980-1, 1984a

**LA:** Hardy 1982; C. Jones & Suttkus 1973; R. Lance 1999; Lance & Garrett 1997; R. Lance & Rogowski 1999; LaVal 1973; Lowery 1936

**MA:** Cardoza 1986; J. Daniels 1960; Harding 1978; Horwitz 1986; Kreindel 1997; G. Miller 1897

**MB:** Barclay 1984; Collister 1995; Sealy 1978;

**MD:** D. Clark & Prouty 1976; H. Hughes 1992; Limpert & Bounds 1999; Paradiso 1965; W. Webster, Parnell and Biggs 1985

**ME:** G. Zimmerman 1997; Zimmerman & Glanz 1998, 2000

**MI:** Bowers, Heidt & Baker 1968; Brach, Taylor & Holmes 1984; Cahalane 1932; Constantine 1961a; Kurta 1980; Kurta & Murray 2000; Tibbels 2000;

**MIDWEST:** D. Carter, Pine and Davis 1966

**MN:** Cahn 1921; W. Davis 1968; C. Evans 1934; Goehring 1954, 1957, 1972; Nordquist 1987; Norquist, 1988-90, 1998; R. Osborn, higgins et al. 1996; Paradiso 1969; Rysgaard 1941-2; Steece, Erickson et al. 1982; G. Swanson & Evans 1936; Vavrick & Galli 1993;

**MO:** Amelon et al. 2000; R. Baker 1983; Barros 1981; Britzke, Bossi & Robbins 1998; Casseday; W. Caire, LaVal et al. 1979; D. Clark 1982; R. Clawson 1987; R. Clawson & Sheriff 1982; Dodd & Kurta 1988; Kurta 1979, 1980-82; Kurta, Hubbard et al. 1992; Lemson 1998; C. Mitchell & Hitchcock 1965 S. Murray 1998; O'Connor & Klomse; Scharf & Jorae 1980; Stones 1980; R. Stones & Holyoak 1970; Wood & Dice 1924; G. Adams & Morris 1971; J. Belcher

1940; Brack & LaVal 1985; Callahan, Drobney & Clawson 1997; D. Clark et al. 1983; R. Clawson 1988-9; R. Clawson, Gray & Gray 1981; Harvey 1975; Hensley & Scott 1995; Easterla 1965; Easterla & Watkins 1970; W. Elliott & Clawson 1999; J. Gardner 1985; Gilkey 1965, 1969; Gunier & Elder 1973; J. Hall & Blewett 1964; Lantz 1918; Laval 1978; Laval, Clawson et al. 1977; LaVal & Laval nd; LaVal & LaVal 1980; Laval, Clawson, et al. 1977; LaVal, Clawson, et al. 1977; B. Martin 1980; N. Miller 1996; N. Miller, Drobney & Clawson 1996; Missouri Dept. 1980; K. Murray, Britzke et al. 1998; R. Myers 1960; R. Myers & Lewis 1955; Neller 1963; Pitts, Schimmelpfenig & Choate 1996; Purdue 1980; Rabinowitz 1982; T. Tucker 1969; L. Watkins 1970; L. Watkins & Shump 1981

**MS:** C. Carter, Rummel & Guy 1987; Cliburn & Middleton 1983; Kennedy, Randolph & Best 1974; LaVal 1967; Wolters & Martin 2000;

**MT:** T.Clark et al. 1989; Fegley, Brown et al. 1997; Hendricks, Genter & Martinez 2000; Hoffmann & Pattie 1968; Hoffmann, Pattie & Bell 1969; Hoffmeister 1955, 1959, 1986; Lampe, Jones et al. 1974; LeGrand 1993; W. Matthews & Swenson 1982; J. Swenson & Shanks 1979; Worthington 1991; Zeveloff 1988;

**NB:** Suppl. Bibil.: Czaplowski 1990-1; ; Czaplowski et al. 1999; P. Freeman, Geluso & Altenbach 1997; J. Jones 1964; Kunz 1965; Quay 1948; O. Webb, & Jones 1952;

**NC:** F. Barkalow & Fundeburg 1960; Barnwell 2000; Britzke, Harvey et al. 1999; M. Clark 1990; M. Clark & Lee 1987; P. Horner, Mirowsky & McDonnell 1998; D. Lee & Marsh 1978; Linzey & Linzey 1968; Nelson-Rees, Kniazeff et al. 1968; Padgett & Rose 1991; Rabinowitz 1982; Shryer & Flath 1980; W. Webster 1970; Whitaker, Rose & Poadgett 1997; W. Webster, Parnell and Biggs 1985;

**ND:** Bailey 1926; J. Jones & Genoways 1966; Genoways 1967; Genoways & Jones 1972

**NF** - Maunder 1988

**NH:** Fujita 1986; Sasse & Perkins 1996

**New England:** Griffin 1940; W.Davis & Hitchcock 1965; Girard et al. 1965; Godin 1997; D. Griffin 1940; J. Hall, Cloutier & Griffin 1957; W. Hood, Bloss et al. 1996; Ladd 1980; Schloyer & Griffiths 1981;

**NH:** E. Anthony & Kunz 1977; J. Horn & Kunz 2000; Kronfeld, Noga et al. 1998; Krusic, Neefus et al. 1995; Krusic, Yamasaki et al. 1995; Sasse 1993; Sasse & Perkins 1994-5; Yamasaki 2000

**NJ:** J. Hall 1961; R. Henry 1979; Leffler et al. 1979; D. Morris 1981; Rhoads 1903; Trapido & Kezer 1941; Trapido & Crowe 1946;

**NM:** Ahlstrand 1974; Allison 1926; J. Baker 1962a; Bogan & O'Shea 1997; Jablonsky 1992b; Koemel 1996; Reeve 1925; Thies, Thies & McBee 1993; Bradley & O'Farrell 1967; F. Brady 1905; D. Buecher, B. Buecher, et al. 1997; Burt & Gannon 1998; G. Cain 1966; Chung 1998; Chung-MacCoubrey 1996; D. Clark 1982; D. Clark et al. 1981; Constantine, 1948-1967,



Constatine et al. 1968; Dalquest, Stangl, Jones 1990; DeCarvalho, Gannon et al. 1997; Eads 1956; Eads & Menzies 1948; Gannon 1998; Gannon, Burt & O'Farrell 1998; Gannon, Scott et al. 1996; Gannon & Sexton 1996; Eads, Menzies & Hightower 1956; Eads, Menzies & Wiseman 1956; Egbert 1979; J. Findley 1987; Geluso, Altenbach & Kerbo 1987; Geluso, Altenbach, Wislon 1981; Gosnell 19?; Hummel 1981; Jagnow 1998; C. Jones 1961, 1964, 1965; C. Jones & Findley 1963; Mahunka 1982; R. Mumford, Oakley & Zimmerman 1964; Pape 1999; H. Parker 1932; Perry & Bogan 1996; Perry, Cryan et al. 1997; Ramsey 1998; Roemer 2000; Route 1998; Rowlett 1972; Exton & Gannon 1996; Sexton, Davenport et al 1996; Sexton, Kendall and Gannon 1998; Studier 1968; Thies & McBee 1994; G. Wright et al. 1933

**NS:** Bleakney 1965; Bleakney 1965; Gould 1936

**NY:** Bergstrom 1979; D. Clark 1986; S. Franz 1983; Hicks, 1981, 1983, 1989; Horst 1994; Neilsojn 1991; Fenton 1966; Horst 1998; Marr & Beck 1976; R. Murphy 1913; Schwager & Benton 1956; Syme 1991-2, 1994; C. Thomson 1982; Trapido 1942; Trimarchi & Debbie 1977; Trimarchi & Rupprecht 2000;

**NV:** Allred & Goates 1964; Anon. 1967; Ramsey 1995; L. Ball 1995, 1998; L. Ball 1998; Bradley 1996; Bridgemon 1965; Byrnes, Rowe et al. 1997; Cockrum & Musgrove 1964; 1977; Cockrum & Petrozyn 1994; Deacon & Bradley 1962; Geluso 2000; E. Hall 1935, 1946; O'Farrell & Bradley 1969; O'Farrel, Bradley & Jones 1967; Perkins 1928; Ports & Bradley 1996; Ramsey 1995, 1997; Straney, O'Farrell & Smith 1976; Szewczak & Szewczak 1998; Zeweloff 1988

**North America:** Allen 1894; E. Hall & Kelson 1959; J. Jones et al. 1978, 1982; Schober & Grimberger 1997; Schum 1975;

**NW:** Humes & Collopy 1996

**NWT:** Hitchcock 1943

**OH:** Belwood 1996; Bole & Moulthrop 1942; Brack & Finna 1987; Dood 1987; Keenan 1988; Gottschang 1966; Long & Severson 1969; J. Hine 1929; R. Mills 1971; R. Mills, Barrett & Farrell 1975; P. Osborn, Schultes & Belwood 1996; Rausch 1946; Reardon 1969, 1976; E. Smith 1954; H. Smith et al. 1973

**OK:** Cadena 1967; Caire 1988; Caire et al 1984; Glass 1955; Glass & Ward 1959; Hensley & Scott 1995; G. Rogers 1972; Saugey et al. 1990; W.F. Blair 1939, 1954; Black 1975b; Bryles et al. 1969; W. Caire 1986, 1988; W. Caire et al. 1989; W. Caire 1985; W. Caire & M. Ports 1981; W. Caire, B. Cox & Levescy 1981; Hardisty & Lacy 1986; W. Caire, Smith et al. 1984; W. Caire, Hornuff & Ports 1981; Choate & Fleharty 1975; Constatine 1958, 1967; Dalquest, Stangl, Jones 1990; Glass 1951, 1958, 1961, 1964, 1975, 1982; Glass & Morse 1959; Glass & Ward 1959; Glass & Halloran 1961; Glass & Humphrey 1970; Hardisty, Caire & Lacy 1987; Hatnie et al. 1998; M. Haynie et al. 1998; S. Humphrey 1969; H. Jackson & Warfel 1933; J. Jones et al. 1990; M. Looney 1971; Macy 1957; Maly 1962; R. Martin & Preston 1970; McDaniel 1982; McDaniel, Harvey et al. 1982; McDaniel, Rick & Gardner 1977; McDaniel, Paige & Tumilson 1979; Morse & Glass 1960; Pritchard 1987; Schackelford & Caire 1990; J. Taylor 1964; Thies & McBee 1994; Thies, Thies & McBee 1993; Tinkle & Patterson 1965; Tinkle & Milstead 1965;

Tumlison 1995; 1976; Twente 1955-6; J. Tyler & Scott 1982; Wethington 1994; Wethington et al. 1996-7

**ON:** G. Buchanan 1985, 1987; G. Buchanan & YoungLai 1987-8; G. Buchanan & Ryan 1983; G. Carmody, Fenton & Lee 1971; Fenton 1966, 1969-70, 1972; T. Harrison 1978; Hickey & Neilson 1995; Hickey, Palen et al. 1996; Hitchcock 1941, 1965; J. Jones 1998; Judd 1953; T. Jung et al. 1999; H., Keen & Kurta 1984; Kenn & Hitchcock 1980; Long & Severson 1969; MacDonald, Matsui & Fenton 1994; Nnagorsen & Nash 1984; Parsons, Smith & Whittam 1986; R. Peterson 1957, 1966; Soper 1923; K. Strong 1978; Toner 1938; Trevor-Deutsch 1973; Wai-Ping & Fenton 1988; P. Wood, Baker & Selden 1984

**OR:** M. Adam 1998; M. Adam & Hayes 2000; Allbright 1959; E. Arnett & Hayes 2000; Booth 1945; Cressman & Reed 1938; Cross 1976-83, 1989, 1992, 1997; E. Easton 1974-5; Erickson 1994; Hansen 1964; J. Hayes & Adams 1995; Hendricks 1997; Henny et al. 1982; Humes, Hayes & Callopy 1999; S. Lewis 1993; McMahan, Oakley & Cross 1981; Maser, Mate & Dryness 1981; Ormsbee 1995-7; Ormsbee & McComb 1997; Perkins 1987; Perkins et al. 1990; J. Perkins & Cross 1988, 1991; Perkins & Levesque 1987; Perlmeter 1993, 1997, 1999; Perlmeter & Ormsby 1996; Roest 1948, 1951; D. Thomas 1991; Verts & Carraway 1998; Whitaker, Maser & Keller 1977; Whitaker, Maser & Cross 1980-1; Whitaker, Yunker & Maser 1983; J. Whiteman 1997

**OZARKS:** Bagley 1981; Cassidy, O'Hagan et al. 1979; McDaniel, Paige & Tumlison 1979; R. Myers 1964; R. Myers et al. 1969; Saugey, Baber & McDaniel 1978; Wethington, Leslie et al. 1996-7

**PA:** Blackburn & Gannon 2000; Blackburn, Gannon & Little 1998; E. Brown & Ropski 1995; K. Campbell 1997-8; K. Campbell, Schwenk et al. 1998; K. Campbell, Tyson & Hall 1991; Douth, Heppenstall & Guilday 1966; Dunn & Hall 1989; Genoways 1985; J. Hall & Brenner 1968; Mohr 1932-3 1932b, 1939a; Butchkoski, 1986, 1990; J. Hall 1985; J. Hall & Brenner 1968; J. Hart et al. 1992, 1997; J. Hill & Brenner 1965; Mohr 1931-45, 1950-2; Kennedy 1989; Kirkland & Krim 1990; Little, Patrick & Gannon 1998; J. Merritt 1987; Nicholas Sullivan 1976; Petterson 1958; Pham 1997; E. Poole 1932, 1938, 1949; Rambaldini 2000; Rhoads 1903; Sakolsky 1992; Schwenk 1997; Todd 1903; Whitaker & Lukoschus 1982; Whitaker & Long 1998; L. Williams & Brittingham 1993; Witt 1954

**PLAINS:** D. Armstrong, Choate & Jones 1986

**PQ:** Beaupre, Caron & Dubuc 1976; Delorme & Juras 2000; Fenton 1969; M. Henry 2000; Hitchcock 1941, 1945, 1949

**RI:** Cronan & Brooks 1968; J. Simmons 1998

**SC:** Chastain; 2000; M. Clark 1997; T. Carter, M. Menzel et al. 1998-9; M. Clark, Black & Kiser 1998; DiSalvo, Hans & Mancke 1992; Golley 1966; Menzel, Carter et al. 1998; Menzel, Chapman & Miller 1998; P. Horner, Mirowsky & McDonnell 1998; Neuhauser & diSalvo 1972; Nichols 1920; diSalvo, Parker & Doda 1978; K. Reynolds & Parker 1983; W. Webster, Parnell and Biggs 1985

**SK:** Bouman et al. 1996; Dempster, Godrums et al. 1972; ; Nero 1957; Novakowski 1956; Parsons, Smith & Whittam 1986 Schowalter 1979

**SD:** K. Andersen & Jones 1971; J. Choate & Jones 1981; P. Cryan 1996-7; P. Cryan, Bogan & Altenbach 2000; J. Jones & Packard 1958; R. Martin & Hawks 1972; Mattson, Buskirk & Stanton 1996; Tigner 1992; R. Turner 1974; R. Turner & Davis 1969; R. Turner & Jones 1968; Tuttle & Heaney 1974; Wilhelm, Choate & Jones 1981; J. Jones & Genoways 1967; M. Kennedy, Kennedy & Baumgardner 1984; R. Martin & Hawks 1972; Mohr 1932; S. Peck 1960, 1964; Rabinowitz 1982; D. Snyder 1993; Spencer et al. 1995; J. Thompson 1965; R. Turner & Jones 1968; Visher 1914;

**SW:** Cockrum & Petrozyn 1992;

**TN:** Bole, 1943; Mohr 1932; Rabinowitz 1979; Tuttle 1964, 1974, 1976; Cadle 1992; F. Graves 1969; Graves & Harvey 1974; Gunier 1970; Handley & Patton 1947; M. Harvey 1989; M. Harvey, Macgregor & Curre 1991; Kellogg 1939, 1963; Tuttle 1964 1

**SE:** LaVal 1967; Bogan 1975; Bole 1935

**SW:** Bogan 1973; Burns et al. 1956; Krutzsch 1975; Cockrum & Petrozyn 1992; J. Findley 1972-3; Genoway & Jones 1969; Zeweloff 1988

**TX:** Blair 1952; Booth, 1985; Eads 1956; D. Jameson 1956; McCracken 1984; McMurray & Russell 1982; Milstead & Tinkle 1959; Mollhagan 1970; R. Packard & Mollhagen 1971; Raun & Baker 1959; G. Rogers 1972; Toomey 1989a, 1992a, 1993a; W.F. Blair 1952, 1954; Borell & Bryant, 1942; K. Burns & C. Farinacci 1995; K. Burns, Farinacci & Murnane 1956; B. Byers 1960; Cagle 1950; Cameron et al. 1997; S. Chapman & Chapman 1990; Choate 1996; D. Clark & Lamont 1976; Clauser m1989, 1990; Constatine 1948, 1958, 1962, 1966, 1967; Constatine, Tierkel 1968; Cutler et al. 2000; Dalquest 1981; Dalquest & Roth 1971; R. Davis, Herreid & Short 1962; W. Davis 1940, 1971, 1974; W. Davis & Robertson 1944; Dixon, Foxworth et al. 1997; Dooley 1974; Dooley, Bristol & Canaris 1976; S. Dorsey 1977; Dowler et al. 1992; Eads, Wiseman & Menzies 1957; Easterla 1970, 1973, 1976; Easterla & Whitaker 1972; Fenton 1969; Foxworth & Dixon 1998; J. Frank et al. 2000; Genoways, Baker & Cornely 1979; George & Strandtman 1960; Goetze & Yancey 1995; Goetze, Manning et al. 1996; A. Harris 1971, 1976; J. Hermann 1950; Herreid 1957, 1960, etc.; Hight 1990; Higginbotham 1999-2000; Higginbotham, Ammerman & Dixon 1997-9; Hollander et al. 1987; J. Horn et al. 2000; Horner, Fleming & Tuttle 1990; Horner & Mirowsky 1996; Horner 1995; Horner & Maxey 1998; P. Horner, Mirowsky & McDonnell 1998; M. Hovorka 1996; J. Jacobs & Bagley 1989; J. Jones 1993; J. Jones & C. Jones 1992; J. Jones, Manning et al. 1987, 1993; J. Jones 1993; J. Jones, Young & Schmidly 1985; Jordan 1986a; Judd 1967; Keeley & Tuttle 1997; Kennedy & Vreeland 1997; Kiser 1995; Krutsch & Hughes 1959; LaVal 1973; Y. Lee 1996, 1998; Leo 1993; Lollar 2000; Manning et al. 1987; Manning, C Jones et al. 1988; McCarley 1959 1986; Medellin 1994; Michael et al. 1970; Mirowsky 1998; Milstead & Tinkle 1959; Mohr 1948; P. Morton 1994; P. Morton & Schmidly 1993; O'Farrell & Bradley 1977; R. Packard 1966; R. Packard & Judd 1968; R. Packard & Mollhagen 1971; W. Phillips 1901; Pool & Schlegel 1984; G. Raun 1961; Raun 1960; Raun & Baker 1958; M. Rhodes 1997; Ridlehuber & Silvy 1981; Ritzi & Richerson 1998; Ritzi, Dixon & Richerson 2000; Ritzi, Walker & Honeycutt 1998; Sandle et al. 1999; D. Scarbrough 1989; Scheel, Vincent & Cameron 1996; Schmidly 1977,

1983; Schmidly & Jones 1984; Schmidly, Wilkins et al. 1977; N. Scott 1981; Short, Davis & Herreid 1960; Specia and Ubelaker 1976; Stihler & Hall 1993; Stager 1942; Stangl, Dalquest & Grimes 1996; Tangl & Jones 1987; Tamsitt, 1953-4; W. Taylor & Davis 1947; Thies 1994; Tinkle & Patterson 1965; Tinkle & Milstead 1965; Wahl 1993; Wahl 1986, 1993; J. Warner, Davis & Grimes 1962; Whitaker, Easterla & Fain 1987; K. Wilkins, Boeer et al. 1979; Yancey, Goetze et al. 1995; Yancey & Jones 1996-7; Rancey, Raj et al. 1997; Yancey, Roberts & Jones 1994, 1996; Yancey, Raj et al. 1997

**US:** Barbour & Davis 1969; J. Cooper 1970-1; W. Hamilton 1943; LeConte 1856; Honacki, Kinman & Koepl 1982

**UT:** D. Allred & Beck 1966; D. Armstrong 1982; Benson 1954; Brennan & Beck 1956; B. Coleman, Sherwin & Rogers 1999; Durrant 1952, 1988; Durrant, Lee & Hansen 1955; Easterla 1965-6; Hansenyager 1980; Hardy 1941, 1949; Kirkland 1981 Krishtalka & Stucky 1984; Mollhagen & Bogan 1996; Musser & Durrant 1960; Padgett & Rose 1991; Poche 1975, 1979; Poche & Bailie 1974; Poche & Ruffner 1975; Ruffner, Poche et al. 1979; Sherwin, Haymond et al. 1996; Sherwin & Rogers 1996; Twente 1960; Pruszko & Bowles 1986; Twente 1960; Zeveloff 1988

**VA:** H. Bryan & MacGregor 1987; Conrad 1962, 1964; Rogers 1952; Conrad 1961-2; Dalton, Brack & Williams 1989; Handley & Patton 1947; Hobson & Holland 1995; Holsinger 1964, 1982; E. Hooper & Cady 1941; D. Johnson 1950; Kirwan 1968, 1974; Leffler et al. 1979; J. Lewis 1940; P. Miller 1993; Padgett 1987; N. Rogers 1952; Tifton 1986; Tipton & Coggin 1977; Tipton, Tipton & Coggin 1979; T. Walker et al. 2000; R. Warner & Czaplowski 1981; W. Webster, Parnell and Biggs 1985; Whitaker, Rose & Poadgett 1997

**VT:** Barr 1951a; Fichteel 1993; D. Griffin & Hitchcock 1965; Hitchcock 1967; Kirk 1922; Sasse & Perkins 1996; R. Stevens et al. 1993; D. Thomas 1995; Menaker 1962; Trombulak et al. 2000;

**WA:** D. Brown 1935; T. Brown 2000; Flahaut 1933; Senger 1969, 1970, 1975; Dicks 1935; Elliot 1899; King 1998; Krishtalka & Stucky 1984; R. Lunder & Herestad 1986; McCorquodale et al. 1997; Perkins 1980, 1985; Senger 1969, 1973, 1986; Svihla 1938; W. Taylor & Shaw 1929; D. Thomas 1991; Whitfield 1980; D. Williams 1968

**WI:** R. Adams 1988; W. Davis & Lidicker 1955; Coggins et al. 1981-2; C. Cory 1912; Dice 1919; Greeley & Beer 1949; J. Hedges 1959; H. Jackson 1919, 1961; Knoche & Stumpf 1990; S. Lewis 1997; S. Leis & Pavwoski 1999; C. Long 1976; Long & Severson 1969; Pavwoski & Lewis 1998; Rupprecht 1980-1; Senlius 1994, 1998, 2000; Senlius & Reinartz 1998; Stumpf 2000; Tallman 1983, 1991; D. Taylor & Row 1999; H. Walley 1974

**WV:** R. Anderson 1991; R. Barbour 1951a; Conrad 1962, 1964; Bradshaw, 1990; D. Clark & Prouty 1976; Conrad 1961-2; Dalton 1986; Delfino 1982-3; J. Findley 1954; J. Fowler 1943; Frum 1944, 1946; Garton 1987; Grady, 1984, 1990; 1991, 1994; Handley 1956; Hight 1990; J. Jacobs & Bagley 1987; Kaye & Grady 1993; Kellogg 1937; Krutsch 1961; Lipske 1984; McKeever 1952; Menzel, Johnson et al. 2000; Stihler 1996-7; D. Stihler, Dalton et al. 1996; Stihler 1996-8; Stihler & Hall 1993; Stihler, Jones & Wallace 1997-8; Tinkle & Milstead 1965; Tipton 1984; R. Turner 1974; L. Wilson 1946; W. Wilson 1946

**WY:** Boyce 1980; T.Clark & Stromberg 1987; Horton, Anthony & Kitchin 1974; Luce & Priday 1996; Mickey 1961; Quay 1948; S. Skinner 1990; D. Stevenson, Oakleaf et al. 1996; Stromberg 1981-2; R. Travis 1979; Worthington 1991; Zevloff 1988

Yukon - P. Youngman 1975

Suborders incl.

Megachiroptera (incl. Pteropodidae)

Microchiroptera (incl. Emballonuridae, Molossidae)

Superfamily Noctilionoidea (incl. Phyllostomidae)

Bat families incl.

**Desmodontidae** - subsumed in Phyllostomidae

**Emballonuridae** Gervais, 1856 (sac-winged or sheath-tailed bats) (*Emballonura*). **Bibl.:** Dunlop 1995-6; Robbins 1983; Robbins & Sarich 1988;

**Molossidae** Gervais, 1856 (free-tailed bats; free-tailed, bulldog & mastiff bats)  
(*Eumops*, *Molossus*, *Nyctinomops*, *Tadarida*) (80 sp. in 12 genera)

**Bibl.:** R. Baker 1976; Freeman 1981; Vaughan & Bateman 1980; V. 1966; D. Walton 1967

**Mormoopidae** (moustached, naked-backed & ghost-faced bats (incl. *Mormoops*, *Pteronopus*)  
Bibl.: J. Smith 1972;

**Phyllostomidae** Gray, 1825 (incl. Desmodontidae) (New World leaf-nosed bats) (incl. *Desmodus*, *Diphylla*, *Leptonycteris* (Glossophaginae), *Macrotus*) **Bibl.:** Baker 1977; R.B aker & Carter 1979; R. Baker, Jones & Carter 1979; Honeycutt 1981; Honeycutt & Sarich 1987; Koopman 1981; P. Tucker 1985-6; P. Tucker & Bickham 1986; Van Den Bussche 1992;

**Pteropodidae** Gray, 1821 (flying foxes) (*Pteropus*)

**Vespertilionidae** Gray, 1821 (plain-nosed or vespertilionid bats)

Subfamily Vespertilioninae (incl. *Antrozous*, *Corynorhinus*, *Eptesicus*, *Euderma*, *Idionycteris*, *Lasionycteris*, *Lasiurus*, *Nycticeius*)

*Antrozous* H. Allen, 1862 - Vespertilionidae bats, Vespertilioninae subfamily (1 extant species in US & Canada)

*Antrozous* (*Antrozous*) *pallidus* (Le Conte, 1856) (= *A. bunkerii*, *koopmani*, *minor*, *pacificus*, *packardi*) (pallid bat/ Queretaro & Baja CA (Mex.) to AZ, extreme scBC, CA, s,nwCO, swCO, swKS, NM, s,nwNV, wOK, OR, s,seUT, eWA, wTX/ federal T&E species of concern in AZ/ TTx in CA, NV, TX)

*Antrozous pallidus* **Bibl.:** Arganbright 1984; L. Ball 1998; Bassett & Wiederhielm 1982; Bassett & Wiederhielm 1982; L. Beasley 1985-6; Beasley, Pelx & Zucker 1984; L. Beasley & Smith 1983-4; G. Bell 1980, 1982; Beck & Rudd 1960; Beck, Beck & Howard 1982; G. Bell 1982; Borell 1942; P. Brown 1982; P. Brown, Berry et al. 1997; P. Brown, Grinnell & Harrison 1978;

P. Brown, Grinnell & Narims 1985; S. Lewis 1993; Sidner, 1997, . K. Chapman, McGuinness & Brigham 1994; Cressman & Reed 1938, Dalquest & Roth 1971; R. Davis 1969; Dickey 1922; Dobkin, Kattel & Gettinger 1995; Engler 1943; B. Fowler & Zook 1982; Fuzessery 1991, 1994, 1997; Fuzessery, Buttenhoff et al. 1993; Fuzessery & Hall 1996; Fuzessery, Zoltan & Pollack 1994-5; C. Gaudet 1981; Grindal, Collard & Brigham 1991; Gaudet 1983; J. Harrison, Brown & Huang 1978; hatt 1923; Herreid 1961; Hermanson 1977;R. Herd 1987; Hermanson & Altenbach 1981;Hermanson & O'Shea 1983; Herrera Montalvo et al 1993; Herrera Montalvo, Fleming & Findley 1991; Huey 1936; D. Johnston 1993, 1997; D. Johnston & Fenton 1997; Kennedy & Fuzessery 1991; Krull 1989; S.Lewis 1990-1, 1993, 1994, 1996-7; Licht & Leitner 1967; Lutch & Miller 1996; Manning, C Jones et al. 1988; C. Martin 1974; C. Martin & Schmidly 1982; Monday 1993; Morse & Glass 1960; K. Muller 1998; O'Shea & Vaugh 1977; Orr 1954; Oxberry 1979; Racey 1933; Shryer & Flath 1980; Sidner 1982, 1988, 1997; Sidner & Davis 1988; H. Taylor, Gould et al. 1974; Trune & Slobodchikoff 1976; Vaughan & O'Shea 1976; T. Williams 1984

*Antrozous pallidus bunkeri* (Hibbard, 1934)(now in wOK, nTX)

*Antrozous pallidus pallidus* ((*Vespertilio p.* LeConte, 1856) H. Allen, 1864) Cockrum, 1960 (now in AZ, NM, OK, w,sTX, UT/ Tx in AZ, NM, OK, TX, UT)

*Antrozous* undescr. sp. (large extinct sp. in FL cave)

*Artibeus* Leach, 1821 - Phyllostomidae bats, Subfamily Stenodermatinae

*Artibeus* (*Artibeus*) *jamaicensis* Leach, 1821 (epigeal in Ecuador, Venezuela, Amazonian Brazil (if *A. obscurus* or *A. planirostris* is included) n. to Mex., Caribbean, FL Keys (sFL)/ Jamaican fruit-eating bats) **Bibl.:** Cotter 1985; Farney 1976; Marques 1993; D. Morrison 1975; Tuttle 1968

*Choeronycteris* Tschudi, 1844 - Phyllostomidae bats, Subfamily Glossophaginae (one species in US)

*Choeronycteris mexicana* Tschudi, 1844 (long-tongued bat; Mexican long-tongued bat/ now in extreme sCA (probable), sAZ, extreme swNM, swTX (rare) to South America/ **Bibl.:** Cryan & Bogan 1999; Monday 1993; R. Mumford & Zimmerman 1962; Nicolay, Dumont & Winter 2000; Peachey 1997; R. Sidner & Houser 1990; Van de Water & Peachey 1997

*Corynorhinus* H. Allen, 1865 (originally as valid genus, then changed to subgenus of *Plecotus* E. Geoffroy, 1818, then reinstated as valid genus) Vespertilionidae bats, Vespertilioninae subfamily subfamily (3 extant species in US or Canada) **Bibl.:** A. Stock 1983

*Corynorhinus alleganiensis* (*Plecotus a.* Gidley & Gazin 1933) (extinct/ Pleist. in Cumberland C.,MD),

*Corynorhinus rafinesquii* Lesson, 1827 (= *Plecotus r.*, *P. leconteii*, *P. macrotis*) (Rafinesque's big-eared Bat/ now in sw,seVA, s. to FL, w. to sIN, sWV, sOH, seIL, seMO, & extreme eOK & TX/ Tx in AL, AR, IL, IN, KY, MO, NC, OH (accidental), TN, WV, VA/ AL & NC T&E; IL T&E, KY & GA T&E S3?, global G3G4 rank)

*Corynorhinus rafinesquii* **Bibl.:** Bagley & Jacobs 1985; M. Clark 1995; M. Clark 1991, 1995, 1997; M. Clark, Black & Kiser 1998; S. Ellis 1988; Fessler 1971; Finn 1995-7; Finn et al. 1999;

D. Heath et al. 1983; Hoffman, Cochran et al. 1998; T. Hurst 1997; T. Hurst & Lacki 1997; J. Hutchinson & Lacki 1999; J. C. Jones 1971, 1977; R. Lance 1999; Lance, Hardcastle & Tally 1998; R. Lance & Leberg 1999; McDonnell & Clark 1999; Mirowsky 1998; O. Pearson, Koford & Pearson 1952; Mirowsky 1998; R. Pitts 1988; Qumsiyeh & Bickham 1993; Saugey, McDaniel et al. 1993; Wolters & Martin 2000; Thies 1994; Yancey & Jones 1996

*Corynorhinus rafinesquii humeralis* (Le Conte, 1831) (Rafinesque's big-eared bat/ Tx in seOK)

*Corynorhinus townsendii* (= *Plecotus t.* Cooper, 1837) Cooper (Wisconsinan Townsends' Big-Eared Bat in Dry C., TN & Clark's C., VA/ now in West, n. to sBC, e. to sMT, eSD, CO (except ne), swOK, wOK, wTX & extreme wNB, s. to Oaxaca (Mex.); *C.t. ingens*: in Ozarks (swMO, nwAR, extreme neOK, seNB) & *C.t. pallescens* in eKY, WV (except extreme n,ne), swOH, wVA & extreme nwNC & neTN/ Tx in AR, CA, CO, IN, KS, KY, MO, MT, NV, OH, OR, TN, TX, WV, VA, WA)

*Corynorhinus townsendii* **Bibl.:** M. Adam, Lacki & Shoemaker 1994; Anthony & Kitchin 1976; Bagley 1981; M. Barclay & Barclay 1990; Barr 1963c; Booth 1945; Burford & Lacki 1995; Cabeza de Baca 1986; B. Clark 1991-2; B. Clark, Clark & Leslie 1996-7, 1990; Clark M. Clark & Lee 1987; M. Clark 1990; M. Clark & Lee 1987; Conrad 1961; Cross 1992; Dobkin et al. 1995; England et al. 1989; Gentner 1989; Goslin 1954; Graham 1966; Grigsby & Puckette 1982; Guilday 1961a; Guilday & Irving 1969 (paleo); Harvey et al. 1978; Harvey & Barkley 1990; M. Harvey, Cassidy & O'Hagen 1979; Hensley & Scott 1995; Hughes 1968; Tipton 1986; B. Clark 1991; Conrad, 1961, 1963; Dalquest 1947; Dalton, Brack 1986; Dalton, Brack & McTeer 1986; Dobkin, Kattel & Gettinger 1995; Dyas 1977; R. Graham 1966; J. Hall 1963; Handley 1955, 1959; Hoffmeister & Goodpaster 1964; Horacek 1975; J. Horn 1988; J. Jacobs & Baghley 1987; Kunz & Martin 1982; Lacki, Adam & Shoemaker 1994; Lengas & MacMahon 1996; Maly 1962; Marcot 1984; McKee 1932; Mika, Sherwin & Stricklan 1999; Monday 1993; Nowak 1980; Perkins & Levesque 1987; E. Pierson 1988; E. Pierson & Fellers 1993; E. Pierson & Rainey 1991, 1996; Pupek; Rippey & Harvey 1965; Qumsiyeh & Bickham 1993; Schommer & Perkins 1993; Scheffer 1930; Senger 1969, 1970, 1973, 1975, 1986; D. Stihler, Dalton et al. 1996; Stihler 1996-8; Stihler, Jones & Wallace 1997-8; 1996; Tipton 1983; Tumilson 1990; United States Fish & Wildlife Service 1995; Wethington 1994; Wethington et al. 1997; Wethington et al. 1996-7

*Corynorhinus townsendii australis* (Handley, 1955) (now in nMex., wTX/ federal T&E)

*Corynorhinus townsendii ingens* (Handley, 1955) (type locality - Hewlitt Cave, WA Co., AR/ now in AR, MO, OK, nTX/ Ozark big-eared bat/ federal T&E/ Tx in AR, MO, OK, VA, WV)

*Corynorhinus townsendii pallescens* (*C. macrotis p.* G.S. Miller, 1897) Handley, 1959 (Western Big-eared or Townsend's big eared bat/ now in sAZ, CA, BC, CO, NM, wOK, UT/ Tx in sAZ, CO, NM, wOK, UT/ OK state special concern species; US candidate species)

*Corynorhinus townsendii t.* (Western Big-eared or Townsend's big eared bat/ now in BC, CA, ID, NV, OR, nwUT (possible), WA)

*Corynorhinus townsendii virginianus* Conrad 1963 (now in KY, VA, WV, NC/ Tx in KY, VA, WV, NC federal T&E in NC, TN; MO T&E; KS S2 Species of concern, global G4 rank) **Bibl.:** Dalton, Brack & Williams 1989;

*Desmodus* Wied, 1824 (vampire bats) Phyllostomidae bats, Subfamily Desmodontinae  
**Bibl.:** Altenbach 1988; Bhatnagar 1988; R.Baker et al.1988; Machado-Allison 1968; C. Ray et al. 1989; U. Schmidt et al. 1990aa

*Desmodus archaeodaptes* G.S. Morgan, O. Linares & C.E. Ray, 1988 (type locality in Irvingtonian Haile, Alachua/ extinct, in FL Pleist. sinkholes/ status unclear, may = *D. stocki*)

*Desmodus stocki* Jones, 1958 (*D. magnus* Gut, 1959) (extinct Stock's vampire bat in Big Bend Natl. Park (TX); Potter Cr. C. (CA), Mammoth C. (KY or undescr. extinct species) & Haile IIB & Reddick (Marion Co.), FL (Illinoan)

*Desmodus* undet. sp. or species ( Pleist. extralimital in Friesenhahn C., TX & (near *D. draculae* G.S. Morgan, O., Linares & C.E. Ray, 1988), New Trout C.(30-17,000BP),WV & RanchoLabrean Arredondo fissure fillings, Alachua Co.,FL) **Bibl.:** Grady 1991

*Diphylla* Spix, 1823 (hairy-legged vampire bats) Phyllostomidae bats, Subfamily Desmodontinae

*Diphylla ecaudata* Spix, 1823 (hairy-legged vampire bat/ now in TX to ePeru & Brazil/ one in tunnel, Val Verde Co., TX)

*Emballonura* Temminck, 1838 (sheath-tailed bats) Emballonuridae bats (one species in US)  
*Emballonura semicaudata* (Peale, 1848) (= *E. sulcata*) (Mariana sheath-tailed bat/ American Samoa/ Species of Concern T&E) **Bibl.:** Freeman 1989; T. Griffiths 1990; Hilton et al. 1990

*Eptesicus* Rafinesque, 1820 - Vespertilionidae bats, Vespertilioninae subfamily. **Bibl.:** Heller & Volleth 1984 (1 extant species in US & Canada)

*Eptesicus (Eptesicus) fuscus* (*Vespertilio f.* Palisot de Beauvois, 1796; *V.f. grandis* Brown, 1908; *Adelonycteris f.*) (= *E. arquatus*, *bahamensis*, *bernardinus*, *carolinensis*, *cubensis*, *dutertreus*, *hispaniolae*, *lynni*, *melanops*, *melanopterus*, *miradorensis*, *osceola*, *pallidus*, *peninsular*, *pelliceus*, *petersoni*, *phaiops*, *ursinus*, *wetmorei*) (big brown bat/ Pleist. Trout C.,WV; New Paris #4(11,300BP),PA & Cumberland C.(MD)/n. Brazil n. to parts of Caribbean & most of NA except AK (perhaps), nCanada (except ncSK), neME/ Tx in AL,AR (or Ac), CA, CO, FL, IA, IN, KY, MD, MO, NC, NJ, NS, NV, OH, OK, PA, TN, TX, WV, VA, WA/ (sub)fossil in sNM; LA state T&E)

*Eptesicus fuscus* **Bibl.:** R. Adams 1988; R. Adams, Thibault & Petru 1999; Adkins & Wasserman 1993; Altes 1981, 1989; Audet 1987; V. August 1984; Banfield 1948, 1950; R. Baker 1990; R. Barclay 1994-5; S. Barnard 1991; Beer 1953; Betts 1998; Betts & Haynes 1994; Bhatnagar & Audet 1987; Bingham 1986; H. Black 1972; Boatright 1999; Boatright & Covey 1995; Brenner 1968; Bringham 1984-6, 1988; J. Christian 1956; C. Burnett 1982; C. Burnett 1982-3; C. Burnett & Kunz 1982; C. Burnett et al. 1998; Cadle 1992; Cahalane 1932; Casseday & Covey 1985, 1992; Casseday, Covey & Grothe 1997; Casseday, Ehrlich & Covey 1994; Casseday, Kobler et



al. 1989; J. Christian 1953; Cuddihee & Fonda 1981; Duchamp 2000; Durden, Best et al. 1992; Durrant 1988; D. Gould 1956; Guilday 1967; Hamilton 1996; Kalcounis 1996; Phillips 1966; Poussin 1982; Sidner, 1997; Twente 1954; Cartwright & Kirkwood 1990; Casseday, Covey & Grothe 1997; J. Christian 1956; D. Clark 1976, 1978; D. Clark & Lamont 1976; Cotter 1985; Cope, Hendricks & Telfair 1970; J. Cope, Koontz & Churchwell 1960; Cope & Mills 1970; Coutts, Fenton & Glen 1973; Covey & Casseday 1986; Covey & Casseday 1996; Cross & Huijbregtse 1964; Cuddihee 1980; Cuddihee & Fonda 1981-2; W. Davis, Barbour & Hassell 1968; W. Davis 1986; W. Davis & Luckens 1966; W. Davis & Mumford 1962; Dear 1995, 1998; Dear, Simmons & Fritz 1993; Dear & Suga 1995; deCarvalho, Gannon & Ruedas 1998; Denzinger & Schnitzler 1998; Dood 1987; Dicks 1935; Drumm 1993; Dubey et al. 1998; Durrant 1988; Ehrlich, Casseday & Covey 1997; Ellins 1972; Engler 1943; Fattu & Suthers 1981; Feng, Simmons & Kick 1978; Ferragamo 1994; Ferragamo, Haresign & Simmons 1998; Fonda & Cuddihee 1982; Fonda & Herbener 1983; Fonda, Herbener & Cuddihee 1983; B. Forbes 1989; Frederickson & Jen 1984; Gates 1937; C. Gaudet 1981; Geggie 1983; Goehring 1954; Haplea, Covey & Casseday 1994; B. Harris & Holting 1977; Hartley 1992; W. Hood, Bloss et al. 1996; Hovorka 1996; Gaudet 1983; Geggie 1983; Geggie & Fenton 1985; Glover 1933; Goehring 1957; Griffiths 1983; Gummer & Whitaker 1993; J. Hall & Davis 1958; I. Hamilton & Barclay 1994, 1998; I. Hamilton 1995-6; Hamr 1978; Hamr & Bailey 1985; B. Harris 1976; Hermanson 1995, 1997; Hitchcock, Keen & Kurta 1984; Hilton et al. 1990; Hollis 2000; Holloway 1998; Holroyd 1991, 1993; Holt 1969; Howell 1990; Hoying & Kunz 1981; Jen et al. 1987, 1989; Jen 1980, 1982, ; Jen & Chen 1988; Jen & Kamada et al. 1984; Jen, Sun & Kamada 1982; Jen, Sun & Lin 1989; Jen & Schlegel 1980, 1982, 1987; Jen, Vater et al. 1981; J. Jones et al. 1990; Kalcounis & Brigham 1998; Kamada, Wu & Jen 1992; Kazial, Burnett & Mitchell 1998; Kazial & Masters 2000; Keeler et al. 1990; Kick 1980, 1982; Kilburn, Best et al. 1990; Kirkwood & Cartwright 1994; Kluger 1970; Koay 1997; Koay, Heffner & Heffner 1997; Koontz & Davis 1991; Koay 1997; Koopman 1974; Krulin 1969; Krutsch 1946; Kunz & Chase 1983; Kunz & Fenton 1973; Kurta & Baker 1990; Kurta, Bell, Nagy & Kunz 1989; Kunz, Stack & Jenness 1983; Kurta 1984; Kurta & Foster 1994, 1998; Kurta, Nagy et al. 1987; Kurts, Kung et al. 1987; Lausen 2000; B. Lawrence, & James A. Simmons 1981; Layne 1992; Lemson 1998; C. Long 1971; Long & Severson 1969; D. Lowe et al. 1990; Luckens, Van Eps & Davis 1971; Lutch & Miller 1996; Manning et al. 1989; Masters et al. 1985, 1989, 1990, 1991; Masters and Raver 1993; Masters, Raver et al. 1997; F. Mayer 1988; McCarty & Jen 1982-3; Mendonca et al. 1993, 1997, Merriam 1989; Milam & Best 1994; J. Miller, Jones & Kin 1973; P. Miller 1995; C. Mitchell & Hitchcock 1965; Mogdans & Schnitzler 1990; Monday 1993; G. Moore & Raymond 1970;; Moss & Schnitzler 1989; Nader & Hoffmeister 1983; Neuweiler 1981; Morrell, Shoults & Vann 1996; M. Morris 1995; R. Mumford 1969; Nester 1993; Obrist 1989; Oelschlaeger et al. 1998; Pagels & Blem 1973; D. Parker 1996; P. Patterson & Davis 1968; Pederson 1989; G. Phillips 1966; Pinheiro, Wu & Jen 1991; Pistole 1989; Pouissin 1982 ; Pouissin, Drake And Simmons 1982; Pouissin & Schlegel 1984; A. Price, McDaniel & Tumilson 1982; Rasmuson & Barclay 1992; Rauch & Beatty 1975, 1977; Reagan & Brueckner 1951; W. Reeder 1965; Reith 1978; K. Reynolds 1941; S. Rhoads 1902; Rysgaard 1941-2; ; R. Russell, Suzanne et al. 1998; Rydell 1990; Rysgaard 1942; Saillant 1995; Schowalter & Allen 1981; Schowalter & Gunson 1979; Sevick & Studier 1990, 1992; Shimozawa, Sun & Jen 1984; Sidner & Davis 1988; Silvia, Kronfeld et al. 1998; J. Simmons 1971, 1979, 1993; J. Simmons & Kick 1984; J. Simmons, Kick et al. 1988; Simmons, Moss & Ferrgamo 1990; Solberg et al. 1999; Spoonamore 1978; Stack 1985-6; Stack & Kunz 1981; Studier, Beck & Lindeborg 1967; Studier, Sevick et al. 1994; Surlykke 1992; Szewezak & Jackson 1991-2; H. Taylor, Gould et al. 1974; Teng 1989, 1991; Teramino 1996; Tiller 1978; Toner 1938; Teramino 1996; Tiller 1977;

Turmelle, Sorenson & Kunz 2000; D. Valentine 1995; S. Walker 1996; H. Walley, Southern & Zar 1969; N. Weber & Findley 1970; Wetmore 1936; Wilkinson 1993-4; Whitaker & Gummer 1999; Wilkinson & Barclay 1997; L. Williams & Brittingham 1997; R. Williams 1960; Winsatt 1983; Wotton 1994; Wotton & Simmons 1991; Wotton, Haresign & Simmons 1995; Wu 1993; Wu & Jen 1991, 1996; Wu, Jen & Kamada 1991; Yacoe 1981-3; Zhang & Jen 1982; Zhang, Sun & Jen 1987; Zook & Dicaprio 1988

*Eptesicus fuscus* (*Vespertilio* f. Palisot de Beauvois, 1796) (big brown bat in Pleist. Trout C., WV; New Paris #4(11,300BP), PA & Cumberland C.(MD)/extant in NA except AK, nCanada, neME/ Tx in AL, AR (or Ac), CA, CO, FL, IA, IN, KY, MD, MO, MT, NC, NJ, NS, NV, OH, OK, PA, TN, TX, WV, VA, WA, WI, WV/ (sub)fossil in sNM; LA state T&E)

*Eptesicus fuscus* f. (*Vespertilio* f. Palisot de Beauvois, 1796) (most of East & sCanada except FL)

*Eptesicus fuscus bernardinus* Rhoads, 1902 (= *E.f. melanopterus* Stone) (sBC s. to cCA)

*Eptesicus fuscus miradorensis* (*Scotophilus* m. H. Allen, 1866) (Panama n. to swTX)

*Eptesicus fuscus osceola* Rhoads, 1902 (in FL, seGA)

*Eptesicus fuscus pallidus* Young, 1908 (now in West from s,cSK, eWA, eOR, sCA east to wSD, wND, wKS, OK, UT, wTX)

*Eptesicus grandis* Brown, 1908 = *E. fuscus*

*Euderma* H. Allen, 1892 - Vespertilionidae bats, Vespertilioninae subfamily (1 extant species in US & Canada)

*Euderma maculatum* (J.A. Allen, 1891) (spotted bat; death's head bat/T&E species of concern in AZ, NM/ Queretaro (Mex.) n. to wMT, AZ, extreme seBC, seCA, NV, ID, NM (except nw), UT (except extreme nw), wNM, eOR, swCO, swTX/ mostly cliffs, Tx in CO, WY)

*Euderma maculatum* **Bibl:** Ashcraft 1932; P. August & R. Digman 1973; Benson 1954; T. Best & Hudson 1996; H. Black 1976; Bleich & Pauli 1988; Constantine 1961a; Constantine, Humphrey & Herbenick 1979; Durrant 1988; Durrant, Lee & Hansen 1955; Easterla 1971, 1976; Fenton, Tennant & Wyszecski 1987; R. Finley & Creasy 1982; Findley & Jones 1965; Fullard & Dawson 1997; Gentner 1989; Navo et al. 1992; Deacon & Bradley 1962; Easterla 1965; Geluso 2000; Grinnell 1910; E. Hall 1934-5; Handley 1955, 1959; Leonard 1982; M. Leonard & Fenton 1984; S. Lewis 1996; McMahon, Oakley & Cross 1981; Medeiros & Heckmann 1971; Mickey 1961; G. Miller 1903; Monday 1993; Navo, Gore & Skiba 1990; H. Parker 1952; Perry, Cryan et al. 1997; Poche 1975, 1979; Poche & Bailie 1974; Poche & Ruffner 1975; Poche & Keirans 1975; J. Priday & Luce 1999; Pride & Luce 1999; Rabe, Siders et al. 1998; R. Reynolds 1981; Shen, Chen & Jen 1997; Siders, Garcia de la Cadena et al. 1997; Siders, Rabe et al. 1997; Siders, Miller et al. 1996; Stager 1957; ; A. Stock 1983; J. Taylor & Wai-Ping 1987; H. Tucker 1957; Vonhof 1993, 1996; Vorhies 1935; Wakins 1977; D. Williams, Druecker & Black 1970; Wong & Fenton 1982; Woodsworth, Bell & Fenton 1981;

*Eumops* Miller, 1906 (mastiff-bats) Molossidae bats (3 extant species in US) **Bibl.:** R. Martin 1977; Pirlot 1965

*Eumops glaucinus glaucinus* (*Dysopes g.* Wagner, 1843; *Molossides floridanus* Allen, 1932; *E. floridanus*) (now in sFL, s. to nSouth America/ Florida or Eastern mastiff-bat/ federal listed endangered/Tx? in FL; Pleist. FL; FL Holocene in Monkey Jungle sinkhole)

*Eumops glaucinus* **Bibl.:** Belwood 1981; D Koopman 1974; R. Martin 1977; Robson, Mazzotti & Parrott 1989; J. Warner, Patton et al. 1974; J. Warner, Patton et al. 1974

*Eumops glaucinus floridanus* (*Molossides floridanus* G.M.Allen, 1932)

*Eumops perotis* (*Molossus p.* Schinz, 1821) (western mastiff bat/ Pleist. of Centipede C., TX/ now in swTX, swNM, AZ (except ne), s,wcCA, & extreme sNV/ Tx in AZ)

*Eumops perotis* **Bibl.:** T. Best, Kiser & Freeman 1996; Bradley & O'Farrell 1967; Castner, Snow, Noel et al. 1996; Cockrum 1960 ; Constantine, Humphrey & Herbenick 1979; T. Cox 1965; Dolan & Honeycutt 1978; Eger 1977; A. Howell 1920; H. Johnson & Trapp 2000; Kruttsch 1955; Leitner 1962, 1966; Little 1920; Monday 1993; O'Farrell & Bradley 1977; Pirlot 1965; Rowlett 1972; Ryan 1991, 1992; Siders, Miller et al. 1996; D. Walton & Kimbrough 1970; J. Warner, Patton et al. 1974

*Eumops perotis californicus* (*Molossus c.* Merriam, 1890) Sanborn, 1932 (Western mastiff bat; greater Western mastiff bat (now in AZ, CA(extirpated), NM (very rare), TX(extirpated?)/ Tx in AZ/ AZ state species of special concern) **Bibl.:** Kruttsch 1944; von Blocker, Jr. 1932

*Eumops underwoodi* Goodwin, 1940 (Underwood's mastiff-b.; Honduras & Nicaragua n. to scAZ/ very rare in caves/ east extralimital in FL Pleist. caves) **Bibl.:** R. Baker 1956; Cockrum & Gardner 1960; Kiser 1995; Monday 1993; J. Warner, Patton et al. 1974

*Eumops underwoodi sonoriensis* Benson, 1947 (Sonora (Mex.) n. to sAZ)

*Idionycteris* Anthony, 1923 (Allen's big-eared or Allen's lappet-browed bats) (1 extant species in US) **Bibl.:** A. Stock 1983

*Idionycteris phyllotis* G. M. Allen, 1916 (= *Plecotus p.*) (Distrito Federal (Mex.), n. to AZ (except extreme sw), extreme eCA, swNM, extreme swMT, extreme seNV, s,seUT, extreme wTX/ Allen's big-eared or Allen's lappet-browed bat/ rare in caves) **Bibl.:** Berry 2000; P. Brown, Berry & Hall 2000; Cockrum & Musgrove 1964; B. Hayward & Johnson 1961; Monday 1993; O'Farrell & Bradley 1969; Simmons & O'Farrell 1977; Tumlison 1993

*Lasionycteris* Peters, 1866 (silver-haired bats) Vespertilionidae bat, Vespertilioninae subfamily (1 extant species in US & Canada)

*Lasionycteris noctivagans* (Le Conte, 1831) (silver-haired bat/ Wisconsinan fossil in Little Box Elder & Bell C., WY/ now in neMex., n. to sCanada & most of US (incl. seAK & except s,cCA, swAZ, FL, sAL, sCA, sGA, SMS, seTX)/ infrequent in caves/ Tx in CO, KY, MN, NV, VA, WV/ LA & NY State T&E, listed as rare in PA)

*Lasionycteris noctivagans* **Bibl.:** R. Adams, Thibault & Petru 1999; R. Barclay 1984-6; R. Barclay et al. 1988; Beer 1954; B. Betts 1998; Betts & Haynes 1994; Bohn & Keller 1999; L. Campbell et al. 1996; Carlstead 1998; C. Carter, Rummel & Guy 1987; M. Clark 1993; Krutzsch 1966; Rogers 1952; B. Clark et al. 1993; Collister 1995; I. Cowan 1933; W. Davis 1952; Druecker 1972; Easterla & Watkins 1967; Faure 1987; Gosling 1977; D. Heath et al. 1983; Hunt & Bhatnagar 1997-8; Kunz 1982; Krutzsch 1966; R. Lance 1999; R. Lance & Rogowski 1999; Limerick & Wiebe 1997; C. Martin 1970; Mattson, Buskirk & Stanton 1996; Menzel et al. 2000; Neunauser & Brisbin 1969; Messenger, Smith et al. 1997; Monday 1993; Nero 1957; D. Parker 1996; Parsons, Smith & Whittam 1986; J. Perkins & Cross 1988, 1991; Reith 1978, 1980; N. Rogers 1952; Saugey, McDaniel et al. 1993; Schowalter, Dorward & Gunson 1978; R. Stones & Holyoak 1970; Twente 1960; Vonhof 1993, 1996, 1999; Whitaker, Maser & Cross 1980; Whitaker & Lawhead 1992

*Lasiurus* Gray, 1831 (hairy tailed bats) Vespertilionidae bat, Vespertilioninae subfamily (6 extant species in US & Canada)

**Bibl.:** E. Hall & Jones 1961; J. Hart et al. 1992, 1997; M. Lyon 1903; McClure 1942; J. Morales 1992; R. Tomes 1857; H. Werner & Dalquest 1952

*Lasiurus blossevillii* Lesson & Garnot, 1826 (= *L. borealis* according to some authors) (desert red or western red bats) (now in AZ, CA (except extreme ne), wOR, seUT, wWA, & extreme s, wNV, swBC & swNM) **Bibl.:** Corben, Pierson & Raioney 1999; Pierson, Rainey and Corben 1999

*Lasiurus (Lasiurus) borealis* (*Nycteris b.* Muller, 1776) (incl. *L. minor* & *L. blossevillii* according to some authors, = *L. bonariensis*, *brachyotis*, *degelidus*, *enslenii*, *frantzii*, *funebriis*, *lasiurus*, *monachus*, *noveboracensis*, *ornatus*, *pfeifferi*, *quebecensis*, *rubellus*, *rubra*, *rufus*) (red, northern red or New York bat/ state T&E species in AZ/) (Pleist. Red Bat in Organ-Hedricks C., WV/sCanada w. to extreme wManitoba, all US East to cFL, neNM, neMT, NB, wCO, ND, SD; Tx in AR, IA, IN, KY, MO, NM, NJ, TN (occasional), TX, WV (sometimes accidental), VA)

*Lasiurus (Lasiurus) borealis* **Bibl.:** Acharya 1990, 1995; P. Allan 1947; R. Baker, Patton, Genoways & Bickham 1988; S. Barnard 1991; T. Carter, M. Menzel et al. 1998-9; Downes 1964; Drake 1957; Gates 1938; Glass 1966; Clay 1956; R. Coleman 1950; Constantine 1958; Cueva, Fenton et al. 1994; Fassler 1975; R. Hamilton & Stalling 1972; Hagner 1921; Hickey 1986; Hickey, Acharya et al. 1996; Hutchinson & Lacki 1998-2000; C. Johnson 1932; C. Jones & Bradley 1999; G. Jones & Klimkiewicz; Menzel et al. 1998; Menzel, Carter et al. 1998; Menzel, Chapman & Miller 1998; C. Merriman 1989; Meritt 1989; H. Mueller 1969; R. Mumford 1963, 1973; R. Myers 1960; Nichols 1920; Norton 1930; Obrist & Wenstrup 1998; R. Orr 1950; Quay 1970; R. Packard 1956; R. Peterson 1970; Quay 195; Quimby 1942; Salcedo, Fenton et al. 1995; Saugey, Vaughn et al. 1998; Scharf & Jorae 1980; Shump & Shump 1982; Stallup 1954; Stangl, Dalquest & Grimes 1996; Stuewer 1948; D. Thomas 1988; Timm 1989; R. Warner & Czaplewaki 1981; Waterstradt 1981; J. Warner, Davis & Grimes 1962; Whitaker, Rose & Poadgett 1997; N. Wilson 1965; J. Wiseman, Davis & Grimes 1962

*Lasiurus (Lasiurus) borealis teliotis* (H. Allen, 1891)

*Lasiurus (Lasiurus) borealis*

*Lasiurus (Lasiurus) cinereus* (Palisot de Beauvois, 1796) (= *L. brasiliensis*, *grayi*, *mexicana*, *pallescens*, *pruinus*, *semotus*, *villosissimus*) (cCHile to sBC, seMAckenzie, Hudson Bay & sPQ, Galapagos, Bermuda, HI, accidental on Cuba, Hispaniola, Iceland and Scotland/ Tx in AR, IN, IA, KY, MO, NJ, NV, TN, TX, WV, VA/ NY state T&E; (sub)fossil in sNM)

*Lasiurus (Lasiurus) cinereus* **Bibl.:** Acharya 1990, 1995; R. Adams, Thibault & Petru 1999; A. Bailey 1937; R. Baker 1954; Barclay 1984-6; ; Barclay, Fullard & Jacobs 1999; Barclay & Koehler 1988; A. Benton & Stanley 1965; S. Bishop 1947; H. Black 1972; Bowers, Heidt & Baker 1968; Brisbin 1966; D. Brown 1935; Constantine 1959, 1996; Couch 1934; P. Cryan 2000; Cueva, Fenton et al. 1994; Denys 1972; Findley & Jones 1964; Fullard 1989; Gottschang 1966; J. Hart et al. 1992, 1993; Hickey 1988, 1990-1, 1993; Hickey, Acharya et al. 1996; Hickey & Fenton 1996; Hickey, Acharya & Pennington 1996; Hitchcock 1943; Koehler 1992; Hoffmeister & Downs 1964; Koehler & Barclay 1988; D. Heath et al. 1983; Iwen 1958; S. Kirk 1922; Merriman 1990; Mumford 1953; Obrist 1989; Caire, Hardisty & Lacy 1986; Church 1967; Mohr 1952; Druecker 1972; Easterla 1967, 1975; Koehler & Barclay 2000; Kunz & Fenton 1973; Maunder 1988; C. Merriman 1989; R. Mumford 1967; Munyer 1967; R. Myers 1960; Mohr 1952; R. Myers & Lewis 1955; Nero 1958; R. Orr 1950; J. Perkins & Cross 1988; Provost & Kirkpatrick 1952; Quay & Miller 1955; Rolseth, Koehler & Barclay 1994; Salcedo, Fenton et al. 1995; Saugey, McDaniel et al. 1993; Shump & Shump 1982; Stains 1965; Tenaza 1966; J. Tyler & Scott 1982; T. Vaughan 1953; Whitaker 1967; Zinn & Baser 1979

*Lasiurus cinereus cinereus* (de Beauvois, 1796) (hoary bat/ all NA except AK, sFL, neCanada/ Tx in AR, IN, IA, KY, MO, NJ, NV, TN, TX, WV, VA/ NY state T&E; (sub)fossil in sNM))

*Lasiurus cinereus semotus* H. Allen, 1890 (Hawaiian hoary bat; opeapea/ T&E/ Tx (rare) in HI; fossils in HI caves)

*Lasiurus cinereus semotus* **Bibl.:** J. Belwood 1982; Cabrera 1996; Fujorka & Gon 1988; Fullard 1984, 1988-91; D. Jacobs 1991-3, 1999; Koopman 1965; W. Maher 1972; McDaniel & Tenorio 1979; Menard 1997; G. Miller 1939; Monday 1993; P. Morton & Schmidly 1993; M. Reynolds, Cooper & Day 1997; M. Reynolds, Nielsen & Jacobi 1997; Sealy 1978; Tomich 1974, 1986; Whitaker & Quentin 1983; Whitaker & Tomich 1983; D. Worthington 1997; D. Worthington & Dwyer 1998

*Lasiurus (Dasypterus) ega (Dasypterus e. Gervais, 1856)* (Argentina, Uruguay & Brazil n. to sCA (rare, accidental?), swAZ (rare, accidental?), seTX/ southern yellow bat/ rare in c./state T&E species in AZ)

*Lasiurus ega* **Bibl.:** R. Baker, Mollhagen & Lopez 1971; Bond 1970; Cockrum 1961; Constantine 1946; Constantine, Humphrey & Herbenick 1979; Kurta & Lehr 1995; R. Loomis 1964; Monday 1993; R. Mumford & Zimmerman 1963; Spencer et al. 1988; G. Stewart 1969

*Lasiurus ega xanthinus* (Thomas, 1897) = *Lasiurus xanthinus*

*Lasiurus (Dasypterus) intermedius* H. Allen, 1862 (= *L. floridanus*, *L. insularis*) (northern yellow bat/ Sangamonian fossil in Devil's Den., FL/ Honduras, n. to coastal plain in sePA, eMD, FL, s,cGA, sAL, sMS, LA (except extreme n.), sMS, eNC, NJ, PA, eSC, seTX, eVA) **Bibl.:** Webster, Jones & Baker 1980

*Lasiurus intermedius i.* (H. Allen, 1862) (now in TX)

*Lasiurus intermedius floridanus* (G.S. Miller, 1902) (now in LA, FL, MS, eTX)

*Lasiurus (Lasiurus) seminolus* (Rhoads, 1895) (may only be a subspecies of *L. borealis*) (Seminole bat/ Bermuda, FL (except sw) n. to GA (except extreme ne), SC (except extreme w.0, cMD, scNY, w. to seOK, extreme sTN & wTX & eVA; rare in caves). **Bibl.:** F. Barkalow & Fundeburg 1960; T. Carter, M. Menzel et al. 1998-9; Coleman 1950; Dunaway 1960; D. Heath et al. 1983; M. Kennedy, Kennedy & Baumgardner 1984; R. Lance 1999; T. Lee 1987; Menzel, Carter et al. 1998; Menzel, Chapman & Miller 1998; Padgett 1987; E. Poole 1932, 1938, 1949; H. Sherman 1935; K. Wilkins 1987;

*Lasiurus* undescr.. sp. (prehistoric fossils in HI caves)

*Lasiurus xanthinus (Lasiurus ega xanthinus* Thomas, 1897) Findley et al. 1975 ((southern yellow bat/ now rare in s,cAZ, nMex., sCA, extreme swNM/ AZ S2 Species of Special Concern; TX state Threatened Species; Critically Imperiled in NM (S1) **Bibl.:** Constantine 1946; Higginbotham 1999; Higginbotham et al. 1999-2000;

*Leptonycteris* Lydekker, 1891 (Mexican long-nosed bats) Phyllostomidae bats, Glossophaginae subfamily (2 extant species in US & Canada). **Bibl.:** R. Baker & Cockrum 1966; Cockrum & Petrozyn 1991; W. Davis & Carter 1962; Griffin 1940; Pirlot 1965

*Leptonycteris curasoae* Miller, 1900 (southern long-nosed bat/ now in c,seAZ & extreme swNM/ Federal & NM T&E)

*Leptonycteris curasoae* **Bibl.:** Cockrum & Petryszyn 1991; Alcorn, McGregor & Olin 1961; Carpenter & Graham 1968; W. Davis 1968; Fleming 1995, 1997, 2000; Fleming et al. 1989, 1994, 1998; Fleming, Newton & Usieh 1999; Fleming & Tuttle 1990; Fleming & Wolff 1998; Greenbaum & Phillips 1974; B. Hayward & Cockrum 1971; Herrera Montalvo 1997; Herrera Montalvo & Martinez del Rio 1998; Horner, Fleming & Sahley 1998; Horner, Fleming & Tuttle 1990; C. Jones & Findley 1963; J. Jorgensen 1994; Monday 1993; Nicolay, Dumont & Winter 2000; Peachey & Bethard 1997; Petryszyn 1992; Pirlot 1965; Rojas-Martinez et al. 1999; Sahley 1990; Sahley, Moirner & Fleming 1993; Voight & Helversen 1994

*Leptonycteris curasoae yerbabuenae* (Martinez and Villa-R.) = *L. nivalis* (lesser (=Sanborn's) long-nosed bat; long-nosed bat; Sanborn's southern long-nosed bat/ now in NM & AZ/ Federal & NM T&E)

*Leptonycteris nivalis* (Saussure, 1860) (incl. *L. yerbabuenae* (Saussure, 1860); *L. nivalis y.* (Saussure, 1880)) (Mexican Long-nosed Bat as Wisconsinan fossil in San Josecito/ now in extreme swTX & seNM (rare), sAZ (rare)/ Tx in TX, Federal & NM T&E)

*Leptonycteris nivalis* **Bibl.:** Medellin 1994; Easterla 1972; Greenbaum & Phillips 1974; Hensley et al. 1988, 1989, 1992; Hevly 1979; D. Howell 1981; D.Lowe et al. 1990; O'Connor et al. 1977; D. Wilson 1985; Voight & Helversen 1994; D.Wilson 1985

*Leptonycteris sanborni* Hoffmeister, 1957 = *L. yerbabuenae*

*Leptonycteris yerbabuenae* Martinez and Villa-R., 1940 = *L. nivalis*

**Macrotus** Gray, 1843 - Phyllostomidae bats, subfamily Phyllostominae (1 extant species in US)  
**Bibl.:** S. Anderson & Nelson 1965; Rehn 1904

**Macrotus californicus** Baird, 1858 (= *M. waterhousii* Gray, 1843; *M. waterhousii californicus*, treated as a subspecies of *M. waterhousii* by Anderson 1969) (California or Waterhouse's leaf-nosed bat/ federal T&E species of concern/ nSinaloa & sw Chihuahua (Mex.) to sNV, wAZ/sCA, extreme sUT, / winter roost in Agua Caliente C., AZ; TTX in AZ, CA)

**Macrotus californicus** **Bibl.:** Arnold 1943; R. Baker & hsu 1970; P. Brown & Berry 1991; G. Bell 1980, 1982; G. Bell et al. 1985; G. Bell & Fenton 1986; Berry & Brown 1995; Blair 1975; Bleier 1975; Bradshaw, 1961-2; C. Brown et al. 1993; P. Brown 1991; P. Brown & Berry 1996; P. Brown, R. Berry et al. 1999; J. Burns & Easley 1977; F. Carter 1987; F. Carter & Bleier 1988; Crichton, Hoyer & Krutzsch 1990; B. Davis & Baker 1974; B. Forbes 1989; Hatfield 1937; Huey 1925; Leitner & Ray 1964; Lu & Bleier 1981; H. Mitchell 1963; Pearl 1992; C. Ray & Wilson 1979; Rehn 1904; B. Richardson 1980-1; Schmidt 1999; Soskic et al. 1987; D. Wilson 1971; J. Burns, Baker & Bleier 1972; Nelson-Rees, Kniazeff et al. 1968; D. Wilson 1971

**Macrotus waterhousii** Gray, 1843 = *M. californicus*. **Bibl.:** S. Anderson 1969

**Molossus** E. Geoffroy, 1805 - Molossidae bats (1 extant species in US)

**Molossus molossus** (*Tadarida m.* Pallas, 1766) (Sinaloa and Coahuila (Mex.) To Peru, nArgentina, Uruguay, Brazil & Guianas, to sCaribbean, rare (accidental?) in TX & three colonies in FL Keys/ Pallas' free-tailed b., rare in caves/ TTx in TX) **Bibl.:** Constantine 1958; Eger 1987; Frank 1997; Stager 1942, 1956

**Mormoops** Leach, 1821 (ghost-faced bats) Mormoopidae bats (1 extant species in US) **Bibl.:** Morrison-Scott 195

**Mormoops megalophylla** (*Mormops m.* Peters, 1864) (= *M. carteri*, *intermedia*, *rufescens*, *senicula*, *tumidiceps*) (now in seAZ, extreme swNM, swTX/ ghost-faced bat north extralimital in Pleist. cave near Rock Springs, FL) **Bibl.:** Constantine 1958a; Monday 1993; Rezsutek & Cameron

**Mormoops megalophylla m.** (Peters, 1864) (Leafchin bat/ swTX, seAZ/ Tx in TX)

**Bibl.:** Rehn 1902

**Myotis** Kaup, 1829 (= *Vespertilio* in part) (little brown or mouse-eared bats) Vespertilionidae bats, Vespertilioninae subfamily (18 extant species in US or Canada)

**Myotis** **Bibl.:** J. Baker 1962; Bickham et al. 1986; Bohn & Keller 1999; Findley 1972; Goldman 1914; G. Miller & Allen 1928; Mohr 1933a; Munson & Keitch 1984; Murray, Heywood et al. 1999; Tinkle & Milstead 1965; Vaughan 1980

**Myotis** (*Myotis*) *auriculus* (*M. a.* Baker & Stains, 1955) (listed as a subgenus of *M. evotis* by Hall & Kelson, 1959 but see Genoways & Jones 1969 & Hall 1981) (now in sw, cNM through

seAZ, s. to cMexico/ southwestern myotis/ rare in caves) **Bibl.:** Gannon 1997-8; Gannon 1995; Monday 1993; R. Warner 1982; R. Werner & Czaplewski 1981;

*Myotis (Myotis) auriculus auriculus* (*M. a.* Baker & Stains, 1955)

*Myotis auriculus apache* (Hoffmeister & Krutzsch, 1955) (now in seAZ, neMex./ Mexican long-eared myotis; long-eared Mexican myotis; southwestern myotis)

*Myotis (Leuconoe) austroriparius* (Rhoads, 1897) (= *M. gatesi*, *mumfordi*) (southeastern or Mississippi myotis. as fossil' in FL sinks/ now in SE from nFL n. to sNC, SC (except extreme nw), c,sGA, sAL, MS, n. to wTN, WKY, seIL, sIN, csAR, LA (except extreme s.), extreme eTX & seOK /AL,NC & TN state listed T&E; KY T& E/ Tx in AL, AR, FL, sIL, IN, KY, MO, TN, TX, WV, VA)

*Myotis (Leuconoe) austroriparius* **Bibl.:** Bole, 1943; Humphrey 1992, C. Jones & Manning 1989; E. Michael et al. 1970; Mirowsky 1998; Rice 1957; S. Barnard 1991; M. Clark 1997; M. Clark, Black & Kiser 1998; W. Davis & Rippey 1968; W. Davis, Lidicker & Sealander 1955; G. Foster et al. 1978-9; G. Foster & Mertins 1996; J. Gardner, Hoffman & Garner 1991; J. Hall 1961; Hoffman, Cochran et al. 1998; P. Horner, Mirowsky & McDonnell 1998; W. Kern 1991; LaVal 1973; Layne 1967; Michael et al. 1970; Mirowsky 1998; R. Packard 1966; R. Phillips & Mumford 1957; D. Rice 1955, 1957; Rippey 1965; Saugey, McDaniel et al. 1993; Sealander 1951; Sherman 1930; W. Webster 1970; Zinn 1977; Zinn & Humphrey 1981

*Myotis austroriparius a.* (Rhoads, 1897) (now in TX)

*Myotis (Selysius) californicus* (*Vespertilio c.* Audubon & Bachman, 1842) (= *M. agilis*, *caurinus*, *exilis*, *mexicanus*, *nitidus*, *oregonensis*, *quercinus*, *stephensi*, *tenuidorsailis*) (now in sAK to Guatemala, w. to TX, not in MT,WY/ California myotis/ extralimital in Klein C. (>8,000BP, Kerr Co.,TX/ Tx in CA, CO, NV, OR, TX, WA)

*Myotis (Selysius) californicus* **Bibl.:** R. Barclay & Brigham 2000; Bogan 1973-5; Brogja, Vpmjpf et al 1997; deCarvalho, Gannon & Ruedas 1998; Dalquest 1946; Duke, Bateman & Bateman 1979; Genter 1989; Krutzsch 1954; Monday 1993; D. Parker 1996; Reeder 1949; Szewczak 2000; Straney, O'Farrell & Smith 1976; Van Zyll de Jong et al. 1980; G. Woodsworth 1981; D. Young & Scudday 1975; D. Young & Scudday 1975

*Myotis californicus californicus* (*Vespertilio c.* Audubon & Bachman, 1842) (seBC s. to nUT, Baja, disjunct in seAZ, wNM, wTX, nMex.)

*Myotis californicus caurinus* Miller, 1897 (wcBC s. to wcCA)

*Myotis californicus stephensi* Dalquest, 1946 (= *Myotis findlevi*) (now in w,nAZ, seCA, wCO, wNV, s,eUT, nMex.)

*Myotis ciliolabrum* (*Vespertilio c.* Merriam, 1886) (formerly incl. in *M. leibii*) (now in West (except coastal), e. to wOK, wNB, wKS, w,sSD, swSD, MT (except extreme ne,nw), swSK, sAB, extreme scBC/ western small-footed bat/ rare Tx in CA, CO, MT, OR, seON, PQ, WA; (sub)fossil in sNM/ KS T&E S1S3B,SZN, Federal Species of Concern G5 global rank)



*Myotis ciliolabrum* **Bibl.:** Collister & Hunt 1990 deCarvalho, Gannon & Ruedas 1998; R. Herd 1987; Holloway 1998; Lopez-Wilchis, Lopez-Ortega & Owen 1994; Monday 1993; Schowalter & Allen 1981; Szewczak 2000;

*Myotis ciliolabrum c. (Vespertilio c. Merriam, 1886)* (now in AB, SK)

*Myotis ciliolabrum melanorhinus* (Merriam, 1890) (now in sBC, CO, NM, sAZ./small-footed myotis/ Tx in CO, NM, AZ)

*Myotis (Myotis) evotis (V.e. H. Allen, 1864)* (= *M. chrysonotus, micronyx, pacificus*) (long-eared myotis / federal T&E species of concern in AZ extralimital in Klein C. (>8,000BP, Kerr Co.,TX/ Tx in CA, CO, MT, NV, OR, WA/ now in West from sBC, sAB, swSK to neAZ, CA (except extreme e., NV (except extreme s.), nw,cNM, w,cCO, WY, Baja CA & extreme wSD, wNB & wND )

*Myotis evotis* **Bibl.:** R. Adams 1988; R. Barclay 1986, 1991, 1993; R. Barclay et al. 1990; Caceres 1998; Chruszcz 1998; Chung-MacCoubrey 1996; De Jong & Van Zyll 1978; Faure 1988-9, 1990; Faure & Barclay 1989, 1994; Faure, Hoy et al. 1992; Findley 1972; Gannon 1997-8; Genoway & Jones 1969; P. Hayes 1998; Hetherington 1971; Hoffmeister & Krutsch 1955; Holloway 1998; Ingles 1949; Kiser, Elliott & Whitaker 1998; Manning 1989, 1991, 1993; Marcot 1984; Miner, Brown et al. 1996; Monday 1993; Morrell, Rabe et al. 1996; E. Pierson & Rainey 1997; Reduker et al. 1983; Schowalter & Allen 1981; Simms 1977; Van Zyll de Jong 1979; Van Zull de Jong & Nagorsen 1994; Walden et al. 2000

*Myotis evotis evotis (Vespertilio e. H. Allen, 1864)* (in eBC, NM, AZ, UT)

*Myotis evotis pacificus* Dalquest, 1943 (now in wBC, wWA)

*Myotis (Leuconoe) fortidens* Miller & G.M. Allen, 1928 (cinnamon myotis/ now in Sonora & Veracruz (Mex.), s. to Guatemala, accidental in sAZ) rare or absent in caves) **Bibl.:** Findley 1967

*Myotis (Leuconoe) grisescens* A.H. Howell, 1909 (type locality in Nickajack C., Mario Co., TN/ gray bat or myotis; gray, cave, large-winged or Howell's bat/ Pleist. in WV & MD caves & extralimital in Devil's Den, FL & Hamilton C., WV/ now in extreme nwFL, e,nAL, neGA, nAR, KY (except extreme n.), sIN, sIL, KS, MO (except extreme nw.), neOK, TN, & extreme sIN, sIA, wVA, wNC, wWV/ federal T&E in GA, KS, MS, NC, MO, OK; KS S1B,SZN, G2G3 global rank /Tx in AL, AR, FL, GA, IA ,IL, KS, MO, MS, NC, OK, TN, WV, VA)

*Myotis grisescens* **Bibl.:** Anon. 1985; Appley 1971; J. Belcher 1940; Best et al 1991, 1997; T. Best & Hudson 1996; Brady 1983, 1985; Brady, Kunz et al. 1982; D. Clark et al. 1983; D. Clark & Prouty 1976; R. Clawson 1988-9; Gore 1992; Grigsby 1980; Holsinger 1964a; Humphrey 1978a; D. Lee 1976; Mohr 1932; Rice 1955a; Theis 1967; Tuttle 1976 1979, 1982; J. Black 1934; Brack 1979; Brady, 1981, 1983; Choate & Decher 1996; R. D. Clark, :LaVal & Wineford 1978; Clawson 1986; W. Davis 1962; Decher & Choate 1995, 1988; Easterla 1967; Elder & Gunier 1981; J. Gardner & Gardner 1980; Goslin 1964;Grigsby & Puckette1982; Gunier 1970-1, 1977; Gunier & Elder 1971; Guthrie, Jeffers & Sawyer 1940; Guthrie, Jeffers & Smith 1951; J. Hall & Wilson 1966; M. Harvey, Cassidy & O'Hagen 1979; Hatcher 1985; Holsinger 1964;

Humphrey & Tuttle 1978; J. Jones & Downhower 1963; Kennedy & Best 1972; Kurta 1999; Lacki, Burford & Whitaker 1995; Laval 1978; LaVal, Clawson, et al. 1977; D. Lee 1976; C. Long 1961; R. Martin & Sneed 1990; MacGregor 1993; McGimsey 1995; McReynolds, Whitaker & Gammon 1979; R. Miller 1938-9; Mohr 1932; R. Myers 1965; Rabe, Robertson & Robbins 1999; Rabinowitz 1982; Rabinowitz 1982; Rabinowitz & Tuttle 1982; D. Rice 1955; Sabol & Hudson 1995; Saugey 1989; A. Schmidt, Romme & Tyrell 1997; Schmidt, Salyers et al. 1997; J. Skeen, Grigsby et al. 1990; Teel 1976; Thies 1967; Tuttle 1975-9, 1980; Tuttle & Stevenson 1977; Ubelaker & Dailey 1971; A. Werner 1984

**Myotis** (*Myotis keenii* (*Vespertilio subulatus keenii* Merriam, 1895) (Keen's myotis as extralimital Wisconsinan fossil in New Paris #4, Robinson C. (TN), Natural Chimneys, Clark's, Organ-Hedricks, & Bootlegger Sink, VA/ wBC (except extreme nw.), nwWA & extreme sAK / Tx in BC, MO?, OH (accidental?), TN(1cave, accidental?), WI (accidental?))

*Myotis* (*Myotis keenii* **Bibl.**: Blankespoor & Szymusiak 1974; Brandon 1961; Coggins et al. 1981; R. Milles 1971; Rice 1955; Scudder & Humphrey 1978; W.Caire, LaVal et al. 1979; B. Clark et al. 1993; Cohen 1942; Cope & Humphrey 1972; Fleharty & Farney 1965; Getty & Barclay 1993; Glass & Baker 1965; Glass & Baker 1965; Goehring 1954; Hitchcock 1949; R. Mills 1971; D. Parker 1996; D. Parker & Cook 1996; D. Rice 1955; Schloyer & Griffiths 1981; Van Zull de Jong & Nagorsen 1994; E. West 1991, 1993; E. West & Swain 1993

**Myotis** (*Selysius leibii* (*Vespertilio gryphus* Audubon & Bachman, 1842) (= *M. subulatus, ciliolabrum, melanorhinus*) (extralimital Irvingtonian in Little Box Elder & Clark's C., MT/ (Eastern) small-footed myotis/ now in sON, sePQ, sNS, s. to New England (except nME), PA, MD, NJ, wMD, NY, wVA, WV, wSC, nwSC, TN, nAR, seMO, sIN, sIL, OH (except nw.) & extreme nAL, nGA, nLA & eOK/ Tx in AR, CO, IA, IN, KY, MD, MO, OH (accidental), TN, WV, VA, VT, WV/ State Special Concern T&E in MA, NC, NH, NY, OH & SC; T&E in TN; federal Species of Concern)

*Myotis leibii* **Bibl.**: D. Adams 1950, 1988, W. Baker 1965, 1967; Best & Jennings 1997; D. Johnson 1950; Krutzsch 1966; Mohr 1932; Schwartz 1954; D. Thomas 1995; Tuttle 1964, 1975; Bogan 1974, 1997; W. Davis 1955; W. Davis & Lidicker 1955; W. Davis, Hassell & Rippy 1965; De Jong & Van Zyll 1984; Erd;e 2000; Fenton 1972; Gunier & Elder 1973; J. Hall 1985; R. Herd 1987; Hitchcock 1945, 1955; Hitchcock, Keen & Kurta 1984; D. Johnson 1950; Koford & Koford 1948;; Krutsch 1966; McDaniel 1982; McDaniel, Harvey et al. 1982; R. Martin, Pawluck & Claney 1966; Mohr 1932, 1936 Nelson-Rees, Kniazeff et al. 1968; Robbins, Engstrom et al. 1977; Saugey, McDaniel et al. 1993; Schloyer & Griffiths 1981; Schwager & Benton 1956; Sealander 1951; Trapido 1942; Tuttle & Heaney 1974; Van Zyll de Jong 1984; G. Woodsworth 1981

**Myotis** (*Leuconoe lucifugus* (*Vespertilio l.* Le Conte in McMurtrie, 1831) (= *M. occultus, affinis, alascensis, albicinctus, altipetens, baileyi, brevirostris, carissima, carolii, crassus, domesticus, gryphus, lanceolatus, pernox, relictus, salarii, virginianus*) (Little Brown Myotis or bat/ fossil in Natural Chimneys, extralimital in Klein C. (>8,000BP, Kerr Co., TX/now in most of NA s. to Distrito Federal (Mex.) except nAK, nCanada, swCA, sFL, wAR, NB, TX & extreme eNC, neGA, sSD, swAZ & eCO/ hybridizes with *M. yumanensis* in some areas/ federal T&E species of concern in AZ, NM; OK T&E/ Tx in AL, AR, CA, Canada, CO, FL, GA, IN, IA, KY, MO, MT, MD, NJ, NS, NWT, OH, ON, OR, PA, TN, VA, WA, WI, WV)

*Myotis lucifugus* **Bibl.:** R. Adams 1990-2, 1993-4, 1996-8; R. Adams & Briggs 1996; R. Adams & Thibault 1999; Aldridge, 1986, 1988; E. Anthony 1982; E. Anthony & Kunz 1977; E. Anthony et al. 1984, 1987, 1989, 1995; E. Anthony 1982, 1985; E. Anthony & Gustafson 1995; E. Anthony & King 1984; E. Anthony & Gustafson 1984; E. Anthony, King, Gustafson & Damassa 1981; J.E. Anthony, King & Stopa 1984; E. Anthony, Neel & Cicione 1992; R. Armstrong, Ianuzzo & Kunz 1977; V. August 1984; M. Avery, Racey & Fenton 1984; R. Barclay 1981-2, 1986, 1991; Bassett & Wiebers 1980; Bauman 1990; Bauman, Hashim & Sershen 1989; K. Beard, Sige' & Krishtalka 1992; J. Bell & Moore 1960, 1971; J. Bell & Thomas 1964; Belwood & Fenton 1976; Borgman & Moon 1976; Brenner 1974; Brigham & James 1993; Brown 1989; L. Brown 1985; G. Buchanan 1985, 1987; G. Buchanan, Garfield & YoungLai 1988; G. Buchanan & YoungLai 1987-8; G. Buchanan & Ryan 1983; Buchler 1975; Buchler 1980a; Burnett & August 1981; C. Burnett & Kunz 1982; G. Carmody, Fenton & Lee 1971; D. Clark 1980; D. Clark, Kunz & Kaiser 1978; ; D. Clark & Krynitsky 1978; D. Clark & Prouty 1977, 1984; D. Clark & Stafford 1981; Condon, White & Feng 1994; Cope et al. 1958; J. Cope, Koontz & Churchwell 1960; J. Cotter & Laemle 1987, 1990; Coutts, Fenton & Glen 1973; Cukierski 1982, 1984-5; Cukierski & Hogan 1986; W. Currie, Blake & Wimsatt 1988; Damassa, Gustafson & Chari 1983; W. Davis 1967; W. Davis & H. 1965; Doctor 1967; Doty & Nunez 1985; Drymond 1936; Dubois 1998; Ellins et al. 1970; A. Enders & Wimsatt 1968; Fenton et al. 1976; Findley & Jones 1968; R. Garfield & Buchanan 1985; Geluso & Studier 1979; Griffin & Hitchcock 1965; Guilday 1950; A. Harris 1974; H. Hitchcock 1949; L. Hoffman, Wimsatt & Olson 1987; J. Horn 1999; J. Horn & Kunz 2000; Hoying & Kunz 1981; Humphrey & Cope 1976; Hurst 1966; Neilson 1991; O'Farrell & Studier 1973; Whitaker & Lawhead 1992; D. Bruce & Wiebers 1966; Cagle & Cockrum 1943; K. Campbell 1990; Canney 1988; D. Clark & Ratner 1987; Cockrum 1949; Coggins et al. 1982; Condon, 1994; Condon et al. 1994; Cukierski 1985-7; W. Davis 1965, 1982; W. Davis & Hitchcock 1964; W. Davis & Rippy 1968; D. Dawson 1975, 1980; Dubb 1968; Fain & Whitaker 1976, 1982; Fascione et al. 1991; Fenton 1970, 1966, 1969, 1970, 1972; Fenton, Belwood, Fullard & Kunz 1976; Frum 1946; Fujita 1986; Galazyuk & Feng 1997; R. Garfield & Buchanan 1985; C. Gaudet 1981; Gilkey 1965, 1969; Ginsburg 1969; D. Griffin & Hitchcock 1965; Grothe, Covey & Casseday 1996; M. Henry 2000; Hitchcock & Keen 1980; Guilday 1948, 1950; Gummer & Brigham 1995; Gustafson & Shemesh 1976; Gustafson, Damassa & Kwiecinski 1995; Guthrie & Jeffers 1933, 1935, 1938; Guthrie Jeffers & Sawyer 1935; W. Hamilton 1933; J. Harrison 1965; T. Harrison 1965, 1983; J. Hayward 1968; J. Hayward & Lyman 1967; Henshaw 1965; Henshaw & Folk 1963, 1966; R. Herd & Fenton 1983; Herman 1969; Hitchcock, Reynolds 1942; Hobson 1998; Holyoak & Stones 1971; Humphrey 1971; Humphrey & Cope 1964; Jen, Vater et al. 1981; Jujita & Kunz 1981; Kalcounis & Brigham 1975; Kalcounis & Hocker 1996; Kallen 1961; Kallen & Gans 1972; Kallen & Wimsatt 1962; Kazial & Masters 1999; King 1984, 1990; Koopman 1981; Kronfeld, Noga et al. 1998; Kruttsch 1961; Kruttsch, Crichton & Nagle 1981; Krook, Wimsatt et al. 1977; Kruttsch & Hess 1961; Kunz 1982; Kunz & Anthony 1982; Kunz, Anthony & Rumage 1977; Kunz, Stack & Jenness 1983; Kunz, Wrazen et al 1998; Kurta 1982, 1985; Kurta & Bell et al. 1990; Kurta & Kunz 1988; Kwiecinski 1982, 1984; Kuiecinski et al. 1987; Kunz & Anthony 1996; Kurta 1986; Laemle, Coter & Feldman 1984; Lauziere & Thomas 1993; Leffler et al. 1979; Lipske 1984; J. Lister 2000; R. Lunder & Herestad 1986; Mackawa, Wong & Paschal 1992; K. Martin 1973; K. Martin & Fenton 1978; R. Martin, Pawluk & Thomas B. Clancy 1966; Masterson & Ellins 1974; McDaniel 1988; Melman & Rosenbaum 1963; Menaker 1962; J. Miller 1955; R. Miller 1938-9; Monday 1993; Moon & Borgmann 1976; Moss, Redish et al. 1997; R. Mumford 1967; R. Myers & Hermanson 1994; Negraeff 1992; Neilson & Fenton 1994;

O'Connor, Cain & Zarrow 1966; O'Farrell 1999; A. Parkinson 1979; Paschal 1994; Patten & Patten 1956; R. Patterson 1935; Payette, Gershon et al. 1987; Pearl 1994; Pearl & Fenton 1996; Powers 1989; Powers et al. 1991; Quay 1976; Racey et al. 1987; Rambaldini 2000; Ramprashad, Landolt et al. 1980; Ramprashad, Money et al. 1983; Rauch & Hayward 1969, 1970; Reagan & Brueckner 1951; Redmond 1939; Reeder 1938-9; Remillard 1954, 1958; D. Reynolds 1993, 1999; D. Reynolds & Kunz 2000; S. Rhoads 1897; C. Richardson 1980; C. Roth 1957; Rumage, Anthony & Kunz 1978; J. Ryan, Baier et al. 1992; Saunders 1987-8; Scharf & Jorae 1980; Scheffer 1930; Schloyer & Griffiths 1981; Schowalter 1980; Schowalter, Gunson & Harder 1979; Shannon-Hartman, Wong & Mackawa 1992; Sisk 1957; E. Smith 1956-7; H. Smith 1977, 1981; H. Smith & Schowalter 1979; Sparks et al. 2000; D. Sparks & Krochmal 2000; Stager 1943; L. Summers et al. 1993; R. Stones & Branick 1969; R. Stones & Wiebers 1965, 1967; Studier 1978, 1981; Studier, Lavoie & Drake 1982; Studier, Beck & Lindeborg 1967; Studier & Weing 1971; W. Sullivan 1981-2, 1986; Syme 1992, 1994, 1995; H. Tanaka, Wong & Taniguchi 1992; Tanaka & Wong 1993; Tandler & Cohan 1984; J. Taylor 1988; D. Thomas 1993; D. Thomas, Fenton & Barclay 1979; D. Thomas 1992; D. Thomas, Dorais & Bergeron 1990; C. Thompson, Fenton & Barclay 1985; C. Thomson, Fenton & Barclay; C. Thomson 1982; Tougaard, Casseday & Covey 1998; Troyer 1955, 1959, 1965, 1968; D. Turner, Shaughnessy & Gould 1972; Wai-Ping 1986; Wai-Ping & Fenton 1988; Wai-Ping 1984, 1986; H. Walley 1970, 1974; Waterman & Maxwell 1963; Watt 1995; R. Webster 1970; H. Wells et al. 1965; Whitaker & Lawhead 1992; K. White 1997; Wimsatt 1942, 1944-5, 1948-9, 1960, 1979, 1984; Wimsatt & Kallen 1952; Wimsatt & Parks 1966; Wimsatt, Krutzsch & Napolitano 1966; Wonget al. 1992; Wotton 1994; T. Warner & Zar 1982; Wong & Shannon 1988; Wunder 1987; Wunder & Nash 1980; Yunker 1958

*Myotis lucifugus alascensis* Miller, 1897 (nw,sBC, wSK, nID, nwMT, eWA, nwOR, seAK s. along coast to cCA/ Ac or Tx in CA, ID, OR)

*Myotis lucifugus carissima* Thomas, 1904 (most of West (AZ, CO, NM, OK, TX, UT) except range of *M.l. alascensis* & *occultus*, sCA,most of AZ, TX & NM)

*Myotis (Leuconoe) lucifugus l. (Vespertilio l.* Le Conte in McMurtrie 1831) (most of East & seCanada (except coastal SC & NC, FL, LA), w. to eOK, eKS, seNB, eSD, eND)

*Myotis lucifugus occultus* Hollister, 1909 (occult little brown bat/ now in seCA, AZ, NM, Mex./ occasional mines in AZ/ historically in AZ, CA, NM (except nw), extreme wTX, ncMex.) **Bibl.:** Piaggio et al. 1999

*Myotis (Leuconoe) lucifugus pernox* Hollister, 1911 (nwBC, SK, Manitoba)

*Myotis (Leuconoe) lucifugus relictus* Harris, 1974 (Sierra Mts., CA)

*Myotis "magnamolaris"* Choate & Hall, 1967 = *Myotis velifer m.*

*Myotis melanorhinus* = *M. ciliolabrum m.*

*Myotis rectidentis* Choate & Hall, 1967 (likely = junior syn. of *M. lucifugus*) (Wisconsinan extinct/ straight-toothed myotis/ Laubach C. (type locality),TX & Dry Cave?, NM/ AZ Myotis/now in most of AZ, wNM)

*Myotis septentrionalis* (*Vespertilio* s. Troussart, 1897; *M. keeni* s.) (NE, sNWT, sCanada, s. to nwFL, wNC, nwSC, wGA, AL (except sw.), nMS, s AR, w. to c,eOK, eKS, NB (except sw.), eBC & extreme wMT & neCO/ northern long-eared or northern bat/ uncommon Tx in AB(rare), AR, BC, FL, GA, IN, KY, MD, MO, NS, OH, ON, PA, TN, WV, VA/ NC State T&E/OK T&E)

*Myotis septentrionalis* **Bibl.:** Broders 2000; S. Carroll et al. 2000; T. Carter et al. 2000; Chermock & White 1953; P. Faure, Fullard & Dawson 1993; Foster 1997; R. Foster & Kurta 1999; J. Jones & Packard 1958; Kurta & Foster 1998; L. Miller 1994; L. Miller & Treat 1993; Sasse & Perkins 1996, 2000; Sparks & Laborda 1999; Sparks et al. 2000; Van Zyll de Jong et al. 1980;

*Myotis (Selysius) sodalis* (Miller & G.M. Allen, 1928) (Indiana or pink bat/ type locality in Wyandotte C., Crawford Co., IN/ extreme nwFL n. to c,nwGA, wSC, w NC, wWV, MD (except se), nNJ, sNH, sVT & w. to sWI, sMI, c,se IA, wOK, AR (except se.) & extreme eKA & seNB/ Federal & State T&E in AL, FL, IA, KY, MA, NC, NH, MD, NY, MA, MO, MS, OH, OK; OK T&E; WV hibernaculum/ Tx in AR, FL, IN, IL, KY, MD, MO, OH, TN, WV, VA)

*Myotis sodalis* **Bibl.:** Ahle'n 1980-1; Ainslie & Long 1980; Anon. 1996; Barbour & Hassell 1966; Belwood 1979, 1996; Bergstrom 1978-9; Bergstrom & Lawson 1978; P. Bishop 1980; J. Bowles 1981; Brack 1983; Brack & Dunlap 1997 ;Brack, Dunlap & Tyrell 1995; Brack & Johnson 1990; Brack & LaVal 1985; Brack & Tyrell 1990; Brady 1983, 1985; Brack 1983; Brack et al.; Brady & LaVal; 1985; Brady, Laval et al. 1983; Britzke, Harvey et al. 1999; Callahan, Drobney & Clawson 1997; Brack, Wilkinson & Mumford 1984; Cardoza 1986; T. Carter, S. Carroll & Feldhamer 2000; Clawson 1986, 1988-9, 1993, 1996; R. Clawson, Gray & Gray 1981; Conn & Demoss 1984; E. Cook, Gardner et al. 1988; Daton 1986; Dunlap 2000; Engel 1976; Fenton 1966; Fichteel 1993; R. Foster & Kurta 1999; J. Gardner et al. 1996; J. Gardner, Gardner & Hoffman 1991; J. Gardner, Hoffman, Garner & Cook 1987; J. Gardner and Taft 1982-4; Grady 1984); J. Hall 1960-2; J.Harding 1967; Harding & Hassell 1970; M. Harvey, Cassidy & O'Hagen 1979; Harvey & McDaniel 1986; Hobson & Holland 1995; Humphrey & Cope 1977, 1992a; Humphrey & Scudder 1978; H. Jackson 1922; S. Johnson et al. 1998; MacGregor 1991; Mohr 1932; Myers 1975; Saugey et al. 1990; R. Williams 1962; Humphrey 1971; Humphrey & Cope 1964; Indiana bat 1980; S. Johnson, Brack & Rolley 1993; Kessler et al. 1981; Kiser & Elliott 1996; Kiser, Elliott & Whitaker 1998; Klaas 1986; Kurta 1980, 1995, 1999; Kurta & Foster 1998; Kurta & King 1991; Kurta & Murray 2000; Kurta & Williams 1994; Kurta, Williams & Mies 1996; Kurta, Kath et al. 1993; Kusewitt, Wagner & Harris 1977; Laval 1978; LaVal & Laval nd; LaVal,Clawson, et al. 1977; MacGregor 1993; MacGregor & Westerman 1982; MacKay 1997; Maryland 1979; McCracken, Saidak & Currie 2000; McReynolds, Whitaker & Gammon 1979; Metzger 1956; N. Miller, Drobney & Clawson 1996; R. Miller 1939; N. Miller 1996; Mohr 1932; R. Mumford & Calvert 1960; R. Mumford & Cope 1958; S. Murray 1997-8; ; Murray & Kurta 1999; Nold et al. 1997; O'Farrell 1999; Palmer-Ball 1996; Quay 1976; Rabinowitz 1982; Richter et al. 1978; Rippy 1965; Romme, Tyrell & Brack 1995; Saidak, McCracken & Currie 1998, 2000; Schloyer & Griffiths 1981; A. Schmidt & Tyrell 1997; Schmidt, Salyers et al. 1997; W. Schutt 1991; J. Skeen, Grigsby et al. 1990; Skibins 1991, 1993; R Stones 1980; C. Thomson 1982; Tipton & Coggin 1977; Tipton, Tipton & Coggin 1979; Tuttle 2000; USFWS 1983; Tyrell, Black & Romme 1994; Whitaker, Deunff & Belwood 2000; Wilhide, Harvey et al. 1999; K. Williams, Mies & Kurta 1996

*Myotis (Myotis) thysanodes* Miller, 1897 (fringed myotis; fringed-tailed bat/ federal T&E species of concern in AZ,NM/ nMex. (Chiapas) n. to sBC, neAZ, NV (except extreme se.), seSK swSD, e. to w,cCO, WY, MT & extreme wSD, wND & wNB/ Tx in AZ, CA, CO, OR, TX, WA)

*Myotis thysanodes* **Bibl.:** Bole, 1935; Boyce 1980; Chung-MacCoubrey 1996; Easterla 1966; J. Jones & Genoways 1967; Maslin 1938; B. Milligan 1993; Miner, Brown et al. 1996; Monday 1993; Musser & Durrant 1960; R. Orr 1956; Pape 1999; Studier 1968; D. Williams 1968

*Myotis thysanodes pahasapensis* Jones & Genoways, 1967 (Fringe-tailed myotis/ now primarily in caves in Black Hills of swSD, eWY and wNB)

*Myotis thysanodes thysanodes (M.t. Miller, 1897)* (fringed myotis/federal T&E species of concern in AZ,NM/ now in W to sBC, swMT,seWY(rare)/ Tx in AZ, CA, CO, NM, OR, TX, WA)

*Myotis velifer (Vespertilio velifer* J.A. Allen, 1890; *M.v. brevis* (southwestern cave bats)) (cave m.; Wisconsin in Cave Without a Name & Inner Space C.(14,000BP) (TX)/ now in SW to s,cAZ, nUT (accidental?), se, extreme wNM sw,cKS, w,swTX, w,cOK, s.to Honduras; accidental in WA/ Tx in CA, KS, NM, OR, TX, WA; nMex., NM T&E; KS T&E S2S3, G5 global rank; s. to Honduras/ Federal Species of Concern)

*Myotis velifer* **Bibl.:** D. Buecher 1996; D. Buecher, Sidner & Buecher 1990; Caire & Stevens 1990; Cockrum & Musgrove 1964; Cadena 1967; Constantine 1957; Earl 1971; Fitch et al. 1981; Hayward 1961; Reeve 1943; Raun 1960; Tinkle & Milestead; Tinkle & Patterson 1965; Cockrum & Musgrove 1964; Constantine 1957; Dunnigan & Fitch 1967; Gannon 1995; J. Harrison, Brown & Huang 1978; B.Hayward 1970; Kennedy & Engbretson 1974; Kleinschmidt, Koop & Braunitzer 1986; Kleinschmidt, Ruchnagle et al. 1987; Krutzsch, Crichton & Nagle 1981; Kunz 1971, 1973; Kunz & Robson 1990; Mann, Steidl & Dalton 1998; Monday 1993; I. Patterson 1961; Pitts & Scharninghausen 1986; Raun 1960; Reisen et al. 1976; Riedesel & Williams 1976; Schackelford & Caire 1993; Studier & Kunz 1995; Tinkle & Patterson 1965; Samanie 1996; Tinkle & Patterson 1965; T. Vaughan 1954; Veal 1983; Zanowiak et al. 1993; Zanowiak 1987

*Myotis velifer incautus* (J.A. Allen, 1896) (cave myotis; Mexican brown bat/Tx in sTX. seNM, nMex./federal species of concern)

*Myotis velifer magnamolaris* (Choate & Hall, 1967) (large myotis/ Inner Space C. (type locality - 14,000 BP),TX/ Tx in wOK, nwTX)

*Myotis velifer velifer (Vespertilio v. J. Allen, 1890; M. v. Brevis* Vaughan, 1954) Miller & Allen, 1928 (now in nMex., sAZ/ Tx in sAZ)

*Myotis volans (Vespertilio volans* H. Allen, 1864) (long-legged myotis; Hairy winged Myotis/ fossil in Little Box Elder C., eastern extralimital in Klein C. (>8,000BP, Kerr Co.,TX/ now in W n. to extreme sNWT & sAK, e. to wND and extreme wSD & wNB/federal T&E; species of concern in AZ,NM/ Tx in CA, CO, OR, MT, TX, WA; (sub)fossil in sNM).

*Myotis volans* **Bibl.:** R. Adams 1988; R. Barclay et al. 1994; Bogan 1978; Druecker 1972; Genoways 1967; Herder & Jackson 1999; Monday 1993; Ormsbee 1996-7; Ormsbee & McComb 1997; D. Parker 1996; Schowalter 1980; H. Smith 1979; Saunders 1987-8; J. Taylor 1998; E. West 1993

*Myotis volans interior* (G.S. Miller, 1914) (now in seWA, ID (except extreme n.) NM, AZ, wTX, UT, CO, WY, wSD, wND, NV, wNB, eOR)

*Myotis volans longicrus* (True, 1886) (now in Pacific NW from sAK, w,seBC s. to sSK, neMT,nID, WA (except seWA), along coast to cCA)

*Myotis yumanensis* (*Vespertilio y.* H. Allen, 1866) (Yuma m./federal T&E; species of concern in AZ,NM/ sBC, WA, n.cID, eWY, wNV, OR (except extreme se.), CA, c,s,neUT, seCO, AZ, NM, wTX & extreme wMT & wOK/ Tx in AZ, CA, CO, OR, TX, WA)

*Myotis yumanensis* **Bibl.:**R. Adams 1988; Easterla 1966; Betts 1997; Brigham et al. 1989; A. Harris 1974; R. Herd 1983; Licht & Leitner 1967; B. Milligan 1991; B. Milligan & Brigham 1993; R. Mumford 1957; A. Parkinson 1979; E. Pierson & Rainey 1997; Speakman & Fenton 1996

*Myotis yumanensis saturatus* Miller, 1897 (now in coastal areas west of Cascad Range in WA, swBC)

*Myotis yumanensis sociabilis* H.W. Grinnell, 1914 (now in sCA n. to e. of Cascades (eWA, scBC/ TTX in AB)

*Myotis yumanensis yumanensis* (H. Allen, 1864) (now in NM, AZ/ Tx in AZ, NM)

*Nycteris* = *Lasiuris*

*Nycticeius* Rafinesque, 1819 - Vespertilionidae bat, Vespertilioninae subfamily (1 extant species in US or Canada)

*Nycticeius humeralis* Rafinesque, 1818 (evening bat/ now in SE, MW,se, e, cTX, n.. to PA (except ne.), sMI, sWI, IA (except extreme n.) & eMD, w.to seNB, eKS, eOK/ rare in caves; Tx in IA?, TX/ TX State T&E Candidate, KY T & E; rare in PA)

*Nycticeius humeralis* **Bibl.:** W. Baker, S. Marshall & V. Baker 1968; J. Bain & Humphrey 1986; Berra & Policello 1979; Bowles, Howell et al. 1996; T. Carter, M. Menzel et al. 1998-9; B. Clark et al. 1993; Clem 1991, 1992; Duchamp 2000; Easterla 1965; Easterla & Watkins 1968, 1970; Gates 1941; D. Heath et al. 1983; E. Hooper 1939; Humphrey & Cope 1970; Kapone 1994; R. Lance 1999; R. Mumford 1953; Scherrer 1989; Schereer & Wilkinson 1991; A. Schwartz 1951; Spears et al. 1995; S. Steele 1989; L. Taylor & Lehman 1997; Ubelaker 1971; Veilleux 2000; Watkins 1972; Whitaker 1992; Whitaker & Clem 1992; Whitaker, Clem & Munsee 1992; Whitaker & Gummer 1993; Wilkinson 1988, 1989; Wilkinson & Chapman 1990; L. Watkins 1970; L. Watkins & Shump 1981

*Nyctinomops* Miller, 1902 (formerly incl. in *Tadarida*) Molossidae bats (1 extant species in US or Canada)

*Nyctinomops femorosaccus* (*Tadarida femorosacca* Merriam, 1889) Constantine 1958 (pocketed freetail bat/ now in swTX (except extreme sw) s,cAZ, extreme sNV, southern quarter of CA & extreme sw,seNM) **Bibl.:** Monday 1993

*Nyctinomops macrotis* (*Nyctinomus macratis* Gray, 1839; *N. macrotis* Miller, 1902) Hoffmeister & Durham, 1971 (big fee-tailed bat/ now in BC (rare, accidental?), s,cCO (rare), NM, AZ, sUT, seCA, w,sTX & extreme neNV, neNB, wOK/ Tx in OH? but rare in caves).

*Nyctinomops macrotis* **Bibl.:** P. August & R. Dugman 1973; Carothers & Ruffner 1971; Constantine 1961; I. Cowan 1945; DiSalvo, Hans & Mancke 1992; Dixon & Higginbotham 1998; Easterla 1968, 1970, 1973; Geoffroy 1824; Milner, Jones & Jones 1990; Monday 1993; Pitts, Schimmelpfenig & Choate 1996; Poche 1979; Pyle & Caire 1979; G. Raun 1961; D. Scarbrough 1989; J. Warner, Patton et al. 1974

*Pipistrellus* Kaup, 1829 (= *Arielulus*, *Falsistrellus*, *Hypsugo*, *Perimyotis*, *Scotozous*, *Vansonia*) Vespertilionidae bats, Vespertilioninae subfamily (2 extant species in US or Canada) **Bibl.** Anon. 1996; Hall & Dalquest 1950; Racey 1974

*Pipistrellus hesperus* (*Scotophilus h.* H. Allen, 1864) (= *P. apus*, *australis*, *maximus*, *merriami*, *oklahomae*, *potosinus*, *santarosae*) (Western pipistrelle; canyon bat/ extralimital in Klein C. (>8,000BP, Kerr Co., TX/ epigeal in extreme sw,wOK w. & sw to wTX, NM (except ne), AZ, swCO, CA (except ne. & extreme nw), eOR, m,scWA, seID, s,cUT, s,wNV, seMT, swWA, nMex. (Baja, Hidalgo & Guerrero)/ TTx in CA, CO, NV, TX)

*Pipistrellus hesperus* **Bibl.:** Anon. 1996; Bradley & O'Farrell 1967; T.Cox 1965; Cross 1965; Findley 1954; Findley & Traut 1970; J. Fries 1981; Hayword & Cross 1979; Cross 1965; W. Davis 1959; Hovorka 1996; Hoying & Kunz 1981-2; Koford & Koford 1948; Krutzsch 1975; Krutzsch & Crichton 1986; MacDonald, Matsui & Fenton 1994; McDonald, Matsui, Matsui & Fenton 1994; Monday 1993; F. Osgood 1936; Poole 1938; Rabinowitz 1981; Rabinowitz & Tuttle 1982; Stager 1943; Straney, O'Farrell & Smith 1976; Surprenant 1978; Speakman & Racey 1989; Whitaker 1998

*Pipistrellus hesperus hesperus* (*Scotophilus h.* H. Allen, 1864) (now in wCO, NM, nMex.)

*Pipistrellus hesperus maximus* (Hatfield, 1936) (now in CA, seCO, swOK, TX/ Tx in CA,TX (rare))

*Pipistrellus hesperus merriami* (Dobson) (Western Pipistrelle) (Tx in CA)

*Pipistrellus hesperus santarosae* (Hatfield, 1936) (now in sCA, swOK, TX/ Tx in CA,TX)

*Pipistrellus subflavus* (*Vespertilio s.* F. Cuvier, 1832; *P. clarus*, *erythrodactylus*, *floridanus*, *monticola*, *obscurus*, *veraecrucis*) (Eastern Pipistrelle/ NS, sME, sPQ, MN, s. to FL & Honduras, w. to sWI, IA, seNB, e,cKS, OK (except extreme w.), e,cTX; in late Irvingtonian in Trout C., WV/ Tx in AL, AR, FL, GA, IA, IN, KS, KY, MD, MO, New Brunswick, NC, NJ, NS, OH, OK, ON, PA, PQ, TN, TX, WI, WV, VA)



*Pipistrellus subflavus* **Bibl:** Ashley & Rabalais 1980; Jennings 1958a; D. Lee 1976; Barros 1981; W.F. Blair 1948; Menzel et al. 1996; Bleakney 1965; Brack & Mumford 1984; Cockrum 1952; Cope & Humphrey 1972; W. Davis 1959, 1965-6; D. Dawson 1975, 1980; Frum 1944; Goehring 1954; Greeley & Beer 1949; Guilday 1956; Hoying 1983; Hoying & Kunz 1998; H. Jackson 1919; C. Jones & Suttikus 1973; Jujita & Kunz 1984; Kurta & Teramino 1994; Laduc 1993; H. Lane 1946; Layne 1992; Lechner 1985; D. Lee & Marsh 1978; Menu 1984; Menzel, Monroe et al. 1997; Morales et al. 1991; Pitts & Galloway 1993; Ploskey & Sealander 1979; Pucinelli & D'Agrosa 1982; Sandle et al. 1999; Sparks et al. 2000; Todd 1903; Traut 1968; Veilleux 1999, 200; Vincent, Whitaker & Koemer 1998; H. Walley 1971; H. Walley & Jarvis 1972; B. Wheat 1975; Winchell 1988; Winchell & Kunz 1993; Yancey & Jones 1997; Zbiden 1985-6, 1994

*Pipistrellus subflavus clarus* Baker, 1954 (extreme swTX & a small portion of adjacent Mexico)  
*Pipistrellus subflavus floridanus* Davis, 1957 (sGA & FL (except nwFL))

*Pipistrellus subflavus* s. (*Vespertilio* s. F. Cuvier, 1832) (range of species except for range s. of US and range of *P.s. floridanus*/ Tx in OK)

*Plecotus* = *Corynorhinus*

*Plecotus phyllotis* = *Idionycteris p.*

*Pteropus* Erxleben, 1777 (flying foxes) Pteropodidae bats, Subfamily Pteropodinae (1 extant species in US)

*Pteropus mariannus m.* (Desmarest, 1822) (Mariana fruit bat, rare in caves/T&E)

*Pteropus tokudae* (Tate, 1934) (little Mariana fruit b., rare in caves/T&E)

*Tadarida* Rafinesque, 1814 (free-tailed bats) Molossidae bats (2 extant species in US or Canada)  
**Bibl.:** Legendre 1984

*Tadarida constantinei* Lawrence, 1960 (extinct Constantine's free-tailed b. in \*New C.,NM)

*Tadarida brasiliensis* (*Nyctinomus b.* I. Geoffroy St. Hilaire, 1824) (placed in distinct genus (*Rhizomops*) by Legendre (1984) but see Freeman 1981 and Owen et al. 1990) (= *T. antillularum, bahamensis, californicus, constanzae, cynocephala, fuliginosus, intermedia, mexicana, mohavensis, multispinosus, murinus, muscula, naso, nasutus, peruanus, rugosus, texana*) (now in nSouth America, n. to SC (except extreme ne.), sTN, n,cAR, KS (except extreme ne.), sNB, n,cCO, scUT, scNV, CA, extreme swOR & swVA/ Brazilian free-tailed or guano bat/ state T&E species in AZ, FL, NC, NM/ extralimital in Hamilton C.(800,000BP), WV; Tx in AZ, CA, CO, NM, OR, TX)

*Tadarida brasiliensis* **Bibl.:** R. Adams & Thibault 1999; Ahlstrand 1974; Altenbach 1998; Altenbach et al. 1979; Altenbach & Hermanson 1985, 1989; A. Harrison et al. 1980; Balcombe 1988-90; Balcombe & Fenton 1988; Balcombe & McCracken 1992; Beckett 1963; Benson 1947; H. Black 1976; Booth, 1985; Borell, 1939; Cadena 1967; Cagle 1950; D. Clark & Kroll 1977; Cockrum 1969; Constantine 1957; Cutler et al. 2000; Davis & Short 1962; Des Marais 1980; Durden, Best et al. 1992; Eads, Wiseman & Menzies 1957; Feldhammer 1985; J. Frank et al. 2000; French & Amanda 1998; Gelfand & McCracken 1986; Glass 1954-5; Gould 1961; Grady

(1991; Henshaw 1959-60; Herreid 1963; H. & Davis 1960; J. Horn et al. 2000; Humphrey 1971; B. Lawrence 19609; D. Lawrence 1968; Marsh 1981; McCracken 1984; M. et al 1994; McCracken, Gustin & McKame 1986; D. Martin 1970; McFarlane & Keeler 19?; McMurray & Russell 1982; O'Shea 1976; J. Pagels & Jones 1974; Ridlehuber & Silvy 1981; G. Rogers 1972; Studier 1965; Svoboda & Choate 1987; J. Taylor 1964; Thies 1993; Thies, Thies & McBee 1993; Thies & Thies 1997; Twente 1956; Villa & Cockrum 1962; Wahl 1986 &; E. Christensen 1947; Cockrum 1969; Commissaris 1961; Constantine 1957, 1961, 1967; Crelin & Newton 1969; C., Tierkel et al. 1968; R. Davis et al. 1962; R. Davis & Loomis 1971 Freeman & Wunder 1988; Edgerton, Spangle & Baker 1966; Foehring & Hermanson 1984; Frazee & Wilkins 1990; Gassel & McCracken 1988; Glass 1955, 1958, 1982; Grothe, Schweizer et al. 1994; Gustin 1985; Gustin & McCracken 1987; Hardisty, Caire & Lacy 1987; Henshaw 1960-1; Herreid 1957-9, 1961, 1963, 1967; Herreid & Davis 1960; Higginbotham, Ammerman & Dixon 1997-8; Humphrey 1971, 1975; Humphrey & Cope 1964; Keeley & Keeley 1999; Kilburn, Best et al. 1990; Kiser 1996; Koford & Krutzsch 1948; Krutsch & Sulkin 1958; Kunz 1989; Kunz & Robson 1990; Kunz, Widmaier et al. 1996; LaVal 1973; Lesser et al. 1957; Y. Lee 1996, 1998; D. Lee & Marsh 1978; Legendre 1994; Licht & Leitner 1967; Lollar 1995, 2000; C. Long 1961, 1976 ;C. Long & Kamensyk 1967; C. Long & Long 1965; D Marsh 1981; McCoy 1960;; McCracken 1984, 1988-7, 1993; McCracken & Gustin 1991; McCracken, Gustin & Vawter 1986; McCracken & Johansen 1982; McCracken, Lee et al. 1997; McCracken, McCracken & Vawter 1994; Meacham 1974; Milam & Best 1994; Mistry 1988; Mistry & McCracken 1982; Nicklaus & Keeley 1998; Nitsche 1994; R. Owen 1989; R. Owen et al.1990, 1989; Pagels 1975; A. Parkinson 1981; Perry 19675; Perry & Rogers 1964; Pitts & Scharninghausen 1986; K. Roberts, Yancey & Jones 1997; Robson, Kunz & Offedal 1988; Roemer 2000; A. Russell 1998, 2000; Sanchez-Brown et al. 1999; Schmidt & Thaller 1994; Sherwin & Gannon 1999; Short 1961; Short, Davis & Herreid 1960; Simmons, Lavender et al. 1978; D. Snyder 1993; Steece & Calisher 1989; Stihler Spears et al. 1995; Studier 1965, 1969; Studier & Kunz 1995; Studier, Beck & Lindeborg 1967; Svoboday 1983; T. Tanner & Baccus 1998; J. Taylor 1964; Tesh & Schneidau 1966-7; Thies & Gregory 1994; Thies & McBee 1994; Tifton 1986; Twente 1955-6; Vege 1999, 2000; Villa R. 1956; Wahl 1993; Walley 1971; H. Werner 1967; H.Werner n.d.; J. Warner, Patton et al. 1974; H. Werner; Westbrook, McCracken et al. 1998; Whitaker, Neefus & Kunz 1996; T. Williams, Ireland & Williams 1973

*Tadarida brasiliensis cynocephala* (Le Conte, 1831) (now in AL, FL, GA?, eTX)

*Tadarida brasiliensis mexicana* (*Molossus mexicanus* Saussure, 1860) Schwartz, 1955 (Mexican freetail bat; guano bat/ now in AZ, CO/ Tx in AZ)

*Tadarida femorosacca* = *Nyctinomus femorosaccus*

*Tadarida macrotis* = *Nyctinomops macrotis*

*Tadarida molossa* = *Molossus molossus*

## **BEARS**

Mammal of Order Carnivora, Suborder Caniformia, Family Ursidae, Subfamily Ursinae (*Arctodus*, *Tremarctos*, *Ursus*)

*Arctodus* Puckette, 1976 - mammal Order Carnivora, Suborder Caniformia, Family Ursidae, Subfamily Ursinae. **Bibl.:** Hawksley 1965

*Arctodus pristinus* Leidy, 1854 (= *A. haplodon* Cope, 1895) (extinct Pleist. Lesser or Eastern Short-faced Bear in Cumberland (MD, Irvingtonian) & Hamilton & Grapevine (WV) Grady 1985; Port Kennedy C. (PA) & Glass & Proctor C. (KY); / in latest Irvingtonian sink near Coleman, Sumter Co., FL & early Irvingtonian in Inglis sinkhole, Citrus Co., FL)

*Arctodus simus* (*Arcotherium simum* Cope, 1879; *A. californicum* Merriam, 1911; *A. yukonense* Lambe, 1911; *Dinarctotherium merriami* Barbour, 1916)) (extinct Giant Short-faced Bear in Round Spr. Cavern and Powder Mill Cr. C. (AR), U-Bar C. (NM), Labor-of-Love C. (NV), McKittrick C. (wTX); Natural Trap & Little Box Elder C. & Prospects Shelter (WY), Mammoth C. (KY, Wilson 1981) & Unthanks C. (VA)

**Bibl.:** Grady 1997; Larson 1996; Matheus 1997; R. Richards 1996

*Arctodus* undet. sp. (extinct in Pleist. Isleta Caves #1 & #2 & Burnet C. (seNM))

*Thalarctos maritimus* = *Ursus m.*

*Tremarctos* Gervais, 1855 - mammal Order Carnivora, Suborder Caniformia, Family Ursidae, Subfamily Ursinae. **Bibl.:** Kurten 1966.

*Tremarctos floridanus* (*Arctodus* f. Gidley, 1928) (extinct Florida cave or spectacled bear from FL caves & sinkholes (Devil's Den, Reddick), Grassy Cove Saltpeter C. (TN), & Inner Space C. (23,000BP), TX)

*Tremarctotherium* = *Arctodus*

*Ursus* Linnaeus, 1758 - Mammal of Order Carnivora, Suborder Caniformia, Family Ursidae, Subfamily Ursinae (3 extant species in US or Canada)

. **Fossil Bibl.:** K. Gordon 1986; C. Stock 1936; Wolverton & Lyman 1998

*Ursus americanus* Pallas, 1780 (*Euarctos vitabilis* Gidley, 1913) (NA/ TTx in AR, FL, CA, OH, OR)

*Ursus americanus amplidens* (*U. amplidens* Leidy, 1853) (MO/extinct) **Fossil Bibl.:** Tucker 1984

*Ursus arctos* Linnaeus, 1758 (AK, wCanada to nNM/Brown & Grizzly Bears as extralimital fossil in Moonshiner, Welsh (13,000BP, KY), cave near Craters of the Moon Natl. Monument, ID, & Jaguar C. (TN)), also in Prince of Wales (10-12,000 BP, 35,000 BP) **Fossil Bibl.:** Grady 1993; Heaton 1995; Heaton & Grady 1994, WV Grady 1985a

*Ursus maritimus* Phipps, 1774 (= *Thalarctos m.*) (extant in coastal nAK & nCanada/bones in lava cave in Pribilof Island, AK) **Fossil Bibl.:** Grady 1989c

*Ursus optimus* Schultz, 1938 (*U. amplidens* Leidy, 1853) (extant in most of NA/Black Bear /widespread in late Pleist./Tx or Ac in WV; Tx in PA, TN; past Tx in MO, OR)

## **BEAVERS**

(see also mountain beaver) Order Rodentia, Suborder Sciurognathi, Family Castoridae (incl. *Castor*, *Castoroides*, *Paradipoides*). **Bibl.:** McAlpine 1977; Richards 1985.

**Castor** Linnaeus, 1758 - mammal Order Rodentia, Suborder Sciurognathi, Family Castoridae (1 extant species in US or Canada)

**Castor canadensis** Kuhl, 1820 (NA except sAZ, sNV, wUT, most of sCA,FL/ beaver/ Tx or Ac in WV; TTx in AK, AL(1 cave), NB, MO, TX)

**Castoroides** Foster, 1838 - mammal Order Rodentia, Suborder Sciurognathi, Family Castoridae  
**Castoroides ohioensis** Foster, 1838 (extinct giant beaver as fossil in many Eastern caves, as in Baker Bluff (TN), Cutoff (KY) & Dutchess Quarry (NY) C.)

**Paradipoides** Rinker & Hibbard, 1952 - mammal Order Rodentia, Suborder Sciurognathi, Family Castoridae

**Paradipoides stovalli** Rinker & Hibbard, 1952 (Extinct Stovall's Beaver as fossil in Cumberland C.)

bighorn sheep - See Sheep

## **BISON**

Artiodactyl mammal, Family Bovidae, Subfamily Bovinae

**Bison** Hamilton-Smith, 1827 - Artiodactyl mammal, Family Bovidae, Subfamily Bovinae (1 extant species in US or Canada)

**Bison bison** (*Bos b.* Linnaeus, 1758; *B. californicus* Rhoads, 1897; *B. occidentalis* Lucas, 1898; *B. kansasensis* McClung, 1905; *B. pacificus* Hay, 1927; *B. figginsi*, *texasus* & *taylori* Hay & Cook, 1928; *B. oliverhayi* Figgins, 1933) ) (extralimital in Smith Cr. Canon C., NV & Bison Alcove, a rockshelter in Arches Natl. Park, UT; dung in Shrubox Alcove (Glen Canyon NRA), sUT / historically in most of NA, now in W pockets)

**Bison bison antiquus** Leidy, 1852 (= *B.a.* Hay & Cook) (extinct/ Burnet & Dark Canyon (NM); Owl Cave Two (NV); Cutler Hammock sinkhole (FL) & Halls & McKittrick C. (TX) & late Rancholabrean Reddick I Site fissure, (Marion Co.), FL) **Bibl.:** Butler, B. 1971; J. McDonald 1976, 1981; Toomey, Huebner & Boutton 1992

**Bison** undet. sp. (Howel's Ridge C. (NM); 8,000 BP Devils Den sink, Levy Co., FL; Sandblast C., Grand Canyon, nAZ)

## **BOBCATS**

**Lynx** Kerr, 1792 Mammal of Order Carnivora, Suborder Fissipedia, Infraorder Feloidea, Suborder Feliformia, Family Felidae, Subfamily Felinae

*Lynx rufus* (*Felis r.* Schreber, 1776; *F. calcaratus* Cope, 1899; *F. wiedii oaxacensis*) (NA except mEast, parts of MW/ bobcat/ TTx in AR, MO, OH, TX; Ttx in NV (preys on bats)),

## CAMEL

Mammal of Order Artiodactyla, family Camelidae (incl. llamas) (undet. fossil genus in Papago Spr. C., AZ)

*Camelops* Leidy, 1854 - mammal of Order Artiodactyla, family Camelidae. **Bibl.:** Dompierre 1995; O. Hay 1913; D. Webb 1961, 1963, 1965.

*Camelops* near *kansanus* Leidy 1854 (extinct/Burnet C., NM)

*Camelops huerfanensis dallasi* (*Auchenia h.* Cragin, 1892) (Moore Pit (Rancholabrean), TX)

*Camelops* undet. sp. or species (Stanton (AZ); Burnet, Conkling, Musko, Shelter, Dry & Isleta C.(NM) Gypsum & Smith (12,600 yrs.) C. (NV); Laubach C.(TX); Wolf River C. (TN); Horned Owl C.(WY); Vulture and Sandblast C., Grand Canyon, nAZ))

*Camelops hesternus* (*Auchenia h.* Leidy, 1873) (Yesterdays camel/ Ventana C. (11,300 yrs., AZ); Vulture C.(13,600-17,200BP),Grand Canyon, AZ; Schuiling & Kokoweef (cf) (CA); Jaguar & Wilson Butte (14,500-15,00) C. (ID); Dry C.? & Isleta C. No.1 (NM); McKittrick (wTX); Crystal Ball (>23,000BP) & Tabernacle C. (UT); Fishbone, Gypsum, Smith & Hidden C. & Owl Cave Two (NV); Horned Owl, Natural Trap & Little Box Elder (cf) C. & Prospects Shelter (cf) (WY) **Bibl.:** Dompierre 1992.

canid - See coyote, dog, fox, wolf

## CAPYBARA

*Nechoerus* Hay, 1926 – Hydrochaeridae capybara rodent, Subfamily Hydrochoerinae

*Nechoerus aesopi* Mones, 1991? (*Hydrochoerus holmesi* Simpson, 1928) (in Sabertooth Cave (*H.h.* type) (Sangomonian or possibly Wisconsinan, Coleman IIA & Inglis IA sinks (FL) & late Rancholabrean Reddick I Site fissure, (Marion Co.), FL/ Aesop's capybara) Mones 1991; Morgan & White 1995

*Nechoerus* undet. sp. (Pleist. (latest Blancan or earliest Irvingtonian) Haile filled-in FL sinkhole or cave)

## CARIBOU

Artiodactyla Cervidae, Subfamily Capreolinae - similar to deer but tundra-adapted & with antlers on both sexes.

*Rangifer* Hamilton-Smith, 1827 (caribou, reindeer) Mammal of Order Artiodactyla, Family Cervidae, Subfamily Capreolinae (1 extant species in US or Canada)

*Rangifer fricki* = *Navajoceros f.*

***Rangifer tarandus*** (Linnaeus, 1758) (extralimital in AL, NM?, NY, TN, PA, VA caves) **Bibl.:** Churcher, et al. 1989; Funk et al 1970 & Guilday, Hamilton & Parmalee 1975

## CATS

(see also cheetah, lynx, mountain lion, ocelot, panther)

Order Carnivora, Suborder Fissipedia, Infraorder Feloidea, Suborder Feliformia, Family Felidae, Subfamily Felinae (*Felis*, *Homotherium*, *Smilodon*)

**Bibl.:** Simpson 1941a; Werdelin 1985

***Felis*** Linnaeus, 1758 - Family Felidae, Subfamily Felinae

***Felis domesticus*** Linnaeus, 1758 (= *F. silvestris* Schreber, 1777; *F. catus*) (feral in most of NA/ domestic cat/ Ac in TX, WA)

***Homotherium*** Fabrini, 1890 - Family Felidae, Subfamily Felinae

***Homotherium serum*** Cope, 1893 (Pleist. scimitar cat in Shela George farm limestone crevice (TN) & at Friesenhahn C.(17-19,000 yrs), TX & late Rancholabrean Reddick I Site fissure, (Marion Co.), FL /) **Bibl.:**Clemmer 1989; Rawn-Schtzinger 1987

***Smilodon*** Lund, 1842 (sabertooth cat or tiger) Family Felidae, Subfamily Machairodontinae, Tribe Smilodontini. **Bibl.:**Akersten 1985; Berta 1985, 1987; Kurten 1990.

***Smilodon* cf. *fatalis*** (Leidy, 1869) (Crystal Ball C.(>25,000BP,UT)

***Smilodon fatalis*** (*Felis (Trucifelis) f.* Leidy, 1869; *Machaerodous floridanus* Leidy, 1889; *S. californicus* Bvovard, 1907; *Smilodontopsis troglodytes* Brown, 1908; *S. conardi* Brown, 1908; *S. nebraskensis* Matthew, 1918; *S. trinitiensis* Slaughter, 1960) (extinct Sabertooth tiger or cat in 8,000 BP Devils Den (FL); Hurricane River (Searcy Co, AR), Irvingtonian in Conrad Fissure (limestone fissures in AR Ozarks); Crystal Ball (NV), Hamilton (WV, Pendleton Co. - 800K) & Harrodsburg Crevice (IN) C./ state fossil of CA) **Bibl.:** Duckler 1997; Janczewski 1993

***Smilodon gracilis*** Cope, 1880 (Irvingtonian gracile sabertooth cat in Port Kennedy (PA) & Hamilton & Organ (WV. - 800K, 21.04K) C., Haile (sink in Alachua Co.), & Inglis (sink or fissure in Citrus Co.), FL)

***Smilodon* undet. sp.** (Pleistocene in Hamilton C.(WV), Port Kennedy (PA), Berome Moore (MO/ prob. tracks) & sink in Cannon Co.(TN)). **Bibl.:** Grady; 1981b

carnivore - Refers to species who eat live animal prey and/or to the mammal Order Carnivora (incl. bear, cheetah, coyote, dog, fishers, lions, martens, sabertooth tiger, weasels, wolf)

## CHEETAHS

Order Carnivora, Suborder Fissipedia, Infraorder Feloidea, Suborder Feliformia, Family Felidae, Subfamily Felinae (*Acinonyx*, *Miracinix*)

**Bibl.:** D. Adam 1979

*Acinonyx* Brookes, 1828 (= *Cynaelurus*, *Schaubia*) (transferred to *Miracinonyx* by Van Valkenburgh et al. 1990) Family Felidae, Subfamily Acinonychinae

*Miracinonyx inexpectatus* (*Crocota i.* Cope, 1895; *Uncia i.* Cope, 1899; *Felis longircus*; *F. cougar* Brown, 1908; *Smilodontopsis mooreheadi* Hay, 1922; *Felis studeri* Savage, 1960; *Acinonyx studeri* Adams, 1979) (Irvingtonian Type in Port Kennedy C., Montgomery Co., PA + Hamilton C. (V) & Conrad Fissure (limestone fissures in AR Ozarks); *M. cf. inexpectatus* early Irvingtonian in Inglis sinkhole, Citrus Co., FL)

*Miracinonyx studeri* (*Felis s.* Savage, 1960; *Uncia i.* Cope, 1899; *Acinonyx (M.) studeri*) (may = *A. (M.) inexpectatus*) (Pleistocene extinct Studer's cheetah in Crypt C. (NV); Natural Trap (WY Sangamonian), Conrad Fissure (limestone fissures in AR Ozarks); cf. in Cumberland C. (MD, Irvingtonian) tracks in flowstone in AR. sabertooth & (Hamilton (10- 100,000BP) C., WV) Van Valkenburgh et al. 1990

*Miracinonyx trumani* (*Felis t.* Orr, 1969; *F. longircus* Brown, 1908; *Smilodontopsis mooreheadi* Hay, 1920?; *Acinonyx (M.) t.*) (extinct American Cheetah/Crypt (NV, type), Muskox (Eddy Co., NM), Haystack (Gunnison Co., CO); Little Canyon Cr. C. (WY)  
**Bibl.:** Adams 1979; Martin, Gilbert & Adams 1977

*Felis inexpectata* = *Miracinonyx i.*

## CHIPMUNKS

Order Rodentia, Suborder Sciueroognathi, Infraorder Sciuromorpha, Family Sciuridae, Subfamily Sciurinae (*Eutamias*, *Tamias*). Small, active, diurnal, ground-dwelling squirrels, of Order Rodentia, with face stripes & erect tail when running.

*Eutamias* Trouessart, 1880 (= *Tamias* in part by some authors) (chipmunks) Family Sciuridae, Subfamily Sciurinae

*Eutamias cinericollis* (*Tamias c.* J.A. Allen, 1890) (grayneck or gray-collared chipmunk/ Pleist. extralimital in Fowlkes C., TX)

*Eutamias minimus* Bachman, 1839 (least chipmunk/ Pleist. extralimital in Clark's, Baker Bluff, & Back Creek C. (VA)/ now in extreme swTX nw.to cAZ)

*Eutamias townsendi* = *Spermophilus t.*

*Tamias* Illiger, 1811 (chipmunks) Sciuridae rodent, subfamily Sciurinae  
*Tamias cinericollis* = *Eutamias c.*

*Tamias dorsalis* Baird, 1855 (*Eutamias d.*) (extreme scID, swWY to eNV, wUT, AZ, eNM to nMex./ Cliff chipmunk/ Ttx in Lehman C., NV)

*Tamias striatus* (*Sciurus striatus* Linnaeus, 1758) (Irvingtonian eastern chipmunk in Cumberland C.; extralimital in RanchoLabrean Klein, Friesenhahn C., Schultze (TX), & C. Without A Name (cTX) & Wisconsinian Bat C., MO/Ac in IN; TTx in PA)

*Tamias striatus rufescens* Bole & Moulthrop, 1942 (Tx? in OH rock crevices)

## COENDU

Extinct rodent genus

*Coendu* Lesson, 1937 - mammal Order Rodentia, Suborder Hystricognathis, Family Erethizontidae

*Coendu cumberlandicus* White, 1968 (extinct, from Irvingtonian Appalachian C.(MD))

## COATI

carnivore, coati(mundi)

*Nasua* Storr, 1780 - Mammal of Order Carnivora, Suborder Caniformia, Infraorder Canoidea, Family Procyonidae, Subfamily Procyoninae

*Nasua nasua* (Linnaeus, 1766). (now in AZ/ Ac or TTx).

## COYOTES

*Canis* Linnaeus, 1758 - mammal of Order Carnivora, Suborder Caniformia, Infraorder Canoidea, Family Canidae, Subfamily Caninae (3 extant species in US or Canada) (*Canis*)

*Canis latrans* Say, 1823 (coyote/ Ttx in PA, TX, WV; Ac in MO; Tx or Ac in CA)

*Canis lepophagus* Johnston, 1938 (*C. arnensis* Del Campana, 1913?) (extinct Johnston's Coyote of Blancan age)

## DEER

Cervidae artiodactyl mammal, Subfamily Odocoileinae (*Blastocerus*, *Odocoileus*, *Navahoceros*, *Sangamona*)

deer scat - Between spherical & bullet shaped & about 3/4 of an inch long.

*Blastocerus* Gray, 1850 (marsh deer) Cervidae artiodactyl, Subfamily Odocoileinae

*Blastocerus extraneus* Simpson, 1928 (RanchoLabrean Florida Marsh Deer in late Sangamonian times in Sabertooth C., FL)

*Odocoileus* Rafinesque, 1832 (mule, white-tailed and black-tailed deer) Mammal of Order Artiodactyla, Family Cervidae, Subfamily Capreolinae (2 extant species in US or Canada)

*Odocoileus virginianus* (*Dama* v. Zimmermann, 1780; *O. cooki* & *sheridanus* Frick, 1937 ) (most of NA except Great Basin, CA/ white-tailed deer/ Ttx in nFL, wTx)



*Odocoileus* cf. *hemionus* (Rafinesque, 1817) (extinct (if new species, subspecies or variety) in Pleist. Dry C.(NM/ mule deer)

*Navahoceros* Kurten, 1975 - Cervidae artiodactyl, Subfamily Odocoileinae

*Navahoceros fricki* (*Rangifer* f. Schultz & Howard, 1935; *Cervus lascrucensis* Frick, 1937; *Odocoileus halli* Alvarez, 1969) (extinct Rancholabrean Mountain Deer in Little Box Elder, Burnet (type locality), New (=Slaughter) & Hermit's Cave (NM)), Cueba Quebrada (cf. *E.s.* at 12,280, 13,920 & 14,300 B.P. at Amistad NRA, TX))

*Sangamona* Hay, 1920 - Cervidae artiodactyl, Subfamily Odocoileinae

*Sangamona fugitiva* Hay, 1920 (*Cervus whitneyi* Allen, 1876) (extinct fugitive or stilt-legged deer in Baker Bluff & Brynjulfson (MO), Little Blue C. (or *Odocoileus* in AR), Peck & Baker Bluff (cf.) (TN), Frankstown (PA), Peccary (AR), Robinson (KY), Patton (WV) & Burnet? C.(NM),) **Bibl.:** Churcher 1984; Durten 1979

## DOG

*Canis* Linnaeus, 1758 - mammal Order Carnivora, Subfamily Caninae (3 extant species in US or Canada)

*Canis familiaris* Linnaeus, 1758. One of NA's oldest (10,370 BP) dogs in Jaguar C., ID; Tx in TX)

## ELEPHANTS

mammal Order Proboscidea

Elephantidae (*Cuvieronius*, *Mammut*, *Mammuthus*)

*Cuvieronius* Osborn, 1923- Elephantidae elephants

*Cuvieronius tropicus* (Cope, 1884) (Pleist. (latest Blancan or earliest Irvingtonian) Haile filled-in FL sinkhole or cave/ gomphothere/ elephant-like species)

*Elephas* Linnaeus, 1758 - Elephantidae elephants

*Elephas* undet. sp. extinct in Pleist. Isleta C.(seNM)

*Mammut* Blumenbach, 1799 (transferred back to *Elephas* by some authors) (mammoth and mastodons) Mammutidae mammoth. **Bibl.:** Grady 1987; W. Johnson & Kost 1988; Lucas & Morgan 1997; Shoshani 1991;.

*Mammut americanum* (*Elaphas a.* Kerr, 1792; *Mastodon giganteus* Cuvier, 1817; *Mammut progenium* Hay, 1914) (American mastodon) (Irvingtonian in Cumberland C., >200,000BP in Heinze C.,MO; Port Kennedy C. (PA), widespread in later times, as at Potter Cr. (CA); 8,000 BP Devils Den, Levy Co., FL; in Sabertooth Cave (Sangomonian or possibly Wisconsinan, FL) ; in Scott Hollow C. (WV), Fossil C. in Lava Beds Natl. Monument (neCA), early Irvingtonian in Inglis sinkhole, Citrus Co., FL), dung in GRCA caves; IL Bagg,1909; sink in TN (Cannon Co.), UT (Sanpete Co., 7,090 +/- 200 yrs BP) & McKittrick C. (TX)

**Bibl.:** Daeschler 1996; R.Laub 1996; Laub & Sues 1992; Laub & Fisher 1996; W. Miller 1987; B. Muller & Camp 1987; Sher & Fisher 1995; K. Stewart & Seymour 1996; S. Webb & Newsom 1991.

*Mammuthus* Brooks, 1828 (mammoth) - Genus of Elephantidae, state fossil of NB.

**Bibl.:** Dudley 1988; W. Johnson & Kost 1988; Saunders 1970; Shoshani 1991

*Mammuthus columbi* (*Elaphas c.* Falconer, 1857; *E. imperator* Leidy, 1858; *E. maibeni* Barbour, 1925; *Archidiskodon sonoriensis* Osborn, 1929) (Schulze C.(12,500BP), TX & McKittrick C. (wTX) & Hermit's C.(NM)/ state fossil of WA) **Bibl.:** Mead & Agenbroad 1992; M.&A.et al. 1986

*Mammuthus jeffersonii* (*Elaphas j.* Osborn, 1822; *E. roosevelti* Osborn, 1922; *E. washingtonii* O., 1923; *E. eellsii* Hay, 1926; *E. exilis* Stock & Furlong, 1928; *E. floridanus* Osborn, 1929; *Paralephas progressus* Osborn, 1924; *M. columbi j.*) (Pleist. in Friesenhahn C. (TX), Huntington Reservoir Sinkhole ( W.E. Miller 1987; Gillette & Madsen 1993) & Natural Trap C. (WY)

**Bibl.:** Haynes 1970; Mead, Agenbroad et al.1986

*Mammuthus primigenius* (*Elaphus p.* Blumenbach, 1799) (probably junior syn. of *M. columbi*)(Pleistocene extinct wholly mammoth in Endless (VA) & Potter Cr. C. (CA)) **Bibl.:** Barsi 1985; Grady et al. 1997; Kahlke et al. 1999

*Mammuthus* undet. sp. or species (Extinct Pleistocene in Papago Springs (AZ); Howell's Ridge (NM) & Natural Trap (WY) C., Welsh C. (13,000BP,Woodford Co.,KY) ), Bison Alcove, a rockshelter in Arches Natl. Park, UT, Grobot Grotto (28,290, 26,140 BP), Glen Canyon, NRA, sUT & in latest Irvingtonian sink near Coleman, Sumter Co., FL,; Pleist. dung at Bechan (11,670 & 12,900 years old), Shrubox Alcove in Glen Canyon NRA, & Cowboy C., UT; scapula in cave in Bering Land Bridge National Preserve, nAK)

## **ELK**

*Cervus* Linnaeus, 1758 (deer, wapiti) Artiodactyl ungulate mammal, family Cervidae, subfamily Cervinae (1 extant species in US or Canada)

*Cervus canadensis* (Erxleben, 1777). *C. cf. c. canadensis* Pleist.? fossil in Dyer Co.,TN (Marcher 1959; elevation extralimital in Crystal Ball C., NV/ elk or wapiti now in sSK,sMB, coastal PNW, se along Rockies to ncNM, also AR,swSD, swTX)

## **ERMINE**

Mammal Order Carnivora, Suborder Caniformia, Family Mustelidae, Subfamily Mustelinae (5 extant *Mustela* species in US or Canada)

*Mustela* Linnaeus 1758 (ermine, ferrets, minks, weasels) Mustelidae, Subfamily Mustelinae

*Mustela erminea* Linnaeus, 1758 (ermine/ approx 13,000 BP, extralimital in Cave-Without-A-Name, cTX)

## **FERRETS**

Mammal Order Carnivora, Suborder Caniformia, Family Mustelidae, Subfamily Mustelinae (5 extant *Mustela* species in US or Canada)

*Mustela* Linnaeus, 1758 (ermine, ferrets, minks, weasels) Mustelidae, Subfamily Mustelinae (5 extant *Mustela* species in US or Canada)

*Mustela nigripes* Audubon & Bachman, 1851 (Pleist. in January C.(AB), Snake Cr. Burial (White Pine Co., NV (15.1k -+700-9,460 -+160 yrs.), Moore Pit (Dallas & Denton Cos., TX (>37,000 yrs.) & Wisconsin in January (all outside present range), Orr (Beaverhead Co. (late Pleist), Jaguar (Lemhi Co. (10.37k -+ 350 yrs.), Little Box Elder (all MT) & Isleta (NM) C.; Irvingtonian in Cathedral C., NV(750-850 k) & early Holocene in Moonshiner C. (ID) / black-footed ferret/ Historically now in Great Plains & central Rocky Mountains, now restricted (all reintroduced except near Meetetse, WY) as a federally endangered species to a few sites in SD, WY)

## **FISHERS**

*Martes* Pinel, 1792 (fishers, martens) mammal Order Carnivora, Suborder Caniformia, Family Mustelidae, Subfamily Mustelinae (2 extant *Martes* species in US or Canada)

*Martes diluviana* (= *Mustela d.* Cope (1889); *M. parapennanti* Gidley & Gazin, 1933) extinct Irvingtonian Diluvial F. in Port Kennedy (PA), Cumberland C.(MD) & Conard Fissure (AR)

**FOXES** - Subfamily Borophaginae (borophagines) (once in Simocyoninae) (*Borophagus*, *Urocyon*, *Vulpes*)

*Borophagus* Cope, 1893 (= *Hyaenognathus* in part) Canidae mammal, Subfamily Borophaginae (borophagines) (once in Simocyoninae) (*Borophagus*, *Urocyon*, *Vulpes*)

*Borophagus diversidens* Cope, 1893 (*Felis hillianus* Cope, 1893; *Hyaenognathus pachyodon* Merriam, 1903; *H. (Porthocyon?) dubius* Merriam, 1903; *Porthocyon matthewi* Freudenberg, 1910) (early Irvingtonian extinct in Inglis sinkhole, Citrus Co.,FL/ bone eating dog)

*Urocyon* Baird, 1857 - mammal Order Carnivora, Suborder Caniformia, family Canidae Mustelinae (1 extant species in US or Canada)

*Urocyon cinereoargenteus* (Schreber, 1775) (extant in US except WA, eOR, neOK, NB, nRockies, wSD, ND/ gray fox/ TTx in OH, PA)

*Vulpes* Frisch, 1775 (kit and red foxes) - mammal Order Carnivora, Suborder Caniformia, family Canidae (2 extant species in US or Canada)

*Vulpes fulva* (Linnaeus, 1758) (may = Old World *Vulpes v.*) (NA except mAB to swTX, coastal CA, most of AZ/red fox/ extralimital in Isleta C.(NM) & Crystal Ball C.(>25,000BP,UT) & /Tx or Ac in IN; TTx in OK, PA)

*Vulpes macrotis* Merriam, 1888 (kit fox/ now in nMex, n. to wTx,NM, swWY, AZ, wUT, NV, wCA, seOR and swID/ north extralimital in Jaguar Cave, Lemhi Co., ID)

*Vulpes velox* (Say, 1823) (sSK, AB s. to nTX/swift fox/extralimital se to Schulze C.(TX), n. to Mid-WI January C., AB & Isleta C.(NM)

*Vulpes velox velox* (Say, 1823) (kit fox/ TTx in OK)

*Vulpes vulpes* (*Canis v.* Linnaeus, 1758; *V. palmaria* Hay, 1917) (may incl. *Vulpes fulva*)

**GLYPTODONS** - A turtle-like mammal fossils

***Glyptotherium*** Osborn, 1904 -Mammal of Order Edentata, Family Glyptodontidae

***Glyptotherium arizonae*** Gidley, 1926 (*Xenoglyptodon fredericensis* Meade, 1953) ( Pleist. Girdley's glyptodont/ early Irvingtonian in Inglis sinkhole, Citrus Co.,FL & Pleist. (latest Blancan or earliest Irvingtonian) Haile filled-in FL sinkhole or cave)

***Glyptotherium floridanus*** (*Boreostracon f.* Simpson, 1929; *Glyptodon petaliferus* Cope, 1888 (nomen nudum)) (both in Inner Space C. (23,000BP), TX)

Goat - See Mountain Goat

## **GOPHERS**

In mammal Order Rodentia, Suborder Sciuerognathi, Infraorder Sciuromorpha,  
Family Geomyidae (pocket gophers) (*Geomys*, *Pappogeomys*, *Thomomys*)

**Fossil Bibl.:** Fling 1994 .

*Cratogeomys castanops* = *Pappogeomys c.*

***Geomys*** Rafinesque, 1817 (eastern pocket gophers) - Order Rodentia, Suborder Sciuerognathi, Infraorder Myomorpha, Family Geomyidae (8 extant species in US or Canada)

***Geomys bursarius*** (Shaw, 1800) (Plains pocket gopher Irvingtonian extralimital in Welsch (KY), Cheek Bend (TN) & Autolite (40,000BP/MO) C. & cf. Harrodsburg Crevice (Monroe Co.,IN/now in MW from nSD s. to sTX, e. to nIL). **Bibl.:** L. Brown 1995

***Geomys propinetus*** K.T. Wilkins, 1984 (type locality in early Irvingtonian in Inglis sinkhole, Citrus Co.,FL/ extinct pocket gopher)

***Pappogeomys*** Merriam, 1895 - Order Rodentia, Suborder Sciuerognathi, Infraorder Myomorpha, Family Geomyidae (1 extant species in US or Canada)

***Pappogeomys castanops*** (= *Cratogeomys c.* Baird, 1852) (Yellow Faced or Mexican pocket gopher as Wisconsinan fossil in Williams (TX) & Burnet C. (NM)/ now in nMex. N. to wTX, eNM, seCO, swKansas)

*Plesiothomomys* – See *Thomomys bottae potomacensis*

***Thomomys*** Wied-Neuweid, 1839 - Order Rodentia, Suborder Sciurognathi, Infraorder Myomorpha, Family Geomyidae (9 extant species in US or Canada). **Bibl.:** Fling 1997

***Thomomys (Megascapheus) bottae (Oryctomys (Saccophorus) b.*** Eydoux & Gervais, 1836) (Rancholabrean Valley P. in Burnet, Dry & Isleta C. (NM) & Klein C. (TX); extralimital in late Sangamonian times in Sabertooth C., FL/ Valley or Botta's pocket gopher/ now in SW n. to swOR, e. to CO, s. to Sinaloa & Nuevo Leon Mex./ endogean in CA) **Bibl.:** Nelson 1951

*Thomomys bottae bursarius* = *Geomys b.*

*Thomomys bottae castanops* = *Pappogeomys c.*

***Thomomys bottae microdon*** Sinclair, 1905 (extinct Sinclair's Mazama G./Wisconsinan fossil in Potter Cr. & Samwel C., CA)

***Thomomys bottae orientalis (T. o.*** Simpson, 1928) (Eastern P. as fossil in late Sangamonian & in Sabertooth C. (Sangomonian or possibly Wisconsinan,L))

***Thomomys bottae potomacensis (Plesiothomomys p.*** Gidley & Gazin, 1933) (extinct Potomac P. in Irvingtonian in Cumberland (MD) & Wisconsinan in Hamilton (WV: also listed as *T.p.*) & Trout C. (WV: also listed as *T. (Plesiothomomys)* undet. sp.) in Appalachians)

*Thomomys bottae talpoides* = *T. talpoides*

*Thomomys bottae umbrinus* = *T. u.*

***Thomomys microdon*** Sinclair, 1905 (extinct Sinclair's Mazama gopher in Samwell Cave, CA)  
**Bibl.:** Sinclair 1904

***Thomomys talpoides (Cricetus t.*** Richardson, 1828) (Pleist. northern pocket gopher extralimital in Dry C. (NM) & Pintwater C. (32-9k BP in NV); Holocene in Lamar C., WY/ now in swCanada s. to nNV, nNM, nAZ, SD, ND). **Bibl.:** Hadly 1995; Hadly et al. 1998

***Thomomys umbrinus (Geomys u.*** Richardson, 1829) (extralimital pygmy pocket gopher in Schulze C.(12,500BP) (TX)/ now in nMex. n. to extreme sAZ, sNM)

**Fossil Bibl.:** Hadly 1990, 1997; Hadly et al. 1998

## **GROUND SLOTHS**

Fossil mammal in Class Edentata

Family Megatheriidae (*Glossotherium, Nothrotheriops, Paramylodon*)

Family Megalonychidae (*Megalonyx*)

***Glossotherium*** Owen, 1840 (= *Myiodon*) - Megatheriidae edentate mammal. **Bibl.:** Naples 1989

*Glossotherium harlani* = *Paramylodon harlani* McDonald, 1995

***Megalonyx*** Jefferson, 1799 - Megatheriidae ground sloths. **Bibl.:** Claypole 1897; W. Cooper 1836

***Megalonyx jeffersonii*** (*Megatherium j.* Desmarest, 1822; *Megalonyx laqueatus* Harlan, 1843; *M. dissimilis* Leidy, 1855; *M. leidy* Lindahl, 1893; *M. sierrensis* Sinclair, 1905; *M. californicus* Stock, 1913; *M. milleri* Lyon, 1938; *M. hogani* Stovball, 1940; *M. brachycephalus* Stovall & McAnulty, 1950) (Wisconsinan Jefferson's ground sloth in Haynes C. (WV – may be type locality), Potter Cr. C. (CA) Devil's Den (FL), Glass, Whiteas (Mammoth C., National Park) & Gillenwater (KY), Cave Acb-3 Unit E (Unit E – Sangamonian, 11.5-4k, average 11.8k yrs., Unit D – 172k +/-10k, both in AL), Sangamonian in AL), Big Bone & Peck (TN), & Haynes C. (WV) **Bibl.:** Grady 1993a, 1995; Harlan 1831; Leidy 1857; Mercer, 1897a

***Megalonyx leptostomus*** Cope, 1893 (early Irvingtonian in Inglis sinkhole, Citrus Co., FL & Pleist. (latest Blancan or earliest Irvingtonian) Haile filled-in FL sinkhole or cave/ narrow-mouthed ground sloth)

***Megalonyx*** undet. sp. (Hawver, Potter Cr. & Samwel C., CA) & late Rancholabrean Reddick I Site fissure, (Marion Co.), FL)

***Megalonyx wheatleyi*** Cope, 1871 (= *M. loxodon*, *M. sphenodon*, *M. tortulus* Cope, 1871; *M. scalper* Cope, 1899) (extinct Middle Pleistocene fossil/ type in Port Kennedy C. (PA) + Haile XVI filled-in FL sinkhole or cave & Scott Hollow C. (WV))

***Eremotherium*** Lund, 1842 – Megatheriidae ground sloth

***Eremotherium*** undet. sp. (Pleist. (latest Blancan or earliest Irvingtonian) Haile filled-in FL sinkhole or cave)

***Eremotherium mirabile*** (Leidy, 1855) (early Irvingtonian in Inglis sinkhole, Citrus Co., FL/ status unclear, may not be valid species)

***Megalonyx wheatleyi*** Cope, 1871 (*M. loxodon*, *sphenodon* & *tortulus* Cope, 1871; *M. scalper* Cope, 1899) (Irvingtonian Wheatley's ground sloth in Port Kennedy C., PA; cf *M.w.* in 8,000 BP Devils Den sink, Levy Co., FL & in Sabertooth Cave (Sangamonian or possibly Wisconsinan, FL))

***Nothrotheriops*** Hoffstetter, 1952 - Megatheriidae ground sloths

***Nothrotheriops shastensis*** (*Nothrotherium s.* Sinclair, 1905; *N. graciliceps* Stock, 1913; *N. texanum* Hay, 1916) (Shasta G. as fossil in Rampart (Akersten & McDonald 1991) & Coconino Cave (both Grand Canyon, AZ); Ventana C. (11,300 yrs. - AZ); Long, Hansen & M. 1974; Phillips & Van Devender 1974, 3 c. (TX, incl. Dust & McKittrick Cave), Cowboy & Gypsum Cave (NV: coprolites: 11,000, 20,000, 28,500 BP) Hofreiter et al. 2000 Poinar et al. 1998; Bechan (UT), Carlsbad C. (111,900 yrs.) NM; Lower Sloth (10,750-11,060 B.P.), Upper Sloth (11,760), Dust and Williams (all in Guadalupe Mts, wTX), & in Hawver, Potter Cr., Newberry (11,600 B.P.), Mitchell & Samwel C., (all 5 in CA); U-Bar C. (NM). **Bibl.:** Hofreiter et al. 2000; Naples 1987; Stock 1917

***Nothrotheriops*** undet sp. (extinct in Pleist. Wilson Butte (14,500-15,00) C. (ID); Shelter C., NM & Williams C. (11,140-12,100 yrs.), wTX)

*Paramylodon* – Mylodontidae giant sloth – treated as a subgenus of *Glossotherium* by Hoffstetter 1952

*Paramylodon harlani* (*Myiodon h.* Owen, 1840; *Paramylodon nebrascensis* Brown, 1903; *M. garmani* Allen, 1913; *Glossotherium chapadmalensis* Kraglievich, 1925 (also treated as separate species) McDonald, 1995 (Pleist. In Hawver C. (sCA) & Lange (in Sierras, cCA) C.; McKittrick C. (wTX) early Irvingtonian in Inglis sinkhole, Citrus Co., FL & late Rancholabrean Reddick I Site fissure, (Marion Co.), FL) / Harlan's ground sloth)

## HORSES

*Equus* Linnaeus, 1758 - mammal Order Perissodactyla, Family Equidae (1 extant species in US or Canada) **Bibl.:** Czaplewski 1991; Davenport & Ruddell 1995; Gibbes 1850; Gidley 1901; Skinner et al. 1992; Stirton 1942; Stock & Howard 1944; Winans 1985, 1989

*Equus alaskae* Winans, 1989 (*E. conversidens* Owen, 1869; *E. semiplicatus* Cope, 1893; *E.c.* retained by most authors) (extinct Mexican Horse or Mexican ass in Jaguar (ID), Dry, Burnet, Dark Canyon & Isleta Cave #1 (NM); Gypsum C. (NV); Williams (nw Culberson Co.,TX), Haystack? (Gunnison Co.,CO) & Crystal Ball? (UT) C.) **Bibl.:** Dalquist & Hughes 1965

*Equus* (*Amerhippus*) undet. sp. (Pleist. extinct in Natural Trap C., WY)

*Equus complicatus* Leidy, 1858 (extinct Complex-tooth Horse) (Pleist. in fissure at Mundy's Landing (KY)), cf. Harrodsburg Crevice (Monroe Co.,IN) & sink above Cove Hollow C. (now dam flooded) (TN) & Pleist. in Craig Quarry & Vess C.,TN)

*Equus conversidens* Owen, 1869 (junior syn. of *E. alaskae* according to some authors) (extinct Mexican Horse or Mexican ass in Papago Springs (AZ); Jaguar (ID), Dry, Burnet, Dark Canyon, Howell's Ridge (cf) & Isleta Cave #1 & #2 (NM); Gypsum C. (NV); Williams (nw Culberson Co.,TX), Haystack? (Gunnison Co.,CO);Crystal Ball? (UT); Natural Trap & Little Box Elder (cf) (WY) C.) **Bibl.:** Dalquist & Hughes 1965

*Equus excelsus* Leidy, 1858 (= *Onager hibbaridi* Mooser, 1959; *O. arellanoi* M.1959; *Asinus agascalentensis* M., 1959) (extinct/Burnet C., NM) **Bibl.:** E. Cope 1892

*Equus francisci* (Pleist. extinct at Cueba Quebrada (cf. *E.s.* at 12,280, 13,920 & 14,300 B.P. at Amistad NRA, TX))

*Equus lambei* Hay, 1917 (extinct, maybe be subspecies of *E. niobrarenensis*/ Moore Pit (Rancholabrean),TX & Bluefish C., Yukon Territory, Canada) **Bibl.:** A. Burke & Cinq-Mars 1998;

*Equus leidy* (Sabertooth Cave (Sangomonian or possibly Wisconsinan, FL) & ), in latest Irvingtonian sink near Coleman, Sumter Co., FL, in early Irvingtonian in Inglis sinkhole, Citrus Co., FL)

*Equus laurentius* Hay, 1913 (= *E. niobrarenensis* Hay, 1913; *E. hatcheri* Hay, 1915) (extinct/Pleist. in Dry, Burnet, Dark Canyon & Isleta Cave #1 & #2 (NM); Haystack (Gunnison Co., CO) C.) **Bibl.:** O. Hay 1927

*Equus midlandensis* = *E. scotti*

*Equus occidentalis* Leidy, 1865 (*E. bautistensis* Frick, 1921?) (Pleistocene extinct fossil in Ventana C. (11,300 yrs. - AZ); Hawver?, Samwel & Potter Cr. (CA); Dry (NM); Gypsum (NV) & McKittrick (TX)) C.)

*Equus pacificus* Leidy, 1869 nomen dubium (Savage, 1951 not nomen dubium; Lundelius, 1972) (extinct Pleistocene in Potter Cr. C. (CA))

*Equus quinni* Slaughter, 1962 (Moore Pit (Rancholabrean), TX)

*Equus* cf. *scotti* Gidley, 1900 (= *E. midlandensis* Quinn, 1957) (Crystal Ball C. (cf. *E. scotti*, 23,000BP, UT), Cueva Quebrada (cf. *E.s.* at 12,280, 13,920 & 14,300 B.P. at Amistad NRA, TX) & Moore Pit (Rancholabrean, TX)) **Bibl.:** C. Johnston 1937

*Equus* undescr. sp.1-4 (extinct Pleist. fossil in Natural Trap C. (WY))

*Equus* undet. or undescr. sp. (extinct Pleist. fossil in Dry C. (NM)) **Bibl.:** Harris & Porter 1980

*Equus (Hemionus)* undet. sp. (Pleist. extinct in Natural Trap C., WY)

*Equus* large extinct Pleist. undet. sp. or species (Crystal Ball (UT); Crypt, Fishbone, Gypsum, Schuiling C. & Owl C. Two (NV); Smith Cr. C. (CA) & dung from Oakleaf Alcove, Glen Canyon NRA, sUT)

*Equus* small extinct Pleist. undet. sp. or species (Crystal Ball C. (UT); Kokoweef, Schuiling & Smith Cr. C. (CA); Owl Cave Two (NV))

*Equus* undet. sp. or species (Papago Spr., Sandblast & Rampart C. (all nAZ); Schuiling (2sp., CA); Wilson Butte (14,500-15,00) C. (ID); Mineral Hill C. (NV); Isleta, Hermit, Shelter, Muskox, U-Bar & Conkling C. (NM); Smith C. (2 species, 12,600 yrs., NV) Snake Cr. Burial (15.1-+7ka BP); Jaguar C. (ID); Schulze C. (12,500BP) & Hall C. (TX); Earlys or Early\* Pit (VA - Late Pleist.); Horned Owl C. & Prospects Shelter (WY); Rampart C. (nUT), 8,000 BP Devils Den sink, Levy Co., FL / in latest Irvingtonian sink near Coleman, Sumter Co., FL & early Wisconsinan in Haile XIVA sink near Haile, Alachua Co., FL)

*Equus tau* Owen, 1869 (*E. littoalis* Hay, 1913; *E. francisci* Hay, 1915; *E. achates* Hay & Cook, 1930; *E. quinni* Slaughter et al., 1962) (extinct/Burnet C., NM)

*Parahippus* Leidy, 1858 - mammal Order Perissodactyla, Family Equidae

*Parahippus leonensis* Leidy, 1858 (early Miocene extinct fossil in Thomas farm sinkhole/cave, Gilchrist Co., FL)

jackrabbit - See Rabbit



## HUMANS

Mammal of Order Primates, Family Hominidae

bones - (Schuiling C. (CA); Anderson Pit (IN) (R. Richards 1987), Carrol C. (MO); Mammoth (KY), Lehman (UT), Jerry Long (Ralls Co.,MO), Warm Mineral Spring, FL (Grey 1985); Hourglass C. (8,000BP) (CO) Rhinehart 1993; Pinnacle Point & Ripply Ridge (C.(CA); Conkling & Howell's Ridge (NM); Spirit C. (9,400 BP) (NV) (Anon. 1996, 1997); Taylor's C. (TN). CA: W. Wallace 1951; Wendell 1990; TX: Setzler 1932-5; Shafer 1970-1  
TN Footprints - Centerville C.,TN - G. Wright et al. 1982  
paleo fecal - Mammoth C. (KY) (2700 to 2300 BP) Sobolik et al. 1996, Oakleaf Alcove, Glen Canyon NRA, sUT - see coprolites

## HYENAS

*Chasmaporthetes* Hay, 1921 (= *Euryboas*) - Hyenidae mammals (hyenas) **Bibl.:** Kurten & Werdelin 1988.

*Chasmaporthetes leptostomus* Hay, 1921 (extinct in early Irvingtonian in Inglis sinkhole, Citrus Co., FL)

*Chasmaporthetes ossifragus* Berta, 1981 (extinct in early Irvingtonian in Inglis sinkhole, Citrus Co., FL)

## LEMMINGS

Suborder Sciurognathis

Infraorder Myomorpha

Muridae (*Dicrostonyx*, *Lemmus*, *Mictomys*, *Synaptomys*) (see lemmings)

*Dicrostonyx* Gloger, 1841 - mammal Order Rodentia, Suborder Sciurognathi, Infraorder Myomorpha, Family Muridae, Subfamily Arvicolinae (7 extant species in US or Canada) **Bibl.:** Koenigswald & Martin 1984; Guilday 1963; G. & Doult 1961; Martin, Gilbert & Chomko 1979

*Dicrostonyx hudsonius* (*Mus h.* Pallas, 1778) (Hudson Bay collard lemming Pleist. extralimital south in New Paris (WV), Jaguar (ID) & Little Box Elder (WY) (11,000BP) C./ now in ne Canada e. of Hudson Bay). **Bibl.:** Gorbault 1981b; Grady & Garton 1981

*Dicrostonyx torquatus* (*Mus t.* Pallas, 1778) (collard lemming/ extralimital south in Jaguar (ID), Charlie Lake (BC: Driver 1996), New Trout C. (WV) & Bell & Little Box Elder Caves (WY: Zeimens & Walker 1974), all extralimital south)

*Lemmus* Link, 1795 (brown lemmings) - mammal Order Rodentia, Suborder Sciurognathi, Infraorder Myomorpha, Family Muridae, Subfamily Arvicolinae (1 extant species in US or Canada)

*Lemmus sibiricus* (*Mus l.s.* Kerr, 1792) (22-23,000 yrs. old extralimital in January C.,Alberta) **Bibl.:** Foley & Raue 1987

*Mictomys* True, 1894 (also treated as subgenus of *Synaptomys*)

*Mictomys meltoni* Paulson, 1961 (= *Synaptomys m.*) (or *M. kansasensis* Hibbard, 1952)  
(Irvingtonian extinct fossil in Cathedral C., NV/ Melton's bog lemming) Heaton 1999, 2000

*Synaptomys* Baird, 1858 - mammal Order Rodentia, Suborder Sciurognathi, Infraorder Myomorpha, Family Muridae, Subfamily Arvicolinae (2 extant species in US or Canada) **Bibl.:** Repenning & Grady 1988

*Synaptomys australis* Simpson, 1928 (extinct / Florida or southern bog lemming in Crankshaft Cave, Rancho Labrean Arredondo fissure fillings, Alachua Co., FL & Devil's Den, FL & in Sabertooth Cave (Sangomonian or possibly Wisconsinan, FL)

*Synaptomys (Myctomys) borealis (Arvicola b.* Richardson, 1828) (northern bog lemming Pleist. extralimital in Bat & Crankshaft C., (MO), Bootlegger Sink & New Paris (PA), Cheek Bend, Guy Wilson, Baker Bluff & Peck (TN), Natural Chimneys, Earlys or Early's Pit (VA - Late Pleist.) & Patton (WV) C./ now in AK, most of Canada)

*Synaptomys cooperi* Baird, 1858 (southern bog lemming south extralimital in Cumberland (MD) & Cheek Bend, Baker Bluff & Peck (TN) C. & TX (Friesenhahn & Klein C. (8- 9,000BP), Bluff (7,200BP), Hall, & Schulze (12,500BP) & C.-Without-A-Name (13,000BP)) & Trout (WV) C.) / now in seCanada s. to NE, NB, nAR, along Appalachians)

*Synaptomys* undet. sp. (Late Pleist. extralimital in Fyllan Cave, TX) **Bibl.:** Repenning 1992

## LLAMAS

Order Artiodactyla mammal

Camelidae (*Hemiauchenia*, *Palaeolama*)

*Hemiauchenia* Hibbard & Dalquest, 1962? - Camelidae llamas. **Bibl.:** Dompierre 1995

*Hemiauchenia macrocephala (Holmeniscus m.* Cope, 1893; *Camelus americanus* Wortman, 1898; *Tanupolama stevensi* Merriam & Stock, 1928; *T. hollomani* Hay & Cook, 1930) (extinct Large-headed Llama / Pleist. Smith; Cr.? & Schuiling? C. (CA); Isleta & Dry C. (NM), Lecanto 2A cave or fissure, Coleman IIA, Inglis & Haile XVA sinks (FL) & late Rancho Labrean Reddick I Site fissure, (FL); McKittrick C. (TX); (Little Box Elder C. (WY))

*Hemiauchenia* cf. *macrocephala* (Cope, 1893) (Crystal Ball C. (.25,000BP), UT/ shortlimbed llama) **Bibl.:** Dompierre 1992.

*Hemiauchenia* undet. sp. (Schuiling C. (CA); Wilson Butte (14,500-15,00) C. (ID); Gypsum, Smith (12,600 yrs.) & Mineral Spring C. (NV); Conkling (NM); Little Box Elder? (WY) C.)

*Palaeolama* Hoffstetter, 1952 - Camelidae llamas. **Bibl.:** Dompierre 1995

*Palaeolama mirifica (Tanuplama m.* Simpson, 1929) (shortlimbed or wonderful llama, extinct/ Rancho Labrean fossil in Moore Pit (TX), in latest Irvingtonian sink near Coleman, FL, & Lecanto 2A cave or fissure (FL)) late Rancho Labrean Reddick I Site fissure, (FL)

*Palaeolama* undet. sp. (FL C. State Park, FL)

*Tanuplama mirifica* = *Palaeolama m.*

LYNX - See **CAT**

*Lynx rufus* = *Felis r.*

Mammoth - See Elephant

## **MARMOTS**

Mammal Order Rodentia, Suborder Sciurognathi, Infraorder Sciuromorpha, Family Sciuridae, Subfamily Sciurinae (*Marmota*) (6 extant species in US or Canada)

***Marmota*** Blumenbach, 1779 (marmots) Family Sciuridae, Subfamily Sciurinae. **Fossil Bibl.:** Goodwin & Reynolds 1989; Lange 1956; Nagorsen, Keddie & Luszcz 1996; Nagorsen 1989.

***Marmota flaviventris*** (*Arctomys flaviventer* Audubon & Bchman, 1841) (rockchuck; yellow-bellied marmot extralimital in Rampart & Papago Sprs. (246 -+19ka to 26.7 -+.7ka) (AZ), Kokoweef (CA), Isleta, Dark, Shelter & Dry (NM) & Fowlkes & Lower Sloth (TX) C.; Elevation extralimital in Haystack (CO), Devils Peak (sNV) & Mormon Mt. & Crystal Ball C.(NV) C./ now in interior W (esp. mts.) e. to wSD) **Fossil Bibl.:** Goodwin 1989a; Goodwin & Reynolds 1989; Karnes 1995; Nagorsen et al. 1996; Saysette & Walker 1992.

***Marmota monax*** Linnaeus, 1758 (woodchuck or groundhog) ( Pleist. extralimital in Trout (WV), Cumberland (MD) C. & Mohave Desert caves; Tx or Ac in nMS, PA, VA; Tx in IN, OH/ sCanada s. to E to n.AL)

## **MARTENS**

Mammal Order Carnivora, Suborder Caniformia

***Martes*** Pinel, 1792 (fishers, martens) Family Mustelidae, Subfamily Mustelinae (2 extant *Martes* species in US or Canada)

***Martes americana***(*Mustela a.* Turton, 1806) (= *M.a.a.*) ( Pleist. Pine Marten extralimital in eastern caves, Snake Cr. Burial C.(NV), Crystal Ball C.(>25,000BP,UT), Baker Bluff (TN) & Bluff & Clark's C. in the West)/ presently in Canada, s.to nCA, nNM, nNE)

***Martes pennanti*** (*Mustela p.* Erxleben, 1777) (Fisher, extralimital in Appalachians, Crankshaft & Peccary (AR), Bat (MO), Baker Bluff (TN), Bobcat (VA, footprints) Gourbault 1981b; Grady 1991d), in Ladds (GA) C. & FL (Barkalow, 1961)/ presently in Canada, s.to nCA, nID,wMT, nNE). **Bibl.:** Reynolds 1987a

***Martes nobilis*** Hall, 1926 (= *M. americana* Turton, 1806 according to some authors) Youngman & Schueler, 1991 (extinct Noble Marten from late Pleist. in Potter Cr. & Samwel C. (CA), Jaguar & Wilson Butte (15,000-14,500) C. (ID); Smith Creek , Snake Cr. (9460-15,000 BP), Burial & Bronco Charlie (NV), Crystal Ball (UT); Old Crow River; Moonshiner (MT); Hidden (NM) Bell, Little Canyon Cr., Chimney Rock, Natural Trap & Little Box Elder C. (WY))

**MICE** (grasshopper, harvest, jumping, pocket, & pygmy)

Mammal Order Rodentia

Suborder Sciurognathi

Infraorder Myomorpha

Family Muridae (Old World **rats** & mice) (see also rats and woodrats) (*Allophaiomys*)

Subfamily Arvicolinae (*Microtus*)

Subfamily Murinae (*Mus*)

Subfamily Sigmodontinae (*Baiomys*, *Onychomys*, *Peromyscus*, *Reithrodontomys*)

Family Heteromyidae (heteromyid rodents)

Subfamily Perognathinae (*Perognathus*)

Family Dipodidae (brich & jumping mice & jeroboas)

Subfamiily Zapodinae (*Napaeozapus*, *Zapus*)

*Allophaiomys* Kormos, 1933 – Muridae rodents

*Allophaiomys pliocaenicus* = *Microtus p.*

*Allophaiomys* undet. sp. (extinct? In Irvingtonian in Cathedral C., NV)

*Baiomys* True, 1894 (pygmy mice) Family Muridae, Subfamily Sigmodontinae (1 extant species in US or Canada)

*Baiomys taylori* (*Hesperomys t.* Thomas, 1887) ((Northern) Pygmy Mouse as fossil in Schulze C. (12,500BP) & Cueva Quebrada/ now in nMex. n. to eTX, seAZ)

*Microtus* Schrank, 1798 - Family Muridae voles, Subfamily Arvicolinae (16 extant species in US or Canada) **Bibl.:** R. Martin 1987, 1995; Meulen 1978; Zakrzewski 1985

*Microtus aratai* (*Pitymys a.* R.A. Martin, 1974) (extinct Llano vole/ in latest Irvingtonian sink near Coleman, Sumter Co., FL/ considered by some authors as *P. cf. mcknowni* )

*Microtus cumberlandensis* Van der Meullen, 1978 (Extinct Cumberland Pine V., Irvingtonian in Cumberland C. (type))

*Microtus chrotorrhinus* (*Arvicola c.* Miller, 1894) ( Pleist. Red, Yellownose or Rock V. in Clark's & Eagle C. & Irvingtonian in Trout C. (WV))/ now in neCanada s. along mts. To nwSC)  
**Bibl.:** Guilday 1982

*Microtus guildayi* Van der Meullen, 1978 (*Arvicola didelta*, *involuta*, *sigmodus*, *speothen* & *tetradelta* Cope, 1871; *M. involutus* Cope, 1871) (Extinct, Irvingtonian type locality in Cumberland C.; Port Kennedy C.)

*Microtus hibbardi* (*Pitymys h.* Holman, 1959) (extinct early Rancholabrean Hibbard's pine vole in Hamilton C. (WV))

*Microtus llanensis* Hibbard, 1944 (extinct Llano vole/ in Coleman Fissure (AR) & latest Irvingtonian sink near Coleman, Sumter Co., FL)

*Microtus longicaudus* (*Arvicola l.* Merriam, 1888; *M. mordax*) (Long-tailed V. Pleist. extralimital in Chimney Rock, Little Box Elder (WY) & Moonshiner C. (ID); Dry & Burnet? C., NM; elevation extralimital in Crystal Ball C., NV/ now in AK s. to cNM, cCA/ Irregular Tx in NWT; Ttx in WV))

*Microtus mexicanus* (*Arvicola m.* Saussure, 1861) (Pleist. north extralimital in Dry, Howells Ridge, Shelter, Conkling & Anthony (seNM) & Papago Springs (AZ) C./ now in nMex. n. to e,nAZ, eNM, seUT, swCO)

*Microtus mordax* = *M. longicaudus*

*Microtus montanus* (*Arvicola m.* Peale, 1848) (Pleist. extralimital in Dry, Howells Ridge, Shelter, Conkling & Anthony C., seNM)

*Microtus ochrogaster* (*Hypudaeus o.* Wagner, 1842) (Pleist. extralimital in Dry, Howells Ridge, Dark Canyon, Shelter, Conkling & Anthony C., seNM c./now in nMex. n. to swCO, seUT, MW n. to cAB, e. to OH, s. to OK/ Tx in IN; preys on bats))

*Microtus paroperarius* Hibbard, 1944 (*Neodon paroperarius*) (extinct Hibbard's Tundra Vole in Cumberland C. (MD), Trout & Hamilton C. (both WV), latest Irvingtonian sink near Coleman, Sumter Co., FL, Irvingtonian in Cathedral Cave (NV) & 750,000 BP in Porcupine C., CO)

*Microtus pennsylvanicus* (*Mus p.* Ord, 1815; *Neotoma p.*) (meadow vole/ widespread Irvingtonian & Wisconsinan in Devil's Den, FL; extralimital in Beartown (TN), C. Without a Name, Hall & Klein C. (TX), Peccary C. (4,300BP, AR), & Bat C. (MO (10-16,000BP), Dry C. (seNM), & Crystal Ball C. (>25,000BP, UT) & filled sinkholes in Alachua Co., FL/ now in N s. to GA, NM/ Ac in OH) **Fossil Bibl.:** Arata 1961; Barnosky 1988, 1993; Bolt & Grande 1997; C. Gordon 1997; Guilday 1982; Hibbard 1956; Martin & Prince 1990; Holman, Bell, & Lamb 1990

*Microtus pinetorum* (*Pitymys p.* Le Conte, 1830) (Pine V. widespread fossil in East; sw extralimital in Rattlesnake C., TX/ now in E. s. to nFL, w. to WI, eTX/ TTx? in AR, OH, TX). **Bibl.:** Meulen 1978; Jans 1993

*Microtus* (*Allophaiomys*) *pliocaenicus* or *M. p.* (= *Allophaiomys p.* Kormos 1933) (Extinct Kormo's Steppe Vole in Fyllan C. (TX) & Irvingtonian in Porcupine C. (750,000 BP in CO) & Hamilton C. (WV). **Fossil Bibl.:** Keesing 1992; Zakrzewski 1975

*Microtus speothen* = *M. guildayi*

*Microtus xanthognathus* (*Arvicola .x.* Leach, 1815) (Pleist. Yellow-cheeked Vole widespread, extralimital in East, as in Cheek Bend & Baker Bluff C. (TN) & Lloyds Rock Hole, PA/ now in cAK to cAB) **Bibl.:** Guilday 1982

*Mimomys* Forsyth Major, 1902 (voles) (also treated as subgenus of *Ophiomys* Reppening, 1987?)

*Mimomys (Cromeromys) virginianus* C. A. Repenning & F. Grady, 1988 (possibly *Cromeromys*) (Irvingtonian extinct fossil in Cathedral C., NV) Owen et al. 2000

*Mimomys (Cromeromys) cf. virginianus* Repenning and Grady, 1988 (extinct fossil in WV & CO (cf. *M. cf. v.*))

*Mus* Linnaeus, 1766 (house mice) Family Muridae, Subfamily Murinae (1 extant species in US & Canada)

*Mus musculus* Linnaeus, 1758 (House Mouse/ now in NA/ Ttx or Ac in AL, PA)

*Napaeozapus* Preble, 1899 (woodland jumping mice) Family Dipodidae (=Zapodidae) Subfamily Zapodinae (jumping mice) (1 extant species in US or Canada)

*Napaeozapus insignis (Zapus i.* Miller, 1891) (Woodland jumping mouse as fossil in Robinson & Clark's C./ now in seCanada, NE, s. along Appalachians/ TTx or Ac in PA; Ac in OH)

*Perognathus* Wied-Neuweid, 1839 (pocket & silky pocket mice) Family Heteromyidae, Subfamily Perognathinae (10 extant species in US or Canada) **Bibl.:** Osgood 1900

*Perognathus flavescens* Merriam, 1889 (= *P. apache* & *melanotus*) (Apache or plains pocket mouse as fossil in Papago Springs C. in AZ/ now in MW, swWI to nTX),

*Perognathus flavus* Baird, 1855 (= *P. merriani* J.A. Allen, 1892) (Silky pocket mouse/ Pleist. in Isleta C./ Tx in TX)

*Perognathus inornatus* Merriam, 1889 (San Joaquin pocket mouse/ Pleist. extralimital in McKittrick C. (NM)/ now in cCA)

*Perognathus intermedius* Merriam, 1889 (rock pocket mouse in Isleta C./now in swTX n. to nAZ, cNM/ TTx in TX)

*Perognathus gilvus* Osgood = *P. flavus*

*Perognathus parvus (Cricetodipus p.* Peale, 1848) ( Pleist. Great Basin pocket mouse in Moonshiner C. (ID) / now in Great Basin n. to seBC)

*Perognathus* undecr. sp. (Pleist. in Dry C., seNM)

*Peromyscus* Gloger, 1841 (deer & white-footed mice) Family Muridae, Subfamily Sigmodontinae (17 extant species in US or Canada)

*Peromyscus attwateri* J.A. Allen, 1895 (Texas mouse/ Ttx in AR)

*Peromyscus boylei (Hesperomys b.* Baird, 1855) (fossil brush mouse in Klein & Schulze C.(12,500BP) & Friesenhahn C.,all TX/ now in SW to nwAR, nCA, UT / Tx in CA (Tulare Co.), NM, TX)

*Peromyscus crinitus* (*H.c.* Merriam, 1891) (canyon mouse/ Pleist. in Dry C. (NM, extralimital/ now in Great Basin n.to cOR/ TTx in CA)

*Peromyscus cumberlandensis* Guilday & Handley, 1967 (extinct Pleist. Cumberland mouse in Cumberland C.(MD) & Trout & Hamilton C. (both WV))

*Peromyscus difficilis* (*Vesperimus d.* J.A. Allen, 1891) (Wisconsinan Rock Mouse extralimital in Dry C.(eNM) & Fowlkes C., TX)/ now in nMex., n.through NM to eAZ, ncCO)

*Peromyscus eremicus* (*Hesperomys e.* Baird, 1858) (cactus mouse/ TX/TTx?/fossil in Friesenhahn C.,TX/ Tx in TX/now in nMex.,swTX nw.to nNV)

*Peromyscus gossypinus* (*H. g.* LeConte, 1853) (cotton mouse extralimital in Friesenhahn C.,TX/ now in SE except sAppalachians)

*Peromyscus leucopus* (*Musculus l.* Rafinesque, 1818) (white-footed mouse/ TTx in IN, KY, MO, MS, OH, PA; Tp in NM/ fossil in Moonshiner C. in ID, extralimital) Viele 1989/ now in E to seAZ, eMT) **Bibl.:** Viele & Studier 1990

*Peromyscus maniculatus* (*Hesperomys m.* Wagner, 1845) (deer mouse /US, Canada except SE/ Tx in CA (Tulare Co.), MO, NV, OR, PA, TX, WA) **Bibl.:** Senger & Crawford 1984

*Peromyscus pectoralis* Osgood, 1904 (white-ankled or encinal mouse /TX/TTx?/fossil in Klei & Schulze (12,500BP) (TX) & Dry C. (NM)/ TTx in KY, OR, TX). **Bibl.:** Cordes 1981,

*Peromyscus* undet. sp. (Tx in BC, KY, & ON (feeds on bats) **Bibl.:** Martin 1968; Tarnsitt 1957; R. Martin 1967

*Proheteromys* A.E. Wood, 1932 – Heteromyidae pocket mice

*Proheteromys floridanus* A.E. Wood, 1932 (early Miocene extinct fossil in Thomas farm sinkhole/cave, Gilchrist Co., FL)

*Proheteromys magnus* A.E. Wood, 1932 (early Miocene extinct fossil in Thomas farm sinkhole/cave, Gilchrist Co., FL)

*Onychomys* Baird, 1858 - mammal Order Rodentia, Suborder Sciurognathi, Infraorder Myomorpha, Family Muridae, Subfamily Sigmodontinae (3 extant species in US or Canada)

*Onychomys leucogaster* (*Hypudaeus l.* Wied-Neuwied, 1841) (Northern M. as fossil in Crankshaft C. (extralimital east)/ now in interior W., from cSK to sTX) **Bibl.:** Riddle & Choate 1986

*Onychomys torridus* (Coues, 1874) (upper elevation extralimital in Pleistocene Lower Sloth (wTX) & Musko (sNM) C. / southern grasshopper mouse/ now in sCA, cNV, swUT s. to AZ (except ne), c,swNM, wTX to Mex.))

*Pitymys pinetorum* = *Microtus p.*

*Perodipus montanus richardsoni* = *Microtus r.*

***Reithrodontomys*** Giglioli, 1874 (harvest mice) Family Muridae, Subfamily Sigmodontinae (5 extant species in US or Canada)

***Reithrodontomys montanus*** (*Reithrodon m.* Baird, 1855) (plains harvest mouse / Pleist. in Klein & Schulze C.(12,500BP) & Longhorn C. in TX/ now in nMex. n. to eWY,swSD)

***Reithrodontomys fulvescens*** J.A. Allen, 1894 (fulvous harvest mouse/ Holocene extralimital in Fowlkes C.,wTX/ now in nMex. nw.to sAZ, se.to swMO)

***Reithrodontomys humulis*** (*Mus h.* Audubon & Bachman, 1841) (Eastern harvest mouse/ Illinoian fossil in Costeau Pit/now in nMex. n.to AR, seAZ)

***Zapus*** Coues, 1876 (jumping mice) Dipodidae, Subfamily Zapodinae (3 extant species in US or Canada)

***Zapus hudsonius*** (*Dipus h.* Zimmermann, 1780; *Z. adamsi* Hibbard, 1955) (meadow jumping mouse as fossil in Cumberland C.,MD/ now in AK s. to sBC, MW, NE)

***Zapus princeps*** J.A. Allen, 1893 (western jumping mouse as fossil only from Schulze C.(12,500BP/ now seAK s. to cCA, cNM, neSD)

***Zapus sandersi*** Hibbard, 1956 (extinct Sander's jumping mouse in Pleist. Port Kennedy C., PA) (13,000BP), cTX).

## **MINK**

Mammal Order Carnivora, Suborder Caniformia, Family Mustelidae, Subfamily Mustelinae (*Mustela*, *Trigonictis*)

***Mustela*** Linnaeus, 1758 (ermine, ferrets, minks, weasels) Family Mustelidae, Subfamily Mustelinae (5 extant *Mustela* species in US or Canada)

***Mustela vison*** Schreber, 1777 (Irvingtonian in Cudahy & Cumberland C. & Conrad Fissure (AR)); extralimital in Snake Cr. Burial, Crystal Ball, & Bronco Charlie (GB)/mink/ [presently in NA except SW)

***Trigonictis*** Hibbard, 1941- Mustelidae mammal, Subfamily Grisoninae

***Trigonictis macrodon*** Hibbard, 1941 (early Irvingtonian extinct in Inglis sinkhole, Citrus Co., FL)

## **MOLES** (see also shrews)

Insectivore mammal of Family Talpidae (moles, desmans & shrew-moles)

Subfamily Talpinae (*Parascalops*, *Scalopus*, *Scapanus*)

***Parascalops*** True, 1894 (hairy-tailed moles) Talpidae, Subfamily Talpinae (1 extant species in US and Canada)



***Parascalops breweri*** (Bachman, 1842) (hairy-tailed mole/ extralimital in MO (Crankshaft C., Irvingtonian), IN caves & TN (cf. *breweri*, Pleist. in Craig Quarry/ now in sME, sON, s. to MD & coastal plain in NC, VA, along Appalachians s. to wTN, wNC, w. to eOH, eKY)

***Scalopus*** E. Geoffroy St.-Hilaire, 1803 - Talidae, Subfamily Talpinae (1 extant species in US and Canada)

***Scalopus aquaticus*** (Linnaeus, 1758) (eastern or common mole/ w. extralimital in latest Pleist. in Hall C., TX/ now in most of US from sMN, extreme seWY, KS and cTX east to Atlantic & Gulf coast (except most of New England, Appalachians & sFL) **Bibl.:** R. Baker 1951

***Scapanus*** Pomel, 1848 - Talpidae, Subfamily Talpinae (3 extant species in US or Canada) . **Bibl.:** J. Hutchison 1966

***Scapanus latimanus*** (Bachman, 1842) (extinct broad-footed mole as Pleist. fossil in Potter Cr. & Hawver Caves, CA. Blancan/ TTx in CA) **Bibl.:** J. Hutchison 1987

## MOOSE

Cervidae artiodactyl mammal, Subfamily Odocoileinae (*Cervalces*)

***Cervalces*** Scott, 1885 (moose) Cervidae ungulate mammal (1 extant species in US & Canada)  
***Cervalces scotti*** (Lydekker, 1898) (extinct stag-moose/ NE, MW/ Frankstown C. (PA).

## MOUNTAIN BEAVER

***Aplodontia*** Richardson, 1829 mammal Order Rodentia, Suborder Sciurognathi, Family Aplodontiidae (1 extant species in US & Canada) (*Aplodontia*)

***Aplodontia rufa*** (*Anisonyx r.* Rafinesque, 1817) (Wisconsinan in Samwel, Potter Cr., & Hawver C. (nCA), Holocene &/or Pleist. in Oregon Caves (OR) & south extralimital in Hawver C. (CA))

## MOUNTAIN GOATS

Mammal Order Artiodactyla, Bovidae, Subfamily Caprinae (*Oreamnos*)

***Oreamnos*** Rafinesque, 1817 (mountain goat) Bovidae, Subfamily Caprinae (1 extant species in US & Canada)

***Oreamnos americanus*** (Blainville, 1816) (mountain goat/ Wisconsinan extralimital in Bell (WY), Horned Owl (WY), Rampart (nAZ), Little Box Elder, Samwel (CA), & Potter Cr. C. (CA)/ now in se AK to nWA, nID)

***Oreamnos harringtoni*** Stock, 1936 (extinct Harrington's mountain goat in Smith Cr. (NV, 12,600 yrs, type locality), Muskox (NM), Bare Ladder Shelter (dung 39,800 B.P.) & Bechan (UT) & Rampart (dung - 10,140 B.P., 28,700 B.P. & bones - 12,930 B.P.), Skull, Stanton, Tsean Kaetan (dung 30,600 B.P. to 14,220 B.P.), Crescendo (prob. dung at 16,640 B.P.), Left

Eye (or dung of *Ovis canadensis*), Right Eye, Five Windows (or dung of *O.c.*), Chuar (29,380 B.P.), Disappearing (dung at 27,360 B.P.) & Tse'an Bida (24,190 to 11,850 B.P.) Caves (all 9 in Grand Canyon) P Caves. **Bibl.:** Cragin 1900; Jass, Mead & Logan 2000; J. Mead 1983; J. Mead & Lawler 1995

**Oreamnos** undet. sp. (fossil dung in Shrubox Alcove (Glen Canyon NRA), sUT)

**Oreamnos**-like species (extinct Pleist. fossil in Muskox C., NM)

## MOUNTAIN LION

*Felis atrox* = *Panthera a.*

**Puma** Jardine, 1834 - Order Carnivora, Suborder Feliformia, Family Felidae, Subfamily Felinae (1 extant species in US & Canada)

**Puma concolor** (*Felis c.* Linnaeus., 1771) (= *F. Californica*, *couguar*, *hippolestes*, *improcera*) (W, sFL, TX, LAT/ mountain lion/ Tx in NM, TX/ common as Pleist. fossil, extralimital in Kitty City C., TN) **Bibl.:** Handley et al 1961

murid - A species of rodent family Muridae (Old World rats and mice). See **mouse, lemming, rat & vole**

## MUSKOXEN (see also shrub-ox)

Of mammal Order Artiodactyla Family Bovidae, Subfamily Caprinae (*Ovibos*, *Symbos*)

**Bootherium** Harlan, 1825 - muskoxen) Family Bovidae, Subfamily Caprinae Mammal of Order Artiodactyla, Family Bovidae, Subfamily Caprinae. **Bibl.:** J. Allen 1913; Hesse 1942

**Bootherium bomifrons** (*Bos b.* Harlan, 1825) (extinct/Natural Trap (WY) Nease 1986, IN (Richards, L. & McDonald 1991), Trout C. (WV) & Frankstown C.(PA). **Bibl.:** J. McDonald, Freeman et al. 1989

**Ovibos** Blainville, 1816 (musk ox) Family Bovidae, Subfamily Caprinae (1 extant species in US & Canada)

**Symbos** Leidy, 1852 (muskoxen) Family Bovidae, Subfamily Caprinae, Tribe Ovibovini. **Bibl.:** J. Allen 1913.

**Symbos cavifrons.** (Leidy, 1852) (*Scaphoceros tyrelli* Osgood, 1905; *Bison appalachicolus* Rhoads, 1895; *Liops zuniensis* Gidley, 1906; *Bootherium sargenti* Gidley, 1908; *Symbos australis* Brown, 1908; *B. nivicolens* Hay, 1915; *Symbos n.* Hay, 1920; *S. convexifrons* Barbour, 1934; *Ovibos giganteus* Frick, 1937; *B. brazosis* Hesse, 1942)) (Pleist. musk-ox in Frankstown (PA), Musk-Ox (NM) Ahlstrand & Crisman 1978 & Natural Trap (WY) & Crystal Ball C.(.25,000BP), UT) **Bibl.:** M. Nelson & Madson 1987

*Symbos* undet. sp. (Deer Cr. C.(NV); Prospects Shelter, Little Box Elder & Little Canyon Cr. C. and Prospects Shelter (WY)).

Muskrat - See rat

**mustelid** - mammal of Order Carnivora, family Mustelidae. Mead & M., 1989. Incl. badger, ferret, fisher, marten, mink, otter, skunk, weasel & wolverine.

## **NUTRIA**

Order Rodentia, Suborder Hystricognathi

*Myocaster* Kerr, 1792 - Family Myocastoridae (1 extant species in US & Canada)

*Myocaster coypus* (Molina, 1782) (nutria) (TTx in TX/ now in scattered areas in US)

## **OCEOLOT**

mammal Order Carnivora, Suborder Feliformi

*Leopardus* Gray, 1842 (American spotted cats) Family Felidae, Subfamily Felinae (1 extant species in US & Canada)

*Leopardus pardalis* (*Felis pardalis* Linnaeus, 1758) (= *Felis albescens*, *canescens*, *griffithii*, *limitis*, *mearnsi*, *mexicana*, *ocelot*, & *pseudopardalis*, *Leopardus griseus*) (sTX, seAZ/ ocelot/ Ttx? In TX/ FL & late Rancholabrean Reddick I Site fissure, (Marion Co.), FL)

## **OPOSSUM**

Mammal of Subclass Theria, Infraclass Metatheria, Superorder Marsupialia (or as order), Order Didelphimorphia

*Didelphis* Linnaeus, 1758 (large American opossums) Family Didelphidae, Subfamily Didelphinae. Syn: possum (1 extant species in US & Canada)

*Didelphis virginiana* Kerr, 1792 (now in E to sNH, sWI, w. to eCO, along Pacific coast/ Virginia opossum/ Ttx in FL(eats Myotis),PA,TX; TTx or Ac in AL, nMS)

## **OTTER**

In mammal Order Carnivora, Suborder Caniformia, Family Mustelidae, Subfamily Lutrinae

*Lutra* Brunnich, 1771 (river otters) Family Mustelidae, Subfamily Lutrinae (1 extant species in US & Canada)

*Lutra canadensis* (*Mustela lutra c.* Schreber, 1776; *L. parvicutis* Gidley & Gazin, 1933; *L. iowa* Goldman, 1941) ( Ttx in MO/ Pleist. fossil in Cumberland C./presently in NA except parts of Great Basin, swTX, sCA, sAZ,sNM)

**Satherium** - Family Mustelidae, Subfamily Lutrinae

**Satherium piscinarium** (*Lutra piscinaria* Leidy, 1873) (*Lutra piscinaria* Leidy; *Satherium ingens* Gazin, 1934) (fossil in Blancan cave or fissure filling in Haile XVA, Alachua Co., FL)-  
otter

**PANTHER** (see also mountain lion)

In mammal Order Carnivora, Suborder Feliformia, Family Felidae, Subfamily Pantherinae  
(*Panthera*)

**Panthera** Oken, 1816 (roaring cats) Family Felidae, Subfamily Pantherinae (1 extant species in US) **Bibl.:** Kurten 1973.

**Panthera leo** (*Felis l.* Linnaeus, 1758)

**Panthera leo atrox** (*Felis a.* Leidy, 1853) (American lion in Ventana C. (11,300 yrs. - AZ); Potter Cr. C. (CA); Smith Cr. C.? (NV); Muskoxy C. & Isleta Cave #1 (NM), Cutler Hammock sinkhole (FL); tracks in MO) Graham, Farlow et al. 1996; Martin & Gilbert 1978 & Jaguar & Natural Trap C. (WY)

**Panthera onca augusta** (*Felis a.* Leidy, 1872) (jaguar/ extralimital north in Ruby Falls, Johnson, Lost Sea & Post Office (prob.) C., TN & FL (Coleman) filled sinkholes),

**Panthera onca** (Linnaeus, 1758) (= *Felis onca*; *F. augustus* Leidy, 1872; *F. veronis* Hay, 1919) (Pleist. jaguar extralimital in Bat C. (Ozark National Scenic Riverways, AR), OR C. (OR), A-maze-in (KY), Harrodsburg Crevice (IN); Hamilton C. (WV), Little Box Elder & Hamilton C. (WY) Grady 1981; Inner Space (23,000BP & Laubach C. (TX), Cumberland (MD), Port Kennedy (PA), Ladds Quarry (GA), Finger Quarry & Big Bone (TN) & footprints & scratch marks in Craighead Caverns (TN); / in latest Irvingtonian sink near Coleman, Sumter Co., FL FL & late Rancholabrean Reddick I Site fissure, (Marion Co.), FL & 8,000 BP Devils Den, FL / presently in seAZ, swNM/TTx? In swTX?) **Bibl.:** Matthews 1971a

**PECCARY**

In mammal Order Artiodactyla, Family Tayassuidae (*Mylohyus*, *Platogonus*, *Tayassu*)  
Undet. Genus - Irvingtonian in limestone fissures in Ozark Mts. of Newton Co., AR.

**Mylohyus** Cope, 1889 - Family Tayassuidae

**Mylohyus fossilis** Westgate & Messick, 1985 (extinct in late Rancholabrean Reddick I Site fissure, (Marion Co.), FL/ forrest peccary)

**Mylohyus nasutus** (*Dicotyles n.* & *fossilis* Leidy, 1860; *D. pennsylvanicus* Leidy, 1889; *M. tetragonus* Cope, 1899; *M. browni* & *exortivus* Gidley, 1920; *M. gidleyi* Simpson, 1920) (extinct long-nosed peccary. in Russel C. (AL); Irvingtonian in Conrad Fissure (limestone fissures in AR Ozarks); Friesenhahn, C.(TX), Ice Box & Savage C.(KY), Jaguar, & Vess C.(TN), Town C.#2 (sp. footprints), Cumberland C.(MD), Sabertooth Cave (Sangomonian or possibly Wisconsinan, FL), Knob Rock C. & Harrodsburg Crevice (IN) Richards 1988, Plummer (MO) & Hartman's C.

& New Paris #4 (11,300BP), PA; in latest Irvingtonian sink near Coleman, Sumter Co., FL) Bib.: Gourbault 1992; Lundelius 1960

*Mylohyus* undet. sp. (Cave Acb-3 Unit E (Unit E – Sangamonian, 11.5-4k, average 11.8k yrs., Unit D – 172k +/-10k, both in AL) ), in latest Irvingtonian sink near Coleman, Sumter Co., FL,

*Platygonus* Le Conte, 1848 - Family Tayassuidae. **Bibl.:** Guilday, Hamilton and McCrady 1971; Leidy 1889; Williston 1894.

*Platygonus alemanii* (extinct Pleistocene fossil in Papago Springs Cave, AZ)

*Platygonus bicalcaratus* Cope, 1892 (*P. texanus* Gidley, 1903) (extinct fossil in early Irvingtonian in Inglis sinkhole, fissure or cave, Citrus Co., FL)

*Platygonus compressus* Le Conte, 1848 (*P. leptorhinus* Williston, 1894) (extinct flat-headed peccary, 10 c. in KY (Mammoth C. , Wilson 1981, Welch Cave, Guilday, Hamilton & McCrady 1971; Wilson, Branstetter & Guilday 1975), MO (Zoo & Bat Caves), Indun Rockshelter (IN), & Appalachian caves (Laubach, Cherokee & Peccary C.), TN (Baker Bluff C.), Laubach (Slaughter 1966a); & Friesenhahn C., TX, 8,000 BP Devils Den sink, FL & late Rancholabrean Reddick I Site fissure, (Marion Co.), FL, ncOH sinkhole (Gobertz 1998) & Castle Rock C.(WI) Palmer, H. 1974

*Platygonus* undet. sp. or species (Potter Cr. (CA) & Mammoth (KY) C.)

*Platygonus vetus* Leidy, 1882 (= *P. cumberlandensis* Gidley, 1920; *P. intermedius* Gidley, 1920) (may be large *P. compressus*) (extinct Leidy's peccary, middle Pleist. in Cumberland C.(MD), cf. Harrodsburg Crevice (IN), Hamilton & Poorfarm C. (both WV), Bishop C. (Bedford Co.,TN) & Lisanby C. (>250,000 BP, Caldwell Co.,KY); in latest Irvingtonian sink near Coleman, Sumter Co., FL, in early Irvingtonian in Inglis sinkhole, Citrus Co., FL)

*Tayassu* Fischer, 1814 (peccaries) Tayassuidae (1 extant species in US & Canada)

*Tayassu tajacu* (*Picari angulatus* Linnaeus, 1758; *Dictyles t.*) (javelina or collared peccary) (TTx in TX)

## PIKAS

In mammal of Order Lagomorpha, Family Ochotonidae (picas, pikas, whistling hares, calling hares, mouse hares, rock conies) (*Ochotona*) **Bibl.:** Crawford 1975c; Grady 1991.

pika scat - Spherical & about 1/8" diameter. Larson 1972

*Ochotona* Link, 1785 (pikas) Family Ochotonidae (1 extant species in US & Canada)

*Ochotona princeps* (*Lepus p.* Richardson, 1828) (elevation extralimital in Mormon Mt. (NV), Haystack (CO), Crystal Ball C.(>25,000BP,UT) , Kelso C. (ON), Pintwater C. (32-9k BP in sNV) & Horned Owl C.(WY); eastern extralimital in Elba C.,ON/ now in sBC s. in W mts./ American pika/ TTx or Ac in CA; Ttx in WA)

*Ochotona* undescr. sp. (Pleist. extinct, Kelso C., ON) Churcher & Dods 1979; Mead & Grady 1996

## **PORCUPINES** (see also coendu)

In mammal Order Rodentia, Suborder Hystricognathis, Family Erethizontidae (*Erethizon*)

*Erethizon* F. Cuvier, 1822 - Family Erethizontidae (1 extant species in US & Canada)

*Erethizon dorsatum* (*Hystrix d.* Linnaeus, 1758) (NA epigeal/ TTx in AZ, CA, NM, NS, OK, TX, IL, AR, PA, (Recent extralimital), WA/ now AK se to. NE, s. in W to nMex.)

**Bibl.:** Barkalow 1961; Betancourt, Van Devender & Rose 1986; Crawford 1975c; Graham 1962a; Bridgemon 1967, 1974. See Coendou.

*Erethizon kleini* Frazier, 1981 (extinct type in early Irvingtonian in Inglis sinkhole, Citrus Co., FL)

*Erethizon poyeri* R. C. Hurlbert, Jr. 1997 (extinct, type locality in Pleist. (latest Blancan or earliest Irvingtonian) Haile filled-in FL sinkhole or cave)

## **PRAIRIE DOGS**

Order Rodentia

Family Sciuridae

Subfamily Sciurinae (*Cynomys*)

*Cynomys* Rafinesque, 1817 (Prairie dogs) Family Sciuridae, Subfamily Sciurinae (4 extant species in US & Canada). **Bibl.:** Rouse 1997

*Cynomys* (*Leucocrossuromys*) *churcherii* Burns & McGillivray, 1989 (= *C.(L.) niobrarius c.* Burns & McGillivray, 1989) (mid-Wisconsinan extralimital fossil in January C., Alberta)

*Cynomys gunnisoni* (*Spermophilus g.* Baird, 1855) (Gunnison's pocket gopher as fossil in Isleta C., NM)

*Cynomys leucurus* Merriam, 1890 (White-tailed p. as fossil in Horned Owl C./ now in cWY s. to nNM, eAZ).

## **PRONGHORNS**

In mammal Order Artiodactyla

Family Antilocapridae (*Antilocapra*, *Capromeryx*, *Stokocerus*, *Tetrameryx*). Has horn cores & deciduous sheaths.

*Antilocapra* Ord, 1818 (pronghorn) Family Antilocapridae (1 extant species in US & Canada)

*Antilocapra americana* (Ord, 1815) (Pronghorn/ Pleist.. extralimital in Brynjulfson C., MO/ now in Great Basin, interior W) **Bibl.:** Chorn, Frase & Frailey 1988

*Capromeryx* Matthew, 1902 (= *Breameryx* in part) (pronghorn) Family Antilocapridae.

*Capromeryx arizonensis* Skinner, 1942 (extinct in early Irvingtonian in Inglis sinkhole, Citrus Co., FL/ Skinner's pronghorn)

*Capromeryx* cf. *furcifer* Matthew, 1902 (= *C. minimus* Meade, 1942) (extinct Pleist. in Fowlkes C., TX)

*Capromeryx minor* Taylor, 1911 (*Breameryx m.* Furlong, 1946) (extinct/ Diminutive Pronghorn/ Schuiling & Smith Cr.? C. (CA); McKittrick C. (TX); possible in Smith Cr Canyon C., NV but unlikely)

*Capromeryx* undet. sp. or species (Rancholabrean fossil in Dry, Dark Canyon, Shelter & Conkling C. (NM); Smith C. (12,600 yrs., NV); Moore Pit & Fowlkes C., TX)

*Stockoceros* Frick, 1937 (described as subgenus of *Tetrameryx*) (pronghorn) Family Antilocapridae

*Stockoceros conklingi* (*Tetrameryx c.* Stock, 1930) (Pleistocene extinct in Shelter (type locality) (Dona Ana Co.) & Muskox C., NM; Ventana C. (11,300 yrs. - AZ); )

*Stockoceros onusrosagris* (*Tetrameryx o.* Rossevelt & Burden, 1934) (Extinct Pleist. Quentin's pronghorn in Papago Springs (AZ) & Burnet (NM) & Muskox (NM) C.

*Tetrameryx* Lull, 1931 (pronghorn) Family Antilocapridae

*Tetrameryx shuleri* Lull, 1921 (Shuler's pronghorn/ extinct Rancholabrean in Moore Pit, TX)

*Tetrameryx* undescr. sp. (extinct/ Burnet C. in Bighorn Canyon ,MT)

## RACCOONS

In Mammal Order Carnivora, Suborder Caniformia, Family Procyonidae, Subfamily Procyoninae (*Procyon*)

*Procyon* Storr, 1780 (raccoons) mammal Order Carnivora, Suborder Caniformia, Family Procyonidae, Subfamily Procyoninae (1 extant species in US & Canada)

*Procyon lotor* (Linnaeus, 1758) (NA/ Tx in AR, CA, IN, MS, OK, TN, WV; TTx in AL, KS, KY, MD, MO, OH, PA; Tx in NC, TX). Feeds on cave crickets & roosting bats (KS). Coprolites in Mammoth C., Wyandotte C., IN (Munson & Keith, 1984. / presently sCanada s.except most of CO, WY, Great Basin) **Fossil Bibl.:** Arata & Hutchinson 1964; P. Munson & Keitch 1984; Guilday & Parmalee 1966

## RABBITS

In mammal Order Lagomorpha, Family Leporidae

Subfamily Archaeolaginae (*Hypolagus*)

Subfamily Leporinae (*Aztilanolagus*, *Brachylagus*, *Lepus*, *Silvilagus*)

Leporidae lagomorph. **Bibl.:** Grayson 1977; Hockett 1994; Pettus 1956; J. White 1984.

rabbit scat - Spherical & about 1/4 inch in diameter.

*Aztlanolagus* Russell & Harris, 1986 - mammal Order Lagomorpha, Family Leporidae, Subfamily Leporinae

*Aztlanolagus agilis* Russell & Harris, 1986 (extinct Rancholabrean fossil/ in Anthony Cave (type locality), U-Bar & Dry Caves, NM & Chihuahua, Mex.)

*Brachylagus* Miller 1900 (as subgenus of *Sylvilagus*) (generally now considered a valid genera) (pygmy rabbits) Family Leporidae, Subfamily Archaeolaginae (1 extant species in US & Canada)

*Brachylagus idahoensis* (*Sylvilagus i.* Merriam, 1891.) ( pygmy rabbit/ Rancholabrean extralimital northwest in Jaguar & Moonshiner C., ID & southeast extralimital in Bechan C., UT/ now in Great Basin n. to seWA & sID)

*Brachylagus coloradoensis* Ramos, 1999 (extinct pygmy rabbit in early to middle Irvingtonian in \*Porcupine C. (Type locality), CO)

*Hypolagus* Dice, 1917 - Leporidae mammal, subfamily Archaeolaginae, Subfamily Leporinae  
*Hypolagus* undet. sp (2 undescr.? fossil species in Irvingtonian in Porcupine C., CO)

*Lepus* Linnaeus, 1758 (hares, jack rabbits) Family Leporidae, Subfamily Leporinae (8 extant species in US & Canada)

*Lepus americanus* Erzleben, 1777 (snowshoe or varying hare, jackrabbit, snowshoe rabbit/ extralimital Irvingtonian in Cumberland C.(MD) & Wisconsinan in Jaguar & Welsch C.(KY), Bat C.(MO), & Crystal Ball C.(>25,000BP,UT)/ now in AK s. to nCA, NE, s. along Appalachians & Rockies to nNM)

*Lepus californicus* Gray, 1837 (black-tailed jackrabbit) (now in SW to seWA, eAR, nSD/Ac in wTX)

*Lepus townsendii* Bachman, 1839 (white-tailed jackrabbit/ south extralimital. in Dry, Jaguar & Little Box Elder C.; elevation extralimital in Crystal Ball C., NV/ now in interior nW to swCanada & e. to MN)

*Sylvilagus* Gray, 1867 (cottontails) (hares, jack rabbits) Family Leporidae, Subfamily Leporinae (8 extant species in US & Canada)

*Sylvilagus floridanus* (Allen, 1877) (eastern cottontail Late Pleist. extralimital in Isleta C.,NM/ now in E to eCO, sNH, eMT)

*Sylvilagus* cf. *hibbardi* J. White, 1984 (cottontail Late Pleist. extinct in Fyllan Cave, TX)

*Sylvilagus idahoensis* = *Brachylagus i.* Merriam, 1891

*Sylvilagus transitionalis* (Bangs, 1895) (New England cottontail Pleist. extralimital in Clark's C./ now in sON s. along Appalachians.)



## RATS

In mammal Infraorder Myomorpha, Order Rodentia, Suborder Sciurognathi, Family Muridae

Subfamily Arvicolinae (*Neofiber*, *Ondatra*)

Subfamily Murinae (*Rattus*)

Subfamily Sigmodontinae (New World rats & mice) (*Neotoma*, *Oryzomys*, *Sigmodon*)

Incl. black, cotton, kangaroo, musk, pack, Norway, water & wood rats (all Muridae rodents)  
rat amber - Syn: amberat, ratite, rat guano deposit.

*Neofiber* True, 1884 (round-tailed muskrats) mammal Order Rodentia, Suborder Sciurognathi, Family Muridae, Subfamily Arvicolinae (1 extant species in US)

*Neofiber alleni* True, 1884 (round-tailed muskrat or Florida water rat/ widespread in FL Pleist.; extralimital in Mammoth C., KY /now in FL to sGA/ TX in nFL)

*Neofiber diluvianus* (*Microtus d.* Cope, 1896; *Schistodelta sulcatus* Cope, 1899; *Proneofiber d.*) (\*Port Kennedy C./extinct/ diluvial water rat)

*Neofiber leonardi* Hibbard, 1943 (*Schistodelta l.*) (Extinct Leonard's W. Rat in Wisconsinan Trout C., WV & Irvingtonian (possibly late Kansan or early Yarmouthian) FL (Levy Co.) sinkhole) Bibl.: M.Frazier 1977.

*Neotoma* Say & Ord, 1825 (wood, cave or pack rat) Family Muridae, Subfamily Sigmodontinae (New World rats & mice) (1 extant species in US) (10 extant species in US or Canada) Syns: Plants in nests document climate change up to 40,000 BP) See darapskite & amberat.

**Bibl.:** Anon. 1951a; Betancourt, Van Devender & Rose 1986 Crawford 1975a; Crim 1961; J. Davis 1956; O. Davis and Anderson 1987; Dunning & Payne 1979; Elias 1987, 1990, 1997; Elias, Mead and Agenbroad 1992; Force 1989-90; J. Goertz 1970; Guilday 1958; W. Hall, Van Devender & Olson 1988, 1990; Holler 1991; Mohr 1964; Nieland 1977; Phillips & Van Devender 1974; Sharpe 1990; Spilman 1976; R. Thompson 1985; Thompson 1979; Van Devender 1986; Van Devender, Owen & Anderson 1988; P. Wells 1976, 1987.

woodrat scat - Spherical & 1/4 inch in diameter. It and associated fungi may sustain fly larva, collembolans, beetles, fungus gnat larvae, & mites.

*Neotoma albigula* Hartley, 1894 (nMex., AZ, NM, sCO, seUT/ whitethroat woodrat/ Tx in TX)

*Neotoma cinerea* (*Mus c.* Ord, 1815; *Neotoma spelaea* Sinclair, 1905) (bushy-tailed woodrat widespread Rancholabrean in West; end Pleist. extralimital in Lower Sloth (TX) & Isleta & Dark Canyon (seNM) C.; elevation extralimital in Crystal Ball C., NV/ now in seAK s. to nCA, se. to nwNM/ TTx in CA, OR, WA) **Bibl.:** F. Smith & Betancourt 1998.

*Neotoma findleyi* Harris, 1984 (extinct/ Pleist. from Dry C., NM)

*Neotoma (N.) floridana* (Ord, 1918, incl. *N. magister*) (Eastern woodrat as Irvingtonian in Cumberland C., Recent extralimital in nIN, IA, IL, IN, OH & MO c./now in cFL n. to seNY, nw to nwSD, w.to cTX/ Tx in AR, FL, GA, KY, IN, MO, OH, OK, WV/ MO Status undet.; IL State T&E)

*Neotoma (N.) floridana* **Bibl.** B. Clark et al. 1994; Fitch & Rainey, 1956; Lavoie, King & Simonovic 1988; Cudmore 1983; Lavoie, King & Simonovic 1985; Lavoie, Helf & Poulson 1996; P. Pearson 1952; Rainey 1956; Rose 1982

*Neotoma floridana illinoensis* A.H. Howell, 1910 (Tx in IL/ state tracked in TN/ now in IL, IN, KY, TN)

*Neotoma fuscipes* Baird, 1858 (Dusky-footed woodrat as fossil in Hawver C., CA/ now in wOR s. to wCA, along coast to Baja/ TTx in neCA/ *N. f. riparia* Federal T&E Candidate)

*Neotoma (N.) goldmani* Merriam, 1903 (Now in se.Chichuahua to wc.San Luis Petosi, Mex./ Pleist. n. extralimital in Dry & Burnet C., seNM)

*Neotoma lepida* Thomas, 1893 (TTx or Ac in CA/ desert woodrat/ now in Baja n.to sCA, NV, eAZ, eUT, seOR, swID)

*Neotoma magister* Baird, 1857 (= *N.floridana m.*) (Allegheny woodrat/ Tx in AL, KY, MD, PA, TN, WV, VA/ NY T&E) **Bibl.:** Heisler 1941; Lefton 1973; Rhoads, 1894, 1897; Poole 1940; Rhoads 1894

*Neotoma mexicana (N. m. m.* Baird, 1855) (Mexican woodrat/ fossil in Burnet, Papago Springs (AZ) & Centipede C. (TX)/ now in nMex. n. to ncCO,seUT) **Bibl.** Finley 1953

*Neotoma micropus* Baird, 1855 (plains packrat/seTX nw to seCO,wNM/ Tx in TX) **Bibl.:** Braun & Mares 1989

*Neotoma pennsylvanica* = *Microtus longicaudus*

*Neotoma pygmaea* Harris, 1984 (extinct/ Pleist. from Dry C., NM)

*Neotoma* undescr. sp. (2 species in Dry C., NM)

*Neotoma (Parahodomys) spelaea (Parahodomys s.* Gidley & Gazin, 1933) (extinct cave woodrat in Cumberland C. (type) locality; Hamilton (WV: Irvingtonian) & Trout (WV: or as *N. (P.)* undet. sp.)

*Neotoma stephensi* Goldman, 1905 (nAZ,eNM/ Stephen's woodrat/ TTx in AZ). **Bibl.:** D. Hanson 1971; Hoffmeister & Torre 1960

*Ondatra* Link, 1795 (muskrats) Family Muridae, Subfamily Arvicolinae (1 extant species in US or Canada)

***Ondatra annectens*** (*Fiber a.* Brown, 1908; *O. kansasensis* Hibbard, 1944) (extinct/ Brown's muskrat/ Conrad Fissure (limestone fissures in Ozarks, Newton Co (AR)), Cumberland (MD: Irvingtonian), Hamilton & Trout C.(both WV: >600,000: also listed as *O. annectens-hiatidens*)  
Bibl.: Grady & Gardon 2000; Grady 1985

***Ondatra annectens-hiatidens*** (Pleist. extinct in Trout C.(>600,000) (WV: also listed as *O. annectens*)  
Bibl.: Grady & Gardon 2000

***Ondatra hiatidens*** (Cope's muskrat/ extinct Irvingtonian Pleist. in Port Kennedy C., PA)

***Ondatra* cf. *idahoensis*** Wilson, 1933 (= *O. hiatidens* Hibbard, 1947) (Browns muskrat/ extinct Pleist. in Fyllan C., TX)

***Ondatra zibethicus*** (*Castor z.* Linneaus, 1776; *Fiber oregonus* Hollister, 1911) (m.; extralimital in Miller's .(>11,000BP), TX) & Crystal (>25,000BP,UT) C.; early Wisconsinian in Haile XIVA sink near Haile, Alachua Co., FL) / now in Canada, US except most of TX, CA, nAK, nCanada, UT, AZ/ TTx in AZ) **Bibl.** Nelson & Semken 1969

***Oryzomys*** Baird, 1858 (rice rats) Family Muridae, Subfamily Sigmodontinae

***Oryzomys palustris*** (Harlan, 1837) ( Pleist. extralimital in Brynjulfson (MO), Anderson Pit & Passenger Pigeon C. (IN) & Schulze C.(12,500BP),TX/ marsh rice rat/ now in SE n. to sNJ, w.to eTX).

*Parahodomys* - An extinct subgenus of *Neotoma*.

*Proneofiber diluvianus* = *Neofiber d.*

***Rattus*** Fischer, 1803 (Old World rats) Family Muridae, Subfamily Murinae (2 extant species in US or Canada)

***Rattus norvegicus*** (Berkenhoust, 1769) (Norway or brown rat) (now in most of NA/Tx in OH),

***Rattus rattus*** (Linnaeus, 1758) (black or house rat) (now where humans concentrate in NA/ alien Tx or Ac in HI; Tx in Longhorn Cavern, TX)

*Schistodelta* = *Neofiber*

***Sigmodon*** Say & Ord, 1825 (cotton rats) Family Muridae, Subfamily Sigmodontinae (4 extant species in US or Canada)

***Sigmodon arizonae*** Mearns, 1890 (*S. cf. a.* extralimital? in Middle Wisconsinian (246 -+19ka to 26.7 -+.7ka) in Papago Sprs. C., AZ/ Arizona cotton rat now in seCA, cAZ, extreme sNV, s. to Mex.)

***Sigmodon curtisi*** Gidley, 1922 (extinct fossil from early Irvingtonian in Inglis sinkhole, Citrus Co.,FL/ Curtis cotton rat/ *S. cf. curtisi* as Pleist. fossil in Fyllan C., TX) Winkler & Grady 1990

*Sigmodon hispidus* Say & Ord, 1825 (hispid cotton rat/ now in Mex., n to seVA, nMO,cAZ/ Ttx? in TX)

*Sigmodon ochrognathus* V.Bailey, 1902 (yellow-nosed cotton rat/ Holocene fossil in Centipede Cave, slightly east extralimital/ now in nMex. n. to extreme seAZ, swNM)

## RHINOS

Mammal Order Perissodactyla, Rhinocerotidae

*Coelodonta* – Rhinocerotidae mammal, Subfamily Rhinocerotinae

*Coelodonta antiquitatis* (Blumenbach) (woolly rhinoceros/ extinct, fossil cast form in Blue Lake Rhino (lava cave created by cast) **Bibl.** C. Holler, 1995; Prothero 1987; Slettebak 1981

## RINGTAILS

In mammal Order Carnivora, Family Procyonidae (*Bassariscus*)

*Bassariscus* Coues, 1887 (ringtails; ring-tailed cats) Family Procyonidae (1 extant species in US or Canada)

*Bassariscus astutus* (*Bassariscus a.* Lichtenstein, 1830) (TTx in AZ, NM, TX (preys on bats); ringtail/ TTx in CA (Tulare Co.) & OR (Josephine Co.)) **Bibl.:** Cunningham 1989; Mead 1981b

*Bassariscus sonoiensis* Skinner, 1942 (extinct Rancholabrean Sonoita ringtail in Papago Springs C. (Type locality, AZ) & Late Pleist. or Early Holocene in Hanging Gardens (CA) C.) R. Graham 1969/ now in SW n. to sOR, nCO, nUT, seTX.)

Rodents - Of Order Rodentia (See **beaver, chipmunk, coendu, marmot, mice, muskrat, nutria, mountain beaver, porcupine, prairie dog, rat, squirrel, woodrat**). Order has nearly half of all mammal species. Unique two upper & two lower incisors.

sabertooth cat - See CAT

sciurid - See chipmunk, gopher, squirrel

## SEA LIONS

In mammal Order Carnivora, Suborder Caniformia, Family Otariidae (*Zalophus*)

*Zalophus* Gill, 1866 (California sea lions) Family Otariidae (1 extant species in US & Canada)

*Zalophus californianus* (*Otaria c.* Lesson, 1828) (Pacific coast/ California sea lion/ Tx marine in CA). **Bibl.:** Rowley 1929

## SHEEP, bighorn

In mammal Order Artiodactyl, Family Bovidae, Subfamily Caprinae (*Ovis*) **Bibl.:** Stokes & Condie, 1961)

*Ovis* Linnaeus, 1758 (sheep) - Artiodactyl, Family Bovidae, Subfamily Caprinae (1 extant species in US & Canada)

*Ovis canadensis* Shaw, 1804 (W except OR, WA, wCA/ Wisconsin in Little Box Elder, Jaguar, Rampart, Natural Trap, Dry & Gypsum C; end Pleist. extralimital in Lower Sloth C., TX; Pleist. or Holocene extralimital in Timpanogos C., UT/ bighorn sheep)

*Ovis canadensis* ssp. *catclawensis* (= *O. c.* Hibbard & White, 1956) Harris & Mundel 1974 (temporal subspecies in Wisconsin in Catclaw C. (AZ/type), Little Box Elder? (15,000 BP in WY); Little Canyon Cr. C. & Prospects Shelter (WY); Haystack C. (CO) & Natural Trap (WY) **Bibl.:** Geist 1971; Wang 1984, 1988, 1989.

### **SHREW** (see also mole)

In mammal Order Insectivora

Family Talpidae **Bibl.:** Findley 1956; C. Jones 1961

Subfamily Talpinae (*Neurotrichus*)

Subfamily Soricinae (*Blarina*, *Cryptotis*, *Notiosorex*, *Sorex*)

*Blarina* Gray, 1838 (American short-tailed shrews) mammal Order Insectivora, Family Soricidae, Subfamily Soricinae (3 extant species in US or Canada) **Bibl.:** Jones, C., Choate, & Genoways 1984

*Blarina brevicauda* (*Sorex b.* Say, 1823; *B. simplicidens* Cope, 1899; *B. fossilis* Hibbard, 1943)) (short-tailed shrew extralimital in C. Without a Name (cTX), Klein C. (>8,000BP), & Williams C. , TX/ now in E to seCanada) **Bibl.:** Guilday 1957

*Blarina brevicauda kirtlandi* Bole & Moulthrop, 1942 (Tx in OH)

*Blarina carolinensis* (Bachman, 1837) (southern short-tailed shrew; extralimital in Schulze C. (12,500BP), TX))

*Blarina ozarkensis* (= *B. brevicauda o.* Brown, 1908) Graham & Semken, 1976 (extinct/ Pleist. shrew in Conrad Fissure (AR)) **Bibl.:** Graham 1976

*Cryptotis* Pomel, 1848 (small-eared shrews) Family Soricidae, Subfamily Soricinae (1 extant species in US)

*Cryptotis parva* (*Sorex p.* Say, 1823) (least shrew / end Pleist. extralimital in Lower Sloth C., (TX) & Dry C., seNM/ now in E to sNY, neCO, sWI) **Bibl.:** A. Harris et al 1973

*Microsorex* = *Sorex*

*Neurotrichus* Guenther, 1880 (American shrew-moles) Family Talpidae, Subfamily Talpinae (1 extant species in US & Canada)

*Neurotrichus gibbsii* (Baird, 1858)(now in sw BC to nwCA/Tx in OR C.)

*Notiosorex* Coues, 1877 (desert shrews) Family, Soricidae, Subfamily Soricinae (1 extant species in US & Canada)

*Notiosorex crawfordi* (c.) (*Sorex* (N.) c. Coues, 1877) (N.c. now in SW, sNV, scCA, n. to extreme sUT, sCO, sOK, w. to extreme wAR/ extinct ssp.?, latest Pleist. in Hall's C.(TX) & NM; Middle Wisconsinian (246 -+19ka to 26.7 -+.7ka) in Papago Sprs. C., AZ)

*Sorex* Linnaeus, 1758 (red-toothed shrews) mammal Order Insectivora, Family, Soricidae, Subfamily Soricinae (29 extant species in US or Canada)

*Sorex arcticus* Kerr, 1792 (arctic shrew / extralimital in Bootlegger Sink & New Paris (PA), Cheek Bend & Peck (TN), Trout (WV) C. & Natural Chimneys (VA)/ now in AK to nMN, wME) Holman & Gray 1987; Kurten & Anderson 1980

*Sorex arizonae* Diersing & Hoffmeister, 1977 (extralimital in Middle Wisconsinian (246 -+19ka to 26.7 -+.7ka) in Papago Sprs. C., AZ/ Arizona shrew now in seAZ & swNM)

*Sorex cinereus* Kerr, 1792 (masked shrew/ extralimital in TX (Hall's, Lower Sloth & Schulze (12,500BP) C., TX & AR (Peccary C.(4,300BP)/ now in AK s. to WA, nNM, nIA, NE s. along Appalachians)

*Sorex fumeus* Miller, 1895 (smokey shrew/ west extralimital in Ladds & Clark's C. & in limestone fissures in AR Ozarks/ now in NE s. along Appalachians/ TTx in KY), (var. f. Ac in OH)

*Sorex hoyi* Baird, 1858 (= *Microsorex h.*) (pygmy shrew/ extralimital in Myer C.(IL), Freemans Pit (IN), Peck (TN) & Little Box Elder C.(WY); *M. h. thompsoni* extralimital in New Paris #4 & Bootlegger Sink (PA), Clark's (VA), Robbins (TN) & Welsh (KY) C.)/ now in cAK s. to WI,MN, NE s. along Appalachians)

*Sorex monticulus* Merriam, 1890 (montane shrew/TTx in CA)

*Sorex palustris* Richardson, 1828 (water shrew/ Pleist. extralimital in Fowlkes C.,(TX) & Peccary C.(4,300BP),AR/ now in Canada s. to cCA, Great Basin, wCO, nNM, NE s. along Appalachians)

*Sorex pratensis* (= *Microsorex p.*) (extinct Irvingtonian fossil in Conrad Fissure (limestone fissures in AR Ozarks)

*Sorex preblei* Jackson, 1922 (Malheur area of eOR/ Malheur shrew/ Pleist.extralimital in Dry Cave., NM)

*Sorex vagrans* Baird, 1858 (= *S. trigonirostris*) (vagrant s.; Pleist. extralimital in Fowlkes & Lower Sloth C., TX & Schulze C.(12,500BP), TX) C./now in sBC s. to nCA,nNV. Great Basin to sAZ,wNM)

## **SHRUB- or BUSH OX**

Artiodactyla mammal, Family Bovidae, Subfamily Caprinae (*Euceratherium*)

***Euceratherium*** Furling & Sinclair, 1904 - Bovidae mammal fossil

***Euceratherium collinum*** Furling & Sinclair, 1904 (*Peptoceras sinclairi* Furlong, 1905; *Taurotragus americanus*; *Aftonius calvini* Hay 1014; *E. bizzelli* Stovall, 1937) (extinct shrub-ox in Cumberland (MD), Bechan bones & dung? in Shrubox Alcove (Glen Canyon NRA), sUT; Hawver & Potter Cr. (CA), Mineral Spring Hill (NV); Muskox (NM) & Burnet (NM) & McKittrick (wTX) C.)

***Euceratherium*** undet. sp. (extinct / Pleistocene Kokoweef (CA), Mineral Hill (NV) & U-Bar (NM) C.)

## SKUNK

In mammal Order Carnivora, Suborder Caniformia, Family Mephitidae, Subfamily Mephitinae (*Brachyprotoma*, *Conepatus*, *Mephitis*, *Spilogale*)

***Brachyprotoma*** Cope, 1899 - Order Carnivora, Suborder Caniformia, Family Mephitidae, Subfamily Mephitinae.

***Brachyprotoma brevimala*** Heaton, 1985 (extinct/ Crystal Ball C.(>25,000BP,UT) &

*Brachyprotoma obtusata* (*Mephitis o.* Cope, 1899; *B. pristina* & *spelaea* Brown, 1908 (Pleist. Extinct Western Short-faced Skunk in Crystal Ball C. (NV); Cumberland (MD), Hamilton & Trout C. (both WV) Grady 1988, 1989) & Conard Fissure, Frankstown, Crankshaft Pit, & Brynjulfson C. (MO))

***Conepatus*** Gray, 1837 (hog-nosed skunks) mammal Order Carnivora, Suborder Caniformia, Family Mephitidae, Subfamily Mephitinae (2 extant species in US or Canada)

***Conepatus leuconotus*** (*Mephitis l.* Lichtenstein, 1832) (Hog-nosed skunk/ Irvingtonian in Inglis 1A & Pleist. in FL, Ladds C. (GA), & TX (Schulze(12,500BP), Centipede, Kyle C.)/now in Mex., n.to AZ, sCO, sTX/ Tx? In TX (preys on bats)

***Conepatus mesoleucus*** (Lichtenstein, 1832) (= *C. leuconotus mearnsii*; may be conspecific with *C. leuconotus*) (AZ, CO, TX, s. To Nicaragua/ Common Hognosed or Western rooter skunk/ Tx in TX)

***Mephitis*** E. Geoffroy Saint-Hilaire & G. Cuvier, 1795 (hooded and striped skunks) Family Mephitidae, Subfamily Mephitinae (2 extant species in US & Canada)

***Mephitis mephitis*** (Schreber, 1776) (Striped Skunk/ TTx in AR, MO, MS, NJ, OH, OK, PA, TX (prey on bats); widespread in Pleist. caves/ now in most of NA except AK, nCanada),

***Osmotherium*** Cope, 1896 (may be junior syn. of *Mephitis*) Family Mephitidae. Subfamily Mephitinae.

***Osmotherium spelaeum*** Cope, 1896 (*Mephitis fossidens* & *orthostichus* Cope, 1896; *M. leptops* Cope, 1899; *Pelycictis lobulatus* Cope, 1896) (may not be valid species) (extinct Port Kennedy skunk (PA) in Port Kennedy C.)

***Spilogale*** Gray, 1865 (spotted skunks) Family Mephitidae, Subfamily Mephitinae (2 extant species in US & Canada)

***Spilogale gracilis*** (g.) Merriam, 1890 (western spotted skunk) (= *S. putorius* by some authors) (Ttx or Ac in CA, OR)

***Spilogale putorius*** (*Viverra p.* Linnaeus, 1758; *S. marylandensis* Gidley & Gazin, 1933; *S. pedroensis* Gidley, 1942)) (eastern spotted skunk /extralimital in Haystack C. (CO), sIN c. & Irvingtonian in Cumberland C., MD/ now most of NA except NE, E coastal plain, nWY north/ prob. Tx in OK, MS) **Bibl.:** R. Richards 1985a

***Spilogale*** undet. sp. (extralimital fossil in IL, IN) Richards, R.L. 1985

## SQUIRRELS

In mammal Order Rodentia, Suborder Sciurognathi, Infraorder Sciuromorpha

Family Sciuridae, Subfamily Sciurinae (*Ammospermophilus*, *Glaucomys*, *Sciurus*, *Spermophilus*, *Tamiasciurus*)

**Bibl.:** Goodwin & Reynolds 1989.

***Ammospermophilus*** Merriam, 1892 (antelope squirrels) mammal Order Rodentia, Suborder Sciurognathi, Infraorder Sciuromorpha, Family Sciuridae, Subfamily Sciurinae (4 extant species in US & Canada)

***Ammospermophilus leucurus*** (Merriam, 1889) (white-tailed antelope squirrel in Centipede C., TX/ now in Great Basin se to swTX, sw to Baja),

*Citellus* Oken, 1816 = *Spermophilus*

***Cryptopterus*** (Old World flying squirrels)

***Cryptopterus webbi*** Robertson, 1976 (Old World flying squirrel) (fossil in Blancan cave or fissure filling in Haile XVA, Alachua Co., FL)

***Glaucomys*** Thomas, 1908 (New World flying squirrels) Family Sciuridae, Subfamily Sciurinae (2 extant species in US & Canada)

“***Glaucomys volans***” Morgan & White 1995 early Irvingtonian in Inglis sinkhole, Citrus Co., FL/ status unclear, may not be new species)

***Glaucomys sabrinus*** (*Sciurus s.* Shaw, 1801) (northern Flying squirrel/ Wisconsinan fossils from Samwel Cave, CA),

***Glaucomys volans*** (*Mus v.* Linnaeus, 1758) (Southern Flying Squirrels as extralimital Wisconsinan fossil from Samwel Cave, CA/now in E to sON, nFL/ Ac in OH)



***Sciurus*** Linnaeus, 1758 (tree squirrels) mammal Order Rodentia, Suborder Sciurognathi, Infraorder Sciuromorpha, Family Sciuridae, Subfamily Sciurinae (7 extant species in US & Canada)

***Sciurus aberti*** Woodhouse, 1853 (extralimital in Middle Wisconsinian (246 -19ka to 26.7 - +.7ka) in Papago Sprs. C., AZ/ now in isolated mtns in AZ, NM, seUT, CO)

***Sciurus carolinensis*** Gmelin, 1788 (Gray Squirrel) (E to sCanada/ Tx in OH)

***Sciurus carolinensis*** (Irvingtonian extralimital fossil in Conrad Fissure (limestone fissures in AR Ozarks)

***Sciurus niger*** Linnaeus, 1758 ( DE,MD,adjacent VA,WV,PA/ Pleist. Fox S. in many caves, extralimital in much of east),

*Sciurus tenuidens* = *Tamiasciurus hudsonicus*

***Spermophilus*** F. Cuvier, 1825 (= *Citellus* by some authors) (ground squirrels) mammal Order Rodentia, Suborder Sciurognathi, Infraorder Sciuromorpha, Family Sciuridae, Subfamily Sciurinae (19 extant species in US & Canada)

***Spermophilus beecheyi*** (Richardson, 1829) (eOR, CA except se, scNV/ California ground squirrel/ TTx in CA),

***Spermophilus elegans*** Kennicott, 1863 (= *S. aureus* & *S. nevadensis*) (NE NV, seOR, sID,swMT to cCO, wNB/Wyoming ground squirrel/extralimital s. in Pleist. Dry C, seNM)

***Spermophilus franklini***. (Sabine, 1822) (Franklin's ground squirrel/ extralimital in Brynjulfson Cave, MO/ now in MW to eAB),

***Spermophilus lateralis*** (Say, 1822) (golden-mantled ground squirrel extralimital in Ventana C.(Rancholabrean,AZ), Kokoweef C.,CA) & Mormon Mt. c.(NV)/ now in W n. to cBC, s. to cCA, cAZ/ Ttx in CA),

***Spermophilus richardsoni*** (Sabine, 1822) (elevation extralimital in Haystack C., CO/ Richardson ground squirrel/ now in eMN sw to cCO, nNV, . nw to cAB ),

***Spermophilus townsendii*** Bachman, 1839 (= *Eutamias t.*) (Townsend's ground squirrel in Jaguar & Moonshiner (ID) C., extralimital in Kokoweef C.,San Bernadino,CA/now in West Coast from sBC to cCA/ TTx or Ac in CA),

***Spermophilus tridecemlineatus*** (Mitchill, 1821) (thirteen-lined ground squirrel/ extralimital in Trout (Wisconsinan/WV) & Peck, Guy Wilson & Baker Bluff (TN) C., Harrodsburg Crevice (IN), & Cumberland C. (Irvingtonian/MD), Dry C. (seNM) & Anderson Pit (IN)/ MW,eW from cAB to sTX)

*Spermophilus variegatus* (Erxleben, 1777) rock squirrel as fossil in McKittrick (TX) & Little Box Elder (WY), extralimital/now in Great Basin s. to nMex./ TTx in TX) **Bibl.:** Keitrans & Clifford 1974

*Tamiasciurus* Trouessart, 1880 (red squirrels) mammal Order Rodentia, Suborder Sciurognathi, Infraorder Sciuromorpha, Family Sciuridae, Subfamily Sciurinae (2 extant species in US & Canada)

*Tamiasciurus douglasii* (Bachman, 1839) (Rancholabrean fossil in Potter Cr. & Samwel C., CA/ Douglas' squirrel/ West Coast from sBC to cCA)

*Tamiasciurus hudsonicus* (*Sciurus vulgaris h.* Erxleben, 1777; *S.tenuidens* Hay, 1920) (extralimital in Cumberland (MD - Irvingtonian) & Trout (WV – Wisconsinian) nw Culberson Co.(TX)(11- 13,000 BP), Anderson Pit (IN) & Bat C.(MO; 10-16,000BP), & New Paris #4(11,300BP), PA/ now in AK se to NE, s. to extreme swTX/ red squirrel/ Tx in WA)

## TAPIRS

In mammal of Order Perissodactyla, Family Tapiridae (*Tapirus*)

*Tapirus* Brisson, 1762 (tapirs) Family Tapiridae. **Bibl.:** C. Ray & Sanders 1984

*Tapirus californus* Merriam, 1912 (= *T. haysii c.*) (extinct California Tapir possibly as fossil in Dry Cave (NM))

*Tapirus copei* Simpson, 1945 (= *T. haysii* Leidy, 1859 (Rancholabrean, extinct/Cope's Tapir in late Sangamonian times in Sabertooth C. (FL) & early Irvingtonian Haile sinkhole (Alachua Co., FL), Moore Pit (Rancholabrean, TX), sinkhole (Scott Co., KY), Hamilton C. (WV) & Vess & Lookout C. & Craig Quarry (TN)/ now in nMex. n. to cAZ, sNM, cTX)

*Tapirus* undet. sp. or species (extinct in Pleistocene Ventana C. (11,300 yrs. - AZ), (Cave Acb-3 Unit E (Unit E – Sangamonian, 11.5-4k, average 11.8k yrs., Unit D – 172k +-10k, both in AL) early Irvingtonian in Inglis sinkhole, Citrus Co., FL) & Bradford C., Bartow Co., GA)

*Tapirus cf. veroensis* Sellards, 1918 (Vero tapir/ Finger Quarry, TN)

*Tapirus veroensis* Sellards, 1918 (= *T. tennesseae* Hay, 1920; *T. excelsus* Simpson, 1945) (Vero tapir extinct Pleist. in Bowman Saltpeter (VA), Reddick (Marion Co., FL), Anderson Spr. (Walker Co., GA), Sabertooth Cave (Sangamonian or possibly Wisconsinian, FL), in latest Irvingtonian sink near Coleman, Sumter Co., FL & late Rancholabrean Reddick I Site fissure, (Marion Co.), FL & Proctor C. (KY) & Claiborne Co, TN)

## VOLES

In mammal Order Rodentia, Suborder Sciurognathi, Family Muridae, Subfamily Arvicolinae. (*Atopomys*, *Clethrionomys*, *Lagurus*, *Phenacomys*) **Paleo Bibl.:** C. Bell 1997; Morlan 1984, 1990; Van der Meullen 1978.

*Atopomys* Patton, 1965 - Family Muridae, Subfamily Arvicolinae. **Fossil Bibl.:** Winkler & Grady 1990

*Atopomys salvelinus* Zakrzewski, 1975 (Extinct Trout Cave vole in Trout (type) & Hamilton C. (both WV) & Cumberland (MD) C.)

*Atopomys texensis* Patton, 1965 (extinct vole in \*Fyllan C.,nwAustin, TX) Bibl.: Winkler & Grady 1990

*Clethrionomys* Tilesius, 1850 (red-backed voles) - Family Muridae, Subfamily Arvicolinae (3 extant species in US & Canada)

*Clethrionomys gapperi* (*Arvicola g.* Vigors, 1830) (boreal redback vole, extralimital in IN, WV, WY, ID, TN & VA (Late Pleist.) caves & Cumberland (MD) C. (late Irvingtonian), Eastman Bluff C.#2 (TN), Peccary C.(4,300BP),AR), & Bat C.,MO(10-16,000BP/ now in Canada to NE s. along Appalachians, s. to cOR, along Rockies to cNM) **Fossil Bibl.:** Cockrum & Fitch 1952; R.L. Richards 1985

*Lagurus* Gloger, 1841 (sagebrush voles) (= *Eremiomys*) Family Muridae, Subfamily Arvicolinae (1 extant species in US & Canada)

*Lagurus curtatus* (*Arvicola c.* Cope, 1868; *Lemmiscus c.*) (Sagebrush or prairie vole in Pleist. Dry, Atlatl & Isleta C. (NM) east extralimital, Bechan C. (seUT, 11,670 to 12,900 yrs. BP) southeast extralimital & Haystack & Porcupine C. (CO) north extralimital/ now in Great Basin n. to seAB,wSD & s.to cUT)

*Lagurus* undescr. sp. (Irvingtonian extinct fossil in Cathedral C., NV) Owen et al. 2000

*Lemmiscus* Thomas, 1912 is included in *Lagurus*

*Pedomys* Baird, 1858 – Muridae rodents

*Pedomys llanensis* Hibbard, 1994 (Llano vole/ extinct Late Pleist. in Fyllan (TX) & Trout (WV) caves) Bibl.: Grady & Gardon 2000; Winkler & Grady 1990

*Phenacomys* Merriam, 1889 (heather voles) Family Muridae, Subfamily Arvicolinae (3 extant species in US & Canada)

*Phenacomys gryci* Repenning, 1987 (extinct fossil 750,000 BP in Porcupine C., CO & Irvingtonian Cathedral C., NV)

*Terricola* Fatio, 1867 – Muridae rodents

*Terricola meadensis* (= *Pitymys m.* Hibbard, 1944) (Irvingtonian extinct fossil in Cathedral (NV) & Porcupine (CO) C.)

*Phenacomys intermedius* Merriam, 1889 (heather vole or mountain phenacomys / extralimital in Peccary (AR/Wisconsinian), Bootlegger Sink & New Paris #4 (PA), Graham (MO), IN caves R.L. Richards 1985; Baker Bluff, Cheek Bend, Carrier Quarry & Guy Wilson C. (TN) Parmalee & Klippel 1981 & in Patton, many WV,VA caves, Horned Owl, Little Canyon Cr. & Little Box

Elder (WY), Wasden, Moonshiner & Wilson Butte (ID) & Cumberland C.(Pre- Wisconsinan) (MD), Parmalee & Klippel 1981a (elevation extralimital in Haystack C., CO/ now in Canada s. along mts. To cCA, nNM)

*Phenacomys* (extralimital in Wisconsinan Trout C. (WV))

## WALRUSES

Order Pinnipeda

Family Odobenidae (*Odobenus*)

*Odobenus* Brisson, 1762 - Odobenidae mammals (walruses) (1 extant species in US & Canada)

*Odobenus rosmarus* (*Phoca r.* Linnaeus, 1758) (TtX in AK sea caves)

**WEASEL** - See also ermine & marten

In mammal Order Carnivora, Suborder Caniformia, Family Mustelidae, Subfamily Mustelinae (*Mustela*)

*Mustela* Linnaeus, 1758 (ermine, ferrets, minks, weasels) Family Mustelidae, Subfamily Mustelinae (3 extant *Mustela* species in US or Canada)

*Mustela frenata* Lichenstein, 1831 (long-tailed weasel as fossil from Moonshiner C., SE ID/ presently sCanada to Mex., except parts of SW/Tx in OH).

*Mustela erminea* Linnaeus, 1758 (short-tailed weasel or ermine; Wisconsinan in Schulze (12,500BP), Crankshaft, Chimney Rock, Silver Creek, Wasden, Moonshiner, & Fairbanks II C.; extralimital in Cave Without a Name & Klein C. (>8k BP), TX & Pintwater C. (32-9k BP in sNV)/ shorttail weasel/ presently N, s.to nNM, nCA, MD)

*Mustela nivalis* Linnaeus, 1766 (s. extralimital in Irvingtonian Cathedral C., NV/ least weasel/ now in most of Canada, s. in MW to ne MT, NE, IA, nIL, nN, OH, PA, WV and through sAppalachians)

*Mustela rixosa* Bangs, 1896 (=M.n.r.; may be same as Old World *M. nivalis* Linnaeus, 1766) (least weasel/ extralimital Pleist. fossil in Crankshaft, Peccary (4,300BP,AR), & Moonshiner C (ID), Snake Cr. Burial C.(NV)/ presently in Canada, nMW to PA, s. in Appalachians),

## WOLVES

In mammal Order Carnivora, Suborder Caniformia, Family Canidae, Subfamily Caninae (*Canis*)

*Canis* Linnaeus, 1758 (dogs, foxes, jackals, wolves) Family Canidae, Subfamily Caninae (3 extant species in US & Canada)

*Canis arnbrusteri* Gidley, 1913 (extinct Arnbrusters Wolf in Cumberland & New Trout (WV,>600,000BP) C. & (early Irvingtonian Haile sinkhole (Alachua Co.,FL) & ), in latest Irvingtonian sink near Coleman, Sumter Co., FL, **Bibl.:** B. Patterson 1932

*Canis dirus* Leidy, 1858 (*C. indianensis* Leidy, 1869; *C. mississippiensis* Allen, 1876; *C. ayersi* Sellards, 1916) (dire wolf in Pleist. in Ventana C. (11,300 yrs. - AZ); Potter Cr., Kokoweef & Samwell (CA); Devil's Den, Reddick (Marion Co.) & Cutler Hammock sinks (FL); Jaguar C. (ID); Harrodsburg Crevice (IN), Muskox, Hermit & Conkling (NM), Welsh (13,000BP,KY); Gypsum C. (NV); Williams (11,140-12,100 yrs.), McKittrick? & Lower Sloth? C. (TX); Little Canyon Cr. C. (WY); 7 c. in MO(13,170+-600 BP) FL & late Rancholabrean Reddick I Site fissure, (Marion Co.), FL) **Bibl.:** Hawksley et al. 1963

*Canis latrans* Say, 1823 (*C. orcutti*, *C. andersoni* Merriam, 1910; *C. riviveronis* Hay, 1917; *C. caneloensis* Skinner, 1942; *C. irvingtonensis* Savage, 1951) (coyote / widespread in NA/ TTx in TX) widespread in Pleist., as in Cumberland C.)

*Canis lupus* Linnaeus, 1758 (grey wolf/ widespread Pleist. fossil; extralimital in Pintwater C. (32-9k BP in sNV); /historically most of NA, now largely AK, Canada & patches in swCO, nMI, nWA, NM, seAZ, nWI, WY, swTX)

*Canis priscolatrans* Cope, 1899 (*C. edwardii* Gazin, 1942) (extinct wolf coyote in Irvingtonian in Cumberland C. & early Irvingtonian Haile sinkhole (Alachua Co.,FL)

## WOLVERINES

*Gulo* Pallas, 1780 - mammal Carnivora of Mustelidae, subfamily Mustelinae (1 extant species in US & Canada)

*Gulo gulo* (*Ursus g.* Linnaeus, 1758; *G. gidleyi* Hall, 1936) in Irvingtonian Port Kennedy (PA) & Cumberland C., both extralimital, & in Wisconsinian across NA; in Nielson's Well, UT (extirpated) & Natural Trap (WY, extirpated)/ presently in AK,nCanada, s. to sBC, patches in cCO,PNW),

ungulate - Mammal that includes Orders Artiodactyla (even toed ungulate) (**antelope, bison, deer, elk, deer, musk-ox, goat, peccary & sheep**) & Perrissodactyla (odd-toed ungulate) (**horse, tapir, rhino**).

mammoth - See mammal, elephant.

man-caused - See human impacts.

management see also conservation) - Baichtal, Swanson & Archie 1996; Helf, Poulson & Lavoie 1996; Grady & McEachern 1977; J. Lewis 1982a, 1996a; Noble 1991; Squire 1979; Tercafs 1988a; Toomey et al 1996; Walsh 1991.

Mandibulata – Arthropods in Subphyla Branchiata (= Diantennata) and Tracheata. Now thought to be an artificial grouping.

manganese - See bacteria

marine relict - Animal whose evolutionary ancestors lived in salt water, but became adapted to life in fresh water when its habitat was gradually raised above sea level, or was recharged by fresh water in some other way.

marine (see biogeography & anchialine) - Iliffe 1990; Iliffe et al 1984

marmot - see mammal, groundhog.

marten - See mammal, marten

MAST – Abbrev. For mean annual surface temperature. The deep zone of caves usually have the same temperature unless there is heat production from the geothermal gradient, biota (such as large bat colonies) or from certain chemical reactions such as concentrated sulfuric acid solution or if the climate is rapidly changing. Lag times in caves in response to MAST changes generally are in the order of thousands of years. Syn.: M.A.S.T.

mastodon(t) - See mammal, elephant.

maternal-offspring - See behavior

Maxillopoda - Crustacean class incl. Subclasses Branchiura, Copepoda (**copepods**), Cirripedia (**barnacles**), Tantulocarida, Mystacacarida (**mystacocarids**) & Ostracoda (**ostracods**). Molecular studies indicate this group is not monophyletic and is artificial.

## Mayflies & Shadflies

Orders Ephemeroptera (=Ephemera) & Palaeodictyoptera of Class Insecta, Subclass Pterygota, Division Palaeoptera (also put in Division Ephemeroptera, Infraclass Pterygota). Of the winged insect orders that have not become extinct, they are the oldest and the only ones that molt after reaching the first winged stage. The few minutes to several day lives of most adults gives them their name (*ephemeroptera*, from *ephemero-* “lasting a day”, and *pteron*, “winged”). Adults don’t feed; their mouthparts are vestigial. 1-30 mm., soft-bodied with a cylindrical elongate shape. Antennae are short and setalike. Two pairs of delicate, triangularly shaped wings with the front pair larger, with many cross veins, and the hind pair smaller, sometimes reduced, or, in a few species, absent. Legs are long, slender, and unmodified 3 except that the front pair is longer than the others. The abdomen is usually as long as or longer than the body.

They are hemimetabolous, with egg, larva, subimago and adult stages. Larvae generally are broad with gills along the sides of the abdomen. Their mouthparts chew aquatic plants, detritus and animal carcasses (sometimes); some are carnivores. They live a few weeks to a year (rarely to 50 in freshwater streams, ponds and lakes. Molting may occur 20-60 times before the subimago stage. Unlike stoneflies, adults fold their wings vertically when not in use and have thin caudal filaments. Males typically perform a mating dance in clusters, rising up a few feet and then falling downwards before rising again

Of the 2,000 or so described species, 611 in 59 genera occur in the U.S. and Canada. Most species are pollution intolerant.

**Bibl.:** Alba-Tercedor & Sanchez-Ortega 1991; Berner 1950; Edmunds 1972; Edmunds & Allen 1957; Edmunds, Allen & Peters 1963; Edmunds, Jensen & Berner 1976; Hubbard 1990; McCafferty 1991. **Areas:** FL L. Berner 1950; IL: Burks 1953; MI: J. Leonard & F. Leonard

1962; NA: G. Edmunds et al. 1990; Klots 1966; McCafferty 1981; Merritt & Cummins 1978;  
World M. Hubbard 1990

Suborder Pannota (subsumed in Rectracheata)

Suborder Pisciforma (= Schistonota in part) (splitback mayflies)

Superfamily Siphonuroidea

Ameletidae

Baetidae

Siphonuridae (once in Baetoidea) (primitive minnow mayflies)

Subfamily Isonychiinae (*Isonychia*)

(also put Isonychiidae, Oligoneuriidae & Amelitidae))

Subfamily Siphonurinae (*Ameletus* (also put in Ameletidae), *Siphonurus*)

Superfamily Heptagenioidea (= Baetoidea in part)

Ameletidae (*Ameletus*) (also put in Siphonuridae)

Baetidae (small minnow mayflies; small mayflies)

(*Baetis*, *Baetodes*, *Callibaetis*; undet. genus (Tx? in MN; Ac in OH)

Heptogeniidae

Isonychiidae

Oligoneuriidae

Suborder Rectracheata (=Pannota in part) (fusedback mayflies)

Superfamily Caenoidea

Caenidae

Subfamily Caeninae (*Caenis*)

Superfamily Ephemerelloidea

Ephemerellidae (now in Ephemeroidea)

Tricorythidae (now in Leptohyphidae)

Superfamily Leptophlebiioidea

Ephemerellidae (now in own superfamily)

Leptophlebiidae (pronggills; pronggill mayflies) (*Leptohypes*, *Tricorythodes*)

Undet. Tx genus in Vancouver Island, BC

Subfamily Atalophlebiinae (*Choroterpes*, *Neochoroterpes*)

Subfamily Leptophlebiinae (*Habrophleboides*, *Leptophlebia*, *Paraleptophlebia*)

Superfamily Ephemeroidea (burrowing & tusked mayflies)

Ephemeridae (burrowing mayflies)

(*Callibaetis*, *Ephemera*, *Hexagenia*, *Leptobrancha*)

Ephemerellidae (spiny crawlers or midboreal mayflies)

Subfamily Ephemerellinae

Tribe Ephemerellini

Subtribe Ephemerellae

(*Caudatella*, *Drunella*, *Ephemerella*, *Eurylophella*, *Sarratella*)

Behningiidae (*Dolania*)

Palingeniidae (spinyheaded burrower mayflies)

Subfamily Pentageniinae (*Pentagenia*)

Polymitarcyidae (pale burrower mayflies)

Subfamily Polymitarcyinae (*Ephoron*)

Potamanthidae (hacklegill mayflies) (*Anthopotamus*)

**Ameletidae** (*Ameletus*) (also put in Siphonuridae)

**Baetidae** (small minnow mayflies; small mayflies)

(*Baetis*, *Baetodes*, *Callibaetis*; undet. genus (Tx? in MN; Ac in OH)

**Behningiidae** (*Dolania*)

**Caenidae**

Subfamily Caeninae (*Caenis*)

**Ephemeridae** (burrowing mayflies)

(*Callibaetis*, *Ephemera*, *Hexagenia*, *Leptobrancha*)

**Ephemerellidae** (spiny crawlers or midboreal mayflies)

Subfamily Ephemerellinae

Tribe Ephemerellini

Subtribe Ephemerellae

(*Caudatella*, *Drunella*, *Ephemerella*, *Eurylophella*, *Sarratella*)

**Heptageniidae** (flatheaded mayflies; stream mayflies)

Subfamily Heptageniinae

(*Cinygma*, *Cinygmula*, *Epeorus*, *Heptagenia*, *Pentagenia* (also put in Leptogeniidae),  
*Rhithrogena*, *Stenacron*, *Stenonema*; Ac or Tx undet. genus in AR)

**Isonychiidae** (*Isonychia*) - Now put in Siphonuridae (also put in Oligoneuriidae)

**Leptophlebiidae** (pronggills; pronggill mayflies) (*Leptohypes*, *Tricorythodes*)

Undet. Tx genus in Vancouver Island, BC

Subfamily Atalophlebiinae *Choroterpes*, *Neochoroterpes*,

Subfamily Leptophlebiinae *Habrophleboides*, *Leptophlebia*, *Paraleptophlebia*)



**Oligoneuriidae** (brush-legged or brushlegged mayflies)  
Subfamily Isonychiinae (*Isonychia* (now in Siphonuridae  
(also in Isonychiidae & Amelitidae))

**Palingeniidae** (spinyheaded burrower mayflies)  
Subfamily Pentageniinae (*Pentagenia*)

**Polymitarcyidae** (pale burrower mayflies)  
Subfamily Polymitarcyinae (*Ephoron*)

**Potamanthidae** (hacklegill mayflies) (*Anthopotamus*)

**Siphonuridae** (primitive minnow mayflies)  
Subfamily Isonychiinae (*Isonychia*) (also put Isonychiidae, Oligoneuriidae & Amelitidae))  
Subfamily Siphonurinae (*Ameletus* (also put in Ameletidae), *Siphonurus*)

**Tricorythidae** (little stout crawlers; little stout crawler mayflies)  
(*Leptohypes*, *Tricorythodes*) (both now subsumed in Leptohyphidae)

**MAYFLY** species incl.

*Ameletus* Eaton, 1885 (= *Chimura* Navas, 1915; *Paleoameletus* Lestage, 1940; *Metreletus* Demoulin, 1951) Siphonuridae Ephemeroptera (mayflies), Subfamily Siphonurinae (also put in Ameletidae) (31 species in US or Canada)

*Ameletus* undet. sp. or species (BC, CO, NC?, WV hyporheic; Tx or Ac in BC & 7 seAK c.; NC hyporheic?, meiofauna & benthic streams)

*Anthopotamus* McCafferty & Bae, 1990 (= *Potamanthus*) - Potamanthidae mayflies (4 species in US or Canada)

*Anthopotamus* undet. sp. (hyporheic burrower in OH; VA, MD brackish infauna)

*Baetis* Leach, 1815 (= *Brachyphlebia* Westwood, 1840; *Montobaetis*, *Rhodobaetis*, *Vernobaetis*, 1972 (Unav.); *Tatubaetis* Kang & Yang, 1994; *Acentrella*, *Neobatis*) (small mayflies) Baetidae Ephemeroptera (mayflies) (59 species in US or Canada) **Bibl.:** Bergman 1977; Morihara 1978

*Baetis intercalaris* McDunnough, 1921 (IL, ON hyporheic)

*Baetis* undet. sp. or species (CA (seasonal resident), CO, ON, TX, WI hyporheic; Tx in BC & 29 c. in seAK)

*Baetis tricaudatus* Dodds, 1923 (= *B. intermedius* Dodds, 1923; *B. incertans*, *vagans* McDunnough, 1925; *B. jesmondensis* McDunnough, 1938; *B. sp. No. 1* Traver, 1932; *Neobatis t.*) (NA, Central Amer./ BC hyporheic, PA spr.)

*Baetodes* Needham & Murphy, 1924 - Baetidae Ephemeroptera (mayflies) (2 species in US or Canada)

***Baetodes alleni*** (McCafferty & Provonsha, 1993) (Edwards Plateau, TX/Pb?)

***Baetodes bibranchius*** (McCafferty & Provonsha, 1993) (sUS to n.Mex./Pb? In Edwards Plateau, TX)

***Caenis*** Stephens, 1835 (*Oxycypha* Burmeister, 1839; *Ordella* Campion, 1923; *Austrocaenis* Barnard, 1932) Caenidae Ephemeroptera (mayflies)(13 species in US or Canada)

***Caenis anceps*** Traver, 1935 (PA hyporheic)

***Caenis*** undet. sp. or species (IL?, OK, ON, PA, PQ, TX hyporheic larvae/Tx? in MN; MI lake benthic; VA, MD brackish infauna)

***Callibaetis*** Eaton, 1881 (= *Neobaetis* Navas, 1924) (flecked mayflies) Ephemeridae Ephemeroptera (mayflies)(23 species in US or Canada)

***Callibaetis*** undet. sp. (sON/Tx or Ac)

***Caudatella*** Edmunds, 1959 - Ephemerellidae Ephemeroptera (mayflies), Subfamily Ephemerellinae, Tribe Ephemerellini, Subtribe Ephemerellae (5 species in US or Canada)

***Caudatella*** undet. sp. (Tx or Ac in 1 seAK c.)

***Centroptilum*** Eaton, 1869 - Baetidae Ephemeroptera (mayflies) (6 species in US or Canada)  
***Centroptilum album*** McDunnough, 1926 (PA hyporheic)

***Choroterpes*** Eaton, 1881 - Leptophlebiidae Ephemeroptera (mayflies), Subfamily Atalophlebiinae (12 species in US or Canada)

***Choroterpes*** undet. sp. (CO hyporheic)

***Cinygma*** Eaton, 1885 - Heptogeniidae Ephemeroptera (mayflies), Subfamily Heptageniinae (3 species in US or Canada)

***Cinygma*** undet. sp. or species (Tx in BC & 13 seAK c; CA hyporheic)

***Cinygmula*** McDunnough, 1933 - Heptogeniidae Ephemeroptera (mayflies), Subfamily Heptageniinae (11 species in US or Canada)

***Cinygmula ramaleyi*** Doods, 1923 (detritus hyporheic in BC)

***Cinygmula*** undet. sp. (CO hyporheic; Tx in 30 seAK c.)

***Dolania*** Edmunds & Traver, 1959 - Behningiidae Ephemeroptera (mayflies)(1 species in US or Canada)

***Dolania americana*** Edmunds & Traver, 1959 (sand burrows in streams in seUS; hyporheic burrower in OH; unlike most species, the females perform a level, slightly undulating mating dance over water)

***Drunella*** Needham, 1905 - Ephemerellidae Ephemeroptera (mayflies), Subfamily Ephemerellinae, Tribe Ephemerellini, Subtribe Ephemerellae (15 species in US or Canada)

***Drunella doddsi*** (*Ephemerella d.* Needham, 1927) (wNA/CO hyporheic)  
***Drunella*** undet. sp. (Tx or Ac in 6 seAK c.)

***Epeorus*** Eaton, 1881 (= *Iron*, *Ironopsis*) Heptogeniidae Ephemeroptera (mayflies), Subfamily Heptageniinae (19 species in US or Canada)

***Epeorus*** undet. sp. or species (Tx in BC, WV & 13 seAK c.; PA spr.)

***Ephemera*** Linnaeus, 1758 (= *Nirvius Navas*, 1922) Ephemeridae Ephemeroptera (mayflies)(7 species in US or Canada)

***Ephemera danica*** Muller, 1764 (burrows in NA river gravel; hyporheic burrower in OH)

***Ephemera simulans*** Walker, 1853 (= *E. decora* Walker, 1853; *Palingenia natata* W.1853; *E.n.* (Walker), 1853) (brown drake; chocolate dun/NA/Tx or Ac in sON; burrows in gravel in Manitoba)

***Ephemerella*** Walsh, 1862 (= *Chitonophora* Bengtsson, 1908) Ephemerellidae Ephemeroptera (mayflies), Subfamily Ephemerellinae, Tribe Ephemerellini, Subtribe Ephemerellae.(28 species in US or Canada) **Bibl.:** R. Allen 1960; Steger 1931

***Ephemerella deficiens*** Morgan,1911 (ON, PQ hyporheic larvae)

***Ephemerella dorothea*** Needham, 1908 (WV nonkarst hyporheic)

***Ephemerella excrucians*** Morgan,1911 (ON, PQ hyporheic larvae)

***Ephemerella infrequens*** McDunnough, 1924 (wNA/CO hyporheic)

***Ephemerella inermis*** Eaton, 1884 (wNA/ BC, CO hyporheic)

***Ephemerella needhami*** MCDunnough, 1925 (NE,SE,nMex./Tx? in MN?)

***Ephemerella*** undet. sp. or species (NC?, PQ hyporheic; NC stream benthic & meiofauna)

***Ephoron*** Williamson, 1802 - Polymitarcyidae mayflies, Subfamily Polymitarcyinae (2 species in US or Canada)

***Ephoron*** undet. sp. or species (hyporheic burrower in OH; NC marine infauna; VA, MD brackish infauna)

***Eurylophella*** Tiensuu, 1935 - Ephemerellidae Ephemeroptera (mayflies), Subfamily Ephemerellinae, Tribe Ephemerellini, Subtribe Ephemerellae. (12 species in US or Canada)

***Eurylophella funeralis*** (*Ephemerella t.* McDunnough, 1925) (WV hyporheic)

***Eurylophella*** undet. sp. (Tx or Ac in 1 seAK c.; MI lake benthic; VA, MD brackish infauna)

***Eurylophella temporalis*** (*Ephemerella t.* McDunnough, 1924) (seVA hyporheic)

**Habrophleboides** Ulmer, 1920 - Leptophlebiidae, Subfamily Leptophlebiinae (4 species in US or Canada)

**Habrophleboides** undet. sp. (PA? hyporheic)

**Isonychia** Eaton, 1871 (= *Jolia*, *Chirotonetes* (emend.) Eaton, 1881; *Eatonia* Ali, 1971 (Unav.) (white legged mayflies) Siphonuridae Ephemeroptera (mayflies), Subfamily Isonychiinae (also put in Ameletidae, Oligoneuriidae, Isonychiidae) (25 species in US or Canada)

**Isonychia sicca** (*Baetis s.* Walsh, 1862; *I. edmundsi* Kondratieff & Voshell, 1984; *I. sieca*)

**Isonychia sicca manca** (*I.m.* Eaton, 1871) (TX hyporheic) **Bibl.:** P. Grant 1978; Kondratieff 1982

**Isonychia** undet. sp. or species (Tx or Ac in sON; IL river benthic)

**Heptagenia** Walker, 1863 (stream mayfly) Heptogeniidae Ephemeroptera (mayflies), Subfamily Heptageniinae (36 species in US or Canada)

**Heptagenia** undet. sp. or species (CO, IL?, TX hyporheic)

**Hexagenia** Walsh, 1863 (golden mayfly) Heptogeniidae Ephemeroptera (mayflies)(5 species in US or Canada)

**Hexagenia bilineata** (*Ephemera b.* Say, 1824) (hyporheic burrower in OH; Virginian (rare), Carolinian freshwater infauna)

**Hexagenia limbata** (*Ephemera l.* Serville, 1829; *Palingenia occulta, viridescens* Walker, 1853; *H. munda, variabilis, venusta* Eaton, 1883; *H. affiliata* McDunnough, 1927; *H. carolina, elegans, marilandica, mingo, rosacea, weewa, pallens* Traver, 1935; *H. californica* Upholt, 1937; *H. kanuga* Traver, 1937)) (NA except AK, NWT/ sandfly, burrowing mayfly, fishfly, giant Michigan mayfly, spinner or caddis, great olivewing drake/ Tx? in MN; sandy hyporheic in Great Lakes, Manitoba, TX; rare Virginian marine infauna)

**Hexagenia** undet. sp. (VA, MD brackish infauna)

**Litobrancha** Mccafferty, 1971 – Ephemeridae Ephemeroptera (mayflies), Subfamily

**Litobrancha recurvata** (Morgan, 1913) (NC marine infauna)

**Leptophlebia** Westwood, 1940 (= *Blasturus* Eaton, 1881; *Euphyurus* Bengtsson, 1909) Leptophlebiidae Ephemeroptera (mayflies), Subfamily Leptophlebiinae (10 species in US or Canada)

**Leptophlebia** undet. sp. or species (Tx? in MN; seVA hyporheic)

**Neochoroterpes** Allen, 1974 - Leptophlebiidae Ephemeroptera (mayflies), Subfamily Atalophlebiinae (3 species in US or Canada) **Bibl.:** B. Henry 1989

**Neochoroterpes oklahoma** (*Choroterpes o.* Traver, 1934; *C. mexicana & mexicanus* Allen, 1974; *C. sp. 2* Lugo-Ortiz & McCafferty, 1995) (NW, SW, Central Amer./ TX hyporheic)

***Paraleptophlebia*** Lestage, 1916 (= *Oligophlebia* Demoulin, 1965) Leptophlebiidae Ephemeroptera (mayflies), Subfamily Leptophlebiinae. (33 species in US or Canada) **Bibl.** Lehmkuhl & Anderson 1971; Mattingly 1986

***Paraleptophlebia*** undet. sp. or species (MI lake benthic; BC, n,sCA, CO, PQ, seVA, WV hyporheic; Tx in BC & 28 seAK c.; VA, MD brackish infauna)

***Paraleptophlebia temporalis*** McDunough, 1926 (Ttx in Vancouver Island, BC)

***Pentagenia*** - Palingeniidae Ephemeroptera (mayflies), Subfamily Pentageniinae (also put in Heptogeniidae) (2 species in US or Canada)

***Pentagenia*** undet. sp. (hyporheic burrower in OH)

*Potamanthus* = *Anthopotamus*

***Rhithrogena*** Eaton, 1881 (brown stream m.) Heptogeniidae Ephemeroptera (mayflies), Subfamily Heptageniinae (21 species in US or Canada)

***Rhithrogena hageni*** Eaton, 1885 (*H. brunnea* Hagen, 1875 (Homo.: *H.b* (Rambur), 1842; in part renamed); *R. doddsi* McDunough, 1926) (wCanada & wUS/western red gill/ BC (detrital), CO hyporheic)

***Rhithrogena*** undet. sp. (Tx or Ac in 4 seAK c)

***Sarratella*** Edmunds, 1959 - Ephemerellidae mayflies , Subfamily Ephemerellinae, Tribe Ephemerellini, Subtribe Ephemerellae. (14 species in US or Canada)

***Sarratella*** undet. sp. (MI lake benthic)

***Siphonurus*** Eaton, 1868 - Siphonuridae Ephemeroptera (mayflies), Subfamily Siphonurinae (17 species in US or Canada)

***Siphonurus*** undet. sp. (Ac in 1 seAK c.)

***Stenacron*** Jenson, 1974 – Heptogeniidae mayflies, Subfamily Heptageniinae (7 species in US or Canada)

***Stenacron*** undet. sp. (VA, MD brackish benthic)

***Stenonema*** Traver, 1933 - Heptogeniidae mayflies, Subfamily Heptageniinae (24 species in US or Canada). **Bibl.:** Bednarik 1978

***Stenonema*** (*S.*) *femoratum* (Baetis f. Say, 1823; *Ecydyonurus* & *Siphonurus* f. (Say), 1823 (comb.) *Heptagenia tripunctata* (Banks, 1910); *S. birdi*, *scitulum* Traver, 1935) (US, Canada, n.Mex./Ac or Tx in AR)

*Stenonema modestum* (*Epeorus modestus* Banks, 1910) (seVA hyporheic)

*Stenonema* undet. sp. or species (MI lake & IL, NC stream benthic & meiofauna; NC?, TX (sandy) hyporheic?; Tx or Ac in sON, WV)

*Tricorythodes* Ulmer, 1920 - Tricorythidae Ephemeroptera (mayflies)(8 species in US or Canada)

*Tricorythodes minutus* Traver, 1935 (= *T. fallax* Traver, 1935; *T. fallacina* McDunnough, 1939) (NE, W, nMex./ CO hyporheic)

*Tricorythodes* undet. sp. or species (IL?, TX hyporheic; VA, MD brackish infauna)

Mecoptera (scorpionflies & allies) – Insect Order of Subclass Pterygota, Division Neoptera, Subdivision Endopterygota (=Holometabola), Section Panorpidia, Subsection Anthophora. Not known from US or Canadian caves or aquatic interstitial habitats

**Mecopterida** - Section of Subdivision Endopterygota of Class Insecta. Includes Superorder Antliophora (Orders Mecoptera, Siphonaptera (fleas) & Diptera (flies) & Superorder Amphiesmenoptera (Orders Trichoptera (stoneflies), Lepidoptera (moths and butterflies) and Hymenoptera (wasps, bees and kin)

**megafauna** - Animals large enough to be seen with our unaided eyes. Cf. macrofauna

**Megaloptera** (=Sialoidea) Small insect order of about 100 species. Included with Neuroptera.

**meiobenthos** - Benthic interstitial fauna. Syn.: Mesopsammon

**meiobenthos** - Benthic species that pass through a 2 mm mesh are retained on a 40-200 micron mesh.

meiobenthic – 1. Benthic species that pass through a 500 micron sieve but are retained on a 40 micron sieve. 2. Adj. for meiobenthos.

**meiofauna** - Benthic or subsurface microfauna which do not pass through a 500 micron sieve but are retained on a 40 micron sieve or which do not pass through a 1mm sieve. Area type of species mostly inhabiting microcavernous spaces in-between particles of (usually unconsolidated) sediments, such as sand & fine gravels, or in porous rocks. Incl. hyporheic, phreatobia, & upper hypogean (edaphophile). **Bibl.:** Furstenberg, et al., 1978; Heip, 1984; Higgins & Thiel, 1988; Husmann 1971; Palmer, M.A. 1990a; Uhlig et al., 1973; Ward & Palmer 1994

**mesobiota** - Soil species of intermediate size. Incl. mesofauna & mesoflora.

**mesophilic** - Species which thrive best in intermediate temperatures and habitats neither very dry nor very wet.

**mesopsammon** - Benthic interstitial fauna. Syn.: meiobenthos.

mesovoid shallow stratum – See superficial underground compartment.

Mesotrophic – Referring to an intermediate amount of available organic matter or medium energy density. Cf. oligotrophic & eutrophic.

**Mesozoic** - Geologic period which lasted for about 100 million years and ended about 75 million years ago. Some cavefish species appeared to have arisen after marine regression at the end of the Mesozoic isolated populations in eastern NA.

**metabolic rate** - The rate at which a specie transforms food into energy & body tissue. The higher its metabolic rate, the more food it must consume to continue living. Many cavernicoles live at a reduced metabolic rate but often live longer compared to surface counterparts & therefore are susceptible to bioaccumulation of pollutants.

**metabolism** - The sum of the chemical activities taking place in living cells; the sum of the processes by which a species transforms food into energy & living tissue. Bibl - See energy). Hueppop 1985; Jegla 1964

cellulose - Chamier, Anne-Carole. 1991

cellular - Dickson & Giesey 1981; Dickson & Franz 1980; Dickson, Gary & Giesey 1982

crayfish - McWhinnie & Connor, 1967

digestion (see feeding) –

Lavoie et al 1988; Lavoie, Phillpotts, et al. 1991; White 1989; Wildfang 1989

energetics - Weingartner 1979

microbial - Hicks, R.J. & J.K. Fredrickson, 1988.

neurology - Takahata, Masakazu & Hisada 1981

osmoregulation - Dobkin & Manning 1964; Parry 1957

oxygen usage - see oxygen

primitiveness - Popa 1997

rates - Hadley, Ahearn & Howarth 1981; Studier & Lavoie 1990

size, effects of - Poulson & Lavoie 1990

starvation resistance/effects - Northup, Lavoie, & Studier 1991; Steeves, 1964

temperature –

Poulson & Lavoie 1990; Studier & Lavoie 1991; Studier, Lavoie, Wares & Linn 1987

water loss - Hadley, et al.1981; Poulson & Lavoie 1990; Studier & Lavoie 1990;

Studier & Lavoie 1991; Studier, Lavoie, Wares & Linn 1987a; Thibaud 1981

Metazoa – A clade that includes all animals except the protists Chaonoflagellata (sometimes excluded from Animalia). Divided into Eumatozoa (most animals) and the Porifera and Placozoa

**microarthropods** - Small athropods that live between soil particles, especially certain mites, springtials, other apterygote insects, spiders and myriapods.

**microbe** - Microscopic current or fossil species. Often filamentous in U-loops, moonmilk. *Leptothrix*, *Crenothrix*, & *Thiobacillus* like filaments in cave & paleokarst sediments in SD & NM Palmer & Palmer, 1990. Incl. algae, bacteria, mold, moonmilk, rotifer, & water bears (tardigrades).

Microbe **Bibl.:** Balkwill & Ghiorse 1985; Beloin & Ghiorse 1988; Boyd 1965; Bone & Balkwill 1988; Brock, Passman & Voder 1974; Coumartin 1963; Cunningham 1991; Davis, Palmer & P. 1990; Dickson 1975; Eicheim et al. 1993; Feldhake & Vestal 1985; Fliermans, Bohlool, & Schmidt 1974; Fliermans & Dupont 1975; Ghiorse 1984; Ghiorse & Wilson 1988; Greer 1985; Hendry, et al 1993; Hicks & Fredrickson 1988; Jimenez 1990; Jones, Beeman & Suflita 1989; Lavoie 1981a; Lavoie et al 1988; Lavoie, Studier, Edwards & Apgar 1985; Lavoie, Studier & Kennedy 1988; Madsen & Ghiorse 1993; Ohde & Takii 1978; Olson & Thompson 1991; Phelps, Raione & White 1989; Phillipotts 1989; Rusterholtz 1989; Sinclair & Ghiorse 1987, 1989; Thompson & Olson 1988; Wood, Keller & Johnstone 1993; Northup, Lavoie & Mallory 1997; Rusterholtz 1989;

**microbe hazard** - Incl. coccidiomycosis, fungus, hantavirus, leptospirosis, plague, rabies, rat bite fever, tetanus, ticks, tularemia. Hazard transmitted by ticks incl. Colorado Tick Fever (west), Lyme Disease, Rocky Mountain Spotted Fever (west), ehrlichiosis (south, south-central, southeast), Tick-bite Paralysis, & Tick-borne Relapsing Fever (TX).

**microbial biomass** - Measured as total lipid phosphate content.

**microbial activity** - The overall respiration of a microbial community. Measured as DO loss for anaerobics) & as the amount of carbon<sup>14</sup>-acetate incorporation into lipids.

**microbiota** - The smallest soil species such as bacteria, fungi, algae, & protists.

microclimate - See climate, habitat, temperature, humidity. Poulson, 1984a

**microfauna** - The smallest soil or benthic animals, those invisible to our unaided eye and which pass through a 40 micron mesh, smaller than meiobenthos

**microhabitat** - A restricted, defineable space where environmental conditions differ from those in surrounding area. See habitat. Poulson, 1984a

microvloid – See mesocaverns.

midges - See Diptera: Caratopogonidae

migration - See dispersal

milieu souterrain superficial – Syn: Superficial underground compartment.

## Millipedes

A primarily phytosaprophagous myriapodous arthropod of the class Diplopoda. Each segment is really a diplosegment formed by fusion of adjacent somites in the embryo, and most therefore



have two pairs or four legs. Autapomorphies include the diplosegment condition, aflagellate spermatozoa, and at least four sensory cones on the apices of the distal antennal articles. The sides of the head are covered by the bases of the large mandibles, the ends of which have a movable gnathal lobe with teeth and a rasping surface. Near the rear top of the head is a plate (gnathochilarium) ;formed by fusion of the first maxillae and vestigial head appendages and the second maxillae) About 7,800 known species. First appear in Silurian.

Millipedes are often called “1000-legged” or “rain” worms. They are wormlike with rounded body segments that bear two pairs of legs on each segment (centipedes have only one leg per segment). The head is rounded with short antennae. Species can vary in length from less than one to two or more inches. They are light brown to black in color.

Millipedes are not poisonous, but many species have glands capable of producing irritating fluids (usually containing benzoquinones) which can create superficial “burns” on human skin, cause damage to the eyes or may produce allergic reactions. Most of these species are found in the tropics.

Most millipedes are scavengers and feed primarily on decaying vegetation and leaf litter, although some species attack roots of living plants and a few cave species (not in US or Canada) are carnivores. Millipedes spend most of their life in the soil where they also overwinter. In the spring, millipedes lay from 20-300 eggs in the soil. The eggs hatch in several weeks, and the young millipedes have only the first three pair of legs and not more than seven segments. With each molt they add additional segments and legs until they reach maturity. Sexual maturity is reached in 2-5 years depending on the species.

**Bibl.:** Anon., 1947a; Bashor, 1974; Bollman, 1893; Carmoody, 1974; Causey, 1960a, 1971, 1973, 1975; Elliott, 1998; Enghoff, 1991; Hoffman, 1980; Hopkin & Read, 1992; Loomis, 1939, 1943; Chamberlin & Hoffman, 1958; Mauriès, 1994; Shear, 1972a, 1969; Bollman, 1887-8;. Packard, 1883

**Areas:** **AZ:** Chamberlin, 1930a; **CA:** Causey, 1963a; Causey, 1973; Graham, 1968; Grinnell, 1908; **IN:** McNeill, 1888; **FL:** Causey, 1960; **IN:** Packard, 1886; **KY:** Kingsley, 1888; **LA:** Causey, 1963; **MO:** Causey, 1960d; **NA:** Causey, 1960a, 1961, C. Hoff, 1958a; Shear, 1969a; **NM:** C. Hoff, 1956d; **OR:** Causey 1973; **PA:** Dearolf 1938; **TX:** Causey 1959; **UT:** Chamberlin 1930a; **VA:** R. Hoffman 1949; **WA:** Causey 1973; **WV:** R. Hoffman 1949.

Subclass Penicillata

Superorder Pselaphognatha

Order Polyxenida

Suborder Polyxenidea

Family Polyxenidae

Subclass Chilognatha

Infraclass Pentazonia

Superorder Chilognatha

Order Glomeridesmida - absent from North America.

Order Sphaerotheriida - absent from North America.

Order Glomerida (= Oniscomorpha) (pill millipedes)  
Family Glomeridae - no cave representatives.

Subclass or Infraclass Helminthomorpha  
Subterclass Colobognatha  
Superorder Typhlogena

Order Platydesmida (= Proterospermophora, Polydesmidea)  
Suborder Platydesmidea  
Superfamily Platydesmoidea

Family Andrognathidae  
Subfamily Andrognathinae – *Andrognathus*  
Subfamily Bazillozoniinae – *Brachycybe*

Superorder Ommatophora  
Order Polyzoniida

Suborder Polyzoniidea  
Superfamily Polyzonioidea

Family Hirudisomatidae.  
Subfamily Kiusionzoniinae – *Octoglena*

Family Polyzoniidae (also put in Order Colobognatha)  
(*Petaserpes*, *Polyzonium*)

Family Siphonotidae - introduced, no cave representatives.

Order Siphonophorida  
Family Siphonophoridae - *Siphonophora*  
Family Siphonorhinidae - no cave representatives.

Subterclass Eugnatha  
Superorder or Order Nematophora (= Chordeumida)

Order Stemmiulida - absent from North America.  
Order Callipodida (also put in Superorder Coelocheta)

Suborder Schizopetalidea  
Superfamily Schizopetaloidea

Family Caspiopetalidae  
Subfamily Abacioninae - *Abacion*, *Tetracion*

Family Schizopetalidae  
Subfamily Acanthopetalinae  
Tribe Colactidini - *Colactis*

Order Chordeumatida (also put in Superorder Coelocheta)

Suborder Striariidea

Superfamily Striarioidea

Apterouridae - no cave representatives

Urochordeumatidae - no cave representatives.

Superfamily Brannerioidea

Branneriidae - no cave representatives

Tingupidae – *Tingupa*

Superfamily Chordeumatidea

Caseyidae (or uncertain superfamily placement)

- *Caseya*, *Opiona*, *Speoseya*, *Underwoodia*, *Vasingtona*

Superfamily Chordematoidea

Order Chordeumidia **Bibl.:** Shear, William A. 1972.

*Idagona*(also in Conotylidae, Subfamily Idagoninae or Idagonidae)

Rhiscosomididae - no cave representatives.

Striariidae - *Striaria*, *Speostriaria*

Superfamily Cleidogonoidea

Cleidogonidae **Bibl.:** Shear 1971 - *Pseudotremia*

Trichopetalidae (see below)

Superfamily Heterochordeumatidea

Adritylidae - *Adrityla*

Trichopetalidae (also put in Superfamily Cleidogonoidea)

- *Scoterpes*, *Trichopetalum*

Conotylidae (two new sp. in Vancouver Island caves) - *Lophomus*, *Plumatyla*

Subfamily Austrotylinae – *Achemenides*, *Austrotyla*

Subfamily Conotylineae - *Conotyla*, *Taiyutyla*

Subfamily Conotylineae – *Macromastus*

Superorder or Order Juliformia (= Opisthopermorphora)

Order Julida (also put under superorder Diplocheta)

Aprosphylosomatidae (also subsumed in Julidae)

Subfamily Aprosphylosomatinae - *Aprosphylosoma*

Chelوجلidae - no cave representatives.

Telsonemasomatidae - no cave representatives.

Zosteractinidae

*Ameractis*, *Zosteractis* (both also put in Nemasomatidae)

Suborder Parajulidea

Blaniulidae

Subfamily Blaniulinae

Tribe Blaniulini – *Blaniulus*

Tribe Boreoiulini – *Proteroiulus*

Nemasomatidae (also subsumed in Julidae)

Subfamily Nemasomatinae

Tribe Ameractini – *Ameractis* (put in Zosteractinidae)

Tribe Nemasomatini – *Nemasoma*

Tribe Zosteractininae – *Zosteractis* (put in Zosteractinidae)

Okeanobatidae - no cave representatives.

Peromopodidae

*Californiulus*, *Paeromopus*, *Tylobolus* (also put in Spirobolidae)

Parajulidae

*Aniulus*, *Oriulus*, *Parajulus*, *Ptyoiulus*, *Spathiulus*, *Uroblaniulus*, Undet. genera in BC

Suborder Julidea

Julidae - introduced

Subfamily Julinae

Tribe Cylandroiulini - *Cylandroiulus*

Tribe Leptoiulini - *Ophiulus*

Superorder Anocheta

Order Spirobolida

Suborder Spirobolidea

Superfamily Spirobolidea

Allopocockiidae - no cave representatives.

Atopetholidae

Subfamily Eurelinae – *Eurelus*

Floridobolidae - no cave representatives

Pachybolidae - introduced to Hawaii, no cave representatives.

Spirobolellidae - introduced to Hawaii, no cave representatives.

Spirobolidae. Bibl.: Keeton 1960

Subfamily Spirobolinae – *Narceus*

Subfamily Tylobolinae - *Tylobolus* (put in Paeromopodidae)

Superorder Diplocheta  
Order Spirostreptida  
Suborder Cambaloidea

Superfamily Cambaloidea  
Cambalidae - *Cambala*, *Dimerogonus*, *Nannolene*

Cambalopsidae - introduced to Hawaii, no cave representatives  
Choctellidae - *Choctella*

Suborder Spirostreptidea  
Superfamily Spirostreptoidea  
Spirostreptidae - *Orthoporus*

Superorder Merocheta  
Order Polydesmida

Suborder Paradoxosomatidea  
Superfamily Paradoxosomatidea

Paradoxosomatidae - introduced  
Subfamily Paradoxosomatinae  
Tribe Sulciferini - *Oxidus*

Superfamily Sphaeriodesmoidea  
Sphaeriodesmidae  
Subfamily Desmoninae  
Tribe Desmonini - *Desmonus*

Superfamily Stygodemoidea  
Pyrgodesmidae - *Myrmecodesmus* (alien)

Superfamily Trichopolydesloidea  
*Phreatodesmus* (uncertain family)

Suborder Chelodesmidea  
Superfamily Platyrrhacoidea  
Platyrrhacidae (= Euryuridae) - *Auturus*, *Euryurus*

Superfamily Xystodesmoidea  
Eurymerodesmidae. **Bibl.:** Shelley 1994b; (*Eurymerodesmus*)

Xystodesmidae. **Bibl.:** Shelley 1994b; Undet. genera & sp. in seAK  
Subfamily Xystodesminae  
Tribe Aphelorini (*Apheloria*, *Brachoria*, *Sigmoria*)  
Tribe Chonaphini - *Chonaphe*, *Semionellus*

Tribe Harpaphini – *Harpaphe*, *Tubaphe*  
Tribe Pachydesmini - *Pachydesmus*

Tribe Rhysodesmini - *Cherokia*, *Rhysodesmus*  
Tribe Sigmocheirini - *Sigmocheir*  
Tribe Xystodesmini – *Motyxia*, *Xystocheir*

Suborder Polydesmidea

Superfamily Polydesmoidea

Haplodesmidae - introduced, no cave representatives.

Macrosternodesmidae - *Chaetaspis* (or put in Superfamily Trichopolydesmoidea)

Nearctodesmidae (or put in Superfamily Trichopolydesmoidea) **Bibl.:** Shelley 1994c  
*Ergodesmus*, *Kepolydesmus*, *Nearctodesmus*

Polydesmidae

*Brachydesmus*, *Polydesmus*, *Pseudopolydesmus*, *Scytonotus*, *Speodesmus*, *Tidesmus*

Superfamily Trichopolydesmoidea

Macrosternodesmidae (see above)

Nearctodesmidae (see above)

***Abacion*** Rafinesque, 1820 (= *Spirostrephon*, *Reasia*, *Platops*) Caspiopetalidae millipedes,  
Subfamily Abacioninae (4 species in eUS, nMex.)

***Abacion lactarium*** (*Pseudotremia l.* Say, 1821; *Lysiopetalum l.*, 1883; *Spirotrephon l.* Wood,  
1865) (Tx or Ac in cave each in Hamilton & Grundy Cos., TN) Loomis 1939

***Abacion tessellatum*** Rafinesque, 1820 (*Julus lactarius* Say, 1821) (Ac in Pulaski Co.,MO; Ttx in  
TN (Davidson, Lawrence, Grundy Cos.) **Bibl.:** Loomis, 1939

***Abacion texense*** (Loomis, 1943) (Tp or Tx in AR (Searcy Co.),OK; Ac in cTX (San Saba Co.))

***Abacion magnum m.*** (*S.m.* Loomis, 1943) (Tp or Tx in nAL,VA)

***Abacion*** undet. sp. (Ac in TX)

*Acanthoiulus* Verhoeff, 1894 = *Pachyiulus*

*Acentronus* Chamberlin, 1938 = *Rhysodesmus*

*Achemenides* Shear, 1971 - Conotylidae millipedes, Subfamily Austrotylinae (1 species in IL,  
IA, WI)

***Achemenides pectinatus*** (= *Conotyla* & *Sonoratyla p.* Causey, 1952) Shelley, 1971 (type  
locality cave in Carroll Co., + caves in Jo Daviess Co.,IL/Upper MS Valley, IA (Des Moines,  
Jackson & Winneshiek Cos.),WI (Grant & Richland Cos.) & MN (Fillmore Co.)/ mines;glacial  
relict? /Tb/ G4G5/ **Bibl.:** Peck & Christiansen 1990; Shear 1971

*Ackandra* Loomis, 1964 = *Cleidogona*

***Adrietyla*** Chamberlin, 1910 - Adrietylidae millipedes (3 species in UT, MT)

***Adrietyla deseretae*** Chamberlin, 1910 UT, Salt Lake Co., Ac or Tx. **Bibl.:** Causey 1972.

***Allajulus*** Koch, 1847 (= *Ypsiloniulus* Verhoeff, 1899 *Diploiulus*?) Julidae millipedes

***Allajulus latistriatus*** = *Cylindroiulus l.*

***Ameractis*** Causey, 1959 - Order Julida, Zosteractinidae millipedes (also put in Nemasomatidae, Subfamily Nemasomatinae, Tribe Ameractini) (1 species in TN)

***Ameractis satis*** Causey, 1959 (type locality cave in White Co., TN & caves in Cumberland, Decatur, Hamilton, Monroe, Overton, Putnam & Roane cos.; AL, Marshall Co.; NC, Madison, McDowell cos. & GA (Dade Co.), Tb/ G3G4) **Bibl.:** Causey, 1959, Hoffman 1964, Shear 1969, Enghoff 1982

***Amplaria*** Chamberlin, 1941 = *Striaria*

***Andineptus*** Chamberlin, 1941 = *Orthoporus*

***Andrognathus*** Cope, 1869 - Andrognathidae millipedes, Subfamily Andrognathinae (one species in US)

***Andrognathus corticarius*** Cope, 1869 (E/Tx in SE)

***Aneuloboilus*** Verhoeff, 1899 = *Neottiulus*

***Aneuloboilus arborum*** Verhoeff, 1899 = *Neottiulus a.*

***Aniulus*** Chamberlain, 1940 - Order Julida, Parajulidae millipedes (14 species in US, SE, w. to AZ, n. to ND, CO)

***Aniulus adelphus*** Chamberlin, 1940 (Ac or Tx in Comal, Travis Cos., TX)

***Aniulus austinensis*** Chamberlin, 1940 (Ac or Tx in Bell, Bexar, Travis, Williamson Cos., TX)

***Aniulus nigrans*** Chamberlin, 1918. (Ac, Tx or Tp in Smith Co., TN) **Bibl.:** Causey 1959

***Antridesmus*** Loomis, 1941 = *Chaetaspis*

***Apacheiulus*** Loomis, 1968? - Parajulidae millipedes (2 species in AZ, NM)

***Apacheiulus guadalupensis*** Loomis, 1968 (Ac in nNM)

***Apheloria*** Chamberlin, 1921 (= *Leptocircus*, *Rudiloria*) Order Polydesmida, Xystodesmidae millipedes, Subfamily Xystodesminae, Tribe Aphelorini (6 species in eUS)

***Apheloria coriacea*** (Koch) = *A. corrugata butleriana*

***Apheloria trimaculata*** (Wood) = *Sigmoria t.*

*Apheloria corrugata butleriana* (Bollman, 1889). IN, Harrison Co., Ac; Tx or Ac? in MO & cave in KY) **Bibl.:** Hoffman & Lewis 1997

*Aporiaria* Verhoeff, 1932 = *Rhysodesmus*

*Aprosphylosoma* Hoffman, 1961 - Order Julida, Aprosphylosomatidae millipedes, Subfamily Aprosphylosomatinae (once subsumed in Julidae) (one species in OR)

*Aprosphylosoma darcenae* Hoffman, 1961. (OR Caves?, Josephine Co., OR/ Tb) **Bibl** Hoffman 1961, Shelley 1994a

*Arctobolus* Cook, 1904 = *Narceus*

*Austrotyla* Causey, 1961 (= *Sonoratyla* Hoffman, 1961)) Order Chordeumatida, Conotyliidae millipedes, Subfamily Austrotylinae (6 species, Rockies from AB to nMex., also upper MS River Valley)

*Austrotyla humerosa* = *Taiyutyla h.*

*Austrotyla specus* s. (*A.s.* Loomis, 1939; *Conotyla s.*, *A.s.s.* & *montivaga*; *S.s.*) Causey, 1961 (type locality cave in Jefferson Co. +Franklin & St.Louis Cos.,MO & IA, Jackson; IL, Jackson, Joe Daviess, Monroe, Henderson, Saline, St. Clair, & Union cos. +MW, WI, MN?/ Tp in nIL, IA, eMo/ rare epigeal, Ac or Tx in NM) **Bibl.:** Loomis 1943, Causey 1961, Shear 1971

*Austrotyla* undescr.? sp. (nNM/Tb)

*Austrotyla* undet. sp. (Shasta Co.,CA)

*Auturus* Chamberlin, 1942 (= *Illiniurus*) Order Polydesmida, Platyrrhacidae millipedes

*Auturus evides* Bollman, 1887 (Tx or Ac in AR (Benton, Fulton & Independence Cos.); MO (Barry, Camden, Carter, Christian, Crawford, Dent, Howell, LaClede, McDonald, Miller, Oregon, Ozark, Pulaski, Shannon, St. Louis, & Washington Cos.) & OK (Cherokee Co.) **Bibl.:** Duniva, Tumilson & McDaniel 1982 Shelley 1982

*Auturus* undet. sp. (or *Euryurus*) (MO/Tx)

*Bazillozonium* Verhoeff, 1935 = *Brachygybe*

*Blaniulus* Gervais, 1836 (= *Typhloblaniulus*; *Plusioiulus*) Order Julida, Blaniulidae millipedes, Subfamily Blaniulinae, Tribe Blaniulini (2 alien species in US)

*Blaniulus guttulatus* (Bosc, 1792) (Europe,Eb/ alien edaphic Tx or Ac in GA (Dade Co.))

*Blaniulus venustus* Meinert, 1868 (*Nopoiulus* v. Schubart, 1934) (Europe,Eb/ alien Tx in cave in Fayette Co.; Pleistocene in MD cave)

*Bollmaniulus* Verhoeff, 1926 - Parajulidae millipedes (12 species in wUS)



*Bollmaniulus* undet. sp. (Amador & Mariposa Cos.,CA)

*Brachoria* Chamberlin, 1939 (= *Tucoria*) Xystodesmidae millipedes, Subfamily Xystodesminae, Tribe Aphelorini (28 species in eUS)

*Brachoria* undet. sp. (nMS/Tx)

*Brachycybe* Wood, 1864 (= *Bazillozonium* Verhoeff, 1935) Order Polydesmida, Andrognathidae millipedes, Subfamily Bazillozoniinae (6 species in Japan, eUS, or CA)

*Brachycybe petasata* Loomis, 1936 (\*?type locality cave in Great Smokies Natl. Park, Blount Co.,TN/ Tp, Tx or Ac) **Bibl.:** Causey 1959.

*Brachycybe lecontei* = *B. superus*

*Brachycybe producta* Loomis (= *B. tuolumna* or *B. tuolumne* Chamberli, 1953) Gardner, 1975 (type locality cave in in Tuolumne Co./ TX, CA epigean)

*Brachycybe tuolumna* Chamberlin, 1953 = *B. producta*

*Brachydesmus* Heller, 1858 - Order Polydesmida, Polydesmidae millipedes (also treated as subgenus or jr. syn. of *Polydesmus*)

*Brachydesmus cavicola* - see *Tidesmus*

*Brachydesmus superus* Latzel, 1884 (= *B. pallidus* Loomis, 1939; *Tidesmus* & *Cambala s.*) (Europe epigean/alien in US/ Ac or Tx in PA (Blair, Mifflin cos) VA (Shenandoah Co.) WV (Kanawha Co. & near Charlestown); AR (Sharp Co.), KY (Fayette Co.) & sON, Europe) **Bibl.:** Loomis 1939, 1943; Chamberlin & Hoffman 1958

*Brachydesmus yosemitensis* = *Californiulus* undet. sp.

*Californiulus* Verhoeff, 1938 - Order Julida, Paeromopodidae millipedes  
*Californiulus chamberlini* (Brolemann, 1922) (Ac in cave in Shasta Co., CA)  
**Bibl.:** Shelley 1994a

*Californiulus dorsovittatus* Verhoeff, 1938. (Ac in cave in Shasta Co., CA)  
**Bibl.:** Shelley 1994a

*Californiulus* undet. sp. (Tx in Calaveras, Mariposa, & Tuolumne Cos.,CA)  
*Californiulus vicinus* (Chamberlin, 1941) (Lassen Natl. Park/Tx in Shasta Co.)

*Cambala* Gray, 1832 (= *Troglocambala*, *Eclytus*, *Eclomus*) Order Spirostreptida, Cambalidae millipedes (8 species in South, WA, ID)

*Cambala annulata* (*Julus a.* Say, 1821) (= *C. cristula* Loomis; *Spirobolus a.*; *C. lactaria* Newport) AL, Talladega Co.; FL, Jackson Co.; TN, Perry & Wayne cos.; IN, Crawford Co.; KY, Robertson Co., Ac (Loomis 1939, 1943; Causey 1959; Shelley 1979; Hoffman & Lewis 1981).

(FL to IN, OH, PA/ Tp in AL, FL, GA, KY, TN (Marion?, Wayne, Perry Cos.), VA, WV; Tx? in IN; TTx or Ac in GA (Bartow, Dade Cos.))

*Cambala captiosa* = *C. speobia*,

*Cambala cristula* = *C. annulata*

***Cambala hubrichti*** Hoffman, 1858 (epigean in nGA, swVA, eTN, wNC/ Tx in TN (Blount Co.); Tx in NC (McDowell, Polk, Rutherford, & Transylvania cos.) & wSC; bat guanobic in GA (Walker Co.)) **Bibl.:** Chamberlin & Hgoffman, 1958; b Shelley 1979

***Cambala minor*** Bollman, 1888. (*C. annulata minor* Bollman, 1888; *C. arkansana* Chamberlin, 1942) AL, Madison Co.; AR, Washington Co.; IL, Monroe & Union cos.; IN, Clark, Crawford, Harrison, Jefferson, Jennings, & Washington cos.; KY, Hart Co.; MO, Genevieve, Perry, & Taney cos.; OK, Adair & Sequoyah cos.; TN, Bedford, Davidson, DeKalb, Hickman, Humphreys, Jefferson, Perry, Wayne, Smith & Roane cos.; VA, Alleghany, Augusta, Bath, & Washington cos.; and WV, Greenbriar Co./ Tp in AL, AR, FL, GA, IL, IN, KY, MO, OH, OK, TN, VA, WV; ecUS epigean/ IN S2G3) **Bibl.:** Loomis 1943; Causey, 1959; Shelley 1979; Hoffman & Lewis 1981

***Cambala ochra*** Chamberlin, 1942 (*C. & Troglocambala loomisi* Hoffman, 1956) (type locality cave in Conecuh Co., nAL/Ep in LA, MS/ Tx in nAL (Conecuh Co.), sIN, cKY, eTX, TN?; Tp in GA (Bartow Co.)) **Bibl.:** Hoffman 1956; Shelley 1979

***Cambala speobia*** (= *Eclytus & Eclomus s.* Chamberlain, 1952; *S. caeca* Loomis, 1953; *C. captiosa & inornatus* Causey, 1959; *C. reddellii i., r* Causey, 1964) Causey, 1964 (type locality cave in Edwards Co. + Bell, Childress, Comal, Coryell, Culberson, Edwards, Kimble, Travis, Wheeler & 18 other cos. in c, sc, swTX/ Tp) **Bibl.:** Bull & Mitchell 1970; Causey 1964, Elliott & Mitchell 1972; Shelley 1979; Bull 1969

*Cambala superus* = *Brachydesmus s.*

*Cambala reddelli inornatus* = *C. speobia* (synonymized by Shelley, not by Shear)

*Cambala reddelli r.* (= *C. speobia*) (synonymized by Shelley, not by Shear)

***Caseya*** Cook & Colins, 1895 - Order Chordeumatida, Caseyidae millipedes

***Caseya*** undet. sp. (Tx? in Mariposa & Tuolumne Cos., CA)

*Cavota* Chamberlin, 1942 = *Cleidogona*

*Campodes* sensu Bollman, 1893 = *Cleidogona*,

***Chaetaspis*** Bollman, 1887 - Order Polydesmida, Macrosternodesmidae millipedes (4 species in eUS)

***Chaetaspis albus*** Bollman, 1887 (Tx in cave in Edmonson Co., KY) **Bibl.:** Loomis 1939

***Chaetaspis debilis*** (*Antriadesmus d.* Causey, 1959) (type locality cave in Wayne Co., + White & Overton Cos., TN/ Tb)

*Chaetaspis fragilis* (*Antriadesmus* f. Loomis, 1953) (\*White's C. (Part of Mammoth Cave System) & under stones outside cave, near Mammoth C. PO, Edmonson Co., TN/ Tp)

**Bibl.:** Loomis 1943, 1960; Chamberlin & Hoffman 1958

*Chaetaspis mollis* (Causey, 1959) (\*Cumberland (=Henshaw, Higgenbotham) C., Warren Co., TN/ Tp)

*Chaetaspis* (= *Antriadesmus*) undet. sp(p). (IL, OK/Tb or Tp in IL, MO, OK; Tb in AR; Tp? in Russel C.?.; Tb or Tp in 2 caves in Wayne Co., KY) **Bibl.:** Ward 1983

*Chamberlineptus* Causey, 1953 = *Orthoporus*

*Cherokia* Chamberlin, 1949 - Xystodesmidae millipedes, Subfamily Xystodesminae, Tribe Rhysodesmini (1 species in seUS)

*Cherokia georgiana* (Bollman, 1889) (Ac or TTx in cave in Walker Co., GA)

*Choctella* Chamberlin, 1918 - Order Spirostreptida, Choctellidae millipedes (2 species in US (SE))

*Choctella cumminsi* Chamberlin, 1918. Ac or Tx in TN, Grundy & Warren Cos.) **Bibl.:** Causey 1959

*Chonaphe* Cook, 1904 - Order Polydesmida, Xystodesmidae millipedes, Subfamily Xystodesminae, Tribe Chonaphini (4 species in OR, WA, ID) **Bibl.:** Shelley 1994

*Chonaphe remissa* Chamberlin, 1949 (= *C. armata* Attems, 1931) (Ac or Tx in Skamania Co., WA)

*Cleidogona* Cooke, 1895 (= *Ackandra*, *Campodes*, *Cavota*, *Cryptotrichus*, *Hirsutogona*, *Mecistopus*, *Mexiceuma*, *Rhabdorona*) Order Chordeumatida, Cleidogonidae millipedes (71 species in Us, s. to Panama)

*Cleidogona bacillipus* (Chamberlin & Mulaik, 1941) (Tx or Ac in Bexar, Comal, and Kendall cos., TX)

*Cleidogona* undescr.? sp.#1, (\*Onondaga C., Crawford Co., MO/ Tp)

*Cleidogona* undescr.? sp. #2 (\*cave in Llano Co., TX/ Tp)

*Cleidogona* undet. sp. or species (Tx or Ac in 2 caves in Greenbrier Co., WV; Tx in nMS)

*Cleidogona unita* Causey, 1951 (epigeal & Tp in IL, KY)

*Colactis* Loomis, 1937 - Order Callipodida, Schizopetalidae millipedes, Subfamily Acanthopetalinae, Tribe Colactidini (4 species in CA)

*Colactis briggsi* = *C. utorum*

*Colactis tiburona* (Chamberlin, 1923). (Tx or Tp in Yuma Co., AZ) **Bibl.:** Shelley 1996

*Colactis utorum* (Chamberlin, 1925) (= *C. briggsi* Shear, 1974) (Tx or Tp in CA, Inyo Co.; AZ (Gila & Pima cos.) **Bibl.:** Shear, 1974, Shelley 1996a

*Conotyla* Cook & Collins, 1895 (= *Proconotyla*) Order Chordeumatida, Conotylidae millipedes, Subfamily Conotylinae (13 species in eUS)

*Conotyla blakei* (*Proconotyla b.* Verhoeff, 1932) (*C. vaga* Loomis, 1939) (type locality cave in Berks Co.(PA)/ E, New England/ glacial relict/ Tp in IL,MD,MO,NY (Orange, Schoharie, & Sullivan cos), PA (Berks, Blair, & Mifflin cos.); Tx or Ac in WV (Jefferson Co./ **Bibl.:** Loomis 1939, 1943; Shear 1971

*Conotyla bollmani* (*Trichopetalum b.* McNeil, 1887; *Craspedosoma b.* Bollman, 1887; *Scoterpes b.* Bollman, 1888; *C.w.*) Cook & Collins, 1896 (type locality cave in Monroe Co. + caves in Jennings, Lawrence, Orange, Owen, Monroe & WA Cos., IN/ Tp or Tb/ caves only) G3 **Bibl.:** Shear 1971; Hoffman & Lewis 1997

*Conotyla humerosa* Loomis, 1943 = *Taiyutyla h.* Loomis, 1953

*Conotyla pectinata* = *Achemenides* p.

*Conotyla* undet. sp. (Tx or Ac in NY (1 cave)

*Conotyla venetia* v. (Hoffman, 1961) (Tx? in cave in Alleghany Co.,VA/T&E VA S1, G2/S2 / Venetia Millipede)

*Conotyla villosus* = *C. blakei*

*Conotyla vista* Shear, 1971 (\*type locality cave in Raleigh Co.,WV/Tb/ SU G1G2)

*Costaricia* Loomis, 1966 & *Cryptotrichus* Packard, 1883 = *Cleidogona*

*Cylindroiulus* Verhoeff, 1894 (= *Allajulus* Curtis, 1945) Order Julida, Julidae millipedes, Subfamily Julinae, Tribe Cylindroiulini (3 species in Europe)

*Cylindroiulus arborum* Verhoeff, 1894 (Europe/ alien Tx in Marengo C., CrawfordCo., IN)

*Cylindroiulus latistriatus* Curtis, 1945 (*Allajulus l.* (Crabtree); *Julus hesperus* Chamberlin) (HA, BC to CA/ Tx or Ac in CA,PQ; Tp? In NS)

*Dampfaria* Verhoeff, 1932 = *Rhysodesmus*

*Dearolifa* Loomis, 1939 = *Pseudotremia*

*Desmonus* Cook, 1898 (= *Ethocyclus* Chamberlin & Mulaik, 1941; *Stilbopagus* Loomis 1966) Sphaeriodesmididae millipede, Subfamily Desmoninae, Tribe Desmonini (7 species in sUS or Mex.)

*Desmonus conjunctus* = *D. pudicus*,

*Desmonus pudicus* (Bollman, 1888) (Tx in Bexar, Burnet, Comal, Travis, & Williamson cos., TX) **Bibl.:** Shelley 1998a

*Diaporus* Silvestri, 1897 = *Orthoporus*

*Diploiulus* Berlese, 1883 (= *Allajulus*?) Order Julida, Julidae millipedes

*Diploiulus* (= *Allajulus*?) undet. sp. (Tx or Ac in sON)

*Dixidesmus* Chamberlin, 1943 = *Pseudopolydesmus*

*Dimerogonus* Attems, 1903 - Cambalidae millipedes (1 species in HA)

*Dimerogonus* undet. sp. (Australia/alien? Tp or Tx in montane wet cave (Maui) & Kazumura Lava Tube, HI Island, HI)

*Eclomus* Chamberlin, 1952 = *Cambala*

*Eclycytes* Chamberlin., 1952 = *Cambala*

*Ectopodesmus* Hoffman, 1942 = *Ergodesmus*

*Endere dusora* = *Plumatyla humerosa*

*Ergodesmus* Chamberlin, 1949 (= *Ectopodesmus* Hoffman, 1962) Order Polydesmida, Nearctodesmidae millipedes (3 species in YWA, MT, IL)

*Ergodesmus remingtoni* Hoffman, 1962 (type locality cave in Jersey Co., IL + Adams, Hardin Monroe, & Pike Cos., IL/ Tp but see remarks by Shelley 1994c:491)

*Ethmoiulus* Verhoeff, 1894 = *Ophiulus*

*Eurelus* Cook, 1911 - Eurelidae millipedes, Subfamily Eurelinae (1 species in TX)

*Eurelus kerrensis* Chamberlin & Mulaik, 1941 (Ac in 2 caves in Uvalde Co., TX)

*Eurymerodesmus* Brolemann, 1900 (= *Kewanius*) Order Polydesmida, Eurymerodesmidae, millipedes (22 species in seUS) **Bibl.:** Shelley 1989

*Eurymerodesmus birdi* b. (Chamberlin 1931) (Ac or Tx in cave ni Seminole Co., OK)

*Eurymerodesmus dactylocyphus* Shelley, 1990. (Ac, Tp, or Tx in TX, Williamson Co.) (Shelley 1990).

*Eurymerodesmus* undet. sp. (Eastern epigean / Tx in MS, MO, TX; TTx in OK)

*Eurymerodesmus digitatus* Loomis, 1976. (Tx or Tp in Travis Co.,TX) **Bibl.:** Shelley 1990

*Eurymerodesmus melacis* Chamberlin & Mulaik, 1941. (Tp or Tx in Bexar, Comal, Hays, Kerr, Medina, Terrell, and Uvalde cos., TX) **Bibl.:** Shelley 1990

*Euryurus* Koch, 1847 (= *Eutheatus*, *Singuliurus*) Order Polydesmida, Platyrrhacidae millipedes. **Bibl.:** Hoffman 1978

*Euryurus erythropygus* = *E. maculatus*

***Euryurus maculatus*** Koch, 1847 (*Polydesmus e.* Brandt, 1834; *E. erythropygus*) (unknown type locality/ Ac or Tx in cave in Madison Co., cAL) TX, Williamson Co. Loomis 1943

***Euryurus l. leachii*** Gray, 1832. (Tx in IN (Harrison, Jennings, Monroe, & Orange Cos.) & OH (Hocking, Highland & Gallia Cos.) **Bibl.:** Hoffman 1978; Hoffman & Lewis 1997

***Euryurus*** undet. sp. (near *E. leachii* (Gray) (MO/Tx)

*Eutheatus* Attems, 1938 = *Euryurus*

*Flagellopetalum* Causey, 1951 = *Zygonopus*

***Gosiulus*** Chamberlin, 1940 (*Ziniulus* Chamberlin, 1940) - Parajulidae millipedes (5 species in TX or NM)

***Gosiulus aethes*** (Chamberlin, 1940) (Ac or Tx in Bexar, Williamson Cos., TX)

***Gosiulus conformatus*** Chamberlin, 1940 (Ac in cave in Medina Co., TX)

***Gosiulus*** undet. sp. (Ac in Devil's Sinkhole, Edwards Co., TX)

***Harpaphe*** Cook, 1904 - Xystodesmidae millipedes, Subfamily Xystodesminae, Tribe Harpaphini (3 species, CA to BC)

***Harpaphe haydeniana*** (Wood, 1864) (yellow-spotted millipede/ Ac or Ttx in 1 WA cave)

*Hawaiicambala* Verhoeff, 1944 = *Nannolene*

*Hexaglena* McNeill, 1887 = *Polyzonium*

*Hirsutogona* Kraus, 1954 = *Cleidogona*

*Hypozonium* Cook, 1904 = *Octoglena*

***Idagona*** Buckett & Gardner, 1967 - Chordeumidae millipedes (also put in Conotylidae, Subfamily Idagoninae or in Idagonidae) (1 species in ID)

***Idagona westcotti*** B.&G.1967 (type locality cave in Clark Co. & caves in Craters of the Moon Natl. Monument, Lincoln Co.,ID + cave in Butte Co., ID)

*Illiniurus* Shear, 1968 = *Auturus*

*Ilyma* Chamberlin, 1941 = *Myrmecodesmus*

*Kalorthomorpha* Attems, 1914 = *Oxidus*

*Kaloiulus* = *Pachyiulus*

***Kepolydesmus*** Chamberlin, 1910 - Nearctodesmidae millipedes (4 species or subspecies in ID, WA, OR)

***Kepolydesmus anderisus*** Chamberlin, 1910 (TTx in OR?)

***Kepolydesmus mimus*** Chamberlin, 1947 (Tp? in WA)

***Kepolydesmus pungo*** Chamberlin, 1949 (Tp or Tx in OR, WA)

*Kewanius* Chamberlin, 1938 = *Eurymerodesmus*

*Lasiolathus* Loomis, 1943 = *Scytonotus*; *Leptocircus* Attens, 1931 = *Apheloria*  
*Leucoiulus* Verhoeff, 1894 = *Cylindroiulus*; *Listrostreptus* Verhoeff, 1941 = *Orthoporus*

***Lophomus*** Loomis & Schmitt, 1971 - Order Chordeumatida, Conotylidae millipedes (1 species in WA)

***Lophomus skamania*** (*Troglotyla s.* Causey, 1972) Shear, 1976 (type locality? & 2 other caves in Skamania Co., \*Mt. Adams area (incl. Klickitat Co.), WA/Tb) **Bibl.:** Shear 1976

***Macromastus*** Loomis & Schmitt, 1971 - Order Chordeumatida, Conotylidae millipedes, Subfamily Macromastinae (1 or 2 species in caves in MT, ID or eOR)

***Macromastus*** undescr. sp(p). or *Macromastus marginandus* Loomis & Schmitt, 1971 (/Tb or Tp in ID, eOR (less likely))

***Macromastus umpqua*** Shear, 1984 (\*type locality cave in Douglas Co., OR/ Tb/ G1G2)

*Mecistopus* Loomis, 1959 = *Cleidogona*  
*Megaiulus* Verhoeff, 1894 = *Pachyiulus*  
*Mexiceuma* Verhoeff, 1926 = *Cleidogona*

*Mexicoiulus* Verhoeff, 1926 = *Parajulus*  
*Minasgonus* Verhoeff, 1938 = *Orthoporus*

***Motyxia*** Chamberlin, 1941 - Order Polydesmida, Xystodesmidae millipedes, Subfamily Xystodesminae, Tribe Xystodesmini (6 species in CA)

***Motyxia pior*** Chamberlin, 1941. (Ac in Tulare Co., CA) **Bibl.:** Shelley 1998b

***Myrmecodesmus*** Silvestri, 1910 (= *Ilyma* Chamberlin, 1941) Pyrgodesmidae millipedes  
***Myrmecodesmus formicarius*** Silvestri, 1910 (Mexico, TX/ alien Tp in TX) (associate of *Solenopsis* fire ants)

***Nannolene*** Bollman, 1887 (= *Hawaicambala*) Cambalidae millipedes (8 species in CA, 14 in HA)

***Nannolene*** undet. sp. (HI Volcanoes Natl Park)

***Narceus*** Rafinesque, 1820 (= *Arctobolus*, *Rhexenor*, *Spirobolus*) Order Spiribolida, Spirobolidae millipedes, Subfamily Spirobolinae

***Narceus americanus*** (Palisot de Beauvois) ssp? (E/ Tx in AR,IL,IN (Harrison & Crawford Cos./S4/G4), nMS, sON,TX; Tx(prob.) in MO; Tx or Ac in 1 cave in Marion Co. & 1 cave in Warren Co, TN)

*Narceus marginatus* = *N. americanus*

*Narceus* undet. sp. (Tx in OH)

*Narceus tinctorius* Rafinesque = *N. americanus*

*Narceus annularis* (= *N. americanus annularis* Rafinesque, 1820) R., 1820 (East epigean/ Tx or Ac in KY, MD) **Bibl.:** Keeton 1960

*Nearctodesmus* Silvestri, 1910 - Order Polydesmida, Nearctodesmidae millipedes

*Nearctodesmus cochlearius* Causey, 1954 (Tp or Tx in OR C.,NM)

*Nearctodesmus cerasinus* (Wood, 1864). (Tx in OR (Josephine Co.) & BC) **Bibl.:** Shelley 1994c

*Nearctodesmus insulanus* (Chamberlin, 1941). (Ac in Vancouver Is., BC) **Bibl.:** Shelley 1994c

*Nearctodesmus salix* Chamberlin, 1949. (Ac in Mendocino Co., CA) **Bibl.:** Shelley 1994c

*Nemasoma* Koch, 1847 - Nemasomatidae millipedes, Subfamily Nemasomatinae, Tribe Nemasomatini (1 alien species in US; 3 species in Europe)

*Nemasoma* undet. sp. (Tp, Ac or Tx alien in MD)

*Neottiulus* Loomis, 1973 = *Aneuloboiulus*

*Octoglena* auct. nec Wood, 1864 (= *Polyzonium*) Hirudisomatidae millipedes, Subfamily Kusionzoniinae (4 species in US or Canada)

*Octoglena anurum* (*Hypozoneum a.* Cook, 1904) (HTx in WA?)

*Octoglena bivirgata* Wood, 1864 (Tp in CA (Napa Co.)) **Bibl.:** Shelley 1995a

*Octoglena* undet. sp. (HTx in WA)

*Ophthalmoblaniulus* Verhoeff, 1897 = *Nopoiulus*

*Ophiulus* Berlese, 1884 (= *Ethmoiulus*) Julidae millipedes, Subfamily Julinae, Tribe Leptoiulini

*Ophiulus* (*O.*) *pilosus* (Newport, 1843) (E/alien or Tx in seVA, WV; Tp? in nAL, NV; Tx in IN (Harrison Co./S4/G5),MD,OH; Ac or Tx in IN (Clark, Harrison, & Jennings cos.)

**Bibl.:** Hoffman & Lewis 1997; Causey 1963

*Opiona* Chamberlin, 1951 - Caseyidae millipedes (4 species in US)

*Opiona siliquae* Causey, 1963 (\*type locality cave in Mendocino Co.,CA/ Tp or Tb) **Bibl.:** Gardner & Shelley 1989

*Oriulus* Chamberlin, 1940 - Parajulidae millipedes (10 "species" (most likely jr. synonyms) in c,eUS, Rockies)

*Oriulus delus* Chamberlin, 1940 (Tx or Ac in MD)



*Orocylindricus* Verhoeff, 1930 = *Cylindroiulus*

**Orthoporus** Silvestri, 1897 (= *Andineptus*, *Chamberlineptus*, *Diaporus*, *Listrostreptus*, *Minasgonus*, *Minigonus*, *Phallorthus*, *Scaphiostreptus*, *Torynopus*, *Trinidadius*) Spirostreptidae millipedes (40 species, SW US to Brazil)

*Orthoporus flavior* = *O. ornatus*

**Orthoporus** undet. sp. (Ac or Tx in Medina, Terrell, Val Verde Cos., TX)

**Orthoporus ornatus** (Causey, 1954) (Ep in Randall Co.,TX/ Ac or Tx in Randall, Uvalde Cos., TX/ sp. cf. *O. ornatus* - 2,000 to 10,800 years BP in Neotoma woodrat nest in wTX (El Paso Co.) or sNM))

**Orthoporus** sp. cf. *texicolens* (Chamberlin, 1938) (Ac in cave in Bexar Co., TX)

**Oxidus** Cook, 1911 (= *Kalorthomorpha* Attems, 1914) Paradoxosomatidae millipedes, Subfamily Paradoxosomatinae, Tribe Sulciferini (1 species in Japan, alien cosmopolitan)

**Oxidus gracilis** (C. L. Koch, 1847) (HI,S,W/Asian alien Tp in nAL, GA (Bartow, Dade, Datur, Grady & WA Cos.), PA, TX, CA, MO, OH (Harding Co.); Tx or Tp in IN, Clark, Crawford, Orange, & Jennings cos.; Tp or Tx in MD?,SC; alien? Tp in Kazumura C., HI Island, HI ) **Bibl.:** Hamazaki 1995; Hoffman & Lewis 1997

*Oxyiulus* Verhoeff, Silvestri, 1896 = *Pachyiulus*

**Pachydesmus** Cook, 1895 - Xystodemidae millipedes, Subfamily Xystodesminae, Tribe Pachydesmini (2 species in se US)

**Pachydesmus** undet. sp. (nMS/Tx?) **Bibl.:** R. Hoffman 1958a

*Pachyiulus* = *Acanthoiulus*, *Kaloiulus*, *Megaiulus*, *Oxyiulus*

**Paeromopus** Karsch, 1881 (= *Paromopellus*) Order Julida, Paeromopodidae millipedes. **Bibl.:** Shelley 1994a

**Paeromopus angusticeps buttensis** Chamberlin, 1954. (Ac or Tx in Calaveras & Tuolumne Cos., CA) **Bibl.:** Shelley 1994a

*Paeromopus eldoradus* = *P. cavicolens*

**Paeromopus cavicolens** Chamberlin, 1949 (type locality cave in Calaveras Co. + caves in Tuolumne Co., CA/ Tx or Tp) **Bibl.:** Shelley 1994a

**Paeromopus angusticeps a.** (Wood, 1864) (Ac in Santa Cruz Co., CA) **Bibl.:** Shelley 1994a; Shelley & Bauer 1997

*Paraiulus* = *Parajulus*

**Parajulus** Humbert & de Saussure, 1869 (= *Mexicoiulus*) - Order Julida, Parajulidae millipedes (15 species in Mexico)

**Parajulus** undet. sp. (Tx? in cave in St. Clair Co.,IL/alien? from Mexico)

*Parajulus impressus* = *Ptyoiulus i.*

*Paranopoiulus* Lothmander, 1939 = *Nopoiulus*

*Paromopellus* Verhoeff, 1938 = *Paeromopus*

**Petaserpes** Cope, 1970 (= *Polyzonium*) - Order Polyzoziida, Polyzoziidae millipede

**Petaserpes bikermani** Causey, 1954. (Tx or Tp in IN (Mitchell Co) & MO (Barry Co.)) **Bibl.:** Shelley 1998c

*Phallorthis* Chamberlin, 1952 = *Orthoporus*

*Phractodesmus* - see *Tidesmus*

*Platops* Newport, 1844 = *Abacion*

*Platyulus* Gervais, 1836 = *Polyzonium*

**Phreatodesmus** Loomis, 1960 – Trichopolydesloidea millipedes, uncertain family (4 species in CA, phreatic habitats?)

**Plumatyla** Loomis, 1943 - Order Chordeumatida, Conotylidae millipedes (1 species in OR, CA)

**Plumatyla humerosa** (*Austrotyla* & *Conotyla h.* Loomis, 1943). (type locality in mine in Plumas Co., +Siskiyou Co., & Lava Beds Natl. Monument,CA & unidentified sites in adjacent OR, Tb/G3) **Bibl.:** Causey 1961, Shear 1971) (glacial refugia?)

*Plusioiulus* Silvestri, 1903 = *Blaniulus*

**Polydesmus** Latreille, 1802 (see *Pseudopolydesmus*, *Brachydesmus c.*, *Euryurus e.*) Order Polydesmida, Polydesmidae millipedes (numerous species in Palearctic) **Bibl.:** Anon. 1883

**Polydesmus inconstans** Latzel, 1884 (Tp? in NV; Ac in PQ; Tx in IN (Harrison Co.))

**Bibl.:** Hoffman & Lewis 1997

**Polydesmus sastianus** Chamberlin (Tx? in Tuolumne Co.,CA)

**Polydesmus** undet. sp. or species (Tx or Ac in GA(1cave) & sON; TTX in NJ)

**Polyxenus** Linnaeus, 1758 - Order Polyxenida, Polyxenidae millipedes

**Polyxenus lagurus** Linnaeus, 1758 (duff millipede) (Tp or Tx? in CO?) **Bibl.:** M. Kane 1981

**Polyzonium** Brandt, 1837 (= *Hexaglena* McNeill, 1887; *Octoglena* auct. nec Wood, 1864,

*Petaserpes* Cope, 1870; *Platyulus* Geraiis, 1836) Order Polyzoziida, Polyzoziidae millipedes (3 species in Europe, 11 species in eUS or eCanada)

**Polyzonium** undet. sp. (Tx or Ac in sON)

*Proconotyla* Verhoeff, 1932 = *Conotyla*

***Proteroiulus*** Silvestri, 1897 - Blaniulidae millipedes, Tribe Boreoiulini (1 alien species in US)  
***Proteroiulus fuscus*** Silvestri, 1897 (alien from Europe; Tx in NV)

***Pseudopolydesmus*** Attems, 1898 (= *Dixidesmus*) (incl. *Polydesmus*) Order Polydesmida,  
Polydesmidae millipedes (13 species in eUS) **Bibl.:** B. Valentine 1988; Withrow 1988

*Pseudopolydesmus branneri* (*Dixidesmus b.*) = *P. serratus*

***Pseudopolydesmus collinus*** Hoffman, 1974 (epigean in KY/Ac in Jennings Co., Inc) **Bibl.:**  
Hoffman & Lewis 1997

*Pseudopolydesmus hortus* (*Polydesmus m.* Wms. & Hef.) = *P. serratus*

*Pseudopolydesmus inconstans* (*Polydesmus i.* Toutes en Marmites) = *P. serratus*

*Pseudopolydesmus moniliaris* = *P. serratus*

***Pseudopolydesmus pinetorum*** (Bollman, 1887) (= *Polydesmus* & *Pseudotremia p.*)(Tx or Tp  
in AR (Fulton & Searcy Cos.),GA(prob.), IL, MO(Taney Co.),OK (Murray Co.))

***Pseudopolydesmus serratus*** (*Polydesmus s.* Say, 1821). Tx in IN (Harrison, Jennings, Monroe  
& Washington cos.), PA (Berks Co.), nAL, MD, sON, OH, PQ)

***Pseudopolydesmus*** undet. sp(p). (AL/Tx or Tp in IL, MD (WA Co.), MO (Crawford, Pulaski  
Cos.); Tx in sON, sOH, nMS, WV (or *Dixidesmus* sp.).

***Pseudotremia*** Cope, 1869 (= *Dearolfia*, incl. *Spirostrephon*) Order Chordeumatida,  
Cleidogonidae millipedes

***Pseudotremia aeacus*** Shear, 1972 (\*type locality cave in Dade Co. & cave (or new ssp.) in  
Walker Co.,GA /Tb/ G1)

***Pseudotremia acheron*** Shear, 1972 (type locality cave in Warren Co. & cave in Van  
Buren Co.,TN/ Tb/G3 or G1) **Bibl.:** Shear 1972

***Pseudotremia amphiorax*** Shear, 1972 (\*type locality cave in Meade Co.,KY/ Tb/ G1G2)

***Pseudotremia armesi*** (s. lat.) Shear, 1972 (type locality & 1 other cave in Mercer Co.,WV &  
cave in Tazewell Co.,VA/Tp,epigean/T&E VA S2, global G2)

***Pseudotremia carterensis*** (*P. cavernarum* var. *carterensis* Packard, 1888) Bollman, 1888  
(type locality + 2 other caves in Carter Co.+ cave in Elliott Co., KY./Tb/ Car. C. millipede/  
G1G2) **Bibl.:** C. Hoff 1958; Loomis 1939, Shear 1972

***Pseudotremia cavernarum*** Cope, 1869 (*Spirostrephon c.* Cope, 1872) (Erhart's (destroyed by  
quarry) Cave type locality & 4 caves in Montgomery Co. + caves in Giles Co.,VA, Nickajack  
C.?(TN) & cave? in Carter Co.,KY/ Tb/ T&E VA S1, global G4G5 or G2G4) **Bibl.:** Hoff 1958a-  
b; R. Hoffman 1950, 1958a; K. Simon 1997; Shear 1972,

*Pseudotremia cercops* Shear, 1972 (type locality & at least one other cave in \*De Kalb Co.,TN/ Tb/ G1G2)

*Pseudotremia cocytus* Shear, 1972 (Tp in 3 caves in Campbell & Cos., TN/ Tp,epigean type locality)

*Pseudotremia conservata* Hoffman & Lewis, 1997 (type locality & 8 other caves in \*s.Harrison Co. Tb/ G1)

*Pseudotremia cottus* Shear, 1972 (type locality cave in The Sinks, Cades Cove,Blount Co. + Anderson, Knox, & Roane cos.,TN/ Tp)

*Pseudotremia deprehendor* Shear, 1972 (\*\*?type locality cave in Anderson Co. & cave in Grainger Co., TN/ Tb/ G1 or G3) **Bibl.:** Shear 1972

*Pseudotremia eburnea* Loomis, 1939 (type locality + 4 other caves in Walker Co.; 3 caves (Dade Co.) & 2 caves (Marion Co.) & cave each in Jackson & Marshall Cos., all in AL / Tb G3G4) **Bibl.:** Buhlamann 2000; Reeves et al. 2000; Shear 1972

*Pseudotremia fracta nantahala* Hoffman, 1981 (type locality cave in NC, Swain Co./ Tp)

*Pseudotremia fracta* (s.lat.) *fracta* Chamberlin, 1951 (Tp in Claiborne & Union Cos.(TN)?)

*Pseudotremia fracta ingens* Hoffman, 1981. (type locality cave in Campbell Co., TN/ Tp)

*Pseudotremia fracta paynei* Hoffman, 1981. (type locality cave in TN, Anderson Co. & caves in Knox, & Roane Cos., TN/ Tp)

*Pseudotremia fulgida* Loomis, 1943 (type locality & >9 other caves (Greenbrier Co.) & 3 caves in Pocahontas Co.,WV/Tb/WV T&E S2 rank & global G2G3 rank/Greenbrier Valley Cave Millipede) **Bibl.:** R. Hoffman 1981; Loomis 1943; Shear 1972

*Pseudotremia hobbsi* Hoffman, 1950 (type locality cave in Alleghany Co. +Bath, Botetourt & Montgomery Cos.,VA; 3 caves in Greenbrier Co. & cave in Monroe Co.),WV/ Tp) **Bibl.:** Shear 1972

*Pseudotremia indianae* Chamberlin & Hoffman, 1958 (*P. cavernarum* Cook & Collins 1893, not Cope) (type locality cave in Wyandotte C.(Crawford CO.) +WA, Orange, Harrison Cos.,IN/ Blue River cave milliped/ Tb/ G3) **Bibl.:** Shear 1972, Hoffman and Lewis 1997

*Pseudotremia lactarium* = *Abacion l.*

*Pseudotremia lethe* Shear, 1972 (\*type locality cave in Jackson Co.,TN/ Tb/ G1G2)

*Pseudotremia lictor* Shear, 1972 (\*type locality cave in De Kalb Co.,TN/ Tb/ G1G2)

*Pseudotremia lusciosa* (*Dearolfia l.* Loomis, 1939) (Seneca & 3 other caves in Pendleton Co. + cave or caves in Pocahontas Co.,WV/Tb/WV T&E S1 rank & global G1 rank/ Germany Valley Cave Millipede) **Bibl.:** Loomis 1943; Shear 1972

*Pseudotremia merops* Shear, 1972 (\*type locality cave in Adair Co.,KY/Tb/ G1G2)

*Pseudotremia minos* Shear, 1972 (\*type locality cave in Jackson Co.,AL/Tb/ G1G2)

*Pseudotremia momus* Shear, 1972 (type locality cave in Smyth Co. & cave near Wythe-Bland Co. line, VA/ Tp, epigean/T&E VA S2, global G2)

*Pseudotremia nefanda* Shear, 1972 (type locality cave in & at least 3 other caves in \*Pleasant Run & Bull Cr. drainages, Clark Co., IN/ Tb/ G1G2) Hoffman & Lewis 1997

*Pseudotremia nodosa* Loomis, 1939 (sensu latu) (type locality cave in Claiborne Co + Anderson & Union Cos., all TN & Lee Co., VA/ Tb/ G3G5) **Bibl.:** Shear 1972

*Pseudotremia nyx* Shear, 1972 (\*type locality cave in Marshall Co., AL/ Tb/ G1G2)

*Pseudotremia pinotorium* = *Pseudopolydesmus p.*

*Pseudotremia princeps* Loomis, 1939 (type locality in cave in Grant Co. & 4 caves in Pendleton Co., WV & cave in Highland Co., VA/ Tp/ T&E VA S1, global G1; WV T&E S1 rank & global G1 rank/ South Branch Valley cave millipede) **Bibl.:** Loomis 1939, 1943; Shear 1972

*Pseudotremia rhadamanthus* Shear, 1972 (type locality cave in Marshall Co., AL + cave in Marion Co., TN/ Tb/ G3G4)

*Pseudotremia scrutorum* Shear, 1972 (Tp or Tx in TN?)

*Pseudotremia simulans* Loomis, 1939 (type locality & at least 2 other caves in Pendleton Co.) & at least one cave in Randolph Co, WV/ Tp/ G3G4T3T4) **Bibl.:** Shear 1972

*Pseudotremia sodalis* Loomis, 1939 (\*type locality cave in Carter Co., KY/ G1)

*Pseudotremia* possibly undescr. sp. (cave in Dade Co., GA/ Tb or Tp)

*Pseudotremia* undescr. sp.#1 (\*? cave in Greenbrier Co., WV/ Tb)

*Pseudotremia* undescr. sp.#2 (Adams Co., OH)

*Pseudotremia* undescr. sp.#3 (cave in Hardin Co., IL/ Tb)

*Pseudotremia* undescr. sp.#4 (part of *P. nodosa* complex) (Scott & Wise Cos., VA/ Tb)

*Pseudotremia* undescr. sp.#5 (\*?cave in Blue River area, Crawford Co., IN/ Tb) Lewis 1997

*Pseudotremia* undescr. sp. #6 (three caves in Hoosier National Forest, Crawford Co., IN/ G1?)

*Pseudotremia* undescr. sp.#7 (\*?cave in Monroe Co., WV/ Tb)

*Pseudotremia* undescr. sp.#8 (\*?Organ C., WV/ Tb)

*Pseudotremia* undescr. sp. 9-? (caves in Giles, Russell, Bath, Smyth, Lee, Wythe, Craig Alleghany Cos., all VA; WA Co., MD/ Tb)

*Pseudotremia* undet. sp. or species (caves in Madison & Jackson Cos., AL/ Tb; 12 cos. in KY (incl. Mammoth Cave); Tx in OH; Tp in Great Smoky Mts., NC )

*Pseudotremia spira* Shear, 1972 (type locality cave in Pulaski Co. & cave or caves in Rockcastle, Co., KY/ Tb/ / G1G2 or G1 or G3)

*Pseudotremia stupefactor* Shear, 1972 (Jessamine, Powell & Anderson Cos., KY/ Tp/ G1G2)

*Pseudotremia sublevis* Loomis, 1944 (type locality & one other cave in Giles Co. & cave or caves in Montgomery Cos., VA/ Tp, epigean/ T&E VA S1, global G1) Shear 1972)

*Pseudotremia tuberculata* Loomis, 1939 (\*type locality cave in Tazewell Co., VA/ Tb/ T&E VA S1, global G1 or G2) **Bibl.:** Shear 1972

*Pseudotremia unca* Shear, 1972 (type locality cave in \*Rockcastle Co., KY/ Tb/ G1G2)

*Pseudotremia valga* Loomis, 1943 (\*\*\*\*?type locality & at least 1 cave in, Lee Co., VA & at least 2 caves in Claiborne Co., TN Tb?/ G1 or G3) **Bibl.:** Shear 1972

*Ptyoiulus* Cook, 1895 - Order Julida, Parajulidae millipedes (3 species in eUS)

*Ptyoiulus impressus* (Say, 1821). (Ac in WV (Kanawha Co.); Ttx in KY) **Bibl.:** Loomis 1939; Sullivan 1962

*Ptyoiulus* undet. sp. (Tx or Ac in cave in Tazewell Co., VA)

*Reasia* Sager, 1853 = *Abacion*

*Rhabdorona* Chamberlin & Mulaik, 1941 = *Cleidogona*

*Rhexenor* Rafinesque, 1820 = *Narceus*

*Rhysodesmus* Cook, 1895 (= *Dampfaria*, *Aporiaria*, *Acentronus*) Xystodemidae millipedes, Tribe Rysodesmini (70 species in Central America)

*Rhysodesmus* undet. sp. or *Rhysodesmus* tribe (c. TX/ Tp? alien?)

*Rudiloria* Causey, 1955 = *Apheloria*

*Scaphiostreptus* Brolemann, 1902 = *Orthoporus*

*Scoterpes* Cope, 1872 (= *Scotherpes* Latzel, 1884) Order Chordeumatida, Trichopetalidae millipedes (4 species in ceUS) **Bibl.:** Causey 1959

*Scoterpes austrinus a.* Loomis, 1943 (type locality cave in De Kalb Co. + Floyd, Walker, Bartow & Dade Cos., nGA/ Tb/ G3G4T3T4) **Bibl.:** Chamberlin & Hoffman 1958; Cain 1966

*Scoterpes austrinus nudus* Chamberlain, 1946 (\*type locality cave in Bartow Co., GA/ Tb) **Bibl.:** Chamberlin & Hoffman 1958

*Scoterpes copei* Packard, 1871 (*Spirostrephon*, *Pseudotremia c.* Packard, 1871)

(type locality cave & Mammoth Cave in Edmonson Co. + Hart, Adair & Barren Cos. (KY), Dade Co. (GA) + Blount, Grundy & Hamilton cos., TN/ Tb/ G3) **Bibl.:** Loomis 1939; Chamberlin & Hoffman 1958

*Scoterpes dendropus* Loomis, 1939 (type locality & one other cave in Stone Co. +Barry, Franklin, Jefferson & OR(prob.) Cos.,swMO (Taney Co.) & AR (Carroll & Newton Cos.)/ Tb/ State T&E Status Undet.) **Bibl.:** Loomis 1943; Chamberlin & Hoffman 1958

*Scoterpes* poss. undescr. sp.#1 (3 caves in Walker Co., GA)  
*Scoterpes* poss. undescr. sp.#2 (cave in Blount Co., TN./Tb?/ G1?)

*Scoterpes* undescr. sp.#1 (\*?cave in Chatooga Co.,GA/Tb)  
*Scoterpes* undescr. sp.#2 (neAL (Jackson Co.) & Franklin Co.,TN)

*Scoterpes* undescr. sp. #3 (2 caves in Harrison Co., IN/ S1/G1)  
*Scoterpes* undescr. sp. #4 (\*?cave in Coffee Co.,TN)

*Scoterpes* undescr. sp.#5-20? (undescr. ssp.? KY (Christian, Simpson Cos.) & TN (Stewart Co.), TN (Dickson, Lewis, Davidson, Rutherford, Maury, Warren, Van Buren, Grundy, Franklin Cos.); Appalachia,E/Tb?) **Bibl.:** Causey 1906

*Scoterpes* undet. sp. or species (Tb in 4 caves in Jackson & Madison Co.,AL + GA, IL, Pulaski & Wayne Cos.(KY) & AR (Marion, Newton, Stone & Searcy Cos.); Tx in Blanchard Spr.(AR) & NJ)

*Scoterpes ventus* Shear, 1972 (\*?type locality cave in Marion Co.,TN/ Tb/ G1G2)

*Scytonotus* Koch, 1847 (= *Lasiolathus*) Order Polydesmida, Polydesmidae millipedes (4 species in eUS, 7 in Rockies & West Coast) **Bibl.:** Shelley 1993; Cook & Cook, 1895

*Scytonotus granulatus* (Say, 1921) (= *S. cavernarum* Bollman, 1887; *Polydesmus* g. Say, 1821; *P. setiger* Wood, 1865; *Stenonia hispida* Sager, 1856) (type locality cave in Monroe Co.,IN/NE from NY & sON w. to eMN, cIA, s. to MO, TN, eNC/ Ac or TTx in KY (Mammoth Cave), MD, MO, OH, sON, PA, VA) **Bibl.:** Loomis 1939, Hoffman & Lewis 1997

*Semionellus* Chamberlin, 1920 Xystodemidae millipedes, Subfamily Xystodesminae, Tribe Chonaphini (1 species in eUS)

*Semionellus placidus* (Wood, 1864) (IL/Ac or Tx in IL (probably))

*Sigmocheir* Chamberlin, 1951 (= *Tuolumnia*) Order Polydesmida, Xystodesmidae millipedes, Subfamily Xystodesminae, Tribe Sigmocheirini (3-? Species in CA)

*Sigmocheir calaveras* Chamberlin, 1951. (Tx or Tp in CA (Calaveras & Tuolumne cos.) **Bibl.:** Shelley 1995b

*Sigmocheir dahehyi* (*S. dohenyi* (missp.) Chamberlin, 1953a) \*\*\*\*( type locality & one other cave in Tuolumne Co. & 2 caves in Calaveras Co.),CA/ Tp or Tb/ G1)

*Sigmocheir* possibly one or more undescr. sp. (Tp? In Amador, Calaveras, Siskiyou & Tuolumne Cos.,CA)

*Sigmocheir furcata* Shelley, 1995 (Tx or Tp in CA (Calaveras Co.) **Bibl.:** Shelley 1995b

*Sigmoria* Chamberlin, 1939 - Order Polydesmida, Xystodesmidae millipedes, Subfamily Xystodesminae, Tribe Aphelorini (6 species in eUS)

*Sigmoria (Rudiloria) trimaculata t.* (Wood, 1864) (*Apheloria t.*) (Tx or Ac in VA)

*Singuliurus* Causey, 1955 = *Euryurus*

*Sirobolus* auct. nec. Brandt = *Narceus*

*Sonoratyla* Hoffman, 1961 = *Austrotyla*

*Spathiulus* Chamberlin, 1940 - Parajulidae millipedes (4 species in CA)

*Spathiulus tribolus* Chamberlin, 1940 (Tx or Ac in CA)

*Speodesmus* Loomis, 1939 (= *Speorthus*) Order Polydesmida, Polydesmidae millipedes (5 species in TX, NM or nMex.) **Bibl.:** Elliott, 1976, 1985

*Speodesmus aquiliensis* Shear, 1984 (\*type locality cave in Fulford Co., CO/ Tb/ G1G2)

*Speodesmus bicornourus* Causey, 1959a (type locality cave in Williamson Co.+ cave in Lampasas Co. + many caves in Travis, Williamson Cos.,TX/ Tb) **Bibl.:** Bull & Mitchell 1970; Elliott & Mitchell 1972

*Speodesmus echinourus* Loomis, 1939 (type locality cave in Kendall Co.+Bandera, Bexar, Comal, Edwards, Hays, Kerr, Mason, Medina, Menard, Real, Sutton, Uvalde, Val Verde Cos.,TX/ Tb/ G3) **Bibl.:** Chamberlin & Hoffman 1958; Bull 1969.

*Speodesmus tunganbius (Speorthus t.* Chamberlin, 1952) (type locality in Carlsbad Cave & 1 oher cave in Eddy Co. & 3 caves in Lincoln Co., NM+ Culberson Co.,wTX/Tb) **Bibl.:** Loomis 1960; Shear 1974

*Speodesmus* undescr. sps.#1-3 (*bicornourus* group/older caves of Balcones Escarpment, TX/ Tb)

*Speodesmus* undescr sps.#4 (s. Balcones Escarpment,TX/ Tb)

*Speodesmus* undescr sp.#5-7 (Tx/Tb)

*Speorthus* Chamberlin, 1952 = *Speodesmus*

*Speoseya* Causey, 1963 - Order Chordeumatida, Caseyidae millipedes

*Speoseya grahami* Causey, 1963. (\*\*\*\*type locality & one other cave in Calaveras Co. + cave each in Tuolumne & Tulare Cos., CA/ Tp or Tb/ caves only/ G3)

*Speoseya* undescr. sp. (\*?OR C.,OR/Tb)

*Speoseya* undet. sp. (near *S. grahami*/ cave in Calaveras Co.,CA/ Tb?)

*Speostriaria* Causey, 1960 - Order Chordeumatida, Caseyidae millipedes (1 species in CA)

*Speostriaria eldora* = *Striaria e.*,



*Speostriaria shastae* (*Striaria s.* Causey, 1958). (\*type locality cave in Shasta Co.,CA/ Tb/ G1G2) **Bibl.:** Causey 1958, 1960

*Spirostrephon* Brandt, 1841 (see *Pseudotremia*, = *Abacion*)

*Striaria* Bollman, 1888 (= *Amplaria* Chamberlin, 1941) Order Chordeumatida, Caseyidae millipedes (7 species in eUS, OR)

*Striaria columbiana* Cook, 1899 (Ac or Tx in Warren Co., VA) **Bibl.:** Loomis 1939; Shear 1969

*Striaria eldora* Chamberlin, 1953a (= *Speostriaria e.*) (\*\*( type locality cave in El Dorado & cave in Calaveras Co., CA/ Tp or Tb/ caves only/ G1) **Bibl.:** Causey 1960

*Striaria granulosa* Bollman, 1888 (Ac in Henderson Co., NC ) **Bibl.:** Causey 1960

*Striaria shastae* = *Speostriaria s.*

*Striaria* undet. sp. or species (Tx in Chatooga Co.,nGA & Simpson Co.,KY)

*Striaria* undescr. (s)sp. (cave in Simpson Co.,KY/Tb; Amador, Santa Cruz, Tulare & Tuolumne Cos., CA (may be one or more undescr. sp.)

*Siphonophora* Brandt, 1837 Order Siphonophorida, Family Siphonophoridae millipedes

*Siphonophora* undet. (?undescr.) spp. (Tp in Bell, Bexar, Coryell, Llano, Travis, Williamson Cos., TX) **Bibl.:** Shelley 1996b

*Taiyutyla* Chamberlin, 1952 - Order Chordeumatida, Conotyliidae millipedes, Subfamily Conotyliinae (14 species in WA,OR, CA, MT) **Bibl.:** Shear 1976

*Taiyutyla humerosa* = *Plumatyla h.*

*Taiyutyla* undescr. sp. or species (OR C./Tb; cave in Harney Co.,OR/Tb?; 11 caves in Mt.St. Helens basalt, WA/ Tp; cave in Trinity Co.,CA)

*Tetracion* Hoffman, 1956 - Caspiopetalidae millipedes, Subfamily Abacioninae (3 species in AL or TN)

*Tetracion antraeum* Hoffman, 1956. (type locality cave in Madison Co., AL (type locality)/ Tb in caves in Madison & Marshall Cos.) (= *T. jonesi a.*) **Bibl.:** Hoffman 1956

*Tetracion jonesi* (*T.j. j.* Hoffman, 1956; *T.j. atreaum* Hoffman, 1956) (type locality cave in Marshall Co. + DeKalb?, Jackson, Madison, & Morgan Cos.,AL & Franklin Co.?, TN/ Tb)

*Tetracion jonesi atreaum* Hoffman, 1956 = *T. j.*

*Tetracion tennesseensis* Causey, 1959 (Cumberland C.(Grundy Co.) +Warren, Van Buren & White Cos., TN/ Tb/ S1S2? G3 or (less likely) G1G2)

*Tidesmus* Chamberlin, 1943 - Order Polydesmida, Polydesmidae millipedes

*Tidesmus hubbsi* Chamberlin, 1943 (\*cave in Cave Valley, n.Lincoln Co.,NV/ gonopods of type sp. of genera similar to *Phreatodesmus*)

*Tidesmus* undescr. sp. #1 (keys to *Tidesmus*) (= *Brachydesmus cavicola* Chamberlin & Hoffman, 1958; *Polydesmus c.* Packard, 1877) (\*cave in Tooele Co.,UT/ Tb)

*Tidesmus superus* = *Brachydesmus s.*  
*Tiganogona* Chamberlin, 1928 (See *Cleidogona*)

*Tingupa* Chamberlin, 1910 - Order Chordeumatida, Tingupidae millipedes

*Tingupa pallida* Loomis, 1939 (type locality cave in Camden Co.(MO)+ e,s,swMO (Carter, Crawford, Dent?, Franklin?, Maries, Miller, Ozark?, Phelps?, Pulaski, Ripley?, Shannon?, St. Louis?, Texas, Washington?, & Wayne Cos.), swIL (Jackson, Johnson & Pike Cos.), AR(Randolph & Sharpe Cos.)/ Tb, rare epigeal/ polytypic or multiple species may be present with different sp. in eMO & swMO) **Bibl.:** Loomis 1939, 1943; Shear 1969, 1972, 1981

*Tingupa* possibly different new sps. in Benton, Boone, Camden, Crawford, Franklin, Maries, Marion, Miller, Jefferson, Phelps, Pulaski, Ripley, Texas & Wayne Cos.,MO) **Bibl.:** Loomis 1943, 1966

*Torynopus* Verhoeff, 1941 = *Orthoporus*

*Trichopetalum* Harger, 1972 (= *Flagellopetalum*, *Tynopus*, *Zygonpus*) Order Chordeumatida, Trichopetalidae millipedes. **Bibl.:** Causey 1960c

*Trichopetalum appropinquo* (Causey, 1969) (type locality cave in Washington Co., MD/ Tp or Tx) **Bibl.:** Causey 1969

*Trichopetalum cornutum* Cook & Collins, 1895 (epigeal in IN, KY, TN/ Tp in cave near Bloomington, Monroe Co., IN)

*Trichopetalum krekeri* (Causey, 1960) (\*\*\*\*?type locality & one other cave in Randolph Co. & cave each in Hardy & Tucker Cos.,WV/ Tb/ WV T&E S1 rank & global G3 rank/ West Virginia blind cave millipede)

*Trichopetalum packardi* (= *Zygonpus p.* Causey, 1959) Shear, 1972 (type locality cave in Randolph Co. & caves in Monroe, Greenbrier, Monroe & Mercer Cos.,WV +seVA (Botetourt, Craig, Giles, Montgomery, Page, Pulaski, Roanoke, Wythe Cos.) & Estill Co., KY/ Tb/ T&E WV & VA S1, global G3Q/ Packard's blind cave millipede)

*Trichopetalum* unidentified sp(p) (Estill & Pulaski Cos.,cKY/Tb or Tp)

*Trichopetalum subterraneum* Causey, 1967 (\*type locality cave in Scott Co.,ncKY/ Tb/ G1G2)

*Trichopetalum syntheticum* Shear, 1972 \*\* (type locality cave in Jackson Co. & cave in Marshall Co., AL/ Tb/ G3)

*Trichopetalum unicum* Cook & Collins, 1895 (Tp in AR, IL, IN, KY, MO, OK, IN, Jennings & Monroe cos.; MO, Dade Co.) **Bibl.:** Causey 1967, Hoffman & Lewis 1997

*Trichopetalum weyeriense* (Causey, 1960) (type locality cave in Augusta Co. & Bath & Rockbridge Cos., VA & >4 caves in Greenbrier, Pendleton & Pocahontas Cos.), WV/ Tb/ T&E WV & VA S1, global G3G4)

*Trichopetalum whitei* (*Zygonopus w.* Ryder, 1881) (type locality in Luray Caverns (Page Co.), 2 caves in Shenandoah, Augusta, Page & Rockingham Cos., VA & Grant & Pendleton Cos., WV/ Tb/ T&E VA & WV S1, global G2G3Q) **Bibl.:** Loomis 1939, 1943; Causey 1960; Shear 1972

*Trigenotyla* Causey, 1951 - Trichopetalidae millipedes

*Trigenotyla parca* Causey, 1951 (\*nwAR/ type locality & 1 othe cave in WA Co., AR/ G1G2/ Tp or Tb)

*Trigenotyla* undescr. sp.1-2 (caves in DE, Johnstone, Murray & Seminole Cos., OK/ Tb?)

*Trinidadius* V., 1941 = *Orthoporus*

*Troglocambala* Hoffman, 1956 = *Cambala*

*Troglotyla* (see *Lophomus*)

*Tubaphe* Causey, 1955 - Xystodesmidae millipedes, Subfamily Xystodesminae, Tribe Harpaphini (1 species in CA)

*Tubaphe levii* Causey, 1955 (Tx in BC)

*Tucoria* Chamberlin, 1943 = *Brachoria*

*Tuolumnia* Chamberlin, 1955 = *Sigmocheir*

*Tylobolus* Cook, 1924 (= *Californibolus* Verhoeff, 1944; *Auxobolus* Chamberlin, 1949)- Order Julida, Paeromopodidae millipedes (also placed in Spirobolidae, Subfamily Tylobolinae) (7 species in US)

*Tylobolus* undet. sp. (Ac in cave? in Uvalde Co., TX),

*Tynopus* Chamberlin, 1940 = *Zygonopus*

*Underwoodia* Cook & Collins, 1895 - Caseyidae millipedes

*Underwoodia* undet. sp, (NE/Tx or Ac in sON)

*Uroblaniulus* Attems, 1909 - Parajulidae millipedes (12 species in eUS, eCanada, ID?)

*Uroblaniulus canadensis* (Newport) (Tx or Ac in sON?)

*Vasingtona* Chamberlin, 1941 - Order Chordeumatida, Caseyidae millipedes

*Vasingtona irritans* (Chamberlin, 1910). (Ac in OR, Harney Co.) **Bibl.:** Gardner & Shelley 1989

*Xystocheir* Cook, 1904 - Xystodesmidae millipedes, Subfamily Xystodesminae, Tribe Xystodesmini (6 species in CA)

*Xystocheir* undet. sp. (Tx or Tp in Calaveras & Tuolumne Cos., CA)

*Zosteractis* Loomis, 1943 - Order Julida, Zosteractinidae millipedes (also put in Nemasomatidae, Subfamily Nemasomatinae, Tribe Zosteractininae) (one species in US)

*Zosteractis interminata* Loomis, 1943 (type locality cave in St. Louis Co. +St. Genevieve, Shannon? & Madison Cos., MO & Pike Co., IL/ Tb/ MO State T&E Status Undet./ G3G4) **Bibl.:** Causey 1960; Shear 1969; Enghoff 1982

*Zygonopus* Ryder, 1881 = *Trichoptetalum*

**minimal area** - The smallest space in which a particular biotic community can develop fully with its full complement of species. The minimal area of a species is that space needed for the species to become stabilized.

mink - See mammal, mink

## MITES

Order Acari (=Acarina) (or in three orders, Acariformes, Parasitiformes & Opilioacarida (=Opilioacariformes) in Subphylum or Class Arachnida. Body with much reduced, unsegmented (very rarely segmented), sack-like rear end (hysterosoma). The proterosoma has the two anterior pairs of legs but, unlike other arachnids, is divided into the anterior gnathosoma (base of the chelicera and pedipalps), and the central propodosoma (carries first and second pairs of legs). Pedipalps are large in predators and chelicera usually have pincers but are often modified to needle-like piercers. Post-embryo forms include larvae (3 pairs of legs), protonymphs, deutonymphs and tritonymphs. About 32,000 described species, perhaps half a million exist.

The three major divisions, sometimes treated as orders, include Parasitiformes, Acariformes and Opilioacariformes. Ticks are Metastigmata mites, part of the Parasitiformes. Water mites are five unrelated groups that may have independently invaded freshwaters and incl. Hydrachnida (Hydrachnella(e), Hydracarina or Hydrachnidia of some authors) and some Halacaridae, Oribatida, Acaridida & Mesostigmata. In interstitial habitats, soft-bodied forms became worm-shaped and sclerotized mites became compressed laterally or dorsoventrally, sometimes with flattened legs.

**Bibl.:** Elliott 1998; Cooley & Kohls 1945; George & Strandtmann 1960; Radovsky 1969; R. Schuster & Murphy 1991; Stock 1961; Thies 1967; Tromba 1954; Ubelaker 1971; Yunker 1958. Areas AL: Durden, Best et al. 1992; CA: Krutzsch 1955; East: Holt 1965a; CO: Stock 1961; GA: Spears et al. 1995; NA: Welbourn 1980; Webb & Loomis 1977; IN: Hughes 1959;

Whitaker 1982; Whitaker & Loomis MN: S. Dood 1981; NB: Wendell 1995; NM: Stock 1961;  
OR: Whitaker, Yunkler & Maser 1983; TX: Ritzi & Richerson 1998; Whitaker & Easterla 1975;  
WI: Thomas 1976; Turner & Jones 1968

Kingdom Animalia

Clade Metazoa

Clade Eumetazoa

Clade Bilateria

Clade Protostomia

Clade Ecydsozoa

Phylum Arthropoda

Subphylum Chelicerata

Class Archnida

Subclass Micrura

Order Acari

Division Notostigmata (now assigned to Division Opilioacariformes)

Division Parasitiformes

Infraorder Mesostigmata (last 3 forms Parasitiformes))

Cohort Dermanyssina

Cohort Parasitina

Cohort Sejina

Cohort Uropodina

Suborder Metastigmata (ticks)

Suborder or Infraorder Ixodides.

**Bibl.:** Hoogstraal; Kohls et al. 1962; Northup & Welbourn 1991

Argasidae (argasine or soft ticks) (*Antricola, Argas, Carios, Ornithodoros*)

Ixodidae (hardback or hard ticks)

(*Amblyomma, Aponomma, Dermacentor, Ixodes, Teinocoptes*)

Division or Order Acariformes (■mite-like• mites) (see Prostigmata),

Superorder Anactinotrichida

Superorder Actinotrichida

Infraorder Prostigmata (now assigned to Suborder Trombidiformes),

Infraorder Oribatida (last two comprise Sacrocoptiformes))

Suborder Cryptostigmata (=Oribatida)

Superfamily Gymnodamaeioidea

Gymnodamaeidae (*Plesiodyamaeus*)

Suborder Endeostigmata

Nanorchestidae (*Nanorchestes, Speleorchestes*)

Superfamily Cosmochthonoidea

Cosmochthonidae (*Cosmochthonius*)

Superfamily Erythraeoidea

Erythraeidae (running mites)

(*Abrolophus*, *Erythraeus*, *Leptus*; undet. Ac or Tx genera & sp. in seA)

Smarididae (*Fessonina*)

Superfamily Eylaoidea (water mites)

Limnocharidae

Subfamily Rhyncholimnocharinae (interstitial water mites)

(*Rhyncholimnochaeres*) (also put in Rhynchohydracaridae)

Limnohalacaridae (also put in Halacaridae, Subfamily Limnohalacarinae)

Piersigiidae

Subfamily Piersigiinae (water mites in springs, temporary pools, interstitial)

(beetle hosts) (*Piersigia*)

Order or Suborder Actinedida (also suborder under Acariformes or Trombidiformes))

Suborder or Infraorder Prostigmata (= Suborder Trombidiformes, = Suborder Actinedida)

Cohort Parasitengona (also as Family Group)

Subcohort Hydrachnidia (= Hydrachnida, = Hydracarina) (true water mites)

Superfamily Hydrachnoidea (water mites)

Hydrachnidae (water mites in mostly lakes and temporary pools)

(*Hydrachna*; undet. genus in LA brackish sediment)

Superfamily Hydryphantoidea (water mites)

Hydryphantidae (water mites) (*Lundbladia*)

Subfamily Cyclothyadinae (interstitial in NA) (*Cyclothyas*)

Subfamily Thyadinae (mostly in springs, ripples & temporary pools)

(bug, Odonata & fly hosts) (*Thyas*)

Protziidae (water mites in springs & interstitial) (also put in Hydryphantidae)

Subfamily Wandesiinae (also put in own family) (stonefly hosts) (*Wandesia*)

(also put in own family)

Rhynchohydracaridae (also subsumed in Limnocharidae, Subfamily

Rhyncholimnocharinae) (*Rhyncholimnochaeres* (now in Limnocharidae))

Subfamily Clathrosperchoninae (water mites) (*Clathrosperchon*)

Wandesiidae (water mites) (also subsumed in Protziidae, Subfamily Wandesiinae)

Subfamily Cowichaninae

(*Wandesia*) (once in Protziidae, Subfamily Wandesiinae)

Superfamily Hydrovolzioidea (water mites)

Acherontacaridae (*Acherontacarus*) (once in Hydrovolziidae)

Hydrovolziidae

Subfamily Hydrovoltziinae (water mites in springs, riffles, interstitial)

(*Hydrovolzia*, *Acherontacarus*) (also in Limnohalacaridae, now in own family)

Superfamily Hygrobatoidea (or Hydrachnellae) (water mites)

Aturidae (water mites)

Subfamily Albiinae (*Albaxona* (now in Axonopsinae), *Albia*)

Subfamily Aturinae (fly & stonefly hosts)

(*Aturus*, *Kongsbergia*, *Phreatobrachypoda*, *Stygalbiella*, *Woolastookia*)

Subfamily Axonopsinae (*Axonopsis*) (now in Axonopsidae)

(*Albaxona*, *Axonopsalbia*, *Axonopsella*, *Bharatalbia*, *Brachypoda*,  
*Erebaxonopsis*, *Estellacarus*, *Lethaxona* (now Lethaxonidae), *Ljania*  
(now in Frontidopsinae), *Neobrachypoda*, *Vicinaxonopsis*)

Subfamily Cowichaninae (*Cowichania*)

Subfamily Frontipodopsinae - now in own family

Axonopsidae (*Axonopsis*) (also put in Aturidae, subfamily Axonopsinae)

Feltriidae (water mites) (parasites of fly larvae) (*Feltria*)

Frontipodopsidae (once a subfamily of Aturidae)

(*Frontipodopsis*, *Lethaxonella*, *Ljania* (put in Axonopsinae), *Phreatobrachypoda*  
(in Aturidae))

Hygrobatidae (water mites in sprgs, riffles, interstitial, lentic) (fly, stonefly hosts)

(*Diamphidaxona*) (once in Aturidae, Subfamily Axonopsinae)

Subfamily Hygrobatinae (*Atractides*, *Hygrobates*)

Lethaxonidae (*Lethaxona*) (once in Aturidae, Subfamily Axonopsinae)

Limnesiidae (water mites) (*Arizonacarus*, *Dorycranosus*)

Subfamily Kawamuracarinae

(*Kawamuracarus*; undet. genus in brackish LA beach)

Subfamily Neomamersinae (interstitial) (*Arizonacarus*, *Neomamersa*, *Meramecia*)

Subfamily Limesiinae (riffles, interstitial, pools & lakes) (*Limnesia*)

Subfamily Protolimnesinae (interstitial) (*Protolimnesia*)

Subfamily Tyrrelliinae (interstitial) (*Tyrrellia*)

Omartacaridae

Subfamily Omartacarinae (water mites in interstitial) (*Omartacarus*)

Pionidae (water mites) (fly hosts)

Subfamily Tiphynae (=Hydrochoreutinae) (springs, interstitial, pools & lakes)

Tribe Foreliini (*Forelia*, *Pionacercus*)

Tribe Tiphyni (*Tiphys*)

Unionicolidae (water mites)

Subfamily Unionicolinae (mostly in pools & lakes) (*Unionicola*)

Subfamily Pionatacinae (fly and stonefly hosts) (*Koenikea*)

Superfamily Lebertioidea

Anisitiellidae (water mites in springs, riffles, interstitial & pools) (fly hosts)

Anisitsiellinae (*Bandakia*, *Bandakiopsis*, *Cookacarus*, *Oregonacarus*, *Utaxatax*)

Lebertiidae (water mites mostly in springs, riffles, pools & lakes) (fly hosts)

(*Estelloxus*, *Lebertia*, *Scutolebertia*)

Oxidae (*Frontipoda*, *Oxus*)

Rutripalpidae (*Rutripalpus*)

Sperchontidae

Subfamily Sperchontinae (water mites in sprs., riffles, pools & lakes)

(fly, stonefly host) (*Spercon*)

Teutoniidae (water mites mostly in pools) (fly hosts) (*Teutonia*)

Torrenticolidae (water mites in interstitial & riffles)

Subfamily Torrenticolinae (fly hosts)

(*Monatractides*, *Neoatractides*, *Pseudotorrenticola*, *Torrenticola*)

Subfamily Testudacarinae (*Testudacarus*)

Superfamily Nematalycoidea

Nematalycidae - Phreatic in Canadian Rocky Mountains area

Superfamily Stygothrombidoidea

Stygothrombiidae (interstitial water mites)

Subfamily Stygothrombiinae

(*Cerberothrombium*, *Hydrothrombium*, *Stygothrombium*, *Victathrombium*)

Superfamily Trombidoidea (velvet mites, chiggers & water mites)

Johnstonianidae (*Johnstoniana*, *Polidiscia*)

Leeuwenhoekidae (*Leeuwenhoekia*, *Whartonia* (both also put in Trombiculidae))

Microtrombiidae (velvet mites)

(undesc. sp. & genus, Ac in El Malpais Natl.Monument, nNM)



Neotrombidiidae (*Ceuthothrombium* (also put in Trombidiidae), *Neotrombidium*)  
Trombidiidae (harvest mites or chiggers; trombidiid mites) (*Ceuthothrombium*  
(now in Neothrombidiidae), *Leptotrombidium*, *Microtrombidium*, *Monunguis*,  
*Trombidium*; undet. genus & sp. in OR C., OR & Mariposa Co., CA; undescr  
parasitic Tb genus in WA & undescr. Ac genus in El Malpais Natl. Monument,  
NM)

Trombiculidae (chigger mites) (mostly parasitic as larvae, predators as adults)  
(*Acomatacarus*, *Albeckia*, *Beamerella*, *Cheladonta*, *Chatia*, *Comatacarus*,  
*Eltonella*, *Euschoengastia*, *Euschoengastoides*, *Eutrombicula*, *Hannemania*,  
*Hexidionis*, *Loomisia*, *Microtrombicula*, *Monunguis*, *Otorhinoiphila*, *Parasecia*,  
*Perissopalla*, *Pseudoschoengastia*, *Radfordia*, *Sasacarus*, *Speleocola*,  
*Tecomatlana*, *Trombicula*, *Whartonia* (also put in Leeuwenhoekidae))

Subfamily Leeuwenhoekinae (*Leeuwenhoekia*) (also put in Leeuwenhoekidae)

Cohort Eleutherengona or Infraorder Tarsonemini

Subcohort Raphignathae

Superfamily Cheyletoidea

Cheyletidae (*Cheletonella*, *Cheyletus*, *Eucheyletia*)

Demodicidae (*Demodex*)

Myobiidae

(*Acanthophthirius*, *Eudusbabekia*, *Ewingana*, *Myobia*, *Neomyobia*, *Pteracarus*)

Superfamily Raphignathoidea

Caligonellidae (*Caligonella*)

Raphignathidae (*Raphignathus*)

Stigmaeidae (*Eustigmaeus*; undet. genus & sp. in MO)

Tetranychoidae

Tetranychidae (also put in Infraorder Prostigmata, family Group Eleutherengona)  
(spider mites or red spiders) (*Bryobia*)

Subcohort Heterostigmata

Tarsonemidae (*Neotarsonemoides*)

Superfamily Pyemotoidea

Pyemotidae (soft-bodied mites) (*Pyemotes*; undet. genus & sp. in MO)

Superfamily Pygmephoroidae

Pygmephoridae

(*Bakerdania*; *Neopygmephorus*, *Pygmephorus*, undet. Tp genera in OR C., OR; undet.  
Tp? genus in prob. fungivores in Kartchner C., Cochise Co., AZ; undet. Tp? genus in  
Flea C., AR)

Scutacaridae (*Scutacarus*; undet. genus & sp. in MO)

Infraorder Astigmata,

Order Astigmata (=Acarodae; Acaridida) (feather, mange & itch mites)  
(undet. genus in Kazumura Lava Tube, HI)

Superfamily Acaroidea (also put in Suborder Sarcoptiformes)

Acaridae (acarid, cereal or root mites) (*Acarus*, *Acotyledon*, *Caloglyphus*, *Calvolia*  
(also put in Laelaptidae), *Rhyzoglyphus*, *Sancassania*, *Schwiebea*, *Stereoglyphus*,  
*Troglocoptes*, *Tyroglyphus*, *Tyrophagus*) undet. genus in Siskiyou Co., phoretic on  
*Neotoma cinerea* woodrats)

Histiostomatidae (=Anoetidae) (mostly feed on microbes)

(undet. genus in OR C., OR & Kartchner C., Cochise Co., AZ); *Histiostoma*  
(also in Anoetidae), *Myianoetus*)

Superfamily Hemisarcoptoidea

Hemisarcoptidae (insect mites) (prob. new phoretic genus in WA caves)

Superfamily Glycyphagoidea

Chortoglyphidae (*Aplodontopus*, *Chortoglyphus*)

Glycyphagidae (glycyphagids) (*Ctenoglyphus*, *Dermacarus*, *Glycyphagus*, *Xenoryctes*)

Rosensteiniidae

Subfamily Chiroptoglyphinae (*Chiroptoglyphus*, *Mydopholeus*)

Subfamily Nycteriglyphinae (*Nycteriglyphus*)

Superfamily Listrophoroidea

Chirodiscidae (*Alabidocarpus* (once put in Listrophoridae), *Olabidocarpus*)

Labidocarpidae (*Dentocarpus*) (also put in Chirodiscidae)

Listrophoridae (hair-clasping mites)

(*Alabidocarpus* (now in Chirodiscidae), *Listrophorus*, *Olabidocarpus* (once put  
in Chirodiscidae))

Order Oribatida (=Oribatei: Cryptostigmata) (moss or beetle mites)

(Tp in Kazumura C., HI Island, HI)

Suborder Euptyctyma

Superfamily Euphthiracaroidae

Oribotritiidae (*Oribotritia*)

Suborder Enarthronota

Superfamily Prothoplophoridae

Prothoplophoridae (*Prothoplophora*)

Suborder Desmonomata (or Cohort) (= Cohort Nothronata in part)

Superfamily Crotonioidea

Nothridae (also put in Desmonomata) (*Nothrus*)

Camisiidae (*Camisia* (also put in Liodidae), *Heminothrus*)

Malaconothridae (*Malaconothrus*, *Trimalaconothrus*)

Trhypochthoniidae (*Trhypochthoniellus*)

Suborder Brachypilina Hyll, 1918 (=Cohort)

Infraorder Gymnonota Balogh, 1972

Superfamily Cymbaeremaeidea

Scheloribatidae (*Scheloribates* (also put in Oribatulidae))

Oribatulidae – Put in Oribatelloidea

Superfamily Damaeidea

Belbidae (also put in Belboidea) (*Belba* (now in Damaeidae))

Damaeidae (*Belba*)

Superfamily Gustavioidea

Liacaridae (*Dorycranopsus*, *Liacarus*, *Opsioristes*)

Superfamily Liodoidea (Liodidae)

Superfamily Oppioidea

Oppiidae (*Multioppia*, *Oppiella*)

Thyrisomidae (*Banksinoma*, *Gemmazetes*, *Oribella*)

Superfamily Tectocephoidea

Tectocephidae (also put in Carabodoidea)

(*Tectocephus*)

Infraorder Poronota in part)

(undet. CA genus in Siskiyou Co. in *Neotoma cinereus* nests) Balogh 1963.

Superfamily Ceratozetoidea

Ceratozetidae (*Ceratozetes*, *Sphaerozetes*)

Superfamily Galumnoidea Jacot, 1925

Galumnidae (beetle mites) (*Galumna*, *Oribata*, *Pilogalumna*)

Niphocephidae (*Niphocephus*)

Superfamily Oribatelloidea

Oribatellidae (*Oribatella*)

Oribatulidae (*Oribatula*, *Scheloribates* (also in own family), *Zygoribatula*)

Suborder Mesostigmata (peritreme mites)

(undet. Tp family in Kazumura C., HI)

Anoetidae (now in Prostigmata)

Gamasidae (*Gamasellodes* (now in Ascidae), *Macrocheles* (now in own family))

Subcohort Hydrachnidia ((fresh)water mites)

Order Hydrachnida (= Hydrachnellae, Hydracarina, Hydrachnidia  
or Monogynaspida-Gamasina in part of some authors)

Superfamily Arrenuroidea

Arenohydracaridae (interstitial water mites) (*Arenohydracarus*)

Arrenuridae (water mites in interstitial, springs, riffles, pools, lakes, temporary ponds)

Subfamily Arrenurinae (*Arrenurus*)

Athienemanniidae (*Chelohydracarus*)

Subfamily Stygameracarinae (water mites in interstitial) (incl. *Stygameracarus*)

Subfamily Athienemanniinae (*Chelomideopsis*, *Platyhydracarus*)

Bogatiidae

Subfamily Horreolaninae (water mites in interstitial) (*Horreolanus*)

Chappuisididae

Subfamily Chappuisidinae (water mites in interstitial) (incl. *Chappuisides*)

Subfamily Morimotacarinae

(*Morimotacarus*, *Yachatsia* (both once in Uchidastygacaridae))

Mideidae (water mites mostly in pools & lakes) (fly hosts) (*Midea*)

Mideopsidae (also put in Prostigmata & Mesostigmata)

(water mites in springs, riffles, interstitial, pools & lakes) (fly hosts)

(*Mideopsis*, *Nudomideopsis* (now in own family))

Momoniidae (water mites in interstitial)

Subfamily Cyclomomoniinae (*Cyclomomonina*)

Subfamily Stygomomoniinae (stonefly hosts) (*Stygomomonina*)

Neoacaridae (*Neoacarus*, *Volsellacarus*)

Nudomideopsidae

(also subsumed in Mideopsidae) (water mites in springs & interstitial) (fly hosts)

(*Neomideopsis* (once in Mideopsidae) *Neomideopsis*, *Nudomideopsis*, *Paramideopsis*)

Uchidastygacaridae (now subsumed in Chappuisididae))

Superfamily Epicrioidea

Arctocaridae (*Arctoseius* (once put in Ascidae))

Cohort Sejina

Superfamily Sejoidea

Urodinychidae (now in Cohort Uropodina)

Veigaiidae (now in Veigaiioidea)

Zerconidae (*Paleozercon*, *Zercon*, *Zerconopsis*; new genera in WA)

Superfamily Uropodoidea (now in Cohort Uropodina)

Cohort Dermanyssina.

Superfamily Ascoidea

Ameroseiidae (*Apicriopsis*)

Ascidae (*Asca*, *Arctoseius* (now in Arctacaridae), *Cheiroseius*, *Gamasellodes*, *Iphidozercon*, *Melichares*, *Proctolaelaps*, *Zerconopsis*; undet. genus & sp. (Tx detritivore? in Calaveras Co.,CA)

Phytoseiidae (phytoseiid mites) (*Typhlodromus* (once put in Dermanyssidae)

Podocinidae (*Podocinum*)

Superfamily Dermanyssoidea **Bibl.:** Radovsky 1994

Dermanyssidae

Subfamily Nycteriglyphinae

(*Chiroptoglyphus* (now in Rosensteiniidae), *Chiroptonyssus*, *Dermanyssus*, *Ichoronyssus*, *Liponyssoides*)

Haemogamasidae (also subsumed in Laelaptidae)

Subfamily Laelaptinae (*Brevisterna*; undet. genus on TX *Neotoma fuscipes* woodrats)

Laelaptidae (also put in Notostigmata & in Superfamily Gamasida) (=Laelaptidae)

(*Androlaelaps*, *Atricholaelaps*, *Echinonyssus*, *Eubrachylaelaps*, *Calvolia* (also put in Acaridae), *Eulaelaps*, *Geolaelaps*, *Gymnolaelaps*, *Hologamasus*, *Haemolaelaps*, *Laelaspis*, *Loelaps*, *Neoichoronyssus*, *Pseudoparasitus*, *Stratiolaelaps*)

Undet. Tp genera (Marion Co., AR)

Undet. Tp genera in Possum Trot Hollow, Shannon Co., MO) **Bibl.:** Radovsky 1967

Subfamily Haemogamasinae, (*Haemogamasus* also put in own family)

Subfamily Myonyssinae (*Hirstionyssus*)

Subfamily Hypoaspidae (*HypoaspisIphis*)

Macronyssidae (macronyssid mites) *Coprolactistus*, *Cytonyssus*)

Subfamily Macronysinae (*Macronyssus*, *Radfordiella*)

Subfamily Ornithonyssinae

(*Cryptonyssus*, *Ornithonyssus*, *Steatonyssus* (once in Dermanyssidae)).

**Bibl.:** Radovsky 1967

Spinturnicidae

(*Paraspinturnix*, *Periglischrus*, *Paraspinturnix*, *Spinturnix*; undet. genus & sp. in MO)

Superfamily Eviphidoidea

Eviphididae (*Alliphis*, *Eviphis*)

Macrochelidae (*Geholaspis*, *Macrocheles* (once put in Dermanyssidae))

Superfamily Laelaptonysoidea

Digamasellidae (also placed in Rhodacaroidea) (*Dendrolaelaps*)

Superfamily Parasitoidea (also put in Cohort Parasitina) **Bibl.:** H. Ewing 1940

Parasitidae

(*Eugamasus*, *Gamasodes*, *Paracarpais*, *Parasitus*, *Pergamasus*, *Poecilophysis*;  
undet. Tp genus in AR & undet. Tp or Tx genera in Shannon & OR Cos.,MO)

Superfamily Rhodacaroidea (=Rhodacaridae Oudemans sensu lato)

Eurypsitidae (*Euryparasitus* (put by Antony 1986 in own family)

Digamasellidae (put in Laelaptonysoidea)

Ologamasidae (*Cyrtolaelaps*, *Gamasellus*, *Gamasellodes* (put in Ascidae),  
*Rhodacaroides* (now in own family), *Euryparasitus* (now in own family))

Rodacaridae (*Rhodacaroides*)

Subfamily Ologamasinae (also put in own family), *Cyrtolaelaps*, *Periseius*,  
*Rhodacarus* (all in Ologamasidae), *Psammonsella*, *Rhodacaropsis*, *Saprolaelaps*)

Superfamily Veigaiioidea

Veigaiidae (undet. Tp genus in IL; *Trigynaspida*, *Uropoda* (now in Uropodidae), *Veigaia*)

Cohort or Supercohort Endeostigmata

Superfamily Bimichaeloidea

Lordalychidae (*Lordalychus*)

Bimichaelidae (*Bimichaelia*)

Cohort Eupodina (also under Endeostigmata)

Superfamily Bdelloidea

Alicorhagiidae (also put in Cohort or Supercohort Endeostigmata) (*Alicorhagia*)

Bdellidae (snout mites) (*Bdella*, *Bdellozonium?*, *Cyta*). Tx? undet. genera in MN,MO;  
undet. Ac or Tx genera & sp. in seAK)

Cunaxidae (*Cunaxa*, *Pulaeus*)

Superfamily Eupodoidea

Actinedidae (*Linopodes* (now in Eupodidae), *Spinibdella*)

Eupodidae (eupodid mites) (*Eupodes*, *Linopodes* (once in Actinidae))

Penthalodidae (*Penthalodes*)

Rhagidiidae

(mostly predators) (*Elliotta*, *Foveacheles*, *Poecilophysis* (now in Parasitidae),  
*Rhagidia*, *Robustocheles*; *Shibaia*, undet. genus & sp. Tp? predator in Mariposa  
& Tuolumne Cos.,CA)

Superfamily Halacaroidae (subsumed in Hydrachnellae?)

Halacaridae

(*Actacarus*, *Anomalohalacarus*, *Halacarus*, *Scaptognathides*, undet. genus in LA brackish beach)

Subfamily Acarochelepodinae (*Acarochelepodia*)

Subfamily Copidognathinae (*Copidognathus*)

Subfamily Halacarinae

(*Nalacarellus*, *Hamohalacarus*, *Lobohalacarus* (both in Limnohalacaridae), *Porohalacarus*)

Subfamily Limnohalacarinae (also in own family)

(*Soldanellonyx* (put in Limnohalacaridae))

Subfamily Lohmannellinae (*Porolohamannella*)

Subfamily Rhombognathinae (*Isobactrus*, *Rhombognathides*)

Subfamily Ropohalacarinae (*Ropohalacarus*)

Subfamily Simognathinae (*Acaromatis*)

Superfamily Tydeoidea

Ereynetidae

(*Ereynetes*, *Neospeleognathopsis*; undet. genus in cave in Eddy CO., NM)

Tydeidae (tydeid mites) (*Tydeus*)

Cohort Uropodina

Superfamily Polyaspidioidea

Polyaspididae (also subsumed in Uropodidae)

(*Dithinozercon* (now in Dithinozerconidae), *Calotrachytes*, *Polyaspis*)

Superfamily Uropodoidea

Dithinozerconidae

(*Dithinozercon* (once in Polyaspididae & Uropodidae);

undet. Tp genera in cave in OR Co., MO)

Leiodinychidae (*Leiodinychus*)

Polyaspididae (now in Polyaspidioidea)

Uropodidae

(*Cilliba*, *Discourella*, *Dithinozercon* (now in Dithinozerconidae) *Polyaspis* (now in Polyaspididae), *Trichouropoda*, *Uropoda* (once in Veigaiidae), undet. genus in cave in Eddy Co., NM/ on bat gauno)

Cohort Anystina,

Superfamily Anystoidea

Anystidae (anystid or whirligig mites) (*Anystis*, *Chausseria*)

Superfamily Caeculoidea  
Caeculidae (*Caeculus*)

Superfamily Hydrachnoidea (now in Hydrachnida)

Superfamily Pterygosomatoidea  
Pterygosomidae (*Pimeliaphilus*)

Cohort (or Suborder) Palaeosomata  
Superfamily Palaeacaroidae  
Palaeacaridae (*Palaeacarus*)

Cohort Circumdehiscenciae = Brachypylina

Cohort Euptyctyma  
Superfamily Euphthiracaroidae

Euphthiracaridae (once in Cohort Mixonomata) (*Euphthiracarus*)  
Phthiracaridae (also put in Cohort Mixonomata)  
(*Steganacarus*; undet. Ac or Tx genera in seAK)

Cohort (or Suborder) Mixonomata  
Superfamily Euphthiracaroidae (Euphthiracaroidae) (now in Cohort Euptyctyma)  
Superfamily Phthiracaroidae (put in Cohort Euptyctima)

Cohort Psoroptidia  
Superfamily Psoroptoidea  
Listrophoridae (put in Listrophoroidea)

Myocoptidae (*Myocoptes*, *Trichoecius*)  
Sarcoptidae (itch, sarcoptic, mange or scab mites)  
(*Histiostoma* (now in own family), *Microtrombicula*?, *Notoedres*, *Sarcoptes*,  
*Teionocoptes*)

**Bibl.:** Bergstrom 1953; Conroy 1968; Conroy & Scudder 1975; Cook 1974; Crowell 1960-1;  
Habeeb 1962, 1974; Marshall 1933, 1943; Quaglia & Conroy 1984; Quaglia, Conroy & Burton  
1988

**Acaridae** (acarid, cereal or root mites) (*Acarus*, *Acotyledon*, *Caloglyphus*, *Calvolia* (also put in  
Laelaptidae), *Rhizoglyphus*, *Sancassania*, *Schwiebea*, *Troglocoptes*, *Tyroglyphus*, *Tyrophagus*)  
undet. genus & sp. in Siskiyou Co., phoretic on *Neotoma cinerea* woodrats)

**Acherontacaridae** (*Acherontacarus*) (once in Hydrovolziidae)

**Actinedidae** (*Linopodes* (now in Eupodidae), *Spinibdella*)

**Alichorhigidiidae** (*Alicorhagia*)

**Ameroseiidae** (*Apicriopsis*)



**Anisitiellidae** Koenike 1910 (water mites in springs, riffles, interstitial & pools) (fly hosts)  
Subfamily Anisitiellinae (*Bandakia*, *Bandakiopsis*, *Cookacarus*, *Oregonacarus*, *Utaxatax*)

Anoetidae = Histiostomatidae

**Anystidae** (anystid or whirligig mites) (*Anystis*, *Chausseria*)

**Arctacariidae** (*Arctoseius* (once put in Ascidae))

**Arenohydracaridae** (interstitial water mites) (*Arenohydracarus*)

**Argasidae** (argasine or soft ticks) (*Antricola*, *Argas*, *Carios*, *Ornithodoros*)

**Bibl.:** Cooley & Kohls 1944; Kohls, Sonenshine & Clifford. 1968

**Arrenuridae** (water mites in interstitial, springs, riffles, pools, lakes, temporary ponds)

Subfamily Arrenurinae (*Arrenurus*)

**Ascidae** (*Asca*, *Arctoseius* (now in Arctacaridae), *Cheiroseius*, *Gamasellodes*, *Iphidozercon*, *Melichares*, *Proctolaelaps*, *Zerconopsis*; undet. genus & sp. (Tx detritivore? in Calaveras Co.,CA)

**Athienemanniidae** (*Chelohydracarus*)

Subfamily Stygameracarinae (water mites in interstitial) (incl. *Stygameracarus*)

Subfamily Athienemanniinae (*Chelomideopsis*, *Platyhydracarus*)

**Aturidae** (water mites) *Woolastookia*)

Subfamily Albiinae (*Albaxona* (now in Axonopsinae), *Albia*)

Subfamily Aturinae (fly & stonefly hosts (incl. *Aturus*)

Subfamily Axonopsinae (incl. *Axonopsis*) (now in Axonopsidae), *Albaxona*, *Axonopsalbia*, *Axonopsella*, *Bharatalbia*, *Brachypoda*, *Erebaxonopsis*, *Estellacarus*, *Ljanina*, *Neobrachypoda*, *Vicinaxonopsis*)

Subfamily Frontipodopsinae - now in own family

**Axonopsidae** (*Axonopsis*) (also put in Aturidae, subfamily Axonopsinae)

**Bdellidae** (snout mites) (*Bdella*, *Bdellozonium?*, *Cyta*). Tx? undet. genera in MN,MO; undet. Ac or Tx genera & sp. in seAK) **Bibl.:** Atyeo 1959-60

Belbidae (*Belba* (now in Damaeidae))

**Bimichaelidae** (*Bimichaelia*)

**Bogatiidae**

Subfamily Horreolaninae (water mites in interstitial) (*Horreolanus*)

**Caeculidae** (*Caeculus*)

**Caligonellidae** (*Caligonella*)

**Camisiidae** (*Camisia* (also put in Liodidae), *Heminothrus*)

**Ceratozetidae** (*Ceratozetes*, *Sphaerozetes*)

**Chappuisididae**

Subfamily Chappuisidinae (water mites in interstitial) (*Chappuisides*)

Subfamily Morimotacarinae (*Morimotacarus*, *Yachatsia* (both once in Uchidastygacaridae))

**Cheyletidae** (*Cheletonella*, *Cheyletus*, *Eucheyletia*)

**Chirodiscidae** (*Alabidocarpus* (once put in Listrophoridae), *Olabidocarpus*)

**Chortoglyphidae** (*Aplodontopus*, *Chortoglyphus*)

**Cosmochthonidae** (*Cosmochthonius*)

**Cunaxidae** (*Cunaxa*, *Pulaeus*)

**Damaeidae** (*Belba* (once in Belbidae), *Caenobelba*, *Epidamaeus*, *Paradamaeus*)

**Demodicidae** (*Demodex*)

**Dermanyssidae** (parasitic mites)

Subfamily Nycteriglyphinae

(*Chiroptoglyphus* (now in Rosensteiniidae), *Chiroptonysus*, *Dermanyssus*, *Ichoronyssus*, *Liponyssoides*)

**Digamasellidae** Evans, 1957 (*Dendrolaelaps*)

**Dithinozerconidae** (*Dithinozercon* (once in Polyaspididae & Uropodidae) undet. Tp genera in cave in OR Co., MO)

**Ereynetidae** (*Ereynetes*, *Neospeleognathopsis*; undet. Genera in cave in Eddy Co., NM)

**Erythraeidae** (running mites)

(*Abrolophus*, *Erythraeus*, *Leptus*; undet. Ac or Tx genera & sp. in seA)

**Euphthiracaridae** (*Euphthiracarus*)

**Euryparasitidae** (*Euryparasitus* (put by Antony 1986 in own family) **Bibl.:** Antony 1986; Goff et al 1979; Krantz & Ainscough 1990,

**Eupodidae** (eupodid mites) (*Eupodes*, *Linopodes* (once in Actinidae))

**Bibl.:** Baker 1990; Thor 1941, Zacharda & Elliott 1985

**Eviphididae** Berlese, 1913 (*Alliphis*, *Eviphis*)

**Feltriidae** Koenike, 1892 (water mites) (parasites of fly larvae) (*Feltria*)

**Frontipodopsidae** (once a subfamily of Aturidae) (*Javalbia*, *Kongsbergia*, *Lethaxona*, *Lethaxonella*, *Phreatobrachypoda* (left in Aturidae))

Subfamily Axonopsiane (*Woolastookia*, *Ljanina*)

Subfamily Frontipodopsinae (*Frontipodopsis*)

**Galumnidae** (beetle mites) (*Galumna*, *Oribata*, *Pilogalumna*)

**Gamasidae** (*Gamasellodes* (now in Ascidae), *Macrocheles* (now in own family))

**Glycyphagidae** (glycyphagid mites) (*Ctenoglyphus*, *Dermacarus*, *Glycyphagus*, *Xenoryctes*)

**Gymnodamaeidae** (*Plesiodamaeus*)

**Haemogamasidae** (also subsumed in Laelaptidae)

Subfamily Laelaptinae (*Brevisterna*; undet. genus on TX *Neotoma fuscipes* woodrats)

**Halacaridae** (*Actacarus*, *Anomalohalacarus*, *Halacarus*, *Scaptognathides*, undet. genus in LA brackish beach. **Bibl.:** C. Walter 1931)

Subfamily Acarochelepodinae (*Acarochelepodia*)

Subfamily Copidognathinae (*Copidognathus*)

Subfamily Halacarinae

(*Nalacarellus*, *Hamohalacarus*, *Lobohalacarus* (both in Limnohalacaridae),  
*Porohalacarus*)

Subfamily Limnohalacarinae (also in own family) (*Soldanellonyx* (put in Limnohalacaridae))

Subfamily Lohmannellinae (*Porolohamannella*)

Subfamily Rhombognathinae (*Isobactrus*, *Rhombognathides*)

Subfamily Ropohalacarinae (*Ropohalacarus*)

Subfamily Simognathinae (*Acaromatis*)

**Hemisarcoptidae** (insect mites) (prob. new phoretic genus in WA caves)

**Histiostomatidae** (=Anoetidae) (mostly feed on microbes) (undet. genus in OR C., OR & Kartchner C., Cochise Co., AZ); *Histiostoma* (also put in Anoetidae), *Myianoetus*)

**Hydrachnidae** (water mites in mostly lakes and temporary pools) (*Hydrachna*; undet. genus in LA brackish sediment)

**Hydrovolziidae**

Subfamily Hydrovoltziinae

(water mites in springs, riffles, interstitial) (*Hydrovolzia*, *Acherontacarus*) (also put in Limnohalacaridae, now in own family)

**Hydryphantidae** (water mites) (*Lundbladia*)

Subfamily Cyclothyadinae (interstitial in NA) (*Cyclothyas*)

Subfamily Thyadinae

(mostly in springs, ripples & temporary pools) (bug, Odonata & fly hosts) (*Thyas*)

**Hygrobatidae** Koch, 1837 (water mites in sprgs, riffles, interstitial, lentic) (fly, stonefly hosts) (*Diamphidaxona*) (once in Aturidae, Subfamily Axonopsinae)

Subfamily Cowichaninae (*Cowichania*)

Subfamily Hygrobatinae (*Atractides*, *Hygrobates*)

Subfamily Kawamuracarinae

(*Kawamuracarus*; undet. genus in brackish beach sediment at Lake Pontchartrain, LA)

**Ixodidae** (hardback or hard ticks) (*Amblyomma*, *Aponomma*, *Dermacentor*, *Ixodes*, *Teinocoptes*)

**Bibl.:** Banks 1908

**Johnstonianidae** (*Johnstoniana*, *Polidiscia*)

**Labidocarpidae** (*Dentocarpus*) (also put in Chrodiscidae) **Bibl.:** McDaniel & Coffman 1970

**Laelapidae** Berlese, 1892 (=Laelaptidae) (*Androlaelaps*, *Atricholaelaps*, *Echinonyssus*, *Eubrachylaelaps*, *Calvolia* (also put in Acaridae), *Eulaelaps*, *Geolaelaps*, *Gymnolaelaps*, *Hologamasus*, *Haemolaelaps*, *Laelaspis*, *Loelaps*, *Neoichoronyssus*, *Pseudoparasitus*, *Stratiolaelaps*)

Undet. Tp genera (Marion Co., AR)

Undet. Tp genera in Possum Trot Hollow, Shannon Co., MO) **Bibl.:** Radovsky 1967

Subfamily Haemogamasinae, (*Haemogamasus* also put in own family)

Subfamily Myonyssinae (*Hirstionyssus*)

Subfamily Hypoaspidae (*HypoaspisIphis*)

**Lebertiidae** Meiam, 1880 (water mites mostly in springs, riffles, pools & lakes) (fly hosts) (*Estelloxus*, *Lebertia*, *Scutolebertia*)

**Leeuwenhoekidae** Womersley, 1945 (*Leeuwenhoekia*, *Whartonia* (both also put in Trombiculidae))

**Leiodinychidae** (*Leiodinychus*)

**Liacaridae** (*Dorycranopsus*, *Liacarus*, *Opsioristes*)

**Limnesiidae** Koch, 1835 (water mites) (*Arizonacarus*, *Dorycranosu*)

Subfamily Neomamersinae (interstitial) (*Arizonacarus*, *Neomamersa*, *Meramecia*)

Subfamily Limesiinae (riffles, interstitial, pools & lakes) (*Limnesia*)

Subfamily Protolimnesinae (interstitial) (*Protolimnesia*)

Subfamily Tyrrelliinae (interstitial) (*Tyrrellia*)

**Limnocharidae**

Subfamily Rhyncholimnocharinae (interstitial water mites)

(*Rhyncholimnochares*) (also put in Rhynchohydracaridae)

**Limnohalacaridae** (also put in Halacaridae, Subfamily Limnohalacarinae)

Subfamily Acherontacarinae

(*Acherontacarus*) (also put in Limnohalacaridae, but now in own family)

Subfamily Porohalacarinae (also in own family) (*Lobohalacarus*) (put in Halacaridae)

Subfamily Limnohalacarinae (*Hamohalacarus*, *Parasoldanellonyx* (both once in Halacaridae. **Bibl.:**Schwoerbel 1986a

Subfamily Lohmannellinae (*Soldanellonyx*) (once in Halacaridae & Limnohalacarinae)

**Listrophoroidae** (hair-clasping mites) (*Alabidocarpus* (now put in Chirodiscidae), *Listrophorus*, *Olabidocarpus* (once put in Chirodiscidae))

**Lordalychidae** (*Lordalychus*)

**Macrochelidae** Vitzthum, 1930 (*Geholaspis*, *Macrocheles* (once put in Dermanyssidae))

**Macronyssidae** (macronyssid mites) *Coprolactistus*, *Cytonyssus*)

Subfamily Macronysinae (*Macronyssus*, *Radfordiella*)

Subfamily Ornithonyssinae

(*Cryptonyssus*, *Ornithonyssus*, *Steatonyssus* (once in Dermanyssidae)).

**Bibl.:** Radovsky 1967

**Malacoethridae** (*Malacoethrus*, *Trimalacoethrus*)

**Microtrombiidae** (velvet mites) - undesc. sp. & genus, Ac in El Malpais Natl.Monument, nNM)

**Mideidae** (water mites mostly in pools & lakes) (fly hosts) (*Midea*)

**Mideopsidae** (water mites in springs, riffles, interstitial, pools & lakes) (fly hosts) (*Mideopsis*, *Nudomideopsis* (now in own family))

**Momoniidae** (water mites in interstitial)

Subfamily Cyclomomoniinae (*Cyclomomonina*)

Subfamily Stygomomoniinae (stonefly hosts) (*Stygomomonina*)

**Myocoptidae** (*Myocoptes*, *Trichoecius*)

**Myobiidae** (*Acanthophthirius*, *Eudusbabekia*, *Ewingana*, *Myobia*, *Neomyobia*, *Pteracarus*)

**Nanorchestidae** (*Nanorchestes*, *Speleorchestes*)

**Naticidae** (*Cryptonatica*)

**Nematalycidae** - Phreatic in Canadian Rocky Mountains area

**Neocaridae** (*Neocaracus*, *Volsellacarus*)

**Neotrombiidae** (*Ceuthothrombium* (also put in Trombidiidae), *Neotrombidium*)

**Niphocephidae** (*Niphocephus*)

**Nothridae** (*Nothrus*)

**Nudomideopsidae** (also subsumed in Mideopsidae) (water mites in springs & interstitial) (fly hosts) (*Neomideopsis*, *Neomideopsis*, *Nudomideopsis*, *Paramideopsis*)

**Ologamasidae** Ryke, 1962 (*Cyrtolaelaps*, *Gamasellus*, *Gamasellodes* (put in Ascidae), *Rhodacaroides* (now in own family), *Euryparasitus* (now in own family))

**Omartacaridae**

Subfamily Omartacarinae (water mites in interstitial) (*Omartacarus*)

**Oppiidae** (*Multioppia*, *Oppiella*)

**Oribatellidae** (*Oribatella*)

**Oribatidae** (*Galumna* & *Nothrus* both now in own family) **Bibl.:** Balogh 1982

**Oribatulidae** (*Oribatula*, *Scheloribates* (also in own family), *Zygoribatula*)

**Oribotritiidae** (*Oribotritia*)

**Oxidae** (*Frontipoda*, *Oxus*)

**Palaeacaridae** (*Palaeacarus*)

**Parasitidae** Oudemans, 1901 (*Eugamasus*, *Gamasodes*, *Paracarpais*, *Parasitus*, *Pergamasus*, *Poecilophysis*; undet. Tp genus in AR & undet. Tp or Tx genera in Shannon & OR Cos., MO)

**Penthalodidae** (*Penthalodes*)

**Phthiracaridae** (*Steganacarus*; undet. Ac or Tx genera in seAK)

**Phytoseiidae** Berlese, 1916 (phytoseiid mites) (*Typhlodromus* (once put in Dermanyssidae))

**Pionidae** (water mites) (fly hosts)

Subfamily Tiphyninae (=Hydrochoreutinae) (springs, interstitial, pools & lakes)

Tribe Foreliini (*Forelia*, *Pionacercus*)

Tribe Tiphyni (*Tiphys*)

Subfamily Pioninae (mostly in springs, riffles, pools, lakes & temporary ponds)

Tribe Pionini (*Piona*)

**Piersigiidae**

Subfamily Piersigiinae (water mites in springs, temporary pools, interstitial)  
(beetle hosts) (*Piersigia*)

**Podocinidae** (*Podocinum*)

**Polyaspididae** (also subsumed in Uropodidae) (*Dithinozercon* (now in Dithinozerconidae), *Calotrachytes*, *Polyaspis*)

**Porohalacaridae** Viets, 1927 (*Porohalacarus*) (put in Halacaridae)

**Prothoplophoridae** (*Prothoplophora*)

**Protziidae** Piersig, 1896 (water mites in springs & interstitial) (also put in Hydryphantidae)

Subfamily Wandesiinae (stonefly hosts) (*Wandesia*)

**Pterygosomidae** (*Pimeliaphilus*)

**Pyemotidae** (soft-bodied mites) (*Pyemotes*; undet. genus & sp. in MO)

**Pygmephoridae** (*Bakerdania*; *Neopygmephorus*, *Pygmephorus*, undet. Tp genera in OR C., OR; undet. Tp? genus in prob. fungivores in Kartchner C., Cochise Co., AZ; undet. Tp? genus in Flea C., AR)

**Raphignathidae** (*Raphignathus*)

**Rhagidiidae** (mostly predators) (*Elliotta*, *Foveacheles*, *Poecilophysis* (now in Parasitidae), *Rhagidia*, *Robustocheles*; *Shibaia*, undet. genus & sp. Tp? predator in Mariposa & Tuolumne Cos., CA) **Bibl.:** Elliott & Strandtmann 1971; Thor 1941; Zacharda 1979, 1980, 1985; Zacharda & Elliott 1981

**Rhodacaridae** (*Rhodacaroides*)

Subfamily Ologamasinae (also put in own family)

*Cyrtolaelaps*, *Periseius*, *Rhodacarus* (all in Ologamasidae), *Psammonsella*, *Rhodacaropsis*, *Saprolaelaps*) **Bibl.:** Oudemans, 1892; Lee 1970, Krantz 1986

**Rhynchohydracaridae** (also subsumed in Limnocharidae, Subfamily Rhyncholimnocharinae)

Subfamily Clathrosperchoninae (water mites) (*Clathrosperchon*)

**Rosensteiniidae**

Subfamily Chiroptoglyphinae (*Chiroptoglyphus*, *Mydopholeus*)

Subfamily Nycteriglyphinae (*Nycteriglyphus*)

**Rutripalpidae** (*Rutripalpus*)

**Sarcoptidae** (itch, sarcoptic, mange or scab mites) (*Histiostoma* (now in own family), *Microtrombicula?*, *Notoedres*, *Sarcoptus*, *Teionocoptes*)

**Scheloribatidae** (*Scheloribates* (also put in Oribatulidae)

**Scutacaridae** (*Scutacarus*; undet. genus & sp. in MO)

**Seuratoidae** (*Seuratum*)

**Smarididae** (*Fessonina*)

**Sperchontidae**

Subfamily Sperchontinae

(water mites in sprs., riffles, pools & lakes) (fly, stonefly host (*Spercon*))

**Spinturnicidae**

(*Paraspinturnix*, *Periglischrus*, *Paraspinturnix*, *Spinturnix*; undet. genus & sp. in MO)

**Stigmaeidae** (*Eustigmaeus*; undet. genus & sp. in MO)

**Stygothrombiidae** (interstitial water mites)

Subfamily Stygothrombiinae

(*Cerberothrombium*, *Hydrothrombium*, *Stygothrombium*, *Victathrombium*)

**Bibl.:** Schwoerbel 1986b

**Tarsonemidae** (*Neotarsonemoides*)

**Tectocephidae** (*Tectocephus*)

**Tetranychidae** (spider mites or red spiders) (*Bryobia*) **Bibl.:** E. Baker 1994,

**Teutoniidae** (water mites mostly in pools) (fly hosts) (*Teutonia*)  
**Thyrisomidae** (*Banksinoma*, *Gemmazetes*, *Oribella*)

**Torrenticolidae** Thor, 1902 (water mites in interstitial & riffles)  
Subfamily Torrenticolinae (fly hosts)  
(*Monatractides*, *Neotractides*, *Pseudotorrenticola*, *Torrenticola*)  
  
Subfamily Testudacarinae (*Testudacarus*)

**Trombiculidae** (chigger mites) (mostly parasitic as larvae, predators as adults) (*Acomatacarus*, *Albeckia*, *Beamerella*, *Cheladonta*, *Chatia*, *Comatacarus*, *Eltonella*, *Euschoengastia*, *Euschoengastoides*, *Eutrombicula*, *Hannemania*, *Hexidionis*, *Loomisia*, *Microtrombicula*, *Monunguis*, *Otorhinoiphila*, *Parasecia*, *Perissopalla*, *Pseudoschoengastia*, *Radfordia*, *Sasacarus*, *Speleocola*, *Tecomatlana*, *Trombicula*, *Whartonia* (also put in Leeuwenhoekiiidae)).  
**Bibl.:** Ewing 1932  
Subfamily Leeuwenhoekiiinae (*Leeuwenhoekia*) (also put in Leeuwenhoekiiidae)

**Trombidiidae** (harvest mites or chiggers; trombidiid mites) (*Ceuthothrombium* (now in Neothrombidiidae), *Leptotrombidium*, *Microtrombidium*, *Monunguis*, *Trombidium*; undet. genus & sp. in OR C., OR & Mariposa Co., CA; undescr. parasitic Tb genus in WA & undescr. Ac genus in El Malpais Natl. Monument, NM) **Bibl.:** Schwoerbel 1986b

**Trhypochthoniidae** (*Trhypochthoniellus*)

**Tydeidae** (tydeid mites) (*Tydeus*)  
Tyroglyphidae = Acaridae

Uchidastygacaridae (*Morimotacarus*)  
Subfamily Uchidastygacarinae (water mites in interstitial) (*Uchidastygacarus*), *Yachatsia*  
Family now subsumed in Chappuisiidae

**Unionicolidae** (water mites)  
Subfamily Unionicolinae (mostly in pools & lakes) (fly and stonefly hosts) (*Unionicola*)  
Subfamily Pionatacinae (*Koenikea*)

**Uropodidae** Kramer, 1881 (*Cilliba*, *Discourella*, *Dithinozercon* (now in Dithinozerconidae) *Polyaspis* (now in Polyaspididae), *Trichouropoda*, *Uropoda* (once in Veigaiidae), undet. genus in cave in Eddy Co., NM/ on bat gauno)

**Veigaiidae** Oudemans, 1939 (undet. Tp genus in IL; *Trigynaspida*, *Uropoda* (now in Uropodidae), *Veigaia*)

**Wandesiidae** (water mites) (*Wandesia*)

**Zerconidae** Canestrini, 1891 (*Paleozercon*, *Zercon*, *Zerconopsis*; new genera in WA) **Bibl.:** Blaszak 1984 (associated with mammal activity)



MITE species incl.

*Acanthopthirus* Perkins, 1925 (= *Ewingana* Radford, 1948) Myobiidae mites

*Acanthopthirus* (*Myotimyobia*) *caudatus* (*Myobia caudata* & *canadensis* Banks, 1910 or 1909; *Radfordia c.* Radford, 1950; *Binucus c.* Radford, 1954; *Neomyobia c.* Jameson, 1955) Dusbabek, 1969 (ectoparasite on AL *Corynorhinus rafinesquii macrotis*, *Myotis grisescens*, *M. keenii septentrionalis*, *Nycticeius h. humeralis*; AL, MD (rare) *Pipistrellus subflavus*, AL, IN? *Eptesicus f. fuscus*, MD *Pipistrellus hesperus* & NJ, MD, ON, WV *Myotis lucifugus* & AL, TN *Lasiurus borealis* bats)

*Acanthopthirus* (*Myotimyobia*) *caudatus caudatus* (*Myobia caudata* Banks, 1910 or 1909) Dusbabek, 1969 (ectoparasite on *Myotis lucifugus* bats)

*Acanthopthirus* (*Myotimyobia*) *caudatus* ssp. *eptesicus* Fain & Whitaker, 1976 (ectoparasite on ON *Myotis lucifugus*; TX *Myotis velifer*; IN, OH, OR *Eptesicus fuscus*; OH *Lasiurus cinereus* & *Lasionycteris noctivagans* bats)

*Acanthopthirus* (*Myotimyobia*) *gracilis* Fain & Whitaker, 1976 (ectoparasite on *Myotis volans*, IL, IN *Myotis keenii* & IN *M. lucifugus*, *Lasiurus borealis*, *Lasiurus cinereus* bats)

*Acanthopthirus* (*Myotimyobia*) *lasiurus* Fain & Whitaker, 1976 (ectoparasite on IN *Lasiurus borealis* & *Lasiurus cinereus* bats)

*Acanthopthirus longa* (*Myobia longa* Ewing, 1938; *Ewingana bispinosa* Radford, 1952; *Myobia canadensis* Banks) Jameson, 1955 (ectoparasite on AL, CA, TX *Tadarida brasiliensis* bats)

*Acanthopthirus* (*Myotimyobia*) *lucifugus* Fain & Whitaker, 1976 (ectoparasite on IN, PA *Myotis lucifugus* & *M. sodalis* bats)

*Acanthopthirus nycticeus* Fain & Whitaker, 1987 (on IN *Nycticeius humeralis* bats)

*Acanthopthirus oregonensis* Brennan 1965 (on OR, SW *Pipistrellus hesperus* bats)

*Acanthopthirus* undet. sp. (on *Lasiurus borealis*, wTX *Eumops perotis*; IN *Myotis keenii* & *volans* (near *A. gracilis*), *Eptesicus fuscus*, *Lasiurus cinereus* & *Lasionycteris noctivagans* bats)

*Acanthopthirus* undescr. sp. or species (ectoparasite on FL *Myotis austroriparius* & NB bats)

*Acarochelopodia* Angelier, 1954 - Halacaridae mites

*Acarochelopodia* undet. sp. (interstitial? in HI intertidal sandy beach)

*Acaromatis* Trouessart & Neumann, 1893 - Halacaridae mites

*Acaromatis arenarius* Bartsch, 1977 (interstitial brackish and marine on US Atlantic beaches)

*Acarus* Linnaeus, 1768 - Acaridae mites

*Acarus immobilis* Griffiths, 1964 (Ac in one NS cave)

*Acarus* undet. sp. or species (Tx in KY (Mammoth C.) & IN)

*Acomatacarus* Ewing, 1942 - Trombiculidae mites, Subfamily Leeuwenhoeikiinae  
*Acomatacarus (Acomatacarus) galli* Ewing, 1946 (ectoparasite on OK *Neotoma floridana* woodrats)

*Acomatacarus (Xenacarus) plumosus* Greenberg, 1951 (ectoparasite on IA *Neotoma micropus* & KS *N. floridana* woodrats)

*Acotyledon* Oudemans, 1903 - Acaridae mites  
*Acotyledon neotomae* Faina & Whitaker, 1986 (ectoparasite on Western *Neotoma cinerea* woodrats)

*Actacarus* Schulz, 1937 - Halacaridae mites  
*Actacarus illustrans* Newell, 1951 (interstitial brackish and marine on US Pacific beaches)

*Actacarus obductus* Bartsch, 1977 (interstitial brackish and marine on US Atlantic beaches)  
*Actacarus pacificus* Bartsch, 1979 (interstitial? in HI intertidal sandy beach)

*Albeckia* Vercammen-Grandjean & Wakins, 1966 - Trombiculidae mite  
*Albeckia albecki* Vercammen-Grandjean & Wakins, 1966 (ectoparasite on CA, TX *Antrozous pallidus* & SD *Myotis leibii* bats)

*Albeckia senase* = *Whartonia s.*

*Abrolophus* Berlese, 1891 - Erythraeidae mites  
*Abrolophus* undesc. sp. (Ac in El Malpais Natl.Monument, nNM)

*Acarochelopodia* Angelier, 1954 – Halacaridae mites, Subfamily Acarochelopodinae

*Acherontacarus* Viets, 1932 - Acherontacaridae mites, Subfamily Acherontacarinae (once placed in Hydrovolziidae, subfamily Hydrovoltziinae & Limnohalacaridae, Subfamily Acherontacarinae (Hemipetra & Diptera hosts)

*Alabidocarpus* Ewing, 1929 - Chirodiscidae mites  
*Alabidocarpus calcaratus* Lawrence, 1952 (ectoparasite on West Indies, Central America, South America bats/ ectoparsite on CA *Myotis yumanensis saturatus*; OR *Myotis californicus* & *M. volans* & MI *Myotis lucifugus* bats)

@*Alabidocarpus longipilus* (ectoparasite on CA *Myotis yumanensis* bats)

*Alabidocarpus* undet. sp. (ectoparasite on OH *Eptesicus fuscus* & *Lasiurus cinereus* bats)

"*Alabidocarpus tuscaloosae*" in J. White, 1960 (ectoparasite on AL *Eptesicus fuscus*, *Corynorhinus rafinesquii macrotis*, *Pipistrellus subflavus* bats)

*Albaxona* Szalay, 1944 - Aturidae mites, subfamily Axonopsinae  
*Albaxona (Vietsaxona) nearctica* Cook, 1974 (VA hyporheic interstitial in stream gravel bar, Simpson Cr., Alleghany Co., VA)

*Albia* Thon, 1899 - Aturidae mites, subfamily Albilinae

*Albia* (*Albiella*) *caerulea* (A. (*Anchistalbia*) c. Marshall, 1927) (hyporheic in temperate NA interstitial)

*Albia* (*Albia*) *neogaea* Habeeb, 1966 (NY, ON surface streams & hyporheic in NY, ON silty sand river bars)

*Alicorhagia* Berlese, 1910 - Alicorhagiidae mites

*Alicorhagia* undet. sp. (hyporheic in CO)

*Alicorhagia* undescr. sp. (Tb? in El Malpais Natl. Monument, nNM)

*Alliphis* Halbert, 1923 Eviphididae mites

*Alliphis* undet. sp. (Tp or Tx in NS)

*Amblyomma* Koch, 1844 - Ixodidae mites. **Bibl.** E. Jones et al. 1972

*Amblyomma americanum* (*Acarus a.* Linnaeus, 1758; *Ixodes a.* Fabricius, 1805) (lone star tick) (parasite on goats, SC *Neotoma floridana* & NM *Neotoma micropus* woodrats & other mammals in TX caves/ Carries *Rickettsia*, *Coxiella burnetii*, *Fracisellatularensis*, blue tongue virus, Cache Valley virus),

*Amblyomma cajennense* (*Acarus c.* Fabricius, 1787) (Ac in Burnet, Llano Cos., TX)

*Androlaelaps* Berlese, 1903 (= *Atricholaelaps* Ewing, 1929; *Cyclolaelaps* Ewing, 1933; *Eubrachylaelaps* Ewing, 1929; *Haemolaelaps* Berlese, 1910; *Ischnolaelaps* Foneseca, 1936; *Turkiella* Zumpt & Till, 1953; *Zygotaelaps* Tipton, 1957) Laelapidae (= Laelaptidae) mites

*Androlaelaps casalis casalis* (*Haemogamasus c.* Berlese, 1887; *Atricholaelaps megaventralis* Strandtmann, 1947; *Haemolaelaps haemorrhagicus* Asunuma, 1952; *H. molestus* Oudemans, 1929; *Hypoaspis freemani* Hughes, 1948; *H. oculatus* Oudemans, 1915; *H. soarianus* Hull, 1925; *Iphis casalis* Berlese, 1887) (Tx in nests of *Hirundo fulva* swallows in cave in Edwards Co., TX; ectoparasite on AL *Tadarida brasiliensis* (rare) bats, UT, NV, OR? *Neotoma lepida*; GA, IN *N. floridana*; & OR *Neotoma cinerea* & *N. lepida* (probably) woodrats)

*Androlaelaps fahrenheitsi* (*Laelaps (H.) f.* Berlese, 1887 or 1911) (= *A. & Atricholaelaps glasgowi* (Ewing, 1925); *Atricholaelaps sigmondoni* Strandtmann, 1946; *A. strandtmanni* Fox, 1947; *Haemolaelaps cricetophilus* Vitzthum, 1930; *H. mohrae* Oudemans, 1928; *H. scalopi* Keegan, 1946; *Hypoaspis (H) eos* Zumpt & Patterson, 1951; *H. microti* Oudemans, 1926; *Laelaps californicus* Ewing, 1925; *L. glasgowi* Ewing, 1925; *L. (H.) stegemoni* Hefley, 1935; *L. virginianus* Ewing, 1925; *Liponyssus setiger* Ewing, 1920) (ectoparasite on *Neotoma c.* nests in caves, Siskiyou Co., CA; ectoparasite on *Myotis grisescens*. GA *Tadarida brasiliensis* & KS *Eptesicus fuscus* bats & UT *Neotoma lepida*, OR *Neotoma cinerea* & *N. fuscipes* & GA, IN *Neotoma floridana* woodrats)

*Androlaelaps geomys* (*Haemolaelaps g.* Strandtmann, 1949; *A. sigmondoni* Randolph & Eads, 1946) (ectoparasite on CO *Neotoma cinerea* woodrats)

*Androlaelaps glasgovi* (*Haemolaelaps g.* Ewing, 1926) (Tx parasite on *Myotis grisescens* & KS *Eptesicus fuscus* bats & *Neotoma floridana*, *N. pennsylvanica*, *N. cinerea*, UT, WY *Neotoma lepida* & wTX *Neotoma micropus* woodrats)

*Androlaelaps johnstoni* Eads and Hightower, 1951 (ectoparasite on TX *Neotoma micropus* woodrats)

*Androlaelaps morlani* (*Haemolaelaps m.* Strandtmann, 1949) (ectoparasite on *Neotoma albigula* & *N. micropus* woodrats)

*Androlaelaps* undet.sp. or species (Tx in VA; Tx in Mammoth Cave (Edmonson Co.) & cave in Hart Co., KY)

*Androlaelaps utahensis* = *Brevisterna u.*

*Anomalohalacarus* Newell, 1949 - Halacaridae mites

*Anomalohalacarus litoralis* Bartsch, 1981 (interstitial sublittoral on US Atlantic beaches)

*Anomalohalacarus tenellus* Bartsch, 1979 (interstitial brackish and marine on US Atlantic beaches)

*Anomalohalacarus tenuis* Bartsch, 1979 (interstitial brackish and marine on US Atlantic beaches)

*Antricola* Cooley & Kohls, 1942 - Ixodidae mites

*Antricola coprophila* (*Ornithodoros c.* McIntosh, 1935) (larvae Tx on AZ (mines), nMex. (Mines), TX *Leptoncycteris n.* bats; adults guanobic)

*Anystis* von Heyden, 1826 (whirligig mites) Anystidae mites

*Anystis* undet. sp. or *agilis* Banks (CA, OR if *A. agilis* (whirligig)/Tx predator in CA)

*Anystis* undet. sp. (Ac in El Malpais Natl. Monument, nNM)

*Apicriopsis* Berlese, 1916 - Ameroseiidae mites

*Apicriopsis* undet sp. (on porcupine dung in one NS cave)

*Aponomma* Nbeumann, 1899 - Ixodidae mites

*Aponomma* undet. sp. (ectoparasite on CO *Neotoma cinerea o.* woodrats)

*Aplodontopus* Fain & Spicka, 1977 - Chortoglyphidae mites

*Aplodontopus* undescr. sp. (ectoparasite on IN *Neotoma floridana* woodrats)

*Aplodontopus* undet. sp. (ectoparasite on OR *Neotoma cinerea* & *fuscipes* woodrats)

*Arenohydracarus* Cook, 1974 - Arenohydracaridae mites

*Arenohydracarus* undet. sp. (shallow phreatic in Sycamore Cr. 32 km ne of Phoenix (Maricopa Co.), Big Sandy River, Santa Maria River and Bridle Cr., AZ)

*Arenohydracarus eremitus* Cook, 1974 (hyporheic in gravel bars in warm reocrene spring, Catron Co., NM)

*Arizonacarus* I.M. Smith & D.R. Cook, 1994 - Limnesiidae mites, subfamily Neomamersinae

*Arizonacarus chiricahuensis* I. Smith & D.Cook, 1994 (interstitial in gravels of hyporheic of streams in \*Chiricahua Mts., seAZ)

*Arrenurus* Dugen, 1835 - Arrenuridae mites, subfamily Arrenurinae

*Arrenurus (Truncaturus) kennedyorum* Habeeb, 1963 (hyporheic in NM (Grant & Catron Cos.) & CA (Trinity Co.))

*Arrenurus (Truncaturus) loticus* Mullen, 1976 (hyporheic in MO (Shannon, Dent & Reynolds Cos.) & OK (Comanche Co.))

*Arrenurus (Truncaturus)* undescr.. sp. or species (Ozarks to SW, s. to Mex.)

*Arrenurus (Truncaturus)* undet. sp. (shallow phreatic in Sycamore Cr. 32 km ne of Phoenix (Maricopa Co.), AZ)

*Arctoseius* Thor, 1930 (= *Tristomus* Hughes, 1948) - Arctacaridae mites (also put in Ascidae)

*Arctoseius cetratus (Lasioseius c.* Sellnick, 1940; *A. bispinatus* Weis-Fogh, 1948; *A. halophilus* sensu Evans, 1954; *A. limburgensis* Nesbitt, 1954) Sellnick, 1940 (US/hyporheic in CO; Tx? in MO)

*Arctoseius* undet. sp. near *cetratus* (Tx detritivore? in Calaveras Co.,CA),

*Arctoseius* undet. sp. (NS/Tp or Tx)

*Argas* Latreille, 1795 - Argasidae mites

*Argas (Argas) cooleyi (Argas c.* McIvor, 1941; *A. (Alveonasus) c.*) Kohls & Hoogstraal (NV/Ttx? in CA condor nest, Ventura Co.,CA)

*Argas* undet. sp. (Kartchner C., AZ/ Tp)

*Argas (A.) reflexus* (Fabricius, 1794) (TTx? in Contra Costa Co.,CA)

*Asca* Heyden, 1826 -Ascidae mites

*Asca* undet. sp. (Jewel C.,SD/TTx?)

*Atractides* Koch, 1837 - Hygrobatidae mites, Subfamily Hygrobatinae

*Atractides riparius* Habeeb, 1957 (hyporheic in NB gravel bars)

*Atractides* undet. sp. or species (CO,NY hyporheic/ shallow phreatic in Sycamore Cr. 32 km ne of Phoenix (Maricopa Co.), AZ)

*Atractides sturgeonensis* (Marshall, 1927) (MI river bed, hyporheic?)

*Atricholaelaps* Strandtmann,1947 - Laelapidae (= Laelaptidae) mites

*Atricholaelaps (Ischnolaelaps) glasgowi (Laelaps g.* Ewing, 1925; *Atricholaelaps virginianus* (Ewing) 1925; *A. g.* (Ewing) 1925) (ectoparasite on PA *Neotoma magister* woodrats)

*Atricholaelaps sigmodoni* Strandtmann, 1947 (on TX *Neotoma floridana* woodrats)

*Aturus* Kramer, 1875 - Aturidae mites, subfamily Aturinae

*Aturus deceptor* Habeeb, 1953 (eCanada, neUS hyporheic in river gravel, parasites on imagos of Chironomidae flies, subfamily Orthocladiinae)

*Aturus mirabilis* Piersig, 1897 (New Brunswick, ON, neUS hyporheic in river gravel, parasites on imagos of Chironomidae flies, Subfamily Orthocladiinae)

*Aturus* undet. sp. (CO, NY, PQ hyporheic)

*Aturus* undescr.. sp. (AB, BC, SK hyporheic)

*Axonopsella* Lundblad, 1930 - Aturidae mites, subfamily Axonopsinae

*Axonopsella bakeri* I.M. Smith & D. R. Cook, 1998 (FL, TX hyporheic interstitial and surface stream water)

*Axonopsis* Piersig, 1893 - Axonopsidae mites (also put in Aturidae, subfamily Axonopsinae

*Axonopsis (Brachypodopsis) arpeda* Cook, 1974 (hyporheic in Wayne & Crawford Cos., MO)

*Axonopsis (Axonopsis) bimaculata* Cook, 1974 (hyporheic interstitial in Jackson Co., FL & Carrol Co., AR)

*Axonopsis (Vicinaxonopsis) californica* Cook, 1974 (hyporheic interstitial in Japan & Monterey & Humboldt Cos., CA)

*Axonopsis (Brachypodopsis) dapsila* Cook, 1974 (hyporheic in NY (Hamilton Co.), ME (Aroostook Co.), NH (Carroll Co.), NJ (Sussex Co.), VA (Bath Co.) & WV (Pocohantas Co.))

*Axonopsis (Brachypodopsis) pallida* Habeeb, 1957 (rheophilic in FL, NC, OK, VA streams/ occasional hyporheic interstitial in OK)

*Axonopsis (Paraxonopsis) pumila* Cook, 1974 (hyporheic in Trinity, Monterey & Humboldt Cos., CA)

*Axonopsis (Brachypodopsis) rivophila* Habeeb, 1957 (rheophilic in NC, OH, KY, PA, VA streams/ occasional hyporheic interstitial in NC)

*Axonopsis (Axonopsis) sabulonis* Cook, 1974 (hyporheic interstitial in NB (Victoria Co.), KY (Russell Co.), ME (Aroostook Co.), NY (Perry Co.), NJ (Sussex Co.) & VA (Bath Co.))

*Axonopsis (Brachypodopsis) setoniensis* Habeeb, 1953 (ON hyporheic in river silt; in NJ, MI lakes & ponds; parasites on imagos of Chironomidae flies, subfamily Orthocladiinae)

*Axonopsis* undet. sp. (MI interstitial),

*Bakerdania* Sasa, 1961 - Pygmephoridae mites

*Bakerdania quadrata* (Ewing) (= *B. sellnicki* Krczal, 1958) (seNM/ Tp?)

*Bakerdania* undet. sp. or species (ectoparasite on OR *Neotoma cinerea* and *fuscipes* woodrats; Tp or Tx in NS on porcupine dung; NY freshwater sandy beach interstitial)

***Bandakia*** Thor, 1913 - Anisitiellidae mites, Subfamily Anisitsiellinae

***Bandakia anisitsipalpis*** Cook, 1963 (interstitial in NC small stream)

***Bandakia borealis*** I. Smith, 1979 (spring seepage, ON (Little East River, Muskoka District)

***Bandakia fragilis*** I. Smith, 1979 (interstitial in mosses & detritus in spring seepage in OR (Benton CO.))

***Bandakia longipalpis*** Cook, 1963 (*B. elongata* Cook 1963; homonym of *Drammenia elongata* Thor (= *B. elongata*), a synonymum of *B. concreta* Thor) (OR, MT (Gallatin Co.) hyporheic in sand and gravel bars)

***Bandakia oregonensis*** I. Smith, 1979 (interstitial in mosses, detritus and gravel in spring seepage in OR (Benton CO.))

***Bandakia phreatica*** Cook, 1974 (ME, ON, New Brunswick, NH, NS, NF interstitial hyporheic in gravel bars; larvae parasitic in *Zavreliomyia* flies)

***Bandakia similis*** Cook, 1963 (NC, VA seepage areas)

***Bandakia*** undet. sp. (NY hyporheic)

***Bandakia vietsi*** Cook, 1961 (spring seepage or streams in New Brunswick (Kent Co., NF, ON (Carleton & Petersborough Cos.) & MI))

***Bandakiopsis*** I. Smith, 1979 - Anisitiellidae mites

***Bandakiopsis fonticola*** I. Smith, 1979 (interstitial in mosses & detritus in spring seepage areas, scBC; larvae parasitic in *Dixa* flies)

***Banksinoma*** Oudemans, 1930 - Thyrisomidae mites

***Banksinoma*** undet. sp. (MO/Tp or Tx guanobic)

***Bdella*** Latreille, 1795 - Bdellidae mites

***Bdella*** undet. sp. (Tp in El Malpais Natl. Monument, nNM)

***Bdellozonium*** Cook & Loomis, 1928 - Bdellidae mites

***Bdellozonium*** undescr. sp. (HTx in WA)

***Belba*** Heyden, 1826 - Damaeidae mite

***Belba bulbipedata*** Packard, 1888 (= *Damaeus b.*) (\*Mammoth C., KY/Tb/ G1G2)

***Belba*** undet. sp. (IA, KY (poss.), WI/ Tp?)

***Beamerella*** Brennan, 1958 - Trombiculidae mites

***Beamerella acutascuta*** Brennan, 1958 (ectoparasite on TX *Mormoops megalophylla* & Trinidad bats)

***Beamerella texana*** (*Trombicula texana* Loomis & Crossley, 1963; *Tecomatlana texana*) Goff & Brennan, 1977. (type locality in Frio Cave, Uvalde Co., TX/ ectoparasite on wTX *Nyctinomops macrotis* & *Mormoops megalophylla* bats)

**Bharatalbia** Cook, 1967 - Aturidae mites, subfamily Axonopsinae

**Bharatalbia** (*Japonalbia*) *cooki* I. Smith, 1989 (interstitial, hyporheic, epigean in CA, ON, OR rivers & streams)

**Bimichaelia** Sig Thor, 1902 - Bimichaelidae mites

**Bimichaelia** undet. sp. (NM/ Tp?)

**Brachypoda** Lebert, 1879 - Aturidae mites, subfamily Axonopsinae

**Brachypoda** (*Brachypoda*) *cornipes* Habeeb, 1956 (likely hyporheic as parasites of *Microcricotopus* & *Tanytarsus* fly larvae)

**Brachypoda** *setosicaudata* Habeeb, 1953 (in BC silt and moss in springs, parasites on imagos of Chironomidae flies, subfamily Orthocladiinae)

**Brachypoda** undet. sp. (interstitial/ shallow phreatic in Sycamore Cr. 32 km ne of Phoenix (Maricopa Co.), AZ)

**Brevisterna** Keegan, 1949 - Haemogamasidae mites, subfamily Laelaptinae (also subsumed in Laelapidae (= Laelaptidae))

**Brevisterna** *morlani* Strandtmann & Allred, 1956 (on NM *Neotoma albigula albigula*, CO *Neotoma* & NM, TX *Neotoma micropus* woodrats)

**Brevisterna** *utahensis* (*Euhaemogamasus* u. Ewing, 1933) (Ectoparasite on TX *Neotoma mexicana*, CO, NV, UT, WY *Neotoma lepida*, AZ, CO, NM *Neotoma albigula* & CA *N. fuscipes* woodrats)

**Bryobia** Koch, 1836 - Tetranychidae mites

**Bryobia** *parasitica* (= ? *Ensliniella* p. Vitzthum, 1924) (Tp or Tx on NS porcupines?)

**Bryobia** *praetiosa* Koch, 1836 (clover mite/ Ac in one KS cave)

**Bryobia** undet. sp. (hyporheic in CO)

**Caeculus** Dufour, 1832 - Caeculidae mites

**Caeculus** *archeri* Mulaik, 1945 (type locality cave in Jackson Co., AL & karstic Montvale sprgs. in TN/ Pb? or Tp?)

**Caeculus** undet. sp. (Tx predator in Calaveras Co., CA; Ac in El Malpais Natl. Monument, nNM)

**Caenobelba** R.A. Norton, 1980 - Damaeidae mites

**Caenobelba** undet. sp. (Tp or Tx in OR C., OR)

**Calotrachytes** Berlese, 1916 - Polyaspididae mites (also put in Uropodidae)

**Calotrachytes** undet. sp. (WA/ Tp?)

**Caligonella** Berlese, 1910 - Caligonellidae mites



*Caligonella* undet. sp. (cave in Eddy Co.,NM/ Tp?)

*Caloglyphus* Berlese, 1923 - Acaridae mites

*Caloglyphus* undet. sp(p). (1 sp. Tp? in MO; 4 sp. phoretic in WA)

*Calvolia* Oudemans, 1911 - Laelapidae (= Laelaptidae) mites

*Calvolia* undet. sp.(MO/ Tp or Tx guanobic)

*Camisia* von Heyden, 1926 - Camisiidae mites

*Camisia* undet. sp.(s) (Tx in OR C.,OR; TTp in WA)

*Carios* Lagreille, 1796 – Argasidae mites

*Carios* kelleyi (Cooley & Kohls) (ectoparasite in *Myotis austroriparius* (likely) bat guano in GA cave (Decatur Co.))

*Ceratozetes* Berlese, 1908 - Ceratozetidae mites

*Ceratozetes gracilis* (Michael, 1884) (Midwest Ed/Tp? in IA,KY(Mammoth C.))

*Ceratozetes* near *gracilis* (Michael, 1884) (Tx detritivore? in Calaveras & Tuolumne Cos.(CA))

*Ceratozetes* undet. sp. or species (Wind C.,SD/TTx?; TTx in OR C.OR); on cricket guano in Mammoth C.(KY); poss. in MO)

*Cerberothrombium* Viets, 1934 - Stygothrombiidae mites, Subfamily Stygothrombiinae (Plecoptera hosts)

*Cerberothrombium caudatum* = *Ceuthothrombium c.*

*Cerberothrombium ida* = *Ceuthothrombium i.*

*Cerberothrombium pauli-henri* Habeeb, 1979 (hyporheic in Wheeler Gorge, Ventura Co., CA)

*Cerberothrombium stella* Habeeb, 1973 (hyporheic in Wheeler Gorge, Ventura Co., CA)

*Ceuthothrombium* Habeeb, 1979 Trombidiidae mites

*Ceuthothrombium* (*Cerberothrombium caudatum* Habeeb, 1955) Habeeb, 1979 (hyporheic in Salmon River & Beaver Brook, Madawaska Co., New Brunswick interstitial)

*Ceuthothrombium cavaticum* Robaux, Webb & Campbell, 1977 (Lake & Lechuguilla C.,Eddy Co.(NM) +cTX & Mexico/Tx,cricket (*Ceuthophilus*) parasite)

*Ceuthothrombium ida* (*Cerberothrombium ida* Habeeb, 1973) Habeeb, 1979 (hyporheic in Wheeler Gorge, Ventura Co., CA)

*Ceuthothrombium* poss. undescr. sp. or species (Tb in Kartchner C.,AZ; Tb larva parasitic on crickets in El Malpais Natl. Monument, nNM),

*Ceuthothrombium vikrami* (*Cerberothrombium vikrami* Habeeb, 1979) Habeeb, 1979 (hyporheic in CA & Rain Cr., Mogollon Mts., NM)

***Chappuisides*** Szalay, 1943 - Chappuisididae mites, subfamily Chappuisidinae  
***Chappuisides acadianus*** I.M. Smith, 1992 (hyporheic in New Brunswick, NF, NS, PQ, NH)

***Chappuisides*** (*Chappuisides*) ***anomalus*** I.M. Smith, 1992 (hyporheic in \*Moccasin Creek, Tuolumne Co., CA)

***Chappuisides*** (*Chappuisides*) ***californicus*** I.M. Smith, 1992 (hyporheic in Humboldt, Mendocino, Monterey & Trinity Cos., CA in gravels in riffles of large streams)

***Chappuisides*** (*Chappuisides*) ***cooki*** I.M. Smith, 1992 (hyporheic in New Brunswick, NS, ME, NY gravels in riffles of large streams and rivers)

***Chappuisides*** (*Chappuisides*) ***eremitus*** Cook, 1963 (hyporheic in sand & gravels in rocky stream riffles in Gibbon River, Yellowstone National Park, WY)

***Chappuisides*** (*Chappuisides*) ***neomexicanus*** I.M. Smith, 1992 (hyporheic in \*Salix Cr., Mogollon Mts, Catron Co., NM)

***Chappuisides*** (*Chappuisides*) ***occidentalis*** I.M. Smith, 1992 (hyporheic in NV, NM gravels in small streams in mts.)

***Chappuisides*** (*Chappuisides*) ***oregonensis*** I.M. Smith, 1992 (hyporheic in sOR & possibly nCA in gravels of small streams)

***Chatia*** Brennan, 1946 - Trombiculidae mites

***Chatia setosa*** Brennan, 1946 (ectoparasite on OR *Neotoma fuscipes* & *cinerea* woodrats)

***Chausseria*** Oudemans, 1937 (whirligig mites) - Anystidae mites

***Chausseria*** undescrb.. sp. (Ac in El Malpais Natl. Monument)

***Cheiroseius*** Berlese, 1916 – Ascidae mites

***Cheiroseius*** nr. *curtipes* (Halbert, 1923) (ON groundwater interstitial)

***Cheladonta*** Lipovsky, Crossley & Loomis, 1955 - Trombiculidae mites

***Cheladonta*** *micheneri* Lipovsky, Crossley & Loomis, 1955 (ectoparasite on KS *Neotoma floridana* woodrats)

***Chelohydracarus*** Smith, 1998 – Athienemanniidae mites

***Chelohydracarus*** *navarrensis* Smith, 1998 (CA coastal hyporheic)

***Chelomideopsis*** Romijn, 1920 - Athienemanniidae mites, Subfamily Athienemanniinae

***Chelomideopsis*** *besselingi* (Athienemannia *schermerei* b. Cook, 1961) (MI,ON,PQ springs & seepages, likely hyporheic when parasitizing *Microspecta* & *Paratanytarsus* larvae)

***Chelomideopsis*** *gledhilli* I. Smith, 1992 (NF, New Brunswick, NS interstitial? in gravel and detritus in helocene and rheocene springs)

***Chelomideopsis minuta*** I. Smith, 1992 (wNA interstitial in gravel and detritus in small streams and rheocrene springs)

***Chelomideopsis occidentalis*** I. Smith, 1992 (BC, OR, WA groundwater interstitial? in detritus and gravel in pools and riffles in spring runs and small streams)

***Chelomideopsis siskiyouensis*** I. Smith, 1992 (seOR interstitial in moss and detritus in seepage areas and springs and superficial gravels in rocky riffles of small streams)

***Cheletonella*** Womersley, 1941 - Cheyletidae mites

***Cheletonella*** undet. sp. (predator on ON bat guano)

***Cheletonella vespertilionis*** Womersley, 1941 (ectoparasite on IN *Eptesicus fuscus* bats)

***Cheyletus*** Latreille, 1796 - Cheyletidae mite

***Cheyletus cacahuamilpensis*** Baker, 1945 (predator in CA bat guano; accidental? on OK (Tx) *Myotis velifer* bats)

***Cheyletus hendersoni*** Baker, 1949 (type locality on ■mummy• in Arkansas C., AR/ ectoparasite)

***Cheyletus malaccensis*** Oudemans, 1903 (ectoparasite on IN *Neotoma floridana* woodrats)

***Cheyletus*** near *cacahuamilpensis* Baker, 1945 (Tx? in swOK (ectoparasite on *Myotis velifer* bats)

***Cheyletus*** undet. sp. or species (Kartchner C., Coshise Co., AZ; ectoparasite on OR *Neotoma fuscipes* & *N. cinerea* woodrats)

***Chiroptoglyphus*** O'Connor & Reisen, 1978 - Rosensteiniidae mite (once put in Dermanyssidae)

***Chiroptoglyphus americanus*** O'Connor & Reisen, 1978 (guanophile on PA *Myotis lucifugus*, TX *Corynorhinus rafinesquii* (one bats) & OK *Myotis velifer* bats)

***Chiroptoglyphus*** undet. sp. (parasite on TX *Leptonycteris nivalis* bats)

***Chiroptonyssus*** Augustson, 1945 (also synonymized with *Ichoronyssus*) - Dermanyssidae mites, Subfamily Nycteriglyphinae

*Chiroptonyssus haematophagus* = *C. robustipes*

***Chiroptonyssus robustipes*** (*Liponyssus r.* & *L. chilensis* Ewing, 1925; *Ichoronyssus r.* Fonseca, 1948b; *Liponyssus nyctinomius* Radford, 1938; *L. venezolanus* Hoffman, 1944; *C. texensis* Augustson, 1945; *Liponyssus hematophagus*; *Bdellonyssus hematophagus* Morlan & Strandtman, 1949; *Ornithonyssus haematophagus* Yunker, 1958; *C. h.*) Whitaker & Wilson? (type locality cave in Hardeman Co., TX) Tp guanobic/ ectoparasite on AK, AL, AZ, CA, FL, GA, NM, OK, TX, s.to Chile *Tadarida b*, NM, TX *Myotis californicus*, CA (accidental) *Myotis yumanensis*, GA *Myotis lucifugus*, OR *Lasiurus cinereus*, wTX *Pipistrellus hesperus*, *Eumops perotis*, *Nyctinomops macrotis* (= *Tadarida m.*), *Myotis velifer*; GA, AL (rare accidental) *Nycticeius humeralis*), wTX *Mormoops megalophylla* & AL, TX *Eptesicus fuscus* bats)

***Chiroptonyssus texensis*** Augustson, 1945 (= *Liponyssus ipes* Ewing, 1925 in part) = *Liponyssus robustipes* Ewing, 1925

***Chirotonyssus venezolanus*** (Vitzthum, 1932) (ectoparasite on AZ, wTX *Nyctinomops macrotis* (= *Tadarida m.*) (near *C. venezolanus*) & wTX *Nyctinomops femorosaccus* (= *T. femorosacca*) bats)

***Chortoglyphus*** Berlese, 1884- Chortoglyphidae mites (once put in Glycyphagidae)  
***Chortoglyphus arcuatus*** (Troupeau, 1879) (ectoparasite on IN *Neotoma floridana* woodrats)

***Cilliba*** van Heyden, 1826 - Uropodidae mites  
***Cilliba*** undet. sp. (TTP in WA?)

***Clathrosperchon*** Lundblad, 1936 - Rhynchohydracaridae mites, Clathrosperchoninae subfamily (beetle & bug hosts)

***Clathrosperchon americanus*** Habeeb, 1953 (brooks, on rocks in moving water, interstitial hyporheic? in FL, NJ, PA, MO, AR streams)

***Clathrosperchon*** undet. sp. (NY hyporheic)  
***Cocceupodes*** Sig Thor, 1934 - Eupodidae mites  
***Cocceupodes*** undet.sp. (on damp timber in one NS cave)

***Comatacarus*** Ewing, 1942 - Trombiculidae mites  
***Comatacarus americanus*** Ewing, 1942 (ectoparasite on OR *Neotoma fuscipes* woodrats)

***Cookacarus*** Barr, 1977 - Anisitiellidae mites  
***Cookacarus columbiensis*** Barr, 1977 (interstitial in mosses & detritus in spring seepage, BC)

***Copidognathus*** Trouessart, 1888 - Halacaridae mites, Subfamily Copidognathinae  
***Copidognathus pygmaeus*** Bartsch, 1980 (interstitial brackish and marine on US Atlantic beaches)  
***Copidognathus*** undet. sp. or species (interstitial? in HI intertidal sandy beach; MA intertidal beach sand interstitial))

***Coprolactistus*** Radovsky & Krantz, 1998 - Macronyssidae mites  
***Coprolactistus whitakeri*** Radovsky & Krantz, 1998 (predator on mites on IN *Eptesicus fuscus* & in Brazilian bat guano)

***Cosmochthonius*** Berlese, 1910 - Cosmochthonidae mites  
***Cosmochthonius*** undet. sp. (ectoparasite on IN *Neotoma floridana* woodrats)

***Cowichania*** I.M. Smith, 1983 - Hydryphatidae mites, subfamily Cowichaninae  
***Cowichania interstitialis*** I.Smith, 1983 (hypogean, hyporheic and interstitial in sVancouver Island, BC)

***Cryptonatica*** Dall, 1892 – Naticidae snails  
***Cryptonatica affinis*** (Gmelin, 1791) (*Natica clausa*) (AK marine infauna)

***Ctenoglyphus*** Berlese, 1884 - Glycyphagidae mites

**Ctenoglyphus** undet. sp. (TTP in WA)

**Cryptonyssus** Radovsky, 1966 - Macronyssidae mites, Subfamily Ornithonyssinae

**Cryptonyssus desultorius** Radovsky, 1966 (ectoparasite on UT *Euderma maculatum*; wTX *Myotis yumanensis*; OR *Myotis lucifugus* & *volans*; CA, TX *Eptesicus fuscus*; Mex., wTX *Myotis velifer*; NV, Mex., OR *Myotis californicus*; IN *Myotis sodalis*; AZ, NV *Pipistrellus hesperus* bats)

**Cryptonyssus flexus** Radovsky, 1967 (on MI, MN, ND *Myotis lucifugus* & one MI *Lasionycterus noctivagans* bats)

**Cunaxa** von Heyden, 1826 - Cunaxidae mites

**Cunaxa** undet. sp. (MO/TP?),

**Cyclomonomia** I.M. Smith, 1989 - Momoniidae mites, subfamily Cyclomoniinae

**Cyclomonomia andrewi** I. Smith, 1989 (interstitial in AB, BC, OR, WA, NV small streams)

**Cyclothyas** Lundbald, 1941 - Hydryphantidae mites, Subfamily Cyclothyadinae

**Cyclothyas siskiyouensis** Smith, 1983 (OR hyporheic)

**Cyllibula** Berlese, 1917 - Trombiculidae mites

**Cyllibula (Wagenaaria) similis** (Brennan, 1967) (ectoparasite on wTX *Mormoops megalophylla* bats)

**Cyta** Heyden, 1826 - Bdellidae mites

**Cyta** undet. sp. (Wind C., SD/ TTX?)

**Cyrtolaelaps** Berlese, 1887 (*Protolaelaps* Tragardh, 1912) - Ologamasidae mites

**Cyrtolaelaps** undet. sp. or species (TP in WA; ectoparasite on OR *Neotoma cinerea* and *fuscipes* woodrats)

**Cyrtolaelaps (Gamaselliphis)** undet. sp. (MA intertidal beach sand interstitial)

**Cytonyssus** Fain, 1960 - Macronyssidae mites

**Cytonyssus** undescr. sp. (ectoparasite on *Euderma maculatum* bats in wTX)

*Demaesus* = *Belba*

**Demodex** Owen, 1843 - Demodicidae mites

**Demodex nycticeii** C.E. Desch, Jr., 1996 (ectoparasite on *Nycticeius humeralis* bats)

**Dendrolaelaps** Halpert, 1915 - Digamasellidae mites

**Dendrolaelaps** undet. sp. (CO/hyporheic),

**Dendrolaelaps** near *laticornis* (*Brachychthonius l.* Berlese, 1910) (Tx? in MO),

**Dentocarpus** Dusbabek & Cruz, 1966 - Labidocarpidae mites (also put in Chirodiscidae)

***Dentocarpus macrotrichus*** Dusbabek & Cruz, 1966 (Nearctic, wHemisphere/ ectoparasite on CA, TX *Tadarida brasiliensis mexicana* & AL, FL *Tadarida brasiliensis cynocephala* bats)

***Dermacarus*** Haller, 1880 - Glycyphagidae mites

***Dermacarus hypudaei*** (*Homopus h.* C.L. Koch, 1841; *Proctolaelaps h.*) (Tx? in MO; ectoparasite on IN *Neotoma floridana* woodrats)

***Dermacarus spermophilus*** A.Fain & Whitaker, 1978 ectoparasite on OR *Neotoma cinerea* and *fuscipes* woodrats),

***Dermacentor*** C.L.Koch, 1844 - Ixodidae mites

***Dermacentor andersoni*** Stiles, 1908 (= *D. venustus* Marx in Neumann, 1897) (ectoparasite on AB, BC *Neotoma* woodrats & nest in Bida Cave, Coconino Co., AZ & MT *Myotis evotis* bats/ Rocky Mountain wood tick)

***Dermacentor hunteri*** Cooley 1938 (on AZ, CA *Neotoma lepida* woodrat)

***Dermacentor occidentalis*** Marx, 1892 (Pacific Coast tick/ ectoparasite on OR *Neotoma cinerea* & *fuscipes* woodrats/ western dog tick)

***Dermacentor oenustus*** (ectoparasite on CO *Neotoma cinerea o.* woodrats)

***Dermacentor parumapertus*** Neumann (epigeal in UT/ on WY, UT *Neotoma cinerea*; TX *Neotoma micropus*, & UT, WY *Neotoma lepida* woodrats)

***Dermacentor pratti*** (ectoparasite on CO *Neotoma cinerea orolestes* woodrats)

***Dermacentor*** undet. sp. or species (Tx in woodrat nest in Kaetan Cave, Grand Canyon, Coconino Co., AZ/ 2,000-3,000, 10,500 to 10,800 & 16,000 to 16,300 years BP in *Neotoma* woodrat nest in wTX (El Paso Co.) or sNM)

***Dermacentor variabilis*** (*Ixodes v.* Say, 1821; *D. electus* Koch, 1844) Banks, 1907 (ectoparasite on GA, IN, SC *Neotoma floridana* woodrats, IN *Lasiurus borealis* bats & GA (Dade Co.) cave)

***Dermanyssus*** de Geer, 1778 - Dermanyssidae mites

***Dermanyssus americanus*** Ewing, 1923 (parasite on TX *Pipistrellus hesperus* bats)

***Dermanyssus carnifex*** Koch, 1839 (*Spinturnix c.*) (ectoparasite on US *Pipistrellus* bats)

***Dermanyssus gallinae*** (*Acarus g.* de Geer, 1778; *D. evotomydis* Ewing, 1933; *Ornithodoros g.*) (cosmopolitan/chicken, poultry, red or roost mite; red chicken mite/ on TX *Pipistrellus subflavus* (Tx) & *Myotis velifer* (Tx) bats & TX, UT, WY *Neotoma lepida* woodrats) **Bibl.:** George & Strandtman 1960

***Dermatophagoides*** Bogdanov, 1864 – Epidermoptidae mites

***Dermatophagoides pipistrelli*** Brennan, 1947 (ectoparasite on PA *Myotis lucifugus* bats)

***Diamphidaxona*** Cook, 1974 - Hygrobatidae mite, (once in Aturidae, Subfamily Axonopsinae)

***Diamphidaxona dolichosoma*** Cook, 1963 (hyporheic in Madison River, Gallatin Co., MT)

*Diamphidaxona imamurai* Cook, 1974 (phreatic sprs., Catron Co., NM/ Pb)

*Diamphidaxona pallida* Cook, 1963 (AR, MI, OK hyporheic)

*Discourella* Berlese, 1910 (= *Trachyuropoda* (*Discourella*) Berlese, 1910) Uropodidae mites

*Discourella* nr *dubiosa* (Schweizer) (IL/Tp)

*Dithinozercon* Berlese, 1916 -Dithinozerconidae mites (once put in Uropodidae)

*Dithinozercon* undet. sp.#1 (IA/Tp?)

*Dithinozercon* undet. sp.#2 (cave in Eddy Co.,NM/ Tp?)

*Dorycranosus* Woolley, 1969 - Limnesiidae mites

*Dorycranosus* near *parallelus* (*Liacarus p.* Hammer, 1967)(Tx detritivore? in Calaveras Co.,CA)

*Echinonyssus* Hirst, 1925 (= *Hirstionyssus* Fonseca, 1948) - Laelapidae (= Laelaptidae) mites

Subfamily Myonyssinae (was in Macronyssidae) **Bibl.:** C. Herrin 1970.

*Echinonyssus bisetosus* (*Hirstionyssus b.* Allred, 1957) (ectoparasite on UT, NV *Neotoma lepida* woodrats)

*Echinonyssus hilli* (*Hirstionyssus h.* Jameson, 1950) (ectoparasite on UT, WY *Neotoma lepida* woodrats)

*Echinonyssus incomptis* (= *Hirstionyssus i.* Eads & Hightower, 1952) (ecotoparasite on *Neotoma lepida* woodrats)

*Echinonyssus neotomae* (*Hirstionyssus n.* Eads & Hightower, 1952) (ecotoparasite on *Neotoma albigula*, *N. lepida* & *N. micropus*, OR *Neotoma fuscipes* & *N. cinerea* woodrats)

*Echinonyssus obsoletus* (*Hirstionyssus o.* Jameson, 1950) (ectoparasite on OR *Neotoma cinerea* woodrats)

*Echinonyssus occidentalis* (*Hirstionyssus o.* ) (ectoparasite on UT, WY *Neotoma lepida* woodrats)

*Echinonyssus triacanthus* (*Hirstionyssus t.* Jameson, 1950) (ectoparasite on *Neotoma cinerea* & *N. lepida* woodrats)

*Echinonyssus utahensis* (*Hirstionyssus u.* Allred & Beck, 1966) (ectoparasite on UT *Neotoma lepida*, OR *Neotoma cinerea* & IN *Neotoma floridana* woodrats)

*Elliotta* Zacharda, 1980 - Rhagidiidae mites

*Elliotta howarthi* (*Flabellorhagidia h.* Elliott, 1976) Zacharda, 1980 (type locality cave in Klickitat Co. & cave in Skamania Co.,WA +ID?/ Tb/ G1)

*Elliotta* undescr. sp(p). 1-2 (Tb in WA)

*Eltonella* Audy, 1956 - Trombiculidae mites. **Bibl.:** Vercammen-Grandjean, 1965

*Eltonella (Coecicula) tibbettsi* (Brennan & White, 1960) (Tx in AL, TX)

*Epidamaeus* Bulanova-Za(c,k)hvatkina, 1957 - Damaeida mites

*Epidamaeus* (subgenus *Akrodamaeus*) undet. sp.#1 (IA, MN, WI/ Tp?)

*Epidamaeus* undet. sp. #2 (cave in Eddy Co., NM/ Tp?)

*Epidamaeus* undet. sp. #3 (Tx detritivore? in Tuolumne Co., CA)

*Erebaxonopsis* Motas & Tanasachi, 1947 - Aturidae mites, subfamily Axonopsinae

*Erebaxonopsis nearctica* Cook, 1974 (interstitial hyporheic in gravel bar in Van Duzen River, (Humboldt Co.) & Moccasin Cr.(Tuolumne Co.), CA)

*Erynetes* Banks, 1904 - Erynetidae mites

*Erynetes* undet. sp. (MO/Tp? gaunobic & carrion)

*Erythraeus* Latreille, 1806 - Erythraeidae mites

*Erythraeus* undesc. sp. (Ac in El Malpais Natl.Monument, nNM)

*Erythraeus* undet. or undescr. sp. (ectoparasite on *Antrozous pallidus* bats)

*Estellacarus* Habeeb, 1954 - Aturidae mites, subfamily Axonopsinae

*Estellacarus unguitarsus (Brachypoda unguitarsa* Habeeb, 1953) Habeeb, 1954 (in silt & moss in BC springs, parasites on imagos of Chironomidae flies, subfamily Chironominae)

*Estelloxus* Habeeb, 1963 - Lebertiidae mites

*Estelloxus californiensis* Habeeb, 1963 (interstitial in silt & gravel in spring runs & springs in BC, CA, OR, WA)

*Eubrachylaelaps* Jameson, 1950 - Laelapidae (= Laelaptidae) mites

*Eubrachylaelaps debilis* Jameson, 1950 (Ac on WA bats; UT (Ac?) *Corynorhinus townsendii* & *Antrozous pallidus* bats)

*Eubrachylaelaps hollisteri* (Ewing, 1925) (ectoparasite on *Neotoma lepida* woodrats)

*Eucheyletia* Baker, 1949 - Cheyletidae mites

*Eucheyletia bishoppi* Baker, 1949 (ectoparasite on CA, OR *Neotoma fuscipes*, OR *Neotoma cinerea* & IN *Neotoma floridana* woodrats)

*Eudusbabekia* Jameson, 1971 - Myobiidae mites

*Eudusbabekia* undescr. sp. (ectoparasite on wTX *Nyctinomops macrotis* bats)

*Eugamasus* Berlese, 1893 (*Gamasus (Eugamasus)* Berlese, 1892) - Parasitidae mites

*Eugamasus* undet. sp.(Tp or Tx in KY, NS, PQ, VA, WV)

*Eulaelaps* Berlese, 1903 - Laelapidae (= Laelaptidae) mites

*Eulaelaps stabularis* (Koch, 1839) (= *Laelaps pedalis* Banks, 1909) (ectoparasite on OR *Neotoma fuscipes* & GA, IN *N. floridana* woodrats)



***Euphthiracarus*** Ewing, 1917 - Euphthiracaridae mites

***Euphthiracarus*** undet. sp. (Ttx in Wind C., SD)

***Eupodes*** Koch, 1834 - Eupodidae mites

***Eupodes*** undet. sp. (Tp in El Malpais Natl. Monument, nNM)

***Euryparasitus*** Oudemans, 1901 (= *Eurylaelaps* Oudemans, 1902)- Euryparasitidae mites

***Euryparasitus*** undet. sp. or species (Tp in WA; TTp in WA; ectoparasite on OR *Neotoma cinerea* and *fuscipes* woodrats)

***Euschoengastia*** Ewing, 1938 (= *Euschongastia*) - Trombiculidae mites (cause dermatitis in domestic animals)

***Euschoengastia brennani stimulans*** Wrenn & Loomis, 1974 (ectoparasite on CA *Neotoma fuscipes* woodrats)

***Euschoengastia californica*** (*Schongastia c.* Ewing, 1925) (ectoparasite on CA *Neotoma fuscipes* & *N. lepida* woodrats)

***Euschoengastia criceticola*** Brennan, 1948 (ID, AB, CA, MT, WY, CO, KS epigeal/ ectoparasite on KS *Neotoma micropus*; CA *Neotoma fuscipes* & *N. lepida* woodrats)

***Euschoengastia diversa*** Farrell, 1956 (NB, KS, MO epigeal/ ectoparasite on KS *Neotoma floridana* woodrats)

***Euschoengastia fasolla*** Brennan & Beck 1956 (ectoparasite on UT *Neotoma lepida* woodrats)

***Euschoengastia finleyi*** Crossley, 1955 (ectoparasite on CO *Neotoma cinerea* woodrats)

***Euschoengastia frondifera*** Gould, 1956 (ectoparasite on CA *Neotoma lepida* woodrat)

***Euschoengastia furmani*** Gould, 1956 (ectoparasite on CA *Neotoma lepida* woodrats)

***Euschoengastia hamiltoni*** Brennan 1947 (ectoparasite on AL, IN, MD, NY, VA *Eptesicus f. fuscus*; WV *Pipistrellus subflavus*; NY, WV *Myotis leibii* & NY (rare), ON, WV *Myotis lucifugus* bats)

***Euschoengastia jonesi*** Lipovsky & Loomis, 1954 (on KS & OK (Tx) *Myotis velifer grandis* bats & KS *Neotoma micropus* woodrats)

***Euschoengastia lacerta*** Brennan, 1949 (CA, e. to KS epigeal/ ectoparasite on KS *Neotoma micropus* woodrats)

***Euschoengastia loomisi*** Crossley & Lipovsky, 1954 (TX, OK, KS epigeal/ ectoparasite on KS *Neotoma micropus* woodrats)

***Euschoengastia marginalis*** Wrenn & Somerby, 1974 (ectoparasite on sCA *Neotoma lepida* & *N. fuscipes* woodrats)

***Euschoengastia libertatis*** Brennan & Yunker, 1966 (ectoparasite on MT *Neotoma* woodrats)

*Euschoengastia mirocoxa* Brennan, 1948 = *E. pipistrelli*

***Euschoengastia oregonensis*** (Ewing, 1929) (ectoparasite on OR *Neotoma fuscipes* woodrat)

***Euschoengastia peromysci*** Wrenn, 1984 (Epigeal MA s. to MS, w. to CA/ ectoparasite on CA,OR *Neotoma fuscipes* & AR, GA, KS, IN, OK, SC *Neotoma floridana* woodrats)

***Euschoengastia pipistrelli*** Brennan, 1947 (type locality cave in Stone Co.,MO/ ectoparasite on KS *Neotoma micropus* woodrats & IN *Myotis austroriparius* & *Eptesicus fuscus*; KY, IL, IN, KS, NJ, NY, PA, SD *Myotis lucifugus*; AL, IN, PA *Myotis keeni*; KS (Tx) *Myotis velifer*; AL, IN, NY *Myotis sodalis*; AL *Myotis grisescens*; AL, AR, OK, KS *Myotis keenii septentrionalis* & AL (Tx), AR (Tx), GA (Tx), IN, KS, MO, OK (Tx), PA, WV *Pipistrellus subflavus* bats)

@***Euschoengastia pomerantzi*** (ectoparasite on OR *Neotoma fuscipes* woodrats)

***Euschoengastia radfordi*** Brennan and Jones, 1954 (ectoparasite on CA *Neotoma fuscipes* & *N. lepida* woodrats)

***Euschoengastia setosa*** (Ewing, 1937) (ectoparasite on KS *Neotoma micropus*; IN, KS *Neotoma floridana* & SD *N. cinerea* woodrats)

***Euschoengastia*** undet. sp. (ectoparasite on WY, UT *Neotoma cinerea* woodrats)

@***Euschoengastia simulansi*** (ectoparasite on OR *Neotoma fuscipes* woodrats)

***Euschoengastia staffordi*** Brennan & White 1960 (type locality in Bibb Co., AL/ ectoparasite on AL *Pipistrellus subflavus* & *Eptesicus fuscus* bats)

***Euschoengastia stimulans*** Wrenn & Loomis, 1974 (ectoparasite on CA *Neotoma lepida* & *N. fuscipes* woodrats)

***Euschoengastia utahensis*** Brennan & Beck, 1966 (ectoparasite on UT *Neotoma lepida* woodrats)

***Euschoengastia velata*** Brennan & Yunker, 1966 (ectoparasite on MT *Neotoma cinerea* woodrats)

***Euschoengastia*** undet. sp. or species (ectoparasite on UT, WY *Neotoma lepida* woodrats & CA *Myotis yumanensis* bats)

***Euschoengastoides*** (*Trombicula* (E.) Loomis, 1954) Crossley, 1960 - Trombiculidae mites

***Euschoengastoides arizonae*** Loomis, 1971 (ectoparasite on CA *Neotoma albigula* & *N. lepida* woodrats)

***Euschoengastoides hoplai*** (*Trombicula* (E.) hoplai Loomis, 1954) Crossley, 1960 (ectoparasite on KS *Neotoma micropus* woodrats)

*Euschoengastoides neotomae* Loomis, 1971 (ectoparasite on CA,KS *Antrozous pallidus* bats & AZ,NM *Neotoma albigula*, IN *N. floridana*, NM *Neotoma albigula*, CA *Neotoma lepida* & KS *Neotoma micropus* woodrats)

*Euschoengastoides tanigoshi* Loomis, 1971 (ectoparasite on CA, Mexican *Eptesicus fuscus* bats/ on NM *Neotoma albigula* woodrats)

*Euschoengastoides tumidus* Loomis, 1971 (ectoparasite on NM *Neotoma albigula* woodrats)

*Eustigmaeus* Berlese, 1910 - Stigmaeidae mites

*Eustigmaeus* poss. undescr. sp. near *E. lirella* (Tp in Kartchner C., AZ)

*Eutrombicula* Ewing, 1938 - Trombiculidae mites. Bibl.: Wolfenbarger 1951-2

*Eutrombicula alfreddugesi* (*Microthrombidium a.* Oudemans, 1910; *Leptus irritans*, Riley, 1873; *Trombicula a.* Ewing, 1938; *T. (E.) a.* Jenkins, 1949) Ewing, 1938 (ectoparasite on GA, IN, KS, SC *Neotoma floridana* & KS *Neotoma micropus* woodrats; OK *Tadarida mexicana*, AL *Lasiurus borealis*, *Myotis keenii septrionalis* (Tx), *Eptesicus fuscus* (Tx) & KS *Myotis velifer grandis* bats)

*Eutrombicula batatas* (Linnaeus, 1758) (= *Trombicula E. a.*) (ectoparasite on AL *Lasiurus borealis* bats & CA *Neotoma lepida* & GA *Neotoma floridana* woodrats)

*Eutrombicula belkini* Gould, 1950 (ectoparasite on CA *Neotoma* woodrats)

*Eviphis* Belese, 1903 (= *Iphidioides* Oudemans, 1904; *Iphis* C.L. Koch, 1835, not C. L.Koch, 1839) Eviphididae mites

*Eviphis* undet. sp. (Ac? in cave in Edwards Co., TX)

*Ewingana* Dusabek, 1968 - Myobiidae mites

*Ewingana (Doreyana) doreya* Dusabek, 1968 (ectoparasite on Trinidad, TX *Nyctinomops macrotis* bats)

*Ewingana (Doreyana) inequalis* (Ewing, 1938) (ectoparasite on CA, FL *Antrozous pallidus* & AL (rare), CA, FL *Tadarida brasiliensis* bats)

*Ewingana (Ewingana) longa* (Ewing, 1938) (ectoparasite on AL, CA, FL, TX *Tadarida brasiliensis* bats)

*Ewingana (Doreyana)* undescr. sp. (ectoparasite on FL *Tadarida brasiliensis* bats)

*Feltria* Koenike, 1892 - Feltriidae mites

*Feltria (Azugofeltria) purpurotinca* (Habeeb, 1954) (surficial substrata in NE/ hyporheic in Little River near Grand Falls, New Brunswick)

*Feltria (Feltria) cornuta* Walter, 1927 (AB, SE hyporheic)

***Feltria (Feltria) cornuta americana*** Cook, 1963 (= *F. (F.) cornuta c.*) (SE hyporheic n. to Great Lakes Basin, ON, PQ & west to Shannon Co.,MO)

***Feltria (Feltria) cornutopis*** Cook, 1963 (hyporheic in CO, wSD, ND, MO, MT, OK, OR, TX, WAt)

***Feltria (Feltria) echinopalpis echinopalpis*** Cook, 1963 (hyporheic in Hamilton Co., NY, New Brunswick & Victoria Co., PQ)

***Feltria (Feltria) echinopalpis projecta*** Cook, 1970 (hyporheic in MT,CO,WY)

***Feltria (Feltria) exilis*** Cook, 1970 (hyporheic in Johnson Co., WY)

***Feltria (Feltria) faceta*** Cook, 1963 (hyporheic in ME,VT,NY,NJ,VA,OK)

***Feltria (Feltria) falcicornia*** Cook, 1970 (hyporheic in Sheridan Co., WY)

***Feltria (Feltria) gennada*** Cook, 1963 (hyporheic in Johnson Co., WY, Lane Co, OR & Lincoln Co.,MT)

***Feltria minuta*** Koenike, 1892 (MT surface waters/ MT (Lake Co.) occasional interstitial hyporheic)

***Feltria (Neofeltria) ozarkensis*** Cook, 1963 (OK (DE Co.) interstitial hyporheic)

***Feltria*** undet. sp. (CO,NY/hyporheic)

***Feltria*** undescr. sp. (ON, PQ hyporheic)

***Feltria (Neofeltria) virginensis*** Cook, 1963 (VA (Bath Co.) interstitial hyporheic)

***Feltria (Azugofeltria) testudo*** (Cook, 1970) (hyporheic in Salmon Cr., Monterey Co., CA)

***Fessonnia*** von Heyden, 1826 - Smarididae mites

***Fessonnia*** probably undescr. sp. (Ac in El Malpais Natl. Monument, nNM)

***Flabellorhagidia*** Elliott, 1976 - Rhagidiidae mites

***Flabellorhagidia howarthi*** Elliott, 1976 = *Elliotta h.*

***Flabellorhagidia pecki*** Elliott, 1976 (\*\*type locality cave in Klickitat Co., WA & cave in Craters of the Moon Natl. Monument, Butte Co.,ID/ Tb G1G2)

***Flabellorhagidia*** undescr. sp. (3 caves in Mt. Adams lava flows, Skamania Co.,WA/ Tp)

***Forelia*** Haller, 1882 - Pionidae mites, Subfamily Tiphynae (=Hydrochoreutinae), Tribe Foreliini

***Forelia (Forelia) ovalis*** Marshall, 1929 (hyporheic in WI)

***Forelia*** undet. sp. (NY hyporheic; MI interstitial/ epigeal)

***Foveacheles*** Zacharda, 1980 - Rhagidiidae mites. Bibl.: Zacharda 1996

*Foveacheles (F.) auricularia* Zacharda & Elliott, 1985 (\*\*?type locality & 1 other cave in Siskiyou Co., CA/ Tp or Tb, only in caves, G1G2)

*Foveacheles goffi* Zacharada, 1982 (\*\*?type locality cave in Kau Forest Res., HI Island & cave near Kawela, Molokai Island, HI/ Tb on rat guano/ G1 or G3 or G1G2)

*Foveacheles holsingeri* (= *Rhyncholophus c.* Packard, 1888; *Rhagidia cavicola* Banks in Call, 1897; *Rhagidia cavernarum* Holsingeri, 1965) Zacharada, 1985 (Mammoth & 1 other cave in Edmonson Co. + Hart Co. e to Pulaski Co. (KY), & s. to Grundy Co., TN + caves in Monroe? & Orange Co., IN/ Tp, Ed). **Bibl.:** Holsinger 1966; Oudemans, 1914

*Foveacheles* cf. *holsingeri* or maybe undescr. sp. (Tp in cave in Hardin Co., KY),  
*Foveacheles melanoseta* = *Poecilophysis m.*

*Foveacheles paralleloseta* Zacharda, 1985 (\*type locality cave in Wythe Co., VA/Tb?/G1/T&E VA S1)

*Foveacheles* undescr. sp.#1 (\*HI Volcanoes Natl. Park/Tp or Tb)

*Foveacheles tenorioae* Zacharda, 1982 (\*\*?type locality cave in HI Volcanoes Natl. Park, cave near Volcano & cave in Kau Forest Res, Big Island, HI/ Tb/ G1G2)

*Foveacheles (Usitorhagidia) titanica* Zacharda & Elliott, 1985 (\*\*?type locality cave in Tuolumne Co. & cave in Calaveras Co., CA/Tp or Tb/ G1 or G3)

*Foveacheles tuktoyaktukensis* Zacharda, 1980 (Canada, WV, epigean/Tp in WV, glacial relict?)  
**Bibl.:** Zacharda 1985

*Frontipoda* Koenike, 1891 - Oxidae water mites

*Frontipoda americana* Marshall, 1914 (in ON, eNA lakes/ parasitic on chironomid flies/ interstitial?)

*Frontipodopsis* Walter, 1919 - Frontipodopsidae mites, Subfamily Frontipodopsinae

*Frontipodopsis nearctica* Cook, 1963 (AB, BC, CA, MT, WA hyporheic interstitial)

*Galumna* von Heyden, 1826 - Galumnidae mites

*Galumna alata* (= *Oribata a.* Packard, 1886) Packard, 1888 (*Galumna alata* (Hermann, 1804); not clear if Mammoth species is *G.a.*; if it is not and it is a species confined to Mammoth, then name needs to be changed to a different species name due to prior name use of *Oribata alata* by Hermann) (Tp or Tb in \*?Mammoth C., KY/ G1G2?)

*Galumna* undescr. sp.#1 (Tp? in cave in Eddy Co., NM)

*Galumna* undet. sp.#2 (Tp in IL, KY)

*Gamasellodes* Athias-Henriot, 1961 - Ascidae mites

*Gamasellodes* undet. sp(p). (Tp or Tb in cave in Custer Co., SD; TTp in WA)

***Gamasellus*** Berlese, 1892 (*Cyrtolaelaps (Gamasellus)* Berlese, 1892; *Gamasus (Laelogamasus)* Berlese, 1905)) Ologamasidae mites

***Gamasellus*** undet. sp. (WA/TTp)

***Gamasodes*** Oudemans, 1939 - Parasitidae mites (most feed with fly larvae and hitchhike on adult flies)

***Gamasodes*** undet. sp. (Tp or Tb in OR C.,OR/ phoretic in WA)

***Geholaspis*** Berlese, 1918 - Macrochelidae mites

***Geholaspis*** undet. sp. (NS/Tp or Tx)

***Gemmazetes*** T. Fujikawa, 1979 - Thyrisomidae mites

***Gemmazetes*** nr. *cavatica* (Kuntz, 1962) (Tp glacial relict? & guanophile in Europe, IA, MN, WI)

***Gemmazetes*** undet. sp. (cave in Eddy Co.,NM/ Tp?)

***Geolaelaps*** Tragardh, 1952 - Laelapidae (= Laelaptidae) mites

***Geolaelaps*** undescr. (poss.) sp. or species (cave in Eddy Co.,NM/Tp? gaunobic; Kartchner C.,AZ/Tp)

***Geolaelaps*** undet. sp. (Ac or Tx in Kartchner C.in AZ & El Malpais Natl.Monument, nNM; Tx in NS)

***Glycyphagus*** Hering, 1838 - Glycyphagidae mites

***Glycyphagus domesticus*** (De Geer, 1778) ZR 115, 134 (Tp? On damp timber in one NS cave/ house mite; house dust mite/ alien?) House dust mites are up to 0.3 mm Their droppings contain enzymes used to digest skin. They are the important cause of asthma and cause other allergic diseases.

***Gymnolaelaps*** Berlese, 1916 -Laelapidae (= Laelaptidae) mites

***Gymnolaelaps*** undet. sp. or species (Tp? in Eddy Co.,NM; Tp in KY (Mammoth C.) or TN)

***Haemaphysalis*** Koch, 1844 - Ixodidae mites

***Haemaphysalis leporis-palustris*** (*Ixodes l.* Packard, 1869; *Gonixodes rostralis* Duges, 1888) Newmann, 1897 or Hunter & Hooker, 1907 (rabbit tick/ ectoparasite on FL *Neotoma floridana*, UT, WY *Neotoma lepida* & wTX *Neotoma micropus* woodrats/ rabbit tick)

***Haemogamasus*** Berlese, 1889 (= *Euihaemogamasus* Ewing, 1933; *Groschaftella* Privora & Samsinak, 1957) Laelapidae (= Laelaptidae) mites, subfamily Haemogamasinae (also put in Haemogamasidae)

***Haemogamasus alaskensis*** Ewing, 1925 = *H. ambulans*

***Haemogamasus ambulans*** (*Dermanyssus a.* Thorell, 1872; *H. sternalis* Ewing, 1933; *H. alaskensis* Ewing, 1925; *Gamasus ovalis* Koch, 1879; *H. avisugus* Vitzthum, 1931; *H. pavlovksy* Bergetova, 1949; *H. twitchelli* Ewing, 1925) (Circumpolar epigeal/ Tx in OR C.,OR; parasite in WA/ carrier of Haemorrhagic fever virus/ ectoparasite on ME *Myotis lucifugus* bats & CA *Neotoma fuscipes*, UT *N. cinerea* & *N. lepida?* woodrats)

***Haemogamasus liponyssoides*** Ewing, 1925 (= *Euhaemogamasus l.* Ewing, 1925) (ectoparasite on IN *Neotoma floridana* woodrats)

*Haemogamasus casalis* = *Androlaelaps c.*

***Haemogamasus pontiger*** (*Laelaps (Eulaelaps) p.* Berlese, 1904; *Eulaelaps mawsoni* Womersley, 1937; *H. oudemansi* Hirst, 1914) (ectoparasite on OR, UT, WY *Neotoma lepida* woodrats)

***Haemogamasus reidi*** Ewing, 1925 (= *Euhaemogamasus oregonensis* Ewing, 1933; *E. sciuropteri* Keegan, 1946; *H. nidiformis* Tipton and Saunders, 1971) (epigeal in VA, OR/ Tx in OR C.,OR; on OR *Myotis californicus* bat; parasite in WA; ectoparasite on OR *Neotoma cinerea* & *N. fuscipes* & IN *Neotoma floridana* woodrats)

***Haemolaelaps*** Berlese, 1910 - Laelapidae (= Laelaptidae) mites

***Haemolaelaps megaventralis*** (*Atricholaelaps m.* Strandtmann, 1947) (Ttx in TX *Petrochelidon fulva* cave swallow nest)

***Halacarellus*** Viets, 1927 - Halacaridae mites

***Halacarellus arenarius*** Bartsch, 1979 (interstitial in beaches in brackish lakes in neUS)

***Halacarellus capuzinus*** (Lohmann, 1893) (beach, brackish & sublittoral interstitial in Mediterranean, Europe & US)

***Halacarellus psammophilus*** (Krantz, 1976) (beach interstitial on Pacific Coast)

***Halacarellus subscripsus*** Bartsch, 1978 (interstitial in neNA, nwEurope marine beaches & Greenland brackish marine)

***Halacarellus subterraneus*** Schulz, 1933 (beach, brackish & stagnant freshwater interstitial in Mediterranean, Europe & US)

***Halacarus*** Gosse, 1855 - Halacaridae mites

***Halacarus anomalus*** Trouessart, 1894 (MA intertidal beach sand interstitial)

***Halacarus*** undet. sp. (PQ Gulf of St. Lawrence sandy marine interstitial)

***Hamohalacarus*** Walter, 1931 - Halacaridae mite

***Hamohalacarus subterraneus*** Walter in Bolivar & Jeannel, 1931 (\*type locality cave in Lawrence Co., IN/ Tb/ G1G2)

***Hannemania*** - Oudemans, 1911 - Trombiculidae mites

**Hannemania dumni** Sambon, 1928 (parasite on *Plethodon ouachitae* & *P. albagula* in Ouachita Mts.) **Bibl.:** C. Anthony 1995

*Hannemania perplexa* Brennan, 1947= *Whartonia perplexa*

**Hannemania** undet. sp. (ectoparasite on non-cave AR *Desmognathus bimleyorum* & *Eurycea multiplicata griseogaster* salamanders)

**Heminothrus** Berlese, 1913 - Camissidae mites

**Heminothrus targionii** (Berlese, 1885) (Tx or Ac in sON)

**Hexidionis** Vercammne-Grandjean & Loomis, 1967 - Trombiculidae mites

**Hexidionis navajoeae** Lucas & Loomis, 1968 (ectoparasite on NM *Neotoma albigula* & *N. lepida* woodrats)

**Hirstionyssus** Fonseca, 1948 (treated as subgenus of *Neoichoronyssus* & as junior syn. Of *Echinonyssus*) - Laelapidae (=Laelaptidae) mites (once in Macronyssidae)

*Hirstionyssus bisetosus* = *Echinonyssus b.*; *H. hilli* = *E. h.*; *H. incomptis* = *Echinonyssus i.*  
*H. neotomae* = *Echinonyssus n.*; *H. triacanthus* = *E. t.*; *H. utahensis* = *Echinonyssus u.*

**Histiostoma** Kramer, 1876 - Histiostomatidae mites (also put in Anoeidae) (worldwide genus)

**Histiostoma guanophilus** Nahunka, 1982 (\*type locality in Carlsbad Caverns, Eddy Co., NM/ guanophile/ Tb)

**Histiostoma** (*Cavanoetus*) *pierrestrinatii* Nahunka, 1982 (\*type locality in Carlsbad Caverns, Eddy Co.,NM)

**Histiostoma** undescr.? sp. or species (Tp? in 2 caves in Eddy Co, NM; Tp in OR Caves, OR)

**Histiostoma** undet. species (WA/Tb phoretic in WA; 3 sp. phoretic on flies in WA; caves in Eddy Co.,NM (may be *H.p.*, *H.g.* or new sp.;Tx or Tp in MO). **Bibl.:** Mahunka, 1982

**Hologamasus** Berlese, 1842 - Laelapidae (= Laelaptidae) mites

**Hologamasus** undet. sp. (cave in WV)

**Horreolanus** Mitchell, 1955 Bogatiidae mites, subfamily Horreolaninae

**Horreolanus orphanus** Mitchell, 1955. (IL (Vermilion Co.) interstitial groundwater from drainage tile)

**Hydrachna** Mueller, 1776 - Hydrachnidae mite (beetle & bug hosts)

**Hydrachna** undet. sp. (Tx or Tp in AK)

**Hydrothrombium** Robaux, 1969 - Stygothrombiidae mites, Subfamily Stygothrombiinae (Plecoptera hosts)



***Hydrothrombium cooki*** Robaux, 1969 (hyporheic in AR, Jack's Fork River, Shannon Co., MO & King's River, Carroll Co., AR)

***Hydrovolzia*** Thor, 1905 - Hydrovolziidae mites, subfamily Hydrovoltziinae

***Hydrovolzia gerhardi*** Mitchell, 1954 (karst seepage \*Rock Cr. Canyon, Kenkakee Co., IL/ interstitial?)

***Hygrobat*** Koch, 1837 - Hygrobatidae mites, Subfamily Hygrobatinae

***Hygrobat*** (*Mixobates*) *inermis* Cook, 1974 (hyporheic interstitial? in MT, WY streams)

***Hygrobat*** (*Hygotetrabates*) *neooctopus* Marshall, 1926 (hyporheic in IA streams)

***Hygrobat*** undet. sp. (NY hyporheic)

***Hypoaspis*** G. Canestrini, 1884 - Laelapidae (= Laelaptidae) mites, Subfamily Hypaspidinae (most species are soil fauna)

***Hypoaspis*** (*Geolaelaps*) near *angusta* Karg, 1965 (Tp in IL)

***Hypoaspis cavernicola*** (*Loelaps* (= *Ipis*?) *c.* Packard, 1888) (Tb or Tp in Mammoth C., KY)

***Hypoaspis*** (*Pneumolaelaps*) *lubrica* (Voigts & Oudemans, 1904) (ectoparasite on OR *Neotoma cinerea* and *N. fuscipes* & IN *Neotoma floridana* woodrats)

***Hypoaspis*** near *sardoa* (Berlese, 1892?) (ectoparasite on IN *Neotoma floridana* woodrats)

***Hypoaspis*** undet. sp. or species (Tp in IL; VA/Tx?; Tp or Tx gnanobic in MO/Tx in PQ; Tx parasite? in *Neotoma c.* nests in Shasta & Siskyou Cos.(CA); ***H.*** (*Cosmolaelaps*) (ectoparasite on IN *Neotoma floridana* woodrats)

***Hypoaspis stygius*** - see *Macrocheles*

***Hypoaspis*** near *subterranea* (Willmann, 1935) (Tp in IL)

***Ichoronyssus*** Kolenati, 1858 (= *Spinolaelaps* Radford, 1940; *Chiroptonyssus*, *Lepronyssus*, see *Macronyssus*) Dermanyssidae mites

***Ichoronyssus crosbyi*** (*Liponyssus c.* Ewing & Stover, 1915) (ectoparasite on AZ *Myotis velifer* & MO *Myotis subulatus* bats)

***Ichoronyssus britannicus*** (*Liponyssus b.* Radford, 1941) (ectoparasite on CA *Myotis californicus*, *Myotis volans* and *Myotis thysanodes* bats)

"***Ichoronyssus jonesi***" in J. White, 1960 (type locality cave in Shelby Co., AL / caves in Colbert, Calhoun, Blount, Conecuh, Lauderdale, Marshall, Morgan & Shelby Cos., AL/ ectoparasite on AL *Corynorhinus rafinesquii* & *Myotis grisescens* bats)

***Ichoronyssus longisetosus*** Furman, 1950 (ectoparasite on CA *Corynorhinus rafinesquii intermedius* & AL *Corynorhinus rafinesquii macrotis* bats)

*Ichoronyssus robustipes* (Ewing, 1925) (ectoparasite on AZ *Tadarida brasiliensis* bats)

*Ichoronyssus* undet. sp. or species (ectoparasite on KY *Myotis*; OR *Myotis lucifugus*, AZ *Leptonycteris nivalis* & *Pipistrellus hesperus*; AZ; *Nyctinomops femorosaccus* & CA *Myotis californicus* bats)

*Ichoronyssus quadridentatus* Strandtmann & Hunt, 1951 (also synonymized with *Macronyssus crosbyi*) (ectoparasite on GA *Eptesicus fuscus* & *Myotis lucifugus* bats)

*Ichoronyssus* undescr. sp. or species (ectoparasite on AL, MO, AR, OK *Myotis grisescens*, MD *Eptesicus fuscus* & KS *Myotis velifer incautus* bats)

*Ischyropoda* Keegan, 1951 - Laelapidae (= Laelaptidae) mites

*Ischyropoda armatus* Keegan, 1951 (ectoparasite on *Neotoma albigula* & *N. Micropus* woodrats & OR *Myotis californicus* bats)

*Isobactrus* Newell, 1947 - Halacaridae mites, Subfamily Rhombognathinae

*Isobactrus setosus* (Lohmann, 1889) (MA intertidal beach sand interstitial)

*Ixodes* Latreille, 1795 (=Pholeoixodes) Ixodidae mites. **Bibl.:** Cooley & Kohls, 1945

*Ixodes (Ixodes) affinis* Neumann, 1899 (ectoparasite on SC *Neotoma floridana* woodrats)

*Ixodes (Ixodopsis) angustus* Newmann, 1899 (= *I. hexagonus* var. *c.* Nuttall & Warburton, 1911) (ectoparasite on ID, WA *Neotoma occidentalis*; ID, MT *Neotoma cinerea occidentalis* & OR *N. cinerea* woodrats)

*Ixodes (Pholeoixodes) banksi* Bishopp, 1911 (AL, AR, MI, WI most often from beavers/ Tx or Ac in MO)

*Ixodes (Pholeoixodes) conepati* Cooley & Kohls, 1943 (type locality cave in Comal Co.,TX/ Tx in MO, seNM, TX),

*Ixodes (Pholeoixodes) cookei* Packard, 1869 (*I. cruciarius* Fitch, 1872; *I. hexagonus* var. *longispinosus* Neumann, 1901; *I. h.* var. *cookei* Packard) (Tx or Ac in KY(Mammoth C.), IN (WA Co.), MO, sON; ectoparasite in GA cave (Walker Co.)/ groundhog tick/ carrier of encephalitis virusus)

*Ixodes dammini* Spielman, Piesman & Corwin, 1979 (ectoparasite on CT bats)

*Ixodes (Pholeoixodes) marxi* Banks, 1908 (ectoparasite on IN *Neotoma floridana* woodrats)

*Ixodes (Ixodes) minor* (ectoparasite on GA, SC *Neotoma floridana* woodrats)

*Ixodes neotomae* Cooley, 1944 (ectoparasite on CA *Neotoma fuscipes* & *N. macrotis* woodrats)

*Ixodes ochotonae* Gregson, 1941 (ectoparasite on BC, OR *Neotoma cinerea* & OR *Neotoma fuscipes* & *N. macrotis* woodrats/ pika tick)

*Ixodes (Ixodes) pacificus* Cooley & Kohls, 1943 (ectoparasite on OR *Neotoma cinerea o.* & CA. *N. fuscipes* woodrats)/ carrier of lyme disease/ blacklegged tick)

*Ixodes pratti* Banks, 1908 = *Ixodes scapularis*  
*Ixodes* undescr.? sp. (near *I. cookei*/ Tx or Ac in MO)

*Ixodes (Ixodes) scapularis* Say, 1821 (= *I. pratti* Banks, 1908; *I. Affinis* Neumann Banks, 1908; *I. ricinus* var. *scapularis* Say) (MO,s.states along coast to New England, w. to Great Lakes/black legged tick/suspected of causing ehrlichiosis) /Tx or Ac/ ectoparasite on *Neotoma cinerea o.* woodrats & CO *Neotoma cinerea orolestes* woodrats)

*Ixodes sculptus* Newmann, 1904 (ectoparasite on CA *Neotoma fuscipes* woodrats)

*Ixodes (Ixodes) spinipalpis* Hadwen & Nuttall in Nuttall, 1916 (ectoparasite on Alberta, OR *Neotoma fuscipes* & CA *Neotoma* woodrats)

*Ixodes (Ixodiopsis) woodi* Bishopp, 1911 (*I. angustus* var. *w.* Bishopp, 1911) ((ectoparasite on ID *Neotoma occidentalis*, IN *Neotoma floridana* & wTX *Neotoma micropus* woodrats)

*Johnstoniana* George, 1909 - Johnstonianidae mites  
*Johnstoniana* undet. sp. (ectoparasite in WA?)

*Kawamuracarus* Uchida, 1937 - Limnesiidae mites, subfamily Kawamuracarinae  
*Kawamuracarus crameræ* Smith & Cook, 2000 (NM hyporheic in gravel bars)

*Kawamuracarus gilaensis* Smith & Cook, 2000 (NM hyporheic in gravel bars)  
*Kawamuracarus longisetus* Cook, 1963 (AZ, IN, MO, MS, TN hyporheic in gravel bars)

*Kawamuracarus serratipalpis* Cook, 1963 (AZ (Yavapai Co.) & NM hyporheic in gravel bars)

*Koenikea* Wolcott, 1900 - Unionicolidae mites, subfamily Pionatacinae  
*Koenikea (Sespekoenikea) expansipalpis* D. Cook, 1974 (CA hyporheic in Ventura Co. streams)

*Koenikea (Tanaognathela) marshallæ* Viets, 1930 (= *K. wolcotti* Viets) (eNA to MI interstitial, hyporheic in sluggish streams, epigeal in standing water)

*Kongsbergia* Sig Thor, 1899 - Aturidae mites, Subfamily Aturinae  
*Kongsbergia* undescr. sp. (AK, AB, BC)

*Laelaps* Koch, 1836 (*Echinolaelaps*, *Macorlaelaps* Ewing, 1929; *Microtilaelaps*, *Myolaelaps*, *Rattilaelaps* Lange, 1955) Laelapidae mites

*Laelaps alaskensis* Grant, 1947 (ectoparasite on AK *Myotis lucifugus* bats)  
*Laelaps* undet. sp. or species (Tp? in KY or TN; ectoparasite in GA cave (Walker Co.))

*Laelaspis* Berlese, 1904 (*Laelaps (Laelaspis)* Berlese, 1904) - Laelapidae (= Laelaptidae) mites  
*Laelaspis* undet. sp. or species (Tx on mice in NM?; Tx or Ac in GA (prob. on bats))

**Lebertia** Neumann, 1880 - Lebertiidae mites

**Lebertia natans** Viets, 1926 (stream bottom, hyporheic? in NC, Europe)

**Lebertia pushorum** Habeeb, 1968 (springs in ON, New Brunswick (nr. *L. p.*); parasites in chironomidflies)

**Lebertia** undet. sp. (hyporheic in CO, NY)

**Leiodinychus** Berlese, 1917 - Leiodinychidae mites (also put in Uropodidae)

**Leiodinychus** undet. sp. (bat guano Tx in cave in Edwards Co., TX)

*Lepronyssus* = junior syn. of *Macronyssus*

**Leptotrombidium** Nagayo, Miyagawa, Mitamura & Itamura, 1916 (chiggers) - Trombidiidae mite

**Leptotrombidium** (*L.*) *myotis* (Ewing, 1929) (ectoparasite on CA, SD *Myotis evotis*; OR, SD *Myotis volans*; OR, ON, SD *Myotis leibii*, OR *Myotis californicus*, *Lasionycteris noctivagans*, *Pipistrellus hesperus*, *Corynorhinus townsendii* & *Antrozous pallidus*, IN, ON, OR *Eptesicus fuscus*; IN, MN, ND, ON, OR, SD *Myotis lucifugus*, ON *Myotis septentrionalis*, GA (Bartow Co.), ON *Pipistrellus subflavus*, SD *Myotis keeni* & *M. thysanodes* & OH *Lasiurus cinereus* bats) **Bibl.:** Ando 1978, 1983; J. Jones 1998

**Leptotrombidium** undet. sp. or species (ectoparasite on CA *Tadarida brasiliensis*, *Myotis yumanensis* & *Antrozous pallidus* bats)

**Leptus** Latreille, 1796 - Erythraeidae mites

**Leptus** undet. sp. or species (Tx in OR Caves, OR; taken only on their hosts, *Nelima* Harvestmen)

**Leptus** undesc. sp. (Ac in El Malpais Natl.Monument, nNM)

**Lethaxona** K. Viets, 1932 - Lethaxonidae mites (once in Aturidae, Subfamily Axonopsinae)

**Lethaxona** (*Lethaxona*) *flexipalpis* Cook, 1981 (hyporheic in Hunter Cr., Curry Co., OR)

**Lethaxona** (*Eolethaxona*) *oregonensis* Cook, 1963 (hyporheic in Big Creek, Lane Co., OR)

**Lethaxona** undet. sp. (OR interstitial)

**Lethaxonella** Cook, 1963 - Frontipodopsidae mites (once in Aturidae, Subfamily Frontipodopsinae)

**Lethaxonella** *parva* Cook, 1963 (AR, MO (Carroll Co.) hyporheic in streams)

**Leeuwenhoekia** Oudemans, 1911 - Trombiculidae mites, Subfamily Leeuwenhoekinae (also put in own family)

**Leeuwenhoekia** (*Comatacarus*) *americana* (*Comatacarus* a. Ewing, 1942) (ectoparasite on CO *Neotoma cinerea* & *C. mexicana* woodrats)

*Liacarus* Michael, 1898 - Liacaridae mites

*Liacarus lectronus* Higgins & Woolley, 1969 (on CA *Neotoma fuscipes* woodrats)

*Liacarus* undet. sp. (Tx or Ac in sON)

*Limnesia* Koch, 1836 - Limnesiidae mites, Subfamily Limnesiinae

*Limnesia (Limnesia) fulgida* Koch, 1835 (= *L. histrionica* Wolcott, 1903; *L. wolcottii* Piersig, 1905) (MI interstitial)

*Limnesia* undet. sp. (shallow phreatic in Sycamore Cr. 32 km ne of Phoenix (Maricopa Co.), AZ)

*Linopodes* C.L.Koch, 1835 - Eupodidae mites

*Linopodes mammothia* Banks in Call, 1897 (\*Mammoth C., KY/ Tb)

*Linopodes motatorius* (Linne') (cave? in Franklin Co., MO)

*Linopodes* prob. undescr. sp. (Tp?, fungivore in Mariposa, Trinity & Tuolumne Cos., CA)

*Linopodes* undet. sp. or species (Tp in IL, IA; Tx or Ac in AB; Tp or Tx in NS, KY, TN; Tp in cave in WA Co., AR; Tp in WA; Tx? in HA?; Tp in El Malpais Natl. Monument, nNM)

*Liponyssoides* Hirst, 1913 (fatmites) Dermanyssidae mites

*Liponyssoides becki* (Allred, 1957) (ectoparasite on *Neotoma albigula* & *N. lepida* woodrats)

*Liponyssus bacoti* = *Ornithonyssus b.*

*Listrophorus* Pagenstecher, 1861 - Listrophoridae mites

*Listrophorus neotomae* Fain & Hyland, 1973 (ectoparasite on TX *Neotoma micropus* & GA *Neotoma floridana* woodrats)

*Ljania* Thor, 1898 - Aturidae, Subfamily Axonopsinae

*Ljania* undet. sp. near *bipillata* Thor, 1898 ssp. *purpurea*? Habeeb, 1953 (w.NA in hyporheic stream riffle gravels)

*Ljania* undescr.. sp. (AB, BC, SK hyporheic)

*Ljania* undet. sp. (NY hyporheic)

*Lobohalacarus* Viets, 1956 - Limnocharidae mites, Subfamily Porohalacarinae (also put in Halacaridae, Subfamily Halacarinae)

*Lobohalacarus* undet. sp. (hyporheic & lake groundwater interstitial in Canadian Rockies area)

*Lobohalacarus weberi* w. (Romijn & Viets, 1924) (NY, West hyporheic, HA & RI caves, karst, groundwater interstitial & phreatic-fed springs; hypogean, hyporheic & surface waters in North Africa, Europe))

*Loomisia* Brennan & Reed 1972 - Trombiculidae mites

*Loomisia univari* Brennan 1965 = *Trombicula univari*

*Lordalychus* Grandjean, 1938 - Lordalychidae mites

*Lordalychus* undet. sp. (Ac in El Malpais Natl.Monument, nNM)

*Lundbladia* Viets, 1929 - Hydryphantidae mites, subfamily Thyadinae (water mites)

*Lundbladia muscicola* = *Trichothyas m.* Mitchell, 1953

*Macrocheles* Latreille, 1829 (*Andrholaspis* Turk, 1948; *Coprholaspis* Berlese, 1918; *Macrholaspis* Oudemans, 1931; *Monoplites* Hull, 1925; *Nothrholaspis* Berlese, 1918 [part])- Macrochelidae mites. **Bibl.:** Krantz & Whitaker 1988

*Macrocheles adenosticta* Krantz & Whitaker, 1988 (= *M. adenostichus*) (in OR, CA *Neotoma fuscipes* woodrat nest; ectoparasite on OR *N. fuscipes* woodrats)

*Macrocheles nemerdaria* Krantz & Whitaker, 1988 (= *M. nemerdarius*) (ectoparasite on FL *Neotoma floridana* woodrats)

*Macrocheles penicilliger* (*Holostaspis p.* Berlese, 1904) Sellnick, 1940 (Europe in litter, bird nests, Italian? bat guano; petrel burrows and nematode culture in OR; assoc. with dung beetle *Dichotomius carolinus* in KY / Tx or Tp in cave in Taney Co.,MO)

*Macrocheles* undet. sp. or species (Tp or Tx guanobic in MO; Tp in cave in Sutton Co.,TX); Tp or Tx phoretic on KY Heleomyzidae flies; Tx or Ac in GA (prob. on bats); Tx in Mammoth C.,KY/ ectoparasite on swOK (Tx) *Myotis velifer* bats & IN *Neotoma floridana* woodrats))

*Macrocheles* undet. sp. (ectoparasite/guanobic in *Myotis grisescens* bat guano in GA (Walker Co.))

*Macrocheles* undescr.? sp.1 (\*\*?2 caves in Eddy Co.,NM/Tp?)

*Macrocheles* undescr. sp.#2 (\*?cave in Eddy Co.,NM/Tp?)

*Macrocheles* undescr. sp.#3 (ectoparasite on OK *Myotis velifer* bats)

*Macrocheles stygia* (*Gamasus s.* Packard, 1888; *M. stygius*) Packard, 1888 (Tb or Tp in 2 caves in Carter Co. & Mammoth C.,KY/ caves only? / G1G2)

*Macrocheles troglodytes* (= *Gamasus* (or *Hypoaspis*? t. Packard, 1888) (\*Mammoth C.,KY/ Tb/ G1G2)

*Macronyssus* Kolenati, 1858 (fatmites) (= *Lepronyssus* Kolenati, 1858; *Ichoronyssus* of authors, not Kolenati, 1858; *Hirstesia* Fonseca, 1948; *Longeonyssus* Grokhovskaya & Nguen-Huan-Hoe, 1961) (genus in Asia, Africa & NA) Macronyssidae mites, Subfamily Macronyssinae. **Bibl.:** Uchikawa 1979

*Macronyssus cavus* Radovsky, 1967(\*type locality cave in Mammoth Cave Natl.Park, Hart Co.,KY/ Tb? or (more likely) bat parasite)

*Macronyssus crosbyi* (*Liponyssus c.* Ewing & Stover, 1915; *Ichoronyssus c.*; *I. brittanicus* Furman, 1950; *I. quadridentatus* Strandtmann & Hunt, 1951) (Western Hemisphere to Chile/ Tp in cave in Cottle & Hardeman Cos., TX & Botetourt Co.,VA/ ectoparasite on MO *Eptesicus*

*fuscus*; CA *Corynorhinus townsendii* & *C. rafinesquii*, OH *Lasiurus cinereus*, CA, OR *Myotis californicus* & *M. volans*, CA *M. thysanodes*, AK, CA, Canada, GA, IL, IN, MI, OH, ON, OR, PA, PEI, TX *M. lucifugus*, IL, IN, MI, PA *M. keeni*; PA *Myotis*; OK, wTX *M. velifer*; OR *Myotis evotis* & *M. leibi*; FL, IL, IN, MI, PA *M. austroriparius*; & IL, IN, MI, OH, PA *Myotis sodalis* bats/ Tx? in AZ, OK, TX *M. velifer*, CA, OR, TX *M. yumanensis*, & OK *Pipistrellus hesperus* bats)

***Macronyssus*** near *cyclaspis* (*M.c.* known from Spain/ ectoparasite on TX *Corynorhinus townsendii* bats)

***Macronyssus jonesi*** (*Ichoronyssus j.* White, 1956) (ectoparasite on *Eptesicus fuscus*?, FL, IL *Myotis austroriparius* & IL, IN, KS *Myotis grisescens* bats)

***Macronyssus longisetosus*** (*Ichoronyssus l.* Furman, 1950) (Tx on KY (Mammoth C.), TX & MO (or *M. crosbyi* (Ewing & Stover) bats; ectoparasite on MT bats; OR, TX *Corynorhinus townsendii*, TX *Corynorhinus rafinesquii pallescens*, SW *Myotis velifer* & AL *Corynorhinus rafinesquii* bats)

***Macronyssus macrodactylus*** Radovsky & Beck, 1971 (parasite on CA, IL, OR, SD *Lasionycteris noctivagans* bats)

***Macronyssus*** undet. sp. (MO/Tp or Tx guanobic & bat ectoparasite)

***Macronyssus*** undescr. sp. or species (Tx on AL, AR, KS, MO, OK)

***Macronyssus unidens*** Radovsky, 1967 (Tp in cave in Armstrong Co., TX/ ectoparasite on IL, TX, WV (Tx) *M. lucifugus* ; AZ (Tx), SD, WY *Lasionycteris noctivagans*; NV, OK(Tx), TX (Tx) *Corynorhinus townsendii*; AZ (Tx) *Leptonnycteris nivalis* ; KS, MO, MD (Tx) & OK (Tx) *Eptesicus fuscus* & OK (Tx) *Pipistrellus hesperus* bats)

***Malaconothrus*** Berlese, 1904 - Malaconothridae mites

***Malaconothrus*** undet. sp. (hyporheic in CO)

***Melichares*** Hering, 1938 (= *Garmania* Nesbitt, 1951; *Mucroseius* Lindquist, 1962; *Orolaelaps* De Leon, 1963) - Ascidae mites

***Melichares*** undet. sp. (Tx in Mariposa Co., CA)

***Meramecia*** Cook, 1963 - Limnesiidae mites, subfamily Neomamersinae

***Meramecia*** (*Meramecia*) *anisitsipalpis* (*Neomamersa* (*M.*) *a.* Cook, 1963) (AR, IN, MO, OK interstitial in gravels of hyporheic of streams)

***Meramecia*** (*Meramecia*) *ocularis* (*Neomamersa* (*M.*) *o.* Cook, 1963) (AL, ME, New Brunswick, NY, OH, TN interstitial in gravels of hyporheic of streams)

***Meramecia*** (*Meramecia*) *perplexa* (*Neomamersa* (*M.*) *P.* Cook, 1963) (MO interstitial in gravels of hyporheic of streams)

***Meramecia*** (*Meramecia*) *occidentalis* I. Smith & D. Cook, 1994 (interstitial in gravels of hyporheic of streams in AZ, sCA, NM)

***Meramecia*** (*Parameramecia*) *multipora* I. Smith & D. Cook, 1994 (dry channel & shallow hyporheic in Sycamore Cr. 32 km ne of Phoenix (Maricopa Co.), AZ)

***Microtrombicula*** Ewing, 1950 - Trombiculidae mites

**Bibl.:** Vercammen-Grandjean, 1965; Webb & Loomis, 1971, 1977; Webb, 1970

***Microtrombicula merrihewi*** Ewing, 1950 (ectoparasite on *Tadarida b.* bats in AZ, CA, NM, OK, TX). **Bibl.:** R. Davis & Loomis, 1971

***Microtrombicula ornata*** (*Trombicula o.* Loomis & Lipovsky, 1954) (ectoparasite on NM *Neotoma albigula* & KS *N. micropus* woodrats)

***Microtrombidium*** Haller, 1882 - Trombidiidae mites

***Microtrombidium sanborni*** (*Zercon?* or *Sejus?* s. Packard, 1886) Vitzthum (\*type locality cave in Edmondson Co.,KY)

***Midea*** Bruzelius, 1854 - Mideidae mites

***Midea determina*** Marshall, 1929 (= ? *M. alaris* Young, 1968) (groundwater interstitial in ON)

***Midea expansa*** Marshall, 1940 (groundwater interstitial in WI)

***Midea*** undet. sp. (eNA interstitial hyporheic)

***Mideopsis*** Neuman, 1880 - Mideopsidae mites, Subfamily Mideopsinae

***Mideopsis*** (*Mideopsis*) *americana* (*Mideopsis americanus* Marshall, 1940) (likely hyporheic in temperate NA when parasitizing insect larvae)

***Mideopsis*** (*Mideopsis*) *borealis* Habeeb, 1958 (= *M. orbicularis borealis*) (likely hyporheic in ON streams when parasitizing insect larvae/ Tx in Harrison Co.,IN/ water mite/ S4/G5)

***Mideopsis*** (*Mideopsis*) *crassipes* Soar, 1904 (AB,ON, Palearctic streams, likely hyporheic when parasitizing *Cricotopus* larvae)

***Mideopsis*** (*Xystonotus*) *interstitialis* Cook, 1976 (interstitial hyporheic in Bath & Hamilton Cos., VA, MO, ON, PQ)

***Mideopsis*** (*Mideopsis*) *laversi* Cook, 1976 (hyporheic in CA (Mendocino & Trinity Cos.) & OR (Lane Co.))

***Mideopsis*** (*Mideopsis*) *orbicularis* (Muller, 1776) (MI interstitial hyporheic; MT lake benthic)

*Mideopsis orbicularis borealis* = *M. b.*

***Mideopsis*** (*Xystonotus*) *pallida* Cook, 1976 (interstitial hyporheic in Whitewater Cr., Catron Co.,NM)

***Mideopsis*** (*Xystonotus*) *paramecia* Cook, 1976 (interstitial hyporheic in Shuyler Co.,NY)



*Mideopsis (Xystonotus) pumila* Cook, 1974 (interstitial hyporheic in sand bar or gravels in AB, ID, BC, OR, WA, MT, WY)

*Mideopsis (Xystonotus) sabulonis* Cook, 1976 (interstitial hyporheic in Bath Co., VA)

*Mideopsis* undet. sp. or species (CA, ON, PQ interstitial hyporheic; cave in Madison Co.,AL)

*Mideopsis (Xystonotus)* undet. sp. shallow hyporheic in Sycamore Cr. 32 km ne of Phoenix (Maricopa Co.), AZ)

*Miyatrombicula* Sasa, Kawashima & Egashira, 1952 - Trombiculidae mites (also placed as subgenus of *Trombicula*)

*Miyatrombicula cynos (Trombicula (M.) c.* Ewing, 1937) (ectoparasite on OR *Neotoma cinerea* & OK, KS *N. floridana* woodrats & on KS (Tx) *Myotis velifer grandis* bats)

*Miyatrombicula jonesi (Trombicula jonesae* Brennan, 1952) (IA, KS, IL epigeal/ ectoparasite on GA *Neotoma floridana* woodrats)

*Monunguis* Wharton, 1938 - Trombiculidae mites

*Monunguis* near *streblida* Wharton, 1938 (Tumbling Cr., Taney Co.,MO),

*Morimotacarus* Imamura, 1962 - Chappuisidae mites, subfamily Morimotacarinae (once put in Uchidastygacaridae)

*Morimotacarus nearcticus* I. Smith, 1992 (hyporheic in AB, BC, MT, WY stream gravels)

*Multioppia* Hammer, 1961 - Oppiidae mites

*Multioppia* undet. sp. (Tp or Tx guanobic in MO)

*Mydopholeus* McDaniel & Baker,1962 - Rosensteiniidae, Subfamily Chiroptoglyphinae

*Mydopholeus capillus* McDaniel & Baker,1962 (type locality cave in in Carlsbad Caverns, Eddy Co., NM/ Tp? guanobic in NM)

*Mydopholeus* undet. sp. (rare ectoparasite on AL *Eptesicus fuscus* bats)

*Mydopholeus wrenni* Fashing, 1981 (\*type locality cave in Woods Co.,OK/bat guanobic/ Tb or Tp)

*Myianoetus* Oudemans, 1929 (cosmopolitan) - Histiostomatidae mites

*Myianoetus* undescr. sp. (Tp or Tb in OR Caves, OR)

*Myobia caudata* = *Acanthophthirius (Myotimyobia) caudatus*

*Myobia* - See *Pteracarus*

*Myocoptes* Clapas, 1869 - Myocoptidae mites

*Myocoptes (Myocoptes) neotomae* Fain, Cudmore & Whitaker, 1984 (ectoparasite on GA, IN *Neotoma floridana* & OR *Neotoma cinerea* and *N. fuscipes* woodrats)

*Nanorchestes* Topsent & Trouessart, 1890 - Nanoorchestidae mites  
*Nanorchestes* undet. sp. (Tp in El Malpais Natl.Monument, nNM)

*Neoacarus* Halbert, 1944 - Neoacaridae mites

*Neoacarus expansus* Cook, 1963 (hyporheic in stream gravel in OK (DE Co.) & MO (OR & Dent Cos.)

*Neoacarus minimus* Cook, 1968 (hyporheic in stream gravel in NH (Coos Co.), NY (Hamilton CO.) & VA (Bath Co.)

*Neoacarus motasi* Cook, 1963 (hyporheic in sand in Bath Co.,VA)

*Neoacarus occidentalis* Cook, 1968 (hyporheic in stream gravel in BC, CA (Shasta Co.), WA (Mason Co.))/ parasites in *Paratanytarsus* flies)

*Neoacarus ozarkensis* Cook, 1963 (hyporheic in stream gravel in Appalachian & Interior Highlands (MO (Dent, Shannon, Reynolds & Wayne Cos.), NY (Hamilton Co.), AR & WV (Pocahontas Co.))

*Neoacarus similis* Cook, 1963 (hyporheic in stream gravel in Appalachian & Interior Highlands (ME ( Aroostock Co.), NB (Victoria Co.), NY (Hamilton Co.), MO (Shannon & Dent Cos.), AR & MT)

*Neoacarus* undet. sp.or species (hyporheic in CO, NY)

*Neobrachypoda* Koenike, 1914 - Aturidae mites, subfamily Axonopsinae

*Neobrachypoda* sp. near *ekmani* (Walter, 1911) (in silt & moss in BC springs)

*Neoichoronyssus* Fonseca,1941 - Laelapidae (= Laelaptidae) mites (also placed in Macronyssidae, Subfamily Ornithonyssinae)

*Neoichoronyssus (Hirstionyssus) neotomae* Eads & Hightower, 1951 (on TX *Neotoma micropus* woodrats)

*Neomamersa* Lundblad, 1953 - Limnesiidae mites, subfamily Neomamersinae. **Bibl.:** D.Cook 1963.

*Neomamersa (Meramecia) anisitsipalpis* = *M.a.*

*Neomamersa boultoni* I. Smith & D.Cook, 1994 (AZ interstitial in gravels of hyporheic of streams)

*Neomamersa californica* I. Smith & D. Cook, 1994 (interstitial in gravels of hyporheic of streams in Humboldt, Monterey, Mendocino, Tuolumne & Ventura Cos.,CA)

*Neomamersa chihuahua* I. Smith & D.Cook, 1994 (AZ, NM, wTX interstitial in hyporheic gravels of streams)

*Neomamersa crameræ* I. Smith & D.Cook, 1994 (interstitial in gravels of hyporheic of streams of Cochise Co., AZ)

*Neomamersa (Neomamersa) hexapora* D.Cook, 1969 (sAZ, sCA, NM (Catron Co.) interstitial in gravels of hyporheic of streams)

*Neomamersa (Neomamersa) lundbladi lundbladi* (N.I. D.Cook, 1963) D.Cook, 1969 (AR, MO, OH, OK interstitial in hyporheic gravels of streams)

*Neomamersa (Neomamersa) lundbladi paucipora* D.Cook, 1969 (seCA, swNM (Catron Co.), cAZ (Coconino Co.) hyporheic in gravel bars)

*Neomamersa neomexicana* I. Smith & D.Cook, 1994 (interstitial in hyporheic gravels of streams of Cochise Co., AZ)

*Neomamersa (Meramecia) ocularis* D.Cook, 1969 (NY (Hamilton Co.) hyporheic in gravel bars)

*Neomamersa (Meramecia) perplexa* D.Cook, 1963 (MO (Wayne, Dent & Reynolds Cos.) hyporheic in streams)

*Neomamersa psammicola* I. Smith & D.Cook, 1994 (AZ interstitial in gravels of hyporheic of streams; dry channel hyporheic & shallow hyporheic in Sycamore Cr. 32 km ne of Phoenix (Maricopa Co.), AZ)

*Neomyobia* Radford, 1948 - Myobiidae mites

*Neomyobia caudata* = *Acanthophthirius (Myotimyobia) caudatus*

*Neomyobia inaequalis (Radfordia inaequalis* Ewing, 1938; *Binucus i.* Radford, 1954) Jameson, 1955 (ectoparasite on AL, FL *Tadarida brasiliensis cynocephala* & CA *T. brasiliensis* & *Antrozous pallidus* (accidental) bats)

*Neopygmephorus* - Pygmephoridae mites, subfamily Neopygmephorinae

*Neopygmephorus* undescr. sp. (Tp in WA)

*Neospeleognathopsis* Fain & Lukoschus, 1979 - Ereyenetidae mites

*Neospeleognathopsis (Speleomyotis) bastini* (Fain, 1958) (on MD, OH, PA *Eptesicus f.* bats)

*Neotarsonemoides* Kaliszewski M., 1984 - Tarsonemidae mites

*Neotarsonemoides* undet sp. (prob. fungivore in Kartchner C., Cochise Co., AZ)

*Neotrombicula* Hirt 1925 - Trombiculidae mites

*Neotrombicula californica (Trombicula (N.) c* Ewing, 1942) (ectoparasite on CA *Neotoma fuscipes* & *N. lepida* woodrats)

*Neotrombicula cavicola* (*Trombicula* (*N.*) *c.* Ewing, 1931) (ectoparasite on OR *Neotoma cinerea* and *N. fuscipes* & IN *Neotoma floridana* woodrats)

*Neotrombicula fitchi* (*Trombicula f.* Loomis, 1954) (ectoparasite on KS *Myotis velifer grandis* bats & *Neotoma micropus* woodrats)

*Neotrombicula harperi* (*Trombicula* (*N.*) *h.* Ewing, 1928) (ectoparasite on OR *Neotoma cinerea* woodrats)

*Neotrombicula lipovskyi* (*Trombicula* (*N.*) *l.* Brennan & Wharton, 1950) (ectoparasite on KS *Neotoma floridana* & *N. micropus* woodrats)

*Neotrombicula microti* (Ewing, 1928) no ZR (ectoparasite on Japanese, MI, NY, USSR, IN *Eptesicus fuscus* bats & OR *Neotoma cinerea* woodrats)

*Neotrombicula waynensis* Brennan & Wharton, 1950 (ectoparasite on IN *Neotoma floridana* woodrats)

*Neotrombidium* Leonardi, 1901 - Neotrombidiidae mites. **Bibl.:** Borland, 1956

*Neotrombidium* undescr. sp. (\*cave in OR Co., MO) **Bibl.:** Lindquist & Vercammen- Grandjean, 1971

*Niphocephus* Balogh, 1943 - Niphocephidae mites

*Niphocephus* undet. sp. (TTP in WA)

*Nothrus* Koch, 1835 - Nothridae mites

*Nothrus* undet. sp. (cave in Eddy Co., NM/ Tp?)

*Notoedres* Railliet, 1893 (= *Prosopodectes* G. Canestrini, 1897)- Sarcoptidae mites

*Notoedres* (*Bakeracarus*) *lasionycteris* (*Sarcoptes l.* Boyd & Bernstein, 1950) Fain, 1961 (ectoparasite on OH *Eptesicus f.* (Tx), OH *Lasiurus cinereus* & OH, PA *Lasionycteris noctivagans* bats; on bats & in guano in cave in Edwards Co., TX)

*Notoedres* (*Bakeracarus*) *lasionycteris corynorhini* Fain, 1961 (ectoparasite on North American *Lasionycteris nivalis* & *Corynorhinus townsendii* bats)

*Notoedres myotis* (*Sarcoptes m.* Hedeem, 1953) (ectoparasite on wTX *Myotis yumanensis* & wTX, AZ (Tx) *Myotis velifer* & CA *Antrozous pallidus* bats)

*Notoedres* (*Bakeracarus*) undet. sp. or species (ectoparasite on OR *Eptesicus fuscus* & *Corynorhinus townsendii*, FL *Tadarida brasiliensis cynocephala*, CA *Tadarida brasiliensis* (2 species, one near *N. tadaridae*)), CA *Myotis yumanensis* & ND, MN *Myotis lucifugus* bats; Tx on WV bats). **Bibl.:** Fain 1961

*Nudomideopsis* Szalay, 1945 - Nudomideopsidae mites (once subsumed in Mideopsidae, Subfamily Mideopsinae)

*Nudomideopsis magnacetabula* (*Mideopsis*. (*N.*) *m.* Smith, 1977) (New Brunswick, NF, ON, PQ interstitial in springs and seepages; hyporheic in sON)

*Nudomideopsis sisulawensis* Smith, 1983 (hyporheic? in southern coastal OR rheocene springs and seepages)

*Nudomideopsis* (*Allomideopsis*) *wichitaensis* I. Smith, 1990 (hyporheic in sand and gravel deposits in small streams of Wichita Mts., OK)

*Nycteriglyphites* Fain, Lukoschus & Whitaker, 1982 - Rosensteiniidae mites

*Nycteriglyphites pennsylvanicus* Fain, Lukoschus & Whitaker, 1982 (on OH guano assoc. with *Eptesicus f.* bats & IN, PA guano assoc. with *Myotis lucifugus*; rare ectoparasite on AL *Eptesicus fuscus* bats) **Bibl.:** Dood 1987; Fain, Lukoschus & Whitaker 1982

*Nycteriglyphites* undet. sp. (on guano assoc. with NH *Myotis lucifugus*)

*Nycteriglyphus* Zakhvatkin, 1941 - Rosensteiniidae mites, Subfamily Nycteriglyphinae

*Nycteriglyphus bifolium* Strandmann, 1962 (Carlsbad C., NM/Tp?) + wTX/Tp guanophile; on NM, TX *Tadarida brasiliensis* bats)

*Nycteriglyphus fuscus* Dodd & Rockett, 1985 (OH guanophile & ectoparasite on OH *Eptesicus f.* bats)

*Nycteriglyphus* undescr. sp. (ectoparasite on TX *Myotis yumanensis* & *M. velifer* & *Corynorhinus townsendii* bats)

*Nycteriglyphus* undet. sp. or species (ectoparasite on swOK *Myotis velifer* bats; guanophile in El Malpais Natl. Monument, nNM; fungivore or detritovore on ON bat guano))

*Nycteriglyphus fuscus* O'Connor, Whitaker & Easterla, 1977 (ectoparasite on *Leptonycteris nivalis* bat guano)

*Nycteriglyphus texanus* O'Connor & Reisen, 1978 (type locality on *Leptonycteris nivalis* bat guano in cave in Big Bend Natl. Park, Brewster Co., TX/ guanophile on OK *Myotis v.*, PA *M. lucifugus*, wTX, *Corynorhinus townsendii*, *Myotis yumanensis*, *Myotis velifer* & *Tadarida brasiliensis* & (near *N. texanus*) Kartchner C., Cochise Co., AZ)

*Odontacarus* Ewing, 1929 (= *Ocomatacarus* Ewing, 1942) Trombiculidae mites

*Odontacarus dentatus* (*Trombicula dentata* Ewing, 1929) Ewing, 1925 (*Acomatacarus galli* Ewing, 1946; *Acomatacarus g.* Ewing, 1946; *A. angulatus* & *A. polychaetus* Greenberg, 1952; *O. whartoni* Brennan & Jones 1959; *O. morlani* Brennan, 1959 (see below)) (ectoparasite on NM *Neotoma micropus* woodrats)

*Odontacarus kromani* Goff & Loomis, 1973 (on CA, Baja CA *Neotoma lepida* woodrats)

*Odontacarus hirsutus* (*Hannemania hirsuta* Ewing, 1931; *Acomatacarus hirsutus*) (ectoparasite on CA *Neotoma fuscipes* woodrats)

***Odontacarus morlani*** Brennan, 1959 (considered a junior syn. of *O. dentatus* by some authors)  
(ectoparasite on *Neotoma micropus* woodrats)

***Olabidocarpus*** Lawrence, 1948 - Listrophoridae mites (also put in Chirodiscidae)

***Olabidocarpus americanus*** McDaniel & Lawrence, 1965 (ectoparasite on HI *Lasiurus cinereus semotus* & TX *Lasiurus intermedius* bats) **Bibl.:** McDaniel & Tenorio. 1979

“***Olabidocarpus taylori***• in J. White, 1960 (ectoparasite on AL *Tadarida brasiliensis cynocephala* bats)

***Olabidocarpus lawrenceii*** McDaniel & Coffman, 1970 (ectoparasite Tx? on TX *Tadarida b.m.* bats)

***Olabidocarpus*** undet. sp. or species (ectoparasite on swOK *Myotis velifer* & IN *Eptesicus fuscus* bats)

“***Olabidocarpus wardi***• in J. White, 1960 (Big Spring Cave No.1 (type locality)/ ectoparasite on AL *Myotis grisescens*, *Myotis a. austroriparius* & *Myotis keenii septentrionalis* bats)

***Olabidocarpus whitakeri*** McDaniel & Coffman, 1970 (type locality cave in Lawrence Co.,IN/ parasite on FL, IL, IN *Myotis austroriparius mumfordi* & IL, IN *M. grisescens*, & *M. keenii* bats)

***Omartacarus*** Cook, 1963 - Omartacaridae mites, subfamily Omartacarinae

***Omartacarus elongatus*** Cook, 1963 (Mex., MO,OK stream hyporheic)

***Omartacarus*** mostly undesr. species (MO, OK, NM, CA. stream hyporheic)

***Omartacarus*** undet. sp. (interstitial/ shallow hyporheic in Sycamore Cr. 32 km ne of Phoenix (Maricopa Co.), AZ)

***Oppiella*** Jacot, 1937 - Oppiidae mites

***Oppiella*** undet. sp. (Tp in cave in Eddy Co.,NM/ TTx, Tx or Tp in Wind & Jewel C.,SD)

***Opsioristes*** Woolley, 1967 - Liacaridae mites

***Opsioristes*** undet. sp.(TTp in WA)

***Oregonacarus*** I. Smith, 1989 - Anisitsiellidae mites, Subfamily Anisitsiellinae

***Oregonacarus rivulicolus*** I. Smith, 1989 (hyporheic in silt & detritus in rocky riffle in spring in Curry Co., OR)

*Oribata alata* – (this may be the valid name for *Galumna a.* in Mammoth) - see *Galumna Oribates lucifugus* = *Uropoda l.*

***Oribatella*** Banks, 1895 - Oribatellidae mites

***Oribatella quadridentatus*** Banks, 1895?) (Tx ectoparasite on FL *Myotis austroriparius* bats)

***Oribatella*** undet. sp. (Tx detritivore? in Calaveras Co.,CA),

**Oribatula** Berlese, 1896 - Oribatulidae mites

**Oribatula minuta** Berlese, 1896 (ectoparasite on IN *Neotoma floridana* woodrats)

**Oribotritia** Jacot, 1924 - Order Oribatida, Oribotritiidae, mites

**Oribotritia** undet. sp. (Ttp in WA)

**Ornithodoros** Koch, 1844 (mammal soft ticks). Ioxidae mites. **Bibl.:** McIntosh 1935

**Ornithodoros (Alectorobius) brodyi** Matheson, 1935 (Panama to TX/ Tx in cave each in Comal & Menard Cos., TX)

**Ornithodoros (Alectorobius) concanensis** Cooley & Kohls, 1941 (Tp in Edwards,Hardeman, Hays, Kinney, Travis & Uvalde Cos.,TX; Tx in AZ mines; ectoparasite on TX *Eptesicus fuscus pallidus* woodrats & *Corynorhinus rafinesquii pallescens* & UT,CO *Pipistrellus hesperus* bats; on guano),

*Ornithodoros cooleyi* = *Argas c.*

**Ornithodoros** coprophilus McIntosh, 1935 (ectoparasite in AZ, Mex. bat guano)

**Ornithodoros (Ornamentum) coriaceus** C. Koch, 1844 (SA,sMex. To CA./pajaroello or talajas/ TTx in cliff swallow nest in Contra Costa Co., CA)

**Ornithodoros dyeri** Cooley & Kohls, 1940 (Tx in mines near Picacho,AZ , seCA & nMex.),

**Ornithodoros (Alectorobius) dyeri** Cooley & Kohls, 1940 ("bat cave" &/or rock crevices, San Bernardino Co. & 15 mi. n.of Yuma (both CA) & mine near Picacho (AZ))

**Ornithodoros (Pavlovskyella) hermsi** Wheeler, Herms, & Meyer, 1935 (W/ Tx in cave in Val Verde Co., TX; ectoparasite on UT, WY *Neotoma lepida* woodrats/ vector for relapsing fever)

**Ornithodoros kelleyi** Cooley & Kohls, 1941 (wNY,ePa, sWI, nMI, IL, IA, sIN, wCO, eUT epigeal/ ectoparasite on MO (Tx), wTX *Antrozous pallidus*, MO (Tx) *Pipistrellus hesperus*; AZ (Tx) *Corynorhinus townsendii*; AL *Myotis grisescens* & *Pipistrellus s. subflavus*; CA *Myotis californicus*; IL, IN, MI, MN, NY, OH, PA, VA, WI *Eptesicus fuscus*; wTX *Myotis yumanensis* & AL, IN, MD, WV *Myotis lucifugus* bats; associated with SK, AB bats)

**Ornithodoros mormoops** Kohls, Clifford & Jones, 1969 (ecotparasite on wTX (probably) *Mormoops megalophylla* bats)

**Ornithodoros (Pavlovskyella) parkeri** Cooley, 1936 (W/ ectoparasite on small mammals in CA)

**Ornithodoros rossi** Kohls, Sonenshine & Clifford, 1965 (Type locality in Crystal Cave, Catalina Mts., AZ/ ectoparasite on AZ *Leptonycteris sanborni*; CA *Macrotus californicus*, UT,wTX *Euderma maculatum*, wTX *Antrozous pallidus*, *Pipistrellus hesperus*, *Corynorhinus townsendii*, AL, wTX, UT *Eptesicus fuscus* & AZ *Leptonycteris nivalis* bats)

**Ornithodoros** undet. sp. or species (Carlsbad C.,NM; 6 cos. in TX; Tx ectoparasite on AZ (Tx) *Leptonycteris nivalis* & BC *Eumops perotis californicus* bats)

***Ornithodoros sparnus*** Kohls & Clifford, 1963 (ectoparasite on UT, AZ *Neotoma cinerea* & *N. lepida* woodrats)

***Ornithodoros (Alectorobius) stageri*** Cooley & Kohls, 1941 (type locality cave in Medina Co., TX/Tp? in OK & Comal, Medina, ?Uvalde Cos., TX/ ectoparasite on AZ (Tx), CA (Tx), OK(Tx) *Myotis velifer*; TX *Myotis yumanensis*, CA *Antrozous pallidus* & AZ, CA, OK *Tadarida mexicana* & wTX *Nyctinomops macrotis* & *Tadarida brasiliensis* bats)

***Ornithodoros (Alectorobius) talaje*** (ectoparasite on *Neotoma floridana baileyi* woodrats)

***Ornithodoros (Pavlovskyella) turicata*** (*Argas t.* Duges, 1876; *O.t.* Neumann, 1896; *O. americanus* Marx, 1895) Francis, 1942 (AZ, CA, FL, NM, Mex., SA to seCO, sOK, FL/adobe tick, *turicata* or *pajaronela*/ TX in OK, TX/ suspected of transmitting Malta fever in TX & relapsing fever in TX & OK; on WTX *Neotoma micropus* woodrats/ relapsing fever tick ) **Bibl.:** Francis, 1942; Francis, 1938

***Ornithodoros (Alectorobius) yumatensis*** Cooley & Kohls, 1941 (ectoparasite on CA, AZ (Tx), *Myotis velifer*, AZ (Tx) *Corynorhinus townsendi*, *Myotis yumanensis*, *Myotis thysanodes*; NM, TX *Pipistrellus hesperus maximus* & *Tadarida brasiliensis mexicana*, FL *Myotis austroriparius* & sNM, TX *Eptesicus pallidus* bats/ Tx in CA, AZ, TX)

***Ornithonyssus*** Sanborn, 1928 (fatmites) - Macronyssidae mites, Subfamily Ornithonyssinae

***Ornithonyssus bacoti*** (*Liponyssus (Bdellonyssus) b.* Hirst, 1913) (tropical rat mite/ rats, mice, occasionally humans, livestock/worldwide/ ectoparasite on *Neotoma micropus* woodrats & GA, IN, TX *Neotoma floridana* woodrats)

*Ornithonyssus gallinae* = *Dermanyssus gallinae*

***Ornithonyssus haematophagus*** (*Liponissus h.* Fonseca, 1935) (ectoparasite on GA *Myotis lucifugus* & *Tadarida cynocephala* bats)

***Ornithonyssus sylviarum*** (Canestrini & Fanzago, 1877; *Liponyssus americanus* Banks, 1806) (ectoparasite on wTX *Myotis velifer incautus*, *Eptesicus fuscus* bats/ northern fowl mite) **Bibl.:** George & Strandtman 1960

***Otorhinophila*** Wrenn & Loomis 1967 - Trombiculidae mites

***Otorhinophila desertorum*** Loomis & Wrenn, 1973 (ectoparasite on *Neotoma lepida* woodrats)

***Otorhinophila*** undet. sp. (on bats in wNA)

***Oxus*** Kramer, 1877 - Oxidae water mites

***Oxus (Oxus) elongatus*** Marshall, 1929 (in ON lake/ parasitic on chironomid flies/ interstitial?)

***Paleozercon*** Blaszak, Cokendolpher & Polyak, 1995 - Zerconidae mites

***Paleozercon cavernicolous*** Blaszak, Cokendolpher & Polyak, 1995 (fossil in sw. cave)

***Panisopsis*** Koenike, 1896 - Hydryphantidae mites, subfamily Thyadinae (water mites)



*Paranisopsis* (*Panisoides*) *setipes* (*Thyas s.* Viets, 1911) (Europe, MI seepage areas, interstitial groundwater?)

*Paradamaeus* Bulanova-Zachvatkina, 1957 (was subgenus of *Damaeus*)

*Paradamaeus* undet. sp(p). (Tp or Tx in OR C.,OR; TTp in WA)

*Paramideopsis*.Smith, 1983 - Nudomideopsidae (once subsumed in Mideopsidae) mites

*Paramideopsis.susanae* Smith, 1983 (AB, BC, ID, MT, NM, NV, OR, WA hyporheic? in gravel deposits in riffles of small streams, occasionally in moss and detritus in springs and seepages)

*Parasoldanellonyx* Viets, 1929 - Limnocharidae mites, Subfamily Limnohalacarinae (once in Halacaridae)

*Parasoldanellonyx parviscutatus* (Walter, 1917) (karst groundwater in Appalachian Highlands, Britain, central Asia, south & central Europe)

*Parasitus* Latreille, 1795 (*Carpais* Latreille, 1796; *Coleogamasus* Tichomirov, 1969; *Gamasus* Latreille, 1802 [part]) Parasitidae mites

*Parasitus loricatus* (*Gamasus n.* Wankel, 1861) (Czechoslovakia/ on porcupine dung in one NS "cave")

*Parasitus niveus* (*Gamasus n.* Wankel, 1861) (on damp timber in one New Brunswick cave)

*Parasitus* nr. *remberti* (Oudemans) (= *Vulgarogasmus r.*) (Tp relict in Europe, NS, IA),

*Parasitus* undet. species (Tx in CA,NS,PA,WV; Ac in El Malpais Natl. Monument, nNM))

*Paraspinturnix* Rudnick, 1960 - Spinturnicidae mite

*Paraspinturnix globosus* Rudnick, 1960. (*Spinturnix g.* (Rudnick, 1960) Domrow, 1972) (type locality cave in Green Co., IN (type locality)/ ectoparasite on OR *Myotis volans*, swOK (Tx) *Myotis velifer grandis*; IL, IN (Wyandotte C), KS, KY *M. grisescens.*, AB *Myotis lucifugus*, AL, IL, IN, OH *Myotis sodalis*, AZ & UT *Myotis* bats)

*Pergamasus* (Dielman, 1984) Berlese, 1903 - Parasitidae mites

*Pergamasus* undet. sp. (Tx, Tp or Ac in sON, PA, PQ; Tx or Tp in KY, VA, WV)

*Perissopalla* Brennan & White, 1960 - Trombiculidae mites

*Perissopalla beltrani* (*Hoffmanniella b.*, Hoffman, 1944) Brennan & White, 1960 (ectoparasite on AZ, CA, Mex. *Macrotus californicus* bats),

*Perissopalla fragillatala* Brennan & White, 1960 (ectoparasite on AL *Pipistrellus hesperus* & *Pipistrellus subflavus* bats)

*Phreatobrachypoda* Cook, 1963 - Aturidae, Subfamily Aturinae

*Phreatobrachypoda* (*Ameribrachypoda*) *acuta* Habeeb, 1975 (hyporheic in OR (Curry & Lane Cos.) & CA (Mendocino, Monterey, Ventura Cos.))

*Phreatobrachypoda* (*Phreatobrachypoda*) *gledhilli* I.Smith, 1991 (hyporheic in CA (Mendocino Co.))

*Phreatobrachypoda* (*Phreatobrachypoda*) *multipora* Cook, 1974 (hyporheic in OR (Curry & Grant Cos.) & nCA (Mendocino Co.))

*Phreatobrachypoda* (*Phreatobrachypoda*) *oregonensis* I.Smith, 1991 (hyporheic in OR (Curry & Grant Cos.))

*Phreatobrachypoda* (*Ameribrachypoda*) *robusta* Cook, 1974 (hyporheic in OR (Curry, Coos & Lane Cos.) & CA (Monterey & Mendocino Cos.))

*Piersigia* Protz, 1896 - Piersigiidae mites, subfamily Piersigiinae (water mites)

*Piersigia crusta* Mitchell 1955 (interstitial? from drainage tiles in field; swamps, temporary pools)

*Piersigia limnophila* Protz, 1896 (MI, IL, NJ drainage, tiles, interstitial?; parasite of hydrophilid beetle *Enochrus ochraceus*)

*Pilogalumna* Grandjean, 1956 - Galumnidae mites

*Pilogalumna* undet. sp. (cave in Eddy Co.,NM/Tp?)

*Pimeliaphilus* Tragardh, 1904 - Pterygosomidae mites

*Pimeliaphilus plumifer* Newell & Ryckman, 1966 (CA, AZ, Mex. epigeal/ Tx? ectoparasite on *Triatoma rubida* (Triatominae reduvids in Hemiptera), Colossal C.,AZ)

*Piona* Koch, 1842 Pionidae mites, subfamily Pioninae, Tribe Pionini

*Piona* undet. sp. (MI interstitial/epigeal)

*Piona triangularis* (Wolcott, 1902) (WI hyporheic)

*Pionacercus* Piersig, 1894 Pionidae mites, Subfamily Tiphynae (=Hydrochoreutinae), Tribe Foreliini

*Pionacercus* (*Pionacercus*) *novus* Marshall, 1924 (hyporheic in AK, Canadian NW)

*Pionacercus* undet. sp. (MI interstitial/ epigeal)

*Platyhydracarus* I.M. Smith, 1989 - Athienemanniidae mites, Subfamily Athienemanniinae

*Platyhydracarus juliani* I.M. Smith, 1989. (AB, BC, ID, OR, MT, UT, WA, WY interstitial in gravel, silt and detritus in riffle sand pools in rheocrenes and small streams)

*Platyhydracarus parvipalpis* I.M. Smith, 1989. (AB, BC, ID, OR, MT, UT, WA, WY interstitial in gravel, silt and detritus in riffle sand pools in rheocrenes and small streams)

*Plesiodamaeus* Grandjean, 1954 - Gymnodamaeidae mites

*Plesiodamaeus* undet. sp. (cave in Taney Co.,MO)

***Palaeacarus*** Tragardh, 1932 - Palaeacaridae mites

***Palaeacarus*** undet. sp. (Tp or Tx guanobic in MO)

***Paracarpais*** Athias Henriot C., 1978 - Parasitidae mites

***Paracarpais*** nr. *niveus* (*Gamasus n.* Wankel, 1861) (IA, Europe/Tp relict?)

***Parasecia*** Loomis 1966 - Trombiculidae mites

***Parasecia gurneyi*** = *Trombicula g.*

***Penthalodes*** Baker, 1946 (cosmopolitan) - Penthalodidae mites

***Penthalodes*** probably undescr. sp. (Tb & Tp in El Malpais Natl. Monument, nNM)

***Penthalodes*** undet. sp. (Ac or Ttx in moss in El Malpais Natl. Monument, nNM)

***Periglischrus*** Kolenati, 1857 - Spinturnicidae mites. **Bibl.:** Tibbets 1957.

***Periglischrus strandtmanni*** Tibbetts, 1957 (ectoparasite on *Mormoops megalophylla* bat/ type locality cave in Uvalde Co., TX)

***Periglischrus vargasi*** Hoffman, 1944 (ectoparasite on AZ, wTX *Leptonycteris nivalis* bats)

***Periseius*** Womersley, 1961 (*Psammonsella* Haq, 1965) Rhodacaridae mites, Subfamily Ologamasinae

***Periseius nobskae*** (*Psammonsella n.* Haq, 1965; *P. schusteri* Hirschmann, 1966) (MA intertidal sandy interstitial)

***Podocinum*** Berlese, 1882 - Podocinidae mites

***Podocinum*** undet. sp. (Tp? in cave in Newton Co.,AR)

***Poecilochirus*** G. & R. Canestrini, 1882 (= *Gamasoides* Berlese, 1904) - Rhagidiidae mites.

**Bibl.:** J. Brown 1989

***Poecilochirus carabi*** G. & R. Canestrini, 1882) (= *P. necrophori* Vitzthum, 1931; *Gamasodes eurasiaticus* Tragardh, 1937) (Tx guanobic in CA, MO)

***Poecilochirus*** undet. sp(p). (Tp or Tx guanobic in MO; Tp in WA)

***Poecilophysis*** Cambridge, 1876 (=Dentocheles) Parasitidae mites

***Poecilophysis extraneostella*** Zacharda, 1985 (type locality cave in Lee Co.,VA & cave in Monroe Co.,WV)/Tp/ G1 or G3)

***Poecilophysis (Dentocheles) melanoseta*** Zacharda & Elliott, 1985 (type locality cave in +other cave in Tuolumne Co. +other cave in Co. & Mariposa Co.,CA/ Tp, epigeal & cave inhabiting)

***Poecilophysis (Dentocheles) pratensis*** (*Scyphius p.* C.L. Koch, 1835; *Rhagidia whartoni* Strandtmann, 1971) Z.1980 (AK, Europe, HI (adventive),US/Tp in Mex., WV)

***Poecilophysis*** undet. sp. (Kartchner C., Cochise Co.,AZ)

***Poecilophysis*** (*Dentocheles*) *weyerensis* (*Bryobia* (or *Penthaleus*?) w. Packard, 1888 & Banks, 1907; *Rhagidia cavicola*? Banta, 1907, *Rhyncolophus* w. Packard, 1888; *Rhagidia* w. Holsinger, 1965; *Acarus*? w.) Holsinger, 1965a (type locality cave in Augusta Co., VA +Tp in Europe, KY, Mex., MO, NM, New Brunswick, NS, TN, VA/ T&E VA S1) **Bibl.**: Elliott & Strandtmann 1971

***Poecilophysis*** (*Wankelia*) *wolmsdorfensis* (*Rhagidia reflexa* w. Willmann, 1936) Zacharda, 1980 (Europe?/ Tb in Greenbrier & Randolph Cos., WV/ WV T&E SUG3?)

***Polidiscia*** Methlagl, 1928 - Johnstonianidae mites

***Polidiscia*** undet. sp. (parasite in WA)

***Polyaspis*** Berlese, 1881(= *Dyscritaspis* Camin, 1953) Polyaspididae mites (also put in Uropodidae)

***Polyaspis*** undet. sp. (MO/Tp? guanobic)

***Porohalacarus*** Sig Thor, 1922 – Halacaridae mites, Subfamily Halacarinae (also put in Porohalacaridae or in Limnohalacaridae)

***Porohalacarus uniscutatus*** Bartsch, 1982 (NY nonkarst hyporheic)  
*Porohalacarus violacea* = *Porolohmannella* v.

***Porolohmannella*** Viets, 1933 – Halacaridae mites, Subfamily Lohmannellinae

***Porolohmannella violacea*** Kramer (Kramer, 1879) (*Porohalacarus violacea*) (NY, Europe, Greenland, Japan hyporheic; brackish coastal waters)

***Proctolaelaps*** Berlese, 1923 - Ascidae mites

*Proctolaelaps hypudaei* = *Dermacarus h.*

***Proctolaelaps*** undet. sp. or species (Carlsbad C.(NM); ectoparasite on OR *Neotoma fuscipes* & *cinerea* & IN *Neotoma floridana* woodrats)

***Protolimnesia*** Lundblad, 1927 - Limnesiidae mites subfamily Protolimnesinae

***Protolimnesia*** (*Protolimnesella*) *ventriplacophora* I.M. Smith & Cook, 1996 (AZ, wTX hyporheic interstitial)

***Prothoplophora*** Berlese, 1910 - Prothoplophoridae mites

***Prothoplophora*** undet. sp. (Ac or Tx in OR C.,OR)

*Psammonsella* Haq, 1965 = *Periseius*

***Pseudoparasitus*** Oudemans, 1902 (= *Hoplolaelaps* Berlese, 1903; *Laelaps* (*Hoplolaelaps*) Berlese, 1910; *Laelapsoides* Willmann, 1952; *Austrogamasellus* Domrow, 1957) - Laelapidae (= Laelaptidae) mites

***Pseudoparasitus austriacus*** (*Laelaspis austriacus* Sellnick, 1935; *Gymnolaelaps a.* Hunter, 1961) (epigeal in Cuba, Mexico, most of US/ Tp or Tx in MO)

***Pseudoschoengastia*** Lipovsky, 1951 - Trombiculidae mites

***Pseudoschoengastia aeci*** Brennan, 1959 (ectoparasite on western *Neotoma lepida* woodrats)

***Pseudoschoengastia farneri*** Lipovsky, 1951 (CO, KS, OK epigeal/ ectoparasite on western *Neotoma lepida* & KS *N. micropus* woodrats)

***Pseudoschoengastia hungerfordi*** Lipovsky, 1951 (ectoparasite on KS *Neotoma micropus* & *N. floridana* woodrats)

***Pseudotorrenticola*** Walter, 1906 - Torrenticolidae mites, subfamily Torrenticolinae

***Pseudotorrenticola chiricahua*** I. Smith, 1991 (hyporheic in sAZ gravel in rocky stream riffles)

***Pteracarus*** Jameson & Chow, 1952 - Myobiidae mites

***Pteracarus aculeus*** Dusbabek & Lukoschus, 1973 in Dusbabek, 1973 (on CA, OH, OR *Eptesicus fuscus* & Suriname bats)

***Pteracarus chalinolobus*** (*Myobia c.* Womersley, 1941) Jameson & Chow, 1952 (ectoparasite on CA *Antrozous pallidus*, IN *Lasiurus cinereus*, AL, CA, NV, TX (Tx) *Corynorhinus rafinesquii*, AL, CA *Eptesicus fuscus*, CA *Myotis volans*, AL *Myotis sodalis*, *Myotis grisescens*, *Nycticeius humeralis* & *Pipistrellus subflavus*, IN *Lasiurus borealis*, IN, OR *Lasiurus cinereus* & CA *M. thysanodes* bats)

***Pteracarus elegans*** Dusbabek & Wilson, 1973 in Dusbabek, 1973 (ectoparasite on CA, NV *Corynorhinus rafinesquii* bats)

***Pteracarus completus completus*** Dusbabek & Wilson, 1973 in Dusbabek, 1973 (ectoparasite on HI *Lasiurus cinereus semotus*, KY *Lasiurus borealis* & IN *Lasiurus cinereus* bats)

***Pteracarus completus vrazi*** Dusbabek & Wilson, 1973 in Dusbabek, 1973 (ectoparasite on KY *Lasiurus borealis* bats)

***Pteracarus minutus*** (Radford, 1940) (ectoparasite on KY, IN *Pipistrellus subflavus* bats)

***Pteracarus minutus occidentalis*** Dusbabek & Wilson, 1973 in Dusbabek, 1973 (type locality cave in Polk Co., GA/ on GA, IN, KY *Pipistrellus subflavus* & OR *Myotis volans* bats)

***Pteracarus robustus*** Dusbabek & Wilson, 1973 in Dusbabek, 1973 (ectoparasite on CA *Antrozous pallidus* bats)

***Pteracarus*** likely undescr. sp. (ectoparasite on CA *Myotis thysanodes* bats)

***Pulaeus*** Den Heyer, 1980 - Cunaxidae mites

***Pulaeus*** undet. sp. (ectoparasite on IN *Neotoma floridana* woodrats)

***Pyemotes*** Amerling, 1861 - Pyemotidae mites

***Pyemotes*** undet. sp. (Tx? parasite on insect in CA)

*Pygmephorus* Kramer, 1877 - Pygmephoridae mites

*Pygmephorus mahunkei* Smiley & Whitaker, 1979 (ectoparasite on Prince Edward Island *Myotis lucifugus* bats)

*Pygmephorus spickai* Mahunka, 1974 (ectoparasite on IN *Neotoma floridana* woodrats)

*Pygmephorus whitakeri* Mahunka, 1973 (ectoparasite on OR *Neotoma cinerea* woodrats)

*Pygmephorus* undet. sp. (Tp or Tx on NS porcupine dung)

*Radfordia* Ewing, 1938 - Trombiculidae mites (also put in Myobidae)

*Radfordia floridensis* (Ewing, 1938) (on FL *Tadarida brasiliensis* bats)

*Radfordia neotomae* Jameson & Whitaker, 1975 (ectoparasite on CA *Neotoma fuscipes* & OR *N. fuscipes* & *N. cinerea* woodrats)

*Radfordiella* Fonseca, 1948 - Macronyssidae mites, Subfamily Macronyssinae

*Radfordiella oricola* Radvosky, Jones & Phillips, 1971 (on wTX (Brewster Co.) *Leptonycteris nivalis* bats) **Bibl.:** Greenbaum & Phillips 1974

*Rhagidia* Thorell, 1871 (see *Robustocheles*, *Poecilophysis*) Rhagidiidae mites. **Bibl.:** Baltac, 1973; Womersley & Strandtmann, 1963

*Rhagidia cavernarum* = *Foveacheles holsingeri*

*Rhagidia cavicola* - See *R. cavernarum*

*Rhagidia diversicolor* (*Scyphius d.* C.L. Koch, 1838) Zacharda, 1980 (Europe,US/ Tp in WV)

**Bibl.:** Zacharda, 1985

*Rhagidia grahami* Elliott, 1976 - junior synonyms to *Robustocheles hilli*

*Rhagidia hilli* Strandtmann, 1971 - junior synonyms to *Robustocheles hilli*,

*Rhagidia longisensilla* Shiba, 1969 (Japan, AK/Tp? in cave in Newton Co.,AR). **Bibl.:** Baltac, 1974

*Rhagidia* undescr.? sp. cf. *hilli* Strandtmann, 1971 (AZ/Tb or disjunct Tp), cf. *R. grahami* (type locality cave in Uinta Mts., Duchesne Co., UT/Tp or Tb)

*Rhagidia* undescr. sp.#1 (\*?cave in Craters of the Moon, National Monument, Butte Co., ID/ Tp?)

*Rhagidia* undescr. sp.#2 (WV/Tb?)

*Rhagidia* undescr. sp.#3 (IL/Tp?)

*Rhagidia* undet. sp. or species (Tp or Tx in AR, AZ, MO)

*Rhagidia varia* Zacharda, 1985 (type locality cave in Bath Co.+ Scott, Pulaski Cos.,VA & caves in Greenbrier & Pocahontas Cos.,WV (SU)/ Tb; *R.v.* may be complex of a few closely related but well differentiated species/T&E VA S2?, global G3) **Bibl.:** Zacharda & Wellbourn, 1982

*Rhagidia weyerensis* = *Poecilophysis w.*

*Rhagidia whartoni* Strandtmann, 1971 = junior synonym of *Poecilophysis pratensis*

***Raphignathus*** Duges, 1833 - Raphignathidae mites

***Raphignathus*** undet. or undescr. sp. (Ectoparasite on FL *Tadarida brasiliensis cynocephala* bats)

***Rhodacaroides*** Willman, 1959 - Rhodacaridae mites

***Rhodacaroides*** undet. sp. (Tp in WA)

***Rhodacaropsis*** Willmann, 1935 - Rhodacaridae mites

***Rhodacaropsis inexpectata*** Willmann, 1935 (Europe, MA intertidal beach sand interstitial)

***Rhodacarus*** Oudemans, 1902 - Rhodacaridae mites

***Rhodacarus pallidus*** Hull, 1918 (MA marine beach interstitial)

***Rhodacarus*** undet. sp. (Kartchner C., Cochise Co.,AZ/Tp)

***Rhombognathides*** Viets - Halacaridae mites, Subfamily Rhombognathinae

***Rhombognathides*** undet. sp. (MA intertidal beach sand interstitial)

***Rhyncholimnochares*** Linnaeus, 1758 - Limnocharidae mites, subfamily Rhyncholimnocharinae (also put in Rhynchohydracaridae)

***Rhyncholimnochares (Rhyncholimnochares) kittatinniana*** Habeeb, 1954 (riffles in shallow streams in E karst areas incl. NY/ parasites on Elmidae beetles)

*Rhyncholophus cavernarum* = *Foveacheles holsingeri*

***Rhyzoglyphus*** Clapar, 1869 - Acaridae mites

***Rhyzoglyphus*** undet. sp. (cave in Taney Co.,MO)

***Robustocheles*** Zacharda, 1980 - Rhagidiidae mites

***Robustocheles hilli (Rhagidia h. Standtmann, 1971) Z.***, 1980 (*Lewia, Rhagida h.*) (NA/Tp in AK, AL, AZ, GA, IN, KY, MO, NW, NWT, TN, UT, VA, WV, WA, epigeal elsewhere/ morphologically indistinguishable populations may represent a number of separate species)

***Robustocheles mucronata*** (Willmann, 1936) (=R.(R.) m.) (Tx or Tp in Jefferson Co., WV)

***Robustocheles occulta*** Zacharda & Pugsley, 1988 (type locality cave in n.Alberta + caves in AK, BC, IA, WA/ Tb) **Bibl.:** Peck & Christiansen 1990

***Robustocheles*** undet. sp. (Tp or Tx genera & sp. in seAK)

***Ropohalacarus*** Bartsch, 1989 – Halacaridae mites, Subfamily Ropohalacarinae

***Ropohalacarus uniscutatus*** (Bartsch, 1982) (Pb in Eastern NA & nEurope)

***Rutripalpus*** Sikolow, 1934 - Rutripalpidae mites

*Rutripalpus canadensis* I. Smith 1991 (interstitial, hyporheic in moss and leaf litter in limnocrene springs in NS)

*Sancassania* Oudemans, 1916 (= *Caloglyphus*) - Acaridae mites

*Sancassania* undescr. or undet. sp.#1 (\*Kartchner C.,AZ/Tp)

*Sancassania* undescr. sp.#1 (Carlsbad C.(NM)/ Tb)

*Sancassania* undescr.? sp.#2 & sp.#3? (cave in Eddy Co.,NM/ Tb)

*Saprolaelaps* Leitner, 1946 - Rhodacaridae mites

*Saprolaelaps subtilis* Leitner, 1946 (MA intertidal beach sand interstitial)

*Sasacarus* Brennan & Jones, 1959 - Trombiculidae mites

*Sasacarus whartoni* (*Whartonia w.* Hoffman, 1951) (ectoparasite on OR *Antrozous pallidus* bats)

*Sarcoptes* Latreille, 1802 (itch mites) Sarcoptidae mites

*Sarcoptes myotis* = *Notoedes m.*

*Scaptognathides* - Halacaridae mites

*Scaptognathides* undet. sp. (interstitial? in HI intertidal sandy beach)

*Scheloribates* Berlese, 1908 - Scheloribatidae mites

*Scheloribates laevigatus* (Koch, 1836) (ectoparasite on IN *Neotoma floridana* woodrats)

*Scheloribates* undet. sp. (Tx detritivore? in Calaveras Co.,CA)

*Schwiebea* Oudemans, 1916 - Acaridae mites

*Schwiebea* undet. sp. (cave in Eddy Co.,NM/Tp on *Cambala reddelli* millipede)

*Scutacarus* Gras, 1845 - Scutacaridae mites

*Scutacarus* undet. sp. (phoretic in WA)

*Scutacarus* undescr.? sp. (cave in Eddy Co.,NM/ Tb)

*Scutolebertia* I.M. Smith, 1991 - Lebertiidae mites

*Scutolebertia trinitensis* I.M. Smith, 1991 (interstitial, hyporheic in gravels in rocky riffles in nCA)

*Shibaia* Zacharda, 1980 - Rhagidiidae mites

*Shibaia longisensilla* (*Rhagidia l.* Shiba, 1969) (Tp or Tx in AK, WA)

*Soldanellonyx* Walter, 1917 - Limnohalacaridae mites, Subfamily Limnohalacarinae (also put in Lohmannellinae & Halacaridae, Subfamily Halacarinae)

*Soldanellonyx chappuisi* Walter, 1917 (Europe, Asia, cave in Lawrence Co., IN/ Tb) **Bibl.:** Walter, 1931.

*Soldanellonyx monardi* Walter, 1919



*Soldanellonyx monardi monardi* Walter, 1919 (NY hyporheic & St in Lawrence Co.,IN; brackish coastal in HI/ caves, groundwater interstitial and hyporheic in Europe, Africa & Japan)

*Soldanellonyx visurgis* Viets, 1956 (NY, Europe, Black Sea hyporheic & epigeal)  
*Soldanellonyx* undet. sp. or species (rare CO hyporheic; Great Lakes benthic)

*Speleocola* Lipovsky, 1952 - Trombiculidae mites

*Speleocola tadarida* (*S. tadaridae* Lipovsky, 1952) (type locality cave in Woods Co.,OK/ ectoparasite chigger mite on KS, OK, TX (Ttx) *Tadarida b. bats*) **Bibl.:** Loomis & Lipovsky 1954

*Speleorchestes* Tragardh, 1909 - Nanorchestidae mites

*Speleorchestes formicarum* Tragardh, 1909 (CO hyporheic)

*Speleorchestes* undet. sp. or species (Wind C.(SD) TTx?; CO hyporheic)

*Sperchon* Kramer, 1877 - Sperchontidae mites, subfamily Sperchontinae

*Sperchon* (*Hispidosperchon*) *glandulosus* Koenike, 1886 (Europe & ON,BC, & temperate NA spring seepages & streams/ interstitial, epigeal)

*Sperchon plumifer acadiensis* Habeeb, 1953 (on rocks in streams, hyporheic? In NB)

*Sperchon* undet. sp. (CO,NY/hyporheic/ epigeal)

*Sperchon texana* J. Davis & Cook, 1985 (hyporheic in TX karstic streams/ parasitic on *Simulium* fly larvae)

*Sphaerozetes* Berlese, 1885 - Ceratozetidae mites

*Sphaerozetes* undet. sp. (TTP in WA)

*Spinibdella* Thor, 1930 - Actinedidae mites

*Spinibdella* undet sp.(predator on ON bat guano)

*Spinturnix* von Heyden, 1826 (*Pteroptus* Dufor, 1832) Spinturnicidae mites. **Bibl.:** Collins 1931

*Spinturnix americanus* (*Pteroptus a.* Banks, 1902) (type locality in IN cave on *Eptesicus fuscus* bat/ NA to Venezuela/ ectoparasite on AZ *Myotis leibii*; CO, OR, wTX *Myotis volans*; FL *Myotis austroriparius*, AK, KS (rare) *Myotis grisescens*, OR *M. evotis*; AK, BC, GA, IL, IN, KS, MA, MD, MI, MN, ND, NY, ON, OR?, PA, Prince Edward Island, VA, WI, WV *M. lucifugus*; IN,ME *M. keeni*; CA, NV,OR, wTX *M. yumanensis*, TX *Myotis velifer*, NV *Myotis* sp., OR,TX *Antrozous pallidus* & AL, AR, AZ, BC, CA, DE, IN, KS, MN, PA, PQ, ON, sTX *Eptesicus fuscus*, AZ, wTX *Myotis thysanodes* & *M. subulatus* bats)

*Spinturnix bakeri* Rudnick, 1960 (type locality in IN cave on *Eptesicus fuscus* bats/ NA to Venezuela/ ectoparasite on KS (rare) *Myotis velifer*, CO, wTX *Myotis volans*, wTX, MI *M. lucifugus*, wTX *M. yumanensis* & AL, AR, BC, IN, MI, MN, ON, OR, PA, PQ, s,wTX *Eptesicus fuscus* bats)

***Spinturnix banksi*** Rudnick, 1960 (type locality cave in Independence Co., AR/ ectoparasite on AL, AR, IL, KS, KY, MO, OK, TN *Myotis grisescens* bat; rare in AL *Myotis keenii* & *sodalis* bats)

***Spinturnix carloshoffmanni*** Hoffman, 1944 (*S. grossus* Kohls & Jellison, 1948) (= junior syn. Of *S. americanus* by Whitaker & Wilson, 1974) (ectoparasite on KY, swOK *Myotis velifer grandis*, KS, OK, TX (Comal & Kimble Cos., wTX) *Myotis velifer incautus* & AZ (Tx) *Myotis thysanodes*, *M. subulatus* & *M. velifer* bats)

*Spinturnix carnifex* = *Dermanyssus c.*

***Spinturnix echinipes*** (*Pteroptus e.* Banks, 1910) Stiles & Nolan, 1931 (ectoparasite on NY *Myotis lucifugus* bats)

*Spinturnix globosus* = *Paraspinturnix g.* Rudnick, 1960

***Spinturnix iowae*** Keegan, 1943 (ectoparasite on IA, MD *Myotis lucifugus* bats)

***Spinturnix myoti*** (Kolenati, 1856; *Pteroptus grossus* Banks, 1910) (ectoparasite on NM *Tadarida brasiliensis?* bats)

***Spinturnix orri*** Rudnick, 1960 (= *S. americanus* in part) (ectoparasite on AZ, CA, Mex., OR, wTX, UT *Antrozous pallidus* & CA *Tadarida brasiliensis* bats)

***Spinturnix rectalis*** J. White, 1960 (type locality cave in Lauderdale Co., AL/ ectoparasite on AL (Tx) *Myotis grisescens* bats)

***Spinturnix*** undet. sp. or species (Tx ectoparasite on NS *Myotis*, FL, TN (Tx), TX (Tx) *Myotis austroriparius*; MD (Tx), ON *Eptesicus fuscus*, CA *Myotis californicus* (Tx), *thysanodes* (Tx) & *velifer* (Tx), *Choeronycteris mexicana*, ON *Myotis lucifugus* & AZ (Tx), CA *Corynorhinus rafinesquii pallescens* bats)

***Spinturnix shermani*** J. White, 1960 (type locality cave in Citrus Co., AL/ Tx ectoparasite on AL *Myotis austroriparius a.* bats)

***Spinturnix*** undet sp. or species (ectoparasite on OK *Myotis velifer*, CA, TX *Antrozous pallidus* & ON *Myotis lucifugus* bats)

***Steatonyssus*** Kolenati, 1858 - Macronyssidae mites, Subfamily Ornithonyssinae. **Bibl.:** Radovsky & Furman 1963

***Steatonyssus*** (*Steatonyssus*) *antrozoi* (*S.a.* Radovsky & Furman, 1963) Till & Evans, 1964 (ectoparasite on *Corynorhinus townsendii*; CA, NM, OK, TX *Eptesicus fuscus*; CA, NV, OK, OR, TX *Antrozous pallidus*, CA *Tadarida brasiliensis* & wTX *Myotis yumanensis* bats)

***Steatonyssus*** (*Steatonyssus*) *ceratognathus* (*Ceratonyssus ceratognathus* Ewing, 1923; *S.c.* Fonseca, 1948) Till & Evans, 1964 (ectoparasite on AL *Lasiurus borealis*, OH ■ common bat, AL (Tx), GA, IN, OK, SC, TX *Nycticeius humeralis*, AL *Eptesicus fuscus* (rare) & *Myotis lucifugus* (Tx) & AL(Tx, rare), GA, *Tadarida b.* bats)

***Steatonyssus*** (*Steatonyssus*) *emarginatus* (S.e. Radovsky & Furman, 1963) Till & Evans, 1964 (ectoparasite on TX *Myotis yumanensis*, CA *Myotis* sp. & AZ, CA, NM, OR, TX *Pipistrellus hesperus* bats)

***Steatonyssus*** (*Steatonyssella*) *furmani* (S.f. Tipton & Boese, 1958; *Eschoengastia* f. Gould, 1956) Till & Evans, 1964 (ectoparasite on AL *Eptesicus fuscus* & AL(Tx), CA, IL, IN, KS, NY, OR, TN *Lasiurus b. borealis* & wTX *Lasiurus cinereus* (rare) bats)

***Steatonyssus*** (*Steatonyssus*) *joaquimi* (Fonseca, 1935) (ectoparasite on TX *Eptesicus fuscus pallidus* & GA *Myotis lucifugus* bats)

***Steatonyssus*** (*Steatonyssus*) *occidentalis* (*Ceratomyssus o.* Ewing, 1933; *S.o.* Radford, 1942) Fonseca, 1948 (ectoparasite on IN *Myotis sodalis*, , TX *Myotis velifer*, DC, TN *Lasiurus borealis*; BC, ON, MD *Myotis lucifugus*; AL, AZ, TX *Tadarida brasiliensis* (Devil's Sinkhole, Edwards Co.); *Nyctinomops macrotis* & *Corynorhinus*; AL, CA, DE, IN, KS, MD, MI, NM (Dona Ana Co. - ssp. *pallidus*), OH, OK, ON, OR, PA, TX, WV, wTX (ssp. *pallidus*) *Eptesicus fuscus*, AL, IN, KS, MD, MI, OH, OR, TX, WV, wTX *Antrozous pallidus*, OR *Myotis* & DC bats)

***Steatonyssus*** (*Steatonyssus*) *radovskyi* Till & Evans, 1964 (ectoparasite on TX *Lasiurus borealis* & *L. intermedius* bats)

***Steatonyssus*** undet. sp. (ectoparasite on AZ *Tadarida brasiliensis* bats)

***Steganacarus*** Ewing, 1917 - Phthiracaridae mites

***Steganacarus*** undet. sp.#1 (Tp in IL)

***Stereoglyphus*** Berlese, 1923 (= *Troglocoptes* Fain, 1966) (caves and decaying organics) Acaridae mites

***Stereoglyphus*** undescr. sp. (\*cave in Walker Co, GA/ Tb)

***Stratiolaelaps*** Berlese, 1916 - Laelapidae (= Laelaptidae) mites

***Stratiolaelaps*** undet. sp. sp. #1-2 (cave in Eddy Co., NM/ Tp?)

***Stygalbiella*** Cook, 1974 - Aturidae, Subfamily Axonopsinae)

***Stygalbiella affinis*** Cook, 1974 (hyporheic in Trinity Co. & Van Duzen River, Humboldt Co., CA)

***Stygalbiella arizonica*** Cook, 1974 (hyporheic in \*Oak Cr., Coconino Co., AZ)

***Stygalbiella chiricahua*** I.M. Smith & D.R. Cook, 1998 (hyporheic in AZ)

***Stygalbiella yavapai*** I.M. Smith & D.R. Cook, 1998 (hyporheic in AZ, NM)

***Stygameracarus*** I. Smith, 1990- Athienemanniidae mites, subfamily Stygameracarinae

***Stygameracarus canadensis*** I. Smith, 1990 (hyporheic in ON)

*Stygameracarus cooki* I. Smith, 1990 (hyporheic in Comanche Co., OK)

*Stygomonomia* Szalay, 1943 - Momoniidae mites, Subfamily Stygomonomiinae (stonefly hosts)

*Stygomonomia* (*Allomonomia*) *atnarkicola* I.M. Smith, 1989 (AB, BC, CA, ID, MT, OR, WA gravel bars and gravel deposits in rocky riffles of streams)

*Stygomonomia* (*Stygomonomia*) *californiensis* I. Smith, 1991 (Coast Range in Ventura Co., CA, and western foothills of Sierra Nevadas, Tuolumne Co., CA hyporheic? in gravel bars and gravel deposits in rocky stream riffles)

*Stygomonomia* (*Stygomonomia*) *cooki* I. Smith, 1991 (western NY hyporheic? in gravel deposits in a small stream)

*Stygomonomia* (*Stygomonomia*) *imamurai* I. Smith, 1991 (\*\*Rancheria Cr. 5 mi.s. of Boonville, Mendocino, CA hyporheic? in gravel bars in stream riffles)

*Stygomonomia* (*Allomonomia*) *mendocinoensis* I.M. Smith, 1989 (Mendocino Co, CA/ gravel bars and gravel deposits in rocky riffles of streams)

*Stygomonomia* (*Allomonomia*) *mitchelli* Cook, 1989 (AB, BC, CA, ID, OR, MT, NV, WA gravel bars and gravel deposits in rocky riffles of streams)

*Stygomonomia* (*Allomonomia*) *moodyi* Mitchell, 1959 (ME, NH, VT, VA hyporheic in gravel bars and gravel deposits in rocky riffles of streams)

*Stygomonomia* (*Stygomonomia*) *neomexicana* Cook, 1968 (hyporheic in Whitewater Cr., Catron Co., NM & AB, BC in gravel bars and gravel deposits in rocky stream riffles)

*Stygomonomia* (*Stygomonomia*) *occidentalis* Cook, 1968 (nwCA, cCA (Tuolumne Co.), swOR, wWA (Kittitas Co.), MT (Lincoln Co.) hyporheic in gravel bars and gravel deposits in rocky stream riffles)

*Stygomonomia* (*Stygomonomia*) *ozarkensis* Cook, 1968 (hyporheic in gravel bar 1.6 km w.of Colcord, DE Co., AR, in small stream)

*Stygomonomia* (*Allomonomia*) *pacifica* I.M. Smith, 1989 (OR,WA,CA,NV,NM,AZ gravel bars and gravel deposits in rocky riffles of streams)

*Stygomonomia* (*Stygomonomia*) *pallida* Cook, 1968 (New Brunswick, NS, ME, NY, VT, VA hyporheic? in gravel bars and gravel deposits in rocky stream riffles)

*Stygomonomia* (*Stygomonomia*) *plana* Cook, 1968 (mostly coastal nCA, OR, sWA in gravel bars and gravel deposits in rocky stream riffles)

*Stygomonomia* (*Stygomonomia*) *riparia* Habeeb, 1957 (hyporheic in most of East (Appalachia & Central Highlands, Coastal Plain, Central Lowland, Superior Upland) in gravel bars and gravel deposits in rocky stream riffles)

***Stygomomonina*** (*Stygomomonina*) *separata* Cook, 1968 (AB, BC, CA, ID, MT, NV, OR, WA in gravel bars and gravel deposits in rocky stream riffles)

***Stygomomonina*** undet. sp. (NY hyporheic),

***Stygothrombium*** Viets, 1932 - Stygothrombiidae mites, Subfamily Stygothrombiinae (Plecoptera hosts)

***Stygothrombium karamani*** Viets, 1932 (CO hyporheic; Macedonian karst groundwater)

***Tectocepheus*** Berlese, 1913 - Tectocepheidae mites

***Tectocepheus*** undet. sp. (Jewel C.,SD/Tx, Tp or Tb),

***Tecomatlana*** Hoffmann, 1947 - Trombiculidae mites

***Tecomatlana (T.) sandovali*** Hoffmann, 1947 (Tx ectoparasite on AZ *Macrotus californicus* bats)

***Tecomatlana (T.) texana*** Loomis & Crossley, 1963 = *Beamerella texana*

***Tecomatlana (T.) watkinsi*** Vercammen-Grandjean, 1947 (ectoparasite on *Macrotus californicus* bats in Riverside & San Bernadino Cos.,CA & in Mex., AZ)

***Testudacarus*** Walter, 1928 - Torrenticolidae mites, Subfamily Testudacarinae

***Testudacarus americanus*** Marshall, 1943 (in silt and gravel in BC,CA spring run/ parasitic on *Rheocricotopus* flies / interstitial)

***Teinocoptes*** Rodhain, 1923 - Ixodidae mites

***Teinocoptes lasionycteris*** (*Sarcoptes l.* Boyd & Bernstein, 1950) Yunker, 1958 (ectoparasite on CA *Antrozous pallidus*, PA, TX *Lasionycteris n.*, TX *Tadarida brasiliensis*, WV, NJ *Myotis lucifugus*, TX (Tx), WV *Corynorhinus rafinesquii* & AL *Myotis grisescens* bats)

***Teinocoptes*** undet. sp. or species (ectoparasite on CA *Antrozous pallidus*, *Myotis yumanensis* & *Tadarida brasiliensis* bats)

"***Teinocoptes tadarida***" in J.White, 1959 (ectoparasite on AL (Tx) & GA *Tadarida brasiliensis* & GA *Nycticeius humeralis* bats)

***Teutonia*** Koenike, 1910 - Teutoniidae mites

***Teutonia (Teutonia) lunata*** Marshall, 1924 (interstitial? in AK,BC pools, parasites on chironomid flies)

***Teutonia*** undet. sp. (CO hyporheic; New Brunswick springs)

***Thyas*** Koch, 1835- Hydryphantidae mites, subfamily Thyadinae (water mites) (bug, thysanoptera, springtails, trichoptera & fly hosts) Bibl.: D.Cook 1959

***Thyas (Thyas)*** undet. sp. (interstitial?)

***Torrenticola*** Thor, 1902 - Torrenticolidae mites, subfamily Torrenticolinae

***Torrenticola*** (*Torrenticola*) *neoanomala* Habeeb, 1955 (nr. *T.(T.)* n. in silt in ON, New Brunswick streams & pools/ interstitial)

***Torrenticola*** undet. sp. or species (CO (rare), NY hyporheic; parasites on chironomid flies in temperate NA/ interstitial)

***Trichoecius*** Canestrini, 1899 - Myocoptidae mites

***Trichoecius*** *gettingeri* Fain, Cudmore & Whitaker, 1984 (ectoparasite on IN *Neotoma floridana* woodrats),

***Trichothyas*** Viets, 1926 - Hydryphantidae, Subfamily Thyadinae

***Trichothyas*** (*Lundbladia*) *musicola* (L.m. Marshall, 1953) IL hyporheic? in karstic seepage in Rock Cr. Canyon, Kenkakee Co., IL, parasite of tipulid fly *Limonia humidicola* larvae)

***Trichouropoda*** Berlese, 1916 - Uropodidae mites

***Trichouropoda*** *orbicularis* (Acarus o. O.F. Mueller, 1776) (cave bat guano in IN)

*Troglocoptes* Fain, 1966 = *Stereoglyphus*

***Trombicula*** Berlese, 1905 (larvae known as chiggers or red-bugs) Trombiculidae mites. **Bibl.:** Ewing, 1933; Loomis & Lipovsky 1954

*Trombicula* (*Eutrombicula*) *alfreddugesi* = *Eutrombicula a.*

***Trombicula*** *allredi* Brennan & Beck, 1956 (ectoparasite on UT *Neotoma lepida* woodrats)

***Trombicula*** (*Eutrombicula*) *batatas* (Acarus b. Linnaeus, 1758; *T. flui*, Ewing, 1931; *T. hominis* Ewing, 1933; *Eutrombiculula h.* Ewing, 1938; *Acariscus h.* Ewing, 1943; *E.b.* Michener 1946) Thor & Willman, 1947 (ectoparasite on AL *Lasiurus b. borealis* bats)

***Trombicula*** *californica* (*Schongastia peromysci* Ewing, 1925) (ectoparasite on CA *Neotoma* woodrats)

***Trombicula*** *crossleyi* Loomis, 1954 (ectoparasite on KS *Neotoma micropus* woodrats)

*Trombicula* (*Miyatrombicula*) *cynos* = *Miyatrombicula c.*

*Trombicula eptesici* Brennan, 1947 = *T. myotis*

*Trombicula fitchi* = *Neotrombicula f.*

*Trombicula* (*Neotrombicula*) *harperi* = *Neotrombicula h.*

***Trombicula*** *gurneyi* Ewing, 1937 (*Eutrombicula g.* Ewing, 1938; *T. (T.) g.* Wharton & Fuller, 1952; *T.g.g.* Loomis, 1955; *Parasecia g.* Loomis, 1966) (high plains epigeal/ ectoparasite on AL *Nycticeius humeralis h.* & MI *Eptesicus fuscus* bats & OK *Neotoma floridana* woodrats)

***Trombicula*** *gurneyi campestris*. Loomis, 1955 (ectoparasite on KS *Neotoma micropus* woodrats)

***Trombicula (Euschogastoides) hoplai*** Loomis, 1954 (ectoparasite on KS *Antrozous pallidus* bats & UT *Neotoma lepida* & KS *N. micropus* woodrats)

***Trombicula jessiema*** Gould, 1956 (ectoparasite on CA *Neotoma lepida* woodrats)

***Trombicula (Neotrombicula) jewetti*** Brennan & Wharton, 1950 (on CA *Neotoma* woodrats)

***Trombicula kansasensis*** Loomis, 1955 (ectoparasite on KS *Neotoma micropus* woodrats)

***Trombicula (Eutrombicula) lipovskyana*** Wolfenbarger, 1953 (ectoparasite on KS, OK *Neotoma floridana*, NM *Neotoma mexicana* & CO *Neotoma lepida* woodrats & KS (Tx?) *Antrozous pallidus* bats)

*Trombicula (Neotrombicula) lipovskyi* = *N. l.*

***Trombicula merrihewi*** Loomis & Lipovsky, 1954 (type locality cave in Woods Co., OK/ectoparasite on OK *Tadarida mexicana* bats)

***Trombicula montanensis*** Brennan, 1946 (ectoparasite on KS *Neotoma micropus* woodrats)

***Trombicula myotis*** Ewing, 1929 (*Eutrombicula m.* Ewing, 1938; *Acariscus m.* Ewing, 1943; *T. eptesici* Brennan, 1947; *T. russicum* var. *m.* Fuller, 1952) (ectoparasite on TN *Myotis leibii*, MT, MO, PA, VA, WV *Eptesicus fuscus*, ME, ON, PA, WV, VA *Myotis lucifugus* & AZ *Myotis thysanodes* (Tx), *M. subulatus* & *M. velifer* (Tx) bats & OK, AR *Neotoma floridana* & KS *N micropus* woodrats)

*Trombicula ornata* Loomis & Lipovsky, 1954 = *Microtrombicula o.*

***Trombicula sola*** Gould, 1956 (ectoparasite on CA *Neotoma lepida* woodrats)

@***Trombicula sproccsi*** (ectoparasite on CA *Tadarida brasiliensis* & *Antrozous pallidus* bats)

***Trombicula*** undet. sp. (ectoparasites on NM (Tx), TX (Tx) bats)

***Trombicula sylvilagi*** Brennan & Wharton, 1950) (ectoparasite on KS *Neotoma floridana* woodrats)

*Trombicula texana* Loomis & Crossley, 1963 = *Beamerella t.*

***Trombicula trisetica*** Loomis & Crossley, 1953 (ectoparasite on KS *Neotoma floridana* woodrats)

***Trombicula tibbettsi*** Brennan & White, 1960 (ectoparasite on AL (Conecuh & Lauderdale Cos.), TX *Myotis grisescens* & TX (Tx) *Mormoops megalophylla* bats)

***Trombicula (Leptotrombidium) twenti*** Loomis, 1954 (ectoparasite on KS (Tx) *Antrozous pallidus* & *Myotis velifer* bats)

***Trombicula univari*** (*Loomisia u.* Brennan, 1965) (ectoparasite on NM (near. *T.u.*), OR, TX, SW *Pipistrellus hesperus* bats)

*Trombicula usitata* Brennan, 1965 (\*type locality cave in Uvalde Co., TX - Type locality / ectoparasite on TX *Mormoops megalophyla* bats)

*Trombicula veanda* Brennan, 1965 (ectoparasite on CA *Neotoma lepida* woodrats)

*Trombidium* Fabricius, 1776 - Trombiculidae mites

*Trombidium* undet. sp. (Tx or Ac in sON; prob. in MO),

*Trimalaconothrus* Berlese, 1916 - Malaconothridae mites

*Trimalaconothrus* undet. sp. (CO/hyporheic)

*Trhypochthoniellus* Berlese, 1904 - Trhypochthoniidae

*Trhypochthoniellus crassus* (*Hydronothrus c.* Warburton & Pearce, 1905) (Tx or Tp in cave in Orangeburg Co., SC)

*Tydeus* Koch, 1836 - Tydeidae mites

*Tydeus* undet. sp. (Wind C.,SD/TTx?)

*Typhlodromus* Scheuten, 1857 - Phytoseiidae mites

*Typhlodromus* undet. sp. (TTp in WA?)

*Tyroglyphus* Latreille, 1796 = *Acarus*

*Tyrophagus* Oudemans, 1923 (mushroom or mold mites) Acaridae mites

*Tyrophagus* undet. sp. or species (Tb or Tp in cave in Eddy Co.,NM; Ttx? in Wind C.,SD; ectoparasite on OR *Neotoma fuscipes* & IN *N. floridana* woodrats; NY freshwater sandy beach interstitial)

*Tyrrellia* Koenike, 1895 - Limnesiidae mites, Subfamily Tyrrellinae

*Tyrrellia* (*Tyrrellia*) *circularis* Koenike, 1895 (karst seepage \*Rock Cr. Canyon, Kenkakee Co., IL/ interstitial?)

*Tyrrellia* (*Tyrrellia*) *ovalis* Marshall, 1932 (karst seepage \*Rock Cr. Canyon, Kenkakee Co., IL/ interstitial?)

*Uchidastygacarus* Imamura, 1956 - Uchidastygacaridae mites, subfamily Uchidastygacarinae

*Uchidastygacarus* (*U.*) *acadiensis* I. Smith, 1983 (hyporheic in New Brunswick, NF, NH, NS, ON, PQ, NY gravels in riffles of large streams)

*Uchidastygacarus* (*U.*) *appalachianus* I. Smith, 1992 (\*hyporheic in NC,VA gravels in riffles of small streams)

*Uchidastygacarus* (*U.*) *imamurai* Cook, 1963 (hyporheic in OR (Lane Co.) & MT (Lake Co.) gravels in riffles of streams)



*Uchidastygacarus (U.) magnificus* I.M. Smith, 1992 (\*hyporheic in gravels in riffles of small streams of North Fork River, Mendocino Co.,CA)

*Uchidastygacarus (Imamurastygacarus) ovalis* Cook, 1974 (hyporheic in NC (Macon Co.) sand bars and rocky riffles in streams)

*Uchidastygacarus (U.) virginiensis* I. Smith, 1992 (\*hyporheic in Standrock Brook, Giles Co.,VA)

*Unionicola* Halderman, 1842 – Unionicolidae mites  
*Unionicola* undet. sp. (rare Virginian marine infauna)

*Uropoda* Latreille, 1806 - Uropodidae mites  
*Uropoda lucifugus* Packard, 1886 (Tx or Ac in IN)

*Utaxatax* Habeeb, 1964 - Anisitiellidae mites, Subfamily Anisitsiellinae  
*Utaxatax californiensis* Habeeb, 1964 (CA rivers, BC,OR spring runs & interstitial hyporheic?)

*Utaxatax newelli (Mamersella n.* Habeeb, 1959) Cook 1974 (BC,OR,WA spring runs, streams, interstitial hyporheic; larvae parasitic in *Dixa* & *Dixella* flies)

*Utaxatax ovalis* Cook, 1974 (\*Salmon Cr., Monterey Co., CA)  
*Utaxatax* undet. sp. (WA, OR, CA/ surface,interstitial aquatic)

*Veigaia* Oudemans, 1905 (= *Cyrtolaelaps* Berlese, 1892, not Berlese, 1887) (Europe, NA, Asia) Veigaiidae mites. **Bibl.:**Hurlbutt 1963

*Veigaia bakeri* Farrier, 1957 (\*?type locality in Wyandotte C., Crawford Co., IN & Tp in Carlsbad C.?, NM/ S1 G1 or G1G2/ Tb or Tp)

*Veigaia kochi* (Tragardh, 1901) (Italy/ Tx or Ac in sON)  
*Veigaia* undet. sp. or species (Ac, Tp or Tx in GA (Walker Co.), NS; Tx or Ac in GA (prob. on bats))

*Veigaia wyandottensis (Laelaps & Holostaspis w.* Packard, 1886) Vitzthum, 1925 (\*?type locality cave in Crawford Co./Tb, Tp or Tx in IN/ G1G2 **Bibl.:** Holsinger 1965; Hurlbutt 1984; Packard 1888

*Victathrombium* Habeeb, 1974 - Stygothrombiidae mites (Plecoptera hosts)  
*Victathrombium ivarum* (Habeeb, 1974) (interstitial groundwater in Los Angeles Co., CA)

*Vicinaxonopsis* = Subgenus of *Axonopsis*

*Volsellacarus* Cook, 1963 - Neoacaridae mites  
*Volsellacarus ovalis* Cook, 1963 (interstitial in MO (Reynolds, Shannon & Crawford Cos.), OH (WA Co.) & VA (Bath Co.))

*Volsellacarus sabulosus* Cook, 1963 (interstitial in OH (WA Co.) & VA (Bath Co.))

*Volcellacarus* undescr. sp. (hyporheic in ON)

*Wagenaaria* - Subgenus of *Cyllibula*

*Walchia* Ewing, 1931 - Trombiculidae mites, Subfamily Walchiinae

*Walchia americana* Ewing, 1931 (FL, n.to WI, w. to UT/ ectoparasite on KS *Neotoma micropus* & *N. floridana* woodrats)

*Walchia senase* = *Whartonia* s.

*Wandesia* Schechtel, 1912 - Protziidae mites, subfamily Wandsiinae (Plecoptera hosts)

*Wandesia* (*Wandesia*) *centensis* Habeeb, 1973 (hyporheic in Libby Creek west of Laramie, WY)

*Wandesia* (*Wandesia*) *extendens* Cook, 1974 (hyporheic interstitial in Gibbon River, Yellowstone Natl. Park, WY/ G1)

*Wandesia* (*Mesowandesia*) *riparia* Habeeb, 1954 (hyporheic in NJ stream bottom deposits)

*Wandesia* (*Partununiella*) undet. sp. (interstitial groundwater? in WY, CA, NM stream bottom deposits)

*Wandesia* (*Pseudowandesia*) *gaspensis* Habeeb, 1955 (hyporheic in Little Caspapia River, PQ)

*Wandesia* undet. blind sp. (interstitial/ phreatic in Sycamore Cr. 32 km ne of Phoenix (Maricopa Co.), AZ)

*Wandesia* undescr. sp. (hyporheic in E Mixedwood Plains)

*Whartonia* Ewing, 1944 - Trombiculidae mites

*Whartonia carpenteri* Cooley and Kohls. 1944 (ectoparasite on NM, TX *Antrozous pallidus*, *Tadarida brasiliensis mexicana* & NM, TX *Pipistrellus hesperus* bats)

*Whartonia glenii* Brennan, 1962 (on CA *Antrozous pallidus* bats) **Bibl.:** Vercammen- Grandjean et al., 1965

*Whartonia glenii californica* Watkins, 1965 in Vercammen-Grandjean, Watkins & Beck, 1965 (ectoparasite in AZ, CA, Mex. *Macrotus calif.* bat & in other Mex. bats)

*Whartonia perplexa* (*Hannemania* p. Brennan, 1947) (ectoparasite on MT, TX *Eptesicus fuscus*; TX *Myotis velifer*; OR *Myotis californicus*, AZ *Pipistrellus hesperus* & *Antrozous pallidus* & OR, NV *Antrozous pallidus* bats)

*Whartonia senase* (*Acomatacarus* s. Greenberg, 1952; *Walchia* s. Greenberg; *Albeckia senase*) Loomis, 1956 (cave (type locality) in Barber Co., KS/ ectoparasite on KS *Neotoma micropus* woodrats (rare), swOK *Myotis velifer grandis*, KS (Tx) *Myotis velifer incautus*, OR, TX *Pipistrellus Hesperus*, TX *Antrozous pallidus* & AL *Eptesicus fuscus* bats)

*Whartonia whartoni* Hoffman, 1951 = *Sasacarus w.*

*Woolastookia* Habeeb, 1854 - Aturidae, Subfamily Axonopsinae

*Woolastookia pilositarsa* (*Herbasacarus p.* Habeeb, 1954) Habeeb, 1974 (in eNA stream riffle gravel, parasites on imagos of Chironomidae flies, subfamily Orthocladiinae)

*Woolastookia* sp. near *pilositarsa* (ON rivers, likely hyporheic as parasites on *Eukiefferella*, *Microcricotopus* & *Orthocladus* larvae)

*Woolastookia setosipes* (*Herbasacarus s.* Habeeb, 1954) Habeeb, 1974 (in BC stream riffle gravel, parasites on imagos of Chironomidae flies, subfamily Orthocladiinae)

*Woolastookia* undet. sp. (interstitial/ (shallow phreatic in Sycamore Cr. 32 km ne of Phoenix (Maricopa Co.), AZ)

*Yachatsia* Cook, 1963 - Chappuisidae mites, subfamily Morimotacarinae mites (once put in Uchidastygacaridae)

*Yachatsia mideopsoides* Cook, 1963 (= *Y. euforma* Habeeb, 1976) (Hyporheic in AZ, BC, CA, ID, NM, NV, OR, WA, WY stream gravels)

*Xenoryctes* Zachvatkin, 1941 - Glycyphagidae mites

*Xenoryctes* sp. near *nudus* Fain & Whitaker, 1875 (ectoparasite on OR *Neotoma fuscipes* woodrats)

*Zercon* C.L.Koch, 1836 (= *Triangulozercon* Jacot, 1938) Zerconidae mites - See *Microtrombidium*

*Zercon* undet. sp. (ectoparasite on IN *Neotoma floridana* woodrats)

*Zerconopsis* Hull, 1918 - Zerconidae mites

*Zerconopsis* undet sp. (in NS cave)

*Zygoribatula* Berlese, 1916 - Oribatulidae mites

*Zygoribatula* undet. or undescr. sp. or species (Tp? in cave in Eddy Co., NM; Tp or Tb in Jewel C., SD)

**mixotroph** - A species who uses energy from organics & inorganics while using inorganic compounds as electron donors. Incl. species with autotrophy via endosymbionts

**mold** - Microbe fungi. Tufted molds in caves often cover scat, dead insects, bats, & wood. .

mold - see trace fossil

mole - See mammal, insectivore

**molecular drive** - When changes within genetic material affects evolution irrespective of natural selection. A mutation spreads through a population until it is expressed in a large part of the population all at once.

## **Molluscs**

Macroinvertebrate phylum typified by a nonsegmented, bilaterally body, & a radially or biradially symmetrical mantle & shell. Bole & Velkovrh, 1986. See **cephalopod** (nautilus), **clams, conchs, & mussels**, gastropods (**abalone, slug, snail**), **limpets, nudibranch**, oyster, **solenogasters** & tusk shell. Archimedes screws - Fossils in Bilbo Baggins C.(GA). Vaught, 1989; Bibl.: Abbott 1974; McMahon 1991; Morton 1967; Pennak 1978; Rehder 1992; Ruhoff 1973; Trueman & Clarke 1985

**molting** - Periodic shedding and regrowth of outer body covering. Because of food and growth limitations, cave species often have longer periods between molts compared to related surface species.

**Monera** - Old Kingdom for procaryotes. Now divided into Kingdoms Bacteria (=Eubacteria) & Archaea (=Archaeobacteria)

**monestrous** - Pertains to species that have a single estrous cycle per year.

**monophyletic** - A species group descended from a common ancestor

**moonmilk** - White clay, often carbonates & rarely sulfates. Like creamy cottage cheese when wet, like dried milk when dry. From Swiss dialect moonmilch, elf's or gnome's milk, as antibiotic activity was ascribed to magical little people. May result from evaporative concentration of magnesium &/or organic activity such as from bacterium *Macromonas bipunctata*, cyanobacteria (*Synechococcus elongatus* & *Gleocapsa* sp.), actinomycetes, or algae. Boyd, 1965; Caldwell 1977; Curl 1962; Northup, Dahm, et al. 2001; Ohde & Takii 1978. Incl. balloon, carbonates (aragonite, calcite (Mundmilch), dolomite, huntite, hydromagnesite, magnesite, monohydrocalcite, nesquehonite) conulite, crinkle, flowstone, phosphates (brushite, fluoroapatite, hydroxylapatite, & taranakite), rim & sulfate (barite, gypsum, jarosite, melanterite, mirabilite, & thenardite.). Cf. lublinitite.

**morph** - A variant form within a species

**morphology** - The form & structure of individuals excluding anatomy. Cf. physiognomy. Bibl.: Conde' 1953; Bechler 1975; Culver, Kane, et al. 1990; Dent & Kirby-Smith 1963; Dickson, 1976, 1977a; Dickson & Kirk 1976; Elliott 1976; Fong 1989; Fong & Ning Dai 1991; Ghaffar, et al. 1984; Hayes & Richmond 1993; Hoffman 1961; Holsinger & Culver 1970; Hyman 1928, 1937; Jeannel 1926-27; Jones 1989; Jones, Culver & Kane 1986; Langecker 1992; L. & Longley 1993a; LaVal 1965a; Levy 1981a; Minckley & Cole 1963; Naples, 1987; Peck, 1986a; Potter 1963; Schwetman 1967; Smith, L. 1920; Smith, S., & Potter 1963; Szeptycki 1977; Sweet 1980; Takahata, et al. 1981; Tumilson et al., 1990; Valentine 1964; Williams, A. 1976; Woodworth, 1891; Wortham et al. 1977; Zacharda, 1980

coloration - see pigmentation

body size - Man & Fong 1991; Van Zant, Poulson & Kane 1978

appendage elongation - Kane & Culver 1991; Studier & Lavoie 1991;  
eyes - (see also sense, & regressive evolution) - Cunningham, 1893; Fong & Dai 1991;  
Kane & Culver 1991; Loeb 1915

reproductive - Aalbu, 1985; Williams, A. 1976.  
sexual differences - Sever 1985;  
wings - Liebherr 1988

**mortality** - Dickson 1978; Studier, Lavoie, Nevin & McMillin 1988a

mosquito - See Diptera: Culicidae.

moss animals - See Bryozoa.

## Mosses (for club-mosses, see Pteridophytes)

Musci, class of bryophyte usually in three dimensions. Most are aliens in caves. See **liverwort**.  
Grout 1931; Mylroie 1972; Prior 1961. **Areas:** **AL:** Goldman; **KY:** Maheu 1926; **MN:** Thatcher  
1947; **NM:** ; Lindsey 1949, 1951; **NA:** L. Anderosn et al. 1990; **NY:** Haring 1931; Haring 1930;  
Lindsey 1949, 1951; **VA:** Lang 1943.

Subclass Bryidae (incl. Dicranales)

Orders:

Bryales:

Aulacomniaceae (*Aulacomnium*)  
Bartramiaceae (*Bartramia*, *Philonotis*)

Bryaceae (*Bryum*, *Leptobryum*, *Pohlia*, *Rhodobryum*, *Webera*)  
Brachytheciaceae (*Bryhnia*)  
Schistostegaceae (*Schistostega*)

Encalyptales: Encalyptaceae (*Encalypta*)

Fabroniaceae (*Clasmatodon*, *Schwetschkeopsis* (or put in Myriniaceae)  
Mniaceae (*Mnium*, *Plagiomnium*)

Pterigynandraceae (*Myurella*)  
Theliaceae (*Myurella*, *Thelia*)  
Timmiaceae (*Timmia*)

Dicranales

Dicranaceae (*Dicranella*, *Dicranodontium*, *Dicranum*, *Leucobryum*, *Paraleucobryum*)  
Ditrichaceae (*Ceratodon*, *Ditrichum*)  
Rhabdoweisiaceae (*Rhabdoweisia*)

Fissidentales: Fissidentaceae (*Fissidens*),

Funariales: Funariaceae (*Funaria*, *Physcomitrium*),

Grimmiales

Grimmiaceae (*Grimmia*)

Hedwigiales

Hedwigiaceae (*Hedwigia*)

Hookeriales

Hookeriaceae (*Hookeria*)

Hypnales

Amblystegiaceae

(*Amblystegiella*, *Amblystegium*, *Campylium*, *Drepanocladus*, *Hygroamblystegium*)

Brachytheciaceae (*Brachythecium*, *Eurhynchium*, *Rhynchostegiella*)

Hypnaceae (*Hypnum*, *Taxiphyllum*)

Plagiotheciaceae (*Plagiomnium*, *Plagiothecium*)

Leucodontales

Anomodontaceae (*Anomodon*) (now in Thuidiaceae)

Leptodontaceae (*Forsstroemia*)

Neckeraceae (*Neckera*)

Thuidiaceae (=Anomodontaceae)]

(*Anomodon* (once put in Anomodontaceae), *Haplohymenium*, *Thuidium*)

Orthotrichales: Orthotrichaceae (*Orthotrichum*, *Ulota*)

Polytrichales

Polytrichaceae (*Catharinea*, *Polytrichum*)

Pottiales

Pottiaceae (*Barbula*, *Didymodon*, *Eucladium*, *Gymnostomum*, *Oxystegus*, *Tortella*, *Tortula*, *Trichostomum*)

Sphagnales

Sphagnaceae (*Sphagnum*)

Tetraphidales

Tetraphidaceae (*Georgia*)

**MOSS** species incl.:

*Amblystegiella* Loeske, 1903 - Amblystegiaceae mosses in Order Hypnales

*Amblystegiella sprucei* (Bruch., 1845) Loeske, 1903 (twilight zone in nNM)

*Amblystegium* Schimp. in Bruch, Schimper & Gumbel, 1853 (amblystegium moss)

Amblystegiaceae mosses in Order Hypnales

*Amblystegium irriguum* = *Hygroamblystegium i.*

*Amblystegium serpens* = *Hypnum s.*

*Amblystegium serpens juratzkanum* (A .s. W. P. Schimper, 1860) (NY, NV caves near lights)

*Amblystegium* undet sp. (Ttx in Mariposa Co., CA)

*Amblystegium varium* (Hedw.) Lindberg, 1879 (NA epigeal/ MN caves)

*Anomodon* Hook. & Tayl., 1818 (anomodon mosses) - Thuidiaceae mosses in Order Leucodontales (also put in Anomodontaceae)

*Anomodon attenuatus* (Hedw.) Huebener, 1833 (AL,KY),

*Anomodon rostratus* (Hedwig) W.P. Schimper, 1860 (AL,KY)

*Anomodon viticulosus* (Hedwig) W.J. Hooker & Taylor, 1818 (AL)

*Aulacomnium* Schwagr., 1827 - Aulacomniaceae moss in Bryales

*Aulacomnium androgynum* (*Muscorum f.* Hedw., 1827) Schwagr. (WV twilight zone)

*Aulacomnium heterostichum* (*Arrhenopterum h.* Hedw., 1801) Bruch & Schimp., 1841 (WV twilight zone)

*Barbula* Hedwig, 1801 (barbula moss) Pottiaceae mosses in Order Pottiales

*Barbula reflexa* (*Tortula r.* Bridel, 1806; *Didimodon fallax var. reflexus*) Bridel, 1819 [1818] (AL twilight zone)

*Barbula unguiculata* Hedwig, 1801 = *B. u.* forma *apiculata* (Hedwig) Moenkemeyer (MN twilight zone)

*Bartramia* Hedw., 1801 - Bartramiaceae mosses in Bryales

*Bartramia pomiformis* (Linnaeus) Hedw., 1801 (*Plagiopus p.* Guim., 1919) (in WV twilight zone)

*Brachythecium* Schimper in Bruch, Schimper & Gumbel, 1853 - Brachytheciaceae mosses in Order Hypnales

*Brachythecium collinum* (Schleich. Ex. C. Mull. Hal., 1851) Schimp in B.S.G., 1853 (twilight zone in nNM)

*Brachythecium oxycladon* (Bridell, 1853) Kindberg, 1897 (AL)

*Brachythecium rivulare* Schimper in Bruch, Schimper & Gumbel, 1853 (KY)

*Brachythecium rutabulum* (*Hypnum r.* Hedwig, 1801) Schimper in Bruch, Schimper & Gumbel, 1853 (NY)

*Bryhnia* Kaurin, 1801 - Brachytheciaceae mosses in Order Bryales

*Bryhnia graminicolor* (*Bryum g.* Bridel, 1803) Grout (Ozarks/AL)

**Bryum** Hedwig, 1801 - Bryaceae mosses in Order Bryales

**Bryum bimum** (*Mnium bimun* Schreber, 1802) (VA)

**Bryum caespiticium** Hedwig, 1801 (Ozarks/alien Tp in NY showcave)

**Bryum capillare** Hedwig, 1801 (Ozarks/alien Tp in NY showcave)

**Campylium** (Sullivant) Mitten, 1869 (campylium moss) Amblystegiaceae mosses in Order Hypnales

**Campylium chrysophyllum** (Bridel, 1826) J. Lange, 1887 (AL,MN, NV near lights)

**Catharinea** Ehrh. Ex F. Weber & D Mohr, 1803 - Polytrichaceae mosses

**Catharinea crispa** var. *densifolia* Lindb., 1868 (*Atrichum crispum* var. *densifolium* Paris, 1894)

**Clasmatodon** Hooker & Wilson in Wilson, 1842 - Fabroniaceae moss in Encalyptales

**Clasmatodon parvulus** (Hampe) Hook. & Wils. ex Sull. in Gray, 1856 (AL)

**Ceratodon** Bridel 1826 - Ditrichaceae moss in Order Dicranales

**Ceratodon purpureus** (Hedwig) Bridel, 1826 (MN, nNM, VA)

**Drepanocladus** (C. Mull. Hal., 1851 as subsect. of *Hypnum*) G.Roth, 1899 (brown mosses) Amblystegiaceae mosses

**Drepanocladus uncinatus** (*Hypnum uncinatum* Hedw., 1801) Warnst., 1903 (twilight zone in nNM)

**Dicranella** (*Aongstroemia* sect. *Dicranella* Mull. Hal., 1848) Schimp., 1856 - Dicranaceae mosses in Dicranales

**Dicranella heteromalla** (*Dicranum heteromallum* Hedw., 1801) Schimp., 1856 (WV twilight zone)

**Dicranodontium** Bruch & Shimp., 1847 - Dicranaceae mosses in Dicranales

**Dicranodontium longirostre** (*Didymodon longirostris* F. Weber & D. Mohr, 1807) Bruch & Schimp., 1847 (WV twilight zone)

**Dicranum** Hedw., 1801 (dicranum moss) Dicranaceae mosses in Dicranales

**Dicranum flagellare** Hedw., 1801 (WV twilight zone)

**Dicranum rhadocarpum** Sullivant, 1849 (twilight zone in nNM)

**Dicranum scoparium** Hedw., 1801 (WV twilight zone)

**Didymodon** Hedwig, 1801 Pottiaceae mosses in Order Pottiales

*Didymodon fallax* var. *reflexus* = *Barbula reflexus*

**Didymodon rigidulus** Hedwig, 1801 (WV twilight zone)

**Ditrichum** Hampe, 1867 - Ditrichaceae mosses in Dicranales

**Ditrichum tortile** (*Trichostomum tortile* Schrad., 1802) Brockm., 1870 (WV twilight zone)



*Encalypta* Hedwig 1801 (candle snuffer mosses) Encalyptaceae mosses in Order Encalyptales  
*Encalypta procera* Bruch, 1832 (AL)  
*Encalypta streptocarpa* Hedwig 1801 (twilight zone)

*Eucladium* Bruch & Schimp. in Bruch, Schimper & Gumbel, 1853 - Pottiaceae moss in Pottiales  
*Eucladium verticillatum* (Hedwig in Bridel) Bruch & Schimp. in B.S.G., 1846 (AL)

*Eurhynchium* Schimp. In B.S.G., 1854 (Eurhynchium moss) Brachytheciaceae mosses in Hypnales

*Eurhynchium rusciforme* (Necke, 1854) Milde, 1869 (MN, VA)  
*Eurhynchium surrulatum* (Hedw.) Kindberb, 1870 (VA),

*Eurhynchium* Schimper in in Bruch, Schimper & Gumbel, 1853  
*Eurhynchium hians* (Hedwig) Sande Lacoste, 1866 (AL)  
*Eurhynchium praelongum* (Hedwig) Schimp. in B.S.G., 1854 (Europe/KY),

*Fissidens* Hedwig, 1801 - Fissidentaceae moss in Fissidentales  
*Fissidens bryoides* var. *b.* Hedwig, 1801 (*F. minutulus* Sullivant, 1846) (Ozarks/AL),

*Fissidens cristatus* Wilson ex Mitten, 1859 (*F. dubius fide* Kattunen, 1987) (Ozarks/AL),  
*Fissidens subbasilaris* Hedwig, 1801 (Ozarks/AL)  
*Fissidens taxifolius* Hedwig, 1801 (Ozarks/AL)

*Forsstroemia* Lindberg, 1863 - Leptodontaceae mosses in Leucodontales  
*Forsstroemia trichomitria* (Hedwig) Lindberg, 1863 (AL)

*Funaria* Hedwig, 1801 - Funariaceae mosses in Funariales  
*Funaria hygrometrica* Hedwig, 1801 (Ozarks/ MN, NY),

*Georgia* Ehrh. & Mull. Hal., 1848 - Tetrarhizaceae mosses in Tetrarhizales  
*Georgia pellucida* (*Tetrarhizis pellucida* Hedw., 1801) Rabenh., 1848 (WV twilight zone)

*Grimmia* Hedw., 1801 - Grimmiaceae mosses in Grimmiiales  
*Grimmia apocarpa* Hedw., 1801 (WV twilight zone)

*Gymnostomum* Nees & Hornschuch in Nees, Hornschuch & Sturm, 1823 - Pottiaceae moss in Pottiales

*Gymnostomum aeruginosum* (Smith, 1804) (Ozarks/AL)  
*Gymnostomum calcareum* Nees & Hornschuch in Nees et al., 1823 (VA)

*Haplohymenium* Dozy & Molkenboer, 1846 - Haplohymenium moss in Leucodontales  
*Haplohymenium triste* (Cesati in De Not.) Kindberg, 1899 (Ozarks/AL)

*Hedwigia* P. Beauv., 1804 - Hedwigiaceae mosses in Hedwigiiales  
*Hedwigia albicans* (*H. ciliata* ssp. *subnuda* Kindb., 1892) C. Mohr, 1901 (WV twilight zone)

**Hookeria** Sm., 1808 - Hookeriaceae mosses in Hookeriales

**Hookeria sullivantii** Mull.Hall, 1884 (WV twilight zone)

**Hygroamblystegium** Loeske, 1903 - Amblystegiaceae mosses in Hypnales

**Hygroamblystegium tenax** var. *tenax* (*Hypnum t.* Hedw., 1801; *Amblystegium irriguum* (*Hypnum i.* Hook & Wilson, 1855) Schimp., 1855) (WV twilight zone)

**Hypnum** Hedwig, 1801 - Hypnaceae mosses in Hypnales

**Hypnum irriguum** Hook. & Wilson, 1855 (*Amblystegium i.* Schimp., 1855; *A. serpens* var. *i.* Austin, 1870; *Hygroamblystegium i.* Loeske, 1903; *Hypnum fluminense* ssp. *i.* Kindb., 1894) (WV twilight zone)

**Hypnum crista-castrensis** Hedw., 1801 (WV twilight zone)

**Hypnum cupressiforme** Hedw., 1801 (twilight zone in nNM)

**Hypnum imponens** Hedw., 1801 (WV twilight zone)

**Hypnum recurvans** (*Leskea r.* Michx., 1803) P.Beauv., 1805 (WV twilight zone)

**Hypnum revolutum** (*Stereodon revolutus* Mitt., 1859) Lindb., 1866 (twilight zone in nNM)

**Hypnum serpens** (Hedwig, 1801) = *Amblystegium s.* Schimp. in Bruch, Schimper & Gumbel, 1853 (AL, NV near lights)

**Leptobryum** (Bruch & Schimp. in Bruch, Schimper & Gumbel, 1853) Wilson, 1855 - Bryaceae mosses in Bryales

**Leptobryum pyriforme** (*Webera pyriformis* Hedwig, 1801) Wilson, 1855 (Ozarks, WV, VA twilight zones)

**Leucobryum** Hampe, 1839 - Dicranaceae mosses in Hypnales

**Leucobryum glaucum** (*Dicranum glaucum* Hedw., 1801) Angstrom, 1845 (WV twilight zone)

**Mnium** Hedwig, 1801 - Mniaceae mosses in Encalyptales

**Mnium affine** = *Plagiomnium ciliare*

**Mnium arizonicum** Aman H.Magn. Or J.J. Amann, 1925 (Twilight zone in nNM),

**Mnium cuspidatum** = *Plagiomnium c.*

**Mnium marginatum** (Dickson ex Withering) Bridel ex Palisot de Beauvois, 1805 (Ozarks/AL)

**Mnium hornum** Hedw., 1801 (WV twilight zone)

**Mnium punctatum** = *P. r.*

**Mnium rostratum** = *Plagiomnium r.*

**Mnium stellare** = *P. s.*

**Myurella** Schimp. in Bruch, Schimper & Gumbel, 1853 - Theliaceae mosses in Encalyptales

**Myurella sibirica** (C. Mueller) Reimers, 1937 (Ozarks/AL)

**Neckera** Hedwig, 1801 - Neckeraceae moss in Leucodontales

**Neckera douglasii** Hooker, 1829 (Ttx in Mariposa Co.,CA)

***Orthotrichum*** Hedwig, 1801 - Orthotrichaceae moss in Orthotrichales

***Orthotrichum strangularum*** Palisot de Beauvois, 1805 (AL)

***Oxystegus*** ((S.O. Lindberg) ex. Limpricht) Hilpert, 1933 - Pottiaceae mosses in Pottiales

***Oxystegus tenuirostris*** (Hook. & Taylor) A. J. Smith, 1977 (oxystegus moss/AL),

***Paraleucobryum*** (Lindb., 1866 (as subgenus)) Loeske, 1907 (paraleucobryum moss)

Dicranaceae in Dicranales

***Paraleucobryum enerve*** (*Dicranum e.* Thed., 1849) Loeske, 1849 twilight zone in nNM)

***Paraleucobryum longifolium*** (Ehrh. ex. Hedw., 1801) Loeske, 1908 twilight zone in nNM)

***Philonotus*** Brid., 1827 - Bartramiaceae mosses in Bryales

***Philonotus fontana*** (*Mnium fontanum* Hedw., 1827) Brid., 1827 (WV twilight zone)

***Plagiomnium*** Koponen, 1968 - Plagiotheciaceae mosses in Hypnales

***Plagiomnium ciliare*** (C. Mueller) T. Koponen, 1977 (*Mnium affine* Blandow ex. Funck. var. *ciliare*; *Bryum a.* (Blandow ex Funck) Brid., 1819 (1818); *P.a.* (Blandow ex Funck) T.J. Kop., 1968) Anderson et al., 1990 (Ozarks, AL, WV twilight zones)

***Plagiomnium cuspidatum*** (*Mnium c.* Hedwig, 1801) Anderson et al., 1990 (AL, Ozarks, WV twilight zones)

***Plagiomnium punctatum*** (*Mnium p.* Aman, 1919) T. Koponen (Ozarks/ Tp alien? in AL; WV twilight zone)

***Plagiomnium punctatum*** var. *elatum* (*Mnium p.* var. *e.* Bruch. & Schimp., 1838) . Koponen (WV twilight zone)

***Plagiomnium rostratum*** (*Mnium r.* Schrader, 1802) (KY/plagiomnium moss)

***Plagiomnium stellare*** (*Mnium r.* Reichard ex. Hedwig, 1801; *Stellariomnium s.*) (Ozarks/AL)

***Plagiothecium*** Bruch & Schimp., 1852 - Plagiotheciaceae mosses

***Plagiothecium cavifolium*** (Bridel) Iwatsuki, 1970 (AL),

***Plagiothecium elegans*** (*Isothecium e.* Brid., 1827) Schimp., 1876 (WV twilight zone)

***Plagiothecium elegans*** var. *gracilens* (Austin & Grout, 1910) R & C. (WV twilight zone)

***Plagiothecium sylvaticum*** (*Hypnum s.* Brid., 1891) Schimp. 1851 var. *laxum* Mole. (WV twilight zone)

***Physcomitrium*** (Bridel, 1826) Bridel, 1827 - Funariaceae mosses in Funariales

***Physcomitrium*** undet. sp. (NV near lights)

***Pohlia*** Hedwig, 1801 - Bryaceae mosses in Bryales

***Pohlia cruda*** (*Mnium crudum* Hedw., 1801) Lindb., 1879 (twilight zone in nNM)

*Pohlia nutans* (Webera n. Hedw., 1801) Lindb., 1879 (twilight zone in WV)  
*Pohlia wahlenbergii* (Weber & D. Mohr, 1807) Andrews in Grout, 1935 (Ozarks/Tp in WA; twilight zone in nNM; NV near lights)

*Polytrichum* Hedw., 1801 - Polytrichaceae mosses in Polytrichales  
*Polytrichum commune* Hedw., 1801 (twilight zone in WV)  
*Polytrichum ohioense* Renauld & Cardot, 1885 (twilight zone in WV)

*Rhabdoweisia* Bruch & Schimp., 1846 - Rhabdoweisiaceae mosses in Dicranales  
*Rhabdoweisia denticulata* Wilson & Mitt., 1857 (WV twilight zone)  
*Rhabdoweisia fugax* (Weissia f. Hedw., 1801) Bruch & Schimp., 1846 (WV twilight zone)

*Rhapidostegium* (B.S.G.) De Not. Ex De Not., 1867 = *Sematophyllum*

*Rhodobryum* (Schimp.) Limpricht & Rabenh., 1892 - Bryaceae mosses in Bryales  
*Rhodobryum roseum* (*Mnium* r. Hedwig, 1801) Limpricht, 1892 (Ozarks/AL)

*Schistotega* D. Mohr & Dumort., 1829 (= *Catoptridium* Brid.) - Schistostegaceae mosses in Bryales

*Schistotega pennata* (*Gymnostomum pennatum* Hedw., 1801) F. Weber & D. Mohr, 1803 (luminous moss/ ME seacave)

*Schistotega* undet. sp. (US noncalcite caves)

*Schwetschkeopsis* Mueller, 1875 - Fabroniaceae mosses in Encalyptales  
*Schwetschkeopsis fabronia* (*Schwagrichen*) Brotherus in Englem. & Prantz 1907 var. *calcareo* (Warnstorf) E.F. Waburg, 1962 [1967] (AL)

*Sematophyllum* Mitt., 1864 (= *Rapidostegium*) - Sematophyllaceae mosses  
*Sematophyllum carolinianum* (*Hypnum* c. Mull. Hal., 1851; *Rapidostegium* n. (C. & M.) J. & S.) E. Britton, 1902 (twilight zone in WV)

*Sematophyllum marylandicum* (Mull. Hal.) E. Britton, 1902 (twilight zone in WV)  
*Sematophyllum novae-caesareae* (*Hypnum* n. Austin, 1870; *Rapidostegium* n. (Aust.) R. & C.) E. Britton, 1902 (twilight zone in WV)

*Sphagnum* Linnaeus, 1753 - Sphagnaceae mosses in Sphagnales  
*Sphagnum compactum* Lam. & DC., 1805 (*S. cymbifolium* ssp. *compactum* (Lam. & DC.) Hartm., *S. cymbifolium* var. *compactum* (Lam. & DC.) Sw., 1829 (WV twilight zone)

*Sphagnum imbricatum* Hornsch. & Russow, 1865  
*Sphagnum imbricatum* var. *affine* (Renauld & Cardot, 1885) Warnst., 1869 (WV twilight zone)  
*Sphagnum subsecundum* Nees., 1819 (WV twilight zone)

*Taxiphyllum* M. Fleischer, 1923 - Hypnaceae mosses in Hypnales  
*Taxiphyllum deplanatum* (Bruch & Schimper ex Sull.) Fleischer, 1923 (Ozarks/Tp in AL)  
*Taxiphyllum taxirameum* (Mitten) Fleischer, 1923 (Ozarks/Tp in AL)

**Thelia** Sull. in Sullivan & Lesquereux, 1856 - Theliaceae mosses in Encalyptales

**Thelia hirtella** (Hedw.) Sullivant in Sull. & Lesquereux, 1856 (1857) (AL),

**Thuidium** Schimper in B.S.G., 1852 - - Haplohymenium moss in Leucodontales

**Thuidium delicatulum** (Hedwig) W.P. Schimper in B.S.G., 1852 (AL, WV twilight zone)

**Thuidium microphyllum** (*Hypnum m.* Hedwig, 1801) A.Jaeger, 1878 (WV twilight zone)

**Thuidium recognitum** (*Hypnum m.* Hedwig, 1801) Lindb., 1874 (WV twilight zone)

**Thuidium pygmaeum** W.P. Schimper in B.S.G., 1852 (AL)

**Thuidium** undet. sp. (VA)

**Timmia** Hedwig, 1801 - Timmiaceae in Encalyptales

**Timmia megalopolitana** Hedwig, 1801 (Ozarks/ TTP in AL)

**Tortula** Hedw., 1801 - Pottiaceae mosses in Pottiales

**Tortula ruralis** (*Barbula r.* Hedw., 1801) Hedw., 1802 (twilight zone in nNM)

**Tortella.** (Lindb., 1879) (as subgenus of *Mollia*) Lindb., 1888 - Pottiaceae mosses in Pottiales

**Torella caespitosa** (*Barbula c.* Schwagr., 1811) Limpr., 1888 (twilight zone in WV)

**Torella viridis** Paris, 1803 (twilight zone in nNM)

**Trichostomum** Bruch in F. Mueller, 1829 - Pottiaceae mosses in Pottiales

**Trichostomum tenuirostre** (W.J. Hooker & Taylor) Linberg, 1864 (AL)

**Ulota** D. Mohr, 1806 - Orthotrichaceae mosses in Orthotrichales:

**Ulota americana** (Beauv.) Limpr. = *U. curvifolia*

**Ulota curvifolia** (*Orthotrichum curvifolium* Wahlenb., 1812) Lilj., 1816. (= *U. curvifolia*) (WV twilight zone)

**Webera** Schreb., 1791 - Bryaceae mosses in Bryales

**Webera sessilis** Lindb., 1865 (WV twilight zone)

*Weisia viridula* Hedw. = *Oxystegus tenuirostris*

## **Moths, Skippers & Butterflies**

Insects of Order Lepidoptera (moths, butterflies & skippers), Subclass Pterygota, Division Neoptera, Subdivision Endopterygota (=Holometabola), Section Panorpida or Mecopterida, Subsection Amphiesmenoptera, Superorder Amphiesmenoptera. Name from *lepidos*, “scaly” and *pteron*, “wing.” Syn. Heterocerca.

Moth is a nonscientific and traditional term for Lepidoptera that close their wings next to their body and which often fly at night. Unlike butterflies, larvae spin either a silken cocoon or make a silk-lined pupal cell and antennae tips are not clubbed shaped although those of some daytime flying moths may be swollen. Larvae (usually called caterpillars) have prolegs only on abdominal segments 3-6, at most, and the last segment in some leafminers have tiny prolegs. Some loopers have one or more pairs of prolegs missing. At least 3 pairs of ocellis and usually 6.

Often in twilight zone. Wingspan 2-300 mm (usually at least  $\geq 5$  mm. &  $< 80$  mm). Hind wings are usually more oval and also smaller and with fewer veins. Body soft to leathery. Front wings are often triangular or trapezoidal but lanceolate in many micromoths. Most moths and skippers are drab but there are many exceptions. The head is usually small and the sucking mouthparts (baustellum), if present, forms a coiled tube beneath it. Antennae usually only about half the length of the body and of various shapes; some families have very long antennae, esp. in males. The thorax is stout due to large flight muscles. A few species have wingless females. The abdomen is slender, elongate and either cylindrical or more oval and stout (esp. if filled with eggs) The abdomen has no obvious cerci and reproductive organs are retracted into the body.

Almost all lepidopteran larvae feed on flowers, fruit, stems, and roots of flowering plants. A few are scavengers, gnanophiles, carnivorous or parasites. Adults feed on nectar, sap, fruit and liquids from decaying animals or plants. About 148,000 known species with 11,600 species and 2,340 genera in the US and Canada.

**Bibl.:** Crawford 1975b, 1976c;; Heppner n.d.; Hodges et al. 1983; Holland 1903; Nielson 1989; A. Peterson 1965; Robinson 1980; Turquin 1994; W. Forbes 1923; M. Young 1997; **Areas:** eCanada: R. Morris 1980; East: Covell 1984; D. Wagner et al. 1997; **FL:** Kimball 1965; **MO:** Heitzman & Heitzman 1987; **NE:** McCabe 1991; **PA:** Titz 1952

Subclass Pterygota

  Infraclass Exopterygota

    Superorder Endopterygota

      Order Lepidoptera

        Suborder Glossata (= Microlepidoptera)

          Infraorder Heteroneura

            Division Ditrysia

              Section Tineina

                Subsection Tineina

                  Superfamily Pyraloidea

                    (Pyralidae) (also in Family Group Pyralidiformes)

                  Superfamily Tineoidea

                    (Gracillariidae, Lyonetiidae, Tineidae) (also in Tineiformes)

                  Superfamily Yponomeutoidea

                    (Acrolepiidae) (also in Tineiformes)

            Section Cossina

              Subsection Cossina

                Superfamily Tortricoidea

                  (Tortricidae) (also in Family Group Tortriciformes)

            Subsection Bombycina

              ("Macrolepidoptera") (includes butterflies)

Superfamily Noctuoidea  
(Noctuidae) (also in Family Group Noctuiformes)

("Rhopalocera")  
Superfamily Bombycoidea  
(Saturniidae) (also in Family Group Bombyciformes)

Superfamily Geometroidea  
(Geometridae) (also in Family Group Pyralidiformes)

**ACROLOPHIDAE** (tube moths) (*Acrolophus*) **Bibl.:** Hasbrouck 1964  
Subfamily Amydriinae (*Amydria*)

**GELECHIIDAE** (twiler or gelechiid moths) **Bibl.:** Busck 1903; Hodges 1971, 1974, 1986  
Subfamily Gelechiinae  
Tribe Gelechiini (*Filatima*)

**GEOMETRIDAE** (geometrid moths & measuring worms; loopers, cankerworms; measuringworm moths) About 12,000 species. **Bibl.:** D. Ferguson 1985; McGriffin 1967-90; A. Packard 1876

Subfamily Ennominae

Tribe Anagogini (*Anagoga*)

Tribe Boarmiini (*Ectropis*)

Tribe Caberini (*Cabera*)

Subfamily Geometrinae

Tribe Geometrini (*Geometra*)

Subfamily Larentiinae

Tribe Eudulini (*Eubaphe*)

Tribe Eupitheciini (*Eupithecia*)

Tribe Hydriomenini (*Triphosa*)

Tribe Rheumapterini (*Mesoleuca*, *Rheumaptera*)

Subfamily Sterrhinae

Tribe Scopulini (*Scopula*)

**GRACILARIIDAE** (leafminer moths; leafblotch miners)  
Subfamily Gracillariinae (*Caloptilia*)

**LYONETHIDAE** (lyonetiid moths)  
Subfamily Lyonetiinae (*Lyonetia*)

**NOCTUIDAE** (owlet moths & underwings; noctuid moths, noctuids, millers, cutworms, armyworms). About 20,00 species with 3,500 in NA. **Bibl.:** Lafontaine & Poole 1991; Poole

1989; Poole & Gentili 1996; Rings et al. 1992; Rockburne & Lafontaine 1976; J. Smith 1895; J. Smith & Dyar 1898

Subfamily Acronictinae

Tribe Acronictini (*Acronicta*)

Subfamily Amphipyriinae

Tribe Apameini (*Apamea*) (also put in Saturnidae)

Tribe Feraliini (*Feralia*)

Subfamily Catocalinae (*Catocala*, *Hypocala*, *Scoliopteryx*)

Subfamily Herminiinae (*Idia*, *Phalaenostola*)

Subfamily Hypeninae (*Hypena*, *Schrankia*, undet. genus & sp. in CO)

Subfamily Noctuinae (= Agrotinae of authors)

Tribe Agrotini (*Agrostis*) (*Euxoa*)

Tribe Aniclini (*Peridroma*, *Pronoctua*)

Subfamily Plusiinae

Tribe Plusiini (*Syngrapha*) (also put in Abrostolini)

**PSYCHIDAE** (bagworm moths) (incl. *Hyalaracta*) **Bibl.:** D. Davis 1964

**PTEROPHORIDAE** (plume-winged moths) (Tx or Tp undet. sp. in Lewis and Clark C., Jefferson Co., MT)

**PYRALIDAE** (= Pyralididae) (snout moths; pyralid, grass, & wax moths; pyralid moths) About 10,000 species. **Bibl.:** Forbes 1923; Munroe 1972-3

Undet. genus & sp.? in CO

Group Pyralinina

Subfamily Pyralinae (*Pyralis*)

Subfamily Nymphulinae

Tribe Nymphulini (*Nymphula*, *Paraponyx*)

**SATURNIIDAE** (emperor moths; giant silkworm moths; wild or giant silk moths & day flying moths) **Bibl.:** D. Ferguson 1971-2; Tuskes et al. 1996

Subfamily Ceratocampinae (*Anisota*)

**TINEIDAE** (clothes or guano moths; tineid moths)

Subfamily Nemapogoninae (*Nemapogon*)

Subfamily Tineinae (*Monopis Tinea*)

**TORTRICIDAE** (leafroller & olethreutine moths; tortricids; fruit & bell moths)

Undet. Genus (bat gauno Tx in MO)

Subfamily Olethreutinae



Tribe Eucosmini (*Zeiraphera*)

Subfamily Tortricinae. Bibl.: J. Pwell 1964

Tribe Archipini (*Archips*)

*Acrolophus* Poey, 1832 (also put in Tineidae) Acrolophidae moth (49 species in US or Canada)  
*Acrolophus* undet. sp. (Ac in Mold Hole, Travis Co., TX)

*Agrotis* Oschsenheimer, 1816 - Noctuidae moth, Subfamily Noctuinae, Tribe Agrotini (29 species in US or Canada)

*Agrotis* undet. sp. (Ac or Tx in HI)

*Acronicta* Oschsenheimer, 1816 (dagger moths) Noctuidae moth, Subfamily Acronictinae, Tribe Acronictini (75 species in US or Canada)

*Acronicta* undet. sp. (Ac in cave in Val Verde Co., TX)

*Amydria* Clemens, 1859 (= *Casape* Walker, 1864; *Amadria* Chambers (missp.); *Amadrya* C.1878 (missp.); *Neomeristis* Meyrick 1919) Acrolophidae moths, Subfamily Amydriinae (once put in Tineidae)

*Amydria arizonella* Dietz, 1905 (AZ epigeal/ Tp in AR, sNM)

*Amydria* near *effrenatella* Clemens, 1859, emend. by Stainton, 1872 (= *A. coloradella* Dietz, 1905) (Tp in Wyatt (Edwards Co.) & Felton (Sutton Co.), TX)

*Amydria effrenatella* Clemens, 1859 (*A. effrenatella* Stainton, 1872 (emend.); *A. coloradella* Dietz 1905; *Myrmecozela e.*) (Ac in Edwards, Sutton Cos., TX & Peddler's Tunnel, NS)

*Amydria* sp. prob. *arizonella* Dietz, 1905 (Tp in Irion, Cutton, Uvalde Cos., TX)

*Amydria* sp. prob. *curvistrigella* D.1905 (= *A. pandurella* D., 1905) (Tp in cave in Irion Co., TX)

*Amydria* undet. sp. (Tx in NV).

*Anagoga* Hubner, 1823 (*Azinephora* Stephens, 1827; *Numeria* Duponchel, 1829; *Axinophora* Agassiz, 1847 Emend.; *Anagoge* Stephens, 1850 Missp.) Geometridae moth, Subfamily Ennominae, Tribe Anagogini (1 species in US or Canada)

*Anagoga occiduaria* (*Numeria o.* Walker, 1861; *Ellopiia plagifasciata* W., 1863) (NF to NC, w. to BC, OR, s. to SD/ Tx or Ac in NWT/ American barred umber)

*Anisota* Hubner, 1820 (= *Adelocephala* Duponchel, 1841; *Adelocampa* Packard, 1905 (missp.)) (oakworm moths) Saturniidae moth, Subfamily Ceratocampinae (also put in Noctuidae, Subfamily Amphipyriinae, Tribe Apameini) (6 species in US or Canada)

*Anisota oslari* Rothchild, 1907 (= *A. skinneri* Biederman, 1908; *A. neomexicana* Brehme, 1909) (royal moth, Carlsbad C.(NM))

***Apamea*** Ochsenheimer, 1816 (= *Abronmias* Billberg, 1820; *Septis* Hubner, 1821; *Hama*, *Xylophasia* Stephens, 1829; *Syma* S.1850 (homo.); *Agrostobia* Boie, 1835; *Crymodes* Guenee, 1841; *Dimya* Moore, 1882; *Eurabila* Butler, 1889; *Eleemosia* Prout, 1901; *Protagrotis* Hampson, 1903; *Agroperina*, *Trichoplexia* H.1908; *Heteromma* Warren, 1911 (homo.); *Heterommiola* Strand, 1912; *Furvabromias*, *Loscopia* Beck, 1991) Noctuidae moth, Subfamily Amphipyridae, Tribe Apameini (40 species in US or Canada)

***Apamea amputatrix*** (*Hadena a.* Fitch, 1856; *Eurois pluviosa* Walker, 1865; *H. formosus* Ellsworth, 1918) (Labrador to NC, w. across s. Canada to OR, s. to MO/ Tx in cave in Uinta Mts, UT/ yellow-headed cutworm moth; yellow-headed cutworm)

***Archips*** Hubner, 1822 - Tortricidae moth, Subfamily Tortricinae, Tribe Archipini (21 species in US or Canada)

***Archips rosanus*** (*A. americanus* Linnaeus, 1758; *A. amerina* Linnaeus, 1761; *A. laevigana* D. & S., 1775) (Ac in cave in Hays Co., TX)

***Cabera*** Treitschke, 1825 (*Sphecodes* Hubner, 1806 Unav.; *Deilinia* Hubner, 1825; *Cabera* Stephens, 1829 Homo.; *Cabira* Sodoffsky, 1837 emend.; *Dilina* Agassiz, 1847 Emend. *Cabiron* Unger, 1856 Emend.; *Deilinea* Holland, 1893 Missp.; *Dilinia* Hampson, 1895 Emend.) Geometridae moths, Subfamily Ennominae, Tribe Caberini (1 species in US or Canada)

***Cabera exanthemata*** (= *Phalaena e.* Scopoli, 1763; *P. exanthemaria* Borkhausen, 1794; *Geometra striaria* Hubner, 1799; *P. approximaria* & *arenosaria* Hawaorth, 1809; *Deilinia bryantaria* Taylor, 1906) (Tx or Ac in NWT)

***Caloptilia*** Hubner, 1825 (= *Poeciloptilia* Hubner, 1825; *Gracillaria* Haworth, 1828; *Ornix* Treitschke, 1833; *Coriscium*, *Gracilaria* (missp.) Zeller, 1839; *Calliptilia* Agassiz (emend.); *Antiolopha* Meyrick, 1894; *Gracilaria* Walsingham, 1907 (emend.); *Sphyrophora* Vari, 1961; *Cecidoptilia*, *Minyoptilia*, *Phylloptilia*, *Rhadinoptilia* Kumata, 1982) Gracilariidae moths, Subfamily Gracillariinae (63 species in US or Canada)

***Caloptilia alnivorella*** (*Gracilaria a.* Chambers, 1875) (Ac or Tx in sON)

***Catocala*** Schrank, 1802 - Noctuidae moth, Subfamily Catocalinae (110 species in US or Canada)

***Catocala similis*** Edwards, 1864 (NY, SOn to FL, w. to MB, TX/similar underwing/Tx or Ac in OH)

*Deilinea* = *Cabera*

***Ectropis*** Hubner, 1825 (= *Boarmia* Stephens, 1829 (homo.); *Tephrosia* Boisduval, 1840; *Coenobita* Gistel, 1848) Geometridae moth, Subfamily Ennominae, Tribe Boarmiini (1 species in US or Canada)

*Ectropis crepuscularis* (*Geometra crepuscularia* Denius & Schiffermuller, 1775) (small, engrailed geometer/ NW, NE, central states/ Ac? in WA)

*Eubaphe* Hubner, 1823 (= *Ameria* Walker, 1854; *Euphanessa* Packard, 1864; *Leptidule* Butler, 1877) Geometridae moths, Subfamily Larentiinae, Tribe Eudulini (also put in Ennominae) (5 species in US or Canada)

*Eubaphe mendica* (= *Nudaria m.* W., 1854; *Eudule biseriata* Herrich-Schaffer, 1855)) (Tx in OH)

*Eupithecia* Curtis, 1825 (= *Arcyonia*, *Dyscymatoge*, *Eucymatoge*, *Hypepirritis*, *Leucocora*, *Tarachia*, *Tephroclystia* Hubner, 1825; *Eupithecia* Bruand, 1847 (homo.); *Eupithesia* Desmarest, 1847 (missp.); *Eupitecia* Rondani, 1872 (missp.); *Eupethecia* Grote, 1882 (missp.); *Epicaste* Gumpfenberg, 1887 (homo.); *Dietzea* Schutze, 1956, *Petersenia* S.1958; *Bohatschia* S.1960; *Heteropithecia*, *Neopithecia*, *Propithecia* Vojnits, 1985) Geometridae moths, Subfamily Ennominae, , Subfamily Larentiinae, Tribe Eupitheciini (157 species in US or Canada) **Bibl.:** McDonnough 1949

*Eupithecia* undet. sp. (Tx or Ac in OR)

*Epizeuxis* = *Idia*

*Euxoa* Hubner, 1821 (= *Brotis*, *Exarnis*, *Metaxyja*, *Mimetes*, *Telmia* H.1821; *Pleonectopoda* Grote, 1873; *Carneades* G.1883; *Chorizagrotis* Smith, 1890; *Orosagrotis* Hampson, 1903; *Paragrotis* Dyar, 1903; *Mesoeuxoa* Corti, 1932; *Menada* Kozhantschikov, 1937; *Longivesica* Hardwick, 1970) Noctuidae moths, Subfamily Noctuinae, Tribe Agrotini (191 species in US or Canada)

*Euxoa axillaris* (*Agrotis a.* Grote, 1873; *A. introferens* Grote, 1875; *A. agrestis* G.1877) (Tx in cave in Uinta Mts, UT/ army cutworm)

*Euxoa idahoensis* (*Agrotis i.* Grote, 1878; *A. furtivus* Smith, 1890)) (Tx in cave in Uinta Mts, UT)

*Feralia* Grote, 1874 (= *Arthrochlora* & *Momophana* G.1875) Noctuidae moths, Subfamily Amphipyriinae, Tribe Feraliini (6 species in US or Canada)

*Feralia jocosus* (*Diphtera j.* Guenee, 1852) (seCanada to nFL, w. to ON, sMO, TX/A c or Tx in sON/ Jocosus Sallow)

*Filatima* Busck, 1939 - Gelechiidae moths, Subfamily Gelechiinae, Tribe Gelechiini (55 species in US or Canada)

*Filatima* undet. sp. (Ac in cave in Edwards Co., TX) Gelechiidae moth

*Geometra* Hubner, 1799 - Geometridae moth, Subfamily Geometrinae, Tribe Geometrini  
*Geometra striaria* Hubner, 1799 (*P. approximaria* & *arenosaria* Haworth, 1809; *Deilinia bryantaria* Taylor, 1906) (Tx or Ac in NWT)

***Hyalarcta*** Meyrick & Lower, 1907 - Psychidae moth (1 species in US or Canada)

***Hyalarcta huebneri*** (Westwood) ( leaf case moth/Australian alien? Ac or Tx in sON)

***Hypena*** Schrank, 1802 (= *Erchila* Billberg, 1820; *Herpyzon* H.1822; *Bomolocha*, *Ophiuche* H.1825; *Badausa* Walker, 1863; *Pelialia* W.1865; *Phanaspa* W.1866; *Euhypena*, *Macryhypena*, *Meghypena*, *Plathypena* G.1873; *Apanda*, *Mathura* Moore, 1882; *Hypoepa* Leech, 1889; *Anepischetos* Smith, 1900; *Placerobela* Turner, 1903; *Anepa* Swinhoe, 1905 (homo.) Noctuidae moths, Subfamily Hypeninae (4 species in US or Canada)

***Hypena humuli*** Harris, 1841 (= *H. germanalis* Walker, 1859; *H. evanidalis* Robinson, 1870; *H. olivacea* Grote, 1873; *H. albopunctata* Tepper, 1881) (Tx or Ac in MO, PA; Tx? in WI/ hop looper)

***Hypena scabra*** (= *Hyblaea s.* Fabricius, 1794 or, 1798; *Hypena erectalis* Guenee, 1854; *Poaphila revoluta* Walker, 1858; *Hypena subrufalis* Grote, 1872; *Plathypena s.*) (E/ TTx in IL, IN, OH, PA/ green cloverworm)

***Hypocala*** Guenee, 1852 - Noctuidae moths, Subfamily Catocalinae (1 species in continental US or Canada)

***Hypocala velans*** Walker, 1857 (epigeal in Kauai, Oahu, Molokai, Maui, Hawaii/ Tp or Tx in HI)

***Idia*** Hubner, 1813 (= *Epizeuxis* H., 1818; *Camptylochila* Stephens, 1834; *Helia* Duponchel, 1845 (homo.); *Camptylochila* Agassiz, 1847 emend.; *Helia* Guenee, 1854 (homo.); *Pseudaglossa* Grote, 1874) Noctuidae moths, Subfamily Herminiinae (15 species in US or Canada)

***Idia*** near *lubricaulis* (*Epizeuxis* l. Geyer, 1832; *C. bistrigalis* Stephens, 1834; *Bleptina surrectalis* Walker, 1859; *Helia occidentalis* Smith, 1884; *E. intensalis*, *partialis* S., 1980; *E. cobeta* S.1910/ Glossy Black Idia/ epigeal in E/Tx or Ac in CA)

***Lyonetia*** Hubner, 1825 (= *Agyromiges* Curtis, 1829 Emend.; *Argyromis* Stephens, 1829; *Nocturno* & *Lyonnetia* (missp.) Gistel, 1847; *Olethria* G., 1848; *Gracillaroides* Bruand, 1851; *Lyonetiola* Kuroko, 1964) Lyonetiidae moth, Subfamily Lyonetiinae (5 species in US or Canada)

***Lyonetia*** near *siliciella* Busck, 1904 (Tx or Ac in NWT)

***Mesoleuca*** Hubner, 1825 - Geometridae moths, Subfamily Larentiinae, Tribe Rheumapterini (2 species in US or Canada)

***Mesoleuca*** undet. sp. (Ac? in WA)

***Monopis*** Hubner, 1825 (= *Blabophanes* Zeller, 1852; *Hyalospila* Herrich-Schaffer, 1853) Tineidae moth, Subfamily Tineinae (7 species in US or Canada)

***Monopis*** prob. *crocicapitella* (*Tinea c.* Clemens, 1859; *T. hyalinella* Staudinger, 1870; *Blabophanes lombardica* Hering, 1889; *B. heringi* Richardson, 1893) (AL, prob TN/ Tp) **Bibl.:** Robinson 1980

***Monopis*** undet. sp. (Ac or TTx in NWT)

*Myrmecozela* Zeller, 1852 - Tineidae moths

*Myrmecozela* sp. nr. *effrenatella* = *Amydria e.* in Acrolophidae

***Nemapogon*** Schrank, 1802, emend. by Agassiz, 1847 (= *Brosis* Hubner, 1806 (Unav.);

***Nemopogon*** Oken, 1815 (missp.); *Diaphthirusa* H.1825) Tineidae moth, Subfamily

Nemapogoninae (15 species in US or Canada)

***Nemapogon*** undet. sp. (E/Tx in MO/ grain moth)

***Nymphula*** Schrank (= *Elophila* Hubner, 1822; *Hydrocampus* Berthold; *Hydrocampa* Stephens;

*Hydrocampe* Latreille, 1829; *Pseudoparaponyx* Patocka, 1951; *Cyrtogramme* Yoshiyasu, 1985)

Pyralidae moths, Subfamily Nymphulinae, Tribe Nymphulini (1 species in US or Canada)

***Nymphula*** *ekthlipsis* (*Hydrocampa e.* Grote, 1876) (TX hyporheic)

***Paraponyx*** Hubner, 1825 - Pyralidae moths, Subfamily Nymphulinae, Tribe Nymphulini (6 species in US or Canada)

***Paraponyx*** undet. sp. MI lake benthic)

***Peridroma*** Hubner, 1821 - Noctuidae moths, Subfamily Noctuinae, Tribe Aniclini (1 species in continental US or Canada)

***Peridroma*** undet. sp. (Tx in HI)

***Phalaenostola*** Grote, 1873 - Noctuidae moths, Subfamily Herminiinae (4 species in continental US or Canada)

***Phalaenostola*** *metonalis* Walker, 1859 (Tx? in WI)

***Phereoeca*** Hinton & Bradley, 1956 (plaster bagworms) Tineidae moths (1 species in continental US or Canada)

***Phereoeca*** *walsinghami* (Busck, 1933) (TTx in nests of *Hirundo fulva* swallows in cave in Edwards Co., TX; Ac in Enchanted Rock Cave, Llano Co., TX)

*Plathypena scabra* = *Hypena s.*

***Pronoctua*** Smith, 1894 - Noctuidae moths, Subfamily Noctuinae, Tribe Aniclini (2 species in continental US or Canada)

***Pronoctua*** *typica* S.1894 (Tx & TTx in nAZ)

***Pyralis*** Linnaeus, 1758 - Pyralidae moths, Group Pyralinina, Subfamily Pyralinae (6 species in US or Canada)

***Pyralis*** undet. sp. MI lake benthic

***Rheumaptera*** Hubner, 1822 (*R. H.*, 1806 Unav.; *Eulype* H., 1825; *Eulypa* H., 1826 (missp.); *Melanippe* Duponchel, 1829; *Rheumatoptera* Gumpfenberg, 1887; *Rhumaptera* Kirby, 1897 Missp.) Geometridae moths, Subfamily Larentiinae, Tribe Rheumapterini (2 species in US or Canada)

***Rheumaptera hastata*** (*Phalaena h.* Linnaeus, 1758; *Melanippe hastaria* Boisduval, 1840 Emend.; *M. gothicata* Guenee, 1857; *M. furcifascia* Walker, 1862) (Labrador to NC & TN, west across Canada, s. to SD/TTx or Ac in NWT/spear-marked black)

***Schrankia*** Hubner, 1825 (= *Hypenodes* Guenee, 1854; *Hypenopsis* Dyar, 1913; *Translatix* Berio, 1991) - Noctuidae moth, Subfamily Hypenodinae

***Schrankia*** undet. sp. (Tp in HI Volcanoes Natl. Park & Kazumura C., HI Island, HI)

***Scoliopteryx*** Germar, 1810 (= *Pterodonta* R.L., 1817; *Ephemias* Hubner; *Euphais* H.1822; *Gonoptera* Berthold, 1827) Noctuidae moths, Subfamily Catocalinae (once in Hypeninae) (1 species in US & Canada)

***Scoliopteryx libatrix*** (*Phalaena l.* Linnaeus, 1758; *Bombyx libatricus* Haworth, 1803 Emend.) (NA, Europe, Russia/ HTx cave or herald moth; scalloped owlet/ HTx in AL, AR, BC, CA, GA (Dade & Walker Cos.), IL, IA, IN(8 cos.; S4?/G4), KY (Mammoth C.), MB, MD, MO, New Brunswick, NJ, NM, NY, OH, OK, sON, OR, PA, PQ, TN, UT, WA, WV, YK). Roeder & Fenton, 1973

***Scopula*** Schrank, 1802 - Geometridae moths, Subfamily Sterrhinae, Tribe Scopulini (24 species in US or Canada)

***Scopula*** undet. sp. (Ttx in Vancouver Island, BC)

***Syngrapha*** Hubner, 1821 (= *Caloplusia* Smith, 1884; *Cornutiplusia* Kostrowicki, 1961; *Palaeographa* Kljutschko, 1983; *Aingrapha*, *Diasyngrapha*, *Microsyngrapha*, *Parsyngrapha* Beck, 1991) Noctuidae moths, Subfamily Plusiinae, Tribe Plusiini (also put in Abrostolini) (24 species in US or Canada)

***Syngrapha alias*** (*Autographa a.* Ottolengui, 1902; *A. interalia* O.1919) (Ac or Tx in sON)

***Tinea*** Linnaeus, 1758 (*T. Geoffroy*, 1762 (Unav.); *T. Muller*, 1764 (missp.); *Ses* Hubner, 1806 (Unav.); *Ses* H.1822; *Tineararia* Rafinesque, 1815 (emend.); *Acedes*, *Autoses* H., 1825; *Taenia* (missp.) W.1855; *Edosa* W.1866; *Chrysoryctis* Meyrick, 1886; *Dystinea* Borner, 1925; *Tineopsis* Zagulajev, 1960) Tineidae moth, Subfamily Tineinae (19 species in US or Canada)

***Tinea irrepta*** Braun, 1926 (Tx? in wCO)

***Tinea*** undescr. sp. (\*? cave in Grand Canyon Natl. Park, Coconino Co, AZ)

***Tinea*** undet. sp. (Tp or Tx in Carlsbad C.(NM)? & TX; Tx in AZ)

***Triphosa*** Stephens, 1829 (= *Umbrosina* Bruand, 1847) Geometridae moths, Subfamily Larentiinae, Tribe Hydrimenini (4 species in US or Canada)

***Triphosa haesitata* h.** (= *Scotosia* h. Guenee, 1857) (most of NA except nAK, nCanada/ tissue moth/ Htx in BC, CA, Manitoba, NS, ON, NV, OR, PQ, WA) Graham, 1968-a. Their wingspan is typically 3-4cm. Caterpillars feed on buckthorns, cascara (*Rhamnus* sp.), barberry, hawthorn and oak.

***Triphosa haesitata affirmaria*** (= ?*Scotosia affirmata* Guenee, 1857) (Tx in sON & PQ)  
***Triphosa* undet. sp.** (Tx? in PQ)

***Zeiraphera*** Treitschke, 1829 (*Ziophora* Agassiz, 1847 Amend.) Tortricidae moth, Subfamily Olethreutinae, Tribe Eucosmini (8 species in US or Canada)

***Zeiraphera improbana*** (*Sciaphila* i., *destitutana*, *indivisana* Walker, 1863; *Cydia pseudotsugana* Kearfott, 1904) (Tx or Ac in NWT) Tortricidae moths, Subfamily Olethreutinae, Tribe Eucosmini

moth flies - See Diptera: Psychodidae

**multivoltine** - Species who have more than two broods or generations each year.

Musci - See mosses.

mucormycosis - Fungus disease contracted by breathing spores in the dirt. Not known from caves.

mushroom - **Fungi** with large/prominent fruiting bodies (esp. Class Hymenomycetes).

musk-ox - See mammal

muskrat - See mammal, muskrat

**mutualism** - An ecology type of relationship between two organisms in which both are benefitted. Incl. inquilism. Lavoie, Studier, Edwards & Apgar, 1985

**mycelium** - A mass of branching, threalike filaments called hyphae; the vegetative part of fungi. Often found on tree roots & in organics.

mycophage - Syn: fungivore

**mycorrhiza** - Fungi part of a aymbiotic or controlled or mutual parasitism with roots. Commonly seen in shallow caves.

mycrophthalmous - Syn: obligate (**troglobitic**) forms.

**myriapod** - Crustacean (Superclass Myriapoda). Incl. centipede, millipede, pauropod & symphylid.

**myrmecophiles** - non-ants who live closely with ants. May be mutualists, symbiots or parasites. Myrmecophilous beetles known from caves. Syn.: ant guests, myrmecophilous beetles. Symphiles (true ant guests) are usually beetles who look like ants and produce exudates favored by ants.

Mysid - See shrimp

## **MYSTACOCARIDA**

Tiny (<1mm. long) and worm-like, primitive in retaining overt segmentation of head

Kingdom Animalia

Phylum Arthropoda

Subphylum Crustacea

Class Maxillopoda

(barnacles, ostracods, mystacocarids, branchiurans, barnacles & copepods)

Subclass Mystacorida

Derocheilocarididae (*Derocheilocaris*)

*Derocheilocaris* Pennak & Zinn, 1943 - Derocheilocarididae mystacocarids

*Derocheilocaris hessleri* Friauf & Bennett, 1974 (FL, MS marine beach interstitial)

*Derocheilocaris ingens* Hessler, 1969 (ME marine beach interstitial)

*Derocheilocaris typicus* Pennak & Zinn, 1943 (FL to CT, MA, NH marine beach interstitial)

**nannoplankton** - 2-20 micron species

**native** - 1. Syn: endemic. 2. A species not introduced by humans.

natural selection - See also evolution - **Bibl.:** Culver, Jernigan, O'Connell & Kane 1994; Jernigan, Culver & Fong 1994; Jernigan & Fong 1994

**naturalization** - The beginning of a breeding population where they were not previously established. Done for some cave species in California threatened by a dam.

**nautiloid** - Any cephalopod of subclass Nautiloidea, Endoceratoides, or Actinoceratoides, typified by a centrally located siphuncle & by a straight, curve, or coiled chambered external shell with less elaborate sutural flexures than in ammonoids.

**Nearctic** - Animal biogeographical region that includes NA s. to Mexico. Now combined with Palearctic to refer to the Holarctic.

**necromass** - Dead organics that is part of the primary production of an area.

**necrophage** - Scavenger who feeds on animal carcasses.



**necrophytes** - Plants which live on dead organisms. Syn.: saprophytes.

**nektonic** - Pertaining to a swimming pelagic species.

Nematode - – See worms.

nemertine worms - See worm, ribbonworm.

**neoendemic** - Recently evolved endemic. Syn. progressive endemic.

**neonate** - A newborn young.

**neoteny** - Heterochrony retention of juvenile form & behavior even as a mature individual. Some cave salamanders are neotenic. Cf. paedomorphosis. Andrews, 1962; Baker, J., 1961; Andrews, M., 1962; Baker, J., 1961.; Bishop, S., 1944; Bishop et al., 1937; Bogart, 1967; Brandon, 1965; Brown, Bryce C. 1942, 1979; Burger, et al., 1950; Dundee, 1962; Kezer, 1952; McAllister & Fitzpatrick, 1985; Mitchell, R. & Smith, 1972; Norris et al., 1963; Potter & Rabb, 1960; Smith, H. & Potter, 1946; Sweet, 1977; Yeatman, 1967

**neotype** - A specimen designated as the type when the holotype or lectotype has been lost or suppressed by the ICZN.

**nest** - Organic fill organized into a home for woodrats, birds, etc.

## Neuroptera

(= Planipennia) (lacewings, mantispids & antlions). Incl. Megaloptera: hellgrammite (larvae of dobsonflies in Corydalidae & Sisyridae), alderflies, dobsonflies, fishflies), lacewings, mantispid & aquatic Neuroptera (Sisyridae)). Of Class Insecta, Subdivision Endopterygota (=Holometabola). Name from neuron, “sinew” and ptron, “wing,” from the old usage of nervation (or neuration) meaning “strengthening by sinews” and referring to the netlike pattern of wing veins. The Neuroptera may not be a single order and is sometimes named the Section Neuropterida. The most primitive insect order with complete metamorphosis (holometabolism: egg, larvae, pupae, adults).

Wingspan 5-160 mm. Body soft-textured; shape various, but elongate, cylindrical (unlike flattened stoneflies), usually with long, narrow, simple abdomen. Most are dull brown, with some green, others black, and some tripicial species with wing markings in vivid colors. Antennae usually are long with many antennomeres, but some are short and not much longer than the head and thorax, rarely pectinate. Both wing pairs are similar, usually longer than the abdomen and held over it when not in use. Well developed legs with some raptorial front legs in predators. Abdomen without cercie.

Most larvae are carnivores, so are some adults but most feed on nectar and pollen. Larvae very different from adults (as in most other aquatics: stoneflies, caddisflies, mayflies) with a terminal pair of prolegs. Larvae cannot pass feces until it is excreted as meconium when the adult emerges. About 4,670 species in the world with 349 species in 61 genera in the US and Canada.

**Bibl.:** Oswald & Penny 1991; Froeschner 1947; J. Oswald & Penny 1991; Penny, Adams & Stange 1997; Poole & Lewis 1996a

Undet. Genus (8160 years old in *Neotoma* woodrat nest in Butler Mts., Yuma Co, AZ)

Suborder Planipennia; Infraorder Hemerobiiformia  
Superfamily Hemerobioidea (once in Osmyloidea)

Sisyridae ((aquatic Neuroptera; spongillaflies) (*Climacia*) **Bibl.:** Parfin & Gurney 1956  
Inhabit only freshwater lakes

Suborder Megaloptera (= Sialodea)  
Superfamily Myrmeleontiodea

Myrmeleontidae (antlions & doodlebugs)  
(*Myrmeleon*) **Bibl.:** N. Banks 1927; Stange & R. Miller 1990

Coryalidae (dobsonflies; dobsonflies & fishflies)  
Corydalinae (dobsonflies & hellgrammites) (*Corydalus*; MO Tx or Ac genus)

Chaulioidinae (fishflies)  
(*Dysmicohermes*, *Neohermes*, *Nigronia*, *Orohermes*, *Protochaulioides*)

Sialidae (alderflies) (*Sialis*) **Bibl.:** K. Davis 1903

***Chauliodes*** Latreille, 1796 emend. Billberg, 1820 - Corydalidae Megaloptera, Subfamily Chaulioidinae (2 species in US or Canada)

***Chauliodes pectinicornis*** (*Hemerobius p.* Linnaeus, 1763; *H. virginiensis* Drury, 1773) (E epigeal /Tx or Ac in sON)

***Chauliodes*** undet. sp. or species (Tx or Ac in MO; Ac in AR; Tx on AR (Marion Co.)  
*Corynorhinus townsendii ingens* bats)

***Climacia*** MacLachlan, 1869 - Sisyridae Neuroptera (3 species in US or Canada)

***Climacia aureolaris*** (*Micromus a.* Hagen, 1861 (*C. dictyona* Needham, 1901; *Sisyra lampra* Nava, 1914) (Tx or Ac in sON)

***Climacia*** undet. sp. (rare Virginian marine infauna)

***Corydalus*** Latreille, 1802 (*Corydalis* Latreille, 1804 (missp.); *Coydalium* Oken, 1815 (missp.); *Corydalia* Billberg, 1830 (missp.)) Corydalidae Neuroptera, subfamily Corydalinae (3 species in US or Canada). **Bibl.:** Contreras-Ramos 1996

***Corydalus cornutus*** (*Hemerobius c.* Linnaeus, 1758; *Corydalis cognata* Hagen, 1861) (NE, SE, TX epigeal/ dobsofly/ IL, TX hyporheic) **Bibl.:** A. Brown 1974; Contreras-Ramos 1998

***Corydalus*** undet. sp. (Tx or Ac in CA)

***Dysmicohermes*** Munroe, 1953 - Corydalidae Megaloptera, Subfamily Chauliondinae (3 species in US or Canada)

*Dysmicohermes crepusculus* = *Orohermes c.*

***Dysmicohermes disjunctus*** (*Chauliodes d.* Walker, 1866) (Ac or Ttx in Vancouver Island, BC)

***Myrmeleon*** Linnaeus, 1767 – Myrmeleontidae Neuroptera

***Myrmeleon*** undet. sp. (ant lion / TTX in TX)

***Neohermes*** Banks, 1908 - Corydalidae Megaloptera, Subfamily Chauliondinae (5 species in US or Canada)

***Neohermes concolor*** (*Chauliodes c.* Davis, 1903) (E epigeal/ Tx in MO)

***Neohermes*** Banks prob. *californicus* (*C.c.* Walker, 1853) (Tx or Ac in CA; hyporheic in CA intermittent streams during summer)

***Nigronia*** Banks, 1908 - Corydalidae Megaloptera, Subfamily Chauliondinae (2 species in US or Canada)

***Nigronia serricornis*** (*Chauliodes s.* Say, 1823; *C. maculatus* Rambur, 1842) (E, Mid-west/ dark fishfly/ Tx in MO; seVA hyporheic)

***Orohermes*** - Corydalidae Megaloptera, Subfamily Chauliondinae (1 species in US or Canada)

***Orohermes crepusculus*** (*Dysmicohermes c.* Chandler, 1954) (Tx or Ac in WA)

***Protochauliodes*** Weele, 1909 - Corydalidae Megaloptera, Subfamily Chauliondinae (6 species in US or Canada)

***Protochauliodes*** undet. sp. or species (phreatic in Sycamore Cr. 32 km ne of Phoenix (Maricopa Co.), AZ); sCA hyporheic)

***Sialis*** Latreille, 1802 - Sialidae Megaloptera (24 species in US or Canada)

***Sialis aequalis*** Banks, 1920 (seVa hyporheic)

***Sialis californica*** Banks, 1920 (sCA hyporheic)

***Sialis mohri*** Ross, 1937 (Virginian freshwater infauna)

***Sialis*** undet. sp. or species (OR, PA hyporheic; in stream muds; rare Virginian marine infauna)

neuston – Species which live in association with the surface film of water. Cf. epineuston.

**niche** - 1. Ecological lifestyle of an organism, unique to that particular species. Cf. guild. Howarth, 1981d.

niche separation - See competition.

**nitrification** - Oxidation of ammonia or nitrite to nitrate by chemolithotrophic bacteria of the family Nitrobacteraceae or other microbes. Gram-negative aerobes can use chemical energy to fix nitrogen, converting it to organic nitrogen compounds. See bacteria (Nitrobacter, Nitrocystis), guano, saltpeter. *Bibl.*: Hill, Eller, et al., 1984; Lewis, W., 1991.

**nitrifying bacteria** - Those able to oxidize ammonia to nitrite (Nitrosomonas, Nitrosococcus, Nitrospira, Nitrosocystis and Nitrosogloea) and nitrite to nitrate (Nitrobacter, Nitrocystis)

**nitrisification** - Oxidation of ammonia to nitrate by nitrifying bacteria. Incl. Nitrosomonas & Nitrosococcus in small cave pools.

**nom. nud.** - Abbrev. for *nomne nudum* (bare name).

**Nom. Rej.** Or *nom. Rejic.* - Abbrev. for *nomen rejiciendum* (rejected name).

**Nomen dubium** - A name whose application is uncertain. Such a name should be rejected.

**nominal** - A taxon which defines its rank.

*nomogenesis* - Hypothesis in which evolution is determined by more than just natural selection. Through heterochrony & molecular drive, may account for certain patterns in fossil record.

Nudibranchs – See sea slugs

**nulliparous** - Pertains to a female which has not given birth (includes individuals which are: immature, mature but not inseminated, mature and primigravid).

**nymph** - Immature stage in the life cycle of acarid arachnids.

obligate cavernicoles - Syn: Tb.

obligate troglaxene - Syn: Habitual Tx.

**obligate** - Capable of surviving in only one environment.

**obligate aerobes** - Bacteria that cannot grow in the absence of free oxygen.

**obsidian hydration dating** - A method for determining the age of an artifact by the thickness of a hydrated outer layer.

occasional troglaxene - Syn: threshold Tx.

## **Odonata**

(damselflies, dragonflies, darners). Of the insect order Odonata (or Odonatoptera (= Odonata) & Megasecoptera) in Subclass Pterygota, Division Palaeoptera. (also put in Infraclass Pterygota, Division Odonata). *Odontos* means “toothed” and refers to the large adult mandibles. About

5,000 species divided into suborders Zygoptera (damselflies & darners) and Anisoptera (dragonflies).

Wingspread 20-190 mm., much larger in some species in Pennsylvanian times. Body thin and flexible, with large spines or setae, without scales but with a very fine pile or bloom of microsetae. Shape elongate and cylindrical. Head large with a slim neck that gives it great flexibility. Antennae are short, resembling setae. Thorax very large with many flight muscles. Hind wings similar to front wings. Abdomen cylindrical, long and slender with small apical cerci used during mating

They are the first very successful (diverse) group of flying insects; the earliest fossils are from the Pennsylvanian period. They retain ancient wing venation patterns but have advanced traits such as the forward placement of adult legs for scooping up prey, large, acute eyes and complex mating and courtship. Both adults and aquatic larvae are carnivorous with chewing mouthparts. The larvae's labium shoots outward in front of the head to capture prey. Larve "breathe" through their anus, taking in oxygenated water by muscle contraction, and escaping predators by jet propulsion. Syns.: devil's darning needles, snake doctors, mosquito hawks. 4,870 or so described species with about 403 in 83 genera in the U.S. and Canada.

All dragonflies hold their wings out from the body; the hind wings are broader near the base than the front wings; the eyes of the adults are not farther apart than the diameter of one of them. Most damselflies hold their wings, when at rest, over the abdomen; their front and hind wings are nearly the same shape. Adult eyes are widely separated and somewhat stalked. Most damselflies and some dragonflies mate on plant stems while most dragonflies mate on the wing.

**Bibl.:** Corbet 1963 **Areas:** **AB:** Pritchard, 1988; **CA:** R. Smith & Pritchard 1956; **Canada:** E. Walker 1953, 1958, 1975; **FL:** Dunkle 1989-90; **NA:** Gloyd & Wright, 1959; Hynes 1988; Merritt & Cummins 1978; Needham & Westfall 1955; Ricker 1959; Stark, et al. 1986; Stewart & Stark 1988; Westfall & May 1996; Wright & Peterson 1944; **PQ:** A. Robert 1963; **World:** Tsuda 1986, 1991. Incl.

Recent Classification (Bechl 1997):

Suborder Anisoptera

Evanisoptera

Aeshnoptera

Aeshnida

Neoaeshnida

Superfamily Aeshnodea

Aeshnoidea (Gomphidae) (or put in Exophytica)

Suborder Euzygoptera

Coenagriomorpha

Coenagrionida

Superfamily Coenagrionodea

Coenagrionidae

Suborder Exophytica  
Gomphides  
Desmoproctida  
Oligophlebiata  
Gomphida  
Gomphidae

Suborder Zygoptera  
Caloptera  
Eucaloptera  
Caloptereygida  
Superfamily Calopterygoidea  
Calopterygidae

Traditional Classification:

Suborder Anisoptera Selys, 1854 (dragonflies; dragonflies & darners):

Superfamily Cordulegastroidea  
Cordulegasteridae (biddies) (*Cordulegaster*)

Superfamily Aeshnoidea  
Aeshnidae (darners) (*Aeshna*, *Basiaeschna*, *Boyeria*)

Gomphidae (clubtails; clubtailes or gomphid darners; gomphid dragonflies)  
(*Erpetogomphus*, *Dromogomphus*, *Gomphus*, *Lanthus*, *Ophiogomphus*, *Progomphus*,  
*Stylurus*)

Superfamily Libelluloidea  
Corduliidae (green-eyed skimmers) (*Epitheca*)

Libellulidae (common skimmers)  
(*Dythemis*, *Ladona*, *Libellula*, *Macromia* (put in Macromiidae))

Macromiidae (belted skimmers) (*Macromia*) (also put in Libellulidae))

Suborder Zygoptera  
Superfamily Coenagrionoidea

Coenagrionidae (= Agrionidae of authors) (narrow winged or stalk-winged damselflies)  
(*Argia*, *Enallagma*, *Telebasis*, *Zoniagrion*; Undet. genus & sp. In 1OK cave)

Superfamily Calopterygoidea  
Calopterygidae (broad-winged damselflies) (*Calopteryx*)

**AESHNIDAE** (darners) (*Aeshna*, *Basiaeschna*, *Boyeria*)

**CALOPTERYGIDAE** (broad-winged damselflies) (*Calopteryx*)

**COENAGRIONIDAE** (= Agrionidae of authors) (narrow winged or stalk-winged damselflies)  
(*Argia*, *Enallagma*, *Telebasis*, *Zoniagrion*; Undet. genus & sp. In 1OK cave)

**CORDULEGASTERIDAE** (biddies) (*Cordulegaster*)  
**CORDULIIDAE** (green-eyed skimmers) (*Epitheca*)

**GOMPHIDAE** (clubtails; clubtail or gomphid darners; gomphid dragonflies)  
(*Erpetogomphus*, *Dromogomphus*, *Gomphus*, *Lanthus*, *Octogomphus*, *Ophiogomphus*,  
*Progomphus*, *Stylurus*)

**LIBELLULIDAE** (common skimmers)  
(*Dythemis*, *Ladona*, *Libellula*, *Macromia* (put in Macromiidae))

**MACROMIIDAE** (belted skimmers) (*Macromia*) (also put in Libellulidae))

*Aeschna* Fabricius, 1775 (= *Aeshna* F.1775; *Cnemophila* Wallengren, 1894; *Rhionaeschna* Forster 1909; *Neureclipsa* Navas 1911; *Hesperaeschna* Cockerell 1913; *Secundaeschna* Gotz 1923; *Marmaraeschna* Clavert 19562; *Schizuraeschna* Calvet 1952; *Adversaeschna* Watson 1992)) Aeschnidae zygoptera darner (19 species in US or Canada)

*Aeschna* undet. sp. or species (blue darner/Tx or Ac in sON; VA, MD brackish benthic)  
*Aeschna umbrosa* Walker, 1908 (epigean most of US (except AK, FL) & southern Canada/ Tx in cave in NS)

*Argia* Rambur, 1842 (= *Hyponeura* Selys, 1854; *Diargia* Calvert, 1909; *Chalcargia*, *Cyanargia*, *Heliargia*, *Leptargia* & *Micragia* Kennedy, 1920) (short-stalked darner; dancers)  
Coenagrionidae Zygoptera Odonata (30 species in US or Canada)

*Argia plana* Calvert, 1902 (*A. vivida* Hagen p. (Calvert); *A. spegazzinii* Navas, 1934) (AR, AZ, CO, IL, IA, KS, MO, NE, NM, OK, SD, TX, WI, s. to Guatemala/springwater dancer/ Tx or Ac in AR)

*Argia vivida* Hagen, 1865 (AB, BC, AZ, CA, CO, ID, IA, MT, NE, NV, NM, OR, SD, UT, WA, WY/ vivid dancer/ sCA hyporheic)

*Basiaeschna* Selys, 1883 - Aeshnidae darners (1 species in US or Canada)

*Basiaeschna janata* (*Aeschna j.* Say, 1883) (epigean most of eUS w. to TX, OK, KS, n. to sCanada/ springtime darner/ MI lake benthic)

*Boyeria* Selys, 1883 - Aeshnidae darners (2 species in US or Canada)

*Boyeria* undet. sp. or species (IL, MI lake benthic)

*Calopteryx* Leach, 1815 (*Agrion* Fabricius, 1775 (also considered senior synonym); *Sylphus* Hagen, 1855; *Anaciagrion* Kennedy, 1920) Calopterygidae Odonata damselflies (5 species in US or Canada)

***Calopteryx*** Leach, 1815 (*Agrion* Fabricius, 1775 (also considered senior synonym); *Sylphus* Hagen, 1855; *Anaciagrion* Kennedy, 1920)

***Calopteryx maculata*** (*Agrion m.* Beauvois, 1805; *C. holosericea* Burmeister, 1839; *C. materna* & *opaca* Say, 1839; *C. papilionaria* Rambur, 1842; *C. floridana* Huggins, 1927) (epigean NS & NY w. to NV, Pacific, ne to Manitoba/ black wing; blackwinged darner/ Tx or Ac in AR/ IL river benthic)

***Cordulegaster*** Leach, 1815 - Cordulegastridae Odonata dragonfly (8 species in US or Canada)  
***Cordulegaster obliqua fasciata*** (= *C. f.* Rambur, 1841) (epigean in ON & eUS, w. to TX, AR/ arrowhead spiketail/ seVA hyporheic)

***Cordulegaster maculata*** Selys, 1854 (= *C. maculatus*) (epigean sCanada & eUS, w. to MN, MO, IL, TX/ twin-spotted spiketail/ Ac or Tx in Cave of the Bats, NS; seVA hyporheic)

***Cordulegaster*** undet. sp. or species (NC hyporheic? & stream benthic & meiofauna; Tx in GA (WA Co.))

***Dromogomphus*** Selys, 1854 - Gomphidae Odonata dragonflies (3 species in US or Canada)  
***Dromogomphus*** undet. sp. (VA, MD brackish benthic)

***Dythemis*** Hagen, 1861 (pond skimmers) Libellulidae Odonata dragonflies (3 species in US or Canada)

***Dythemis*** undet. sp. (skimmers/Tx or Ac in nMS)

***Enallagma*** Charpentier, 1840 (= *Telleallagma*) Coenagrionidae Odonata damselflies (zygoterid) (37 species in US or Canada)

***Enallagma*** undet. sp. or species (Tx or Ac in cave in Madison Co. & caves in AL; IL, MI lake benthic)

***Epitheca*** Burmeister, 1839 - Corduliidae damselflies (10 species in US or Canada)  
***Epitheca*** undet. species ( MI lake benthic)

***Erpetogomphus*** Selys, 1857 (= *Herpetogomphus* Walsh, 1862 (emend.); *Calogomphus* & *Erpetocyclops* Carle, 1992) (snake darners) Gomphidae Odonata dragonfly (5 species in US or Canada)

***Erpetogomphus*** undet. sp. (TX hyporheic)

***Gomphus*** Leach, 1815 (= *Stylurus* Needham, 1897; *Thanatophora* Selys, 1850; *Gomphurus* Needham, 1901; *Hylogomphus* Needham, 1951 (Unav.); *Hylogomphus* Needham & Westfall, 1955; *Phanogomphus* & *Stenogomphurus* Carle, 1986) Gomphidae Odonata dragonfly (53 species in US or Canada)

***Gomphus cavillaris*** Needham, 1902 (epigean FL, n. to VA/ beaverpond clubtail/ seVA hyporheic)



**Gomphus** undet. sp. or species (common clubtails/ PA, seVA hyporheic; VA, MD brackish benthic)

**Ischnura** Charpentier, 1840 – Coenagrionidae Odonata dragonflies (14 species in US or Canada)  
**Ischnura** undet. sp. or species (VA, MD brackish benthic)

*Ladona* - now as subgenus of *Libellula*

**Lanthus** Needham, 1897 - Gomphidae Odonata dragonfly (2 species in US & Canada)  
**Lanthus parvulus** (*Gomphus p.* Selys, 1854) (seCanada and neUS, s. to SC, w. to MN/ northern pygmy clubtail/ WV hyporheic)

**Libellula** Linnaeus, 1758 (= *Leptetrum* & *Platetrum* Newman, 1833; *Pigiphila* Buchecker, 1876; *Plathemis* Hagen, 1861; *Holotania* Kirby, 1889; *Ladona* Needham, 1897; *Belonia*, *Eolibellula*, *Eurothemis*, *Neotetrum*, *Syntetrum* Kennedy, 1922) Libellulidae Odonata dragonfly (21 species in US or Canada)

**Libellula** (*Plathemis*) *lydia* Drury, 1770 (= *L. trimaculata* De Geer, 1773; *L. seva* Fabricius, 1793) (common whitetail/NA except AK, NWT, SK/ Tx or Ac in AR)

**Libellula** (*Ladona*) undet sp. (MI lake benthic)

**Macromia** Rambur, 1862 - Macromiidae Odonata skimmer (Also put in Libellulidae) (9 species in US or Canada)

**Macromia illinoensis** Walsh, 1862 (epigeal sCanada & eUS, w. to TX/ Illinois river cruiser/ pond in 1 NS cave)

**Octogomphus** Selys, 1873 – Gomphidae Odonata dragonflies (1 species in US & Canada)

**Octogomphus specularis** (*Neogomphus s.* Hagen, 1859) (epigeal Pacific Northwest, BC, s. to n.Mex./ grappletail/ sCA hyporheic)

**Ophiogomphus** Hagen, 1874 (= *Ophionuroides* & *Ophionurus* Carle, 1986) (once put in Aeshnidae) Gomphidae Odonata dragonfly (14 species in US or Canada)

**Ophiogomphus severus montanus** (*O. m.* Selys, 1878) Hagen, 1874 (AB, BC, s. to NV, MT, WY, UT, WA/ snake darner/CO hyporheic)

**Progomphus** Selys, 1854 - Gomphidae Odonata (4 species in US or Canada)

**Progomphus obscurus** (Rambur, 1842) (eUS, n. to CT, w. to OK, TX, KS/ common sanddragon/ Tx in GA (WA Co.)

**Progomphus** undet. sp. (sandy hyporheic in TX)

**Stylurus** Needham, 1897 - Gomphidae Odonata (11 species in US or Canada)

**Stylurus notatus** (*Gomphus n.* Rambur, 1842) (epigeal sCanada, eUS, w. to MO/ elusive clubtail/ Carolinian, Virginian freshwater infauna)

**Telebasis** Selys, 1865 - Coenagrionidae zygopterid Odonata (7 species in US or Canada)

**Telebasis salva** (*Agrion s.* Hagen, 1861; *T. boucardi* Selys, 1868) (epigean sNM, s,wAZ, seUT, sNV, n.,c.CA desert firetail/ Ac in cave in San Saba Co., TX; Tx? in Montezuma Well, AZ)

**Bibl.:** Runk 1996

**Zoniagrion** Kennedy, 1917 Coenagrionidae zygopterid Odonata (1 species in US or Canada)

**Zoniagrion exclamationis** (*Agrion e.* Selys, 1876) (epigean cCA/ Sierra damsel/ exclamation exclamationis/ Ac in seAK cave?)

**oligotrophic** - Adj. for waters or soils low in nutrients or primary productivity but usually with an abundance of dissolved oxygen.

omnivore - See feeding

**ontogeny** - Growth & development of an organism from embryo to adult.

Opisthobranchia (sea slugs and allies). Gastropod superorder of Subclass Heterobranchia. Body is generally uncoiled to some extent and the shell is often lost or reduced. About 100 families. Orders incl. Anaspidea (sea hares), Nudibranchia ('true' **nudibranchs**), Thecosomata (shelled pteropods) & Gymnosomata (naked pteropods).

opossum - See Mammal, opossum.

**opportunistic feeding** - Pertains to a feeding habit where individuals consume the most abundant prey items.

orb - See Araneidae

**organic acids.** Incl. fulvic, humic. White, Smailer & Brennan, 1994; White, 1994

organics - See biomass

**organotroph** - Species that only metabolises organic compounds. Cf. heterotroph & lithotroph.

ornithocopros - Syn: **bird guano** (Def.#2).

**orophilous** - Pertaining to species living in mountainous areas.

**orthogenesis** - Evolution toward a "perfect form," determined by factors internal to the species. Singular or specific evolutionary trends over long periods & which appear independent of natural selection or other factors.

**Orthoptera** - Insect Order (**cockroaches, crickets**, grasshoppers, katydids, locusts, mantids (also put in own order), walking stick (now in Order Phasmatodea) ) with only first two groups found much beyond the twilight zone. Area: NA: Rehn & Grant, 1961

## Ostracods

Phylum Arthropoda, Class or Subphylum Crustacea in Class Maxillopoda, Class or Subclass Ostracoda Latreille, 1806. Ostracoda is divided into Subclass or Superorder Myodocopa (not found in freshwater) & Podocopa. Syns.: mussel & seed shrimps. Mostly 1-2 mm long, Amer. freshwater sp. seldom >3mm., usually <1mm. Unsegmented body encased by bivalve carapace with adductor muscle. Elliptical valves impregnated with calcite. Head appendages well developed but no more than two pairs of trunk limbs (may be absent). Mostly detritivores. Abdomen ends in furcae pair. Sperm among longest of animals, can reach 1mm, 10 times longer than animal. Can swim short distances with antennulae & antennae. Aquatic on bottom or on aquatic plants. Predators, herbivores, filter feeders. Some, especially Entocytheridae, occur in caves as commensals on crayfish, or as fossils in shaly limestones. About 2,300 known living sp., some 10,000 sp. vital as index fossils from Ordovician to Recent, oldest freshwater in Upper Devonian peak evolutionary development in Devonian. Ostracods may have arisen by neoteny from the larvae of barnacles that achieved sexual maturity and dropped the sessile stage.

**Ostracod Bibl.:** Danielopol 1994; Griffiths 1991; Hart & Hart 1969; Hartman 1973; Hobbs 1973, 1975; Hoff 1944a; Maguire 1960; Parasteno 1981. **Areas:** **AK:** Sars 1926; **Appalachia:** Klie 1931; **Canada:** Delorme 1970-1; Sars 1926; **CO:** Marmonier & Ward 1990; **FL:** Furtos 1933; Hart 1959; **GA:** Hobbs Jr. & Peters 1982; **IL:** Hoff 1942a; **IN:** Hobbs 1975; Goins 1972; Tressler 1969; **NC:** Hjobbs, Jr. & Peters 1977; **KY:** Hobbs Jr. & Peters 1976; **MA:** Furtos 1935; **NA:** Downes & Kavanaugh 1988; **NC:** Furtos 1933; Hobbs Jr. & Peters 1977; **OH:** Furtos 1933; **TN:** Hobbs Jr. & Peters 1970-6; **TX:** Tressler 1947, 1949; **US:** Forester 1991; **VA:** Hobbs Jr. & Peters 1970; Peters 1973; **WA:** Dobbin 1941; **West:** Ferguson 1966; World: Danielopol 1976; D., Marmonier, Boulton & Bonaduce 1994; Lescher-Moutoué 1986.

Class or Subclass Ostracoda (in Class Maxillopoda if subclass)

Subclass Myocopa (or Ostracoda)

Order Cladocopina

Superfamily Cytheroidea

Family Candodidae

Subfamily Thalassocypridinae (*Dolerocypria*)

Family Cytheruridae

Subfamily Cytheropterinae (*Cytheropteron*)

Family Loxoconchidae (*Loxoconcha*)

Family Paracytherideidae (*Paracytheridea*)

Family Paradoxostomatidae (*Paradoxostoma*)

Family Parvocytheridae (*Parvocythere*)

Family Polycopidae (also put in Order Myodocopida)

(*Polycope*, *Saipanetta*) (also put in Order Podocopida)

Family Pectocytheridae (*Morkhovenia*)

Family Pontocyprididae (undet. genus: HI Island of Hawaii marine interstitial)

Family Psammocytheridae (*Psammocythere*)

Family Xestoleberididae (*Xestoleberis*)

Order Myodocopida (= Myodocoda or Myodocopina)

Suborder Myodocopa

Family Cypridinidae (*Megalocypris*, undet. genus in LA brackish beach sediment)

Family Sarsiellidae (*Sarsiella*)

Subclass Podocopa

(1-2 two pairs trunk appendages. Endopite = or >exopodite, marine, freshwater)

Order Myodocopida

Suborder Myodocopina

Superfamily Cypridinoidea

Cypridae (all or most genera now in Candoniidae & Cyprididae)

(parthenogenesis common, males unknown in some species) (undet. genus in LA brackish beach sediment)

Cylindroleberididae

(*Asteropella*, *Bathyleberis*, *Diasterope*, *Leuroleberis*, *Parasterope*, *Postasterope*, *Xenoleberis*)

Philomedidae

(*Euphilomedes*, *Harbansus*, *Philomedes*, *Scleroconcha*)

Order Podocopida Sars, 1866

Suborder Podocopina

Infraorder Cypridocopina

Superfamily Cypridacea Baird, 1845

Candoniidae (*Fabaeformiscandona*, *Prionocypris* (now in Cyprididae))

Subfamily Candoninae (*Candona*, *Nannocandona*, *Pseudocandona*)

Cobanocytheridae (*Cobanocythere*, *Paracobanocythere*) (also put in Entocytheridae)

Cyprididae (*Cyclocypris*, *Cyprideis*, *Cypria*, *Megalocypris*)

Subfamily Cypridinae

(*Cypria*, *Eucypris*, *Prionocypris* (once in Cypridae), *Strandesia*)

Subfamily Cyclocyprinae Hoff 1942 (*Cyclocypris*, *Physocypris*)

Cypridopsidae (*Vargula*)

Subfamily Cypridopsinae (*Cavernocypris*, *Cypridopsis*, *Potamocypris*)

Ilyocyprididae (put in Cypridoidea)

Paracyprididae (*Aglaioocypris*)

Superfamily Cypridoidea (also put in Cypridacea)

Ilyocyprididae

Subfamily Ilyocyprinae (*Ilyocypris*)

Macrocyprididae (*Macrocyprina*)

Superfamily Cytheracea Baird, 1845

Cytheridae (also subsumed in Entocytheridae)

Subfamily Candoninae (*Pseudocandona*)

Cytherideidae (*Haplocytheridea*)

Entocytheridae (incl. *Enkylocythere*)

Subfamily Entocytherinae

(*Ankylocythere*, *Cymocythere*, *Dactylocythere*, *Donnaldsoncythere*, *Geocythere*,  
*Hartocythere*, *Ornithocythere*, *Phymocythere*, *Sagittocythere*, *Sphaeromicola*)

Subfamily Limnocytherinae (also put in own family)

((*Limnocythere*, undet. genus in LA brackish beach sediment)

Subfamily Sphaeromicolinae (*Hobbsiella*, *Sphaeromicola*, *Uncinocythere*)

Limnocytheridae (subsumed in Entocytheridae)

Trachyleberididae (*Cythereis*)

Infraorder Darwinulocopina

Superfamily Darwinuloidea Brady & Norman, 1889

Darwinulidae (*Darwinula*)

Subclass Ostracoda

Order Msytacocaridada

Family Derocheilocarididae - See Mystacocaridida

### **Candodidae**

Subfamily Thalassocypridinae (*Dolerocypria*)

**Candoniidae** Kaufmann, 1900 (*Fabaeformiscandona*, *Prionocypris* (now in Cyprididae))

Subfamily Candoninae (*Candona*, *Nannocandona*, *Pseudocandona*)

2 species of undet. genus or genera - parafluvial & shallow, deep, & dry channel

hyporheic in Sycamore Cr. 32 km ne of Phoenix (Maricopa Co.), AZ) Bibl.:Delorem 1970

**Cobanocytheridae** (*Paracobanocythere*) (also put in Entocytheridae)

### **Cylindroleberididae**

(*Asteropella*, *Bathyleberis*, *Diasterope*, *Leuroleberis*, *Parasterope*, *Postasterope*, *Xenoleberis*)

**Cypridae** (all or most genera now in Candoniidae & Cyprididae)  
(parthenogenesis common, males unknown in some species) (undet. genus in LA  
brackish beach sediment) Bibl.: Shaver 1951

**Cyprididae** Baird, 1845 (*Cyclocypris*, *Cyprideis*, *Cypria*)  
Subfamily Cypridinae (*Cypria*, *Eucypris*, *Prionocypris* (once in Cypridae), *Strandesia*)  
Subfamily Cyclocyprinae Hoff 1942 (*Cyclocypris*, *Physocypris*)

**Cypridinidae** (= Cypridininae)  
undet. genus in brackish beach sediment at Lake Pontchartrain, LA

**Cypridopsidae** Kaufmann, 1900 (*Vargula*)  
Subfamily Cypridopsinae (*Cavernocypris*, *Cypridopsis*, *Potamocypris*)

**Cytheridae** (also subsumed in Entocytheridae) (*Pseudocandona*)

**Cytheruridae**  
Subfamily Cytheropterinae (*Cytheropteron*)

**Cytherideidae** (*Haplocytheridea*)

**Darwinulidae** (*Darwinula*)

**Entocytheridae** Hoff, 1942 (incl. *Enkylocythere*)

Subfamily Entocytherinae

(*Ankylocythere*, *Cymocythere*, *Dactylocythere*, *Donnaldsoncythere*, *Geocythere*,  
*Hartocythere*, *Ornithocythere*, *Phymocythere*, *Sagittocythere*, *Sphaeromicola*)

Subfamily Limnocytherinae (also put in own family)

((*Limnocythere*, undet. genus in LA brackish beach sediment)

Subfamily Sphaeromicolinae (*Hobbsiella*, *Sphaeromicola*, *Uncinocythere*)

**Ilyocyprididae** Kaufmann, 1900

Subfamily Ilyocyprinae (*Ilyocypris*)

**Limnocytheridae** Klie, 1938 (subsumed in Entocytheridae)

**Loxoconchidae** (*Loxoconcha*)

**Macrocyprididae** (*Macrocyprina*)

**Paracyprididae** (*Aglaiocypris*)

**Paracytherideidae** (*Paracytheridea*)

**Paradoxostomatidae** (*Paradoxostoma*)

**Parvocytheridae** (*Parvocythere*)

**Pectocytheridae** (*Morkhovenia*)

**Philomedidae** (*Euphilomedes*, *Harbansus*, *Philomedes*, *Scleroconcha*)

**Polycopidae** (*Polycope*, *Saipanetta*)  
**Pontocyprididae** (undet. genus: HI Island of Hawaii marine interstitial)  
**Psammocytheridae** (*Psammocythere*)

**Sarsiellidae** (*Eusarsiella*, *Sarsiella*)  
**Trachyleberididae** (*Cythereis*)  
**Xestoleberididae** (*Xestoleberis*)

**OSTRACOD** species incl.

*Aglaiocypris* Sylvester-Bradley, 1947 – Paracyprididae ostracods  
*Aglaiocypris mauiensis* Hartmann, 1991 (HI Maui Island marine interstitial)

*Amboleberis* L.S.Kornicker, 1981 - Cylindroleberididae ostracods  
*Amboleberis americana* (Muller, 1890) (FL marine benthic)

*Ankylocythere* Hart, 1962 - Entocytheridae ostracods, subfamily Entocytherinae . **Bibl.:** Hobbs Jr. 1966

*Ankylocythere ancycla* Crawford, 1965 (AL, FL,GA, NC epigeal /commensal on Tp crayfish *C.diogenes*, *bartoni*, *P. acutus* a.)

*Ankylocythere coryphodes* Hobbs & Hart, 1966 (TN/commensal on Tp *Cambarus bartoni* b. crayfish)

*Ankylocythere didactylata* Hobbs & Hart, 1966 (TN/commensal on Tp *Cambarus bartoni* crayfish)

*Ankylocythere burkerorum* Hobbs, 1971 (no caves /commensal on Tp *Cambarus d. diogenes* crayfish)

*Ankylocythere copiosa* (Hoff, 1942) (AR, IA, IL, IN, KY, LA, TN, WI/ commensal on Tp *O. immunis*, *virilis*, & *propinquus*, *P. acutus*, a. crayfish)

*Ankylocythere sinuosa* (*Enkylocythere* s. Rioja, 1942) (AL, AR, CA, GA, HI(alien), KY, LA, MS, OK/ Tp in TX) **Bibl.:** J. Baker 1969

*Asteropella* L. S. Kornicker, 1975 - Cylindroleberididae ostracods  
*Asteropella slatteryi* L. S. Kornicker, 1981 (sCA marine infauna)

*Bathyleberis* L.S. Kornicker, 1975 - Cylindroleberididae ostracods

*Bathyleberis garthi* Baker, 1979 (sCA marine infauna)  
*Bathyleberis hancocki* Baker, 1979 (sCA, WA (cf. *B.h.*) marine infauna)

*Candona* Baird, 1845 - Candonidae ostracods, subfamily Candoninae (genus dates from Silurian)

*Candona candida* Muller, 1776 (MA, MT, ND, OR, Europe, central Asia/ CO hyporheic)  
*Candona crogmanniana* Turner, 1894 (epigeal in GA, OH/ MI interstitial)

*Candona exilis* Furtos, 1933 (MI interstitial)  
*Candona jeanelli* Klie, 1931 = *Pseudocandona j.*

*Candona* undet. sp. or species (Pb? in 5 seAK caves; interstitial in MI, NH lake sediments and VA freshwater tidal marsh; seVA hyporheic)

*Cavernocypris* Hartmann, 1964 - Cypridopsidae ostracods, subfamily Cypridopsinae. **Bibl.:**  
Marmonier et al. 1989

*Cavernocypris subterranea* (Wolf, 1920) (\*Head Spr., Bannock Co., ID/interstitial)  
*Cavernocypris wardi* P. Marmonier, C. Meisch & Danielopol, 1989 (interstitial in CO, MT; spr. in MT, WY, NV, CO)

*Cavernocypris* undescr. sp. (parafluvial & shallow, deep, & dry channel hyporheic in Sycamore Cr. 32 km ne of Phoenix (Maricopa Co.), AZ)

*Cobanocythere* Hartmann, 1959 - Cobanocytheridae ostracods  
*Cobanocythere konensis* Hartmann, 1991 (HI Island of Hawaii marine interstitial)

*Cycloocypris* Brady & Norman, 1889 - Cyprididae ostracods, Subfamily Cycloocyprinae  
*Cycloocypris* undet. sp. (Tx or Tp in cave in Orangeburg Co., SC)

*Cypria* Zenker, 1854 - Cyprididae ostracods, subfamily Cycloocyprinae  
*Cypria lacustris* Sars, 1926 (epigeal in MI, TX/ MI interstitial)

*Cypria turneri* Hoff, 1942 (mostly in top 2 cm. of NH lake sediment)  
*Cypria* undet. sp. or species (CO hyporheic; mostly in top 2 cm. of MI lake sediment)

*Cyprideis* Jones, 1856 – Cyprididae ostracods  
*Cyprideis stewarti* Benson, 1959 (CA marine infauna?)

*Cypridopsis* Brady, 1867 - Cypridopsidae ostracods, subfamily Cypridopsinae.

*Cypridopsis helvetica* Kaufmann, 1900 (epigeal in Ottawa, UT, OK/ Tp in cave each in Lampasas & Medina Cos., TX)

*Cypridopsis* near *vidua* (O.F. Muller, 1776) (NA/ commensal Tx or Tp in TX (near *vidua*); interstitial in VA freshwater tidal marsh)

*Cypridopsis vidua obesa* Brady & Robertson, 1869 (= *C.o.*) (artesian well at San Marcos, TX/Tx)  
Reddell 1970

*Cypris* Mueller, 1776 - Cyprididae ostracods, Subfamily Cypridinae  
*Cypris* undet. sp. (MS marine interstitial)



*Cythereis* Jones, 1849 - Trachyleberididae ostracods  
*Cythereis* undet. sp. or species (MS, WA marine interstitial)

*Cytheropteron* Sars, 1866 – Cytheruridae ostracods, Subfamily Cytheropterinae  
*Cytheropteron?* undet. sp. (HI Maui Island marine interstitial)

*Dactylocythere* Hart, 1962 - Entocytheridae ostracods, subfamily Entocytherinae  
**Bibl.:** Hart & Hart 1974; Hobbs 1967

*Dactylocythere ampliakis* Hart & H.1966 (epigean in Warren & Christian Cos., KY/Tx or Tp in cave in Hart Co.,KY)

*Dactylocythere arcuata* (=Entocythere a. Hart & Hobbs, 1961) Hart, 1962 (\*\*type locality cave & Russell C., Jackson Co.,AL/ commensal Tb on *Cambarus (E.) tenebrosus* crayfish/ G1G2)

*Dactylocythere charadra* Hobbs III, 1971 (\*Sinking Cr.,Hoss Cove near Johnson City, WA Co.,TN/ commensal on *Cambarus* crayfish /Tp?)

*Dactylocythere daphnioides* (=Entocythere d. Hobbs, 1955) (commensal WV on prob. Tb *Cambarus nerterius* crayfish/ Tb)

*Dactylocythere falcata* Hobbs & Walton, 1961 (SE/Tp commensal on Tb *Cambarus* crayfish /Hiwasee Crayfish Ostracod/ NC Watch List)

*Dactylocythere jeanae* Hobbs, 1966 (NE, NC, VA /commensal on Tp? *Cambarus d. diogenes*)  
*Dactylocythere macroholca* Hart & Hobbs, 1970 (KY/ commensal on Tp *C. laevis* crayfish)

*Dactylocythere prionata* (E.p. Hart & Hobbs, 1961) Hart, 1962 (type locality cave in Jackson Co. +cave & spr. in Jackson, Warren & Pulaski Cos.,KY/ commensal on St *O. a.packardi* & *O. tenebrosus c.* crayfish/ G3)

*Dactylocythere runki* Hart, 1955 (NC, VA/ TN commensal Tp? on *C. b. bartoni* crayfish)

*Dactylocythere* undescr. sp. (\*cave in Pulaski Co., VA)

*Dactylocythere steevesi* (E.s. Hart & Hobbs, 1961) (type locality cave in Jackson Co.(AL) +KY(Edmonson (Mammoth Cave), Green, Hardin, Hart, Jefferson, Meade, Trigg,Warren,Wayne Cos.) & TN (Clay, Davidson, Franklin, Putnam Cos.)/ Tb commensal on KY *Cambarus tenebrosus*, *O.a.australis*, *O.a. packardi*, *O. pellucidus* crayfish/ G3G4). **Bibl.:** Hart, 1962

*Dactylocythere susanae* Hobbs III, 1971 (type locality cave in Orange Co. +Lawrence, Monroe, WA, Harrison & Owen Cos.,sIN) & Breckenridge, Hart, Pulaski & Rockcastle Cos.,cKY/ commensal on Tb *Cambarus tenebrosus*, *Oconectes inermis i.*, St *O. australis p.* (KY) & *a.*, also on cave Tb *O. i. testii*, Tp *C. laevis* (main host in IN) & *O. immunis*; epigean on *O. laevis*/ G3G4)

***Dactylocythere suteri*** Crawford, 1959 (GA, sVA, NC, PA, SC, TN epigeal/ Tx? commensal on *C.bartoni*, *d. diogenes* crayfish)

***Dactylocythere ungulata*** (*Entocythere u.* Hart & Hobbs, 1961) (type locality cave in Overton Co., TN/ Tp? commensal on *Orconectes pellucidus*, *St. Orconestes australis p.*, Tx, Tp & Tb *Cambarus* crayfish in KY, TN). **Bibl.:**Hobbs III, 1971) Hart 1962

***Darwinula*** Brady & Norman, 1885 - Darwinulidae ostracods

***Darwinula*** undet. sp. (*paglioli* group) (parafluvial & shallow, deep, & dry channel hyporheic in Sycamore Cr. 32 km ne of Phoenix (Maricopa Co.), AZ)

***Darwinula stevensoni*** (*Polycheles s.* Brady & Robertson, 1870; *Polycheles improvisa*) (interstitial in VA freshwater tidal marsh; mostly in top 2 cm. of NH lake sediment)

***Diasterope*** Kornicker, 1975 - Cylindroleberididae ostracods

***Diasterope pilosa*** (WA marine infauna)

***Donnaldsoncythere*** Hart, 1962 - Entocytheridae ostracods, subfamily Entocytherinae

***Donnaldsoncythere donnaldsonensis*** (*Entocythere d.* Klie in Bolivar & Jeannel, 1931) Hart, 1962 (type locality cave in Lawrence Co., + caves in 7 other cos., IN/Tb, St commensal on *Orconectes i. inermis*, *O .i. testii*, *C. laevis* crayfish)

***Donnaldsoncythere tuberosa*** (*E.t.* Hart & Hobbs, 1961) Hart, 1962 (type locality cave in Overton Co. & caves in Putnam Co., both TN +KY(Wyane Co.) & WV (Pocahontas Co.)/ commensal on *Orconectes australis a.*, *inermis t.,i.* & *Cambarus tenebrosus* St or Tp crayfish in TN, KY/ G3G4)

*Entocythere sinuosa* = *Ankylocythere s.*

***Eucypris*** Vavra, 1891 - Cyprididae ostracods, Subfamily Cypridinae

***Eucypris*** undet. sp. (CO hyporheic)

***Euphilomedes*** Poulsen, 1962 (clam shrimps) - Philomedidae ostracods

***Euphilomedes carcharodonta*** (Smith, 1952) (AK, sCA, WA marine infauna)

***Euphilomedes longiseta*** (*Philomedes l.* Juday, 1907) (sCA, WA marine infauna)

***Euphilomedes producta*** Poulsen, 1962 (AK, sCA, WA marine infauna)

***Eusarsiella*** Cohen & Kornicker, 1975 - Sarsiellidae ostracods

***Eusarsiella childi*** L.S. Kornicker, 1986 (FL marine benthic)

***Eusarsiella*** undet. sp. (WA marine infauna)

***Eusarsiella thominx*** L.S. Kornicker, 1987 (sCA marine infauna)

***Eusarsiella zostericola*** (Cushman, 1906) (FL, Virginian marine infauna)

***Fabaeformiscandona*** Krstic, 1972 - Candoniidae ostracods

***Fabaeformiscandona pennaki*** Marmonier & Ward, 1990 (CO, MT hyporheic)

*Fabaeformiscandona* (*Eucandona*) *wegelinii* (Petkovski, 1962) by Sywula, 1974 (Europe, CO & AZ hyporheic)

*Fabaeformiscandona* undet. sp. near *F. wegelinii* (Petkovski, 1962) (parafluvial & shallow, deep, & dry channel hyporheic in Sycamore Cr. 32 km ne of Phoenix (Maricopa Co.), AZ)

*Haplocytheridea* Stephenson, 1936 - Cytherideidae ostracods

*Haplocytheridea setipunctata* Stephenson, 1936 (FL, Virginian marine infauna)

*Harbansus* Kornicker, 1978 – Philomedidae ostracods

*Harbansus bradmyersi* Kornicker, 1978 (CA marine infauna?)

*Hobbsiella* Danielopol & Hart, 1985 - Entocytheridae, Subfamily, Sphaeromicolinae

*Hobbsiella moria* (Hart, 1962) D. & H., 1985 (\*type locality cave in Uvalde Co., TX/Tb),

*Ilyocypris* Brady & Norman, 1889 - Ilyocyprididae ostracods, Subfamily Ilyocyprinae

*Ilyocypris gibba* (*Cypris* g. Ramdohr, 1808; *Ilyocypris* g. Ramdohr, 1808) Brady & Norman 1889 (epigeal in most of E, Midwest and Canadian Prairies/ interstitial in VA freshwater tidal marsh)

*Ilyocypris* undet. sp. or species (CO hyporheic; parafluvial & shallow, deep, & dry channel hyporheic in Sycamore Cr. 32 km ne of Phoenix (Maricopa Co.), AZ)

*Leuroleberis* L.S.Kornicker, 1981 - Cylindroleberididae ostracods, Order Myodocopina

*Leuroleberis sharpei* L.S.Kornicker, 1981 (sCA marine infauna)

*Loxoconcha* Sars, 1966 – Loxonconchidae ostracods

*Loxoconcha* undet. sp. (HI Island of Hawaii marine interstitial)

*Macrocyprina* G.W. Mueller, 1894 – Macrocyprididae ostracods]

*Macrocyprina pacifica* LeRoy, 1943 (CA marine infauna?)

*Megalocypris* Sars, 1898 – Cyprididae ostracods

*Megalocypris* undet. sp. (seVA hyporheic)

*Morkhovenia* Teeter, 1975 – Pectocytheridae ostracods

*Morkhovenia inconspicua* (Brady, 1880) (HI Island of Hawaii marine interstitial)

*Nannocandona* 1845 - Candoniidae ostracods, subfamily Candoninae

*Nannocandona faba* (Eckman, 1914) (Europe (bog) & CO hyporheic)

*Paracobanocythere* J. Gottwald, 1983 - Cobanocytheridae ostracods

*Paracobanocythere hawaiiensis* Goitwald, 1983 (HI Hawaiian, Kauai and Maui Islands marine interstitial)

*Paracytheridea* G.W. Muller, 1894 – Paracytherideidae ostracods

*Paracytheridea* undet. sp. (HI Island of Hawaii (Big Island) marine interstitial)

*Paradoxostoma* Fischer, 1855 - Paradoxostomatidae ostracods

*Paradoxostoma kauaiensis* Hartmann, 1991 (HI Kauai Island marine interstitial)

*Paradoxostoma kunzi* Hartmann, 1991 (HI Kauai Island marine interstitial))

*Parasterope* Kornicker, 1975 - Cylindroleberididae ostracods

*Parasterope barnesi* J.H. Baker, 1978 (WA marine infauna)

*Parasterope muelleri* (Skogsberg, 1920) (FL marine benthic)

*Parasterope pollex* Kornicker, 1996 (Virginian (rare), FL marine infauna)

*Parasterope hulingsi* Baker, 1978 (sCA marine infauna)

*Parvocythere* Hartmann, 1959 – Parvocytheridae ostracods

*Parvocythere maueinsis* Hartmann, 1991 (HI Maui Island marine interstitial)

*Philomedes* Lilljeborg, 1853 – Philomedidae ostracods

*Philomedes dentata* Poulsen, 1962 (CA, WA marine infauna)

*Philomedes globosus* (Lilljeborg, 1853) (Baffin Island (neCanada) marine infauna)

*Phymocythere* Hobbs & Hart, 1966 - Entocytheridae ostracods, subfamily Entocytherinae

*Phymocythere phyma* Hobbs & Hart, 1966 (VA, WV/on Tp *Cambarus bartoni* b. crayfish)

*Physocypria* Vavra, 1897 - Cyprididae ostracods, subfamily Cypridopsinae

*Physocypria pustulosa* (Sharpe, 1897) (US n. to WI/Tx in TX; MN lake interstitial burrower)

*Physocypria* undet. sp. (interstitial in VA freshwater tidal marsh)

*Polycope* Sars, 1866 – Polycopidae ostracods

*Polycope hawaiiensis* Hartmann, 1991 (HA Maui and Hawaiian Islands marine interstitial infauna)

*Polycope* (*Polycopiella*?) undet. sp. (HA Maui Island marine interstitial infauna)

*Postasterope* Kornicker, 1986 – Cylindroleberididae ostracods

*Postasterope barnesi* (*Parasterope* b. Baker, 1978)(sCA marine infauna)

*Potamocypris* Brady, 1870 - Cyprididae ostracods, subfamily Cypridopsinae

*Potamocypris* cf. *fulva* (Brady, 1868) (Ac, Tx or Tp in GA (Walker Co.))

*Potamocypris* undet. sp. (CO hyporheic)

*Prionocypris* Brady & Norman, 1896 - Cyprididae ostracods, subfamily Cypridinae

*Prionocypris canadensis* Sars, 1926 (= *Strandesia* c.?) (Alberta/CO, MT hyporheic),

*Prionocypris* undescr. sp.#1 (\*cave in Travis Co., TX/Tb)

*Prionocypris obesa* (Brady & Robertson, 1869) (MI interstitial)

*Psammocythere* Klie, 1938 - Psammocytheridae ostracods

*Psammocythere hawaiiensis* Hartmann, 1991 (HI Island of Hawaii marine interstitial)

***Pseudocandona*** Kaufmann, 1900 - Cytheridae ostracods, subfamily Candoninae

***Pseudocandona*** cf. *albicans* (Brady, 1870) (CO, MT hyporheic)

***Pseudocandona jeanneli*** (*Candona j.* Klie in Bolivar & Jeannel, 1931) (\*type locality cave in Marengo C., Crawford Co., IN or Mammoth C., KY/ Tb)

***Pseudocandona marengoensis*** (*Candona m.* Klie in Bolivar & Jeannel, 1931) (\*type locality cave in Marengo C., IN/ Tb)

***Pseudocandona*** undescr. sp.#1-3 (CO hyporheic)

***Pseudocandona*** undescr. sp.#4 (Tb in GA (Dade Co.))

***Pseudocandona*** undet. sp. (parafluvial & shallow, deep, & dry channel hyporheic in Sycamore Cr. 32 km ne of Phoenix (Maricopa Co.), AZ)

***Rutiderma*** Brady and Norman, 1896 - Rutidermatidae ostracods

***Rutiderma apex*** K.L. Kornicker & E. Harrison Nelson, 1997 (WA marine infauna)

***Rutiderma lomae*** (Juday, 1907) (sCA, WA marine infauna)

***Rutiderma rostratum*** Juday, 1907 (sCA marine infauna)

***Rutiderma rotundum*** Poulsen, 1965 (sCA marine infauna)

***Sagittocythere*** Hart & Hobbs, 1962 - Entocytheridae ostracods, Subfamily Entocytherinae

***Sagittocythere barri*** (Hart & Hobbs, 1961) Hart & Hobbs, 1962 (type locality in cave in Madison Co., AL/ ectocommusal on *Orconectes pellucidus australis* crayfish in Jackson, Madison, Morgan Cos., AL; on *O.p. inermis* in Crawford, Harrison Cos. & on *O.p. testii* in Monroe Co. (also on unspecified crayfish in Greene, Lawrence Cos.), IN; on *Orconectes pellucidus packardii* in Pulaski & Rockcastle Cos., KY & on *Orconectes pellucidus p.* in Barren, Edmonson (also on *Cambarus tenebrosus* crayfish), Hart, Meade, & Trigg Cos., (also on unspecified crayfish in Breckenridge, Larue, Wayne Cos.), KY, & in Jackson, & Putnam Cos., TN/ G4 )

***Sagittocythere stygia*** (Hart & Hart, 1966) (\*type locality in Mammoth C., Edmonson Co., KY/ ectocommusal on *Orconectes p. pellucidus* crayfish/ G1G2)

***Saipanetta*** McKenzie, 1967 - Polycopidae ostracod

***Saipanetta kelloughae*** Maddocks, 1972 (marine sublittoral interstitial)

***Sarsiella*** Norman, 1869 - Sarsiellidae ostracods

***Sarsiella*** undet. sp. (WA marine infauna)

***Sarsiella texana*** Kornicker & Wise, 1962 (TX estuary marine infauna)

***Scleroconcha*** Skogsberg, 1920 – Philomedidae ostracods

***Scleroconcha trituberculata*** (*Philomedes t.* Lucas, 1931) (CA, WA marine infauna)

***Sphaeromicola*** Paris, 1916 - Entocytheridae ostracods, Subfamily Sphaeromicolinae

***Sphaeromicola moria*** Hart, 1978 (\*type locality cave in Uvalde Co.,TX/Tb commensal on isopod *Cirolanides texensis* isopod/ G1G2) Hershler & Longley 1986,

*Strandesia* Vavra, 1895 - Cyprididae ostracods, subfamily Cypridinae  
*Strandesia canadensis* = *Prionocypris c.*

***Thermastrocythere*** Hobbs & Walton, 1966 - Entocytheridae ostracods, subfamily Entocytherinae

***Thermastrocythere riojai*** (Hoff., 1943) (\*Sinking Cr.,Hoss Cove near Johnson City, WA Co., TN/ Tp? or Tb)

***Uncinocythere*** Hart, 1962 - Entocytheridae ostracods, subfamily Entocytherinae

***Uncinocythere lucifuga*** (Walton & Hobbs, 1961) (ectocommensal on FL Tb *Procambarus* & *Cambarusalachua* crayfish),

***Uncinocythere ambophora*** (*Entocythere a.* Walton & Hobbs, 1959) Hart, 1962 (ectocommensal on FL Tb *Procambarus morrissi* (cave in Putnam Co.) & *P. acherontis* (cave in Palm Sprs.,Seminole Co.,FL (type locality)/ caves only/ G3)

***Uncinocythere equicurva*** Hoff, 1944 (ectocommensal Tx? in FL? on *Procambarus lucifugus a.* & *Cambarusalachua* crayfish)

***Uncinocythere pholetera*** (*E.p.* Hart & Hobbs, 1961) Hart, 1962 (\*type locality cave in Ripley Co.,MO/ ectocommensal on Tb *C. hubrichti* crayfish/ Tb/G1G2)

***Uncinocythere simondsi*** (*Entocythere s.* Hobbs & Walton, 1960) Hart, 1962 (creeks in AL, GA, IL, KY, MS, TN/ Tp ectocommensal in IN, MO & on KY crayfish *St Cambarus australis p.* crayfish)

***Uncinocythere stubbsi*** Hobbs & Walton, 1966 (E to MI,SD/ ectocommensal in KY cave Tp on Tb *Cambarus pellucidus* crayfish)

***Uncinocythere warreni*** Hobbs & Walton, 1968 (\*?type locality cave in Decatur Co.(GA) & possibly caves in Jackson Co.,FL/ ectocommensal on *Cambarus cryptodytes* crayfish/ G1G2/ Tp &/or Pp/ caves only)

***Uncinocythere xania*** (*E.x.* Hart & Hobbs, 1961) Hart, 1962 (type locality cave in Christian Co. + Green Co.,MO/Tp ectocommensal on Tb *Cambarus laevis* in IN; on MO *St C. setosus* & *C. pellucidus* & Tb *Orconestes inermis i.*; epigeal on *O. laevis* & *O. propinquus* crayfish/ G3)

***Uncinocythere zancla*** Hobbs & Walton, 1963 (GA, KY, NC, TN/ ectocommensal on St and/or Tp *Cambarus*, KY on *Cambarus* crayfish/ caves only)

***Vargula*** Skogsbwerg, 1920 - Cypridinidae ostracods  
***Vargula tsujii*** (sCA marine infauna)

*Xenoleberis* Kornicker, 1994 – Cylindroleberididae ostracods

*Xenoleberis californica* (*Baathyleberis c.* Baker, 1979) (CA marine infauna?)

*Xestoleberis* Sars, 1866 – Xestoleberididae ostracods

*Xestoleberis hawaiiensis* Hartmann, 1991 (HI Island of Hawaii (Big Island) marine interstitial)

Otariidae - See mammal, seal. Includes eared seals & sea lions.

otter - See mammal, carnivora

**oxygen** - Abbott 1960; Burbank, Edwards & Burbank 1948; Culver & Poulson 1971; Dickson & Franz 1980; Danielopol & Niederreiter 1987; Dresco-Derouet 1969; Fingerman 1955; Hadley, Ahearn & Howarth 1981; Holsinger & Poulson 1971; Hubbs, Baird & Gerald 1967; McAllister & Fitzpatrick 1985; Norris et al. 1963; Rees 1972; Roth, J. 1986; Wiens & Armitage 1961; Schlagel & Breder 1947

packrat - Syn: woodrat.

paedogenesis - Syn: neoteny.

paedomorphic - Syn: neotenic.

**paedomorphosis** - Evolution that results in retention of juvenile traits into adulthood. May be caused by neoteny, progenesis or post-displacement.

Palaearctic – Once a separate region, now subsumed in Holarctic. Incl. non-tropical Eurasia, nAfrica and much of Arabia

**paleoanthropology** - The study of the biotic and cultural evolution of hominids and abiotic and biotic factors that affect this process.

**paleobiocoenosis** - A fossil grouping with many members of a single community.

**paleobotany** - The study of plant fossils.

paleoecology - See ecology

**paleoendemic** - Survivors of a previous geologic period when the species was more widely distributed. Syn.: relict or conservative endemic, epibiont.

**Paleolithic, Upper** - The third & most recent division of the Paleolithic, characterized by the appearance of humans in the Americas & Australia.

## Palpigrade

Arachnid of Order Palpigradi (= Palpigrada, Palpigradida). 1mm., eyeless, no respiratory system. Cephalothorax with 3 dorsal shields, anterior larger, two posterior smaller. Ventrally has a sternum divided into several plates. Abdomen segmented & extended by multiarticulated tail with many sensorial hairs. Chelicerae formed by three articles, the last two being a pincer. Pedipalps adapted for moving, first pair of legs tactile. Feed on springtails, etc. About 50 species,

mostly in southern Europe, South America and sUS. Syn: microwhipscorpion. Bibl.: Briggs 1986a.

Kingdom Animalia

Clade Metazoa

Clade Eumetazoa

Clade Bilateria

Clade Protostomia

Clade Ecydsozoa

Phylum Arthropoda

Subphylum Chelicerata

Class Archnida

Subclass Micrura

Order Palpigradi

Eukoeneniidae (undet. genus (Kartchner C., Cochise Co., sAZ); *Prokoenenia*)

***Prokoenenia*** Borner, 1901 - Eukoeneniidae palpigrade

***Prokoenenia*** undescr. sp. (\*cave in Harney Co., OR)

***Prokoenenia*** undet. or undescr. sp. or species (cave each in Amador & Calaveras Cos., CA)

palynology - See pollen

pandemic - Pertaining to broad ecologic conditions or widely distributed populations.

para-ecology - Syn: taphonomy.

para-epigeal - Syn: pro-epigeal.

**parafluvial** - Part of the active creek, stream or river channel without surface water.

**parallelism** - Independent evolution of similar traits in two or more genetically connected taxa by similar genetic & developmental pathways.

**parapatric** - Adj. for species with contiguous but non-overlapping geographic distributions. Bibl. - See biogeography.

**parapatric speciation** - Occurs despite minor gene flow between demes. Selection apparently prevents homogenization of immigrant genes by interbreeding.

**paraphyletic** - Adj. for taxon with some but not all descendants of common ancestor. Cf. holophyletic.



**parasite** - An ecology type that derives its food, & usually some other benefit, from another species without killing it but usually causing it some harm. Incl. ectoparasites (live on host), endoparasites (live in host), facultative parasites (complete life cycle as free-living), obligate parasites (always live parasitically), holoparasites (require all nutrients from host), hemiparasites (only require some nutrients), hyperparasites (parasites on or in parasites). Cf. commensalism.

**parasitism** (see annelid, bats, bat fly, copepod, flea, mite, nematode, trematode, worm (cestode))  
- Allen, S. 1933; Brandon 1967; Dyer 1975; Castle et al. 1987; Dyer & Peck 1975; Esser et al. 1985; Faulkner 1989a; France & Graham 1985; Jobling 1949; Keith 1973; Kohls & Jellison 1948; Moore J. 1894; Nichol & Whittaker 1978; Peck 1982c; Relsen et al. 1976; Poulson, Lavoie & Chandler 1990; Robaux et al. 1976-7; Ross 1961; Schmidt et al. 1992; Sprague & Couch 1971; Webb & Campbell 1977; Whittaker 1968; Whittaker & Zober 1978; C. Wilson 1944; Cain 1966; Radovsky 1967; Turner & Jones 1968; Whitaker, Yunkler & Maser 1983;

**parasitoses** - Diseases caused by parasites

**parasitoid** - Endoparasite that causes death of host

**paratype** - Specimens used in the description of a holotype & so designated by the author.

**parietal** - A threshold, wall species. R. Graham 1967

**parous** - Pertains to a female which has given birth (may include females which have been inseminated, not inseminated, pregnant, or lactating. See bat, maternity.

**parthenogenesis** - Self-fertilization of an embryo. Hubbs 1932. Found in cave isopods, crickets, amphipods, rotifers, flatworms, ostracods & thysanurans. Probably more common in hard-to-get-to habitats (such as caves & groundwater ) than in more accessible habitats.

**pauropod** - Pauropoda, a class of myriapodous arthropods. 20 to 2000 per square meter in soils.

Order Tetramocerata, family Pauropodidae - undet. genus & species

(cave each in Linn Co.,IA & Pierce Co.,WI/Tp)

peccary - See mammal, ungulate

pelecypod - Syn: bivalve.

Peracarida - Superorder of Eumalacostracan crustaceans. Incl. mysids, Mictacea, tanaids, cumaceans, Spelaeogriphacea, isopods, & amphipods.

permanent resident - See troglobite & troglophile

pesticide - see human impacts

pesticides - See pollution

pH (see acidification under human impacts)

**phenogram** - A tree-like diagram that shows the amount of similarity between taxa.

**phenology** - Refers to the seasonal timing of the various life cycle processes.

**phenotype** - The structural, physiological, biochemical, behavioral & other traits of an organism. Cf. genotype.

**pheromone** - Chemical released by an animal & which elicits a response in other individuals of the same species. Sex pheromones (=sex attractants) are used to attract the opposite gender. Aggregation pheromones attract members to a host plant or repel them if the density is too high. Alarm pheromones communicate danger to other members of a species. Trail pheromones are used to mark trails for other members of a species.

pholeophile - Syn: troglophile.

**phoresy** - Dispersal by clinging to the body of a larger animal.

**phoretic** - Ecology type that appears parasitic but is on an animal for the ride. Not commensal or mutualistic.

## Phoronida

Twelve recognized species in two genera (*Phoronis* and *Phoronopsis*) in this marine phylum. They live in chitinous tubes on ocean bottoms. Unlike annelids, their gut is u-shaped with anus near the mouth. Lophophores can regenerate.

Kingdom Animalia

Clade Metazoa

Clade Bilateria

Clade Lophotrochozoa (=Lophoporata)

Phylum Phoronida

***Phoronis*** Wright, 1856 - Phoronidae phoronid

***Phoronis architecta*** Wright, 1856 (Virginian (rare), FL marine infauna)

***Phoronis hippocrepi*** Wright, 1856 (FL marine benthic)

***Phoronis mulleri*** (FL, LA marine benthic)

***Phoronis psammophila*** Cori, 1889 (= *P. architecta* Andrew, 1890; *P. sabatieri* Roule, 1890) (FL, TX estuary marine infauna & interstitial)

***Phoronis*** undet. sp. or species (CA, TX, WA, Virginian infauna)

***Phoronopsis*** - Phoronidae phoronids

***Phoronopsis harmeri*** Pixell, 1912 (= *P. viridis* & *P. striata* Hilton, 1930; *Phoronis pacifica* Torrey, 1901) (AK, WA marine infauna)

phosphorescence - see bioluminescence

photo-autotroph - See bacteria

**phototaxis** - Species motion affected or directed by light

**phreatic zone** - Subsurface water saturated areas not affected by surface water flow. Below or adjacent to hyporheic areas.

**phreatobia** - Meiofauna fauna found in groundwater below the water table. Incl. phreatobite & hyporheic. (in title) - Crawford 1976d; Lewis, J. & Holsinger 1985

**phreatobiology** - Scientific study of the systematics, ecology & biogeography of freshwater meiofauna. Danielopol 1982

**phreatobite** - Phreatobia found only in subsurface water & at spring outlets. Abbrev. as Pb.  
**phycology** - The study of algae.

**phyletic gradualism** - Morphologic evolution both gradual & continuous. Syn: gradualistic speciation. Cf. punctuated equilibria.

## Phyllocarids

Subphylum Crustacea

Shrimp/turtle- like. About 25 primitive, marine species, .6-4 cm., elongate body and end in a large, 2-valved carapace with a small plate covering the head. 8 Abdominal segments (incl. telson) instead of 7 of other malacostracans. 8 pairs of similar, foliaceous, biramous thoracic appendages produce current for filter feeding. Differ from malacostracans in their extra abdominal 'phyllopodous' thoracic appendages. From intertidal to about 400 meters esp. in low oxygen areas, one in hydrothermal areas.

Subclass Malacostraca

Subclass Phyllocarida,

Superorder or Order Leptostraca

Order Nebaliacea or Leptostraca

Family Nebaliidae (*Nebalia*)

*Nebalia* (= *Epinebalia*) Leach, 1814 - Nebaliidae phyllocarid crustacean

*Nebalia daytoni* Vetter, 1996 (sCA, BC, WA marine infauna)

*Nebalia pugettensis* (Clark, 1932) (sCA, BC, WA marine infauna)

**phylogenetic tree** - A dendrogram or other diagram showing evolutionary relationships between related taxon.

**phylogenetic systematics** - 1. The study of the evolutionary history of taxon. 2. Such a study by means of cladism.

phylogenetics - Bibl. - See evolution

**phylogeny** - The evolutionary history (=genealogy) of any group of organisms and the relationships between different taxa.

**phylum** - A major group in taxonomy below sub-kingdom & kingdom. Incl. Nematomorpha, Anthozoa, Annelida, archeocyatha, Arthropoda, Chilopoda, Dioplopda, Symphyla

**physiognomy** - The form & structure of natural communities. Cf. morphology.

physiology (see metabolism) - Ahearn & Howarth 1982

**phytogenic** rock - Biogenic rock directly resulting a species actions.

**phytokarst** - Produced by boring algae and/or fungi, typically with small to medium scale sharp ridges & points. Black phytokarst is biokarst where algal attack produces randomly oriented spongelike surfaces like lacework with a black coating.

**phytophage** - Animal which feeds on living green plants. Bibl. - See scavenger.

**phytoplankton** - Photosynthetic (algae and cyanobacteria) species suspended in water.

**picoplankton** - .2 to 2 microns, mostly cyanobacteria

pictographs - Faulkner 1992

**pigment** - Chemical that imparts color to an object by reflecting or transmitting only certain light rays & absorbing others. Many Tbs have lost pigment. Bibl. - See evolution, regressive.

caratenoids: Wolfe & Cornwell 1964

pika - See mammal

pill bug - Syn: isopod.

pinniped - Of Mammal order Pinnipeda; in sea caves. Incl. **Mammal**, seal, sea lion, & **walrus**.

pioneer - A species or individual that colonizes a depauperate or barren area.

**plague** - Can be carried by Ttx rodents in West. Control by DDT polluted some caves in CA,OR. Kartman 1962

**plankton** - Biocoenoses of aquatic species, floating in open water. Cf. necton. Incl. zooplankton & phytoplankton (plants). Freshwater limnoplankton are mostly the size equivalent of meiofauna & incl. microplankton (.05-1mm; incl. **rotifers**, most **worms**) & nannoplankton (<50 microns; incl. most algae, protists (ciliates, esp. Phytoflagellates), monera). Larger but rarer are mesoplankton (1-5mm), especially small crustaceans (most **branchiopods**, **isopods**, **amphipods**). Eulimnoplankton live in open waters of large lakes. Heleoplankton in ponds may also be benthic esp.as juveniles. Telmatoplankton in small ponds & puddles often burrow into mud & form resistant resting stages during drought. Currents carry species from other biocoenosses to form tychoplankton (amoebas, **rotifers**, **nematodes**, chironomid **fly** larvae). **Bibl.:** Scott 1909

planthopper - See Homoptera

**plants** - Cole 1982-3; fossil - Madsen & Rhode 1990; Van Devender 1977; Well 1969. See pollen. *Celtis* hackberry seeds replaced by calcite in MT)) Moreland1961

**Platyhelminthes** (flatworms) (see worms)

Animal of clade Bilateria, Phylum of worms with four classes: **Turbellaria**, **Trematoda**, Monogenea (both commonly called flukes), & **Cestoda** (see worms, tapeworms). May

Form a sister group to both protostomes and deuterostomes, arising before those groups diverged.

**pleiotropic** - Pertaining to a gene that has more than one phenotypic effect.

**plesiotypical** - Conservative or unmodified attribute or morphic trait. Syn.: plesiomorphic

**pleosponge** - Syn: archeocyathid & included with fossil sponge.

**pollen** - paleo - Brook, Burney, Cowart & Ellwood 1990; Brook, Keferl & Nickmann 1988; Brook, Burney & Cowart 1990; Bushman 1969; Mulewich 1988

**pollution** (see **bats, human impacts**) - Green, Elliott & Crawford 1990; Holsinger 1963, 1966; Hobbs III 1995b; Nicholas 1963; Praeger 1972; Schindel 1984; K. Simon 1994; Simon & Buikema 1997 Steever 1995; Febroriello 1983; George 1973; Holsinger 1963; Mahler 1997; Rusterholtz 1989; Streever 1992a; Thenhaus 1973

**bacterial** - Butoryak 1988; Nemetz et al. 1994;

**carbide** - Lavoie, 1980a. 1981d; Peck 1969; Garrison 1968; Hoey 1979

**chlorination** - Matthews, Bosnak et al. 1977

**coliform** - Hoey 1971; Simon & Buikema 1997

**dieldrin** - Luckens & Davis 1965;

**DDT** - Butcher, Kirknel, & Zabik 1969

**gasoline/oil** - Estes 1984; Hobbs III 1987, 1989

**heavy metals** - Bosnak & Morgan 1981; Dickson, Briese, & Giesey 1979, 1981; Dickson, Giesey & Briese 1982; Lewis 1996; Plenet et al. 1992; Vermeer 1972; Plenet 1995

**ions** - Scanlon 1990

**monitoring** - Plenet 1995; Plenet et al. 1992; Poulson 1988;

**nitrates** - E. Wells & Krothe 1989

**nutrient enrichment** - Hakenkamp 1991; Holsinger & Buikema 1979a; Jablonsky 1992a; Simon & Buikema 1997; Stolzenburg 1995

**polyestrous** - Pertains to species that have two or more estrous cycles per year.

**polygyny** - A mating system involving the access of a single male to more than one female during a mating season.

**polymorphic** - Occurring in several different forms. Noun: polymorphism.

**polyphyletic** - Evolving from more than one group of organisms. A polyphyletic group is a taxon in which not all species evolved from a common ancestor

**polyphyly** - Presence of taxa of members who are polyphyletic.

**polythetic** - Taxon classification based on traits common to most of the members of that group.

**polytomy** - A node in a phylogenetic tree with more than two descendant nodes.

polytrophic - See omnivore.

**polytopism** - The independent origin of a species or group in more than one area.

**polytypic** - Adj. for species with distinct geographic races or subspecies.

**polytypy** - A species with several forms separated geographically. Adj. polytypic. Cf. polymorphism.

**polyvoltine** - Adj. for species with several generations per season. Cf. univoltine.

**population** - The number & distribution of individuals in a species. Incl. abundant, accidental, alien, age/stage/size, barriers, biodiversity, breeding, casual, (fairly) common, communities, density/cover, distribution, endemic, extinct, extirpated, growth (decrease, increase, seasonal, stable), irregular, local, migrant, mortality, nesting, permanent, range, & uncommon. Bruce 1976; Dickson 1982; Green 1964, 1964a; Hellman 1989; Jegla, Poulson & Cooper 1965; Kane 1981, 1982; Kane & Ryan 1983; Laing, Carmody & Peck 1976a; Mitchell 1970; Peck 1975; Poulson 1969; Studier et al 1988; Swofford 1982;

**ecology** - Collins & Holsinger, 1981; Conrads, 1969;

**fluctuations** - A. Williams 1980; Studier, Lavoie, Nevin & McMillin 1988a

**seasonality** - Keith 1975a

**sex ratios** - Culver & Holsinger 1969; Goad 1983; Kane 1981; Tinkle & Patterson 1965; Tinkle & Milstead

**structure** - Studier, Lavoie, Nevin & McMillin 1988

porcupine - See mammal, rodent

**post-partum estrus** - Anestrus immediately following birth. Cf. polyestrous.

**potamon** - The spring zone below the rhithron extending to the sea or a large lake, where the annual range of monthly mean temperature rises above 20° Centigrade, where the flow is slow (except during seasonal peaks such as spring floods) in temperate and polar regions, and during the monsoon in the tropics) and nearly laminar over substrates of predominantly sand with some mud and silt; where there may be partial light extinction from turbidity and where oxygen deficiencies may develop.

prairie dog - See mammal, rodent

**pre-adapted** - Possessing adaptations that would contribute to survival in a habitat other than the immediate one because of similarities in living conditions in the two habitats. Insects that live in low nutrient litter, for example, may be pre-adapted to cave life. The current preferred term is exadaptation because preadaptatino implies a preparation for adapting to a new environment.

**predation & prey (see feeding)** - Burger, J. et al. 1992; Culver 1975; Griffith 1990; Kane 1974, 1984; Kane & Poulson 1973; Man & Fong 1991; Munson & Keith 1984; Newman & Waters 1984; Norton 1984; Richards, P. 1989, 1991; Romero, A. 1985a; Studier 1996; Weeks & Hespeneide 1985

**predator** - An ecology type in which a species kills & eats other species for food.

present - Syn: current.

**prey** - A living animal captured for food by another animal.

**primary productivity** - In a body of water, the rate of photosynthetic carbon fixation by plants & bacteria forming the base of the food chain. Cf. productivity.

**pro synonym.** - Abbrev. for pro synonymon (as synonym).

**pro-epigean** - Said of the area from a cave entrance to the limit of the twilight zone. Incl. threshold trogloniles (TTP) & trogloniles (Ttx)

**procaryotes** - Species who lack nuclei. Now divided into Kingdoms Bacteria (=Eubacteria) & Archaea (=Archaeobacteria),

**procyonid** - In Procyonidae, **mammal** carnivore family that incl. coatimundi & ringtails.

**producers** - Species that make their food from sunlight or other nonliving substances.

**production** - 1. Growth of lake organisms. 2. Rate of total amount of organisms grown.

**productivity** - Aquatic fertility. 2. The capacity of a lake to produce a particular organism. 3. Primary productivity. Incl. bottlenecks (nutrient & energy). 4. Production.

Bibl.: Corey, 1987; Hendry, et al. 1993; Lewis, W., 1991; Momot & Gowing, 1977a; Weingartner, 1977; Wood, et al., 1993

**progenesis** - Paedomorphosis more complete than neoteny, where development is cut short by early onset of maturity & adult resembles the juvenile stage of its ancestor.

**pronghorn** - Artiodactyl **mammal** ungulate.

**protandry** - Hermaphroditism in which the female stage follows the male stage.

Proteobacteria (= purple bacteria) – A phylum of Gram-negative bacteria divided into five groups (alpha, beta, gamma, delta & epsilon ( a deep division within delta). Many proteobacteria photosynthesize differently than other bacteria and use bacterial chlorophyll a. except where it has been lost in some species. Closest relatives of heterotrophs may be chemolithotrophs. Anaerobes and aerobes sometimes are closely related. Aerobic respiration has arisen independently several times.

protists - See protozoa.

**protocols** - Nicholas & Brucker 1965; Poulson 1988

**Protostomia** – One of the two clades of Bilateria animals. All animal embryos form a hollow gastrula with an indentation (blastophore) that sometimes becomes the mouth in Protostomia but never in Deuterostomia. Includes all bilaterians except Pterobranchia, Echinodermata, Enteropneusta (acorn worms) and chordates.

**protonymph** - First nymphal instars in many mite life cycles.

## Protists

Informal superphylum that includes all kingdoms of animal-like protoctists (and sometimes protophytes) whose members are mostly unicellular, although some form colonies and others may have more than one nucleus. Once considered a kingdom or phylum. Their plant-like counterparts, protophytes, are usually known as various **algae** (sometimes placed there are the grass-green flagellates (Division Euglenophycota; Class Euglenophyceae; Order Euglenales: Euglenaceae). Plant-like counterparts, protophytes, are usually known as various algae & diatoms. Protozoa incl. several phyla of unicellular or colonial organisms that may have little in common with each other. Some protists have differences in somatic and generative (reproductive) cells but different tissues are never formed.

**Bibl.:** Gittleson 1969; Gittleson & Hoover 1969, 1970; Golemansky 1994; Kofoid, 1899; Plafkin 1975; Sprague & Couch 1971; Thompson & Olson 1988; McDonald & Evans 1956; Rossman 1959

Subkingdom Myxobionta

Division Acrasiomycota

Order Dictyosteliida (=Acrasiales) (cellular slime molds)

Dictyosteliaceae (*Dictyostelium* (also put in Mycetozoida), *Polysphondylium*)

Phylum Ascomycota = Haplospora

Phylum Ciliophora

Subphylum Ciliophora (ciliates) (also in own phylum or class under Mastigophora))

Class Ciliata (= Ciliata)

Subclass Holotricha

Order Microthoracida

Subclass Choreotricha

Order Oligotrichida

Subphylum Cyrtophora (or as class under Subphylum Mastigophora)

Class Oligomenophorea

Subclass Peritrichia or Oligohymenophorea

Order Peritrichida (also put in Subphylum Cyrtophora)

Subclass Holotrichia (incl. Enchelyidae, Prorodontidae)



Order Gymnostomatida (incl. Colepidae)

Class Coccidiasina

Order Eucoccidiorida

Class Litostomatea (or as order under Subclass Rhabdophora)

Subclass Haptoria

Order Haptorida

Order Pharyngophorida

Class Heterotrichea

Order Amophorida

Order Odontostomatida

Class Oligohymenophorea (or as Subclass under Class Cyrtophora)

Subclass Hymenostomatia (or as order)

Order Hymenostomatida

Order Astomatida

Order Sessilida

Class Polyhymenophorea

Order Heterotrichida

Class Sporozoasida

Order Archigregarinorida

Suborder Aseptatorina (Lecudinidae: *Monocystella*)

Order Coccidia: Suborder Adeloerina (Klossiellidae: *Klossiella*)

Subclass Telosporea

Order Eugregarinorida

Subphylum Oligomenophora: Hymenostomata

Orders Hymenostomatida & Hypotrichida

Class Nassophorea (or as subclass under Class Cyrtophora)

Subclass Nassophoria (or as order)

Order Peniculida

Class Phyllopharyngea

Subclass Phyllopharyngia (or as order under Subclass Cyrtophora)

Order Cyrtophorida

Order Exogenida

Class Kinetofragminophoba (=Prostomatea (once incl. Prostomatida))

Subclass Gymnostomata

Infraorder Karyorelictea  
Orders Cryptophorida, Karyorelictida, Prorodontida

Subclass Hypostomatia  
Order Synhymeniida

Subclass Suctoria (or as order under Subclass Phyllopharyngea)  
Order Automatida  
Order Exogenida

Order Gymnostomatida  
Order Hymenostomatida  
Order Scuticociliatida

Subclass Vestibulifera  
Order Trichostomatida

Phylum Microspora, (Amblyosporidae)  
Class Myxozoa (Subclass Myxosporea: order Bivalvulida)  
Class Ascetospora

Phylum Myxozoa (now considered Cnidarians by some authors)  
Class Myxosporea  
Order Bivalvulida

Class Microsporea  
Order Microsporida

Phylum Sarcomastigophora (amebas, flagellates, opalinids)  
Subphyllum Mastigophora  
Order, Class or Division Cryptophyta

Class Phytomastigophorea  
Order Chrysomonadida  
Order Cryptomonadida

Order Dinoflagellid  
Order Euglenida  
Order Volvocida

Subclass Spirotrichia  
Order Armophorida  
Infraorder Spirotrichea

Order Heterotrichida (= Heterotrichea)  
Order Rhabdomonadales  
Order Stichotrichida (= Sticotrichea)

Subclass Zoomastigia  
Order Protomastigida (now in Zoomastigophorea)  
Order Proteomyxida (now in Sarcodina)

Order Mycetozoida  
Order Protomonadina  
Order Amoebida

Division: Euglenophycota  
Class Euglenophyta or Euglenophyceae (zooflagellates or Zoomastigophorans)  
Order Sphenomonadales  
Order Heteronematales

Subclass Euglenozoa  
Order Zoomastigophorea (or class; nonphotosynthetic flagellates)

Subclass Zoomastigina (also elevated to Class Zoomastiphora)  
Order Cercomonadida  
Order Protomonadina  
  
Order Kinetoplastida  
Order Protomastigida (also placed in Prostomatea)  
Order Phytomastigophorea (also as class)

Superclass or Phylum Rhizopoda  
(Sub)class Filosea (now in Rhizopoda)

Class Lobosea  
Division Protophyta,  
Subclass Gymnamoebia  
Order Schizopyrenida

Subclass Testaceolobosa  
Superorder Reticulobosa  
Order Beggiatoales  
Order Arcellinida.

Superclass, Class or Subphylum Sarcodina  
Order Aconchulinida  
Suborder Gromiina (or as Order Gromiida)  
Euglyphidae (or in Euglyphina)  
  
Suborder Euglyphina  
Euglyphidae (or in Gromiina) (*Euglypha*, *Paraeuglypha*)  
Cypoderiidae (*Cyphoderia*)  
Vampyrellidae (*Astrodisculus*, *Nuclearia*)

Order Sarcodina

Subclass Lobosea  
Order Amoebida

Class Actinopodea  
Subclass Radiolaria Or Order Radiolarida  
Subclass or Order Proteomyxida

(Sub) class Filosea (now in Rhizopoda)

Subclass Heliozoidea (heliozoans; sun animalcules)  
(or Order Helizoda or Class Heliozoa)

Order Actinophryida  
Order Centrohelida

Order Ciliophryida (= Ciliophrida)  
Order Rotosphaerida: Heterophrys (now in Centrohelida)

Class Nassophorea (also put in Ciliophora)  
Subclass Nassophoria  
Order Euplotida

Order Peniculida (see above)  
Order Schizomycetes

Class Rhizopodea  
Order Foraminifera (=Foraminiferida)  
Suborder Fusulinidea  
Superfamily Fusulinacea (*Parafusulina*)

Suborder Textulariina

Superfamily Lituolacea  
Lituolidae  
Subfamily Haplophragmoidinae (*Haplophragmoides*)

Suborder or Order Rotaliina  
Elphidiidae (*Elphidiella*)

Order Aconchulinida  
Suborder Euglyphina  
Euglyphidae (or in Gromiina) (*Euglypha*, *Paraeuglypha*)

Cypoderiidae (*Cyphoderia*)  
Vampyrellidae (*Astrodisculus*, *Nuclearia*)

Suborder Gromiina

Euglyphidae (*Euglypha*)

Order Actinophryida

Actinophryidae (*Actinophrys*)

Order Amoebida

Suborder Bubulina

Superfamily Gymnamoebia

Amoebidae (*Amoeba*)

Suborder Thecina

Discamoebidae (*Vannella*)

Suborder Tubulina: Hartmannellidae (*Hartmannella*, *Saccamoeba*)

Order Armophorida = Heterotrichida

Order Arcellinida

Diffugiidae (*Diffugia*)

Arcellidae (*Arcella*, *Centropyxis*),

Hyalospheniidae (*Wailesella*)

Nebelidae (*Nebela*)

Paraquadrulidae (*Quadrulella*)

Order Archigregarinorida

Suborder Aseptatorina

Lecudinidae: *Monocystella*)

Order Astomatida

Haptophryidae (now in Euglinida) (*Cepedietta*, *Haptophrya*)

Order Bivalvulida

Sphaerosporidae (*Chloromyxum*)- protist?, metazoan, bilaterian

Order Centrohelida

Heterophryidae (*Heterophrys*) (once in Raphidiophryidae)

Raphidiophryidae (also put in Phaneraxohelida & Centroplasthelida)

(*Heterophrys* (now in Heterophryidae), *Oxnerella*, *Raphidiophrys*, *Raphidocystis*)

Order Cercomonadida

Superfamily Zoomastigophorea

Cercomonadidae (*Cercomonas*)

Order Chrysomonadida

Ochromonadidae (also put in Order Ochromonadales) (*Spumella*)

Superfamily Chromulinacea: Chromulinaceae (*Monas*, *Oikomonas*)

(also put in Chrysophyta algae)

Superfamily Dinobryacea: Dinobryaceae (*Codonoeca*)

Order Ciliophrida (=Ciliophryida)

Heliozoa: Dictyochophyceae (*Ciliophrys* (pedinellid))

Order Coccidia

Suborder Adeloerina

Klossiellidae (*Klossiella*)

Order Colpodida

Colpodidae (*Colpoda*)

Order Cryptomonadida

Goniomonadidae (*Chilomonas*, *Goniomonas*)

Order Crytophorida

Suborder Chlamydodontina:

Chilodonellidae (*Chilodonella*)

Chlamydomonadidae (*Chlamydomon*, *Chlamydomonas*, *Sphaenochloris*)

Suborder Dysteriina

Dysteriidae (*Trochilia*)

Order Cryptophyta

Cryptophyceae (*Guillardia*)

Katablepharidaceae (*Cryptaulax*)

Order Dinoflagellida

Gymnodiniaceae (*Gymnodinium* (or in Gynodiniidae), *Amphora* (now in algae Pennales))

Suborder Diniferina

Peridiniidae (*Ceratium*, *Peridinium*)

Order Eucoccidiorida

Suborder Eimeriorina: Eimeriidae (*Archeococcia*, *Eimeria*, *Isospora*)

Suborder Haemospororina: Plasmodiidae (*Polychromophilus*)

Order Euglenida

Suborder Scytomonadina

Peranamaceae (*Anisonema*)

Petalomonadeae (*Petalomonas*, *Scytomonas*) (see below)

Suborder Euglenina

Superfamily Euglenoidea

Euglenaceae (*Trechelomonas*)

Euglenophyceae (*Astasia*, *Colacium*, *Distigma*, *Entosiphon*)  
Euglenidae (*Euglena*, *Phacus*)

Order Eugregarinorida

Suborder Aseptatorina

Lecudinidae (*Lankesteria*) (also in Diplocystidae in same suborder)

Order Exogenida

Podophryidae (*Podophyra*, *Sphaerophyra*)

Order Gromiida

Infraorder? Filosea

Suborder Gromiina

Pseudodifflugiidae (*Pseudodifflugia*)

Suborder Euglyphina

Euglyphidae (*Trinema*)

Order Gymnostomatida

Actinobolinidae (*Actinobolinida*) (or in Pharyngophorida)

Rhabdophorina: Placidae (*Placus*) (or in Prorodontida)

Colepidae (once in Prorodontida) (*Coleps*)

Prorodontidae (*Prorodon*, *Pseudoprorodon*, *Rhagdostoma*, *Urotricha*)

Order Haptorida

Enchelyidae (also put in Subclass Holotrichia) (*Enchleys*)

Lacrymariidae (*Lacrymaria*) (also put in Enchelyidae)

Spathidiidae (*Spathidium*)

Order Heteronematales

Peranemeae or Peranemaceae (*Peranema*, *Urceolus*)

Peranemidae or Peranemaceae (*Heteronema*)

Suborder Heteronematina

Haptophryidae (*Heteronema*, *Haptophrya*)

Order Heterotrichida

Suborder Heterotrichina

Caenomorphidae (*Caenomorpha*)

Holostichidae (*Paraholosticha* (now in Urostylidae), *Trichotaxis*)

Keronidae (*Epiclintes*)

Peritromidae (*Peritromus*)

Spirostomidae (*Blepharisma*, *Gruberia*, *Metopus*, *Spirothomum*)

Urostylidae (*Paraholosticha* (also put in Holostichidae), *Paraurostyla*, *Urostyla*)

Superfamily Heterotrichea

Metopidae (*Metopus*) (also put in Order Armophorida)

Superfamily Stentoridea

Stentoridae (*Stentor* (large ciliate))

Suborder Prorotrichina

Didiniidae (*Didinium*)

Suborder Sporadotrichina

Oxytrichidae (*Gastrostyla*, *Oxytricha*, *Stylonychia*, *Tachysoma*, *Urosoma*)

Suborder Rhabdomonadina

Rhabdomonidae (*Gyropaigne*)

Bobonidae (*Rhynchomonas*) (also put in Kinetoplastida),

Petalomonadeae (*Scytomonas*) (put in Heteronematina but of uncertain affinity)

Suborder Hymenostomatida

Urocentridae (*Urocentrum*)

Suborder Peniculina

Parameciidae (*Paramecium*),

Suborder Hymenostomatina

Tetrahymenidae (*Tetrahymena*)

Turaniellidae (*Colpidium*)

Suborder Ophryoglenina

Ophryoglenidae (*Ophryoglena*)

Suborder Tetrahymenina

Tetrahymenidae

Order Hypotrichida (*Balladyna*, *Stichotricha*) (all now in Stichotrichida)

Aspidiscidae (*Aspidica*)

Euplotidae: (*Euplotes*)

Order Kinetoplastida (families now subsumed in Protomastigida)

Trypanosomatidae (also put in Protomastigida) (*Heteromyoxuris*)

Bobonidae: Bodoninae: *Bodo*, *Cercobodo*. *Pleuromonas*, *Rhynchomonas*),

Order Loxodida

Geleidae (*Geleia*)

Loxodidae (*Loxodes*)

Order Microsporida

Amblyosporidae (*Amblyospora*)



Order Microthoracida

Discotrichidae (*Discotricha*)

Order Odontostomatida

Epalxellidae (*Saprodinium*)

Order Oligotrichida

Halteriidae (*Halteria*)

Strombidiidae (*Strombidium*)

Suborder Tintinnina

Codonellidae (*Coldonella*)

Order Peniculida

Frontoniidae (*Frontonia*),

Urocentridae (*Urocentrum*)

Suborder Frontoniina

Lembadionidae (*Lembadium*)

Order Pleruostomatida

Amphileptidae (*Litonotus*, *Loxophyllum*)

Order Proteomyxida: Aspidiscidae (*Aspidisca*, *Nucleria*)

Order Protomonadina: Craspedomonadidae (*Salpingocoecca*)

Order Protomastigida

Katablepharidaceae (*Phyllomitus*)

Bobonidae: *Bodo*, *Cercobodo*, *Pleuromonas*, *Rhynchomonas*)

Trypanosomatidae (*Leptomonas*, *Trypanosoma*)

(also put in Suborder Trypanosomatina, Order Hypermastigida)

Order Pharyngophorida

Actinobolinidae (Actinobolinida) (or in Gymnostomatida)

Tracheliidae (*Dileptus*) (now in Prostomatida)

Order Prostomatida (*Prorodon* (now in Prorodontida)

Suborder Haptorina

Enchelyidae (*Chilophrya*)

Spathidiidae (*Perispira*, *Spathidium* (now in Haptorida))

Tracheliidae (*Dileptus*)

Suborder Prostomatina

Metacystidae (*Metacystis*)

Order Rhabdomonadales

Rhabdomonidae (*Rhabdomonas*)

Order Schizopyrenida: Vahlkampfiidae (*Tetramitis*, *Vahlkampfia*)

Order Scuticociliatida

Suborder Philasterina

Cinetochilidae (*Cinetochilum*)

Loxocephalidae (*Loxocephalus*)

Philasteridae (*Loxocephalus*, *Paranophrys*, *Parauronema*, *Paratetrahymena*)

Pseudocohnilembidae (*Pseudocohnilembus*)

Uronematidae (*Uronema*)

Suborder Pleuronematina

Cyclidiidae (*Cyclidium*, *Cristigera*)

Pleuronematidae (*Pleuronema*)

Order Sessilida

Suborder Sessilina

Epistylidae (*Epistylis*),

Vorticellidae (*Vorticella*, *Vortex?*), Vaginicolidae (*Cothurina*),

Order Sphenomonadales

Suborder Sphenomonadina

Anisonemidae or Anisonemataceae (*Anisonema*)

Petalomonadae (*Petalomonas*, *Rhyncomonas*, *Scytomonas* (or uncertain classification))

Order Stichotrichida

Amphisiellidae (*Eschaneustyla*)

Suborder Stichotrichina

Spirofilidae (*Balladyna* (now in Heterotrichida Holostichidae), *Stichotricha*)

Urostylidae - now in Heterotrichida

Suborder Sporadotrichina

Trachelostylidae (*Trachelostyla*)

Order Synhymeniida

Scaphiodontidae (*Chilodontopsis*)

Order Trichostomatida

Suborder Trichostomatina

Coelosomididae (*Conchostoma*)

Order Volvocida (*Lobomonas*, *Phacotus*, *Polytoma*) (all now in green algae)

*Actinophrys* Ehrenberg, 1830 – Order Actinophryida: Actinophryidae protists  
*Actinophrys sol* Ehrenberg, 1830 (soil/Mammoth C.,KY & cave in Rockcastle Co., KY))

*Amblyospora* Hazard & Oldacre, 1975 - Order Microsporida, Amblyosporidae protists

*Amblyospora californica* Hazard & Dacre, 1975 (*A. (Thelohania) c.*) - parasite in Tp  
*Acanthocyclops vernalis* copepod)

*Amoeba* Bory de St. Vincent, 1822 (see *Hartmannella*) Order Amoebida, Amoebidae protists

*Amoeba guttula* Dujardin (Kudo) (AL,KY)

*Amoeba limax* = *Hartmannella limax*

*Amoeba proteus* Leidy (?) (MI benthic; TX aquatic)

*Amoeba radiosa* Ehrenberg (Kudo) (Mammoth C.,KY)

*Amoeba* undet. sp. or species (cave in Rockcastle Co., KY; MN lake benthic) Daniels 1973

*Amoeba vespertilio* Penard (Kudo) (cave in Madison Co., AL)

*Anisonema* (Dujardin, 1841) emend. Stein, 1878 - Order Sphenomondales, Anisonemataceae  
protists (also put in Anisonemidae)

*Anisonema acinus* Dujardin, 1841 (Kudo) (Mammoth C.,KY),

*Anisonema* undet. sp. (MN lake benthic)

*Anisonema dextotaxum* = *Metanema d.*

*Arcella* Ehrenberg, 1832 - Order Arcellinida, Arcellidae protists

*Arcella aculeata* = *Centropyxis a.*

*Arcella dentata* Ehrenberg (MN hyporheic)

*Arcella discoides* Ehrenberg (MN hyporheic)

*Arcella* undet. sp. or species (cave in Rockcastle Co., KY; AK freshwater pond interstitial)

*Arcella vulgaris* Ehrenberg, 1830 (Kudo) (soil; MN hyporheic & lake benthic/Mammoth  
C.,KY)

*Archeococcia* Schmidt, Duszynski & Martin 1992 - Order Eucoccidiorida, Eimeriidae protists

*Archeococcia antiquus* Schmidt, Duszynski & Martin 1992 (\*type locality cave in Mohave Co.,  
AZ/ extinct in *Nothrotheriopsis s.* ground sloth dung)

*Archeococcia nothrotheropsidae* Schmidt, Duszynski & Martin 1992 (\*type locality cave in  
Mohave Co., AZ/ extinct in *Nothrotheriopsis s.* ground sloth dung)

*Aspidisca* Ehrenberg, 1830 (= *Aspidicopsis* Ghosh, 1921; *Onychaspis* Stein, 1859; *Coccludina*  
Dujardin, 1841) - Order Proteomyxida, Aspidiscidae protists

*Aspidisca andrewi* Meresehkowski, 1877 (cave in Madison Co., AL)

*Aspidisca costata* (Dujardin, 1841) (MN lake benthic)

*Astasia* Dujardin, 1841 - Order Euglinida, Euglenophyceae protists  
*Astasia klebii* Lemmermann (MN lake benthic)

*Astrodisculus* Greeff, 1869 - Order Aconchulinida, Vampyrellidae protists  
*Astrodisculus laevis* Christen (Leedale) no ZR (Mammoth C., KY)  
*Astrodisculus radiosa* Greeff (Kudo) no ZR (Mammoth C., KY),

*Balladyna* Kowalewsky, 1882 - Holostichidae protists, Order Heterotrichida  
*Balladyna elongata* Roux (Kudo) (Mammoth C., KY)

*Blepharisma* Perty, 1849 - Spirostomidae protists, Order Heterotrichida  
*Blepharisma elongatum* (*Apgaria e.* Stokes, 1884) Kahl, 1926 (US marine interstitial)

*Blepharisma lateritium* (AK freshwater pond interstitial; MN hyporheic)  
*Blepharisma* undet. sp. (MN lake benthic)

*Bodo* Ehrenberg, 1836 - Order Protomastigida, Bobonidae protists  
*Bodo caudatus* (Dujardin, 1841) Stein, 1875 (KY, AL)  
*Bodo celer* Klebs (Pascher) no ZR (AL, KY, TN)

*Bodo compressus* Lemmermann (Pascher) no ZR (AL, KY)  
*Bodo edax* (Kent, 1880) Klebs, 1892 (common in soils/ cave in Jackson Co., AL)  
*Bodo globosus* Stein (Pascher) ZR 133 (common in soils/Tp or Tx? in KY, TN)

*Bodo lens* Muller (Pascher) no ZR (AL, KY),  
*Bodo minimus* Pascher no ZR (Tx or Tp in KY, AL; in polluted MA aquifer)  
*Bodo mutabilis* Klebs (Pascher) no ZR (AL),

*Bodo* undet. sp. or species (2 caves in UT; cave in Rockcastle Co., KY; AK freshwater pond interstitial)

*Bodo uncinatus* Kent (Pascher) no ZR (Mammoth C., KY)  
*Bodo variabilis* (Stokes) Lemmermann, 1914 (Mammoth C., KY)

*Caenomorpha* Perty, 1852 - Caenomorphidae protists  
*Caenomorpha medusula* (AK freshwater pond interstitial)

*Centropyxis* Stein, 1859 Order Arcellinida, Arcellidae protists  
*Centropyxis aculeata* var. *ecornis* (*Arcella a.* Ehrenberg) (MN hyporheic)  
*Centropyxis aculeata* var. *ecornis* (*Arcella a.* Ehrenberg; *C.e.* E.1879) Leidy (Germany, Mammoth C., KY)

*Centropyxis ecornis* (Ehrenberg) Leidy (MN hyporheic)  
*Centropyxis* undet. sp. (MI sandy freshwater interstitial)

*Ceratium* Schrank, 1703 – Peridiniidae protists (also treated as fungi in Diniphyta Dinophyceae: Peridinales: Peridinaceae)

*Ceratium carolinianum* (Bailey) Jorgenson (MN hyporheic)  
*Ceratium hirundinella* (O.F. Muell.) Dujardin (MN hyporheic)

*Cercobodo* Krassilotchick, 1886 - Order Kinetoplastida, Bobonidae protists  
*Cercobodo crassicauda* Alexieff (Pascher) (AL, KY)

*Cercomonas* Dujardin, 1841 (probable syns. = *Cercobodo*, *Dimastigamoeba*, *Mukdenamonas*, *Changia*, *Reptomonas*, *Cercomastix*)

*Cercomonas crassicauda* (Alexieff) (AL cave & cave in Rockcastle Co., KY),  
*Cercomonas* undet sp. (in polluted MA aquifer)

*Chilomonas* Ehrenberg, 1832 - Order Cryptomonadida, Goniomonadidae protists  
*Chilomonas emarginata* no ZR (Mammoth C., KY)

*Chilomonas oblonga* (cave in Rockcastle Co., KY),  
*Chilomonas paramecium* Ehrenberg, 1832 (MN lake benthic)

*Chilodonella* Strand, 1926 - Order Cryptophorida, Chilodonellidae protists  
*Chilodonella caudata* Stokes (Kudo) (cave each in TN; Madison Co., AL & KY; TX aquatic)

*Chilodonella cucullulus* (*Colpoda c.* Myller, 1786; *Chilodon c.* Ehrenberg or Catkins, 1902)  
(KY, TX aquatic)

*Chilodonella* undet sp. (MN lake benthic)

*Chilodontopsis* (Blochmann, 1895) Deroux, 1978 - Scaphidiodontidae protists  
*Chilodontopsis vorax* (*Chilodon v.* Stokes, 1886) Kahl, 1928 (US marine interstitial)

*Chilophrya* Kahl, 1930 - Enchelyidae protists  
*Chilophrya* (*Urotricha l.* Edmonson, 1920) Kahl, 1930 (US marine (Devil's Lake) interstitial)

*Chlamydodon* Ehrenberg, 1835 - Order Cryptophorida, Chlamydomonadidae protists  
*Chlamydodon lynchelliformis* Borror, 1972 (NH marine interstitial)

*Chlamydomonas* Ehrenberg, 1833 - Order Cryptophorida, Chlamydomonadidae protists  
*Chlamydomonas* undet sp. (MN lake benthic)

*Chloromyxum* Mingazzini, 1890 - Order Bivalvulida, Sphaerosporidae protists

*Chloromyxum salamandrae* S.J. Upton, C.T. McAllister & S.E. Trauth, 1995 (endoparasite in non-cave? AR *Desmognathus brimleyorum*, *Eurycea multiplicata griseogaster* & Tb *Eurycea neotenes* salamanders)

*Ciliophrys* Cienkowski, 1875 - Order Ciliophryida, Dictyochophyceae protists  
*Ciliophrys marino* Caullery (Kudo) (Mammoth C., KY)

*Cinetochilum* Perty, 1852 - Cinetochilidae protists, Order Scuticociliatida

*Cinetochilum margaritaceum* (Ehrenberg, 1831) Perty? (MN lake benthic)

*Codonella* – Order Oligotrichida, Codonellidae protists

*Codonella cratera* (Leidy) (MN hyporheic)

*Codonoeca* James-Clark, 1868 – Order Ochromonadales, Dinobryaceae protists

*Codonoeca inclinata* Kent (Mammoth C., KY)

*Colacium* Ehrenberg, 1833 - Order Euglenozoa, Euglenophyceae protists

*Colacium vesiculosum* Ehrenberg, 1938 (Mammoth C., KY)

*Coleps* Nitzsch, 1827 - Order Gymnostomatida, Colepidae protists

*Coleps hirtus* (Muller, 1786) N. (MI, MN lake benthic; AK freshwater pond interstitial)

*Coleps striata* Smith, 1897 (LA marine interstitial)

*Colpidium* Stein, 1860 - Turaniellidae protists

*Colpidium* undet. sp. AK freshwater pond interstitial)

*Colpoda* Muller, 1773 (= *Kolpoda*, *Repoma*)- Order Colpodida, Colpodidae protists

*Colpoda steini* Maupas, 1883 (Mammoth C., KY)

*Colpoda* undet. sp. or species (Logan & Neff C., UT & Mammoth C., KY?; MN lake benthic)

*Cothurnia* Ehrenberg (1832) Vaginicolidae protists

*Cothurnia* undet. sp. or species (MI benthic & hyporheic)

*Cristigera* Roux, 1899 (pleuronematids) Cyclidiidae protists

*Cristigera cirrifera* Kahl, 1928 (TX aquatic)

*Cristigera minor* Penard, 1922 (TX aquatic)

*Cryptaulax* Skuja, 1948 - Katablepharidaceae protists

*Cryptaulax vulgaris* Skuja, 1948 (in polluted MA aquifer)

*Cryptomonas* Ehrenberg, 1831 = *Guillardia*

*Cryptomonas emarginata* (= *Chilomonas e.*?) (in polluted MA aquifer)

*Cyathomonas truncata* = *Goniomonas t.*

*Cyclidium* Mueller, 1786 - Cyclidiidae protists

*Cyclidium glaucoma* (Mueller, 1773) (Kahl) (AL, KY)

*Cyclidium marinum* Borror, 1963 (FL marine interstitial)

*Cyclidium* undet. sp. (cave in Rockcastle Co., KY; MN lake benthic)

*Cyphoderia* Schulberger, 1845 - Cypoderiidae protists

*Cyphoderia ampulla* (Ehrenberg, 1840) (MI benthic & hyporheic)

***Dictyostelium*** Brefeld, 1869 (dictyostelid cellular slime molds) (once in fungi or green algae)  
Dictyosteliaceae protists in Order Dictysteliida

***Dictyostelium giganteum*** Singh (GA cave)

***Dictyostelium mucoroides*** Brefeld, 1869 (WV & GA caves)

***Dictyostelium purpureum*** E. S. Olive (MO, WV & GA caves)

***Dictyostelium rosarium*** Raper & Cavender or Cavender and Raper (MO, WV; in bat guano in Blanchard Spr. C., AR)

***Dictyostelium*** undet. sp. (NV near lights)

***Dictyostelium sphaerocephalum*** (Oudemans, 1885) Sacch. & March. (WV)

***Didinium*** Stein, 1859 - Didiniidae protists, Order Heterotrichida

***Didinium nasatum*** (Muller, 1786) Kahl, 1930 (MN lake benthic)

***Diffugia*** Leclerc, 1815 - Diffugiidae protists

***Diffugia acuminata*** Ehrenberg, 1838 (MI benthic & hyporheic)

***Diffugia constricta*** (Ehrenberg) (MI benthic; Mammoth C., KY)

***Diffugia corona*** Wallich, 1864 (MI hyporheic)

***Diffugia globulosa*** Ehrenberg, 1838 (Germany, Mammoth C., KY; MN hyporheic)

***Diffugia lebes*** Penard (MI hyporheic)

***Diffugia lobostoma*** Leidy, 1879 (MI benthic & hyporheic)

***Diffugia*** undet sp. or species (cave in Rockcastle Co., KY; AL caves; AK freshwater pond interstitial)

***Diffugia spiralis*** Ehrenberg (MI benthic & hyporheic)

***Diffugia urceolata*** Carter (MI hyporheic)

***Dileptus*** Dujardin, 1840 - Order Pharyngophorida, Tracheliidae protists

***Dileptus anser*** (Muller, 1786) (MN lake benthic; US, European marine interstitial; AK freshwater pond interstitial)

***Dileptus gigas*** Claparede & Lachmann (soil/MI benthic)

***Dileptus monilatus*** (Stokes, 1886) Kahl, 1931 (US marine interstitial)

***Discotricha*** Tuffrau, 1954 – Microthoracidae protists

***Discotricha papillifera*** Tuffrau, 1954 (ME, NH marine interstitial)

***Distigma*** Ehrenberg, 1838 - Order Euglinida, Euglenophyceae protists

***Distigma (Astasia) proteus*** Ehrenberg (MN lake benthic)

***Eimeria*** Schneider, 1875 - Order Eucoccidiorida, Eimeriidae protists. Bibl.: Duszynski, Reduker & Parker 1988

*Eimeria albigulae* Levine, Ivens & Kruidenier, 1957 (endoparasite in AZ,NM *Neotoma albigula* & NM, UT *Neotoma cinerea* & NM *Neotoma micropus* woodrats)

*Eimeria antonelli* Straneva & Gallati, 1980 (endoparasite in PA *Neotoma floridana* woodrats)

*Eimeria antrozoi* Duszynski, Scott, Aragon, Leach & Perry, 1999 (endoparasite in feces of NM *Antrozous pallidus* bats)

*Eimeria arizonensis* Levine, Ivens & Kruidenier, 1957 (endoparasite in NM (cf. *E.a.*) *Antrozous pallidus* bats)

*Eimeria balpahe* Ernst, Chobotar & Anderson, 1967 (endoparasite in NM *Neotoma albigula* woodrats)

*Eimeria barleyi* Straneva & Gallati, 1980 (endoparasite in PA *Neotoma floridana* woodrats)

*Eimeria californicensis* Duszynski, Scott, Aragon, Leach & Perry, 1999 (endoparasite in CA, NM *Myotis californicus* bats)

*Eimeria catronensis* Scott & Duszynski, 1997 (endoparasite in NM *Myotis lucifugus* & *M. yumanensis* bats)

*Eimeria chobotari* Ernst, Chobotar & Anderson, 1970 (endoparasite in NM *Neotoma albigula* & *N. micropus* woodrats)

*Eimeria dusii* Wheat & Ernst, 1974 (endoparasite in AL *Neotoma floridana* woodrats)

*Eimeria eumopos* Marinkelle, 1968 (endoparasite in CA (Baja?) *Eumops trumbulli* bats)

*Eimeria evoti* Duszynski, Scott, Aragon, Leach & Perry, 1999 (endoparasite in NM *Myotis evotis* bats)

*Eimeria glaucaeae* Wheat & Ernst, 1974 (endoparasite in AL *Neotoma floridana* woodrats)

*Eimeria humboldtensis* Duszynski, Scott, Aragon, Leach & Perry, 1999 (endoparasite in CA *Myotis californicus* bats)

*Eimeria jacksonensis* Duszynski, Scott, Aragon, Leach & Perry, 1999 (endoparasite in SC *Nycticeius humeralis* bats)

*Eimeria knoxjonesi* Duszynski & McAllister, 1995 (endoparasite in NM *Neotoma albigula* woodrats)

*Eimeria ladronensis* Reducker & Duszynski, 1985 (endoparasite in NM,UT *Neotoma cinerea* & NM *Neotoma albigula* & *N. micropus* woodrats)

*Eimeria langebarteli* Iveris, Kruidenier & Levine, 1959 (endoparasite in NM *Neotoma albigula* woodrats)



*Eimeria macyi* Wheat, 1975 (endoparasite in AL *Pipistrellus subflavus* bats)

*Eimeria neotomae* Henry, 1932 (endoparasite in CA *Neotoma fuscipes* woodrats)

*Eimeria operculata* Levine, Ivens & Kruidenier, 1957 (endoparasite in AZ *Neotoma stephensi stephensi* woodrats)

*Eimeria pilarensis* Scott & Duszynski, 1997 (endoparasite in NM *Myotis ciliolabrum* & CA, NM *M. yumanensis* bats)

*Eimeria residua* Henry, 1932 (endoparasite in CA *Neotoma fuscipes* woodrats)

*Eimeria rioarribaensis* Duszynski, Scott, Aragon, Leach & Perry, 1999 (endoparasite in NM, Mex. *Myotis ciliolabrum* bats)

*Eimeria strangfordensis* Straneva & Gallati, 1980 (endoparasite in PA *Neotoma floridana* woodrats)

*Eimeria* undescr. sp. (endoparasite in NM *Lasiurus cinereus* bats)

*Eimeria subflavus* Wheat, 1975 (endoparasite in AL *Pipistrellus subflavus* bats)

*Elphidiella* Cushman, 1936 - Elphidiidae protists

*Elphidiella hannai* (WA marine infauna)

*Enchleys* Nitzsch, 1817- Order Haptorida, Enchelyidae protists

*Enchleys gracilis* Mansfeld (Kudo) no ZR (Alexander C., TN)

*Entosiphon* Stein, 1878 - Order Euglinida, Euglenophyceae protists

*Entosiphon* undet sp. (MN lake benthic)

*Epiclintes* (Stein, 1862) Carey & Tatchell, 1983 - Keronidae protists, Order Heterotrichida

*Epiclintes radiosa* Calkins, 1902 (MA marine interstitial)

*Epistylis* Ehrenberg, 1830 - Epistylididae protists

*Epistylis* undet. sp. or species (Mammoth C., KY; MN lake benthic)

*Eschaneustyla* Stokes, 1886 – Amphisiellidae protists brachytone Stokes (MN hyporheic)

*Euglena* Ehrenberg, 1830 - Euglenidae protists (also put in algae)

*Euglena acus* Her. (MN hyporheic)

*Euglena acus* Her. var. *angularis* Johnson (MN hyporheic)

*Euglena chlamydophora* Mainx (MN hyporheic)

*Euglena deses* . Ehr. (MN hyporheic)

*Euglena proxima* Dangeard (MN hyporheic)

*Euglena* undet sp. (MN lake benthic)

*Euglena terricola* Dangeard (MN hyporheic)

*Euglypha* – Euglyphidae - Gromiina protists  
*Euglypha alveolata* Dujardin (MN hyporheic)

*Euglypha ciliata* Ehrenberg (MN hyporheic)  
*Euglypha laevis* Ehrenberg (MN hyporheic)

*Euplotes* Ehrenberg, 1830 - Order Hypotrichida, Euplotidae protists  
*Euplotes aediculatus* Pierson, 1943 (US marine interstitial)  
*Euplotes charon* (Muller, 1786) Ehrenberg, 1830 (Mammoth C.,KY/ Europe marine interstitial)

*Euplotes minuta* Yocum, 1930 (WA marine interstitial)  
*Euplotes patella* (Muller, 1773) (KY caves; AK freshwater pond interstitial)  
*Euplotes* undet sp. or species (MN lake benthic & hyporheic)

*Frontonia* Ehrenberg, 1838 - Order Peniculida, Frontoniidae protists  
*Frontonia acuminata* (Ehrenberg, 1833) (AK freshwater pond interstitial)

*Frontonia leucas* (Ehrenberg, 1833) (KY cave soil; MN lake benthic; AK freshwater pond interstitial)

*Gastrostyla* Englemann, 1862 - Oxytrichidae protists, Order Hetertrichida  
*Gastrostyla stenocephala* (*Oxytricha s.* Borror, 1963) Borror, 1972 (FL marine interstitial)

*Geleia* Kahl, 1933 - Geleidae protists  
*Geleia simplex* Faure-Fremiet (CT marine interstitial)

*Goniomonas* Stein, 1878 - Order Cryptomonadida, Goniomonadidae protists  
*Goniomonas truncata* (*Monas t.* Fresenius 1858; *Cyathomonas t.* Fisch 1885) (Mammoth C., KY; in polluted MA aquifer)

*Gruberia* Kahl, 1930-5 - Spirostomidae protists, Order Heterotrichida  
*Gruberia calkinsi* Beltrán, 1933 (MA marine interstitial)

*Guillardia* D. Hill & Wetherbee, 1990 (= *Cryptomonas*) Cryptophyceae protists  
*Guillardia* undet sp. (MN lake benthic; in polluted MA aquifer)

*Gymnodinium* Stein, 1878 - Dinoflagellida Gymnodiniaceae (or in Gynodiniidae) protists  
*Gymnodinium tenuissimum* Laut. (Mammoth C.,KY),

*Gyropaigne* Skuja, 1939 - Rhabdomonidae protists, Order Rhabdomonadales  
*Gyropaigne lefevrei* Bourrely & Gores (Leedale) (cave in Madison Co.,AL)  
*Halteria* Dujardin, 1841 - Order Oligotrichida, Halteriidae protists  
*Halteria grandinella* (Muller, 1773) (Kudo) (soil in Mammoth C.,KY; MN lake benthic),

*Halteria* undet. sp. (cave in Rockcastle Co., KY)

*Haplophragmoides* - Lituolidae foraminifera, Subfamily Haplophragmoidinae  
*Haplophragmoides* undet. sp. (MS marine interstitial)

**Haptophryra** Stein, 1867 - Order Euglinida, Haptophryidae protists

**Haptophryra gigantea** Maupas, 1879 (endoparasite in *Typhlotriton spelaeus* salamander),

**Hartmannella** Alexeief, 1912 - Hartmannellidae protists (once put in Order Amoebida, Amoebidae)

**Hartmannella limax** (*Amoeba limax* Dujardin, 1841) (Mammoth C., KY)

**Heteronema** Dujardin, 1841 - Heteronematales, Superfamily Astasiaea, Peranemidae protists

**Heteronema cryptocercum** Skuja, 1939 (TX aquatic)

**Heteronema** undet. sp. (MN lake benthic)

**Heterophrys** Archer, 1876 - Heterophryidae protists in Order Centrohelida protists

**Heterophrys glabrescens** Penard (Kudo) no ZR (AL, KY caves)

**Holosticha diademata** (Rees, 1844) (NH tidal marsh interstitial)

**Holosticha** (*Keronopsis*) *rubra* (Ehrenberg, 1838) (FL marine interstitial sands)

**Isospora** Schneider, 1881 - Order Eucoccidiorida, Eimeriidae protists

**Isospora hightoni** Upton, McAllister & Trauth, 1993 (endoparasite in non-cave AR *Plethodon cinereus albagula* salamander)

**Isospora peromysci** Davis, 1959 (endoparasite in NM *Neotoma micropus* woodrats)

**Klossiella** Smith & Johnson, 1902 - Klossiellidae protist in Order Coccidia

**Klossiella** undet. sp. (in *Myotis sodalis* bats)

*Kolpoda* Mueller, 1773 = *Colpoda*

**Lacrymaria** Bory de St. Vincent, 1826 - Order Haptorida, Lacrymariidae protists (also put in Enchelyidae)

**Lacrymaria pupula** Muller, 1786) Kahl, 1930 (Sauta C., AL)

**Lacrymaria** undet. sp. (AK freshwater pond interstitial)

**Lankesteria** - Order Eugregarinorida, Lecudinidae protists (also put in Diplocystidae)

**Lankesteria** undet. sp. (endoparasite in *Sphalloplana percoeca* flatworm in Jackson Co. KY)

**Lembadion** Perty, 1849 - Lembadionidae protists

**Lembadion bullinum** Perty, 1841 (MN lake benthic)

**Leptomonas** Kent, 1880 - Trypanosomatidae protists, Order Hypermastigida

**Leptomonas** undet. sp. or species (hyperparasite in *Myodopsylla gentilis* fleas parasitizing OK *Tadaridia brasiliensis* bats)

*Leucophrys* Mueller [1830] - See Tetrahymena

*Litonotus* Wresniowski, 1870 - Amphileptidae protists

*Litonotus* undet. sp. (MN lake benthic & hyporheic)

*Lobomonas* P.A. Dangeard, 1898 – (now in Volvocales protists)

*Lobomonas* undet. sp. (MN lake benthic)

*Loxocephalus* Eberhard, 1862 - Philasteridae protists, Order Scuticociliatida

*Loxocephalus plagius* (*Dexioptricha p.* Stokes, 1885) Kahl, 1931 (US Atlantic marine interstitial)

*Loxocephalus wassi* Thompson, 1963 (US Atlantic marine interstitial)

*Loxodes* Ehrenberg, 1830 - Order Loxodida, Loxodidae protists

*Loxodes magnus* Stokes, 1887 (US marine interstitial; MN hyporheic)

*Loxodes rostrum* (O.F. Muller, 1786) (MI benthic)

*Loxodes* undet. sp. or species (MN lake benthic & hyporheic)

*Loxophyllum* Dujardin, 1841 - Amphileptidae protists

*Loxophyllum helus* Stokes, 1884 (US marine interstitial)

*Loxophyllum* undet. sp. (MN lake benthic)

*Metacystis* Kahl, 1926 - Metacystidae protists

*Metacystis striata* Stokes, 1893 (US marine interstitial)

*Metopus* Claparede & Lachmann, 1858 - Metopidae protists

*Metopus es* (Claparede; & Lachmann, 1858) Kahl, 1930-5 (MN lake benthic; (AK freshwater pond interstitial)

*Metopus spiralis* Smith, 1897 (TX freshwater; LA marine interstitial)

*Microcystis* - see bacteria

*Monocystella* Valkanov, 1935 - Lecudinidae protists in Order Archigregarinorida

*Monocystella* undet. sp. (endoparasite in *Sphalloplana percoeca* flatworm in Jackson Co.KY)

*Nassula* Ehrenberg, 1833 - Nassulidae protists, Order Nassulida, Suborder Nassulina

*Nassula* undet sp. (AK freshwater pond interstitial)

*Nebela* - Nebelidae protists

*Nebela collaris* Ehrenberg (MN hyporheic)

*Nuclearia* Cienkowski, 1865 - Order Aconchulinida, Vampyrellidae protists

*Nuclearia delicatula* (KY)

*Ophryoglena* Ehrenberg, 1831 - Ophryoglenidae protists

*Ophyroglena* undet. sp. AK freshwater pond interstitial

*Oxnerella* Dobell, 1917 - Raphidiophyryidae protists, Order Centrohelida

*Oxnerella maritima* Dobell, 1917 (Kudo) (Mammoth C.,KY)

*Oxytricha* (Bory St. Vincent, 1826) Ehrenberg, 1832 - Oxytrichidae protists, Order Heterotrichida

*Oxytricha bifaria* Stokes, 1887 (NH marine interstitial)

*Paraholosticha* Kahl, 1930-5 - Urostylidae protists, Order Heterotrichida (once put in Holostichidae)

*Paraholosticha polychaeta* Borror, 1966 (NH tidal marsh interstitial)

*Paramecium* Muller, 1773 - Order Hymenostomatida, Parameciidae protists

*Paramecium bursaria* (Ehrenberg, 1831) (TX aquatic),

*Paramecium caudatum* Ehrenberg, 1833 (KY,TX aquatic)

*Paramecium micromultinucleatum* (VA)

*Paramecium bursaria* (Ehrenberg, 1831) (TX aquatic)

*Paramecium calkinsi* Woodruff, 1921 (US marine interstitial)

*Paramecium caudatum* Ehrenberg, 1833 (MN lake benthic)

*Paramecium* undet. sp. or species (cave in Rockcastle Co., KY; MN hyporheic)

*Paramecium trichium* (Stokes, 1885) Wenrich, 1926 (US marine interstitial)

*Paranophrys* Thompson & Berger, 1965 - Philasteridae protists, Order Scuticociliatida

*Paranophrys magna* Borror, 1972 (NH marine interstitial)

*Parafusulina* - Superfamily Fusulinacea foram

*Parafusulina* undet. sp. (extinct Permian fossil in Lechuguilla C., Eddy Co., NM)

*Paratetrahymena* Thompson, 1963 - Philasteridae protists, Order Scuticociliatida

*Paratetrahymena wassi* Thompson, 1963 (VA marine interstitial)

*Parauronema* Thompson, 1967 - Philasteridae protists, Order Scuticociliatida

*Parauronema virginianum* Thompson, 1967 (VA marine interstitial)

*Peranema* Dujardin, 1841 (= *Pseudoperanema* Christen 1962 (ICBN)) Peranemeae protists

*Peranema* undet. sp. or species (MN lake benthic; MN hyporheic)

*Peranema trichloporum* Ehrenberg (Kudo) no ZR (Tx? in Mammoth C.,KY & Rockcastle Co., KY/ flagellate)

*Paraeglypha* Penard, 1902 – Euglyphidae protists

*Paraeglypha reticulata* Penard, 1902 (MN hyporheic)

*Peridinium* Ehrenberg, 1832 - Peridiniidae protists (also treated as fungi in Diniphyta  
Dinophyceae: Peridinales: Peridinaceae)

*Peridinium* undet. sp. - Peridiniidae (MN hyporheic)

*Perispira* Stein, 1859 - Spathidiidae protists

*Perispira strephosoma* Stokes, 1886 (US marine interstitial)

*Peritromus* Stein, 1867 - Peritromidae protists, Order Heterotrichida

*Peritromus californicus* Kirby, 1935 (CA marine interstitial)

*Petalomonas* Stein, 1859 (= *Copromonas* Dobell, 1908; Huber-Pestalozziomonas Skvortzov, 1967; *Pentamonas* Lackey, 1962; *Thylakomonas* Schwewiakoff, 1982; *Trinagulomonas* Lackey, 19409) Order Sphenomonadales, Petalomonadiae protists (dinoflagellates)

*Petalomonas mediocanellata* (Ac or Tx in KY)

*Petalomonas pusilla* Skuja, 1948 (Ac or Tx in KY).

*Petalomomas* undet. sp. (MN lake benthic)

*Phacotus*. Perty, 1852 - Chlorophyceae in Chlamydomonadales or Volvocales protists (now in green algae (also put in Phacotaceae)

*Phacotus lenticularis* (Ehrenberg, 1831) (MN lake benthic)

*Phacus* Dujardin, 1841 - Euglenidae protists in Order Euglenales (also put in algae)

*Phacus acuminatus* Stokes (MN hyporheic)

*Phacus pleuronectes* (*Lercaria p.* O.F. Muller, 1773) (Europe, KY) (protist)

*Phacus pleuronectes* var. *hyalinus* (KY)

*Phacus* undet. sp. (Mammoth C.,KY)

*Phacus spirogyra* var. *maxima* Prescott (MN hyporheic)

*Phacus striqueter* (Ehr.) Dujardin (MN hyporheic)

*Phyllomitus* Stein, 1878 – Order Protomastigida, Katablepharidaceae protists

*Phyllomitus amylophagus* (Kudo) Klebs, 1892 no ZR (Mammoth C.,KY)

*Pleuronema* Dujardin, 1836 - Pleuronematidae protists

*Pleuronema balli* Small, 1968 (US marine interstitial)

*Pleuronema setigerum* Calkins, 1902 (MA marine interstitial)

*Podophyra* Ehrenberg, 1835 [1834] - Order Exogenida, Podophryidae protists

*Podophyra cyclosum* Ehrenberg, 1835 [1834] (on *Cyclops* in Mammoth C.,KY),

*Podophyra* undet. sp. or species (MN lake benthic & hyporheic)

*Polychromophilus* Dionisi, 1899 ZR 125 - Plasmodiidae protists, Order Eucoccidiorida

*Polychromophilus* undet sp. (endoarasite in FL *Myotis austroriparius* bats)

***Polysphondylium*** Olive (dictyostelid cellular slime molds) (once in fungi or green algae)  
Dictyosteliaceae protists in Order Dictysteliida

***Polysphondylium discoideum*** = *Dictyostelium d.* (KY, WV)  
***Polysphondylium violaceum*** Raper (MO, WV)

***Polytoma*** Ehrenberg, 1838 - Order Volvocida, Chlorophyceae protists (now put in green algae)

***Prorodon eres*** (AK freshwater pond interstitial)  
***Prorodon*** undet. sp. (MI benthic)

*Protococcus* - Put in algae

***Pseudocohnilembus*** - Pseudocohnilembidae protists, Order Scuticociliatida  
***Pseudocohnilembus hargisi*** Thompson, 1964 (VA marine interstitial)

***Pseudocohnilembus longisetus*** Evans & Thompson, 1964 (VA marine interstitial)  
***Pseudocohnilembus marinus*** Thompson, 1964 (VA marine interstitial)

***Pseudoprorodon*** Blochmann, 1886 - Prorodontidae protists  
***Pseudoprorodon*** undet. sp. or species (AK freshwater pond interstitial; MN hyporheic)

***Pseudodifflugia*** Schlumberger, 1845 - Order Gromiida, Pseudodifflugiidae protists  
***Pseudodifflugia gracilis*** Schlumberger, 1845 (Kudo) (cave in Madison Co., AL)

*Pyxidicula* – Put with diatoms

***Quadrullella*** Cockerell, 1911 – Paraquadrulidae protists  
***Quadrullella symmetrica*** Wallich (MN hyporheic)

***Raphidiophrys*** Archer, 1867 - Raphidiophryidae protists  
***Raphidiophrys pallida*** Schulze, 1874 (Kudo) (Mammoth C., KY)

***Raphidocystis*** Penard, 1904 - Order Centrohelida, Raphidiophryidae protists  
***Raphidocystis infestans*** Wetzel (Mammoth C., KY)

***Reticularia*** Bull., 1791 - Phylum Sarcodina, Class Reticularia  
***Reticularia*** undet. sp. (endoparasite in UT *Neotoma cinerea* cinereus woodrats)

***Rhabdomonas*** Fresenius, 1858 - Rhabdomonidae protists, Order Rhabdomonadales  
***Rhabdomonas costata*** Korschikow (Leedale) (Mammoth C., KY)

***Rhagdstoma*** Kahl, 1926 - Prorodontidae protists, Order Gymnostomatida  
***Rhagdstoma*** undet. sp. (MN lake benthic)

***Rhynchomonas*** Klebs, 1893 - Order Kinetoplastida, Bobonidae protists  
***Rhynchomonas nasuta*** Klebs, 1892 (AL, KY)

***Saccamoeba*** Frenzel, 1892 Amoebida: Tubulina, Hartmannellidae protists  
***Saccamoeba gorgonia*** (*Amoeba g.* Penard) (Kudo) no ZR (Mammoth C.,KY)

***Salpingoeca*** James-Clark, 1868 - Protomonadina, Craspedomonadidae protists  
***Salpingoeca amphoridium*** J.Clark (Mammoth C.,KY)

***Saprodinium*** Lauterborn, 1908 - Epalxellidae protists undet. sp. (AK freshwater pond interstitial)

***Scytomonas*** Stein, 1878 - Petalomonadidae protists  
***Scytomonas pusilla*** Stein, 1878 (Caraway & Lackey) (KY,TN/euglenoid),  
***Scytomomas*** undet. sp. (MN lake benthic)

***Sieboldiellina*** (*N.N.* pro *Discophryra* Stein, 1860)  
***Sieboldiellina planariarum*** (holotrichous ciliate (endoparasite in cave *Planaria occulta*)

***Spathidium*** Dujardin, 1841 - Order Haptorida, Spathidiidae protists  
***Spathidium*** undet. sp. or species (MI benthic; AK freshwater pond interstitial)

***Sphaenochloris*** - Chlamydomonadidae protists  
***Sphaenochloris urceolata*** Kent, 1880-1882 (Mammoth C.,KY)

***Sphaerophrya*** Claparede & Lachmann, 1859 – Podophyridae protists  
***Sphaerophrya*** undet. sp. (MN hyporheic)

***Spirothomum*** Ehrenberg, 1834 - Spirostomidae protists, Order Heterotrichida  
***Spirothomum ambiguum*** Ehrenberg, 1838 (MI benthic; Europe marine interstitial/ VA c.?)  
***Spirothomum loxodes*** Stokes, 1885 (US marine interstitial)

***Spirothomum teres*** Claparede & Lachmann, 1858 (MI, MN lake benthic; Europe marine interstitial; AK freshwater pond interstitial)

***Spumella*** Cienkowski - Ochromonadidae protists  
***Spumella elongata*** (in polluted MA aquifer)  
***Spumella guttula*** (in polluted MA aquifer)

***Stentor*** Oken, 1815 - Order Heterotrichida, Stentoridae protists  
***Stentor coerulens*** Ehrenberg (MI benthic)

***Stentor roeseli*** Ehrenberg, 1835 (MN lake benthic; Europe marine interstitial)  
***Stentor*** undet. sp. (AK freshwater pond interstitial)

***Strombidium*** Claparede & Lachmann, 1859 - Strombidiidae protists  
***Strombidium*** undet. sp. (AK freshwater pond interstitial)

***Stylonychia*** Ehrenberg, 1830 - Oxytrichidae protists, Order Heterotrichida  
***Stylonychia mytilis*** AK freshwater pond interstitial)



*Stylonychia putrina* Stokes, 1885 (US marine interstitial)

*Stylonychia* undet. sp. (MN lake benthic)

*Tachysoma* Stokes, 1887 - Oxytrichidae protists, Order Heterotrichida

*Tachysoma parvistyla* Stokes, 1887 (US marine interstitial)

*Tetrahymena* Ferguson, 1940 - Tetrahymenidae protists

*Tetrahymena patula* (*Leucophrys patula* Ehrenberg, 1831) Corliss, 1951 (MI benthic),

*Tetrahymena* undet. sp. or species (KY caves; AK freshwater pond interstitial) Corliss 1973

*Tetramitis* Perty, 1852 - Vahlkampfiidae protist of Order Schizopyrenida

*Tetramitis* undet. sp. (Neff C., UT)

*Trachelomonas* Ehrenberg, 1835 - Euglenaceae protists (also put in algae)

*Trachelomonas acanthostoma* (Stokes) Deflandre (MN hyporheic)

*Trachelomonas varians* (Lemm.) Deflandre (MN hyporheic)

*Trachelomonas verrucosa* (*T. lemmermannii* form. *verrucosa* Skuja, 1955) Stokes (KY)

*Trachelomonas volvocina* Ehr. (MN hyporheic)

*Trachelostyla* Kahl, 1932 - Trachelostylidae protists

*Trachelostyla pediculiformis* (Cohn, 1866) (FL, NH marine interstitial)

*Trichotaxis* Stokes, 1891 - Holostichidae protists, Order Heterotrichida

*Trichotaxis pulchra* Borror, 1972 (NH marine interstitial)

*Trimyema* Lackey, 1925

*Trimyema* undet. sp. AK freshwater pond interstitial)

*Trinema* Dujardin, 1841 - Euglyphidae protists, Order Gromiida

*Trinema enchelys* (Ehrenberg, 1838) (Kudo) (Mammoth C., KY; MN hyporheic)

*Trinema lineare* Penard (MN hyporheic)

*Trochilia* Dujardin, 1841 - Dysteriidae protists

*Trochilia fluviatilis* Smith, 1897 (LA marine intestinal)

*Trochaminna* undet. sp. (MS marine interstitial)

*Trypanosoma* Gruby, 1843 - Order Protomastigida or Kinetoplastida, Trypanosomidae protists

*Trypanosoma ambystomae* (endoparasite in non-cave CO *Ambystoma tigrinum* salamanders)

*Trypanosoma* (*Schizotrypanum*) *cruzi* Chagas, 1909 (endoparasite in wTX *Tadarida brasiliensis* & OK *Myotis velifer* & *M. grisescens* bats)

*Trypanosoma* (*Schizotrypanum*) *hedricki* Bower & Woo, 1981 (endoparasite in sON *Eptesicus f.* bats)

*Trypanosoma kansasensis* Upton, Fridell & Tilley, 1993 (endoparasite in KS *Neotoma floridana* woodrat)

*Trypanosoma* (*Schizotrypanum*) *myoti* Bower & Woo, 1981 (endoparasite in sON *Myotis lucifugus* bats)

*Trypanosoma protracta protracta* (Uhler, 1894) (endoparasite in CA *Neotoma fuscipes* woodrats)

*Trypanosoma ogawai* Miyata, 1977 (endoparasite on bats)

*Trypanosoma* undet.sp. (endoparasite in OK *Myotis velifer* bats)

*Trypanosoma* (*Schizotrypanum*) *verspertilionis* Battaglia, 1904 (Europe, NA/ endoparasite in AZ, sCA, VA *Eptesicus fuscus*, *Corynorhinus townsendii*; CA *Myotis yumanensis sociabilis* (rare), *M. californicus*, *Antrozous pallidus pacificus*, *Eptesicus fuscus bernardinus* (rare), *Corynorhinus rafinesquii* (rare) & *Tadarida mexicana*; AZ *Myotis velifer* & CA, TX *Pipistrellus hesperus*) bats) **Bibl.:** Mitchell, 1956

*Urocentrum* Nitzsch, 1827 - Urocentridae (=Calceolidae) protists, order Hymenostomatia  
*Urocentrum turbo* Mueller, 1786) (TX aquatic)

*Uronema* Dujardin, 1964 - Uronematidae protists, Order Scuticociliatida

*Uronema nigricans* Thompson & Evans, 1968 (US marine interstitial)

*Uronychia* Stein, 1859 - Order Hypotrichida, Euplotidae protists

*Uronychia setigera* Calkins, 1902 (MA marine interstitial)

*Urosoma* Kowalewski, 1882 - Oxytrichidae protists, Order Heterotrichida

*Urosoma caudata* Stokes, 1887 (US marine interstitial)

*Urosoma macrostyla* (*Opisthotricha emarginata* Stokes, 1885) Wrzesniowski, 1870 (US marine interstitial)

*Urosoma* undet. sp. (MN hyporheic)

*Urostyla* Ehrenberg, 1830 - Urostylidae protists

*Urostyla* undet. sp. (MI benthic)

*Urotricha* Claparede & Lachmann, 1858 - Prorodontidae protists

*Urotricha agilis* (*Balanitoozon a.* Stokes, 1886) Kahl, 1930 (US marine interstitial)

*Vahlkampfia* Chatton & Lalung-Bonnaire, 1912 - Vahlkampfiidae protist

*Vahlkampfia limax* (Dujardin) (MN lake benthic)

*Vahlkampfia* undet. sp. or species (KY, TX aquatic; cave in Rockcastle Co., KY))

"*Vortex*" Ehrenberg, 1831 - Order Sessilida, Vorticellidae? protist

"*Vortex*" *cavicolens* Packard, 1883 (may not be valid species) (1-2 caves in Carter Co., KY/scKY/Tb?) Packard, 1886.

*Vorticella* Linneaus, 1767 - Order Sessilida, Vorticellidae protist

*Vorticella microstoma* Ehrenberg, 1838 (Kahl) (AL,KY)

*Vorticella* undet. sp. or species (MN lake benthic; sandy hyporheic in TX; AK freshwater pond interstitial; MN hyporheic)

*Wailesella* – Hyalospheniidae protists

*Wailesella eboracensis* Wailes (MN hyporheic)

**Protostomia** - A branch of the Bilateria of the animal kingdom. Incl. mollusks, onychoporan worms, tartigrades, and arthropods.

**Proturans** (= Myrientomata) An order of Class Ellipura (=Entognatha), Superclass Hexapoda. .6-2.5 mm long, soft-bodied, elongate, blind soil hexapods lacking antennae with the appendages of the first thoracic segment, the front legs, serving as antennae. The mouth-parts are of a primitive sucking type with mandibles long and thin but not forming a sucking tube such as found in winged insects.. The abdomen lacks cercie but has a well-developed telson and three basal segments (sometimes two) with paired appendanges. Feed on fungi in moist areas such as moldy soil around roots. Likely to be found in caves but not yet reported from US or Canadian caves. About 260 species worldwide with 20 species in nine genera reported in the US and Canada. Bibl.: Nosek 1973, 1978; Tuxen 1960, 1964

**provenance** - A place of origin.

**psammonbiotic** - Adj. for aquatic species who live almost exclusively in sand sediments.

**psammon** - Interstitial aquatic life (especially on or between sand grains) of both freshwater lentic (standing water) and marine habitats. Interstitial aquatic life in the hyporheic zone of freshwater lotic (running water) habitat is the hyporheos. Few species are epipsammon (living on the sand surfaces). Most are moseopsammon, living in spaces between the grains, especially **cnidarians nematodes**, polychaetes **worms** and **copepods**. Psammoxenes are species commonly found in bodies of water and interstitially within the first 100 cm of the bodies of water. Like troglonexes, they cannot complete their life cycle in that habitat. Psammophiles tend to be found further back in the sand. Like troglophiles, they can spend their entire lives in that habitats but are found in other habitats as well. Epipsammon live on sand grain surfaces while mesopsammon live within cavities between sand grains. Endopsammon include burrowing animals.

**psammonphilic** - Aquatic species which prefer living in sandy sediments but also live in other regions of the littoral.

**psammoxenic** - Aquatic species found occasionally in sandy sediments but gnerally live elsewhere and normally die in sandy sediments in they stay too long.

## **Pseudoscorpions**

Arachnid of Order Pseudoscorpiones (= Pseudoscorpionida, Chelonethida).

A peculiarity of the pseudoscorpion is their ability to run backwards, especially if it brushes against another animal representing a potential danger. They seem to be able to move backwards faster than they can forwards.

The first pair of mouthparts, the chelicerae, possess glands, but whereas in spiders similar glands secrete venom, in pseudoscorpions, they produce silk. This silk is used for making nests and shelters used during the period of moulting. A pseudoscorpion moults four times in the course of its 2-3 years of life.

The construction of its shelter is done systematically. The animal first selects a site and collects tiny fragments of wood and sand grains and arranges these in a circle around itself. On this it lays down a layer of silk in which the debris finally becomes embedded. Then more sticks and stones are laid on this and more silk added to cement them until a sliken igloo results. In the later stages of construction, the opening of the igloo is very small yet the animal manages to climb in and out to collect building materials. When complete the false scorpion is fully imprisoned. It then gives the shelter a final lining of silk. The igloo is just large enough for the animal to be stretched out to moult, hibernate or lay eggs. The animal has to break through the wall of the shelter to be free again.

Food for a pseudoscorpion are primarily springtails and mites which are seized with the large pedipalps and chewed. Unlike other small animals, such as spiders, a pseudoscorpion eats all of its prey leaving no remains at all.

Certain species of pseudoscorpions use a form of travel called phoresia, or hitch hiking. One of them may grab the leg of a fly and be carried off, holding on by one claw. The large harvestmen spider is also used by pseudoscorpions for transport. As many as eight pseudoscorpions have been seen riding at one time on the legs of a harvestmen spider.

Approximately one-sixth of the 2,000 described species and subspecies of pseudoscorpions world wide are reported from caves.

**Bibl.:** Beier, 1936, 1940, 1948; Chamberlin, J. 1929a, 1931; Harvey 1991-2; Heurtault 1994; Muchmore 1982. **Areas:** **AR:** C. Hoff 1945a; **CO:** Hoff 1961; **HI:** Muchmore 1979a; 1998a; **IN:** Beier 1932, 1932a; Hagen, 1879; Muchmore 1993; **KY:** Beier 1932, 1932a, Packard, 1884; Hagen, 1879; **MI:** Nelson 1975; **MO:** Muchmore & Alteri 1974; **NA:** Hoff 1958; **NM:** Hoff 1959; **OR:** Benedict 1978b, 1979; Benedict & Malcom 1972, 1977; **SD:** C. Hoff 1963; **VA:** Beier 1932, 1932a

Kingdom Animalia

Clade Metazoa

Clade Eumetazoa

Clade Bilateria

Clade Protostomia

Clade Ecydsozoa

Phylum Arthropoda

Subphylum Chelicerata

Class Archnida

Subclass Lipoctena or Dromopoda

Superorder Haplocnemata

Order Pseudoscorpiones

Suborder Monophryonida

Superfamily Feaelloidea (Pseudogarypidae)

Superfamily Cheiridioidea

Superfamily Cheliferoidea

(Cheliferidae, Chernetidae) Paxton 1885

Superfamily Chthonioidea (Chthoniidae)

Superfamily Garypoidea (Garypidae)

Superfamily Neobisioidea

(Bochicidae, Ideoroncidae, Neobisiidae, Syarinidae)

Families incl.

**Bochicidae**

Subfamily Leucohyinae (*Leucohya*)

**Cheiridiidae** H.J. Hansen (*Apocheiridium*, *Cheiridium*) Chamberlin (1924),

**Chernetidae** (*Dinocheirus*, *Hesperochnes*, *Neoallochnes*, *Tejachernes*, *Tuberochnes*)

**Cheliferidae** (*Chelifer*)

**Chthoniidae** Daday, 1888 (*Aphrastochthonius*, *Apoththonius*, *Chthonius*, *Kleptochthonius*, *Lechytia*, *Mexichthonius*, *Mundochthonius*, *Neochthonius*, *Pseudotyranochthonius*, *Tyrannochthonius*, *Vulcanochthonius*)

(unidentified Tx or Ac genera in San Bernardino & Tulare Cos., CA)

**Bibl.:** J. Chamberlin 1929a, 1962

(undescribed genera incl. 2 undescribed species & *Tyrannochthonius h.* Muchmore, 1979d)

**Bibl.:** Muchmore, 1998

**Garypidae** Simon, 1893 (*Archeolarca*, *Larca*)

**Ideoroncidae** Chamberlin, 1930 (*Albiorix*)

**Neobisiidae** Chamberlin, 1930 (*Alabamocreagris*, *Americocreagris*, *Australinocreagris*, *Fissilicreagris*, *Halobisium*, *Lissocreagris*, *Microbisium*, *Microcreagris*, *Minicreagris*, *Novobisium*, *Parobisium*, *Saetigerocreagris*, *Trisetobisium*, *Tartarocreagris*) **Bibl.:** Chamberlin 1962

**Pseudogarypidae** Chamberlin, 1923 (*Pseudogarypus*) **Bibl.:** Benedict & Malcolm 1978

**Syarinidae** Chamberlin, 1930 (*Chitrella*, *Chitrellina*)

*Alabamocreagris* Curcic, 1984 - Neobisiidae pseudoscorpion

*Alabamocreagris mortis* (*Microcreagris m.* Muchmore, 1969) (= *Lissocreagris mortis m.*)  
\*\*(type locality & 1 other cave in Jackson Co., AL/ Tb/ G1G2)

*Alabamocreagris pecki* (*M.p.* Muchmore, 1969) Curcic, 1989 \*\* (type locality & 1 other cave in Marshall Co., AL/ G1G2)

*Albiorix* Chamberlin, 1930 - Ideoroncidae pseudoscorpion

*Albiorix anophthalmus* Muchmore 1999 (\*type locality cave in Pima Co., AZ/ Tb/ G1G2)

*Americocreagris* Curcic, 1982 - Neobisiidae pseudoscorpions

*Americocreagris columbiana* (*Microcreagris c.* Chamberlin, 1962) Curcic, 1984) (type locality in well in Clatskanie Co., OR/ Tp in cave in Columbia Co. + caves or cave in Klickitat Co., WA/ Ed?/ G3G4)

*Apocheiridium* Chamberlin, 1924 - Cheiridiidae pseudoscorpion. **Bibl.:** Benedict, 1978c

*Apocheiidium reddelli* Muchmore 1992 (\*type locality cave in Edwards Co., TX/ Tb or Tp/ G1G2)

*Apochthonius* Chamberlin, 1929 - Cheiridiidae pseudoscorpion (see *Kleptochthonius*)

*Apochthonius coecus* (*Chthonius c.* Packard, 1884) Muchmore, 1963b \*\* (Grand (= Weyer's) & 1 other cave in Augusta Co., VA/ Tb/ T&E VA S1, global G1)

*Apochthonius colecampi* Muchmore, 1967c (type locality cave in Benton Co. & cave in Crawford & Franklin Co., MO/ Tb/ G1G2)

*Apochthonius diabolus* Muchmore, 1967e (\*type locality cave in Washington Co., AR/ Tb/ G1G2)

*Apochthonius forbesi* Benedict, 1979b (\*type locality cave in Deschutes Co., OR/ Tb/ G1G2)

*Apochthonius grubbsi* Muchmore, 1980a (prob. valid but may = *A. similis*) (\*type locality & 3 other caves in Calaveras Co., CA/ Tb/ G1G2)

*Apochthonius hobbsi* Muchmore, 1994 (\*type locality cave in Ross Co., OH/ blind Tb/ G1G2)

*Apochthonius holsingeri* Muchmore, 1967e (\*\*type locality cave in Bath Co.? + 1 cave in Bath Co., VA/ Tb/ G1G2)

*Apochthonius hypogeus* Muchmore, 1976b (\*type locality cave in Augusta Co., VA/ Tp?)

*Apochthonius indianensis* Muchmore, 1967c (\*\*\*\*?type locality cave in Spring Mill State Park & 1 other cave in Lawrence Co. + 2 caves in Orange Co., IN/ Tb/ G1 or G3)

*Apochthonius magnanimus* Hoff, 1956 (San Miguel & Eddy Cos.,NM/ Tx or Ac)

*Apochthonius malheuri* Benedict & Malcolm, 1973a (\*type locality cave in Harney Co.,OR/ Tp/ FC-2 T&E; critically imperiled in OR Natural Heritage list/ G1) **Bibl.:** Benedict & McEvoy, 1995

*Apochthonius minimus* R. O. Schuster, 1966 (WA/ Tp?)

*Apochthonius minor* Muchmore, 1976b (\*\*( type locality cave in Chatooga Co. & cave in Dade Co., GA/ Tb or Tp)

*Apochthonius mysterius* Muchmore, 1976b (\*type locality cave in Perry Co.,MO/ Tb/ G1G2)

*Apochthonius paucispinosus* Muchmore, 1967 (\*type locality cave in Tucker Co.,WV/ Dry F. Valley cave pseudoscorpion/ Tb/ G1)

*Apochthonius russelli* Muchmore, 1976b (\*\*Russell (Russell C. Natl. Monument) & other cave in Jackson Co., AL/ Tb? / G1G2)

*Apochthonius* undescr.? sp(p). (Tp or Tb in IL; Tp in Blanchard Spr.; Tb in OH)

*Apochthonius* undet. sp.#1 (Calaveras, Mariposa & Tuolumne Cos.,CA)

*Apochthonius* undet. sp.#1 sp.>1 (prob.) (Blanchard Spr. & other cave in AR/ Tb or Tp)

*Apochthonius titanicus* Muchmore, 1976b (\*Blanchard Springs C.,Stone Co., AR/ G1G2)

*Apochthonius typhlus* Muchmore, 1967 \*\*\*\*( type locality & 1 other cave in Stone Co.,MO + 2 caves in Newton Co.,AR/ Tb/ G1G2)

*Archeolarca* Hoff & Clawson, 1952 - Garypidae pseudoscorpion. **Bibl.:** Muchmore 1981

*Archeolarca aalbui* Muchmore, 1984e (\*Mitchell C.,San Bernadino Co.,CA/CA T&E "S1 G1 or G1G2, Federal Species of Concern/Aalbu's Cave Pseudoscorpion/Tb)

*Archeolarca cavicola* Muchmore, 1981 (\*type locality cave in Grand Canyon Natl. Park,Coconino Co., AZ/ Grand Canyon Pseudoscorpion/ federal species of concern/ Tb/ G1G2)

*Archeolarca guadalupensis* Muchmore, 1981 (\*type locality cave in Guadalupe Mts. Natl. Park, Culberson Co., TX/ Tb/ federally listed as endangered/ G1/ Guadalupe cave pseudoscorpion/ G1)

*Archeolarca rotunda* Hoff & Clawson, 1952 (epigean in UT, NM, OR, WY/ Tx in woodrat nests in UT)

*Archeolarca* indet. (undet.?) sp. (cave in Valencia Co.,NM)

*Archeolarca welbourni* Muchmore, 1981 (type locality & 2 other caves in Wupatki Natl. Monument, Coconino Co., AZ/ Tb? / G1G2)

*Aphrastochthonius* Chamberlin, 1962 - Chthoniidae pseudoscorpions. **Bibl.:** Muchmore 1972a, 1976, 1980

*Aphrastochthonius grubbsi* Muchmore, 1984e (\*type locality cave in Calaveras Co., CA/Federal T&E Category 2/ Tb/ G1G2)

*Aphrastochthonius pachysetus* Muchmore, 1976 (\*type locality cave in Eddy Co., NM/ Tb/ G1G2)

*Aphrastochthonius pecki* Muchmore, 1968 (\*type locality cave in Jefferson Co., AL/ Tb/ G1G2)

*Aphrastochthonius russelli* Muchmore, 1972 (type locality cave in Russell C., Jackson Co., Al & caves in Mexico/ Tb)

*Aphrastochthonius similis* Muchmore, 1984e (\*type locality cave in Calaveras Co., CA/CA T&E G1S1, Federal Species of Concern/Carl. Cave Pseudoscorpion/ Tb/ G1G2)

*Aphrastochthonius* undescr. sp.#1 (Travis, Williamson Cos., TX/ Tb)

*Aphrastochthonius* sp.#2 (Comal Co., TX/ Tb)

*Aphrastochthonius* sp. #3 (Bandera Co., TX/ Tb)

*Aphrastochthonius tenax* J.C. Chamberlin, 1962 (type sp.) (\*\*( type locality cave in Blount Co. & cave in Marshall Co., AL/ Tb/ G1 or G1G2)

*Australinocreagris* Curcic, 1984 - Neobisiidae pseudoscorpion

*Australinocreagris grahami* (= *Microcreagris g.* Muchmore, 1969) Curcic, 1984 (type locality & 1 other cave in Calaveras Co. & cave or caves in Tuolumne Co., CA/ Tb/ G1G2)

*Australinocreagris ozarkensis* (*Microcreagris o.* Hoff, 1945) Curcic, 1984 (\*type locality cave in WA Co., AR/ Tb/ G1G2)

*Australinocreagris reddelli* = *Tartarocreagris r.*

*Australinocreagris texana* = *Tartarocreagris t.*

*Chamberlinochthonius* Vachon, 1952 - see *Kleptochthonius*

*Chelifer* Geoffroy, 1762 - Cheliferidae pseudoscorpion

*Chelifer cancroides* (*Acarus c.* Linnaeus, 1758) (global epigean/ Tx? in Mammoth C., KY)

*Chelifer* undet. sp. (predator on ON bat guano)

*Cheiridium* Menge, 1855 - Cheiridiidae pseudoscorpion

*Cheiridium firmum* Hoff, 1953 (IL/Tx or Ac in MO cave)

*Cheiridium reyesi* Muchmore, 1992 (\*type locality cave in Kinney Co., TX/ Tb/ G1G2)

*Chitrella* Beier, 1932 - Syarinidae pseudoscorpion. **Bibl.:** Malcom & Chamberlain 1961; Muchmore 1973b



*Chitrella archeri* Malcolm & J.C.Chamberlin, 1960 (type locality cave & likely other caves in Grundy Co. + cave or caves in Smith Co.,TN/ Tb/ S3?G3)

*Chitrella cavicola* (*Obisium c.* Packard, 1884; *Microcreagris* (?) *c.* (P) Beier, 1932) (Endless (=Newmarket) C.,Rockingham Co.,VA & cave in Berkeley Co.,WV/Tb or Tp/ G3)

*Chitrella elliotti* Muchmore 1992 (\*type locality cave in Sutton Co.,TX/ Tb/ G1G2)

*Chitrella major* Muchmore, 1992 (\*type locality cave in Verde Co.,TX/ Tb/ G1G2)

*Chitrella regina* Malcolm & J.C.Chamberlin, 1960 (\*\*type locality & 1 other cave in Greenbrier Co.,WV/Tb?/WV T&E S1 rank & global G1 rank; Federal Species of Concern/ Royal syarinid pseudoscorpion/ G1)

*Chitrella* undescr. sp. (VA/ T&E VA S1, global G1/ Tb)

*Chitrella* (*Ephippiochthonius*) undescr. sp. (OH/Tb)

*Chitrella* undet. sp. (Tb? in cave inCulberson Co., TX)

*Chitrella superba* Muchmore 1973 (\*type locality cave in Shenandoah Co.,VA/ Tb/ G1)

*Chitrella welbourni* Muchmore 1992 (\*type locality cave in Eddy Co.,NM/ Tb? / G1G2)

*Chitrella transversa* (*Obisium t.* Banks, 1909; *Microcregris t.* Beier, 1932) Hoff, 1956 (CO, NM/ Tp?)

*Chitrellina* Muchmore 1996b - Syarinidae pseudoscorpion

*Chitrellina chiricahuae* Muchmore 1996b (\*type locality cave in Cochise Co.,AZ/ Tb/ G1G2)

*Chthonius* C.Koch, 1843 - Chthoniidae pseudoscorpions

*Chthonius packardi* = *Kleptochthonius p.*

*Chthonius paludis* (J. Chamberlin, 1929) (Ttp in GA (Walker Co.))

*Chthonius* (*Ephippiochthonius*) *tetrachelatus* (*Scorpio t.* Preysler, 1790) (E/Tx in AL, IL, IN (WA Co.), OH, KY, TN, ?TX, VA)

*Chthonius virginicus* Chamberlin, 1929 (epigean in MD, NC, VA, DC/Ac or Tx in IL, IN (Harrison & Jefferson Cos.), OH, VA; Tp in GA (Dade Co.)). **Bibl.:** Muchmore, 1981b

*Dinocheirus* Chamberlin, 1929 - Chernetidae pseudoscorpions. **Bibl.:** Muchmore 1974

*Dinocheirus astutus* Hoff., 1956 (NM epigean/Tx or Tp in NM, UT(poss.))

*Dinocheirus cavicolus* Muchmore, 1992 (= *D. cavicola*) \*\*\*?(type locality cave in Val Verde Co. & 2 caves in Kinney Co.,TX/ Tb/ G3)

*Dinocheirus* undet. sp. (cave each in Edwards & Hays Cos.,TX/ Tb?)

*Dinocheirus stercoreus* - see *Neoallochernes*

*Dinocheirus texanus* Hoff & Clawson, 1952 (TX woodrat nests; epigean in Cameron Co.,TX/ Tp in cave in Uvalde Co.,TX)

*Dinocheirus venustus* Hoff & Clawson, 1952 (woodrat nests, KS ,MO/Tx or Tp in Comal, Edwards, Medina, Val Verde Cos., TX)

*Fissillicreagris* Curcic, 1984 - Neobisiidae pseudoscorpions

*Fissillicreagris imperialis* (*Microcreagris i.* Muchmore, 1969) M.& Cokendolpher, 1995  
\*\*\* (type locality & 2 other caves in Santa Cruz,CA/Tb/vandalized, logging/CA T&E G1S1, Federal Species of Concern)

*Halobisium* J.C. Chamberlin, 1930 - Neobisiidae pseudoscorpion

*Halobisium* undet. sp. (Tx or Ac in sea cave, Santa Cruz Co.,CA)

*Hesperochnes* Chamberlin, 1924 - Chernetidae pseudoscorpion. **Bibl.:** Muchmore 1974

*Hesperochnes holsingeri* Muchmore, 1994a (\*type locality cave in Jefferson Co.,IN/ Tb/ G1G2)

*Hesperochnes mimulus* Chamberlin, 1952 (epigean in NH/ Ac or Tx in caves in Calaveras Co.,CA),

*Hesperochnes mirabilis* (*Parachelifer m.* Banks, 1895; Chelifer, *Pseudozoana* & *Chelodamus m.*) (type locality cave in Barren Co., KY/ caves in Adair, Barren, Carter, Christian, Edmonson (Mammoth Co.), Hart, Jackson, Rockcastle, Warren, Woodford Cos., KY + caves in nAL (Blount, Colbert, De Kalob, Jackson, Jefferson, Lauderdale, Madison, Marshall Cos.), nGA (Chattooga, Dade, Floyd & Walker Cos.), IN (Harrison, Jefferson & Washington Cos. – Se G3G4), TN (Anderson, Bedford, Cannon, Clay, De Kalb, Fentress, Giles, Hickman, Jackson, Marion, Putnam, Roane, Van Buren, Warren, Wayne, White Cos.), sOH, VA (Bath, Giles, Highland, Lee, Roanoke, Rockinham, Scott & WA Cos.)/ bat guano Tp or TTP in IN(cave in Harrison Co.)/ KY, TN IN T&E)

*Hesperochnes molestus* Hoff, 1956 (epigean in rodent nests in NM/ Tx in NM; Tp in cave in TX)

*Hesperochnes occidentalis* (*Pseudozoana o.* Hoff & Bolsterli, 1956) (type locality cave in Washington Co.(AR)/ Tx or Tp in AR (Boone, Greene, Lawrence, Maron, Newton, Randolph, Searcy Cos.), MO (Barry, Camden, Carter, Chistian, Crawford, Dent, Franklin, Hickory, Howell, Madison, Oregon, Ozark, Phelps, Pulaski, Shannon, Taney, Texas Cos.)), OK (Delaware Co.); Tb in Edwards Co.,TX/ G4G5)

*Hesperochnes riograndensis* Hoff & Clawson, 1952 (woodrat nest in Socorro Co., NM/ Tx in NM; Tp in Irion, Terrell Cos.,TX & Socorro Co.,NM)

*Hesperochnes unicolor* (*Chelanops u.* Banks, 1908; *H.u.* Hoff, 1947) (epigean near Austin, TX/ Ac or Tx in Hays, Williamson Cos., TX)

*Heterochthonius* Chamberlin, 1929 = *Kleptochthonius*

*Kleptochthonius* Chamberlin, 1949 (= *Apochthonius*, *Heterochthonius* in part) - Chthoniidae pseudoscorpions. **Bibl.:** Malcolm & Chamberlin 1961; Muchmore 1965, 1966, 1970, 1974

*Kleptochthonius (C.) affinis* Muchmore, 1976a (\*\*( type locality & 1 other cave in Claiborne Co.,TN/ Tb/ S1S2? G1G2)

*Kleptochthonius (C.) anophthalmus* Muchmore, 1970a (C.a.) (type locality cave in \*Bath Co.,swVA/Tb/T&E VA S1, global G1 or G1G2)

*Kleptochthonius (C.) attenuatus* Malcom & J.C.Chamberlin, 1961 (\*type locality cave in Hart Co., KY/ Tb/ G1G2)

*Kleptochthonius (C.) barri* Muchmore, 1965 (type locality cave in Grundy Co., +Warren Co.,TN/ S3?G3)

*Kleptochthonius (C.) binocularis* Muchmore, 1974d (\*type locality cave in Scott Co.,VA/T&E VA S1, global G1)

*Kleptochthonius (C.) cerberus* Muchmore & Chamberlin, 1961 (\*White Cave in Mammoth C. System, KY/ G1G2)

*Kleptochthonius (C.) charon* Muchmore, 1965 (\*type locality cave in Bledsoe Co.,TN/ Tb/ S1S2? G1G2)

*Kleptochthonius (C.) daemonius* Muchmore, 1965 (\*type locality cave in Van Buren Co.,TN/ Tb/ S1S2? G1G2)

*Kleptochthonius (C.) erebicus* Muchmore, 1965 (\*type locality cave in Wayne Co.,KY/ Tb/ G1G2)

*Kleptochthonius (C.) gertschi* Muchmore & C., 1961 (\*type locality cave in Lee Co.,VA/T&E VA S1, global G1/ Tb)

*Kleptochthonius griseomanus* Muchmore, 2000 (\*\*(type locality & 1 other cave in Harrison Co, IN/ Tp or Tx (known only from caves))

*Kleptochthonius (C.) hageni* Muchmore, 1963 (type locality in Mammoth C./+cKY/ Tb/ G1G2)

*Kleptochthonius (C.) henroti* (*C.h.* Vachon, 1952a; K.h. Drewry, 1989) Muchmore & C., 1961 (type locality & >5 other caves in Greenbrier Co. & cave in Pocahontas Co.,WV/Tb/WV T&E S1 rank & global G1 or G1G2 rank; Federal Species of Concern/ Greenbrier Valley cave pseudoscorpion)

*Kleptochthonius (C.) hetricki* Muchmore, 1974d (K.h. Drewry, 1989) (\*Organ (part of Greenbrier Cave System),Greenbrier Co.,WV/ WV T&E S1 rank & global G1 rank; Federal Species of Concern/ Tb/ Organ Cave pseudoscorpion)

*Kleptochthonius (C.) hubrichti* Muchmore, 1965 \*\* (type locality & at least one other cave in Barren Co., KY/ Tb/ G1 or G1G2)

*Kleptochthonius (C.) infernalis* Muchmore & Chamberlin, 1961 (\*type locality cave in Cumberland Co., TN/ Tb/ S1S2? G1G2)

*Kleptochthonius (C.) krekeleeri* Muchmore, 1965 (type locality cave in Adair Co. + caves in Rockcastle & Powell Cos., KY/ Tb/ G3)

*Kleptochthonius (C.) lewisorum* Muchmore, 2000 (\*type locality cave in Harrison Co., IN/ Tb)

*Kleptochthonius (C.) lutzi* Muchmore & Chamberlin, 1961 (\*type locality cave in Lee Co., VA & Claiborne Co., TN/ T&E VA S1, global G1/ Tb)

*Kleptochthonius (Kleptochthonius) magnus* Muchmore, 1966a \*\*\* (type locality cave in Franklin Co. (TN) & cave each in Dade & Walker Co., GA/ Tp or Tb/ S1S2? G1G2)

*Kleptochthonius (Chamberlinochthonius) microphthalmus* Malcolm & J.C. Chamberlin, 1961 (\*type locality cave in Warren Co., KY/ Tb guanophile/ State T&E/ G1G2)

*Kleptochthonius moestus (Chthonius m. Banks, 1891; Apochthonius m. Chamberlin, 1929)* (epigeal in IL, IN, MO, NM, NC, NY, PA, WV/ Tx in MD(prob.) & KY)

*Kleptochthonius (C.) myopioides* Malcolm & J.C. Chamberlin, 1961 (\*type locality cave in De Kalb Co., TN/ Tb/ S1S2? G1G2)

*Kleptochthonius (Kleptochthonius) multispinosus (Heterochthonius m. Hoff, 1945)* Hoff, 1951 (AL, IL, KY, MS, MO, NC, TN, VA/ Tp? or Tx in AL)

*Kleptochthonius (Chamberlinochthonius) orpheus* Muchmore, 1965 (K.o. Muchmore, 1970) (\*type locality cave in Monroe Co., WV/WV T&E S1 rank & global G1 rank; Federal Species of Concern/ Tb/ orpheus cave pseudoscorpion/ G1)

*Kleptochthonius (C.) packardii (Blothrhus p. Hagen, 1879; Chthonius p. Hagen, 1880)* Muchmore, 1963 (Wyandotte C. (IN) (extirpated?) + cave in Crawford Co., 4 caves in Harrison CO) & cave in Orange Co., IN/ Tb, S1 G3 (some localities may be undesc. sp.)

*Kleptochthonius (C.) pluto* Muchmore, 1965 (= *Microcreagris p.*) (\*type locality cave in Overton Co., TN/ Tb/ S1S2? G1G2)

*Kleptochthonius (C.) proserpinae* Muchmore, 1965 (K.p. Muchmore, 1970) (\*type locality cave in Greenbrier Co., WV/WV T&E S1 rank & global G1 rank; Federal Species of Concern/ Tb/ proserpina cave pseudoscorpion/ G1)

*Kleptochthonius (C.) proximisetus* Muchmore, 1976a \*\* (type locality & 1 other cave in Lee Co., VA/ Tb/ T&E VA S1, global G1/ Tb/ G1)

*Kleptochthonius (C.) regulus* Muchmore, 1970 (\*type locality cave in Tazewell Co.,VA/T&E VA S1, global G1)

*Kleptochthonius (C.) rex* Malcolm & J.C.Chamberlin, 1961 (\*type locality cave in Pickett Co.,TN/ Tb/ S1S2? G1G2)

*Kleptochthonius (C.) similis* Muchmore, 1976a (\*\*type locality & one other cave in Lee Co.,VA/ T&E VA S1, global G1/ Tb)

*Kleptochthonius* undescr. sp.#1 (AL/Tp?)

*Kleptochthonius* undescr. sp.#2 (\*Organ C.,WV)/ Tb)

*Kleptochthonius* undescr. sp.#3 (\*cave in Hancock Co.,TN/ Tb)

*Kleptochthonius* undescr. sp.#4 (\*cave in Augusta Co.,VA/Tb/ T&E VA S1, global G1)

*Kleptochthonius* undescr. sp. #6? (\*?cave in Coronation Island, AK)

*Kleptochthonius (C.) stygius* Muchmore, 1965 (\*type locality cave in Putnam Co.,TN/ Tb/ S1S2? G1G2)

*Kleptochthonius (C.) tantalus* Muchmore, 1966a (\*type locality cave in Franklin Co.,TN/ Tb/ S1S2? G1G2)

*Larca* Chamberlin, 1920 - Garypidae pseudoscorpion. **Bibl.:** Muchmore 1981

*Larca chamberlini* Benedict & Malcolm, 1978 (OR, CA epigeal/Tp in Calaveras & Tuolumne Cos.,CA)

*Larca laceyi* Muchmore, 1981 (type locality & 2 other caves in Calaveras Co.,CA/CA T&E G1S1, Federal Species of Concern/ Lacey's Cave Pseudoscorpion/ Tb/ G1G2)

*Lechytia* Balzan, 1891 - Chthoniidae pseudoscorpions

*Lechytia sini* Muchmore, 1975 (epigeal in IN, FL, TX/ Ac or Tx in Williamson Co.?,TX)

*Leucohya* J.C. Chamberlin, 1946 - Bochicidae pseudoscorpions, subfamily Leucohyinae

*Leucohya texana* Muchmore, 1986a (\*type locality cave in Uvalde Co.,TX/ Tb/ G1G2)

*Lissocreagris* Curcic, 1981 (=Microcreagris) Neobisiidae pseudoscorpions

*Lissocreagris eurydice* (*Microcreagris e.* Muchmore, 1969) (\*type locality cave in Jackson Co.,AL/ Tb/ G1G2)

*Lissocreagris mortis* (*Microcreagris m.* Muchmore, 1969) = *Alabamocreagris m.*

*Lissocreagris nickajackensis* = *Microcreagris n.*

*Lissocreagris pluto* (*M.s.* J.C.Chamberlin, 1962) (\*type locality cave in Marshall Co., AL/ Tb)

*Lissocreagris persephone* (*M.p.* J.C.Chamberlin, 1962) \*\*\*\*(type locality & 3 other caves in Marshall Co.,AL/ Tb/ G1G2)

*Lissocreagris pumila* = *Minicreagris pumila*

*Lissocreagris* undescr. sp.#1 \*\*\* (2 caves in Marshall Co. & one in Hampton Co.,AL/ Tb?)

*Lissocreagris subatlantica* (M.s. Chamberlin, 1962) Curcic, 1981 (type locality cave in Colbert Co.,AL +Morgan Co.(AL) & nGA (Chattooga Co.)/ Ep or surface Ac in GA?/ Tb or Tp in AL; endogean)

*Lissocreagris valentinei* (*Microcreagris* v. J.C.Chamberlin, 1962) Curcic, 1981 (\*type locality cave in Lee Co.,VA & cave or caves in Claiborne Co.,TN/ Tb/T&E VA S1, global G1 or G1G3)

*Mexichthonius* Muchmore 1975 - Chthoniidae pseudoscorpions

*Mexichthonius exoticus* Muchmore 1996b (\*type locality cave in Travis Co.,TX/ Tb/ G1G2)

*Microbisium* J.C. Chamberlin, 1930 - Neobisiidae pseudoscorpions

*Microbisium parvulum* (*Obisium* p. Banks, 1895; *M. confusum* Hoff, 1946) Chamberlin, 1930 (epigean in Canada to El Salvador and Costa Rica/ Tp in Bell, Bexar, Burnet, Coryell, San Saba, Travis Cos.,TX)

*Microcreagris* Balzan, 1892 - Neobisiidae pseudoscorpions. **Bibl.:** Curcic, 1984, 1989; Muchmore 1969

*Microcreagris columbiana* = *Americocreagris* c.; *Microcreagris eurydice* = *Lissocreagris* e.  
*Microcreagris fallax* = *Trisetobisium* f.; *Microcreagris grahami* = *Australinocreagris* g.

*Microcreagris grandis* Muchmore, 1962 (Lehman C. & one cave system, Great Basin Natl.Park, White Pine Co., NV/ Tb, Tm) **Bibl.:** Bridgemon 1967

*Microcreagris imperialis* = *Fissilicreagris* i.

*Microcreagris infernalis* = *Tartarocreagris* i.

*Microcreagris mortis* = *Lissocreagris* m.

*Microcreagris nickajackensis* Muchmore, 1966 (= *Lissocreagris* n.) \*\* (Nickajack C.(flooded by dam), Marion Co.,TN) & cave in Jackson Co.,AL/ Tb/ G1G2)

*Microcreagris pecki* = *A labamocreagris* p.

*Microcreagris persephone* = *Lissocreagris* persephone

*Microcreagris phyllisae* Chamberlin, 1930 = *Saetigerocreagris* p.

*Microcreagris pluto* = *Kleptochthonius* (C.) pluto

*Microcreagris pumila* = *Minicreagris* p.

*Microcreagris reddelli* = *Australinocreagris* r.

*Microcreagris* undescr. sp. = *Lissocreagris* undescr. sp.

*Microcreagris* undet. sp. (Calaveras & Mariposa Cos.,CA)

*Microcreagris valentinei* = *Lissocreagris* v.

*Minicreagris* Curcic 1989 - Neobisiidae pseudoscorpions

*Minicreagris pumila* (*Microcreagris p.* Muchmore, 1969) Curcic, 1989 (type locality cave in Blount Co. & caves in Chatooga Co., GA +seVA/ Tp or Tx in GA, VA; epigean in AL, GA. TN)

*Mundochthonius* Chamberlin, 1929 - Chthoniidae pseudoscorpions. **Bibl.:** Muchmore (1968)

*Mundochthonius cavernicolus* Muchmore, 1968e (type locality cave in Monroe Co., IL +Lincoln Co., MO/Tb G3G4)

*Mundochthonius holsingeri* Benedict & Malcolm, 1974 (\*type locality cave in Shenandoah Co., VA/ Tb/ T&E VA S1, global G1)

*Mundochthonius* (seems to be) undescr. sp. (near *M. cavernicolus*) (\*cave in Mark Twain National Forest, Oregon Co., MO/ TTP?)

*Mundochthonius* undet. sp. (Epigean in Tuolumne Co, CA/ Tb)

*Neallochernes* Hoff, 1947 - Chernetidae pseudoscorpions

*Neallochernes incertus* Muchmore, 1992 (\*type locality cave in Eddy Co., NM/ Tb/ G1G2)

*Neallochernes* undet. sp. (Tp in cave each in Coryell & Val Verde Cos., TX)

*Neallochernes stercoreus* (*Dinocheirus s.* Turk, 1949; *Tejachernes s.* Hoff, 1957) (type locality cave in Comal Co. & caves in Bexar, Blanco, Burnet, Comal, Edwards, Kendall, Ker, Kinney, Mason, Medina, Terrell, Uvalde, Val Verde Cos., TX & in cave in Grand Canyon, Cococino Co., AZ/ Tp gaunobic/ G3)

*Neochthonius* Chamberlin, 1929 - Cheiridiidae pseudoscorpions. **Bibl.:** Muchmore, 1969a

*Neochthonius imperialis* Muchmore 1996 (\*type locality cave in Santa Cruz Co., CA/ Tb/ G1G2)

*Neochthonius* undescribed sp(s). (epigean &/or Tp? in Calaveras & Tuolumne Cos., CA)

*Neochthonius* undet. sp(s). (epigean &/or Tp? in Calaveras, Tulare & Tuolumne Cos., CA),

*Neochthonius troglodytes* Muchmore, 1969a (type locality cave in Calaveras Co. +Tuolumne Co., CA/Tb G3)

*Novobisium* Muchmore, 1967 - Neobisiidae pseudoscorpions

*Novobisium ingratum* (*Neobisium i.* Chamberlin, 1962) Muchmore, 1967 (type locality cave in Jackson Co., AL/epigean in AL, TN / Ac, Tp or Tx in AL, TN)

*Obisium* - See *Chitrella*

*Parobisium* J. Chamberlin, 1930 - Neobisiidae pseudoscorpion

*Parobisium charlotteae* Chamberlin, 1962 (\*type locality cave in Deschutes Co., OR/Tp or Tb/ G1G2, caves only)

*Parobisium* undescr. sp. (\*cave in Skamania Co., WA/Tb?) Benedict (1977),

*Parachelifer* Beier, 1932 - See *Hesperochernes m.*

*Pseudogarypus* Ellingsen, 1909 (= *Cerogarypus*) - Pseudogarypidae pseudoscorpion  
*Pseudogarypus hypogeus* Muchmore, 1981 \*\* (type locality & one other cave in Wapatki Natl. Monument, Navajo Co., AZ/ Tp, hypogean/ G1G2)

*Pseudogarypus orpheus* Muchmore, 1981 \*\* (type locality cave in Calaveras Co. & cave in Tuolumne Co., CA/ CA T&E G1S1, Federal Species of Concern/ Tb/ G1G2)

*Pseudogarypus spelaeus* Benedict & Malcolm, 1978 (\*type locality cave in Shasta Co., CA/ Tb/ G1G2)

*Pseudozoana occidentalis* = *Hesperochnes o.*

*Pseudozoana mirabilis* = *Hesperochnes m.*

*Pseudotyranochthonius* Beier, 1930 - Chthoniidae pseudoscorpions

*Pseudotyranochthonius gracilis* undescr. ssp. (OR C., OR) **Bibl.:** Benedict 1977

*Pseudotyranochthonius utahensis* Muchmore, 1967 (UT/ Tp, Tx or Ac in WA)

*Saetigerocreagris* Curcic, 1984 - Neobisiidae pseudoscorpions

*Saetigerocreagris phyllisae* (*Microcreagris p.* Chamberlin, 1930) Curcic, 1984 (Coronado Beach in kelp & nearby cave, Los Angeles Co., CA/ Tx?, epigean in CA)

*Tartarocreagris* Curcic, 1984 - Neobisiidae pseudoscorpions

*Tartarocreagris comanche* Muchmore 1992 (\*type locality cave in Travis Co., TX/ Tb/ G1G2)  
**Bibl.:** Muchmore 2000

*Tartarocreagris infernalis* Muchmore 1969 \*\* (type locality & probably one other cave in Williamson Co., TX/ Tb/ G1G2)

*Tartarocreagris intermedia* Muchmore 1992 (\*type locality cave in Travis Co., TX/ Tb/ G1G2)

*Tartarocreagris texana* (*Microcreagris t.* Muchmore, 1969; *Australinocreagris t.* Curcic, 1989) Curcic, 1984 (To. C. pseudoscorpion) (type locality & at least four other caves in Travis Co. , TX/T&E/ Tb/ G3 or (less likely) G1)

*Tartarocreagris reddelli* (*Microcreagris r.* Muchmore, 1969; *Australinocreagris r.* Curcic, 1989) Muchmore, 1992 \*\*\*\*? (type locality cave in Travis Co. & 2 caves Williamson Co., TX/ Tb/ G3 or (less likely) G1)

*Tartarocreagris* undescr. 1-5 sps. (Bexar, Burnet, Travis & Williamson Cos., TX/Tb) **Bibl.:** Muchmore 2000

*Tejachernes* Hoff, 1957 - see *Neoallochernes*

*Trisetobisium* Curcic, 1982 - Neobisiidae pseudoscorpion

*Trisetobisium fallax* (*Microcreagris f.* Chamberlin, 1962) (type locality cave in Colbert Co., AL / Tp or Tx in AL; endogean & Tx or Ac in NC)



*Tuberochernes* Muchmore, 1997 - Chernetidae pseudoscorpions

*Tuberochernes aalbui* Muchmore, 1997 (\*type locality cave in Inyo Co.,CA/ Tb/ G1G2)

*Tuberochernes ubicki* Muchmore, 1997 (\*type locality cave in Santa Cruz, AZ/ Tb/ G1G2)

*Tyrannochthonius* Chamberlin, 1929 - Chthoniidae pseudoscorpions. **Bibl.:** Muchmore, 1996a; Muchmore & Chamberlin 1995

*Tyrannochthonius aladdinensis* C.1995 (\*type locality cave in Madison Co.,AL/ Tb/ G1G2)

*Tyrannochthonius aralu* Chamberlin., 1995 (\*type locality cave in Madison Co.,AL/ Tb/ G1G2)

*Tyrannochthonius archeri* Chamberlin., 1995 (\*type locality cave in Morgan Co., AL/ Tb/ G1G2)

*Tyrannochthonius attenuatus* Muchmore1996 (\*type locality cave in Madison Co.,AL/ Tb/ G1G2)

*Tyrannochthonius averniculus* Chamberlin., 1995 (\*\*type locality & 1 other cave in Marshall Co.,AL/ Tb/ G1G2)

*Tyrannochthonius barri* Muchmore, 1996 (\*type locality cave in Marshall Co.,AL/ Tb/ G1G2)

*Tyrannochthonius binoculatus* Muchmore, 1996 (\*type locality cave in Jackson Co.,AL/ Tb/ G1G2)

*Tyrannochthonius chamberlini* Muchmore, 1996 (\*type locality cave in Calhoun Co.,AL/ Tb/ G1G2)

*Tyrannochthonius charon* Muchmore, 1996 (\*type locality cave in Jackson Co.,AL/ Tb/ G1G2)

*Tyrannochthonius diabolus* Muchmore, 1996 (\*type locality cave in ,Jackson Co.,AL/ Tb/ G1G2)

*Tyrannochthonius erebicus* Muchmore, 1996 (\*\*type locality & 1 other cave in Jackson Co.,AL/ Tb/ G1G2)

*Tyrannochthonius felix* Muchmore, 1996 (\*type locality cave in Jackson Co.,AL/ Tb/ G1G2)

*Tyrannochthonius fiskei* Muchmore, 1996 (\*type locality cave in Franklin Co.,TN/ Tb/ S1S2? G1G2)

*Tyrannochthonius gnomus* Muchmore, 1996 (\*type locality cave in Marshall Co.,AL/ Tb/ G1G2)

*Tyrannochthonius halopotamus* Muchmore, 1996 (\*type locality cave in Jackson Co.,AL/ Tb/ G1G2)

*Tyrannochthonius howarthi* = Undescr. Genus *h.* (see above undescr. genus in Chthoniidae)

*Tyrannochthonius hypogeus* Muchmore, 1996 (\*Mammoth C.,KY/ Tb/ G1G2)

*Tyrannochthonius infernalis* Muchmore, 1996 (\*type locality cave in Jackson Co.,AL/ Tb/ G1G2)

*Tyrannochthonius jonesi* Chamberlin, 1995 (\*type locality cave in Blount Co.,AL/ Tb/ G1G2)  
*Tyrannochthonius nergal* Chamberlin, 1995 (type locality cave in Madison Co.,AL/ Tb/ G1G2)

*Tyrannochthonius orpheus* Muchmore, 1996 (\*type locality cave in Madison Co.,AL/ Tb/ G1G2)

*Tyrannochthonius osiris* Muchmore, 1996 (\*type locality cave in Jackson Co.,AL/ Tb/ G1G2)

*Tyrannochthonius parvus* Muchmore, 1996 (\*type locality cave in Blount Co.,AL/ Tb/ G1G2)

*Tyrannochthonius pecki* Muchmore, 1996 (type locality & 2 other caves in Madison Co.,AL/ Tb/ G1G2)

*Tyrannochthonius pholeter* Muchmore, 1996 (\*type locality cave in Madison Co.,AL/ Tb/ G1G2)

*Tyrannochthonius pluto* Muchmore, 1996 (\*type locality cave in Marshall Co.,AL/ Tb)

*Tyrannochthonius pupukeanus* Muchmore,1983 (\*\*type locality cave in Oahu & Maui lowland dry cave, HI/ Tb/ G1)

*Tyrannochthonius satan* Muchmore, 1996 (\*type locality cave in Marshall Co.,AL/ Tb/ G1G2)

*Tyrannochthonius sheltae* Muchmore, 1996 (\*type locality cave in Madison Co.,AL/ Tb/ G1G2)

*Tyrannochthonius skeletonis* Muchmore, 1996 (\*type locality cave in Jackson Co.,AL/ Tb/ G1G2)

*Tyrannochthonius* undescr. sp.#1 (\*cave in Maui, HI/ Tb)

*Tyrannochthonius* undescr. sp.#2 (Bexar Co.,TX/Tb)

*Tyrannochthonius steevesi* Muchmore, 1996 (\*type locality cave in Pickett Co.,TN/ Tb/ S1S2? G1G2)

*Tyrannochthonius stygius* Muchmore, 1996 (\*type locality cave in Jackson Co.,AL/ Tb/ G1G2)

*Tyrannochthonius stonei* Muchmore, 1989 (\*type locality cave in Maui, HI/ Tb/ G1G2)

*Tyrannochthonius tartarus* Muchmore, 1996 (\*type locality cave in Marshall Co.,AL/ Tb/ G1G2)

*Tyrannochthonius tenuis* Muchmore1995 (\*type locality cave in Madison Co.,AL/ Tb/ G1G2)

*Tyrannochthonius texanus* Muchmore1992 (type locality cave in Travis Co. +Bexar, Blanco, Coryell, Edwards, Hays, & Val Verde Cos.,TX/ Tp, Ep/ G3)

*Tyrannochthonius torodei* Muchmore, 1996 (\*type locality cave in Jackson Co.,AL/ Tb/ G1G2)

*Tyrannochthonius troglodytes* Muchmore, 1986a (type locality & 1 other cave in Llano Co.,TX/ Tb/ G1G2)

## Psocoptera

(=Corredentia & Copeognatha) (booklice (=book-lice) & barklice; psocids & trogiids) - Insect Order of Division Neoptera, Subdivision Acercaria, Section Psocodea. Name derives from Greek psokos, meaning "rubbed small," hence "gnawed," a reference to its feeding method. Booklice refers to a common habitat in old books, old papers. They also live in stored cereals. 1.5-5 mm. (rarely less than 1 mm or as large as 10 mm). Oval; pale or dusky; antennae long and slender, at least half the length of the body and often longer than the body. Biting mandibles. Wings rarely reduced in size or absent; the front pair larger than the hind pair and both membranous; venation with few or no cross veins. Some species can jump. Abdomen oval, without cerci. The coxae have organs presumably used for courtship sounds. Sperm is transferred in a spermatophore. Faculative parthenogenesis. Nymphs resemble adults and are often gregarious. Among the first species to colonize new lands. Barklice are common scavengers in some birds nests. About 3,200 species in 33 families, 230 genera, mostly tropical. 297 known species in 78 genera and 28 families in US and Canada. Earliest fossils in Permian. **Bibl.** Smithers, 1972; Mockford 1993; Mockford & Gurney, 1956; Smithers 1967, 1972

Undet. Genus in Carlsbad C.(NM), NW caves & ectoparasite on FL *Tadarida brasiliensis cynocephala* bats).

### Suborder Troctomorpha

Family Group Amphientometae

Amphientomidae (tropical barklice)

Subfamily Amphientominae (tropical barklice) (*Lithoseopsis*)

Family Group Nanopsocetae

Liposcelididae (booklice)

Subfamily Liposcelidinae (*Liposcelis*)

### Suborder Psocomorpha

Family Group Psocetae

Caeciliidae (lizard barklice) (*Caecilius*)

Myopsocidae (mouselike barklice) (*Myopsocus*)

Psocidae (=Psyllipsocidae, psocidae or cave barklice family) (most genera, *Psocatropos*) (also put in Superfamily Eupsocida)

Ectopsocidae (outer barklice) (*Ectopsocopsis*)

Elipsocidae (damp barklice)

Subfamily Elipsocinae (Subfamily not used by Mockford 1993) (*Elipsocus*)

Pseudocaeciliidae (false lizard barklice) (undet. Tx? genus in WA)

### Suborder Trogiomorpha:

Family Group Atropetae

Trogiidae (granary booklice)  
Subfamily Trogiinae (*Atropos*, *Cerobasis*, *Trogium*)

Family Group Psocatropetae  
Prionoglaridae (large-winged psocids) (*Speleketor*) **Bibl.:** Mockford, 1984

Psyllipsocidae (also = Psocidae) (cave barklice) (*Dorypteryx* (once put in Trogiidae))  
*Psocatropos*, *Psyllipsocus*; undet. genera(s) (cave in Bisbee Co.,AZ/ Tp?;  
Kartchner C.,AZ/Tp) **Bibl.** Badonnel & Lienhard (1994); Mockford, 1993

*Atropos* = *Trogium*

***Caecilius*** Curtis, 1837 - Caeciliidae psocoptera (29 species in US or Canada)

***Caecilius aurantiacus*** (*Psocus a.* Hagen, 1861) Hagen, 1866 (Tx or Ac in cave in Great Smoky Mts. Natl. Park., TN)

***Cerobasis*** Kolbe, 1882 (= *Hyperetes* Kolbe,1880; *Tichobia* Kolbe, 1882; *Albardia* Jacobson & Binachi, 1904; *Myhopsocnema* Enderlein, 1905; *Zlinia* Obr, 1948) Trogiidae psocoptera, Subfamily Trogiinae (3 species in US or Canada)

***Cerobasis guestfalicus*** (*H.g.* Kolbe; *H. pinicola* Kolbe, 1881; *T.alternan*, *C.muraria* Kolbe, 1882; *H. tessulatus* Hagen, 1883) (Tp or Tx in Mammoth C.,KY)

***Dorypteryx*** Aaron, 1883 (*Dolopteryx* Smithers, 1958) (see *Psyllipsocus*) Psyllipsocidae psocoptera (2 species in US or Canada)

***Dorypteryx pallida*** Aaron, 1884 (*D. albicans* Ribaga, 1907) (Tp or TTx in Augusta Co., VA)

***Ectopsocus*** McLachlan, 1899 (= *Micropsocus* Enderlein, 1901; *Chaetopsocus* Pearman, 1929) Ectopsocidae psocoptera (1 species in US or Canada)

***Ectopsocus vachoni*** Badonnel, 1946 (= *E. dimorphus* Mockford & Gurney, 1956) (Ttx in Sutton, Travis Cos., TX)

***Elipsocus*** Haen, 1866 (= *Cabarer* Navas, 1908) Elipsocidae psocoptera, Subfamily Elipsocinae (Subfamily not used by Mockford 1993) (6 species in US or Canada)

***Elipsocus*** or *Myopsocus* undet. sp. (Tp or Tx in Mammoth C.,KY),

*Hyperetes tessulatus* = *Cerobasis guestfalicus*

***Liposcelis*** Motschulsky, 1852 (= *Termes* Muller, 1776 (Homo.) Liposcelididae Psocoptera, Subfamily Liposcelidinae (24 species in US or Canada)

***Liposcelis decolor*** (Pearman, 1925) (Tp in GA (Bartow & Walker Cos.)

***Liposcelis bostrychophilus*** Badonnel,1931 (Ac in 1 NS cave)

**Liposcelis** undet. sp. or species (TTx in Edwards, Irion, Llano, Pecos, Travis Cos., TX; Tx in Carlsbad C.,NM; undet sp.(predator on ON bat guano))

**Lithoseopsis** E.L. Mockford, 1993 - Amphientomidae psocoptera, Subfamily Amphientominae (2 species in US or Canada)

**Lithoseopsis hellmani** (= *Pseudoseopsis h.* Muchmore & Gurney, 1956) (Mexico/ Tp in cave each in Hayes & Travis Cos.,TX)

**Myopsocus** Hagen, 1866 (= *Phlotodes*, *Rhaptoneura* Enderlein, 1910) Myopsocidae family (3 species in US or Canada)

**Myopsocus** or *Elipsocus* undet. sp. (Tp or Tx in Mammoth C.,KY)  
*Pseudoseopsis hellmani* = *Lithoseopsis h.*

**Psocatropos** Ribaga, 1899 (= *Psocinella* Banks, 1900; *Axinopsocus* Enderlein, 1903; *Vulturops* Townsend, 1912; *Gambrella* E.1931; *Psocatropos* Bandonnel, 1931 (Emend.) Psyllipsocidae psocoptera (1 species in US or Canada)

**Psocatropos microps** (*A.m.* Enderlein, 1903; *Psocinella slossonae* Banks, 1900 (syn.?); *V. floridanus* Corbett & Hargreaves, 1915; *Psocatropos lesnei* Bandonnel, 1931) (Tp? In Kendall, Travis Cos., TX)

**Psyllipsocus** de Selys Longchamps, 1872 - Psyllipsocidae psocoptera (2 species in US or Canada)

**Psyllipsocus ramburii** Selys-Longchamps, 1872 (book-louse) (*P. troglodytes*, *D. hageni* Banks, 1897, *Psocus pedicularius* Rambur, 1842 (Homo.); *Ocelloria gravonymph* Weber, 1906; *Nymphopsocus t. & algericus* Enderlein, 1909; *Fita vestigator* Navas, 1913; *Fabrella convexa* Lacroix, 1915; *Psyllipsocus brachypterus* Bandonnel, 1943) (worldwide epigeal, caves,Canada to Mexico)/Tp in AL, AR, AZ ,CA, GA, IL, KY (Mammoth C.),MI, MO, NM, NV, TN, TX)  
**Bibl.** Peck & Richardson 1976

*Psyllipsocus pallida* = *Dorypteryx p.*

**Psyllipsocus** undet. sp. (2 caves in Tuolumne Co., CA/Tp; Comal & Travis Cos., TX/Tp)

**Psyllipsocus** probable undescr. sp. (\*type locality cave in Kerr Co.,TX/ Tp)

**Speleketor** Gurney, 1943 - Prionoglaridae psocoptera (3 species in US, genus related to *Sensitibilla* in Africa)

**Speleketor flocki** Gurney, 1943 (\*\*type locality cave in Pima Co., Az & cave in Clark Co., seNV/ Tb)

**Trogium** Illiger, 1898 (*Atropos* Leach, 1815; *Clothilla* Westwood, 1841) Trogiidae psocoptera, Subfamily Trogiinae (3 species in US or Canada)

*Trogium divinatoria* (*Termes & Liposcelis d.* O.F. Muller, 1776; *Atropos d.*) (Tp or Tx in Mammoth C.,KY)

**psychrophilic** - Cold-adapted species showing growth temperature optimum of <15o C..

**psychrotolerant** - Species able to grow at low temperatures and showing a growth optimum >15o C.

**Pteridoiphytes** - Phylum Pteridophyta usually divided into four classes: Psilophytales, clubmosses, horsetails and ferns

**pubertal** - Pertains to a male undergoing spermatogenesis for the first time, or a female undergoing first estrus.

**punctuated equilibria** - Puntuational evolution at the species leve.

**punctuated gradualism** - Phyletic gradualism alternating with morphologic stasis.

**punctuational evolution** - Periods of rapid shape change separated by much slower/static evolution.

**pupa** - Inactive stage in certain insects during which larva gradually reorganizes tissues while becoming an adult.

Pycnogonids - See sea spiders

**quantum evolution** & speciation - Rapid speciation in small populations due to founder effect and/or genetic drift. Usually starts with loss of most of the popualtions. Cf. punctuated equilibrium.

rabbit, (jack) - See mammal, rabbit

**rabies** - Microbe (virus) hazard from mammal bites & rarely from airborne guano.. See microbe.

raccoon - See mammal, carnivore, raccoon

**racemization age method** - Dating based on the chemical racemization of amino acids, where an optically active amino acid over time is converted to a mixture of two isomers which possess no optical activity.

**radiation** - The migration of a taxon into different habitats & accompanied by genetic changes, radiocarbon age - Syn: carbon-14 age. Hunt 1955

**radiocarbon** - Radioactive carbon, esp. carbon-14, but also carbon-10 & -11.

**rare** - Population usually present with 1 to 5 individuals per year.

rarity - Bibl - See biogeography.

rearing - Lamb & Willey 1987

**recessive gene** - One masked phenotypically by a dominant allele in species heterozygous for that gene.

**rectilinear evolution** - Continued change of a similar type & direction over a long period of time but, unlike orthogenesis, without stating how the change is determined.

**refugium** or refugia - A refuge either from abiotic changes, predators, or competitors. High, rough ceilings provide small-scale r. for cave crickets at Mammoth C. (LaVoie, Poulson, & Helf, 1996. Cf. relict.

regeneration - Krichinskaya 1986; Putnam 1875; Rose & Shostak 1968; Stone 1964; Zeleny 1906

**regressive evolution** - Loss of morphologic or behavior traits, as in size reduction on islands or eye loss in Tbs. Since there is never a return to the presumed original genetics Romero (1985) argues for substituting the term convergent evolution.

**rehabilitation** - Restoration of certain desired traits but not all of the original attributes.

**relapsing fever** - Spirochete microbe hazard from *Borrelia* sp. in *Ornithodoros* ticks. Vectored mainly by rodents. Intermittent fever occurs in 1-2 weeks. Known from TX, KS, CA *Antrozous pallidus* bats have *Borrelia* but its relation to human disease is unknown. **Bibl.:** Bruce 1934; Coleman & Wright 1942; Cooley 1942; Eads et al 1956; M. Graham 1931; Lawrence & Terrell 1942; W. Lewis 1990a; Weller & Graham 1945; Wiseman 1945. Bohls 1942; Bohls & Schuhardt 1933; G.Davis et al. 1941; G. Davis 1940, 1942; Kemp et al. 1942; D. Lawrence & Terrell 1942; Weller & Graham 1930; Wisener 1976; Wiseman 1945

relative humidity - See humidity

**relict distribution** - Patchy distribution of species in widely scattered locations is evidence for former dominance of the group to which the species belongs, &/or which delimits former domains since fragmented by continental drift.

**relict** - 1. A type of species belonging to ancient groups whose fortunes have waned through geological time. Cf. living fossil. Many troglaphiles showing little morphologic change may be relicts; their closest surface relatives having become extinct. Incl. glacial, hygrophilic, & marine. See biogeography (bibl.).

**reproduction** (see also sex ratios): Barclay 1995; Cyr et al. 1991; Kunz & Stern 1995; McCracken 1984; McCracken & Bradbury 1977; Bradshaw, 1962; Cockrum 1955; Druecker 1972; Guthrie 1939; C. Hartmann 1933; Krutzsch 1975; R. Miller 1939; A. Parkinson 1981; O. Pearson, Koford & Pearson 1952; Petterson 1958; Racey et al. 1987; Reeder 1939; Wai-Ping & Fenton 1988; J. Whitaker & Mumford 1971-2; Whitaker & Mumford 1971-2; Wimsatt 1945;

**reproduction** (see morphology, population, sex ratio) - Clergue-Gazeau & Thorn, 1976; Clergue-Gazeau 1974; Corey, 1987; Holt, 1949; Resertarits & Aldrige, 1988; Strenth & Longley, 1990; Studier et al 1988-a

asexual - Krichinskaya, 1986.

copulation - Bechler 1981

courtship - Man & Fong 1991; Organ 1968; Parzefall 1982, 1991;

crowding effects - Green 1964, 1964a

cycles - Hobbs, III 1976; Jegla 1964, 1966, 1969; Jegla & Poulson, 1970; Palunas 1989; Studier, Lavoie, Nevin & McMillin 1988

eggs - Cyr 1989; Franz 1964; Martin et al 1977; Relyea & Sutton 1974; Studier 1996;

fertility - Kane 1981; Jegla 1966

hybridization - Peck 1983; Sweet 1982, 1984

interactions with predations - Man & Fong 1991

parthenogenesis - Chiba, Cutkomp & Halberg 1973; Glesener & Tilman 1978; Lamb 1973; Lamb & Wiley 1975, 1986-7, 1989

pheromones & sex detection - Hazlett 1985; Tierney, Thompson & Dunham 1984

spermiogenesis - Shasy & Biesele 1968

strategies - Cooper & Cooper 1978, 1978a; Davies et al., 1977; Northup 1989; Martin, R.F.1982; Palunas, 1989

**Reptile** - Of the class Reptilia, one of the vertebrates. Accidental in NA caves. **Areas:** **AR:** Duellman 1955; **CA:** Brattstrom 1953, 1958; **CO:** Douglas 1966; Hammerson 1986; **FL:** Carr & Goin 1955; Holman 1958-9; McDiarmid 1978; **GA:** 1958-9; McDiarmid 1978; **HI:** McKeown 1996; **IL:** : R. Olson 1956; **IN:** Hay, 1891; Minton 1972; Richards 1980d; **IN:** Butler, 1887; **KS:** J. Bruiekelman 1946; J. Collins 1982; B. & Smith 1946; H. Smith 1950; Tihen 1939; Webb 1970; **KY:** Barbour 1971; Chenoweth 1949; **MD:** Franz 1969; McCauley 1945; **MO:** Holman 1965; **MN:** Breckenridge 1944; Oldfield & Moriarty 1994;: New England: DeGraaf & Rudis 1983; **NM:** Van Devender & Worthington 1977; **MO:** Myers 1959; **NA:** Collins 1990, 1997; **NV:** Brattstrom 1958; **OH:** Conant 1938, 1951; Langlois 1964; **OK:** Black 1975; **Ozarks:** Dowling 1958; **PA:** Conant 1974; A. Smith 1945; McCoy 1982; **TN:** Blair 1961; **TX:** Strecker & Williams; **VA:** Hutchinson 1956; Tobey 1985; **WV:** Green 1964; **TX:** Raun 1971; Paleo: Fay 1984; Gehlbach 1965; Holman 1995;

resilience - The speed and/or degree that an ecosystem returns to original conditions following displacement or disturbance. See extirpation.

resistance - The ability of an ecosystem to resist change.

**retrogression** - The change from a more specialized to a less specialized organization or structure in a species during its development.

**rheocrene** - Spring with sand or gravel as substrate. Cf. holocrene.



**rheophile** - A taxon that favors or thrives in a habitat with flowing water.

**rheotaxis** - Movement or orientation in response to a current, usually water. A species who does this is rheotactic.

**rhithron** - The spring zone extending from the hypocrenon to the point where the annual range of monthly mean temperature does not exceed 20° Centigrade, where the current is fast and turbulent; where the substrate is composed of large particles, mainly fixed boulders, stable cobble, and gravels with some sand, silt and mud in sheltered patches, and where dissolved oxygen is near saturation.

**rhizosphere** - The surface of roots and immediately surrounding soil areas, a zone of high biologic activity.

**riffle** - Shallow water 2" to 1' deep, moderately swift moving water and a rocky stream bottom with gravel 1/4" to 10" diameter.

ringtail - See mammal, ringtail

**riparian** - Vegetated area adjacent to waterbodies.

Rocky Mountain Spotted Fever - Transmitted by ticks. Symptoms include sudden onset of fever lasting for 2-3 weeks (if untreated). Lethargy, deep muscle pain, severe headache, & chills. Rash may appear on limbs around the 3rd day, & spread rapidly.

roost - Where bats or birds sleep or rest. Incl. deserted, distribution (ceiling, crevice, single, groups of 2-10, groups >10, wall), hibernaculum, migratory, moth wings, night, nursery, occasional, scratches, summer, & transitory.

root scales - See Homoptera, Family Ortheziidae.

## Rotifers

Aquatic Phylum Rotifera (less often put in class Rotatoria within phylum Aschelminthes). Acoelomate, unsegmented, bilaterally symmetrical. About 1,800 species. .4 to 2.5 mm long with fusiform or sac-like (bottom dwellers) but sometimes with spherical (surface floating forms) or with a flower-like shape (sessile). The rear end is bordered by a double-ciliated ring in many species and is used for locomotion and food collection. Syn.: wheel animalcules. **Areas:** **Canada:** Chengalath, 1977, 1984; **KS:** Velez, 1964

Kingdom Animalia

Clade Bilateria

Clade Protostomia

Clade Lophotrochozoa

Phylum Rotifera

Class Bdelloidea

Order Bdelloidea

Adinetidae (*Adineta*)

Habrotrochidae (*Philodina*) (put in Philodinidae by most authors)

Philodinidae (*Dissotrocha*, *Philodina*, *Rotaria*)

Class Eurotatoria (=Monogononta Plate, 1889)

Order Collothecaceae

Collothecidae (*Collotheca*)

Order Flosculariaceae

Conochilidae (*Conochilus*)

Filiniidae (*Filinia*)

Testudinellidae (*Pompholyx*, *Testudinella*)

Subclass Pseudotrocha

Order Ploimida (=Ploima) (undet. family in VA)

Asplanchnidae (*Asplanchna*)

Brachionidae (*Brachionus*, *Colurella*, *Cyrtonia*, *Kellicottia*, *Keratella*,  
*Lepadella*, *Lophocharis*, *Mikrocodides*, *Mytilina*, *Notholca*, *Paracolurella*,  
*Plationus*, *Platyias*, *Squatinella*, *Trichotria*, *Volga*)

Dicranophoridae (*Dicranella*, *Dicranophorus*, *Keratella* (put in Brachionidae  
by most authors), *Notholca*, *Wierzejskiella*)

Euchlanidae (*Euchlanis*)

Gastropidae (*Ascomorpha*, *Gastropus*)

Lecanidae (*Lecane*, *Monostyla*)

Notommatidae (*Aspelta*, *Cephalodella*, *Encentrum*, *Eothinia*, *Erignatha*,  
*Itura*, *Monommata*, *Myersinella*, *Notommata*, *Pedipartia*, *Pleurotrocha*,  
*Proales*, *Proalides*, *Resticula*, *Rousseletia*, *Scaridium*, *Taphrocampa*)

Proalidae (*Bryceella*)

Synchaetidae (*Polyarthra*, *Synchaeta*)

Trichocercidae (*Diurella*, *Elosa*, *Macrochaetus*, *Trichocerca*)

**Adinetidae** (*Adineta*)

**Asplanchnidae** (*Asplanchna*)

**Brachionidae** (*Brachionus*, *Colurella*, *Cyrtonia*, *Kellicottia*, *Keratella*, *Lepadella*, *Lophocharis*,  
*Mikrocodides*, *Mytilina*, *Notholca*, *Paracolurella*, *Plationis*, *Platyias*, *Squatinella*, *Trichotria*,  
*Volga*)

**Collothecidae** (*Collotheca*)

**Conochilidae** (*Conochilus*)

**Dicranophoridae** (*Dicranella*, *Dicranophorus*, *Keratella* (put in Brachionidae by most authors),  
*Notholca*, *Wierzejskiella*)

**Euchlanidae** (*Euchlanis*)

**Filiniidae** (*Filinia*)

**Gastropidae** (*Ascomorpha*, *Gastropus*)

**Habrotrochidae** (*Philodina*) (put in Philodinidae by most authors)

**Lecanidae** (*Lecane*, *Monostyla*)

**Notommatidae** (*Aspelta*, *Cephalodella*, *Encentrum*, *Eothinia*, *Erignatha*, *Itura*, *Monommata*,  
*Myersinella*, *Notommata*, *Pedipartia*, *Pleurotrocha*, *Proales*, *Proalides*, *Resticula*,  
*Rousseletia*, *Scaridium*, *Taphrocampa*)

**Philodinidae** (*Dissotrocha*, *Philodina*, *Rotaria*)

**Proalidae** (*Bryceella*)

**Synchaetidae** (*Polyarthra*, *Synchaeta*)

**Testudinellidae** (*Pompholyx*, *Testudinella*)

**Trichocercidae** (*Diurella*, *Elosa*, *Macrochaetus*, *Trichocerca*)

*Adineta* Hudson & Gosse, 1886 - Adinetidae rotifers

*Adineta barbata* Janson, 1893 (epigeal in moss in PA, MA, VA, Canada; AB lake benthic; VA hyporheic)

*Adineta vaga* (*Callidina* v. Davis, 1873) (hyporheic in Ninnescah River, KS)

*Ascomorpha* Perty, 1859 (= *Sacculus* Gosse, 1851) - Gastropidae rotifers

*Ascomorpha agilis* Zacharias, 1893 (NJ lake interstitial psammoxene)

*Ascomorpha agilis* var. *americana* de Beauchamp, 1932 (NJ lake interstitial psammoxene)

*Ascomorpha ecaudis* Perty, 1850 (NJ lake interstitial psammoxene)

*Ascomorpha saltans* Bartsch, 1870 (NJ lake interstitial psammoxene)

*Aspelta* Harring & Myers, 1928 Notommatidae rotifer

*Aspelta angusta* Harring & Myers, 1928 (VA hyporheic)

*Aspelta asper* (*Encentrum a.* Harring, 1913) (NJ lake interstitial psammoxene; hyporheic in Ninnescah River, KS)

*Aspelta circinator* (*Encentrum g.* Gosse, 1886; *Dicranophorus giraffa*) (NJ lake interstitial psammoxene; KS hyporheic)

*Aspelta beltista* Harring & Myers, 1928 (MI interstitial & NJ lake psammoxene)

*Aspelta egregia* Myers, 1936 (NJ beach lake interstitial psammophilic)

*Aspelta imbuta* Harring & Myers, 1928 (NJ lake interstitial psammoxene)  
*Aspelta* undet. sp. (NY freshwater sandy beach interstitial)

*Asplanchna* Goose, 1850 - Asplanchnidae rotifers  
*Asplanchna girodi* De Geurne, 1888 hyporheic in Ninescah River, KS

*Brachionus* Pallas, 1766 - Brachionidae rotifers  
*Brachionus angularis* Goose, 1851 (hyporheic in Ninescah River, KS)  
*Brachionus bidentatus* Anderson, 1889 (TX aquatic; hyporheic in Ninescah River, KS)

*Brachionus calyciflorus* Pallas, 1766 (hyporheic in Ninescah River, KS)  
*Brachionus caudatus* Barrois & Daday, 1894 (hyporheic in Ninescah River, KS)  
*Brachionus nilsoni* (Ahlstrom, 1940) (= *B. urceolaris n.*)(hyporheic in Ninescah River, KS)

*Brachionus quadridentatus* Hermann, 1783 (hyporheic in Ninescah River, KS)  
*Brachionus* undet. sp. (CO hyporheic)

*Brachionus urceolaris* Muller, 1773 (hyporheic in Ninescah River, KS)  
*Brachionus urceolaris nilsoni* = *B. n.*  
*Brachionus variabilis* Hampel, 1896 (hyporheic in Ninescah River, KS)

*Bryceella* Remane, 1929 - Proalidae rotifers  
*Bryceella* undet. sp. (interstitial in US sandy beaches)

*Bryceella tenella* (*Stephanops tenellus* Bryce, 1897; *Squatinella tenella* Harring, 1913) (NJ beach lake interstitial psammophile)

*Cephalodella* Bory de St Vincent, 1826 - loricata Notommatidae rotifers

*Cephalodella forficula* (*Notommata f.* Ehrenberg, 1831; *Diaschiza acronota* Gosse, 1887; *D. caeca* Dixon-Nuttall, 1903; *D. f.* Harring, 1913; *D. paeta* Gosse, 1886; *D. laeve* Eichwald, 1847) Harring & Myers, 1924 (TX aquatic)

*Cephalodella apocolea* Myers, 1924 (epigeal in NJ/ NJ, SC & WI (rare) lake beach sand interstitial psammophile; OH hyporheic)

*Cephalodella auriculata* (*Diaschiza a.* Mueller, 1773; *Diaschiza lacinulata* Levander, 1894; *Plagiognatha l.* Dumjardin, 1841) Harring & Myers, 1924 (NJ, MI & rare WI lake beach sand interstitial & hygropsammon; VA hyporheic)

*Cephalodella catellina* (*Cercaria catellina* O.F.Muller, 1786; *Diaschiza c.* Weber & Montet, 1918; *Diglena c.* Ehrenberg, 1830) Sasulinm, Kabanov & Neiswestnova, 1927 (rare WI lake beach sand interstitial psammophile; hyporheic in Ninescah River, KS)

*Cephalodella compacta* Wiszniewski, 1934 (lakeshore interstitial or hyporheic in Europe & Eastern Coastal Plain & Central Lowlands in US; NJ beach lake interstitial psammobiotic)

*Cephalodella delicata* Wulfert, 1937 (VA hyporheic)

*Cephalodella elongata* Myers NJ beach lake interstitial psammophile)

*Cephalodella eva* (Gosse, 1887) (NJ lake interstitial psammoxene; SC lake benthic)

*Cephalodella exigua* (Gosse, 1886) (WI lake beach sand rarity & NJ beach interstitial psammophile common; AB lake benthic (nr. *C.e.*); hygropsammon in Ninnescah River, KS; MN hyporheic)

*Cephalodella forficula* (Ehrenberg, 1831) (NJ, SC lake interstitial psammoxene; hygropsammon in Ninnescah River, KS; VA hyporheic)

*Cephalodella galbina* Myers (NJ lake interstitial psammoxene)

*Cephalodella gibba gibba* (Ehrenberg, 1832) (= *C. g.*) (CO, MI, ON hyporheic; WI lake beach sand interstitial; NJ beach interstitial psammophile; hygropsammon in Ninnescah River, KS)

*Cephalodella gibba microdactyla* Koch-Althaus, 1963 (VA hyporheic)

*Cephalodella gracilis* (Ehrenberg, 1832) (rare WI lake beach sand interstitial; NJ beach interstitial psammoxene; hygropsammon in Ninnescah River, KS)

*Cephalodella hoodii* (Gosse, 1886) (VA hyporheic)

*Cephalodella innesi* Myers, 1924 (NJ lake interstitial psammoxene)

*Cephalodella inquilina* Myers, 1924 (NJ lake interstitial psammoxene)

*Cephalodella intuta* Myers, 1924 (NJ lake interstitial psammoxene)

*Cephalodella megalcephala* (Glasscott, 1893) (MI interstitial; rare WI lake beach sand interstitial; NJ lake interstitial psammoxene; hygropsammon in Ninnescah River, KS; VA hyporheic)

*Cephalodella misgurnus* Wulfurt, 1937 (cf. *C. m.* - hygropsammon in Ninnescah River, KS)

*Cephalodella mucronata* Myers, 1924 (NJ lake interstitial psammoxene)

*Cephalodella obvia* Donner, 1950 (cf. *C. o.* hygropsammon in Ninnescah River, KS)

*Cephalodella physalis* Myers, 1924 (NJ lake interstitial psammoxene)

*Cephalodella remanei* Wiszniewski, 1934 (rare WI lake beach sand interstitial; NJ lake interstitial psammophile)

*Cephalodella* undet. sp. or species (CO hyporheic; (NY freshwater sandy beach interstitial; MN hyporheic)

*Cephalodella* undescr. sp. #1-2 (hyporheic in Ninnescah River, KS)

*Cephalodella sterea* (*Furcularia s.* Gosse, 1887; *Diaschiza s.* Dixon-Nuttall & Freemann, 1903) (hyporheic in Ninnescah River, KS)

*Cephalodella tantilla* Myers, 1924 (NJ lake interstitial psammophile)

*Cephalodella tenuior* (*Diaschiza t.* Gosse, 1886) Haring & Myers, 1924 (NJ lake interstitial psammoxene)

***Cephalodella ventripes*** Dixon-Nuttall, 1901 (hyporheic in Ninnescah River, KS)

***Collotheca*** Harring, 1913 - Collothecidae rotifers

***Collotheca pelagica*** (*Floscularia pelagica* Rousselet, 1893) Harring, 1913 (hyporheic in Ninnescah River, KS)

***Collotheca wiszniewski*** (= *Cephalodella w.* Edmondson & Hutchinson, 1934?) (hyporheic in Ninnescah River, KS)

***Colurella*** Bory De St. Vincent, 1824 (= *Colurus* Ehrenberg) Brachionidae rotifers

***Colurella adriatica*** Ehrenberg, 1831((VA, KS hyporheic)

***Colurella aemula*** Myers, 1934 (NJ lake interstitial)

***Colurella anodonta*** Carlin, 1939 (VA hyporheic)

***Colurella colurus*** (*Monurus colurus* Ehrenberg, 1831; *C. amblytelus* von Hofsten, 1909; *Colurus grallator*, *Monura loncheres* Gosse, 1887; *Colurus rotundatus* Daday, 1890) (WI lake beach sand & Fl marine sands interstitial psammophile; hyporheic in Ninnescah River, KS)

***Colurella colurus*** forma *compressa* (Lucks, 1912) (Fl marine sands interstitial psammophile)

***Colurella dicentra*** (Gosse, 1886) (Fl marine sands interstitial psammophile)

***Colurella gastracantha*** (Hauer, 1924) (VA hyporheic)

***Colurella hindeburgi*** (Steinecke, 1917) (VA hyporheic)

***Colurella obtusa*** (*Colurus dicentrus* Gosse, 1886) (rare WI lake beach sand interstitial; NJ lake interstitial psammoxene; VA, KS hyporheic)

***Colurella sinistra*** Carlin, 1939 (OH psammobiotic & hyporheic)

***Colurella*** undet. sp. (NY freshwater sandy beach interstitial)

***Colurella tessellata*** (*Colurus t.* Glascott, 1893) (NJ lake interstitial psammoxene)

***Colurella uncinata*** (*Brachionus uncinatus* O.F. Muller, 1773; *Colurus micromela*; *Monura m.* Gosse, 1887) Bory de St. Vincent, 1824 (rare WI lake beach sand interstitial; hyporheic in Ninnescah River, KS)

***Conochilus*** Ehrenberg, 1834 - Conochilidae rotifers

***Conochilus hippicrepis*** (Linza h. Schrank, 1830; *C. volvox* Ehrenberg, 1834) (SC lake benthic)

***Cyrtonia*** Rousselet, 1894 - Brachionidae rotifers

***Cyrtonia tuba*** (*Notommata t.* Ehrenberg, 1834; *Proales hyalina* Stokes, 1897) Rousselet, 1894 (NJ lake interstitial psammoxene)

***Dicranella*** Myers, 1936 - Diacranophoridae rotifers

***Dicranella gracilis*** = *Pedipartia g.* Myers, 1936

***Dicranophorus*** Nitzsch, 1827 - Dicranophoridae rotifers

*Dicranophorus artamus* Haring & Myers, 1928 (MI interstitial groundwater; NJ interstitial lakshore sediment, psammophile; VA hyporheic)

*Dicranophorus capucinus* Haring & Myers, 1928 (Europe, NJ, OH, WI lake beach sand interstitial, psammophile)

*Dicranophorus epicharis* Haring & Myers, 1928 (MI interstitial; hyporheic in Ninnescah River, KS)

*Dicranophorus erdestes* Haring & Myers, 1928 (MI interstitial; NJ lake interstitial psammoxene)

*Dicranophorus forcipatus* (Cercaria f. O.F. Muller, 1786) Haring, 1913 hyporheic in Ninnescah River, KS)

*Dicranophorus haueri* Haring & Myers, 1936 (NJ lake interstitial psammoxene)

*Dicranophorus hercules* Wiszniewski, 1934

*Dicranophorus hercules* var. *capucinoides* (Wiszniewski, 1932) (Hungary, Poland, NJ, MI lakeshore sand interstitial, psammobiotic)

*Dicranophorus lutkeni* (Arthroglena l. Bergendal, 1892; *Diglena dromius* Glascott, 1893; *D.l.* Weber & Montet, 1918) (rare WI lake beach sand interstitial; NJ lakeshore sand interstitial, psammobiotic)

*Dicranophorus prionacis* (Haring and Myers, 1928) (rare WI lakeshore sand interstitial psammophile)

*Dicranophorus proclastes* Haring & Myers, 1937 (NJ lake interstitial psammoxene)

*Dicranophorus robustus* Haring & Myers, 1937 (NJ lake interstitial psammoxene)

*Dicranophorus rostratus* (Dixon-Nuttall & Freeman, 1902) (MI interstitial; NJ lake interstitial psammoxene)

*Dicranophorus* undet. sp. (NY freshwater sandy beach interstitial)

*Dicranophorus thysanus* Haring & Myers, 1928 (NJ lake interstitial psammoxene)

*Dicranophorus uncinatus* (*Arthroglena u.* Milne, 1886) Haring, 1913 (KS, MI, NY, ON hyporheic)

*Dissotrocha* Bryce, 1910 - Philodinidae rotifers

*Dissotrocha aculeata* (Ehrenberg) = *D. hertzogi* a.

*Dissotrocha hertzogi aculeata* W. Koste, 1996 (hyporheic in Ninnescah River, KS (or new species); AB lake benthic; VA hyporheic)

*Dissotrocha* undet. sp. (CO,KS hyporheic)

***Dissotrocha macrostyla*** (*Philodina m.* Ehrenberg, 1838; *P. pannosa* Bailey, 1851; *Philoidna tuberculata* Gosse, 1886) (NA,SA,Carib/lakes bogs, MI interstitial; MN,SC lake benthic; NJ lake interstitial psammoxene; VA hyporheic)

*Diurella* - now subgenus of *Trichocerca*

*Diurella bidens* = *T. b.*; *Diurella brachyura* = *T. b.*; *Diurella cavia* = *T. c.*;

*Diurella collaris* = *T. c.*; *Diurella edmonsoni* = *T. e.*; *Diurella insignis* = *T. i.*

*Diurella insolens* = *T. i.*; *Diurella intermedia* = *T. i.*; *Diurella porcellus* = *T. p.*

*Diurella stylata* = *T. s.*; *Diurella tenuior* = *Trichocerca t.*; *Diurella tigris* = *T. t.*

*Diurella tortuosa* = *T. t.*; *Diurella uncinata* = *T. u.*

***Elosa*** Lord, 1891 - Trichocercidae rotifers

***Elosa worralli*** Lord, 1891 (rare WI lake beach sand interstitial; NJ ocean beach interstitial; NJ lake interstitial psammophile)

***Encentrum*** Ehrenberg, 1838 - Notommatidae rotifers

***Encentrum felis*** Muller, 1773 (NJ lake interstitial psammoxene)

***Encentrum insolitum*** Myers, 1936 (NJ, WI beach lake interstitial, psammobiotic)

***Encentrum lucidum*** Haring and Myers (NJ lake interstitial psammoxene)

***Encentrum marinum*** (*Furcularia m.* Dujardin, 1841; *Distemma platyceps* Gosse, 1887) Haring, 1913 (freshwater interstitial & Fl marine sands interstitial psammophile; hyporheic in Ninescah River, KS)

***Encentrum*** (*Paracentrum*) ***semiplicatum longipes*** Wulfert, 1936 (= *E.l.*) (hygropsammon in Ninescah River, KS)

***Encentrum striatum*** Althaus (Fl marine sands interstitial psammobiont)

***Encentrum?*** undet. sp. (NY freshwater sandy beach interstitial)

***Encentrum*** (*Wierzejskiella*) ***velox*** Wiszniewski, 1932 (hyporheic in Ninescah River, KS; hyporheic or interstitial beach sediment & psammobiotic in Italy, Germany, Poland, NJ, NY, OH, WI)

***Encentrum villosum*** Haring & Myers, 1928 (East US marine sands interstitial )

***Eothinia*** Haring & Myers, 1922 - Notommatidae rotifers

***Eothinia*** undet. sp. hyporheic in Ninescah River, KS

***Erignatha*** Haring & Myers, 1922 - Notommatidae rotifers

***Erignatha clastopis*** (*Encentrum c.* Gosse, 1886) Haring & Myers, 1922 (NJ lake interstitial psammoxene; VA hyporheic)

***Euchlanis*** Ehrenberg, 1832 - Euchlanidae rotifer

***Euchlanis alata*** Voronkov, 1911 (NJ lake interstitial psammoxene)

***Euchlanis arenosa*** Myers, 1936 (MI, NJ, OH, WI lakeshore interstitial, psammobiotic)



*Euchlanis callysta* Myers, 1936 (NJ lake interstitial psammoxene)

*Euchlanis dilatata* Ehrenberg, 1832 (VA, KS hyporheic)

*Euchlanis incisa* Carlin, 1936 (VA hyporheic)

*Euchlanis inquieta* Myers, 1936 (NJ, OH, WI lakeshore interstitial)

*Euchlanis lyra* Hudson, 1886 (hyporheic in Ninescah River, KS; cf. - AB lake benthic;)

*Euchlanis meneta* Myers, 1930 (NJ lake interstitial psammoxene; cf. - hyporheic in Ninescah River, KS)

*Euchlanis parva* Rousselet, 1892 (hyporheic in Ninescah River, KS; NJ lake interstitial psammoxene)

*Euchlanis pellucida* Harring = *E. triquetra* var. *mucronata*

*Euchlanis triquetra* Ehrenberg, 1838 (hyporheic in Ninescah River, KS)

*Euchlanis triquetra* var. *mucronata* Ahlstrom, 1938 (= *Dapidia carinata*, *D. lata* Carlin-Nilsson, 1934; *Euchlanis longobardica* Manfredi, 1927; *E. pellucida* Harring, 1921) (NJ lake interstitial psammoxene)

*Filinia* Brory De St. Vincent, 1824 (= *Triarthra* Ehrenberg, 1832; *Fadeewella* Smirnow, 1928) - Filiniidae rotifers

*Filinia longiseta longiseta* (Ehrenberg, 1834; *F. l.*; *F. limnetica* Fadeew) hyporheic in Ninescah River, KS

*Gastropus* (Imhof, 1898) - Gastropidae rotifers

*Gastropus hytopus* (*Notommata h.* Ehrenberg, 1838; *G. bretensis* Linder, 1904) (NJ lake interstitial psammoxene)

*Gastropus stylifer* Imhof, 1891 (NJ lake interstitial psammoxene)

*Euchlanis* undet. sp. (MN lake benthic)

*Itura* Harring & Myers, 1928 - Notommatidae rotifers

*Itura aurita aurita* (*Diglena a.* Ehrenberg, 1830) (hyporheic in Ninescah River, KS)

*Itura aurita* var. *intermedia* Wulfert, 1835 (= *I. itermedia*) (hyporheic in Ninescah River, KS)

*Itura* undescr. sp.? (hyporheic & psammobiotic in Ninescah River, KS)

*Kellicottia* Ahlstrom, 1938 (= *Anuraea* Ehrenberg) - Brachionidae rotifers

*Kellicottia longispina* (*Keratella l.* Kellicott, 1879) (Tx? in MN; CO hyporheic)

*Keratella* Bory de St. Vincent, 1822- Brachionidae rotifers

*Keratella americana* Carlin, 1943 (hyporheic in Ninescah River, KS)

*Keratella cochlearis* forma *c.* (Gosse, 1851) (eNA/ interstitial, Tx? in MN; NJ lake interstitial psammoxene; hyporheic in MN, KS)

*Keratella cochlearis* (*Anuraea c.* Gosse, 1851) form. *tecta* (hyporheic in Ninnescah River, KS)

*Keratella hiemalis* Carlin, 1943 (hyporheic in Ninnescah River, KS)

*Keratella quadrata* (*Branchionus q.* O.F. Muller, 1786) (nNA/ Tx? in MN) &

*Keratella longispina* = *Kellicottia l.*

*Keratella serrulata* (*Anuraea s.* Ehrenberg, 1838) NJ lake interstitial psammoxene)

*Keratella* undet. sp. (Ac or Tx in AR)

*Keratella tecta* = *K. cochlearis* form. *tecta*

*Keratella tropica* Apstein, 1907 (hyporheic in Ninnescah River, KS)

*Lecane* Nitzsch, 1827 (= *Cathypna* Gosse, 1886; *Distyla* Eckstein, 1883; *Monostyla* Ehrenberg, 1830) Lecanidae rotifers

*Lecane agilis* (*Distyla a.* Bryce, 1892) (NJ lake interstitial psammoxene)

*Lecane aquila* Harring and Myers, 1926 (NJ lake interstitial psammoxene)

*Lecane* (*Monostyla*) *arcuata* (*Cathypna a.* Bryce, 1892) (cf. *L.a.* - Fl marine sands interstitial psammophile)

*Lecane* (*Monostyla*) *bullata* (*Monostyla b.* Gosse, 1851; *M. incisa* Daday, 1897; *M. bipes* Stokes, 1896) (KS, VA hyporheic)

*Lecane* (*Monostyla*) *bullata* var. *styrax* (Harring and Myers, 1926) (NJ lake interstitial psammoxene)

*Lecane clara* (*Distyla c.* Bryce, 1892; *C. sulcata* Murray, 1913; *Diglena beauchampi* von Hofsten, 1923) Harring, 1913 (rare WI lake beach sand interstitial; NJ ocean beach & lake interstitial, psammophile; OH psammobiotic & hyporheic)

*Lecane* (*Monostyla*) *closterocerca* (*Monostyla c.* Scyhmarda, 1859; *M. cornuta* f. *anglica* Bryce, 1924) (rare WI lake beach sand interstitial; NJ ocean beach interstitial; MN, KS, VA hyporheic; KS; NJ lake interstitial psammoxene)

*Lecane* (*Monostyla*) *copeis* (Harring & Myers, 1926) (Cf. *L. c.* hyporheic in Ninnescah River, KS)

*Lecane* (*Monostyla*) *cornuta* (*Tricoda c.* O.F. Muller, 1786; *M. c.*, *Notommata c.* Ehrenberg, 1830; *M. robusta* Stokes, 1896; *M. rotundata* Jakubski; *M. truncagta* Turner, 1892) (KS, VA hyporheic)

*Lecane* (*Monostyla*) *crenata* Harring, 1913 (SC lake benthic)

*Lecane crepida* Harring, 1914 (MI lake beach sand interstitial)

*Lecane flexilis* (*Dystyla f.* Gosse, 1889) (MI interstitial; NJ, WI lake beach sand interstitial, psammophile; MN, VA hyporheic)

*Lecane (Monostyla) furcata* (L.f. Murray, 1913) (hyporheic in OH; Daday (NJ lake interstitial psammoxene; OH hyporheic; cf. *L.(M.) f.* -KS hyporheic; Daday)

*Lecane (Monostyla) hamata* (L.h. Stokes, 1896) (MI, WI lake beach sand interstitial; MN, KS, VA hyporheic)

*Lecane hastata* (Murray, 1913) (hyporheic in Ninnescah River, KS)

*Lecane inermis* (*Distyla i.* Bryce, 1892; *Lecane amorpha* Haring, 1914) Haring, 1913 (hyporheic in Ninnescah River, KS; Fl marine sands interstitial psammophile) **Bibl.:** H. Miller 1930

*Lecane inquieta* Myers, 1936 (NJ, WI, Sweden lakeshore interstitial, psammobiotic)

*Lecane lauterborni* Hauer, 1924 (OH hyporheic)

*Lecane* cf. *levistyla* (*Cathypna l.* Olofsson, 1917) Retowski, 1933 (hyporheic & psammobiotic in Ninnescah River, KS)

*Lecane ligona* (*Cathypna l.* Dunlop, 1901) Haring, 1913 (NJ lake interstitial psammoxene)

*Lecane luna* (*Cathypna l.* Mueller, 1776; *Cercaria l.* Muller, 1776; *Euchlanis l.* Ehrenberg, 1832) Nitzsch, 1827 (hyporheic in Ninnescah River, KS; MN lake benthic; MI lake beach interstitial; Fl marine sands interstitial psammophile)

*Lecane (Monostyla) lunaris* (M.l. Ehrenberg, 1832) Ehrenberg, 1838 (AB lake benthic; MI lake beach interstitial psammoxene; OH, KS, VA hyporheic)

*Lecane mira* (*Cathypna m.* Murray, 1913) Haring & Myers, 1926 (NJ lake interstitial psammoxene)

*Lecane (Monostyla) mitella* Myers, 1936 (NJ lakeshore interstitial; psammobiotic)

*Lecane mucronata* Haring & Myers, 1928 (MI, NJ lake interstitial, psammobiotic)

*Lecane nana* (Murray, 1913) (MI, WI lake beach sand interstitial)

*Lecane (Monostyla) obtusa* (L.o. Murray, 1913) (AB lake benthic; VA hyporheic)

*Lecane ohioensis* (*Cathypna o.* Herrick, 1885) (MI, WI lake beach sand interstitial psammophile; MN hyporheic)

*Lecane papuana* (*Cathypna p.* Murray, 1913; *L. paxiasna* Hauer, 1940; *L. paradox* (Steinecke, 1924)) (hyporheic in Ninnescah River, KS)

*Lecane paraclosterocerca* (Pennak, 1939) (WI lakeshore interstitial psammobiotic; OH psammobiotic & hyporheic)

*Lecane pertica* Haring & Myers, 1926 (NJ lake interstitial psammobiotic)

*Lecane ploenensis* (*Cathypna p* Voigt, 1902) Haring, 1913 (SC lake benthic)

*Lecane pomiformis* (Edmondson, 1938) (MI lake beach interstitial)

*Lecane* (*Monostyla*) *pyriformis* (*M. p.* Daday, 1905; *M. truncata* Murray, 1913) (OH, KS hyporheic)

*Lecane* (*Monostyla*) *psammophila* (*Monostyla p.* Wiszniewski, 1932) (MI, NJ, OH, Poland, USSR lakeshore interstitial or hyporheic; MN, NJ, OH psammobiotic & hyporheic))

*Lecane pygmaea* = *L. (M.) furcata*

*Lecane pyriformis* (Daday, 1905) (OH hyporheic)

*Lecane pyrrrha* Haring & Myers, 1926 (NJ lake interstitial psammoxene)

*Lecane* (*Monostyla*) *quadridentata* (*M.q.* Ehrenberg, 1932) (NJ lake interstitial psammoxene; VA hyporheic)

*Lecane* (*Monostyla*) *scutata* (*M. s.* Haring & Myers, 1926) (WI lake beach sand interstitial psammophile; hyporheic in Ninnescah River, KS; NJ lake interstitial psammoxene)

*Lecane* (*L.*) *signifera s.* (Jennings, 1896) (MI interstitial)

*Lecane* undet. sp. or species (NY freshwater sandy beach interstitial; MN hyporheic)

*Lecane stichaea* Haring, 1913 (NJ lake interstitial psammoxene)

*Lecane tenua* Myers, 1936 (NJ lakeshore interstitial, psammobiotic)

*Lecane tenuiseta* Haring, 1914 (VA hyporheic)

*Lecane vastita* Haring & Myers, 1926 (OH psammobiotic & hyporheic)

*Lecane verecunda* Haring & Myers, 1926 (WI lake beach sand interstitial psammophile)

*Lepadella* Bory de St. Vincent, 1826 (= *Metopidia* Ehrenberg, 1830) - Brachionidae rotifers

*Lepadella acuminata* (*Metopidia a.* Ehrenberg, 1834) Dujardin, 1841 (OH, KS, VA hyporheic)

*Lepadella benjamini* Haring, 1916 (NJ lake interstitial psammoxene)

*Lepadella ehrenbergi* ((*H.*) *e.* Perty, 1850) Haring, 1913 (TX aquatic)

*Lepadella* cf. *eurysterna* (Myers, 1942) (VA hyporheic)

*Lepadella ovalis* (*Branchionus o.* O.F. Muller, 1896; *Metopidia solidus* Gosse, 1851; *Squamella oblonga* Ehrenberg, 1834)) (NJ, WI lake beach sand interstitial psammophile)

*Lepadella patella* (*Branchionus p.* Muller, 1786 (MN, OH, KS hyporheic; MI, NJ lake beach sand interstitial psammophile)

*Lepadella rhomboides* (*Metopidia r.* Gosse, 1886) (TX aquatic; hyporheic in Ninnescah River, KS)

*Lepadella* undet. sp. (NY freshwater sandy beach interstitial; MN hyporheic)

*Lepadella triptera* (*Metopidia t.* Ehrenberg, 1830)

*Lepadella triptera* var. *alata* Myers, 1934 (Sumatra/ MI, NJ lake beach sand interstitial psammophile)

*Lepadella venefica* Myers, 1934 (NJ lake interstitial psammoxene)

*Lindia* Dujardin, 1841 - Lindiidae rotifers

*Lindia annecta* Harring and Myers, 1922 (NJ lake interstitial psammoxene)

*Lindia* undet. sp. or species (Fl marine sands interstitial psammobiont; NY freshwater sandy beach interstitial; MN hyporheic)

*Lindia* (*Halolinda*) *tecusa* Harring and Myers, 1922 (WI lake interstitial & marine sands interstitial)

*Lindia torulosa* Dujardin, 1841 (KS, VA hyporheic)

*Lophocharis* Ehrenberg, 1838 (= *Oxysterna* Orosio, 1910) - Brachionidae rotifers

*Lophocharis naias* Wulfurt, 1942 (hyporheic in Ninnescah River, KS)

*Lophocharis salpina* (*Lepadella* s. Ehrenberg, 1834; *Lophocharis oxysternum* Iroso, 1913; *Metopidia* o. Bilfinger, (1894); *O. major* Iroso, 1910) Harring, 1916 (hyporheic in Ninnescah River, KS)

*Macrochaetus* Perty, 1850 (= *Polychaetus* s. Perty, 1850) Trichocerae rotifers

*Macrochaetus subquadratus* (*Polychaetus* s. Perty, 1850) (NE/ MI interstitial),

*Microcodides* Bergendal, 1892 (= *Mikrocodides*) Brachionidae rotifers

*Microcodides chlaena* (*Stephanops* c. Gosse, 1886; *M. dubius* Bergendal, 1892; *M. orbiculodiscus* Jennings, 1894) (MI interstitial; (NJ lake interstitial psammoxene)

*Monommata* Bartsch, 1870 - Notommatidae rotifers

*Monommata astia* Myers, 1930 (NJ lake interstitial psammoxene)

*Monommata diaphora* Myers, 1930 (NJ lake interstitial psammoxene)

*Monommata grandis* Tessin, 1890 (NJ lake interstitial psammoxene)

*Monommata* undet. sp. (WI lake beach sand interstitial psammophile)

*Monostyla* Ehrenberg, 1830 = subgenus of *Lecane*

*Myersinella* Wiszniewski, 1936 - Notommatidae rotifers

*Myersinella tetraglena* (*Myersina* t. Wiszniewski, 1934) Wiszniewski, 1936 (NJ lakeshore interstitial)

*Mytilina* Bory de St. Vincent, 1826 (= *Salpina*) Brachionidae rotifers

*Mytilina mucronatas* (*Brachionus* m. O.F. Muller, 1773)

*Mytilina mucronata* var. *brevispina* (Ehrenberg, 1832) (MI lake beach sand interstitial)

*Mytilina mucronata redunca* (Ehrenberg, 1832) (MI interstitial)

*Mytilina ventralis* (Ehrenberg, 1832) (VA hyporheic)

*Notholca* Gosse, 1886 - Brachionidae rotifers

*Notholca bipalium* = *N. striata*

*Notholca acuminata* (*N. striata a.* Ehrenberg, 1832) (MI interstitial; hyporheic in Ninnescah River, KS)

*Notholca salina* (*Notholca squamula salina* Focke, 1961) (Fl marine sands interstitial psammophile)

*Notholca striata* (*Brachionus bipalium* O.f. Muller, 1786) Carlin, 1943 (= *N. s. bipalium* Haring, 1913) (Fl marine sands interstitial psammophile)

*Notholca* undet. sp. (CO hyporheic)

*Notommata* Ehrenberg, 1830 - Notommatidae rotifer

*Notommata bennetchi* Myers, 1942 (PA hyporheic, lakeshore interstitial)

*Notommata cerebrus* (*Copeus c.* Gosse, 1886) (NJ lake interstitial psammoxene)

*Notommata contorta* (*Diglena c.* Stokes, 1897) (NJ lake interstitial psammoxene)

*Notommata copeus* Ehrenberg, 1934 (near *N.c.* - AB lake benthic)

*Notommata diasema* Myers, 1936 (NJ lake interstitial psammobiotic or psammophilic)

*Notommata fasciola* Myers, 1933 (NJ lake interstitial psammoxene)

*Notommata galena* Haring and Myers (NJ lake interstitial psammoxene)

*Notommata glyphura* Dwulfert, 1935 (hyporheic in Ninnescah River, KS)

*Notommata pachyura* (*Copeus p.* Gosse, 1886) Haring, 1913 (NJ lake interstitial psammoxene)

*Notommata saccigera* Ehrenberg, 1832 (NJ lake interstitial psammoxene)

*Notommata* undet. sp. or species (MI lake beach interstitial; ON hyporheic)

*Notommata tripus* Ehrenberg, 1938 (NJ lake interstitial psammoxene)

*Paracolurella* Myers, 1936 - Brachionidae rotifers

*Paracolurella* undet. sp. (NJ lake interstitial)

*Pedipartia* Myers, 1937 - Notommatidae rotifer

*Pedipartia gracilis* (*Dicranella gracilis* Myers, 1936) (NJ lakeshore interstitial, psammobiotic)

*Philodina* Ehrenberg, 1930 - Philodinidae rotifers

*Philodina acuticornis* Milne, 1916 (VA hyporheic)

*Philodina flaviceps* Bryce, 1906 (VA hyporheic)

*Philodina roseola* Ehrenberg, 1830 (near *P.r.* - AB lake benthic)

*Philodina rugosa* Bryce, 1903 (VA hyporheic)

*Philodina* undet. sp. or species (KS, CO hyporheic)

*Plationus* H. Segers, G. Murugan, H.J. Dumont, 1993 – Brachionidae rotifers

*Plationus patulus* (Muller, 1786) (VA hyporheic)

*Platyias* Haring, 1913 - Brachionidae rotifers

*Platytias quadricornis* (*Brachionus q.* Ehrenberg, 1932) Haring, 1913 (KS hyporheic)

*Pleurotrocha* Ehrenberg, 1830 - Notommatidae rotifers  
*Pleurotrocha petromyzon* Ehrenberg, 1830 (KS hyporheic)

*Polyarthra* Ehrenberg, 1834 -Synchaetidae rotifers  
*Polyarthra remata* Skorikov, 1896 (KS hyporheic)  
*Polyarthra* undet. sp. (CO hyporheic)

*Polyarthra trigla* = *P. vulgaris*  
*Polyarthra vulgaris* Carlin, 1943 (KS hyporheic; MN lake benthic; NJ lake interstitial psammoxene)

*Pompholyx* Gosse, 1851 - Testudinellidae rotifers  
*Pompholyx complanata* Gosse, 1851(KS, VA hyporheic)

*Proales* Gosse, 1886 - Notommatidae rotifers  
*Proales decipiens* (*Notommata d.* Ehrenberg, 1832) (WI lake beach sand interstitial psammophile; NJ lake interstitial psammoxene)

*Proales doliaris* (Rousselet, 1895) Haring & Gosse, 1886 (NJ lake interstitial psammoxene)  
*Proales fallaciosa* Wulfert, 1937 (VA hyporheic)

*Proales granulosa* Myers NJ lake interstitial psammoxene))  
*Proales longidactyla* Edmondson, 1948 (MI lakeshore interstitial)

*Proales minima* (*Pleurotrocha m.* Montet, 1915) (KS, OH, VA hyporheic)  
*Proales similis* de Beauchamp, 1907 (KS hyporheic)  
*Proales sordida* Gosse, 1886 (NJ lake interstitial psammoxene))

*Proalides* de Beauchamp, 1907 - Notommatidae rotifers  
*Proalides tentaculatus* de Beauchamp, 1907 (KS hyporheic)

*Resticula* Haring & Myers, 1924 - Notommatidae rotifers  
*Resticula melandocus* (Gosse, 1887) (NJ lake interstitial psammoxene))  
*Rotaria* Scopoli, 1777 (Rotifer Cuvier, 1798; Schrank, 1803) Philodinidae rotifers

*Rotaria neptunia* (Ehrenberg, 1832) (= *R. neptunoida* Haring, 1913) (MN lake benthic; KS hyporheic)

*Rotaria rotatoria* (*Brachionus r.* Pallas, 1766; *Rotifer vulgaris* Schrank, 1801) (US, NH, Carib.,SA/ MI interstitial; MN lake benthic; KS, VA hyporheic; NJ, SC lake interstitial psammoxene)

*Rotaria sordida* (*Callidina s.* Western, 1893) Haring, 1913 (NJ lake interstitial psammoxene)

*Rotaria* undet. sp. or species (KS, MN hyporheic)

***Rotaria tardigrada*** (*Rotifer tardigradus* Ehrenberg, 1832) Harring, 1913 (NJ lake interstitial psammoxene; KS hyporheic)

***Rotaria tridens*** (*Rotifer t.* Montet, 1915) Remane, 1929 (US, NH, MI?, Europe, Japan, Peru, Carib./ MI interstitial)

***Rotaria vulgaris*** = *R. rotatoria*

***Rousseletia*** Harring, 1913 - Notommatidae rotifers

***Rousseletia corniculata*** Harring, 1913 (NJ lake interstitial psammoxene)

***Scaridium*** Ehrenberg, 1830 - Notommatidae rotifers

***Scaridium longicaudum*** (*Trichoda longicaudata* O.F. Muller, 1786; *Eudactylota eudactylota* (Gosse, 1886)) (MI lake beach interstitial; VA hyporheic)

***Scaridium*** undet. sp. (NY freshwater sandy beach interstitial)

***Squatinella*** Bory de St.Vincent, 1826 - Brachionidae rotifers

***Squatinella longispina*** (*Stephanops longispinatus* Tatem, 1867) (= *S. leydigi longispina*) (NJ lake interstitial psammoxene)

***Synchaeta*** Ehrenberg, 1832 - Synchaetidae rotifer

***Synchaeta longipes*** Gosse, 1887 (NJ lake interstitial psammoxene; KS hyporheic)

***Synchaeta oblonga*** Ehrenberg, 1831 (NJ lake interstitial psammoxene; KS hyporheic)

***Synchaeta pectinata*** Ehrenberg, 1832 (NJ lake interstitial psammoxene)

***Synchaeta*** undet. sp. (MN lake benthic)

***Synchaeta stylata*** Wierzejski, 1893 (NJ lake interstitial psammoxene)

***Synchaeta tremula*** (*Vorticella t.* O.F. Muller, 1786) Ehrenberg, 1832 (NJ lake interstitial psammoxene)

***Taphrocampa*** Gosse, 1851 - Notommatidae rotifers

***Taphrocampa annulosa*** Gosse, 1851 (MI, NJ lake interstitial psammophile)

***Testudinella*** Bory de St.Vincent, 1826 - Testudinellidae rotifers

***Testudinella dicella*** (Myers, 1934) (*Testudinella tridentata dicella*) (NJ lake interstitial psammoxene)

***Testudinella epicopta*** Myers, 1934 (NJ lake interstitial psammoxene)

***Testudinella incisa*** (*Perodina i.* Ternetz, 1892) (NJ lake interstitial psammoxene)

***Trichocerca*** Lamarck, 1901 - Trichocercidae rotifers

***Trichocerca (Diurella) bicristata (Diurella b.* Gosse, 1887) (NJ lake interstitial psammoxene)**

***Trichocerca (Diurella) bidens (Diurella b.* Lucks, 1912) (NJ lake interstitial psammoxene)**

***Trichocerca (Diurella) brachyura (Diurella b.* Gosse, 1851) (NJ lake interstitial psammoxene)**



*Trichocerca* (*Diurella*) *capicina multigrinis* Kellicott, 1894 (= *T. c.*) (NJ lake interstitial psammoxene)

*Trichocerca* (*Diurella*) *cavia* (*Diurella c.* Gosse, 1886) (NJ lake interstitial psammoxene)

*Trichocerca* (*Diurella*) *collaris* (*Diurella c.* Rousset, 1896) (NJ lake interstitial psammoxene)

*Trichocerca* (*Diurella*) *edmonsoni* (*Diurella e.* Myers, 1936) (NJ lake interstitial; NJ lake interstitial psammoxene)

*Trichocerca* (*Diurella*) *eukosmeta* Myers, 1934 (NJ lakeshore interstitial)

*Trichocerca* (*Diurella*) *inernis* (*Mastigocerca i.* Gosse, 1887; *Rattulus gracilis* Jennigs, 1903; *Acanthodactylus g.* Tessin, 1886) (MI lake beach sand interstitial)

*Trichocerca* (*Diurella*) *insignis* (*Diurella i.* Herrick, 1885) Carlin, 1939 (MI lake beach sand interstitial)

*Trichocerca insolens* Myers, 1936 (MI, NJ, WI lakeshore interstitial, psammobiotic)

*Trichocerca* (*Diurella*) *intermedia* (*Coelopus i.* Stenroos, 1898; *Diurella intermedia* Jennings, 1903) (MI, NJ, WI lake beach sand interstitial psammophile)

*Trichocerca* (*Diurella*) *lophoessus* (*Mastigocerca l.* Gosse, 1887) Haring, 1913 (SC lake benthic)

*Trichocerca* (*Diurella*) *longiseta* (*Vaginarina l.* Schrank, 1802) (NJ lake interstitial psammoxene)

*Trichocerca multigrinis* = *T. capicina m.*

*Trichocerca neeli* Edmondson, 1948 (MI lakeshore interstitial)

*Trichocerca* (*Diurella*) *porcellus* (*Diurella p.* Gosse, 1886) (NJ lake interstitial psammoxene)

*Trichocerca* (*Diurella*) *rattus* (*Trichoda r.* Muller, 1776) (NJ lake interstitial psammoxene)

*Trichocerca rousseti* (*Coelopus r.* Voigt, 1901) (KS hyporheic)

*Trichocerca* undet. sp. or species (NY freshwater sandy beach interstitial; MN hyporheic)

*Trichocerca* (*Diurella*) *stylata* (*Diurella s.* Gosse, 1851) (NJ lake interstitial psammoxene)

*Trichocerca* (*Diurella*) *taurocephala* (*Diurella t.* Hauer) (MI lake beach sand interstitial; FL marine sands interstitial psammobiont; KS, VA hyporheic)

*Trichocerca* (*Diurella*) *tenuior* (*Diurella t.* Gosse, 1886) (NJ, WI lake beach sand interstitial psammophile; KS, VA hyporheic)

*Trichocerca* (*Diurella*) *tigris* (O.F. Muller, 1786) (*Diurella t.*) (MI interstitial; WI sandy lakeshore interstitial; MN beach & lake benthic; MI, NJ lake interstitial psammophile)

*Trichocerca* (*Diurella*) *tortuosa* (*Diurella t.* Myers, 1936) (NJ lake interstitial)

*Trichocerca* (*Diurella*) *uncinata* (*Diurella u.* Voigt, 1902) (NJ lake interstitial psammophile)

*Trichocerca wiszniewskii* Varga, 1938 (MI lakeshore interstitial)

*Trichotria* Bory De St. Vincent, 1927 - Brachionidae rotifers

*Trichotria eukosmeta* Myers, 1934 (NJ lake interstitial; NJ lake interstitial psammobiotic)

*Trichotria tetractis* (*Dinocharis t.* Ehrenberg, 1830) (MI, NJ, AB lake interstitial psammoxene; KS, OH hyporheic)

*Trichotria tetractis* var. *caudata* (Lucks) (NJ lake interstitial psammoxene)

*Trichotria* undet sp. (MN hyporheic)

*Wierzejskiella* Wiszniewski, 1934 - Dicranophoridae rotifers

*Wierzejskiella velox* = *Encentrum* (*W.*) v.

*Wierzejskiella* undet. sp. or species (interstitial in US sandy beaches & OH sandy hyporheic; OH psammobiotic & hyporheic)

*Wolga* Skorikov, 1903 - Brachionidae rotifers

*Wolga spinifera* (*Distyla s.* (Western, 1894)) Skorikov, 1908 KS hyporheic

## Salamanders

Lizardlike amphibian of kingdom Animalia, phylum Chordata, subphylum Vertebrata, class Amphibia, Subclass Lepospondyli, order Caudata

**Bibl.:** C. Anderson, 1976; Anon. 1960; Barr 1953c; Clergue-Gazeau 1974, 1975; J. Cooper 1978; Cram & Anderson 1976; LaVal 1965a; Storage 1977; Swingle, 1922; Valentine 1964c; Vandel 1961; Wortham et al. 1977; Piatt 1935; Wake 1966 H. Fowler & Dunn 1917; Blair 1968; J. Davis 1956; Hilton 1947; Valentine 1964

**Areas:** **AL:** Knight 1969; Mount 1976; Valentine 1962; Penn 1940; Rosman 1964; **AR:** Crowell 1981; C. Smith 1960; Ireland & Altig 1983; McAllister & Fitzpatrick 1985; Thurow 1963; **AZ:** Duellman 1955; **CA:** Brode 1978; Funkhouser 1951; **CO:** Hammeson 1986; **CT:** Klemens 1991; **GA:** Vi8tt 1982; **HI:** McKeown 1996; **IA:** Clerge-Gazeau 1974; Bury 1971; **IL:** R. Olson 1956; Cagle 1942; H. Smith 1961; Rossmann 1960; **IN:** Blanchard 1926; Hay, 1891; Reynolds 1937; Rubin 1968; Thurow 1963; **KS:** Collins 1974; H. Smith 1950; Ireland & Altig 1983; Tihen 1937; Thurow 1963; **KY:** Barbour 1971; Bishop 1926; Walston & Wilder 1977; Rafinesque, 1832a; Reagan 1974; Grant 1936; Weller 1930; **MD:** Cooper 1967; **MN:** Oldfield & Moriarty 1994; **MO:** T.R. Johnson 1977; P.W. Smith 1948; Hershey 1964; Hurter 1911; Ireland & Altig 1983; Kezer 1955; H. Marx 1958; Peters 1946, 1952; Thurow 1963; **MS:** Cliburn & Middleton 1983; **NC:** Eaton & Eaton 1956; Knight 1972; **NE:** Conant 1942a; **New England:** DeGraaf & Rudis 1983; **NY:** Bishop 1941a; Cooper 1962; **OH:** Seibert & Brandon 1960; H. Smith 1973; Cooper 1967; Duellman 1951; **OK:** Black 1973; Blair 1952; Dundee & Bragg 1950; Ireland & Altig 1983; Ortenburger 1930; Rudolph 1978; **Ozarks:** Besharse & Hollfield 1976; Saugey et al. 1988; C. Dowling 1956; Dundee 1958-9; **PA:** Cooper 1967; Mohr 1944; **TN:** A.F. Scott 1991; Malnate, 1891; Redmond 1985; Redmond & Scott 1996; C. Walker & Weller 1932; **TX:** J. Baker, 1956-7-b, 1960; Burt 1938; Chippendale 1991; Raun 1971; H. Smith & Buechner 1947; Strecker & Williams, 1927; Sweet 1978, 1979; Brame 1962; Chippendale & Hillis 1993; C Curtis & Tinkle 1952; Curtis 1951; Eaton 1956; Haurwitz 1993, 1997; Hurter 1906; Kellogg 1932; J. Larsen & Guthrie 1974; H. Marx 1958; Noble 1927; Price

1993; Raun 1986; Reddell, 1966. 1977; Reed 1920; Terent'ev 1965; R. Thomas 1974; Wake 1972, 1974; Wittstein-Westersheim 1922; Wheeler 1900; US: Bishop 1947; J. Cooper 1978; Cope, 1889; VA: Cooper 1962; Netting & Wilson 1940; Newman 1954; Clifford 1968, 1974; Cooper 1967; J. Fowler 1944; R. Hoffman & Kleinpeter 1948; Hutchison 1956; H. Marx 1958; West: Halliday 1959; World: Brame 1967. WV: Carey 1973; Clifford 1968; Cooper 1962; Green 1937, 1942, 1956; Green & Brant 1967; Netting 1936; Storage 1978. Brandon 1962; Cooper 1967

Albinism: Brame 1962.  
Biology: Duellman & Trueb 1994  
Competition - Rudolph 1978, 1979a

Conservation - Anon. 1989  
Defense: Brodie 1973, 1977;  
Evolution: T. Jones & Thompson 1993; Lombard & Wake 1976; Noble 1927; Ozeti & Wake 1969; Wake, Roth & Wake 1983;

Habitat effects on temperature: Fedfer & Lynch 1982;.  
Habitat selection of pH - Mushinsky & Brodie 1975;  
Metamorphosis- hlenhuth 1921; Wells, Wallen et al. 1954; Wilbur & Collins 1973; Wilder 1925

Morphologic adaptation - LaVal 1965, 1967;  
Neoteny - Collins 1978; Pierce & Smith; Reese & Smith 1951  
Osteology: J. Jarsen 1963

Oxygen consumption - McAllister & Fitzpatrick 1985;  
Post larval changes - J. Moore 1900  
Sound transmission - Hilton 1949;

#### Suborders

Ambystomatoidea (also as superfamily)

**Ambystomatidae** (mole salamanders) (*Ambystoma*) Tihen 1958,

**Cryptobranchidae** (hellbenders and giant salamanders) (*Cryptobranchus*)

**Plethodontidae** (*Aneides*, *Batrachoseps*, *Desmognathus*, *Dicamptodon*, *Ensatina*, *Gyrinophilus*, *Haideotriton*, *Hemidactylum*, *Hydromantes*, *Plethodon*, *Pseudotriton*, *Typhlomolge* /lungless salamanders)  
Hemidactyliine

**Bibl.:** Eaton 1956; C. Dunn 1926; Hilton 1947; Noble 1927; Palunas 1989

Salamandroidea (also as superfamily)

**Proteidae** (= Necturidae) (Olms, mudpuppies, proteids, necturids, waterdogs) (*Necturus*)

**Salamandridae** (salamandrids, newts & salamanders) (*Notophthalmus*, *Taricha*, *Triturus*)

Sirenoidea (also as superfamily)

**Sirenidae** (sirens) (*Pseudobranchus*)

All Tb species, except *Gyrinophilus subterraneus*. & *Typhlotriton spelaeus*, are neotenic, retaining gills as adults so they can live permanently below water

*Ambystoma* Tschudi, 1838 (mole salamanders) (= *Rhyacosiredon*) Ambystomatidae salamanders (16 species in US or Canada)

**Bibl.:** J. Anderson & Graham 1967; Brandon 1961; Detwiler & Laurens 1921; Valentine & Dennis 1964

*Ambystoma cingulatum* Cope, 1868 (SC s. to sGA & nFL, w. to sAL, sMS/ flatwoods salamander/ TTx or Ac in FL)

*Ambystoma gracile* (*Siredon g.* Baird, 1859 "1857") (northwestern salamander/ seAK to CA/ Tx in OR, WA)

*Ambystoma jeffersonianum* (*Salamandra j.* Green, 1827) (Jefferson's salamander/s.Canada to sIN, VA, KY/ Pleist. in Worm Hole C., WV/ TTx or Ac in KY, WV (2 caves))

*Ambystoma maculatum* (*Lacerta m.* Shaw, 1802) (spotted salamander/ Pleist. in Worm Hole (WV) C. & Pleist./Holocene in Cheek Bend C. (TN)/E to eTX,sGA,eIL & MI/ Tx in AR, OH, TN; Tx or Ac in IL, KY, MD, PA) **Bibl.:** Whiteford & Hutchinson 1962-3, 1965

*Ambystoma macrodactylum* Baird, 1849 (long-toed salamander/ sBC to cCA, e.to Alberta, ID, MT/ Tx in WA?)

*Ambystoma opacum* (Gravenhorst, 1807) (marbled salamanders/ Pleist. in Worm Hole C., WV/ sNH to nFL,seTX, eIL, seMI epigeal/ Tx in IL, NJ, OH; TTX in FL; TTx or Ac in KY, NJ)

*Ambystoma talpoideum* (*Salamandra t.* Holbrook, 1838) (SC to nFL w. to eTX, n. in MS Basin to seOK & sIL; disjunct in swNC & eTN/ mole salamander/ TTX or Ac in FL)

*Ambystoma tigrinum mavortium* Bard (Barred tiger salamanders/ neNE to extreme neWY epigeal/ Tx or Tp in OK; Ac? in nCO(1 cave)) J. Black 1969,

*Ambystoma tigrinum t.* (*Salamandra t.* Green, 1825) (tiger salamander/AB to SK, s.to FL,Mex., absent in Appalachians, new England, Far West (may be *A. californiense* Gray, 1853 in CA)/ Pleistocene/ Holocene fossil & Tp or Tx in Cheek Bend C. (TN)/ Tx in KS, OK, eWA?/ G5 T&E in FL(S3)/ Tp in nFL, TX, NC & NY; TTx or Ac in CO, KY) **Bibl.:** Banta 1912; Beidleman 1954; Black 1969a; Tihen 1942

*Ambystoma tigrinum melanosticum* (*Siredon lichenoides m.* Baird, 1860) (sBC to cAB, se to sWY, nwNB epigeal/ blotched tiger salamander/ Ttx in OR)

*Aneides* Baird, 1849 (climbing salamanders) Plethodontidae salamanders (5 species in US or Canada)

*Aneides aeneus* (*Plethodon a.* Cope & Packard, 1881) (type locality in Nickajack C. mouth, TN/ Appalachians from s.OH & swPA to n.AL & neMS/ arboreal, rock crevices/ Tx in TN; Ac or Tx in NC, VA (one cave), WV?/ green salamander/ NC T&E; GA T&E S2, TN T&E, G3G4 global rank) **Bibl.:** Gordon 1952; Gordon & Smith 1949, 1967

*Aneides flavipunctatus* (*f.*) (*Plethodon f.* Strauch, 1870) (black salamanders/ nwCA to extreme swOR/ Tx or Ac in CA; Ttx or Ac in sOR mine)

*Aneides lagubris l.* (*Salamanda l.* Hallowell, 1849) (arboreal salamanders/wCA to Baja/ Tx or Ac in CA)

*Batrachoseps* Bonaparte, 1841 (slender salamanders) Plethodontidae salamanders (8 species in US or Canada)

*Batrachoseps attenuatus* (*Salamandrina a.* Eschscholtz, 1833) (may incl. *B.r.*) (garden slender salamander/ seCA to Baja/ Tx or Ac in CA (Sierras))

*Batrachoseps relictus* Brame & Murray, 1968 (also incl. in *B.a.* or as subspecies of *B. pacificus* (*Hemidactylum p.* Cope, 1865)/sCA & nw Baja CA)) (wc, swCA & Great Valley & nwBaja CA) (Tx or Ac in CA)

*Cryptobranchus* Leuckart, 1821 (hellbender) Cryptobranchidae salamanders (1 species in US)

*Cryptobranchus alleganiensis* (Daudin, 1803) (swNY to nAL, TN, KY, GA, MO, NY, PA/ hellbender/ Pleistocene/Holocene fossil (prey item?) in Cheek Bend C. (TN) & Mammoth C., KY; Ttx or Ac in nAL (one cave))

*Desmognathus* Baird, 1850 (dusky salamanders; dusky and seal salamanders; seal salamanders) Plethodontidae salamanders (3 species in US or Canada) (11 species in US or Canada)

*Desmognathus auriculatus* (*Salamandra a.* Holbrook, 1838 (dusky salamander/ seSC s. to cFL, w.to seMS/Tx in TX; Ac in GA)

*Desmognathus fuscus brimleyorum* (*D.b.* Stejneger, 1895) (dusky salamander/ Ouachita Mts of swAR & seOK & in neTX/ Tx in TX). **Bibl.:** McCallister et al. 1995

*Desmognathus fuscus conanti* (*D.c.* Rossman, 1958) (spotted dusky salamander/ sIL, wTN, wSC to Gulf/ Tx or Ac in MS, PA, WV) **Bibl.:** Wood & Fitzmaurice 1948

*Desmognathus fuscus f.* (*S.f.* Green, 1818) Rafinesque northern spotted or dusky salamander/ seCanada to neLA, & nwSC, NC, GA/TTx or Ac in GA, KY(1cave), MS, NJ (1cave), TN(1cave); Tx in OH, WV, VA; Tx or Ac in PA/ IL T&E)

*Desmognathus monticola monticola* Dunn, 1816 (Appalachian Seal Salamander) (wPA sw to extreme wFL/ TTx or Ac in nFL, PA, WV(one cave), VA (2 caves))

*Desmognathus ochrophaeus* Cope, 1859 (mountain dusky salamander/w of Hudson R. in NY to ne GA & ne AL/ Tx in MD?, PA, VA(one cave?), WV)

*Desmognathus quadramaculatus* (*Salamandra quadra-maculata* Holbrook, 1840) eVA e.to Henry Co., VA, s. to ne GA/Ac or Tx in TN(1cave)

*Desmognathus* undet. sp. (Ac in Walker Co., GA)

*Dicamptodon* Strauch, 1870 (giant salamanders) Plethodontidae salamanders (3 species in US or Canada)

*Dicamptodon tenebrosus* (Baird & Girard, 1852) (BC to nCA/ Pacific giant salamander/ TTx & Ac in n,cCA; Tx in sOR; surface hyporheic in WA, OR, nCA stream gravels)

*Dicamptodon ensatus* (Eschscholtz, 1833) (Pacific giant salamander/ Tx or Ac in CA (Santa Cruz Co., Sierras)

*Ensatina* Gray, 1850 (ensatina) Plethodontidae salamanders (1 species in US or Canada)

*Ensatina eschscholtzi croceator* (epigean interior mountains of Kern Co., CA/ TTx in Crystal Cave, Tulare Co., CA/ yellow-blotched ensatina or salamander; small ensatina/ G5T2T3 S2S3)

*Ensatina eschscholtzi e.* Gray, 1850 (may incl. *Dicamptodon ensatus* (Triton e. Eschscholtz, 1833)) (ensatina/ sBC to sCA/TTp or Tx in cCA,OR, WA; Tx in CA) **Bibl.:** C. Brown 1970; Funkhouser 1950; Hetherington 1979; Rosenberg 1994

*Ensatina eschscholtzi platensis* (Jimenez de la Espada, 1875) ((Sierra Nevada Mts, e. of Great Valley/ California/ TTX or Ac in Sequoia Natl. Park)

*Ensatina eschscholtzi xanthoptica* Stebbins, 1949 (epigean in San Francisco Bay and opposite side of Great Valley in Sierran foothills/ yellow-eyed ensatina/ TTx in Calaveras Co., CA)

*Eurycea* Rafinesque, 1822 (brook salamanders) (see *Typhlomolge*) (11 species in US or Canada) **Bibl.:** J. Baker 1960c, 1961; Chippindale 1992; Mitchell & Reddell 1965; Mitchell & Smith 1972; Sweet 1977, 1978, 1978b, 1982, 1984

*Eurycea bislineata b.* (*Salamandra b.* Green, 1818) (two-lined salamander/seCanada to Gulf of Mexico/ Pleistocene/ Holocene fossil (Tx?) in Cheek Bend C. (TN); Tx in MS, WV; TTx or Ac in FL, KY, MD, NJ (2cave), NY(1 cave), PA, VA/ G5). **Bibl.:** Burns 1965. Mittleman 1942

*Eurycea bislineata wilderae* (= *E.w.* Dunn, 1926) (swVA & extreme wNC,eTN to nGA in sBlue Ridge Mts./ Ac or Tx in TN(1cave)/ Blue Ridge two-lined salamander) **Bibl.:** Rossman 1964

*Eurycea chisholmensis* Chippendale, Price, Wiens & Hillis, 2000 (type locality in Big Boiling (= Main, Salado, Sire) Sprs. & Robertson Springs at Salado, Bell County, TX/ Edwards Plateau spring or Chilsholm Trail or Salado Springs salamander/ G1)

*Eurycea guttolineata* Holbrook, 1838 (= *E.g. longicauda*) (VA sw to nwFL & w to MS R./three-lined salamander/Tx in MS, NJ; Tp in FL; Tx or Tp in Walker Co., GA; KY State T&E/ G5) **Bibl.:** Carlin 1997; R. Gordon 1953; A. Williams 1976

*Eurycea latitans* Smith & Potter, 1946 (= *E. neotenes* Wright & Wright, 1938; *E. neotenes latitans* Schmidt, 1953; *E. neotenes* (in part)/ *E. tridentifera* Sweet, 1978, 1984) ( a hybrid between *E. neotenes* & *E. tridentifera*) (Cascade Cavern(s) salamander/ type locality in Cascade C., Kendall Co., + Kerr & Comal Cos., TX/ Tb/ G3)

*Eurycea longicauda guttolineata* (*E. g.* Holbrook, 1838) = *E.g.*

*Eurycea longicauda l.* (*Salamandra l.* Green, 1818) (longtail(ed) or dark-sided salamander/ sNY & nNJ sw to nAL & w to sIL epigeal / Pleistocene/Holocene fossil (Tp?) in Cheek Bend C., TN) Tp or Tx in AL, nFL, GA (Walker Co.), IL, KY, MD, MO, MS, NC, NJ, OK, TN, VA, WV; Tp in AR, MO, OH; Ttx in PA; Tx in TN(2c.)/ NC & NY Special Concern T&E; KS T&E/ G5) **Bibl.** Buhlmann 2000

**Bibl.:** J. Anderson & Martino 1967; Collins 1990; Franz 1964; Hutchison 1956; Mohr 1943, 1944; Franz & Harris 1965; Franz 1967, 1977; A. Williams 1976 ; Ireland 1979

*Eurycea longicauda melanopleura* (Cope, 1893) (dark sided salamander/mostly Ozarks in seKS, neOK, swAR, sMO/ Tp in AR (Stone Co.), IL; Tp or Tx in swMO) **Bibl.:** C. Smith 1964; Woolley 1969, 1981; Mittleman 1942

*Eurycea lucifuga* Rafinesque, 1822 *lucifuga* (cave salamander/limestone areas in s.Appalachians (nAL, neGA, swVA, seWV) to Ozark Plateau (nAR, sMO, neOK) & sIN, extreme sOH, swKS, central KY, sIL, extreme neMS & central TN/ Tp in AL (Colbert Co.), AR (Izard Co.), GA (Walker Co.), IL, IN, KY, MO, OK, PA?, swVA, WV; Tx in GA, IL, TN/ VA & KS Endangered T&E; OK T&E/ G5)

*Eurycea lucifuga* **Bibl.:** Barret & Benjamin 1977; Clergue-Gazeau & Thorn 1976; Cliburn & Middleton 1983; Cudmore & Rubin 1983; Dyer & Peck 1975; Fowler 1944; Green, Brant & Dowler 1968; Hutchison 1956a, 1958; Jaeger 1972; Krusling & Davis, 1992; Merkle 1967; Merkle & Guttman 1977; Middlefauf 1943; Myers 1958; Organ 1968; Peck 1974b; Peck & Richardson 1976; Phillips 1977; Rafinesque, 1822; Sinclair 1965; C. Smith 1964; D.D. Smith 1985; D.D. Smith, Balch & Castle 1985; Stone 1964; Strohlein & Christensen 1987; Valentine 1962; Walston & Wilder 1977, 1979; A. Williams 1976, 1980; Woods & Wake 1968; Woolley 1969, 1981; Burns 1965; Graham 1959; Meyers 1958; Minckley 1959; Reese & Smith 1951

*Eurycea multiplicata griseogaster* (Moore & Hughes, 1941) (graybelly salamander/seKS & eOK, nwAR, seMO/adult Tp in AR, OK/KS T&E) **Bibl.:** Ireland 1971; McAllister & Fitzpatrick

1985; McCallister & Trauth 1995; Putnam, 1832a; Tumblison, Cline & Zwank 1990; C. Dundee 1965;

*Eurycea multiplicata* m. (*Spelerpes* m. Cope, 1869) (epigeal in ncAR, sw to seOK/ many-ribbed salamander/ TX in AR, OK/ G4) **Bibl.:** Banta & McAtee 1906.

*Eurycea nana* Bishop, 1941 = valid species (San Marcos salamander/ G1) or = *E. neotenes*

*Eurycea naufragia* Chippindale, Price, Wiens & Hillis, 2000 (type locality in Lake Georgetown springs, possibly one cave & prob. Cowan Cr. drainage, all associated with drainages of the south, middle and north forks of the San Gabriel River, Williamson Co., TX/ Pb?/ Georgetown salamander) / G1)

*Eurycea neotenes* Bishop & Wright, 1937 (= *E. neotenes neotenes* Bishop & Wright, 1953; *C. neotenes latitans*, *C. l.*; *E. nana* Bishop, 1941- may be hybrid of *E. tridentifera* & *neotenes* according to Chippindale, 1995 (type locality cave in Bexar Co., TX/ Bandera, Bandera, Blanco, Comal, Kendall, Real, Travis, Uvalde, Val Verde Cos., TX/ G3 or (less likely) G1; Federally threatened T & E (*E. nana*)/ Tb/ TX cave salamander; TX salamander)

*Eurycea neotenes* **Bibl.:** Bruce 1976; Kezer 1952a; Sever 1985; Smith & Potter 1946; Sweet 1977,1978a,1982,1984; B. Brown 1967

*Eurycea porphyriticus* = *Gyrinophilus p.*

*Eurycea pterophila* Burger, Smith & Potter, 1950 (= *E. neotenes pterophila* Schmidt, 1953) (Stream from Fern Bank Spr.+ other sprs. & 2 caves in Hays Co. / Blanco River Sprs. or fern bank Salamander/ Tp/ G2)

*Eurycea quadridigitata* (*Salamandra q.* Holbrook, 1842; *Manculus q.* Mittleman 1967) (SE to seOK, swAR/dwarf (four-toed) salamander/coastal plain from seNC to cFL & seTX/Tx or TTx in TX/ NC T&E/ G5)

*Eurycea rathbuni* & *robusta* (see *Typhlomolge*)

*Eurycea sosorum* P.T. Chippindale, A.H. Price, D.M. Hillis, 1993 (= *E. sosoensis*) (Barton Springs salamander/ Tp/Pb? In Barton Cr. watershed (Barton Springs Pool with nearby Eliza & Sunken Gardens Springs, Travis Co., TX/ G1/ Proposed T&E) **Bibl.:** Elliott 1996; Russell 1994; US Fish & Wildlife Service 1984a, 1992a; O'Donnell 1997

*Eurycea* undescr. sp.#1 (springs along Pedernales River, Blanco, Gillespie, seKimble Cos., TX/ Pedernales River spring salamander / G1)

*Eurycea* undescr. sp.#2 (\*Comal Springs, Comal Co., TX/ Comal Springs salamander/ G1)

*Eurycea* undescr. sp.#3? ("Carson Cave group", caves and springs in Kerr, Bandera, Real, Edwards., nMedina, Uvalde, Kinney (prob.), Val Verde (likely) Cos., TX)



*Eurycea* undescr. sp. #4? (\*?cave in Real Co.,TX)

*Eurycea* undescr. sp.#5? (may be part of sp. #3) (Murphy's Spr. & Sabinal Canyon Spr., Uvalde Co., TX/ Pb)

*Eurycea tonkawai* Chippendale, Price, Wiens & Hillis, 2000 (type locality in \*Bull Cr. watershed from confluence with Lake Austin in Travis County upstream to its headwaters west of Jollyville in nc. Travis Co., possibly Brush Cr. watershed and nearby watersheds in Travis & Williamson Cos. (Cedar, Long Hollow, & Walnut Creeks)/ caves, springs and spring runs in Jollyville Plateau/ Jollyville Plateau salamander/ G1?) **Bibl.:** Chippendale, 1885; 1997; Cole 2000; S. Sweet 1978a

*Eurycea tridentifera* Mitchell & Reddell, 1965 (= *Typhlomolge t.* Wake, 1966) (type locality & 1 other cave in Comal Co. + cave each in Kendall & Bexar Co., TX/ w.Comal, n.Bexar, s.Kendall Cos.,TX/ Hon. Cr. Cave salamander; Comal blind salamander/ St, Tb) **Bibl.:** Sweet 1984,

*Eurycea troglodytes* Baker, 1957 (Val. Fa. Salamander/\*cave type locality in Medina Co.,TX/ G1G2/St, ?extinct, last seen in 1985, recharge dam flooded cave/ G1, GX or (less likely) G3 (for *E. t.* complex) **Bibl.:** Reddell 1988

*Eurycea tynerensis* Moore & Hughes, 1939 (Oklahoma salamander/ swMO, nwAR, neOK/ Tx or adult Tp in AR, MO?,OK/ OK T&E G3 rank) **Bibl.:** Kezer 1952a; Tomlinson & Cline 1990;

*Eurycea waterlooensis* Hillis, Chamberlain, Wilcox & Chippindale, 2000 (type locality in Springs nr. Austin, Buttercup Cr. karst, Travis County, TX/ Pb?/ Austin blind salamander)

*Gyrinophilus* Cope, 1869 (spring salamanders; cave and spring salamanders; cave salamanders) Plethodontidae salamanders (4 species in US or Canada) **Bibl.:** McCrady 1954; Besharse & Holsinger 1977; Brandon 1962a, 1964, 1971; Bruce 1979; Cooper 1974; Cooper & C. 1970; J. Craig et al 1956; Grobman 1959; Martof & Rose 1962, Brandon 1967; Bruce 1979;.D. Craig et al. 1956; Mittleman & Jopson 1941; Valentine & Dennis 1964

*Gyrinophilus danielsi d.* = *G. porphyriticus d.*  
*Gyrinophilus duryi* = *G.porphyrificus d.*

*Gyrinophilus gulolineatus* Brandon, 1965 (= *G. palleucus g.*) (\*\*cave type locality in Roane Co. + cave in Grundy Co.,TN/ St/ TN T&E/ B. cave salamander) **Bibl.:** Godwin 1995; Yeatman & Miller 1985

*Gyrinophilus lutescens* (*Triturus l.* Rafinesque, 1832a) Mittleman, 1942 (n,e.KY/ Tx?)

*Gyrinophilus palleucus gulolineatus* = *G. g.*

***Gyrinophilus palleucus necturoides*** Lazell & Brandon, 1962 or McCrady, 1954 (cave type locality in Grundy Co.,TN/ St/ Big-mouth cave salamander/TN T&E, G4G5T3T4) **Bibl.:** Brandon 1967

***Gyrinophilus palleucus p.*** McCrady, 1954 (Tennessee cave salamander) (cave type locality in Franklin Co. + Marion & Jackson Cos.,scTN +neAL (Colbert, Jackson & Madison Cos.), nwGA (2 caves in Walker Co.,state listed T&E/ Irvingtonian Pleist.? in Hamilton C., WV)/ St?, Tb/ TN state amphibian & T&E, TN S2 G2G3) **Bibl.:** Buhlmann & Wynn 1991

***Gyrinophilus palleucus*** **Bibl.:** Anon. 1984b, 1986a; Ashton 1986; Besharse & Brandon 1973; Brandon 1962, 1967a, 1971-a; Brandon et al. 1986; J.Cooper 1968; B. Miller 1994; Simmons 1976a; Yeatman 1967; Miller & Walther 1994

***Gyrinophilus porphyriticus danielsi*** (Blatchley, 1901) (Blue Ridge Spr. Salamander/(Tx in high Smokies of NC, TN)

*Gyrinophilus porphyriticus subterraneus* = *G. s.*

***Gyrinophilus porphyriticus duryi*** (Weller, 1930) (KY Spr. Salamander/swOH to extreme swVA/ Tp? in KY, VA, WV)

***Gyrinophilus porphyriticus p.*** (*Salamandra p.* Green, 1827) (sME, adjacent Canada to AL, nGA, neMS/ TTx in AL, KY, MD, MS, PA, cTN, VA, WV; Tp in GA (Walker Co.) & WV; Tp or Tx in PA/ Northern Spr. Salamander/ KY endangered T&E; MA,PA Special Concern T&E)

***Gyrinophilus porphyriticus*** **Bibl.:** Brandon 1967; Bruce 1972, 1978; Collazo & Marks 1994; Culver 1973; Brandon 1967

***Gyrinophilus subterraneus*** Besharse & Holsinger, 1977 (= *G. porphyriticus s.*) (WV Spr. Salamander/ \* cave type locality in Greenbrier Co.,sWV/St, Tb /VA Endangered T&E/ G1 or G1Q) **Bibl.:** Howard, Raesly et al. 1984

***Haideotriton*** Carr, 1939 (Georgia blind salamander) Plethodontidae salamanders (1 species in US)

***Haideotriton wallacei*** Carr 1939 (Georgia Blind Salamander) (well at Albany (Dougherty Co.) & cave each in Decatur & Walker Co.,swGA + seAL? & in several caves n. of Marianna, Jackson Co.,FL/ Pb/ GA state T&E, FL T&E S2 Species of Concern, global G2 rank). **Bibl.:** Brandon 1968; H. Harris 1968; D. Lee 1969a,c; Peck 1973a; Middlekauff 1943; Warren 1959

***Hemidactylum*** Tschudi, 1838 (four-toed salamanders) Plethodontidae salamanders (1 species in US or Canada)

***Hemidactylum scutatum*** (*Salamandra scutatum* Schlegel in Temminck & Schlegel, 1838) (Four-toed Salamander) (E to nwFL, se & neGA,nwSC & nwNC/ Tx in OH; Tx or Ac in WV (one cave)) **Bibl.:** Green 1941

**Hydromantes** Gistel, 1848 (web-toed salamanders) Plethodontidae salamanders (3 species in US or Canada) **Bibl.:** Gorman 1955, 1964

**Hydromantes brunus** Gorman 1954 (Limestone Salamander) Lower Merced Canyon, Mariposa Co., CA/ Tx/ CA T&E Threatened G1S1, Federal Species of Concern) **Bibl.:** Gorman 1964

**Hydromantes platycephalus** (*Spelerpes p.* Camp 1916) (Mount Lyell Salamander) (high elev. Sierra Nevada Mts. from Sonora Pass s. to Sequoia Natl. Park, CA/Tx/CA T&E G3G4S2S3, Federal & CA Species of Concern) **Bibl.:** L. Adams 1942

**Hydromantes shastae** Gorman & Camp, 1953 (Shasta Salamander) (cave type locality in entrance to cave, Shasta Co., CA/ nCA near Shasta Reservoir headwaters, Shasta Co., CA/ Tx or Tp during dry weather /CA T&E G1G2, S1S2 Threatened, Federal Species of Concern). **Bibl.:** Wake et al. 1978; Bury 1971; Bury, Fellers & Ruth 1969; Honegger 1970

*Manculus quadridigitatus* = *Eurycea q.*

**Necturus** Rafinesque, 1819 (waterdogs & mudpuppies; mudpuppies; waterdogs) Proteidae salamanders (5 species in US or Canada)

*Triturus* Rafinesques, 1815 – Salamandridae salamanders sierra (Tx or Ac in Sierras, CA)

**Necturus maculosus** (*Siren m.* Rafinesque, 1818) (seManitoba to sPQ, s. to nGA, LA/ Pleistocene/Holocene fossil (prey item?) in Cheek Bend C. (TN)

**Necturus** undet. sp. (Rancholabrean extralimital n. in Arredondo Site, Alacua Col., FL; Tx or Ac in nAL? (one cave) **Bibl.:** Brandon 1969; Kingsbury 1905; Norris 1911

**Notophthalmus** Rafinesque, 1820 (eastern newts; North American newts; Eastern American salamanders) Salamandridae salamanders (3 species in US or Canada)

**Notophthalmus** undet. sp. (extralimital e. in Irvingtonian Fyllan C., TX),

**Notophthalmus viridescens** v. (*Triturus (N.)* v. Rafinesque, 1820) (Eastern Newt/ NS w. to Great Lakes, s to nw SC, cGA & AL/ Pleistocene/Holocene fossil (Tx?) in Cheek Bend C. (TN)/ TTx or Ac in KY, NJ, PA, WV (one cave); Tx in OH)

**Plethodon** Tschudi, 1838 (forest or woodland salamanders) Plethodontidae salamanders (27 species in US or Canada) **Bibl.:** Grobman, 1944; Hairstron 1951; Highton 1956; Murphy 1917

*Plethodon aeneus* = *Aneides aeneus*

**Plethodon albagula** Grobman, 1944 (= *P. glutinosus a*) (Edwards Plateau, scTX/white-throated, light throat or western slimy salamander/ Tx in cTX)

***Plethodon angusticlavius*** Grobman, 1944 (= *P. cinereus a.*) (red-backed salamander./Tx in AR; TX or Ac in MO). **Bibl.:** Highton 1997; Thuirow 1963

***Plethodon caddoensis*** Pope & Pope 1951 (now incl. in *P. glutinosus* group) (Caddo Mts of Montgomery & Polk Cos.,AR/ Caddo Mountain salamander/ Tx in mines in AR)

*Plethodon cinereus angusticlavius* = *P.a.*

***Plethodon cinereus c.*** (*Salamandra c.* Green, 1818) Grobman (neUS & se.Canada/(eastern) redback or zig-zag salamander/ Tx or Ac in AR, IN, MD, eMO, NJ, OK, PA, VA, WV; Tx in OH; KY species of concern) **Bibl.:** J. Cooper 1956; Highton & Webster 1976; Lancaster 1994; Mohr 1952a; Wise 1995

*Plethodon cinereus serratus* = *P.s.*,  
*Plethodon dixi* = *Typhlomolge wehrlei*

***Plethodon dorsalis*** (*P. cinereus d.* Cope, 1889) (zigzag salamander/ IN, sIL,wNC to TN, nAL, neMS, Ozarks of AR, OK epigeal/ Pleistocene/Holocene fossil (Tx?) in Cheek Bend C, TN); Ttx in AL, AR, IL, IN, KY, MS, TN ; Ac in GA/NC T&E). **Bibl.:** B. Miller, et al. 1998; Thuirow 1957

*Plethodon glutinosus albagula* = *P.a.*

***Plethodon glutinosus g.*** (*Salamandra g.* Green, 1818) (slimy salamander/E, w.to IL, KY, TX/ Pleistocene/Holocene fossil (Tx or Tp) in Cheek Bend C., TN); Tx or Tp in AL, AR, GA, IN, IL, IN, KY, MD, MO, MS, NJ, OK, TN, TX, VA (or Ttx), WV (or Ttx); Ac or TTx in PA; Tp in AL; Tx in NC, OH, TN; Ttp or Ttx in FL, PA)

***Plethodon glutinosus g.*** **Bibl.:** Highton 1956, 1962; Adler & Britton 1986; Brode & Gunther 1958; Gail 1993; Dawley 1984; Early 1974; Grover Humphries 1956; Jaeger 1972; Kerr 1968; Kuss 1985; Michael 1986; Moody 1993; Okey 1916; Peabody 1978; Peck 1974b; Pope & Fowler 1949; Powders 1967; Thuirow 1951; Vernberg 1955; Wells & Gordon 1958; Varnedoe & Mohr 1959; Wilbur 1996

*Plethodon glutinosus grobmani* = *P.g.*

***Plethodon glutinosus*** group (Tx in IN)

***Plethodon grobmani*** Allen & Neill, 1949 (= *P. glutinosus grobmani*) (southeastern slimy salamander/ Tx in FL)

***Plethodon hoffmani*** Highton, 1972 West Branch of Susquehanna River Valley in cPA, sw in Appalachians to New River, WV/ valley and ridge salamander/ Ttx or Ac in PA, WV, VA)

***Plethodon larselli*** Burns, 1954 (Kentucky salamander) (now in Lower Columbia River gorge, sWA (Skamania Co.) & nOR (Multnomah, Hood River Cos.)Larch Mountain salamander/ TTx

in nOR, sWA(or Tp)/ State Candidate T&E in WA) **Bibl.:** Aubry et al. 1987; Herrington 1985; Herrington & Larsen 1985; Humphries 1956,

*Plethodon longicrus* Adler & Dennis, 1962 (incl. in *P. glutinosus* group) (Tx in NC) **Bibl.:** Martof 1977; Rubin 1969

*Plethodon ouachitae* Dunn & Heintze, 1933 (Ouachita Mts., Polk & Scott Cos.(swAR) & Latimer & LeFlore Cos.(seOK)/Rich Mt. salamander/Tx in OK/OK T&E) . **Bibl.:** C. Anthony 1995; Black 1974a; Black & Puckette 1974c; Kuss 1985

*Plethodon petraeus* Wynn, Highton & Jacobs, 1988 (P. Mt. salamander/ rare Tx in Walker Co.,GA/ may be declining due to collecting) **Bibl.:** C. Camp 1985

*Plethodon richmondi* Netting & Mittleman, 1938 (=P.r.r.) (wPA to seIN,s.to nwNC, neTN/ ravine salamander/ migratory Tp or Tx in PA, WV; Tx in MD). **Bibl.:** Cooper 1962a; Duellman 1954; Cooper 1967

*Plethodon serratus* (*P. cinereus* s. Grobman, 1944) (= *P. cinereus* s.) (cLA, Ouachita Mts (AR, OK), MO, seTN & swNC/ southern redback salamander/ Tx in OK; Ac in Ga (Walker Co.) **Bibl.:** Buhlmann 2000

*Plethodon welleri* Walker, 1931 (Weller's salamander/ neTN,adjacent nwNC,VA/ Tx or Ac in IN). **Bibl.:** Thurow 1963

*Plethodon wehrlei* Fowler & Dunn, 1917 (swNY to ncNC, VA, w.to seOH & Letcher Co., KY/ Wehrle's salamander/ Tx & Tp (color/pattern phases restricted to certain caves) in VA (3 caves) & WV; Tx or Ac in PA/ NC T&E; KY T&E; TN T&E) **Bibl.:** J. Cooper 1962c

*Pseudobranchius* Gray, 1825 (dwarf sirens) Sirenidae salamanders (1 species in US)

*Pseudobranchius robustus* (robust dwarf siren/extinct Pleist. In late Rancholabrean Reddick I Site, (Marion Co.), Arrendondo Site, Alacua Co. & type locality in Haile (Rancholabrean) Site (A.Co.), FL)

*Pseudotriton* Tschudi, 1838 (red & mud salamanders; mud salamanders; red salamanders) Plethodontidae salamanders (2 species in US or Canada) **Bibl.:** Grobman 1959; Martof & Rose 1962; Mittleman 1942

*Pseudotriton montanus diastictus* (*P. d.* Bishop, 1941) (w. of Appalachians to sOH,seTN, Gulf Coast/ midland mud salamander/ Tp)

*Pseudotriton montanus* Baird, 1941 (coastal plain & Piedmont,sNJ to cFL,low elevations west of Appalachians from sOh to scTN)

*Pseudotriton montanus diastictus* Bishops, 1941 (type locality in Cascade Caverns, Carter Co., KY/ midland mud or red salamander/ epigeal west fo Appalachians, s. to OH to sTN/ Tx or Ac in KY)

*Pseudotriton ruber* (*Salamander r.* Latreille in Sonnini & Latreille, 1801) (NY to nwFL, w.to LA(not coastal plain)/northern red salamander/ Tx in AL, MS, WV; Ac in GA; Ttx or Ac in NJ (one cave)) **Bibl.:** Buhlmann 2000

*Pseudotriton ruber r.* (*P.r.* Latreille in Sonnini & Latreille, 1801) (Tx in TN; TTx or Ac in KY, MD, PA, TN, VA)

*Pseudotriton ruber schencki* (Brimley, 1912) (south of French Broad River in NC Blue Ridge Mts. To Smokies/ Blackchin red salamander/ Tx in Great Smokies, Blount Co.,TN)

*Pseudotriton ruber vioscai* Bishop, 1928 (sGA to seLA, n.to wTN/ southern red salamander/ TTx & Tx in MS)

*Taricha* Gray, 1850 (Western American salamanders; Pacific newts) Salamandridae salamanders (3 species in US or Canada)

*Taricha granulosa* (*Salamandra g.* Skilton, 1849) (epigeal in NW coast from cCA to AK/ rough-skinned newt/ possible Ttx or Ac in Prince Albert Cave, Mt. St.Helens area, WA)

*Taricha rivularis* (*Triturus r.* Twitty, 1935) (nCA in Sonoma, Mendocino, Humboldt & DelNorte Cos./ red-bellied newt) (endogean, HTx in CA)

*Taricha torosa* (*t.*) (*Triton t.* Rathke, 1833) (Ca coast n. to nMendocino Co. + w.slopes of Sierras/ California newt/ epigeal, Tx or Ac in CA)

*Triturus sierrae* (Tx or Ac in Sierras, CA)

*Typhlomolge* Stejneger, 1896 (Texas blind salamanders) Plethodontidae salamanders.. **Bibl.:** Chippindale 1992; Potter & Sweet 1981; Brandon 1970; Chippindale, Price et al. 2000 (place *Typhlomolge* as junior syn. of *Eurycea*).

*Typhlomolge robusta* (*Eurycea r.* Longley, 1978) Potter & Sweet 1981 (robust blind or Blanco blind salamander) (\*river fissure, Hays Co.,TX/ last seen in 1948, may be extinct/ St/ G1 or GX). **Bibl.:** Anon. 1968a; Potter & Sweet 1981, 1984

*Typhlomolge rathbuni* Stejneger, 1896 (= *Eurycea r.* Mitchell & Reddell, 1965) (Frontis-piece C) (Texas blind salamander) (artesian well from San Marcos Pool & Purgatory Cr.,Hays Co.,+ Kendall & Comal Cos.,TX/ Pb/ Federally endangered T&E)

*Typhlomolge rathbuni* **Bibl.:** Bechler 1986; E.Benedict 1979; S.Bishop, 1947; Blackford, 1899; Eigenmann, 1900; Hilton, 1956; Hunsaker & Johnson, 1959; Kingsbury & R., 1909; Longley 1978a, 1978a; Norman, 1900; Platt, 1935; Potter & Sweet 1981, H.Reed, 1920; Sever 1985; L. Smith, 1920; Stejneger, 1892; Uhlenhuth, 1919, 1921-a; Eigenmann, 1899; Honegger 1968

*Typhlomolge wehrlei* (= *Plethodon dixi*) (Dixie C. salamander, \*Dixie C., New Dixie & Blankenship C., Roanoke Co., VA). **Bibl.:** Cooper 1962a; J. Fowler 1951, 1952; Netting 1936; H. Fowler 1952; J. Fowler 1951; Fowler 1951;

*Typhlotriton* Stejneger, 1893 (grotto salamanders) Plethodontidae salamanders.  
*Typhlotriton braggi* C. Smith, 1968 (subsumed in *Typhlotriton s.*)

*Typhlotriton spelaeus* Stejneger, 1892 (incl. *T. nereus* according to Brandon, 1970) (cave type locality in Barry Co., MO/Ozark Plateau in nAR (Baxter, Benton, Boone, Carroll, Fulton, Independence, IZard, Lawrence, Marion, Newton, Searcy, Sharp, Stone, WA, Cos.), eKS Cherokee Co.), sMO (Laclede, OR & Shannon Cos.) & neOK (Adair, Cherokee, DE, Ottawa Cos.)/ Tb/ KS T&E S1, MO State T&E Watch List, global G4G5 rank/ Ozark blind or grotto salamander)

*Typhlotriton spelaeus* **Bibl.:** Alt 1910; Besharse 1973; Besharse & Brandon 1974, 1974a; Besharse & Hollyfield 1976, 1977; Blair 1939; Brandon 1961, 1962b, 1967b, 1968a, 1971; Dyer 1975; Kezer 1952; Noble & Pope 1928; Potter 1963; Stone 1964-a,c; P. & Sweet 1981; Sweet 1964; Wilkens 1980; William 1975; Wratherred & Harvey 1971; Brandon 1970; C. Dodd 1980; Eigenmann 1900; Eigenmann & Denny 1909; Hilton 1909, 1945; Kezer 1952, 1955; Pyle 1964; L. Stone 196a,b

salt peter - Fliermans & Schmidt, 1977; Hill, 1981, 1993; Hill, Eller, Fliermans & Hauer, 1983; Lewis, 1993

**sanguivorous** - Adj. for species which feed on blood. See flies, bats, mites.

**saprophage** - Scavenger feeding on dead organic material. Syn: saprogene.

**saprophyte** - Plant type which obtains its energy heterotrophically from dead organic matter. See fungi. Holoesaprophytes get all their carbon from dead organics. Hemisaprophytes use some inorganics for their carbon. Facultative saprophytes are saprophytes only for a certain period in their life cycle. Polysaprophytic species live in waters with high concentrations of decomposing organics. Oligosaprophytic species live in low organic mountain lakes and streams, and most cave waters.

**saprotroph** - Species which obtain most of their food by absorbing decaying organics. Plant saprotrophs are called saprophytes (syn.: saprobe, saprovore).

**scaphopod** - Any fossil macroinvertebrate, bottom-dwelling, marine univalve mollusk of the class Scaphopoda, with an elongate body surrounded by mantle & a tubular calcareous shell open at both ends.

Class Scaphopoda

Order Dentaliida

Dentaliidae (*Dentalium*)

*Dentalium* Linnaeus, 1758 – Dentaliidae scaphopod

*Dentalium laqueatum* A.E. Verrill, 1885 (reticulate tuskshell/ wFL Gulf of Mex. marine infauna)

*Dentalium pilsbryi* Rehder, 1942 (LA Gulf of Mex. marine infauna)

*Dentalium texasianum* Philippi, 1848 (Texas tuskshell/ wFL, TX Gulf of Mex. marine infauna)

**scavenger** - Detritivore that feeds on dead animal matter. Incl. coprophage, necrophage, saprophage.

**Schiner-Racovitza System** - Classification that divides species according to supposed ecologic dependency on caves. See terminology (bibl.)

schizomid - see whipscorpion.

**sciaphilic** - Referring to a taxon that prefers shaded habitat.

scorpion, sun or wind - see solifugid.

Scorpionflies & allies – See Mecoptera

## Scorpions

Arthropod of Order Scorpiones (=Scorpionida) About 600 species. 4-9 cm. Body has a short prosoma with 6 pairs of limbs and a long opisthosoma divided into mesosoma and metasoma. The rear end of the opisthosoma (15-90 segments) can be moved in all directions. And the end of the opisthosoma is a telson modified to a venom gland with a sting. Small, pincer-like chelicerae and large, strong pedipalps usually with the last segment enlarged into large pincers.

Scorpions are predatory carnivores that feed on insects and spiders, capturing the prey with their pedipalps and killing them with their sting. Jawlike appendages near the mouth crush the prey, over which the scorpion then discharges a digestive fluid and sucks up the liquefied prey. Young scorpions are born alive and are then carried on the mother's body for a short time.

Few scorpions are dangerous to humans, and ordinarily they do not attack unless disturbed. The only species in the United States with a potentially fatal sting, *Centruroides sculpturatus*, is yellow to yellow brown with two black stripes on the back. They inject venom with a sharp sting at the end of their tails. The sting from most species produces pain and swelling. Serums are available to relieve the more severe symptoms. The *centruroides* scorpion is found in Arizona.

All scorpions fluoresce under UV light ("blacklight"). Longwave ultraviolet light is reflected as visible light in the green range. In darkness, the scorpions appear to glow. This fluorescence is caused by an unidentified substance in a very thin layer in the cuticle of the scorpion called the hyaline layer. Newly molted scorpions do not fluoresce. As the new cuticle hardens, the fluorescent quality increases. This indicates that the fluorescent factor is either secreted by the



scorpion shortly after molting or that the fluorescence is a by-product of the tanning process. Alcohol in which scorpions have been preserved may also fluoresce.

The hyaline layer of the cuticle is very tough stuff. It is often found in scorpion fossils. Even after hundreds of millions of years, while all the other layers of the cuticle have been lost, this hyaline layer remains embedded in fossil rocks and still fluoresces.

Kingdom Animalia

Clade Metazoa

Clade Eumetazoa

Clade Bilateria

Clade Protostomia

Clade Ecydsozoa

Phylum Arthropoda

Subphylum Chelicerata

Class Archnida

Subclass Cteidophora or Dromopoda

Order Scorpiones

Superfamily Buthoidea Simon, 1879

**Buthidae** Simon, 1879 (*Centruroides*, *Isometrus*),

**Chactidae** (*Superstitionia* (now in Superstitionidae)

Vaejovoidea Thorell, 1876

**Superstitionidae** Stahnke, 1940

Subfamily Superstitioninae Stahnke, 1940

Tribe Superstitionini (*Superstitionia*)

**Vaejovidae** Thorell, 1876 (undet. AC genus in Kartchner C., Coshise Co., AZ)

Subfamily Uroctoninae Mello-Leitao, 1934 (*Uroctonus*)

Subfamily Syntropinae (*Pseudouroctonus*)

Subfamily Vaejovinae Thorell, 1876

(*Serradigitus*, *Superstitionia* (now in Superstitionidae), *Vaejovis*)

**Centruroides** Marx in Howard, 1890 - Buthidae scorpions

*Centruroides carolinensis* = *Vaejovis c.*

**Centruroides** undet. sp. (6,000 year old fossil in Neotoma woodrat midden, Puerto Blanco Mts., Pima Co., sAZ/ 0 to 1,000 & 9,400 to 10,300 years BP in Neotoma woodrat nest in wTX (El Paso Co.) or sNM)

**Centruroides vittatus** Say, 1821 (Ac in TX)

***Isometrus*** Hemprich & Ehrenberg, 1828 - Buthidae scorpions

***Isometrus maculatus*** (DeGeer, 1778) (alien in HA/ lesser brown scorpion/ Tx or Ac in HA (one cave))

***Pseudouroctonus*** Stahnke, 1974 - Vaejovidae, subfamily Syntropinae

***Pseudouroctonus reddelli*** (*Uroctonus r.* Gertsch & Soledad, 1972) (type locality cave in Uvalde Co., & other caves & epigeal in Balcones Fault Zone & Edwards Plateau, TX Hill Country, Williamson, Travis, Burnet, Real, Bandera, Bexar, Comal, Edwards, Hays, Kerr, Kimble, Medina, Uvalde, and Val Verde Cos., TX/ Tp). **Bibl.:** Stockwell 1986

***Pseudouroctonus iviei*** (*Vaejovis i.* Gertsch & Soleglad, 1972) (Epigeal in nCA (Sierra, Trinity, Placer, Butte, Eldorado, Plumas, Yuba, Shasta, Napa, Sonoma, and Mendocino Cos.) /Tp or Tx in El Dorado & Shasta Cos., CA)

***Serradigitatus*** Stahnke, 1974 - Vaejovidae scorpions, subfamily Vaejovinae

***Serradigitatus gertschi* g.** (= *Vaejovis g.* Williams, 1968) (San Ysidro, San Diego County, south to San Ignacio, Baja California Sur, and islands of Gulf of California epigeal/ Ep & Tx in cave in Calaveras & Tuolumne Cos.,CA)

***Superstitionia*** Stahnke, 1940 - Superstitionidae scorpions, subfamily Superstitioninae

***Superstitionia donensis*** (Stahnke, 1937) (TX/epigeal, Tx or Ac)

***Uroctonus*** Thorell, 1876 - Vaejovidae scorpions, subfamily Uroctoninae

***Uroctonus glimpei*** (Hjelle, 1972) (epigeal Tx or Ac in cave in Shasta Co., CA)

***Uroctonus grahami*** Gertsch & Soleglad, 1972 (\*cave type locality in Shasta Co.,CA/ Tb)

***Uroctonus mordax* m.** (= *U.m.* Thorell, 1876 (Klickitat Co., WA, s. toOR Coast Ranges and most of CA s. to Los Angeles County,CA epigeal/mordant scorpion/Tp? in Amador, El Dorado, Mariposa & Tulare Cos.,CA)

*Uroctonus sequoia* = *Uroctonites s.*

***Uroctonites*** Williams and Savary, 1991 - Vaejovidae scorpions, subfamily Uroctoninae (4 species in US)

***Uroctonites sequoia*** (*Uroctonus s.* Gertsch & Soleglad, 1972) (\*cave type locality in Sequoia-Kings Canyon Natl. Park, Tulare Co., CA/ Tp)

***Vaejovis*** C.L.Koch, 1836 - Vaejovidae scorpions, subfamily Vaejovinae

***Vaejovis carolinensis*** (Palisot de Beauvois, 1805) (= *Vaejovis c.*) (Tx or Ac in TN)

*Vaejovis gertschi* = *Serradigitus g.*; *Vaejovis iviei* = *Pseudouroctonus i.*; *Vaejovis reddelli* = *P. r.*

*Vaejovis* undet. sp. or species (Ac or Ttx in El Malpais Natl. Monument, nNM; fossil in Neotoma woodrat midden, Puerto Blanco Mts., Pima Co., sAZ; 13,500 years old in *Neotoma* nest, Ajo Mts., Pima Co., AZ))

## Sea Cucumbers

(holothroids) Holothuroid echninoderms with a body like a cucumber & a flexible body wall. Elongated cylindrical bodies averaging 10-20 cm. (longest up to 2 m.). Mouth and anus are at opposite ends. Skin leathery and pliable with calcareous skeleton reduced to minute sclerites or spicules. About 1,100 known species. Creeps along the floor of submarine caves but no cavernicoles known.

Kingdom Animalia

Clade Metazoa

Clade Eumetazoa

Clade Bilateria

Clade Deuterostomia

Phylum Echinodermata

Subphylum Echinozoa

Class Holothuroidea

Subclass Apodacea

Order Apodida

Family Chirodotidae (*Chiridota*)

Family Synaptidae (*Leptosynapta*, *Taeniogyrus*)

Order Molpadiida

Family Caudinidae (*Paracaudina*)

Family Molpadiidae (*Eupyrgus*, *Molpadia*)

Subclass Aspidochirotacea

Order Aspidochirotida

Family Stichopodidae (*Parastichopus*)

Subclass Dendrochirotacea

Order Dendrochirotida

Family Cucumariidae

(*Cucumaria*, *Pentamera* (also put in Phyllophoridae), *Pseudocnus*, *Thyone*, *Thyonella*)

Family Phyllophoridae (*Havelockia*)

Family Psolidae (*Lissothuria*, *Psolus*)

Family Sclerodactylidae (*Eupenctacta*, *Sclerodactyla*)

***Chiridota*** Eschscholtz, 1829 - Chiridotidae sea cucumbers

***Chiridota albatrossii*** Edwards, 1907 (BC marine infauna)

***Chiridota laevis*** (O. Fabricius, 1780) (PQ Gulf of St. Lawrence sandy marine interstitial)

***Chiridota*** undet. sp. (VA marine infauna)

***Chiridota tuftsi*** (VA marine infauna)

***Cucumaria*** Blainville, 1830 - Cucumariidae sea cucumbers

***Cucumaria calcigera*** (WA marine benthic)

***Cucumaria crucigera*** (WA marine benthic)

***Cucumaria curata*** Cowles, 1907 (WA marine benthic)

***Cucumaria fallax*** Ludwig, 1874 (WA marine benthic)

***Cucumaria frondosa*** (Gunnerus, 1770) (NB, PEI, PQ Gulf of St. Lawrence sandy marine interstitial)

***Cucumaria lissoplaca*** H.L. Clark, 1924 (WA marine benthic)

***Cucumaria lubrica*** Clark, 1901 (WA marine benthic)

***Cucumaria miniata*** (Brandt, 1835) (WA marine benthic)

***Cucumaria*** (*C.*) ***pseudopopulifera*** Deichmann, 1938 (WA marine benthic)

***Cucumaria piperata*** Stimpson, 1864 (WA marine benthic)

***Cucumaria pseudocalcigera*** (*Pentamera p.* Deichmann, 1938) (WA marine benthic)

***Cucumaria pseudocurata*** Deichmann, 1938 (WA marine benthic)

***Cucumaria pulcherrima*** (VA marine benthic)

***Cucumaria trachyplaca*** Clark, 1924 (WA marine benthic)

***Eupentacta*** - Sclerodactylidae sea cucumbers

***Eupentacta*** (*Cucumaria*) ***chronhjelmi*** (WA marine infauna)

***Eupentacta pseudoquinquesemita*** Deichmann, 1938 (WA marine infauna)

***Eupentacta quinquesemita*** (Selenka, 1867) (WA marine infauna)

***Eupyrgus*** - Molpadiidae sea cucumbers

***Eupyrgus scaber*** Lutken, 1857 (NB, PEI, PQ Gulf of St. Lawrence sandy marine interstitial)

***Havelockia*** Pearson, 1903 - Phyllophoridae sea cucumbers

***Havelockia benti*** (Deichmann, 1937) (WA marine infauna)

***Havelockia scabra*** (Virginian marine infauna)

***Leptosynapta*** Verrill, 1867 – Synaptidae sea cucumbers

***Leptosynapta clarki*** Heding, 1928 (WA marine infauna)

*Leptosynapta crassipatina* H.L. Clark, 1924 Carolinian marine infauna)

*Leptosynapta inhaerens* (Carolinian, WA marine infauna)

*Leptosynapta tenuis* (MA, Carolinian, Virginian marine infauna)

*Leptosynapta transgressor* Heding, 1928 (WA marine infauna)

*Lissothuria* Verrill, 1867 - Psolidae sea cucumbers

*Lissothuria nutriens* (*Thyonepsolus nutriens*, Clark, 1901) (Ttx in CA sea caves)

*Molpadia* Risso, 1826 – Molpadidae sea cucumbers

*Molpadia intermedia* (WA marine infauna)

*Paracaudina* Heding, 1931 – Caudinidae sea cucumbers

*Paracaudina chilensis* (J. Mueller, 1850) (WA marine infauna)

*Parastichopus* Clark, 1922 - Stichopodidae sea cucumbers

*Parastichopus californicus* (*Stichopus californicus* Stimpson, 1857) (Ttx in CA sea caves)

*Pentamera* (also name for beetle genus) - Cucumariidae sea cucumbers (also put in Phyllophoridae)

*Pentamera calcigera* (Stimpson, 1851) (NB, PEI, PQ Gulf of St. Lawrence sandy marine interstitial)

*Pentamera pseudopopulifera* (AK marine infauna)

*Pentamera pulcherrima* (Virginian marine infauna)

*Pentamera* undet. sp. (Carolinian marine infauna)

*Pseudocnus* Panning, 1949 – Cucumariidae sea cucumbers

*Pseudocnus* undet. sp. (WA marine infauna)

*Psolus* Jaeger, 1833 - Psolidae sea cucumbers

*Psolus chitinoides* H.L. Clark, 1901 (WA marine infauna)

*Psolus phantapus* (Strussenfeldt, 1765 (NB, PEI, PQ Gulf of St. Lawrence sandy marine interstitial)

*Sclerodactyla* - Sclerodactylidae sea cucumbers

*Sclerodactyla briareus* (Carolinian marine infauna)

*Taeniogyrus* Semper, 1868 – Synaptidae sea cucumbers

*Taeniogyrus* undet. sp. (WA marine infauna)

*Thyone* Oken, 1815 - Cucumariidae sea cucumbers

*Thyone briareus* (NC marine infauna)

*Thyonella* - Cucumariidae sea cucumbers

*Thyonella gemmata* Purtales, 1852 (Carolinian marine infauna)

## Sea Spiders

**Pycnogonids**, a class of marine arthropods with over 1,000 species.

Order Pantopoda

Family Ammotheidae (*Achelia*)

Family Nymphonidae (*Nymphon*)

Family Phoxichilidiidae (*Anoplodactylus*, *Phoxichilidium*)

Order Pycnogonida

Family Callipallenidae (*Callipallene*) (once in Pallenidae)

Family Pycnogonidae (*Pycnogonum*)

*Achelia* Hodge, 1864 - Ammotheidae sea spiders

*Achelia chelata* (CA, WA marine infauna)

*Achelia sawayai* (Carolinian marine infauna)

*Achelia spinosa* (Stimpson, 1853) (NB, PQ, PEI Gulf of St. Lawrence sandy marine interstitial)

*Anoplodactylus* Wilson, 1878 - Phoxichilidiidae sea spiders

*Anoplodactylus erectus* (WA, Virginian marine infauna)

*Anoplodactylus petiolatus* (Kroyer, 1844) (Virginian marine infauna)

*Anoplodactylus viridintestinalis* (WA marine infauna)

*Callipallene* Flynn, 1929 – Callipallenidae (once in Pallenidae) sea spiders

*Callipallene brevirostris* (Johnston, 1837) (MA, Carolinian & Virginian marine infauna)

*Callipallene pacifica* (WA marine infauna)

*Nymphon* Fabricius, 1794 - Nymphonidae sea spiders

*Nymphon grossipes* (O. Fabricius, 1780) (WA, Gulf of St. Lawrence (NB, PEI, PQ) sandy marine interstitial)

*Nymphon pixellae* (WA marine infauna)

*Phoxichilidium* Milne-Edwards, 1840 - Phoxichilidiidae sea spiders

*Phoxichilidium femoratum* (Rathke, 1799) (WA, Gulf of St. Lawrence (NB, PEI, PQ) sandy marine interstitial)

*Pycnogonum* Brunnich, 1764 – Pycnogonidae sea spiders

*Pycnogonum* undet. sp. (WA marine infauna)

sea lion - Pinniped **mammal** of family Otariidae.

## Sea Slugs, Nudibranchs, and Allies

Phylum Mollusca

Class Gastropoda,

Subclass Heterobranchia (=Euthyneura)

Subclass, superorder or Cohort Opisthobranchia  
(sea slugs, sea hares, sea butterflies, canoe shells, & others)

Order Acochilidioidea (= Acochliidiomorpha)

Asperspinidae (*Asperspina*, *Microhedyle*, *Unela*)

Microhedylidae (*Hedylopsis*)

Order Nudibranchia

Suborder Doridina or Doridoidea

Superfamily Anadoridoidea

Family Corambidae (*Doridella*)

Family Polyceratidae *Polycera*

Suborder Eolidoidea

Superfamily Cleioprocta

Family Aeolidiidae (*Aeolidia*)

Superfamily Acleioprocta

Family Pseudovermidae (*Pseudovermis*)

Suborder Doridoidea Odhner 1934

Superfamily Anadoridoidea

Tribe Non-Suctoria

Family Aegiretidae (now in Suborder Phanerobranchia)

Family Notodorididae (*Aegires*) (also put in Aegiretidae)

Superfamily (or Suborder) Doridacea

Family Kentrodorididae (*Jorunna*)

Superfamily Eudoridacea Odhner, 1934

Family Cadlinidae Bergh, 1891

Subfamily Cadlininae Bergh, 1878 (*Cadlina*) (now in Chromodorididae)

Family Chromodorididae (*Cadlina*)

Suborder or Superfamily Eueolidoidea  
Facelinidae (*Cratena*)

Suborder Phanerobranchia  
Superfamily Anadoridoidea  
Family Aegiretidae (once in Suborder Doridoidea )

*Aegires* Leven, 1844 – Notodorididae nudibranch (once in Aegiretidae) (1 species in US or Canada)

*Aegires albopunctatus* MacFarland, 1905 (salt-and-pepper doris/ Ttx in Ca sea caves)

*Aeolidia* Cuvier, 1797- Aeolidiidae nudibranch (1 species in US or Canada)

*Aeolidia papillosa* (Linnaeus, 1761) (shag-rug aeolis/ ME sea cave)

*Asperspina* Rankin, 1979 - Asperspinidae sea slug

*Asperspina riseri* (Morse, 1976) = *Hedylopsis r.*

*Cadlina* Bergh, 1878 – Chromodorididae nudibranchs (once in Cadlinidae, subfamily Cadlininae) (9 species in US or Canada)

*Cadlina limboughorum* Lange, 1962 (Conrad Limboughs' nudibranch; yellow-edge cadlina) (OR sea caves)

*Cadlina luteomarginata* MacFarland, 1905 (WA marine infauna)

Facelinidae (*Cratena*)

*Cratena* Bergh, 1864 – Facelinidae nudibranch

*Cratena pilata* (Gould, 1870) (rare/ Virginian marine infauna)

*Doridella* Verrill, 1870 – Corambidae nudibranch

*Doridella obscura* A.E. Verrill, 1870 (Carolinian, Virginian, MA marine infauna)

*Hedylopsis* Thiele, 1931 – Microhedyliidae sea slug (also put in Hedylopsidae) (1 species in US or Canada)

*Hedylopsis riseri* M.Morse, 1976 (ME marine interstitial)

*Jorunna* Bergh, 1876 - Kentrodorididae nudibranch (1 species in US or Canada)

*Jorunna pardus* D.W. Behrens & R. Henderson, 1981 (leopard spot nudibranch; leopard jorunna) (Ttx in CA)

*Polycera* Cuvier, 1817 – Polyceratidae nudibranchs

*Polycera* undet. sp. WA marine infauna



***Pseudovermis*** Periaslavzeff, 1891 - Pseudovermidae nudibranch  
***Pseudovermis*** undet. sp. (ME marine interstitial)

***Unela*** Marcus, 1953 – Microhedyllidae sea slug (also put in Asperspinidae) (2 species in US or Canada)

***Unela remanei*** Marcus, 1953 (sand slug/ FL, Mex., Brazil marine beach interstitial)

**Sea Spiders** - Phylum Pygngoniad (=Pantopoda)

***Tanystylum*** Miers, 1879 - Tanystylidae

***Tanystylum*** orbiculare (Virginian marine infauna)

**Sea Stars** - Echinoderm of class Stelleroidea and Class or Subclass Ophiuroidea (ophiuroids, brittle stars, serpent stars), with 5-20 arms. Includes brittle stars. Common in sea caves below the mid-tide mark.

Phylum Echinodermata

Class Stelleroidea

Subclass Asteroidea

Order Paxillosida

Suborder Cribellina

Porcellanasteridae (*Ctenodiscus*)

Order Platyasterida

Family Luidiidae (*Luidia*)

Order Forcipulatida

Suborder Asteriadina

Family Asteriidae (*Leptasterias*, *Asterias*, *Pisaster*, *Pycnopodia*)

Order Valvatida

Suborder Asteriadina

Asteropseidae (*Dermasterias*)

Suborder Granulosina

Family Goniasteridae (*Mediaster*)

Order Spinulosida

Suborder Eugnathina

Family Solasteridae (*Crossaster*, *Solaster*)

Class Ophiuroidea (or subclass of Stelleroidea)

Order Ophiurida

Suborder Chilophiurina  
Family Ophiuridae (*Ophiopenia*, *Ophiura*)

Suborder Gnathophiurina  
Family Amphiuridae  
(*Amphiodia*, *Amphipholis*, *Amphiura*, *Axkiognathus*, *Diamphiodia*, *Dougaloplus*,  
*Microphipholis*, *Micropholis*, *Ophiophragmus*, *Unioplus*)

Family Ophiactidae (*Hemipholis*, *Ophiactis*)  
Family Ophiothricidae (*Ophiothrix*)

*Amphiodia* Varrill, 1899 - Amphiuridae sea stars  
*Amphiodia atra* (rare Virginian marine infauna)

*Amphiodia digitata* Nielsen, 1932 (CA, WA marine infauna)  
*Amphiodia occidentalis* (Lyman, 1960) (WA marine infauna)

*Amphiodia periercta* H.L. Clark, 1911 (WA marine infauna)  
*Amphiodia pulchella* (Lyman, 1869) (wFL Gulf of Mex. marine infauna)

*Amphiodia psara* H.L. Clark, 1935 (WA marine infauna)  
*Amphiodia urtica* (*Ophiophragmus u.* Lyman, 1860) (CA, WA marine infauna)

*Amphipholis* Ljungman, 1966 - Amphiuridae sea stars  
@*Amphipholis macraspis* (WA marine infauna)  
*Amphipholis pugetana* (Lyman, 1860) (AK, WA marine infauna)

*Amphipholis squamata* (Delle Chiaje, 1829) (WA, Carolinian marine infauna)  
*Amphipholis strongyloplax* (H.L. Clark, 1911) (WA marine infauna)

*Amphioplus* Verrill, 1899 - Amphiuridae sea stars  
*Amphioplus abdita* (FL Gulf of Mex. marine infauna)  
@*Amphioplus cuneatus* (FL Gulf of Mex. marine infauna)

*Amphioplus sepultus* G. Hendler, 1995 (Carolinian marine infauna)  
*Amphioplus thrombodes* (Carolinian, wFL Gulf of Mex. marine infauna)

*Amphiura* Forbes, 1843 - Amphiuridae sea stars  
*Amphiura carchara* H.L. Clark, 1911 (WA marine infauna)

*Asterias* Linnaeus, 1758 - Asteroiidae sea stars  
*Asterias forbesi* (Desor, 1848) (MA marine infauna)  
*Asterias rubens* Linne<sup>▲</sup>, 1758 (NB, PEI, PQ Gulf of St. Lawrence sandy marine interstitial)

*Axiognathus* - Amphiuridae sea stars  
*Axiognathus pugetana* (Lyman) s (OR marine infauna)

***Crossaster*** Muller & Troschel, 1840 – Solasteridae sea stars  
***Crossaster papposus*** (*Solaster p.* Linnaeus, 1767) (WA marine infauna)

***Ctenodiscus*** Mueller & Troschel, 1842 – Porcellanasteridae sea stars  
***Ctenodiscus crispatus*** (Retzius, 1805) (BC marine infauna)

***Dermasterias*** Perrier, 1881 – Asteropseidae sea stars  
***Dermasterias imbricata*** (Grube, 1857) (WA marine infauna)

***Diamphiodia*** - Amphiuridae sea stars  
***Diamphiodia craterodmeta*** (AK marine infauna)

***Dougaloplus*** - Amphiuridae sea stars  
***Dougaloplus amphacanthus*** (McClendon, 1909)(sCA marine infauna)

***Hemipholis*** – Ophiactidae sea stars  
***Hemipholis elongata*** (Say, 1825) (Carolinian, e,wFL, LA marine infauna)

***Leptasterias*** Verrill, 1866 - Asteroidea sea stars  
***Leptasterias groelandica*** (Steenstrup, 1857) (NB, PQ Gulf of St. Lawrence sandy marine interstitial)

***Leptosynapta*** Verrill, 1867 - Synaptidae sea stars  
***Leptosynapta albicans*** (Selenka, 1867) (CA marine infauna)  
***Leptosynapta inhaerens*** (MA, Russian marine infauna)

***Leptasterias*** (*Leptasterias*) ***tenera*** (Stimpson, 1862) (PEI Gulf of St. Lawrence sandy marine interstitial)

***Luidia*** - Luidiidae sea stars  
***Luidia foliolata*** (WA marine infauna)

***Mediaster*** Stimpson, 1857 – Goniasteridae sea stars  
***Mediaster aequalis*** Stimpson, 1857 (WA marine infauna)

***Microphiopholis*** – Amphiuridae sea stars  
***Microphiopholis atra*** (Stimpson) (= *Micropholis a.*) (wFL Gulf of Mex., Carolinian, LA marine infauna)

***Microphiopholis gracillima*** (Carolinian marine infauna)

***Micropholis*** Thomas, 1966 - Amphiuridae sea stars  
***Micropholis atra*** = ***Microphiopholis a.***

***Micropholis gracillima*** (Stimpson, 1852) wFL Gulf of Mex. marine infauna)

*Micropholis* undescr. sp. (wFL Gulf of Mex. marine infauna)

*Ophiactis* Luetken, 1856 – Ophiactidae sea stars

*Ophiactis rubropoda* (Carolinian marine infauna)

*Ophiopenia* Luetken, 1855 - Ophiuridae sea stars

*Ophiopenia disacantha* Clark, 1911 (AK marine infauna)

*Ophiopenia tetracantha* Clark, 1911 (AK marine infauna)

*Ophiophragmus* - Ophiuridae sea stars

*Ophiophragmus brachyatis* (wFL Gulf of Mex. marine infauna)

*Ophiophragmus filograneus* (Lyman, 1875) (Carolinian, wFL Gulf of Mex. marine infauna)

*Ophiophragmus pulcher* H.L. Clark, 1918 (wFL Gulf of Mex. marine infauna)

*Ophiophragmus wurdemanii* (Lyman, 1860) (wFL Gulf of Mex., NC marine infauna)

*Ophiothrix* Mueller & Troschel, 1840 - Ophiothricidae sea star

*Ophiothrix spiculata* LeConte, 1851 (Ttx in CA sea caves)

*Ophiura* Lamarck, 1816 - Ophiuridae sea stars

*Ophiura brevispina* (Say, 1825) (OR marine infauna)

*Ophiura luetkenii* (Lyman, 1860) (CA, OR, WA marine infauna)

*Ophiura robusta* (Ayres, 1851) (NB, PEI, PQ Gulf of St. Lawrence, ME sandy marine interstitial)

*Ophiura sarsi* Lutken, 1855 (BC, ME, OR, WA marine infauna)

*Solaster* Forbes, 1839 – Solasteridae sea stars

*Solaster stimpsoni* Verrill, 1880 (WA marine infauna)

*Unioplus* - Amphiuroidae sea stars

*Unioplus micraspis* (Clark) (AK, OR marine infauna)

*Unioplus euryaspis* (Clark) OR marine infauna)

**Sea Urchins** - Echinoderm with a globular shape & a covering of calcareous plates, commonly with sharp movable spines. Common in sea caves partly or fully submerged at low tide.

Class Echinoidea (sea urchins & sand dollars)

Subclass Euechinoidea

Superorder Atelostomata

Order Spatangoida

Suborder Hemiasterina

Schizasteridae (*Moira*, *Brisaster*)

Superorder Echinacea

Order Arbacioida

Arbaciidae (*Arbacia*)

Order Echinoida

Family Strongylocentrotidae (*Strongylocentrotus*)

Superorder Gnathostomata

Order Glypeasteroida

Suborder Scutellina

Family Dendrasteridae (*Dendraster*)

Family Echinarachniidae

Family Mellitidae (*Mellita*)

Subclass Perischoechinoidea

Order Cidaroida

Family Cidaridae (*Eucidaris*)

*Arbacia* Gray, 1835 Arbaciidae sea urchins

*Arbacia punctulata* (Lamarck, 1816) (VA marine infauna)

*Brisaster* Gray, 1855 – Schizasteridae sea urchins

*Brisaster latifrons* (A. Agassiz, 1898) (WA marine infauna)

*Dendraster* Agassiz in Agassiz & Desor, 1847 - Dendrasteridae sea urchins

*Dendraster excentricus* (Escholtz, 1831) (WA marine infauna)

*Echinarachnius* Echinarachniidae sea urchins

*Echinarachnius parma* (Lamarck, 1816) (Virginian, Gulf of St. Lawrence (NB, PEI, PQ) sandy marine interstitial)

*Eucidaris* Pomel, 1883 - Cidaridae sea urchins

*Eucidaris thouarsi* (Valenciennes, 1846) (Ttx or Tp in CA sea caves)

*Mellita* L. Agassiz, 1841- Mellitidae sea urchins

*Mellita fresnelii* (Audouin) (NC marine infauna)

*Mellita quinquiesperforata* (Leske, 1778) (LA, VA marine infauna)

*Mellita tenuis* Clark, 1940 (wFL Gulf of Mex. marine infauna)

*Moira* Agassiz, 1872 – Schizasteridae sea urchins

*Moira atropos* T.L. Erwin, 1983 (WA marine infauna)

*Strongylocentrotus* Brandt, 1835 - Strongylocentrotidae sea urchins

*Strongylocentrotus droebachiensis* (O.F. Muller) (AK, WA infauna; NB, PEI, PQ Gulf of St. Lawrence sandy marine interstitial)

*Strongylocentrotus purpuratus* (WA infauna)

*Strongylocentrotus* undet. sp. (Ttx or Tp in CA sea caves)

**seal** - Pinniped **mammal** of family Otariidae (eared seal, sea lion) & Phocidae (earless seal & true seal)

seasonality - See temporal

**selection**, (natural) - Nonrandom differential survival or reproduction of groups of organisms in successive generations. Incl. directional.

**semelparous** - Where most individuals of a species breed only once and then die.

**semivoltine** - Having two generations or brood every two years or seasons.

**senses** (see also feeding, regressive in evolution). Peck 1977

chemical feeding stimulants - Tierney & Atema 1986

chemoreceptors - Hodgson 1957; Peck 1976b

easthetasc sensilla - Tierney & Dunham 1984

eyes (see evolution) - Culver 1986, 1987; Parker, 1890; John 1957; Jones & Culver 1989; Noble & Pope 1928; Stone 1964a-c; Thompson 1967; Wells 1957, 1959; Wilkens 1980

light sensitivity - Maguire 1960-a; P. Wells 1952, 1957, 1959; P. Wells & C. Harris 1954; Welsh 1934

magnetic field - Phillips 1977

neuromast - Hill 1969

pheromonal (see reproduction) - Bechler 1986

taste - Hill 1969; Packard, 1889

touch - Bechler 1986; thigmotactic - Hill 1969; Tierney & Dunham 1984;

vibrations - Howarth, Hoch & Asche 1990

**sensitive** - T&E species of special concern. Incl. overall sensitive & those sensitive to pollution. See endangered (bibl.)

sensory - see senses, regressive evolution

**sensu lato** - Referring to the wide application in a taxon's name. Sensu strictu refers to a narrow interpretation.

**Shannon-Wiener index of diversity** - Ratio of number of species to their communal importance as in biomass, productivity, etc.

shrew - See mammal, shrew

## Shrimp

Crustacean of Phylum Arthropoda, subphylum Chelicerata, Class Malacostraca, Subclass Eumalacostraca, Superorders Eucarida (Order Decapoda), Peracarida (Order Mysida) & Hoplocarida (Order Stomatopoda). Also a name for two suborders of macrurous crustaceans. Large, fringed pelopods adapted for swimming. Long and slender legs. Chelipeds may be present. Body is laterally compressed with a keel-shaped, serrated rostrum in many species. Most benthic but some pelagic. Larger species are often called prawns. For mussel & seed shrimps, see ostracod. Anchialine ones often control red color by expansion or contraction of chromatophores.

**Shrimp Bibl.:** Bouchard 1978, 1986; Hobbs III 1994a; Parry 1957; Cooper 1978.; Ortmann, 1892 ; Vandel 1964

Superorder Eucarida

Order Decapoda

Suborder Dendrobranchiata

Superfamily Penaeoidea

Penaeidae (*Panaeus*, *Trachypenaeus*)

Superfamily Sergestoidea

Sergestidae (*Acetes*)

Suborder Pleocyemata (= Natantia) (see also crabs)

Infraorder Caridea (shrimps)

Superfamily Atyoidea

Atyidae (also placed in Oplophoroidea)

(*Antecaridina*, *Atyoida*, *Calathaemon*, *Halocaridina* *Palaemon*,  
*Palaemonias*)

Superfamily Alpheoidea

Alpheidae (*Alpheus*, *Automate*, *Eualus*, *Heptacarpus*, *Metabetaeus*)

Hippolytidae (*Calliasmata*, *Heptacarpus*, *Hippolyte*, *Latreutes*, *Tozeuma*)

Superfamily Crangonoidea

Crangonidae (*Crangon*, *Mesocrangon*, *Neocrangon*)

Superfamily Palaemonoidea

Palaemonidae (*Periclimenes*)

Subfamily Palaemoninae (*Macrobrachium*, *Palaemonetes*, *Palaemon*)

Subfamily Pontoniinae (*Palaemonella*)

Superfamily Pandaloidea

Ogyrididae (*Ogyrides*, *Ogyris*)

Pandalidae (*Pandalus*)

Superfamily Pasiphaeoidea

Pasiphaeidae (*Leptochela*, *Pasiphaea*)

Superfamily Procaridoidea

Procarididae

(*Antecaridina*, *Halocaridina* (both also put in Atyidae), *Procaris*, *Vetericaris*)

Superfamily Processoidea

Processidae (*Ambidexter*, *Processa*)

Infraorder Thalassinidea (mud and ghost shrimp)

Superfamily Thalassinidea

Axiidae (*Axiopsis*)

Callianassidae (*Neotrypaea*)

Subfamily Callianassinae (*Callianassa*)

Superorder Hoplocarida

Order Stomatopoda (mantis shrimp)

Suborder Unipeltata

Superfamily Squilloidea

Squillidae (*Squilla*)

Superorder Peracarida

Order Mysida (=Mysidacea) (mysids, Mysid or opossum shrimps)

Suborder Mysida

Stygiomysidae Caroli, 1933 (*Stygiomysis*)

***Periclimenes*** Costa, 1844 – Palaemonidae shrimp

***Periclimenes americanus*** (Kingsley, 1878) (American grass shrimp/ wFL Gulf of Mex. marine infauna)

***Periclimenes longicaudatus*** (Stimpson, 1869) (longtail grass shrimp/ LA, wFL Gulf of Mex. marine infauna)

**Alpheidae** Rafinesque, 1815 (snapping shrimp) (*Automate*, *Eualus*, *Heptacarpus*, *Metabetaeus*)

**Atyidae** De Haan, 1849 (*Antecaridina* (also in Procarididae), *Atyoida*, *Calathaemon*,

*Halocaridina* (once in Procarididae), *Palaemon*, *Palaemonetes* (put in Palaemonidae by Holthius)



1952), *Palaemonias*) **Bibl:** Bouchard 1976); Hobbs, Hobbs, & Daniel 1977; Kemp 1912; Kingsley, 1899

**Axiidae** (*Axiopsis*)

**Callianassidae** (*Neotrypaea*)

**Crangonidae** (*Crangon*, *Mesocrangon*, *Neocrangon*)

**Hippolytidae** Dana, 1852 (*Calliasmata*, *Hippolyte*, *Latreutes*, *Tozeuma*)

**Ogyrididae** (*Ogyrides*, *Ogyris*)

**Palaemonidae** Rafinesque, 1815 (once put in Atyidae)

Subfamily Palaeomoninae (*Macrobrachium*, *Palaemonetes*, *Palaemon*)

Subfamily Pontoniinae (*Palaemonella*)

**Pasiphaeidae** (*Leptochela*, *Pasiphaea*)

**Procarididae** Dana, 1853 (*Antecaridina*, *Halocaridina* (both also put in Atyidae), *Procaris*, *Vetericaris*) **Areas:** **HI:** Holthius 1973; Maciolek 1983; **KY:** Bouvier 1925.

**Processidae** (*Ambidexter*, *Processa*)

**Sergestidae** (*Acetes*)

**Squillidae** (*Squilla*)

**Stygiomysidae** Caroli, 1933 (*Stygiomysis*)

*Acetes* H. Milne-Edwards, 1830 – Sergestidae shrimp

*Acetes americanus* Ortmann, 1893 (wFL Gulf of Mex. infauna)

*Acetes carolinae* Hansen, 1933 (Virginian marine infauna)

*Alaocaris* (see *Palaemonetes*)

*Alpheus* Weber, 1795 – Alpheidae shrimp

*Alpheus armillatus* Milne Edwards, 1837 (wFL Gulf of Mex. marine infauna)

*Alpheus heterochaelis* Say, 1818 (Virginian marine infauna)

*Alpheus lobidens* de Haan, 1850 (*A. crassimanus* Heller, 1862; *A. inopinatus* Holthuis & Gootlieb, 1958) (anchialine HI caves)

*Alpheus normanni* Kingsley, 1878 (Virginian marine infauna)

*Ambidexter* Chace, 1971 - Processidae crabs

*Ambidexter symmetricus* Manning & Chace, 1971 wFL Gulf of Mexico infauna)

*Antecaridina* Edmondson, 1935 - Procarididae shrimp (also put in Atyidae)

*Antecaridina lauensis* (Edmondson, 1935) (Maui, HI to Red Sea/ hypogean, anchialine caves/ Pb) **Bibl.:** Maciolek 1983; Maciolek & Brock 1974

*Alpheus* undet. sp. (wFL Gulf of Mex. marine infauna)

*Atyoida* Randall. 1840 - Atyidae shrimp

*Atyoida bisulcata* Randall. 1840 (anchialine pools in HA/'opae kala 'ole/G4S4)

*Automate* De Man, 1888 – Alpheidae shrimp

*Automate* undescr. sp. wFL Gulf of Mex. marine infauna)

*Axiopsis* Borradaile, 1903 – Axiidae shrimp

*Axiopsis spinulicauda* (Rathbun, 1902) (AK, WA marine infauna)

*Calathaemon* A.J. Bruce & J.W. Short, 1993 - Atyidae shrimp

*Calathaemon holthuisi* (Strenth, 1976) (Edwards Aquifer TX/Pb in cave in Hays Co.),

*Calliasmata* Holthius, 1973 - Hippolytidae shrimp

*Calliasmata pholidota* Holthius, 1973 (Egypt, Maui, HI/ hypogean, anchialine cave, Pb/ Federal Species of Concern; HI S2.2, global G2). **Bibl.:** Maciolek 1983, 1986

*Callianassa* Leach, 1814 - Callianassidae shrimp, Subfamily Callianassinae

*Callianassa californiensis* Dana, 1854 (OR marine infauna burrower)

*Crangon* Fabricius, 1798 (sand shrimp) Crangonidae shrimp]

*Crangon alaskensis* = *Neocrangon a.*

*Crangon communis* Rathbun, 1899 (WA marine infauna)

*Crangon crangon* (*Crango c.* Linnaeus, 1758; *C. vulgaris* Fabricius, 1758; *C. septemspinus?*) (Europe, NA North Atlantic epigean/ MA marine infauna)

*Crangon dalli* Rathburn, 1902 (WA marine infauna)

*Crangon franciscorum* Stimpson, 1856 (WA marine infauna)

*Crangon septemspinosa* Say, 1818 (WA, Virginian (rare) marine infauna)

*Eualus* Thallwitz, 1892 – Hippolytidae shrimp

*Eualus subtilis* A. Carvacho & R. Olson, 1984 (WA marine infauna)

*Eualus pusiolus* (Kroyer, 1841) (WA marine infauna)

*Halocaridina* Holthuis, 1963 - Atyidae shrimp

*Halocaridina palahemo* Kensley & Williams, 1986 (\*cave type locality in Big Island, HI/ anchialine St/Federal Species of Concern; HI S1.1, global S2)

*Halocaridina rubra* Holthius, 1973 (Maui, HI, Oahu/ 'opae ula/ hypogean, anchialine cave, Pb ).

**Bibl.:** Bailey-Brock 1993

*Heptacarpus* Holmes, 1900 – Hippolytidae shrimp  
*Heptacarpus brevirostris* (Dana, 1852) (WA marine infauna)  
*Heptacarpus stimpsoni* Holthuis, 1947 (CA marine infauna)

*Heptacarpus flexus* (Rathbun, 1902) (WA marine infauna)  
*Heptacarpus stimpsoni* Holthuis, 1947 (WA marine infauna)

*Hippolyte* Leach, 1814 – Hippolytidae shrimp  
*Hippolyte clarki* Chace, 1951 (WA marine infauna)

*Hippolyte pleuracanthus* Stimpson (Virginian marine infauna)  
*Hippolyte zostericola* (Smith, 1873) (zostera shrimp/ FL Gulf of Mex. marine infauna)

*Latreutes* Stimpson, 1860 - Hippolytidae shrimp  
*Latreutes parvulus* (Kingsley, 1878) (wFL Gulf of Mexico infauna)

*Leptochela* Stimpson, 1860 - Pasiphaeidae shrimp  
*Leptochela serratorbita* Bate, 1888 (combclaw shrimp/ wFL Gulf of Mex. marine infauna)

*Macrobrachium* Bate, 1868 - Palaemonidae shrimp, Subfamily Palaemoninae

*Macrobrachium carcinus* (Linnaeus, 1758) (Costa Rica, Mex. & PR caves/ Tp in Marion & Putnam Cos.(FL) & Edwards Plateau (TX); pools fed by subterranean waters in St. Augustine & Silver Springs, FL /bigclaw river shrimp),

*Macrobrachium grandimanus* (Randall, 1840) (= *Palaemon* & *Bithynis* g.; *M. gracilimanus*) (HI anchialine pools, estuaries/ HI T&E S3?, global G3? rank/Hawaiian prawn; opae oeha'a)

*Mesocrangon* Zarenkov, 1965 – Crangonidae shrimp  
*Mesocrangon munitella* (Walker, 1898) (AK, WA marine infauna)

*Metabetaeus* Borradaile, 1898 - Alpheidae shrimps

*Metabetaeus lohena* Banner & Banner, 1960 (\*Cape Kinau, Maui, HI/ hypogean, anchialine caves, Pb/ Federal T&E Species of Concern; HI S1.3, global G1 rank)

*Neocrangon* Zarenkov, 1965 - Crangonidae shrimp  
*Neocrangon alaskensis* (= *Crangon a.* Lockington, 1877) (sCA, WA marine infauna)

*Neotrypaea* Manning & Felder, 1991 - Callianassidae shrimp  
*Neotrypaea californiensis* (Dana, 1854) (AK, CA, WA marine infauna)  
*Neotrypaea gigas* (Dana, 1852) (WA marine infauna)

*Ogyrides* Stebbing, 1914 - Ogyridae shrimp  
*Ogyrides alphaerostris* (Kingsley, 1880) (GA, NC, Virginian, e,wFL marine infauna)  
*Ogyrides* undescr. sp. (sCA marine infauna)

*Ogyris* Stimpson, 1860 -Ogyrididae shrimp

*Ogyris alphaerostris* = *Ogyrides a.*

*Palaemon* Weber, 1795 - Palaemonidae shrimp, Subfamily Palaemoninae. **Bibl.:** Ortmann, 1891

*Palaemon debilis* Dana, 1852 (pool at Makalawena, HI/Pb?/anchialine pool shrimp/G1S1.3)

*Palaemonella* Dana, 1852 - Palaemonidae shrimp, Subfamily Pontoniinae

*Palaemonella burnsi* Holthuis, 1973 (Pool Group I, Cape Kinau (Maui) & Koloko Pond & other open coastal ponds on HI Island/HI T&E S3.3, global G1 rank)/Federal T&E Species of Concern/open ponds; Ac (probably) in anchialine pools) **Bibl.:** Maciolek 1983, 1986

*Palaemonetes* Heller, 1869 (= *Aleocaris*) Palaemonidae shrimp

**Bibl.:** Anon. 1980a; Fleming 1969); Hobbs,H.III & Daniel 1977); kezer & Bradbury 1952; Holthuis 1949, 1952); Strenth 1976); Collins & Strenth 1992

*Palaemonetes (Alaocaris) antrorum* Benedict, 1896 (artesian well & cave in Hays Co. +Bexar & Uvalde Cos.,TX/ Pb/ Balcones cave shrimp) Neher 1902); Strenth 1991; S.& Longley 1990

*Palaemonetes (Palaemonetes) cummingi* Chace, 1954 \*( cave type locality in Alachua Co. & cave in Jackson Co., Aucilla-Suwannee hydrologic subregion, ncFL/T&E/ FL or Squirrel Chimney Cave Shrimp) **Bibl.:** Dobkin 1971; Dobkin & Manning 1964); USFWS 1990

*Palaemonetes (Alaocaris) holthuisi* Strenth, 1976 (A.h.) (\*cave type locality in Hays Co., TX/ Pb/ Purgatory cave shrimp)

*Palaemonetes (Palaemonetes) paludosus* (Gibbes, 1850) (Tx & stygoxene in Leon Co.,FL/ riverine grass shrimp)

*Palaemonetes pugio* Holthuis, 1949 (NC marine infauna)

*Palaemonetes* undescr.? sp. (Silver Spr.,FL/Pb?)

*Palaemonetes texanus* Strenth, 1976 (San Marcos River in San Marcos, TX/ Pb/ Texas river shrimp)

*Palaemonias* Hay, 1901 - Atyidae shrimp, Subfamily Palaemoninae. **Bibl.:**Cooper & Cooper 1974

*Palaemonias alabamae* Smalley, 1961 (type locality (extirpated?) & four other caves (total of three cave systems) in Madison Co. & cave in Jackson Co.,AL/ Alabama cave or atyid shrimp, federal T&E) **Bibl.:** Cooper & C. 1964; C. 1975; Hartfield 1990; Jacobson & Hartfield 1997; USFWS 1988a,e; Cooper 1989

*Palaemonias ganteri* Hay, 1901 (Kentucky cave or Mammoth Cave s.) (Roaring R. & Golden Triangle area in Mammoth-Flint Ridge System, Edmonson & Hart Cos., KY/ Federal T&E)

*Palaemonias ganteri* **Bibl.:** Leitheuser 1984; Lisowski 1979, 1982, 1983, Lisowski et al. 1982-6); Norkin 1980; USFWS 1983, 1988; Fage 1932; Fage 1931; Hay 1902; Stroh 1998

*Pandalus* Leach, 1814 – Pandalidae shrimp

*Pandalus jordani* Rathbun, 1902 (WA marine infauna)

*Panaeus* – Panaeidae shrimp

*Panaeus duorarum* (pink shrimp/ wFL Gulf of Mex. marine infauna)

*Pasiphaea* Savigny, 1816 - Pasiphaeidae shrimp

*Pasiphaea pacifica* Rathbun, 1902 (WA marine infauna)

*Procaris* Holthuis, 1973 - Procarididae shrimp

*Procaris hawaiiiana* Holthuis, 1973 (Cape Kinau (Maui) & Lua o Palehemo (HI), HI/ hypogeal, anchialine cave & pools, Pp/ Federal Species of Concern; HI S1.2, global G2) **Bibl.:** Maciolek 1983, 1986; Kensley & Williams 1986

*Processa* Leach, 1815 – Processidae shrimp

*Processa hemphilli* Manning & Chace, 1971 wFL Gulf of Mex. marine infauna)

*Processa bermudensis* (Rankin, 1900) (wFL Gulf of Mex. marine infauna)

*Squilla* Fabricius, 1793 - Squillidae shrimp

*Squilla empusa* Say, 1818 (mantis shrimp/ Virginian (rare), MA, RI infauna)

*Stygiomysis* Caroli, 1933 - Stygiomysidae mysid shrimp

*Stygiomysis* undet. sp. (FL?/ Pb?)

*Tozeuma* Stimpson, 1860 – Hippolytidae shrimp

*Tozeuma carolinense* Kingsley, 1878 (wFL Gulf of Mexico infauna)

*Trachypenaeus* Alcock, 1901 – Penaeidae shrimp

*Trachypenaeus constrictus* (Stimpson, 1871) (roughneck shrimp/ wFL Gulf of Mex. marine infauna)

*Vetericaris* Kensley & Williams, 1986 - Procarididae shrimp

*Vetericaris chaceorum* Kensley & Williams, 1986 (\*cave type locality in Big Island, HI/ anchialine/ hypogeal St/Federal Species of Concern; HI S1.1, global G1)

**sibling species** - Closely related species often with a common ancestor. Identical or nearly identical in form but are reproductively isolated. See speciation. **Bibl.:** Laing, Carmody, & Peck 1976

sideswimmer - Syn: amphipod.

## Silverfish, Bristletails & Allies

Paraphyletic, rather primitive wingless insects in Superclass Hexapoda, Class Insecta, Superorder Thysanura

Subclass Apterygota, Order (sometimes Subclass) Archaeognatha (=Thysanura in part; Microcoryphia, Micro-coryphia) (jumping bristletails; bristletails)

Subclass Dicondylia, Infraclass Thysanura, Order Zygentoma (three-pronged bristletails or bristletails, silverfish, firebrats; silverfish & allies) (= Thysanura)

Both subclasses once considered a part of Order Thysanura and monophyletic Entognatha (see springtails, proturans & diplurans).

Archaeognatha (Microcoryphians) (= (jumping) bristletails) are differentiated from Zygentoma by having contiguous (touching) eyes. They are considered the most primitive of true insects. The name Microcoryphia derives from the Greek *micro*, "small," and *coryphia*, "head," and refers to the primitive type of head (the mandible moves vertically on the head and is equivalent to the swing of a walking leg). May once have been a link between Apterygota (mainly wingless insects) and Pterygota (mainly winged insects) but are now a secondarily highly specialized group of soil insects. Flightless insects 10-12 mm. Long; body soft, with flexible integument; white, gray or yellowish gray to brown; body somewhat flattened, with pigmented scales. With externally visible mouth parts. Large compound eyes (ocelli present) meet dorsally. Thorax strongly arched. Unlike the thysanurans, the ommatidium is primitive, resembling that of springtails, with only a single-layered retina and other details. Abdominal segments 2 through 9 with ventral styles and 1 through 7 usually with one or two pairs of exsertile vesicles. Immature stages resemble the adult with no noticeable external metamorphosis. Long thin antennae with as many as, or > 30 segments. Abdomen with 11 segments usually ending in three 'tails' (two cerci and a telson). >720 species worldwide, 20 species in 12 genera in the US and Canada.

**Bibl.:** N. Banks 1879b; Mendes 1994; A. Packard 1873a; Remington 1954; Wygodzinsky 1961,1972

Bristletails hide day in crevices and under bark. They feed at night on algae, lichens and plant debris. They commonly occur at seashores above the high water mark or in other rocky areas especially at dusk.

All members of the Order Zygentoma (=Thysanura) have a 2-20 mm. Long teardrop/carrot/fish-shaped body and get their common name of bristletail because of the 3 long, bristlelike or taillike appendages on the posterior/rear end of their body. The body is soft, with flexible integument. The body shape is flattened or convex, with or without scales. Compound eyes are small or absent. They never meet dorsally. Also unlike Microcoryphia, the jaws have an advanced structure. Ocelli are absent except in one family. Antennae are short to nearly and long as the body, with many segments. Abdomens have short styli on segments 2 through 9 but are sometimes absent on some segments. The median apical abdominal filament is usually only slightly longer than the side cerci. Color is white, gray, brown, or ground color. Silverfish is a common name for species of this group whose bodies are covered with silvery scales. Those in

Zygentoma without silvery scales are usually called firebrats or three-pronged bristletails. About 320 species have been recorded with 18 species and 12 genera in the United States and Canada.

The silverfish female lays about 1-3 eggs per day, placing them in cracks, under objects, or left exposed. During its lifetime, Silverfish females may lay over 100 eggs which commonly hatch in three to six weeks. Developmental time (egg to adult) is 3-4 months under favorable conditions (72-80° F (22-27° C) and 75-97% RH), but may require up to 2-3 years otherwise. Young silverfish and firebrats resemble adults except being smaller, white and take on the adult color in four to six weeks. Adults may live two to eight years. Firebrats lay about 50 eggs at one time in several batches. Eggs hatch in about two weeks under ideal conditions. Silverfish and firebrats, depending on the species, may reach maturity in three to twenty-four months.

Order Microcoryphina (jumping bristletails; bristletails)  
Superfamily Machiloidea

Machilidae (jumping bristletails) (*Machilus*; *Machilinus* (now in Meinertellidae),  
*Mesomachilis*, *Neomachilis*, *Pedetontus*, undet. genus or genera (CA, sON/Tx or Ac)  
Bibl.: Sturm & Bach 1992

Meinertellidae (rock bristletails) (*Machilinus* (also put in Machilidae))

Order Zygentoma (three-pronged bristletails, silverfish, firebrats; silverfish & allies)  
Superfamily Lepismatoidea

Labidostommatidae (or in Labidostommatoidea (=Nicoletiellidae by some authors)  
(*Lapidostomma*, *Nicoletiella*: once put in Nicoletiellidae))

Lepismatidae (silverfish & firebrats) (*Allocrotelsa*, *Prolepisma*)  
Bibl.: Wygodzinsky 1972

Lepidotrachidae (=Lepistatidae?) (forest silverfish)  
Bibl.: Paclt 1967; Wygodzinsky 1961 (undet. Tx genus in AZ)

Nicoletiidae (subterranean silverfish) (= Labidostommatidae by some authors)  
(*Battigrassiella*, *Nicoletia*, *Texoreddellia* (subfamily Cubacubaninae); undescribed genus in  
\*cave in Ward Co., TX/ Tb) Bibl.: Paclt 1963; Riddell 1994; Wygodzinsky 1963

*Allocrotelsa* Silvestri, 1935 (= *Stachisma* Wygodzinsky) Lepismatidae (silverfish & firebrats) of  
order Zygentoma (1 species in US or Canada)

*Allocrotelsa spinulata* (*Lepisma* s. Packard, 1873) (epigeal in TN, SC, FL, AR, OK, TX, AZ,  
CA, WA, OR/ Tx in Marshall Bat Cave, Val Verde co., TX)

*Battigrassiella* Paclt, 1963 (= *Grassiella* Silvestri, 1912 (Homo.)) Nicoletiidae silverfish  
*Battigrassiella* undet. sp. (?Tx in cave in Val Verde Co., TX)

*Grassiella* = *Battigrassiella*

**Lapidostoma** Kramer, 1879 - Labidostommatidae bristletails

**Lapidostoma** undet. sp. (Tx or Tp in Van Buren Co.,TN)

**Machilinus** Silvestri 1905 - Meinertellidae microcoryphians (once in Machilidae) (2 species in US or Canada)

**Machilinus** undet. sp.(Ac in El Malpais Natl. Monument, nNM)

**Machilis** Latreille, 1806 (genus not known from NA according to Wygodzinsky & Schmidt, 1980)

Machilidae bristletails (microcoryphians) (1 species in US or Canada)

**Machilis cavernicola** (*Triura c.* Tellkampff, 1844) (likely not a valid species) (\*?Mammoth C.,KY/Tp, Tb or Tx)

*Machilis strenua* Silvestri = *Mesomachilis s.*

*Machilis variabilis* Say, 1821 prob. = *Pedetontus*

**Mesomachilis** Silvestri, 1911 - Machilidae bristletails (microcoryphians) (5 species in US or Canada)

**Mesomachilis strenua** (*Machilis s.* Silvestri, 1911)(CA epigean/ Tx in IL?, nMS)

**Neomachilis** Silvestri, 1911 - Machilidae microcoryphians (1 species in continental US or Canada)

**Neomachilis** undet. sp. (Tx? in HI)

**Nicoletia** Gervais, 1842 - Nicoletiidae thysanurans (2-4 species in US or Canada)

**Nicoletia meinerti** Silvestri, 1905 (alien Tx in HI)

**Nicoletia** undescr. sp. #1 (AL?,GA/Tp or Tb), poss. sp.#2 (Kartchner C.,AZ/Tp)

**Nicoletia** undet. sp. or species (Kartchner C. (AZ/Tb or Ed); AL/Tp,Ed; HI/alien Tp; Ac or Tx in KY(Mammoth C.))

*Nicoletia texensis* = *Texoreddellia t.*

**Nicoletiella** R. Canestrini, 1882 - Nicoletiidae silverfish

**Nicoletiella** undet. sp. or species (Tx, fungivore in Tuolumne Co.,CA; Ac in El Malpais Natl. Monument, nNM))

**Pedetontus** Silvestri, 1911 (described as subgenus of *Petrobius* Leach, 1809) - Machilidae bristletails (1 species in US & Canada)



*Pedetontus saltator* Wygodzinsky & Schmidt, 1980 (MA, CT, NJ, PA epigean/ Tx in IN(prob.), OH, TN(prob.); Tx or Tp in cave in Skagit Co., WA (or undescr. sp.))

*Prolepismina* Silvestri, 1940 - Lepismatidae silverfish

*Prolepismina* undet. sp. (?Ac in cave in Val Verde Co., TX)

*Texoreddellia* Wygodzinsky, 1973 - Nicolettiidae thysanuran silverfish, subfamily Cubacubaninae (1 species in US or Canada)

*Texoreddellia texensis* (=Nicoletia t. Ulrich, 1902; *N. wheeleri* Silvestri, 1905) W.1973 (type locality cave in Hays Co., TX/ Tb in Edward's Plateau & cTX(Bexar, Comal, Edwards, Hays, Kendall, Kinney, Mason, Medina, Menard, Pecos, Real, San Saba, Terrell, Travis, Uvalde, Val Verde, Williamson Cos., TX)/ G3)

**Similarity Index** - A measure of how similar two communities are species wise.

**Simpson Index** - An index of biodiversity based on the probability of randomly choosing two different species.

Siphonoptera - See flea.

**sister groups** - The twin result of cladogenesis. They are grouped as the same taxon rank, such as two lineages formed by the splitting of a single parent taxon.

skink - See Lizard.

skunk - See mammal

slime molds - See fungi

**slime, cave** - Small white to off-white, brown or red, fairly circular dots up to 3 cm wide in cold caves but can cover large areas & be up to half an inch thick; algae-like, gelatinous, or with water beads. Mostly bacteria, especially actinomycetes, but can include fungi & amorphous minerals. Streptomyces may be symbiotic with Fusarium. Sometimes is silvery reflective & has concentric bands of color, like lichens. Fed upon by fungus gnats (OR C.(NM) & Lava Beds (CA)) & crane flies (HI Volcanoes Natl Park). Doesn't flake off like moonmilk. Syn: wall fungus.

slime mold - See fungi.

**Slugs** (See also snail)

Shellless gastropod of order Stylommatophora, Subclass Euthyneura (=Pulmonata)

**Bibl.:** Crawford 1976e; Fullington 1978. Areas: NE: Chichester & Getz 1973.

Slugs use their muscular foot located on the ventral surface for locomotion. Slugs have two sets of tentacles. The upper, longer pair are optic tentacles with eyes located on the end. The lower tentacles are sensory organs and are shorter than the optic tentacles. Inside the mouth,

which is ventral and caudal to the sensory tentacles, is a radula, a feeding organ present in many mollusks. The radula is a belt of as many as 27,000 teeth pointed toward the back of the mouth, which slides back and forth to “chew” plant material and help move material toward the back of the throat. The odontophore, which has muscle and cartilage, functions to support the radula. The mantle covers the front of the back beginning at the back of the head. The mantle is important in snails because it secretes the shell, and it is thought to provide some protection for slugs. The hole found on the right side of the mantle is called the pneumostome, and is a breathing hole. The slug is able to open and close the pneumostome. Other holes under the mantle are the genital opening and the anus.

A slug’s coating of slime absorbs water, keeping them moist. Slime also protects the slug-so well that it can crawl unharmed along the edge of a razor blade. Slime probably also has a scent that helps slugs find other slugs. Slugs hermaphroditic (each slug contains organs of both sexes), live from one to six years. Slugs help decompose organic material, disperse seeds and spores, and excrete a nitrogen-rich fertilizer.

Infraorder Aulacopoda  
Order Stylommatophora  
Suborder Signurethra

Superfamily Arionacea (incl. Endodontacea)

Arionidae (*Hemphillia*)  
Ariolimacinae (*Ariolimax*)  
Arioninae (*Arion*)  
Anadeninae (*Prophysaon*)

Philomycidae (*Megapallifera*, *Pallifera*, *Philomycus*, *Phyllomycus*)  
Limacidae (*Deroceras*, *Limax*)

***Ariolimax*** Morch, 1860- Arionidae slugs, Subfamily Ariolimacinae (3 species in US or Canada)  
***Ariolimax*** (*Ariolimax*) *columbianus* (Gould, 1851) (epigeal in OR, CA, WA, BC, swAK/ TTx in CA, OR, WA/ Pacific bananslug)

***Arion*** Fe'russac, 1819 - Arionidae slugs, Subfamily Arioninae (10 species in US or Canada)

***Arion fasciatus*** Nillson in part, 1822 (= *A. circumscriptus* Johnston, 1828; *Limax f.*; *Arion hortensis* in part Binney, 1851; *A. fuscus* Muller, Smith & Prime, 1870) (Ac or Tx in sON; Tx in Frenchmen's cave, NS/ orange banded arion)

***Deroceras*** Rafinesque, 1820 - Limacidae slugs (6 species in US or Canada)

***Deroceras*** (*Derocerus*) *laeve* (Muller, 1774) (NE, MW, ON epigeal/ Tx or Ac in sON/ meadow or marsh slugs)

***Deroceras laeve gracile*** (Rafinesque, 1820) (Tx in MO & Frenchmen's Cave, NS/ meadow or marsh slug)

***Deroceras*** (*Agriolimax*) *reticulatum* (Muller, 1774) (nEuropean/Tx or Ac alien in nON/ field grayslug)

***Hemphillia*** Bland & Binney, 1872 (7 species in US or Canada)

***Hemphillia camelus*** Pilsbry & Vanatta, 1897 (NW/ pale jumping slug/ Tx in MW)

***Limax*** Linnaeus, 1758 - Limacidae slugs (4 species in US or Canada)

***Limax*** (*Limax*) *maximus* Linnaeus, 1758 (sMW, SE/ n,cEurope/ giant gardenslug/ Tx or Ac alien in TN)

***Limax*** undet. sp. (Tx in IN)

***Megapallifera*** Hubricht, 1956 - Philomycidae slugs (3 species in US or Canada)

***Megapallifera mutabilis*** (*Pallifera m.* Hubricht, 1951; *Mesodon pallifera*?) (changeable mantleslug) (\**Mesodon p.* in Nameless Cave, Crawford Co., MO/Tp, classification uncertain),

***Megapallifera ragsdalei*** (*Eumelus wetherbyi r.* Webb, 1951 or 1950; *Pallifera r. & mutabilis*) (nwAR, swIL, s,eMO, eOK/ Ttx? in AR,IL,OK; Tp? in MO,talus,cliff/ Ozark mantleslug) **Bibl.:** Hubricht 1976

***Megapallifera*** undet. sp. (Ttx or Ac in Carter Co., MO)

***Pallifera*** Morse, 1864 (mantled slugs) - Philomycidae slugs (10 species in US or Canada)

***Pallifera secreta*** Cockerell, 1900 (Ac or TTx in KY/severed mantleslug) & undet. sp. (MO/Tp)

***Philomycus*** Rafinesque, 1820 - Philomycidae slugs (8 species in US or Canada)

***Philomycus carolinianus*** (Bosc(.), 1802) (E/Tx in MO, OK/ Carolina mantleslug)

***Philomycus togatus*** (*Limax t.* Gould, 1841) Hubricht, 1968 (NE (except New England) to ON/Tx or Ac in ON/ toga mantleslug)

***Prophysaon*** Bland & Binney, 1973 - Arionidae slugs (9 species in US or Canada)

***Prophysaon*** (*Prophysaon*) *andersoni* (J.G. Cooper, 1872) (reticulate taidropper/T x in CA, OR, WA)

## Snails

(see also **Slugs** (Shellless Stylommatophora) and **Abalone**

Order Archaeogastropoda (=Vetigastropoda))

Class Gastropoda

Subclass Euthyneura (=Pulmonata)).

About 35,000 species, all hermaphrodite, gill replaced by vascular network ("lung) in mantle cavity, a few freshwater species have secondary gills), operculum usually absent.

Often endemic & abundant in CaCO<sub>3</sub> areas because of much calcium for shells. Many species secrete enzymes that dissolve arthropod exoskeletons. A few fossils (Bogan & Grady 1991) but most are extant:

**Bibl.:** A.H. Clark 1970; Coan 1986; Crawford 1976e; Hubricht 1985, Hershler 1990, Hershler & Holsinger; Morton 1979; Thompson 1976; Vaught 1989.

**Areas** **AK:** Dall 1910; Roth & Sattler, 1991; **AR:** Hinkley 1915; **AL:** Archer 1941; Bogan & Pierson 1993; Clench 1974; Clench & Turner 1956; Hubricht 1965; Stein 1976; B. Walker 1906, 1928; **CA:** Roth & Reynolds 1990; Smith 1957; D. Taylor 1966, 1981; Ingram 1946, 1948-9; **Canada:** Clarke 1981; East: Burch 1962; Burch & Van Devender 1980; Hubricht 1985; Morrison 1949; **FL:** Clench & Turner 1956; Franz, Lee & Stifel 1971; F.G. Thompson 1984; Morrison 1951; F. Thompson 1976; **GA:** Brook, Keferl & Nickmann 1988; Clench & Turner 1956; **IL:** F. Baker 1939; **HI:** T. Miller 1989; Cowie, Evenhuis & Christensen 1995; Cowie 1997; **IN:** Goodrich 1944; J. Lewis 1992; **KY:** Bickel 1967; Branson 1970; Hubricht 1968, 1968a-b; Goodrich 1937; **MI:** Berry 1943; Goodrich & van der Schalie 1939; Winslow 1926; **MO:** Hubricht; Hinkley 1915; Pilsbry & Ferris 1906; Wu et al. 1997; Richards 1980; **NA:** Burch 1979, 1982; K. Brown 1991; W. Miller et al. 1984 Pilsbry 1939-48; Turgeon 1988; **NM:** Metcalf 1970; D. Taylor 1987; **NY:** Harman & Berg 1971; **OK:** Hinkley 1915; Webb 1955; **OR:** Henderson 1929, 1936a; **PA:** Dearolf 1938; **SC:** Mazyck 1913; Wood 1982; **SE:** Hubricht 1960; **SW:** Pilsbry & Ferris 1906; **TN:** Hubricht 1968a; **TX:** Fullington 1978; Hubricht, 1940a; Murray & Roy 1968; Strecker 1935; B. Wallace 1918; Cheatum & Fullington 1971, 1973; Pilsbry & Ferris 1906; Pilsbry 1900; **UT:** Chamberln & Jones 1929; **US:** Burch 1982a; **VA:** Morrison 1939, 1943; **WA:** Henderson 1929, 1936a; West: Henderson 1924, 1936; D. Taylor 1975; **WI:** Baker 1928; **WV:** MacMillan 1949.

Gastropod clades incl.

Order Heterostropha or Valvatida –  
Superfamily Acteonoidea

Superfamily Pyramidelloidea

Pyramidellidae (*Boonea*, *Eulimastoma*, *Fargoa*, *Odostomia*, *Petitilla*, *Pyramidella*, *Sayella*, *Turbonilla*)

Superfamily Valvatoidea (also put in Order Mesogastropoda)

Valvatidae (*Valvata*)

Eogastropoda (incl. true **limpets** or Patellogastropoda and their extinct coiled ancestors)

Orthogastropoda (Vetigastropoda, Neritopsina, Caenogastropoda, Heterobranchia (incl. Pulmonates and opisthobranchs))

Subclass Euthyneura

Order Archaeogastropoda (=Archeoplumonata, Aspidobranchia, Diotocardia)  
(see **Abalone**)

Carychiidae (now in Basommatophorea)

Ellobiidae (once in order Bassamatophora)

Basommatophora (or superorder) (= Subclass Pulmonata)  
(One pair of nonretractable tentacles, and an eye near each tentacle base)

Superfamily Ancyloidea  
Ancylidae (*Laevape*)

Superfamily Auriculoidea  
Carychiidae (also put in Archaeogastropoda) (*Carychium*) (once in Ellobiidae)

Superfamily Camenoidea  
Megomphicidae (put in Order Stylommatophora)

Superfamily Cerithiacea  
Thiaridae - now in Order Neotaenioglossa

Superfamily Corbilioidea  
Cyrenidae (see **Clams**)  
Sphaeriidae (see **Clams**)

Vitrinidae – now in Stylommatophora  
Ellobiidae - now in Archaeopulmonata

Superfamily Lymnaeoidea  
Lymnaeidae  
Subfamily Lymnaeinae (*Fossaria, Lymnaea, Stagnicola*)

Superfamily Physacea  
Physidae (also put in Order Neotaenioglossa) (*Aplexa, Physa, Physella*)

Superfamily Planorbacea  
Ancylidae (now in Superfamily Ancyloidea)  
Planorbidae (also put in Order Neotaenioglossa)

Planorbinae  
Planorbini: *Gyraulus, Ferrissia* (now in Ancylidae)  
Helisomini: *Helisoma, Menetus, Micromenetus, Planorbella*  
Helisomini: *Promenetus*

Order Neritimorpha (also subsumed in Archaeogastropoda)

Superfamily Helicinoidea  
Helicinidae (once in Order Archaeogastropoda) (*Helicina, Hendersonia, Oligyra*)

Superfamily Neritoidae  
Neritidae (once in Order Archaeogastropoda)

Neritiliinae (*Neritilia*)

Order Stylommatophora (land snails) (= Geophila in part) (incl. Arionidae (see slug))  
(Two pairs of retractable tentacles with upper pair eyed at tips)  
(many authors now drop superfamilies or use order endings)

Humboldtianidae (*Humboldtiana*) (once Helminthoglyptidae or Xanthonychidae)  
Vertiginidae

Superfamily Camenoidea

Megomphicidae

Megomphicinae (=Ammonitellidae) (*Ammonitella* (also put in Thysanophoridae),  
*Glyptostoma*, *Megomphix*)

Suborder Heterurethra

Succineidae (now in Aulacopoda)

Suborder Aulacopoda (or infraorder)(see also **Slugs**)

Superfamily Arionacea

Discidae (*Anguispira*, *Discus* (both once put in Endodontidae)), *Nematodiscus*  
(also put in Endodontidae), *Speleodiscoides*)

Endodontidae (*Anguispira*, *Discus* (both now in Discidae), *Helicodiscus*  
(once in Helicodiscidae), *Nematodiscus* (now in Discidae),  
*Speleodiscoides*) (also put in Helicodiscidae)

Helicodiscidae (or in Helicinoidea) (see Endodontidae)  
(*Helicodiscus*, *Speleodiscoides* (now in Discidae))

Philomycidae (see **Slugs**)

Punctidae (*Punctum*)

Superfamily Limacacea (also put in Suborder Sigmurethra)

Limacidae (*Deroceras*, *Limax* (see **Slugs**), *Nesovitrea*  
(now in Vitrinidae or Zonitidae))

Vitrinidae (now includes Zonitidae according to some authors)

(*Gastrodonta*, *Glyphyalina*, *Hawaiiia*, *Mesomphix* (last 3 retained in Zonitidae),  
*Mesovitrea*, *Nesovitrea* (last 2 retained in Zonitidae), *Ogaridiscus*, *Paravitrea*,  
*Pristiloma* (but retained in Zonitidae), *Speleodiscoides* (once put in in  
Helicodiscidae & Endodontidae, now in Discidae) *Ventridens* (retained in  
Zonitidae) *Vitrea*, *Zonites*, *Zonitoides*)

Zonitidae (subsumed in Vitrinidae by some authors)

*Gastrodonta*, *Glyphyalinia*, *Hawaiiia*, *Mesovitrea*, *Nosovitrea*, *Ogaridiscus*,  
*Paravitrea*, *Pristiloma*, *Speleodiscoides* (now in Discidae), *Ventridens*, *Vitrea*)

Subfamily Zonitinae  
Tribe Zonitini (*Zonitoides*)

Superfamily Succineacea  
Succineidae (once in Suborder Heterurethra, also put in **Slugs**)  
(*Catinella*, *Novisuccinea*, *Succinea*)

Suborder Mesurethra  
Infraorder Holopodopes

Superfamily Achatinacea  
Achatinidae (*Euglandina* (once also put in Oleacinidae, now in Spiraxidae)  
Spiraxidae (*Euglandina*) (once put in Oleacinidae & Achatinidae)

Superfamily Bulimulacea  
Buliminidae (once subsumed in Hydrobiidae)  
(*Bulimulus* (once in Orthalicidae), *Horatia*, *Rabdotus*)

Urocoptidae (also put in Suborder Sigmurethra) (*Holospira*)

Superfamily Rhytidacea  
Haplotrematidae (also put in Suborder Sigmurethra, Infraorder Holopodopes)  
(green snails) (*Haplotrema*)

Suborder Orthurethra  
Superfamily Cionellacea  
Amastridae (*Leptachatina*)  
Cionellidae (*Cionella Cochlicopa*) (both put in Hydrobidae)

Superfamily Pupillacea  
Pupillidae (*Chaenaxis*, *Columnella*, *Gastrocoptinae*, *Gastrocopta*, *Pupillinae*,  
*Pupilla*, *Pupisoma*, *Pupoides*, *Vertigo*)

Valloniidae (*Vallonia*)

Suborder Sigmurethra  
Superfamily Limacacea (put in Suborder Aulacopoda)

Infraorder or Suborder Holopoda  
Superfamily Helicoidea  
Bradybaenidae (*Monadenia*)

Helminthoglyptidae (also put in Camaenacea & Helicacea)  
(*Lyrodes*, *Helminthoglypta*, *Humboldtiana* (now in Humboldtianidae),  
*Monadenia* (now in Bradybaenidae), *Sonorella*)

Oreohelicidae (*Oreohelix* (also put in Thysanophoridae))  
Polygyridae

Subfamily Polygyrinae  
(*Allogona*, *Daedalochila*, *Euchemotrema*, *Mesodon*, *Millerelix*, *Neohelix*,  
*Patera*, *Polygyra*, *Stenotrema*, *Trilobopsis*)

Tribe Vespericonini Emberton, 1994 (*Vespericola*) (coiled snails)

Superfamily Camaenacea  
Helminthoglyptidae (now in Helicoidea)

Superfamily Helicacea  
Helicidae (*Helix*, *Trichia*)  
Helminthoglyptidae (now in Helicoidea)

Xanthonychidae (*Humboldtiana* (now in Humboldtianidae), *Lyrodes*,  
*Monadenia* (now in Bradybaenidae), *Helminthoglypta* (now in  
Helminthoglyptidae), *Sonorella* (now in Helminthoglyptidae))

Superfamily Oleacinacea  
Oleacinidae (*Euglandina* (now in Spiraxidae))

Subclass Opisthobranchia

Order Archaeopulmonata

Superfamily Ellobioidea

Ellobiidae (once in order Basommatophora)

Order Cephalaspidea (= Bullomorpha)

Superfamily Acteonoidea

Acteonidae (*Acteon*, *Rictaxis*)

Actinidae

(also put in Order Heterostropha & Order Opisthobranchia, Suborder  
Cephalaspidea) (*Acteon*)

Bullidae (*Bulla*)

Haminoeidae (*Haminoea*)

Philinidae (*Philine*)

Superfamily Philinoidea

Aglajidae (agljajids) (*Melanochlamys*)

Cylichnidae (*Acteocina*, *Cylichnella*, *Cylichna*, *Tornatina*)

Retusidae (*Retusa*)



Subclass Prosobranchia

Order Mesogastropoda (also put in Subclass Streptoneura)

Superfamily Calyptraeacea (now in Order Neotaenioglossa)

Family Calyptraeidae (now in Order Neotaenioglossa)

Subclass Streptoneura

Order Architaenioglossa (= Mesogastropoda in part)

Superfamily Viviparacea

Viviparidae (also put in Order Neotaenioglossa) (*Campeloma*)

Superfamily Polygyracea (put in Order Stylommatophora)

Polygyridae, Thysanophoridae (both in Order Stylommatophora)

Order Ctenobranchiata (radula is a transverse row of 7 teeth)

Amnicolidae (now in Superfamily Trucatelloidea, Hydrobidae)

Order Mesogastropoda (=Ctenobranchiata) (=Architaenioglossa & Neotaenioglossa)

(also put in Subclass Prosobranchia)

Superfamily Calyptraeacea (now in Order Neotaenioglossa)

Family Calyptraeidae (*Crepidula*)

Superfamily Naticoidea

Naticidae (*Polinices*, *Cryptonatica*, *Neverita*,

undet. genus in LA brackish beach sediment)

Superfamily Littorinoidea

Littorinidae (now in Order Neotaenioglossa)

Order or Suborder Neogastropoda (radula has a transverse row of 3 teeth)

Superfamily Conoidea

Conidae (*Pyrgocyathara*, *Kurtzia*, *Kurtziella*)

Turridae (*Crassispira*, *Pyrgospira*)

Superfamily Muricoidea (=Muricacea)

Cystiscidae (*Granulina*)

Columbellidae (also put Order Caenogastropoda, Superfamily Buccinacea)

(*Anachis*, *Astyris*, *Parvanachis*)

Nassariidae (*Nassarius*)

Melongenidae (also put in Superfamily Buccinacea)

(*Buscon*, *Busycotypus*, *Melongena*)

Muricidae (also put in order Stenoglossa) (*Acanthina, Eupelura, Thais, Urosalpinx*)  
Olividae (*Oliva*)

Superfamily Volutacea  
Marginellidae (*Marginella, Prunum*)

Order Neotaenioglossa

Superfamily Epitoniioidea  
Epitoniidae (*Epitonium*)

Superfamily Cerithiacea  
Pleuroceridae (once put in order Mesogastropoda)  
(*Elimia, Goniobasis, Leptoxis, Lithasia, Pleurocera*)

Superfamily Littorinacea  
Littorinidae (also placed in Superfamily Littorinoidea under order Mesogastropoda)  
(undet.genus in LA brackish beach sediment; *Littorina, Nodilittorina*)

Superfamily Physacea  
Physidae (put in Basommatophora)

Superfamily Planorbacea  
Planorbidae (put in order Basammatophora)

Superfamily Polygyracea (put in Order Architaenioglossa)

Superfamily Rissoacea  
Pomatiopsidae (once placed in order Mesogastropoda) (*Pomatiopsis*)  
Rissoidae (*Alvania, Rissonia, Schwartziella*)

Thiaridae (once placed in orders Mesogastropoda & Basommatophora)  
(*Melanoides, Tarebia*)

Superfamily Trucatelloidea  
Hydrobiidae (*Onobops, Gilla, Heleobops, Hydrobia, Lartetia, Littoridinops,*  
*Texadina, Texapyrgus*)

Amnicolinae (*Amnicola, Dasyscias, Hauffenia, Horatia, Lyogyrus*). Undescr. Pb  
genera & sp. in cave in Econfina Basin, nwFL.

Cochliopinae (*Antroseletes*) (also in Littoridininae), *Cionella, Cochliopa*  
(tribe Cochliopini) (both also put in Cionellidae), *Texapyrgus, Tryonia*)

Emmerciinae (*Holsingeria*)

Fontigentinae Taylor, 1966 (*Fontigens*)

Hydrobiinae ]

(*Aphaostracon*, *Phreatoceras*, *Phreatodrobia*, *Tryonia* (now in Cochliopinae)

Lithoglypinae (*Antrobia*, *Antrorbis?* *Balconorbis*, *Holsingeria* (once put in Emmerciinae)), *Phreatoceras*, *Phreatodrobia* (once in E. & Hydrobiinae)

Undescr. Pb genera & sp. in Coosa Basin, neAL

Littoridininae (*Tryonia*)

Nymphophilinae (*Cincinnatia*, *Dasycias*, *Marstonia*, *Orygoceras*, *Phreatodrobia* (now in Littoridininae), *Pyrgulopsis*).

Undescr. genera & sp. (*Heleobops* group) in Devils, Rio Grande Basins, scTX..

Superfamily Viviparacea

Viviparidae) (put in Architaenioglossa)

Infraorder Discopoda

Superfamily Cerithioidea

Cerithiidae (*Bittiolium*, *Bittium*, *Cerithium*, *Diastoma*)

Modulidae (*Modulus*)

Potamididae (*Cerithidea*)

Superfamily Naticoidea

Naticidae (*Natica*, *Neverita*, *Sinum*, *Tectonatica*)

Superfamily Rissooidea

Barleeiidae (also put in Neotaenioglossa) (*Barleeia*)

Vitrinellidae (*Cochliolepis*, *Vitrinellidae*)

Superfamily Vanikoroidea

Vanikoridae (*Megalomphalus*)

Infraorder Ptenoglossa

Eulimidae (*Strombiformis*)

Families & subfamilies incl.

Achatinidae Swainson, 1840 (*Euglandina* (once also put in Oleacinidae, now in Spiraxidae)

**Acteonidae** (*Acteon*, *Rictaxis*)

**Aglajidae** (agljajids) (*Melanochlamys*)

**Amastridae** (*Leptachatina*)

Amnicolidae Tyron, 1862 - subsumed as Amnicolinae Martens, 1858 in Hydrobiidae

Subfamily Bythiniinae (now subsumed in Hydrobiidae) (*Amnicola*, *Fontigens*)

Ammonitellidae - subsumed in Megomphicidae  
**Ancylidae** (*Ferrissia* (also put in Planorbidae), *Laevape*)

**Barleeiidae** (Barleeiidae (also put in Neotaenioglossa) (*Barleeia*)  
**Bradybaenidae** (*Monadenia*)

Bythiniinae = Amnicolinae  
**Bulimulidae** (once subsumed in Hydrobiidae) (*Bulimulus* (once in Orthalicidae), *Horatia*, *Rabdotus*)

**Carychiidae** Jefferys, 1829 (*Carychium*) (once in Ellobiidae)  
Cionellidae (*Cionella Cochlicopa*) (both put in Hydrobiidae)

**Cerithiidae** (*Bittiolium*, *Bittium*, *Cerithium*, *Diastoma*)  
**Columbellidae** (*Anachis*, *Astyris*, *Mitrella*)

**Conidae** (*Pyrgocyathara*, *Kurtzia*, *Kurtziella*)  
**Cylichnidae** (*Tornatina*)  
**Cystiscidae** (*Granulina*)

**Discidae** (*Anguispira*, *Discus* (both once put in Endodontidae)), *Nematodiscus* (also put in Endodontidae), *Speleodiscoides*)

Ellobiidae (*Carychium* (put in Carychiidae))

**Endodontidae** (see **Slug**) (*Anguispira*, *Discus* (both now in Discidae), *Helicodiscus* (once in Helicodiscidae), *Nematodiscus* (now in Discidae), (*Speleodiscoides*) (also put in Helicodiscidae)

Emmericiinae (*Fontigens* (also put in Amnicolinae, Bulimulidae & Hydrobiidae)  
Littoridininae (*Antrobia*, (also in Lithoglypinae), *Antroselates*, *Balconorbis*,  
*Phreatodrobia* (once in Nymphophilinae), *Stygopyrgus*)

**Eulimidae** (*Strombiformis*)

**Haplotrematidae** H.B. Baker, 1925 (green snails) (*Haplotrema*) Bibl.: Roth 1991  
**Helicidae** (*Helix*, *Trichia*)

**Helicinidae** Latreille, 1825 (*Helicina*, *Hendersonia*, *Oligyra*)  
**Helicodiscidae** Pilsbry, 1948 (see Endodontidae) (*Helicodiscus*, *Speleodiscoides* (now in Discidae))

**Helminthoglyptidae** (*Lyrodes*, *Helminthoglypta*, *Humboldtiana* (now in Humboldtianidae), *Monadenia* (now in Bradybaenidae), *Sonorella*)  
**Humboldtianidae** (*Humboldtiana*) (once Helminthoglyptidae or Xanthonychidae)

**Hydrobiidae** Troschel, 1857. **Bibl.:** Hershler & Holsinger, 1990; Hershler & Landeye 1988; Kabat & Hershler 1993 (*Gilla, Hydrobia, Lartetia, Littoridinops, Texadina, Texapyrgus*)

Amnicolinae Tryon, 1862 (*Amnicola, Dasyscias, Hauffenia, Horatia, Lyogyrus*). Undescr. Pb genera & sp. in cave in Econfina Basin, nwFL.

Cochliopinae (*Antroseletes*) (also put in Littoridininae), *Cionella, Cochliopa* (tribe Cochliopini) (both also put in Cionellidae), *Texapyrgus, Tryonia*).

**Bibl.:** Hershler & Thompson 1992

Nymphophilinae Taylor, 1966 (*Cincinnatia, Dasyscias, Marstonia, Orygoceras, Phreatodrobia* (now in Littoridininae), *Pyrgulopsis*).

Undescr. general & sp. (*Heleobops* group) in Devils, Rio Grande Basins, scTX.

**Bibl.:** Hershler & Longley 1986b; Morrison 1969,

Emmerciinae (*Holsingeria*)

Fontigentinae Taylor, 1966 (*Fontigens*)

Hydrobiinae (*Aphaostracon, Phreatoceras, Phreatodrobia, Tryonia* (now in Cochliopinae))

Lithoglypinae (or as subfamily) (*Antrobia, Antrorbis? Balconorbis, Holsingeria* (once put in Emmerciinae)), *Phreatoceras, Phreatodrobia* (once in E. & Hydrobiinae) **Bibl.:** R.

Thompson 1984. Undescr. Pb genera & sp. in Coosa Basin, neAL

Littoridininae (*Tryonia*)

**Limacidae** Rafinesque, 1815 (*Deroceras, Limax* (see **Slugs**), *Nesovitrea* (now in Vitrinidae or Zonitidae))

**Littorinidae** Gray, 1840 (*Littorina*)

**Lymnaeidae**

Lymnaeinae (*Fossaria, Lymnaea, Stagnicola*)

**Marginellidae** (*Marginella, Prunum*)

**Megomphicidae**

Megomphicinae (=Ammonitellidae) (*Ammonitella* (also put in Thysanophoridae), *Glyptostoma, Megomphix*)

**Melongenidae** (also put in Superfamily Buccinacea) (*Buscon, Busycotypus, Melongena*)

Mesodontidae = Polygyridae

Micromelaniidae Thiele, 1928 (*Antroseletes*: now in Hydrobiidae)

**Modulidae** (*Modulus*)

**Muricidae** (*Acanthina, Eupleura, Thais, Urosalpinx*)

**Nassariidae** (*Nassarius*)

**Nataicidae** (*Natica*, *Neverita*, *Sinum*, *Tectonatica*)

**Neritidae** Rafinesque, 1815

Neritiliinae (*Neritilia*)

**Oleacinidae** (*Euglandina*) (now put in Spiraxidae)

**Olividae** (*Oliva*)

**Oreohelicidae** (*Oreohelix* (also put in Thysanophoridae))

Orthalicidae Albers-Martens, 1860 = Bulimulidae

**Physidae** (*Aplexa*, *Physa*, *Physella*) **Bibl.:** Te 1973, 1978

**Planorbidae**

Planorbinae

Planorbini: *Gyraulus*, *Ferrissia* (now in Ancyliidae)

Helisomimi: *Helisoma*, *Menetus*, *Micromenetus*, *Planorbella*

Helisomini: *Promenetus*. **Bibl.:** Baker 1945

**Pleuroceridae** (*Elimia*, *Goniobasis*, *Leptoxis*, *Lithasia*, *Pleurocera*)

**Polygyridae**

Subfamily Polygyrinae Pilsbry, 1895

Tribe Vespericonini Emberton, 1994 (*Vespericola*) (coiled snails)

(*Allogona*, *Daedalochila*, *Euchemotrema*, *Mesodon*, *Millerelix*, *Neohelix*, *Patera*,  
*Polygyra*, *Stenotrema*, *Trilobopsis*)

Subfamily Tridopsinae (*Tridopsis*) **Bibl.:** emberton 1994

**Potamididae** (*Cerithidea*)

**Pomatiopsidae** Stimpson, 1865 (*Pomatiopsis*)

**Punctidae** (*Punctum*)

**Pupillidae** Turton, 1831 (*Chaenaxis*, *Columnella*, *Gastrocoptinae*, *Gastrocopta*, *Pupillinae*,  
*Pupilla*, *Pupisoma*, *Pupoides*, *Vertigo*)

**Pyramidellidae**

(*Boonea*, *Eulimastoma*, *Fargoa*, *Odostomia*, *Petitilla*, *Pyramidella*, *Sayella*, *Turbonilla*)

**Retusidae** (*Retusa*)

**Rissoidae** (*Alvania*, *Rissonia*, *Schwartziella*)

**Sphaeriidae** (*Sphaerium*) (see **Clams**)

**Spiraxidae** Baker, 1955 (*Euglandina*) (once put in Oleacinidae & Achatinidae)

**Succineidae** Beck, 1837 (*Catinella*, *Novisuccinea*, *Succinea*)

**Thiaridae** (*Melanoides*, *Tarebia*)

Thysanophoridae Pilsbry, 1926 (*Oreohelix* (now in Oreohelicidae))

**Turridae** (*Crassispira*, *Pyrgospira*)

**Urocoptidae** Pilsbry & Vanatta, 1898 (*Holospira*)

**Valloniidae** (*Vallonia*)

**Vanikoridae** (*Megalomphalus*)

Vertiginidae (*Vertigo* (now subsumed in Pupillidae))

**Vitrinellidae** (*Cochliolepis*, *Vitrinellidae*)

**Vitrinidae** (now includes Zonitidae according to some authors) (*Gastrodonta*, *Glyphyalina*, *Hawaiiia*, *Mesomphix* (last 3 retained in Zonitidae), *Mesovitrea*, *Nesovitrea* (last 2 retained in Zonitidae), *Ogaridiscus*, *Paravitrea*, *Pristiloma* (but retained in Zonitidae), *Speleodiscoides* (once put in in Helicodiscidae & Endodontidae, now in Discidae), *Ventridens* (retained in Zonitidae), *Vitrea*, *Zonites*, *Zonitoides*)

**Viviparidae** (*Campeloma*)

**Xanthonychidae** Strebel & Pfefer, 1879 (*Humboldtiana* (now in Humboldtianidae), *Lyrodes*, *Monadenia* (now in Bradybaenidae), *Helminthoglypta* (now in Helminthoglyptidae), *Sonorella* (now in Helminthoglyptidae))

**Zonitidae** (subsumed in Vitrinidae by some authors) *Gastrodonta*, *Glyphyalina*, *Hawaiiia*, *Mesovitrea*, *Nesovitrea*, *Ogaridiscus*, *Paravitrea*, *Pristiloma*, *Speleodiscoides* (now in Discidae), *Ventridens*, *Vitrea*)

Subfamily Zonitinae

Tribe Zonitini (*Zonitoides*)

**Acanthina** Wiederman, 1839 - Muricidae snails (4 species in US or Canada)

**Acanthina paucilirata** (Stearns, 1871) (*Gastrocopta* p.; *Retinella* p. Morrison; *Hyalinia* p. Von Martens, 1892;) (SE to OK, AZ, Guatemala/ Pleist.? fossil in Kartchner Cave, AZ/ Tp or Tx in GA, KY, TN)

**Acteocina** - Cylichnidae snails

**Acteocina caniculata** (Say, 1826) (channeled barrel-bubble/ TX Gulf of Mex. marine infauna)

**Acteocina bidentata** (d'Orbigny, 1841) (*Cylichnella* b.) (two-tooth barrel-bubble/ MA, Virginian, wFL Gulf of Mex. marine infauna)

**Acteocina harpa** (Dall, 1871) (*Cylichnella* b.) (harp baby-bubble/ AK marine infauna)

**Acteon** Montfort, 1810 – Acteonidae snails

*Acteon punctostriatus* = *Rictaxis* p.

***Allogona*** Pilsbry, 1939 - Polygyridae snails

***Allogona profunda*** (Say, 1821) (NY to NC, w. to MN,IA,NB,MS/ broad-banded forestsnail/ subfossil? Ac or Tx in AL)

***Alvania*** Risso, 1826 (= *Alvinia*) - Rissoidae snails

***Alvania compacta*** (Carpenter, 1864) (AK marine infauna)

***Ammonitella*** Cooper, 1918 - Megomphicidae snails (1 species in US or Canada)

***Ammonitella yatesii*** (J.G. Cooper, 1869) Cooper, 1918 (type locality cave in Calaveras Co. +Fresno & El Dorado Cos., CA/Tp/ tight coin)

***Amnicola*** Gould & Haldeman in Haldeman, 1840 (= *Euamnicola*) (see *Fontigens*) Hydrobiidae snails, Subfamily Amnicolinae (7 species in US or Canada) **Bibl.:** Hershler & Thompson 1988

*Amnicola aldrichi* = *Fontigens a.*,

*Amnicola (A.) aldrichi antroecetes* Hubricht, 1940 = *Fontigens antroecetes*

*Amnicola (A.) antroecetes* = *Fontigens a.*

***Amnicola (A.) cora*** Hubricht, 1979 (\*stream in cave in Independence Co.,AR/ Tb/ Foushee cavesnail/ S1G1, State species of Concern)

*Amnicola proserpina* = *Fontigens p.*

***Amnicola*** undet. or undescr. sp. or species (\*cave in OH-TN River drainage & other cave in KY)

*Amnicola (Lyogyrus) retromargo* = *Lyogyrus r.*

***Amnicola (A.) stygius*** Hubricht, 1971 (\*\*type locality & 1 other cave in Perry Co, MO/ Tb/ MO State T&E Status Uncertain/ stygian amnicola)

***Anachis*** H. & A. Adams, 1855 – Columbelloidae snails

*Anachis obesa* (C.B. Adams, 1845) = *Parvanachis o.*

*Anachis ostreicola* Sowerby, 1882 = *Parvanachis o.*

***Anachis semiplicata*** Stearns, 1873 (Gulf dovesnail/ LA marine infauna)

***Anguispira*** Morse, 1864 - Discidae snails (13 species in US or Canada)

***Anguispira alabama*** (*A. cumberlandiana a.* G.H. Clapp, 1920) Pilsbry, 1948 (nAL, cTN/ sinks, TTx?/ Alabama tigersnail or disc)

*Anguispira alternata angulata* = *Helisoma anceps*



*Anguispira alternata a.* (Say, 1816; A.a. Pilsbry, 1948) (Canada to AL, nAR, nGA, MS, TN epigeal/ flamed tigersnail or disk/ Tx in FL, KY(one cave), MD, MO, OH, sON, OK, PA, WV)

*Anguispira alternata crassa* (valid subspecies?, not list in Turgeon et al., 1998) (subfossil? Ac or Tx in AL/flamed tigersnail or disc)

*Anguispira kochi kochi* (Pfeiffer,1821) Pilsbry, 1948 (*A. k. strontiana* (Clapp); *A.k. roseopicta* (Clapp)) (PA, TN, OH & KY/ Tx in KY(Holocene extralimital in one cave),OH; Tx or Ac in IN/ banded tigersnail or globe)

*Antrobia* Hubricht, 1971 - Hydrobiidae snails, Subfamily Lithoglypinae (1 species in US)

*Antrobia culveri* Hubricht, 1971 (T. Cr. Cavesnail/ \*type locality cave in Taney Co., MO/ Federal Species of Concern T&E,priority 7; MO State T&E) **Bibl.:** Hershler & Thompson, 1992

*Antrorbis* Hershler & Thompson, 1990 - Hydrobiidae snails, Subfamily Lithoglypinae (1 species in US)

*Antrorbis breweri* Hershler & Thompson, 1990 (type locality cave in \*Coosa R. Basin, DeKalb Co.,AL/ Tb/ Manitou Cavesnail/extinct? in type locality (entrance closed by metal door))/ G1 S?, Previous federal T&E candidate)

*Antroselates* Hubricht, 1963 - Hydrobiidae snails, Subfamily Cochliopinae (once put in Littoridininae & Micromelaniidae, Subfamily Emmericiinae) (1 species in US)

*Antroselates spiralis* Hubricht, 1963 (Mammoth C./ Edmonson Co.(Mammoth C., KY) & lower Blue River drainage in Crawford & Harrison Cos.(IN)/Federal Species of Concern T&E; KY State T&E Sensitive Species/Tp,streams/Shaggy Cavesnail) **Bibl.:** Lewis 1993a; Lewis & Lewis 1995

*Aphaostracon* F. Thompson, 1968 - Hydrobiidae snails, Subfamily Hydrobiinae (9 species in US or Canada)

*Aphaostracon asthenes* F. Thompson, 1968 (\*Blue Spr., Volusia Co.,FL/ federal T&E Review Status, FL S1 T&E/ Blue Spring hydrobe)

*Aphaostracon chalarogyrus* F. Thompson, 1968 (\*Magnesia Spr., Alachua Co.,FL/federal T&E Review Status, FL S1 T&E/ freemouth or Magnesia Spring hydrobe)

*Aphaostracon hypohyalinum* F. Thompson, 1968 (ncFL in sprs. In lower Suwannee River and its tributary (Santa Fe River) and neary landlocked spr., Wakulla Co., ncFL/ Suwanee hydrobe)

*Aphaostracon monas* (Pilsbry, 1899) F. Thompson, 1968 (\*Wekiwa Spr., Orange Co.,FL/ Wekiwa Hydrobe/ federal T&E Review Status, FL G1S1 T&E)

*Aphaostracon pycnum* or *pycnus* F. Thompson, 1968 (Alexander Spr. Run, Lake Co., ncFL/ dense hydrobe)

*Aphaostracon theiocrenetum* or *thiocrenetus* F.Thompson, 1968 (\*Clifton Spr.,FL/ FL G1S1 T&E/Clifton Spr. hydrobe)

*Aphaostracon xynoelictum* or *xynoelictus* F.Thompson, 1968 (\*Fenney Spr.,FL/water filled sinks, immediately adjacent spr. run, Sumter Co.,FL/ T&E review status, FL G1S1 T&E/ Fenny Spr. Hydrobe)

*Appalachina* Pilsbry, 1939 = *Mesodon* only in part. See Emberton 1994

*Aplexa* Fleming, 1820 - Physidae snails (1 species in US or Canada)

*Aplexa elongata* (Say, 1821) (= Eurasian *A. hypnorum*?; *Bulla h.* Linnaeus, 1758 according to some authors) (ON to Saskatchewan & AK, eSiberia, NE to WA,s.to ID,UT,WY/ Ac or Tx in sON; n. extralimital fossil in Moore Pit (Dallas Co.),TX/ lance aplexa) **Bibl.:** Starobogatov & Strelezkaja 1967 & Te 1978, 1980

*Arion* – See Slugs

*Astyris* H. Adams & A. Adams, 1853 – Columbellidae snails

*Astyris gausapata* (Gould, 1850) (East Pacific/ shaggy dovesnail/ AK marine infauna)

*Astyris lunata* (Say, 1826) (*Mitrella lunata*) (lunar dovesnail/ Virginian, MA, wFL, TX marine infauna)

*Balconorbis* Hershler & Longley, 1986 - Hydrobiidae snails, Subfamily Lithoglypinae (1 species in US)

*Balconorbis uvaldensis* Hershler & Longley, 1986 (G.Ligocky Well,\*Uvalde Co.,Edwards Aquifer,scTX/ Balcones ghostsnail/ Pb) **Bibl.:** Hershler &Thompson, 1992

*Barleeia* Clark, 1853 – Barleeiidae snails

*Barleeia subtenuis* Carpenter, 1864 (AK marine infauna)

*Bittium* Gray, 1847 – Cerithiidae snails

*Bittium alternatum* = *Bittiolum a.*

*Bittiolum* – Cossmann, 1906 – Cerithiidae snails

*Bittiolum alternatum* (Say, 1822) (rare Virginian, wFL Gulf of Mex. marine infauna)

*Bittiolum varium* (*Diastoma varium* (Pfeiffer, 1840)) (grass cerith/ TX marine infauna)

*Boonea* Robertson, 1978 – Pyramidellidae snails

*Boonea impressa* (impressed odostome/ rare Virginian, wFL, TX Gulf of Mex. marine infauna)

*Boonea seminuda* (C.B. Adams, 1839) (half smooth odostome/ Virginian marine infauna)

*Bulimulus* Leach, 1815 (see Rhabdotus) Bulimulidae snails (1 species in US)

***Bulimulus guadalupensis*** (Bruguiere, 1789) (Tx in cave in Murray Co., OK/ West Indian bulimulus)

***Bulla*** Linnaeus, 1758 – Bullidae snails

***Bulla striata*** Bruguiere, 1792 (wFL, LA Gulf of Mex. marine infauna)

***Busycon*** Roding, 1798 – Melongenidae snails

***Busycon canaliculatum*** (Linnaeus, 1758) = ***Busycotypus canaliculatus***

***Busycon carica*** (Gmelin, 1791) (NC marine infauna)

***Busycotypus*** – Melongenidae snails

***Busycotypus canaliculatus*** (***Busycon canaliculatum*** (Linnaeus, 1758) (channel welk/ Virginian, NC marine infauna)

***Campeloma*** Rafinesque, 1819 - Viviparidae snails (16 species in US or Canada)

***Campeloma*** undet. sp. (Tx or Ac in OH/campeloma)

***Carychium*** (H.C. Lea) Muller, 1774 - Carychiidae snails (10 species in US or Canada) **Bibl.:**

Greene 1984 (Europe, NA)

***Carychium exiguum*** (= *Pupa e.* Say, 1822; *C. existelium* & *euphaeum* Boorguignat, 1857)

(James Bay (Canada) to US Gulf Coastal Plain/Tx or Ac in cave in Putnam Co., TN/ obese thorn)

***Carychium exile*** e. I. Lea, 1842 (E except FL, LA/ Tp in AL, KY(Mammoth C.), IN, MO, TN/ ice thorn) **Bibl.:** Hobbs III, 1995a; Hobbs III 1994

***Carychium*** undet. sp.#1 (East/MO TTp?)

***Carychium stygium*** Call, 1897 (*Zospeum s.?* Call, 1897) (type locality in Mammoth C., Edmonson Co., & caves in Barren, Hart, Jackson, Rockcastle, Simpson, Warren Cos., KY & one cave in ncTN (Sumner Co.)/ Tb/ TN State T&E, S2 G3G4/ cave thorn) **Bibl.:** Hubricht 1958a, 1960

***Catinella*** Pease, 1871 - Succineidae snails (15 species in US or Canada)

***Catinella (Mediappendix) cf. gabbi*** (*Succinea g.* Tyron, 1866) Burch, C. Patterson & R. Natarajan, 1966 (WA, OR, Inyo Co., CA/ extralimital fossil in Kokoweef C., CA/ riblet ambersnail)

***Catinella gelida*** (*S. grosvenori g.* Baker, 1927) (glacial relict calciphile in non-cave cracks & crevices in 14 sites in neIA (Winneshiek, Allamakee, Clayton & Dubuque Cos./ frigid ambersnail)

***Cerithidea*** Swainson, 1840 - Potamididae snails

***Cerithidea costata*** (E.M. da Costa, 1778) (BC marine infauna)

***Cerithidea scalariformis*** (Say, 1825) (w,eFL marine infauna)

***Cerithium*** Bruguiere, 1789 – Cerithiidae snails

***Cerithium varium*** Menke, 1828 (grass cerith/ TX marine infauna)

***Chaenaxis*** Pilsbry & Ferris, 1906 (originally described as subgenus of *Bifidaria*) Pupillidae snails (1 species in US or Canada)

***Chaenaxis tuba*** (Pilsbry and Ferris, 1906) (36,000 +/- 360 yrs. B.P. in Kartchner C., sAZ; 11,470 +/-170 to present in *Neotoma* packrat middens in Waterman Mts.,Pima Co.,AZ)

***Cincinnatia*** Pilsbry, 1891 (siltsnail) Hydrobiidae snails, Subfamily Nymphophilinae (13 species in US or Canada)

***Cincinnatia mica*** Thompson, 1968 (\*Spring along west bank of Ichetucknee River, about 1 mi. Ne of US Hwy. 27, Suwannee Co., FL)

***Cincinnatia monroensis*** (Dall, 1885) (\*Benson's Mineral Spring near Enterprise, Volusia Co., FL/ thought to be extinct)

***Cincinnatia parva*** F.Thompson, 1968 (\*Blue Spr.,Volusia Co.,FL/ cave sprs. & spr. run/ T&E review status/ pygmy siltsnail)

***Cincinnatia petrifons*** F. Thompson, 1968 (\*Rock Sprs.,Orange Co.,FL/cave sprs./Rock Springs siltsnail)

***Cincinnatia ponderosa*** F. Thompson, 1968 (\*Sanlando Spr.,Seminole Co.,FL/cave sprs. to 300 yds. downstream, Little Wekiva R. to about 500 yds. from cave/T&E review status/ ponderous siltsnail or spring snail)

***Cincinnatia vanhyningi*** (Vanatta, 1934) (\*Seminole Spr., Lake Co.,FL/ water filled cave entrance, spring run/ federal T&E review status, FL T&E G1S1/ Seminole siltsnail)

***Cincinnatia wekiwae*** F. Thompson, 1968 (\*Wekiwa Spr.,Seminole Co.,FL/cave sprs. to short distance downstream/ T&E review status/ Wekiwa siltsnail)

***Cionella*** Jeffrys, 1829 - Hydrobiidae snails, Subfamily Cochliopinae (European usage is consistently now *Cochlicopa*) (also put in Cionellidae) (4 species in US or Canada)

***Cionella morseana*** (*Cochlicopa morseana* Doherty, 1878; *C. lubrica* D.; *Ferussacia subcylindrica* L., Sargent, 1891) (epigean in Al, KY, MI, NC, NY, OH, TN, VA/ Appalachian pillar/ Tx in MO)

***Cerithium*** Bruguiere, 1789 – Cerithiidae snails

***Cerithium muscarum*** Say, 1822 (flyspeck cerith/ wFL Gulf of Mex. marine infauna)

***Cochliolepis*** Stimpson, 1858 – Vitrinellidae snails

***Cochliolepis striata*** wFL Dahl, 1899 (striate scalesnail/ wFL Gulf of Mexico infauna)

***Cochliopa*** Stimpson, 1865 - Hydrobiidae snails, Subfamily Cochliopinae, tribe Cochliopini  
***Cochliopa texana*** Pilsbry, 1935 (classification uncertain as all other species recently restricted to Costa Rica and Panama) (Phantom Lake Spr. (Jeff Davis Co.) +Reeves Co.,TX/cave-fed spr./state park in part)

***Crassispira*** Swainson, 1840 -Turridae snails  
***Crassispira ostrearum*** Stearns, 1872 = *Pyrgospira o.*

***Crepidula*** Lamarck, 1799 - Calyptraeidae snails (14 species in US or Canada)  
***Crepidula aculeata*** (Gmelin, 1791 (Ttx in CA seacaves)  
***Crepidula fornicata*** (Linnaeus, 1758) (wFl, TX Gulf of Mex. marine infauna)

***Crepidula convexa*** Say, 1822 (Virginian marine infauna)  
***Crepidula maculosa*** Conrad, 1846 (Virginian, wFL Gulf of Mexico marine infauna)  
***Crepidula plana*** (Say, 1822 (Virginian, wFl Gulf of Mex. marine infauna)

***Cryptonatica*** Dall, 1892 – Naticidae snails  
***Cryptonatica affinis*** (= *Natica clausa* Broderip & Sowerby G.B.I, 1829) (AK marine infauna)

***Cylichna*** Loven, 1846 – Cylichnidae snails  
***Cylichna attonsa*** Carpenter, 1865 (BC marine infauna)

***Cylichnella*** - Cylichnidae  
***Cylichnella bidentata*** (d'Orbigny, 1841) = *Acteocina b.*

***Daedalochila*** Beck, 1837 (= *Polygyra* by some authors) Polygyridae snails (15 species in US or Canada)

***Daedalochila triodontoides*** (Bland,1861) Branson, 1962 (*Polygyra texasiana* (Moricand, 1833) Pilsbry, 1940; *P. scintilla* & *polita* Pilsbry & Hinkley, Branson, 1962; *P. rexroadensis* Taylor, 1960) (paleo & Tx or Ac in TX/ marsh liptooth)

***Daedalochila tamaulipasensis*** (Lea, 1912) (= *D. triodontoides* (Bland, 1861)according to some authors) (northern extralimital paleo & Ac or Ttx in cave in Uvalde Co., TX)

***Dasyscias*** F.Thompson & Hershler, 1991 - Hydrobiidae snail, subfamily Amnicolinae (1 species in US or Canada)

***Dasyscias franzi*** F.T.& 1991 (\*type locality in Choctawhatchee-Yellow-Escambia hydrologic subsystem, WA Co., FL/ Tp, Pb/ shaggy ghostsnail/ G1S1)

***Diastoma*** Deshayes, 1850 – Cerithiidae snails  
***Diastoma varium*** (Pfeiffer, 1840) = *Bittiolium v.*

***Discus*** Fitzinger, 1833 (see *Pyramidula*, *Patulas*) - Discidae snails (12 species in US or Canada)

*Discus campestris* = *Planorbella c.*

***Discus catskillensis*** (Pilsbry, 1896) (*Pyramidula striatella c.* Pilsbry, 1898; *P. cronkhitei catskillensis* Walker, 1906; *Discus c.* (P., 1898); *Pyramidula c.*) (ME to PA, w. to SD/ angular disc/ Tx in sON, New Brunswick (on damp timber))

*Discus conkhitei* = *D. whitneyi*

***Discus macclintocki*** (*D.m. angulata* F.C. Baker, 1928; *Planorbula m.*) Pilsbry, 1948 (Pleistocene disc or Iowa Pleistocene snail) (until 1982 known to live only in cave in Clayton Co., IA/ Tx glacial relict, IL State T&E). **Bibl.:** Ferst 1981; Hubricht 1955; T. Ross 1998; US Fish & Wildlife 1984

***Discus nigrimontanus*** (Pilsbry, 1924; *Patula* or *Pyramidula n.* P.1948) (nAL, sIA, seKY, nMO, wNC, swVA/ Tx in MO/Black Mountain disc)

***Discus patulus*** (Deshayes, 1830) (sON,WI to LA & up Appalachians to nNY/ Tx or Tp in TN; subfossil? Ac, Tp or Tx in AL, AR/ domed disc)

***Discus* (*Discus*) *whitneyi*** (*D. conkhitei* Pilsbry, 1948, *Helix c.* Newcomb, 1865; *Gonyodiscus cronkhitei* Berry, 1922; *Pyramidula c.* Dall, 1905; *G.c. anthonyi* Henderson, 1924; *D. c.c.* , 1936; *Helix striatella* Anthony, 1840; *Patula s.* Morse, 1864; *Pyramidula c.*) P.1948 (ME ot MD, w. to WA,CA?/ angular or forest disk/ Tx or Ac in sON; Tx? in OH)

***Elimia*** A. Adams, 1841 (= *Goniobasis*, *Macrolimen*, *Melasma*) Pleuroceridae snails (86 species in US or Canada)

***Elimia clavaeformis*** (*Melania c.* Lea, 1841) (Upper TN R. tributaries in VA, TN, NC/ Tx or Ac in Hancock Co., TN/ club elimia)

***Elimia clenchi*** (Goodrich, 1924) (= *Patera c.*? (Rehder, 1932)) (AL, AR/ Ttx in FL/ slackwater elimia)

***Elimia curreyana*** (Lea, 1841) (*Goniobasis c.*) (Tx or Ac in one KY cave/ amber elimia)

***Elimia curvicostata*** (Reeve, 1861) (streams in wGA & wFL, rivers & creeks of sw AL/ Ttx in FL, subterranean aquifers in WA Co., FL/ graphite elimia)

***Elimia edgariana*** (*Goniobasdis e.* I. Lea, 1841) (streams of Cumberland, Elk & Duck Rivers, TN/ Tx? in De Kalb Co.,TN/ Cumberland elimia)

***Elimia laqueata l.*** (*Goniobasdis l.* Say, 1829) (Green River & tributaries, KY; tributaries of middle Cumberland R., TN; tributaries of TN River, TN & AL/ subfossil? Ac or Tx in AL/panel elimia)

***Elimia*** undesc. ssp. (\*cave in Rutherford Co., TN/ Tb?)

*Elimia livescens* l. (Menke, 1830) (Missourian, St. Lawrence River drainage from Great Lakes to Lake Champlain & PQ, alien in Hudson River basin/ Ac or Tx in OH/liver elimia)

*Elimia potosiensis* (group)? (I. Lea, 1841) (Ozarks of AR, MO, OK/ Tx in MO/ pyramid elimia)

*Elimia potosiensis ozarkensis* (E.o. Call, 1886) (spr. in Shannon, Carter, WA, Dent & Camden Cos., MO/ Tx in Shannon, Carter, WA. cos., MO) **Bibl.:** Goodrich, 1939

*Elimia* near? *semicarinata* (Say, 1829) (near? or hybridized? with *E. indianensis* (valid species?)) (fine-ridged c.\ tributaries of OH & Scioto Rivers, OH to Blue River, IN; Licking to Salt River, creeks of Green R., KY/ Tx in IN),

*Elimia simplex* (Say, 1825) (headwaters of upper TN R. in VA, TN, NC; tributaries of Kenawha R. in WV/ Tx in seVA/ smooth elimia) **Bibl.:** Goodrich 1940

*Elimia* undet. sp. or species (Tb in Rutherford Co., TN; Tp or Tx in cave in Rockcastle Co., KY)

*Elimia vanhyningiana* (Goodrich, 1921) (= *E. catenaria* v.) Rock (Orange Co.) & Alexander & Seminole (Lake Co.) Springs/ goblin Elimia/ G1)

*Epitonium* Roding, 1798 – Epitoniidae snails

*Epitonium angulatum* (Say, 1830) (angulate wentletrap/ wFL Gulf of Mex .marine infauna)

*Epitonium greenlandicum* (G. Perry, 1811) (Greenland wenteltrap / Virginian marine infauna)

*Epitonium rupicola* (Kurtz, 1860) (wFL marine infauna)

*Epitonium tollini* Bartsch, 1938 (LA marine infauna)

*Euchemotrema* Archer, 1939 (= *Stenotrema* in part, see Emberton 199) Polygyridae snails (5 species in US or Canada)

*Euchemotrema fraternum* (Say, 1824) (*Stenotrema* f.; *S.f. cavum*; *S.f.f.*) (NH to AL, w. to IA, IN, MN, MO, OK/ upland pillsnail/ Tx or Ac in PA; Tx in OH)

*Euchemotrema leai* (A. Binney, 1841) (Tx in one KY cave/ lowland pillsnail)

*Euglandina* Fischer & Crosse, 1870 - Spiraxidae snails (3 species in US or Canada)

*Euglandina* (*Euglandina*) *rosea* (Fe'russac, 1818) Pilsbry, 1946 (AL, FL, GA, SC epigeal/ Tp in nMS (probably); Tx in nwFL/ rosy wolfsnail) **Bibl.:** Franz, Lee & Stifel 1971

*Eulimastoma* Bartsch, 1904 – Pyramidellidae snails

*Eupleura* H. Adams & A. Adams, 1853 – Muricidae snails

*Eupleura caudata* (Say, 1822) (Virginian marine infauna)

*Eupleura sulcidentata* Dall, 1890 (wFL Gulf of Mexico marine infauna)

*Eulimastoma* Bartsch, 1904 – Pyramidellidae snails  
*Eulimastoma teres* (Bush, 1885) (TX marine infauna)

*Fargoa* Robertson, 1978 – Pyramidellidae  
*Fargoa bushiana* (Bartsch, 1909) / Virginian marine infauna)

*Ferrissia* Walker, 1903 – Ancyliidae snails (once in Planorbidae) (6 species in US or Canada)  
*Ferrissia rivularis* (Say, 1817 (= *F. kirklandi* (Walker, 1918))) (creeping ancyliid/ Tx in MO)  
*Ferrissia* undet. sp. or species (Tx or Ac in MN; rare Virginian marine infauna)

*Fontelicella hendersoni* = *Pergulopsis h.*

*Fontigens* Pilsbry, 1933 - Hydrobiidae snails, Subfamily Fontigentinae (14? species in US or Canada) **Bibl.:** Hershler, Holsinger & Hubricht 1980; Hubricht 1976; Hubricht, Holsinger, & Hershler 1990; Taylor 1966; Hershler & Holsinger 1990

*Fontigens aldrichi aldrichi* Call & Beecher, 1886 (= *Amnicola aldrichi* Call & Beecher, 1886)  
(spr. in Reynolds Co., MO/ springs in IL, MD, MO (disjunct), OH, VA/ Pp & Tp in IL?, MD, MO, OH?, VA/ Hoosier amnicola)

*Fontigens aldrichi antroecetes* = *F. antroecetes*

*Fontigens aldrichi insolita* Hubricht, 1940 (Coldwater Spr., near Coldwater (Wayne Co.) + Meramec Spr., Phelps Co., MO/ Pb?, spr.)

*Fontigens antroecetes* (*F. aldrichi antroecetes* Hubricht 1972; *Amnicola antroecetes a.* Hubricht, 1940) (uncertain classification) (type locality cave in St. Clair Co., sw IL, + Perry, St. Louis, Pulaski & Shannon Cos., se. & e MO/ Pb, Tb, St/ enigmatic cavesnail/MO State T&E)  
**Bibl.:** Peck & Lewis 1978

*Fontigens cryptica* Hubricht, 1963 (\*\*spr. 3mi. w. of Bethlehem (Clarke Co.) & cave in Harrison Co., IN/ spring, Pp/ hidden springsnail/ S1 G1)

*Fontigens holsingeri* Hubricht, 1976 = *F. tartarea*

*Fontigens* near *nickliniana* (*Paludina n.* Lea, 1838) (cool, shallow spr. PA to WI, ON to AL/ Pb? in 3 caves in Lee Co., VA)

*Fontigens nickliniana* (*Paludina n.* Lea, 1838) (cool shallow spr. PA (hardwater) to WI, ON to AL/ Pp in IL, MI, WV, VA/ watercress snail)

*Fontigens orolibas* Hubricht, 1957 (spr. in Shenandoah Natl. Park & Blue Ridge Parkway, VA/ Tp?, Pb in Warren, Giles, Tazewell Cos., VA/ Blue Ridge springsnail or cavesnail)



*Fontigens proserpina* (*Amnicola p.* Hubricht, 1940) (type locality cave in Jefferson Co. +sprs. at Glencoe Cr. & Osage Hills Golf Course (Kirkwood), cave in Ste. Genevieve Co.) & spr.(St. Louis Co.), MO/ Tp, Pp/ eMO T&E/Proserpine Cavesnail) **Bibl.:** Hubricht 1942

*Fontigens* undescr. sp.#1 (\*?type locality in cave in Greenbrier Co.,WV/ Tb/ S1G1)

*Fontigens* undescr. sp.#2 (Harrison Co.,IN/Pb) **Bibl.:** Lewis 1993

*Fontigens* undet. sp. (Pb in WA Co., MD)

*Fontigens tartarea* Hubricht, 1963 (stream in Organ C.(Greenbrier Co.) +Randolph, Tucker, Monroe, & Pocohontas Cos.,WV (incl. *F. holsingeri* Hubricht, 1976 (cave in Randolph Co.) +Pocahontas Co.,WV/ Tb, Pb, St/ WV T&E S2 rank & global G2 rank/ Greenbrier or organ cavesnail)

*Fontigens turritella* Hubricht, 1976 (type locality & 1 other cave in Greenbrier Co.,WV & VA (2 caves in Warren Co.(VA) according to H.H.H. 1990)/ Tb, St, Pb/ WV T&E S1 rank & global G1 rank/ Greenbrier cavesnail)

*Fossaria* Westerlund, 1885 - Lymnaeidae snails (22 species in US or Canada)

*Fossaria* (*F.*) *humilis* (Say, 1822) (= *Lymnaea h.*) (sNJ s. to SC/ PA spr./Pb?/ marsh f.)

*Fossaria modicella* (Say, 1825) (*L.m.*)(NS & NJ w.to BC, nw to NWT. s. to CA, AZ, TX, AL/ Ac or Tx in sON/ rock f.)

*Fossaria parva* (I. Lea, 1841) (*L.p.*) (CT to ID, s. to AZ, sNM, OK, KY, n. to PQ, Great Slave Lake/ Tx? in MO/ pygmy f.)

*Fossaria* undet. sp. (Ac in OH/fossaria)

*Gastrocopta* Wollaston, 1878 - Pupillidae snails (25 species in US or Canada)

*Gastrocopta* (*Albinula*) *armifera* (*Pupa a.* Say, 1821; *Bifidaria a. & clappi* Sterki, 1909; *P. moreletiana* Grasset, 1856) Pilsbry, 1948 (ME to FL, w. to ND, CO,NM/Tp or Tx in MO; Tx in MD; Pleistocene extralimital in Dry Cave, NM /armed snaggletooth)

*Gastrocopta nickliniana* = *Fontigens n.*; *G. orolibas* = *F. o.* ; *G. paucilirata* = *Acanthina p.*  
*G. rimula* = *G. r.*; *G. roemeri* = *G. r.*; *G. sculptilis* = *G. s.* ♦ *G. specus* = *G. s.*

*Gastrocopta* (*A.*) *contracta* (*Pupa c.* Say, 1822; *P. deltostoma* Kurster, 1852; *P. nebraskana* Binney, 1855-7; *Bifidaria c.*) Pilsbry, 1906 (ME to FL, w.to Mex./paleo & TTx or Ac in TX; Tx in OH/ bottleneck snaggletooth)

*Gastrocopta holsingeri* (Sterki, 1889) (E to MW, n. to MI /dry limestone ledges, Tx?)

*Gastrocopta perversa* (Gould, 1840) (36,000 +/- 360 yrs. B.P. in Kartchner C., sAZ; extralimital Pleistocene in Dry Cave, seNM)

***Gastrocopta procera*** (Gould, 1840) (36,000 +/- 360 yrs. B.P. in Kartchner C., sAZ; )

***Gastrodonta*** Albers, 1850 - Zonitidae snails (once in Vitrinidae) (2 species in US or Canada)

***Gastrodonta interna*** i. (*G.i.* Say, 1822) Pilsbry, 1946 (WV w.to IN, e.to NC, s.to cAL/Tx in AL, TN, VA, WV/ brown bellytooth/ VA Species of Concern)

***Gillia*** Stimpson, 1865 – Hydrobiidae snails

***Gillia altilis*** (I. Lea, 1841) (buffalo pebblesnail/ Virginian marine infauna)

***Glyphyalinia*** Martens, 1892 - Zonitidae snails (25 species in US or Canada)

***Glyphyalinia cryptomphala*** c. (SE to AL/ Tx in cKY/ /thin glyph)

***Glyphyalinia cryptomphala solida*** H.B.Baker (Tx or Tp in Warren Co.,KY/ thin glyph)

***Glyphyalinia cryptomphala*** (*Retinella* c. G.H. Clapp, 1915) Hubricht, 1964 (Tp in AL, GA, KY, TN; Tp or Tx in cKY/ / thin glyph)

***Glyphyalinia cumberlandiana*** (G.H. Clapp, 1919) (*Carocolla* c. Lea, 1840; *R.c.* Pilsbry, 1946; *Helix* c. Binney, 1851; *Patula* c. B., 1875; *Pyramidula* c. Clapp, 1920) Hubricht, 1964 (neAL, seKY, wNC, wTN, wVA, WV/sinks,TTx?/ hill glyph or Cumberland disc)

***Glyphyalinia indentata*** (Say, 1823) Pilsbury, 1946 (R.i.p. H. Baker, 1930; *Zonites* i. var. *umbilicatus* Cockerell, 1890; *Gastrocopta* i.; R.i.) (E,MW/Tp or Tx in KS,OK; Tx in IN; prob.Tp in TX;Ep/ extralimital Pleist.? fossil in Kartchner Cave, AZ/ carved glyph; indented terrestrial snail /S4G4) **Bibl.:** Zilch, 1959

***Glyphyalinia latebricola*** Hubricht, 1968 (*Gastrocopta* l.) (Ep, Tp in 2 caves in Madison Co.,Burwell Mt. near Jeff, neAL/ stone glyph)

***Glyphyalinia lewisiana*** (R.l. Clapp, 1908; *Gastrocopta* l.) Pilsbry, 1946 (AL, nAR, KY, sMO, MS, TN, WV, wVA/ pale glyph/ Cp, Tx in MO)

***Glyphyalinia pecki*** Hubricht, 1966 (*Gastrocopta* p.)\*\*( type locality & 1 other cave in Jefferson Co.,AL/ Tb/ blind glyph)

***Glyphyalinia praecox*** (H.B. Baker, 1930) (Ac, Tx or Tp in GA (Bartow Co.)

***Glyphyalinia rhoadsi*** (Pilsbry, 1899) (Ac, Tx or Tp in GA (WA Co.)

***Glyphyalinia rimula*** Hubricht, 1968 (G.r.) (seKY, ncTN, swVA, swWV/ tongued glyph; karst glyph snail/ Ep, Tp in Cannon Co.,TN & Corydon area caves, Harrison Co., IN/ imperiled)

***Glyphyalinia roemeri*** (R.r. Pilsbry & Ferris, 1906; *Gastrocopta* r. Zilch, 1959) (Tp in Medina, Hays, Travis, Uvalde & Williamson Cos., TX/ pretty glyph)

***Glyphyalinia sculptilis*** (R. s. Bland, 1858; *Gastrocopta* s. Zilch, 1959) Pilsbry, 1946 (SE except FL/ TTx in GA (Bartow Co.), KY/ suborb glyph)

***Glyphyalinia specus*** Hubricht, 1965 (type locality cave in Barren Co. & Mammoth C., Edmondson Co., both KY + cKY(5cos.), nAL (Jefferson, Jackson & Madison cos.), nwGA (Chattooga, Dade & Walker cos.), eTN (Bedford, Cannon, Grundy, Jackson, Sullivan, Van Bure Cos.), seWV (Monroe Co.)/ Tb on cricket guano/ Texas or hollow glyph)

***Glyphyalinia wheatleyi*** (R.w. Bland, 1883; *Gastrocopta* w.) Hubricht 1964 (E to MS, AL, AR, GA, KY, NE, PA, TN, WV, VA/ Tx or Ac in MO sinks, TTx?; Tx in IN/bright glyph; Wheatley's terrestrial snail/ S4G4)

***Glyptostoma*** Bland & Binney, 1873 - Megomphicidae snails  
*Glyptostoma* (*Megomphix*) *californicum* = *Megomphix californicus*  
*Goniobasis* - see *Elimia* & *Hadoceras taylori* - see *Phreatocereas*

***Granulina*** di Monterosato, 1884 – Cystiscidae snails  
***Granulina ovuliformis*** (d'Orbigny, 1841) (teardrop marginella/ wFL Gulf of Mexico infauna)

***Gyraulus*** Agassiz in Charpentier, 1837 - Planorbidae snails (5 species in US or Canada)  
***Gyraulus* (*Torquis*) *circumstrianis*** Tyron, 1866 (CT n.to PQ, w.to Alberta, s.to Rockies in NM/ disk gyro/ Ac or Tx in sON)

***Gyraulus* (*Torquis*) *parvus*** (Say, 1817) (NA epigeal /Tx? in FL/ ash gyro)

***Haminoea*** Turton & Kingston, 1830 – Haminoeidae snails  
***Haminoea antillarum*** (d'Orbigny, 1841) (TX, wFL Gulf of Mex. marine infauna)  
***Haminoea solitaria*** (Say, 1822) (Virginian marine infauna)

***Haminoea succinea*** (Conrad, 1846) (TX Gulf of Mex. marine infauna)  
***Haminoea virescens*** (G.B. Sowerby II, 1833) (East Pacific/ green glassy-bubble/ AK marine infauna)

***Haplotrema*** Ancy, 1881 - Haplotrematidae snails (11 species in US or Canada)  
***Haplotrema* (*H.*) *alameda*** Pilsbry, 1930 (*H.a. fieldi* Pilsbry, 1930) (Calavareas to Tulare Cos., CA/ Ac or Tx in Amador & Tuolumne Cos., CA/ Alameda lancetooth)

***Haplotrema concavum*** (*Helix* c. Say, 1821; *Macrocyclus* c. Morse, 1864; *Helix planorboides* Ferussac, 1821; *H. dissidens* Deshayes, 1850; *Selenites* c. Ancy, 1882; *Circinaria* c. Pilsbry, 1900) H. Baker, 1930 (ON to AR, nFL, MS/ Tx in FL & MD; subfossil? Ac or Tx in AL/grayfoot lancetooth)

***Haplotrema* (*H.*) *alameda* (*H. a. fieldi*)** Pilsbry, 1930) (epigeal? in Fresno & Tuolumne Cos., CA)

***Haplotrema (H.) costatum*** A.G. Smith, 1957 (\*C. #12-19, Tulare Co.,CA/ costate lancetooth/  
Tp)

***Haplotrema (Ancomena) keepi (Selenites vancouverensis var. k.*** Hemphill, 1890) H. Baker, 1930  
(Tx in Mendocino & Alameda Cos.,CA/Tx or Tp in Shasta Co.,CA/ glassy lancetooth)

***Haplotrema (Ancomena) minimum (Selenites vellicata & var. minim*** Ancey, 1888; *S.*  
*vancouverensis* Hemphill in Binney, 1892; *Circinaria* var. *kelseyi* Hemphill, 1911) H. Baker,  
1942 (Napa Co., midCA/Tx or Tp in Santa Cruz Co.,CA/CA lancetooth)

***Haplotrema*** undet. sp. (Ac or TTX in 2 caves in Mt. St. Helens area, WA)

***Haplotrema vancouverense*** I. Lea, 1839 (=Helix v. Lea, 1839; *Macrocyclus* v. Binney, 1878;  
*Circinaria* v. Pilsbry, 1908; *Helixvellicata* Forbes, 1850) Henderson, 1929 (Ac in WA/robust  
lancetooth),

*Hauffenia* (see *Phreatodrobia*),

***Hawaiiia*** Gude, 1911 - Zonitidae snails (also put in Vitrinidae) (25 species in US or Canada)

***Hawaiiia minuscula*** (A. Binney, 1840) Pilsbry, 1946 (KS, MN, OK, TX, e. to FL, ME/ Tx in IL?,  
KY(one cave); Tx or Ac in MO, TX/ minute gem/ extralimital fossil in Kokoweef C.,CA)

***Helebops*** F.G. Thompson, 1968 – Hydrobiidae snails

***Helebops*** undet. sp. (wFL marine infauna)

***Helisoma*** Swainson, 1840 - Planorbidae snails (2 species in US or Canada)

***Helisoma (H.) anceps a. (Planorbis a.*** Menke, 1830) (ne Canada to nFL, TX, nwMex.,w.to NT,  
Alberta, MT, OR/ two ridge rams-horn/ Tx in MD & OK; Tx or Ac in PA, MN)

*Helix* Linnaeus, 1758 - see *Polygyra*

***Helminthoglypta*** Pfeifer, 1857 - Helminthoglyptidae snails (69 species in US or Canada)

***Helminthoglypta allyniana a.*** (S.S. Berry, 1920) (= junior syn. of *H. willetti* S.S. Berry, 1920 or  
*H. petricola* S.S. Berry, 1916 according to one author) (epigean and Tx or Ac in cave in Tulare  
Co., CA/ Sierra shoulderband)

***Helminthoglypta (H.) cypreophila*** (W.G. Binney & Bland, 1869) (Tp in Amador, Calaveras,  
Shasta Cos., CA/ foothill shoulderband)

***Helminthoglypta (H.) crotalina*** S.S. Berry, 1928 (Ac or Tx in cave in Tulare Co., CA/  
sidewinder shoulderband)

***Helminthoglypta (H.) exarata*** (Pfeiffer, 1857) (Tx or Ac in cave in Santa Cruz Co.,CA/ Santa  
Cruz shoulderband)

*Helminthoglypta (H.) napaea* S.S. Berry, 1938

*Helminthoglypta (H.)* cf. *napaea yosemitensis* (Pilsbry, 1939) (Ac or Tx in cave in Mariposa Co.,CA/ bigtree shoulderband)

*Helminthoglypta (H.) ferrissi* Pilsbry, 1924 (Ac or Tx in cave in Mariposa Co.,CA/kings shoulderband),

*Helminthoglypta (H.) nickliniana n.* (I. Lea, 1838) (Ac or Tx in marine cave in Santa Cruz Co., CA/Coast Range shoulderband)

*Helminthoglypta (H.) nickliniana* (I. Lea, 1838)

*Helminthoglypta (H.) nickliniana anachoreta* (Lea, 1838) (Ac or Tx in marine cave in Napa Co., CA/ Coast Range shoulderband)

*Helminthoglypta proles* (Hemphill in W.G. Binney, 1892) (Ac or Tx in cave in Plumas Co., CA/ Yosemite shoulderband)

*Helminthoglypta* undet. sp. (Epigeal? in cave in Tuolumne Co.,CA)

*Helminthoglypta (H.) tularensis* (Hemphill in W.G. Binney, 1892) (Tx in Fresno & Tulare Cos.,CA/Tulare shoulderband)

*Helicina* Lamarck, 1799

*Helicina orbiculata o. & tropica = Oligyra o.*

*Helicodiscus* Morse, 1864 - Helicodiscidae snails (22 species in US or Canada)

*Helicodiscus (Troglodiscus) barri* Hubricht, 1962 (type locality cave in Dickson Co.,TN /nAL (Colbert, Lauderdale & Madison Cos.),nGA (Chattooga Co.) & scTN (Anderson, Davidson & Dickson Cos./ Tb on raccoon dung/ raccoon coil/ G1G2)

*Helicodiscus eigenmanni e.* Pilsbry, 1900 (type locality cave in Hays Co., TX +West,Mexico/Tp in TX/ Mexican coil)

*Helicodiscus hadenoecus* Hubricht, 1962 (type locality cave in Van Buren Co.,TN/Barren Co.(KY) & DeKalb, Van Buren, White, Jackson Cos.(TN) & Madison Co.(AL)/ cricket coil/ Tp, endogean, upper hypogean)

*Helicodiscus inermis* H. B. Baker, 1929 (= *H.ingleyanus i.* Baker) (GA,KS,NJ/Tp or Tx in AL, FL, MD, MI, MO, TX, VA; Tp in TN/ extralimital Pleist.? fossil in Kartchner Cave, AZ/ VA T&E S2 rank & global G4 rank/oldfield coil)

*Helicodiscus (Hebetodiscus) intermedius* Morrison, 1942 (= junior syn. of *H. inermis* according to Hubricht, 1962, 1985) (AL/TTp or Tp in cave in Uvalde Co., TX)

*Helicodiscus multidentis* Hubricht, 1962 (= *H. enneodon*) (type locality cave in DeKalb Co., TN/ seKY, neTN, swVA/ rock, Ed?, Tp? in DeKalb & Putnam Cos., TN/VA T&E S2 rank, & global G3 rank/twilight coil)

*Helicodiscus notius notius* Hubricht, 1962 (= *H.n.n.* Hubricht, 1985) (KS to TX, e. to MD, s. to Jamaica/ Ed, Tp in AL, FL, KY (Mammoth C.), MO, TN (/ tight coil)

*Helicodiscus notius specus* Hubricht, 1962 (\*\*\*)type locality cave in Barren Co.,KY & 2 caves in Sullivan Co.,TN/ Tb on cricket guano/ tight coil/ KY State T&E/ G1?)

*Helicodiscus parallelus* (*Helix lineata* Say, 1817; *Planorbis p.* Say, 1821; *Helix lineatus* Morese, 1864) Pilsbry, 1906 (MN s. TX, Fl n. to ME, eCanada/ Tp? in TN; Tx or Ac in AL, sOn; Tx in MD & OH; subfossil? /compound coil)

*Helicodiscus (Pseudiscus) punctatellus* Morrisson, 1942 (type locality cave in near Mammoth C./ scKY, ncTN/ Tp, glacial relict?/T N State T&E; KY Sensitive Species/ punctate coil)

*Helicodiscus shimeki* Hubricht, 1962 (epiean IA to ME, s. in Appalachians to WV /Tx or Ac in sON/ VA T&E/ temperate coil)

*Helicodiscus (Hebetodiscus) singleyanus* (Pilsbry, 1889) (epigean most of sUS/ Pleist.? fossil in Kartchner Cave, AZ)

*Helicodiscus* undescr. sp. or species (\*?near *H. barri* in cave in Rockcastle Co.,KY & caves in eTN/ Tb or Tp) **Bibl.:** Seibert 1973

*Helicodiscus* undet. sp. (cave in Murray Co.,OK)

*Helicodiscus triodus* Hubricht, 1958 (East in limestone rubble /Tp? in 2 caves in Greenbrier Co. & 1 cave in Monroe Co.,WV/ VA T&E S2 rank & global G3 rank; OK T&E S1? Species of Concern / tallus coil)

*Hendersonia* Dall, 1905 - Helicinidae snails (1 species in US or Canada)

*Hendersonia occulta* (*Helicina o.* Say, 1831; *H. oculina* Owen, 1852; *H. rubella* Green, 1832; *H.o. rubella* Morrison, 1928) H. Baker, 1922 (PA to NC,IA,TN, MI & ON(disjunct), WI/ Tx? in MD, WV/ MO T&E R/cherrystone snail or drop)

*Holospira* Martens, 1860 - Urocoptidae snails (24 species in US or Canada)

*Holospira arizonensis* Stearns, 1890 (Ac in Cochise Co.,AZ/ Arizona holospira)

*Holospira ferrissi* Pilsbry, 1905 (Tx mine in AZ/ stocky holospira)

*Holopsira* undet. sp. (Pleist.? fossil in Kartchner Cave, AZ)

*Holsingeria* Hershler, 1989 - Hydrobiidae snails, Subfamily Lithoglypinae (1 species in US)

**Holsingeria unthakensis** Hershler, 1988 (\*type locality cave in Lee Co.,VA, E?/ Tb/Unthanks Cave Snail/ VA T&E/ G1S2) **Bibl.:** Hershler & Thompson 1990

**Horatia** Bourguignat, 1887 (See *Phreatodrobia*). **Bibl.:** Binder 1957; Bole & Volkovrh 1986; Bouters 1974; Hubricht, 1940a (Old World genus, undetermined &/or undescr. species ascribed to this genus likely are in *Phreatodrobia*)

*Horatia micra* = *Phreatodrobia m.*

**Humboldtiana** Jhering, 1892 (threeband snails) Xanthonychidae snails

**Humboldtiana cheatumi** (*Lyrodes c.* Pilsbry, 1935) (Phantom Lake Spr. & spr. at Balmorhea, Reeves Co.,TX/cave fed spr./state park in part/Davis Mountain threeband)

**Hydrobia** Hartmann, 1821 - Hydrobiidae snails (2 species in US or Canada)

**Hydrobia minuta** (Totten, 1834) (interstitial in PQ salt marsh)

**Hydrobia truncata** (Vanatta, 1924) (Virginian marine infauna)

**Inflectarius** Pilsbry, 1939 = *Mesodon* in part. See Emberton 1910 (11 species in US or Canada)

**Inflectarius inflectus** (Say, 1821) (*Mesodon i.* Pilsbry, 1940; *M. i. mobilensis* (Clapp) Pilsbry, 1940; *M. i. edentatus* (Sampson) Branson, 1962 (Onondaga C., Crawford Co., MO/ IL, IN, KY, nFl to VA, sMI, eMO, eTX, eOK/ Tp in AL, IL, IN, KY (Mammoth C.), MO, OH, OK; Tp or Tx in KY/ lidded oval; shagreen)

**Kurtzia** Bartsch, 1944 - Conidae mollusk

**Kurtzia arteaga** (Dall & Bartsch, 1910) (East Pacific/ beaded mangelia/ AK marine infauna)

**Kurtziella** Dall, 1918 - Conidae mollusk

**Kurtziella limonitella** (Dall, 1884) (punctate mangelia/ Virginian marine infauna)

**Kurtziella cerina** Kurtz & Stimpson, 1851 (Virginian marine infauna)

**Kurtziella atrostyla** (Tryon, 1884) (brown-tip mangelia/ wFL Gulf of Mex. marine infauna)

**Laevapex** Walker, 1903 – Ancyliidae snails

**Laevapex fuscus** (C.B.Adams, 1841) (dusky ancyliid/ Virginian marine infauna)

**Lartetia** Bourguignat, 1869 - Hydrobiidae snails (1 species in US or only in Laurasia)

**Lartetia** undescr. sp. (= *Fontigens turritella*?) (\*Skyline C., Warren Co.,VA/Tb)

**Leptachatina** Pease, 1870 - Amastridae snails

**Leptachatina** undet. sp (amastrid land snail/ subalpine lava tube, HI)

**Leptoxis** Rafinesque, 1819 (= *Mudalia*) Pleuroceridae snails (25 species in US or Canada)

**Leptoxis** (*Mudalia*) *carinata c.* (Bruguiere, 1792) (= *Discus patula*; *Helix p.* Deshayes, 1830) NY to NC, SC?/ (Tx in PA/crested mudalia),

*Leptoxis (Mundalia) carinata nickliniata* (I. Lea, 1841) (Hot Sprs., Bath Co., VA/ phreatophile?)

*Lithasia* Haldeman, 1840 (= *Angitrema*, *Athearnia*, *Eurycaelon*, *Glittella*, *Megara*, *Meseschiza*)  
Pleuroceridae snails (10 species in US or Canada)

*Lithasia (L.) obovata* (Say, 1829) (OH River and tributaries in IL, IN, KY, OH, PA, TN/ Tx or Tp in DeKalb Co.,TN; (Tx or Ac in one KY cave)/ Shawnee rocksnail)

*Lithasia (Angitrema) verrucosa* (Rafinesque, 1820) (branch of OH River near Cincinnati to lower part of river/lower Wabash River; lower eTN headstreams of TN River to Marshall Co, KY; Black & Spr. Rivers, AR/ subfossil? Ac or Tx in AL/Varicose Rocksnail/ AL T&E; GA,KY & TN Species of Concern)

*Littoridinops* Pilsbry, 1952 - Hydrobiidae snails

*Littoridinops palustris* F.G. Thompson, 1968 (bantam hydrobe/ wFL marine infauna)

*Littoridinops tenuipes* (Couper, 1844) (henscomb hydrobe/ Virginian marine infauna)

*Littorina* Ferussac, 1822 - Littorinidae snails (10 species in US or Canada)

*Littorina (L.) irrorata* (Say, 1822) (marsh periwinkle/ wFL marine infauna)

*Littorina* undet. sp. or species (ME sea caves; WA marine infauna)

*Littorina ziczac* (Gmelin, 1791) = *Nodilittorina z.*

*Lyogyrus* Gill, 1863 - Hydrobiidae snails, subfamily Amnicolinae (9 species in US or Canada)

*Lyogyrus retromargo* (*Amnicola r.* F.G.Thompson, 1968) Hershler & Thompson, 1990 (FL peninsular w. of St. John's River in Clay & Putnam w. to Dixie Co./ Tp in Shallow Spr.,Hamilton Co.,FL/indented duskysnail)

*Lymnaea* Lamarck, 1799; *Lymnaea caperata* = *Stagnicola c.*; *Lymnaea catascopium* = *S. c.* ;  
*Lymnaea elodes* = *S. e.* ; *Lymnaea humilis* = *Fossaria h.*; *Lymnaea modicella* = *F. m.*  
*Lymnaea (Fossaria) parva* = *F. p.* ; *Lyrodes cheatumi* = *Humboldtiana c.*

*Macromphalina* Cossman, 1888 (= jr. syn. of *Megalomphalus*) – Vitrinellidae snails

*Macromphalina floridana* Moore, 1965 = *Megalomphalus floridanus*

*Marginella* Lamarck, 1799 - Marginellidae

*Marginella lavalleenana* (wFl Gulf of Mex. marine infauna)

*Marginella aureocincta* Stearns, 1872 (wFl Gulf of Mex. marine infauna)

*Marginella apicina* Menke, 1828/ Virginian marine infauna)

*Marstonia* F.C. Baker, 1926 - Hydrobiidae snails, Subfamily Nymphophilinae

*Marstonia ogmorphaphe* = *Pyrgulopsis o.*



**Megalomphalus** Brusina, 1871 – Vanikoridae snails

**Megalomphalus floridanus** (*Macromphalina floridana* Moore, 1965) (Florida macromphaline/wFL Gulf of Mexico infauna)

**Megomphix** H.B.Baker, 1930 - Megomphicidae snails (3 species in US or Canada)

**Megomphix californicus** (A.G. Smith, 1960) (= *Glyptostoma (Megomphix) californicum*) (nCA/ Natural Bridge megomphix/ Ac or TTx in Trinity Co., CA)

**Melanochlamys** Cheesman, 1881 – Aglajidae snails

**Melanochlamys diomedea** (Bergh, 1894) (East Pacific/ albatross aglaja/ AK marine infauna)

**Melanoides** Olivier, 1804 - Thiaridae snails (1 species in US or Canada)

**Melanoides tuberculatus** (Mueller, 1774) (alien from seAsia, now in TX,AZ/ Tx? in FL/red-rim melania)

**Melongena** Schumacher, 1817 – Melongenidae snails

**Melongena corona** (Gmelin, 1791) (crown conch/ wFL Gulf of Mex. marine infauna)

**Menetus** H. & A. Adams, 1855 - Planorbidae snails

**Menetus sampsoni** = *Micromenetus s.*

**Mesodon** Rafinesque, 1821 (in part = *Appalachina* Pilsbry, 1939; *Inflectarius* Pilsbry, 1939; *Patera* Albers, 1850 in part) Polygyridae snails (10 species in US or Canada) **Bibl.:** Emberton 1988

**Mesodon appressus a.** = *Patera appressa*

**Mesodon elevatus** (Say, 1821) (subfossil? Ac or Tx in AL/proud globe)

**Mesodon clausus** (Say, 1821) (OH to AL, w. toMN, OK, mostly transappalachian from Gulf Coastal Plain to n.Interior Basin/ subfossil? Ac or Tx in AL/yellow globelet),

**Mesodon elevatus** (Say, 1821) (SE, n. to KY/ Tx or Ac in one KY cave/ proud globe)

**Mesodon inflectus** (Say, 1821) = *Inflectarius inflectus* P.1940 (*M. i. mobilensis* (Clapp) Pilsbry, 1940; *M. i. edentatus* (Sampson) Branson, 1962 (Onondaga C. (type locality), Crawford Co.,MO/epigean in AL, IL, IN, KY, nFl to VA, sMI, eMO, eTX, eOK/ Tp in AL, IL, IN, KY (Mammoth C.), MO, OH, OK; Tp or Tx in KY/lidded oval)

**Mesodon laevior** (*Mopalia l.* Pilsbry, 1918) (SE, n. to KY/ Tx in KY(Mammoth C.))

**Mesodon normalis** (Pilsbry, 1900) (*Polygyra andrewsae normalis*) (SE, n. to KY/ grand globe/ Ac or Tx in cave in Claiborne Co.,TN)

**Mesodon pallifera** = *Megapallifera mutabilis*?

*Mesodon perigraptus* (Pilsbry, 1894) Pilsbry, 1940 (SE, n. to MO/ logs, leaf litter, urban, Tx in AL, GA, MO, TN; subfossil? Ac or Tx in AL/engraved bladetooth)

*Mesodon rugeli* (Shuttleworth, 1852) (subfossil? Ac or Tx in AL/deep tooth shagreen)

*Mesodon roemeri* (*Cylindrella r.* Pfeiffer, 1848; *Holospira r.*) (NM & TX epigeal/ Tx in TX/ Texas oval)

*Mesodon sargentianus* (C.W. Johnson & Pilsby, 1892) Pilsbry, 1940 (= *Triodopsis obstricta occidentalis*; *Pergulopsis s.*) (neAL/ Ttp,Cp/ grand bladetooth)

*Mesodon* undet. sp. or species (Tx, Tp or Ac in nMS, PA; Ttx in MO (Carter Co.); Ac, Tx or Tp in GA (Walker & Bartow (or *Triodopsis*) Cos.))

*Mesodon thyroidus* (Say, 1816) (TX to MN, e. to cFL, New England/ Tx in FL, eMO/ white-lip globe)

*Mesodon zaletus* (A. Binney, 1837) Pilsbry, 1940 (*M. z. ozarkensis* Pilsbry & Ferris,) (E river bluffs, ravines, mts., QB, ON s. to mostly Appalachians /Tx in MO; Tx or Ac in PA/ toothed globe) **Bibl.:** Pilsbry, 1949; Branson, 1962

*Mesomphix* Rafinesque, 1818 – Zonitidae snails (also put in Vitrinidae) (14 species in US or Canada)

*Mesomphix californicus* = *Glyplostoma c.*

*Mesomphix inornatus* (*Helix i.* Say, 1821; *Zonites i.* Binney, 1900; *Omphlin i.* Walker, 1906) Pilsbry, 1911 (ON, QB, VT s. to VA, w. to IN, OH, KY, TN/ Ac or Tx in MD/ plain button)

*Mesomphix vulgatus* (*H. perlaevis v.* H.B. Baker, 1933; *Helix laevigata* Rafinesque; M.l. Ferussac, 1821; *Zonites l.* Binney, 1878; *H. lucubrata* Binney, 1851) (PA to FL, w. to IL, LA/ subfossil? Ac or Tx in AL/common button)

*Micromenetus* F.C. Baker 1945 - Planorbidae snails) (5 species in US or Canada)

*Micromenetus sampsoni* (*Menetus (Micromenetus) s.* "Ancey" Sampson, 1885; *Menetus s.* Sampson, 1913) (classification uncertain) (AR, IL/ Tx in MO)

*Millerelix* Pratt, 1981 (once a subgenus of *Polygyra*) Polygyridae snails) (11 species in US or Canada)

*Millerelix dorfeuilliana* (*Polygyra d.* I. Lea, 1838) Pilsbry, 1940 (Tx in MO, OK/ oakwood liptooth)

*Millerelix mooreana* (*Polygyra m.* W. G. Binney, 1858) (Tx & paleo in cave in Val Verde Co., TX/ grassland liptooth)

***Millerelix troostiana*** (= *Polygyra t.*) (Moricand, 1833) (Nashville lipetooth/ Tx or Ac in cave Edmondson Co.,KY)

*Mitrella* Risso, 1826 – Columbelloidea snails  
*Mitrella lunata* (Say, 1826) = *Astyris l.*

***Modulus*** Gray, 1842 – Modulidae snails  
***Modulus modulus*** (Linnaeus, 1758) (buttonsnail/ wFL Gulf of Mexico infauna)

***Monadenia*** Pilsbry, 1897 - Xanthonychidae snails) (15 species in US or Canada)

***Monadenia (Shastelixa) churchi*** Hanna & A.G. Smith, 1933 (Epigeal? & Tx in Shasta & Trinity Cos., CA/ sensitive sp./Klamath sideband)

***Monadenia (Corynadenia) circumcarinata*** (Stearns, 1879) (keeled sideband/Epigeal? & Tx or Ac in Tuolumne Co., CA)

***Monadenia (M.) fidelis f.*** (Gray, 1834) (CA,OR,WA/Pacific sideband/ Tx or Ac in WA)

***Monadenia (C.) hillebrandi*** (Newcomb, 1864) (Epigeal? & Tx or Ac in cave in Fresno Co.,CA/ Mariposa sideband)

*Monadenia (C.) hillebrandi mariposa* = *M. mariposa*

***Monadenia (Corynadenia) mariposa*** A.G. Smith, 1957 (=M. hillebrandi m.) (Epigeal? & Tx in Naruoisa & Tuolumne Cos.,CA/ Mariposa sideband),

***Monadenia (M.) marmoratis*** S.S. Berry, 1940 (marble sideband) (Epigeal? & Tx in Siskiyou Co., CA/ Sierra sideband)

*Monadenia mormonum hillebrandi* (Newcomb, 1864) = *M.h.*  
***Monadenia (Corynadenia) mormonum m.*** (Pfeiffer, 1857) (Sierra sideband/ Tp in CA;/ Sierra sideband)

***Monadenia*** undescr. sp. (■*rothii*•Frest, 1999) (epigeal in Josephine Co./ Tx in OR C., OR)

***Monadenia (Shastelixa) troglodytes t.*** Hanna & A.G. Smith, 1933 (fossil type in Samwel C.,CA/ Shasta sideband/ Federal T&E Candidate Category 2/TTp? in CA, common near or in c. mouths/ Shasta sideband) Roth 1981

***Monadenia (Shastelixa) troglodytes wintu*** Roth, 1981 (likely Tx in nSierras, CA)

***Monadenia (Corynadenia) tuolumneana*** (S.S. Berry, 1955) (epigeal? & Tx or Ac in Tuolumne Co., CA/ Tuolumne sideband)

**Nassarius** Dumeril, 1806 - Nassariidae snails

**Nassarius acutus** (Say, 1822) (sharp nassa/ TX Gulf of Mex. marine infauna)

**Nassarius albus** (Say, 1826) (white nassa/ wFL Gulf of Mex. marine infauna)

**Nassarius mendicus** (Gould, 1850) (lean western nassa/ AK marine infauna)

**Nassarius obsoletus** (Say, 1822) (eastern mudsnail/ NC, Virginian marine infauna)

**Nassarius trivittatus** (Say, 1822) (threeline mudsnail/ RI marine infauna)

**Nassarius vibex** (Say, 1822) (bruised nassa/ MA, NC (rare), wFL, TX Gulf of Mex. rare marine infauna)

**Natica** Scoploi, 1777 – Naticidae snail

**Natica clausa** Broderip & Sowerby G.B.I, 1829 = *Cryptonatica affinis*

**Natica pusilla** = *Tectonatica p.* Say, 1822 (wFL Gulf of Mexico infauna)

**Nematodiscus** (Pilsbry, 1948 (as subgenus of *Discus*; still treated as such by Turgeon et al. 1998)) Discidae snails

**Nematodiscus** (*Nematodiscus*) *selenitoides* (*Zonites s.* Pilsbry, 1890; *Discus (N.) s.* Pilsbry, 1948; *Goniodiscus s.* H. Baker, 1929) (epigean in Mariposa Co.,CA/Tp? in cave in Mariposa Co.,CA/ file disc)

**Neohelix** von Ihering, 1892 (once a subgenus of *Xolostrema*) Polygyridae snails) (7 species in US or Canada)

**Neohelix albolabris** (*Polygyra a.* Say, 1816; *Triodopsis albolabris*; Pilsbry, 1940; *Xolostrema a.a.* Webb, 1952) Emberton, 1988 (IN,E wooded hill sides, ravines, under logs,rocks,leaf litter, urban/Tx or Ac in sON, PA; Tx in KY, MD, VA; subfossil? Ac or Tx in AL/western whitelip)

**Neohelix alleni** (Sampson, 1883 or Wetherby in Sampson, 1883; *Polygyra a.* Hubricht, 1965 (*T.albolabris allenis* Pilsbry, 1940; *X. albolabris allenis* Webb, 1952) Emberton, 1988 (same habitat as *T.albolabris*/ Tx in MO/western whitelip)

**Neritilia** Van Martens, 1879 - Neritidae snails, Subfamily Neritiliinae

**Neritilia hawaiiensis** E.A. Kay, 1979 (anchialine pools Awakee-Paeula, Haena, Luahinewai) s.of Kakoko Point, HI Island/ HI Species of Concern S1.1, global G1)

**Neritilia** undescr. sp. #1 & #2 (HI anchialine pools/HI T&E S1?, global G1?)

**Nesovitrea** Cooke, 1921 – Zonitidae snails (also put in Vitrinidae) (4 species in US or Canada)

**Nesovitrea binneyana** (*Retinella b.* E.S. Morse, 1864) Hubricht, 1962 (ME to PA, w. to CA, WA/ Tx or Ac in sON; Tx in OH/ blue grass)

**Neverita** Risso, 1826 – Naticidae snails

*Neverita duplicata* (*Polinices duplicatus* Say, 1822) (shark eye/ LA, MD, NC, Virginian marine infauna)

*Nodilittorina* Martens, 1897 – Littorinidae snails

*Nodilittorina ziczac* (Gmelin, 1791) (*Littorina z.*) (zebra periwinkle/ TX marine infauna)

*Novisuccinea* Pilsbry, 1948 - Succineidae snails (4 species in US or Canada)

*Novisuccinea* undescr. sp. (N. "Minnesota A" Hoagland & Davis, 1987) ((glacial relict calciphile in non-cave cracks & crevices in 13 sites in Fillmore & Olmstead Cos., MN & Winneshiek Co., IA/ Minnesota Pleistocene ambersnail)

*Novisuccinea* undescr. sp. (N. "Minnesota B" Hoagland & Davis, 1987) ((glacial relict calciphile in non-cave cracks & crevices in 17 sites in Fillmore & Olmstead Cos., MN & Winneshiek Co., IA/ Minnesota Pleistocene ambersnail)

*Odostomia* Fleming, 1813 - Pyramidellidae snails

*Odostomia engonia* Bush, 1885 (Virginian (rare), MA marine infauna)

*Odostomia gibbosa* Bush, 1909 (Virginian, FL, TX Gulf of Mex. marine infauna)

*Odostomia engonia* (Virginian marine infauna)

*Odostomia impressa* Say, 1822 (LA marine infauna)

*Odostomia seminuda* (C.B. Adams, 1839) (LA marine infauna)

*Odostomia* undet. sp. (AK marine infauna)

*Ogaridiscus* Chamberlin & Jones, 1929 (once a subgenus of *Pristiloma*) Zonitidae snails (2 species in US or Canada)

*Ogaridiscus subrupicola* (*Hyalina s.* Dall, 1877) Riedel, 1980 (*Ogaridiscus s.* Chamberlin & Jones, 1929; *Vitrea s. var. s.* Dall, 1895)) (type locality cave in Tooele Co., UT & epigena in ID & OR/ southern tightcoil/ Tx or Tp?)

*Ogaridiscus spelaeum* Dall, 1895 (also subsumed in *P. subrupicola*) = *Pristiloma spelaeum* & *P. juniperum*)

*Oligyra* Say, 1818 - Helicinidae snails (1 species in US)

*Oligyra orbiculata* Say, 1818 (*H. hanleyana* Pfeiffer, 1848; *Helicina o.* Say, 1852; *O. tropica* Pfeiffer, 1852) (AR, SE, OK, TN, Mex./ Tx in TX/globular drop)

*Onobops* F.G. Thompson, 1969 – Hydrobiidae snails

*Onobops* undet. sp. (wFL brackish marine infauna)

*Oreohelix* Pilsbry, 1904 - Oreohelicidae snails (41 species in US or Canada)

*Oreohelix handi* Pilsbry & Harris, 1918 (extralimital fossil in Kokoweef C., CA/ spring mountainsnail)

*Oreohelix strigosa* (Gould, 1846) (rocky mountainsnail/ Ttx? in CO)

*Orygoceras* Brusina, 1882 - Hydrobiidae snails, Subfamily Nymphophilinae (1? species in US)  
*Orygoceras* undescr.? sp. (Roaring Spr., Real Co., TX/ phreatophile?)

*Paravitrea* Pilsbry, 1898 Zonitridae snail (also put in Vitrinidae) (41 species in US or Canada)

*Paravitrea petrophila* (*Zonites p.* Bland, 1883; *Z. p. sinistrorsus* Cockerell, 1893; *Vitrea p.* Pilsbry, 1906) Binney, 1885 (SE n. to VA, TX/ Tx, Ac or alien Tp in TX/ Cherokee supercoil)

*Paravitrea significans* (Bland, 1866) Pilsbry, 1946 (AR, IL, IN, OK, TN epigeal /domed supercoil/ Tx in MO)

*Paravitrea* undet. sp. (MS/Tp)

*Parvanachis* Radwin, 1968 (also treated as subgenus of *Anachis*) – Columbelloidea snails  
*Parvanachis elongata* (*Anachis elongata* C.B. Adams, 1845) (wFL Gulf of Mex. marine infauna)

*Parvanachis obesa* (*Anachis o.* C.B. Adams, 1845)(fat dovesnail/ wFL, Virginian (rare) Gulf of Mexico infauna)

*Paranachis ostreiocola* (*Anachis o.* Sowerby, 1882 (oyster dovesnail/ wFL, TX Gulf of Mex. marine infauna)

*Patera* Pilsbry, 1939 (= *Mesodon* in part according to some authors) Polygyridae snails, Subfamily Polygyrinae, Trube Vespericonini (14 species in US or Canada)

*Patera appressa* (*Polygyra a.* Say, 1821) Pilsbry, 1940 (VA to IN, s. to nAL/ TTx in TN, KY (Mammoth & 3 other caves) / talus, river bluffs, roadsides, urban/ flat bladetooth)

*Patera sargentiana* (C.W. Johnson & Pilsby, 1892) Emberton, 1991 (*Mesodon* & *Pergulopsis sargentianus*) (Jackson & Madison \*\*Co., AL/ grand bladetooth/ federal Species of Concern T&E/ Tp),

*Pallifera mutabilis* & *ragdalei* = *Megapallifera m.* & *r.*

*Petitilla* Wise, 1996 –Pyramidelloidea snails

*Petitilla crosseana* (Dall, 1885) (*Sayella c.*) (TX Gulf of Mexico marine infauna)

*Philine* Ascanius, 772 - Philinidae snail (15 species in US or Canada)

*Philine bakeri* Dall, 1919 (WA marine infauna)

*Philine sinuata* Stimpson, 1850 (ME, MA, CT sublittoral marine interstitial)

*Phreatoceras* Hershler and Longley, 1986 (= *Hadoceras*) Hydrobiidae snails, Subfamily Lithoglypinae (1 species in US)

*Phreatoceras taylori* (= *Hadoceras t.* Hershler & Longley, 1986) Hershler & Longley, 1987 ((Roaring Spr., 7.6mi.w. of Camp Wood/Nueces & Brazos R. Basins, \*Real Co.,scTx/ Tp, Pb, springs?/ nymph trumpet)

*Phreatodrobia* Hershler in H. & Longley, 1986 - Hydrobiidae snails, Subfamily Lithoglypinae (9 species in US)

*Phreatodrobia conica* Hershler & Longley, 1986 (Hueco Spr., Comal Co.(Edwards (Balcones Fault Zone) & possibly Cow Cr. Aquifers in Comal & Bexar Cos., TX/ Pb/ Hueco cavesnail/ G1)

*Phreatodrobia coronae* Hershler & Longley, 1987 (cavesnail/ sprs. near Del Rio, Val Verde Co.,swTX/ Pb/ G1)

*Phreatodrobia imitata* Hershler & Longley, 1986 (= *Physa i.*) (Verstraeten Well, Edwards Aquifer (Falcones Fault Zone) in the \*Von Army Section of Bexar Co., TX/ Pb/ mimic cavesnail/ G1)

*Phreatodrobia micra* (*Hauffenia m.* Pilsbry & Ferriss, 1906; *Valvata* & *Horatia m.* ) Hershler & Longley, 1986 (drift on Guadalupe R.,4mi.n.of New Braunfels +Artesian Well & caves and groundwater in Hays, Comal & Kendall Cos.,sTX/ Tb G3 or G2G3/ flattened cavesnail) **Bibl.:** Pilsbry 1916

*Phreatodrobia nugax n.* (*V.micra n.* Pilsbry & Ferriss, 1906; *Horatia n.* Taylor, 1975) Hershler & Longley, 1986 (drift debris of Guadalupe R.,(Comal Co.)+Travis, Hays, Kendall, Bexar, Uvalde Cos.,\*scTX/ phreatic G3T3/ domed cavesnail)

*Phreatodrobia nugax inclinata* Hershler & Longley, 1986 (\*Longhorn Portland Cement Co.well/ domed cavesnail/ Pb/ G1)

*Phreatodrobia plana* Hershler & Longley, 1986 (San Marcos Spr.,Hays Co.,Edwards Aquifer (Falcones Fault Zone) & poss. Glen Rose Aquifer in Hays & Comal Cos., TX/ Pb G1 or G3T3/d isc cavesnail)

*Phreatodrobia punctata* Hershler & Longley, 1986 (San Marcos Spr.,Hays Co.,Edwards Aquifer (Falcones Fault Zone) in Hays & Travis Cos., TX/ Pb G3 or (less likely) G1/ high-hat cavesnail)

*Phreatodrobia rotunda* (= *Physa r.*) Hershler & Longley, 1986 (San Marcos Sprs. & cave in Comal Co., \*Edwards (Balcones Fault Zone) Aquifer, Bexar & Hays Co.,TX/ Pb/ beaked cavesnail)

*Phreatodrobia?* undet. sp. (near *Horatia*) ( artesian well at San Marcos, TX/Pb?) Hubricht, 1940  
*Phreatodrobia?* undescr. sp. (near *Horatia*) (\*?cave in De Kalb Co., Al/Pb) **Bibl.:** Hubricht 1940

*Physa* Draparnaud, 1801 (most sp. also put in *Physella*) Physidae snails (6 species in US or Canada) **Bibl.:** Dawson, 1911; D. Taylor, 1988

*Physa anatina* = *Physella gyrina a.*; *Physa aurea* - see *Physella*  
*Physa heterostropha* = *Physella h.*; *Physa spelunca* = *Physella s.*

*Physa* undet. sp. (Tp in MO, WV/ Tx or Ac; Tx or Ac in MN)

*Physella* Haldeman, 1843 - Physidae snails (33 species in US or Canada)

*Physella gyrina* (Say, 1821) (tadpole physa)

*Physella (P.) gyrina aurea* (*Physa aurea* & *gyrina* Say, 1821; *P. crocata* Clench & Turner, 1956)  
(E to AL,MT/Ac or Tx in AR, sON, MO; n. extralimital fossil in Moore Pit (Dallas Co.), TX/  
tadpole physa)

*Physella (P.) gyrina anatina* (Lea, 1864) (WI,SD sw to CO, NV; TX,AR n to IL,NB/ Tx in  
AR, TX)

*Physella heterostropha* (*Physla h.* Say, 1817) (PA spr./ pewter physa/ Pb?, Tx or Ac in 2 caves  
in WV)

*Physella spelunca* (*Physa s.* R. Turner & Clench, 1974) (\*type locality cave in Big Horn  
Co., WY/Pb, Tb?/cave physa)

*Physella* undet. sp. (CO hyporheic)

*Physella virgata* v. (Gould, 1855) (NB w.to CA, MT, e.to TX, n.to KS/Tx in OK, TX/protean  
physa)

*Planorbella* Haldeman, 1840 - Planorbidae snails (20 species in US or Canada)

*Planorbella armigera a.* (Say, 1821) (NB w.to seOn, w.to SK, nw to Mackenzie R., s.to GA, LA,  
w.to NB, MT/n. extralimital fossil in Moore Pit, TX/ thicklip rams-horn)

*Planorbella campestris* (Dawson, 1875) (= *Discus c.*) (meadow rams-horn/ TTx or Ac in  
Coronation Island c., seAK)

*Pleurocera* Rafinesque, 1818 - Pleuroceridae snails (19 species in US or Canada)

*Pleurocera canaliculata* (Say, 1821) (Tx or Ac in one KY cave/ silty hornsnail)

*Polinices* Montfort, 1810 – Naticidae snails

*Polinices duplicatus* (Say, 1822) = *Neverita duplicata*

*Polinices mamillaris* (Lamarck, 1822) (NC marine infauna)

*Polinices pallidus* (Broderip and G.B. Sowerby I, 1829) (palen moonsnail/ AK marine infauna)

*Polygyra* Say, 1818 (= *Daedalochila* Beck, 1837 in part) Polygyridae snails

*Polygyra appressa* - See *Mesodon*; *Polygyra dorfueilliana* = *Millerelix d.*



*Polygyra hirsuta* = *Stenotrema hirsutum*; *Polygyra mooreana* = *Millerelix m.*

***Polygyra*** undet. sp. (Tx or Ac in Mammoth C.,KY)

*Polygyra tamaulipasensis* = *Daedalochila t.*; *Polygyra texasiana* = *Daedalochila triodontoides*

*Polygyra troostiana* = *Millerelix t.*

***Pomatiopsis*** Tryon, 1862 - Pomatiopsidae snails (5 species in US or Canada)

***Pomatiopsis lapidaria*** (*Cyclostoma l.* Say, 1817) (epigean aquatic in AL, GA, IA, IL, IN, KY, MO, MS, NC, eND, OK, sON, eSD, TN, VA, WI, WV; occasional occurrences in NM, nTX/ Tx or Ac in AR,OH/ slender walker)

***Pristiloma*** Ancey, 1887 – Zonitidae snails (also put in Vitrinidae) (13 species in US or Canada)

***Pristiloma cavator*** Roth, 1998 (extinct? Tx? /\* type locality cave in Shasta Co.,CA/ all fossil snails except one with dried flesh remains)

***Pristiloma*** (*Priscovitrea*) *chersinella* (*Helix c.* Dall, 1886; *Zonites c.* Binney, 1883) (southern & middle Sierras/Ac or Tx in Tuolumne Co.,CA/ black-foot tightcoil)

*Pristiloma juniperum* A.G. Smith, 1957 = junior syn. of *P. spelaeum*

***Pristiloma*** (*Priscovitrea*) cf. *nicholsoni* H.B. Baker, 1930 (*P. (Priscovitreaops) n.* Baker, 1931) (epigean? in Santa Cruz Co.,CA/ riparian tightcoil)

***Pristiloma*** undet. sp. (Epigean? in Shasta & Tuolumne Cos.,CA)

*Pristiloma subrupicola* = *Ogaridiscus s.*

***Pristiloma*** (*Priscovitrea*) *spelaeum* (Dall, 1895) (*P. subrupicola* ssp. *spelaeum*; *Vitrea s.* var. *spelaea*; *Ogaridiscus subrupicola*) (type locality cave in Calaveras Co.& cave in Plumas Co., CA/Tx?/ southern tightcoil/ Tp or Tx)

***Promenetus*** F.C. Baker, 1935 - Planorbidae snails (2 species in US or Canada)

***Promenetus umbilicatellus*** (Cockerell, 1887) (AK s. to OR, nUT, CO, NM, eOK, e to eOH, wNY, AB, SK, MB, TX/ umbilicate sprite/ TTx or Ac in Prince of Wales Island cave, seAK)

*Prophysaon* - see slug

***Prunum*** Herrmannsen, 1852 – Marginellidae snails

***Prunum apicinum*** (Menke, 1828) (queen marginella/ wFL Gulf of Mex. marine infauna)

***Punctum*** Pilsbry, 1898 - Punctidae snails (7 species in US or Canada)

***Punctum californicum*** Pilsbry, 1898 (Ep/Tx or Ac in CA/ribbed spot),

***Punctum randolphi*** (Dall, 1895) (conical spot/ Tx? in cave in Tooele Co.,UT)

***Pupilla*** Leach in Fleming, 1828 - Pupillidae snails, Subfamily Pupillinae (5 species in US or Canada)

***Pupilla blandi*** E.S. Morse, 1865 (Pleistocene extralimital fossil in Dry Cave, NM/ rocky mountain column)

***Pupilla (P.) hebes*** (Ancey, 1881) extralimital fossil in Kokoweef C., CA/ crestless column)

***Pupisoma*** Stoliczka, 1873 - Pupillidae snails, Subfamily Pupillinae (3 species in US or Canada)

***Pupisoma dioscoricola*** (*Helix d.* C. B. Adams, 1845; *H. punctum* Morelet, 1851; *Microphysa d.* Binney; *P. americanum* Moellendorff, 1899) P., 1920 (FL, TX, Mex./s. extralimital fossil in Moore Pit, TX/ yam babybody)

***Pupoides*** Pfeiffer, 1854 - Pupillidae snails, Subfamily Pupillinae (4 species in US or Canada)

***Pupoides albilabris*** (C.B. Adams, 1841) (36,000 +/- 360 yrs. B.P. in Kartchner C., sAZ)

***Pupoides*** undet. sp. (C.B. Adams, 1841) (36,000 +/- 360 yrs. B.P. in Kartchner C., sAZ)

***Pupoides hordaceus*** (Gabb, 1866) (Pleistocene extralimital fossil in Dry Cave, NM/ ribbed dagger)

***Pyramidella*** Lamarck, 1799 –Pyramidellidae snails

***Pyramidella crenulata*** (Holmes, 1860) (MA, wFL, TX Gulf of Mex. marine infauna)

***Pyrgocythara*** –Woodring, 1928 – Conidae snails

***Pyrgocythara plicosa*** (C.B. Adams, 1850) (plicate mangelia/ wFL Gulf of Mexico infauna)

***Pyrgospira*** Swainson, 1840 -Turridae snails

***Pyrgospira ostrearum*** (*Crassispira ostrearum* Stearns, 1872) (Virginian marine infauna)

***Pyrgulopsis*** Call & Pilsbry, 1886 (= *Fontelicella*, *Pygophorus*) (Springsnails) Hydrobiidae snails, Subfamily Nymphophilinae (68 species in US or Canada) **Bibl.:** Frest 1995; Hershler 1994; Taylor 1966; Thompson 1968

***Pyrgulopsis chupaderae*** (*Fontelicella c.* Taylor, 1987) Hershler, 1994 (Chupadera springtail; pyrg snail/ NM/ spring, Pb?)

***Pyrgulopsis fairbanksensis*** Hershler & Sada, 1987 (\*Fairbanks Spr., Ash Meadows karstic sprs., Nye Co., NV/ Fairbanks springsnail/ federal Species of Concern T&E)

***Pyrgulopsis gilae*** (*Fontelicella g.* Taylor, 1987) Hershler, 1994 (Gila springsnail, snail or pyrg / NM/ federal Species of Concern T&E/ Pb?)

***Pyrgulopsis hendersoni*** (*Amnicola h.* Pilsbry, 1933; *Fontelicella h.*) (\*Point of Rocks spr. complex, Ash Meadows karstic sprs., Nye Co., NV/ Harney Lake springsnail/ federal Species of Concern T&E)

*Pyrgulopsis isolata* Hershler & Sada, 1987 (\*Ash Meadows karstic spr.,Nye Co.,NV/ elongate-gland springsnail/ federal Species of Concern T&E/)

*Pyrgulopsis montezumensis* Hershler in Hershler & Landye, 1988 (\*Montezuma Well, Yavapai Co., AZ/Pb/Montezuma Well springsnail/ federal Species of Concern)

*Pyrgulopsis morrisoni* Hershler, 1988 (Page s., AZ/ federal Species of Concern T&E/ spring, Pb?)

*Pyrgulopsis nanus* Hershler & Sada, 1987 (\*Ash Meadows karstic sprs.,Nye Co.,NV/ distal gland springsnail)

*Pyrgulopsis ogmorphaphe* (*Marstonia o.* Thompson, 1977) (Owen Spr., Sequatchie, Marion Co.,TN/ karst spring, phreatophile?)

*Pyrgulopsis pachyta* (*Marstonia p.* Thompson, 1977) (armored marstonia or snail/ AL spr./federal Species of Concern T&E/ e T&E)

*Pyrgulopsis pecosensis* (*Fontelicella p.* Taylor, 1987) (karstic Blue Spring, Eddy Co., NM/ Pecos springsnail)

*Pyrgulopsis roswellensis* Taylor, 1987 (Roswell spring, NM/ spring, Pb?)

*Pyrgulopsis sargentianus* = *Patera s.*

*Pyrgulopsis thermalis* Taylor, 1987 (NM/spring,Pb/ New Mexico hot springsnail or New Mexico hot spring pyrg/ federal Species of Concern T&E)

*Pyrgulopsis thompsoni* Hershler, 1988 (Huachuca s./AZ/spring,Pb?)/ federal Species of Concern T&E),

*Rabdotus* Albers, 1850 – Bulimulidae snails (also put in Orthalicidae)(4 species in US or Canada)

*Rabdotus dealbatus* (Say, 1821) (= *Bulimulus a. mariae* Pilsbry, 1946; *B.a.* Hubricht, 1960); *R.a.a.*, *R.a. hesperius* Pratt, 1969) (Central and Southern US, Mexico epigeal/ Tx in MO/ KY State T&E/ whitewash rabdotus)

*Retinella* (see *Nesovitrea*, *Glyphyalina c.,p.*)

*Retusa* T. Brown, 1827 – Retusidae snails  
*Retusa canaliculata* (Say, 1826) (FL marine infauna)

*Rictaxis* Dall, 1871 – Acteonidae snails  
*Rictaxis punctocaelatus* (Carpenter, 1864) (AK marine infauna)

*Rictaxis punctostriatus* (*Acteon* p. C.B. Adams, 1840) (pitted baby-bubble/ Virginian, wFL, TX Gulf of Mex. marine infauna)

*Sayella* Dall, 1885 – Pyramidellidae snails  
*Sayella crosseana* (Dall, 1885) = *Petitilla* c.

*Sayella chesapeakea* Morrison, 1939 (MA, Virginian marine infauna)  
*Sayella hemphillii* (Dall, 1884) (*S. livida* Rehder, 1935) (wFL Gulf of Mexico marine infauna)

*Sayella producta* (= *Odostomia* p. C.B. Adams, 1840) (odostome/ Virginian marine infauna)  
*Sayella chesapeakea* Morison, 1939/ Virginian marine infauna)

*Schwartziella* Ponder, 1985 - Rissoidae snails  
*Schwartziella catesbyana* (*Rissoina catesbyana* D'Orbigny, 1840) (LA, wFL Gulf of Mexico infauna)

*Sinum* Roding, 1798 – Naticidae snail  
*Sinum perspectivum* (Say, 1831) (white baby ear/ wFL Gulf of Mexico infauna)

*Sonorella* Pilsbry, 1902 (talusnails) Helminthoglyptidae snails (2? species in US or Canada) .  
**Bibl.:** W. Miller 1967

*Sonorella reederi* W. B. Miller, 1984 (type locality near Rampart Cave, Mohave Co.,AZ/ Tx? in AZ)

*Sonorella* undet. sp. or species (Pleist.? fossil in Kartchner Cave, AZ; late Pleist. or early to middle Holocene in Tse'an Bida C., Grand Canyon, nAZ)

*Speleodiscoides* A.G. Smith, 1957 - Discidae snails (1 species in US )  
*Speleodiscoides spirellum* A.G. Smith, 1957 (fossil type in Samwel C., CA/Tx or Tp in CA/glass coil). **Bibl.:** W.Miller 1972

*Stagnicola* Leach, 1830 - Lymnaeidae snails (24 species in US or Canada)  
*Stagnicola* (*Hinckleyia*) *caperata* (Say, 1829; *Lymnaea* c.) (PQ,MA w to CA,MT, n to Yukon, s. to MD, IN, CO/ extralimital (sub)fossil in TX/ wrinkled marshsnail)

*Stagnicola* aff. *catescopium* (*Lymnaea* c. Say, 1867 or 1817) (NS w. to ND; Great Slave Lake s. to nIA, nOH & MD/ Tx or Ac in PA/woodland pondsnailed)

*Stagnicola cockerelli* (Pilsbry & Ferris, 1906) (= *Fossaria cockerelli*) (Pleistocene TTx? In seNM)

*Stagnicola elodes* (*Lymnaea* e. Say, 1821) (New England w. to MT, OR, CA?, s. to NM, Canadian Interior Basin, MT/ marsh pondsnailed/ Ac or Tx in nON)

***Stenotrema*** Rafinesque, 1819 (= *Euchemotrema* Archer, 1939 in part, long used as subgenus of *S.*) Polygyridae snails (26 species in US or Canada)

*Stenotrema fraternum* = *Euchemotrema f.*

***Stenotrema hirsutum*** (*Helix h.* Say, 1817) Pilsbry, 1940 (MA, ON, s. to AL, w. to MN, KS, MS/ Tx or Ac in MD; Tx in KY, NJ/ hairy slitmouth)

*Stenotrema leai* = *Euchemotrema l.*

***Stenotrema morosum*** Hubricht, 1978 (valid species?, not listed in Turgeon et al., 1998) (neTN/ Pleist. to Recent fossil/Tb?)

***Stenotrema*** undet. sp. (Tp in nMS)

***Stenotrema spinosum*** (I. Lea, 1830) (AL, GA, TN, VA epigean / subfossil? Ac or Tx in AL/carinate slitmouth)

***Stenotrema stenotrema*** (Pfeiffer, 1842) (VA ot GA, w. to OH, MO, OK, LA/ subfossil? Ac or Tx in AL/ inland slitmouth)

***Stygopyrgus*** Hershler & Longley, 1986 - Hydrobiidae snails, Subfamily Littoridininae (1 species in US)

***Stygopyrgus bartonensis*** Hershler & Longley, 1986 (\*Barton Spr., Travis Co., scTX/ Pb/ Barton cavesnail)

***Succinea*** Draparnaud, 1801 - Succineidae snails (21 species in US or Canada)

***Succinea forsheyi*** I. Lea, 1864 (*S. haleana* Lea, 1864; *S. halei* Lea; *S. witteri* Shimek, 1913; *S. concordialis* Gould, 1848; *S. forsheyi* I. Lea, 1864; *Physa h.*) (SE to TX, AR epigean/ Tp in 2 caves in Monroe Co., IL & cave each in Crawford Co., MO & Christian Co., MO)/ spotted ambersnail) **Bibl.:** Rehder 1934

*Succinea* cf. *gabbi* = *Catinella g.*

***Tarebia*** Adams, 1854 - Thiaridae snails (1 species in US or Canada)

***Tarebia granifera*** (Lamarck, 1822) (seAsia alien/Tx? in FL/ quilted melania)

***Tectonatica*** Sacco, 1890 – Naticidae snails

***Tectonatica pusilla orbigny, 1842*** (*Natica p.* Say, 1822)(miniature moonsnail/ wFL Gulf of Mexico infauna)

***Texadina*** Abbott & Ladd, 1951 - Hydrobiidae snails

***Texadina sphinctostoma*** (Abbott & Ladd, 1951) (narrowmouth hydrobe/ AL, TX marine infauna)

***Texapyrgus*** Thompson & Hershler, 1991 - Hydrobiidae snails, Subfamily Cochliopinae (1 species in US)

***Texapyrgus longleyi*** Thompson & Hershler, 1991 (\*rheogene spr., Devils R., Slaughter Bend, Amistad Natl. Rec. Area, Val Verde Co., TX/ striated hydrobe/ Pb?),

***Thais*** Roding, 1798 - Muricidae snails

***Thais lapillus*** (Linnaeus, 1758) (ME sea cave)

***Tornatina*** A. Adams, 1850 – Cylichnidae snails

***Tornatina inconspicua*** (Olsson & McGinty, 1958) (wFL Gulf of Mex. marine infauna)

***Trichia*** Hartmann, 1840 - Helicidae snails (2 species in US or Canada)

***Trichia hispida*** (Linnaeus, 1758) (Ac alien in NS)

***Trilobopsis*** Pilsbry, 1939 - Polygyridae snails (5 species in US or Canada)

***Trilobopsis roperi*** (Pilsbry, 1889) (Shasta chaparral/Epigeal, Ttx in Shasta Co., CA/ Shasta chaparral),

***Triodopsis*** Rafinesque, 1819 - Polygyridae snails (27 species in US or Canada) **Bibl.:** Emberton 1988; Vagvolgyi 1968

*Triodopsis albolabris* = *Neohelix a.*; *Triodopsis alleni* = *N. a.*

*Triodopsis caroliniensis* = *Xolostoma c.*; *Triodopsis fosteri* = *X.f.*

***Triodopsis fraudulenta*** (Pilsbry, 1894) (NY to NC, w. to MI, MO/ Tx or Ac in PA; /baffled threetooth)

***Triodopsis hopetonensis*** (Shuttleworth, 1852) (VA, s. to AL/ Tx in FL/ magnolia threetooth)

***Triodopsis*** undet. sp. or species (Ttx in Carter Co., MO; Ac, Tx or Tp in GA (Bartow Co. (or *Triodopsis*)))

***Triodopsis tridentata juxtidentis*** (= *T. j.*) (Pilsbry, 1894) (NC, VA, WV/ Tx in MD/ northern threetooth)

***Triodopsis tridentata (t.) (Polygyra t.* Say, 1816) (NH, n. to AL, w. to MI, MS, MO, IL, IN, MO, WV, VA/ Tx or Ac in KY, PA/ northern threetooth)**

***Triodopsis vulgata*** (*Triodopsis fraudulenta* v. Pilsbry, 1940; *T. neglecta* v. Pilsbry; *T. hopetonensis claibornensis* Lutz) (AL, GA, IN, KY, MI, MS, NC, TN, VA, WV, mostly mid-Appalachians & w. in ne. Interior Basin/ Tp? in IL; subfossil? Ac or Tx in AL/baffled/dished threetooth)

**Tryonia** Stimpson, 1865 - Hydrobiidae snails, Subfamily Cochliopinae (once in Hydrobiinae & Littoridininae) **Bibl.:** Hershler 1999 (22 species in US or Canada) **Bibl.:** Hershler & Sada 1987; Hershler, 1989; Hershler & Landye 1988; H. & Thompson 1987, 1992; Taylor 1987

**Tryonia adamantina** Taylor, 1987 (diamond tryonia or diamond Y springsnail/ Tx? in TX)

**Tryonia circumstriata** (Leonard and Ho, 1960) (Gonzales Spring, TX)

**Tryonia kosteri** Taylor, 1987 (Koster's springsnail/ ,NM/candidate T&E)

**Tryonia stocktonensis** Taylor, 1987 = junior syn. of *T. circumstriata*

**Turbonilla** Risso, 1826 – Pyramidellidae snails

**Turbonilla interrupta** Virginian, wFL Gulf of Mex .marine infauna)

**Turbonilla conradi** (wFL Gulf of Mex. marine infauna)

**Turbonilla** undescr. sp. (wFL Gulf of Mex. marine infauna)

**Turbonilla viridaria** (wFL Gulf of Mex. marine infauna)

**Urosalpinx** Stimpson, 1865 – Muricidae snails

**Urosalpinx cinerea** (Say, 1822) (Atlantic oyster drill)

**Vallonia** Risso, 1826 - Valloniidae snails (8 species in US or Canada)

**Vallonia cyclophorella** Sterki, 1892, ex Ancey; ms (*Helix costata* form *cyclophorella* Cockerell, 1890) (WY, NV, CA, OR/ silky vallonia/ Pleistocene fossil in Kokoweef C.,CA/silky vallonia)

**Vallonia gracillicosta** Reinhardt, 1883 (Pleistocene extralimital fossil in Dry Cave, Eddy Co.,seNM)

**Vallonia** undescr.? sp. (extinct? fossil in Kokoweef C.,CA)

**Valvata** O.F. Muller, 1774 – Valvatidae snails

**Valvata** undet. sp. (Virginian marine infauna)

**Ventricallus** - See *Zonitoides*

**Ventridens** Pilsbry, 1946 – Zonitidae snails (also put in Vitrinidae) (22 species in US or Canada)

**Ventridens demissus** (*Helix* d. Binney, 1843; *Gastrodonta* d. Pilsbry, 1900; *Zonitoides* (*Ventricallus*) d. Riedel, 1980) (SE, n. to VA, KY/ perforate dome/ Tx in KY(one cave), FL)

**Ventridens** undet. sp. (Ac, Tx or Tp in GA (Walker Co.)

**Vertigo** Muller, 1774 - Pupillidae snails (32 species in US or Canada)

**Vertigo brierensis** Leonard, 1972 (glacial relict calciphile in non-cave cracks & crevices in 2 sites in Galena Group areas in IA)

**Vertigo hubrichti hubrichti** (*V. gouldi* h. Pilsbry, 1934) (glacial relict calciphile in non-cave cracks & crevices in 23 sites in IA(Winneshiek Co.) MN (Fillmore Co.) & WI (Grant Co.))

*Vertigo hubrichti variabilis* Frest, 1991 (glacial relict calciphile in non-cave cracks & crevices in 48 sites in IA, MN, WI)

*Vertigo iowaensis* Frest, 1991 (glacial relict calciphile in non-cave cracks & crevices in 6 sites in IA (Allamakee, Clayton & Howard Cos.)/ Iowa Pleistocene vertigo)

*Vertigo meramecensis* Van Devender, 1979 (glacial relict calciphile in non-cave cracks & crevices in MO (2sites),IA (13sites) & perhaps 3 sites in Fillmore & Olmstead Cos., MN/ Tx in MO/MN T&E; IO T&E/ bluff vertigo)

*Vespericola* Pilsbry, 1939 (*Vespericolini* Emerton, 1994) Polygyridae snails, Subfamily Polygyrinae, Tribe Vespericonini (16 species in US or Canada)

*Vespericola shasta* (S.S.Berry, 1921) (Shasta or Siskiyou hesperian/Epigean & Tx in Shasta Co.,CA/ Shasta hesperian)

*Vitrea* Fitzinger, 1833 - Zonitidae snails  
*Vitrea petrophila* = *Paravitrea petrophila*

*Vitrinella* C.B. Adams, 1850 – Vitrinellidae snails

*Vitrinella floridana* Pilsbry & McGinty, 1946 (Florida vitrinella/ TX marine infauna)

*Xolotrema* Rafinesque, 1819 (once a subgenus of *Triodopsis*) Polygyridae snails (4 species in US or Canada)

*Xolotrema caroliniensis* (*Triodopsis c.*) (I. Lea, 1834) Emberton, 1988 (SC, n. to AL, w. to TN, LA/ subfossil? Ac or Tx in AL/blunt wedge)

*Xolotrema fosteri* (F. C. Baker, 1921) (*Triodopsis f.* Pilsbry, 1940; *T. f. hubrichtii* Pilsbry, 1940; *T.h.* Leonard & Fryie, 1960) (NJ, IN to IA, s. to MS,LA/ Tp or Tx in IL,MO/ bladetooth wedge)

*Zonitoides* Lehmann, 1862 (= *Ventricallus* Pilsbry, 1946) Zonitidae snails, Subfamily Zonitinae, Tribe Zonitini (7 species in US or Canada)

*Zonitoides (Zonitoides) arboreus* (Say, 1816) (NA (except AK,nCanada) near logs & in urban areas/ quick gloss/ epigean in most of East, Central US, n. to sCanada/ Tx in IL (4caves), IN (Lawrence Co.), KY(Mammoth C.), NJ, ON (2 caves), NS (1 cave), TN, TX, WV, VA; Tp or Tx in AL, GA (Decatur Co.), MO; Ttp in cave in Rockcastle Co., KY)

*Zonitoides nitidus* (Muller, 1774) Pilsbry, 1946 (NE, ON w.to eSD,s.to IN, WV, MD/ Tx or Ac in sON/ black gloss)

*Zonitoides demissus* = *Ventridens d.*



*Zonitoides kirbyi* R.W. Fullington, 1974 (TTp or Tx in eOK,scMO (Camden & Christian & Pulaski Cos.), swTX (Dickens Co. epigean)/ shadow gloss)

*Zonitoides limatulus* (*Helix l.* A. Binney, 1840) (Tx or Ac in cave in Edmondson Co., KY/dull gloss)

*Zospeum* Bourguignat, 1856 - See *Carychium*

## Snakes

Class Reptilia, Subclass Sauria, Infraclass Lepidosauria, Order Squamata, Suborder Serpentes.

**Bibl.:** Benedict 1976b; Drada 1968; Stechert 1980; Archeol.: Athens 1989; **Areas; FL:** Auffenberg 1963; Holman 1958; **MO:** Barnholtz 1960-a; **OK:** Black 1974; **TX:** Fowler 1948. **UT:** D. Cox & Tanner 1995; Woodbury & Hansen 1950

Families incl.

**Boidae** (boas, pythons & anacondas)  
Subfamily Erycinae (*Charina*)

**Colubridae** (colubrids; culubrid snakes; harmless snakes) (*Carphophis*, *Coluber*, *Diadophis*, *Elaphe*, *Heterodon*, *Hypsiglena*, *Lampropeltis*, *Masticophis*, *Nerodia*, *Opheodrys*, *Oxybelis*, *Pituophis*, *Regina*, *Rhadinaea*, *Salvadora*, *Storeria*, *Tantilla*, *Thamnophis*, *Trimorphodon*, *Virginia*)

**Elapidae** (elapids; front-fanged snakes; cobras & allies) (*Micrurus*)

**Viperidae** (pit vipers & vipers) (*Agkistrodon*, *Crotalus*)

*Agkistrodon* Beauvois, 1799 (copperheads, cottonmouths) Viperidae snake (2 species in US or Canada)

*Agkistrodon contortrix c.* (Linnaeus, 1766) (southern copperhead/ eNC to nwFL, w to e,cTX, seOK, AR, wTN, sMO to swIL/ TTX in AR (Baxter Co., TX)

*Carphophis* Gervais, 1843 (worm snakes) Colubridae snake (1 species in US or Canada)

*Carphophis amoenus* (Say, 1825) (Worm Snake/sNew England to c.GA, w. to seNB, eKS, eOK, extreme neTX/ Ranchlabrean extralimital in Arrendondo & Haile Sites, Alacua Co., FL & Conrad Fissure (AR))

*Charina* Gray, 1849 (= *Calabaria*, *Lichanura*) (rubber boas) Boidae snakes, Subfamily Erycinae Bonaparte, 1831 (1 species in US or Canada)

*Charina bottae* (Blainville, 1835) (rubber boa/epigean in WA,OR,CA/ Tx or Ac in WA)

*Coluber* Linnaeus, 1758 - Colubridae snake

*Coluber constrictor* Linnaeus, 1758 (racer/ sBC to sON, eMex to nGuatamala;all US except AK/ Ac in NJ?, OH)

*Crotalus* Linnaeus, 1758 (rattlesnakes) Viperidae snakes (13 species in US or Canada). **Bibl.:** Benedict 1976f; Crawford 1975d

*Crotalus adamanteus* Palisot de Beauvois, 1799 (Lower coastal plain, seNC to Florida Keys, w. to sMS and extreme eLA/ eastern diamondback rattlesnake/ TTx in FL)

*Crotalus atrox* (Bair & Girard, 1853) (seCA e.to cAR, s.to nMex./ western diamondback rattlesnake; TTx in NM, OR, TX) **Bibl.:** Benedict 1976f; Chantell 1970

*Crotalus horridus h.* (Linnaeus, 1758) (timber rattlesnake/swME s.to FL, w.to seMN & cTX/ extralimital fossil in s.IN/ TTx in NJ, OH; Ac in SC) **Bibl.:** R.Richards 1991.

*Crotalus lepidus* (Kennicott, 1861) (rock rattlesnake/ seAZ, wc,seNM, se. to Jalisco, through Trans-Pecos to scTX/ TTx in cave in Edwards Co., TX)

*Crotalus molossus* (Baird & Girard, 1853) m. (black-tailed rattlesnake/ AZ, e.to cTX, s. to cMex./ TTx in San Saba, Terrell Cos., TX )

*Crotalus oreganus*. Rafinesque, 1818 = *Crotalus viridis oreganus*

*Crotalus potterensis* Brattstrom, 1953 (questionable sp./extinct in Potter Cr. C.,CA).

*Crotalus viridis oreganus* Holbrook, 1840 (*C. oreganus* Rafinesque, 1818) (scBC s. to OR (except se) to w. of Sierra Nevada in CA s. to Kern Co./ northern Pacific rattlesnake/ Ttx in OR)

*Diadophis* Baird & Girard, 1853 (ring-necked snakes) Colubridae snakes, subfamily Xenodontinae (1 extant species in US or Canada)

*Diadophis elinorae* Auffenberg, 1963 (extinct Pleist. in Inglis sink, Citrus Co.,FL)

*Diadophis punctatus* p. Linnaeus, 1766) (sNJ to FL/ southern ring-necked snake/ TTx in FL; Ac in KY, NJ; Ttx or Ac in AL)

*Diadophis punctatus stictogenys* Cope, 1860 (extreme sIL, s. in MS Valley to Gulf, MobileBay w. to eTX/ Mississippi ring-necked snake/ Tx or Ac in AR; Tx in MS)

*Dryinoides* Auffenberg, 1958 (extinct ring-necked snakes) Colubridae snakes, subfamily Xenodontinae

*Dryinoides* cf. undet. sp. (extinct Pleist. in Inglis sink, Citrus Co.,FL)

*Elaphe* Fitzinger in Wagler, 1833 - Colubridae snake (7 species in US or Canada)

*Elaphe guttata g.* (Linnaeus, 1766) (sNJ to sFL w. to LA/ corn snake/ Tx or Ac in MS, TX; Tx in FL, WV (feeds on *Ceuthophilus* crickets)

*Elaphe guttata emoryi* (Baird & Girard, 1853) (LA, swIL w. to CO, UT, eNM, s. to Mex./ Great Plains rat snake/ predation on OK *Myotis velifer* bats)

*Elaphe obsoleta* (Say in James, 1823) (eON, sVT s. to sFL, w. to wTX, adjacent Mex. n. to swMN & sMI/ rat snake/ Rancho Labrean extralimital, Schultze C., TX/ Ac in OH; TTx in FL, TX; Ttx or Ac in NJ) **Bibl.:** Sexton & Hunt 1980

*Elaphe obsoleta bairdi* (Yarrow, 1880) (Baird's rat snake/ cTX w. to Big Bend, adjacent Mex./ TTx in TX)

*Elaphe obsoleta o.* (Say, 1823) (VT to NC, sw to cGA, n. to scIL, s. to nLA, OK, n. to swMN, sMI/ black rat snake/ Tx or Ac in AR; Tx in KL, MD, MO (eating bats), WV)

*Elaphe obsoleta quadrivittata* (Holbrook, 1836) (NC to n, cFL/ yellow ratsnake; chicken snake/ Tx in FL),

*Elaphe obsoleta spiloides* (Dumeril, 1854) (sIL, swIN to MS, e. to swGA, nwFL/ gray ratsnake/ Tx in FL)

*Elaphe obsoleta lindheimeri* (Baird & Girard, 1853) (sLA to ecTX/ TTx in TX)

*Elaphe triaspis* (*Senticolis t.* Cope, 1866) (eAZ s. to Costa Rica/ green rat snake /Tx or Ac in AZ)

*Elaphe subocularis* (Brown, 1901) (Trans-Pecos rat snake/ scNM, swTX, adjacent Mex./ TTx in Pecos, Val Verde Cos., TX)

*Elaphe vulpina* (Baird & Girard, 1853) (Great Lakes w. to seSD, eNB, nMO/ fox snake/ extralimital Wisconsin fossil in Bell C., AL & Conrad Fissure (AR))

*Heterodon* Latreille in Sonnini & Latreille, 1801 (hog-nosed snakes) Colubridae snakes (3 species in US or Canada)

*Heterodon nasicus* Baird & Girard, 1852 (western hog-nosed snake/ now in seAB and nw Manitoba, s. to seAZ, TX, nMex, disjunct in MN, IA, IL, MO, AR/ Pleist. extralimital in Inglis sink, Citrus Co., FL)

*Heterodon platyrhinos* Latreille in Sonnini & Latreille, 1801 (eastern longnosed or hognose snake) (ecMN to sNH, s. to sFL, w. to eTX, wKS/ Ac in Fenceline Sink (Burnet Co., TX) & NJ)

*Hypsiglena* Cope, 1860 (night snakes) - Colubridae snakes (1 species in US)

*Hypsiglena torquata* (Gunther, 1860) (SW to eOR, scWA, sCA/ night snake/ ?Tx in cave I Edwards Co., TX)

***Lampropeltis*** Fitzinger, 1843 (kingsnakes, milk snakes) Colubridae snakes (6 species in US or Canada)

***Lampropeltis calligaster*** (Harlan, 1827) (prairie kingsnake) (cMD to nFL, w.to seNB, eTX/ extralimital in C.Without A Name, & Miller's C.(11,000BP), Llano Co.,TX) cTX)

***Lampropeltis getulus*** (Linnaeus, 1766) (sNJ to nFL, w.to swOR, s.to Baja,Zacatecas, Mex/ common kingsnake/ Ac in OH)

***Lampropeltis mexicana*** (Garman, 1884) gray-banded kingsnake

***Lampropeltis mexicana blairi*** Flury, 1950 x *L. m. alterna* (Brown, 1901) (= *L. a.* Garstka, 1982) (Trans-Pecos s.to Mex./gray-banded kingsnake/Ac or Tx in cave in Edwards Co., TX),

***Lampropeltis pyromelana*** (Cope, 1867) (ncAZ, s. to nMex., disjunct in seNV, wAZ & scNM/ Sonoran mountain kingsnake kingsnake/ Pleist. fossil in Vulture C., AZ)

***Lampropeltis triangulum*** (Lapepede, 1788) (swPQ,seM, sON, c,seMN s. to most of E, s. to Venezuela/ Sonoran mountain kingsnake/ extralimital e. in late Wisconsinan Smith Cr. C.,NV/ Ac or Ttx in NJ)

***Liochlorophis*** Oldham & Smith, 1991 - Colubridae snakes (1 species in US or Canada)

***Liochlorophis vernalis*** (= *Opheodryx vernalis* (Harlan, 1827) (*Coluber v.*) (smooth green snake/ now in NS w. to seSK, s. to NC & neKS; seID & WY s. to ne,seUT & eNM, wTX/ Pleist. extralimital in Inglis sink, Citrus Co.,FL, Worm Hole C.,WV; Williams C. (TX) & Anderson Pit (IN)/ Ac in NJ)

***Masticophis*** Baird & Girard, 1853 (coachwhips, whipsnakes, racers) Colubridae snakes (4 species in US or Canada)

***Masticophis flagellum*** (Shaw, 1802) (coachwhip/ nc. to sFL, w.to swTN, LA, seKS, sMO s.to wLA, eTX/ TTx in TX; feeding on bats)

***Masticophis taeniatus*** (Hallowell, 1852) (striped whipsnake/ sWA se to sNM, w,cTX, s. to wcMex./ TTx in TX; feeding on bats)

***Masticophis flagellum f.*** (Shaw, 1802) (swNC, swTN, swIL, NB, e.CO, ncNM, swUT, wc,sNVA, sCA, s.to FL,TX,cMex./ coachwhip/ TTx in OK (hibernating); TTx in TX (feeding on bats); Late Pleist. in Smith Cr. & Baker C., NV)

***Micrurus*** Wagler, 1824 (American coral snakes) Elapidae snakes (1 species in US or Canada)

***Micrurus fulvius*** (Linnaeus, 1766) (northern coral snake)

***Micrurus fulvius tenere*** (Linnaeus, 1766) (Texas or North American coral snake/ sAR, wLA, sTX to neMex./ TTx in TX)

*Natrix* = *Nerodia*

***Nerodia*** Baird & Girard, 1853 (water snakes) Colubridae snakes (7 species in US or Canada)

***Nerodia fasciata*** f. (Linnaeus, 1766) (coastal plain of NC to sFL, w. to eTX, n. in MS Valley to extreme sIL/ banded watersnake/ Tx in FL)

***Nerodia sipedon*** (Linnaeus, 1758) (ME to NC coast, nw SC & GA to sAL,eLA, w. to eCO,ne through MN to sOn & PQ/ northern water snake/ Pleist. in Worm Hole C.,WV/ Tx or Ac in OH, TN)

***Nerodia*** undet. sp. (Ac or Ttx in AL)

***Opheodrys*** Fitzinger, 1843 (green snakes) Colubridae snakes (1 species in US or Canada)

***Opheodrys aestivus*** (Linnaeus, 1766) (NS w.to seSK, s.to NC,neKS,seID & W s. into ne,seUT, eNM, seTX/ rough green snake/ Tx in OH,TX; extralimital sw. in Pleist. Fowlkes C., TX)

*Opheodrys vernalis* = *Lichlorophis* v.

***Oxybelis*** Wagler, 1830 (vine snakes) Colubridae snakes (1 species in US or Canada)

***Oxybelis aeneus*** (Wagler, 1824) (extreme sAZ, s. to Brazil/ brown vine or Mexican vine snake/Tx or Ac in AZ),

***Pituophis*** Holbrook, 1842 (bullsnakes, gopher snakes, pine snakes) Colubridae snakes (1 species in US or Canada)

***Pituophis melanoleucus*** (Daudin, 1803) (pine gopher s./ SE, MW, W, swCanada/ TTx in CA)

***Pituophis melanoleucus catenifer*** Blaineville, 1835 (= *P.c.*) (wOR to w,c TX/ Pacific gopher snake /Late Pleist. in NV)

***Pituophis melanoleucus sayi*** (Schlegel, 1837) (sAB to s,cWI & wIN, s. through c.,wTX to neMex./ bullsnake/ TTx or Ac in OK),

***Regina*** Baird & Girard, 1853 (crayfish snakes) Colubridae snakes (4 species in US or Canada)

***Regina intermedia*** Meylan, 1982 (extinct Pleist. in Inglis sink, Citrus Co.,FL)

***Rhadinaea*** Cope, 1863 (pine woods snakes) Colubridae snakes (1 species in US or Canada)

***Rhadinaea flavilata*** Cope, 1871 (coastal plain of NC s. to FL, w. to eLA/ pine woods s./ s.extralimital in late Wisconsinian Cheek Bend C., TN)

***Salvadora*** Baird & Girard, 1853 (patch-nosed snakes) Colubridae snakes (3 species in US or Canada)

***Salvadora grahamiae*** Baird & Girard, 1853 (mountain patch-nosed snake/ seAZ to ncTX, s.to Mex./ Ac in TX)

*Senticolis* = *Elaphe*

***Storeria*** Baird & Girard, 1853 (brown- & red-bellied snakes) Colubridae snakes (2 species in US or Canada)

***Storeria occipitomaculata*** (Storer, 1839) (eTX, e. of MS River/ red-bellied snake/ Tx or Ac in OK & Baxter & Stone Co., AR)

***Storeia*** undet. sp. (Pleist. in Worm Hole C., WV)

***Tantilla*** Baird & Girard, 1853 (black-headed snakes) Colubridae snakes

***Tantilla gracilis*** Baird & Girard, 1853 (flat-headed snake/ seIL to eNB, s. to eTX, adjacent Coahuila/ Ac or Tx in TX)

***Thamnophis*** Fitzinger, 1843 (garden snakes, ribbon snakes) Colubridae snakes (11 species in US or Canada)

***Thamnophis cyrtopsis*** (Kennicott, 1860) (black-necked garter snake/ sUT, sCO s. to eAZ, NM, swTX, nMex./ TTx in TX)

***Thamnophis cyrtopsis ocellata*** Cope, 1880 (*T.o.*) (Edwards Plateau w. to Big Bend/ eastern black-necked garter snake/ TTx in TX)

***Thamnophis elegans*** (Baird & Girard, 1853) (swMB, cBC s. to cNM & CA, sAZ, e.to extreme swSD & wOK/ western terrestrial garter snake/ TTx in CA)

***Thamnophis marcianus marcianus*** (Baird & Girard, 1853) (checkered garter snake/ c,wTX, swKS, wOK, sNM, sAZ/ TTx in TX)

***Thamnophis sirtalis*** s. (Linnaeus, 1758) (sON w to eMN, eIA, e,sMO, AR, eTX to Atlantic coast from sNF to sFL/ Eastern garter snake/ Ttx in NJ, PA)

***Thamnophis*** undet. sp. (Pleist. in Worm Hole C., WV)

***Trimorphodon*** Cope, 1861 (lyre snakes) Colubridae snakes (1 species in US or Canada)

***Trimorphodon biscutatus*** (Dumeril, Bibron & Dumeril, 1854) (sCA e. to wTX, s. to Mex./ lyre snake/Tx or Ac in AZ; Pleist. fossil in Vulture C., AZ)

***Virginia*** Baird & Girard, 1853 (earth snakes) Colubridae snake (2 species in US or Canada)

***Virginia valerie*** Baird & Girard, 1853

***Virginia valerie elegans*** Kennicott, 1859 (eVA to nFL, w.to eTX,n.to sMO/smooth earth snake/ Tx or Ac in AR (Baxter & Stone Cos.), OK)

***Virginia striatula*** (Linnaeus, 1788) (eVA to nFL, w.to eTX, n.to s.MO/rough earth snake/ s. extralimital in Clark's C., VA)

social organization: Bradbury 1977; Ramsey 1995

**soil animals** - Species who live in the soil either all the time or during a major part of their life cycle. Incl. euedaphon (natural pores), epedaphon & edaphobites (surface, larger cavities in litter & hemiedaphon (burrowers & diggers). Bellinger 1954; Dindal 1990; DiSalvo et al. 1970; Domsch et al. 1980; Drake 1980; Eisenbeis & Wichard 1987; Feldhake & Vestal 1984- 5; Goodey 1963; Griffiths 1978; Kethley 1991

**soil biology** - The study of the makeup and actions of soil communities and populations. Syn.: pedobiology.

## Solenogastres

A class of Lower Mollusca. Incl.

Class Aplacophora (solenogasters)

Subclass Chaetodermomorpha

Family Chaetodermatidae (*Chaetoderma*)

Subclass solenogastres

Order Cavibelonia

Family Meiomeniidae (*Meiomenia*, *Meioherpia*)

Subclass Euthyneura

Order Aeochlidioidea

Hedylopsidae (*Hedylopsis*) (now in Order Acochilidioidea)

Subclass Prosobranchia

Order Caenogastropoda

Superfamily Rissoidea

Family Caecidae (*Caecum*)

*Caecum* Fleming, 1813 - Caecidae prosobranch mollusks (33 species in US or Canada)

*Caecum californicum* Dall in Orcutt, 1885 (*C. cooperi* of Carpenter, 1864 not Smith, 1862) (CA marine infauna)

*Caecum (Elephantulum) clava* Folin, 1867 (TX sublittoral marine interstitial)

*Caecum crebricinctum* Carpenter, 1864 (CA marine infauna)

*Caecum (Meioceras) cubitatum* Folin in Folin & Peier, 1868 (FL, NC, Brazil, TX sublittoral marine interstitial)

*Caecum dalli* Bartsch, 1920 (CA marine infauna)

*Caecum imbricatum* Carpenter, 1858 (imbricate caecum/ wFL, LA Gulf of Mex .marine infauna)

*Caecum* cf. *johnsoni* Winkley, 1908 (wFL (cf. *C.j.*), TX Gulf of Mex .marine infauna)

*Caecum nitidum* Stimpson, 1851 (wFL, LA Gulf of Mex .marine infauna)

*Caecum pulchellum* Stimpson, 1851 (beautiful caecum/ wFL (cf. *C.j.*), TX, LA Gulf of Mex .marine infauna)

*Caecum regulare* Carpentere, 1858 (wFL Gulf of Mex .marine infauna)

*Caecum* (*Meioceras*) *sandwichensis* Folin, 1881 (HI sublittoral marine interstitial)

*Caecum* (*Caecum*) *textile* Folin in Folin & Peabody, 1867 (West Indies, FL sublittoral marine interstitial)

*Caecum strigosum* de Folin, 1868 (FL marine benthic)

*Caecum* (*Fartulum*) *vestitum* Folin in Folin & Peabody, 1870 (TX sublittoral marine interstitial)

*Chaetoderma* Loven, 1844 - Chaetodermatidae chaetogaster

*Chaetoderma* undet. sp. (BC marine infauna)

*Meiomenia* Morse, 1979 - Meiomeniidae solegastres mollusk

*Meiomenia arenicola* Salvini-Plawen, 1985 (FL, NC marine sublittoral sandy interstitial)

*Meiomenia swedmarki* Morse, 1979 (WA marine sublittoral interstitial)

*Meioherpia* Salvini-Plawen, 1985 - Meiomeniidae solegastres mollusk

*Meioherpia atlantica* Salvini-Plawen, Rieger & Sterrer, 1985 (NC, Bermuda marine sublittoral interstitial)

*Microhedyle* Hertling, 1930 - Asperspinidae opisthobranch mollusks (also put in Microhedylidae) (1 species in US or Canada)

*Microhedyle fundensis* Rankin (ME marine beach interstitial)

## Solifugids

Arachnid of Order Solifugae (= Solpugida), Subclass Solifugidae. Both thorax & abdomen segmented & joined by clear waist. The prosoma has a proterosoma and two free segments, the opisthosoma, is segmented. The carapace has a pair of large median eyes. Chelicerae big & strong, with two segments for grabbing. About 800 species. Incl. false spiders, sun spiders or scorpions & **wind scorpions**. Expected to be rare Ttx or Ac in SW. Putnam, 1883.

Kingdom Animalia

Clade Metazoa



Clade Eumetazoa

Clade Bilateria

Clade Protostomia

Clade Ecydsozoa

Phylum Arthropoda

Subphylum Chelicerata

Class Archnida

Subclass Dromopoda

Order Solifugae

**sonar** - A system for detecting obstacles by emitting sounds & intercepting echoes that bounce back. Used by bats, oilbirds & some swiftlets when they flying in caves.

**speciation** - Creation of new species. See also evolution. Incl. allopatric (clinal), area effect, centrifugal, parapatric, quantum & sympatric. Barr 1959e, 1985a-b; Barr & Holsinger 1985; Causey 1960; Gertsch, 1992; Goodnight & G. 1960; Hoch 1996; Holsinger 1966c, 1967e; Howarth 1987b; Howarth, Hoch & Asche 1987; Hubbs 1961; Kane, 1991; Krekeler 1958a; Laing & Carmody & Peck 1976, 1976a; Lee et al. 1977; Noble 1930; Sbordoni 1982; Valentine 1943, 1945; Willaims 1954

sibling species - Laing, Carmody, & Peck 1976

species of concern or at risk - see endangered

species, fossil - Incl. algae, bryozoan/coral, brachiopod, crinoid, foram, gastropod, nautiloid, pelecypod, scaphopod, sponge, & vertebrate.

**species** - The basic taxonomic unit in bio-classification. Usually based on evolutionary kinship (phylogenetic) or the potential for natural interbreeding.

**species richness** - Biodiversity measured by the number of species compared to the number of individuals in a community.

**species group** - A complex of morphologically related species that exist allopatrically. Experimental breeding of certain pairs of species in these groups often result in hybrids. Syn.: superspecies.

speleobiont - Syn: cavernicole.

speleothem formation - Davis, Palmer & P., 1990

## Spiders

Order Araneae arachnid. With abdominal silk spinnerets, usually with venom & 2- part body (prosoma and opisthosomal (abdomen)) separated by a narrow pedicle. Prosoma covered with a top carapace (tergal shield) and a nonsegmented bottom shield. Strong chelicerae have fang-like subchela with venom glands. Leg- or feeler-like pedipalps and four pairs of legs. Spinnerets arise on body segments 10 and 11 but move to the rear during embryonic development. 2-8 (usually 8) eyes may be lost during evolution of cave or interstitial forms. Most primitive forms with book lungs but replaced by tracheae in more advanced forms. Only one species aquatic although some hunt on the water's surface. Dominate as predators in most tropical caves. Most cave spiders occupy areas near entrances and twilight areas of caves where they prey on flying and crawling insects who also naturally occupy these areas of the cave. Installation of artificial lighting has encourages spiders to migrate into and occupy deeper areas of the caves. First known from Devonian. About 22,000 known species.

**Spider Bibl.:** Archer 1942; Brignoli 1983; Comstock 1940; Fage 1929, 1931; Muma 1945a; Petrunkevitch 1911, 1939; Vogel 1967; Packard, 1875; **Areas. Appalachians:** R. Hoffman 1963; **AL:** Archer 1940, 1940a, 1942, 1944; Hentz, 1850, 1875; **CO:** Vogel & Ayre 1961; CT:Kaston 1948; **HI:** Brignoli 1973; Suman 1964; Tenorio & Beatty 1978; **IL:** Rapp 1946, Kaston 1955; **IN:** F. Elliot 1953; Emerton, 1877; Fage 1931; Kyser 1966; **KY:** Packard, 1875; Chamberlih 1925; Emerton, 1877; Fage 1931; Kingsley, 1888; Levi 1971; Luck 1907; Marx, 1890; **MD:** Muma 1944; Muma 1945; **NA:** Banks 1910; Keyserling, 1881-92; Roth 1985, 1993; Petrunkevitch 1911; Vogel 1967; **NC:** Fage 1931; **NM:** Crosby 1926; **NY:** Crosby & Bishop 1928; **OH:** Barrows 1918; Beatty 1970; **OK:** N. Banks et al. 1932; Branson 1966, 1968; **TN:** Marx, 1890; Petrunkevitch 1925; **TX:** Jackman 1997; Lehtinen 1967; Rowland & Reddell 1976; **US:** 1953; Emerton 1961; Levi 1971; **VA:** 1953; Emerton, 1877; Fage 1931; Marx, 1890; **WI:** H. Field; Levi & Field 1954; Levi & Kaspar 1958; **WV:** Muma & Muma 1943; **WY:** Levi & Levi, 1951, Lowrie & Gertsch, 1955.

Kingdom Animalia

Clade Metazoa

Clade Eumetazoa

Clade Bilateria

Clade Protostomia

Clade Ecydsozoa

Phylum Arthropoda

Subphylum Chelicerata

Class Archnida

Subclass Lipoctena or Micrura

Superorder Megoperculata

Order Araneae

Suborder Mesothelae (trap door spiders)

Suborder Opisthothelae

(all following suborders also subsumed in this one)

Infraorder Ecribellatae (=Araneomorphae)  
(subsequent orders also subsumed in Opisthothelae)

Suborder Labidognatha (=Haplogynae)  
(=primitive hunters & weavers)  
(Caponiidae, Dysderidae, Filistatidae, Ochyroceratidae,  
Oonopidae, Pholcidae, Telemidae)

Superfamily Orbicularia  
Uloboridae

Suborder Ecribellatae  
Superfamily Gnaphosoidea  
Gnaphosidae

Superfamily Amaurobioiidea  
Amaurobiidae

Suborder Araneomorpha  
Superfamily Araneoidea (aerial web spinner)  
Araneidae, Mysmenidae, Nesticidae, Linyphiidae,  
Symphytognathidae, Tetragnathidae, Theridiidae,  
Theridiosomatidae)

Superfamily Dictynoidea  
(Amaurobiidae, Angelenidae, Dictynidae, Stiphidiidae,  
Tengellidae & Uloboridae)

Superfamily "Dionycha" (=Clubionoidea) (=running s.)  
(Clubionidae, Corinnidae, Gnaphosidae, Liocranidae,  
Philodromidae, Thomisidae, Salticidae)

Superfamily Hypochiloidea (=four-lunged true s.)  
Forster et al. 1987 (Hypochilidae)

Superfamily Lycosoidea (Agelenidae, Ctenidae, Lycosidae,  
Miturgidae, Pisauridae)

Infraorder Mygalomorphae  
(Ctenizidae, Cyrtaucheniidae, Dipluridae, Nemesiidae,  
Theraphosidae)

**SPIDER** families incl.

**Agelenidae** (funnel (web) s.) (See also Dictynidae) **Bibl.:** Kishida 1955; Roewer 1954; Roth & Brame 1972 (*Agelenopsis*, *Blabomma* (now in Dictynidae), *Calummaria* (now in Hahniidae),

*Cicurina* (now in Dictynidae), *Coelotes* (see *Coras* in Amaurobiidae), *Coras* (now in Amaurobiidae), *Corinna* (now in Corinnidae), *Cryphoeca* (now in Hahniidae), *Cybaeus*, *Cybaeozyga* (both in Cybaeidae), *Dirksia* (now in Hahniidae), *Hololena*, *Meta* (now in Tetragnathidae), *Rualena*, *Tegenaria*, *Wadotes* (now in Amaurobiidae) **Family Agelenidae**

**Back:**

Funnel weavers or grass spiders

Most Agelenidae spiders have elongated spinners. These spiders are known by their common name as 'funnel weavers'. Sometimes spiders of this family as well as the spiders of the family Theridiidae are called 'cobweb' spiders. The spiders weave a tubular funnel shaped web as a retreat at one end of the silken sheet of the web. The prey that lands on the sheet is caught and consumed in the retreat. The egg sac is made in the funnel and the male often stays with the female. As the second common name suggests, they can be found between grass.

**Amaurobiidae** (*Amaurobius*, *Arctobius*, *Arcuphantes* (now in Linyphiidae), *Callobius*, *Coelotes*, *Coras*, *Cybaeopsis*, *Pimus*, *Telema* (now in Telemidae), *Theotima* (now in Ochyroceratidae), *Titanoeca* (now in Titanoecidae), *Usofila* (now in Telemidae), *Wadotes*)

The members of the Amaurobiidae family have a most peculiar and unselfish characteristic in taking care of their offspring. The female becomes mature during her second year of life. She lays only around 40 eggs and spins a closed breeding chamber where she stays with her eggs. After the spiderlings have consumed the egg yolk, they eat their mother before they emerge from the chamber. Most Amaurobiidae members hide in holes in trees or man made constructions. Their size is between 7 and 12 mm. The web usually extends around the entrance of the hole. These spiders can also be spotted inside our houses during the night.

The Amaurobiidae are also called night spiders because they are active at night. All five species are quite large with firm legs and may live for several years. The head-breast part is pear shaped and the spider resembles the *Coelotes*. But when identifying the spider, the dark raised head part will remove any doubt.

Another important family characteristic is the woolly combed catching silk, which often has a shiny blue color. It is a cribellate web. The spider combs its silk with a comb or calamistrum located on her rear legs. The comb is made of a row of small, stiff hairs.

The silk comes from an organ called the cribellum and contains a lot of small spinnerets that deliver the small threads of silk. All spiders with a cribellum (Amaurobiidae, Eresidae, Uloboridae and Dictynidae) are incorporated in a group called the Cribellatae.

**Anapidae** (*Gertschanapis*)

**Antrodiaetidae** (foldingdoor or folding trapdoor spiders) (*Antrodiaetus*)

**Araneidae** (orbweavers, orb, orb-web or cave spiders) (= Argiopidae in part) (*Acanthepeira*, *Araneus*, *Argiope*, *Argyrodes* (now in Theridiidae), *Azilla* (now in Tetragnathidae), *Calisoga* (now in Nemesiidae), *Cyclosa*, *Epeira* (now in Araneus), *Metellina*, *Meta* (both in Tetragnathidae), *Metepeira*, *Neoscona*, *Pseudometra*, *Tetragnatha*, (both now in Tetragnathidae), *Theridiosoma* (now in Theridiosomatidae), *Zygiella*) About 2,550 species. Most build typical orb webs.

Argiopidae - once included Theriodisomatidae and Tetragnathidae, now subsumed in Araneidae  
Attidae - subsumed in Salticidae

**Caponiidae** (caponiid spiders) (*Orthonops*)

**Clubionidae** (Sac or running (in part) spiders. Bibl. Dondale and Redner, 1982  
(*Agroeca*, *Corinna* (now in Corinnidae), *Liocranoides* (also put in Tengellidae), *Neoanagraphis*,  
*Phrurotimpus*, *Scotinella* (both now in Liocranidae), *Teminlus* (now in Miturgidae), *Titiotus*  
(now in Tengellidae, subsumed by some authors in *Liocranoides*))

**Corinnidae** (antmimic (sac) spiders) (*Castianeira*, *Corinna*)

**Ctenidae** (wandering spiders (see also Gnaphosidae). Bibl. Peck, 1981  
(*Anahita*, *Corinna* (now in Corinnidae), *Ctenus*, *Leptoctenus*))

Cteniziidae = Cyrtauchenidae

**Cybaeidae** (also subsumed in Agelenidae) (*Auchicybaeus*, *Cybaeozyga*, *Cybaeus*)

**Cyrtaucheniidae** (= Ctenizidae) (trapdoor spiders (*Aptostichus*))

**Dictynidae** (meshweb weavers and hackled ban weavers (in part; dictynid spiders). **Bibl.**  
Chamberlin and Gertsch 1958; Kaston 1978 (*Blabomma*, *Cicurina*, *Dictyna*, *Lathys*, *Yorima*))

**Diguetidae** (*Diguetia*)

**Dipluridae** (funnelweb spiders or sheetweb tarantulas) (*Calisoga* (now in Nemesiidae),  
*Microhexura*)

Dolomedidae (subsumed in Pisauridae)

**Dysderidae** (typical cribellate spiders) (*Dysdera*)

**Erigonidae** (dwarf or micryphantid spiders) (all genera also placed in Linyphiidae, subfamily  
Erigoninae) (*Ceraticelus*, *Ceratinops*, *Ceratinopsis*, *Eperigone*, *Erigone*, *Islandiana*,  
*Tapinocyba*) **Bibl.** Bishop 1936; Chamberlin 1948; Millidge 1984, 1987

**Filistatidae** (crevice weavers) (*Filistatinella*, *Kukulcania*)

**Gnaphosidae** (ground-dwelling running (in part) spiders) (*Callilepis*, *Drassyllus*, *Gnaphosa*,  
*Herpyllus*, *Hyptiotes* (now in Ulorboridae), *Micaria*, *Neoanagraphis* (now in Clubionidae),  
*Rachodrassus*, *Scotophaeus*, *Sergiolus*, *Talanites*, *Urozelotes*, *Zelotes*)

**Hahniidae** (funnel web spiders (in part)) **Bibl.** Opell and Beatty 1976; Rower 1954

(*Calymmaria* (also put in Agelenidae (Chamberlin & Ivie 1937) & Stiphidiidae), *Cryphoeca*, *Dirksia* (once in Agelenidae), *Hahnia*, *Hahnistea*)

**Hypochilidae** (four-lunged true spiders) **Bibl.** Forster and Gray 1987; Forst, Platnick and Gray 1987; Gertsch 1958a (*Hypochilus*)

**Leptonetidae** (sheet weaver group). **Bibl.:** Gertsch 1973, 1974; Brignoli 1977; Platnick 1986 (*Appaleptoneta*, *Archoleptoneta*, *Calileptoneta*, *Leptoneta*, *Neoleptoneta*)

**Linyphiidae** ((sheetweb & dwarf weavers, line-weaving & dwarf s.) (see also Erigonidae) **Bibl.:** Hormiga 1995; Poulson 1981, 1985; Roth 1988.

undescr. genus? sp.#1 (Amador & Tuolumne Cos.,CA/Tb) & sp.#2 (Tulare Co.,CA/Tb),  
Subfamily Linyphiinae (Tulare Co.,Tb? (or poss. Pimosa new sp. #3), new genus?  
(subalpine lava tube (CSJ000000\*002), HI) & undet.genus or genera (Tx or Tp in MS; Tx or  
Tp in 4 seAK caves)

(*Agyneta*, *Anacornia*, *Anthrobia*, *Arcuphantes*, *Bathyphantes*, *Centromerus*, *Ceraticelus*,  
*Ceratinops*, *Ceratinopsis*, *Eperigone*, *Eridantes*, *Erigone*, *Eulaira*, *Frontinella*, *Gnathonaroides*,  
*Grammonota*, *Islandiana*, *Jalapyphantes*, *Lepthyphantes*, *Linyphanthes*, "*Linyphia*", *Masoncus*,  
*Meioneta*, *Microneta*, *Nerienne*, *Oaphantes*, *Oreonetides*, *Oreophantes*, *Phanetta*, *Phrurotimpus*  
(now in Liocranidae), *Pimosa* (now in Pimoidae), *Pityohyphantes*, *Porrhomma*, *Sciates*,  
*Scotinotylus*, *Scylaceus*, *Sisicottus*, *Sisicus*, *Tennesseeillum*, *Troglohyphantes*, *Tuganobia* (now in  
Nesticidae)

Subfamily Erigoninae (*Anacornia*, *Ceraticelus*, *Ceratinops*, *Ceratinopsis*, *Eperigone*, *Erigone*,  
*Halorates*, *Islandiana*, *Tapinocyba*; undet. genus in BC) (all put in own family)

Subfamily Linyphiinae

(*Agyneta*, *Anthrobia*, *Arcuphantes*, *Bathyphantes*, *Centromerus*, *Eulaira*, *Frontinella*,  
*Jalapyphantes*, *Lepthyphantes*, *Linyphanthes*, *Meioneta*, *Microneta*, *Nerienne*, *Oaphantes*,  
*Porrhomma*, *Sisicus*, *Tapinocyba*, *Tennesseeillum*)

The Linyphiidae is a very large family of more than 3500 species worldwide. Most of the spiders of this family weave sheet like webs and the spider hangs under the web. Above the sheets the spider inserts scaffolding of threads. Insects fly against these strands and falls onto the web where they are caught. The spiders are so small and light weight that they have the capability of "flying" through the air by means of their threads. They are referred too as dwarf spiders. In the British Isles, they are called money spiders.

**Liocranidae** (lioncranid spiders) (*Liocranoides*, *Phrurotimpus* (also put in Clubionidae),  
*Scotinella* (See Gnaphosidae)

Loxoscelidae (recluse spiders or sendentary weaver group) (*Loxosceles* (now in Sicariidae)

**Lycosidae** (wolf spiders (*Adelocosa*, *Allocosa*, *Alopecosa*, *Gladicosa*, *Hogna*, *Lycosa*, *Pardosa*, *Pirata*, *Schizocosa*, *Trochosa*, *Varacosa*))

Metidae = Tetragnathidae

Micryphantidae (midget spiders) - Subsumed in Linyphiidae

**Mimetidae** (pirate spiders, aerial web spinner group) (*Mimetus*)

Miturgidae (miturgid spiders) - See Tengellidae (*Teminius*)

**Mysmenidae** (dwarf cobweb spiders, aerial web spinner group) (once in Symphytognathidae and Theridiidae) **Bibl.** Forster and Platnick 1977; Gertsch 1960 (*Calodipoena*, *Maymena*, *Microdipoena*, *Trogloneta*)

**Nemesiidae** (*Calisoga*) (also put in Ctenizidae)

**Nesticidae** (cave (cobweb) spiders) **Bibl.:** Gertsch 1984 (*Eidmannella*, *Gaucelmus*, *Ivesia*, *Howaia*, *Nesticella*, *Nesticus*)

**Ochryceratidae** (line weaver group) (*Theotima*)

**Oonopidae** (jumping spider group) (*Oonopinus*)

**Philodromidae** ((running) crab spiders) (*Ebo*, *Misumenops* (now in Thomisidae), *Philodromus*, *Thanatus*, *Tinebo*)

**Pholcidae** (cellar or house spiders or daddylonglegs (name also used for harvestmen). (undet. Ac or Ttx genus in HI; *Modisimus*, *Pholcus*, *Physocyclus*, *Psilochorus*, *Smeringopus*)

**Pimoidae** Hormiga 1994 (*Pimoa*)

**Pisauridae** (nursery web or fisher spiders) (incl. Dolomedidae) **Bibl.** Rower 1954 (*Cispiolus* (also put in Pholcidae), *Dolomedes*, *Pisaurina*)

**Plectreuridae** (*Kibramoa*)

**Salticidae** (jumping spider group) (incl. Attidae) (*Bavia*, *Habronattus*, *Metaphidippus*, *Pelegrina*, *Phidippus*) The largest family of spiders, about 4,000 species.

**Scytodidae** (spitting spiders) (*Scutodes*, *Scytodes*)

**Segestriidae** (segestriid spiders) (*Adriadna*)

**Selenopidae** (selenopid crab spiders) (*Selenops*)

**Sicariidae** (six-eyed sicariid spiders) (=Loxoscelidae) (*Loxosceles*)

**Stiphidiidae** (*Calymmaria* (also put in Agelenidae & Hahniidae))

Symphytognathidae (dwarf orbweavers) Bibl. Forster 1958 - See Mysmenidae (*Anapistula*)

**Tarantulidae** = Phryniidae

**Tengellidae** (Hackled band or typical cribellate spiders, also subsumed in Miturgidae) (*Zorocrates* (now in Zorocratidae, also put in Zoropsidae), *Titiotus* (also put in Clubionidae, subsumed by some authors in *Liocranoides*)

**Telemidae** (primitive line and sheet weaver group) **Bibl.** L Brignoli 1973; Marx 1891 (Telema, Usofila (also put in Ochryceratidae and Amaurobiidae))

**Tetragnathidae** (longjawed orb weaver group; stretch spiders) (*Azilla*, *Glenognatha*, *Leucauge*, *Meta*, *Metellina*, *Pimoida* (put in Linyphiidae or more recently in Pimoidae), *Tetragnathina*) **Bibl.:** Mormiga 1995

About 50 species belongs to the Tetragnathidae. They probably arose from the same evolutionary line as the Araneids because they also build orb webs. The family of the Tetragnathina is often found in damp, swampy habitats. These spiders have long slim bodies and their abdomen has a metal shiny look. They build orb webs with an open center like the Metidae.

**Theridiidae** (cobweb weavers, tangled-web spinners or cobweb or comb-footed spiders). **Bibl.** Levi and Levi 1962; Levbi and Randolph 1975 (*Achaearanea*, *Argyrodes*, *Ctenium*, *Dipoena*, *Enoplognatha*, *Latrodectes*, *Robertus*, *Rugathodes*, *Steatoda*, *Theridion*, *Theridula*, *Thymoites*, *Tidarren*)

**Thridiosomatidae** (ray (orb) spiders (also put in Araneidae) (*Theridiosoma*)

**Thomisidae** (crab spiders) - See Philodromidae (*Misumena*, *Misumenops*, *Thanatus* (put in *Philodromidae*), *Xysticus*)

**Titaneocidae** (Titanoecca (once put in Amaurobiidae))

**Triaenonychidae** (*Sclerobonus*)

**Uloboridae** (hackled (band) or cribellate orb weavers, feather legged or featherfoot spiders) **Bibl.:** Numa and Gertsch 1964; Opell 1979, 1983 (*Hyptiotes*, *Philoponella*, *Uloborus*; undet. TTX or Ttp genus in HI.

Zorocratidae (*Zorocrates* (once in Zoropsidae & Tengellidae))

Zoropsidae (*Zorocrates* - put in Zorocratidae)



**SPIDER** genera and species incl.

*Acanthepeira* Marx, 1883 - Araneidae spiders (3 species in US or Canada)

*Acanthepeira stellata* (*Epeira* s. Walckenaer, 1805; *E. nobilis*, *E. cerasiae*, *E. iris*, *Plectana* s. Walkenaer, 1842; *Acrosoma stellatum* Butler, 1873; *Cyrtarachne mexicana*, *C. dugesi* O.P. – Cambridge, 1893; *Marxia nobilis*, M. s. McCook, 1894; *Araneus* s. Simon, 1895; *Araneus iris* Petrunkevitch, 1911; *A. venusta* Bryanbt, 1949) (East US, e Canada to Mexico epigean/ Tx in Harrison Co.,IN/ star(bellied) orb-weaver spider)

*Achaearanea* Strand, 1929 (= *Cryptachaea*, *Hentziectypus*, *Parasteatoda*; Archer, 1946; *Theridion* in part) (17 species in US or Canada) (mostly litter sp.) Theridiidae spiders. **Bibl.:** Levi 1959, 1955, 1963

*Achaearanea canionis* (*Theridion* c. Chamberlin & Gertsch, 1929) Levi, 1955 (CA, NM, UT, wTX epigean/mesic epigean,non- disjunct TTp or Tx in AZ; TTp in Culberson Co.,TX; Tp, Tx or Ac in WA)

*Achaearanea fresno* Levi, 1955 (Tp in Calaveras & Fresno Cos.,CA)

*Achaearanea porteri* (*T.p.* Banks, 1896; *T. redemptum* Gertsch & Mulaik, 1936) Levi, 1955 (type locality cave in Owen Co.,IN/ epigean in eUS to West Indies, Panama/ Tp in AL, AR, FL, GA, IN, KY(Mammoth C.), MD?, MO (Laclede Co.), TX (Kimble Co.))

*Achaearanea rupicola* (*Theridion* r. Emerton, 1882) (sCanada to KS & FL/ Tp in AL, IL)

*Achaearanea schullei* (*Theridion* s. Gertsch & Mulaik, 1936) (T.s. Levi, 1955) (Mex., FL, TX/ Tx or Tp in AZ mine & human made tunnel),

*Achaearanea* undet. sp. (Tx in MO; TX/ TTp in TX; TTx in nAZ)

*Achaearanea tepidariorum* (*Theridion* t. C.L.Koch, 1841; *T. pallidum* Walckenaer, 1842; *T. vulgare* Hentz, 1850; *Steatoda* t. Thorell, 1856; *T.t.* Blackall; *T. marmoreum* Holmberg, 1876; *T. varium* Urquhart, 1885; *Parasteatoda* t. Archer, 1946) Levi, 1955 (common house, house or domestic s./cosmopolitan, may be native to SA/Tp in AL, GA (Bartow & Dade Cos.), HI(alien), IL,IN(Crawford, Harrison, WA Cos.), MD, OK, TN, TX, WV, VA; TTp in AR; Tx or Tp in MO, OH, sON) **Bibl.:** Cady 1984; E. Young 1983

*Adelocosa* Gertsch, 1973 (= *Solicosa* Roewer, 1960) Lycosidae spiders (one species in US)

*Adelocosa anops* Gertsch, 1973 (\*\*cave type locality & 2 other Koloana lowland dry caves cave (one presumed destroyed), Koloa, Kauai, HI/ Tb/ Federal T&E ; HI S1.2/ Kaua'i cave wolf spider or pe'e pe'e maka'ole/ threatened by surface activities such as vegetation removal, grading, filling, paving, agricultural development, and chemical and biological controls employed to control non-native plants) **Bibl.:** Finnley 1978; Hadley, Ahearn & Howarth 1981

*Agelenopsis* Giebel, 1869 (grass spiders, mostly litter sp.) Agelenidae spiders Chamberlin & Ivie 1941

*Agelenopsis aleenae* Chamberlin & Ivie, 1935 (SW/Ac in TX)

*Agelenopsis aperta* (*Agelena a.* Gertsch, 1934) Chamberlin & Ivie, 1941; *A. gertschi* Schenkel, 1950; *A. aperta guttata* (sCA, SW, Mex. epigeal/ TTx or Ac in TX)

*Agelenopsis emertoni* Chamberlin & Ivie, 1935 (OH, TX/ Tx in MO)

*Agelenopsis pennsylvanica* (*Agelena p.* C.L. Koch, 1843; *A. americana* Keyserling; *A. naevia* (var.) Comstock, 1912; *Agelena p.* Exline) Chamberlin & Ivie, 1941 (US epigeal, OH/ grass spider/ Tx in IL)

*Agelenopsis* undet. sp.#1 (NM hyporheic)

*Agroeca* Westring, 1862 – Liocranidae spiders (once in Clubionidae) (6 species in US or Canada)

*Agroeca* undet. sp. (Tx or Ac in seAK)

*Agyneta* Hull, 1911 (= *Argyneta* Hack., 1954 (misspelling) (= incl. *Meioneta* Hull, 1920 as a subgenus for some authors) - Linyphiidae spiders, Subfamily Linyphiinae (3 species in US or Canada, 49 in Nearctic, cosmopolitan) Bibl.: Hippa & Oksala 1985

*Agyneta* undescr. sp. (HI Volcanoes Natl. Park/ Tb?)

*Agyneta* undet. sp. (Tx or Ac in seAK)

*Allocosa* Banks, 1900 (*Moenkhausiana* Petrunkevitch, 1910; *Glieschiella* Mello-Leitao, 1932; *Araucaniocosa* Mello-Leitao, 1951) Lycosidae spiders (18 species in US or Canada)

*Allocosa parallela* (*Pardosa p.* Banks, 1898; *Schizocosa celerior* Chamberlin, 1910; *S.p.* Gertsch & Davis) Roewer, 1955 (Ac in TX)

*Alopecosa* Simon, 1885 (*Jollecosa*, *Solicosa* Roewer, 1960) Lycosidae spiders (8 species in US or Canada)

*Alopecosa kochi* (*Tarentula kochii* Keyserling, 1877; *Lycosa brunneiventris* Banks, 1894; *L. k.* Chamberlin, 1908; *Pardosa heretica* Chamberlin, 1925; *T. gertschi*, *Lycosa jollensis* Schenkel, 1951; *Jollecosa jollensis* Roewer, 1955; *A. kochii* Dondale & Redner, 1990) (Nearctic, NA/ Tx in 2 caves in Calaveras Co., CA)

*Amaurobius* C.L. Koch, 1837 (= *Walmus* Chamberlin, 1947) Amaurobiidae spiders (25 species in US or Canada)

*Amaurobius borealis* Emerton, 1909 (*Walmus b.* Chamberlin, 1947; *Callioplus b.* Kaston, 1948) (eCanada to SK, NE/ Tx in mine in PA)

*Anaurobius ferox* (*Clubiona f.* Walckenaer, 1830; *A. cryptarum* C. Koch, 1837; *Ciniflor mordax* Blackwall, 1859; *A. mordax* Canestrini & Pavesi, 1870; *A. corsicus* Simon, 1874; *A. peninsulanus* Banks, 1898; *C. f.* Lessert, 1910) C.L. Koch, 1839 (eCanada, NE/ Tx in 4 caves in WA Co., MD)

*Anacornia* Chamberlin & Ivie, 1933 - Linyphiidae spiders (2 species in US or Canada)

*Anacornia microps* Chamberlin & Ivie, 1933 (NW, UT epigean/ Tx in WA)

*Anacornia proceps* Chamberlin, 1948 (UT epigean /Tp in cave in Uinta Mts., UT)

*Anahita* Karsch, 1879 (once in Clubionidae) - Ctenidae spiders (1 species in US)

*Anahita punctulata* (*Ctenus p.* Hentz, 1844; *Arctosa animosa* Simon, 1864) Simon, 1897 (seUS to TX/wandering spider/Tp? in AL, TN; Ac in cave in Comal Co., TX; Tx in Harrison Co., IN (S1/G3))

*Anapistula* Gertsch, 1941 - Symphytognathidae spiders (1 species in US)

*Anapistula secreta* Gertsch, 1941 (US to Columbia, Bahamas, Jamaica/ Tp in cave each in Travis & Williamson Cos., TX)

*Anapistula* undescr.? sp. (\*? cave in Travis Co., TX/ Tp?)

*Anthrobia* Tellkamp, 1844 - Linyphiidae spiders (also placed in Leptonetidae), Subfamily Linyphiinae

*Anthrobia mammothia* Tellkamp, 1844 (type locality in Mammoth C.(KY)/KY (Wayne, Jackson Cos.), TN (Smith, Warren Cos.), WV (Greenbrier, Mercer, Pocahontas Cos.), VA (Alleghany, Bath, Scott, Smyth Cos.)/ Tb/ T&E VA S1, global G3G4) **Bibl.:** Poulson 1977, 1981

*Anthrobia* undescr.? sp. (\*?Tb cave in Bartow Co., GA)

*Antrodiaetus* Ausserer, 1871 (= *Brachybothrium* Simon, 1884; *Acattyma* L. Koch, 1878) Antrodiaetidae spiders (11 species in US) **Bibl.:** Coyle, 1971

*Antrodiaetus pacificus* (*Brachybothrium pacificum* Simon, 1884) (Tx or Tp in BC)

*Antrodiaetus unicolor* (*Mygale u.* Hentz, 1842; *A. accentuatus* (Simon, 1884); *A. angustatus* (Atkinson, 1886); *A. gracilis* (Hentz, 1842); *A. marxi* (A.1886)) (c.& s. Appalachians, w. to Ozarks/ probably *A.u.*: Ttx or Ac in TN(2 caves); Tp in GA (Dade & Walker Cos.))

*Appaleptoneta* Platnick, 1986 - Leptonetidae spiders (7 species in US)

*Appaleptoneta barrowsi* (*Leptoneta b.* Gertsch, 1974) Platnick, 1986 (\*type locality cave in Blount Co, AL/ Tp?)

*Appaleptoneta credula* (*Leptoneta c.* Gertsch, 1974; *Neoleptoneta c.*) Platnick, 1986 (\*type locality cave in Lauderdale Co.,AL/ Tp?)

*Appaleptoneta fiskei* (*Leptoneta f.* Gertsch, 1974; *Neoleptoneta f.*) Platnick, 1986 (type locality & at least one other cave in Walker Co.,\*nwGA/ Tp)

*Appaleptoneta georgia* = *Neoleptoneta g.*

*Appaleptoneta jonesi* (*Leptoneta j.* Gertsch, 1974; *Neoleptoneta j.*) Platnick, 1986 (\*type locality cave in Jefferson Co.,AL/Tp?)

*Appaleptoneta* undescr. sp.#1-4 or 5 (AL &/or GA (\*? cave in Walker Co.)/ Tb)

*Aptostichus* Simon, 1891 - Cyrtaucheniidae spiders (5 species in US)

*Aptostichus* undet. sp. (Tx? in Calaveras & Tuolumne Cos.,CA)

*Aranea* (see *Tegenaria* & *Meta* in TETRAGNATHIDAE)

*Araneus* Clerck, 1757 (*Cathaistela* Archer, 1958; *Amamrotypus*, *Cambridgepeira*, *Conaranaea*, *Conepeira* Archer, 1951; *Neosconella* F.O. P. –Cambridge, 1903; *Atea* C. Koch, 1837)

Araneidae spiders (43 species in US or Canada) **Bibl.:** Levi, 1971

*Araneus cavaticus* (*Epeira c.* Keyserling, 1882; *E. cinerea* Emerton, 1884; *Aranea c.* Comstock, 1940) Petrunkevitch, 1911 (E US & adjacent Canadian, sw to AL & TX/ type in Mammoth C./ barn spider/ TTx in AL,KY(Mammoth C.), epigeal in OH)

*Araneus diadematus* Clerck, 1757 (cosmopolitan?, Russian Far East/ alien in NW & MA to Great Lakes/garden or cross spider/Tx or Ac in sOn; Ac in WA)

*Araneus illaudatus* (*Aranea illaudata* Gertsch & Mulaik, 1936; *A. pima* Levi, 1971) Levi, 1970 (*A. pima* Levi, 1971) (Ac in TX)

*Araneus miniatus* (*Epeira m.* Walckenaer, 1841; *E. scutulata* Hentz, 1847; *Larinia nigrofoliata* Keyserling; *E. scutulata* Keyserling, 1892; *E. floridensis* Petrunkevitch, 1911; *Aranea miniata*, *A. f.* Archer, 1941; *Conepeira partita*, *C.m.*, *C. dawsoni*, *C.n.* Archer, 1951 ) Levi, 1973 (SE/ TTx in cave in Morgan Co.,AL)

*Araneus* undet. sp. (TTx or Ac in NWT)

*Archaeearanea* - See *Achaeearanea*

*Archoleptoneta* Gertsch, 1974 - Leptonetidae spiders (2 species in US)

*Archoleptoneta schusteri* Gertsch, 1974 (most of CA, ground litter/Tp in Amador, Tulare & Tuolumne Cos.,CA)

*Arctobius* Lehtien, 1967 - Amaurobiidae spiders (1 species in US & Canada)

*Arctobius agelenoides* (*Amaurobius agelenoides* Emerton, 1919; *Hesperauximus a.* Chamberlin, 1947) Lehtinen, 1967 (AK, wCanada, Finland, Russia/ Tx or Ac in cave in AB)

*Arcuphantes* Chamberlin & Ivie, 1943 - Linyphiidae spiders, Subfamily Linyphiinae (7 species in US or Canada)

*Arcuphantes arcuatulus* (Roewer, 1942) (near *A.a.*: Tx in Tulare Co., CA) (see undescr. sp. below)

*Arcuphantes cavaticus* Chamberlin & Ivie, 1943 (Tp in NW (CA?, OR?, WA?))

*Arcuphantes potteri* Chamberlin & Ivie, 1943 (type locality cave in Shasta Co. + Calaveras & Plumas Cos., CA/Tp in nCA, seOR, WA)

*Arcuphantes* probable new sp. near *arcuatulus* (Roewer, 1942) (Tp in \*?cave in Tulare Co., CA)

*Argiope* Audouin, 1826 (*Austrariope*, *Chaetargiope*, *Coganargiope*, *Heterargiope* Kishida, 1936; *Brachygea* Caporiacco, 1947) – Araneidae spiders (once in Dipluridae) (7 species in US or Canada)

*Argiope aurantia* Lucas, 1833 (*Nephila vestita* C. L. Koch; *Epeira a.* Lucas, 1840; *E. cophinaria*, *E. ambitoria* Walckenaer; *E. riparia*, *E. sutrix* Hentz, 1847; *E. personata* O.P. – Cambridge, 1893; *A. godmani* O.P. – Cambridge, 1898; *Miranda c.* O.P. – Cambridge, 1903; (yellow garden argiope or s., black & yellow garden s., writing s.) (Canada to Costa Rica/ Ac or TTx in TX)

*Argyrodes* Simon, 1864 (= *Argyrochina* Strand, 1926; *Ariamnes* Thorell, 1869; *Conopistha* Karsch, 1881; *Microcephalus* Restrepo, 1944; *Neospintharus* Exline, 1950; *Rhomphaea* L.Koch, 1872; *Spheropistha* Yaginuma, 1957) Theridiidae spiders (17 species in US or Canada)

*Argyrodes argyrodes* (*Linyphia a.* Walckenaer, 1841; *L. gibbosa* Lucas, 1846; *A. eperiae* Simon, 1866; *A. gibbosus* Simon, 1873; *Aranea epeira* O.P. – Cambridge, 1880; *Conopistha a.* Brignoli; *A. ammonia* Denis, 1947) Simon, 1881 (HI (alien), India, Melanesia, Mediterranean to West Africa, Seychelles/ Tp or Tx in HI)

*Argyrodes trigonum* (*Theridion t.* Hentz, 1850) Emerton, 1882 (Canada, e. to NE, eTX/ Tx in IN)

*Argyrodes* undet. sp. (TX in Coryell, Hays, San Saba, Val Verde Cos., TX)

*Ariadna* Audouin, 1826 (= *Citharoceps* Chamberlin, 1924; *Segestriella* Purcell, 1904) - Segestriidae spiders) (5 species in US or Canada)

*Ariadna bicolor* (*Pylarus b.* Hentz, 1842; *P. pumilus* Hentz, 1842; *A. pallida* C Koch, 1843; *A. rubella* Keyserling, 1877; *A. mexicana* Banks, 1898; *A. philosopha* Chamberlin, 1924) Emerton, 1902 (CA, SE/ Ac in cave each in Edwards & Lampasas Cos., TX)

*Auchicybaeus* Gertsch, 1933 - Cybaeidae spiders  
*Auchicybaeus ovalis* = *Meta menardi*

*Azilia* Keyserling, 1882 - Tetragnathidae spiders (1 species in US)  
*Azilia affinis* O.P.-Cambridge, 1893 (= *A. vagepicta* Simon, 1895; *A. mexicana* Banks, 1898)  
(Costa Rica to TX, Gulf/ TTp or TTx in FL)

*Azilia vagepicta* = *A. affinis*

*Bathypantes* Menge, 1866 (= *Bathypantoides* Kaston, 1948; *Oreodia* Hull, 1950) (mostly litter sp.) - Linyphiidae spiders, Subfamily Linyphiinae (19 species in US or Canada). **Bibl.:** Ivie 1969

*Bathypantes* (*B.*) *alameda* Ivie, 1969 (epigeal in CA, OR, BC/ Tp in cave in Santa Cruz, CA)

*Bathypantes alascensis* (*Lepthyphantes a.* Banks, 1900) Ivie, 1969 (AK, BC, CA, OR, WA epigeal/ Ttp in AK, BC, OR, WA & Shasta, Siskiyou? & Trinity Cos.,CA)

*Bathypantes* (*B.*) *alboventris* (*Diplostyla a.* Banks, 1892) Petrunkevitch, 1911 (= *B. albiventris* Petrunk., 1911) (epigeal in KY, NY, NJ, IN, IL, OH, PA, WI, NE, ON, TN, VA, WV / Tp or Tx in IL, MO, VA; Tp in IN (Orange Co./S4/G4))

*Bathypantes crosbyi* = *B. reprobus*

*Bathypantes* (*B.*) *diasosnemus* Fage, 1929 (= *B. hubbsi* Chamberlin & Ivie, 1943) (Subway C. (type locality) ,Shasta Co.,CA/epigeal in nCA, sOR, WA/ Tp or Tx in OR,WA; Tp in nCA; near *B.(B.) d.*: Tp? in cave in Tulare Co., CA)

*Bathypantes hubbsi* = *B. diasosnemus*

*Bathypantes* (*B.*) *keenii* (*Diplostyla k.* Emerton, 1917) Ivie, 1969 (epigeal in Russian, AK, BC, CA, WA/ TTp in BC, WA)

*Bathypantes* (*B.*) *orica* Ivie, 1969 (epigeal in CA, OR, WA, BC/ Tx in Santa Cruz Co.,CA)

*Bathypantes* (*B.*) *pallidus* (*Diplostyla p.* & Banks, 1892; *B. banksi* Petrunkevitch, 1911; *B. nigrinus* Comstock,1940) Banks, 1892 (Nearctic, NA (all n. states & provinces, n. to NT, s. to AZ, NC / Tp in IL, MO, WV; Tx in IN (Crawford Co.(S4/G4), leaf litter)

*Bathypantes* (*B.*) *reprobus* (*Lepthyphantes r.* Kulczynski, 1916; *Diplostyla crosbyi* Emerton, 1919; *B. rupestris* Holm, 1945) Pakhorukov, 1981 (Nearctic in ME, NY, NH, AK, PQ, ON, MB, NT, boreoalpine, deciduous leaf litter/ Tx or Ac in sON)

*Bathypantes* undet. sp. (near *B. diasosnemus*) (Kings Canyon Natl. Park,CA/ Tp or Tx)

***Bathyphantes* (*Weyerphantes*) *weyeri*** (*Linyphia* w. Emerton, 1875) Berland, 1931 (type locality cave in Augusta Co., VA + AR (WA Co.), KY (Barren, Edmondson (Mammoth C.), Pulaski, Warren Cos.), PA (Lancaster Co.), WI (Richland Co.) & WV (Pocahontas Co.) & PQ/ Tb/ T&E VA S1 & WV S1, global G3G4) **Bibl.:** Holsinger et al. 1976; Harker & Barr 1979; Peck & Christiansen 1990

***Bavia*** Simon, 1877 - Salticidae spiders) (1 species in US)

***Bavia aericeps*** Simon, 1877 (*Acompse suavis* L. Koch, 1879) (Philippines to New Guinea, eAsia, Pacific Islands, HI(alien)/ Tp or Tx)

***Blabomma*** Chamberlin & Ivie, 1937 Dictynidae spiders (also put in Agelenidae) (9 species in US)

***Blabomma*** undescr. sp.#1 (\*\*2 caves in Calaveras Co., CA/Tb)

***Blabomma*** undescr. sp.#2 (\*cave in Calaveras Co., CA/Tb)

***Blabomma*** undescr. sp.#3 (\*cave in Shasta Co., CA/Tb)

***Blabomma*** undescr. sp.#4 (\*cave in Tulare Co., CA./Tb)

***Blabomma*** undescr. sp.#5 (\*\*\*)? Three caves in Calaveras Co., CA/ Tb)

***Blabomma*** undescr. sp.#6 (\*cave in Amador Co., CA/ Tp)

***Blabomma*** undescr. sp.#7 (\*cave in Amador Co., CA/ Tp)

***Blabomma*** undescr. sp.#8 (> 5 caves in Calaveras Co. CA/Tb)

***Blabomma*** undescr. sp.#9 (>5 caves in Mariposa Co., CA/Tp)

***Blabomma*** undescr. sp. #10 (\*cave in Amador Co., CA/ Tp)

***Blabomma*** undescr. sp. #11 \*cave in Calaveras Co., CA/ Tp)

***Blabomma*** undescr. sp.#12 (\*cave in Santa Cruz Co., CA/ Tp)

***Blabomma*** undescr. sp. #13 (\*cave in Tuolumne Co., CA/ Tb)

***Blabomma*** undescr. sp.#14 (\*cave in Tuolumne Co., CA/Tp)

***Blabomma*** undescr. sp. #15 (\*cave in Tuolumne Co., CA/Tp)

***Blabomma*** undet. sp. (3 caves in Calaveras Co., CA/Tp)

***Calileptoneta*** Platnick, 1986 - Leptonetidae spiders (5 species in US)

***Calileptoneta*** undescr. sp. (or same as below) (\*?Crystal C., Tulare, CA/ Tb)

***Calileptoneta*** undescr. sp. (Trinity Co., CA/ Tb)

***Calisoga*** Chamberlin, 1937 (= *Hesperopholis* Chamberlin & Ivie, 1939) - Nemesiidae spiders (also put in Ctenizidae) (3 species in US)

*Calisoga theveneti* (*Brachythele t.* Simon, 1891) Raven, 1985 (Sierras/ Tx or Tp in Calaveras Co.,CA)

*Callilepis* Westring, 1851 - Gnaphosidae spiders (5 species in US or Canada)

*Callilepis imbecilla* (*Pythonissa i.* Keyserling, 1887; *C. munda* Chamberlin, 1935) Comstock, 1912 (US/ Tx or Ac in OK) **Bibl.** Platnick & Shadab 1981

*Callilepis* undet. sp. (Ac in TX)

*Callobius* Chamberlin, 1947 - Amaurobiidae spiders (25 species in US or Canada) **Bibl.:** Leech, 1974 (mostly litter sp.)

*Callobius bennetti* (*Ciniflo b.* Blackwall, 1846; *Amaurobius sylvestris* Emerton, 1888) Chamberlin, 1947 (Eastern Nearctic/ Tx in IL, IA, IN, KY, MD (Rocky Gap C, Allegheny CO.), MO, MN, ON)

*Callobius nevadensis* (*Amaurobius n.* Simon, 1884; *A. utahensis*, *Auximus pallescens* Chamberlin, 1919; *C. pallescens* Chamberlin, 1920; *C. shastus*, *A.s.* Chamberlin & Ivie, 1947) Chamberlin, 1947 (CA, MT, NV, OR, WA epigean/ epigean in Subway C., Shasta Co., CA)

*Callobius rothi* Leech, 1972 (WA to CA epigean/ Tx or Tp in Sonoma Co., CA)

*Callobius* undet. sp. or species (NW; Tp or Tx in Kings Canyon Natl. Park,CA; Tx in Shasta Co.,CA; NM hyporheic)

*Callobius tehama* Leech, 1972 (Tx in Butte, Lassen, Shasta & Tehama Cos., CA)

*Callobius tibialis* = *Cybaeopsis t.*

*Calodipoena* Gertsch & Davis, 1936 - Mysmenidae spiders (1 species in US)]

*Calodipoena incredula* Gertsch & Davis, 1936 (= *Mysmena i.* Levi, 1956) (US, Bahamas, Cuba/ Ac in cave in Hardeman Co., TX)

*Calymmaria* Chamberlin & Ivie, 1937 Hahniidae spiders (once in Agelenidae, also put in Stiphidiidae) (11 species in US or Canada) **Bibl.:** Heiss 1982; Lehtinen 1967 (perhaps 31 sp., only 12 described)

*Calymmaria cavicola* (*Tegenaria c.* Banks, 1896) Chamberlin & Ivie, 1937 (syn. of *T. persica*?) (type locality cave in Crawford Co., IN/ epigean in E/ cave funnel web spider/ Tp in AL (Walker Co.), GA (Dade & Walker Cos.), IL, IN (S1), TN, VA, WV; TTx in KY(Mammoth C; Edmonson, Rockcastle, Pulaski, Wayne Cos.),OH)

*Calymmaria shastae* Chamberlin & Ivie, 1937 (Epigean, Ac or Tx in cave in Calaveras Co., CA)



*Calymmaria* undet. sp. (epigeal in cave in Calaveras, Plumas, Tulare & Tuolumne Cos.,CA; Tp? in cave in Walker Co.,GA)

*Calymmaria* probable undescr. sp. (\*?in cave in Tulare Co., CA/ Tp)

*Castianeira* Keyserling 1879 - Corinnidae spiders

*Castianeira longipalpus* (*Herpyllus l.* Hentz, 1847; *Agroeca tristis* Keyserling; *Geotrecha pinnata* Emerton, 1890; *Thargalia longiopalis*, *T. pinnata* Marx, 1889; *T. perplexa* Banks, 1892; *Corinna media*, *C. pacifica* Banks, 1896; *C. pinnata* Bryant, 1908; *C. tristis*, *C. longipalpis*, 1910) Dondale & Redner, 1982 (Nearctic/ Tx or Tp in TN, Blount Co.)

cave spiders - See Araneidae

*Chasmocephalon* Pickard-Cambridge, 1889 - Anapidae spiders

*Chasmocephalon shantzi* = *Gertschanapis s.*

*Centromerus* Dahl, 1886 (*Atopogyna* Millidge, 1984) (9 species in US or Canada) (mostly litter sp.) Linyphiidae spiders, Subfamily Linyphiinae. **Bibl.:** Ivie 1969; Van Helsdingen 1973

*Centromerus cavernarum* (*Linyphia c.* L. Koch, 1872; *Troglobyphantes c.* Simon, 1884; *Taranucnus c.* Enslin, 1906; *C. satyrus* Millidge & Locket, 1947; *C. derscoi*, *C. jacksoni* Denis, 1952) Pro'szyn'ski & Utochkin, 1977 (European epigeal and Tp/ non-native Tp in GA)

*Centromerus cornupalpis* (*Erigone c.* O. Pickard-Cambridge, 1875; *Microneta c.* Emerton, 1882; *M. complicata* Levi & Field, 1954; *Atopogyna c.* Millidge, 1984) Kaston, 1948 (US, Canada epigeal in MA, CT, NY, MI, NH, OH, IL, VI, NC, MO, WI, TN, UT, WY, NF, NS, ON/ Tp or Tx in IL,MO,VA,WV; Tx in IN (Harrison & Orange Cos./S4/G4))

*Centromerus denticulatus* (*Microneta denticulata* Emerton, 1909; *C. claytoni* Chamberlin & Ivie, 1944) Kaston, 1948 (Eastern Nearctic, Mex. to US, epigeal in ME, MA, CT, MI, NC, GA, TN, AL, PQ, ON, MB/ Tp in nAL, GA, OK, esTN)

*Centromerus latidens* (*Microneta l.* Emerton, 1882; *Meioneta luteola* Banks, 1892; *Bathyphantes l.* Crosby & Bishop, 1928; *Meioneta l.* Ivie, 1969) Kaston, 1948 (E, Canada, endogean in CT, GA, TN, MO, FL, WV, KY, NY, NH, OH, AL, MD, MI, TX, NF, ON/ **Tp** or **TTx** in AL, AR, IL, KY (Mammoth C.), OK, TX; Tp in FL,MO; Tx in IN (WA Co./S4/G4))

*Centromerus longibulbis* (*Microneta l.* Emerton, 1882) Kaston, 1948 (US epigeal in ME, MA, NH, NY, NF, PQ, ON, MB, [SK], [AB], BC/ Tx or Ac in NY (1 cave))

*Centromerus serratus* (*Erigone s.* O.P.-Cambridge, 1875; *Tmeticus s.*, *T. probosus*, *Sintula longulus*, *S. balteatus* Simon, 1884; *C.b.* Lessert, 1904; *Parasintula b.* Dahl, 1912) Lessert, 1910 (Europe epigeal & Tp/ prob. Tp or Tx alien in cave in Mercer Co.,WV)

*Centromerus* undet. sp. (cave in Tucker Co.,WV/ Tp?)

***Ceraticelus*** Simon, 1884 - Linyphiidae spiders, subfamily Erigoninae (31 species in US or Canada)

***Ceraticelus minutus*** (*Ceratinella minuta* Emerton, 1882; *Erigone m.* Marx, 1890) Banks, 1892 (Eastern Nearctic, incl. ME, MA, CT, NY, NH, PA, VA, NC, OH, MI, WI, MN, MO, GA, PQ, ON, MB / Tx or Ac in Manitoba, leaf litter)

***Ceraticelus*** undet. sp. or species (cave in Carter Co., KY & cave in WV)

***Ceratinops*** Banks, 1905 - Linyphiidae spiders (9 species in US or Canada)

***Ceratinops inflatus*** (*Lophocarenum inflatum* Emerton, 1923) Crosby & Bishop, 1933 (= *C. inflata*) (epigean in WA, BC, OR?, AK?/ Tp or (less likely) Tx in Calaveras, Mariposa, Tulare Cos., CA)

***Ceratinopsis*** Emerton, 1882 - Linyphiidae spiders, subfamily Erigoninae (25 species in US or Canada)

***Ceratinopsis interpres*** (*Erigone i.* O.P.-Cambridge, 1874; *Notionella i.* Banks, 1905) Bishop & Crosby, 1905 (Ed, epigean in MA, NH, NY, CT, MD, PA, VA, DC, NC, KY, MO, SC, NB, PQ, ON/ Tp or Tx in WA Co., MD)

***Cicurina*** Menge, 1871 (= *Moguracicurina* Komatsu, 1947; *Terilus* Simon, 1886) Dictynidae spiders (also put in Agelenidae) (102 species in US or Canada, Nearctic in Europe and Palearctic in Asia) **Bibl.:** Cokendolpher, J. C. & J. R. Reddell 2001.

**Bibl.:** Bonnet 1956; Chamberlin & Ivie 1940; Comstock 1912; Exline 1936; Gertsch 1992; Kaston 1978; Petrunkevitch 1911; Simon 1898; Chambelin & Ivie 1940; Gertsch 1992; Exline 1936

***Cicurina*** (*Cicurella*) *arcuata* Keyserling, 1887 (*C. complicata* Emerton, 1890; *Coelotes gnavus* Banks, 1892; *Tegenaria c.* Emerton, 1902) (Nearctic, AL, LA, NC, NM, VA/ Tx in GA, IL, IN (Crawford, Harrison Cos., S1/G3); leaf litter)

***Cicurina*** (*Cicurella*) *arkansa* Gertsch, 1992 (Tp in East Fork Fissure, Williamson Co., TX)

***Cicurina*** (*Cicurella*) *bandera* Gertsch, 1992 (\*type locality cave in Bandera Co., TX/ Tb/ G1G2)

***Cicurina*** (*Cicurella*) *bandida* Gertsch, 1992 (\*\*type locality & 1 other cave Travis Co., TX/ Tb/ / federally listed as endangered/ Bandit cave spider/ G1)

***Cicurina*** (*Cicurella*) *baronia* Gertsch, 1992 (\*type locality cave in Bexar Co., TX/ Tb/ / federally listed as endangered/ R. B. cave spider/ G1)

***Cicurina*** (*Cicurella*) *barri* Gertsch, 1992 (\*Caverns of Sonora(=Mayfield) C., Sutton Co., TX/Tb/ G1G2)

***Cicurina*** (*Cicurella*) *breviaria* Bishop & Crosby, 1926 (= *C. exlinae* Bishop & Crosby, 1940; *C. atomaria* Exline, 1938; ) (E/ endogean, Tp or Tx in AL, TN (Bedford Co.), Appalachia)

***Cicurina*** (*Cicurella*) *brevis* (Tegenaria b. Emerton, 1889; *C. creber* Banks, 1892) Chamberlin & Ivie, 1940 (Nearctic, BC, MO, WA?/ Tx? in AR, KY, NC, ON, TN, VA; Ac in NS, ON; leaf litter)

***Cicurina*** (*Cicurella*) *browni* Gertsch, 1992 (\*type locality cave in Williamson Co.,TX/ Tb/ G1G2)

***Cicurina*** (*Cicurella*) *buwata* Chamberlin & Ivie, 1940 (nomina inquirenda by Gertsch 1992) (type locality in cave near Austin (about W.97o58',N30o21'), Travis Co. + Bandera, Bell, Bexar,Comal, Coryell, Edwards, Hays, Kendall, Kerr, Kimble, Kinney, Lampasas, Medina, Menard, , Real, San Saba, Sutton, Travibs, Uvalde, Val Verde Cos.,TX/ Tb)

***Cicurina*** (*Cicurella*) *cavealis* Bishop & Crosby, 1926 (type locality cave in Boone Co.,MO/E/ Tp in AR, IL, MO)

***Cicurina*** (*Cicurella*) *caverna* Gertsch, 1992 (\*type locality cave in Kimble Co.,TX/ Tb/G1G2)

***Cicurina*** *caliga* Cokendolpher & Reddell, 2001 (\*type locality cave in Bell Co.TX/ Tb/ G1)

***Cicurina*** (*Cicurella*) *coryelli* Gertsch, 1992 (\*type locality cave in Coryell Co.,TX/ Tb/G1G2)

***Cicurina*** (*Cicurella*) *cueva* Gertsch, 1992 (\*\*type locality & 1 other cave in Travis Co.,TX/ Tb/ / federally listed as endangered, G1)

***Cicurina*** (*Cicurella*) *delrio* Gertsch, 1992 (\*\*\*)type locality & 2 other caves in Val Verde Co.,TX/ Tb)

***Cicurina*** (*Cicurella*) *deserticola* Chamberlin & Ivie, 1940 (AZ, NM, UT epigean/ Tp in cave in Eddy Co., NM)

***Cicurina*** (*Cicurella*) *elliotti* Gertsch, 1992 (type locality cave in (Williamson Co. + caves in Travis Co.,TX/ Tb/ G3)

*Cicurina exlinae* = *C. breviaria*

***Cicurina*** (*Cicurella*) *ezelli* Gertsch, 1992 (\*type locality cave in Hays Co.,TX/ Tb/G1G2)

***Cicurina*** (*Cicurella*) *gatita* Gertsch, 1992 (\*type locality cave in Bexar Co.,TX/ Tp)

***Cicurina*** (*Cicurella*) *gruta* Gertsch, 1992 (\*type locality cave in Edwards Co.,TX/ Tb/G1G2)

*Cicurina (Cicurella) holsingeri* Gertsch, 1992 (\*type locality cave in Seminole Canyon State Historical Park, Val Verde Co., TX/ Tb/ G1G2)

*Cicurina caliga* Cokendolpher & Reddell, 2001 (\*type locality cave in Bell Co. TX/ Tb/ G1)

*Cicurina (Cicurella) joya* Gertsch, 1992 (\*type locality cave in Comal Co., TX/ Tb?)

*Cicurina (Cicurella) machete* Gertsch, 1992 (\*type locality cave in San Saba Co., TX/ Tb/ G1G2)

*Cicurina (Cicurella) madla* Gertsch, 1992 (type locality cave + 4 caves, Bexar Co., TX/ Tb/ Federal endangered T&E/ G1)

*Cicurina (Cicurella) mckenziei* Gertsch, 1992 (\*type locality cave in Bandera Co., TX/ Tb/ G1G2)

*Cicurina (Cicurella) medina* Gertsch, 1992 (\*type locality cave in Medina Co., TX/ Tb/ G1G2)

*Cicurina (Cicurella) menardia* Gertsch, 1992 (\*type locality cave in Menard Co., TX/ Tb/ G1G2)

*Cicurina (Cicurella) minima* Chamberlin & Ivie, 1940 (AL, NC, TN/ Tp in AL)

*Cicurina (Cicurella) mirifica* Gertsch, 1992 (\*type locality cave in Pecos Co., TX/ Tb)

*Cicurina mixmaster* Cokendolpher & Reddell, 2001 (\*type locality cave in Bell Co. TX/ Tb/ G1)

*Cicurina (Cicurella) obscura* Gertsch, 1992 (\*type locality cave in Bandera Co., TX/ Tb/ G1G2)

*Cicurina (Cicurella) orellia* Gertsch, 1992 (\*type locality cave in Real Co., TX/ Tb/ G1G2)

*Cicurina (Cicurella) pablo* Gertsch, 1992 (\*type locality cave in Uvalde Co., TX/ Tb/ G1G2)

*Cicurina (Cicurella) pallida* Keyserling, 1887 (NE to MI, DC/ Tp or Tx in GA, IL, VA, WV/ Tx in OH & KY; Tp in IN (S2)(Crawford, Harrison, Oragne Cos.)

*Cicurina (Cicurella) pastura* Gertsch, 1992 (\*type locality cave in Kerr Co., TX/ Tb/ G1G2)

*Cicurina (Cicurella) patei* Gertsch, 1992 (\*type locality cave in Val Verde Co., TX/ Tb/ G1G2)

*Cicurina (Cicurella) porteri* Gertsch, 1992 (\*type locality cave in Val Verde Co., TX/ Tb/ G1G2)

*Cicurina (Cicurella) puentecilla* Gertsch, 1992 (\*Natural Bridge C., Comal Co., TX/ Tb/ G1G2)

*Cicurina (Cicurella) rainesi* Gertsch, 1992 (\*type locality cave in Edwards Co., TX/ Tb/ G1G2)

*Cicurina* (*Cicurella*) *reclusa* Gertsch, 1992 (type locality & 1 other cave in Comal Co.,TX/ Tb/ G1G2)

*Cicurina* (*Cicurella*) *reddelli* Gertsch, 1992 (\*type locality cave in Travis Co.,TX/ Tb/ G1G2)

*Cicurina* (*Cicurella*) *reyesi* Gertsch 1992 (\*type locality cave in Travis Co.,TX/ Tb/ G1G2)

*Cicurina* (*Cicurella*) *robusta* Simon, 1886 (*Coelotes longitarsus* Emerton, 1890; *C. garrina* Chamberlin, 1919) (E,SW,Nearctic/ type in Carlsbad C.,seNM/ Tp or Tx in KY, NM, OH)

*Cicurina* (*Cicurella*) *russelli* Gertsch, 1992 (\*type locality cave in Hays Co.,TX/ Tb/ G1G2)

*Cicurina* (*Cicurella*) *sansaba* Gertsch, 1992 (\*\*type locality & 1 other cave in San Saba Co.,TX/ Tb/ G1G2)

*Cicurina* (*Cicurella*) *selecta* Gertsch, 1992 (\*type locality cave in Uvalde Co.,TX/ Tb/ G1G2)

*Cicurina* (*Cicurella*) *serena* Gertsch, 1992 (\*type locality & 1 othe cave in Uvalde Co.,TX/ Tb/ G1G2)

*Cicurina* (*Cicurella*) *sheari* Gertsch, 1992 (\*type locality cave in Real Co.,TX/ Tb/ G1G2)

*Cicurina* (*Cicurella*) undescr. sp.#1 (MO/ Tp)

*Cicurina* (*Cicurella*) undescr sp.#2 (AL/ Tb)

*Cicurina* (*Cicurella*) undescr sp.#3 (AZ/Tb or Tp)

*Cicurina* undet. sp.#1-4 (NM hyporheic)

*Cicurina* (*Cicurella*) undet. sp. or species (Eddy Co.NM/ Tx in CA & Onondaga Cave, MO; Tp in cave in Mario Co. & CA)

*Cicurina* (*Cicurella*) *sprousei* Gertsch, 1992 (\*type locality cave in Bandera Co.,TX/ Tb/ G1G2)

*Cicurina* (*Cicurella*) *stowersi* Gertsch, 1992 (\*type locality cave in Kerr Co.,TX/ Tb/ G1G2)

*Cicurina* (*Cicurella*) *suttoni* Gertsch, 1992 (\*type locality cave in Sutton Co.,TX/ Tb/ G1G2)

*Cicurina* (*Cicurella*) *travisae* Gertsch, 1992 (type locality cave in Travis Co.,+ cave or caves in Williamson Co., TX/ Tb/ G1G2)

*Cicurina* (*Cicurella*) *ubicki* Gertsch, 1992 (\*type locality cave in Hays Co.,TX/ Tb/ G1G2)

*Cicurina* (*Cicurella*) *uvalde* Gertsch, 1992 (\*type locality cave in Uvalde Co.,TX/ Tb/ G1G2)

*Cicurina* (*Cicurusta*) *variens* Gertsch & Mulaik, 1940 (CO, NM epigeal/ Tp in NM, OK, TX)

*Cicurina (Cicurella) venefica* Gertsch, 1992 (\*type locality cave in Terrell Co.,TX/ Tb/ G1G2)

*Cicurina (Cicurella) venii* Gertsch, 1992 (\*type locality cave in Bexar Co.,TX/ Tb/ /Federally listed as endangered T & E/ Veni's cave spider/ G1)

*Cicurina (Cicurella) vespera* Gertsch, 1992 (\*\*type locality & 1 other cave in Bexar Co.,TX/ Tb/ Proposed federal endangered T&E/ G1)

*Cicurina (Cicurella) vibora* Gertsch, 1992 (\*\*type locality & 1 other cave in Williamson Co., TX/ Tb/ G1G2)

*Cicurina (Cicurella) wartoni* Gertsch, 1992 (Wharton's cave spider/ \* type locality cave in Travis Co., TX/ Federal Candidate T&E, priority 2/ Tb/ G1G2)

*Cicurina (Cicurella) watersi* Gertsch 1992 (\*type locality cave in Uvalde Co.,TX/ Tb/ G1G2)

*Cicurina (Cicurella) wiltoni* Gertsch, 1992 (\*\*type locality & 1 othe cave in Jefferson Co.,AL/ Tb/ G1G2)

*Cispiolus* (also put in Pholcidae) = *Dolomedes*

cobweb spider - See Theridiidae

*Coelotes* Blackwall, 1841 (not in America, see *Coras*) Amaurobiidae spiders

*Coelotes plumarius* Bishop & Crosby, 1926 = *Tegeneria domestica*

*Coras* Simon, 1898 - Amaurobiidae spiders (14 species in US or Canada) **Bibl.:** Muma 1946

*Coras cavernorum* Barrows, 1940 (Tp in US)

*Coras juvenilis* (*Coelotes j.* Keyserling, 1881; *C. fidelis*, *C. longitarsus*, *C. lineatus* Banks, 1892) Banks, 1916 (CT, IN, MD, MI, NY, PA, VT, VA epigeal/ Tx or Tp in GA (Walker Co.), KY(Mammoth C.),OH) **Bibl.:** Chamberlin 1925

*Coras lamellosus* (*Coelotes l.* Keyserling, 1887) Muma, 1946 (type locality cave in Marshall Co./Tp in AL), Tp or Tx (near *Coras lamellosus*) in 2 caves in Crawford Co.,MO; Tx in, IL,OK/ S4(IN)/G4)

*Coras* undet. sp. or species (Tx or Ac in IN; Tp in cave in Crawford Co.,MO; NM hyporheic)

*Coras taugynus* Chamberlin, 1925 (= *Coelotes t.* Lehtinen, 1967) (epigeal in eTN, wNC/ Tp in AL)

*Corinna* C.L. Koch, 1841 (*Falconina Brignoli*, 1985; *Chemmis* in part) Corinnidae spiders (once put in Agelenidae & Clubionidae) (2 species in US)

*Corinna* undet. sp. (Tp in Bexar, Travis, Williamson Cos., TX)

*Corinna cetrata* (*Creugas cetratus* Simon, 1889; *C. tahitica* Strand, 1913) Simon, 1898 (New Caledonia, Tahiti, Marquesas Islands (alien in HI (Kauia,Oahu))/ Tp or Tx)

*Cryphoeca* Thorell, 1870 (also put in Agelenidae) (2 species in US or Canada) (mostly litter sp.) Hahniidae spiders

*Cryphoeca* undet. sp. (Tx in NM)

*Ctenium* Menge, 1871 (see *Robertus*) Ctenidae spiders. Bibl.: Kaston 1946

*Ctenus* Walckenaer, 1805 (wandering spiders) Ctenidae spiders (5 species in US or Canada)

*Ctenus captiosus* Gertsch, 1935 (FL epigean/Tp? in FL (prob.))

*Ctenus exlineae* Peck, 1981 (Tp? in karstlike cavities in \*Devils Den State Park, WA Co.,AR)

*Ctenus* undescr.? sp. (Tx in cave in Adair Co.,OK)

*Ctenus valverdiensis* Peck, 1981 (\*\*\*\*type locality & 3 other caves in Val Verde Co.,TX/ Tp)

*Cybaeopsis* Strand, 1907 (*Callioplus* Bishop & Crosby, 1935) - Amaurobiidae spiders (9 species in US or Canada)

*Cybaeopsis tibialis* (*Amaurobius t.* Emerton, 1888; *Callioplus t.* Chamberlin & Ivie, 1947) Yaginuma, 1987 (Tx in nON)

*Cybaeozyga* Chamberlin & Ivie, 1937 - Cybaeidae spiders (6? Species in US)

*Cybaeozyga* undescr. sp.#1 (\*?cave in Shasta Co.,CA/Tb)

*Cybaeozyga* undescr. #2 (\*?cave in Shasta Co.,CA/Tb)

*Cybaeozyga* undescr. sp. #4? (Shasta Co.,CA)/Tb (or new *Cybaeus* sp.#2)

*Cybaeozyga* undescr. sp.#5? (NY/Tb)

*Cybaeus* L. Koch, 1868 (*Bansaia* Uyemura, 1938) Cybaeidae spiders (also put in Agelenidae) (40 species in US or Canada, genus also in Europe & Japan) (mostly litter sp.) **Bibl.:** Chamberlin & Ivie 1932; Roth 1952

*Cybaeus eutypus* Chamberlin & Ivie, 1932 (BC to CA epigean/ Tx or Tp in BC)

*Cybaeus giganteus* Banks, 1892 (= *C. patritus* Bishop & Crosby, 1926; *C. silicis* Barrows, 1919) (NY, NC epigean/ Tp in Mammoth C.,KY; Tx or Tp in cave in Blount Co.,TN)) **Bibl.:** Roth & Brown, 1986

*Cybaeus morosus* Simon, 1886 (= *C. signifer* Emerton, 1923) (US, n. to AK epigean/ Tx or Tp in BC)

***Cybaeus reticulatus*** Simon, 1886 (US, n. to Canada, AK epigeal/ Ac in WA; Ac, Tp or Tx in BC)

***Cybaeus septatus*** Chamberlin & Ivie, 1942 (type locality cave in Shasta Co.,CA/ sOR & nCA epigeal)

***Cybaeus*** undet. species (Tx or Ac in nON; Ac or Tx in Calaveras & Tuolumne Cos.,CA; Tp or Tb? in cave in Skamania Co.,WA; Tx or Tp in BC & Nickajack C.,TN)

***Cybaeus*** undescr. sp.#1 (Trinity Co.,CA/ Tb)

***Cybaeus*** undescr. sp.#2 (cave in Shasta Co.,CA/ Tb (or new *Cybaeozyga* sp.#4))

***Cybaeus*** undescr. sp.#2-8 (wCA/ Tb)

***Cyclosa*** Menge, 1866 (= *Parazygia* Caporiacco, 1955) - Araneidae spiders (9 species in US or Canada) *Cyclosa argyroides* = *A. a.*

***Cyclosa conica*** (*Aranea c.* Pallas, 1772; *C. conica canadensis* Blackwall, 1846; *A. triquetra* Sulzer, 1776; *Epeira c.* Walckenaer, 1802; *Singa c.* Hahn, 1834) Menge, 1866 (Holarctic, CA, SW, Russian Far East/ Tx or Ac in Manitoba)

***Dictyna*** Sundevall, 1833 (= *Brigittea* Lehtinen, 1967) Dictynidae spiders (41 species in US or Canada)

***Dictyna bellans*** Chamberlin, 1919 (= *D. longispina* Getsch & Mulaik, 1940; *D. extensa* Jones, 1947) (LA/ Ac in cave in San Saba Co., TX)

***Dictyna*** undet. sp. (Tx or Ac in 1 IL cave)

***Diguetia*** Simon, 1895 - Diguetidae spiders (5 species in US)

***Diguetia canities*** (*Segestia c.* McCook, 1890) Simon, 1895 (SW, s. to Mex. epigeal/ Tx in Colossal C., AZ)

***Dipoena*** Thorell, 1869 (= *Umfila* Keyserling, 1886; *Trigonobothrys* Simon, 1889; *Stictoxena* Simon, 1895; *Paoningia* Schenkel, 1936; *Pselothorax* Chamberlin, 1948) Theridiidae spiders (16 species in US or Canada)

***Dipoena abdita*** Gertsch & Mulaik, 1936 (FL to CA, NV/Tx in OK)

***Dipoena*** undet. sp(p). (MO,OK/Tx?)

***Dirksia*** Chamberlin & Ivie, 1942 (described as subgenus of *Ethobuella*) – Hahniidae spiders (once placed in Agelenidae) (1 species in US)

***Dirksia cinctipes*** (*Apostenus c.* Banks, 1896; *Ethobuella (Dirksia) c.* Chamberlin & Ivie; *E. anyphaenoides* Chamberlin & Ivie, 1942; *E.c.* Chamberlin & Ivie, 1947) Lehtinen, 1967 (Tx or Tp in BC)



***Dolomedes*** Latreille, 1804 (*Teippus* Chamberlin, 1924; *Cispiolus* Roewer, 1955) Pisauridae spiders (8 species in US or Canada). **Bibl:** Carico, 1973

***Dolomedes scriptus*** Hentz, 1845 (*D. fontanus*, *D. tenebrosus* Emerton, 1885) (Eastern Nearctic, NC, OH, KY, n. to Canada epigeal/ Ttx in IL, IN (Crawford, Harrison, Orange Cos./S1?/G3), KY, MO, OH, TN, TX; Ttx or Ac in MD (one cave))

*Dolomedes sexpunctatus* = *D. triton*

***Dolomedes*** undet. sp. or species (Tx in IL, MO, MS)

***Dolomedes tenebrosus*** Hentz, 1843 (New England & adjacent Canada s. to FL & w. to ND & eTX/ brownish-gray fishing s./Tx in IL, MO, MS, sON)

***Dolomedes triton*** (*Lycosa t.* Walckenaer, 1837; *D. expunctatus* Hentz, 1845; *D. scapularis* C.L. Koch, 1847; *Potamia t.* Simon, 1864; *D. major* Banks, 1898; *Thaumasia t.* F.O.P-Cambridge, 1903; *D. albiclavius* Bishop, 1924) Petrunkevitch, 1910 (E of Rockies, rare in Rockies & Great Plains, Nearctic, NM, TX, s. to Cuba epigeal/ six-spotted fishing s./Tx or Tp in WV) **Bibl.:** Carico 1970; Figiel 1995; Kreiter 1997; M. Moore 1997; Wojcicki 1992

*Dolomedes urinator* = *D. vittatus*

***Dolomedes vittatus*** Walckenaer, 1837 (= *D. urinator* Hentz, 1847) (TX/Tx in IL, IN (Harrison Co./ S1/G4), MO?, TN, WV)

***Drassyllus*** Chamberlin, 1922 Gnaphosidae spiders (once put in Ctenidae) (56 species in US or Canada) (mostly litter sp.) **Bibl.:** Platnick & Shadab, 1981-2

***Drassyllus depressus*** (*Prothesima d.* Emerton, 1890; *Melanophora d.* Bryant, 1908; *Zelotes d.* Banks, 1911; *Prothesima d.* Emerton, 1911) Chamberlin, 1922 (AZ, Canada, NM, OH, Nearctic/ Tx or Ac in WV; ground litter)

***Drassyllus dromeus*** Chamberlin, 1922 (= *D. lutzi*, *D. devexus* Chamberlin, 1936; *D. orgilus* Ubick & Roth, 1973) (Ac in cave in Kimble Co., TX)

***Drassyllus fallens*** Chamberlin, 1922 (*Prothesima depressa* Emerton, 1911 (in part)) (US, Canada epigeal/Tx in 2 caves in Hocking Co., OH)

***Drassyllus gynosaphes*** Chamberlin, 1936 (Ac in cave in Bexar Co., TX)

***Drassyllus prosaphes*** Chamberlin, 1936 (Ac in cave in Brewster Co., TX)

*Drassyllus* undet. sp(p). (Ac in TX; WA)

***Drassyllus texamans*** Chamberlin, 1936 (SE to OK, TX, Mex./ Ac in TX)

***Dysdera*** Latreille, 1804 - Dysderidae spiders (1 species in US & Canada)

*Dysdera crocota* C.L. Koch, 1838 (cosmopolitan, prob. introduced into US from Mediterranean/ New England s. to LA & W.to CA/alien Tp or Tx in 2 HA caves)

*Ebo* Keyserling, 1884 (= *Titanebo* Gertsch, 1933) Philodromidae spiders(21 species in US or Canada)

*Ebo* undet. (Carlsbad C.,NM)

*Eidmannella* Roewer, 1935 Nesticidae spiders (once in Theridiidae) (6 species in US)

*Eidmannella bullata* Gertsch, 1984 (\*type locality cave in Culberson Co.,wTX/ Tb/ G1G2)

*Eidmannella delicata* Gertsch, 1984 (\*type locality cave in Verde Co.wTX/ Tb/ G1G2)

*Eidmannella nasuta* Gertsch, 1984 (\*type locality cave in Medina Co.,TX/ Tb/ G1G2)

*Eidmannella pallida* (*Nesticus p.* Emerton, 1875; *N. cavicola* Banks, 1898; *Pocobletus mexicanus* Banks, 1898; *Bathyphantes ovigerus* Petrunkevitch,1926; *Theonoe striatipes*, *Centromerus o.* Petrunkevitch, 1930; *Eidmannella attae* Roewer, 1935; *N. dragani* Dumitresco, 1973; *E. suggerens* Chamberlin, 1924; *Nesticus mexicanus* Banks) Millidge & Locket, 1955 (cotypes from cave in Augusta Co.,VA +Ed in England(alien),Ontario s. in E to Panama,West Indies/ AK, CA, GA, IA, KS, KY, LA, MA, MS, NJ, NC, OK epigeal/ Tp or Tx in AL (Maidson Co.), AR, AZ, FL, HI(alien), IA, IL, IN(Crawford Co.), MD, NM, NY, OH, ON, OR, PA, TN (Davidson, Wayne &Rutherford Cos.), TX ( cave in Travis Co. & 2 caves in Williamson Co.); VA, WI, WV; Tp in AZ (Kartchner C.,Coshise Co), FL, GA (Dade & Decatur Cos.), MO,TN; Tx in NJ) **Bibl.:** Ives 1935; Muma 1945

*Eidmannella reclusa* Gertsch, 1984 (type locality & at least 5 other caves in Travis Co.,TX/ Tb/ G1G2)

*Eidmannella rostrata* Gertsch, 1984 (type locality cave in Kendall Co.,+ caves in & adjacent to Edwards Plateau, cTX (Bandera, Bexar, Blanco, Burnet, Comal, Hays, Kendall, Medina, Real, Terrell, Uvalde, Val Verde Cos.)/ Tb)

*Eidmannella* undescr.? sp. (\*? cave in Hays Co., TX/ Tb)

*Eidmannella tuckeri* Cokendolpher & Reddell 2001 (\*cave in Jeff Davis Co.,TX/ Tb)

*Eidmannella* undet. sp(p). (Tb? in Kartchner C.,AZ; Tp in cave in MO; Tp in TX)

*Elaver* Pickard-Cambridge, 1898 – Clubionidae spiders (8 species in US or Canada)

*Elaver exceptus* (*Clubiona pallens* Hentz, 1847 (preoccupied by Hahn, 1834); *Clubiona e.* L. Koch, 1866; *Clubionoides e.* Edwards, 1958) Brescovit, Bonaldo & Mikhailov, 1994 (US, Canada, West Indies epigeal/ Ttp in GA (Dade Co.))

*Enoplognatha* Pavesi, 1880 (Smopagia Simon, 1894) - Theridiidae spiders (mostly litter sp.) (7 species in US or Canada) **Bibl.:** Levi 1957

*Enoplognatha ovata* (*Araneus ovatus*, *A. lineatus* Clerck, 1757; *Aranea redimita* L., 1758, *A. coronata* De Geer, 1778) Levi, 1957 (Holarctic/ Tx or Ac in sON)

*Enoplognatha selma* Chamberlin & Ivie, 1946 (*E. (rugatha)* s. C.& I., 1946) (Tx in Mariposa Co., CA)

*Enoplognatha* undet. sp. (Tx or Tp in MS)

*Epeira* - See *Araneus*

*Eperigone* Crosby & Bishop, 1928 (mostly litter sp.), Linyphiidae spiders, subfamily Erigoninae (35 species in US or Canada) **Bibl.:** Millidge, 1987

*Eperigone antraea* (*Parerigone a.* Crosby, 1926; *E. antraea* Millidge, 1987) Crosby & Bishop, 1928 (Carlsbad C.(NM) (type locality) / epigean in Mexico, AZ, CO, NM, TX/ Tp or Tx in AZ, IL?, TX, Mex; Tx? or Tp? in CO)

*Eperigone autumnalis* = *Erigone a.*

*Eperigone eschatologica* (*Erigone e.* Crosby, in Chamberlin, 1924) Crosby & Bishop, 1928 (epigean in AL, AZ, CA, FL, GA, OK, TX, Mexico, s. to Columbia/ Tp or Tx in IL, NM, TX)

*Eperigone indicabilis* Crosby & Bishop, 1928 (IL, NY, NB, ON epigean/ Tp or Tx in IL; Ac or Tx in IN (Orange Co.)

*Eperigone maculata* (*Tmeticus maculatus* Banks, 1892; *Oedothorax m.* Crosby, 1905; *Parerigone m.* Crosby, 1926) Crosby & Bishop, 1928 (epigean in Russia, Canada to US, incl. ME, NH, MA, CT, RI, NY, NJ, PA, DC, MD, VA, NC, SC, GA, FL, AL, TN, KY, OH, MI, WI, MN, IN, IL, MO, AR, MS, LA, TX, KS, AZ, NF, NS, PQ, ON, Mexico/ Tx in IL,OK; Tp in TX; Tx or Tp in IN (Harrison & Orange Cos./S4/G4))

*Eperigone* undet. spp. (Tp in 8 cos. in TX)

*Eperigone tridentata* (*Tmeticus t.* Emerton, 1882; *Gongylidium t.* Simon, 1884; *Erigone t.* Marx, 1890; *Grammonota venusta* Banks, 1892; *Erigone clacksvillense* Petrunkevitch, 1925; *Oreonetides p.* Petrunkevitch, 1930; *E. p.* Saaristo, 1972 ) Crosby & Bishop, 1928; (epigean in Nearctic, incl. MA, VT, CT, RI, NY, NJ, DC, MD, VA, NC, GA, FL, PA, OH, IL, IN, KY, TN, AR, MO, LA, TX, WI, NE, PQ, ON, MB, TX/ **Tx** or **Tp?** in IL, IN, MD(Eb), WV, leaf litter)

*Eridantes* Crosby & Bishop, 1933 - Linyphiidae spiders (2 species in US or Canada)

*Eridantes erigonoides* (*Lophocarenum e.* Emerton, 1882; *Erigone percisa* Keyserling, 1886; *L. parvum* Banks, 1892; *L. formosum* Banks, 1892; *Diplocephalus e.* Simon, 1894; *Plaesiocraerus lobiceps* Banks, 1897; *Erigone e.* Petrunkevitch, 1911; *L. formosum* Banks, 1916; *Caseola*

*howardi* Petrukevitch, 1925) Crosby & Bishop, 1933 (epigean in US, incl. MA, CT, NY, NH, MD, DC, VA, TN, OH, IL, WI, MN, MO, KS, NE, NF, PQ, ON, MB/ Tx in AR)

***Erigone*** Audouin, 1826 (= *Eriogone* in part) in Linyphiidae, subfamily Erigoninae (also put in Erigonidae) (41 species in US or Canada, mostly in leaf litter, genus cosmopolitan)

***Erigone autumnalis*** Emerton, 1882 (= *Eperigone a*). (Eastern Nearctic, AZ, CA, NM, ME, NY, CT, NH, MA, NJ, MD, DC, OH, VA, NC, TN, FL, LA, AR, KY, IL, MS, MO, KS, OK, TX, NE, AZ, CA, NS, PQ, MB Holarctic, s. to Panama, West Indies, w. to Azores, Europe epigean/ Tp or Tx in IL,IA; Tx in IN (Harrison Co./S4?/G4))

***Erigone infernalis*** Keyserling, 1886 (*Araeoncus i.*) (type locality cave in Monroe Co. & cave in Lawrence Co., IN)& cave in Barren Co.,KY/ Tp in KY) (probably *Porrhomma* & so not a valid species)

***Erigone maculata*** (Banks, 1892) (= *Eperigone m.*) (epigean ne.Canada, s. to FL, w. to MO, AZ but not most of West/ Tp in GA (Bartow Co.))

***Erigone stygius*** (= *E. stygia* Gertsch, 1973) (\*\*type locality cave in HI Volcanoes Natl. Park & Kazumura Lava Tube/ Tb/ G1g2)

***Eulaira*** Chamberlin & Ivie, 1933 - Linyphiidae spiders, Subfamily Linyphiinae (12 species in US or Canada)

***Eulaira*** undet. sp. (Tx or Ac in NM)

***Eulaira suspecta*** Gertsch & Mulaik, 1936 (epigean in AZ, TX, Mex./ Ac in cave in Val Verde Co., TX)

*Filistata arizonica* = *Kukulcania a.*

***Filistatinella*** Gertsch & Ivie, 1936 (downgraded to subgenus of *Filistata* Lareille, 1810 by Zapfe, 1961 but accepted as valid genus by all modern workers) Filistatidae spiders (1 species in US)

***Filistatinella crassipalpis*** (*Filistata c.* Gertsch, 1935) Gertsch & Ivie, 1936 (Lower Rio Grande Valley of NM,TX epigean/ Tp in cave in Val Verde Co.,TX)

***Frontinella*** O. P.-Cambridge, 1902 - Linyphiidae spiders, Subfamily Linyphiinae (2 species in US or Canada) **Bibl.:** Blauvelt 1933

***Frontinella pyramitela*** (Walckenaer, 1841) Chamberlin & Ivie, 1944) Kaston, 1948 (*Linyphia communis* Hentz, 1850 (synonymy of *communis* is difficult to evaluate, as the Abbot drawing on which the name *pyramitela* is based has not been published) (Canada to Central America epigean / bowl & dolly weaver or spider/ Ac in cave in Medina Co., TX)

funnel spider - See Agelenidae & Dictynidae

**Gaucelmus** Keyserling, 1884 - Nesticidae spiders (1 species in US & Canada)

**Gaucelmus augustinus** Keyserling, 1884 (= *Theridion a.*) (female syntypes from 2 caves in Hays Co., TX/ SE to KY, nFL, West Indies, s. to Panama/ Tp in FL, GA (Decatur & Houston & WA Cos.), LA?, TX) **Bibl.:** Brignoli 1979

**Gertschanapis** Platnick & Forster, 1990 - Anapidae spiders (1 species in US)

**Gertschanapis shantzi** (*Chasmocephalon s. Gertsch*, 1960) Platnick & Forster, 1990 (Tp in Calaveras & Tuolumne Cos., CA)

**Gladicosa** (*Varacosa*) *avara* = *V.a.*

**Glenognatha** Simon, 1887 (= *Mimognatha* Banks, 1929, *Hivaoa* Berland, 1935) Tetragnathidae spiders (4 species in US or Canada)

**Glenognatha foxi** (McCook, 1893) (epigean in US to Panama, MO, NM, OH, OK, TN, TX epigean/ Tx in GA)

**Glenognatha** undet. sp. (Tx in MO)

**Gnaphosa** Latreille, 1804 (*Cylphosa* Chamberlin, 1933) Gnaphosidae spiders (21 species in US or Canada) **Bibl.:** Platnick & Shadab 1976

**Gnaphosa fontinalis** Keyserling, 1887 (*G. americana* Banks 1896; *G. distincta* Banks, 1898; *G. texana* Chamberlin, 1922 (US, Mex./Ac in cave in Hays Co., TX)

**Gnathonaroides** Bishop & Crosby, 1923 - Linyphiidae spiders (1 species in US & Canada)

**Gnathonaroides pedalis** (*Araeoncus p.* Emerton, 1923) Bishop & Crosby, 1938 (Eastern Nearctic, AB, ON, MB, ME to WI epigean/Tx or Ac in sON)

**Grammonota** Emerton, 1882 - Linyphiidae spiders (25 species in US or Canada)

**Grammonota** undet. sp. or species (Tx in MO; on porcupine dung in one NS cave)

**Habronattus** F.O. P-Cambridge, 1901 (once a subgenus of *Pellenes* Simon, 1876) Salticidae spiders (67 species in US or Canada)

**Habronattus elegans** (*Pellenes e.* Peckham & Peckham, 1901) Pro'szyn'ski, 1976 (US, s. to Mex. epigean/ Ac in cave in Irion Co., TX)

**Habronattus** undet. sp. or species (Ac in cave in Williamson Co., TX; Ac or Ttx in moss in El Malpais Natl. Monument, nNM))

**Hahnia** Koch, 1841 (= *Hahnistea* Chamberlin & Ivie, 1942; *Unzickeria* Lehtinen, 1967; *Haniops* Roewer, 1942; *Muizenbergia* Hewitt, 1915; *Simonida* Schiapelli & Gerschman, 1958)  
Hahniidae spiders (6 species in US or Canada)

**Hahnia flaviceps** Emerton, 1913 (E/ Tx in caves in Bexar, Travis, Williamson Cos., TX)

**Hahnea sanjuanensis** Exline, 1938 (= *Hahnistea longipes* Chamberline & Ivie, 1941; *Hahnistea* s. Lehtinen, 1967) (US, Mex. epigeal/ Tx or Tp in caves in Shasta Co.,CA)

**Hahnia** undet. sp. (Tx in caves in Bell, Bexar, Hays, Travis, Williamson Cos., TX)

*Hahnistea* Chamberlin & Ivie, 1941 - subsumed in *Hahnia*

**Halorates** Hull, 1911 - Linyphiidae spiders (also put in Erigonidae) (1-2? species in US or Canada)

**Halorates** undescr. sp. or *H. reprobus* (*Neriene reprobata* O.P. Cambridge, 1879; *Pedanostethus* r. Simon, 1884; *Tmeticus denticulatus* Hull, 1896; *T. commodus* O.P.-Cambridge, 1905; *Centromerus c.* Hull, 1911) Hull, 1911 (Tp or Tb in \*?cave in BC)

**Herpyllus** Hentz, 1832 (Bonna O.P. –Cambridge, 1898) Gnaphosidae spiders (12 species in US or Canada) **Bibl.:** Platnick & Shadab 1977

**Herpyllus** undet. sp. (Ac in cave in Edwards Co., TX)

**Hogna** Simon, 1885 (= *Isoghogna* Roewer, 1960; *Rabidosa* Roewer, 1960; *Birabenia* Mello-Leitao, 1941; *Lycorma* Simon, 1885) Lycosidae spiders (24 species in US or Canada)

**Hogna antelucana** (*Lycosa a.* Montgomery, 1904; *L. apicata* Banks, 1904) Roewer, 1955 (US epigeal/ Ac in Edwards, Val Verde Cos., TX)

**Hogna carolinensis** (*Lycosa c.*, *L. tarentula c.* Walckenaer, 1805; *L. t. georgiana*, *L. vehemens*, *L. milberti* Walckenaer, 1837; *L. pilosa* Girard, 1852; *Leimonium m.* Simon, 1864; *Geolycosa texana*, *G.c.* Montgomery, 1904) Roewer, 1955 (NC to GA,NE & sCanada to MO/ Carolina wolf s./Ac in TX)

**Hogna frondicola** (*Lycosa f.*, *L. nigroventris* Emerton, 1885; *Tarentula modesta* Thorell, 1877; *Lycosa m.* Banks, 1894; *Trochosa f.* Montgomery, 1902) Dondale & Redner, 1990 (US, Canada epigeal/ Tx or Ac in Manitoba, nON)

*Hogna howarthi* = *Lycosa h.*

*Hogna rabida* = *Rabidosa r.* Walckenaer, 1837

**Hololena** Chamberlin & Gertsch, 1929 - Agelenidae spiders (30 species in US or Canada)

**Hololena** undet. sp. (NM hyporheic)

*Howaia* Lehtinen & Saaristo, 1980 - Nesticidae spiders  
*Howaia mogera* = *Nesticella m.*

*Hypochilus* Mark, 1888 ("lamp shade" spiders) Hypochilidae spiders (9 species in US)

*Hypochilus bonneti* Gertsch, 1964 (type locality cave in Fremont Co. +>8 CO Rocky Mt. caves, Black Canyon of the Gunnison (scCO)/ Tp) **Bibl.:** Meacham 1983; Meachan 1991

*Hypochilus coylei* Platnick, 1987 (\*?rock overhangs below cave in Rutherford Co., NC/TTp or TTx?) NC State Species of Concern; global G3? rank) **Bibl.:** Huff & Coyle 1992

*Hypochilus gertschi* Hoffman, 1963 (WV epigean/Tp? in KY,VA) **Bibl.:** Shear, 1969

*Hypochilus jemez* Catley, 1994 (\*type locality cave in San Miguel Co.,NM/ Tb)

*Hypochilus petrunkevitchi* Gertsch, 1958 (San Bernadino Co. n.in Sierras to Humboldt Co./ TTp or (less likely) Tx in Siskiyou, Tulare & Fresno Cos.,CA)

*Hypochilus pococki* Platnick, 1987 (neGA, eTN, wVA epigean/ Tp? in wNC,TN (Blount Co.)) **Bibl.:** Catley 1993

*Hypochilus thorelli* Marx, 1888 (neAL, nGA, seTN, wNC, wSC epigean / TTx in TN (Blount & Robertson Cos.) & GA (Dade Co.)/Lamp Shade Spider) **Bibl.:** Fergusson 1972; Foelix & Jung 1978; Gertsch, 1992

*Hyptiotes* Walckenaer, 1837 (= *Uptiotes*) - Uloboridae spiders (4 species in US or Canada)

*Hyptiotes cavatus* (*Cyllopodia c.* Hentz, 1847; *H. americanus* Wilder, 1847) McCook, 1881 (eTX to GA, n.to New England/ triangle weaver/Ac in cave in Travis Co., TX)

*Hyptiotes gertschi* Chamberlin & Ivie , 1935 (Nearctic, NW, eCanada s. to CA, ME, NY/ Tx or Ac in WA)

*Islandiana* Braendegaard, 1932 (*Aduva* Bishop & Crosby, 1936) Linyphiidae spiders (also put in Erigonidae) (= *Aduva* Bishop & Crosby, 1936) (16 species in US or Canada) (mostly litter sp.) **Bibl.:** Ivie 1965

*Islandiana cavealis* Ivie, 1965 (type locality & at least one other cave in Fayette Co.,KY + 2 caves in Crawford Co.,MO & one cave in Harrison Co.,IN/ Tb)

*Islandiana flaveola* (*Tmeticus flaveolus* Banks, 1892; *Oedothorax f.* Crosby 1905; *Aduva f.* Bishop & Crosby, 1936; *Tapinocyba iowa* Chamberlin, 1948) Kaston, 1948 (epigean s.Canada to Mid-West, SW but not NW or CA/ Tp or Tx in IL,WV)

*Islandiana muma* Ivie, 1965 (= *Lepthyphantes m.*) \*\*\* (type locality cave in Rockbridge Co., VA & cave each in Colbert & Lawrence Cos., AL/Tb/T&E VA S1, global G2G3 or (less likely) G1G2) **Bibl.:** Holsinger & Culver 1988; Peck 1989

*Islandiana princeps* Braendegaard, 1932 (Holarctic, boreoalpine & subarctic, CO, IL, MN, Newfoundland, NH, NY, UT, VT, WY, n. to Greenland & Iceland/ Tp? in IL, NY)

*Islandiana* undet. sp. or species (cave in Taney Co., MO; Tp in cave each in Edwards & King Cos., TX)

*Islandiana* undescr. sp. #1 (VA, WV (S1G1), KY, TX/ Tb/ G1?)

*Islandiana* undescr. sp. #2 (\*?cave in FL C.State Park, Jackson Co., FL/ Tb)

*Islandiana* undescr. sp.#3 (cave in Ste. Genevieve Co., IL/ Tb?)

*Islandiana* undescr. sp.#4 &/or #1 (\*?Devil's Sinkhole, Edwards Co., TX/ Tp?)

*Islandiana speophila* Ivie, 1965 (type locality cave in Pendleton Co., WV & cave? each in Shannon Co. & OR Cos., MO) /Tb/WV T&E S1 rank & global G1 rank; Federal Species of Concern/Cavern Sheet-web Spider) **Bibl.:** Holsinger et al. 1976

*Islandiana unicornis* Ivie, 1965 (*Lepthyphantes u.*) (type locality & one other cave in Childress Co., + caves in Wheeler Co. TX + Woodward Co., OK)/gypsum Tb/ G3G4) **Bibl.:** Black, 1971

*Ivesia* Petrunkevitch, 1925 (= *Nesticus* by Kaston, 1945)

*Ivesia tennesseensis* = *N. t.*

*Jalapyphantes* Gertsch & Davis, 1946 - Linyphiidae spiders, Subfamily Linyphiinae (1 species in US or Canada)

*Jalapyphantes puebla* Gertsch & Davis, 1946 (Mex. epigeal/ Ac in cave in Jeff Davis Co., TX)

jumping spiders - See Oonopidae, Salticidae

*Kibramoa* Chamberlin, 1924 - Plectreuridae spiders (8 species in US or Canada)

*Kibramoa madrona* Gertsch, 1958 (Tx in Shasta Co., CA)

*Kibramoa paiuta* Gertsch, 1958 (\*type locality cave in Clark Co., NV/ Tp?)

*Kibramoa suprenans* (*Plectreurys s.* Chamberlin, 1919) Chamberlin, 1924 (Tp? in cave in Coconino Co., AZ)

*Kukulcania* Lehtinen, 1967 - Filistatidae spiders (6 species in US)

*Kukulcania arizonica* (*Filistata a.* Chamberlin & Ivie, 1935) Lehtinen, 1967 (CA, US/Ac in cave in Real Co., TX)

*Kukulcania crassipalpis* = *Filistatinella c.*



*Lathys* Simon, 1884 (*Auximus* Simon, 1892) - Dictynidae spiders (9 species in US or Canada)  
*Lathys* undet. sp. (Cassel Farm C., VA)

*Latrodectus* Walckenaer, 1805 (= *Chaococa* Bradcock, 1932) (black widows) Theridiidae spiders (5 species in US or Canada)

*Latrodectus hesperus* Chamberlin & Ivie, 1935 (epigean in NA, Israel/ Tx in 2 caves in Culberson Co., TX)

*Latrodectus mactans* (*Aranea m.* Fabricius, 1775) C.L.Koch, 1837 (ON, SK, QB, all US but ME/ southern black widow/ Tx in TX; Tx or Ac in WV)

*Latrodectus* undet. sp. (TX in TX)

*Leptoctenus* L. Koch, 1878 - Ctenidae spiders (1 species in US)

*Leptoctenus byrrhus* Simon, 1888 (s & swTX to Mex. epigean/ Tp in Up the Creek Cave, Bexar Co., TX)

*Leptoneta* Simon, 1872 (= *Neoleptoneta* in part; no true *Leptoneta* in US/Canada) - Leptonetidae spiders

*Leptoneta georgia* = *Neoleptoneta* g.

*Lepthyphantes* Menge, 1866 (mostly litter sp.) Linyphiidae spiders, Subfamily Linyphiinae (22 species in US or Canada) **Bibl.:** Zorch 1937

*Lepthyphantes intricatus* (*Bathyphantes i.* Emerton, 1911; *Microneta complicata* Banks, 1892 (name preoccupied); *M.i.* Emerton, 1911) Ivie, 1969 (Nearctic, epigean in ME, NY, WI, OR, [AK], ON, PQ, MB, BC / Tp? in cave in Harney Co.,OR) **Bibl.:** Benedict & McEvoy 1995

*Lepthyphantes leprosus* (*Linyphia l.* Ohlert, 1865) (Europe,NA (CT, NH, NY, RI, MI, OH, WI, WA), Canada (NS, PQ, [SK], BC), Palaearctic, Chile epigean/ alien Tp or Tx in IL)

*Lepthyphantes* undescr.? sp.(IA/Tp)

*Lepthyphantes* undet. sp. or species (Ac in cave in Culberson Co., TX; TTx in nAZ; Tp or Tx in Orange Co.,IN; Tp in El Malpais Natl. Monument, nNM))

*Lepthyphantes sabulosus* (*Linyphia s.* Keyserling, 1886; *Bathyphantes s.* Petrunkevitch, 1911; *L. appalachia* Chamberlin & Ivie, 1944) Zorsch, 1937 (E to TX, epigean in CT, DC, GA, KS, MD, MO, NC, PA, MI, WI, TX, VA, PQ, MB, AB. UT / **Tp** or **Tx** in AL,IL,MD (Eb))

*Leucauge* White, 1841 (Opas O.P.-Cambridge, 1896; Plesiometa F.O.P-Cambridge, 1903) (once put in Araneidae) Tetragnathidae spiders

***Leucauge venusta*** (*Epeira v.* Walckenaer, 1841; *E. hortorum* Hentz, 1847; *Tetragnatha 5-lineata* Keyserling, 1864; *Argyropeira h.* Emerton, 1884; *A.v.* McCook, 1894; *L. mabelaei* Archer, 1951) F.O. P.-Cambridge, 1903 (CA,AZ,NE s.to FL, w.to TX,NB/orchard orbweaver; Venusta orchard s./Tp? in AL, Ac in TX)

***Linyphanthes*** Chamberlin & Ivie (= *Centromeroides* Schenkel, 1950 (19 species in US or Canada) Linyphiidae spiders, Subfamily Linyphiinae

***Linyphanthes*** undet. sp. (Tx in Calaveras Co.,CA)

"***Linyphia***" Latreille, 1804 - Linyphiidae spiders (mostly litter sp.) (no authentic members of genus in NA, but 8 species in US or Canada placed in this genus have not been transferred elsewhere) Bibl.: Blauvelt 1933

"*Linyphia*" *digna* = *Neriene d.*

"*Linyphia*" *incerta* = *Porrhomma emertoni*

"*Linyphia*" *litigiosa* = *N.l.*

"*Linyphia*" (*Neriene*) *marginata* Koch = *N. radiata*

"*Linyphia*" *nigrina* references are to *Bathyphantes pallidus*

"***Linyphia***" undet. sp. or species? (Tx or Ac in nON; Ac in cave in Orange Co.,IN; Tx in WV (Pendleton Co.) & TN (White Co.))

"*Linyphia*" (*Neriene*) *radiata* = *N. r.*

***Linyphia rita*** Gertsch, 1951 (AZ, wTX epigeal/ Tp or Tx in WV? (not likely as species not known otherwise from this state)

"*Linyphia*" *subterranea* (see *Phanetta s.*)

"*Linyphia*" *weyeri* (= *Bathyphantes w.*)

***Liocranoides*** Keyserling, 1881 (= *Titiotus*) Liocranidae spiders (once put in Clubionidae and Tengellidae)

***Liocranoides archeri*** Platnick, 1999 (type locality cave in Madison Co. & caves in Jackson & Marshall Cos., neAL + cave in Grundy Co., scTN/ Tb)

***Liocranoides coylei*** Platnick, 1999 (epigeal swVA, far wNC, far eTN/ type locality cave in Blount Co., scTN & cave in WA Co., VA/ Tp)

***Liocranoides gertschi*** Platnick, 1999 (type locality cave in Lawrence Co., AL/ Tp in nAL (Bibb, Blount, Calhoun, DeKalb, Jefferson, Lauderdale, Madison, Marshall Cos. & caves in Dade Co, nwGA/ Tp)

***Liocranoides*** probable undescr. sp. (Crystal Cave & possible new sp. in 2 other caves, Tulare Co., CA)

***Liocranoides*** undet. sp. or species (Tp in KY (Rockcastle Co.))

*Liocranoides tennesseensis* Platnick 1999 (epigean in Blount & Roane Cos., TN/ Tp in Anderson, Cumberland, Putnam & Warren Cos. c,eTN)

*Liocranoides unicolor* Keyserling, 1881 (type locality in Mammoth C., Edmonson Co. + Pulaski Co., cKY, & ncTN (DeKalb, Smith, & Sumner Cos.)/ redescribed by Platnick 1999 as restricted to KY & TN & separated into *L. unicolor*, *L. tennesseensis*, *L. coylei*, *L. archeri* & *L. gertschi*/ G3G4)

*Loxosceles* Heineken & Lowie, 1835 (once put in Loxoscelidae & Scytodidae) (violin spiders) Sicariidae spiders (10 species in US or Canada)

*Loxosceles blanda* Gertsch & Ennik, 1983 (Tp in cave each in Terrell & Val Verde Cos., TX)

*Loxosceles deserta* Gertsch, 1973 (*L. uicolor* (nec Keyserling, 1887) Gertsch, 1958 (AZ, sCA, NM, nMex., NV epigean/ desert loxosceles/ Tx in San Bernardino Co.,CA; Tx or Ac in TX)

*Loxosceles devia* Gertsch & Mulaik, 1940 (Mex./Tp in Real, Sutton, Uvalde Cos.,TX)

*Loxosceles kaiba* Platnick & Shadab, 1983 (\*\*type locality & 1 other cave in Grand Canyon Natl. Park, Coconino Co.,AZ/ Tp or Tb/ caves only)

*Loxosceles russelli* Gertsch & Ennik, 1983 (epigean in San Bernardino & Inyo Cos./ Tx in S.B. Co., CA)

*Loxosceles reclusa* Gertsch & Mulaik, 1940 (SE,C/(brown) recluse or violin s./Tp in cave each in Bexar & Williamson Cos.,TX) **Bibl.:** Hite 1966

*Loxosceles* undet. sp(s). (Tp in central & west TX; Ac or TTx in 2 caves in Grand Canyon, Coconino Co., AZ)

*Loxosceles* undescr. sp.#1 (\*?Death Valley, CA/ Tp)

*Loxosceles unicolor* - see *L. deserta*

*Lycosa* Latreille, 1804 (= *Galapagosa*, *Mimohogna*, *Hoggicosa*, *Tetrallycosa*, *Citilycosa*, *Ishicosa*, *Foxicosa* Roewer, 1960; *Allohogna* Roewer, 1955; (thinlegged wolf s.) Lycosidae spiders (12 species in US or Canada). **Bibl.:** Wallace, 1942

*Lycosa carolinensis* = *Hogna c.*

*Lycosa howarthi* Gertsch, 1973 (now = *Rabidosa h.* if that genus is accepted) (*Hogna howarthi*; *Rabidosa h.*) (\*\*type locality and 1 other cave in Volcanoes Natl. Pk, & Kazumura C., Big Island,HI/ Tb)

*Lycosa punctulata* = *Anahita p.* in Ctenidae

*Lycosa* undet. sp. (Tx in AR; Ac in TX)

**Masoncus** Chamberlin, 1948 - Linyphiidae spiders (4 species in US or Canada)

**Masoncus conspectus** (*Tapinocyba conspecta* Gertsch & Davis, 1936; *M. nogales* Chamberlin, 1948) Ivie, 1967 (US/Ac or Tx in Culberson, Val Verde Cos., TX)

**Maymena** Gertsch, 1960 - Mysmenidae spiders (1 species in US)

**Maymena ambita** (*Theridium* a. Barrows, 1940) Gertsch, 1960 (Tp in AL, FL, GA (Walker Co.), IL, KY, MO, TN/ disjunct in Mexico & Caribbean)

*Maymena guttata* = *Microdipoena* g.

**Maymena** undet. sp. (Tx or Ac? alien? in MO)

**Meioneta** Hull, 1920 (= *Aprolagus* Simon, 1929; *Euplis* O.P. Cambridge, 1900; *Gnathantes* Chamberlin & Ivie, 1943; *Syedrula* Simon, 1929) Linyphiidae spiders, Subfamily Linyphiinae (mostly litter sp.) (39 species in US or Canada)

**Meioneta gagnei** Gertsch, 1973 (\*\*type locality + 1 other cave, Maui, HI/ cave sheetweb spider/ Tb/ G1)

**Meioneta llanoensis** (*Microneta l.* Gertsch & Davis, 1936) van Helsdingen, 1973 (epigean in Tx/ Tp in TX)

**Meioneta** undescr. sp. (2 caves in Kauai, HI/ Tp)

**Meioneta** undet. sp(p). (Tx or Ac in TN; Tp in 2 caves in Kiowa Co., cave in Meniffee Co.,KY; Tx in Calaveras Co.,CA), Tp in TX)

**Meioneta unimaculata** (*Bathypantes u.* Banks, 1892) Chamberlin & Ivie, 1944 (Eastern Nearctic/Tp or Tx in IL)

**Meta** C.L. Koch, 1836 (= *Auchicybaeus* Gertsch, 1933) Tetragnathidae spiders (also put in Anglenidae, Argiopidae, Araneidae, Metidae) (2 species in US or Canada)

*Meta curtisi* - see *Metellina c.*

**Meta dolloff** Levi, 1980 (= *Pseudometa biologica* Graham, 1967) (\*\*\*)type locality & 2 other caves in Santa Cruz Co.,CA/ Tb/ Dolloff Cave spider)

*Meta menardi* = *M. ovalis* (NA specimens only)

*Meta merianae* = *Metellina m.*

**Meta ovalis** (*Auchicybaeus o.* Gertsch, 1933; *M. americana* Marusik & Koponen, 1992; *Meta menardi* Kaston, 1948) Dondale, 1995 (TTx or TTp in Al, AR, GA (Dade & Walker Cos.), KY(Mammoth C.), IL, IN, MA, MD, MS, New Brunswick, NC, NH, NY, NS, NV, OH, OK, PA,

sON, PQ, TN, VA, WV; Tp in GA, IN(all cos. with caves), MO,OH; Tx & Ttx in NJ) **Bibl.:**  
Eckert 1993; Johnston & Carmody 1977; Levi 1980; Rochez 1992; Tercafs 1988

*Meta* probable undescr. sp. (cave each in Greer, Major & Woodward Cos., OK/ Tp)

*Meta* undet. or undescr. (cave in Monterey Co.,CA/ Tp)

*Mimetus* Hentz, 1832 - Mimetidae spiders (8 species in US)

*Mimetus puritanus* Chamberlin, 1923 (eUS to TX/Tx or Ac? in MO)

*Metaphidippus* F.O. Pickard-Cambridge, 1901 - Salticidae spiders (10 species in US or Canada)

*Metaphidippus exiguus* = *Pelegrina e.*

*Metaphidippus* undet. sp. (Ac in cave in Edwards Co., TX)

*Metellina* Chamberlin & Ivie, 1941 (metid spiders) - Tetragnathidae spiders (2 species in US or Canada)

*Metellina curtisi* (*Pachygnatha c.* McCook, 1894; *Epeira peckhami* Petrunkevitch, 1911)

Chamberlin & Ivie, 1936 (TTp in BC, CA(Napa Co.) & WA)

*Metellina mimetoides* Chamberlin & Ivie, 1941 (AZ,CA,OR/TTp in WA, Tp in Calaveras & Tuolumne Co.,CA; 8 cos. in TX)

*Metellina merianae* (*Aranea m.* Scopoli, 1763; *Meta m.* Heimer, 1892) Levi, 1980 (Europe/alien Tx or Ac in KY)

*Metepeira* F.O. Pickard-Cambridge, 1903 - Araneidae spiders (11 species in US or Canada)

*Metepeira labyrinthea* (*Epeira l.* Hentz, 1847; *E. rectangula* Nicolet, 1849; *E. crucifera* Keyserling, 1864; *E. solitudinis* Holmberg, 1881; *Araneus karkii* Tyullgren, 1901; *A.l.* Simon, 1904; *A.c.*; *A. solitudinis* Petrunkevitch, 1911; *Mangora trinagularis* Frannillo; *A. keyserlingi* Roewer, 1942) O.P. -Cambridge, 1903 (NA/labyrinth orbweaver/Tx in TX)

*Micaria* Westring, 1851 (= *Micariolepis* Simon, 1879) Gnaphosidae spiders (42 species in US or Canada)

*Micaria imperiosa* Gertsch, 1935 (Tx or Tp in Colossal C., AZ)

*Microdipoena* Banks, 1895 - Mysmenidae spiders (1 species in US)

*Microdipoena guttata* Banks, 1895 (= *Mysmena* & *Maymena* g.) (US to SA/Tx or Ac in OK)

*Micrommata undata* Hentz = *Pisaurina mira*

*Microneta* Menge, 1869 (Maro O.P.-Cambridge, 1906) Linyphiidae spiders, Subfamily Linyphiinae (mostly litter sp.) (3 species in US or Canada)

*Microneta* undet. sp. (Tx or Ac in VA)

**Microhexura** Crosby & Bishop, 1924 - Dipluridae spiders (2 species in US)

**Microhexura idahoana** Chamberlin & Ivie, 1945 (= *M. rainieri* Chamberlin & Ivie, 1945) (ID, OR, WA/ Tx or Tp in Ape C.,WA)

**Misumena** Latreille, 1804 - Thomisidae spiders (2 species in US or Canada)

**Misumena vatia** (*Araneus vatius* Clerck, 1757; *Aranea calycina* Linnaeus, 1758; *A. 4-lineata* Linnaeus, 1761; *A. kleinii*, *A. osbekii*, *a. hasselquistii* Scopoli, 1763; *A. scorpiformis* Fabricius, 1775; *A. virginea* Muller, 1776; *A. citrea* De Geer, 1778; *A. sulphureoglobosa*, *A. sulphurea*, *A. quinquepunctata*, *A. albonigricans* Martini & Goeze, in Lister, 1778; *A. cretata* Preyssler, 1791; *Thomisus citreus*, *T. calycinus*, *T. dauci* Walckenaer, 1805; *T. pratensis* Hahn, 1833; *T. viridis*, *T. citreus georgiensis* Walckenaer, 1837; *T. phrygiatus* Walckenaer, 1837; *T. devius* C.L. Koch, 1845; *T. fartus* Hentz, 1847; *Pachyptile devia* Simon, 1864; *T. cucurbitinus* Sordelli, 1868; *M. expallidata*, *M. oblonga* O.P.-Cambridge, 1885) Thorell, 1872 (LA/ Ac in cave in Val Verde Co., TX)

**Misumenops** F.O. Pickard-Cambridge, 1900 (Runcinioides Mello-Leitao, 1929) Thomisidae spiders (also put in Philodromidae) (40 species in US or Canada)

**Misumenops celer** (*Thomisus c.* Hentz, 1847; *Misumena spinosa*, *M. georgiana* Keyserling, 1880; *M. alabamensis* Keyserling, 1884; *M. diegoi* Keyserling, 1887; *Diaea spinigera* O.P. – Cambridge, 1898) Chamberlin, 1924 (celer crab s./TTx in TX swallow scat; Tx in AL,VA)

**Misumenops coloradensis** Gertsch, 1933 (Ac in cave in Presidio Co., TX)

**Misumenops dubius** (*Misumena dubia* Keyserling, 1880; *M. ornata* F.O.P.-Cambridge, 1900) Chamberlin, 1924 (Ac in cave in Burnet Co., TX)

**Misumenops** undet. sp. (Ac in cave in Edwards Co., TX)

**Modisimus** Simon, 1893 (*Hedypsilus* Simon, 1893) Pholcidae spiders (2 species in US or Canada)

**Modisimus texanus** Banks, 1905 (Tp in 8 cos. in cTX)

**Modisimus** undet. sp. (Tp in Bexar, Travis Cos., TX)

*Mysmena incredula* = *Calodipoena i.*

**Neoanagraphis** Gertsch & Mulaik, 1936 - Clubionidae spiders (also put in Gnaphosidae & transferred from Liocranidae) (2 species in US or Canada)

**Neoanagraphis chamberlini** Gertsch & Mulaik, 1936 (Ac in cave in Culberson Co., TX)

**Neoleptoneta** Brignoli, 1972 (= *Leptoneta* in part) Leptonetidae spiders (also put in Caponiidae) (19 species in US)

*Neoleptoneta alabama* (*Leptoneta a.* Gertsch, 1974) Brignoli, 1977 (\*\*\*\*type locality cave in Marshall Co. & cave in Calhoun Co. & 2 caves in DeKalb Co., AL/ Tb/ G1?)

*Neoleptoneta anopica* (*Leptoneta a.* Gertsch, 1974) Brignoli, 1977 (\*type locality cave in Williamson Co.,TX/ Tb/ G1G2)

*Neoleptoneta arkansa* (*Leptoneta a.* Gertsch, 1974) Brignoli, 1977 (\*Blanchard Spr. C.,Stone Co.,AR/ Tp/ G1G2)

*Neoleptoneta blanda* (*Leptoneta a.* Gertsch, 1974) Brignoli, 1977 (\*type locality cave in Blount Co., AL/ Tp/ G1G2)

*Neoleptoneta coeca* (*Leptoneta c.* Chamberlin & Ivie, 1942) Brignoli, 1977 (\*type locality cave in Comal Co.,TX/ Tb/ G1G2)

*Neoleptoneta concinna* (*L.c.* Gertsch, 1974) Brignoli, 1977 (\*\*type locality cave & mine in Travis Co., TX/ Tb/ G1G2)

*Neoleptoneta credula* = *Appaleptoneta c.*

*Neoleptoneta devia* (*L.d.* Gertsch, 1974) Brignoli, 1977 (\*type locality cave in Travis Co.,TX/ probable Tb/ G1G2)

*Neoleptoneta fiskei* = *Appaleptoneta c.*

*Neoleptoneta georgia* (*Leptoneta g.* Gertsch., 1974) Brignoli, 1977 (\*type locality cave in Dade Co.,GA/Tb/ G1G2)

*Neoleptoneta jonesi* = *Appaleptoneta c.*

*Neoleptoneta microps* (*L.m.* Gertsch, 1974) Brignoli, 1977 (\*\*type locality & 1 other cave in Bexar Co.,TX/Tb/ G. Canyon cave spider/ Federal endangered T&E/ G1)

*Neoleptoneta myopica* (*L.m.* Gertsch, 1974) Brignoli, 1977 (T. Cave spider/ type locality & 1 other cave in Travis Co.,TX/ Tb/ T&E federally listed as endangered, G1)

*Neoleptoneta novaegalleciae* Brignoli, 1979 (\*New Cave,Eddy Co.,seNM/ Tb/ G1)

*Neoleptoneta serena* (= *Leptoneta s.* Gertsch, 1974) Brignoli, 1977 (\*type locality cave in Lauderdale Co.,AL/Tb/ G1G2) **Bibl.:** Peck 1989

*Neoleptoneta* undescr. sp.#1 (New C. & 2 other caves, Eddy Co.(NM)/ Tb?)

*Neoleptoneta* undescr. sp.#2 (Blanchard Spr.,AR/ Tx?)

*Neoleptoneta* undescr. sp.#3 (Hays Co.,TX/ Tb)

*Neoleptoneta* undescr. sp.#4-6 (TX/Tb) (pers. comm. Cokendolpher 28 July, 1996)

*Neoleptoneta uvaldea* (*Leptoneta u.* Gertsch, 1974) Brignoli, 1977 (\*type locality cave in Uvalde Co.,TX/Tb or Tp/ G1G2)

*Neoleptoneta valverde* (*Leptoneta* v. Gertsch, 1974) Brignoli, 1977 (\*type locality cave in Val Verde Co.,wTX/ Tb or Tp/ G1G2)

*Neoscona* Simon, 1864 (= *Chinestela* Chamberlin, 1924; *Cubanella* Franganillo, 1926)  
Araneidae spiders (7 species in US or Canada)

*Neoscona arabesca* (*Epeira* a. Walckenaer, 1841; *E. trivittata* Keyserling, 1964; *E. singularis* Banks, 1898l; *N. minima* F.O. P. –Cambridge, 1904; *Araneus* a. , *A. m.* Petrunkevitch, 1911)  
F.O. P. –Cambridge, 1904 (Nearctic, NA, Central America, West Indies, most of US epigean/  
arabesque orbweaver/ Tx in OK)

*Neoscona crucifera* (*Epeira* c. Lucas, 1939; *E. lentiginosa* Blackwell, 1862; *E. hentzii* Keyserling, 1864; *Aranea* c. *albimaculata* , *A.c. ochroleucella*, *A.c. pyramidella* Strand, 1908; *N. benjamina* Comstock, 1940; *N. arkansa*, *N. nebraskensis* Chamberlin & Ivie *N. sacra* Chamberlin & Ivie, 1944; *N. hentzi* Berman & Levi, 1971) Grasshoff, 1986 (NA, Madeira, Canay Islands/ Ac in TX)

*Neriene* (subgenus *Neriene* Blackwall, 1833) (see *Linyphia*) (= *Neolinyphia* Oi, 1960; *Prolinyphia* Homann, 1952; *Linyphiella* Hoffmann, 1950) Linyphiidae spiders, Subfamily Linyphiinae (8 species in US or Canada) **Bibl.:** Blauvelt 1933

*Neriene digna* (= *Linyphia* d. Keyserling, 1886) (epigean in CA, OR, WA, AK, BC/ Tp in WA)

*Neriene litigiosa* (= *Linyphia* l. (Keyserling, 1886) (epigean in CA, OR, WA, UT, WY, MT, BC, Mexico/ Tx or Ac in WA)

*Neriene radiata* (*Linyphia* r. Walckenaer, 1841; *L. marginata* C.L. Koch) Song, 1981 (ON, MB, SK, ON, s. to FL, w.to CA, AZ, Russian Far East/ filmy dome spider/ TTp or Tx in BC, IL, sON, WA, IN, KY, MO, OK, VA, WV) **Bibl.:** D. Wise 1974

*Nesticella* Lehtinen & Saaristo, 1980 - Nesticidae spiders (1 species in US)

*Nesticella mogera* (*Nesticus* m. Yaginuma, 1972; *Howaia* m.) Kim, Yoo & Lee, 1999 (HI (alien), Fiji, Japan/Tp)

*Nesticus* Thorell, 1870 (see *Ivesia*) (= *Tuganobia*, *Ivesia* in part) - Nesticidae spiders (18 described species in US, 2 in Europe, 1 in Japan). **Bibl.:** Cesaroni et al., 1981; Hedin, 1995, 1997a,b; Keefer 1994, 1996

*Nesticus archeri* Gertsch, 1984 (AL epigean/ Tp? In Claiborne Co.,AL)

*Nesticus barri* Gertsch, 1984 (type locality cave in Franklin Co. +Blount & Marion Cos.(scTN) +adjacent AL (Jackson & Marshall Cos.)/Tb/ G3G4)

*Nesticus barrowsi* Gertsch, 1984 (type locality cave in & at least 11 caves in Blount Co.,Great Smoky Mts. Natl. Park,TN/ Tb or Tp/ G3)



*Nesticus brimleyi* Gertsch, 1984 (type locality cave in near Lake Lure, R.B. Mt, + 3 caves in Rutherford Co.,NC/Tp or TTp/NC State Species of Concern/ G1G2)

*Nesticus carolinensis* (*Ivesia c.* Bishop, 1950) Brignoli, 1983 (\*\*\*?type locality & at least 2 other caves in \*McDowell Co.,NC/Linville Caverns Spider/TTp/ NC State Species of Concern)  
**Bibl.** Coyle 1977

*Nesticus carteri* Emerton, 1875 (female cotypes from type locality cave in 2 caves in Carter Co.,KY/ epigeal in nNC,eTN,swVA,seWV/ Tp & wet drains in neKY(Mammoth C., Hart Co.) & sIN(Crawford, Sullivan, Clairborne, Hamilton & Harrison Cos.); VA (Rockbridge, Lee, Scott, Smyth Cos.);WV (Mercer CO.); Tp in eTN /S1/G3)

*Nesticus cooperi* Gertsch, 1984 (type locality & 1 other cave in Swain Co.,NC/Tp, a few epigeal sites within 20mi. of caves/ State Species of Concern/Lost Nantahala Cave Spider/ / G1G2 or G3)

*Nesticus crosbyi* Gertsch, 1984 (NC - type locality is small crevice in Grandfather Mt., Vancey Co., NC/ epigeal, Tp?/ NC State Species of Concern)

*Nesticus dilutus* Gertsch, 1984 (\*type locality cave in Rhea Co.,TN/ Tb/ TN State T&E/ Grassy Cr. Cave Spider/ S1S2? G1G2)

*Nesticus furtivus* Gertsch, 1984 (\*type locality & other caves in Hamilton Co., TN/ Tb/ TN State T&E/Cry. Caverns Cave Spider/ S1S2? G1G2)

*Nesticus georgia* Gertsch, 1984 (\*\*\*?type locality & 2 other caves near Trenton, Dade Co.nwGA +TN?/ Tb/ G1G2)

*Nesticus gertschi* F.A. Coyle & A.C. McGarity, 1992 (TN epigeal/ cave in Green Co.,IN & epigeal in NC)

*Nesticus holsingeri* Gertsch, 1984 (type locality & other cave in Scott Co., cave in Wise Co.)+ 2 caves in Lee Co.,VA/ Tb/ T&E VA S1, global G2 or G2G3)

*Nesticus jonesi* Gertsch, 1984 (\*type locality cave in Morgan Co.,AL/Tb/Cave Spr. spider/ G1G2)

*Nesticus mexicanus* = *Eidmanella p.*

*Nesticus mimus* Gertsch, 1974 (type locality & 1 other cave in WA Co.,VA & NC epigeal/Tp) NC State Species of Concern,T&E VA S1, global G2)

*Nesticus mogera* = *Nesticella m.*

*Nesticus nasicus* F.A. Coyle & A.C.McGarity, 1992 (type locality cave + epigeal in Jackson, Transylvania Cos., NC)

*Nesticus pallidus* = *Eidmanella p.*

*Nesticus paynei* Gertsch, 1984 (type locality cave in Anderson Co.) +Campbell, Carter, Hancock, Hawkins, Knox, Scott, Sullivan & Union Cos.(TN) & Scott Co.(VA)/ Tb or Ttp/ T&E VA S1, TN S2S3?, global G2 or G2G3)

*Nesticus potterius* (*Tuganobia potteria* Chamberlin, 1933) Gertsch, 1984 (\*\*\*)type locality & 2 other caves in Shasta Co.,CA/ Tb/ G1G2) **Bibl.:** Rudolph et al., 1985

*Nesticus reclusus* Gertsch, 1984 (epigean in TN & Swain, Graham Cos.,NC/ Tp?)

*Nesticus sheari* Gertsch, 1984 (*Ivesia s.*) (NC epigean/Tp?) NC State Species of Concern)

*Nesticus silvanus* Gertsch, 1984 (epigean in Haywood ,Jackson, Cos.(NC)/ Tp cave in Madison Co./ NC State Species of Concern)

*Nesticus silvestrii* Fage, 1929 (CA, OR, WA epigean/ type locality in Oregon Caves, Josephine Co, OR/ Tp in AZ, CA (Sierra Nevada); Tp? in BC, sOR, WA)

*Nesticus sodanus* Gertsch, 1984 (type? in cave in Plumas Co.,CA/Tp or Tx, epigean?)

*Nesticus* undet. or undescr. sp. (cave in Kings Canyon Natl. Park,Tulare Co.,CA/Tp?; Tb in 2 caves in Walker Co.,GA; Tp in cav in Dade Co.,GA; Tp or Tb in cave in Blount Co.,TN),

*Nesticus* undescr. 1-4 sp. (Appalachian fauna of *Nesticus* 'group' = *Ivesia*) (Tp in 2 caves in WA Co. & 1 cave each in Giles & Smyth Cos.,VA)

*Nesticus* undescr. sp. #5 (Californian fauna of *Nesticus* 'group' = *Tuganobia*)

*Nesticus* undescr. sp.#7 (Tp in 2 caves in Mt. St. Helens area, Skamania Co., WA)

*Nesticus* undescr. sp. #8 (NC/ Tb/ NC State Species of Concern)

*Nesticus* undescr. sp.#9 (epigean in Sevier Co.,IN/ Tp?)

*Nesticus stupkai* Gertsch, 1984 (type locality & at least 4 other caves in Blount Co.,Great Smoky Mts Natl. Park/ Ed in Cades & Wears Cove,Great Smoky Mts Natl. Park, TN/ sinkhole epigean)

*Nesticus stygius* Gertsch, 1984 (\*\*\*\*)type locality & 2 other caves in Overton Co. + 1 cave in Putnam Co., TN/ Tb/ S2G3)

*Nesticus tennesseensis* (*Ivesia t.* Petrunkevitch, 1925) Jackson, 1944 (TN, VA, WV epigean/ type locality cave in Jefferson Co. +Grainger, Hawkins, Roane, Sullivan Cos.),eTN, swVA (Alleghany, Craig, Giles, Highland, Russell, Smyth, Tazewell Cos.),WV (Raleigh Co.)/Tp/T&E VA S2, WV SU, global G2G4) **Bibl.:** Blastx

*Nesticus tuckeri* Cokendolpher & Reddell, 2001 (\*\*type locality cave in Kendall Co. + cave in Hays Co., TX/ Tp, caves only)

*Nesticus valentinei* Gertsch, 1984 (\*type locality cave in Marion Co., TN/Tb/TN State T&E/ S1S2? G1G2/ Valentine's cave spider/ G1G2)

*Nodocion* Chamberlin, 1922 (*Liodrassus* Chamberlin, 1935) Gnaphosidae spiders (5 species in US or Canada)

*Nodocion eclecticus* Chamberlin, 1924 (*Herpyllus atopophysis* Chamberlin, in Chamberlin & Gertsch, 1928; *Liodrassus arizonicus* Chamberlin, 1936; *L. metalleus* Chamberlin & Gertsch, 1940; *N. arizonicus* Ubick & Roth, 1973; *N. atopophysis* Platnick & Shadab, 1977) (Ttx in cave in Portal, AZ)

*Oonopinus* Simon, 1892 - Oonopidae spiders (3 species in US or Canada)

*Oonopinus* undet. sp. near *hunun* Suman, 1965 (HI Volcanoes Natl. Park, HI/Tb?)

*Oonops* Templeton, 1835 - Oonopidae spiders (4 species in US or Canada)

*Oonops* undescr. sp.? (\*cave in Big Island, HI Island/ Tb)

*Oonops?* undescr. or undet. sp. or species (epigean in Midway, Oahu, HI; Tp? in Kazamura Lava Tube, Hawaii Island, HI)

*Oaphantes* Chamberlin & Ivie, Linyphiidae spiders, Subfamily Linyphiinae (1 species in US)

*Oaphantes pallidulus* Banks, 1904 (epigean in CA/ Tx in Santa Cruz Co., CA)

*Oreonetides* Strand, 1901 (*Aigola* Chamberlin, 1922; *Labuella* Chamberlin & Ivie, 1943; *Paramaro* Wunderlich, 1980; *Meontitextrix* Denis, 1963) - Linyphiidae spiders, Subfamily Linyphiinae (6 species in US or Canada)

*Oreonetides* undescr. sp. or species (Tb in VA; \*?cave in WA Co., MD (Snively's cave spider – G1 /Tb or Tp)

*Oreonetides* (*O.*) *vaginatus* (*Erigone vaginata* Thorell, 1872; *Linyphia reticulata* O. P.- Cambridge, 1873; *E. macrochaera* Thorell, 1875; *Microneta crassimanus* Emerton, 1882; *Porrhomma adipatum* Simon, 1884; *Erigone ululabilis* Keyserling, 1886) Locket & Millidge, 1953 (Holarctic, n. to Greenland, NT, AK, s. to NY, AZ, w. to Russian Far East/ Tx or Ac in sON)

*Oreonetides recurvatus* = *Oreophantes r.*

*Oreophantes* Eskov, 1984 - Linyphiidae spiders, Subfamily Linyphiinae (1 species in US & Canada)

*Oreophantes recurvatus* (*Bathyphantes r.* Emerton, 1913; *Aigola recurvata* Crosby, 1937; *Troglohyphantes kokoko* Ivie, 1966; *Oreonetides r.* Van Helsdingen, 1973) Eskov, 1984 (AB, ON, VT, ME, NY, PQ, [SK], AB, [BC] epigean/ Tx or Ac in sON)

***Orthonops*** Chamberlin, 1924 - Caponiidae spiders (7 species in US)

***Orthonops gertschi*** Chamberlin, 1928 (AZ/Tx or Tp in NM)

***Orthonops lapanus*** Gertsch & Mulaik, 1940 (= *O. gertschi* Gertsch, 1935) (Ac in TX; Tp in Calaveras Co., CA & Eddy Co., NM)

*Paidisca* Bishop & Crosby, 1925 = *Thymoites*

***Pardosa*** C.Koch, 1848 (*Pardosops* Roewer, 1955; *Acraniops* Simon, 18908; *Chorilycosa* Roewer, 1960) (76 species in US or Canada) mostly litter sp.)(thin-legged s.) Lycosidae spiders.  
**Bibl.:** Vogel 1964; Wallace & Exline 1978

***Pardosa giebelsi*** (*Lycosa* g. Pavesi, 1873; *P. ferruginea* Simon, 1876; *P. uncata* Emerton, 1894; *L. sordidata* Dahl, 1908) L. Koch, 1879 (Tx or Ac alien in 2 caves in Monroe Co., WV)

***Pardosa*** undet. sp(p). (Tx in MO; Ac in TX; Tx? in OH, seNM)

*Pelegrina* Franganillo, 1930 – Salticidae spiders (25 species in US or Canada)

*Pelegrina exigua* (*Dendryphantas exiguus* Banks, 1892; *Metaphidippus virginis* Muma, 1944; *M. exiguus* Kaston, 1945) Maddison, 1996 (US epigeal/ Tx or Ac in 1 IL cave)

*Pellenes* Simon, 1876 = *Habronattus*

***Phanetta*** Keyserling, 1886 - Linyphiidae spiders (1 species in US) **Bibl.:** Millidge 1984

***Phanetta subterranea*** (= *Linyphia* s. Emerton, 1875) Keyserling, 1886 (Wyandotte C. (Type locality - IN) +nAL (Colbert, De Kalb, Jackson, Jefferson, Lauderdale, Lawrence, Limestone, Madison, Marshall, Morgan, St. Clair Cos.), GA (Dade, Floyd & Walker Cos.), IL (Carroll, Hardin, Jackson, Johnson, Monroe, Saline, Union), IN(all cave cos. – Clark, Crawford, Decatur, Harrison, Jefferson, Jennigs, Lawrence, Monroe, Orange, Owen Cos.), KY (Carter, Edmonson (Mammoth C.), Elliott, Estill, Hart, Jackson, Menifee, Pike, Powell, Puloaski, Rockcastle, Wayne, Whitley Cos.), MD, MO (Perry Ste. Genevieve cos.), NJ, OK(most likely in Stone Co.), PA (Fayette & Westmoreland Cos.), e,cTN (Campbell, Claiborne, Davidson, DeKlab, Hancock, Maury, Grundy, Sullivan Cos.), VA (Alleghany, Augusta, Bath, Bland, Botetourt, Craig, Frederick, Giles, Lee, Montgomery, Page, Pulaski, Roanoke, Rockinham, Russell, Scott, Smyth, Tazewell, Warren, Washington, Wise, Wythe Cos.) & eWV (Grant, Greenbrier, Mercer, Monroe, Pendleton, Pocahontas, preston, Randolph, Tucker)/ Tb/ WV T&E S3 rank & global G3 rank)  
**Bibl.:** Brignoli 1979; Elliott, 1953; Mill 1984; Peck & Lewis 1978; Poulson 1977, 1981

***Phidippus*** C.L. Koch, 1846 - Salticidae spiders (47 species in US or Canada)

***Phidippus purpuratus*** Keyserling, 1885 (= *P. albomaculatus* Keyserling, 1885; *P. galathea* Peckham & Peckham, 1888; *P. mystaceus* Emerton, 1902; *Dendryphantas p.* Petrunkevitch, 1911) (Nearctic, boreal/Tx or Ac in nON)

***Phidippus*** undet. sp. (OK epigeal /Tx or Ac in cave in Irion Co., TX)

***Phidippus texanus*** Banks, 1906 (*P. albomaculatus* Peckham & Peckham, 1888; *Dendryphantes t.* Petrunkevitch, 1911; *P. peritus* Gertsch, 1934) (Ac in cave in Williamson Co., TX)

***Philodromus*** Walckenaer, 1825 (*Philodromoides* Scheffer, 1904; *Horodromoides* Gertsch, 1933) Philodromidae spiders (also put in Thomisidae) (inconspicuous crabs) (55 species in US or Canada)

***Philodromus vulgaris*** (Thomisus v. Hentz, 1847; *P. gracilis* Banks, 1892) Keyserling, 1880 (Nearctic, LA, NM, TX/ Tx in OH)

***Philodromus*** undet. sp. (Ac in cave in Bell Co., TX)

***Philoponella*** Mello-Leitao, 1917 - Uloboridae spiders (3 species in US or Canada)

***Philoponella arizonica*** (= *Uloborus a.* Gertsch, 1936) Opell, 1979 (TTx in AZ)

***Pholcophora*** Banks, 1896 - Pholcidae spiders (3 species in US or Canada)

***Pholcophora*** undet. sp. (Tp in El Malpais Natl. Monument, nNM)

***Pholcus*** Walckenaer, 1805 - Pholcidae spiders (6 species in US or Canada)

***Pholcus muralicola*** Maughan & Fitsch, 1976 (Tx in MO)

***Pholcus phalangioides*** (*Aranea p.* Fuesslin, 1775; *A. meticulosa* Forucroy, 1785; *P. nemastomoides* C.L.Koch, 1837; *P. americanus* Nicolet, 1849; *P. atlanticus* Hentz, 1850; *P. communis* Piza, 1938) Walckenaer, 1805 (introduced, widespread temperate houses, CA/ Tp or Tx in Al, IL, NM, TN, TX, VA)

***Pholcus*** undescr. sp.#1 (cave in Jackson Co.+ 2 caves in Marshall Co.,AL; cave in Wayne Co.,KY & cave in Warren Co.,TN/Tp or Tx)

***Pholcus*** undet. sp. (Tx or Tp in cave in Wayne Co.,KY)

***Pholcus*** undescr. sp. #1 (\*?Tx or Tp in cave in Bartow Co., GA)

***Pholcus*** undescr. sp. #2 (\*\*?Tx or Tp in 2 caves in Dade CO, GA)

***Pholcus*** undescr. sp. #3 (\*\*?Tx or Tp in 2 caves in Walker Cos., GA)

*Pholcus vittatus* = *Dolomedes v.?*

***Phrurotimpus*** Chamberlin & Ivie, 1935 - Liocranidae spiders (also put in Clubionidae and Linyphiidae) (16 species in US or Canada) **Bibl.:** Roth, 1993

***Phrurotimpus*** undet. sp. or species (Ac in cave in Bexar Co., TX; Tx or Ac in WA)

***Physocyclus*** Simon, 1893 - Pholcidae spiders. **Bibl.:** Brignoli 1981 (4 species in US or Canada)

***Physocyclus californicus*** Chamberlin & Gertsch, 1929 (Tp in Calaveras, Mariposa & Tuolumne Cos., CA)

*Physocyclus enaulus* Crosby, 1926 (*P. neomexicanus* Chamberlin & Gertsch, 1929) (Carlsbad C.(NM)/ US,Mex./Tp or TTP in eAZ, sNM (Carlsbad C.), OK, wTX)

*Physocyclus hoogstraali* Gertsch & Davis, 1942 (Tb in cave near Pandale Crossing, Val Verde Co.,TX + Mex.)

*Physocyclus* undet. sp. (Tp in Edwards, Llano, Medina, Val Verde Cos., TX)

*Physocyclus tanneri* Chamberlin, 1921 (Tp? in AZ)

*Pimoo* Chamberlin & Ivie, 1943 (= *Louisfagea* Brignoli, 1971) Pimoidae spiders (also put in Linyphiidae and Tetragnathidae) (13 species in US or Canada)

*Pimoo altiocularata* (*Labulla a.* Keyserling, 1886) Chamberlin & Ivie, 1943 (epigean in nCA to AK, UT/ Tp in BC, OR, WA (perhaps the most common twilight spider in those areas))

*Pimoo hespera* (*Labulla h.* Gertsch & Ivie, 1936; *L. utahana* Gertsch & Ivie, 1936; *Pimoo utahana* Chamberlin & Ivie, 1943; *Acrometa a.* Wunderlich, 1979) Chamberlin & Ivie, 1943 (\*type locality cave in Tulare, Co., CA/ Tx or Tp in Tulare Co.,CA)

*Pimoo mephitis* Hormiga, 1994 (\*\*\*type locality & 2-3 other caves in Siskiyou Co.,CA/ Tp or Tb/ caves only)

*Pimoo mono* Hormiga, 1994 (\*type locality cave in Mono Co.,CA/ Tp?)

*Pimoo* undescr. sp.#1 (>5 caves in Santa Cruz Co.,CA)

*Pimoo* undescr. sp.#2 (\*\*\*\*Tp in 3-4 caves in Tulare Co.,CA)

*Pimus* Chamberlin, 1947 - Amaurobiidae spiders (10 species in US or Canada)

*Pimus hesperellus* Chamberlin, 1947 (\*?type locality & one other cave (or new sp.) in Shasta Co.,CA/ Tp?)

*Pimus nawtawaketus* Leech, 1972 (\*type locality cave in Shasta Co.,CA/ Tp?)

*Pimus pitus* Chamberlin, 1947 (*Walmus varus* Chamberlin, 1947; *P. pictus* Roewer, 1955) (Tx in Calaveras & Mariposa Cos.,CA),

*Pirata* Sundevall, 1833 (= *Sosilaus* Simon, 1898; *Piratula* Roewer, 1960) Lycosidae spiders (26 species in US or Canada) (mostly litter sp.) **Bibl.:** Wallace & Exline, 1978

*Pirata insularis* Emerton, 1885 (*Pardosa bilobata* Tullgren, 1901; *P. liber* Montgomery, 1902; *P. piccolo* Dahl, 1908; *P. sylvestris* Emerton, 1909; *Allocosa i.* Roewer, 1955) (Holarctic epigean/ Ac, Tx or Tp in GA (Grady Co.))

*Pirata sedentarius* Montgomery, 1904 (*P. californica* Banks, 1904; *Lycosa wacondana* Scheffer; *P. maculatus* Emerton, 1909; *P.w.* Crosby & Bishop, 1928; *Allocosa m.* Roewer, 1955; *Piratula s.* Roewer, 1955) (Nearctic, SW/ Tx in IL; Ac or Tx in TX; Tx in Harrison Co.,IN/ S4/G4)

*Pirata* undet. sp(p). (Tx or Tp in MO, MS; Ac in TX)

*Pirata spiniger* (*Sosilaus s.* Simon, 1898) Wallace & Exline, 1978 (FL, GA, LA litter & gopher burrows/Tp in MO)

*Pisaurina* Simon, 1898 (Thanatidius Simon, 1898; Pelopatis Bishop, 1924) Pisauridae spiders spiders (4 species in US or Canada)

*Pisaurina mira* (*Dolomedes mirus*, *D. virgatus* Walckenaer, 1837; *Micrommata undata*, *M. serrata*, *M. marmorata*, *M. carolinensis* Hentz, 1845; *Dolomedes binotatus* C.L. Koch, 1847; *M. subinflata* Hentz, 1850; *Ocyale m.*, *O. virgata* Simon, 1864; *Dapanus mirus* Bryant, 1941) Simon, 1898 (New England & adjacent Canada s. to FL & w. to NB, ND, WI & eTX/ nursery web s./Tx in MO, OH)

*Pityohyphantes* Simon, 1929 - Linyphiidae spiders, subfamily Linyphinae (16 species in US or Canada)

*Pityohyphantes costatus* (*Linyphia c.* Hentz, 1850; *L. phrygiana* Emerton, 1882) Kaston, 1948 (epigean in northeastern US, OH, MI, WI, NC, NS, NF, PQ, ON, MB, [SK], [AB] / hammock spider/ epigean Tx or Ac in cave in Blount Co., TN)

*Porrhomma* Simon, 1884 (= *Opistoxys* Simons, 18840 (also put in Erigonidae) (mostly litter sp.) Linyphiidae spiders, subfamily Linyphinae (9 species in US or Canada) **Bibl.:** Bourne 1977

*Porrhomma cavernicola* (*Willibaldia c.* Keyserling, 1886; *Troglohyphantes cavernicolous* Simon, 1894) Roewer, 1942 ((\*type locality cave in Barren Co., KY/Ozark cave spider/ AL (Limestone Co.), AR, GA (Bartow Co.), KY (Barren, Carter, Pulaski & Powell Cos.), IL (Carroll & Jo Daviess Cos.), IN (Jennings, Lawrence & Orange Cos./S1/G3), IA (Jackson Co.), MD (WA & Alleghany Cos.), MO (Barry, Boone, Howell, Lawrence, Shannon Cos.), OK (Adair Co.), PA (Berks, Dauphin, Franklin, Mifflin Cos.), WV, VA (Augusta, Bath, Bland, Craig, Frederick, Giles, Lee, Page, Roanoke, Rockbridge, Rockingham, Smyth, Tazewell, Wise Cos.)/ Tb/ Appalachian Cave Spider/ MD T&E rare)

*Porrhomma convexum* (*Erigone c.*, *E. reticulata* Westring, 1861; *P. proserpina* Fage, 1931; *Linyphia convexa* Westring, 1861, *L. proserpina* Simon, 1872; *L. thorellii* Herman, 1879; *P. proserpina*, *P. scopiferum*, *P. diabolicum*, *P. scopiferum* Simon, 1884; *P. norvegicum* Strand, 1901; *P. pygmaeum* Dersco, 1959; *P. p. proserpina* Miller & Kratochvil, 1940) Holm, 1944 (epigean in Palearctic, WA, AK, BC?, Greenland / Ac (alien?) in WA)

*Porrhomma egeria* Simon, 1884 (= *P. moravicum* Silhavy', 1958; *P.e. m.* Thaler, 1968; *P. obambulatum* Kritscher, 1969; *P. moderatum* Miller, 1971) (Europe, Palaeartic in caves/ Tx or Ac alien? in sON)

*Porrhomma emertoni* Roewer, 1942 (= *Linyphia incerta* Emerton, 1875; *P. incerta* Packard, 1886; *Willibaldia i.* Keyserling, 1886 & *Troglohyphantes i.*) (VA, KY epigean/ Tp or Tx in IL?, KY (Mammoth C.), sON, VA)

***Porrhomma*** undet. sp. (cave in Monroe CO.,IL/ Tp)

***Porrhomma terrestre*** (*Tmeticus t.* Emerton, 1882; *Gongylidium t.* Simon, 1884; *Erigone t.* Marx, 1890; *Oedothorax t.* Crosby, 1905; *Microneta clavata* Emerton, 1917; *Sciates t.* Bishop Crosby) Ivie, 1967 (E epigeal in MA, NY, MI, WI, WY, AK, PQ, ON, MB, [SK], [AB] / Tx in IL, MD(Eb)

*Pseudometa biologica* = *Meta d.*

***Psilochorus*** Simon, 1893 - Pholcidae spiders (long-legged cellar spiders) (19 species in US or Canada)

***Psilochorus imitatus*** Gertsch & Mulaik, 1940 (Tp in cave in Val Verde Co., TX)

***Psilochorus*** undet. sp. (Tp in cave in Grand Canyon, Coconino Co., AZ)

***Psilochorus*** undescr. sp.#2 (\*cave in Kimble Co.,TX/Tp)

***Psilochorus*** undescr. sp.#3 (\*cave in Verde Co.,TX/Tb)

***Psilochorus*** undescr. sp.#4 (Tp in Calaveras, Mariposa & Tuolumne Cos.,CA)

***Psilochorus*** undescr. sp.#5 (\*cave in Cochise Co., AZ/ Tb)

***Rabidosa*** Roewer, 1960 (junior syn. of *Hogna* according to some authors) (5 species in US)

***Rabidosa r.*** (*Lycosa r.*, *Dolomedes lineatus* Walckenaer, 1837; *Lycosa scutulata* Emerton, 1885; *L. scutata* Simon, 1898; *Hogna r.* Dondale & Redner, 1990) Brady & McKinley, 1994 1990 (OK n.to NB, e.to ME, s.to FL, KY/ Ac in TX)

***Rachodrassus*** Chamberlin, 1922 = *Talanites*

***Robertus*** O. Pickard-Cambridge, 1879 (= *Garritus* Chamberlin & Ivie, 1933; *Ctenium* – considered senior synonym) Theridiidae spiders (16 species in US or Canada) (mostly litter sp.)  
**Bibl.:** Kaston, 1946

***Robertus frontatus*** (*Microneta f.* Banks, 1892; *Pedanostethus terrestris* Emerton, 1914; *R.t.* Crosby & Bishoop, 1928; *Ctenium f.* Kaston, 1946) (sCanada to MD; NC, TN, OH/ Tp or Tx in IL)

***Rualena*** Chamberlin & Ivie, 1942 - Agelenidae spiders (9 species in US or Canada)

***Rualena*** undet. sp. (NM hyporheic)

***Rugathodes*** Archer, 1950 - Theridiidae spiders (2 species in US or Canada)

***Rugathodes sexpunctatum*** (*Theridion s.* Emerton, 1882) Archer, 1950 (Russia, AK to CA; BC, AB to AZ; w.of Rockies; MN,ON e. to NF, s. to NC, Appalachians/ Tx or Ac in BC, sON; Ac in WA; Tx in CA/ Tx? in nMS)



**Schizocosa** Chamberlin, 1904 (*Avicosa* Chamberlin & Ivie, 1942) (24 species in US or Canada) (mostly litter sp.) Lycosidae spiders. **Bibl:** Dondale & Redner 1978

**Schizocosa ocreata** (*Lycosa o.* Hentz, 1844; *L. charonoides* Montgomery, 1902; *S. saltatrix* Comstock, 1940) Emerton, 1885 (NA/ Tx in IL,MO)

*Schizocosa parallela* = *Allocosa p.*

**Schizocosa** undet. sp. (MO/Tx?), (Ac in cave in Comal Co., TX)

**Schizocosa rovneri** Uetz & Dendale, 1979 (US/Tx? in IL)

**Schizocosa saltatrix** (*Lycosa s.* Hentz, 1844; *L. venustula* Hentz, 1844; *L. relucens*, *L. versimilis* Montgomery, 1902) Comstock, 1912 (NA/Tx or Ac in sON,TX)

**Sciastes** Bishop & Crosby, 1938

*Sciastes terrestris* = *Porrhomma t.*

**Scotinella** Banks, 1911 (incl. US species formerly misplaced in *Phrurolithus* Koch, 1839) Liocranidae spiders (also put in Clubionidae & Gnaphosidae) (mostly litter sp.) (16 species in US or Canada) **Bibl.:** Dondale & Redner, 1982

**Scotinella redempta** (*Phrurolithus r.* Gertsch, 1941) Dondale & Redner, 1982 (US,Canada/Tx in IL)

**Scotinella** undet. sp. (Ac in Bexar, Williamson Cos., TX),

**Scotinotylus** Simon, 1884 (*Caledonia* O.P-Cambridge, 1894; *Cervinargus* Vogelsanger, 1944; *Cheraira* Chamberlin, 1948; *Cochlembolus* Corsby 1929; *Yukon* Chamberlin & Ivie, 1947) Linyphiidae spiders (mostly litter sp.) (34 species in US or Canada) **Bibl.:** Crosby & Bishop 1935; Millidge 1981

**Scotinotylus patellatus** (*Araeoncus p.* Emerton, 1917) Millidge, 1981 (AK, Canada, US epigeal/ Ac in WA)

**Scotinotylus** undet. sp. (WA)

**Scotophaeus** Simon, 1893 - Gnaphosidae spiders (1 species in US or Canada) **Bibl.:** Platnick & Shadab, 1977

**Scotophaeus blackwalli** (*Drassus b.*, *D. gotlandicus* Thorell, 1871; *D. ravidus* Pavesi, 1873; *D. immundus* Kulczyn'ski in Chyzer & Kulczyn'ski, 1897; *Drassodes californica* Banks, 1904; *D. b.* Lessert, 1910; *Herpyllus pius* Chamberlin, 1919; *Scotophaeus furtadoi* Reimoser, 1919; *Herpyllus b.* Braendegaard, 1966) Kulczyn'ski, 1898 (cosmopolitan/Ac in TX)

**Scylaceus** Bishop & Crosby, 1938 - Linyphiidae spiders (2 species in US or Canada)

**Scylaceus** undet. sp. (Ac in cave in King Co., TX)

**Scytodes** Latreille, 1804 - Scytodidae spiders(7 species in US or Canada)

**Scytodes longipes** Lucas, 1844 (HI/alien Tp)

**Scytodes** undet. or undescr. sp. (TTx or Ac in TX)

**Selenops** Latreille, 1819 - Solenopidae spiders (6 species in US or Canada)

**Selenops** undet. sp. (Ac in wTX; TTx in cave in Grand Canyon, Coconino Co., AZ)

**Sergiulus** Simon, 1891 (considered a junior synonym of *Poecilochroa* by Ubick & Roth, 1973)

Gnaphosidae spiders

**Sergiulus angustus** (*Herpyllus a.* Banks, 1904; *S. atomisticus* Chamberlin, 1924; *S. fruitanus*

Chamberlin & Gertsch, 1928; *S. bebius*, *S. clarus*, *Zelotes pananus* Chamberlin, 1926;

*Poecilochroa angusta*, *P. bebia*, *P. clarus*, *P. fruitana*, *P. panama*, *P. atomistica* Ubick & Roth, 1973) Platnick & Shadab, 1981 (Ttx in Carlsbad C.,NM)

sheet weaver groups - See Leptonetidae

sheet web - See Linyphiidae

**Sisicottus** Bishop & Crosby, 1938 - Linyphiidae spiders (mostly litter sp.) (9 species in US or Canada)

**Sisicottus montanus** (*Tmeticus m.* Emerton, 1882; *Gongylidium montanum*, *Plaesiocraerus m.*

Simon, 1884; *Erigone collina* Marx, 1890; *Eodothorax m.* Crosby, 1905) Bishop & Crosby, 1838 (US, Canada epigean/ Tp? on porcupine dung in cave in NS)

**Sisicottus nesides** (*Oedothorax n.* Chamberlin, 1922; *S. montanus* Bishop & Crosby, 1938)

Crawford & Edwards, 1989 ((\*type locality cave in Val Verde Co., TX/ US, Canada epigean/ Tp in TX)

**Sisicus** Bishop & Crosby, 1938 - Linyphiidae spiders, subfamily Linyphinae (2 species in US or Canada)

**Sisicus** undescr. sp. (\*\*2 caves in Jackson Co.,IA/ Tb)

**Smeringopus** Simon, 1890 - Pholcidae spiders

**Smeringopus pallidus** (*Pholcus p.* Blackwall, 1858; *P. phalangioides* Doleschall; *S. elongatus*

Vinson, 1863; *P. distinctus* O.P.-Cambridge, 1869; *P. tipuloides* L. Koch, 1972; *P. margarita*

Workman, 1878; *S. todai* Kishida, 1913; *S. geniculatus*, *S. purpureus* Mello-Leitao, 1918; *S.*

*kishidai* Saito, 1933; *S. katangae* Giltay, 1935; *S. pullidus* Lee, 1966) Mello-Leitao, 1918;

(Oahu & Kauai/alien Tp or Tx)

*Solicosa* - see *Adelopezosa*

**Steatoda** Sundevall, 1833 (= *Asagena* Sundevall, 1833; *Lithyphantes* thorell, 1869; *Teutana* Simon, 1881; *Stephopoma* Simon, 1894; *Steassa* Simon, 1910; *Argyroelus* Hogg, 1922; *Asagenella* Schenkel, 1937) (mostly litter sp.) Theridiidae spiders (21 species in US or Canada)

**Steatoda albomaculata** (*Aranea alabo-maculata* DeGeer, 1778; *A. maculata* Olivier, 1789; *Theridion maculatum* Walckenaer; *T. dispar* Sundevall, 1832) Levi, 1957 (cosmopolitan, AK, WNT to CA; AB to Mex.; MAN to NB; MN, IO to NH, CT/ Tx in MO)

**Steatoda** undet. sp. or species (MS/Tx or Tp); Tp or Tx in Bexar, Coryell Cos., TX; Ac or Ttx in moss in El Malpais Natl. Monument, nNM))

**Talanites** Simon, 1893 (= *Rachodrassus* Chamberlin, 1922; *Drassyllochemmis* Gertsch & Davis, 1936) Gnaphosidae spiders (5 species in US or Canada)

**Talanites echinus** (*Rachodrassu e.*, *R. chera* Chamberlin, 1922) Platnick & Ovtsharenko, 1991 (SE epigean/ Tx in IN (S1/G2); Tp or Tx in cave in Jackson Co., AL / sac-web spider)

tangled-web spinners - See Theridiidae

**Tapinocyba** Simon, 1884 (= *Colobocyba* Simon, 1926) Linyphiidae spiders, subfamily Linyphiinae (mostly litter sp.) (13 species in US or Canada) **Bibl.:** Bishop & Crosby 1933

**Tapinocyba dietrichi** Crosby & Bishop, 1933 (epigean in WA, AK?, CA/ Tx in Amadro & Mariposa Cos., CA)

**Tapinocyba** undet.? sp. (IA/Tp)

**Tegenaria** Latreille, 1804 (= *Drassina* Grube, 1861) Agelenidae spiders. **Bibl.:** V. Roth 1952, 1968 (6 species in US or Canada)

*Tegenaria antrias* = *T. pagana*

**Tegenaria chiricahuae** Roth, 1968 (shallow caves (cave#1 (canyon floor ne. of SW Research  
**Tegenaria derhami** = *Aranea d.* Scopoli; *T. domestica*)

**Tegenaria domestica** (*Araneus domesticus* Clerck, 1757; *Aranea derhamii* Scopoli, 1763; *Aranea longipes* Fuesslin, 1775; *A. flava*, *A. tomentosa*, *A. annulata* Martini & Goeze, in Lister, 1778; *Aranea civilis* Walckenaer, 1805; *Arachne familiaris* Audouin, 1826; *Agelena civilis* Sundevall, 1831; *T. scalaris* Krynicky, 1837; *T. l.*, *T. c.* C.L. Koch, 1840; *Agelena f.* Walckenaer, 1842; *Philoica civilis* C.L. Koch, 1850; *T. fontium* Simon, 1875; *T. modesta* Keyserling, 1878; *Coelotes calcaratus* Keyserling, 1887; *C. plumarius* Bishop & Crosby, 1926; *T. ochracea* (Grube, 1861)) Simon, 1875 (global, US, Canada/barn funnel weaver/TTp or Tx in AL, GA, HI (alien in Kauai, Oahu, Maui, HI), IN, TN; Tx or Ac in MD, WA) **Bibl.:** Holmes 1982

**Tegenaria pagana** C. L. Koch, 1840 (*T. antrias* Crosby, 1926; *T. obscura* Banks, 1898; *T. proxima* O.P.-Cambridge, 1873; *T. testacea*, *T. subtilis* Simon, 1870; *T. p. cavernicola* Simon, 1907; *T. variata* Thorell, 1875; *T. heteropalpa* Lebert, 1877; *T. bidentata* Keyserling, 1878; *T. p.*

*proxima* Strand, 1909) Warburton, 1892 (Europe to Asia Minor, n. Africa to Azores, CA, AZ/ alien TTp in AL, Mex., NM (Carlsbad C.), wTX, Station & cave #2 (opp. Station), C. Cr. Canyon, Chiricahua Mts., AZ)

*Tegenaria* undescr. sp. (\*cave in Travis Co.,TX/ Tb?)

*Tegenaria* undet. sp. or species (Tb or Tp? in cave in DE Co.,OK; Tp or Tx in Nickajack C.,TN)

*Telema* Simon, 1882 - all sp. moved to *Usofila*

*Teminius* Keyserling, 1887 (= *Eutychuroides* Petrunkevitch, 1926; *Paratyle* Simon, 1896) Miturgidae spiders (2 species in US or Canada)

*Teminius affinis* Banks, 1897 (*Syrisca a.* Petrunkevitch, 1911) (?Tp in Bexar Co., TX)

*Tennesseellum* Petrunkevitch, 1925 Linyphiidae spiders, subfamily Linyphiinae (also put in Erigonidae) (mostly litter sp.) (1 species in US & Canada)

*Tennesseellum formicum* (*Bathyphantes f.* Emerton, 1882; *Erigone f.* Keyserling, 1886; *Prosopotheca t.* Crosby, 1905; *T. minutum* Petrunkevitch, 1925; *Meioneta f.* Chamberlin & Ivie, 1944) Kaston, 1945 (AK, s.,m.Canada, New England s. to GA, w. to AZ, CA, WA/ Ac or Tx? in OK)

*Tetragnatha* Latreille, 1804 - Tetragnathidae spiders (also put in Araneidae) (longjawed orbweavers) (44 species in US or Canada) They have an extreme elongated abdomen, long legs and extreme large chelicera. They spin an orb web with a hole in the hub. They do not use many radii in their web.

*Tetragnatha elongata* Walckenaer, 1842 (*T. fulva*, *T. fimbriata*, *T. culcivora*, *T. sanctitata*, *T. violacea* Walckenaer, 1842; *T. armigera* Blackwall, 1846; *T. grallator* Hentz, 1850; *T.* (Holarctic, AZ ,NA, Cuba, Jamaica/e longate long-jawed orb weaver/ Tx or Ac in sON; TTx in mine in Bell Co.,TX)

*Tetragnatha laboriosa* Hentz, 1850 (= *T. illinoiensis* Keyserling, 1879; *T. alba* F.O.P. – Cambridge, 1903; *T. seydi* Strand, 1908; *T. numa* Levi & Levi, 1955) (Nearctic,US & Canada to Ca, AK, LA/ silver longjawed orbweaver/ Tx or Ac in IN, OH)

*Tetragnatha* undet. sp. (Ac in Comal, Travis, Williamson Cos., TX)

*Tetragnatha straminea* Emerton, 1884 (*Eugnatha s.* Banks, 1893) (US, Canada, Cuba epigeal/ Tx in WA Co.,IN/ S5/G5)

*Tetragnatha versicolor* Walckenaer, 1841 (*T. trapezoides*, *T. casula.* Walckenaer, 1842; *T. dentigera* F.O.P. –Cambridge, 1903; *T. convexa* Banks, 1898; *T. limnocharis* Seeley, 1928; *T. munda* Chamberlin & Gertsch, 1929; *T. marianna* Archer, 1940) Chamberlin & Ivie, 1944 (Nearctic, SE, Central Amer., Cuba, CA, TX epigeal/ Ac in WA)

*Teutana* - see *Steatoda*

**Thanatus** C.L. Koch, 1837 - Philodromidae spiders (also put in Thomisidae) 81 species in US or Canada)

**Thanatus** undet. sp. (Ac in cave in Williamson Co., TX)

**Theotima** Simon, 1893 - Ochryceratidae spiders (1 species in US)

**Theotima makua** Gertsch, 1973 (\*\*\*?type locality & 2 other caves in Kauai, HI/ Tb/ G3)

**Theridion** Walckenaer, 1805 (*Allotheridion* Archer; *Phaeototicus* Simon, 1894; *Billima* Simon, 1908 (mostly litter sp.) Theridiidae spiders (67 species in US or Canada) **Bibl.:** Levi 1957, 1959, 1963a-b

*Theridion albomaculatum* (see *Steatoda*)

*Theridion ambitum* (see Mysmenidae)

**Theridion cochise** Levi, 1963 (Tp? in AZ)

*Theridion eigenmanni* Banks in Uhler, 1902 = *Gaucelmus augustinus*

**Theridion flavonotatum** Becker, 1879 (SE, Cuba epigean/ Tx in Morgan Co., AL)

**Theridion glaucescens** Becker, 1879 (US, Canada epigean/ Tx or Ac in nON (probably))

**Theridion grillator** Simon, 1900 (happy face spider/ HA epigean/ Tp or Tx in HA) **Bibl.:** Gon 1985

**Theridion lyricum** Walckenaer, 1842 (SE, Russian Far East / Tx in Colbert Co., AL)

**Theridion llano** Levi, 1957 (Tx or Tp in cave in Hardeman Co., TX)

*Theridion opulenta* = *Theridula o.*

*Theridion porteri* = *Achaearanea p.*

*Theridion redemptum* = *A. porteri*

*Theridion rupicola* = *A. r.*

*Theridion sisyphoides* = *Tidarren s.*

*Theridion sexpunctatum* = *Rugathodes s.*

**Theridion** undet. sp. or species (Tx in CA (Santa Cruz Co); KY, WV & TX (Val Verde Co.)

*Theridion tepidariorum* = *Achaearanea t.*

*Theridion ventillans* = *Theridula v.*

*Theridion wallacei* Levi, 1942 = *Thymoites w.*

**Theridion** undescr. sp. #1 (\*cave in subalpine in HI Volcanoes Natl. Park)

**Theridion** undescr. sp. #1 sp.#2 (IL/Tp or Tx)

**Theridiosoma** O.P.-Cambridge, 1879 - Theridiosomatidae spiders (once in Araneidae)

***Theridiosoma gemmosum*** (*Theridion g.* L. Koch, 1877; *T. argenteolum* O.P.-Cambridge, 1879; *Epeira radiosa* McCook; *Microepeira r.* Emerton, 1884) Simon, 1881 (*T. radiosum* Keyserling, 1893; *Epeira r.* McCook, 1881) Keyserling, 1884 (Europe, eCanada / Tp in AL, IL, IN, sON, TN; Tx or Ac in GA (Walker Co.))

*Theridiosoma radiosa* & *radiosum* = *T. g.*

***Theridula*** Emerton, 1882 - Theridiidae spiders (3 species in US or Canada)

***Theridula opulenta*** (*Theridion o.* Walckenaer, 1842; *Theridion sphaerula* Hentz, 1850; *Chryso cordiformis* Butler, 1882; *Theridion ventillans* Keyserling, 1884; *Theridion quadripunctata* Keyserling, 1886) Petrunkevitch, 1911 (cosmopolitan/ (Tx or Tp in cave in Decatur Co., AL)

***Thymoites*** Keyserling, 1884 (= *Sphyrotinus* Simon, 1894; *Hypobares* Simon, 1894; *Philto* Simon, 1894; *Thonastica* Simon, 1909; *Garricola* Chamberlin, 1916; *Paidisca* Bishop & Cosby, 1926; *Tholocco* Archer, 1946; *Thymoella* Bryant, 1948; *Brontosauriella* Bristowe, 1938; *Spelobion* Chamberlin & Ivie, 1938) Theridiidae spiders (15 species in US or Canada). Bibl.: Levi, 1964a

***Thymoites camano*** Levi, 1957 (UT,WA to CA/ Ttp in WA; Tx in Amador, Calaveras, Mariposa, Shasta & Tuolumne Cos., CA)

***Thymoites marxi*** (*Histagonia m.* Crosby, 1906; *Ulesanis serrata* Emerton, 1913; *Paidisca marxi* Kaston, 1948; *Sphyrotinus m.* Levi, 1959) Levi & Levi, 1962 (SE/Tx or Tp in Colbert Co.,AL & Randolph Co., GA)

***Thymoites minero*** Roth, 1992 (\*type locality cave in Cochise Co.,AZ/ Tb/ G1G2)

***Thymoites pallidus*** (*Dipoena pallida* Emerton, 1913; *Theridion edinburgensis* Gertsch & Mulaik, 1936; *D. cubana* Bryant, 1940; *Theridion wallacei* Gertsch & Archer, 1942) Levi, 1964 (epigeal in US to West Indies & Venezuela/ TTx? In Gator Sink,Alachua Co.,FL)

***Thymoites*** undescr. sp.#1 (AZ/Tb) (pers. comm. Cokendolpher 28 July, 1996)

***Thymoites*** undescr sp. 2-3. (NM/Tb) (pers. comm. Cokendolpher 28 July, 1996)

***Tidarren*** Chamberlin & Ivie, 1934 - Theridiidae spiders (2 species in US or Canada)

***Tidarren sisypoides*** (*Theridion s.* Walckenaer, 1842; *Theridion ansatum* Walckenaer; *Theridium fordum* Keyserling, 1894; *Dipoena proba* O.P.-Cambridge, 1902; *Steatoda forda* O.P.-Cambridge, 1902; *Theridium fordum* Petrunkevitch, 1930 ) (sCA, SE epigeal/ Ttp in Bexar, San Saba, Travis, Williamson Cos., TX & cave in Madison Co.,AL)

*Titanebo* Gertsch, 1933 = *Ebo*

***Titanoeca*** Thorell, 1869 (once in Amaurobiidae) Titanoecidae spiders (4 species in US or Canada)

*Titanoeca* undet. sp. (NM hyporheic)

*Titiotus* Simon, 1897 (= *Anachemmis* Chamberlin, 1920 but synonymy rejected by Platnick 1999) (put by some authors into *Liocranoides*) Tengellidae spiders (originally in Ctenidae, also placed in Clubionidae)

*Titiotus* undescr. species (Amador, Calaveras, Mariposa, Shasta, Siskiyou Cos., CA/Tp/ About 30 undescr., 2 described US species, mostly epigeal species)

*Titiotus* probable undescr. sp. (\*\*? 2 caves in Tulare Co., CA/ Tp)

*Tmeticus* - see *Eperigone*

*Trochosa* C.L. Koch, 1847 (*Trochosina* Simon, 1885; *Allotrochosina*, *Diahogna*, *Trochosomma*, *Metatrochosina* Roewer, 1960; (mostly litter sp.) Lycosidae spiders (3 species in US or Canada).  
Bibl.: Barry, 1974

*Trochosa* undet. sp. (Ac in Coryell, Edwards Cos., TX)

*Trochosa terricola* Thorell, 1856 (= *Lycosa agretyca* Balckwall; *L.t.* Westring, 1861; *T. trabalis* Ohlert, 1867; *L. lugubris* Menge, 1879; *Trochosina t.* Simon, 1885; *L. terricola pallida* Nosek, 1904; *L. orophila* Chamberlin & Gertsch, 1929; *L. pratensis o.* Chamberlin & Ivie, 1947; *Allohogna p.* Roewer, 1955; *T.p.* Crawford, 1988) (Holarctic, s. to TX epigeal / Tx or Ac in sON)

*Troglohyphantes* Joseph, 1882 (= *Stygohyphantes* Kratochvil, 1948) (see *Oreonetides*)  
Linyphiidae spiders (1? species in US or Canada) **Bibl.:** Deeleman-Reinhold 1978

*Troglohyphantes incerta* (Emerton) = *Porrhomma emertoni*

*Troglohyphantes* undet. sp. (alien? in cave in Rockcastle Co., KY/Tp or Tb)

*Trogloneta* Simon, 1922 (= *Troglonata*) Mysmenidae spiders (1 species in US)

*Trogloneta paradoxa* Gertsch, 1960 (*T. paradoxum* Gertsch, 1960) (UT to CA, OR/ Tp in Amador, Calaveras & Plumas Cos., CA),

*Uloborus* Latreille, 1806 - Uloboridae spiders (4 species in US or Canada)

*Uloborus americanus* Walckenaer = *U. g.*

*Uloborus arizonicus* = *Philoponella a.*

*Uloborus diversus* Marx, 1898 (SW, Mexico epigeal/ Tp in Calavaeras, San Bernardino & Tuolumne Cos., CA) **Bibl.:** Eberhard 1970

*Uloborus glomosus* (*Epeira g.* Walckenaer, 1842; *U. americanus* Kaston, 1948) Chamberlin & Ivie, 1944 (eUS & Canada/ featherfoot s./ TTx in MO, NM)

*Uloborus* undet. sp. (Tx? in Blood C.,KY)

*Urozelotes* Mello-Leito, 1938 - Gnaphosidae spiders (2 species in US or Canada)

*Urozelotes rusticus* (*Prothesima rustica* L. Koch, 1872) Heiss & Allen, 1986 (cosmopolitan/Ac in Blanco, Medina Cos., TX)

*Usofila* Keyserling in Marx, 1891 (considered a junior syn. of *Telema* by Gertsch 1973 & Roth 1982) Telemidae spiders (also put in Ochyroceratidae & Amaurobiidae) (4 described species in US or Canada)

*Usofila gracilis* Keyserling, in Marx, 1891 (*Usophila g.* Fage, 1912) (= *Telema g.*) (type locality cave in El Dorado Co. + Tp or Tb in Calaveras, Mariposa, San Bernardino & Tuolumne Cos.,CA/ G3)

*Usofila pacifica* (*Ochyrocera p.* Banks, 1894) Chamberlin & Ivie, 1947 (Tp or Tx in BC; Tp in cave in Skagit Co.,WA)

*Usofila* undet. sp. (cave near Columbia,Tuolumne Co., CA), See also Nesticidae.

*Usofila* undescr. sp. #1 (\*?Subway C.,Shasta Co.,CA/Tb?)

*Usofila* undescr. sp.#2 (2 caves in Shasta Co. & cavea in Plumas Co.,CA/Tp)

*Usofila* undescr. sp.#3 (\*?(\*cave in Grand Canyon, Coconino Co., AZ/Tb)

*Usofila* undescr. sp.#4 (Calaveras & Tuolumne Cos.,CA/Tb or Tp)

*Usofila* undescr. sp.#5 (\*\*?2 caves in Tulare Co., CA/ Tb)

*Usofila* undescr. sp.#5 (\*?(\*cave in El Dorado, CA/ Tb)

*Usofila* undescr. sp.#6 (Amador, Calaveras, Kern & Tuolumne Cos., CA/Tb)

*Usofila* undescr. sp.#7 (\*?cave in Tulare Co.,CA/ Tb)

*Usofila* undescr. sp.#8 (Siskiyou Co.,CA/Tb)

*Usofila* undescr. sp.#9 (Tp in WA)

*Usofila* undescr. sp.#10 (2 caves in Santa Cruz Co. + 15 other cos.? ,CA/ CA T&E G1S2, Federal Species of Concern/Tb or Tp?)

*Usofila* undescr. sp.#11 (\*cave in San Bernardino,CA/ Tb)

*Varacosa* Chamberlin & Ivie, 1942 – Lycosidae spiders (4 species in US or Canada)

*Varacosa avara* (*Trochosa a.* Keyserling, 1877; *Lycosa rufiventris* Banks, 1892; *L.a.* Montgomery, 1903; *Gladicosa (V.) a.*) Roth, 1982 (epigean US & Canada/ Tx or Ac in 1 IL cave?)

*Wadotes* Chamberlin, 1925 Amaurobiidae spiders (once in Agelenidae) (11 species in US or Canada) **Bibl.:** Muma 1947



*Wadotes bimucronatus* (*Coelotes b.* Simon, 1898; *W. carolinus* Chamberlin, 1925; *W. convolutus* Muma, 1947) Chamberlin, 1925 (AL, GA, NC, TN epigean/ Tp or Tx in cave in Colbert Co.,AL)

*Wadotes calcaratus* (*Coelotes c.* Keyserling, 1887; *C. longitarsus* Emerton, 1890; *C. nigriceps* Banks, 1895) Chamberlin, 1925 (New England & adjacent Canada s. to GA, w. to IN/ Tx or Ac in sON; Tx in AL, GA, TN)

*Wadotes convolutus* Muma, 1947 (female holotype from cave in Marshall Co.,AL) = *W. bimucronatus*

*Willibaldia cavernicola* - see *Porrhomma c.*

wolf spider - See Lycosidae

*Xysticus* C.L. Koch, 1835 (*Psammitis* Menge, 1868) Thomisidae spiders (68 species in US or Canada)

*Xysticus canadensis* Gertsch, 1934 (*Oxyptila cinerea* Emerton, 1892) (LB to BC, Yukon, NH/ Tx or Ac in ON mine)

*Xysticus ferox* (*Thomisus f.* Hentz, 1847; *X. stomachosus* Keyserling, 1880; *X. distinctus*, *transversus* Banks, 1892) Gertsch, 1939 (Russia, Canada, US epigean/ Ac in cave in Bexar Co., TX)

*Xysticus (Proxysticus) punctatus* Keyserling, 1880 (= *X. formosus* Banks, 1892) (NA, Nearctic, boreoalphe/ Tx or Ac in CA)

*Xysticus* undet. sp. (Ac in cave in Burnet Co., TX)

*Yorima* Chamberlin & Ivie, 1942 - Dictynidae spiders (once in Agelenidae) (5 species in US or Canada) **Bibl.:** Roth 1956

*Yorima* undescr. or undet. sp. (possibly *Y. angelica* Roth 1956) (Calaveras Co., CA/Tp or Tx)

*Zelotes* Gistel, 1848 (= *Scotophinus* Simon, 1905; *Zavattarica* Caporiacco, 1941) Gnaphosidae spiders (also put in Ctenidae) (42 species in US or Canada) (mostly litter sp.) **Bibl.:** Platnick & Shadab 1983

*Zelotes* undet. sp. (Tx or Ac in IL(1cave), TX)

*Zorocrates* Simon, 1888 - Zorocratidae spiders (put in Zoropsidae & Tengellidae) (5 species in US or Canada)

*Zorocrates aemulus* Gertsch, 1935 (Tx? In Uvalde, Val Verde Cos., TX)

*Zygiella* Pickard-Cambridge, 1902 - Araneidae spiders (4 species in US or Canada)

*Zygiella* undet. sp. (Tx or Ac in seAK)

spider, false & sun - See solifugids.

**Spider hazards** incl. black widow (*Latrodectus mactans*) & brown recluse (*L. reclusa*) both Tx in TX & Ctenus sp. (Ac in TX)

## Spikemosses

There are living and extinct forms but only one third as many as the Lycopodiales. This Order possesses 1) ligules, the tapered structures at the base of leaves, and 2) two types of spores (heterosporous), microspores and megaspores, which give rise to male and female gametophytes and sperm cells with two flagella. The development of the gametophytes is described to be "endosporic", a character peculiar to the spikemosses and the quillworts.

Kingdom Plantae

Subkingdom Tracheobionta

Phylum or Division Lycopodiophyta (= Mycophyllophyta) (lycophytes)

Class Lycopodiopsida (=Isoetopsida, Aglossopsida) (club mosses)

Order Selaginellales (spikemosses)

Selaginellaceae (*Selaginella*)

***Selaginella*** Palisot de Beauvois (= *Hypopterygiopsis* Sakurai) (Less clubmoss, spikemoss, selaginella) Selaginellaceae Clubmoss

***Selaginella eatonii*** Hieronymus ex Small, 1918 (Eaton's spike-moss/ likely twilight zone & in sinkholes in sFL)

***Selaginella ludoviciana*** (*Lycopodium ludovicianum* A. Braun, 1858) (Gulf or Louisiana spike-moss/ likely twilight zone & in sinkholes in nFL & sAL, epigeal in MS,LA)

***Selaginella mutica*** (*S. m.* Eaton ex L. Underwood, 1898) (moss/ likely twilight zone in AZ, CO, NM, UT, TX, WY)

***Selaginella rupestris*** (*Lycopodium r.* Linnaeus, 1838) (spike or dwarf spike-moss/ likely twilight zone in east, n. to eCanada, nw to AB, s. to GA)

***Selaginella underwoodi*** Hieronymus in Engler & Prantl, 1901 (Underwood's spike-moss/ likely twilight zone in AZ, CO, NM, OK, TX, UT, WY, Mex)

***Selaginella wrightii*** Hieronymus, 1900 (Wright's spike-moss/ calciphile, likely twilight zone in NM, TX, Mex.)

## Sponges and Placozoans

(= Spongiaria) Of Porifera, an aquatic phylum of the Metazoa. Sponges and the phylum Placozoa (a single species, *Trichoplax adhaerens*), together known informally as parazoans, have

an almost plant-like organization of loosely connected cells whereas all other metazoans have cells that functionally are tightly co-ordinated. Sponges and placozoans are the only metazoans in which the main opening to the exterior (osculum) is an exit, rather than an entrance. Sponges generally consist of a hollow cup of tissue with holes called ostia and an open top, the osculum. Sponges in freshwater caves usually are macroinvertebrate fossils with an internal skeleton usually of opaline silica, rarely calcium carbonate. Current encrusting sponges may be the most common organisms in tidally flushed sea caves. Includes encrusting & pleosponges. About 5,000 known living species.

Class Calcarea (= Calcispongea) (calcareous sponges)

Order Thalamida (*Amblysiphonella*, *Gaudalupia*)

Class Pharetronida

Superorder Calcaronea

Order Leucosoleniida

Leucosoleniidae (*Leucosolenia*)

Class Demospongiae

Order Choristida (=Anacorinida)

Ancorinidae: Stellettiniae (*Stelletta*)

Order Poecilosclerida (also put in Cornacuspongida)

Myxillidae (*Hymenamphiastra*)

Order Haplosclerida (=Halichondrida?)

Halichondriidae (*Halichondria*), Haliclonaidae (*Haliclona*)

Spongillidae (*Spongilla*)

Order Monaxonida (=Cornacuspongida in part)

Demospongidae

(*Eunapius*, *Haliclona* (now in Haliclonaidae), *Spongilla* (now in Spongillidae))

Haliclonaidae (*Haliclona*) (family also put in Order Haplosclerida)

***Amblysiphonella*** – Sponge of Order Thalamida

***Amblysiphonella*** undet. sp. (extinct Permian fossil in Lechuguilla C., Eddy Co., NM)

***Cystaulites*** undet. sp. (extinct Permian fossil in Lechuguilla C., Eddy Co., NM)

***Eunapius*** Gray, 1867 - Demospongidae sponge

***Eunapius fragilis*** (*Spongilla* f. Leidy, 1851) (E/ Tx? in Mammoth C., KY)

***Eunapius*** undet. sp. (CT)

***Gigantospongia*** Rigby & Daryan, 1996

***Gigantospongia discoforma*** Rigby & Daryan, 1996 (Permian wall fossil in Lechuguilla C., NM)

***Girtycoela*** undet. sp. (extinct Permian fossil in Lechuguilla C., Eddy Co., NM)

**Guadalupia** – Sponge of Order Thalamida

**Guadalupia** undet. sp. (extinct Permian fossil in Lechuguilla C., Eddy Co., NM)

**Halichondria** Fleming, 1828 - Haliclonidae sponge

**Halichondria panicea** (Pallas, 1766) (Atlantic & Pacific shores/ breadcrumb sponge/ME sea c.)

**Haliclona** Grant, 1841 - Haliclonidae sponge

**Haliclona ecbasis** De Laubenfels, 1930 (= *H. cinerea*, *Reniera c.*) (ME sea c.)

**Haliclona permollis** Bowerbank, 1866 = *H. ecbasis*

**Hymenamphiastra** de Laubenfels, 1930 - Myxillidae sponge

**Hymenamphiastra** undet. sp. (CA marine)

**Lemonia** undet. sp. (extinct Permian fossil in Lechuguilla C., Eddy Co., NM)

**Leucosolenia** - Leucosoleniidae sponges

**Leucosolenia** undet. sp. (WA marine infauna)

**Spongilla** Lamarck, 1816 - Spongillidae sponge

**Spongilla fragilis** = *Eunapius* f.

**Spongilla lucustris** (Linnaeus, 1758) (Mammoth C.,? KY)

**Stelletta** Wright, 1870 - Stellettinae sponge

**Stelletta** undet. sp. (CA marine)

**springs** - AR: Bryan 1924; FL: Mattson, Epler & Hein 1995; Rosenau et al. 1977; TN: Whitlatch 1943; TX: Brune, 1981; VA: W. Collins et al. 1930; Reeves 1932; WV: Price, McCue & Hoskins 1936

## Springtails & Allies

Collembola (= Springtails & allies). Small (Usually less than 4 mm. long) wingless hexapods with distinct head, internal mouthparts, one pair of 4 segmented antennae sometimes subdivided. No more than six abdominal segments. All species have the unique feature of a ventral tube (collophore) on the first abdominal segment. Except for the family Onychiuridae almost all troglobite species have a posterior jumping organ or furcula. They have no true compound eyes (ocelli) but the plesiomorphic feature is 8 + 8 ommatidia on solid dark eyepatches. Pseudocelli, smooth, thin areas of cuticle usually outlined by a rim or ring of granules, are located on the head and body of Onychiuridae. They are not true ocelli but probably control the release of hemolymphs to repel predators. Springtails usually have a very simple lifestyle, with little change in their appearance from the time they hatch from eggs to the time they reach sexual maturity in the adult stage. They continue to molt after they have reached adulthood. They & mites are by far the two most important groups of micro-arthropods in the soil in terms of biomass & breakdown of organics. Collembola grazing of soil bacteria enhances nitrogen mineralization; moderate grazing of fungi stimulates fungal growth. Syn: collembola, snow fleas.

Springtails are among the most primitive of hexapods and one of the first to invade dry land during the Silurian, about 430 million years ago. They are common in leaf litter and rotten logs. Some cave ones have elongated antennae and legs, increased body size, and the ability to jump over 20 times their own length. The greater jumping ability probably evolved in caves so springtails could escape such predators as trechine beetles or pseudoscorpions. Such an ability would be less needed in soil habitats. Elongation of appendages helps springtails walk on the surface tension film of cave pools instead of being trapped by it (Barr and Holsinger). Development of larger “claws” helps movement on slippery mud (Culver, 1982). Cave springtails often have longer legs, a flattened outermost antennal segment and a large body size than the ancestors they evolved from (Barr and Holsinger, 1985). Springtails will often play dead when approached by a potential predator.

There are more than 6 000 known species in the world and some people estimate that there may be as many as 50 000, making them very a successful group of hexapods. They live just about everywhere, in the canopy of tropical rain forests, on the beach, in tidal rock pools, on the surface of fresh water ponds and streams, in the deserts of Australia and in the frozen wastes on Antarctica, in fact they reach a more Southerly distribution than any other hexapod (84° 47' S.) and can survive temperatures less than —60 C.

Springtails are minute, wingless insects that get their name from the fact that they have an unusual locomotor organ. The main locomotor organ is a forked, tail-like structure (called a furcula) which is folded forward under the abdomen when the insect is at rest. The furcula is held in place by a clasp-like structure, called a tenaculum. When the tenaculum is released, the furcula thrusts downward and backward against the substrate, allowing the springtail to jump considerable distances. A springtail 5-6 mm in length can jump 75-100 mm and floating springtails can even jump on water. If a human had this same capability, a five foot tall individual could jump 80 feet high.

Springtails usually appear in the spring and early summer. Springtails are often known as “snow fleas” as they appear on the top of the snow during late winter and early spring. Springtails live in the soil, organic matter and anywhere it is damp, and they feed on fungus, decaying vegetable matter, or plant roots and young plant leaves. Springtails are beneficial in that they reduce decayed vegetation in the soil, and they also are among the few organisms that break down DDT in the soil.

The abdomen possess's only 6 segments, on the first is the ventral tube (an organ for the absorption of moisture, from which the order derives its name [kolla, = glue {in the mistaken belief that the ‘peg’ was used by the animal to glue itself to smooth surfaces} and embolon (= a peg), on the third is the minute retinaculum or hamula which helps to hold the furca in place when it is held under the abdomen, and on the fourth is the ‘furca’ itself, this is a forked springing organ from which the creature derives its common name of “springtail”.

Collembola reach sexual maturity after their 4th or 5th molt, but unlike most insects, though they are now adults they do not stop molting but may have as many as 15 to 20 molts before the end of their life, though they do not get any bigger. Growth rate is mainly related to temperature and food, if there is plenty of food then temperature is the controlling factor. Though it varies from species to species the higher the temperature the faster the growth rate, with molting occurring every 4 or 5 days at 15 degrees C but only every 20 to 30 days at 3 degrees C. Collembola stand around doing apparently nothing while preparing to moult and have to have an empty gut before

moulting because like their close relatives the insects they shed part of the stomach lining with their external skin. Because of this females lose any sperm they have stored from mating and have to mate again after each moult.

They are generally small and some species of Neelidae are among the smallest hexapods in the world at just over 0.2 mm long while the largest Collembola are in the family Uchidanuridae which can reach 10 mm in length. Most species live for a year or less, however some live considerably longer and the record for long life in the laboratory is 67 months for a specimen of *Pseudosinella decipiens*.

Populations are often high with up to 100,000 per cubic meter of surface soil, or many millions per acre. An individual walking through the forest with a size 10 boot would tread on about 2,000 springtails with each step.

In the wild, Collembola will feed mainly on fungal mycelium, bacteria and algae. In captivity they will eat just about anything, but will thrive on dried whole/live yeast, just sprinkle in a little at a time, and a bit of algae now and then. If you have more facilities you can grow various fungi on agar plates and then let the Collembola feed on this. They will also eat their own feces quite naturally so don't worry if this happens they are actually digesting the micro-organisms that live on the half digested food in the feces. Some species will eat their own exuviae (shed skins) but if they do not you will have to remove them, and any dead bodies, from the container with a fine paint brush.

Males leave a spermatophore (a bag of sperm) where the females might find it, sometimes this is off the ground on a short stalk. This habit is feasible because many species tend to collect in groups, like small herds of miniature cattle, and thus the females are quite likely to find the spermatophores. Some can reproduce at temperatures as low as 40 degrees Fahrenheit. A female will lay about 90 to 150 eggs during her life, though this also varies with species. The eggs take about a month to hatch at 8 degrees C but are quicker at warmer temperatures, *Tomocerus plumbeus* eggs hatch in 3-4 day at about 20 degrees C most will live for about a year. Some will live for a long time with out food, the longest I know of being 18 months for a single specimen on its own, though if the food runs out you will get cannibalism, particularly of eggs in some cultures. Collembola have been around at least 400 million years. The oldest known fossil hexapod *Rhyniella praecursor* is from chert of the Lower Devonian era.

**Bibl.:** Bagnall 1948-c; Christiansen 1964; Bellinger 1954; Bonet 1931; Christiansen 1960b, 1963, 1965, 1971; Christiansen & Snider 1984; C. & Culver 1987; Culver 1974; Scott 1961; Thibaud 1981, 1994; Thibaud & Massoud 1973; Wray 1952; Rees 1971

**Areas:** **AL:** Deboutteville 1949; **CA:** Wilkey 1959; East: Christiansen 1982; **HI:** Bellinger & Christiansen 1974; **IA:** Christiansen 1970a; Hedges 1962; **ID:** Wray & Knowlton 1956; **IN:** Hart 1970, 1971, 1973, 1974; **KY:** Lesshafft 1977; **MI:** Snider 1967; **MN:** Guthrie 1903; **NA:** Waltz & McCafferty 1979; **NY:** Maynard 1951; **NM:** H. Scott 1957, 1962, 1967; **TN:** Copeland 1960; Deboutteville 1949; **US & Canada:** Christiansen 1978; Christiansen & Bellinger 1980-1; Christiansen & Bellinger 1998; H. Scott 1961; Waltz & McCafferty 1979; **UT:** Wray & Knowlton 1953; **WI:** Thomas 1976; **World:** Salmon 1964; **WV:** Lippert & Butler 1976.

Order Arthropoda

Suborder Arthropoda

Hypogastruridae (now in Poduromorpha)

Neanuridae  
Odontellidae (now in Poduromorpha)  
Onychiuridae)

Order Entomobryomorpha

Superfamily Entomobryoidea Womersley, 1934 sensu Szeptycki, 1979  
(=Entomobryomorpha)

Cyphoderidae

Entomobryidae (*Entomobrya*, *Cyphoderus*, *Hawinella*, *Isotomiella*, *Janetschekbryas*,  
*Oncopodura*, *Parasinella*, *Pseudosinella*, *Salina* (now in Paronellidae), *Seira*, *Sinella*,  
*Tomocerus* (also put in own family), *Tritomurus*, *Unostrigata*, *Willowsia*)

Subfamily Lepidocyrtinae: *Lepidocyrtus*

Subfamily Orchesellinae: *Heteromurus*

Superfamily Isotomoidea Szeptycki, 1979

Isotomidae (also put in Entomobryoidea) (smooth springtails)

Subfamily Isotominae

*Agrenia*, *Biacanthella*, *Cryptopygus*, *Desoria*, *Dicyrtoma* (also in own family),  
*Folsomia*, *Folsomides*, *Folsomina*, *Isotoma*, *Isotomurus*, *Metisotoma*

Subfamily Anurophorinae (*Appendisotoma*, *Ballistura*, *Folsomia*, *Proisotoma*)

Order Metaxypleona

Poduridae (undet. genus in LA brackish beach sediment)

Order Neelipleona

Neelidae (*Neelus*)

Order Poduromorpha

Brachystomellidae (also put in Order Arthropleona) (*Brachystomella*) (also put in  
Hypogastruridae)

Odontellidae (also put in Order Arthropleona) (*Odontella*)

Hypogastruridae (also put in Order Arthropleona)

(*Acherontiella*, *Anurida*, *Brachystomella* (put in own family), *Friesea*, *Hypogastrura*,  
*Microgastrura*, *Morulina*, *Neanura*, *Odontella* (put in own family), *Paranura*,  
*Pseudachorutes*, *Schaefferia*, *Sensillanura*, *Tricanthella*, *Willemia*, *Xenylla*, *Xenyllodes*)

Subfamily Frieseinae (*Friesia*)

Subfamily Hypogastrurinae (*Acherontiella*, *Hypogastrura*, *Mesachorutes*, *Schaefferia*,  
*Tricanthella*, *Willemia*, *Xynella*, *Xenyllodes*)

Subfamily Morulininae (*Morulina*)

Subfamily Neanurinae (*Sensillanura*)

Tribe Neanurini (*Neanura*)

Subfamily Pseudachorutinae (*Anurida*)

Onychiuridae (blind springtails) (also put in Order Arthropleona)

Subfamily Onychiurinae (*Kalaphorura*, *Onychiurus*)

Subfamily Tetrodontophorinae (*Lophognathella*)

Subfamily Tullberginae (*Mesophorura*, *Tullbergia*)

Subfamily Paronellidae (*Salina* (once put in Entomobryidae))

Order Symphyleona

Dicyrtomidae (*Dicyrtoma*) (also put in Isotomidae, Subfamily Isotominae)

Sminthuridae (globular springtails) (*Arrhopalites*, *Dicyrtoma*, *Ptenothrix*, *Sminthurides*, *Sminthurinus*, *Sminthurus*) **Bibl.:** W. Richards, 1968

Subfamily Dicyrtominae (*Dicyrtoma*, *Ptenothrix*)

Subfamily Katianninae (*Arrhopalites*, *Sminthurinus*)

Subfamily Sminthuridinae (*Sminthurides*)

Subfamily Sminthurinae (*Neosminthurus*, *Sminthurus*)

Families incl.

Arrhopalitidae (now subsumed in Sminthuridae)

**Brachystomellidae** (*Brachystomella*) (also put in Hypogastruridae)

**Dicyrtomidae** Börner, 1906 (*Dicyrtoma*)

**Entomobryidae** Schott, 1891 (smooth springtails)

Subfamily Entomobryinae (*Entomobrya*, *Cyphoderus*, *Hawinella*, *Isotomiella*, *Janetschekbryas*, *Oncopodura*, *Parasinella*, *Pseudosinella*, *Salina* (now in Paronellidae), *Seira*, *Sinella*, *Tomocerus* (also put in own family), *Tritomurus*, *Unostrigata*, *Willowsia*)

Subfamily Lepidocyrtinae (*Lepidocyrtus*)

Subfamily Orchesellinae (*Heteromurus*) **Bibl.:** Christiansen 1961

**Hypogastruridae** (elongate-bodied springtails) (*Acherontiella*, *Anurida*, *Brachystomella* (also put in own family), *Friesea*, *Hypogastrura*, *Microgastrura*, *Morulina*, *Neanura*, *Odontella* (also put in own family), *Paranura*, *Pseudachorutes*, *Schaefferia*, *Sensillanura*, *Tricanthella*, *Willemia*, *Xenylla*, *Xenyllodes*) **Bibl.:** Thibaud 1967, 1970

Subfamily Frieseinae (*Friesea*)



Subfamily Hypogastrurinae (*Acherontiella*, *Hypogastrura*, *Mesachorutes*, *Schaefferia*, *Tricanthella*, *Willemia*, *Xynella*, *Xenyllodes*)

Subfamily Morulinae (*Morulina*)

Subfamily Neanurinae (*Sensillanura*)  
Tribe Neanurini (*Neanura*)

Subfamily Pseudachorutinae (*Anurida*)

**Isotomidae** (smooth springtails) Schaffer, 1896

Subfamily Isotominae S., 1896 (*Agrenia*, *Biacanthella*, *Cryptopygus*, *Desoria*, *Dicyrtoma* (also in own family), *Folsomia*, *Folsomides*, *Folsomina*, *Isotoma*, *Isotomurus*, *Metisotoma*, *Anurophorinae*: *Appendisotoma*, *Ballistura*, *Folsomia*, *Proisotoma*)

Neanuridae (=Subfamily Neanurinae in Hypogastruridae) Massoud 1967

**Neelidae** Folsom, 1896 (*Neelus*)

**Odontellidae** (*Odontella*) (also put in Hypogastruridae)

Oncopoduridae Bonet (1943) (=Oncopodurinae in Entomobryidae) Bibl.: Deharveng 1988

**Onychiuridae** Börner, 1901 (blind springtails)

Subfamily Onychiurinae (*Kalaphorura*, *Onychiurus*)

Subfamily Tetrodontophorinae (*Lophognathella*)

Subfamily Tullberginae (*Mesophorura*, *Tullbergia*)

Subfamily Paronellidae (*Salina* (once put in Entomobryidae))

**Poduridae** (water springtails) (undet. genus in LA brackish beach sediment)

**Sminthuridae** Lubbock, 1862 (globular springtails) **Bibl.:** Richards, 1968

Subfamily Dicyrtominae (*Dicyrtoma*, *Ptenothrix*)

Subfamily Katianninae (*Arrhopalites*, *Sminthurinus*)

Subfamily Sminthuridinae (*Smithurides*)

Subfamily Sminthurinae (*Neosminthurus*, *Sminthurus*)

Tomoceridae Schaffer, 1896 (tomocerids) = Subfamily Tomocerinae in Entomobryidae

Tullbergiidae Bagnall, 1935 (*Mesaphorura*, *Tullbergia* (both put in Onychiuridae)).

*Acherontiella* Absolon, 1913 - Hypogastruridae springtails, subfamily Hypogastrurinae

*Acherontiella (A.) sabina* Bonet, 1945 (kangaroo rat nests in nNM/ Tp in cave in Sutton Co., TX)

*Agrenia* Boerner, 1906 - Isotomidae springtail, Subfamily Isotominae

*Agrenia bidenticulata* (*Isotoma b.* Tullberg, 1876) Folsom, 1937 (Ep in AK, Alberta, CT, ID, IN, MT, NY, WA, WY/ CO hyporheic)

*Anurida* Laboulbene, 1865 - Hypogastruridae springtails, Subfamily Pseudachorutinae

*Anurida granaria* (*Anoura g.* Nicolet, 1842) ( epigean rare, widespread N.A.) (caves in Edmonson Co., KY (Mammoth C.) & cave in Jackson Co. IA, hyporheic in CO/ HTx ( local))

*Aphoromma* = *Anurida*

*Appendisotoma* = *Proisotoma* subgenus

*Arrhopalites* Boerner, 1906 - Sminthuridae springtails, Subfamily Katianninae

**Bibl.:** Christiansen 1966; C. & Bellinger, 1996

*Arrhopalites altus* Christiansen, 1966 ((\*type locality cave Mammoth C, Edmonson Co. & cave in Hart Co. KY / Tb/Tm/G3)

*Arrhopalites ater* Christiansen & Bellinger, 1998 (type locality & 2 other caves in Harrison Co. & 2 caves in WA Co., IN/ Tb/ G3)

*Arrhopalites benitus* Mills, 1934 (*Smynthrus b.* Folsom, 1896; A. ( Epigean widespread in N.A.) (type locality cave in Jackson Co., IA & caves in IN (Harrison, Orange, Washington Cos.), MD (Alleghany Co.) , VA (Bath, Augusta, Alleghany Co.), WV (Hampshire Co.)/ Tp)

*Arrhopalites bimus* Christiansen, 1966 type locality cave in Lawrence Co., + cave in Orange Co., IN, caves in Dubuque, Delaware & Winneshiek Cos. IA.; Barren Co, KY & Barry Co., MO/ Tp/ Epigean IL; MA; NH; NJ; PA; OR/ G3G4)

*Arrhopalites* cf. *bellingeri* Christiansen, 1966 (Tp or Tx in BC (cf. *A.b.*)

*Arrhopalites binoculatus* Denis, 1933 - No valid North American records

*Arrhopalites caecus* Tullberg, 1871 (widespread epigeic/ caves in Jackson Co., IA ; Mystery Cave, Fillmore Co.MN, Freemont Co., CO ; Harvey Co.,OR; Eddy Co., NM ; Giles Co., VA; Black Hill's caves, Custer Co., SD; cave in WI/ Tp)

*Arrhopalites caedus* Christiansen & Bellinger, 1996 (\*\*type locality cave in Botetourt Co. & cave in Bath Co., VA /Tb/ G1G2)

*Arrhopalites carolynae* Christiansen & Bellinger, 1996 (type locality cave in Wise Co. & caves in Augusta, Botetcourt, Lee, Highland & Bath Cos., VA/ Tb)

*Arrhopalites clarus* Christiansen, 1966 (type locality cave in Barry Co. MO +5 other MO counties), Jackson & Clayton Co. IA; Boone, Marion Cos., AR; Pike Co., IL; Allen & Woodford

Cos., KY; Garrett Co., MD; Kendall Co., TX; Lee, Scott & Wise Cos., VA; Crawford, Pierce, Richland & Sauk Cos., WI; Klickitat Co., WA; Greenbrier & Hampshire Cos., WV/ Tp/ Epigeic Benton Co. OR; BC/ G2G4)

*Arrhopalites commorus* Christiansen & Bellinger, 1996 (type locality cave in Giles Co.) & caves in Scott, Wise & Lee Cos., VA/ Tb/ G1G2)

*Arrhopalites diversus* Mills, 1934 (AZ, CA, CT, IA, IL, OR/ Tx or Ac in 1 seAK cave)

*Arrhopalites dubius* Christiansen, 1966 ( Epigeic MI) (type locality cave in Jackson Co. & caves in Dubuque Co., IA + MI?, MN?/ Tb or Tp/ G3G4)

*Arrhopalites ferrugineus* ( Packard, 1888) (see *A. pygmaeus*)

*Arrhopalites hirtus* Christiansen, 1966 (type locality cave in Jackson Co ,IA/ **Tp** in Vancouver Isl. BC; 4 islands in seAK; Clayton & Jackson Cos. IA; Pike Co. IL; Allen Co. KY; Garrett Co. MD; sOH; Kendall & Burnet Co. TX; Lee Co. VA; Klickitat Co. WA; Crawford, Pierce, Richland & Sauk Co. WI; cave in NS/ Epigeic in AK, OR, CA, PQ)

*Arrhopalites jay* Christiansen & Bellinger, 1996 (\*\*?type locality cave in Delaware Co. & cave in Cherokee Co.,OK/ Tb/ G3)

*Arrhopalites lacuna* Christiansen & Bellinger, 1996 (\*type locality cave in Alleghany Co. VA/ Tb/ G1G2)

*Arrhopalites lewisi* Christiansen & Bellinger, 1988 (type locality in Wyandotte C., Crawford Co., + caves in WA & Harrison Cos., IN/ Lewis▲ cave springtail/ Tb)

*Arrhopalites mammothia* (*Smynthurus .m.* Banks, 1897) = *A. pygmaeus*

*Arrhopalites marshalli* Christiansen & Bellinger, 1996 (type locality & at least one other cave in Scott Co. + Highland, Washington & Russell Cos.,VA/ Tb/ G3)

*Arrhopalites pavo* Christiansen & Bellinger, 1996 (type locality & 1 other cave in Rockbridge Co. & cave in Scott Co., VA / Tb / Tm/ G1G2)

*Arrhopalites pygmaeus* (Wankel, 1860) (*A. ferrugineus* Packard , 1888; *Smynthurus f.* Packard, 1886) ( Epigeic rare, widespread N.A. Europe) (Widespread in caves of Continental U.S.(AL, AR, CT, Europe, GA (Bartow Co.), IL, IA, IN (Crawford, Harrison, Orange, WA Cos.(S3/G4)),KY (Mammoth C.), LA, MD, MO, NM, NS, OK, PA, TN, TX, VA, WV)/ Tp or Tb)

*Arrhopalites sacer* Christiansen & Bellinger, 1998 (\*\*?type locality & 1 other cave in Bath Co. & cave in Pulaski Co. VA/ Tb/ G1G2)

*Arrhopalites silvus* Christiansen & Bellinger, 1998 (\*\*?type locality & 1 other cave in Highland Co. + cave in Bath Co. VA/ Tb/ G1G2)

*Arrhopalites* undet. (s)sp. (GA/Tp, WV/Tp?; MO/Tp; MO/Ac; Carter, Pulaski & Rockcastle Cos. in KY), Bexar, Hays, Travis Cos., TX; 2 caves in seAK)

*Arrhopalites* poss. undescr. sp.#1 (\*cave in Greenbrier Co., WV/Tp?)

*Arrhopalites* undescr. sp.#2 (\*?cave in Mercer Co., WV/Tp?)

*Arrhopalites* undescr. sp.#3 (\*Mt. St. Helens cave/Tb)

*Arrhopalites* undescr. sp.#4 (\*OR C., OR/Tb)

*Arrhopalites* undescr. sp.#5 (\*cave in Garrett Co., MD/Tb/ sp. #1 in MD T&E SU G?)

*Arrhopalites* undescr. sp. #6 (Harrison & WA Cos., IN (S2/G2/ Tb or Tp)

*Arrhopalites* undescr. sp. #7 (cave in Prince of Wales Island, AK)

*Arrhopalites* poss. undescr. sp.#8? (near *A. pygmaeus*) (cave in NS)

*Arrhopalites texensis* Christiansen & Bellinger, 1996 (type locality cave in Williamson Co. & caves in Bandera; Bexar; Hays; Kendall & Travis Cos., TX/ Tb, Tm/ G3)

*Arrhopalites whitesidei* Jacot, 1938 (epigeic rare but widespread N.A.) (Tp in AL; IL; IN; IA; MD; MO; NM; NY; WI; VA; WV)

*Arrhopalites* undescr. sp. (Tp or Tb in Corydon area caves, Harrison Co., IN)

*Ballistura* Borner, 1906 = *Proisotoma* subgenus

*Biacanthella* Scott, 1961 = *Hypogastrura*

*Brachystomella* Agren, 1903 - Hypogastruridae or Brachystomellidae springtails

*Brachystomella parvula* (Schaeffer, 1896) (epigeic uncommon but widespread in continental U.S./ Tx in Wagons Trail Sink, Burnet Co. TX)

*Ceratophysella* Boerner, 1932 = *Hypogastrura* subgenus

*Coecobrya* Yosii, 1956 = *Sinella* subgenus.

*Cryptopygus* Willem, 1901 - Isotomidae springtails, Subfamily Isotominae

*Cryptopygus* undet. sp. (TTx or Ac in TX)

*Cryptopygus thermophilus* (*Isotoma t.* Axelson, 1900; *C. constrictus* Folsom, 1937) (Epigeic Widespread N.A. & HI), (Tx in cave in Travis Co.; alien? Tx? in HI)

*Cyphoderus* Nicolet, 1842 - Entomobryidae springtails, subfamily Entomobryinae

*Cyphoderus similis* Folsom, 1927 (= *C. assimilis* Borner, 1906) (Epigeic CA; HI; LA; MA; NJ; Tx in HI; Tx or Ac in TX)

*Cyphoderus* undet. sp. (Tx or Ac in Organ C., WV)

*Degeeria* - See *Sinella* & *Entomobrya*.

*Desoria* = *Isotoma* subgenus

*Dicyrtoma* - No valid Nearctic cave records

*Entomobryoides* Maynard, 1951 = *Entomobrya* subgenus

***Entomobrya*** Rondani, 1861 (= *Degeeria* Nicolet, 1842, nec Meigen, 1838) - Entomobryidae springtails. **Bibl.:** Christiansen 1951

***Entomobrya*** (*E.*) *arnaudi* Wray, 1953 (Epigeic rare, western U.S.) (at least 5 caves in Tuolumne Co. CA/ HTx (local))

***Entomobrya*** (*Entomobrya*) *assuta* Folsom, 1924 (epigeic, uncommon but Widespread N.A.) (Tx in Linn Co., IA )

***Entomobrya*** (*Entomobrya*) *atrocincta* Schoett, 1896 (epigeic widespread N.A. especially in SW) (cave each in Travis & Val Verde Cos.; 2 caves in Williamson Co. TX/ HTx ( local))

***Entomobrya*** (*Drepanura*) *californica* (*D. c.* Schoett, 1891; *D. rolfsi* Milles, 1935, *D. neomexicana* Scott, 1963), (Ep in CA, WA, NM/ Tp in CA(Calaveras Co.), seNM, TX, WA)

*Entomobrya cavernarum* - See *Sinella*  
*Entomobrya cavicola* = *Folsomia candida*

***Entomobrya*** (*Entomobrya*) *confusa* Christiansen, 1958 (epigeic widespread western 2/3 N.A.) (cave in Jackson Co. IA & Shasta Co. CA/ Tx)

***Entomobrya*** (*Entomobrya*) *decemfasciata* (Packard, 1873) (epigeic uncommon widespread N.A.) (cave each in Uvalde, Williamson, Travis Cos., TX/ Tx)

***Entomobrya*** (*Entomobrya*) *griseoolivata* (Packard, 1873) (epigeic Widespread N.A. & HI (alien)) (Tx in cave in Jackson Co. IA & Haleakala Nat. Pk. Maui, HI)

***Entomobrya*** (*Entomobryoides*) *guthriei* Mills, 1931 (epigeic common Western continental U.S. S.W. Canada; HI in Kauai, Oahu, Molokai; Amador, Calaveras, El Dorado, Shasta & Tuolumne Cos., CA; cave in Santa Cruz Co. AZ; Simon Says Sink, Burnet Co., TX; Wind C., Custer Co., SD; Kazumura C. , Hawaii HI/ Tp)

***Entomobrya*** (*Homidia*) *haikea* Christiansen & Bellinger, 1992 (epigeic widespread HI) (cave in Hawaii HI / Tx)

***Entomobrya*** (*Entomobrya*) *intermedia* Brook, 1883 (Ep in CA, MA, MN, ON, OR, WA/ Tx or Ac in 1 IL cave)

***Entomobrya*** (*Homidia*) *laha* Christiansen & Bellinger, 1992 (epigeic widespread HI) (2 caves in Hawaii HI/ Tx)

***Entomobrya*** (*Entomobrya*) *multifasciata* (Tullberg, 1871) ( widespread N.A., world) (Tx in cave in Boone Co. MO, Travis & Williamson Cos., TX; Tx alien in 2 caves in Big Island, HI)

*Entomobrya (D.) neomexicana* Scott, 1963 (epigeic widespread Western U.S., particularly SW.) (2 caves in Coconino Co. & 1 cave in Santa Cruz Co., AZ; Eddy Co. (10 records), cave in Lincoln Co. & cave in Sandoval Co., NM; cave each in Travis & Hudspeth Cos., TX / Tx)

*Entomobrya (Entomobrya) nivalis* Linnaeus, 1758 (epigeic Holarctic/ cave in Hants Co. NS; 2 caves in Travis Co., TX; cave in Pocahontas Co., WV/ Tx)

*Entomobrya (Entomobrya) nyhusae* Christiansen & Bellinger, 1992 ( Epigeic Hawaii HI) (Tx in cave in Hawaii HI) Tx)

*Entomobrya (Entomobryoides) purpurascens* (= *Deegeria p.* Packard, 1873) (epigeic widespread N.A. mostly in East, Europe) (Carlsbad Caverns Eddy Co.; WA Co., IN (S4/G4); 2 caves in Sandoval Co., 1 cave in Pulaski Co., MO; cave each in Kiowa & Greer Cos., OK; cave in Bell Co., KY; 2 caves in WA Co., VA/ Tp? )

*Entomobrya (Homidia) sauteri* Boerner, 1909 (epigeic KY, LA [recently introduced]; Tx alien in cave in Hawaii, HI (rare))

*Entomobrya (Homidia) socia* Denis, 1939 (epigeic in GA; LA; IA; IN; SC [recently introduced], widespread in HI) (Tx in cave in Johnson Co., IL; cave each in Crawford & Harrison Cos., IN (S2/G2) & cave in Hawaii HI)

*Entomobrya* undet. sp(p). (CO hyporheic; TTp in NW & Shasta Co., CA (or *Entomobrya unostriata* Stach, 1930); Tp? in cave & Carlsbad C., Eddy Co., NM; Tx? in TX; Tx or Tp in Morrison C., MT))

*Entomobrya (Entomobrya) suzannae* Scott, 1942 ( Epigeic Western U.S.) ( cave in Cochise Co. AZ, & cave each in Calaveras, Mariposa, Tuolumne, El Dorado Cos., CA/ HTx ( local) )

*Entomobrya (Entomobrya) troglodytes* Christiansen, 1958 (type locality cave in Meade Co. & Jewel & Wind C. (Custer Co.), SD + cave in Freemont Co., CO/ Tb/ G3)

*Entomobrya (Entomobrya) troglophila* Christiansen & Bellinger, 1998 (type locality & 1 other cave in Williamson Co. & cave each in Bell & Kinney Cos., TX/ G1/ Tp?)

*Entomobrya (Entomobrya) unostriata* Stach, 1930 (Epigeic worldwide tramp species [ recently introduced into N.A.]) ( cave in Cochise Co., AZ; Carlsbad Caverns, Eddy Co., NM; Shasta Co., CA/ Tx).

*Folsomia* Willem, 1902 - Isotomidae springtails, Subfamily Isotominae. **Bibl.:** Grow & Christiansen 1977

*Folsomia candida* Willem, 1902 (*Entomobrya c.* Banks, 1897; *Folsomia cavicola* (Banks)) (epigeic, widespread primarily in human structures) (Found in some caves in all states and provinces with caves, incl. AK, AR, GA (Walker Co.), HI (alien in Kauai, Oahu, Lanai, Maui, HI), IN(4cos.(S2/G3)), KY (Mammoth), MO, NM, NS, OH, PQ, TX, WV/ harmed by paraquat & Atrazine/ Tp)

*Folsomia candida* **Bibl.:** Butcher, Kirknel, & Zabik 1969; Chiba, Cutkomp & Halberg 1973; Dwidjasatmoko 1978; Green 1964, 1964a; Grimnes 1982; Marshall & Kevan 1962; Zhang 1992

*Folsomia elongata* (*Isotoma e.* MacGillivray, 1896) (Epigeic widespread N.A./ Tx in cave each in Williamson Co., TX; Orange Co., IN & IL)

*Folsomia ozeana* Yosii, 1954 (OR,VA,WA?/ Tx or Ac in 1 AK c.)

*Folsomia fimetaria* (*Podura f.* Linnaeus, 1758) (Epigeic MA; NY; SC; widespread Canada/ Tx or Tp in cave each in Orange Co., IN; Bell Co., TX, Barren Co., KY; Hants Co., NS, Claiborne Co.,TN + cave or caves in sON)

*Folsomia nivalis* (*Isotoma n.* Packard, 1873; ( Epigeic widespread N.A.) (Tx or Tp? in Jackson Co., IA; Hardin Co., IL; Perry & Stone Co., MO; Hants Co., NS; Bell & Travis Co., TX; Pierce Co., WI; Tx or Ac in HI; Tp? in AR)

*Folsomia penicula* Bagnall, 1939 ( Epigeic in CT; ME; NH; NY; ONT; QUE; SC) (Tx? in 2 caves inMadison Co., AL)

*Folsomia prima* Mills, 1931 (Epigeic widespread in continental US) (Tx in cave in Clayton Co., IA; Hardin Co. IL, Orange & WA Cos., IN & Travis Co., TX)

*Folsomia setula* Christiansen & Tucker, 1977 (Epigeic in KY; Tx in cave in Hardin Co., IL)

*Folsomia stella* Christiansen & Tucker, 1977 (widespread epigeic in NA & HI) (type in cave in Clayton Co., IA/ Tp in HI; KY (Mammoth C., Edmonson, Jefferson, Knox Cos.); IA (Jackson & Winnesheik Cos.); IL; IN (Crawford, Harrison, Orange, WA Cos.(S4/G4)); MN; OH; OK; NS (Seminole Co.); VA; WI (Pierce Co.)/ translucent white, with no apparent eyes, a furcula that extends well beyond abdominal segments, a slightly swollen posterior abdominal area, and antennae about the same length as the head.)

*Folsomides* Stach, 1922 - Isotomidae springtails, Subfamily Isotominae

*Folsomides decemoculatus* Mills, 1935 (= *F. millsii* Paclt, 1945) (epigeic in CA,UT/ Ac in cave in Bell Co., TX)

*Folsomides parvus* Folsom, 1934 = *F. parvulus*

*Folsomides parvulus* Stach, 1922 (= *F. americanus* Denis, 1931) ( Epigeic widespread NA & Holarctic) (local Htx in Bell, Bexar, Burnet, Coryell, Travis Cos., TX; cave in WA Co., IN)

*Folsomina* Denis, 1931 - Isotomidae springtails, Subfamily Isotominae

*Folsomina onychiurina* Denis, 1931 (global epigeic & in Hawaii, Kauai & Oahu, HI/ Tp? In Hawaii, HI)

*Friesea* Dalla Torre, 1895 - Hypogastruridae springtails, subfamily Frieseinae

*Friesea claviseta* Axelson, 1900 (widespread epigeic in NA & Europe/ Tx in cave in Jackson & Linn Cos., IA + ON)

*Friesia sublimis* Macnamara, 1921 (epigean NY to PQ, w. to IN,IL/Tx? alien in HA)

*Hawinella* Christiansen & Bellinger, 1974 - Entomobryidae springtails, subfamily Entomobryinae

*Hawinella kuaola* Christiansen & Bellinger, 1992 (epigeic, Tp? in Oahu,HI)

*Hawinella lava* Christiansen & Bellinger, 1974 (\*\*\*?type locality cave in Oahu & at least 2 caves in Big Island, HI / Tb/ G3)

*Heteromurus* Wankel, 1860 Entomobryidae springtails, subfamily Orchesellinae

*Heteromurus nitidus* (*Podura n.* Templeton, 1835; *Pseudosinella marmaratus* Packard, 1873) Wankel, 1860 (epigeic in Europe, ON; ME; UT; LA) (alien? Tp in Dubuque Co., IA; Jefferson & Columbia Co., NY; Hants Co., NS; NB; PQ)

*Hypogastrura* Bourlet, 1839 Hypogastruridae springtails, subfamily Hypogastrurinae (112 species in US or Canada). **Bibl.:** Yosii 1960

*Hypogastrura* (*H.*) *antra* Christiansen & Bellinger, 1980 (type locality cave in Jackson Co., KY +Tx in Woodford Co., KY; Newton Co., AR; Shannon Co., MO; Madison Co., NC/ Epigeic PQ, AR)

*Hypogastrura* (*Ceratophysella*) *brevis* Christiansen & Bellinger, 1980 (Epigean rare, CA,WY,UT) (Tx in cave each in Edmonson Co., KY & Bell Co.,TX)

*Hypogastrura* (*Ceratophysella*) *boletivora* Packard, 1873 (Epigean widespread in NA/ Tx in Laclede & Boone Cos, MO)

*Hypogastrura* (*Ceratophysella*) *denticulata* ( complex?) (*Achorutes d.* Bagnall, 1941) (HTx in AL; CA; GA; IL; IN (Crawford, Harrison, WA Cos.); KY (Mammoth C.); MO; OH; VA; YN; TX; VA)

*Hypogastrura* (*H.*) *essa* Christiansen & Bellinger, 1980 (epigeic in AK; AZ; IA; MA; NE) (Tx in Morgan Co., AL; Davies Co., IL; Overton Co., TN; Williamson Co., TX / Tx)

*Hypogastrura* (*Ceratophysella*) *gibbosa* (*Achorutes g.* Bagnall, 1940; *H. azteca* Yosii, 1962) Lawrence, 1962) (epigean in CA, IA, PA/ Tx in IN)

*Hypogastrura* (*Ceratophysella*) *glancei* Hammer, 1953 (Epigeic in NWT/ Tx or Ac in 1 AK cave)

*Hypogastrura* (*H.*) *helena* Christiansen & Bellinger, 1980 (epigeic in CA, AK/ Tx in Harrison Co., IN; Scott Co. VA)

*Hypogastrura* (*Mitchellania*) *horrida* Yosii, 1960 (epigeic in BC,CA,OR/ Tx or Tp in WA Co.,IN)



*Hypogastrura (C.) lucifuga (Achorutes l. Packard, 1888; Lipura lucifugus) (\*\*\*?Wyandotte (Crawford Co.) & cave each in Harrison & Lawrence Cos., IN/ Tb/ S1G2)*

*Hypogastrura (H.) lima* Christiansen & Bellinger, 1980 (epigeic in NY; PA; MD) (Tx in cave in Jennings Co. IN)

*Hypogastrura (Ceratophysella) maheuxi* Butler, 1966 (widespread epigeic in NA) (Tx in cave in Crawford Co., IN),

*Hypogastrura (H.) manubrialis (Achorutes m. Tullberg, 1869) ( Epigeic widespread epigeic in NA/ Tx in cave in Travis Co., TX)*

*Hypogastrura (H.) matura (Achorutes m. Folsom, 1916; A. schoetti of Guthrie, 1903, not of Reuter) (widespread epigeic in NA/ HTx (local) in Perry Co., MO ( 5 records); Hardin Co., IL; Preston Co., WV; IL)*

*Hypogastrura (H.) packardi* (Folsom, 1902) (epigeic e. of Mississippi) (Tx in cave each in Hardin Co., IL; Harrison Co.,IN (S4/G4))

*Hypogastrura (H.) pannosa* (Macnamara, 1922) (widespread epigeic in NA/ Tx in cave in Woodford Co., KY),

*Hypogastrura (Ceratophysella) pecki* Christiansen & Bellinger, 1980 (epigeic in AK, AB/ Tp? in 2 caves in Albany Co. & 1 in Sullivan Co., NY; cave in Bennington Co.,VT)

*Hypogastrura (H.) promatro* Wray, 1950 (epigeic in ID & UT) (Tx in cave in Coryell Co., TX),

*Hypogastrura (Ceratophysella) pseudarmata* (Folsom, 1916) (Tx in New Brunswick)

*Hypogastrura (Ceratophysella) undescr. sp.* (Tp in cTX)

*Hypogastrura* undet. sp(p). (TTp in WA; Ac in MO; Tx or Ac in CA; Tp or Tx in TX)

*Hypogastrura (H.) tullbergi* (Schaeffer, 1900) (epigeic in AK; BC; CA; MB; NT; ON) (Tx in cave each in Morgan Co., AL; Jennings Co., IN)

*Hypogastrura sparta* Christiansen & Bellinger, 1980 (Pb? in SC)

*Hypogastrura (Ceratophysella) succinea* Gisin, 1949 (rare epigeic widespread in NA, Europe/ Tx in Harrison Co., IN (S1/G4); Barren (Mammoth C.) ;& Edmonson Cos., KY; WA Co., MD; Culberson Co.,TX)

*Hypogastrura (Ceratophysella) undet. sp.* (Tx or Tp in Vancouver Island, BC)

*Hypogastrura* undescr. sp.#1-2? (Tp? in IL & 2 caves inPerry Co.,MO)

*Hypogastrura (Michellania) undescr. sp.#1-2?* (Tx or Tp in Vancouver Island, BC)

*Hypogastrura (H.) ripperi* Gisin, 1952 (epigeic in MN/ Tx in Dubuque Co.,IA)

***Hypogastrura* (*Schoetella*) *ununguiculatus* (*Achorutes* u. Tullberg, 1869)** (epigeic in CT, IL, MA, ME, NH, PA, WV/ Tp? in IL)

*Isotobryoides* Maynard, 1951 = *Entomobrya*

***Isotoma* Bourlet, 1839** - Isotomidae springtails, Subfamily Isotominae

***Isotoma* (*I.*) *anglicana*** (Lubbock 1862) (WA Co., IN (S1/G3))

***Isotoma* (*Desoria*) *brucealla*** Wray, 1953 (UT(gopher burrow) & cave in Skamania Co. WA / Tp?)

***Isotoma* (*Desoria*) *caeruleatra*** Guthrie, 1903 (Ep in IA?, MN, PA?/ Tx? in cave in WA Co., IN (S1); Tx or Ac in NS)

***Isotoma* (*I.*) *carpenteri*** Borner, 1909 (*P. difficilis* Folsom, 1937) (widespread epigeic in Japan, NA (PQ to NC, IN)/ Tx in cave in Travis Co., TX; Tx or Ac in 1 IL cave)

***Isotoma* (*Desoria*) *christianseni*** Fjellberg, 1978 (Ep in IL/ Tp in 2 caves ub Harrison Co., IN (S1/G1))

***Isotoma* (*Desoria*) *gelida*** Folsom, 1937 (epigeic in KY & WV/ Tx in cave in Hardin Co., IL)

***Isotoma* (*Desoria*) *nixonii*** Fjellberg, 1978 (type locality cave in Marshall Co., AL/ Tp in cave in WA Co., IN & Carter Co., KY)

***Isotoma* (*Desoria*) *notabilis*** Schaffer, 1896 (= *I. Eunotabilis* Folsom, 1934) (Epigeic widespread epigeic/ HTx in AR; IA; IL; IN (Crawford, Harrison, Orange Cos. (S4/G4)); KY; MN; MO; NS; OH; PA; TN, TX; WI; VA; WV)

***Isotoma* (*Desoria*) *nigrifrons*** Folsom, 1934 (widespread epigeic in NA/ Tx in cave in Glacier Nat. Pk., MT; WA Co., IN)

***Isotoma* undet. sp(s).** (Tx? In 6 AK cave)

***Isotoma* undescr. or European sp.** (Tp? In cave in NS)

***Isotoma* (*Desoria*) undescr. sp. or species** (Tb in cave in WA Co., IN (S4/G4); Tx, Tp or Tb in Vancouver Island, BC; Tp or Tb in caves in Blue River basin, Harrison Co., IN)

***Isotoma* (*Desoria*) *torildae*** Fjellberg, 1978 (epigeic in IL/ Tx or Tp in cave in Washington Co., IN)

***Isotoma* (*Desoria*) *trispinata*** MacGillivray, 1896 (widespread epigeic in NA, HI (alien)) (HTx in AR (Newton Co.); HI; IA (Dubuque Co.); IL; IN (Harrison Co. (S4/G4)); MN; MO (Jefferson Co.); OH; TX)

*Isotoma (Desoria) truncata* Waltz & Hart, 1995 (epigean in Wayne Co. IN) (Tx in cave in Crawford Co. IN/ Tx)

*Isotoma violacea* Tullberg, 1876 (no valid Nearctic records according to Christiansen & Bellinger, 1980 & 1998)

*Isotoma (I.) viridis* Bourlet, 1839 (epigeic worldwide ?), ALL RECORDS DOUBTFUL. (2 caves in IL; 1 cave in Jefferson Co., IN (S4/G4); Shannon Co. MO; Putnam Co. TN; Bell, Bexar, Coryell Travis & Williamson Co. TX; OK/ Htx)

*Isotomiella* Bagnall, 1939 - Isotomidae springtails, Subfamily Isotominae

*Isotomiella minor (Isotoma m.* Schaeffer, 1896) (widespread epigeic in NA, Europe, HI (Kauai, Oahu, Maui, HI)/ Tx in Pima Co. AZ; Jackson Co. IA; Perry Co. MO; Bell, Coryell & Williamson Co. TX; Maui HI; Coronation Island, AK)

*Isotomiella* undet. sp(s). (Tx? In 6 AK cave)

*Isotomodes* Linnaniemi, 1907 - Isotomidae springtails, Subfamily Isotominae

*Isotomodes denisi* Folsom, 1932 (cave near Honokaa, HI/epigean? In Oahu/ soil Tb?)

*Isotomodes* undescr.? sp. (Tb in WA)

*Isotomurus* Börner, 1903 [ ALL IDENTIFICATIONS SUSPECT] - Isotomidae springtails, Subfamily Isotominae

*Isotomurus bimus* Christiansen & Bellinger, 1980 (CA, MI, MO, OR, WA/CO hyporheic?)

*Isotomurus palustris* (Podura p. Muller, 1776) (Ep in CA, CT, MA/ marsh springtail/ OK hyporheic; Tx? in PQ)

*Isotomurus palustroides* Folsom, 1937 (Epigeic widespread? in NA/ Tx in cave in TX Co., MO)

*Isotomurus retardatus* Folsom, 1937 (Epigeic in SW & continental US?/ Tx in cave in Shannon Co., MO)

*Isotomurus* undet. sp. (Ttp in TX, WA)

*Isotomurus tricolor (Isotoma t.* Packard, 1873) (epigeic in FL; KS; LA; MA; NY; OH; ON; TX; VT; WV/ Tx in cave each in Bexar & Coryell Cos., TX)

*Janetschekbryas* Yosii, 1971 - Entomobryidae springtail, Subfamily Entomobryinae

*Janetschekbryas* undet. sp. (Ac in Organ C., WV)

*Lepidocyrtus* Bourlet, 1839 Entomobryidae springtails, subfamily Lepidocyrtinae  
Bibl.: Snider 1967a

*Lepidocyrtus atropurpureus* Packard, 1888 (Tx in Mammoth C., KY)

*Lepidocyrtus cinereus* Folsom, 1924 (Epigeic widespread epigeic in NA/ HTx (local) in Shasta Co., CA; Hardin Co., IL; Laclede & Texas Cos., MO; Bell, Bexar, Coryell & Travis Cos., TX)

*Lepidocyrtus curvicollis* (Bourlet, 1839) Gervais in Walckenaer, 1844 (epigeic in IL; NY; OH; Europe) (Tx in cave each in Pettis Co., MO; Wyandotte Co., IN; NC; Ottawa CO., OH)

*Lepidocyrtus dubius* Christiansen & Bellinger, 1998 (\*\*type locality cave in Bell Co. & cave in Coryell Co., TX/ G1/ Tp?)

*Lepidocyrtus finus* Christiansen & Bellinger, 1980 (epigeic in AL, LA, KS, AR, MS/ Ac in cave in Burnet Co., TX)

*Lepidocyrtus helenae* Snider, 1967 (epigeic in continental US, Kansas & e./ Tx in cave in Shannon Co., MO; Eddy Co., NM; Bell Co., TX)

*Lepidocyrtus hirtus* Christiansen & Bellinger, 1990 (Tx or Ac in El Capitan area caves, Prince Wales Island, seAK)

*Lepidocyrtus immaculatus* (Tullbergia i. Lie-Petersen, 1897) (global epigeic/ Tx? in HI )

*Lepidocyrtus paradoxus* Uzel, 1891 (epigeic in Europe, CT, DC, IN, MA, MD, ME, MI, UT, VA, WV/ Tx? in sON)

*Lepidocyrtus* cf. *ruber* Imms, 1912 (Holarctic epigeic/ Tx in HI anchialine pool & Koloana lowland dry cave)

*Lepidocyrtus* undet. sp. (Tp guanobic in Bartow Co., GA)

*Lepidocyrtus vita* = *Pseudosinalla vita*

*Lophognathella* Borner, 1908 - Onychiuridae springtails, subfamily Tetrodontophorinae

*Lophognathella choreutus* Borner, 1908 (epigeic in Japan, OR, CA/ Tx or Ac in 1 cave in Coronation Island, AK)

*Mesachorutes* Absolon, 1900 - Hypogastruridae springtail, subfamily Hypogastrurinae

*Mesachorutes thomomys* Chamberlain, 1943 (epigeic in MT/ Tp in cave in Meade Co. SD)

*Mesaphorura* = *Tullbergia*

*Metaphorura* = *Tullbergia* subgenus

*Metisotoma* Maynard, 1951 (= *Cephalotoma* Bagnall, 1949 nec Lesne, 1911) Isotomidae springtails, Subfamily Isotominae

*Metisotoma grandiceps* (*Isotoma* g. Reuter, 1891; *Isotoma macnamarai* Folsom, 1918; *Metisotoma capitona* Maynard, 1951; *M. spiniseta* Maynard, 1951) [ All identifications

questionable, probably a number of species] ( Epigeic Holarctic, Canada and northern U.S.)  
(Epigeic in AK, CT, ID, IA, IL, MA, MT, ON, PA., PQ, VT, WI, WV/ type locality cave in Clayton Co., IA/ Tx in AK glacial relict forest / Tx)

*Metisotoma* undet. sp(s). (Tx? In 1 WV cave)

*Microgastrura* Stach, 1922 - Hypogastruridae springtails

*Microgastrura minutissima* (*Achorutes m.* Mills, 1934) (Epigeic in CA, CT, IA, WV/ Tp or Tx in OR C., OR)

*Morulina* Borner, 1906 - Hypogastruridae springtails, subfamily Morulininae

*Morulina crassa* Christiansen & Bellinger, 1980 (epigeic in AR; FL; LA; NC/ Tx in cave in Menife Co., KY)

*Morulina* undesr. sp. (Ac, Tx or Tp in Vancouver Island, BC)

*Morulina* undet. sp. (TTx or Ac in NWT)

*Morulina multatuberculata* (*Neanura m.* Coleman, 1941) (epigeic in BC; CA / Tx in cave in Calaveras Co., CA)

*Neanura* MacGillivray, 1893 - Hypogastruridae springtails, subfamily Neanurinae, Tribe Protanurini

*Neanura* (*Protanura*) *aleo* Christiansen & Bellinger, 1992 (type locality & 1 other cave in Molokai HI/ Tp/ epigeic in Maui)

*Neanura barberi* = *Sensillanura* b.

*Neanura* (*Protanura*) *hawaiiensis* Christiansen & Bellinger, 1974 (\*\*\*\*type locality in Kazamura C., 3 other caves in Big Island, HI/ Tp/ G1G2)

*Neanura* (*N.*) *muscorum* (Templeton, 1835) (widespread epigeic in Holarctic/ Tx in Jackson & Johnson Cos., IL; Rockcastle Co., KY; Pulaski Co., MO; Albany Co., NY; Mifflin Co., PA; Bell Co., TX; Greenbrier Co., WV; sON; New Brunswick)

*Neanura* (*N.*) *persimilis* Mills, 1934( Epigeic BC; NS and widespread Continental U.S.) (Tx in cave each in Hardin Co. IL; Coryell Co. TX)

*Neanura* (*Neanura*) undet. sp. or species (Ac in TX; Tx or Tp in cave in Rockcastle Co., KY)

*Neelus* Folsom, 1896 - Neelidae springtails

*Neelus* (*Megalothorax*) *minimus* (Willem, 1900) (widespread epigeic/ Tp in Dubuque & Jackson Cos., IA; Hants Co., NS; Scott & Wythe Cos., VA; Pierce Co., WI).

*Neelus* (*Neelides*) *minutus* (Folsom, 1901) (widespread epigeic in NA/ type locality cave in Jackson Co., IA; cave in Williamson Co., 2 in Bell Co., TX/ Tp)

*Neelus* (*Neelus*) *murinus* Folsom, 1896 (widespread epigeic/ Tp in Newton Co. AR; Bell & Travis Co.(5 records), GA (Dade Co.), TX; Tx? in MI cave)

*Neosminthurus* Mills, 1934 - Sminthridae springtails, Subfamily Sminthuridinae

*Neosminthurus clavatus* (*Smynthurus c.* Banks, 1897) (widespread US epigeic/ Htx (local) in Bell, Coryell, Travis ( 3 records) & Williamson ( 2 records) Cos., TX)

*Neelus* undet. sp. (Tx or Ac in 2 AK cave),

*Neelus* undesc. sp. (\*?cave in Coronation Island, AK)

*Odontella* Schaeffer, 1897 - Hypogastruridae or Odontellidae springtails

*Odontella* (*Odontella*) undescr.? species (Tx in Bell, Bexar, Travis Cos., TX)

*Odontella* (*O.*) *stella* Christiansen & Bellinger, 1980 (type locality cave in Clayton Co.,IA/ Epigeic CA; IN; NC; PA/ Tx in cave in Johnson Co., IL)

*Oncopodura* Carl & Lebedinsky, 1905 - Oncopoduridae or Oncopodurinae springtails in Entomobryidae. **Bibl.:** Mills 1942; Szeptycki 1977; Mills 1934

*Oncopodura cruciata* Bonet, 1943 (\*Lewis & Clark (=Morrison C.) Jefferson Co. MT/ Tb)

*Oncopodura fenestra* Christiansen & Bellinger, 1996 (type locality & 2 other caves Travis Co. & 3 caves in Williamson Co., TX/ Tb/ G3)

*Oncopodura frankae* Christiansen & Bellinger,1998 (\*\*\*type locality & 1 other cave in Lincoln Co. & 1 cave inSierra Co., NM / Tb)

*Oncopodura hoffi* Christiansen & Bellinger, 1981 (\*\*type locality & 1 other cave in Perry Co., MO/ Tb/ G1G2)

*Oncopodura hubbardi* Christiansen & Bellinger, 1996 (type locality & 3 other caves in Lee Co. & 1 cave in Scott Co., VA / Tb/ G1)

*Oncopodura iowae* Christiansen, 1961 (CO epigeic/ Tp in type locality cave in Jackson Co. IA; caves in Monroe Co., IL (Renault karst area); Boone, Camden, Newton & Pulaski Cos., MO; Custer Co., SD/ G3G4)

*Oncopodura mala* Christiansen & Bellinger, 1996 ( Epigeic CA; OR/ type locality cave in Harney Co. OR; caves in Calaveras, Contra Costa & Tulare Cos.,CA/ G3G4)

*Oncopodura prietoi* Bonet, 1943 (epigeic far western US from AK to Mex./ Tp?/ G1G2?)

*Oncopodura subhoffi* Christiansen & Bellinger, 1998 (\*\*\*?type locality & 1 other cave in Fremont Co. & cave in Garfield Co., CO / Tb/ G1 or G3)

***Oncopodura tunica*** Christiansen & Bellinger, 1980 (type locality cave in Tuolumne Co. & 1 cave in Ventura Co., CA / Tb/ G1G2)

***Onychiurus*** Gervais, 1841 - Onychiuridae springtails, subfamily Onychiurinae

***Onychiurus (Protaphorura) armatus*** Folsom, 1924 (widespread Holarctic epigeic/ Tp? in Calaveras Co., CA; Lawrence Co., IN; Shannon Co., MO; Albany & Schoarie Co., NY; Hants Co., NS; Hawkins Co., TN; CO hyporheic) **Bibl.:** Ek 1993

***Onychiurus (Protaphorura) bimus*** Christiansen & Bellinger, 1980 (widespread continental epigeic in US east of Great Plains/ Tx in cave in Barry Co., MO)

***Onychiurus (Protaphorura) casus*** Christiansen & Bellinger, 1980 (type locality cave in Hardin Co., IL/ epigeic in PA/ Tp? In Hardin Co. ( 5 records), IL; Crawford, Harrison, Orange & Washington Cos., IN (S2/G4); Barren, Powell & Pulaski Cos., KY)

***Onychiurus (Protophorura) cocklei*** (*Aphorura c.* Folsom, 1908; *Aphorura lutea* & *A. montis* Bacon, 1913; *O. irregularis* Chamberlain, 1943) (epigeic in AK, BC, CA, ID, MT, NC, OR, VA, WA/ Tp in IA, KY, PA, VA; Tp or Tx in BC)

***Onychiurus (Protaphorura) decus*** Christiansen & Bellinger, 1980 (MT epigeic on melting snow/Tp in cave in Uinta Mts., Uintah Co., UT),

***Onychiurus (Protaphorura) encarpatus*** Denis, 1931 (widespread US epigeic, alien in HI (Kauai, Oahu, Molokai, Lanai, HI) (Tp in Hawaii, HI; Jackson Co. IA; Johnson Co., IL; Washington Co., IN; Crawford Co., MO; Bell Co., TX)

***Onychiurus (O.) eous*** Christiansen & Bellinger, 1980 (\*type locality cave in Clayton Co. IA; /Tb guanobic)

***Onychiurus (O.) flavescens*** Kinoshita, 1916 (epigeic in MT, CA, OR, UT, WA, WY, NWT/ Tx or Ac in BC & 1 cave in Dall Island, AK)

***Onychiurus (O.) folsomi*** Schaeffer, 1900 (widespread epigeic in NA, Japan; alien in Kauai, Maui, HI) (Tp in Hawaii (8 records), HI; Calaveras Co., CA; Bexar Co., TX; Scott Co., VA)

***Onychiurus (Archaphorura) gelus*** Christiansen & Bellinger, 1980 (type locality & 2 other caves in Winneshiek Co., IA; Richland Co., WI; Skamania Co. ( 3 caves), WA /Tb glacial relict/ G3G4)

***Onychiurus (O.) janus*** Christiansen & Bellinger, 1980 (type locality & one other cave? in Calhoun Co., AL; cave in Warren Co., VA & cave in Greenbrier; Co., WV/ Tb/ G3G4)

***Onychiurus (O.) millsii*** Salmon, 1959 (epigeic in OR/ Tx or Ac in cave in Prince of Wales Island, AK)

***Onychiurus (Protaphorura) obesus*** Mills, 1934 (*O. acuticornis*) (type locality cave in Clayton Co.+ caves in DE, Dubuque & Jackson Cos., IA; Perry Co.. MO; Filmore Co.. MN; Pierce & Sauk Cos., WI /Tb/ G3G4)

***Onychiurus (O.) opus*** Christiansen & Bellinger, 1981 (epigeic in CA/ type locality cave in Dubuque Co. IA/ Tp?)

***Onychiurus (O.) oregonensis*** Bonet, 1931 (type locality cave in Oregon Caves, Josephine Co., OR & cave in Trinity Co. CA / Tp/ epigeic in OR & MT / G3 or (less likely) G1G2)

***Onychiurus (O.) paro*** Christiansen & Bellinger, 1981 (type locality cave in Marshall Co., AL; & one cave in Scott Co. VA / Tb/ G1G2)

***Onychiurus (Protaphorura) parvicornis*** Mills, 1934 ( Epigeic widespread epigeic in continental US east of Great Plains/ Tx in unnamed cave in relict forest, Clayton Co., IA)

***Onychiurus (Cerastophysella) pseudarmatus*** (Folsom, 1917) (epigeic in BC, CA, CT, GA, WA/ Tx or Ac in 1 cave, Prince of Wales Island,AK; Tp or guanophile in NS)

***Onychiurus (O.) pseudofimetarius*** Folsom, 1917 (Epigeic widespread epigeic in continental US/ Tp? in IA; OH; WA Co., AR; Calaveras Co., CA (Tx?); Barry , Franklin, Phelps & St. Louis Cos., MO; Tx in CA)

***Onychiurus (O.) ramosus*** Folsom, 1917 (widespread epigeic in NA/ Tp in Prince of Wales & Dall Islands, AK; Christian, Franklin & Phelps Cos., MO; Flathead & Beaverhead Cos., MT; Duchesne Co., UT; Lee , Russel & Wise Cos., VA; Tp or Tx in Sauk Co.,WI)

***Onychiurus (O.) reluctus*** Christiansen, 1961 (epigeic in CA; MO; ND; SD/ [numbers of records beside each State] Tp in IA (7, Jackson, Fayette, Clayton & Dubuque Cos.); IL (3, Jackson, Pike & Union Cos.); IN (8, Crawford, Harrison, Orange Wa Cos. (S2 /G3)); KY(5, Breckenridge, Carter, Warren Cos.); MO (33, Barry, Camden, Cedar, Jefferson Cos.); MN (1); OH(4); PA (2, Miffling Co.); TN(?); WI(5, Crawford & Pierce Cos.))

***Onychiurus (Protaphorura) reus*** Christiansen & Bellinger, 1980 (Tp or Tx? in PA; Randolph Co., AR; Calhoun & Union Cos., IL; Rockcastle Co., KY: Isle Wise & Tazewell Cos., VA)

***Onychiurus (Protaphorura) sibiricus*** (Tullberg, 1876) (Northern Holarctic epigeic/ Tx? in Dall Isl., AK; Rockcastle Co.,KY & Warren Co.,VA)

***Onychiurus (Protaphorura) sibiricus*** group sp. 1 (not known in NA) (Ac or Tx in 1 cave in Dall Island, AK)

***Onychiurus (Protaphorura) sibiricus*** group sp. 2 (not known in NA) (Ac or Tx in 1 c in Dall Island, AK)

***Onychiurus (Protaphorura) similis*** Folsom, 1917 (widespread epigeic in NA/ Tx in Collingsworth Co., TX; & cave in Duchesne Co. UT)



***Onychiurus*** undescr. sp.#1 (near *O. paro*, poss. new sp./OR & Shannon Cos.,MO/Tb?)  
***Onychiurus*** undescr. sp.#2 (near *Onychiurus pseudofimetarius*, poss. new sp./\*? Cave om OR Co.,MO)

***Onychiurus*** undescr. sp.#3 (Blue River basin, Harrison & Crawford cos./Tb)  
***Onychiurus*** undescr. sp.#4 (cave in Hardin Co.,IL +6 KY C./Tp) & sp. #5 (Tx or Ac in Dall Island cave, AK)

***Onychiurus*** (*O.*) undescr. sp.? (Ac? in Burnet Co., TX)  
***Onychiurus*** (*Protaphorura*) undescr. sp. (?Ac in cave in Travis Co., TX)

***Onychiurus*** undet. sp.1-? (Tb in AL; Tp in IL, Peachtree C., DE Co., OK; cave each in Crawford & Taney Cos., MO; Carter & Wayne Cos., KY Tp &/or TTP in WA; Ac in TX; Tx? (*Protaphorura* subgenus) in PQ; Tp or Tx in 11 AK cave; Tx or Tp in Vancouver Island, BC & Morrison C.,MT))

***Onychiurus*** (*Protaphorura*) *subtenuis* Folsom, 1917 (widespread NA epigeic/ Tp or Htx in Johnson Co., IL; Orange ( 3 records) & Crawford Cos., IN; Texas Co., MO; 1 cave in Prince of Wales Island, AK)

***Onychiurus*** (*Protaphorura*) *uenoi* Yosii, 1954 (epigeic in OK, CA ) (Tp or Tx in 1 cave in Shasta Co. CA).

***Orchesella*** Templeton, 1835 - Entomobryidae springtails, subfamily Orchesellinae  
***Orchesella texensis*** Snider 1997 (Tp? in Burnet, Travis, Williamson Cos., TX)

***Orchesella celsa*** Christiansen & Tucker, 1977 (epigeic in AR, IL, IA, LA, MO, NC, PA, SC, TN/  
Ac in Travis, Williamson Cos., TX)

***Paranura*** Axelson, 1902 - Hypogastruridae springtails  
***Paranura*** cf. *anops* Christiansen & Bellinger, 1980 (epigeic in CA/ CO hyporheic),

***Paranura colorata*** (*P. sexpunctata colorata* Mills, 1934) Christiansen & Bellinger, 1980  
(Epigeic in CA, IN, MD, NC ,SC, UT Tx or Ac in 3 AK caves)

*Parasinella* - See *Sinella cavernarum*

*Parisotoma notablis* = *Desoria*

*Pogognathellus* = subgenus of *Tomocerus*

***Proisotoma*** Borner, 1901 (in part) Isotomidae springtail, Subfamily Isotominae  
***Proisotoma*** (*Ballistura*) *antigua* (*Guthriella a.* Folsom, 1937) (epigeic in LA; MO; WV/ Tx in cave in Marion Co., AR)

***Proisotoma perparva*** Jackson, 1927 (Caribbean,HI epigeic/TTx alien? in HI)  
***Proisotoma*** undet. sp(p). (TTp in TX,WA; hyporheic in CO)

*Proisotoma* undescr. sp. (Tx or Tp in <5 AK cave in El Capitan area, Prince Wales Island, AK)

*Proisotoma* (*Appendisotoma*) *veca* (Wray, 1952) (epigeic in IA; IL; NJ/ Tx in cave in Clayton Co., IA)

*Proisotoma* (*Appendisotoma*) *dubia* Christiansen & Bellinger, 1980 (Ep in CA, ND/ Ac in cave? in Burnet Co., TX)

*Proisotoma* (*Appendisotoma*) *vesiculata* (*Proisotoma* (A.) v. Folsom, 1937) Skidmore, 1995 (epigeic in CT; IN; ON/ Tx in cave in Clayton Co., IA)

*Proisotoma* (*P.*) *minuta* Tullberg, 1871 (= *P. clavipila* (Axelson, 1903)) (Epigeic widespread epigeic/ Tp in Hardin Co., IL; Fillmore Co., MN; Franklin Co., TN; Bexar, Travis & Williamson Cos., TX; UT, WA)

*Protanura* Boerner, 1906 = subgenus of *Neanura*  
*Protanura hawaiiensis* = *Neanura* (*P.*) *h.*

*Protaphorura* Absolon, 1901 = subgenus of *Onychiurus*

*Pseudachorutes* Tullberg, 1871 - Hypogastruridae springtails, Subfamily Pseudachorutinae  
*Pseudachorutes aureofasciatus* (*Gnathocephalus a.* Harvey, 1898; *P. millsii* Maynard, 1951) (widespread epigeic in NA/ Tx in cave in Clayton Co. IA)

*Pseudachorutes* (*P.*) *saxatilis* Macnamara, 1920 (Tx or Ac in 1 IL cave)

*Pseudachorutes* (*P.*) *simplex* Maynard, 1951 (widespread continental epigeic in US e. of Mississippi + PQ) (Tx in Unnamed (Hardin CO.) & Devils Backbone (Jackson Co.), IL; KY; WV)

*Pseudosinella* Schaffer, 1897 – Entomobryidae springtails. **Bibl.:** Christiansen 1960, 1961, 1988; Christiansen, da Gama, & Belling 1983; de Gama 1973

*Pseudosinella aera* Christiansen & Bellinger, 1981 (Epigeic in AL; AR; ,CA; LA; MA; SC/ Tp in St. Clair Co., AL; Gallatin, Johnson & Dade Cos., IL; Shannon Co., MO; Henry, Dade?, Newton Cos., KY; OH; Coffee, Decatur, Franklin, Montgomery, Roberts & Wilson Cos., TN; Williamson Co., TX; Shenandoah Co., VA; WV)

*Pseudosinella alba* (Packard, 1873) ( Epigeic widespread epigeic in mid continental US & sCanada/ Tx in 1 cave each in Fillmore Co., MN & Hants Co., NS & ON)

*Pseudosinella argentea* Folsom, 1902 ( Epigeic widespread epigeic in continental US e. of great plains/ wdespread Tp in AR; IN; MO; PA; TN; WV & VA; Jefferson & Jackson Co. AL; Jackson Co., FL; Hardin & Monroe Co. IL; Edmonson (Mammoth C.) & Henry Co. KY)

*Pseudosinella bona* Christiansen & Bellinger, 1996 \*\* (type locality cave in Roanoke Co. & 1 cave in Washington Co. VA/ Tb)

*Pseudosinella boneti* Christiansen, 1960, nec Bagnall, 1941 = *P. christianseni*

*Pseudosinella certa* Christiansen and Bellinger, 1980 (\*\*? type locality cave in Randolph Co., WV/ Gandy Cr. cave springtail/ S1G1)

*Pseudosinella christianseni* Salmon, 1964 (artificial taxon comprised of series of species all of which are highly troglomorphic) (type locality cave in White Co., TN / Tb in GA (Walker, Dade Cos.), KY (Pulaski, Wayne, White Cos.), WV (Randolph Co.), TN (White, Grundy Cos.), FL (Jackson Co.), & AL (DeKalb, Jackson, Morgan Cos.) / G4G5)

*Pseudosinella collina* Wray, 1952 (widespread epigeic in NA east of Great Plains) (Tp in Blount & Calhoun Cos., AL; Carter, Wayne, Pulaski & Christians Cos., KY; WA Co., IN (S1/G2); Wayne Co., MS; Caldwell & Polk Cos., NC; Blount, Carter, Grundy, Montgomery & Sullivan Cos., TN; Bath & Wythe Cos., VA; New Brunswick)

*Pseudosinella dubia* Christiansen, 1960 (type locality & at least 3 other caves in WA Co., AR; cave each in Dent Co., MO & White Co., TN/ Tb/ G1G2)

*Pseudosinella extra* Christiansen & Bellinger, 1996 \*\*\* ( type locality & 2 othe caves in Scott Co. VA/ Tb/ Tm)

*Pseudosinella erehwon* Christiansen & Bellinger, 1996 (\*\*type locality cave in Scott Co. & cave in WA Co., VA /Tb/ G1)

*Pseudosinella espanita* Christiansen & Bellinger, 1996 (\*Mammoth C. KY /Tb/ G1G2)

*Pseudosinella espana* Christiansen, 1961 (type locality cave in Stone Co. + caves in Christian, Newton & Oregon (3 records) Cos., MO; Mammoth C., KY; Montgomery Co.,TN /Tb /Tm, Tb/ G1G2)

*Pseudosinella flatua* Christiansen & Bellinger, 1996 \*\*?( type locality cave in Swain Co., NC & cave in WA Co., VA / Tb/ G1 or G1G2)

*Pseudosinella folsomi* Mills, 1931 (Epigeic AR; IL; LA; MS; TX) (Tp in cave each in Barry, Camden & Phelps Cos., MO; cave in Bexar Co.,TX; cave or caves in GA)

*Pseudosinella fonsa* Christiansen & Bellinger, 1996 (type locality & 2 other caves in Clark Co., 2 caves in Harrison Co., cave each in Jennings, Monroe, WA Cos. + cave or caves in Clark & Crawford Cos., IN (S2/G2); one cave in Adams Co., OH/ Tb/ G3G4)

*Pseudosinella georgia* Christiansen & Bellinger, 1998 (\*\*?type locality & 2 other caves in Walker Co., GA / Tb )

*Pseudosinella gisini virginia* Christiansen & Bellinger, 1996 (\*\*type locality cave in Lee Co. & cave in Russell Co., VA/ Tb)

*Pseudosinella gisini* g. (Christiansen, 1961) (type locality cave in Greenbrier Co. + Pocahontas & Monroe Cos., WV/ abundant Tb).

*Pseudosinella gisini carolina* Christiansen & Bellinger, 1996 \*\*\* (type locality & 2 other caves in Rutherford Co. NC / Tb)

*Pseudosinella granda* Christiansen & Bellinger, 1996 (\*\*?type locality cave in Augusta Co. & cave in Scott Co., VA/ Tb/ G3 )

*Pseudosinella hirsuta* (*Troglosinella h.* Delamare Deboutteville, 1949) Christiansen, 1961 (1 epigeic record in TN/ (type locality cave in Hamilton Co.(TN) + caves in nAL (Blount, Calhoun, Colbert, De Kalb, Etowah, Jackson, Lauderdale,Limestone, Madison, Marshall, Morgan Cos.), nwGA (Dade, Pike,Polk, Stephens Cos.), c&eKY (Adair, Barren, Edmonson (Mammoth C.), Gallatin, Grayson, Green, Hardin,Larue, Metcalfe, Monroe, Pulaski,Taylor,Warren, Wayne, Woodford Cos.(, TN (Bedford, Campbell, Clay, Coffee,Davidson, Fentress, Franklin, Giles, Johnson, Maury, McNairy, Pickett,Smith,Sumner, Wilson Cos., S3), eVA (Lee Co.),WV; nwFL/ Tb/ G3 or / G2G4)

*Pseudosinella nata* Christiansen & Bellinger, 1981 (\*type locality cave in Jefferson Co., AL /Tb/ G1 or/ G1G2)

*Pseudosinella octopunctata* Borner, 1901 (epigeic in MO & west in NA; Hawaii , Molokai & Maui HI) (Tx? in cave each in Stone Co. MO & Travis Co., TX)

*Pseudosinella ops* Christiansen & Bellinger, 1998 (type locality cave in Scott Co. & cave each in Montgomery & Russell Cos., VA / Tb)

*Pseudosinella orba* Christiansen, 1961 (type locality cave in Sullivan Co. TN; McDowell Co., NC; VA (Bath, Bland, Craig, Giles, Pulaski, Russell, Scott, Smyth, Sussex,Tazewell, Wise, Mecer, Mineral Cos.); Mercer & Mineral Cos., WV (S1); NM?, KY/ Tb/ G3G4 or G4G5)

*Pseudosinella pecki* Christiansen & Bellinger, 1981 (type locality cave in Jackson Co.(FL); Jackson Co. AL; Decatur, Randolph, Stephens & Stewart Cos., GA; cave ni Swain Co., NC; TX/ Tb/ G3G4)

*Pseudosinella petterseni* Bonet, 1934 (all Nearctic records are *P. violenta*)

*Pseudosinella rolfsi* Mills, 1932 (widespread epigeic in continental US) (Tx? in cave each in Metcalfe Co., KY & Pulaski Co., VA)

*Pseudosinella sexoculata* Schoett, 1902 (*Entomobrya (S.) aglis* Harvey, 1900, *Lepidocyrtus s.*) (type in Carlsbad C.(NM), epigeic in Europe; widespread in Continental U.S.) (Tx in caves in CA, IA, NM, TN,VA, WV; Tp or Tx in CA, KY),

*Pseudosinella* prob. undescr. sp.#1 (\*cave near Honolulu, Oahu/Tp or Tx)

*Pseudosinella* prob. sp.#2 (\*cave in Jackson Co.,AL/Tb)

*Pseudosinella* prob. sp.#3 (\*\*\*? 3 caves in Walker Cos.,GA/ Tp or Tb) **Bibl.:** Buhlmann, 1996

*Pseudosinella* undet. sp. (Tx or Tp in Jefferson Co., MT)

*Pseudosinella* undescr. sp.#1 (WV/Tb/ S1G1)

*Pseudosinella* undescr. sp.#2 (2 cos. in IN/ Tb)

*Pseudosinella* undescr. sp.#3 (\*cave in Hawkins Co.,TN/Tb)

*Pseudosinella* undescr. sp.#4 (\*cave in WA Co.,VA/Tb)

*Pseudosinella* undescr. sp.#5 (\*cave in Johnson Co.IL/Tb?)

*Pseudosinella* undescr. sp.#6 (\*cave in Newton Co.,AR)

*Pseudosinella* undescr. sp.#7 (near *P. collina*) (cave in Harrison Co.,IN/ S1G1)/ Tp)

*Pseudosinella* undescr. sp.#8 (3 caves in Pigeon Mt. caves and Pricks Cave, Walker Co., GA)

*Pseudosinella spinosa* (*T.s.* Delamare Deboutteville, 1949) (type locality cave in Madison Co. + caves in Jackson. Marshall, Morgan & Shelby Cos. AL; Pulaski Co.,KY; Dade Co. GA; TN (DeKalb, Franklin, Grundy, Lincoln, Putnam, Sumner, Warren, Washington, White Cos.)/ Tb/ G3G4) **Bibl.:** Christiansen 1960; Christiansen & Bellinger 1980

*Pseudosinella testa* Christiansen & Bellinger, 1981 (\*\*type locality cave in Mercer Co., WV & cave in Scott Co., VA/ Tb/ G1G2)

*Pseudosinella vespera* Christiansen & Bellinger, 1996 (\*\*( type locality cave in Rutherford Co. & cave in Swain Co., NC /Tb/ G1G2)

*Pseudosinella violenta* Folsom, 1924 ( Epigeic widespread epigeic in NA/ Tp throughout continental U.S. but dominant in TX, NM, lesser in AL, AZ, AR, CA, IA, KY, n.Mexico, MI, MO, NY, OK, ON, SD, TN, UT, VA, WI, WV) **Bibl.:** Christiansen & Culver 1969; Davis & Harris 1936

*Pseudosinella vita* Christiansen & Bellinger, 1981 (\*type locality cave in Lincoln Co. NM/ G1 or G1G2/ Tb)

*Ptenothrix* Linnaeus, 1758- Sminthuridae springtails, Subfamily Dicyrtominae

*Ptenothrix (Ptenothrix) atra* Linnaeus, 1758 (NA epigeic east of Great Plains (1 record for BC & 1? for UT) ( Tx in cave each in Johnson Co., IL; Clark & Jennings Cos., IN; Carter & Madison Co., MO)

*Ptenothrix (P.) californica* Christiansen & Bellinger, 1980 (epigeic in AZ, CA) (Tx in cave in Amador Co., CA )

*Ptenothrix (P.) maculosa* (Schoett, 1891) (epigeic in BC; CA; ON; OR/ Tx in Calaveras ( 3 records), Mariposa, Santa Cruz, Shasta & Tuolumne Cos., CA; Lincoln Co. OR)

***Ptenothrix*** (*P.*) *marmorata* (Packard, 1873) (*Ptenothrix m. & oswegatchiensis*, *Papirius testudineatus*) (widespread epigeic in NA/ HTx in AL (Marshall Co.); KY (Wayne Co.); Netwon Co. AR; Calaveras Co., CA; Jefferson & Harrison Cos., IN; Boyle Co., KY; Crawford, Howell & Texas Cos., MO; Rutherford Co., NC; Coryell, Hays & Travis Cos., TX; WV (Monroe Co.); cave in NS; New Brunswick)

***Ptenothrix*** (*Bothriovulsus*) *pineolae* (*P. pineolae* Wray, 1946) (epigeic in MI,NC/ Tx in Jackson Co., IL)

***Ptenothrix*** undet. sp. (Tx or Tp in BC)

***Salina*** MacGillivray, 1894 - Entomobryidae springtails

***Salina maculata*** Folsom, 1932 (Ac in HI)

***Schaefferia*** Absolon, 1900 - Hypogastruridae springtails, subfamily Hypogastrurinae

***Schaefferia*** (*Typhlogastrura*) *alabamensis* Thibaud, 1975 (\*\*\*?type locality & 1 other cave in Jackson Co. & cave in Blount Co., AL/ G1/ Tb/ G3)

***Schaefferia*** (*Typhlogastrura*) *christianseni* Thibaud, 1975 (\*type locality cave in Morgan Co. AL/ Tb/ G1G2)

***Schaefferia*** (*Schaefferia*) *hubbardi* Thibaud, 1995 \*\*?( type locality cave in Highland Co. & cave in Scott Co., VA / G3 or (less likely) G1/ Tb)

***Schaefferia*** (*Typhlogastrura*) tentatively undescr. sp.#1 (\*?cave in Johnson Co.,IL/Tp? or Tb)

***Schaefferia*** (*Schaefferia*) tentatively undescr. (s.Str.) sp. #2 (TX/ Tb)

***Schaefferia*** (*T.*) *valentini* Thibaud, 1996 (type locality cave in Scott Co. + caves in Pulaski. Russell (1 record), Scott (7 more records) & Wythe (1 record) Cos. VA/ Tb/ G3 or (less likely) G1)

***Seira*** Lubbock, 1869 - Entomobryidae springtails, subfamily Entomobryinae

***Seira bipunctata*** (*Lepidocyrtus b.* Packard, 1873) (epigeic in BC; CA; FL; LA; NE; SC ) (Tx in Carlsbad Caverns, Eddy Co., NM)

***Seira distincta*** Mari-Mutt, 1986 (epigeic in MA; Mexico, PR) (Tx in cave in Bexar Co., TX)

***Seira dubia*** Christiansen & Bellinger, 1981 (type locality & 1 other cave in Culbertson Co. TX/ epigeic in AZ; NM, TX/ Tx)

***Seira knowltoni*** (*Drepanocyrtus k.* Wray, 1953) (epigeic in AZ; CA; CO; NM; UT; WY/ Tx in Carlsbad Caverns, Eddy Co., NM)

***Seira lelo*** Christiansen & Bellinger, 1981 (Steaming Bluff Tr., HI Volcanoes Natl. Park, HI/volcanic vent)

*Seira reinhardi* (D. r. Mills, 1931) (epigeic in TX/ Htx in cave each in Clark Co. IN, Eddy Co., NM; Bexar & Travis Cos., TX)

*Seira* undescr.? sp. (Tx or Tp in Pima Co.,AZ)

*Sensillanura* Deharveng, 1981 - Hypogastruridae springtails, subfamily Neanurinae

*Sensillanura* (*Americanura*) *bara* Christiansen & Bellinger, 1980 (epigeic in IL; LA; TN; NC; PA; WV; QU/ Tx in Edmonson (Mammoth C.) & Barren Cos., KY)

*Sensillanura* (*s.s.*) *barberi* (*Achorutes b.* Handschin, 1928; *A. quadrioculata* Folsom, 1916; *S.q.* Guthrie, 1903; *S. pseudoquadrioculata* Stach, 1951; *Neanura p.*) (epigeic in DC; IL; IN; MN; NY; PA; WV) (Tx in Unnamed, Hardin Co., IL; cave each in Harrison & Orange Cos., IN (S1/G2); cave in Barren Co., KY; cave in Augusta Co., VA; WV cave)

*Sensillanura* (*s.s.*) *caeca* Folsom, 1916 (epigeic in CA; IA; IL; IN; NC; PQ; NC; TN) (Tx in cave each in Winnesheik CO., IA; Hardin Co., IL; Harrison Co.,IN)

*Sensillanura* (*s.s.*) *millsi* Christiansen & Bellinger, 1980 (epigeic in CO; IL; IN; PA; OR; WI/ Tx in cave each in Jackson Co., IL & Orange Co., IN)

*Sinella* Brook, 1883 - Entomobryidae springtails, subfamily Entomobryinae

*Sinella* (*Sinella*) *aera* Christiansen & Bellinger, 1980 (epigeic in AL; GA; KY; LA; OR) (Tp in St. Claire Co. AL; Marion Co., AR; Gallatin & Johnson Co., IL; Henry, Johnson, Pulaski & Wolfe Cos., KY; Crawford, Dade, Newton, Phelps & Texas Cos., MO; Coffee, Decatur, Franklin, Montgomery, Robertson, Warren & Wilson Cos., TN; Williamson Co., TX; Shenandoah & Warren Co., VA; Ritchie & Hampshire Cos., WV)

*Sinella* (*S.*) *agna* Christiansen & Bellinger, 1980 (type locality cave in Tucker Co. + Berkeley, Mineral, Pocahontas, Preston, Randolph, & Tyler Cos., WV, & Livingston & Rockcastle Cos., KY /Tb/ G2G3)

*Sinella* (*S.*) *alata* Christiansen, 1960 (type locality cave in Monroe Co., & caves in Clark, Greene, Harrison, Jefferson, Jennings, Kosciusko, Lawrence, Orange, Washington Cos., IN, mostly in Blue River area, IN / wingless winged cave springtail/ Tb/ state T&E S2, G3)

*Sinella* (*S.*) *avita* Christiansen, 1960 (type locality cave in Johnson Co., IL; caves in Crittenden, Grant, Harrison, Livingston Cos., KY; Clark, Crawford & Harrison Cos., IN (S1); Franklin, Jefferson & WA Cos., MO / Tb/ G4G5 or (less likely) G3)

*Sinella* (*S.*) *baca* Christiansen & Bellinger, 1981 (type locality cave in Santa Cruz Co. +Amador, Baca, Calaveras (4 records), Mariposa, Napa, Santa Cruz ( 6 records), Shasta, & Tuolumne Cos., CA; Kendall Co., TX; Vancouver Island, BC/ Tb/ G3G4)

*Sinella* (*S.*) *barri* Christiansen, 1960 (type locality cave in Perry Co. + Harrison Co.,IN (Epigeic) (Widespread in caves of AL (Marshall & De Kalb Cos.), AR (Izard, Lawrence, Randolph &

Stone Cos.), Carroll & Hardin Cos. IL (rare, 3 records); Edmonson (Mammoth C.), Barren, Henry, Grayson & Ohio Cos., cKY; Jefferson, Perry & WA Cos. MO, VA (Alleghany, Giles, Scott, Smythe, WA Cos.), cTN (11 cos., Blount, Campbell, Cannon, Cumberland, DeKalb, McMinn, McNairy, Maury, Monroe, Perry, Robertson, Sumner, Union, Warren, Wayne Cos.) / rare (Ac?) epigeic / G5 or (less likely) G4G5, & WI (1 record each) / Tb)

*Sinella (S.) basidens* (*S.b. var. cavernarum* Bonet, 1934) Bonet, 1935 (type locality cave in Fayette Co. + 8 other cos. (KY) + neHighland Rim, TN (Clay Co.) & Monroe Co., IN / Tb, Tm / G3G4)

*Sinella (S.) binocularata* (Schott, 1896) (epigeic in CA & OR; 1 questionable record in SC) (Tx? in cave in Calaveras CO., CA)

*Sinella (Coecobrya) borerae* Christiansen & Bellinger, 1992 (epigeic on Hawaii, Lanai, Maui & Oahu, HI / Tx? in cave in Maui, HI)

*Sinella (Coecobrya) caeca* Schoett, 1896 - see *S. tenebricosa*

*Sinella (Sinella) cavernarum* (*Degeeria c.* Packard, 1888; *Sinella lucifuga* Folsom, 1902) (Epigeic in CT; DC; IL; IN; KY (Mammoth C.); PA / Tp in Wyandotte C. (type), Crawford Co., IN; widespread in caves of IN (Clark, Crawford, Greene, Harrison, Jennings, Washington Cos.); KY (Barren, Breckenridge, Carter, Christian, Crittenden, Edmonson, Hardin, Hart, Henry, Jackson, Jessamine, Livingston, Woodford); OH (Adams Co.); IL (Hardin, Lee, Saline & Union Cos.); MD (Alleghany & Garrett Cos.); MO (Franklin, Jefferson & Washington Cos.); OH (Adams, Highland, Ottawa, Ross, Wyandotte Cos.); PA (Center, Huntington & Mifflin Cos.); ncTN (Dickson, Hardin & Montgomery Cos.); TX; VA (Alleghany, Washington & Warren Cos.) & WV (Pendleton Co.) / IN S2G3, G4G5)

*Sinella (S.) curviseta* Brook, 1882 (global epigeic, tramp species) (Tx in Edmonson & Fayette Cos., KY; Oregon Co., MO; Williamson Co., TX; Montgomery Co., VA; Wind Cave, Custer Co., SD)

*Sinella (S.) hoffmani* Wray, 1952 (type locality cave in Alleghany Co. & caves in Bath, Botetourt, Highland, Lee, Roanoke, Rockbridge, Tazewell Cos., VA + caves in WV (Berkeley, Grant, Greenbrier, Hampshire, Mercer, Mineral, Monroe, Morgan, Pendleton, Pleasants, Pocahontas, Peston, Putnam, Randolph, Ritchie Cos.), MD (Garrett & Allegany Cos.) & Somerset Co. (PA) / Tp or Tb, rare WV & NC Ep / VA S2S3 T&E rank, G4G5), Widespread in Appalachian caves from Mercer Co. WV to Somerset Co. PA / Tb / Tm / G4G5)

*Sinella (S.) krekeleri* Christiansen, 1960 (type locality cave in Jackson Co., + caves in Carter, Estill, Jackson (4 records), Larue, Lee, Powell (3 records) & Rockcastle (10 records) Cos., KY; Tyler, Randolph & Tucker Cos., WV; ec TN (Clay Co.) & neAL? / Tb, Tm / G3G4)

*Sinella (Coecobrya) kukae* Christiansen & Bellinger, 1992 (\*type locality cave in Maui, HI / Tb / G1)



***Sinella*** (*Coecobrya*) *lua* Christiansen & Bellinger, 1992 (\*type locality cave in Oahu, HI /Tb/ G1)

*Sinella lucifuga* = *S. cavernarum*

***Sinella*** (*Coecobrya*) *nupa* Christiansen & Bellinger, 1992 (\*type locality cave in Maui, HI /Tb/ G1)

***Sinella*** (*S.*) *quadrioculata* Mills, 1935 (epigeic in CA & WA/ Tp? in unnamed CAVE, Calaveras Co., CA)

***Sinella*** (*S.*) *sexoculata* (*Entomobrya s.* Schoett, 1896) (epigeic in CA; OR./Tp in Amador, Calaveras ( 13 records) Mariposa, Santa Cruz & Tuolumne ( 3 records) Cos., CA; cave in Harney Co., OR / Tp)

***Sinella*** undescr. sp. #1 (CA/Tb)

***Sinella*** undescr. sp. #2 (\*cave in Crawford Co.,IN/ Tb)

***Sinella*** undescr. sp.#3 (Jennings Co.,IN/ Tb)

***Sinella*** undescr. sp. #4 (WV/Tb)

***Sinella*** undescr. sp.#5 (TX/ Tb)

***Sinella*** undet. sp. (Tx or Tp in Vancouver Island, BC?)

***Sinella*** (*S.*) *tecta* Christiansen & Bellinger, 1981 (type locality & at least four other caves in \*Calaveras Cos., CA /Tb/ G1G2)

***Sinella*** (*Coecobrya*) *tenebricosa* Folsom, 1902 [ species generally called *S. caeca*] (epigeic, probably global, tramp species) (Tp? in AL; AR; AZ; CA; FL; IA; KS; KY; MN; MO; OH; OK; PA; TX; VA; WI; alien? Tp in HI (feeding on root sap)

***Sinella*** (*S.*) *yosiia* Christiansen & Bellinger, 1974 (type locality in Kazumura C., near Kaumana; widespread in caves of HI & Maui, HI/Tb, one epigeic record near Lanai, HI/ G3)

***Sminthurides*** Börner, 1900 - Sminthuridae springtails, Subfamily Sminthuridinae

**Bibl:** Folsom & Mills 1938

***Sminthurides aquaticus*** (*Smynthurus a.* Bourlet, 1843) (NA,much of world/Tx? in OK)

***Sminthurides*** (*Polykatianna*) *intermedius* Snider, 1978 (CT,I L ,IN, MD/ Tp? in IA)

***Sminthurides*** (*S.*) *hypogramme* Pedigo, 1966 (Ep in IN, IA/ Tx or Tp in cave in Harrison Co.,IN (S1))

***Sminthurides*** (*S.*) *malmgreni* (*Sminthurus m.* Tullberg, 1876) ( Epigeic worldwide?, widespread NA ) (Tx in Hardin, Jackson & Johnson Co. IL; Crawford & Harrison (2 records) Co. IN (T&E S2/ Malmgren's springtail)

***Sminthurides*** (*S.*) *occultus* Mills, 1934 (Ep in CA?,IL, IN, IA, MB, MI, NC, ON, TN/ Tx in WA Co.,IN),

*Sminthurides* (*S.*) *weichseli* Christiansen & Bellinger, 1980 (epigeic in IL & IN/ Tx in cave each in Hardin Co., IL & Harrison Co.,IN/ T&E S2)

*Sminthurinus* Börner, 1901 - Sminthuridae springtails, Subfamily Katianninae

*Sminthurinus* (*Sminthurinus*) *elegans* (*Smynthurus e.* Fitch, 1863) (Epigeic global widespread/ Tx in cave in Travis Co., TX)

*Sminthurinus* (*S.*) *henshawi* (*Smynthurus h.* Folsom, 1896) (widespread epigeic in NA/ Tx in cave in Travis Co., TX)

*Sminthurinus* (*Katiannina*) *macgillivrayi* (*Smynthurus m.* Banks, 1897; *S. altamontus* Wray, 1848; *S. batrachos* Wray, 1848; *M. batchi* Snider, 1969) (widespread Ep in E/ Tx in WA Co.,IN (S4/G4))

*Sminthurinus* (*S.*) *quadrifasciatus* (*Smynthurus q.* Ryder, 1879) (widespread epigeic in NA, Mexico, Hawaii) (Tx in 2 caves in Travis Co., TX)

*Sminthurus* Latreille, 1802 - Sminthridae springtails, Subfamily Sminthurinae

*Sminthurus* undet. sp. (Tx? in 3 AK caves; Tx? in Vancouver Island, BC)

*Tomocerus* Nicolet, 1842 - Entomobryidae springtails, subfamily Entomobryinae. **Bibl.** Christiansen, 1964

*Tomocerus* (*Pogonognathellus*) *bidentatus* Folsom, 1913 (epigeic in AL; CT; DC; IL; Manitoba; MD; NC; NY; ON; TN; WA; WV) (type locality cave in Montgomery Co., VA +AL; CA; GA (Walker Co.); IL; IN; KY (Mammoth C.); MD; NC; OH; TN; VA; WV/ Tp/ IN T&E S3)

*Tomocerus* (*Plutomurus*) *brevimucronatus* Denis, 1928 (epigeic in CA; OR; WA/ Tp in Mariposa, Mendocino, Santa Clara, Santa Cruz, Siskiyou & Trinity Co. CA; Josephine Co. OR (3 records, OR C.); NM?; BC)

*Tomocerus* (*Plutomurus*) *californicus* (*Tritomurus c.* Folsom, 1913) (type locality cave in Santa Clara Co. + caves in Mendocino, Santa Cruz ( 5 records) & Shasta ( 10 records) Cos., CA; OR (OR C., Josephine Co.) /epigeic in CA & OR/ Tp & Tm/ G3)

*Tomocerus* (*Pogonognathellus*) *celsus* Christiansen, 1964 (type locality cave in Calaveras Co. +Amador ( 4 records), Calaveras (39 records), El Dorado, Mariposa ( 4 records), Siskiyou, & Tuolumne ( 6 records) Cos., CA / epigeic in AZ; OR/ Tb or Tp)

*Tomocerus* (*Tomocerina*) *curtus* Christiansen, 1964 (epigeic in CO & NM/ Tp? in cave in Siskiyou Co., CA; cave each in Jones Co., IA; Santa Fe Co., NM; Josephine Co., OR; caves in 3 cos. in nMex.)

*Tomocerus* (*Pogonognathellus*) *dubius* Christiansen, 1964 (epigeic in AK; AR; BC; CA; FL; GA; KY; MS; NC; TN; WV) (type locality cave in Johnson Co.,TN & caves in DeKalb &

Jackson Cos., AL; CA; Alachua Co., FL; Bartow Co, GA; Barren, Edmonson, Johnson & Rockcastle Cos., KY; Pulaski Co., MO; Highland Co., OH; Sullivan & Johnson Cos., TN; Coryell Co., TX/ Tp)

*Tomocerus (Pogonognathellus) elongatus* Maynard, 1951 (epigeic in AK; AR; IL; IA; KY; ME; MO; NH; NY; NC; OH; PA; VA; WV; WY) (Tx in AR; caves in Harrison. Jennings, Clark, Crawford, Orange & WA Cos., IN (S3/G4); cave in Pulaski Co., MO)

*Tomocerus (Pogonognathellus) flavescens (Macrotoma f. Tullberg, 1871) (T. alba, americanus, arcticus, pallidus* Giovannoli, 1933, *T. separatus & plumbea* var. *p.* Packard, 1888; *T. plumbeus* var. *pallida*. Packard, 1886) (type locality cave in Carter Co., KY/ Epigeic widespread N.A. & Europe; Found in virtually every cave region in N.A./Tp in AK, AL, AR, CA, GA, ID, IL, IA, IN(6 cos./S3/G4), KY (Mammoth C., Rockcastle, Edmonson, Hart Cos.), MD, MO, NWT, OH, OK, ON, PA, SC, TN, TX, UT, VA, WI, WV) **Bibl.:** Christiansen 1964; Christiansen & Bellinger 1980

*Tomocerus (Plutomurus) grahami* Christiansen, 1980 \*\*?( type locality cave in Santa Fe., CO., & cave in Coconino Co. AZ /Tb, Tm/ G1G2)

*Tomocerus (Tomocerina) lamelliferus* Mills, 1934 (Epigeic widespread in NA/ Tx in Madison Co., AL; Marion Co., AR; El Dorado Co., CA; Jackson Co., IA; Harrison Co., IN (S1/G4); Lee Co., KY; Christian, Franklin, Oregon & Texas Cos., MO; Eddy Co. NM)

*Tomocerus (Tomocerus) minor* (Lubbock, 1862) (epigeic in BC; HI (alien in all islands); MA; ME; OR; WA; CA/ Tx in cave each in Big Island, Maui & Molokai, HI; cave in Bell Co., TX; PQ)

*Tomocerus (Lethemurus) missus* Mills, 1932 (type locality cave in Jersey Co. & cave in Monroe Co., IL; Harrison Co., IN (S1); Boone, Jefferson, Perry, Ripley, Ste. Genevieve Cos, MO; Garfield & Rio Blanco Cos., NY; KY/ Tb /Tm/ G4G5)

*Tomocerus plumbeus* - see *T. flavescens*

*Tomocerus* undescr. sp. #1-2 (\*cave in Prince Wales Island, seAK)

*Tomocerus* undescr. sp.? (near *T. californicus* Folsom, 1913 - troglomorphic near Tb in Crystal C., Tulare Co., CA)

*Tomocerus (Tomocerus) vulgaris (Macrotoma v. Tullberg, 1871)* (epigeic in Holarctic) (Tx in Plumas & Tuolumne Cos., CA; WA Co., IN; Centre Co., PA; OR; WA; Pierce & Richland Cos., WI)

*Tomocerus (Plutomurus) wilkeyi* Christiansen, 1965 (type locality cave in Plumas Co., CA/Primarily Ep in AZ, CA, CO, ID, OR, WA; Tp in Cochise & Coconino ( 3 records) Co. AZ; Calaveras ( 7 records), Mariposa ( 3 records), Plumas, Santa Cruz ( 6 records), Siskiyou & Tuolumne Cos., CA; OR C., Josephine Co., OR; Cache & Utah Cos., UT; Klickitat & Skamania Cos., WA)

***Tricanthella*** Schaffer, 1897 - Hypogastruridae springtails, subfamily Hypogastrurinae  
***Tricanthella copelandi*** (*Clingmantha* c. Wray, 1963) (Epigeic in Sevier Co., TN/ Tx in White Co., TN)

*Tritomurus* - see *Tomocerus bidentatus*, *californicus*, *missus*  
*Troglosinella* = *Pseudosinella* (see *P. spinosa*)

***Tullbergia*** Lubbock, 1876 - Onychiuridae springtails, subfamily Tullberginae

***Tullbergia*** (*Tullbergia*.) *clavata* Mills, 1934 ( Epigeic widespread N.A. east of mid Rocky Mts..) (Tp? in IA; Hardin Co., IL)

*Tullbergia granulata* = *T. silvicola*.

***Tullbergia*** (*T.*) *hades* Christiansen & Bellinger, 1981 (Epigeic in ND) (Tp type locality cave in in Jackson Co., IA; cave in Wabasha Co., MN/ G3G4)

***Tullbergia*** (*Neonaphorura*) *howdeni* Wray, 1958 (epigeic in Anderson Co. TN/ Tx in cave in Rutherford Co., NC)

***Tullbergia*** (*T.*) *iowensis* Mills, 1932 (US Epigeic CA; IA; IL; MA; ME; NS/ Tp in cave each in WA Co., AR; Jackson Co., IA; Hants Co., NS & Dade Co., GA)

***Tullbergia*** (*T.*) *macrochaeta* (*Mesaphorura* m. Rusek, 1976) (epigeic from sCanada to KY & in Hawaii, Maui & Oahu, HI/ Tp in cave each in Jackson Co. IA & Adair Co. KY; hyporheic in CO)

***Tullbergia*** (*T.*) *mala* Christiansen & Bellinger, 1980 ( Epigeic in AB; CO; CT; IA; IL; ND/ Tx? in cave in Coryell Co., TX)

***Tullbergia*** (*T.*) *pacifica* (Rusek, 1976) (epigeic in BC; CA; IN; MI; ND; OR/ Tp? in cave in Jackson Co., IA)

***Tullbergia*** *ruseki* Christiansen and Bellinger, 1980 (guanophile? in NS)

***Tullbergia*** (*T.*) *silvicola* Folsom, 1932 (epigeic in CT; HI; IA; MA; NH; ND/ Tp? in cave in Jackson Co., IA) Bibl.: Dwidjasatmoko 1978

***Tullbergia*** undet. sp. (Tx or Ac in 1 AK cave)

*Typhlogastrura* = subgenus of *Schaefferia*

***Willemia*** Börner, 1901 - Hypogastruridae springtails, subfamily Hypogastrurinae  
***Willemia scandinavica*** Stach, 1949 (epigeic in AK/ Tx? in NS on porcupine dung and plant debris)

***Willemia*** undet. sp. cf. *dubia* Christiansen & Bellinger, 1980 (Ac or Tx in cave in Collingsworth Co., TX)

*Willowsia* Shoebottom, 1917 - Entomobryidae springtails, subfamily Entomobryinae

*Willowsia buski* Lubbock, 1870 (epigeic in ME, WA/ Tx or Ac in 1 AK cave)

*Willowsia nigromaculata* Lubbock, 1873 (epigeic in NA, Europe, seAsia, Mex.) (All US cave records suspect/ Tx in IA (Clayton & Jackson Cos.); MA (Middlesex Co.); MO (Pulaski & Shannon Cos.); TX (Val Verde Co.)

*Willowsia platani* (*Degeeria p.* Nicolet, 1842) (alien epigeic in NA/ alien Ac in cave in Travis Co., TX)

*Xenylla* Tullberg, 1869 - Hypogastruridae springtails

*Xenylla acauda* Gisin, 1947 (epigeic in ID/ Tx in cave in Shasta Co., CA)

*Xenylla christianseni* Gama, 1974 (epigeic in AZ & CA/ Tx in 2 caves in Travis Co., TX)

*Xenylla grisea* Axelson, 1900 (widespread epigeic in Americas, HI (alien in Oahu, HI), Australia) (Tx in cave each in Harrison Co., IN & Travis Co., TX)

*Xenylla* undet. sp.? 1-2 (TTP in TX, WA)

*Xenyllodes* Axelson, 1903 - Hypogastruridae springtails

*Xenyllodes* undet. sp. (Tp in NW)

Squamata (lizards, snakes and allies) – An order of terrestrial and aquatic reptiles that shed their skin at intervals and have jointed jaws and skulls that enhance flexibility and strength. Oldest fossils from mid-Jurassic, modern groups date from late Jurassic. Includes six infraorders, the snakes, amphisbaenids (legless burrowers) and four infraorders commonly called lizards.

squirrel - See mammal, rodent

stagnant air zone - See carbon dioxide

**stenobiontic** - A taxon that needs a stable, uniform habitat.

**stenophagic** - Taxon with a highly specialized diet.

**stenothermal** - Having little variation in temperature.

**stenotopic** - 1. Taxon found only in one or a few habitats. 2. A taxon with little adaptability to environmental change. Adj.: stenoecious.

## Stoneflies

Insect Order Plecoptera (= Perlaria), Subclass Pterygota, Division Neoptera. About 1,700 species. **Bibl.:** Alba-Tercedor & Sanchez-Ortega 1991; Baumann et al. 1977; Botosaneanu 1986b; Hynes 1976; Stewart & Stark 1993; **Areas:** **AR:** Poulton & Stewart 1991; **CA:** Usinger 1956; Jewett 1960; **CT:** S. Hitchcock 1974; **East:** Fiance 1977; **IL:** Frison 1935; **NA:** Leiser &

Boyle 1982; Merritt & Cummins 1978; Needham & Claassen 1925; **OK:** Poulton & Stewart 1991; **Rockies:** Baumann et al. 1977; **World:** Claassen 1939; Illies 1966; Wick 1973

Undet. genus rarely found in hyporheic of SC coastal blackwater stream

Order Aciculata (see below)

Suborder Arctoperlaria

Group Euholognatha (Also put in Order Arctoperlaria, Suborder Filopalpia)

Superfamily Nemouroidea

Capniidae (snowflies or slender winter stoneflies)

Subfamily Capniinae (*Allocapnia*, *Bolshecapnia*, *Capnia*, *Paracapnia*, *Utacapnia*)

Nemouridae (spring stoneflies; needleflies or nemourid broadbacks)

Subfamily Amphinemurinae (*Amphinemura*)

Subfamily Nemourinae: *Amphinemura*, *Nemoura*, *Prostoia*, *Visoka*, *Zapada*)

Leuctridae (rolled-winged winter stoneflies; needleflies or rolledwinged stoneflies)

Subfamily Leuctrinae

(*Leuctra* (once put in Nemouridae), *Despaxia*, *Paraleuctra*, *Sweltza*, *Zealeuctra*)

Peltoperlidae (also put in Subulipalpia) (roachlike stoneflies)

Subfamily Peltoperlinae (*Peltoperla*, *Tallaperla*)

Superfamily Perloidea (also put in Subulipalpia)

Chloroperlidae

Perlidae (common stoneflies)

(*Calineuria*, *Isoperla* (now in Perlodidae), *Hastaperla* (now in Chloroperlidae))

Subfamily Acroneuriinae

Tribe Acroneuriini (*Acroneuria*, *Hesperoperla* (once in Perlodidae))

Subfamily Perlinae

Tribe Neoperlini (*Neoperla*)

Tribe Perlini (*Claassenia*, *Paragnetina*, *Taeniopteryx* (now in own family))

Perlodidae (predatory stoneflies; springflies & stripetails; perlodid stoneflies)

Subfamily Isoperlinae (*Clioperla*, *Isoperla* (once in Perlidae))

Subfamily Perlodinae (*Skwala*)

Tribe Arcynopterygini (*Arcynopteryx*)

Tribe Diploperlini (*Cultus*, *Rickera*)

Tribe Perlodini (*Yugus*)

Suborder Setipalpia

Superfamily Subulipalpia (also subsumed into Perloidea)

Chloroperlidae (green stoneflies) (*Plumiperla*)

Subfamily Chloroperlinae

(*Alloperla*, *Hastaperla*, *Nemouria*, *Perlomyia*, *Suwallia*, *Sweltsa*)

Subfamily Paraperlinae (*Kathroperla*, *Paraperla*)

Perlidae (also put in Perloidea)

Perlodidae (also in Perloidea)

Taeniopterygidae (also subsumed in Nemouroidae)

(winter stoneflies; willowflies or taeniopterygidae broadbacks)

(*Prostoia* (now in Nemouridae))

Subfamily Brachypterinae (*Strophopteryx*, *Taenionema*)

Subfamily Taeniopteryginae (*Taeniopteryx*)

**STONEFLY** families incl.

**Capniidae** (snowflies or slender winter stoneflies)

Subfamily Capniinae (*Allocapnia*, *Bolshecapnia*, *Capnia*, *Paracapnia*, *Utacapnia*)

**Chloroperlidae** (green stoneflies)

Subfamily Chloroperlinae

(*Alloperla*, *Hastaperla*, *Nemouria*, *Perlomyia*, *Plumiperla*, *Suwallia*, *Sweltsa*)

Subfamily Paraperlinae (*Kathroperla*, *Paraperla*)

**Leuctridae** (rolled-winged winter stoneflies; needleflies or rolledwinged stoneflies)

Subfamily Leuctrinae

(*Leuctra* (once put in Nemouridae), *Despaxia*, *Paraleuctra*, *Sweltza*, *Zealeuctra*)

**Nemouridae** (spring stoneflies; needleflies or nemourid broadbacks)

(*Leuctra* (now in Leuctridae) **Bibl.:** Bauman 1975)

Subfamily Amphinemurinae (*Amphinemura*)

Subfamily Nemourinae: *Amphinemura*, *Nemoura*, *Prostoia*, *Visoka*, *Zapada*)

**Peltoperlidae** (roachlike stoneflies) **Bibl.:** Stark & Stewart 1981

Subfamily Peltoperlinae (*Peltoperla*, *Tallaperla*)

**Perlidae** (common stoneflies) (*Calineuria*, *Isoperla* (now in Perlodidae), *Hastaperla* (now in Chloroperlidae) **Bibl.:** Stark & Gaufin 1976)

Subfamily Acroneuriinae

Tribe Acroneuriini (*Acroneuria*, *Hesperoperla* (once in Perlodidae))

Subfamily Perlinae

Tribe Neoperlini (*Neoperla*)

Tribe Perlini (*Claassenia*, *Paragnetina*, *Taeniopteryx* (now in own family))

**Perlodidae** (predatory stoneflies; springflies & stripetails; perlodid stoneflies)

Subfamily Isoperlinae (*Clioperla*, *Isoperla* (once in Perlidae))

Subfamily Perlodinae (*Skwala*)

Tribe Arcynopterygini (*Arcynopteryx*)

Tribe Diploperlini (*Cultus*, *Rickera*)

Tribe Perlodini (*Yugus*)

**Taeniopterygidae** (winter stoneflies; willowflies or taeniopterygidae broadbacks)

(*Prostoia* (now in Nemouridae))

Subfamily Brachypterinae (*Strophopteryx*, *Taenionema*)

Subfamily Taeniopteryginae (*Taeniopteryx*)

**STONEFLY** species incl.

*Acroneuria* Pictet, 1841 (Nosatura Navas, 1918) Perlidae stoneflies, Subfamily Acroneuriinae, Tribe Acroneuriini (12 species in US or Canada)

*Acroneuria abnormis* (Perla a. Neuman, 1838; *A. depressa* Needham & Claassen, 1922; *A. eidmanni* Samal, 1933) (E, w. to UT, NM, AB, s. to SC/ Ac or Tx in sON)

*Acroneuria* undet. sp. (AB hyporheic)

*Allocapnia* Claassen, 1828 (= *Capnella* Claassen, 1924 (Homo.); *Capnellula* Strand, 1935) Capniidae Plecoptera (stoneflies), Subfamily Capniinae (38 species in US or Canada)

*Allocapnia* undet. sp. or species (Tx in MO; VA, MD brackish benthic)

*Allocapnia pygmaea* Burmeister, 1839 (epigeal in CT, DC, IN, KY, MD, ME, MI, MN, MO (disjunct) NB, NS, NY, OH, ON, PA, PQ, RI, TN, VA, VT, WI, WV/ hyporheic larvae down to 30 cm. in ON & MO) **Bibl:** Pugsley & Hynes 1986

*Alloperla* Banks, 1906 - Chloroperlidae Plecoptera (stoneflies), Subfamily Chloroperlinae (17 species in US or Canada)

*Alloperla* undet. sp. or species (AB, BC, CO hyporheic; Ac in 1 seAK caves)



*Amphinemura* Ris, 1902 - Nemoridae Plecoptera (stoneflies), Subfamily Amphinemurinae (13 species in US or Canada)

*Amphinemura* undet. sp. or species (nCA, WV hyporheic)

*Arcynopteryx* Klapalek, 1904 - Perlodidae Plecoptera (stoneflies) (1 species in US or Canada), Subfamily Perlodinae, Tribe Arcynopterygini

*Arcynopteryx compacta* (*Dictyopteryx c.* MacLachlan, 1872) (epigean in AB, AK, BC, CO, ME, MT, NH, NT, SK, WY/ AB hyporheic larvae; Ac or Tx in WA)

*Bolshecapnia* Ricker, 1965 - Capniidae Plecoptera (stoneflies), Subfamily Capniinae (6 species in US or Canada)

*Bolshecapnia gregsoni* (*Capnia g.* Ricker, 1965) (epigean in BC; Ac in seAK cave)

*Calineuria* Ricker, 1954 - Perlidae Plecoptera (stoneflies) (1 species in US or Canada)

*Calineuria californica* (*Perla c.* Banks, 1905) (epigean in AB, BC, CA, ID, MT, OR, WN; nCA? hyporheic)

*Capnia* Pictet, 1841 (= *Arsapnia* Banks, 189; *Capinia* Needham & Claassen, 1925 (missp.; *Capnura(s)*) Capniidae Plecoptera (stoneflies), Subfamily Capniinae (50 species in US or Canada)

*Capnia* undet. sp. (Tx in TN; CO hyporheic)

*Capnia melia* Frison, 1942 (epigean in AK, BC, CA, OR; Ac in 2 seAK caves)

*Capnia* or *Utacapnia* undet. species (CO hyporheic)

*Cultus* Ricker, 1952 - Perlodidae Plecoptera (stoneflies), Subfamily Diploperlini (4 species in US or Canada)

*Cultus* undet. sp. (CO hyporheic)

*Claassenia* Wu, 1934 (= *Adelungia* Klapalek, 1914 (Homo.) Perlodidae Plecoptera (stoneflies), Subfamily Perlini (1 species in US or Canada)

*Claassenia sabulosa* (*Perla s.* Banks, 1900; *Adelungia arctica* K.1916; *P. languida* Needham & Claassen, 1925) ( epigean in AB, AZ, BC, CA,CO, ID, MB, MT, NM, NT, ON, OR, PQ, SD, SK, UT, WN, WY/ CO hyporheic)

*Clioperla* Needham & Claassen, 1925 - Perlodidae Plecoptera (stoneflies), Subfamily Isoperlinae (1 species in US or Canada)

*Clioperla clio* (*Isogenus c.* Newman, 1939) (E, w. to AR, MO epigean/ seVA hyporheic)

***Despaxia*** Ricker, 1943 - Leuctridae Plecoptera (stoneflies), Subfamily Leuctrinae (1 species in US or Canada)

***Despaxia augusta*** (*Leuctra a.* Banks, 1907; *L. glabra* Claassen, 1937) (AK to CA, e. to WN, MT/ Tx or Ac in CA; Tx in 11 seAK caves & Vancouver Island, BC)

***Haploperla*** Navas, 1934 (*Hastaperla* Ricker, 1935) Chloroperlidae Plecoptera (stoneflies) (3 species in US or Canada)

***Haploperla*** undet. sp. or species (Tx or Ac in nMS, 4 seAK caves, Vancouver Island, BC)

*Hastaperla* = *Haploperla*

***Hesperoperla*** Banks, 1938 - Perlidae Plecoptera (stoneflies), Subfamily Acroneuriinae, Tribe Acroneuriini (also put in Perlodidae) (2 species in US or Canada)

***Hesperoperla pacifica*** (*Acroneuria* Bansk, 1900 (= *A. nigritta* Banks, 1904; *A. pumila* B., 1906; *A. ruficeps* Klapalek, 1917; *A. okanagan* Ricker, 1935; *A. delta* Claassen, 1937; *H. obscura* Banks, 1938) (epigean in AB, AK, BC, CA, CO, ID, MT, NM, NV, OR, SD, SK, UT, WN, WY/ Tx in AZ; Tx or Ac in 2 seAK caves)

***Isoperla*** Banks, 1906 (= *Megahelus* Klapalek, 1923, *Nanoperla*, *Occiperla*, *Perliola*, *Perliphanes*, *Walshiola* Banks, 1947; Okamoto, 1912) Perlodidae Plecoptera (stoneflies), Subfamily Isoperlinae (60 species in US or Canada). **Bibl.:** Szczytko 1978; Szczytko & Stewart 1979

***Isoperla fulva*** Claassen, 1937 (= *I. chrysannula* & *cascadensis* Hoppe, 1938) (epigean in AB, AZ, BC, CA, CO, ID, MT, NM, NV, OR, UT, WN, WY/ CO hyporheic)

***Isoperla*** undet. sp. (AB hyporheic; Tx or Ac in AR)

***Isoperla signata*** (*Perlinella s.* Banks, 1902; *Pictetia bimaculata* B., 1948) (E, w. to AR, WI/ Light Brown Stonefly/ Tx in MN)

***Kathroperla*** Banks, 1920 - Chloroperlidae Plecoptera (stoneflies), Subfamily Paraperlinae (2 species in US or Canada)

***Kathroperla perditata*** Banks, 1920 (epigean in AB, AK, BC, CA, ID, MT, NV, OR, WN; AB hyporheic)

***Kathroperla*** undet. sp. or species (Ac or Tx in Vancouver Island, BC)

***Leuctra*** Stephens, 1833 - Leuctridae Plecoptera (stoneflies), Subfamily Leuctrinae (21 species in US or Canada)

*Leuctra glabra* = *Despaxia a.*,

***Leuctra*** undet. sp. or species (Tx in WV; PA spr.; WV hyporheic)

*Megahelus & Nanoperla = Isoperla*

**Nemoura** Latreille, 1796 (= *Nemura* Kempny, 1898 (missp.) Nemouridae Plecoptera (stoneflies), Subfamily Nemourinae (4 species in US or Canada)

*Nemoura columbiana = Zapada c.*; *Nemoura oregonesis = Zapada o.*

**Nemoura trispinosa** Claassen, 1923 (NB to OH, w. to WI, IL/ Tx or Ac in sON)  
**Nemoura** undet. sp. (Ac in WA)

**Neoperla** Needham, 1905 (= *Oseudoperla* Banks, 1892 (Homo.); *Ochthopetina* Enderlein, 1909; *Javanita* Klapalek, 1909; *Tropidogynoplax* Enderlein, 1910; *Formosina* (Homo.) K.1913; *Formosita* K., 1914; *Oodeia* K., 1921; *Simpliperla* Wu, 1962) - Perlodidae Plecoptera (stoneflies), Subfamily Neoperlinae (2 species in US or Canada)

**Neoperla clymene** (*Chloroperla c.* Newman, 1839) (VA to FL, w. to TX/ TX hyporheic) **Bibl.:** Vaught & Stewart 1974

**Neoperla** undet. sp. (sandy hyporheic in TX)  
*Nephelopteryx = Taeniopteryx*  
*Occiperla, Pergiphanes & Perliola (=Isoperla)*

**Paracapnia** Hanson, 1946 - Capniidae Plecoptera (stoneflies), Subfamily Capniinae (3 species in US or Canada)

**Paracapnia angulata** Hanson, 1961 (PQ to NC, w. to SK, WY, CO epigeal / hyporheic in WV)  
**Paracapnia** undet. species (Ac in seAK cave; Ac or Tx in Vancouver Island, BC (2 species))

**Paragnetina** Klapalek, 1907 (= *Tylopyge* K.1913; *Banksiella* K., 1921; *Banksiana* Claassen, 1936; *Caucasoperla* Zhiltzova, 1967) Perlidae Plecoptera (stoneflies), Subfamily Perlinae, Tribe Perlinae Perlodidae (5 species in US or Canada)

**Paragnetina media** (*Perla m.* Walker, 1852) (PQ, w. to SK, s. to AR, VA epigeal/ Ac or Tx in AR, sON)

**Paraleuctra** Hansen, 1941 - Leuctridae Plecoptera (stoneflies), Subfamily Leuctrinae (7 species in US or Canada)

**Paraleuctra** undet. sp. or species (AB, CO hyporheic; Tx or Ac in 4 seAK caves)

**Paraperla** Banks, 1906 – Chloroperlidae Plecoptera (stoneflies), Subfamily Paraperlinae  
**Paraperla frontalis** Banks, 1906 (hyporheic larvae in AB, ID, MT, UT, WY / hyporheic sallfly)

**Peltoperla** Needham, 1905 - Peltoperlidae Plecoptera (stoneflies), Subfamily Peltoperlinae (1 species in US or Canada)

***Peltoperla arcuata*** N.1905 (epigean in KY, NY, OH, PA, PQ, TN, VA, WV/ hyporheic in WV)

***Perlomyia*** Banks, 1906 - Chloroperlidae Plecoptera (stoneflies), Subfamily Chloroperlinae (2 species in US or Canada)

***Perlomyia*** undet. sp. or species (nCA hyporheic; Ac or Tx in Vancouver Island, BC)

***Plumiperla*** Surdick, 1985 - Chloroperlidae Plecoptera (stoneflies), Subfamily Chloroperlinae (2 species in US or Canada)

***Plumiperla diversa*** (Frison, 1935) (epigean in AB, AK, BC, CA, CO, ID, MT, NM, OR, WN, WY, YK/ Tx or Ac in 4 AK cave)

***Plumiperla*** undet. sp. (Tx or Ac in 2 AK caves)

***Prostoia*** Ricker, 1952 - Nemouridae Plecoptera (stoneflies), Subfamily Nemourinae (3 species in US or Canada)

***Prostoia*** undet. sp. (Tx? in MN)

***Rickera*** Jewett, 1954 - Perlodidae stoneflies, Subfamily Isoperlinae, Tribe Diploperlini (1 species in US & Canada)

***Rickera sorpta*** (*Perla* s. Needham & Claasen, 1925; *R. venusta* Jewett, 1954) (epigean in CA, NV, OR, WA, WN/ Tx or Ac in Paradise Ice C., WA)

***Skwala*** Ricker, 1943 - Perlodidae stonefly, Subfamily Perlodinae (2 species in US or Canada)  
***Skwala*** undet. sp. or species (Tx or Ac in 2 AK caves; BC detrital hyporheic)

***Strophopteryx*** Frison, 1929 - Family Taeniopterygidae, Subfamily Brachypterinae

***Strophopteryx cucullata*** Frison, 1934 (= *S. ostra* Ricker & Ross, 1975) (epigean in AR, MO, OK, TX/ hyporheic? in AR, MO)

***Sweltsa*** Ricker, 1943 - Chloroperlidae Plecoptera (stoneflies), Subfamily Chloroperlinae (23 species in US or Canada)

***Sweltsa borealis*** (*Chloroperla* b. Banks, 1895) (epigean in AK, BC, CA, CO, ID, MT, NM, NV, OR, SD, UT, WN, WY, YK/ Tx in Vancouver Island, BC)

***Sweltsa coloradensis*** (*Chloroperla* c. Banks, 1898) (epigean in AB, AZ, BC, CO, ID, MT, NM, NV, OR, SD, UT, WN, WY, YK/ Little Olive Stonefly/ WV?, CO hyporheic)

***Sweltsa revelstoka*** Jewett, 1955 (Tx in 26 seAK caves)

***Sweltsa*** undet. sp. or species (Tx in cave in NS, 26 seAK caves & Vancouver Island, BC; CA (seasonal resident), NC, WV hyporheic)

***Suwallia*** Ricker, 1943 - Chloroperlidae Plecoptera (stoneflies), Subfamily Chloroperlinae (4 species in US or Canada)

***Suwallia*** undet. sp. or species (CO hyporheic; Ac or Tx in Vancouver Island, BC)

***Taenionema*** Banks, 1905 - Taeniopterygidae Plecoptera (stoneflies), Subfamily Brachypterinae (8 species in US or Canada)

***Taenionema*** undet. sp. (CO hyporheic)

***Taeniopteryx*** Pictet, 1841 (= *Nephopteryx* Klapalek, 1902; *Nephelopteryx* Needham & Claasen, 1925 or Klapalek, 1903) - Taeniopterygidae Plecoptera (stoneflies), Subfamily Taeniopteryginae (8 species in US or Canada)

***Taeniopteryx nivalis*** Fitch, 1847 (AB to CA, e. to PQ, s. to PA epigeal/ Tx in MN)

***Taeniopteryx parvula*** Banks, 1918 (AB to PQ, s. to AR, MO, MS, GA, WY/ Tx in MN?)

***Taeniopteryx*** undet. sp. (Tx? In Organ C., WV)

***Taeniopteryx starki*** Stewart & Szczytko, 1974 (Edwards Plateau, TX/ Pb?)

***Tallaperla*** Stark & Stewart, 1981 - Peltoperlidae Plecoptera (stoneflies), Subfamily Peltoperlinae (6 species in US or Canada)

***Tallaperla*** undet. sp. or species (NC hyporheic?, meiofauna & benthic)

***Utacapnia*** Gaufin, 1970 - Capniidae Plecoptera (stoneflies), Subfamily Capniinae (10 species in US or Canada)

***Utacapnia*** or *Capnia* undet. species (CO hyporheic)

***Visoka*** Ricker, 1952 - Nemouridae Plecoptera (stoneflies), Subfamily Nemourinae (1 species in US or Canada)

***Visoka cataractae*** (*Nemoura c.* Neave, 1933) (epigeal in AB, AK, BC, CA, ID, MT, OR, WN/ Ac in 1 seAK caves)

*Walshiola* = *Isoperla*

***Yugus*** Ricker, 1952 - Perlodidae Plecoptera (stoneflies), Subfamily Perlodinae, Tribe Perlodini (3 species in US or Canada)

***Yugus bulbosus*** Frison, 1942 (PA to GA, w. to TN/ hyporheic in WV)

***Zapada*** Ricker, 1952 - Nemouridae Plecoptera (stoneflies), Subfamily Nemourinae (8 species in US or Canada)

*Zapada cinctipes* Banks, 1897 (epigean in AB, AK, CA, CO, ID, MB, MT, NM, NV, SD, SK, UT, WY/ BC detrital hyporheic)

*Zapada columbiana* Claassen, 1923 ( epigean in AB, AK, BC, CA, ID, MT, OR, UT, WN, WY/ Tx in 16 seAK caves; AB hyporheic)

*Zapada cordillera* (*Nemoura c.* Bauman & Gaufin, 1971) (CA to OR, e. to WN/ Tx or Ac in CA)

*Zapada oregonensis* (*Nemoura o.* Claassen, 1923) (AK to CA, e. to MT, NV/ AB, CO hyporheic; & Vancouver Island, BC)

*Zapada* undet. sp. (Tx in 16 seAK caves)

*Zealeuctra* Ricker, 1952 - Leuctridae Plecoptera (stoneflies), Subfamily Leuctrinae (8 species in US or Canada)

*Zealeuctra arnoldi* Ricker & Moss, 1969 (Edwards Plateau, TX/Pb?),

*Zealeuctra hitei* Ricker & Moss, 1969 Edwards Plateau, TX/Pb?) Snellen 1978

stress - Howarth, 1983; Rusterholtz, Karl. 1989

stygicole (Chapman, 1986) - Syns: Tb+Tp & cavernicole. Entomology: "dark dweller."

**stygobiont** - Abbrev. as St. Def. #1. Groundwater, wells, springs, caves, and/or deep oligotrophic lakes sp., the phreatic equivalent of cavernicole. Syn.: groundwater fauna. Def. #2. An obligate groundwater species (often interstitial) & which show some degree of troglomorphy (e.g., loss of eyes & pigment). Syn.: Phreatobite (Pb). Both often found in caves or small subterranean cracks. Unlike phreatobites, stygobionts can be larger than meiofauna. Incl. limnostygobiont.

stygobite - Syn: stygobiont.

**stygophilic** - 1. species that can live either in surface waters or groundwater. 2. Species rarely found far from caves.

**stygoxene** (Chapman, 1986) -1. Syn: Tx. 2. A surface water species that can be a troglaxene.

**sub-fossil** - A dead organic tissue, such as a tooth, bone or shell, or the entire body of a dead organism preserved over a long period in its original form, rather than as a fossil. **Bibl.:** Anderson, E. 1974; Baichtal 1994; Barnosky et al. 1988; Graham & G. 1989; Grayson 1977; Hadly 1990; Jans 1993; Manganaro 1994; Martin, L. & Alex 1987; Mead, et al. 1981-7; Morlan 1989; Warren, R. 1983; Whistler 1991; Ziegler 1963

**substrate** - Where species live. Incl. bedrock, dark, epizoic, floor, nest, organic, pool, sink, stream, & twilight

**successional speciation** - The gradual change of one species into another.

**succession** - One-way change in a habitat caused by biologic interactions. Poulson & Kane 1981.

**sulfur bacteria or microbe** - Anaerobic bacteria that get their oxygen for metabolism by reducing sulfate ions to hydrogen sulfide or elemental sulfur. Accumulations of sulfur formed in this way are bacteriogenic ores.

sun spider - See solifugids.

superficial underground compartment - See interstitial

superspecies - Syn: species groups.

surface - see epigeal

**sweepstake dispersal route** - Where partial geographic barriers allows some species virtually at random to migrate while others do not.

**symbiont** - One member in a symbiotic relationship.

**symbiosis** - An ecology type of relationship between two different species that live in close association, with at least one being helped & without either being harmed. Incl. facultative, homosymbiosis.

**sympatric speciation** - New taxa from ancestral taxon within the same geographic range. Interbreeding geographically can occur but for some reason does not.

**sympatry** - The occurrence of related taxon, especially species, in the same area. See biogeography

## Symphylids

Myriapod crustacean of (Sub)class Symphyla. 7-12 (nearly always 11-12) pairs of legs, long, unbranched beaded antennae; body with 15-22 segments. Anal segment has a pair of large spinnerets and a pair of long sensory hairs. Most species 4-5 mm. long. Most feed on living plant roots & so don't occur in deep caves. About 130 species in 3 families. Up to 3000 per square meter of woodland soils. Syn: symphylans; pseudocentipedes. **Bibl.:** Juberthie-Jupeau 1994; Scheller 1986.

ScutigereLLidae Bagnall (*ScutigereLLa*, *Hanseniella*)

Scolopendrellidae Bagnall (*Symphyla*, *Symphylella*)

**Hanseniella** Bagnall, 1913 - ScutigereLLidae symphylids

**Hanseniella vandykei** M.1942 (AL(prob.), FL, GA, NC, VA, WV/ Tx or Tp in CA)

*Scolopendrella americana* Packard, 1881 = *ScutigereLLa immaculata*

*Scolopendrella immaculata* Newport = *ScutigereLLa i.*

**ScutigereLLa** Ryder, 1882 - ScutigereLLidae symphylan

*Scutigerella causeyae* Michelbacher, 1942 (NA,Europe/epigean & Tp in CA)

*Scutigerella immaculata* (*Scolopendrella i.* Newport, 1845) (= *Scolopendrella americana* Packard, 1881) (garden centipede or symphylan/ Tp in Mammoth C.,KY)

*Scutigerella inculta* Michelbacher, 1942 (epigean in Marin, Alameda & Napa Cos., CA/ Tp in CA)

*Scutigerella palmonii* Michelbacher, 1942 (epigean in E,Europe,Japan?/ Tp in CA,TX)

*Scutigerella silvestrii* Michelbacher, 1942 (epigean in Italy,Mex./ Tp in TX)

*Scutigerella* undescr. sp.#1 (Medina Co., TX/ Tb)

*Scutigerella* undescr. sp.#2 (Williamson Co, TX/ Tb)

*Scutigerella* undescr. sp.#3 (\*?cave near Mammoth,KY)

*Scutigerella* undet. sp. or species (Ed/ Ac or Tx in seAK (once cave), BC, GA (Dade Co.))

*Symphyla* Silvestri, 1912 - Scolopendrellidae symphilids

*Symphyla* undet. sp. (WA/Tp?).

*Symphylella* Silvestri, 1902 - Scolopendrellidae symphilids

*Symphylella* undet. sp. (Tp? in NS)

## **Syncarids, Mysids, Bathynellids, Tanaids & Cumaceans**

Syncarida, superorder, order or class of eyeless shrimp-like crustaceans. **Isopods & amphipods** are listed separately. **Bibl.:** Schminke 1981, 1986

Subclass Eumalacostraca

Superorder Syncarida

Order Cumacea (hooded shrimp; cumaceans)

(or combined with Cumacea & Spelaeogriphacea in Order Hemicaridea)

Family Bodotriidae

Subfamily Bodotriinae (*Cyclaspis*)

Subfamily Mancocumatinae (*Mancocuma*, *Spilocuma*)

Subfamily Vaunthompsoniinae (*Glyphocuma*, *Leptocuma*, *Vaunthompsonia*)

Family Campylaspididae (*Campylaspis*) (also put in Nannastacidae)

Family Diastylidae

(*Anchicolurus*, *Brachydiastylis*, *Colurostylis*, *Diastylis*, *Diastylopsis*, *Leptostylis*, *Oxyurostylis*)

Family Lampropidae (*Hemilamprops*, *Lamprops*, *Mesolamprops*)



Family Leuconidae (*Eudorella*, *Eudorellopsis*, *Hemileucon*, *Leucon*, *Nippoleucon*)  
Family Nannastacidae (*Almyracuma*, *Camella*, *Campylaspis*, *Procampylaspis*)

Order Mysidacea (mysids)

Suborder Mysida

Family Mysidae (*Acanthomysis*, *Alienacanthomysis*, *Amathimysis*, *Americamysis*,  
*Archaeomysis*, *Bowmaniella*, *Cubanthomysis*, *Eleomysis*, *Heteromysis*, *Holmesiella*,  
*Homesimysis*, *Inusitatomysis*, *Metamysidopsis*, *Meterythrois*, *Mysidella*, *Mysidopsis*,  
*Neomysis*, *Pacificanthomysis*, *Proneomysis*, *Pseudomma*, *Siriella*, *Taphromysis*,  
*Xenacanthomysis*)

Subfamily Gastrosaccinae, Tribe Mysini (*Mysis*, *Neomysis*)

Order Tanaidacea (= Tanaida) (syncarids)

(or combined with Cumacea & Spelaeogriphacea in Order Hemicaridea)

Suborder Dikonophora

Family Leptognathiidae (*Leptognathia*)

Family Pseudozeuxidae (*Leptochelia*, *Pseudoleptochelia*)

Suborder Monokonophora

Family Apseudidae (*Apseudes*, *Halmyrapseudes* (put in Parapseudidae))

Family Kalliapseudidae (*Kalliapseudes*)

Family Parapseudidae (*Halmyrapseudes*) (also put in Apseudidae)

Suborder Tanaidomorpha

Superfamily Paratanoidea

Family Anthuridae (*Araphura*, *Chaulioleona*, *Haliophasma*, *Scoloura*,  
*Silophasma*, *Siphonolabrum*, *Tanaella*, *Tanaopsis*)

Family Leptocheliidae (*Hargeria*, *Leptochelia* (once in Pseudozeuxidae))

Family Paratanaidae (*Paratanais*, *Tanaissus* (once in Tanaidae))

Family Pseudotanaidae (*Pseudotanais*)

Family Typhlotanaidae (*Typhlotanais*)

Superfamily Tanaidoidea

Family Tanaidae

(*Sinelobus*, *Synaptotanais*, *Tanais*, *Tanaissus* (now in Paratanaidae) *Zeuxo*)

Order Bathynellacea (bathynellids)

Parabathynellidae, Tribe Iberobathynellini, Subtribe Iberobathynellina

(*Californibathynella*)

Undet. family in Blue River gravel bar at Rothrocks Mill, Crawford Co.,IN/ Pb/ S1G1

Order Podophallocarida (bathynellids)

Superfamily Bathynellacea (also treated as order)

Family Bathynellidae (*Bathynella* (also put in Parabathynellidae)

Family Parabathynellidae

(*Bathynella*, *Iberobathynella*, *Pacificabaythynella*, *Parabathynella*; parafluvial undet. AZ genus) Bibl.: Camacho, Serban & Guil 2000

*Acanthomysis* Czerniavsky, 1882 – Mysidae syncarids

*Acanthomysis columbiae* (WA marine infauna)

*Acanthomysis macropsis* Tattersall, 1932 (WA marine infauna)

*Almyracuma* – Nannastacidae syncarids

*Almyracuma proximoculi* Jones & Burbanck, 1959 (Carolinian, MD, MA, VA rare marine infauna)

*Almyracuma* undet. sp. (FL marine infauna)

*Americamysis* W.W. Price, R.W. Heard & Stuck, 1994 – Mysidae mysids

*Americamysis almyra* (Bowman, 1964) (Virginian, wFL Gulf of Mex. marine infauna)

*Americamysis bahia* (Molenock, 1969) (e,wFL, MD, LA, VA marine infauna)

*Americamysis bigelowi* complex (Carolinian, MD, VA marine infauna)

*Americamysis stucki* W.W. Price, R.W. Heard & L. Stuck, 1994 (wFL Gulf of Mex. marine infauna)

*Anchicolurus* Hale, 1945 - Diastylidae syncarids

*Anchicolurus occidentalis* (*Colurostylus o.* Calman, 1812) (CA. OR marine infauna)

*Apseudes* Leach, 1813 – Apseudidae syncarids

*Apseudes* undet. sp. or species (Carolinian, wFL Gulf of Mex. marine infauna)

*Araphura* Bird & Holdich, 1984 - Gnathiidae syncarids (also put in isopods Gnathiidea suborder)

*Araphura breviaria* Dojiri & Sig, 1997 (CA, WA marine infauna)

*Araphura cuspirostris* Dojiri & Sig, 1997 (CA marine benthic)

*Araphura* 2 undescr. species (sCA marine infauna)

*Archaeomysis* Czerniavsky, 1882 – Mysidae syncarids

*Archaeomysis grebnitzkii* (WA marine infauna)

*Bathynella* Vejdovsky, 1882 - Bathynellidae syncarids. **Bibl.:** Serban 1972.  
*Bathynella riparia* Pennak & Ward, 1985 (CO hyporheic) (uncertain generic status)  
*Bathynella* undet. sp(p). Pennak & Ward, 1985 (CO,MT/nonkarst stygobite)

*Bowmaniella* – Mysidae syncarids  
*Bowmaniella dissimilis* (wFL marine infauna)  
*Bowmaniella floridana* (Virginian (rare), e,wFL, LA, NC marine infauna)

*Brachydiastylis* Stebbing, 1912 - Diastylidae syncarids  
*Brachydiastylis* undet. sp. (Baffin Island (neCanada) marine infauna)

*Californibathynella* Camacho & Serban, 1998 - Parabathynellidae syncarids, Tribe Iberobathynellini, Subtribe Iberobathynellina

@*Californibathynella* Camacho & Serban, 1998 (CA groundwater interstitial stygobiont)

*Campylaspis* G.O. Sars, 1865 – Nannastacidae syncarids (also put in Campylaspidae)  
*Campylaspis affinis* (Carolinian marine infauna)

*Campylaspis biplicata* Watling & McCann, 1995 (CA, WA marine infauna)  
*Campylaspis blakei* Watling & McCann, 1995 (CA marine infauna)

*Campylaspis canaliculata* Zimmer, 1936 (CA, WA marine infauna)  
*Campylaspis costata* (WA marine infauna)

*Campylaspis crispera* (WA marine infauna)  
*Campylaspis hartae* Lie, 1969 (CA, WA marine infauna)

*Campylaspis maculinodulosa* Watling & McCann, 1995(CA marine infauna)  
*Campylaspis* cf *nodulosa* (WA marine infauna)

*Campylaspis papillata* Lomakina, 1952 (AK marine infauna)  
*Campylaspis rubicunda* (Lilljeborg, 1885) (NC, OR, WA marine infauna)  
*Campylaspis rubromaculata* Lie, 1971 (sCA, WA marine infauna)

*Campylaspis rufa* Hart, 1930 (CA, WA marine infauna)  
*Campylaspis* undescr. sp. (sCA marine infauna)  
*Campylaspis* undet. sp. (AK, VA, (Baffin Island (neCanada) marine infauna)

*Chaulioleona* M. Dojiri & J. Sieg – Anthuridae syncarids  
*Chaulioleona dentata* Dojiri & Sieg, 1997 (CA marine benthic)

*Colurostylis* Calman, 1911 - Diastylidae syncarids  
*Colurostylis occidentalis* = *Anchicolurus o.*

*Cumella* Sars, 1865 - Nannastacidae syncarids  
*Cumella californica* Watling & McCann, 1974 (CA, WA marine infauna)

*Cumella* cf. *garrityi* Bacescu & Muradian, 1977 (wFL Gulf of Mex. marine infauna)

*Cumella* undet. sp. (Carolinian marine infauna)

*Cumella vulgaris* Hart, 1930 (WA marine infauna)

*Cyclaspis* (err. Pro *Cycapis* Sars, 1865) Hansen [1830] Bodotriidae syncarids, Subfamily Bodotriinae

*Cyclaspis bacescui* P.E. Omholt & R.W. Heard, 1982 (FL marine infauna)

*Cyclaspis nubila* Zimmer, 1936 (sCA marine infauna)

*Cyclaspis pustulata* Zimmer, 1943 (e,wFL, LA marine infauna)

*Cyclaspis* undet. sp. or species (TX, VA marine infauna)

*Cyclaspis varians* Calman, 1912 (FL, LA, MD, NC, TX, VA estuary marine infauna)

*Diastylis* Say, 1818 - Diastylidae cumacean (hooded shrimp)

*Diastylis alaskensis* Calman, 1912 (AK, BC, WA marine infauna)

*Diastylis bidentata* Calman (AK, OR, WA marine infauna)

*Diastylis californica* Zimmer, 1936 (AK, OR marine infauna)

*Diastylis crenellata* Watling & McCann, 1997 (CA marine infauna)

*Diastylis dalli* Calman, 1912 (OR marine infauna)

*Diastylis hirsuta* Petrescu & Bacescu, 1991 (WA marine infauna)

*Diastylis loricata* Lomakina, 1955 (AK marine infauna)

*Diastylis* cf. *nucella* (WA marine infauna)

*Diastylis paraspinulosa* Zimmer, 1928 (AK, OR, WA marine infauna)

*Diastylis pellucida* Hart, 1930 (sCA, OR, WA marine infauna)

*Diastylis polita* (MA marine infauna)

*Diastylis* undet. sp. or species (Baffin Island (neCanada) & sCA marine infauna)

*Diastylis rathkei sarsi* (Norman, 1902) (NB, PQ Gulf of St. Lawrence sandy marine interstitial)

*Diastylis rathkei typica* Zimmer, 1926 (NB, PQ Gulf of St. Lawrence sandy marine interstitial)

*Diastylis santamariensis* Watling & McCann, 1997 (CA, WA marine infauna)

*Diastylis sculpta* G.O. Sars, 1871 (NB, PQ Gulf of St. Lawrence sandy marine interstitial)

*Diastylis sentosa* Watling & McCann, 1997 (CA marine infauna)

*Diastylopsis* Smith, 1880 - Diastylidae syncarids

*Diastylopsis tenuis* Smith, 1880 (sCA, WA marine infauna)

*Eudorella* Norman, 1867 - Leuconidae syncarids

*Eudorella emarginata* (Kroyer, 1846) (AK, BC marine infauna)

*Eudorella monodon* Calman, 1912 (TX estuary marine infauna)

*Eudorella (Tridentata) pacifica* Hart, 1930 (*E. tridentata* Hart, 1930) (AK, BC, sCA, OR, WA marine infauna)

*Eudorellopsis* Sars, 1882 - Leuconidae syncarids

*Eudorellopsis biplicata* Calman, 1912 (AK marine infauna)

*Eudorellopsis integra* (Smith, 1879) (AK, WA marine infauna)

*Eudorellopsis longirostris* Given, 1961 (sCA, WA marine infauna)

*Glyphocuma* Hale, 1944 – Bodotriidae hooded shrimps (cumaceans), Subfamily Vaunthompsoniinae

*Glyphocuma* undescr. sp.(sCA marine infauna)

*Haliophasma* Hawell, 1881 – Anathuridae syncarids

*Haliophasma geminata* Menzies & Barnard, 1959 (WA marine infauna)

*Halmyrapseudes* Bacescu & Gutu, 1974 - Parapseudidae syncarids (also put in Apseudidae)

*Halmyrapseudes bahamensis* Bacescu & Gutu, 1974 (FL, LA marine benthic)

*Halmyrapseudes cubanensis* Bacescu & Gutu, 1974 (FL marine benthic)

*Hargeria* Lang., 1973 - Leptocheiliidae syncarids

*Hargeria rapax* Lang, 1973 (Carolinian, e,wFL, LA, MD, TX, VA marine infauna)

*Hemilamprops* Sars, 1883 - Lampropidae cumacean

*Hemilamprops californica* Zimmer, 1936 (sCA, WA marine infauna)

*Hemilamprops* undet. sp. (AK marine infauna)

*Hemileucon* Calman, 1907 - Leuconidae syncarids

*Hemileucon* undet. sp.(OR, WA marine infauna)

*Heteromysis* Smith, 1873 – Mysidae syncarids

*Heteromysis odontops* (WA marine infauna)

*Holmesiella* – Mysidae syncarids

*Holmesiella anomala* (WA marine infauna)

*Iberobathynella* Schminke, 1973 (considered confined to Spain by Camacho, Serba & Guil 2000 who returned North American species to *Texanobathynella* in Tribe Iberobathynellini, Subtribe Hexaiberobathynellia) - Parabathynellidae syncarids, Tribe Iberobathynellini, Subtribe Iberobathynellina

*Iberobathynella bowmani* (*Texanobathynella b.* Delamare Deboutteville, Coineau, & Serban, 1975) (type locality cave in San Saba Co. & cave in Dickens Co.,TX/Pb G3)

***Iberobathynella*** undescr. sp. (Phreatic & parafluvial in Sycamore Cr. 32 km ne of Phoenix (Maricopa Co.), Big Sandy River, Santa Maria River and Bridle Cr., AZ)

***Inusitatomysis*** – Mysidae syncarids

***Inusitatomysis insolita*** (WA marine infauna)

***Kalliapseudes*** Stebbing, 1910 - Kalliapseudidae syncarids

***Kalliapseudes 2*** undescr. sp. (e,wFL marine infauna)

***Lamprops*** Sars, 1863 - Lampropidae cumacean

***Lamprops carinatus*** Hart, 1930 (*L. carinata* Hart, 1930)(sCA, WA marine infauna)

***Lamprops quadriplicatus*** Smith, 1879 (*L. quadriplicata* Smith, 1879) (sCA, WA marine infauna; NB, PQ Gulf of St. Lawrence sandy marine interstitial)

***Lamprops*** undet. sp. (AK marine infauna)

***Leptochelia*** Dana, 1849 (= *Tanaiomeras*) Leptocheliidae syncarids (also put in Pseudozeuxidae)

***Leptochelia dubia*** (Kroyer, 1842) (= *L. affinis*; *L. algicola*; *L. corsica*; *L. durbanensis*; *L. edwardsii*; *L. incerta*; *L. lifuensis*; *L. neopolitana*; *L. savignyi*; *Paratanais algicola*; *P. edwardsii*; *Pl. Kroyerii*; *P. savignyi*; *Tanaiomera columbina*; *Tanais dubius*; *Tanais durbanensis*; *T. edwardsi*; *T. filum*) (sCA, MA, WA marine sandy interstitial)

*Leptochelia filum* = *Pseudoleptochelia f.*

***Leptochelia savignyi*** (*Leptognathia s.* Kroyer, 1842; *Leptochelia edwardsii*, *incerta*, *lifuensis*, *neapolitana*; *Paratanais algicola*, *edwardsii*) (AK,CA, NJ, WA marine infauna)

***Leptocuma*** Sars, 1873 – Bodotridae cumaceans, Subfamily Vaunthompsoniinae

***Leptocuma forsmanni*** Zimmer, 1943 (CA marine infauna?)

***Leptognathia*** Sars, 1882 - Leptognathiidae tanaids

***Leptognathia brevimanus*** (Lilljeborg, 1864) (WA marine infauna)

***Leptognathia gracilis*** (Kroyer, 1842) WA marine infauna)

***Leptognathia longiremus*** (Lilljeborg, 1864) (WA marine infauna)

***Leptognathia savignyi*** (WA marine infauna)

***Leptostylis*** Sars, 1869 - Diastylidae hooded shrimp (cumaceans)

***Leptostylis*** undet. sp. (AK marine infauna)

***Leptostylis abditus*** Watling & McCann, 1997 (CA marine benthic)

***Leptostylis villosa*** (WA marine infauna)

***Leucon*** Kroyer, 1846 - Leuconidae syncarids

***Leucon*** (*Leucon*) *americanus* Zimmer, 1943 (MD, MA, VA common marine infauna)

*Leucon* (*Diaphonoleucon*) *declivis* L. Watling & L.D. McCann (WA marine infauna)  
*Leucon boshopi* Bacescu, 1988 (CA marine benthic)

*Leucon falcicosta* Myers & Benedict, 1974 (CA marine benthic)  
*Leucon* (*Epileucon*) *longirostris* Sars, 1871 (OR marine infauna)  
*Leucon* (*Leucon*) *nasica* Kroyer, 1846 (AK, WA marine infauna)

*Leucon* undet. sp. (TX estuary benthic)  
*Leucon subnasica* Given, 1961 (sCA, WA marine infauna)

*Mancocuma* Zimmer, 1943 – Bodotriidae hooded shrimp (cumaceans), Subfamily Mancocumatinae

*Mancocuma stellifera* Zimmer, 1943 (Virginian (rare), MA marine infauna)

*Mesolamprops* Given, 1964 - Lampropidae cumacean  
*Mesolamprops bispinosus* Given, 1964 (*M. bispinosa* Given, 1964) (CA marine benthic)

*Meterythrops* – Mysidae syncarids  
*Meterythrops robusta* Smith (WA marine infauna)

*Mysidella* – Mysidae syncarids  
*Mysidella americana* (WA marine infauna)

*Mysidopsis* Sars, 1864 - Mysidae syncarids  
*Mysidopsis almyra* Bowman, 1963 (Virginian (rare), FL, LA marine infauna)

*Mysidopsis bahia* Molenock, 1969 (FL, LA, TX estuary marine infauna)  
*Mysidopsis bigelowi* Tattersall, 1926 (FL, NC marine infauna)

*Mysidopsis furca* (NC marine infauna)  
*Mysidopsis* undet. sp. or species (TX, FL Gulf of Mex. marine infauna)

*Mysis* Latreille, 1803 - Mysidae syncarids, Subfamily Gastrosaccinae, Tribe Mysini  
*Mysis gaspensis* O. Tattersall, 1954 (NB, PQ Gulf of St. Lawrence sandy marine interstitial)  
*Mysis stenolepis* S.I. Smith, 1873 (Gulf of St. Lawrence (NB, PQ), NC sandy marine interstitial)

*Neomysis* Zimmer, 1909 or Czernaivsky, 1882 - Mysidae syncarids, Subfamily Gastrosaccinae, Tribe Mysini

*Neomysis americana* (S.I. Smith, 1873) (NB, PQ Gulf of St. Lawrence & Carolinian, MD, NC, VA marine interstitial)

*Neomysis kadiakensis* (AK, BC, WA marine infauna)  
*Neomysis mercedis* (OR, WA marine infauna)

*Nippoleucon* L. Watling, 1991 – Leuconiidae syncarids  
*Nippoleucon hinumensis* (Gamo, 1967) (WA (alien) marine infauna)

*Oxyurostylis* Calman, 1912 - Diastylidae syncarids  
*Oxyurostylis lecrovae* D. Roccatagliata & R.W. Heard, 1995 (Carolinian marine infauna)  
*Oxyurostylis pacifica* Zimmer, 1936 (sCA, wA marine infauna)

*Oxyurostylis salinoi* (TX estuary marine infauna)  
*Oxyurostylis smithi* Calman, 1912. (CA, e,wFL, GA, MD, NJ, TX, VA estuary infauna)

*Pacificabathynella* Schminke & Noodt, 1988 - Parabathynellidae syncarids  
*Pacificabathynella sequoiae* Schminke & Noodt, 1988 (hyporheic in nCA)  
*Pacificabathynella* undescr. sp. (Pb in Vancouver Island caves, BC)

*Pacificanthomysis* C. Holmquist, 1981 – Mysidae syncarids  
*Pacificanthomysis nephrophthalma* (*Acanthomysis n.* Banner, 1948) (WA marine infauna)

*Parabathynella* Chappuis, 1926 - Parabathynellidae syncarids. **Bibl.:**L Delamare Douboutteville & Chappuis 1954

near *Parabathynella* undet. sp. (Phreatic & parafluvial in Sycamore Cr. 32 km ne of Phoenix (Maricopa Co.))

*Paratanais* Dana, 1852 – Paratanaidae syncarids  
*Paratanais intermedius* Dojiri & Sige, 1997 (CA marine benthic)

*Procampylaspis* Bonnier, 1896 - Nannastacidae syncarids  
*Procampylaspis caenosa* Watling & McCann, 1997 (CA marine benthic)

*Pseudoleptocheilia* Lang, 1973 - Pseudozeuxidae syncarid  
*Pseudoleptocheilia filum* (*Leptocheilia f.* Stimpson, 1853) (MA marine sandy infauna)

*Pseudomma* Sars, 1870 – Mysidae syncarids  
*Pseudomma berkeleyi* (WA marine infauna)  
*Pseudomma truncatum* Smith, 1879 (WA marine infauna)

*Pseudotanais* G.O. Sars, 1882 – Pseudotanaidae syncarids  
*Pseudotanais makrothrix* Dojiri & Sieg, 1997 (CA marine benthic)

*Scoloura* J. Sieg & M. Dojiri, 1991 – Anathuridae syncarids  
*Scoloura phillipsi* Dojiri & Sieg, 1991 (CA, WA marine infauna)

*Silophasma* – Anathuridae syncarids  
*Silophasma geminata* (WA marine infauna)

*Sinelobus* Seig, 1980 – Tanaidae syncarids



*Sinelobus stanfordi* (*Tanais* s. Richardson, 1901; *Tanais vanis* Miller, 1940) (CA, WA marine infauna)

*Siphonolabrum* Lang, 1971 – Anathruridae syncarids

*Siphonolabrum californiensis* Dojiri & Sieg, 1997 (CA marine benthic)

*Spilocuma* - Bodotriidae cumaceans, Subfamily Mancocumatinae

*Spilocuma salomani* Watling, 1977 (FL marine infauna)

*Synaptotanais* Sieg, 1980 – Tanaidae syncarids

*Synaptotanais notabilis* Sieg & Winn, 1981 (CA marine benthic)

*Tanaella* Norman & Stebbing, 1886 – Anathuridae syncarids

*Tanaella propinquus* Dojiri & Sieg, 1997 (CA marine benthic)

*Tanais* Latreille, 1831 – Tanaidae syncarids

*Tanais stanfordi* Richardson, 1901 = *Sinelobus stanfordii*

*Tanaissus* Norman & Scott, 1906 – Paratanaidae (once in Tanaidae) syncarids

*Tanaissus psammophilus* (Wallace, 1919) (Virginian (rare), Carolinian marine infauna)

*Tanaopsis* G.O. Sars, 1896 – Anathruridae syncarids

*Tanaopsis cadieni* Dojiri & Sieg, 1997 (CA marine benthic)

*Taphromysis* Bacescu, 1961 - Mysidae syncarids

*Taphromysis bowmani* Bacescu, 1961 (e,wFL marine infauna)

*Texanobathynella* Delamare, Deboutteville, Coineau & Serban, 1975 = *Iberobathynella*

*Typhlotanais* G.O. Sars, 1882 – Typhlotanaidae syncarids

*Typhlotanais crassus* Dojiri & Sieg, 1997 (CA marine benthic)

*Typhlotanais williamsi* Dojiri & Sieg, 1997 (CA marine benthic)

*Vaunthompsonia* Zimmer, 1943 – Bodotriidae hooded shrimp (cumaceans)

*Vaunthompsonia pacifica* Zimmer, 1943 (CA marine infauna?)

*Xenacanthomysis* C. Holmquist, 1980 – Mysidae syncarids

*Xenacanthomysis pseudomacropsis* (Tattersall, 1933) (WA marine infauna)

*Zeuxo* Templeton, 1840 – Tanaidae syncarids

*Zeuxo normani* (*Tanais* n. Richardson, 1905) (CA, WA marine infauna)

Synedra - see diatom

**syntype** - Any specimens used for description when no holotype is designated.

**systematics** - The study of taxon & their relationships. Bibl. - See taxonomy

**T&E** - Threatened, endangered & related types of categories. Incl. endangered, federal, rare, sensitive, & state. A candidate taxa is one in which there is sufficient information on biological vulnerability & threats) to support proposals to list them as threatened or endangered.

## **Tanaidaceans** (= Tanaeid crustaceans)

Class Malacostraca

Subclass Eumalacostraca

Superorder Syncarida

Order Tanaidacea

Suborder Apseudomorpha (=Dikonophora?)

Superfamily Paratanaoidea

Family Leptocheliidae (*Hargeria*, *Heterotanais*) (both once in Paratanaidae)

Family Paratanaidae (*Hargeria*, *Heterotanais*) (now both in Leptocheliidae)

Suborder Monokonophora

Family Parapseudidae (*Halmyrapseudes*)

*Halmyrapseudes* Bacescu & Gutu, 1974 - Parapseudidae tanaids

*Halmyrapseudes* undet. sp. (FL marine benthic)

*Hargeria* Lang, 1973 - Leptocheliidae tanaids (once in Paratanaidae)

*Hargeria rapax* (Harger, 1879) (FL, LA marine infauna)

*Heterotanais* Sars, 1882 - Leptocheliidae tanaids (once in Paratanaidae)

*Heterotanais* undet. sp. (VA marine benthic)

tapeworm - See Worm, Cestoda

**taphonomy** - The study of processes acting on a taxon after its death. D. Lawrence, 1968.

tapir - See **Mammal**, perrisodactyl

## **Tardigrades**

Tardigrada - Protostomia phylum of micrometazoans (.2-1.2mm) most closely allied with either the aschelminth complex or the Arthropoda. Body short & barrel-shaped, ventrally flattened. No neck. Two pointed, chitinous stylets protrude from mouth. Move by 4 pairs of non-jointed, stumpy, retractable limbs. Simple eye spots. All both male & female. Mostly on water films in soil and on moss & lichens. Suck out plant juices. Can form decades-long resting stage if drying occurs. About 440 known species. Syn: water bears. **Bibl.:** Bertolani 1987; Strayer et al. 1988. **Areas:** VA: Riggin 1962; NY: Strayer et al. 1988.

Kingdom Animalia

Clade Pararhropod

Phylum Tardigrada

Class Eutardigrada

Order Eutardigrada (now in Mesotardigrada)

Order Macrobiotidea (see below)

Order Parachela (now in Eutardigrada)

Hypsibiidae

(*Diphascion*, *Isohypsibius* (also in Arctiscidae & Macrobiotidae), *Stringophorus*)

Macrobiotidae (or in Macrobiotidea) (*Dactylobiotus*, *Macrobiotus*)

Class Heterotardigrada (once an order under Eutardigrada)

Order Arthrotardigrada (once a suborder)

Batillipedidae (*Batillipes*; undet. genus in brackish beach at Lake Pontchartrain, LA)

Halechiniscidae, (*Raiarctus*)

Subfamily Halechiniscinae (*Halechiniscus*, *Orzeliscus*)

Subfamily Tanarctinae (*Tanarctus*)

Dipodarctinae (*Dipoarctus*)

Renaudarctidae (*Renaudarctus*)

Stygarctidae (*Stygarctus*, *Parastygarctus*)

Order Macrobiotida (or subsumed in order Parachela)

Macrobiotidae (*Dactylobiotus*)

Class Mesotardigrada (once an order)

Order Parachela (now in Eutardigrada)

***Batillipes*** Richters, 1909 - Batillipedidae tardigrade

***Batillipes bullacaudatus*** (McGinty & Higgins, 1968) (FL, MA, VA, NC marine beach interstitial)

***Batillipes dicrocercus*** Pollock, 1970 (MA, Mediterranean marine beach interstitial)

***Batillipes friaufi*** Riggin, 1962 (FL, MS marine beach interstitial)

***Batillipes gilmartini*** McGinty, 1969 (CA marine beach interstitial)

***Batillipes limnorhae*** Cantacuzene, 1951 (US Atlantic shores, Bahamas marine beach interstitial)

***Batillipes mirus*** Richters, 1909 (MS marine interstitial)

***Batillipes pennaki*** Marcus, 1946 (US Atlantic, West Indies, Brasil, Indian Ocean marine beach interstitial)

***Dactylobiotus*** Schuster et al, 1980 - Macrobiotidae tardigrades

*Dactylobiotus* undescr. sp. (Tx? in MN?)

*Diphascon* Plate, 1889 - Hypsibiidae tardigrades

*Diphascon alpinum* Murray, 1906 (cosmopolitan?/ occasional river hyporheic)

*Dipodarctus* Pollock, 1995 - Dipodarctinae tardigrades

*Dipodarctus anaholiensis* Pollock, 1995 (HI beach interstitial)

*Dipodarctus borrori* Pollock, 1995 (HI beach interstitial)

*Halechiniscus* Richters, 1908 - Halechiniscidae tardigrades Subfamily Halechiniscinae

*Halechiniscus remanei* Schulz, 1955 (FL, cosmopolitan in marine sublittoral interstitial)

*Hypsibius* Ehrenberg, 1848 - Hypsibiidae tardigrades

*Hypsibius convergens* (Urbanowicz, 1925) (cosmopolitan/ occasional river hyporheic)

*Hypsibius dujardini* (DoyEre,1840) (cosmopolitan/ occasional river hyporheic; AB lake benthic)

*Hypsibius* undet. sp. (MN hyporheic)

*Isohypsibius* Thulin, 1928 (= Hyposibius) Hypsibiidae tardigrades

*Isohypsibius augusti* (Murray, 1907 (cosmopolitan/ occasional river hyporheic)

*Isohypsibius granulifer* (Thulin, 1928 (cosmopolitan/ occasional river hyporheic)

*Isohypsibius saltursus* Schuster, Toftner & Grigarick, 1977 (OH hyporheic & interstitial in Lake Tahoe, CA)

*Isohypsibius tetradactyloides* (Richter, 1907) (cosmopolitan/ occasional river hyporheic)

*Macrobiotus* Schultze, 1833 - Macrobiotidae tardigrades

*Macrobiotus dispar* Murray, 1907 (cosmopolitan/ occasional river hyporheic)

*Macrobiotus furcatus* (Ehrenberg, 1858) (NY freshwater sandy beach interstitial)

*Macrobiotus grandipes* Schuster, Toftner & Grigarick, 1977 (interstitial in Lake Tahoe, CA)

*Macrobiotus (Macrobiotus) hufelandi* Schultze, 1834 (cosmopolitan/ occasional river hyporheic)

*Macrobiotus macronyx* Dujardin, 1851 (cosmopolitan/ occasional river hyporheic)

*Macrobiotus* undet. sp. or species (CO, MN, TX hyporheic; MI interstitial)

*Orzeliscus* Bois-Reymond-Marcus, 1952 - Halechiniscidae tardigrades Subfamily Halechiniscinae

*Orzeliscus belopus* Bois-Reymond-Marcus, 1952 (cosmopolitan in marine sublittoral interstitial)

*Parastygarctus* Renaud-Mornant, 1965 - Stygarctidae tardigrades

*Parastygarctus sterreri* Renaud-Mornant, 1970 (FL marine beach interstitial)

*Raiarctus* Renaud-Mornant, 1981 - Halechiniscidae tardigrades

*Raiarctus colurus* Renaud-Mornant, 1981 (FL marine beach interstitial)

*Renaudarctus* Kristensen & Higgins, 1984 - Renaudarctidae tardigrades  
*Renaudarctus psammocryptus* Kristensen & Higgins, 1984 (FL marine beach interstitial)

*Steringophorus* Digenean, 1979 (both marine and freshwater) Hypsibiidae tardigrades  
*Steringophorus bertolani* (*Thulinia* b. R.Bertolani, 1981) (stygobiont & hyporheic in NY)  
*Steringophorus ruffoi* (*Thulinia ruffoi* R.Bertolani, 1981) (stygobiont & hyporheic in NY)

*Stygarctus* Schulz, 1951 - Stygarctidae tardigrades  
*Stygarctus bradypus* Schulz, 1951 (Indian Ocean, Europe, Malaysia, US Atlantic marine beach vadose interstitial)

*Stygarctus goubaultae* Renaud-Mornant, 1981 (FL marine beach interstitial)  
*Stygarctus granulatus* Pollock, 1970 (NC,MA marine beach vadose interstitial)

*Tanarctus* Renaud-Mornant, 1959 - Halechiniscidae tardigrades Subfamily Tanarctinae  
*Tanarctus arbospinosus* Lindgren, 1971 (NC marine beach interstitial)  
*Tanarctus tauricus* Renaud-Debyser, 1959 (FL marine beach interstitial)

*Thulinia* R. Bertolani, 1981 (junior homo. of *Steringophorus*)

**taxa** - Plural of taxon.

**taxis** - The movement of an organisms in response to a stimulus. Incl. rheotaxis, telotaxis.

**taxon** - A named group of organisms of any rank, such as a particular species, family, or class, also the name applied to that unit.

**taxonomy** - The theory & practice of classifying lifeforms according to their natural affinities, especially their evolutionary ones. Syn.: systematics

**Taxonomy Bibl.:** (in title; see citations in taxon groups) Ball, G. 1966a, 1985; Barnhart 1975; Barr 1979a; E. Berry 1943; Chandler 1985; Chippindale 1995; G. Davis 1989; Ferguson 1974; L. Fleming 1969; Fryer 1985; A. Gurney 1961; A. Hamilton 1973; Herman 1970; C. Hoff 1942 1964 1981; R. Hoffman 1958; Holsinger 1967e; Hyman 1928 1937; Keeton 1960; Kelson 1952; Lippert & Butler 1976; R. Martin 1969; Millidge 1980; Mockford 1984; O. Park 1951 1953b; Rhoades 1944a; G. Robinson 1980; Rosen 1962; C. L. Smith 1980; Stock 1977 1981; Valentine 1943; Vogel 1964.

teaching - Anon. 1975; Ashley 1996; Benedict 1967g, 1980a; Canaday & Vitello 1996; Eddleman et al 1977

**telotaxis** - Movement of a motile species in response to a single stimulus.

**temperature** (T0C) - Cave-adapted species are often sensitive to slight T. changes, which increases in caves with large entrances, small caves, caves with at greatly different elevated entrances, & caves near the surface. Public tour groups can raise T. 1/2o when they pass by.

Lights left on overnight can raise T. a degree C.. Roughly a 10o C increase doubles metabolic rate of cold-blooded species (most macroinvertebrates, reptiles & amphibians. Concentrations of dissolved CO<sub>2</sub> & O<sub>2</sub> are inversely proportional to T. Incl. average, high & low/day & year.

**temporal** (circadian, circaseptan, seasonality) rhythms & changes - Campbell 1976, 1976a; Chiba, Cutkomp & Halberg 1973; Jegla 1966; Jegla & Poulson 1968, 1970; Keith 1975a; Lamprecht & Weber 1985; Palmer 1990; Poulson 1973; Poulson & Jegla 1966; Reichle, Palmer & Park 1965; Simon 1973; Studier, Lavoie, Nevin & McMillin 1988  
terminology - Barr 1963a, 1969; Benedict 1977; Brandon 1962; Christiansen 1962; Erdos 1973; Gnaspini 1992 Hamilton-Smith 1971

**Thallophyta** - Plants not separated into roots, stems and leaves. The vegetative bodies are called thallus and are common in commercialized caves. (Syn.: thallophytes).

**Theria** - Subclass of Class Mammalia. Incl. Pantotheria (extinct ancestors of present-day mammals), Metatheria (marsupials - opossum only representative in US) and Eutheria (placental mammals - all other present-day cave associated species in US and Canada).

**thermal conductance** - A measure of the insulative properties of the skin and/or pelage.

**thermoneutrality** - The ambient temperature at which the basal metabolic rate of a hemeotherm is minimal.

**thermophile** - Type of species, such as in hot springs, that prefer high or warm T. Syn: thermophilic.

**thermoregulation:** McManus 1976; Pagels 1975; Herreid 1961, 1963; Hock 1951; Lichtg & Leitner 1967; Menaker 1960, 1962; O'Farrell & Bradley 1977; Perkins 1976-7; Reeder 1949; Reite & Davis 1966; Remillard 1958; Twente & Twente 1964

## **Thermobaenaceans**

Thermobaenacea is a small crustacean order of Class or Subclass Malacostraca & superorder Pancarida. About 10 sp. In 4 genera. Carapace reduced in size, esp. in males. Body stout, first thracic segment fused to cephalon (cephalothorax). Eyes usually absent. About 4 mm. long. Differ from Peracarida in having a dorsal brook pouchy. First pair of thoracopods modified as maxillipeds while thoracopods 2-8 are biramous and lack epipodites. **Bibl.:** Barker 1958, 1959; Maguire 1964, 1965, J. Stock 1986b; Stock & Longley 1981; Wagner 1988.

Monodellidae (also subsumed in Thermosbaenidae) (*Monodella*)

Kingdom Animalia

Phylum Arthropoda

Subphylum Crustacea

Class Malacostraca

Superorder Pancarida

Order Thermosbaenacea

Monodellidae (*Monodella*) (also put in Thermosbaenidae)

*Monodella* Barker, 1959 - Monodellidae thermobaenid (also put in Thermosbaenidae)

Bibl.: Wagner 1988, 1990

*Monodella texana* Maguire, 1965 (type locality cave in Hays Co., artesian wells in Hays, Bexar & Uvalde Cos., TX/Pb G3) (likely derived from marine ancestors) **Bibl:** Stock & Longley 1981.

**thermotaxis** - Directional motion of motile species or organelles due to a temperature difference.

**thigmotaxis** - Active response to touch.

**threatened** - A T&E defined in ESA as any species which is likely to become an endangered species within the foreseeable future throughout a significant portion of its range.

threatened - See endangered species

threshold troglaxens & troglaphiles - See terminology

**threshold** - 1. Syn: twilight. 2. An area of reduced light around a cave entrance, generally before the drip line is reached & where area type (threshold troglaxenes & troglaphiles) live. Syn. for threshold species is pro-epigean. 3. Twilight zone where microclimate rapidly becomes cavelike. 4. Steep part of (half-)blind valley above a stream sink.

## Thrips

Insect of Order Thysanoptera (= Physopoda). Of Subclass Pterygota, Division Neoptera, Subdivision Acercaria, Section Condylognatha. Name from greek thysanos, "fringe" or "tassel," referring to long hairs fringing both pairs of strap-like wings (sometimes wingless). Body black, dark brown or yellow, < 1/8 inch long. Soft-bodied; adults more chitinized than nymphs. Antennae short, sometimes as long as head and thorax but usually shorter. Right mandible vestigial, but other mouthparts elongate into stylets for piercing plant tissue or sucking blood. They are paurometabolous, with terrestrial eggs, nymphs (larvae) and adults. Modified to resemble holometabolism. Nymphs resemble adults except for lack of wings. Found in flower heads, under bark, on leaves and fruit, in leaf litter, moss. Some feed on algae, fungi, insect eggs and larvae, mites and even nematodes. About 4,500 species with over 600 in US. Earliest fossils are Permian. Rare in caves. Bibl.: Jacot-Guillarmod 1970-78; Stannard 1968

Suborder Terebrantia (boring thrips) (two tarsomeres; terminal abdominal segment not tubular)

Superfamily Thripodea

**Heterothripidae** (tree thrips)

Tribe Heterothripini (*Heterothrips*)

**Thripidae** (thrips)

Subfamily Thripinae:

Tribe Thripini (*Frankliniella*)

Suborder Tubulifera (banded thrips) (front tarsi with 1 tarsomere and middle and hind tarsi with 2 tarsomeres; terminal abdominal segment tubular)

Superfamily Phlaeothripoidea

**Phlaeothripidae** (tube-tailed thrips)

Subfamily Phlaeothripinae (*Andraneothrips*)

*Andraneothrips* Uzel, 1895 (= *Notothrips* Hood, 1933) Phlaeothripidae thrips, Subfamily Phlaeothripinae (18 species in US or Canada)

*Andraneothrips* undet. sp. (Ac in Travis Co., TX)

*Frankliniella* Karny, 1910 - Thripidae thrips, Subfamily Thripinae, Tribe Thripini (40 species in US or Canada)

*Frankliniella* undet. sp. (Ac in Isopit, Bexar Co., TX)

*Heterothrips* Hood, 1908 (= *Phyllothrips* Buffa, 1908; *Phyllothripsiolus* Strand, 1912; *Protēmnothrips* Hood, 1937) Heterothripidae thrips, Tribe Heterothripini (4 species in US or Canada)

*Heterothrips* undet. sp. (Ac in TX)

thysanurans - See silverfish and bristletails

tick - See mite, families Argasidae & Ixodidae.

**Tick-bite Paralysis** - Usually disappears when tick is removed.

tiger - Cat carnivora. - See **Mammal, cat**.

**time activity budget** - The amount of time allocated to various activities (e.g. day roosting, night roosting, flight, rest, grooming), expressed in absolute timeunits or by percent of total activity.

## Toads

Amphibian of Subclass Apsidospondyli

Superorder Salientia

Order Anura. Areas: OH: C. Walker 1946

Suborder Neobatrachia,

Superfamily Bufonoidea

**Bufonidae** (true toads, bufonids)(*Bufo*)

**Pelobatidae** (pelobatids, spadefoot and horned toads) (*Scaphiops*, *Spea*)

*Bufo* Laurenti, 1768 (toads) Bufonidae toads (18 species in US or Canada)



***Bufo americanus a.*** Holbrook, 1836 (se.Canada to E/ American toad/ Tx or Ac in MD, MS, WV; Ac in OH)

***Bufo boreas*** Baird & Girard, 1852 (sAK to wCanada, s. toCO, UT, NV, n.Baja CA/ TTx or Ac in CA, WA/ western toad/ late Wisconsinan extralimital in Smith Cr. C., NV)

***Bufo compactilis*** Wiegmann, 1833 (Sonora toad/ central highlands of Mexico/ Tx in TX)

***Bufo debilis*** Girard, 1854 (se AZ to sw KS, s. to Mex./green toad / TTx in wTX/ KS T&E S2, global G5 rank)

***Bufo punctatus*** Baird & Girard, 1852 (canyon toad/ se CA, UT, wKS, s. to Mex./ Tx in TX; Late Pleist. in Gypsum C., NV/ KS T&E S2, global G5 rank)

***Bufo terrestris*** (*Rana t.* Bonnatere, 1789) (southern toad/ seVA & LA to n.FL/ southern toad/ Tx in FL; rare Ac or Ttx in NJ/ cf. s.extralimital Pleist. in Cheek Bend C.,TN)

***Bufo valliceps*** Wiegmann, 1833 (Gulf Coast toad/ SE to Costa Rica/Tx in TX; extralimital sw. in Fowlkes C., TX)

***Bufo woodhousei*** Girard, 1854 (extralimital in Late Pleist. in Devils Den Sinkhole (Levy Co.),FL/ sON to US (except Great Basin, Pacific Coast) to Mex./ Woodhouse's toad/ Tx in KY; Ac in OK /late Wisconsinan extralimital in Smith Cr. C.,NV)

***Bufo woodhousei bexarensis*** Mecham, 1958b (extinct in Wisconsinan Friesenhahn C., TX)

***Bufo woodhousei fowleri*** Hinckley (= *B.f.*, junior syn. of *B.w.*; unjustified use as ssp. /in *Bufo americanus* group) (Lake MI e to PA, seNY, sNE, s.to Gulf (excl. coastal SC, GA, sFL)/ Ac in OH; extralimital in RanchoLabrean Reddick I (Marion Co.) & Haile (Alacua Co.) Sites, & late Wisconsinan in Devil's Den, FL)

***Scaphiopus*** Holbrook, 1836 - Pelobatidae toads, subfamily Pelobatinae (6 species in US or Canada)

*Scaphiopus bombifrons* = *Spea bombifrons*

***Scaphiopus couchi*** Baird, 1854 (Couch's spadefoot) (seCA, sAZ & NM, swOK s.to nMex./ Tx in TX)

***Scaphiopus hammondi h.*** Baird, 1859 (western or Hammond's spadefoot, Hammonds' spea) (sCO to NM, eAZ, nwTX & nwMex./ Tx in TX)

*Scaphiopus intermontanus* = *Spea intermontana*

***Spea*** Cope, 1866 (Western spadefoots) Pelobatidae toads, subfamily Pelobatinae (2 species in US or Canada)

*Spea* cf. *bombifrons* (*Scaphiopus b.* Cope, 1861) (now in n Mex, n. to sSK,sAB,MB, eMT, wSD, wND,eWY, NB, wOK, eCO, NM, nwTX, disjunct in sTX/ western or Plains spadefoot/ Pleist. Bechan C. (UT, 11,670 to 12,900 yrs. BP) west extralimital)

*Spea intermontana* (*Scaphiopus intermontanus* Cope, 1883) (sBC s. to eCA, e. to CO, nwNM/ Mexican or Great Basin spadefoot/ Pleist. Bechan C. (UT, 11,670 to 12,900 yrs. BP))

Stylopsids (= stylopoids) Insects of Order Strepsiptera, Insect Order of Subclass Pterygota, Division Neoptera, Subdivision Endopterygota (=Holometabola), Section Panorpidia, Subsection Anthophora. Not known from US or Canadian caves or aquatic interstitial habitats

**TOC** - Total organic content in milligrams per liter.

**topotype** - Specimen taken from same locality as holotype.

**torpidity** - The state or quality of being dormant or inactive; a temporary loss of all or part of sensation or movement.

**torpor** (a state in which an animal's body temperature is depressed below homeothermic levels and that results in a lowered metabolic rate and an inability to perform normal locomotor functions (e.g. flight). Bibl.: Krutzsch & Hughes 1959; W. Davis 1965; ; Krutzsch & Hughes 1959;

tortoise - See turtle

**Tp** - Abbrev. for troglophile.

**trace organic** - Evidence of life. Incl. coprolite, petroleum, asphalt, etc.

**trace fossil** (incl. casts, coprolite, molds, tracks, burrows, organics). See also coprolites. Eifet 1995; Turner & Szukalski 1985

**track** - Prints of an animal. Syn.: trail, spoor. See jaguar, human

transition zone - See twilight

**trap, natural** - Usually vertical shafts into which animals fall. Sometimes a bone cave.

trap door - see Ctzenizidae

**tree (cast), lava** - An igneous half-cylindrical projection above the surrounding surface, caused by the flow of lava against the upflow side of a tree which then burns. Unusual & mostly found on recent flows. Fossils - Turner & Szukalski 1985

**tree-mold** - A cylindrical hollow in an igneous flow formed by the envelopment of a tree by the flow, solidification of lava in contact with the tree & removal of the charcoal & ash from the burned tree.

Trematoda – See worms.

Trichoptera (= Phryganoidea) - Phylum or Order (caddisflies & water moths). Of Superorder Amphisomenoptera, Section Mecopterida, Subdivision Endopterygota See **caddisfly**.

**Trilobite** – Extinct order of arthropod.

*Anisopyge perannulata* (wallrock in Carlsbad Caverns Natl. Park, NM)

**troglobiont** or troglobite (in title) - Anonymous 1977; Barr 1968; Barr & Holsinger, 1971; Barr & Peck, 1965; Benedict, E., & Malcolm 1973a; Besharse & Brandon 1973, 1974-a, 1976; Besharse & Holsinger, 1977; Bowman, T. 1964, 1975, 1981; B. & Beckett 1978; B. & Hobbs III 1983; B. & Lewis 1984; B. & Longley 1976; B. & Sket 1985; Brandon 1967-8, 1971; Briggs 1973, 1983, 1986, 1992; Brindle 1980; Caine 1974-a; Causey 1960b-c; Christiansen 1971; Collins & Holsinger 1981; Conde' 1953; Cooper, J. & C. 1974, 1978; Cram & Anderson 1976; Crawford 1974a-c; Deelman-Reinhold 1981; Dickson 1975-9; D. & Holsinger 1981; Eberly 1965; Elliott 1972; Estes 1978; Estes & Holsinger 1976; Fleming, L. 1972; F. & Steeves, 1972; Franz 1978; Franz & Hobbs 1983; Franz & Lee 1982; Franz et al. 1977; Gertsch 1992; Gunter, Gordon & Eleutherius 1971; Hart & Hart 1966; Hart & Hobbs 1961; Hobbs, Jr. 1971; Hobbs, Horton, Jr. & Barr 1960, 1972; Hobbs, Jr. & Bedinger 1964; Hobbs, Jr. & Cooper 1972; Hobbs, Horton, Jr. Hobbs & Daniel; Hobbs, Jr., Krantz & Lee 1976; Hobbs, Jr., K. & Means, 1972; Hobbs, III 1973b, 1980-1, 1993, 1996; Hobbs, III & Barr 1960, 1972; Hobbs, III, Barr, & Daniel 1977; Hobbs, III & Brown 1987; Hobbs, III & Franz 1991-2; Holsinger 1963-a, 1967, 1981, 1988; H., & Bowman 1973; H. & Dickson 1977; H. & Estes 1978; Howarth 1981a, 1986-7; Hurst 1976; Kane 1991; Kane & Culver. 1991; Kane, Norton & Poulson 1975; Kane & Richardson 1991; Karnei 1979; Kawakatsu & Mitchell 1981; Keith, J. 1979, 1984; Lee, G. et al. 1977; Lewis, J. 1982a, 1983b-4; Lewis & Lewis 1983; Liebherr & Samuelson 1992; McNulty 1978; Manicasteri & Argano 1989; Marquart 1979; Marshall & Peck 1985; Mitchell, R. 1965, 1968a, 1971-a-b; M. & Reddell 1965; Muchmore 1970b, 1979-a, 1983; Nicholas 1960-a-b, 1969; Nickol & Whittaker 1978; Norton, Kane et al. 1975; Poulson 1985a; P. & White 1971; Relyea & Bankowski 1976; Relyea & Sutton; Roth, V. 1992; Russell, W. 1976; Schram 1982; Smith, D.G. 1984; Steeves 1963, 1963a, 1964a, 1965a, 1966, 1968a, 1969; S. & Holsinger 1968; S. & Seidenberg 1971; Stone 1991; Streever 1996; Sweet 1974, 1982; Thompson, D. & Jones 1996; Wilkens 1980; Zacharda & Pugsley 1988.

**troglobiont** - A troglodyte, especially one living in the lightless waters of caves.

**troglobite** - A type animal restricted to living its entire life cycle in cave darkness & only accidentally leaving it. Abbrev. as Tb. Many biologists use the term in a more restrictive sense for species also "modified to the cave environment" (Hamilton-Smith, 1971), especially in the attenuation of bodies and/or appendages.

**troglo-dyte** - A human cave dweller.

**troglo-morphic** - Adj. for morphologic cave adaptations, such as body & limb attenuation.

**troglophile** - Abbrev. as Tp. Current type of animal habitually entering the dark zone of a cave but necessarily spending part of its time outside such as some bats. Incl. habitual, facultative, threshold. Bibl. (t. in title) - Bruce Conn & Demoss, 1984; Choate & Rogers 1976; Conn, D., 1984; Crowell, 1981; Gourbault 1975; Hobbs, III 1995a; Holsinger 1967a; Jenio 1980; McCormick & Sarbu; McNulty 1978-a; Weise 1953

**troglophobe** - Animal unable physically or psychologically to enter the dark zone or other underground area.

**trogloxene** - animal entering cave but not living there permanently. Most bats are non-obligates as they can use other habitats. Incl. hibernating, obligate (syn: habitual), & threshold. Abbrev. as Tx.

trophic substances - Fingerman & Mobberly 1969

**trophic levels** - Feeding levels in a food chain, such as producers, herbivores, & so on. Most food chains form no more than 4-5 trophic levels. Low energy cave may have only 2-3.

**trophic** - the nutrient status of a water body.

trophic relationships/levels - Culver 1985

**tropism** - Automatic orientation of a taxon, as in a plant growing towards light. Cf. taxis, rheotaxis, thermotaxis, tropotaxis

tropotaxis - Movement toward or away from a stimulus received by bilateral sense organs.

tubificid worm -. See worm, earthworm.

## Tunicates

Phylum Cordata, Subphylum Oprochordata: Class Ascidiacea

Order Enterogona (or Suborder Aplousobranchia)

Suborder Aplousobranchia (or order)

Family Clavelinidae (*Clavelina*, *Pycnoclavella*)

Family Didemnidae (*Trididemnum*)

Family Polyclinidae (=Synoicidae) (*Ritterella*)

Family Polycitoridae (*Archidistoma*, *Pycnoclavella* (now in Clavelinidae))

Order Phlebobranchia (= Diktyobranchia)

Family Agnesiidae (*Agnesia*)

Family Ascidiidae (*Ascidia*)

Family Cionidae (*Ciona*)

Family Corellidae (*Chelyosoma*, *Corella*)

Order Stolidobranchia

Family Mogulidae (*Bostrichobranchnus*, *Eugyra*, *Molgula*)

Family Pyuridae (*Boltenia*, *Halocynthia*, *Pyura*)

Family Styelidae (*Styela*)

*Agnesia* Michaelsen, 1898 - Agnesiidae tunicates

*Agnesia septentrionalis* Huntsman, 1912 (WA marine infauna)

*Archidistoma* Garstang, 1891 - Polycitoridae tunicates

*Archidistoma ritteri* (*Eudistoma ritteri* Van Name, 1945) (CA sea caves)

*Ascidia* Linnaeus, 1767 - Ascidiidae tunicates

*Ascidia ceratodes* (*Phallusia c.* Huntsman, 1912) (WA marine infauna)

*Ascidia paratropa* (*Ascidiopsis p.* Huntsman, 1912) (WA marine infauna)

*Boltenia* Savigny, 1816 - Pyuridae tunicates

*Boltenia echinata* (Linnaeus, 1767) (NB, PQ Gulf of St. Lawrence sandy marine interstitial)

*Boltenia villosa* (WA marine infauna)

*Bostrichobranchnus* Traustedt, 1883 - Molgulidae tunicate

*Bostrichobranchnus pilularis* Verrill, 1871) (GA brackish marine infauna)

*Ciona* Fleming, 1922 - Cionidae tunicates

*Ciona intestinalis* (*Ascidia i.* Linnaeus, 1767) (WA marine infauna)

*Chelyosoma* Broderip & Sowerby, 1830 - Corellidae tunicates

*Chelyosoma columbianum* Huntsman, 1912 (WA marine infauna)

*Chelyosoma productum* Stimpson, 1864 (WA marine infauna)

*Clavelina* Savigny, 1816 - Clavelinidae tunicates

*Clavelina huntsmani* Van Name, 1941 (bulb tunicate/ CA sea caves)

*Corella* Alder & Hancock, 1870 - Corellidae tunicates

*Corella columbianum* (WA marine infauna)

*Eugyra* Alder & Hancock, 1870 – Molgulidae tunicates

*Eugyra arenosa* (Alder & Hancock, 1848) (WA marine infauna)

*Halocynthia* Verrill, 1879 - Pyuridae tunicates

*Halocynthia hilgendorfi* (*Cynthia h.* Traustedt, 1885) ssp. *igaboja* Oka, 1906 (WA marine infauna)

*Molgula* Fores & Hanley, 1848 - Molgulidae tunicate

*Molgula manhattensis* (Dekay, 1843) (Carolinian, Virginian marine infauna)

*Molgula occidentalis* (Traustedt, 1883) (Carolinian marine infauna)

*Pycnoclavella* Garstang, 1891 - Clavelinidae tunicate (once in Polycitoridae)  
*Pycnoclavella stanleyi* berrill & Abbott, 1949 (Ttx? in sand of CA sea caves)

*Pyura* Molina, 1782 – Pyuridae tunicates  
*Pyura haustor* (*Cynthia haustor* Stimpson, 1864) (WA marine infauna)  
*Pyura mirabilis* (*Cynthia m.* Von Drasche, 1884) (WA marine infauna)

*Ritterella* Harant, 1931 (= *Sigillinaria*) Polyclinidae tunicates  
*Ritterella pulchra* (*Sigillinaria pulchra* Ritter, 1901) (Ttx in CA sea caves)  
*Ritterella rubra* Abbott & Trason, 1968 (Ttx in CA sea caves)

*Styela* Fleming, 1822 – Styelidae tunicates  
*Styela gibbsii* (*Cynthia g.* Stimpson, 1864) (WA marine infauna)

*Trididemnum* Della Valle, 1881 - Didemnidae tunicates  
*Trididemnum opacum* (Ritter, 1907) (Ttx? in sand of CA sea caves)

Turbellaria – See worms.

**turnover time** - Duration in which a species' entire standing biomass is replaced

## **Turtles, terrapins & tortoises**

Reptile (Class Reptilia) of Order Testudines (testudines; turtles, terrapins & tortoises). 244 known species. **Bibl.:** Ernst et al., 1994; Parris & Daeschler, 1995

Infraorder Cryptodira

Superfamily Trionychoidea

(Kinosternidae (mud & musk turtles) (*Kinosternon*))

Superfamily Testudinoidea

Chelydridae (*Chelydra*)

Emydidae (emydid, freshwater, pond & river turtles, terrapins)  
(*Chrysemys*, *Clemmys*, *Emydoidea*, *Terrapene*, *Trachemys*)

Testudinidae (tortoises) (*Emydoidea*, *Geochelone*, *Gopherus*)

*Chelydra* Schweigger, 1812 (common snapping turtles; snapping turtles)- Chelydridae turtles (1 species in US or Canada)

*Chelydra serpentina* (Linnaeus, 1758) (snapping turtle) (sAB to NS, s. To Gulf/ Tx in San Antonio Springs, Bexar Co., TX)

*Chrysemys* Gray, 1844 (painted turtles) Emydidae turtles (1 species in US or Canada)

*Chrysemys picta* (Schneider, 1783) (BC to NS, s. to GA, w. to LA, n. to OK, nw to OR, disjunct in SW/ painted turtle/ Ttx or Ac in 2 NJ caves)

*Clemmys* Ritgen, 1828 (pond turtles; marsh turtles)- Emydidae turtles (4 species in US or Canada)

*Clemmys insculpta* (Le Conte, 1830) (NE to eWI, Great Lakes, nVA/ Wood Turtle/ Late Irvingtonian (Port Kennedy C.,PA) & late Pleist. (mTN)/ Ac in NJ)

*Clemmys marmorata m.* (Baird & Girard, 1852) (Northern Pacific or Northwestern Pond Turtle/ w.BC to w.Baja CA/ TTx or Ac in CA)

*Emydoidea* Gray, 1870 (Blanding's turtles) Testudinidae turtles (1 species in US or Canada)

*Emydoidea blandingii* (Holbrook, 1838) (now in IA, nIN, nIL, MI, NB, seON, nOH, s eSD, sWI/ Blanding's Turtle/ late Irvingtonian fossil south extralimital in Port Kennedy (PA) & Brynjulfson (MO) C. & Enon Sink (MO, Wisconsinian), early Sangamonian in Nye Sink,OK)

*Geochelone* Fitzinger, 1835 (geochelone tortoises; typical tortoises) - Testudinidae turtles (1 extant species in US or Canada)

*Geochelone mlynarskii* Auffenberg, 1988 (Irvingtonian extinct in Coleman IIA (Sumpter Co.), FL)

*Geochelone (Hesperotestudo) percassa (Clemmys p.* Cope, 1899) Parris & Daeschler, 1995 (extinct, type locality in late Irvingtonian Port Kennedy C., PA)

*Geochelone* cf. *crassicutata* (Leidy, 1889) (extinct in Moore Pit (Dallas Co., TX), early Wisconsinian in Haile XIVA near Haile, Alachua Co., FL & late Wisconsinian in Devil's Den.,FL))

*Geochelone incisa* (Hay) (extinct/Late Pleist. in Devils Den Sinkhole (Levy Co.,FL), early Wisconsinian in Haile XIVA near Haile, Alachua Co., FL & Rancho Labrean Arredondo Site (Alacua Co.),FL)

cf. *Geochelone* undet. sp. (Late Pleist. extinct in Tom Moore C., MO)

*Geochelone wilsoni* Milstead, 1956 (extinct tortoise in Wisconsinian Friesenhahn (Bexar Co.,TX) & Dry Cave, Eddy Co.,NM & Rancho Labrean in Edwards Co.,TX ) **Bibl.:** Parmley 1986

*Gopherus* Rafinesque, 1832 (gopher tortoises)- Testudinidae turtles (3 extant species in US or Canada)

***Gopherus agassizii*** (Cooper, 1863) (now in seCA & sNV, se to EAZ, Mex./ desert tortoise/ Wisconsinan extralimital in e. in Dry (Eddy Co.) & Shelter & Robledo (probably, Pleist.?), NM; Holocene or Pleist. extralimital at Lehman C., sNV)

***Gopherus*** undescr. sp. (extinct/ Rancholabrean in Nye Sink, Beaver Co.,OK)

***Kinosternon*** Spix, 1824 (American mud and musk turtles; mud turtles) Kinosternidae turtles (5 species in US or Canada)

***Kinosternon flavescens*** (Agassiz, 1857) (nNB to TX, NM, seAZ, disjunct in nwIL, adjacent IA/ yellow mud turtle/ Ac in TX)

***Kinosternon sonoriense*** (LeConte, 1854) (sAZ, swNM, nMex. epigean/ Sonora Mud Turtle/ TTx in AZ)

*Pseudemys scripta* = *Trachemys s.*

***Trachemys*** Agassiz, 1857 (slider turtles; sliders) Emydidae turtles (2 species in US or Canada)

***Trachemys scripta petrolei*** (extinct Pleist. In Reddick I Site, (Marion Co.) & Arrendondo Site (Alacua Co.), FL)

***Trachemys scripta*** (*Pseudemys s.* Schoepff, 1792; *Chrysemys s.*) (nFL to VA, sMW, seNM/ Common or Pond Slider/ TTx in AZ)

***Terrapene*** Merrem, 1820 (box turtles) Emydidae turtles (2 species in US or Canada)

***Terrapene carolina*** (Linnaeus, 1758) (FL to sMA, MI, sNY, w.to sIL,eKS, eOK,e TX/ Eastern Box Turtle/ extralimital to west in Kendall Co.,TX; Yarmouthian Pleist. extralimital in Port Kennedy C.,PA/ Ac in NJ, MD; Tx or Ac in nAL, nMS, TN; Ttx in WV) **Bibl.:** Poly & Noggle 1996

***Terrapene ornata*** (Agassiz, 1857) (western box turtle) (sSD,IA,eIL, s.to LA,TX, w.to swAZ/ Ac in TX)

**twilight zone** - The area of a cave between the drip line (if present) and where sunlight penetrates. Peck & Richardson, 1976; Culver & Poulson, 1970; Hellman, 1989; Lavoie, Cyr, et al., 1991; Lavoie, Poulson, Helf 1996; Olson, R. 1973; Peck, 1976; Richard, C.M. et al., 1993-4, 1995; Nicholas 1971; Poulson & Culver 1981

**twin species** - Very similar species in form and which live in the same region.

**tychoc(o)enic** - Refers to species with a fairly strict dependence on a specific mix of ecologic factors found in several similar habitats. Syn.: Preferential

type specimen or taxon - Syn: holotype.



**type of species** - Incl. area (benthic, meiofauna (endogean & phreatobia (phreatobite)), lotic, threshold, & wall), chemotroph, chemoorganotroph, cryophilic, heterotroph, inquilism, locality, parasite, stygobiont (St), troglobite (Tb), troglophile (Tp) (threshold), troglophage, troglaxene (obligate (Tx) & threshold), & T&E (endangered, federal, rare, sensitive, & state).

ungulate - Order of hoofed mammals, including the Perissodactyla, Artiodactyla and the extinct and ancestral Condylartha. See bison, deer, goat, horse, pronghorn, sheep & tapir in **Mammals**

**Uniramia** - Subphylum of arthropods, incl. insects & myriapods.

Urodela - See salamander.

**valley fever** - Disease caused by *Coccidioides immitis* fungi in SW, known from Inyokern C..  
**Bibl.:** W. Lewis 1992a.

**variety** - A taxon division below that of subspecies, abbrev. as var.

**vertebrate** - Animal with backbone. Incl. amphibian, bird, fish, mammal & reptile.

**vicariance biogeography** - Where distribution of taxon is due to dispersal rather than sweepstakes routes. New barriers & extirpations result in disjunct ranges.

Virginian – Area that includes nSC, n. to NJ.

viviparous - Reproduction in which eggless young are internally maintained and nourished by the mother before birth.

vole - See **mammal**, vole

**voltine** - Refers to the number of generations during the year or during the reproductive season. Incl. univoltine, bivoltine, polyvoltine.

**voltinism** - Refers to the frequency with which the life cycle is completed within a year

## Walkingsticks

(phasmids; stick & leaf insects). Once in Orthoptera, now in Class Insecta, Order Phasmatodea (= Phasmodea, Cheleutoptera, Gressoria), Subclass Pterygota, Division Neoptera. Body elongate, cylindrical and sticklike (stick insects) or flattened and leaflike (leaf insects). 5-35 cm. Long. Two pairs of wings may be more or less reduced; a few species are wingless. Strong, biting mandibulate mouthparts. Antennae filiform or moniliform with 8->100 segments. Compound eyes but only a few with ocelli. Prothorax short, the meso- and metathorax long. Legs similar, with small, widely separate dcoxae. Tarsi usually with 5 segments. Paurometabolous. >2,500 species, mostly tropical. May be most closely related to Caelifera in Orthoptera or with Dermaptera and Grylloblattodea **Bibl.:** Bedford 1978; Bradley & Galil 1977; J. Helfer 1963

Phasmatidae (walkingsticks)

undet genus (4,340 to 2,260 years old in scNM *Neotoma* woodrat nest)

**wall association** - A specific group area type of invertebrates frequently found on the walls & ceilings of the deep threshold & transition zones of caves.

walrus - Odobenidae family of Pinnipeds - See walrus in **Mammal**

water - Ballinger & Ryan 1990; Barr 1976; Bechler 1983; Branstetter 1974; Chess & White 1989; Glasco 1992; Greer 1985; Jones 1983; Mathews et al 1977; Pearson 1996; Poulson 1988, 1992; Pride et al. 1989, 1991; Lewis 1996; Rusterholtz 1989; Rusterholtz & Mallory 1990.

water striders - See **Bugs**

**water "flea"** - Amphipod or an aquatic branchiopod crustacean of Order Cladocera.

**weaning** - Time when a juvenile begins to take food other than its mothers milk.

weasel - See **Mammal**, weasel

**weather** (see climate, habitat) - Nixon 1975a; Poulson, Lavoie & Helf 1995

**webspinners** – Insects of Order Embioptera, not known from US or Canadian caves or aquatic interstitial. **Bibl.:** E. Ross 1940, 1944, 1984

webworm - See Mycetophilidae in **Flies**

weevils – See Beetles

## **Whipscorpions & Schizomids**

Class Arachnida, Order Uropygi (=Thelyphonida), Suborder Schizomida (schizomids & whipscorpions). Or order Pedipalpi, suborder Uropygi (schizomids & whipscorpions). whipscorpions, whipless or tailless whipscorpions are of Order Amblypygi (=Amblypygida)

20-70 mm. long arachnids. Scorpion-like with long, slender tails. Gas defense from rear end smells like acetic acid, hence the common name of vinergarone. Having no venom, they kill nocturnal prey (roaches, grasshoppers, worms, slugs) by crushing them. Use front legs like antennae. Four pairs of weak, simple eyes. Abdomen with 12 segments, the last three form small plate (pygidium). Dig holes under rock. Young sucker to back of fasting mother. When they leave upon molting, the mother dies. Maturity reached after three molts in three years. About 75 whipscorpions & >50 schizomid species

Whipscorpion **Bibl.:** Anon. 1984a; Georgoseu 1994; Bennett 1985; Briggs 1986a; Elliott 1984, 1984a; Reddell & Cokendolpher 1995; Rowland 1975, 1975a; Rowland & Reddell 1976-7, 1979, 1981; Weygoldt

Kingdom Animalia

Clade Metazoa

Clade Eumetazoa

Clade Bilateria

Clade Protostomia

Clade Ecydsozoa

Phylum Arthropoda

Subphylum Chelicerata

Class Archnida

Subclass Micrura

Order Amblypygi (tail-less whips scorpions)

Order Thelyphonida (= Uropygi) (whip scorpions)

Order Schizomida (schizomids)

**HUBBARDIIDAE** (incl. *Hubbardia*)

**PROTOSCHIZOMIDAE** Brach, 1975

undet. genus (cave in Val Verde Co. ,TX/ Tb) **Bibl.:** Cokendolpher & Reddell 1992; Gertsch 1992

**SCHIZOMIDAE** (incl. *Schizomus*)

*Hubbardia* Cook, 1889 - Hubbardiidae whipscorpions. **Bibl.:** Reddell & Cokendolpher 1991, 1995

*Hubbardia shoshonensis* (*Trithyreus s.* Briggs & Hom, 1972; *Schizomus s.*) (\*type locality cave in Inyo Co.,CA/ CA T&E G1S1, Federal Species of Concern/ Tb) **Bibl.:** US Bureau of Land Management 1982

*Schizomus* Cook, 1899 - Schizomidae whipscorpion

*Schizomus siamensis* Hansen, 1905 (HI caves)

*Schizomus shoshonensis* = *Hubbardia s.*

*Phrynus* Lamarck, 1801 (tailess whipscorpion) Phrynidae tailess whipscorpion (Amblypygi)

**Bibl.:** Quintero 1981

*Phrynus* undescr. sp. (\*cave in Val Verde Co., wEdwards Plateau, TX/ Tp)

*Trithyreus* Kraepelin, 1899 *shoshonensis* = *Hubbardia s.*

*Triura* - See *Machilis*

*Paraphrynus* Moreno, 1940 - Phrynidae tailess whipscorpion

*Paraphrynus raptator* (Pocock, 1902) (Tp in FL)

*Tarantula* Fabricius, 1793 (side-spotted tailess whipscorpion)

*Tarantula* undet. sp. (Tp in cave in Edwards Co.,TX)

wind scorpion - See solifugids.

**wing-loading** - The ratio of body mass divided by the wing area. Expressed as grams of body mass/ wing area (centimeters squared)

**Wisconsinian** - Last of four glaciations, from 80,000 to 10,000 years ago.

wolf, wolverine & woodrat - See **mammal**

## **Worms**

Phylum Annelida

Coelomate, segmented animals that are almost all wormlike & elongate. About 17,000 described species. Usually segmented in their trunks, with each segment carrying bristles (setae or chetae)

Subphyllum Clitellata

Class Aphanoneura

Class Branchiobdellida (also grouped with leeches) (branchiobdellids)

Class Hirudinea (=Hirudinoidea) (leeches) (see below)

Subclass Branchiobdellidea

Order Branchiobdellida

Class Oligochaeta (earthworms, leeches)

Subclass Hirudinea (or placed in class above)

Subphyllum or Class Polychaeta (polychaete, lug, rag and sand worms)

Subclass Canalipalpata (see below)

Subclass Palpata

Order Canalipalpata (or as subclass)

Phylum Chaetognatha (arrow worms)

Phylum Gastrotricha (gastrotrichs)

Phylum Hemichordata (= Branchiotremata) (acorn worms)

Phylum Nematomorpha

Class Gordioida (hairworms)

Phylum Nemertina (ribbon worms)

earthworm (see oligochaete below), flatworm (see **Turbellaria**) fluke, jaw worms (Gnathostomulida), horsehair (see hairworms), onychophoran, roundworm (see **Nematode**) tapeworm (see below) and thorny headed.

## **Acorn Worms**

Of Phylum Hemichordata of the Deuterostomia. Hemichordates are marine, wormlike animals, which are solitary (Class Enteropneusta, acorn worms) or live in communities or colonies (Class Pterobranchia) Undet. genus (sCA marine infauna)

Class Enteropneusta (acorn worms; enteropneusts)  
Harrimaniidae (*Balanoglossus*, *Saccoglossus*)

Class Sagittoidea  
Order Aphragmophora

Suborder Ctinodontina  
Family Pterosagittidae *Pterosagitta*

***Balanoglossus*** - Ptychoderidae acorn worms

***Balanoglossus*** undet. sp. or species (FL, GA marine infauna)

***Balanoglossus aurantiacus*** (Carolinian marine infauna)

***Saccoglossus*** Shimkewitsch, 1892 (= *Balanoglossus*, *Dolichoglossus*)] Harrimaniidae acorn worms

***Saccoglossus kowalewskyi*** (CT, ME, Virginian & Carolinian marine benthic)

## Arrow Worms

Phylum Chaetognatha

Class Sagittoidea

Order Aphragmophora

Krohnittellidae (*Krohnitta*)

Pterosagittidae (*Pterosagitta*)

Sagittidae (*Sagitta*)

***Krohnitta*** Ritte-Zahony, 1910 – Krohnittellidae arrow worms

***Krohnitta subtilis*** (Grassi, 1881) (FL marine infauna)

***Pterosagitta*** Costa, 1969 draco - Pterosagittidae arrow worms

***Pterosagitta draco*** (Krohn, 1853) (FL marine infauna)

***Pterosagitta*** undet. sp. (HA marine infauna)

***Sagitta*** Quoy & Giamard, 1827 - Sagittidae arrow worms

***Sagitta elegans*** Verrill, 1873 (ME marine infauna)

***Sagitta enflata*** Grassi, 1881 (FL, HA marine infauna)

***Sagitta hispida*** Conant, 1895 (FL marine infauna)

***Sagitta regularis*** Aida, 1897 (HA marine infauna)

***Sagitta tenuis*** Conant, 1896 (FL marine infauna)

## Gastrotrichs

Gastrotricha, a marine phylum or class of Pseudocoelomates (=Aschelminthes) worms.

Order Chaetonotida

Suborder Multitubulatina

Family Neodasyidae (*Neodasys*)

Suborder Paucitubulatina

Family Chaetonotidae (also put in Order Macrodasysida)

(*Aspidiophorus*, *Chaetonotus*, *Heterolepidoderma*, *Ichthydium*, *Lepidodermella*,  
*Musellifer*, *Polymerurus*)

Family Dasydytidae (*Dasydytes*)

Family Xenotrichulidae (*Draculiciteria*, *Heteroxenotrichula*, *Xenotrichula*)

Order Macrodasysida

Family Dactylopodolidae (*Dactylopodola*)

Family Lepidodasyidae (*Cephalodasys*, *Dolichodasys*, *Lepidodasys*, *Mesodasys*)

Family Macrodasysidae (*Macrodasys*)

Family Thaumastodermatidae

Subfamily Diplodasyine (*Acanthodasys*, *Diplodasys*)

Subfamily Thaumastodermatinae (*Platydasys*, *Pseudostomella*, *Tetranchyroderma*)

Family Turbanellidae (*Paraturbanella*, *Turbanella*)

*Acanthodasys* Remane, 1927 - Thaumastodermatidae gastrotrich worms, Subfamily Diplodasyine

*Acanthodasys aculeatus* Remane, 1927 (Gulf of Mexico (AL, FL &/or TX) interstitial)

*Acanthodasys* undescr. sp. (Gulf of Mexico (AL, FL &/or TX) interstitial)

*Aspidiophorus* Voigt, 1904 - Chaetonotidae gastrotrich worms

*Aspidiophorus marinus* Remane, 1925 (MA marine interstitial)

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*Aspidiophorus mediterraneus* Remane, 1927 (Mediterranean, Gulf of Mexico (AL, FL &/or TX) interstitial)

*Aspidiophorus multitubulatus* Hummon, 1974 (NC marine beach interstitial)

*Aspidiophorus paramediterraneus* Hummon, 1974 (NC & Gulf of Mexico (AL, FL &/or TX) marine beach interstitial)

*Aspidiophorus* undet. 2 species (interstitial in NH lakes)

*Aspidiophorus tentaculatus* Wilke, 1954 (NC, Mediterranean marine beach interstitial)

*Cephalodasys* Remane, 1926 - Lepidodasyidae gastrotrich worms

*Cephalodasys* undet. sp. (MA marine benthic infauna)

*Cephalodasys turbanelloides* (Boaden, 1963) (Europe & Gulf of Mexico (AL, FL &/or TX) interstitial)

*Chaetonotus* Ehrenberg, 1830 - Chaetonotidae gastrotrich worms

*Chaetonotus acareus* Hummon, 1974 (US Atlantic marine beach interstitial)

*Chaetonotus aculifer* Gerlach, 1953 (MA marine infauna)

*Chaetonotus apolemmus* Hummon, Balsamo & Todaro, 1992 (Europe & Gulf of Mexico (AL, FL &/or TX) interstitial)

*Chaetonotus atrox* Wilke, 1954 (Gulf of Mexico (AL, FL &/or TX) interstitial)

*Chaetonotus dispar* Wilke, 1954 (Gulf of Mexico (AL, FL &/or TX) interstitial)

*Chaetonotus foliatus* (Renaud-Mornant, 1967) (MA marine infauna)

*Chaetonotus maximus* Ehrenberg, 1838 (MA marine infauna)

*Chaetonotus sagittarius* Evans, 1992 (Gulf of Mexico (AL, FL &/or TX) & East Coast interstitial)

*Chaetonotus schoepferi* Thane-Fenchel, 1970 (US Atlantic beach & sublittoral interstitial)

*Chaetonotus schoepferi sagittarius* = *C. sagittarius*

*Chaetonotus* undet. sp. or species (MA, NY freshwater sandy beach interstitial)

*Chaetonotus testiculophorus* Hummon, 1966 (WA marine infauna)

*Chaetonotus triacanthus* Todaro, Fleeger & Hummon, 1995 (Gulf of Mexico (AL, FL &/or TX) interstitial)

*Chaetonotus* undet. sp. or species (interstitial in NH lakes; MN hyporheic))

*Chaetonotus* undescr. sp. (Gulf of Mexico (AL, FL &/or TX) interstitial)

*Chaetonotus woodi* Thane-Fenchel, 1970 (US Atlantic marine sublittoral interstitial)

*Dactylopodola* Strand, 1929 - Dactylopodolidae gastrotrich worms

*Dactylopodola typhle* (Remane, 1929) (= *Dactylopodalia typhle*; *Dactylopodella typhle*;

*Dactylopodalia weilli*) (Europe & Gulf of Mexico (AL, FL &/or TX) interstitial)

*Dasydytes* Gosse, 1851 - Dasydytidae gastrotrich worms

*Dasydytes ooeides* Brunson, 1950 (MI lake interstitial)

*Diplodasys* Remane, 1927 - Thaumastodermatidae gastrotrich worms, Subfamily Diplodasyine

*Diplodasys ankei* Wilke, 1954 (MA marine infauna)

*Dolichodasys* Gagne, 1977 - Lepidodasyidae gastrotrich worms

*Dolichodasys elongatus* Gagne, 1977 (Gulf of Mexico (AL, FL &/or TX) interstitial)

*Dolichodasys* undescr. sp. (Gulf of Mexico (AL, FL &/or TX) interstitial)

*Draculiciteria* Hummon, 1974 - Xenotrichulidae gastrotrich worms

*Draculiciteria tessellata* (*Polymerurus tessellatus* Renaud-mornant, 1968) (Gulf of Mexico (AL, FL &/or TX) interstitial)

***Halichetonotus*** Chaetonotidae gastrotrich worms

***Halichetonotus margaretae*** (Europe & Gulf of Mexico (AL, FL &/or TX) interstitial) *aculifer*, *decipiens*, *paradoxus*, *spinosus* (Gulf of Mexico (AL, FL &/or TX) interstitial)

***Heterolepidoderma*** Remane, 1927 - Chaetonotidae gastrotrich worms

***Heterolepidoderma loricatum*** Schrom, 1972 (Europe & Gulf of Mexico (AL, FL &/or TX) interstitial)

***Heterolepidoderma*** undescr. sp. (Gulf of Mexico (AL, FL &/or TX) interstitial)

***Heterolepidoderma texana*** Todaro, Fleeger & Hummon, 1995 (Gulf of Mexico (AL, FL &/or TX) interstitial)

***Heteroxenotrichula*** Wilke, 1954 - Xenotrichulidae gastrotrich worms

***Heteroxenotrichula pygmaea*** Remane, 1934 (Gulf of Mexico (AL, FL &/or TX) interstitial)

***Heteroxenotrichula squamosa*** Wilke, 1954 (MA, Gulf of Mexico (AL, FL &/or TX) interstitial)

***Heteroxenotrichula texana*** M.A. Todaro, 1994 (Gulf of Mexico (AL, FL &/or TX) interstitial)

***Ichthydium*** Ruppert, 1977 - Chaetonotidae gastrotrich worms

***Ichthydium hummoni*** Ruppert, 1977 (NC marine beach vadose interstitial)

***Ichthydium*** undet. sp. or species (interstitial in NH lakes; NY freshwater sandy beach interstitial))

***Lepidodasys*** Remane, 1926 - Lepidodasyidae gastrotrich worms

***Lepidodasys elongatus*** Remane, 1926 (Gulf of Mexico (AL, FL &/or TX) interstitial)

***Lepidodasys*** undescr. sp. (Gulf of Mexico (AL, FL &/or TX) interstitial)

***Lepidodasys*** undet. sp. (MA marine benthic infauna)

***Lepidodermella*** Blake, 1933 - Chaetonotidae gastrotrich worms

***Lepidodermella*** undet. sp. (NY freshwater sandy beach interstitial)

***Lepidodermella squammata*** Blake, 1933 (rare interstitial in NH lakes)

***Lepidodermella trilobum*** (*Lepidoderma t.* Brunson, 1950) (interstitial in NH lakes)

***Macrodasys*** Remane, 1924 - Macrodasyidae gastrotrich worms

***Macrodasys caudatus*** Remane, 1927 (MA marine benthic infauna)

***Macrodasys cunctatus*** (WA marine infauna)

***Mesodasys*** Remane, 1951 - Lepidodasyidae gastrotrich worms

***Mesodasys elongatus*** Remane, 1951 (Gulf of Mexico (AL, FL &/or TX) interstitial)

***Mesodasys laticaudatus*** Remane, 1951 (MA marine benthic infauna)

***Mesodasys*** undescr. sp. (Gulf of Mexico (AL, FL &/or TX) interstitial)

***Musellifer*** Hummon, 1969 - Chaetonotidae gastrotrich worms

***Musellifer sublittoralis*** Hummon, 1969 (WA, US Pacific Ocean marine sublittoral interstitial)



*Neodasys* Remane, 1927 - Neodasiidae gastrotrich worms Suborder Multitubulatina  
*Neodasys chaetonotoideus* Remane, 1927 (MA marine infauna)  
*Neodasys ciritus* W.A. Evans, 1993 (Gulf of Mexico (AL, FL &/or TX) interstitial)

*Paraturbanella* Remane, 1927 - Turbanellidae gastrotrich worms  
*Paraturbanella aggregotubulata* W.A. Evans, 1993 (East coast & Gulf of Mexico (AL, FL &/or TX) interstitial)

*Paraturbanella intermedia* Wieser, 1957 (WA marine infauna)  
*Paraturbanella solitaria* Todaro, 1995 (CA marine interstitial)

*Paraturbanella teissieri* Swedmark, 1954 (Gulf of Mexico (AL, FL &/or TX) interstitial)  
*Paraturbanella* undescr. sp. (Gulf of Mexico (AL, FL &/or TX) interstitial)

*Platydasys* Remane, 1927 (= *Pseudostomella*) Thaumastodermatidae gastrotrich worms  
Subfamily Thaumastodermatinae

*Platydasys ocellatus* Clausen, 1965 (= *Pseudostomella plumosa*) (East coast & Gulf of Mexico (AL, FL &/or TX) interstitial)

*Platydasys plumosa* (*Pseudostomella p.* Ruppert, 1970) (Gulf of Mexico (AL, FL &/or TX) interstitial)

*Platydasys roscovita* (*Pseudostomella r.* Swedmark, 1956) (Gulf of Mexico (AL, FL &/or TX) interstitial)

*Platydasys* undet. sp. (MA marine benthic infauna)

*Polymerurus* Remane, 1927 - Chaetonotidae gastrotrich worms  
*Polymerurus* cf. *callosus* Brunson, 1950 (AB lake benthic; rare interstitial in NH lakes)

*Polymerurus nodicaudus* (Voight, 1901) (rare interstitial in NH lakes)  
*Polymerurus* undet. sp. (NY freshwater sandy beach interstitial)

*Pseudostomella* Remane, 1927 - Thaumastodermatidae gastrotrich worms Subfamily  
Thaumastodermatinae  
*Pseudostomella plumosa* = *Platydasys ocellatus* Clausen, 1965

*Pseudostomella* Swedmark, 1956 = *Platydasys*

*Tetranchyroderma* Remane, 1926 - Thaumastodermatidae gastrotrich worms, Subfamily  
Thaumastodermatinae

*Tetranchyroderma bunti* (Thane-fenchel, 1970) (East coast & Gulf of Mexico (AL, FL &/or TX) interstitial)

*Tetranchyroderma papii* Gerlach, 1953 (MA marine benthic infauna)

*Tetranchyroderma* 3 undet. species (MA marine benthic infauna)

*Tetranchyroderma paradoxa* Thane-Fenchel, 1970 (East coast & Gulf of Mexico (AL, FL &/or TX) interstitial)

*Tetranchyroderma pugetensis* Wieser, 1957 (WA marine infauna)

*Tetranchyroderma sardum* (Europe & Gulf of Mexico (AL, FL &/or TX) interstitial)

*Tetranchyroderma swedmarki* Chandras, Rao, Ganapati, 1968 (Gulf of Mexico (AL, FL &/or TX) interstitial)

*Turbanella* Schultze, 1853 - Turbanellidae gastrotrich worms

*Turbanella ambronensis* Remane, 1943 (Gulf of Mexico (AL, FL &/or TX) interstitial)

*Turbanella bocqueti* Kaplan, 1958 (Europe & Gulf of Mexico (AL, FL &/or TX) interstitial)

*Turbanella cirrata* Papi, 1957 (MA marine benthic infauna)

*Turbanella cornuta* Remane, 1925 (MA, Puget Sound (WA) & Europe marine interstitial)

*Turbanella mustela* Wieser, 1957 (FL, WA marine interstitial)

*Xenotrichula* Remane, 1927 - Xenotrichulidae gastrotrich worms

*Xenotrichula beauchampi* Levi, 1950 (MA marine infauna)

*Xenotrichula intermedia* Remane, 1934 (Gulf of Mexico (AL, FL &/or TX) interstitial)

*Xenotrichula lineata* Schrom, 1972 (Gulf of Mexico (AL, FL &/or TX) interstitial)

*Xenotrichula punctata* Wilke, 1954 (MA marine infauna)

*Xenotrichula pygmaea* Remane, 1934 (MA marine infauna)

## Gnathostomulids

Phylum Gnathostomulida (freeliving microscopic marine worms within Pseuocoelomates (=acoelomate Bilateria)

Order Filospermoidea

Haplognathiidae (*Haplognathia*, *Labidognathia*, *Tenuignathia*)

Gnathostomariidae

(*Austrognathia*, *Gnathostomula*, *Nanognathia*, *Onychognathia*, *Semaeognathia*)

*Austrognathia* Sterrer, 1965 - Gnathostomariidae gnathostomulid worms

*Austrognathia christiana* Farris, 1977 (US Atlantic marine beaches interstitial in sand)

*Austrognathia kirsteueri* Riedl, 1971 (US Atlantic marine beaches & sublittoral interstitial in sand)

*Gnathostomula* Ax, 1956 - Gnathostomariidae gnathostomulid worms

*Gnathostomula armata* Riedl, 1971 (US Atlantic marine beache & sublittoral interstitial in sand)

*Gnathostomula brunidens* Riedl, 1971 (US Atlantic marine beache & sublittoral interstitial in sand)

*Gnathostomula jenneri* Riedl, 1971 (US Atlantic marine beache & sublittoral interstitial in sand)  
*Gnathostomula mediocrista* Riedl, 1971 (US Atlantic marine beache & sublittoral interstitial in sand)

*Gnathostomula microstyla* Riedl, 1971 (US Atlantic marine beache & sublittoral interstitial in sand)

*Gnathostomula nigrostoma* Riedl, 1971 (US Atlantic marine beache & sublittoral interstitial in sand)

*Haplognathia* Sterrer, 1970 - Haplognathiidae gnathostomulid worms

*Haplognathia ctenifera* Sterrer, 1970 (US Atlantic marine beaches interstitial in sand)

*Haplognathia lyra* Sterrer, 1970 (US Atlantic marine beaches interstitial in sand)

*Labidognathia* Riedl, 1970 - Haplognathiidae gnathostomulid worms

*Labidognathia longicollis* Riedl, 1970 (US Atlantic marine beaches interstitial in sand)

*Nanognathia*, Ax, 1956 - Gnathostomariidae gnathostomulid worms

*Nanognathia exigua* Sterrer, 1972 (US Atlantic marine beaches & sublittoral interstitial in sand)

*Onychognathia* Riedl, 1971 - Haplognathiidae gnathostomulid worms

*Onychognathia filifera* Riedl, 1971 (US Atlantic marine beaches & sublittoral interstitial in sand)

*Pterognathia* Sterrer, 1966

*Pterognathia ctenifera* (US Atlantic marine beaches & sublittoral interstitial in sand)

*Pterognathia rosacea* Riedl, 1971 (US Atlantic marine beaches & sublittoral interstitial in sand)

*Pterognathia tyra*, (US Atlantic marine beaches & sublittoral interstitial in sand)

*Semaegnathia* Riedl, 1970 - Haplognathiidae gnathostomulid worms

*Semaegnathia sterreri* Sterrer, 1970 (US Atlantic marine beaches interstitial in sand)

*Tenuignathia* Sterrer, 1976 - Haplognathiidae gnathostomulid worms

*Tenuignathia rikeri* Sterrer, 1976 (US Atlantic marine beaches & sublittoral interstitial in sand)

## Hairworms

Unsegmented worms of Class Gordioidea, Phylum Nematomorpha. = or > 1' long, about 1/24" diameter common. Once thought to arise spontaneously from horse hairs, hence the name.

Immature worms are obligate parasites. In cave crickets in AR, KY, NM, TX, rarely in *Neaphaenops* & *Pseudanopthalmus* beetles & in leeches, caddisflies & dragonflies. Marine ones parasitize crabs. Food absorbed through body as intestines vetigial.. Usually encyst on aquatic plants which are then eaten by host. Larvae grows into adult in several weeks to months. Bore out of body if insect becomes too wet. The phylum Nematomorpha (from the Greek nema,

“thread,” and morphe, “shape”), consists of a group of invertebrates, commonly called horsehair or gordian worms, that has no close relationships with any other living organisms. The name horsehair is derived from the worm’s hair or threadlike appearance in its adult stage. The first known fossil record of this group dates from the Eocene (40 - 70 million years ago), but experts suggest it may have its roots in the lower Paleozoic Era (over 500 million years old).

As larvae, horsehair worms are parasites of insects and other aquatic and terrestrial invertebrates, most notably grasshoppers, crickets, locusts, katydids, and beetles. Other hosts include caddisflies, dragonflies, spiders, millipedes, centipedes, crustaceans, and leeches. Host specificity has not yet been well documented. Other hosts include representatives of vertebrate groups.

Most horsehair worms are observed in their adult, free-living stage among the vegetation near edges of ponds and streams, although a few semiterrestrial species occur in damp soil. A small group of marine species, parasitic on crustaceans, have been collected from coastal environments.

Nematomorphs measure up to 1 meter in length and from less than 1 to 3 millimeters in diameter; diameter is uniform from one end to the other. Color usually ranges between light tan to dark brown, although yellowish and black individuals have been observed. Size and coloration vary considerably, even within the same species. Males are smaller than females, and the two sexes may be found in equal and unequal numbers in the same population. Locomotion of adult horsehair worms is at most a very slow whipping action; males seem to be much more active than females.

Horsehair worms reproduce sexually, in spring, early summer, or autumn. Eggs, often numbering in the millions, are laid in long gelatinous strings. For aquatic forms, the incubation period may range between 15 and 80 days, depending upon water temperature.

The mode of development of nematomorphs after hatching has been the subject of much debate. Some experts suggest that the larvae encyst on vegetation or other substrates along the water’s edge soon after hatching. Eventually, some of these cysts are ingested by hosts feeding on these substrates. The cyst rapidly degenerates in the digestive tract of the new host. The larva then burrows its way through the intestinal wall into the host’s body cavity, continuing its development. When ingested by inappropriate hosts, the cyst may degenerate and then reencyst in the tissues of the host. If this inappropriate host is then ingested by one of its predators (an appropriate host for the nematomorph). The cyst may again disintegrate and continue its life cycle in this new host. Other researchers have suggested that after the nematomorph larva emerges from the egg, it will penetrate the body wall of just about any animal it happens to encounter, although again, normal development will occur only in hosts. This mode of development may occur in the semiterrestrial species of horsehair worms.

After entering the body cavity of an appropriate host, the larva grows to a juvenile stage, then emerges from the host to mature. During the larval stage of development, the horsehair worm digests and absorbs surrounding tissue. This period of metamorphosis occurs over a period of several weeks to several months; eventually the larval form develops into a tightly coiled mass in the host. One to several horsehair worms may occur in a single host. The parasite uses the important nutrients of the host, probably impairing its reproductive system. It has been suggested that hosts seek water when the horsehair worm is ready to emerge, perhaps even being driven to water by some physiological cue. Once the host enters the water, the horsehair worm breaks

through the body wall of the host. Newly released horsehair worms soon die if they do not have access to water.

Phylum Nematomorpha (horsehair worms (=gordian worms) and hairworms) (incl. Aschelminthes in part)  
Class Gordioida

Order Chordodea  
Superfamily Gordioidea

Chordodidae (*Chordodes*)  
Gordiidae (*Gordius*)  
Paragordiidae (*Paragordius*)

**Bibl.:** <http://ctr.uvm.edu/ctr/el/el222.htm>; Poulson, Lavoie & Chandler 1990; Studier et al. 1991

***Chordodes*** Creplin, 1847 - Chordodidae hairworms  
***Chordodes morgani*** (KY/parasite in crickets) Studer, Lavoie, Chandler (1988),

***Gordius*** Linnaeus, 1758 - Gordiidae hairworms  
***Gordius aquaticus*** Duj (Tx parasitic on arthropods in ON)  
***Gordius*** undet. sp. (MO/Tx parasitic on arthropods in MO, ON)

## Leeches & Branchiobdellids

Segmented, closely allied to or part of Oligochaeta. Of Phylum Annelida, Class Oligochaeta or Hirudinoidea (=Clitellata?), Order, Class or Subclass Hirudinea (leeches) & Branchiobdellida (branchiobdellids).

Branchiobdellids are from 2-5 mm long and usually are commensals on crayfish & some isopods. Probably diverged early from oligochaete-leeches. Very small (14-5 segments) with head sucker-like with a circle of finger-like projections. Setae are absent. The buccal cavity has two teeth. Rear segments also modified into a sucker.

**Leech Areas:** **Canada:** Davies 1971; Madill 1985; **CO:** Hermann 1970; **HI:** J. Moore 1946; **MI:** Klemm 1972a; **NA:** Beauchamp 1931-2; Klemm 1972, 1985; Sawyer 1972; **NC:** Shelley 1975; **World:** Soos 1969.

**Branchiobdellid Bibl.:** Gelder & Brinkhurst 1990; Gelder 1996; Holt 1953, 1963, 1965b, 1968, 1969; C. Goodnight 1940; Holt & Opell 1993; Leidy 1851; Moore 1894; Young 1966. **Areas:** **Canada:** Chengalath 1987; **FL:** Holt 1973; **MI:** Ellis 1918

Class Hirudinea  
Subclass Branchiobdellidea

Order Branchiobdellida  
Branchiobdellidae (undet. symbiotic genus on crayfish in GA caves; *Ankyrodrilus*)'

Subclass Euhirudinea

Order Arhynchobdellida

Suborder Erpobdelliformes

Family Erpobdellidae (*Dina*, *Erpobdella*, *Mooreobdella* (now in Glossiphoniidae))

Suborder Hiridiniformes

Family Hirudinidae

Subfamily Haemopinae (*Haemopsis*)

Order Branchiobdellida

Family Bdellodrilidae

(*Bdellodrilus*, *Branchiobdella*, *Cronodrilus*, *Xironodrilus* (now in Xironnodrilidae))

Family Branchiobdellidae (*Ankyrodrilus*, *Xironogiton* (also put in Cambarincolidae))

Family Cambarincolidae

(*Cambarinocola*, *Ellisodrilus*, *Oedipodrilus*, *Pterodrilus*, *Sathodrilus*, *Tettodrilus*, *Xironodrilus* (now in Xironnodrilidae), *Xironogiton* (now in Branchiobdellidae))

Family Xironnodrilidae (*Xironodrilus*)

Order Arynchobdellida

Suborder Erpobdelliformes

Family Eropodbellidae (also put in Order Pharyngobdellia)

Order Rhynchobdellia

Family Glossiphoniidae

Subfamily Glossiphoniinae

(*Desserobdella*, *Dina*, *Mooreobdella* (both once in Eropodbellidae), *Glossiphonia*, *Placobdella*)

Family Piscicolidae

Subfamily Piscicolinae (*Piscicola*)

Subfamily Platybdelliae (*Piscicolaria*)

Families incl.

**Branchiobdellidae** (*Ankyrodrilus*)

**Bdellodrilidae** (*Bdellodrilus*, *Branchiobdella*, *Cronodrilus*, *Xironodrilus* (now in Xironnodrilidae))

**Cambarincolidae** (*Cambarinocola*, *Ellisodrilus*, *Oedipodrilus*, *Pterodrilus*, *Sathodrilus*, *Tettodrilus*, *Xironodrilus* (now in Xironnodrilidae) *Xironogiton* ).

**Erpodbellidae** (*Dina*, *Erpobdella*, *Mooreobdella* (now in Glossiphoniidae))

### **Glossiphoniidae**

Subfamily Glossiphoniine (*Dina*, *Mooreobdella* (both once in Eropodbelidae), *Glossiphonia*, *Placobdella*)

### **Hirudinidae**

Subfamily Haemopinae (*Haemopsis*)

### **Piscicolidae**

Subfamily Piscicolinae (*Piscicola*)

Subfamily Platybdelliae (*Piscicolaria*)

**Xironodrilidae** (*Xironodrilus*) (once in Cambarincolidae & Branchiobdellidae)

*Ankyrodrilus* Holt 1965 - Branchiobdellidae branchiobdellid worms

*Ankyrodrilus koronaeus* Holt 1965 (wVA, eTN epigean/ commensal on Tp crayfish *Cambarus bartoni* b.)

*Ankyrodrilus legaeus* Holt 1965 (swVA, neTN epigean/ Tp commensal on TN Tp *Cambarus bartonii* crayfish/VA T&E S1 rank & global G1 rank)

*Bdellodrilus* Moore 1895a - Branchiobdellidae branchiobdellid worms

*Bdellodrilus illuminatus* (East) Moore (1895a) (epigean in East, n. To PA, s. To NC, Mex., w. To IL/ Tp? commensal on Tb *C.b.* crayfish in TN, WV) P. Moore 1894

*Branchiobdella* Odier, 1823 - Branchiobdellidae branchiobdellid

*Branchiobdella* undet. sp. (Tp or Tx commensal on Tp *Cambarus tenebrosus* crayfish in SC (Orangeburg Co.) cave stream)

*Cambarincola* Ellis 1912 - Cambarincolidae branchiobdellid worms. **Bibl.:** R. Hoffman 1963a

*Cambarincola aliena* Holt 1963 (= *C. alienus*) (type locality cave in Franklin Co.,TN & Smokies TN +Warren & Todd Co.,KY/ Tb commensal on *Caecidotea alabamensis* & egg eater? on *Caecidotea bicrenata* isopods/ S1S2 G1G2)

*Cambarincola branchiophila* (Holt 1954) (type locality cave in Giles Co.,swVA/ commensal on *Cambarus bartonii* b. & *C. sciotensis* Rhoades),

*Cambarincola chirocephala* Ellis 1919 (*C. chirocephalus* Holt 1973) (FL n.to IN,TN & w.to OK,KS,AR/on Tp? *Orconectes virilis* & Tb crayfish in Ozarks)

*Cambarincola demissus* Hoffman 1963 (*C. demissus* Holt 1973) (epigean/Tp or Tb commensal on Tb crayfish in swVA,WV (*Cambarus nertius*) & *Orconectes erichsonianus* & *rusticus* crayfish),

*Cambarincola dubius* Holt 1973 (type locality & 1-2 other caves in Monroe Co.,IN/on Tb *Cambarus laevis* crayfish)

**Cambarincola fallax** Hoffman 1963 (epigean in NY, sON, wPA, wNC to GA, TN/ Tx commensal on Tb or Tp *C.b.* crayfish in se VA, eTN, WV/ VA T&E S1)

**Cambarincola heterognathus** Hoffman 1963 (*C. heterognatha* H. 1963) (SE,FL (Leon, Calhoun Cos.,disjunct), eKY, wNC, eTN,/ Tx or Ac commensal on wVA & sWV *Cambarus b. bartoni* crayfish)

**Cambarincola holostoma** Hoffman 1963 (*C. holostomus* Holt 1973) (headwaters of Potomac & James Rivers/may occur as commensal on wVA Tx or Tp *Cambarus bartoni* crayfish)

**Cambarincola holti** Hoffman 1963 (\*stream in s. part of Somerset, Pulaski Co.(KY), commensal on Tx? *Cambarus*)

**Cambarincola ingens** Hoffman 1963 (type locality cave in Giles Co.,VA commensal on *Cambarus sciotensis* crayfish in TN,wVA,WV; epigean in NC, TN, VA, WV)

**Cambarincola leoni** Holt 1973 (type locality cave in Marion Co., FL/ commensal on Pb *Procambarus orcinus* & *Troglocambarus maclanei* crayfish in Leon, Marion & Alachua Cos.,FL/Pb G3)

**Cambarincola leptadenus** Holt 1973 (\*type locality cave in Perry Co.,TN/ commensal on Tp *Cambarus tenebrosus* crayfish/ G1)

**Cambarincola manni** Holt 1973 (epigean in peninsular FL / Tx or Ac commensal in Polk & Levy Cos. on *Cambarus* St & *Procambarus fallax* & *paeninsulanus*)

**Cambarincola marthae** Holt 1973 (\*type locality cave in Jackson Co.,scTN/ Tb or Tp commensal on *Caecidotea alabamensis* isopod)

**Cambarincola mesochoreus** Hoffman 1963 (epigean in CA,MA/ poss. commensal on Tx *Orconectes* in IN),

**Cambarincola meyeri** Goodnight 1942 (poss. commensal on Tx *Cambarus bartoni b.*, Fayette Co,KY),

**Cambarincola philadelphicus** (*Astacobdella p.* Leidy 1851) (NE to WI, s. to FL/ Tx or Ac commensal on Tb/ Tp on St crayfish in FL, TN, WV,V A; on VA *Cambarus bartoni*) **Bibl.:** Holt 1949

**Cambarincola sheltensis** Holt 1973 (\*type locality cave in Madison Co.,AL/ Tb commensal on Tb *Cambarus hamulatus* & *jonesi*, *Procambarus pecki* & *Cambarus australis a.* crayfish)

**Cambarincola** undescr.? sp.#1 (\*?cave in Sullivan Co.,TN commensal on *Cambarus bartonii cavatus* crayfish)



*Cambarincola* undescr.? sp.#2 (\*?cave in Meade Co.,KY commensal on *Cambarus tenebrosus* crayfish)

*Cambarincola* *steevesi* Holt 1973 (type locality cave in Todd Co. + Barren & Trigg Cos.,cKY & scTN/ Tb or Tp commensal on TN *Caecidotea alabamensis* isopods / G3)

*Cambarincola* *vitreus* (*C. vitrea* Ellis 1919) Holt 1973 (ON to FL, w. to ND, TX/on FL Pb *Ortmannicus acherontis* crayfish; on TX Tp crayfish *Procambarus simulans* )

*Cronodrilus* Holt 1968a - Cambarincolidae branchiodellid worms

*Cronodrilus* *ogygius* Holt 1968a (commensal in caves in Haralson Co.,GA)

*Cronodrilus* *durbini* Ellis 1918 (commensal in IN, MI caves)

*Ellisodrilus* Holt 1960 - Cambarincolidae branchiodellid worms.

*Ellisodrilus* *carronamus* Holt 1988 (epigean in 2 caves in Overton Co.,TN/ may occur in Tx *Orconectes* crayfish)

*Desserobdella* Barta & Sawyer, 1990- Glossiphoniidae leech, Subfamily Glossiphoniinae

*Desserobdella* *phalera* (*Batracobdella p.* Graf, 1899) wFL Gulf of Mexico infauna)

*Dina* Leidy 1870 - Glossiphoniidae leech, Subfamily Glossiphoniinae

*Dina* *anoculata* Moore, 1898 (WA freshwater infauna)

*Dina* *dubia* (Moore & Meyer 1912) (Canada, W, ME, MidW/Tx in Manitoba,ON) &

*Dina* *microstoma* (= *Mooreobdella m.* Moore 1901) (MidW, NE, S,W/Tp? in MO),

*Erpobdella* de Blainville 1918 - Eropodbellidae leech

*Erpobdella* *montezuma* R. Davies et al. 1985 (Montezuma's Well, AZ/ Tp in cenote caves) Bibl.: Runck 1993

*Erpobdella* *punctata* (Leidy 1870) (AZ, CO hyporheic) **Bibl:** Sawyer 1970

*Haemopsis* Savigny 1820 - Hirudinidae leech, Subfamily Haemopinae

*Haemopsis* *oenops* (= *Aulastoma o.* Grube 1871; *Percymoorensis l.* Richardson 1969; *Haemopsis l.* Sawyer 1972; *Semiscolex terrestris* Forbes 1890; not *Hirudo lateralis* Say 1824; *Haemopsis t.*) (E/Tx? in s.ON)

*Mooreobdella* Pawlowski, 1955 (see *Dina*) - Glossiphoniidae leech (once put in Erpobdellidae, Subfamily Erpobdellinae)

*Mooreobdella* *fervida* (Verrill, 1872) (WA freshwater infauna)

*Mooreobdella* undescr. sp. \*\*(cave & artesian well at or near San Marcos, Hays Co., TX/Tb)

*Oedipodrilus* Holt 1967a - Cambarincolidae branchiodellid worms

*Oedipodrilus anisognathus* Holt 1988 (epigean in Dickson & Overton Cos., TN/ maybe commensal on Tx *Orconectes* crayfish)

*Oedipodrilus macbaini* Holt 1955 (KY, ncTN/ commensal on Tp? *Cambarus bartonii cavatus* crayfish in TN)

*Oedipodrilus oedipus* Holt 1967 (Duck R., cTN commensal on *Orconectes compressus* crayfish)

*Percymoorensis lateralis* = *Haemopsis oenops*

*Piscicola* Lamarck 1818 - Piscicolidae leech

*Piscicola punctata* (Verrill 1871) (Canada, MidW, SE, W epigean/ Tx in MO)

*Piscicolaria* M.C. Meyer, 1940 - Piscicolidae leech

*Piscicolaria reducta* M.C. Meyer, 1940 (commensal on tail of Centrachidae sunfish in cave in Orangeburg Co., SC)

*Placobdella* Blanchard 1893 - Glossiphoniidae leech, Subfamily Glossiphoniine

*Placobdella ornata* (Verrill 1872) (NA/St? or Tx in MO)

*Placobdella papillifera* (Verrill, 1872) (Virginian marine infauna)

*Placobdella parasitica* (Say 1824) (AZ, CO, E, MidW, NV, Canada/ St? or Tx parasite on crayfish? in MO)

*Placobdella punctata* (Verrill) (AR, MO, North/St?) **Bibl.:** R.W.Davies et al. 1977

*Placobdella* undescr.? sp.#1 (2 caves in OR Co., MO/ St?)

*Pterodrilus* Moore 1895 - Cambarincolidae branchiodellid worms. **Bibl.:** Holt 1968b

*Pterodrilus cedrus* Holt 1968 (epigean in eastern Highalnd Rm & Nashville Basin, TN/ may occur as commensal on Tp *Cambarus tenebrosus* crayfish)

*Sathodrillus* Holt 1968a - Cambarincolidae branchiodellid worms.

*Sathodrillus hortonii* Holt 1973 (epigean in Okaloosa Co./poss. on Tp *Cambarus* crayfish)

*Sathodrillus megadenus* Holt 1968a (epigean/poss. commensal on Tp or Tx *Cambarus latimanus* crayfish)

*Tettodrilus* Holt 1968 - Cambarincolidae branchiodellid worms.

*Tettodrilus friaufi* Holt 1968 (cTN/ commensal on Tp *Cambarus tenebrosus* crayfish)

*Xironodrilus* Ellis 1918 – Xironodrilidae branchiodellid worms (also put in Cambarincolidae & Branchiobdellidae)

*Xironodrilus appalachius* Goodnight 1943 (wNC, eTN, swVA caves)

*Xironodrilus formosus* Ellis 1918 (IN, KY, MI, OH, TN, VA/ commensal on Tb *C.b.* crayfish in TN)

*Xironodrillus instabilis* (s.Appalachia) = *Xironogiton instabilis*?

*Xironodrillus pulcherrimus* (Moore 1894) (NC, VA caves)

*Xironogiton* Ellis 1919 - Branchiobdellidae branchiodellid worms (also put in Cambarincolidae)

*Xironogiton instabilis* (Moore 1894) (E, TN, , NC, OR epigeal/Tx or Ac commensal on Tb *C.b.* crayfish in VA, WV caves)

## Earthworms

Phylum Annelida

Subphylum Aclitellata

Class or Subclass Clitellata

Class or Subclass Oligochaeta. Bibl.: Reynolds & Cook 1976; Reynolds 1977

Division Megadrile (earthworms) undet. Tx or Tp in seAK

Order Aeolosomatida (put in Aphoneura, **head crawling worms**)

Superorder Haplotaxidea

Order Haplotaxida (= Opisthopora)

Suborder Haplotaxina

Haplotaxidae (*Haplotaxis*)

Suborder Lumbricina:

Superfamily Lumbricoidea

Aeolosomatidae (put in Order Aeolosomatida)

Komarekionidae (*Komarekiiona*) (also put in Ailoscolecidae)

Lumbriculidae (now in Order Lumbriculida)

Superfamily Megascolecidea

Acanthodrilidae

(*Argilophilus*, *Diplocardia*, *Microscolex* (last two also put in Megascolecidae))

Megascolecidae (*Amyntas*, *Diplocardia* (now in Acanthodrilidae),

*Microscolex*, *Nephrellaxis*, *Phallogrilus* (now in Tubificidae), *Pheretima*)

Superfamily Ocnodriloidae

Ocnodrilidae (*Eukerria*)

Suborder Tubificina (once put in Order Tubificida (= Pleisopora) or Enchytraeina

Superfamily Enchytraeidea

(Enchytraeidae) (pot worms)

(*Achaeta*, *Barbidrilus*, *Enchytraeus*, *Grania*, *Lumbricillus* (also put in Lumbriculidae), *Marionina*, *Mesenchytraeus*, *Randidrilus*)

Superfamily Tubificoidea

Naididae (*Allonais*, *Amphichaeta*, *Arcteonais*, *Bratislavia*, *Chaetogaster*, *Dero*, *Nais*, *Ophidonais*, *Paranais*, *Piguetiella*, *Pristina*, *Pristinella*, *Slavina*, *Specaria*, *Vejdovskyella*)

Tubificidae (*Aulodrilus*, *Bathydrius*, *Caralliodrilus*, *Clitellio*, *Haber*, *Heterodrilus*, *Ilyodrilus*, *Inanidrilus*, *Limnodriloides*, *Limnodrilus*, *Monopylephorus*, *Olavius*, *Peloscolex*, *Potamothrix*, *Rhyacodrilus*, *Psammoryctides*, *Smithsonidrilus*, *Spirosperma*, *Tectidrilus*, *Telmatodrilus*, *Teneridrilus*, *Varichaetadrilus*)

Superorder Microdrili

Order Lumbriculida (=Prosopora)

Lumbriculidae (once put in suborder Lumbricina) **Bibl.:** Gates 1972; Pop 1968 (*Allolobophora*, *Aporrectodea*, *Bythonomus*, *Bimastos*, *Dendrodrius*, *Dendrobaena*, *Eisenia*, *Eiseniella* (put in Lumbriculidae (*Lumbricillus* (now in Enchytraeidae), *Lumbriculus*, *Lumbricus*, *Octolasion*, *Rhynchelmis*, *Spelaedrilus*, *Stylodrilus*, *Tenagodrilus*, *Trichodrilus*))

Order Opisthopora

Suborder Lumbricia

Superfamily Lumbricoidea

Lumbricidae (*Eiseniella*) (also put in Lumbriculidae)

**Areas:** **NA:** Brinkhurst 1986; Gates 1959, 1978; Klemm 1985; Reynolds & Cook 1976; Stimpson 1982; Tynen 1975; **NB:** McAlpine & Reynolds 1977; **NC & SC:** Brigham et al. 1981; **East:** Cook 1975; Klemm 1985; NY: Strayer & Bannon-O'Connell 1988; **ON:** Reynolds 1977; **WA:** Altman 1936; **World:** Brinkhurst & Wetzel 1971, 1984; Juget & Dumnicka 1986.

**Acanthodrilidae** (*Argilophilus*, *Diplocardia*, *Microscolex* (last two also put in Megascolecidae))

**Aeolosomatidae** (*Aeolosoma*) (once in Scolicida polychaetes, now put in Aphanoneura head crawling worms)

**Ailoscolecidae** (*Komarekiona*) (also put in Komarekionidae)

**Enchytraeidae** (potworms) (*Achaeta*, *Barbidrilus*, *Enchytraeus*, *Grania*, *Lumbricillus* (also put in Lumbriculidae), *Marionina*, *Mesenchytraeus*,

*Randidrilus*) Eyeless; undet. Tp in IA; Tx in NWT; hyporheic in FL, MI, NH, NY, MI, OH, PA, KY, TN, VA)

**Bibl.:** Bauer 1996; Coates 1990; Tynen 1971, 1975

**Haplotaxidae** (*Haplotaxis*)

**Komarekionidae** (*Komarekiiona*) (also put in Ailoscolecidae)

**Lumbriculidae** (*Allolobophora*, *Aporrectodea*, *Bythonomus*, *Bimastos*, *Dendrodrilus*, *Dendrobaena*, *Eisenia*, *Eiseniella*, *Lumbricillus* (now in Enchytraeidae), *Lumbriculus*, *Lumbricus*, *Octolasion*, *Rhynchelmis*, *Spelaedrilus*, *Stylodrilus*, *Tenagodrilus*, *Trichodrilus*; undescr. Tb genera in 2 caves in Lee Co., Va; (undet. hyporheic genus or genera in AL, TN) **Bibl.:** Gates 1972; Pop 1968

**Megascolecidae** (*Amyntas*, *Diplocardia* (now in Acanthodrilidae), *Microscolex*, *Nephralaxis*, *Phalldrilus* (now in Tubificidae), *Pheretima*)

**Naididae** (*Allonais*, *Amphichaeta*, *Arcteonais*, *Bratislavia*, *Chaetogaster*, *Dero*, *Nais*, *Ophidonais*, *Paranais*, *Pristina*, *Pristinella*, *Slavina*, *Specaria*, *Vejdovskyella* & Tx? undet. genera in MN) **Bibl.:** Brinkhurst 1964; Hiltunen & Klemm 1980

**Ocnerodrilidae** (*Eukerria*, Undet. genus - Tp or Tx in Montezuma Well, AZ)

**Randiellidae** (*Randiella*)

**Tubificidae** (*Aulodrilus*, *Bathydrilus*, *Clitellio*, *Haber*, *Ilyodrilus*, *Inanidrilus*, *Limnodriloides*, *Limnodrilus*, *Monopylephorus*, *Peloscolex*, *Potamothrix*, *Rhyacodrilus*, *Psammoryctides*, *Smithsonidrilus*, *Spirosperma*, *Tectidrilus*, *Telmatodrilus*, *Teneridrilus*, *Thalassodrilides*, *Varichaetadrilus*; Tx? undet. genera in MN) **Bibl.:** Brinkhurst 1965; Klemm 1985.

Subfamily Phalldrilineae (*Aktedrilus*, *Phalldrilus* (once in Megascolecidae))

*Achaeta* Vedjovsky 1877 - Enchytraeidae worms

*Achaeta* or *Marionina* undet. sp. (Tx in KY, TN)

*Aktedrilus* Knollner, 1935 - Tubificidae worms, Subfamily Phalldrilineae

*Aktedrilus monospermathecus* Knollner, 1935 (US & South American Atlantic supralittoral, eulittoral, brackish, marine interstitial or burrower)

*Allolobophora* Eisen 1873 - Lumbriculidae oligochaete worms

*Allolobophora chlorotica* (*Enterion c.* Savigny 1826) (epigeal in nUS, Canada, Europe/Tx or Ac in CA, NY, VA, WV)

*Allolobophora trapezoides* (*Lumbricus t.* Duges 1828) (E/alien Ed, Tx or Ac in AR, GA, IL, KY (Mammoth C.), MO, OK, TN, WV; Tp in TX)

*Allolobophora tuberculata* = *Aporrectodea turgida*

*Allolobophora turgida* Eisen 1874 (= *Lumbricus t.*; *Helodrilus t.*) (E/Tx or Ac in VA, WV; Pb? in MD)

*Allonais* Sperber, 1948 - Naididae oligochaete worms

*Allonais paraguayensis* (*Nais p.* Michaelson 1905) (rare NA/Pb? in IL karstic sprs.)

*Amphichaeta* Tauber 1879 - Naididae oligochaete worms

*Amphichaeta leydigi* Tauber, 1879 (Holarctic?/ AL, GA, NY, PA, TN, VA hyporheic)

*Amyntas* Kinberg 1867 - Megascolidae oligochaete worms

*Amyntas minimus* (*Perichaeta minima* Horst, 1893; *Pheretima m.*) (Tx or Tp in GA (Dade Co.))

*Amyntas hawayanus* = *Pheretima h.*

*Amyntas* undet. sp. (Tx or Tp in SC (Orangeburg Co.))

*Arcteonais* Piguet, 1928 – Naididae worms

*Arcteonais lomondi* (Martin, 1907) (Tp in cave in Bartow Co., GA; rare Virginian marine infauna)

*Argilophilus* Eisen, 1893 - Acanthodrilidae oligochaete worms

*Argilophilus* undet. sp. (Ttx or Ttp in Pype cave in Trinity Co., CA)

*Barbidrilus* M.S. Loden & S.M. Locy, 1980 - Enchytraeidae oligochaete worms

*Barbidrilus paucisetus* M.S. Loden & S.M. Locy, 1980 (FL, GA hyporheic) **Bibl.:** Stites 1986

*Bythonomus* Grube 1879 (= *Bathynomus* Grube, 1879) - Subgenus of *Stylodrilus*

*Aporrectodea* Orley 1885 - Lumbriculidae oligochaete worms

*Aporrectodea rosea* (*Enterion roseum* Savigny, 1826; *Lumbricus r.*; *Allolobophora r.*; *Helodrilus r.*; *Eisenia r.*) (Tp or Tx in IL, KY, NB, VA) **Bibl.:** Gates 1978

*Aporrectodea* undet. sp. (GA caves)

*Aporrectodea trapezoides* (*Lumbircus t.* Duges, 1928; *Allolobophora t.*, *Helodrilus t.*) (Alien Tp in GA (Walker & Dade Co.))

*Aporrectodea tuberculata* (*Allolobophora t.* Eisen 1874) (alien epigeal in much of US/ alien Tp in New Brunswick, IA, MN)

*Aporrectodea turgida* (*Allolobophora t.* Eisen 1873; *Lumbricus t.*, *Helodrilus t.*; *A. caliginosa*) (Tx or Tp in CA)

*Aulodrilus* Bretscher 1899 - Tubificidae oligochaete worms

*Aulodrilus americana* Brinkhurst & Cook 1986 (WA freshwater infauna/ Tx in KY, TN)

*Aulodrilus limnobius* Bretscher 1899 (cosmopolitan/ CO, VA hyporheic; rare Virginian marine infauna / Tx in KY, TN)

*Aulodrilus pigueti* Kowalewski, 1914 (= *Aulodrilus stephensoni*) (KY hyporheic; Carolinian & Virginian marine infauna)

*Aulodrilus pluriseta* (*Naidium p.* Piguet, 1907) (NY hyporheic; WA freshwater infauna; rare Virginian marine infauna)

*Aulodrilus* undet. sp. (NY freshwater sandy beach interstitial)

*Bathydrilus* Cook, 1970 - Tubificidae oligochaete worms

*Bathydrilus litoreus* Baker, 1983 (CA marine benthic)

*Bathydrilus parkeri* Erseus, 1991 (CA marine benthic)

*Bathydrilus* sp. undet. sp. (wFL Gulf of Mexico marine infauna)

*Bimastos* Moore 1893 - Lumbriculidae oligochaete worms

*Bimastos heimbürgeri* Smith 1928 (epigeal in 14 states in East/ Ed & Tp in IL)

*Bimastos longicinctus* (*Helodrilus l.* F. Smith & Gittens 1915) (14 states in East/ Ed & Tp in IL),

*Bimastos parvus* (Eisen, 1874) (epigeal in 20 states in the south/ Tp in Kappelman Salamander Cave, Comal Co., TX)

*Bimastos* undet. sp. (Tp in cave each in Bexar, Burnet, Uvalde & Williamson Cos.,TX)

*Bimastos tumidus* (*Allolobophora tumida* Eisen 1874) (epigeal in 19 states in East and South, west to MO,TN/ Tx in AL, CA, MO, TN, VA; Tp in GA (Dade Co.))

*Bimastos zeteki* (*Helodrilus* F. Smith & Gittins, 1915) (Tx or Tp in GA (Dade Co.))

*Branchiura* Beddard, 1892 - Tubificidae oligochaete worms

*Branchiura sowerbyi* Bedd., 1892 (hyporheic in IL, OH rivers; alien rare Virginian marine infauna)

*Bratislavia* Kosel, 1976 - Naididae oligochaete worms

*Bratislavia bilongata* (*Naidium b.* Chen, 1944) (CA benthic)

*Bratislavia unidentata* (*Pristina u.* Harman 1973) (rare NA/Pb? in IL karstic sprs.; rare Virginian marine infauna)

*Chaetogaster* Von Baer 1827 - Naididae oligochaete worms

*Chaetogaster diaphanus* (*Nais d.* Guithuisen, 1821) (Tx or Tp in SC (Orangeburgh CO.); CA benthic; AZ sinkhole interstitial)

*Chaetogaster diastrophus* (*Nais d.* Gruithuisen 1828) (Holarctic/ AL, FL, GA, KY, MI, NH, NY, PA, TN, VA hyporheic)

*Chaetogaster krasnopolskiae* Lastockin, 1937 (species inquirenda) (Holarctic/NY hyporheic)

*Chaetogaster limnaei* Von Baer, 1827 (CA benthic)  
*Chaetogaster pellucidus* Walton, 1906 (MN lake benthic)

*Chaetogaster* undet. species (MI interstitial; CO hyporheic, sandy hyporheic in TX; Tp in cave in Hart Co.,KY; Tx or Tp in Edmonson Co., TN & Smith, Dekalb & Franklin Cos.,TN)

*Clitellio* Savigny, 1820 - Tubificidae oligochaete worms  
*Clitellio arenarius* (*Lumbricus a.* Mueller, 1776)(US (ME) & Europe Atlantic supralittoral, brackish, marine interstitial)

*Coralliodrilus* Erseus, 1979 – Tubificidae oligochaete worms  
*Coralliodrilus* undet. sp. wFL Gulf of Mexico marine infauna)

*Dendrobaena* Eisen 1873 - Lumbriculidae oligochaete worms  
*Dendrobaena octaedra* (*Enterion octaedrum* Savigny, 1826; *Lumbricus o.*, *Helodrilus o.*, *Allolobophora o.*) (Tx or Tp in GA (Dade Co.))

*Dendrobaena rubida* = *Dendrodrilus r.*

*Dendrodrilus* Omodeo 1956 - Lumbriculidae oligochaete worms  
*Dendrodrilus rubidus* (*r.*) (*Enterion r.* Savigny 1826; *Dendrobaena r.*) (NUS, Canada Ed/Tp or (Tx) in AL, GA, IL, IA, KY(Mammoth C.), MD, MO, NB, ON, PA, PQ, SC, TN, TX, VA, WV; Tp in GA (Bartow Co.))

*Dero* Okem 1815 - Naididae oligochaete worms  
*Dero digitata* (*Nais d.* Mueller, 1773) (CA, Carolinian marine infauna)  
*Dero nivea* Aiyer, 1930 (CA marine infauna)

*Dero* (*D.*) *obtusata* D'udekem 1855 (= *D. latissima*) (NY hyporheic; rare Virginian marine infauna)

*Dero* undet. sp. (MN lake benthic)  
*Dero trifida* Loden, 1979 (CA freshwater benthic)

*Diplocardia* Garman 1888. - Acanthrodriilidae oligochaete worms (also put in Megascolecidae))  
**Bibl.:** Gates 1977

*Diplocardia fusca* Gates, 1943 (Tp in TX)  
*Diplocardia singularis* (*Geodrilus s.* Ude 1893) (Ed & Tp in IL, MO)

*Diplocardia* undet. sp.or species (Tp in IL,MO,TX/Ed; Tp in Travis & Uvalde Cos.,TX; Ac in WA)

*Diplocardia verrucosa* Uddekem, 1895 (= *Pelosclex oeneden*) (Ed & Tp in IL, MO)

*Eisenia* Malm 1877 - Lumbriculidae oligochaete worms



***Eisenia foetida*** (= *Helodrilus* or *Enterion f.* Savigny 1826; *E. foetida Eiseniella f.*) Duges 1837 (Epigeal in US and Canada/ Ac, Tp or Tx in Mammoth C., KY) **Bibl.:** Gates 1978

*Eisenia rosea* = *Aporrectodea rosea*

***Eiseniella*** Michaelsen, 1900 - - Lumbriculidae oligochaete worms

*Eiseniella foetida* = *Eisenia fetida*

***Eiseniella tetraedra*** (*Enterion tetraedrum* Savigny 1826 in part) (epigeal in US, sCanada/ Tp, Tx or Ac in IA, NY, VA, WV; CO hyporheic)

***Eisenoides*** Gates 1969 - Lumbriculidae oligochaete worms

***Eisenoides carolinensis*** (*Microscolex c.* Michaelsen, 1910 in part) (epigeal in 13 states in Southeast n. to IL/Ed)

***Enchytraeus*** Henle, 1837 - Enchytraeidae worms

***Enchytraeus albidus*** Henle, 1837 (US (ME) Atlantic & Pacific marine interstitial or burrower)

***Eukerria*** Michaelsen, 1835 - Ocnerodrilidae oligochaete worms

***Eukerria saltensis*** (Beddard, 1892) (NC aquatic infauna)

***Glossiphonia*** Johnson, 1816 - Glossiphoniidae oligochaete worms

*Glossiphonia complanata* (Linnaeus, 1758) = *G.c.c.*

***Grania*** Southern, 1913 - Enchytraeidae worms

***Grania americana*** Kennedy, 1966 (FL marine interstitial sand)

***Grania atlantica*** Coates & Erseus, 1985 (Eastern marine interstitial sand)

***Grania laevis*** Coates & Erseus, 1985 (MA, NJ marine interstitial sand)

***Grania longiducta*** (*G. postclitellochaeta l.* Erseus & Lasserre, 1976) Coates & Erseus, 1985 (MA to MD marine interstitial sand)

***Grania maricola*** Southern, 1913 (DE, MD, NJ marine interstitial sand)

***Grania monospermatheca***. Erseus & Lasserre, 1976 (MA to FL marine interstitial sand)

***Haber*** Homlquist, 1978 - Tubificidae oligochaete worms

***Haber*** cf. *speciosus* (Hrabe, 1931) (Virginian marine infauna)

***Haplotaxis*** Hoffmeister 1843 - Haplotaxidae oligochaete worms

***Haplotaxis gordioides*** (*Lumbricus g.* Hartmann, 1821) (cosmopolitan/ CO, NY hyporheic; Tx in KY, TN, WV; cf. *H. g.* - AZ sinkhole interstitial)

***Haplotaxis brinkursti*** Cook 1975 (\*type locality cave in Pocahontas Co., WV/ Tb/ G1)

*Helodrilus* Hoffmeister 1845 - Lumbriculidae oligochaete worms - see *Eiseniella*

***Heterodrilus*** Pierantoni, 1902 Lumbriculidae oligochaete worms

***Heterodrilus pentcheffi*** C. Erseus, 1981 (LA marine infauna)

***Heterodrilus*** undesr. sp. (wFL Gulf of Mex. marine infauna)

***Heterodrilus*** undet. sp. (Carolinian freshwater interstitial)

***Ilyodrilus*** Eisen 1879 - Tubificidae oligochaete worms

***Ilyodrilus templetoni*** (*Tubifex t.* Southern 1909) (Europe, Asia, NA/ Tx in KY, TN; MB lake benthic; Virginian marine infauna)

***Inanidrilus*** Erseus, 1979 - Tubificidae oligochaete worms

***Inanidrilus bulbosus*** Erseus, 1979 (FL marine interstitial sand)

***Inanidrilus*** 2 undesr. species (wFL Gulf of Mex. marine infauna)

***Isochaetides*** Hrabce 1965 (= *Peloscolex*) Tubificidae oligochaete worms

***Isochaetides freyi*** Brinkhurst, 1965 (= *Peloscolex f.*) (Tx in KY, TN; Virginian marine infauna)

***Komarekiona*** Gates, 1974 - Ailoscolecidae oligochaete worms (also put in Komarekionidae)

***Komarekiona eatoni*** Gates, 1974 (Ed & Tp in IL, MO)

***Limnodriloides*** Pierantoni, 1903 - Tubificidae oligochaete worms

***Limnodriloides appendiculatus*** Pierantoni, 1904 (FL marine benthic)

***Limnodriloides baculatus*** Pierantoni, 1903 (FL, LA marine benthic)

***Limnodriloides barnardi*** Cook, 1974 (FL, CA marine benthic)

***Limnodriloides monotheucus*** Cook, 1974 (US Atlantic & Pacific (CA) (alien) marine interstitial or burrower)

***Limnodriloides rubicundis*** (Carolinian marine infauna)

***Limnodriloides victoriensis*** R.O. Brinkhurst & H.R. Baker, 1979 (WA marine infauna)

***Limnodrilus*** Claparede 1862 - Tubificidae oligochaete worms

***Limnodrilus cervix*** Brinkhurst, 1963 (hyporheic in OH river; rare Virginian marine infauna)

***Limnodrilus claparedeanus*** (PQ hyporheic)

***Limnodrilus hoffmeisteri*** Claparede, 1862 (= *Clitellio* & *Tubifex h.*) (NA, cosmopolitan/ hyporheic in CO, OH, ON, PQ; AB lake benthic; Tx in KY, TN; Tp or Tx in Montezuma Well, AZ; NY freshwater sandy beach interstitial; common Virginian marine infauna) **Bibl.:** Keilty 1987

***Limnodrilus profundicola*** (*Tubifex p.* Verrill, 1871) (interstitial in Montezuma Well, AZ; Carolinian freshwater? infauna)

***Limnodrilus udekemianus*** Claparede, 1862 (hyporheic in OH river; AZ sinkhole interstitial; rare Virginian marine infauna)

*Lumbricillus* Orsted, 1844 - Enchytraeidae oligochaete worms (once in Lumbriculidae)  
*Lumbricillus* undet. sp. (CO, MT/ nonkarst stygophile)

*Lumbriculus* Grubbe 1844 - Lumbriculidae oligochaete worms  
*Lumbricillus lineatus* (*Lumbricus l.* Mueller, 1774) (US & Europe Atlantic supralittoral, eulittoral, brackish, marine interstitial)

*Lumbricillus pagenstecheri* (*Enchytraeus p.* Ratzel, 1869) (US? & Europe Atlantic supralittoral, eulittoral, brackish, marine interstitial)

*Lumbriculus* Grube, 1884 - Lumbriculidae oligochaete worms  
*Lumbriculus variegatus* (*Lumbricus v.* Mueller 1774) (NY hyporheic)

*Lumbricus* Linnaeus 1758 - Lumbriculidae oligochaete worms  
*Lumbricus rubellus* Hoffmeister 1843 (Ed in most of East/ Tp in GA (Dade Co.), IA, IL ) **Bibl.:** Gates 1978

*Lumbricus* undet. sp(s). (Tx in PQ; Tx? in CA?; Tx? in Mammoth C.,KY)  
*Lumbricus terrestris* Linnaeus 1758 (IL,NB/Tp) **Bibl.:** Gates 1978

*Marionina* Pfeffer, 1890 - Enchytraeidae oligochaete worms  
*Marionina diazi* Coates & Erseus, 1985 (MA, NJ marine sand interstitial)  
*Marionina* or *Achaeta* undet. sp. (Tx in KY,TN)

*Marionina* undet sp. (CA marine beach interstitial)  
*Marionina southerni* (*Pachydrilus s.* Cernovitov, 1937) (US & Europe Atlantic supralittoral, eulittoral, brackish, marine interstitial)

*Marionina spicula* (*Enchytraeus s.* Leuckart, 1847) (US & Europe Atlantic supralittoral, eulittoral, brackish, marine interstitial)

*Marionina* undet. sp. (PQ Gulf of St. Lawrence sandy marine interstitial)  
*Marionina subterranea* (*Michaelsena s.* Knollner, 1935) (US & Europe Atlantic supralittoral, eulittoral, brackish, marine interstitial)

*Marionina welchi* Lasserre, 1971 (MA, NJ, MD, DE marine sand interstitial)

*Mesenchytraeus* Eisen, 1878 - Enchytraeidae worms  
*Mesenchytraeus solifugus* (*Melanenchytraeus s.* Emery, 1898) (ice worm) (AK, WA glacier cave; TTP in WA)

*Microscolex* Rosa, 1887 -Acanthrodilidae oligochaete worms (also put in Megascolecidae))  
*Microscolex dubius* (*Eudrilus d.* Fletcher, 1888) (Tp in cave in Uvalde Co.,TX)

*Monopylephorus* Levinsen, 1884 - Tubificidae oligochaete worms

***Monopylephorus irroratus*** (*Clitellio irrorata* Verrill, 1873) (cosmopolitan brackish interstitial or burrower)

***Monopylephorus parvus*** Ditlevesen, 1904 (cosmopolitan brackish interstitial or burrower)

***Monopylephorus rubroniveus*** Levinsen, 1884 (SC, Virginian (rare) cosmopolitan brackish interstitial or burrower)

***Nais*** Mueller 1773 - Naididae oligochaete worm

***Nais barbata*** (Mueller, 1773) (cosmopolitan/CO hyporheic)

***Nais behningi*** Michaelsen, 1923 (PQ hyporheic)

***Nais bretscheri*** (*Nais b.* Michaelsen, 1923) (cosmopolitan/NY, PQ (*N. b.-pardalis* complex) hyporheic)

***Nais communis*** (*Nais c.* Piquet, 1907) (cosmopolitan/ CO, FL, GA, NY hyporheic; interstitial in top few cm. of lake sediments; CA benthic)

***Nais elinguis*** Muller, 1774 (cosmopolitan/CO, NY hyporheic; CA benthic; PQ Gulf of St. Lawrence sandy marine interstitial; AZ sinkhole interstitial)

***Nais pardalis*** Piquet, 1906 (AB lake benthic; CA benthic)

***Nais pseudobtusa*** Piquet, 1906 (CA benthic)

***Nais*** undet. sp. or species (AL, KY, MI, PA, TN hyporheic; NY freshwater sandy beach interstitial)

***Nais simplex*** Piquet, 1909 (NY hyporheic; CA benthic)

***Nais variabilis*** Piquet, 1907 (Tx? in WV; CO, NY hyporheic; Virginian marine infauna)

***Nephralaxis*** Fender & McKey-Fender 1990 - Megascolecidae oligochaete worms

***Nephralaxis*** undescr. sp. (Epigean in Oregon Caves Natl. Monument, Josephine Co./ Tx or Tp in OR Caves)

***Octolasion*** Michaelson 1900 - Lumbriculidae oligochaete worms

***Octolasion lacteum*** (*Octolasion l.* Oberley, 1885) (E/Tx in VA,WV; Tp? in TN)

***Octolasion tyrtaeum*** (*Enterion t.* Savigny 1826; *O. gracile* Orelly, 1885) (epigean in US, eCanada/ Eb & Tx in AL, GA, IL, MD)

***Olavius*** Erseus, 1984 – Tubificidae oligochaete worms

***Olavius*** undet. sp. wFL Gulf of Mex. marine infauna)

***Ophidonais*** Gevais, 1838 - Naididae oligochaete worm

***Ophidonais serpentina*** (*Nais s.* Mueller 1774) (CO hyporheic; CA benthic)

***Paranais*** Czerniavsky 1880 - Naididae oligochaete worms

*Paranais frici* Hrabe, 1941 (CA (alien) marine benthic)

*Paranais litoralis* Muller, 1784 (Atlantic, Pacific marine interstitial or burrower)

*Paranais* undet. sp. or species (Tx, Tp or hyporheic in VA; rare Virginian marine infauna)

*Parvidrilus* Erseus, 1999 - Parvidrilidae oligochaete worms

*Parvidrilus strayeri* Erseus, 1999 (AL hyporheic)

*Peloscolex* Leidy, 1851 *freyi* = *Isochaetides f.*

*Peloscolex apectinatus* Brinkhurst, 1965 (= *Tubifi]coides a.*; *Peloscolex gariellae apectinata*)  
(US Atlantic & Pacific marine interstitial or burrower; alien US marine infauna)

*Peloscolex benedeni* (*Tubifex b.* Udekem, 1855) (Europe, Atlantic marine interstitial or burrower)

*Peloscolex gabiellae* Marcus, 1950 (CT marine infauna)

*Peloscolex pigueti* = *Aulodrilus p.?*

*Phallogrilus* Pierantoni, 1902 - Tubificidae oligochaete worms (also put in Megascolecidae)

*Phallogrilus aquaedulcis* Hrabe, 1960 (alien hyporheic in Niagara River, NY) **Bibl.:** Farara and Erseus 1991

*Phallogrilus coeloprostatu*s Cook, 1969 (MA, NJ interstitial marine sands)

*Phallogrilus extremis* Erseus, 1979 (FL interstitial marine)

*Phallogrilus hallae* Cook & Hitunen, 1975 (Lake Superior (MN, WI, ON) interstitial?)

*Phallogrilus inconspicu*s Erseus, 1979 (PEI, Madagascar interstitial marine)

*Phallogrilus marionensis* Erseus, 1979 (PEI interstitial marine)

*Phallogrilus obscurus* Cook, 1969 (MA, NJ interstitial marine sands)

*Phallogrilus profundus* Erseus, 1979 (MA interstitial marine)

*Phallogrilus remus* Erseus, 1979 (MA interstitial marine)

*Phallogrilus sabulosus* Erseus, 1979 (FL interstitial marine sands)

*Phallogrilus simplidentatus* Erseus, 1979 (High Arctic interstitial marine)

*Phallogrilus* undet. sp. (hyporheic in OH?)

*Pheretima* Kinberg 1867 - Megascolecidae oligochaete worms

*Pheretima hawayana* (*Perichaeta h.* Rosa, 1891; *Amyntas h.* Kinberg, 1867) Kinberg, 1867 (Tp in cave om Hays Co.,TX) Easton 1979

*Piguetiella* Sperber, 1939 – Naididae oligochaete worms

*Piguetiella michiganensis* Hiltunen, 1967 (rare Virginian marine infauna)

*Potamothrrix* Vejdovsky & Mrazek, 1902 - Tubificidae oligochaete worms

***Potamothrix bavaricus*** (*Tubifex b.* Oschman, 1913) (alien US aquatic infauna)

***Pristina*** Ehrenberg 1828 - Naididae oligochaete worms

***Pristina aequiseta*** Bourne 1891 (cosmopolitan/ AL, CO, FL, GA, KY, MI, NY, TN, VA hyporheic)

***Pristina breviseta*** Bourne 1891 (CA benthic)

***Pristina leidy*** Smith 1896 (= *P. longiseta* forma *leidy*) (AL, FL, NY hyporheic; Tp or Tx in SC (Orangeburg Co.) cave stream; CA benthic)

***Pristina osborni*** (*Naidium o.* Walton 1906) (CO hyporheic)

***Pristina sima*** = *Pristinella s.*

***Pristina*** undet. sp(p). (ON, TX hyporheic/ Tx in TN, KY)

***Pristina unidentata*** = *Bratislavia u.*

***Pristinella*** Brinkhurst 1985 - Naididae oligochaete worms

***Pristinella jenkinsae*** (*Naidium j.* Stephenson 1931) (AL, CO, NY, OH, TN, VA hyporheic; AZ sinkhole interstitial; Virginian marine infauna)

***Pristinella osborni*** (Walton, 1906) (IL freshwater infauna; rare Virginian marine infauna)

***Pristinella sima*** (*Pristina s.* Marcus 1944) (AL, CO, FL, GA, KY, NY, OH, PA, TN, VA hyporheic)

***Pristinella*** undet. sp. (Tx or Ac in AK),

***Psammoryctides*** Vejdovsky 1875 (= *Spencerius*) Tubificidae oligochaete worms

***Psammoryctides californianus*** Brinkhurst 1965 (CO hyporheic),

***Quistadrilus*** R.O. Brinkhurst, 1981 Tubificidae oligochaete worms

***Quistadrilus multisetosus*** (*Embolorephalus m.* F. Smith, 1900; *Tuibifex m.*; *Peloscolex*) Tp or Tx in Montezuma Well, AZ; Virginian marine infauna)

***Randiella*** Erseus & Strehlow, 1986 - Randiellidae oligochaete worms

***Randiella littoralis*** Erseus & Strehlow, 1986 (OR marine interstitial)

***Randiella multitheca*** Erseus & Strehlow, 1986 (East US marine continental shelf interstitial)

***Randidrilus*** Coates & Erseus, 1985 - Enchytraeidae oligochaete worms

***Randidrilus codensis*** (*Lumbricillus c.* Lasserre, 1971) (MA, NJ marine interstitial sand)

***Randidrilus quadrithecatus*** Coates & Erseus, 1985 (NJ, MD marine interstitial sand)

***Rhyacodrilus*** Bretscher 1901 - Tubificidae oligochaete worms

**Rhyacodrilus** *coccineus* (Tubifex c. Vejdovsky, 1875) (WA epigeal, freshwater infauna/ NY hyporheic)

**Rhyacodrilus** *montanus* (Edmondsonia montana Brinkhurst, 1965) (AB lake benthic)

**Rhyacodrilus** *sodalis* (Pheretima s. Eisen, 1879) (Canada, SE/Tx? in WV)

**Rhyacodrilus** *subterraneus* Hrabe, 1963 (AL, KY, MI, NY, OH, TN, VA hyporheic)

**Rhynchelmis** Hoffmeister, 1843 - Lumbriculidae oligochaete worm

**Rhynchelmis** *brooksi* Holmquist, 1976 (Tx or Tp in seAK)

**Rhynchelmis** undet. sp. (Tx or Tp in seAK)

**Specaria** Sperber, 1939 - Naididae oligochaete worm

**Specaria** *josinae* Vejdovsky 1883 (= *Nais* s. Bohm) (Holarctic/ FL, NY hyporheic; interstitial burrower below top cm. of NH lake sediment)

**Slavina** Vejdovsky 1883 - Naididae oligochaete worms

**Slavina** *appendiculata* d'Udekem 1885 (cosmopolitan/NY hyporheic)

**Smithsonidrilus** Brinkhurst, 1966 - Tubificidae oligochaete worms

**Smithsonidrilus** *marinus* Brinkhurst, 1966 (FL, LA marine infauna)

**Smithsonidrilus** undescr. sp. (wFL Gulf of Mex. marine infauna)

**Spelaedrilus** Claparede 1975 - Lumbriculidae oligochaete worms

**Spelaedrilus** *multiporus* Cook 1975 (\*type locality cave in Russell Co., VA/Tb/VA T&E S1 rank & global G1 rank)

**Spirosperma** Eisen, 1879 – Tubificidae oligochaete worms

**Spirosperma** *nikolskyi* (Peloscolex n. Lastockin & Sokolskaya, 1953) (WA freshwater infauna)

**Stylaria** Lamarck 1816 - Naididae oligochaete worms

**Stylaria** *lacustris* (*Nereis* l. Linnaeus, 1767) Lamarck, 1816 (GA hyporheic; MN lake benthic)

**Stylaria** undet. sp. (sandy hyporheic in Chowan River, NC)

**Stylodrilus** Claparede, 1862 - Lumbriculidae oligochaete worms

**Stylodrilus** (*Bythonomus*) *beattiei* Cook 1975 (\*\*\*\*\*?type locality in Tazewell Co., VA + 2 caves in Greenbrier Co. & one cave in Pocahontas Co., WV/ Tb/ VA & WV T&E S1 rank & global G1G2 rank)

**Stylodrilus** *heringianus* Claparede, 1862 (Holarctic epigeal, incl. NF, NB, PQ & Great Lakes/ NH, NY hyporheic) Bibl.: Keilty 1987

**Stylodrilus** *sovaliki* Claparede, 1862 (AK epigeal/ Tx or or Ac in 2 seAK caves)

**Stylodrilus** *wahkeenensis* P. Rodriguez & K.A Coates, 1996 (AL, OR, TN hyporheic)

**Tectidrilus** Erseus, 1982 - Tubificidae oligochaete worms

*Tectidrilus bori* (Righi & Kanner, 1979) (LA marine benthic)  
*Tectidrilus diversus* Cook, 1974 (CA, WA marine infauna )

*Tectidrilus profusus* Erseus, 1991 (CA marine benthic)  
*Tectidrilus squalidus* Erseus, 1982 (FL, LA marine benthic)

*Telmatodrilus* Eisen, 1879 – Tubificidae oligochaete worms  
*Telmatodrilus vejdoskyi* Eisen, 1879 (WA freshwater infauna)

*Tenagodrilus* Eckroth & Brinkhurst, 1996 - Lumbriculidae oligochaete worms  
*Tenagodrilus musculus* Eckroth & Brinkhurst, 1996 (AL temporary freshwater pond interstitial and hyporheic)

*Teneridrilus* Holmquist, 1985 - Tubificidae oligochaete worms  
*Teneridrilus mastix* (Brinkhurst) alien WA aquatic infauna

*Thalassodrilides* Brinkhurst & Baker, 1970 – Tubificidae oligochaete worms  
*Thalassodrilides belli* Cook, 1974 (LA marine benthic)

*Trichodrilus* Claparede 1862 - Lumbriculidae oligochaete worm  
*Trichodrilus allegheniensis* Cook 1971 (\*type locality cave in Franklin Co.,TN/Tb)

*Trichodrilus culveri* Cook 1975 (\*type locality cave in Pocahontas Co.,WV/Tb/WV T&E S1 rank & global G1G2 rank),

*Tubifex* Lamarck, 1816 - Tubificidae oligochaete worms  
*Tubifex templetoni* = *Ilyodrilus t.*

*Tubifex tubifex* (*Lumbricus t.* Muller, 1774) (hyporheic in OH river; MB lake benthic; AZ sinkhole interstitial)

*Tubifex pseudogaster* = *Tubificoides p.* (Dahl, 1960) (*Isochaetides p.*; *Limnodrilus p.*; *Tubifex alpinus*) (Atlantic marine interstitial or burrower)

*Tubificoides apectinatus* = *Peloscolex apectinatus* Brinkhurst, 1965  
*Tubificoides bakeri* Brinkhurst, 1985 (CA, WA marine infauna)

*Tubificoides brownae* Brinkhurst & Baker, 1979 (FL, LA, SC,WA alien marine infauna)

*Tubificoides gabriellae* (*Pelescolex g.* Marcus, 1950)(US (FL, LA, MA) & South American Atlantic supralittoral, brackish, marine interstitial or burrower)

*Tubificoides heterochaetus* (*Peloscolex h.* Michaelsen, 1926) (rare Virginian supralittoral, brackish, marine infauna (interstitial or burrower))



***Tubificoides nerthoides*** (*Peloscolex n.* Brinkhurst, 1965) (US Atlantic & Pacific marine interstitial or burrower)

***Tubificoides pseudogaster*** (*Tubifex p.* Dahl, 1960; *Isochaetides p.*; *Limnodrilus p.*; *Tubifex alpinus*) (Atlantic marine interstitial or burrower)

***Tubificoides wasselli*** (alien Virginian, LA marine infauna)

***Varichaetadrilus*** Brinkhurst & Kathman 1983 - Lumbriculidae oligochaete worms

***Varichaetadrilus angustipenis*** (*Limnodrilus a.* Brinkhurst & Cook 1966) (rare NA/Pb? in IL karstic sprs; alien US aquatic infauna; AZ sinkhole interstitial)

***Vejdovskiyella*** Michaelsen 1903 - - Naididae oligochaete worms

***Vejdovskiyella comata*** (= *Bohemilla c.* Vejdovsky 1883) (NY hyporheic)

***Vejdovskiyella intermedia*** (Bretscher 1896) (NA/Europe/CO hyporheic; Tx? in MN)

## Head crawling Worms or suction-feeding worms

Class Aphanoneura

Order Aeolosomatida

Family Aeolosomatidae (suction-feeding worms)

(*Aeolosoma*, *Potamodrilus*, Undet. Tx genus in FL)

***Aeolosoma*** Ehrenberg 1828 - Aeolosomatidae Aphanoneura worm (also put in Scolicida polychaetes)

***Aeolosoma hemprichi*** Ehrenberg 1828 (cosmopolitan/Tx in KY(Mammoth C.),VA; MN lake benthic)

***Aeolosoma*** undet. sp. or species (hyporheic in AL, CO, NC, NH, NY, FL, GA, MI, MN, OH, PA, KY, TN, VA; Tp or Tx in SC (Orangeburg Co.) cave stream))

***Potamodrilus*** Lastockin, 1935 - Aeolosomatidae Aphanoneura worm

***Potamodrilus*** undesr. sp. (hyporheic in VA)

## Nematodes

Of Phylum Nemata (=Nematoda)

Parasitic worms with unsegmented, white or brown, cylindrical body, without tentacles.

Unsegmented, white or brown, cylindrical, no tentacles. Partly incl. Aschelminthes. Both aquatic & terrestrial species. Parasites in crickets, bats, woodrats & salamanders. Up to 30 million per square m. of woodland soil where they feed on bacteria, fungi, protozoa and plant roots. Preyed upon by bacteria & fungi.

**Bibl.:** Eber 1994; Altherr & Delamare 1972; Goodey 1963; Nicholas 1984; Anderson 1992. Partly incl. Aschelminthes. Both aquatic & terrestrial species. Parasites on cave crickets. Areas.

East: Ferris, Ferris & Tepkema 1973; FL: Esser et al 1985; NA: Cobb 1914; Tarjan et al. 1977; NY: Strayer & Bannon-O'Connell 1992; Cain 1966. TN: Chandler 1985; US: Altherr Delamare 1972; Esser & Buckingham 1987; Poinar 1991; World: Eber 1986; Goodey 1963. Skrjabin 1923-1987; Yamaguti, 1961; Class Gordioidea Chandler 1985

Kingdom Animalia

Clade Bilateria

Clade Protostomia

Clade Ecdysozoa

Phylum Nematoda (= Nemata)

Class Chromadorea (= ?Adenophorea)

Subclass Chromadoria

Order Desmodorida

Family Ceramonematidae

(*Ceramonema*, *Dasynemella*, *Dasynemoides*, *Pselionema*)

Family Choniolaimidae

(*Choniolaimus*, *Gammanema*, *Halichoanolaimus*

(now in Selachinematidae), *Latronema*, *Pseudonchus*)

Family Desmodoridae

(*Acanthopharynx*, *Chromaspirina*, *Desmodora*, *Desmodorella*,  
*Eubostrichus*, *Leptonemella*, *Metachromadora*, *Onyx*, *Polysigma*,  
*Sigmophoranema*, *Spirinia*)

Family Microlaimidae (now in Chromadorida)

Family Monoposthiidae (*Monoposthia*, *Nudora*)

Family Richtersiidae (*Dracograllus?*, *Richtersia*)

Family Selachinematidae (*Halichoanolaimus*)

(also put in Choniolaimidae)

Suborder Chromadoria

Superfamily Chromadoroidea

Family Comesomatidae

(*Comesoma*, *Dorylaimopsis*, *Laimella*, *Mesonchium*,  
*Metacomesoma*, *Paracomesoma*, *Sabatieria*)

Superfamily Draconematoidea

Family Draconematidae (*Draconema*)

Family Epsilonematidae (*Epsilonema*)

Subclass Enoplia

Order Enoplida

Suborder Enoplina

Family Anoplostomatidae (*Anoplostoma*)

Family Leptochinidae (undet. genera or genus in LA brackish beach)

Family Oxystominidae (*Halalaimus*, *Litinium*, *Oxystomina*, *Porocoma*)

Family Rhabdodemaniidae (*Rhabdodemia*)

Family Symplocostomatidae (= Enchelidiidae) (*Catyptonema*, *Thoonchus*)

Family Trefusiidae (*Cytolaimium*)

Superfamily Alaimoidea (also subsumed in Tripyloidea)

Family Alaimidae

Subfamily Alaiminae: *Alaimus*; *Apholaimus*

Superfamily Enoploidea

Family Anticomidae (*Anticoma*)

Family Enoplidae

(*Chaetonema*, *Eleutherolaimus*, *Enploidis*, *Enoplus*, *Epacanthion*, *Filipjevia*,  
*Mesacanthion*, *Mesacanthoides*, *Metenploidis*, *Paramesacanthion*, *Trileptium*)

Family Lauratonematidae

(*Lauratonema*, *Lauratonemoides*; undet. genera or genus in LA brackish beach)

Family Phanodermatidae (*Klugea*, *Phanopharynx*, *Phanoderma*, *Phanodermopsis*)

Superfamily Oncholaimoidea

Family Enchelidiidae (*Illium*)

Family Eurystominidae

Subfamily Eurystomininae

(*Eurystomina*, *Pareurystomina*; undet. genera or genus in LA brackish beach)

Suborder Oncholaimina

Superfamily Oncholaimoidea

Family Oncholaimidae (undet. genus in LA brackish beach, *Filoncholaimus*,  
*Metaparoncholaimus*, *Metoncholaimus*, *Meyersia*, *Oncholaimellus*,  
, *Paroncholaimus*, *Pontonema*, *Prooncholaimus*, *Viscosia*)

Subfamily Oncholaiminae: *Oncholaimus*, *Oncholaimoides*, *Oncholaimellus*

Suborder Tripylina (also subsumed in Enoplina)

Superfamily Tripyloidea

Family Alaimidae (also put in own superfamily)  
(undet. genera or genus in LA brackish beach)

Family Ironidae (put in own superfamily)

Family Tripylidae (undet. genus in LA brackish beach sediment)  
Subfamily Tripylinae: *Trichistoma*; *Tobrilus*; *Trilobus*;

Superfamily Ironoidea (also subsumed in Tripyloidea)

Family Ironidae (undet. genus in LA brackish beach ; *Ironella*, *Parironus*,  
*Thalassironus*, *Trissonchulus*)

Subfamily Ironinae: *Ironus*; *Cephalonema*; *Nanonema*;  
Subfamily Cryptonchinae: *Cryptonchus*; *Ditlevsenia*;

Order Monochida

Family Monochidae (also put in Order Enoplida)  
(undet. genera or genus in LA brackish beach)

Order Monochinda

Suborder Mononchina

Superfamily Mononchoidea

Family Anatonchidae (*Anatonchus*) (put in Mononchidae)

Family Mononchidae

Subfamily Mononchinae

*Mononchus*, *Anatonchus* (also in Anatonchidae), *Granonchus*, *Mylonchulus*,  
*Prionchulus*

Order Dorylaimida

Suborder Dorylaimina

Superfamily Dorylaimoidea

Family Dorylaimidae

(*Laimydorus*; undet. genus in LA brackish beach, *Nygolaimus*)

Subfamily Dorylaiminae:

*Dorylaimus*; *Aporcelaimus*; *Aporcelaimellus* (now in Aporcelaimidae);  
*Chrysonema*, *Discolaimus*, *Depranodorylaimus*, *Eudorylaimus* (now  
in Qudsianematidae); *Cabronema*; *Caimydorus*; *Labronema*, *Mesodorylaimus*;  
*Prodorylaimus*, *Pungentus* (now in Nordidae); *Thornia*; *Thornenema*;  
*Witoldinema*

Subfamily Actinolaiminae

*Actinolaimus*; *Paractinolai* (now in Actinolaimidae)

Subfamily Meromyariaminae: *Adoncholaimus*; *Dorylaimoides*;

Subfamily Tylencholaiminae: *Enchodelusus*;

Family Aporcelaimidae *Aporcelaimellus* (once in Dorylaimidae)

Family Actinolaimidae: *Paractinolaimus* (once in Dorylaimidae)

Family Longidoridae (*Xiphinema*)

Family Nordiidae: *Pungentus* (once in Dorylaimidae)

Family Nygolaimidae (see below)

Family Qudsianematidae: *Eudorylaimus* (once in Dorylaimidae)

Superfamily Belondiroidea

Family Belondiridae

Subfamily Belondirinae: *Axonchium*; *Oxydirus*

Suborder Nygolaimina (also subsumed in Dorylaimina)

Superfamily Nygolaimoidea (also subsumed in Dorylaimoidea)

Family Campydoridae

Subfamily Campydorinae: *Aulolaimoides*

Family Nygolaimidae: *Laevides*

Order Trichocephalida

Suborder Trichocephalina

Superfamily Trichocephaloidea

Family Trichocephalidae

Subfamily Trichurinae: *Trichurus*;

Subfamily Capillariinae: *Capillaria*; *Trichosoma*;

Family Trichosomoididae

Subfamily Trichosomoidinae: *Trichuroides*;

Subfamily Trichuridinae: *Trichusomoides*;

Order Mermithida

Suborder Mermithina

Superfamily Mermithoidea

Family Mermithidae (undet. genus in GA Tb *Pseudotremia eburnean* millipede)

(*Hydromermis*)

Subfamily Mermithinae: *Mermis*

Order Muspiceida

Superfamily Muspiceoidea

Family Muspiceidae (*Maseria*)

Subclass Chromadoria

Order Araeolaimida

Suborder Araeolaimina

Superfamily Leptolaimoidea

Family Leptolaimidae

(*Antomicron*, *Camacolaimus*, *Ixonema*, *Leptolaimus*, *Procamacolaimus*)

Family Rhabdolaimidae (also put in Chromadorida) (*Rhabdolaimus*)  
(also put in Leptolaimidae)

Family Teratocephalidae (*Teratocephalus*) (once put in Plectidae)

Family Tripyloididae (*Bathylaimus*, *Tripyloides*)

Superfamily Axonolaimoidea

Family Axonolaimidae

(*Odontophora*, *Apondontium*, *Pascolaimus*, *Paradontophora*, *Pseudolella*)

Subfamily Axonolaiminae (*Axonolaimus*, *Diplopeltis*)

Subfamily Belondirinae (*Axonchium*)

Subfamily Cylindrolaiminae (*Cylindrolaimus*)

Superfamily Camacolaimoidea

Family Camacolaimidae

Subfamily Halaphanolaiminae

*Aphanolaimus*; *Paraphanolaimus*;

Superfamily Plectoidea

Family Plectidae (*Teratocephalus*) (now in Teratocephalidae)

Subfamily Plectinae

*Plectus*; *Plectoides*; *Anaplectus*; *Chronogaster*, *Plectoidea*, *Pycnolaimus*; *Walcherenia*

Family Teratocephalidae

(also put under Leptolaimoidea or in Order Rhabdita, Suborder Teratocephalina)

(*Teratocephalus*) (once put in Plectidae)

Order Chromadorida (also as subclass)

Suborder Chromadorina

Superfamily Chromadoroidea

Family Chromadoridae

(*Actinonema*, *Atrochromadora*, *Austranema*, *Chromadorita*, *Graphonema*)

*Hypodontolaimus, Neochromadora, Prochromadora, Prochromadorella, Spilophorella*, undet. genus in LA brackish beach)

Subfamily Chromadorinae:

*Chromadorina; Chromatodora; Chromadorella, Dichromadora, Euchromadora, Spilophora*

Family Selachinematidae (also put in Enoplina)

(*Cheironchus, Richtersia* (now in Richtersiidae), *Synonchiella*)

Suborder Cyatholaimina

Superfamily Cyatholaimoidea

Family Cyatholaimidae

(*Acanthonchus, Gomphionema, Longicyatholaimus, Marylynnia, Metacyatholaimus, Nannolaimoides, Nannolaimus, Neotonchus, Paracanthonchus, Paracyatholaimus, Pomponema, Propomponema*)

Subfamily Cyatholaimrinae

*Cyatholaimus; Achromadora; Ethmolaimus; Prodesmodora*

Family Microlaimidae (also put in Dorylaimida)

(*Microlaimus, Microdorylaimus, Paramicrolaimus*)

Order Desmoscolecida

Family Desmoscolecidae (*Desmoscolex, Tricoma*)

Order Monhysterida

Family Linhomoeidae

(*Anticyathus, Anticyclus, Desmolaimus, Didelta, Disconema, Eleutherolaimus, Linhomoeus, Metalinhomoeus, Paralinhomoeus, Terschellingia*)

Family Scaptrellidae (*Scaptrella*)

Family Sphaerolaimidae (*Sphaerolaimus*)

Family Siphonolaimidae

(*Cyartonema, Dermatolaimus, Paraterschellingia, Siphonolaimus*)

Family Xyalidae

(*Daptonema, Rhyntonema* (also put in Monhysteridae), *Theristus* (also put in Monhysteridae))

Suborder Monhysterina

Superfamily Monhysteroidea

Family Monhysteridae

(undet. genus in LA brackish beach, TTx? undet. genus & sp. in Wind C.,SD; *Cobbia*, *Eumonhystera*, *Gonionchus*, *Amphimonhystera*, *Paramonhystera*, *Rhynchonema*, *Steineria*, *Xenolaimus*, *Xyala*)

Subfamily Monhysterinae

*Monhystera*; *Hofmaenneria*; *Mesotheristus*, *Paramonhystera*, *Prismatolaimus*;  
*Theristus* (also in Xyalidae)

Class Secernentea

Subclass Rhabditia

Order Rhabditida (= Phasmidea, Secernentea)

Suborder Rhabditina

Superfamily Rhabditoidea

Family Cephalobidae (now in Cephaloboidea)

Family Neodiplogastridae:

*Mononchoides*; *Fictor* (also put in Aphelenchidae)

Family Rhabditidae (undet. genus in GA Tb *Cambala hubrichti* millipedes)

Subfamily Rhabditinae (*Rhabditis*; *Cuticularia*; *Curviditis*)

Family Rhabdochonidae

Subfamily Rhabdochoninae: *Rhabdochona*;

Family Rhabdiasidae

Subfamily Rhabdiasinae: *Rhabdias*;

Family Strongyloididae

Subfamily Strongyloidinae: *Strongyloides*;

Suborder Cephalobina

Superfamily Cephaloboidea

Family Cephalobidae (also put in Rhabditoidea)

Subfamily Cephalobinae: *Cephalobus*;

Subfamily Acrobolinae: *Acrobeles*; *Acrobelloides*;

Superfamily Panagrolaimoidea

Family Panagrolaimidae

Subfamily Panagrolaiminae: *Panagrolaimus*;

Order Strongylida

Suborder Strongylina

Superfamily Strongyloidea



Family Strongylidae  
Subfamily Strongylinae: *Strongylus*;

Superfamily Trichostrongyloidea  
Family Trichostrongylidae (*Nematospiroides*)

Subfamily Trichostrongylinae  
*Trichoston*: *Trichostrongilus*; *Parallintoshius*;

Subfamily Strongilacanthinae  
*Allintochus*; *Anoplostrongilus*;  
*Molinastrongilus*; *Molinostrongilus*; *Tricholeiperia*

Subfamily Boehmiellinae: *Boehmiellina*;  
Subfamily Nematoderinae: *Nematodirus*;  
Subfamily Vianniinae: *Nippostrongilus*; *Longistriata*;

Subfamily Heligmosominae  
*Heligmonella*; *Nematospiroides*, *Nippostrongilus*;

Subfamily Oswaldocruziinae: *Oswaldocruzia*;

Order Ascaridida

Suborder Ascaridina

Superfamily Ascaridoidea

(endoparasite in OH *Gyrinophilus porphyriticus* p. salamander)

Family Ascarididae  
Subfamily Megalobatrachonemaninae  
*Megalobatrachonema*; *Chabaudgolvania*

Superfamily Oxyuroidea

Family Kathlaniidae (now in Cosmoceroidea),  
Family Oxyuridae (*Mastophorus*)

Subfamily Oxyurinae: *Oxyuris*; *Thelandros*;  
Subfamily Aspicularinae: *Aspicularis*;  
Subfamily Syphaciinae: *Syphacia*;

Superfamily Cosmoceroidea

Family Cosmoceridae  
Subfamily Cosmocerinae: *Cosmocercoides*;

Family Kathlaniidae  
Subfamily Kathlaniinae: *Falcaustra*, *Kathlania*;  
Subfamily Spironurinae: *Spironoura*, *Falcaustra*;

Superfamily Seuratoidea  
Family Quimperiidae  
Subfamily Quimperiinae: *Desmognathinema*

Family Seuratidae  
Subfamily Seuratinae: *Seuratum*;

Subclass Spiruria  
Order Spirurida  
Suborder Spirurina

Superfamily Spiruroidea  
Family Spiruridae (*pirurata*)  
Undet. endoparasite genus in NY *Lasiurus borealis* bats)

Subfamily Ascaropsinae: *Ascarops*; *Physocephalus*;  
Subfamily Spiroxynae: *Spiroxys*;  
Subfamily Ardenninae: *Ardenna*;  
Subfamily Gongylonematinae: *Gongylonema*;

Family Acuariidae  
Subfamily Acuariinae: *Spiroptera*;

Family Hedruridae  
Subfamily Hedrurinae: *Hedruris*;

Family Thelaziidae  
Subfamily Omeiinae: *Omeia* (or in Quimperiidae)

Superfamily Physalopteroidea  
Family Physalopteridae  
Subfamily Physalopterinae: *Abbreviata*; *Physaloptera*

Family Rictulariidae  
Subfamily Rictulariinae: *Rictularia*; *Pterygodermatites*;

Superfamily Filarioidea  
Family Filariidae  
Subfamily Filariinae: *Agamofilaria*;

Family Dipetalonematidae  
Subfamily Dipetalonematinae: *Litomosa*;

Family Onchocercidae (*Dunnifilaria*)

Subclass Diplogasteria

Order Diplogasterida  
Suborder Diplogasterina

Superfamily Diplogasteroidea  
Family Diplogasteridae  
Subfamily Diplogasterinae: *Diplogaster*;

Superfamily Cyliandrocorporoidea  
Family Cyliandrocorporidae  
Subfamily Cyliandrocorporinae: Longibucca];

Order Aphelenchida  
Suborder Aphelenchina  
Superfamily Aphelenchoidea

Family Aphelenchidae  
Subfamily Aphelenchinae  
*Aphelenchus*; *Fictor* (also put in Neodiplogastridae); *Isonchus*;

Order Tylenchida  
Suborder Tylenchina  
Superfamily Tylenchoidea

Family Tylenchidae  
Subfamily Tylenchinae: *Tylenchus*; *Filenchus*;

Superfamily Hoplolaimoidea (also subsumed in Tylenchoidea)  
Family Hoplolaimidae

Subfamily Dolichodorinae: *Dolichodorus*;  
Subfamily Hoplolaiminae: *Helicotylenchus*; *Neotobrilus*; *Rotylenchus*;

Suborder Criconematina (also subsumed in Tylenchina)  
Superfamily Criconematoidea

Family Criconematidae  
Subfamily Criconematinae: *Hemicycliophora*;

***Abbreviata*** Travassos, 1919 - Physalopteridae nematode, Subfamily Physalopterinae  
***Abbreviata*** undet. sp. (In TX *Tadarida brasileinsis* bats)

***Acanthonchus*** Cobb, 1920 - Cyatholaimidae nematodes  
***Acanthonchus cobbi*** Chitwood, 1951 (FL marine infauna)

***Acanthopharynx*** Marion, 1870 (= *Xanthodora*) Desmodoridae nematodes  
***Acanthopharynx*** undet sp. ( NC deep-sea infauna)

*Achromadora* Cobb, 1913 (Soil, algy, grass & plant associated) Cyatholaimidae nematodes, Subfamily Cyatholaimrina

*Achromadora pseudomicoletzkyi* Van der Linde, 1938 (in NY hyporheic)

*Achromadora ruricola* (de Man, 1880) Micoletzky, 1925 (in NY hyporheic)

*Achromadora* undet. sp. (NY freshwater sandy beach interstitial)

*Achromadora terricola* (deMan, 1880) Micoletzky, 1925 (in MA, WA hyporheic)

*Acrobeles* Linstow, 1877 (Soil- algy, grass & plant associated) Cephalobidae nematode, Subfamily Acrobelinae. Bibl.: P. Thomas 1964

*Acrobeles ciliatus* Linstow, 1877 (in MA, TX, WA hyporheic).

*Acrobeles* undet. sp. (Wind C.,SD/TTx).

*Acrobeloides* (Cobb, 1924) Thorne, 1925 (Soil- algy, grass & plant associated) Cephalobidae nematodes, Subfamily Acrobelinae

*Acrobeloides* undet. sp. (Wind C.,SD/TTx?)

*Actinolaimus* Cobb, 1913 (Soil- algy, grass & plant associated) Dorylaimidae nematodes, Subfamily Actinolaiminae

*Actinolaimus macrolaimus* (Man, 1884) Steiner, 1916 (in NY hyporheic).

*Actinolaimus micoletzkyi* ((Schneider, 1935) (in NY hyporheic).

*Actinonema* Cobb, 1920 - Chromadoridae nematodes

*Actinonema celtica* Cobb, 1920 (AK marine meiofauna)

*Actinonema pachydermatum* Cobb, 1920 (MA marine meiofauna)

*Adoncholaimus* de Man, 1886 (Soil- algy, grass & plant associated) Dorylaimidae nematodes, Subfamily Meromyariaminae

*Adoncholaimus lepidus* (Thorne & Swanger, 1936) (in AZ, CA hyporheic)

*Adoncholaimus* undet. sp. (GA salt marsh benthic)

*Agamofilaria* Schmidt, Duszynski & Martin 1992 - Filariidae nematodes, Subfamily Filariinae (parasites found in 10 500 years radiocarbon dated ground sloth dung balls)

*Agamofilaria oxyura* Schmidt, Duszynski & Martin 1992 (\*type locality cave in Mohave Co., AZ/ extinct in *Nothrotheriopsis shastensis* ground sloth dung)

*Alaimus* de Man, 1880 (Soil- algy, grass & plant associated) Alaimidae nematode, Subfamily Alaiminae

*Alaimus minor* Cobb, 1893 (*A. simplex* Cobb, 1914; *Apholaimus tenuis* Daday, 1899; *A. primitivus* de Man, 1880) (MA?, NY hyporheic)

*Allintoshius* Chitwood, 1937 (Intestinal parasites of Chiroptera) Trichostrongylidae nematodes, Subfamily Nematoderinae

*Allintoshius nycticeius* Chitwood, 1937 (endoparasite in DC, IA *Nycticeius humeralis* & KS *Myotis velifer* bats) **Bibl.:** Nickel & Hansen, 1967

*Allintoshius* undet. sp. (endoparasite in WI (infrequent Tx) *Eptesicus fuscus* bats)

*Allintoshius travassosi* Chandler, 1938 (endoparasite in KS *Myotis grisescens*; IA, IN, KS *Eptesicus fuscus f.*, KS, TX *Myotis velifer* & IA, IN, TX *Nycticeius humeralis* bats) **Bibl.:** Nickel & Hansen, 1967

*Amphiera* Allgen, 1920 - Monhysteridae nematodes

*Amphimonhystera anechma* (Southern, 1914) (NY marine infauna)

*Anaplectus* de Coninck & Schuurmans Stekhoven, 1933 (Soil- algy, grass & plant associated) Plectidae nematodes, Subfamily Plectinae

*Anaplectus granulatus* (Bastian, 1865) Fuchs, 1930 (in NY hyporheic).

*Anatonchus* (Cobb, 1916) de Coninck, 1939 (Soil- algy, grass & plant associated) Mononchidae nematodes, Subfamily Mononchinae (also put in Anatonchidae)

*Anatonchus dolichurus* (Ditlevsen, 1911) Andrassy, 1958 (NY, MA, WA hyporheic).

*Anatonchus tridentatus* (de Man, 1876) Andrassy, 1958 (NY hyporheic)

*Anoplostoma* Butschli, 1874 - Anoplostomatidae nematodes

*Anoplostoma* undet. sp. (PQ Gulf of St. Lawrence sandy marine interstitial)

*Anoplostrongylus* Boulenger, 1926 (Intestinal parasites of Chiroptera) Trichostrongylidae nematodes, Subfamily Strongilacanthinae

*Anoplostrongylus bari* Boulenger, 1926 (endoparasite in non-cave TX *Eumops perotis* bats)

*Anoplostrongylus delicatus* (Schwartz, 1927) Boulenger, 1926 (endoparasite in LA (non-cave), NM, OK & TX *Tadarida brasiliensis mexicana*; TFL *Tadarida brasiliensis cynocephala* & TX *Myotis velifer* & *Eptesicus fuscus* bats)

*Anticoma* Bastian, 1865 - Anticomidae nematodes

*Anticoma acuminata* (Eberth, 1863) (CT, WA marine interstitial up to 5 cm deep)

*Anticoma campbelli* Allgen, 1932 (CT marine interstitial up to 5 cm deep)

*Anticoma columba* Wieser, 1953 (CT marine interstitial up to 5 cm deep)

*Anticoma ecotronis* (AK marine infauna)

*Anticoma litoris* Chitwood, 1936 (CT, MA, NY marine interstitial up to 5 cm deep)  
*Anticoma* undet. sp. (FL marine infauna)

*Anticyathus* Cobb, 1920 - Linhomoeidae nematodes  
*Anticyathus* undet. sp. (FL marine infauna)

*Anticyclus* Cobb, 1920 - Desmodoridae nematodes  
*Anticyclus iniquus* (*Linhomoeus i.* Wieser, 1956) (MA, NJ marine meiofauna)

*Antomicron* Cobb, 1920 - Leptolaimidae nematodes  
*Antomicron* undet. sp. (FL marine infauna)

*Aphanolaimus* de Man, 1880 (Soil- algy, grass & plant associated) Camacolaimidae nematodes,  
Subfamily Halaphanolaiminae

*Aphanolaimus aquaticus* Daday, 1894 or 1898 (groundwater in Sweden/ in CO, NY hyporheic).  
*Aphanolaimus communis* Cobb in M.V. 1915 (lakes/ NY hyporheic)

*Aphelenchus* Bastian, 1865 (Soil- algy, grass & plant associated) Aphelenchidae nematodes,  
Subfamily Aphelenchinae

*Aphelenchus avenae* Bastian, 1865 (in MA hyporheic) Bibl.: Dowsett 1977  
*Aphelenchus* undet. sp. (Wind C., SD/TTx).

*Apodontium* Cobb, 1920 - Axonolaimidae nematodes  
*Apodontium* undet. sp. (FL marine psammon)

*Apholaimus* de Man, 1880 (Soil- algy, grass & plant associated) Alaimidae nematode,  
Subfamily Alaiminae

*Apholaimus tenuis* Daday, 1899 (in MA, NY hyporheic).  
*Apholaimus primitivus* de Man, 1880 (in MA, NY hyporheic).

*Aporcelaimellus* Heyns, 1965 (Soil- algy, grass & plant associated) Aporcelaimidae nematodes  
(once in Dorylaimidae, Subfamily Dorylaiminae. **Bibl.:** Tjepkema 1971

*Aporcelaimellus obscuroides* Altherr, 1968 (in CO hyporheic).  
*Aporcelaimellus obscurus* (Thorne & Swanger, 1936) Heyns, 1935 (predacious in streams/ CO  
hyporheic).

*Aporcelaimellus obtusicaudatus* (in NY, WA hyporheic).  
*Aporcelaimellus punctatus* Altherr & Deboutteville, 1973 (in MA hyporheic).  
*Aporcelaimellus regis* (de Man, 1876) Thorne & Swanger, 1936 (in NY, WA hyporheic).

*Ardenna* Railliet & Henry, 1911 (Intestinal parasites of mammals, including bats). Spiruridae nematodes, Subfamily Ardenninae

*Ardenna strongylina* (Rudolphi, 1819) Railliet & Henry, 1911 (parasites in Tx *Myotis velifer* & *Lasiurus borealis* bats).

*Ascarops* Beneden, 1873 (Intestinal parasites of mammals, including woodrats and bats). Spiruridae nematodes, Subfamily Ascaropsinae

*Ascarops strongylina* (Rudolphi, 1819) Alicata & McIntosh, 1933 (parasites in Tx *Myotis velifer incautus* & *Lasiurus borealis* bats; on OH bats).

*Ascarops* undet. sp. (endoparasite in AZ *Neotoma albigula* woodrats)

*Ascolaimus* Ditlevsen, 1919 - Axonolaimidae nematodes  
*Ascolaimus elongatus* (Butschli, 1874) (FL marine psammon)

*Aspicularis* Schulz, 1924 (Intestinal parasites of rodents, including woodrats)  
Oxyuridae nematodes, Subfamily Aspicularinae (once in Heteroxynematidae)

*Aspicularis ackertii* Kruidenier & Mehra, 1959 (in AZ *Neotoma cinerea acraia* & *N. albigula* & on AZ, WY *Neotoma cinerea rupicola* woodrats).

*Aspicularis tetraptera* (Nitzsch, 1821) Schultz, 1924 (in non-cave CO *Neotoma cinerea rupicola* woodrat).

*Aspicularis* undet. sp. (ectoparasite in FL *Neotoma floridanus f.* woodrats)

*Atrochromadora* Wieser, 1959 - Chromadoridae nematodes  
*Atrochromadora denticulata* Wieser & Hopper, 1967 (FL marine infauna)

*Aulolaimoides* Micoletzky, 1915 (Soil- algy, grass & plant associated) Campydoridae nematodes, Subfamily (1) Campydorinae

*Aulolaimoides elegans* Micoletzky, 1915 (creeks & lakes/ NY hyporheic)

*Austranema* Inglis, 1969 - Chromadoridae nematodes  
*Austranema pectinatum* (*Euchromadora pectinata* Wieser & Hopper, 1957) (NY marine sandy meiofauna, interstitial?)

*Axonchium* Cobb, 1920 (Soil- algy, grass & plant associated) Axonolaimidae nematodes, Subfamily Belondirinae

*Axonchium amplicolle* Cobb, 1920 (NY hyporheic).

*Axonolaimus* DeMan, 1889 - Axonolaimidae nematodes, Subfamily Axonolaiminae

*Axonolaimus helgolandicus* (AK marine meiofauna)

*Axonolaimus interrogativus* Wieser, 1959 (NY marine meiofauna interstitial)

*Axonolaimus* undet. sp. or species (CT marine meiofauna down to 5cm deep; PQ Gulf of St. Lawrence sandy marine interstitial)

*Axonolaimus spinosus* (Butschli, 1874) (GA, MA, CT, NY marine meiofauna)

*Bathylaimus* Cobb, 1894 (= *Bathylaimoides*, *Parabathylaimus*) - Tripyloididae nematodes

*Bathylaimus tenuicaudatus* (Allgren, 1933) MA marine meiofauna)

*Belbolla* Andrassy, 1973 - Enoplida – Oncholaimina nematodes

*Belbolla sundaensis* Micoletzky and Kreis (CT marine meiofauna down to 5cm deep)

*Belbolla tenuidens* (PQ Gulf of St. Lawrence, NC sandy marine interstitial; GA salt marsh benthic)

*Boehmiella* Gebauer, 1932 (endoparasites of Carnivora & rodents)

*Boehmiella wilsoni wilsoni* Lucker, 1943 (in KS,OK *Neotoma floridana* woodrats).

Trichostrongylidae nematodes, Boehmiellinae

*Camacolaimus* De Man, 1889 - Leptolaimidae nematodes (also put in Camacolaimidae)

*Camacolaimus* undet. sp. (NY marine meiofauna interstitial)

*Capillaria* Zeder, 1800 (Parasites in digestive tract or urinary bladder of vertebrates, including woodrat) Trichocephalidae nematodes, Subfamily Capillariinae

*Capillaria americana* Reid, 1949 (endoparasite in MD *Neotoma magister* woodrats)

*Capillaria inaequalis* Walton, 1935 (endoparasite in MO *Typhlotriton spelaeus*, KY (Trigg Co.)

*Eurycea lucifuga* & non-cave OH *Gyrinophilus porphyriticus duryi* salamanders)

*Capillaria martinezi* Caballero, 1942 (endoparasite in TX *Myotis velifer* bats)

*Capillaria michiganensis* Read, 1949 (endoparasite in CT *Myotis lucifugus* bats)

*Capillaria palmata* Chandler, 1938 (endoparasite in IA, TX *Nycticeius humeralis*; LA *Myotis*

*austroriparius*; IA, IN, MD, WI (infrequent Tx) *Myotis lucifugus*; IA *Lasionycteris noctivagans*;  
IA, IN, WI, TX *Eptesicus fuscus*; KS *Myotis grisescens* , IN *Corynorhinus rafinesquii* bats)

*Capillaria* undet. sp. or species (endoparasite in MO *Typhlotriton spelaeus* salamanders & FL

*Tadarida brasiliensis cynocephala*; IN *Myotis lucifugus* & TX *Myotis velifer* bats)

*Capillaria* undescr. sp. (endoparasite in KY *Myotis grisescens* bats)

*Capillaria trasvassosi* Ehrlich, 1947 (endoparasite in IN *Myotis lucifugus* bats)

*Catytronema* Wieser, 1953 - Symplocostomatidae nematodes



*Catytronema* undet. sp. (FL marine infauna)

*Cephalobus* Bastian, 1865 (Soil- algy, grass & plant associated) Cephalobidae nematodes, Subfamily Cephalobinae

@~*Cephalobus* Schneider, 1866 (in NY hyporheic) - nematode

*Cephalobus ciliatus* (Linstow, 1877) de Man, 1884 (in MA, TX, WA hyporheic).

*Cephalobus infestans* Cobb, 1893 (in NY hyporheic).

*Cephalobus oxyuris* Butschli, 1873 (in NY hyporheic).

*Cephalonema* Cobb, 1893 (Soil- algy, grass & plant associated) Ironidae nematodes, Subfamily Ironinae

*Cephalonema longicaudata* (de Man, 1884) Cobb, 1893 (in NY, OR hyporheic)

*Ceramonema* Cobb, 1920 - Ceramonematidae nematodes

*Ceramonema reticulatum* Chitwood, 1936 (NC deep-see marine infauna)

*Ceramonema sculpturatum* Chitwood, 1936 (NC deep-see marine infauna)

*Cerconema mediocris* Wieser (MA, NJ marine meiofauna)

*Chabaudgolvania* Freitas, 1958 (Parasites in amphibians, including in salamanders).

Ascarididae nematodes, Subfamily Megalobatrachonemaninae

*Chabaudgolvania waldeni* (Richardson & Adamsom, 1988) (endoparasite in non-cave BC *Ambystoma gracile* salamanders)

*Chaetonema* Filipjev, 1927 - Enoplidae nematodes

*Chaetonema* undet. sp. (NY marine infauna)

*Cheironchus* Cobb, 1917 - Selachinematidae nematodes

*Cheironchus* undet. sp. (Fl marine infauna)

*Choniolaimus* Ditlevsen, 1918 (= *Bulbopharyngiella*) - Choniolaimidae nematodes

*Choniolaimus* undet. sp. or species (NC deep-sea infauna; (NY marine infauna)

*Choniolaimus tautraensis* Allgren (CT marine meiofauna down to 5cm deep)

*Chromadora* Bastian, 1865 (Soil- algy, grass & plant associated) Chromadoridae nematodes, Subfamily Chromadorinae

*Chromadora axi* Gerlach, 1951 (CT, MA, NJ marine meiofauna down to 5cm deep)

*Chromadora leuckarti* (de Man, 1876) Mikoletzki, 1922 (in MA hyporheic).

*Chromadora macrolaimoides* Steiner, 1915 (FL marine infauna)

*Chromadora musae* Cobb, 1893 (in TX hyporheic).

*Chromadora nudicapitata* Bastian, 1865 (= *C. quadrilinea* Filipjev; *C. quadrilineoides*; *C. undecimpapillata*) (CT marine meiofauna down to 5cm deep)

*Chromadora quadrilinea* Filipjev = *C. nudicapitata*

*Chromadorella* Filipjev, 1918 - Chromadoridae nematodes

*Chromadorella filiformis* (Bastian, 1865) (NY marine meiofauna interstitial)

*Chromadorella filaformoides* Chitwood (CT marine meiofauna down to 5cm deep)

*Chromadorella* undet. sp. (FL marine infauna)

*Chromadorella vanmeterae* Wieser & Hopper, 1967 (NY marine meiofauna interstitial)

*Chromadorida* - Plectidae nematodes

*Chromadorina* Filipjev, 1918 (Soil- algy, grass & plant associated) Chromadoridae nematodes, Subfamily Chromadorinae

*Chromadorina epidemos* Hopper & Meyers, 1967 (AK, FL marine psammon)

*Chromadorina germanica* (Butschli, 1874) (MA, NY marine mud meiofauna)

*Chromadorina* undet. sp. (PQ Gulf of St. Lawrence sandy marine interstitial)

*Chromadorina viridis* (Linstow, 1876) Wieser, 1954 (in MA hyporheic).

*Chromadorita* Filipjev, 1922 (Soil- algy, grass & plant associated; may be derived from marine ancestors) Chromadoridae nematodes, Subfamily Chromadorinae

*Chromadorita leuckharti* (de Man, 1876) Filipjev, 1922 (in MA, WA hyporheic).

*Chromadorita* undet sp. (FL marine psammon)

*Chromadorita tentabunda* (de Man, 1890) (CT marine meiofauna down to 5cm deep)

*Chromaspirina* Filipjev, 1918 - Desmodoridae nematodes

*Chromaspirina arietina* Wieser (MA marine meiofauna)

*Chromaspirina ciliata* Wieser (MA, NJ marine meiofauna)

*Chromaspirina pellucida* (Cobb, 1920) (NY marine infauna)

*Chromaspirina renaudae* (AK marine infauna)

*Chromaspirina* undet. sp. or species (FL marine psammon; CT marine meiofauna down to 5cm deep; FL, NY marine infauna)

*Chronogaster* Cobb, 1913 (Soil- algal grass & plant associated) Plectidae nematodes, subfamily Plectinae

*Chronogaster typicus* (*Walcherenia t.* deMan, 1921) de Coninck, 1935 (algal herbivore in lakes/ MA hyporheic).

*Chrysonema* Thorne, 1929 (Soil- algy, grass & plant associated) Dorylaimidae nematodes, Subfamily Dorylaiminae

*Chrysonema aurum* Thorne, 1929 (in MA hyporheic).

***Cobbia*** De Man, 1907 - Monhysteridae nematodes

***Cobbia crenata*** Wieser (MA marine meiofauna)

***Cobbia*** undet sp. or sp. (NC, NY marine infauna)

***Comesoma*** Bastian, 1865 - Comesomatidae nematodes

***Comesoma pararenae*** Wieser (MA, NJ marine meiofauna)

***Comesoma*** undet sp. or species (CT, NC marine meiofauna down to 5cm deep; FL marine infauna)

***Comesoma stenocephalum*** Filipjev, 1918 (NY marine infauna)

***Cosmocercoides*** Wilkie, 1930 (endoparasites in digestive tract of amphibians, including salamanders). Cosmoceridae nematodes, Subfamily Cosmocerinae

***Cosmocercoides dukae*** (Holl, 1928) (endoparasite in non-cave IL *Gyrinophilus porphyriticus duryi* & non- cave CA *Ambystoma tigrinum* salamanders).

***Cosmocercoides variabilis*** (Harwood, 1930) (in non-cave VA *Plethodon cinereus* salamanders).

***Cosmocercoides*** undet. sp. (endoparasite in AR *Eurycea multiplicata* salamanders)

***Crenopharynx*** Filipjev, 1934 - Phanodermatidae nematodes

***Crenopharynx*** undet sp. (CT marine meiofauna down to 5cm deep)

***Crenopharynx marioni*** (Southern, 1914) (NY marine infauna)

***Cryptonchus*** Cobb, 1913 (Soil- algy, grass & plant associated) Ironinae nematodes, Subfamily Cryptonchinae

***Cryptonchus exilis*** (Cobb, 1893) Andrassy, 1959 (in NY hyporheic)

***Cryptonchus*** undet. sp. (NY freshwater sandy beach interstitial)

***Cryptonchus tristus*** (Ditlevson, 1911) (in ponds/ MA, NY hyporheic).

***Cuticularia*** Van der Linde, 1938 (Soil- algy, grass & plant associated) Rhabditidae nematodes, Subfamily Rhabditinae

***Cuticularia curviditis*** Dougherty, 1953 (NY hyporheic)

***Cuticularia mthesoni*** van der Linde, 1938 (NY hyporheic)

***Cuticularia oxycerca*** (*Rhabditis o.* deMan, 1895; *R. demani* Hntewytsch, 1929; *R. oerlei* Volk, 1950; *R. variabilis* Fuchs, 1931; *C. mthesoni* van der Linde, 1938; *R. nudicapitata* Stefanski, 1922; *R. parapapillosa* Schuurmans Stekhoven, 1951; *R. stalbergi* Allgen, 1950) (NY hyporheic)

***Cyartonema*** Cobb, 1920 - Siphonolaimidae nematodes

***Cyartonema*** undet. sp. (PQ Gulf of St. Lawrence sandy marine interstitial)

***Cyatholaimus*** Micoletzky, 1925 - Cyatholaimidae nematodes, Subfamily Cyatholaimrina

***Cyatholaimus gracilis*** (Eberth, 1863) (NY marine infauna)

*Cyatholaimus ornatus* Steiner, 1916 (in NY hyporheic).  
*Cyatholaimus ruricola* de Man, 1880 (in NY hyporheic).

*Cylindrolaimus* de Man, 1880 (Soil- algy, grass & plant associated)  
Cylindrocorporidae, Subfamily Cylindrocorporinae

*Cylindrolaimus communis* de Man, 1880 (in NY hyporheic).  
*Cylindrolaimus* undet sp. (NC deep-sea infauna)  
*Cylindrolaimus tristus* (Ditlevson, 1911) (in ponds/ MA, NY hyporheic).

*Cylindrotheristus* - Monhysteridae nematodes  
*Cylindrotheristus divertens* (AK marine meiofauna)  
*Cylindrotheristus fistulatus* (*Theristus f.* Wieser & Hopper, 1967) (Fl, MA meiofauna benthic)

*Cylindrotheristus* undet. sp. (NY marine meiofauna interstitial)  
*Cylindrotheristus xyaliformis* (*Theristis x.* Wieser & Hopper, 1967) (FL marine infauna)

*Cytolaimium* Cobb, 1920 - Trefusiidae nematodes  
*Cytolaimium* undet. sp. (PQ Gulf of St. Lawrence sandy marine interstitial)

*Daptonema* Cobb, 1920 - Xyalidae nematodes, Subfamily Xyalinae  
*Daptonema tenuispiculum* (Ditlevsen, 1919) (PQ Gulf of St. Lawrence sandy marine interstitial)

*Dasynemella* Cobb, 1933 - Ceremonematidae nematodes  
*Dasynemella phalangida* Chitwood, 1936 (NY marine infauna)  
*Dasynemella* undet sp. (FL marine psammon)

*Dasynemoides* Chitwood, 1936 - Ceramonematidae nematodes  
*Dasynemoides setosus* Chitwood, 1936 (NY marine infauna)  
*Dasynemoides* undescr. sp. (NC marine infauna)

*Depranodorylaimus* Andrassy, 1959 (Soil- algy, grass & plant associated)  
Dorylaimidae nematodes, Subfamily Dorylaiminae

*Depranodorylaimus renwicki* (Van der Linde, 1938) (in NY, TX hyporheic).

*Dermatolaimus* Steiner, 1920 - Siphonolaimidae nematodes  
*Dermatolaimus elegans* Stekhoven & De Coninck (MA meiofauna benthic)

*Desmodora* De Man, 1889 - Desmoderidae nematodes  
*Desmodora devestita* Wieser (MA marine meiofauna)  
*Desmodora punctata* Jensen, 1985 (interstitial? in TX marine sands)

*Desmodora polychaeta* (NY marine meiofauna interstitial)  
*Desmodora pontica* (Filipjev, 1922) (AK marine infauna)  
*Desmodora scaldensis* De Man, 1889 (NY marine meiofauna interstitial)

*Desmodora* undet. sp. (CT marine meiofauna down to 5cm deep)  
*Desmodora tenuispiculum* Allgen, 1928 (= *Desmodorella t.*) (AK, NY marine infauna)  
*Desmodora varioannulata* Kreis (NY marine infauna)

*Desmodorella* Cobb, 1933 - Desmoderidae nematodes  
*Desmodorella cephalata* Cobb, 1933 (NC deep-sea marine infauna)

*Desmognathinema* Baker, Goater & Esch, 1987- Quimperidae nematodes, Subfamily Quimperinae (Intestinal parasites of vertebrates)

*Desmognathinema nantahalaensis* Baker, Goater & Esch, 1987 (epigean in AR/ Tx in WA & Independence Cos., AR, in *Eurycea multiplicata griseogaster* & non-cave AR *E.m.g.*, *E. lucifuga* & *Desmognathus brimleyorum* salamanders).

*Desmolaimus* De Man, 1880 - Linhomoeidae nematodes  
*Desmolaimus elongatus* Allgen (CT marine meiofauna down to 5cm deep)

*Desmolaimus fennicus* De Man, 1880 (MA meiofauna benthic)  
*Desmolaimus* undet. sp. or species (CT, FL marine infauna)  
*Desmolaimus thiobioticus* (interstitial? in TX marine sulphide-rich brine interstitial)

*Desmoscolex* Claporede, 1863 - Desmoscolecidae nematodes  
*Desmoscolex americanus* Chitwood, 1936 (NC deep-sea infauna)  
*Desmoscolex scanicus* (Allgen, 1935) (NC deep-sea infauna)

*Dichromadora* Kreis, 1929 - Chromadoridae nematodes, Subfamily Chromadorinae  
*Dichromadora cephalata* (*Chromadora cephalata* Steiner; *Hypodontolaimus geophila*) (MA marine meiofauna)

*Dichromadora cucullata* (AK marine infauna)  
*Dichromadora hyalocheile* DeConick & Stekhoven, 1933 (CT marine meiofauna down to 5cm deep)

*Didelta* Cobb, 1920 - Linhomoeidae nematodes  
*Didelta maculata* Conn (FL marine infauna)

*Didontolaimus sabulosus* Southern (FL marine infauna)

*Diplogaster* Schultze in Carus, 1857 (Soil- algy, grass & plant associated)  
Diplogasteridae, Subfamily Diplogasterinae

*Diplogaster rivalis* (Leidy, 1854) Schultze in Carus, 1857 (in NY hyporheic).

*Diplopeltis* Cobb in Stiles & Hassal, 1904 (= *Discophora*) Subfamily Axonolaiminae  
*Diplopeltis* undet. sp. (CT marine meiofauna down to 5cm deep)  
*Diplopeltis incisus* (Southern, 1914) (NC deep-sea infauna)

*Discolaimus* Micoletzky, 1922 (Soil- algy, grass & plant associated)  
Dorylaimidae nematodes, Subfamily Dorylaiminae

*Discolaimus ruttner* Schnider, 1937 (in NY, WA hyporheic).

*Disconema* Filipjev, 1918 - Linhomoeidae nematodes

*Disconema minuta* Vitiello (NC deep sea meiofauna)

*Disconema succium* Allgen (CT, NC marine meiofauna down to 5cm deep)

*Ditlensennia* Mikoletzky, 1925 (Soil- algy, grass & plant associated)

Ironinae nematodes, Subfamily Cryptonchinae

*Ditlensennia tristus* (Ditlevson, 1911) Mikoletzky, 1925 (in ponds/ MA,NY hyporheic)

*Dolichodorus* Cobb, 1914 (Soil- algy, grass & plant associated) Hoplolaimidae nematodes,  
Subfamily Dolichodorinae

*Dolichodorus heterocephalus* Cobb, 1914 (in MA hyporheic)

*Dorylaimoides* Thorne & Swanger, 1936 (Soil- algy, grass & plant associated) Dorylaimidae  
nematodes, Subfamily Meromyariaminae

*Dorylaimoides lepidus* Thorne & Swanger, 1936 (in AZ, CA hyporheic)

*Dorylaimoides parvus* Thorne & Swanger, 1936 (in NY hyporheic)

*Dorylaimopsis* Ditlevsen, 1918 - Comesomatidae nematodes

*Dorylaimopsis metatypicus* Chitwood (CT, MA marine meiofauna down to 5cm deep)

*Dorylaimus* Dujardin, 1845 (Soil- algy, grass & plant associated)

Dorylaimidae nematodes, Subfamily Dorylaiminae

*Dorylaimus carteri* Bastian, 1865 (predator in lakes/ CO,NY,WA hyporheic).

*Dorylaimus centrocerus* de Man, 1880 (in MA hyporheic).

*Dorylaimus consobrinus* (de Man, 1918) Andrassy, 1959 (in WA,CO hyporheic).

*Dorylaimus exilis* Cobb, 1893 (in NY hyporheic).

*Dorylaimus macrolaimus* (Man, 1884) (in NY hyporheic).

*Dorylaimus montanus* Stefanski, 1923 (in NY hyporheic),

*Dorylaimus obtusicaudatus* Bast.1865 (in NY, WA hyporheic).

*Dorylaimus proximus* (Thorne & Swanger, 1936) (in NY hyporheic).

*Dorylaimus ornatus* Fuchs, 1930) (in NY, WA hyporheic).

*Dorylaimus oxycephaloides* (de Man, 1885) (in NY hyporheic).

*Dorylaimus renwicki* Van der Linde, 1938 (in TX hyporheic).

*Dorylaimus stagnalis* Dujardin, 1845 (in NY, WA hyporheic) **Bibl.:** Fennel 1959

*Dorylaimus* undet species (MN lake benthic; CA marine benthic)

*Dorylaimus uniformis* (Thorne, 1939) Andrassy, 1959 (WA hyporheic)

*Dracograllus* - Richtersiidae nematodes

*Dracograllus kreisi* (= *Richtersia kreisi*?) (AK marine infauna)

*Draconema* Cobb, 1913 - Draconematidae nematodes

*Draconema annulatum* (= *Manunema a.* Ditlevsen, 1915) (NY marine infauna)

*Eleutherolaimus* Filipjev, 1922 - Linhomoeidae nematodes

*Eleutherolaimus stenosoma* (*Monhystera s.* De Man, 1907) (MA, NJ, NY marine infauna)

*Enchodelus* Thorne, 1939 (Soil- algy, grass & plant associated) Dorylaimidae nematodes,  
Subfamily Tylencholaiminae

*Enchodelus knuppenburgensis* Altherr & Deboutteville, 1973 (in WA hyporheic).

*Enoploides* - Saweljev, 1912 - Enoplidae nematodes

*Enoploides delamarei* (Noury-Srairi, 1994) (AK marine meiofauna)

*Enoploides harpax* Wieser, 1959 (WA marine sandy interstitial)

*Enoploides polysetosus* Jensen P., 1886 (interstitial? in TX marine sands)

*Enoplolaimus* De Man, 1893 - Enoplidae nematodes

*Enoplolaimus conicollis* De Man, 1893 (NY marine infauna)

*Enoplolaimus* undet sp. (CT marine meiofauna down to 5cm deep)

*Enoplolaimus vulgaris* De Man, 1893 (NY marine infauna)

*Enoplus* Dujardin, 1845 - Enoplidae nematodes

*Enoplus behringicus* Filipjev (MA, NJ marine meiofauna)

*Enoplus communis* Bastian, 1865 (CT, MA marine meiofauna)

*Enoplus* undet sp. (CT, MA marine meiofauna down to 5cm deep)

*Epacanthion* Wieser, 1953 (= *Hyalacanthion*) - Enoplidae nematodes

*Epacanthion oweni* Keppner, 1986 (FL marine infauna)

*Epacanthion* undet. sp. (FL marine infauna)

*Epsilonema* Steiner, 1927 - Epsilonematidae nematodes

*Epsilonema* undet. sp. (Ca beach interstitial)

*Ethmolaimus* de Man, 1880 (Soil- algy, grass & plant associated) Cyatholaimidae nematodes,  
Subfamily Cyatholaimrina. **Bibl.:** Tjepkema 1971

*Ethmolaimus pratensis* de Man, 1880 (in lakes, eats bacteria/ NY hyporheic).

*Ethmolaimus* undet sp. (NC deep-sea infauna)

*Eubostrichus* Greeff, 1969 (= *Catanema*) Desmodoridae nematodes

*Eubostrichus parasitiferous* Chitwood (CT, NY marine meiofauna down to 10cm deep)

*Eubostrichus* undet. sp. (FL marine infauna)

*Euchromadora* De Man, 1886 - Chromadoridae nematodes, Subfamily Chromadorinae

*Euchromadora pectinata* = *Austranema pectinatum* ?

*Euchromadora striata* (interstitial? in TX marine sands)

*Euchromadora meadi* Wieser & Hopper, 1967 (FL marine infauna)

*Eudorylaimus* Andrassy, 1959 (Soil- algy, grass & plant associated) Qudsianematidae nematodes, Subfamily? (Once in Dorylaimidae, Subfamily Dorylaiminae)

*Eudorylaimus carteri* (Bastian, 1865) Andrassy, 1959 (predator in lakes/ CO, NY, WA hyporheic)

*Eudorylaimus consobrinus* (de Man, 1918) Andrassy, 1959 (in WA, CO hyporheic).

*Eudorylaimus obtusicaudatus* Andrassy, 1959 (in NY, WA hyporheic).

*Eudorylaimus proximus* (Thorne, 1939) Andrassy, 1959 (NY hyporheic).

*Eudorylaimus* undet sp. or species (AB lake benthic; VA hyporheic)

*Eudorylaimus uniformis* (Thorne, 1939) Andrassy, 1959 (WA hyporheic).

*Eumonhystera* Andrassy, 1981 (Soil- algy, grass & plant associated) Monhysteridae nematodes, Subfamily Monhysterinae

*Eumonhystera dispar* (Bastian, 1865) Andrassy, 1981 (NY hyporheic).

*Eumonhystera filiformis* (Bastian, 1865) Andrassy, 1981 (NY hyporheic).

*Eurystomina* Filipjev, 1921 - Eurystominidae nematodes

*Eurystomina* undet sp. (FL marine psammon)

*Falcaustra* Lane, 1915 - Kathlaniidae nematodes, subfamily Kathlaniinae (Intestinal parasites of reptilians, amphibians and fishes, including salamanders).

*Falcaustra catesbeiana* Walton, 1929 (endoparasite in MO Tb *Typhlotriton spelaeus* salamander).

*Fictor* Paramonov, 1952 (Soil- algy, grass & plant associated) Aphelenchidae nematodes Subfamily Aphelenchinae (also put in Neodiplogastridae)

*Fictor fictor* (Bastian, 1865) Paramonov, 1952 (in NY hyporheic).

*Filenchus* Andrassy, 1954 (Soil- algy, grass & plant associated) Tylenchidae nematodes, Subfamily Tylenchinae



*Filenchus filiformis* (Butschli, 1873) Andrassy, 1954 (in NY hyporheic).

*Filipjevia* Kreis, 1928 (= *Enoplonea*) Enoplidae nematodes

*Filipjevia meridionalis* Kreis (NC deep-sea infauna)

*Filipjevinema potor* Wieser (MA, NJ marine meiofauna)

*Filoncholaimus* Filipjev, 1927 - Oncholaimidae nematodes

*Filoncholaimus prolatus* Hopper, 1967 (FL marine infauna)

*Gammanema* Cobb, 1920 - Choniolaimidae nematodes

*Gammanema rapax* (*Halichoanolaimus* r. Ssaweljev, 1912; *G. ferox*) (NY marine infauna)

*Gomphonema* Wieser & Hopper, 1966 - Cyatholaimidae nematodes

*Gomphonema typica* Wieser & Hopper, 1966 (FL marine infauna)

*Gongylonema* Molin, 1857 (Parasites in oesophagus and stomach walls of mammals and birds, including woodrats) Spiruridae nematodes, Subfamily Gongylonematinae

*Gongylonema musculi* (Rud, 1819) (endoparasite in FL *Neotoma floridanus* f. woodrat).

*Gonionchus* Cobb, 1920 - Monhysteridae nematodes

*Gonionchus intermedius* (TX marine sulphide-rich brine interstitial?)

*Granonchulus* Andrassy, 1958 (Soil- algy, grass & plant associated) Mononchidae nematodes, Subfamily Mononchinae

*Granonchulus auberti* Altherr & Deboutteville, 1973 (in MA hyporheic).

*Graphonema* Cobb, 1898 - - Chromadoridae nematodes

*Graphonema* undet. sp. (FL marine infauna)

*Halalaimus* De Man, 1888 (= *Acoma*, *Halalaimoides*) Oxystominidae nematodes

*Halalaimus anulatus* Wieser (MA, NJ marine meiofauna)

*Halalaimus filum* Gerlach, 1962 (NC deep-sea infauna)

*Halalaimus longisetosus* Hopper, 1963 (NC deep-see marine infauna & MA saltmarsh benthic)

*Halalaimus pachydermatus* (Cobb, 1920) (MA meiofauna benthic)

*Halalaimus meyersi* Wieser & Hopper, 1967 (NC deep-see marine infauna)

*Halalaimus simiferus* Wieser (MA marine meiofauna)

*Halalaimus longisetosus* Hopper, 1963 (FL marine infauna)

*Halalaimus* undet. sp. (PQ Gulf of St. Lawrence sandy marine interstitial)

*Halichoanolaimus* De Man, 1886 (= *Smalsundia*) Selachinematidae nematodes (also put in Choniolaimidae & Choanolaimidae)

*Halichoanolaimus duodecimpapillatus* Timm, 1952 (VA marine infauna)

*Halichoanolaimus longicauda* Ditevsen, 1918 (GA salt marsh benthic)

*Halichoanolaimus quattuordecimpapillata* Chitwood, 1951 (NC deep-sea infauna)

*Halichoanolaimus raritanensis* Hasbrouck or Hasbrouck, 1866 (CT, NY marine meiofauna down to 5cm deep)

*Halichoanolaimus robustus* (Bastian, 1865) (MA, NJ marine meiofauna)

*Halichoanolaimus quattuordecimpapillata* Chigwood, 1951 (NC deep-sea infauna)

*Halichoanolaimus* undet. sp. (NC deep-sea infauna)

*Hedruris* Nitzsch, 1821 (Parasites in intestine, stomach and mouth cavity of amphichelomans and fishes). Hedruridae nematodes, Subfamily Hedrurinae

*Hedruris brevis* Walton, 1930 (in non-cave GA *Desmognathus fuscus* salamander).

*Hedruris pendula* (Leidy, 1851) (in non-cave AR *Desmognathus bimleyorum* salamander).

*Helicotylenchus* Steiner, 1945 (Soil- algy, grass & plant associated) Hoplolaimidae nematodes, Subfamily Hoplolaiminae. Bibl.: Golden 1956

*Helicotylenchus multicinctus* (Cobb, 1893) (NY hyporheic).

*Heligmonella* Moennine, 1927 (Soil- algy, grass & plant associated) Trichostrongylidae nematodes, Subfamily Heligmosominae

*Heligmonella intermedia* Baylis, 1929 (MA hyporheic).

*Heligosomoides* Durette-Desset, 1968 - Trichostrongylidae nematodes, Subfamily Heligmosominae

*Heligosomoides polygyrus* (*Strongylus polygyrus* Dujardin, 1845; *Heligmosmum polygyrum* Railliet & Henry, 1909; *Viannia polygyra* & *Heligmosomoides linstowi* Hall, 1916) Durette-Desset, 1968 (endoparasite in NM *Neotoma albigula* woodrats)

*Hemicycliophora* de Man, 1921 (Soil- algy, grass & plant associated) Criconematidae nematodes, Subfamily Criconematinae (also put in Hemicycliophoridae)

*Hemicycliophora thornei* Goodey, 1963 (NY hyporheic)

*Hemicycliophora* undet. sp. or species (hyporheic, phreatobia (non-hyporheic groundwater) in OH, ON)

*Heteromyoxuris* Read & Millemann, 1952- Trypanosomatidae nematodes

*Heteromyoxuris deserti* Read & Millemann, 1952 (endoparasite in NM *Neotoma albigula* woodrats)

*Hofmaenneria* Gerlach & Meyl, 1957 (Soil- algal, grass & plant associated)  
Monhysteridae nematodes, Subfamily Monhysterinae

*Hofmaenneria* undet. sp. (WA hyporheic).

*Hydromermis* Corti, 1902 – Mermithidae nematodes

*Hydromermis contorta* (Kohn) (parasite in chironomid flies in MN lake infauna)

*Hydromermis pseudocontorta* A.A.Johnson & M.G. Kleve, 1999 (parasite in chironomid flies in MN lake infauna)

*Hydromermis* undet. sp. (ON hyporheic)

*Hypodontolaimus* de Man, 1886 - Chromadoridae nematodes (Soil- algal, grass & plant associated)

*Hypodontolaimus balticus* (G. Schneider, 1906) (MA, CT marine meiofauna down to 5cm deep; PQ Gulf of St. Lawrence sandy marine interstitial)

*Hypodontolaimus cephalata* Steiner? (CT marine meiofauna down to 5cm deep; GA salt marsh benthic)

*Hypodontolaimus geophila* or *geophilus* DeMan = *H. cephalata*

*Hypodontolaimus patagiatus* Wieser (MA, NJ marine meiofauna)

*Hypodontolaimus ponticus* (Filipjev, 1922) (CT, AK marine meiofauna down to 5cm deep)

*Hypodontolaimus schurmans-stekhoveni* Gerlach (CT marine meiofauna down to 5cm deep)

*Hypodontolaimus setosus* (Butschli, 1874) (CT marine meiofauna down to 5cm deep; NY marine sandy meiofauna, interstitial?; NC deep-sea infauna))

*Hypodontolaimus* undet. sp. or species (WA? hyporheic; FL marine infauna)

*Illium* Cobb, 1920 – Enchelidiidae nematodes

*Illium* undet. sp. (FL marine infauna)

*Ixonema* Lorenzen, 1971 - Leptolaimidae nematodes

*Ixonema cobbi* (Steiner, 1916) (NY marine infauna)

*Ixonema sordidum* Lorenzen, 1971 (AK marine infauna)

*Ironella* Cobb, 1920 - Ironidae nematodes

*Ironella* undet. sp. (FL? marine infauna)

*Ironus* Bastian, 1865 (Soil- algy, grass & plant associated) Ironidae nematodes, Subfamily Ironinae

*Ironus filiformis* Altherr, 1963 (in WA,CA hyporheic).

*Ironus ignavus* Bastian, 1865 (predaceous in filter systems/ NY hyporheic).

*Ironus longicaudatus* de Man, 1884 (predaceous in filter systems/ NY hyporheic)

*Ironus* undet. sp. or species (hyporheic in seVA; AB lake benthic))

*Isonchus* Cobb, 1913 (Soil- algy, grass & plant associated) Aphelenchidae nematodes Subfamily Aphelenchinae

*Isonchus radicolus* Cobb, 1913 (Wind C.,SD/TTx).

*Isonchus* undet. sp. (Wind C.,SD/TTx).

*Klugea* Filipjev, 1927 - Phanodermatidae nematodes

*Klugea* undet sp. (FL marine psammon)

*Labronema* Thorne, 1939 ZR 134 - Dorylaimidae nematodes, Subfamily Dorylaiminae (Soil- algy, grass & plant associated)

*Labronema goodeyi* Altherr & Deboutteville, 1973 (in MA hyporheic).

*Labronema* undet. sp. (hyporheic in seVA)

*Laevides* Heyns, 1968 - Nygolaimidae nematodes

*Laevides rapus* (Thorne & Wanger, 1936) (NY hyporheic)

*Laimella* Cobb, 1920 - Comesomatidae nematodes

*Laimella longicauda* Cobb, 1920(FL marine infauna)

*Laimella quadrisetosa* Chitwood (MA marine meiofauna)

*Laimydorus* Siddiqi, 1969 - Dorylaimidae nematodes (Soil- algy, grass & plant associated)

*Laimydorus proximus* (Thorne & Swanger, 1936) Siddiqi, 1969 (NY hyporheic).

*Laimydorus* undet. sp. (hyporheic in seVA)

*Latronema* Wieser, 1954 - Choniolaimidae nematodes

*Latronema macromphida* Wieser, 1954 (MA marine meiofauna)

*Latronema* undet. sp. (NY marine infauna)

*Lauratonema* Gerlach, 1953 - Lauratonematidae nematodes

*Lauratonema originale* = *Lauratonemoides i*,

*Lauratonemoides* De Coninck, 1965 - Lauratonematidae nematodes

*Lauratonemoides originale* (*Lauratonema o.* Gerlach, 1965) (AK, NJ, MA marine meiofauna)

*Paramonohystera* Steiner, 1916 - Monhysteridae nematodes

*Paramonohystera (Leptogastrella) paranormandica* (*L. p.* Micoletzky, 1922) (NY marine infauna)

*Leptolaimus* De Man, 1876 - Leptolaimidae nematodes

*Leptolaimus elegans* (Stekhoven & DeConinck, 1933) (PQ Gulf of St. Lawrence sandy marine interstitial)

*Leptolaimus* undet. sp. (NC deep-sea marine infauna)

*Leptolaimus tripapillatus* (AK marine infauna)

*Leptolaimus* undet. sp. (FL marine infauna)

*Leptonemella* Cobb, 1920 - Desmoderidae nematodes

*Leptonemella aphanothecae* Gerlach (MA sandy marine meiofauna)

*Leptonemella cincta* Cobb, 1920 (MA marine meiofauna)

*Leptonemella pellita* Wieser (MA marine meiofauna)

*Linhomoeus* Bastian, 1865 - Linhomoeidae nematodes

*Linhomoeus buculentus* (Wieser, 1956) (MA, NJ marine meiofauna)

*Linhomoeus elongatus* Bastian, 1865 (MA marine meiofauna)

*Linhomoeus gittingsi* Jensen P., 1986 (interstitial? in TX marine sulphide-rich brine interstitial)

*Linhomoeus hirsutus* Bastian, 1865 (NY marine infauna)

*Linhomoeus* undet. sp. or species (CT, FL, NY marine meiofauna down to 5cm deep)

*Linhomoeus iniquus* Wieser = *Anticyclus iniquus*

*Litinium* Cobb, 1920 - Oxystominidae nematodes

*Litinium bananum* Gerlach, 1957 (NC deep-sea infauna)

*Litomosa* Yorke & Mapelstone, 1926 (Parasites in abdominal cavity of bats).  
Dipetalonematidae nematodes, Subfamily Dipetalonematinae

*Litomosa chiropterorum* Ortlepp, 1932 (endoparasite in WI (Sauk Co.) *Lasiurus cinereus* bats).

*Litomosa americana* McIntosh, 1932 (endoparasite in MA, DC *Nycticeus humeralis* bats).

*Litomosa filaria* (Beneden, 1873) (endoparasite in CA *Myotis lucifugus* bats)

*Longibucca* Chitwood, 1933 (Parasites in stomach wall of snakes and bats)  
Cylindrocorporidae nematodes, Subfamily Cylindrocorporinae

*Longibucca "eptesica"* Elsea, 1953 (endoparasite in bats)

*Longibucca lasiura* McIntosh & Chitwood, 1934 (endoparasite in *Eptesicus fuscus*,  
*Corynorhinus townsendii*, MD *Lasiurus cinereus*, WV *C. rafinesquii* & *Myotis lucifugus*, DC  
*Lasiurus borealis* & *Lasionycteris noctivagans* & WA *Myotis yumanensis saturatus* bats).

*Longicyatholaimus* Micoletzky, 1924 - Cyatholaimidae nematodes

*Longicyatholaimus fannae* (Wieser & Hopper, 1967) (NC deep-sea infauna)

*Longicyatholaimus filicaudatus* Stekhoven (NC deep-sea infauna)

*Longicyatholaimus* undet. sp. or species (FL, NY marine infauna)

***Longistriata*** Schulz, 1926 (Parasites in mammals, usually in rodents, including woodrats).  
Trichostrongylidae nematodes, Subfamily Vianniinae

***Longistriata carolinensis*** Travassos, 1937 (endoparasite in GA *Neotoma floridanus* f. woodrats)

***Longistriata intermedia*** (Bayliss, 1929) Dikmans, 1935 (endoparasite in FL *Neotoma floridanus* f. woodrat).

***Longistriata musculi*** (Rud, 1819) Dikmans, 1935 (endoparasite in FL *Neotoma floridanus* f. woodrat).

***Longistriata neotoma*** (Hall, 1916) Murphy, 1952 (endoparasite in OK *Neotoma floridanus* f. woodrats).

*Manunema annulatum* = *Draconema a.* (NY marine infauna)

***Marylynnia*** Hopper, 1977 (= *Marylynia*) Cyatholaimidae nematodes

***Marylynnia hopperi*** Sharma & Vincx (BC marine infauna)

***Marylynnia preclara*** Hopper, 1977 (interstitial? in TX marine sands)

***Maseria*** Rausch & Rausch, 1983 - Muspiceidae nematode

***Maseria vespertilionis*** Rausch & Rausch, 1983 (ectoparasite on OR *Myotis volans* & *Eptesicus fuscus* & OR, AK *Myotis lucifugus* bats)

***Mastophorus*** Diesing, 1853 (pinworm) Oxyuridae nematodes

***Mastophorus dipodomis*** Read & Millemann, 1953 (endoparasite in NM *Neotoma albigula* & *N. micorpus* woodrats)

***Megalobatrachonema*** Yamaguti, 1941 (Parasites in amphibians, mainly in Urodela, incl. salamanders) Ascarididae nematodes, Subfamily Megalobatrachonemaninae

***Megalobatrachonema waldeni*** Richardson & Adamsom, 1988 (endoparasite in non-cave BC *Ambystoma gracile* salamander).

***Mermis*** Dujardin, 1842 (Soil- algy, grass & plant associated) Mermithidae nematodes,  
Subfamily Mermithinae

***Mermis*** undet. sp. (in NY,ON hyporheic).

***Mesacanthion*** Filipjev, 1927- Enoplidae nematodes

***Mesacanthion*** undet sp. (MA marine meiofauna)

***Mesacanthion ungulatus*** Wieser (CT marine meiofauna down to 5cm deep)

***Mesacanthoides*** Wieser, 1953 - Enoplidae nematodes

***Mesacanthoides fibulatus*** Wieser & Hopper, 1967 (interstitial? in TX marine sulphide-rich brine interstitial)

*Mesancanthoides sinuosus* Wieser, 1959 (WA marine interstitial?)

*Mesodorylaimus* Andrassy, 1959 (Soil- algy, grass & plant associated) Dorylaimidae nematodes, Subfamily Dorylaiminae

*Mesodorylaimus margaritus* Basson & Heyns, 1974 (in NY hyporheic).

*Mesodorylaimus renwicki* Andrassy, 1959 (in TX hyporheic)

*Mesodorylaimus* undet. sp. (NY freshwater sandy beach interstitial)

*Mesodorylaimus subtilis* (Thorne & Swanger, 1936) (in NY hyporheic).

*Mesodorylaimus* undet. sp. (sandy hyporheic in TX; CO hyporheic).

*Mesonchium* Cobb, 1922 - Comesomatidae nematodes

*Mesonchium* undet. sp. (FL marine infauna)

*Mesotheristus* Wieser, 1956 Monhysteridae nematodes, Subfamily Monhysterinae

*Mesotheristus erectus* (*Theristus e.* Wieser & Hopper, 1867) (MA marine meiofauna?)

*Mesotheristus hirsutus* (AK marine meiofauna)

*Metachromadora* Filipjev, 1918 (= *Ichthyodesmodora*, *Neonyx*) - Desmodoridae nematodes

*Metachromadora additus* Wieser (MA marine meiofauna).

*Metachromadora* undet 2 sp. (FL marine psammon)

*Metachromadora* (*Metachromadoroides*) undet sp. (PQ Gulf of St. Lawrence sandy marine interstitial)

*Metachromadora obesa* Chitwood, 1936 (NY, CT marine meiofauna down to 10cm deep)

*Metachromadora onyxoides* Chitwood, 1936 (CT marine meiofauna down to 5cm deep)

*Metachromadora vivipara* (NY marine infauna)

*Metacomesoma* Wieser, 1954 - Comesomatidae nematodes

*Metacomesoma* undet. sp. (PQ Gulf of St. Lawrence sandy marine interstitial)

*Metacyatholaimus* Stekhove, 1942 - Cyatholaimidae nematodes

*Metacyatholaimus spatiosus* Wieser, 1954 (NC deep see meiofauna)

*Metalinhomoeus* De Man, 1907 - Linhomoeidae nematodes

*Metalinhomoeus additus* Weiser (NJ marine meiofauna)

*Metalinhomoeus dimorphus* Weiser (MA, NJ marine meiofauna)

*Metalinhomoeus effilatus* Stekhoven (NC deep-sea infauna)

*Metalinhomoeus retrosetosus* Weiser (NC deep-sea infauna; CT marine meiofauna down to 5cm deep))

*Metalinhomoeus setosus* Chitwood, 1951 (MA, NJ, WA marine meiofauna)

*Metalinhomoeus* undet sp. CT marine meiofauna down to 5cm deep))

*Metalinhomoeus tenuicaudatus* Allgen CT marine meiofauna down to 5cm deep))  
*Metalinhomoeus typicus* DeMan, 1907 (MA saltmarsh benthic; NY marine infauna)

*Metaparoncholaimus* De Coninck & Stekhoven, 1933 - Oncholaimidae nematodes  
*Metaparoncholaimus* undet. sp. (CT marine meiofauna down to 5cm deep)

*Metenoploides* Wieser, 1953 - Enoplidae nematodes  
*Metenoploides* undet. sp. (interstitial? in TX marine sands)

*Metoncholaimus* Filipjev, 1918 - Oncholaimidae nematodes  
*Metoncholaimus parasimplex* Keppner, 1987 (FL marine infauna)  
*Metoncholaimus pelor* Hopper, 1967 (FL marine infauna)

*Metoncholaimus pristiurus* (Zur Strassen, 1894) (MA marine meiofauna; GA salt marsh benthic)

*Metoncholaimus scissus* Wieser & Hopper, 1967 (FL marine infauna)

@*Metonyx horridus* Chitwood (CT marine meiofauna down to 5cm deep)

*Microdorylaimus* Andrassy, 1986 - Microlaimidae nematodes  
*Microdorylaimus longicollis* (*Microlaimus l.* Brzesky, 1964) (AK marine meiofauna)

*Microlaimus* De Man, 1880 (= *Microlaimoides*, *Paracothonolaimus*) - Microlaimidae nematodes

*Microlaimus cochleatus* Wieser, 1959 (NC, NY marine infauna)  
*Microlaimus conspicuus* Lorenzen, 1973 (AK marine infauna)

*Microlaimus dimorphus* Chitwood, 1937 (NC, NY marine infauna)  
*Microlaimus gerlachi* Wieser, 1954 (CT marine meiofauna down to 5cm deep)

*Microlaimus honestus* De Man, 1922 (NY marine infauna)  
*Microlaimus kaurii* Wieser, 1954 (NC, NY marine infauna)

*Microlaimus* undet. sp. (FL marine infauna)  
*Microlaimus problematicus* Allgren, 1932 (NC, NY marine infauna)  
*Microlaimus* undet. sp. (NC, NY marine infauna),

*Molinostrongylus* Skarbilovitch, 1934 (Intestinal parasites of chiroptera) Trichostrongylidae nematodes, Subfamily Strongilacanthinae

*Molinostrongylus delicatus* (Schwartz, 1927) Travassos, 1937 (in LA (non-cave), NM, OK & TX (Tx) *Tadarida brasiliensis mexicana*, FL *Tadarida brasiliensis cynocephala* & TX *Myotis v.* bats).

*Monhystera* Bastian, 1865 - Monhysteridae nematodes



(Soil- algy, grass & plant associated) Monhysteridae nematodes, Subfamily Monhysterinae

*Monhystera agilis* de Man, 1880 (WA hyporheic)

*Monhystera anoxybiotica* (interstitial? in TX marine sulphide-rich brine interstitial)

*Monhystera disjuncta* Bastian, 1865 (NY marine infauna)

*Monhystera dubicola* Hopper & Meyers, 1967 (NY marine infauna)

*Monhystera,parelegantula* de Coninck, 1943 (FL, NY marine infauna)

*Monhystera filicaudata* Allgen, 1929 (RI marine estuary interstitial; CT marine meiofauna down to 5cm deep)

*Monhystera microphthalma* DeMan, 1880 (CT marine meiofauna down to 5cm deep; NC deep-sea infauna)

*Monhystera paludicola* de Man, 1881 (NY hyporheic).

*Monhystera parva* (Bastian, 1865) (*Monhystera heteroparva*; *M. pavameridiana*; *Tachyhodites parvus*) (CT, MA, NJ marine meiofauna down to 5cm deep)

*Monhystera parlegantula* de Coninck, 1943 (NY marine infauna)

*Monhystera pusilla* Boucher & Helleouets, 1977 (AK marine meiofauna)

*Monhystera* undet. sp. or species (MA, NY, ON, WA hyporheic/phreatobia interface; AB lake benthic; NC deep-sea infauna; NY freshwater sandy beach interstitial; NY marine infauna)

*Monhystera vulgaris* de Man, 1880 (CO hyporheic).

*Mononchoides* Rham, 1928 (Soil- algy, grass & plant associated). Neodiplogastridae, Subfamily

*Mononchoides changi* Goodrich et al., 1968 (NY hyporheic)

*Mononchus* Bastian, 1865 (Soil- algy, grass & plant associated). Mononchidae nematodes, Subfamily Mononchinae

*Mononchus bellus* Andrassy, 1985 (in NY hyporheic)

*Mononchus dolichurus* Cobb, 1916 (in MA,WA hyporheic)

*Mononchus lacustris* (Cobb in Cobb., 1915(in NY hyporheic)

*Mononchus brachyuris* var. *macrodenticulatus* Cobb in Cobb, 1915 (in NY hyporheic).

*Mononchus obtusicaudatus* (Daday, 1899) (in NY hyporheic).

*Mononchus truncatus* Bastian, 1865 (predator in streams/ CO,MA,WA hyporheic)

*Mononchus tunbridgensis* Bastian, 1865 (in NY hyporheic).

*Mononchus* undet. sp. (ON phreatobia (groundwater); AB lake benthic).

***Monopostia*** De Man, 1889 - Monoposthiidae nematodes

***Monopostia duodecimalata*** Chitwood, 1936 (NY marine infauna)

***Monopostia costata*** (Bastian, 1865) (CT, MA, NY marine meiofauna down to 5cm deep; GA salt marsh benthic)

***Monoposthia hexalata*** Chitwood, 1936 (NC marine infauna)

***Monoposthia mirabilis*** Schulz, 1932 (AK, FL marine infauna)

***Meyersia*** Hopper, 1967 - Oncholaimidae nematodes

***Meyersia minor*** Hopper, 1967 (FL marine infauna)

***Mylonchulus*** (Cobb, 1916) Pennak, 1953 (Soil- algy, grass & plant associated) Mononchidae nematodes, Subfamily Mononchinae

***Mylonchulus boveyi*** Altherr & Deboutteville, 1973 (in WA, MA? hyporheic).

***Mylonchulus brachyuris*** (Butschli, 1874) Altherr, 1954 (predator in IN streams/ NY hyporheic).

***Mylonchulus lacustris*** (Cobb in Cobb., 1915) (in NY hyporheic).

***Mylonchulus sigmaturus*** (Cobb, 1917) Schuurman Stekhoven, 1943 (in NY hyporheic).

***Mylonchulus vulvapurpillatus*** Altherr & Deboutteville, 1973 (in MA hyporheic).

***Nannolaimoides*** Ott, 1972 - Cyatholaimidae nematodes

***Nannolaimoides effilatus*** (Boucher, 1976) (PQ Gulf of St. Lawrence sandy marine interstitial)

***Nannolaimus*** Cobb, 1920 Cyatholaimidae nematodes,

***Nannolaimus fusus*** Gerlach, 1956 (CT marine meiofauna down to 5cm deep)

***Nanonema*** Cobb in Stiles & Hassall, 1905 (Soil- algy, grass & plant associated)

Ironidae nematodes, Subfamily Ironinae

***Nanonema longicaudatus*** (de Man, 1884) Cobb in Stiles & Hassall, 1905

(predaceous in filter systems/ NY hyporheic).

***Nematodirus*** Ransom, 1907 (Parasites in ruminants, occasionally in rats)

Trichostrongylidae nematodes, Subfamily Nematoderinae

***Nematodirus neotoma*** Hall, 1916 (= *N. tortuosus* Tucker, 1941 or 1942) (endoparasite in NM *Neotoma albigula*, CO, WY *Neotoma cinerea rupicola*, *N. desertorum*, *N. mexicana fallax* & *N. floridana baileyi*, CA *N. fuscipes macrotis*, OK *Neotoma floridana*, PA (probably) *Neotoma magister*; CO *Neotoma stephensi relicta* & *Neotoma mexicana inopinata* & CA, UT *Neotoma lepida* woodrats).

***Nematospiroides*** Baylis, 1926 - Trichostrongylidae nematodes, Subfamily Heligmosominae

(Parasites of rodents, including woodrats).

***Nematospiroides dubia*** Baylis, 1926 (endoparasite in NH *Neotoma fuscipes* woodrats)

***Nematospiroides microti*** Kuntz & Rausch, 1950 (endoparasite in OR *Neotoma fuscipes* woodrats)

*Nematospiroides* undet. sp. (endoparasite in NH *Neotoma fuscipes* woodrats).

*Neochromadora* Micoletzky, 1924 - Chromadoridae nematodes  
*Neochromadora attenuata* (Gerlach, 1952) = *Prochromadorella a.*

*Neochromadora paramunita* Boucher, 1976 (AK marine meiofauna)  
*Neochromadora pistillata* Wieser (MA sandy marine meiofauna)

*Neochromadora poecilosoma* (DeMan, 1893) (CT, MA marine meiofauna down to 5cm deep;  
NY marine sandy meiofauna)

*Neochromadora* undet. sp. (FL marine infauna)  
*Neochromadora tecta* Gerlach, 1951 (CT, NY marine meiofauna down to 5cm deep)

*Neotobrilus* Tsalolichin, 1981 (Soil- algy, grass & plant associated)  
Hoplolaimidae nematodes, Subfamily Hoplolaiminae

*Neotobrilus longus* (Leidy, 1851) Tsalolichin, 1981 (in NY hyporheic)

*Neotonchus* Cobb, 1933 - Cyatholaimidae nematodes  
*Neotonchus corcunda* Gerlach (NC deep-sea infauna)

*Neotonchus punctatus* Cobb, 1933 (NY marine infauna)  
*Neotonchus* undet. sp. (FL marine infauna)

*Nippostrongylus* Lane, 1923 - Trichostrongylidae nematodes, Subfamily Heligmosominae  
(Intestinal parasites of rodents, including woodrats). Trichostrongylidae nematodes, Subfamily  
Heligmosominae

*Nippostrongylus muris* Yokogawa, 1920 (endoparasite in FL *Neotoma floridanus f.* woodrat).

*Nudora* Cobb, 1920 - Monoposthiidae nematodes  
*Nudora armillata* Wieser, 1959 (WA marine sandy interstitial)

*Nudora lineata* Cobb, 1920 (CT, MA, NJ, NY marine meiofauna down to 5cm deep; GA salt  
marsh benthic)

*Nygolaimus* – Nygolaimidae nematodes  
*Nygolaimus* undet. sp. (hyporheic in seVA)

*Odontophora* Butschli, 1974 (*Conolaimus*, *Trigonolaimus*) Axonolaimidae nematodes  
*Odontophora armata* (Ditlevsen, 1918) (CT, NY marine interstitial up to 5 cm deep)  
*Odontophora calcarea* Wieser (MA marine meiofauna)

*Odontophora loffleri* Wieser (MA marine meiofauna)  
*Odontophora peritricha* Wieser, 1956 (WA marine sandy interstitial)  
*Odontophora papusi* Wieser, 1956 (MA marine meiofauna; GA salt marsh benthic)

*Odontophora pugilator* Wieser, 1956 (MA marine meiofauna)  
*Odontophora setosa* (Allgen, 1919) (NY marine infauna)  
*Odontophora setosoides* Timm, 1952 (CT marine interstitial up to 5 cm deep; GA salt marsh benthic)

*Omeia* Hsu, 1932 (Abdominal and intestinal parasites of amphibians) Thelaziidae nematodes, Subfamily Omeiinae  
*Omeia chickasawi* Walton, 1940 (endoparasite in non-cave TN *Eurycea bislineata* salamander).  
*Omeia papillocauda* Rankin, 1937 (endoparasite in non-cave OH *Gyrinophilus porphyriticus*, non-cave NC *Desmognathus ochrophaeus* & *quadramaculatus*, AR *Eurycea multiplicata m.* & non-cave TN *Eurycea bislineata* salamanders)

*Oncholaimellus* De Man, 1890 - Oncholaimidae nematodes  
*Oncholaimellus patkellyi* Keppner, 1987 (FL, NC marine infauna)

*Oncholaimoides* Chitwood, 1937 - Oncholaimidae nematodes  
*Oncholaimoides rugosus* Chitwood, 1937 (CT, NC, NY marine meiofauna)

*Oncholaimoides* undet. sp. or species (FL, CT marine meiofauna down to 5cm deep)  
*Oncholaimoides striatus* Chitwood, 1937 (NC marine infauna)

*Oncholaimus* Dujardin, 1845 (Soil- algy, grass & plant associated)  
Oncholaimidae nematodes, Subfamily Oncholaiminae

*Oncholaimus brachycercus* DeMan, 1889 (CT marine meiofauna down to 5cm deep)  
*Oncholaimus campylocercoides* De Coninck & Stekhove, 1933 (MA marine benthic)

*Oncholaimus dujardinii* DeMan, 1876 (CT marine meiofauna down to 5cm deep; (FL marine infauna))

*Oncholaimus paralangrunensis* (Allgen, 1947) (NY marine infauna)  
*Oncholaimus* undet. species (in WA hyporheic; MA, NY marine meiofauna).  
*Oncholaimus vesicarium* (= *Oncholaimium v.*) (WA meiofauna benthic)

*Oncholaimium* = *Oncholaimus* Dujardin, 1845

*Onyx* Cobb, 1891 (= *Oistolaimus*) (Onyx-nematode) Desmodoridae nematodes  
*Onyx rugata* (Gray, 1821) (WA marine sandy interstitial)

*Oswaldocruzia* Travassos, 1917 - Trichostrongylidae nematodes, subfamily Oswaldocruziinae (also put in Molineidae, subfamily Molineinae) (Intestinal parasites of amphibians, including salamanders).

*Oswaldocruzia euryceae* (in non-cave? GA *Eurycea guttolineata* salamanders).  
*Oswaldocruzia leidyi* Travassos, 1914 (in non-cave TN *Desmognathus fuscus* salamanders).

***Oswaldocruzia pipiens*** Walton, 1929 (endoparasite in KY (Trigg Co.) *Eurycea lucifuga* salamander, non-cave CA *Aneides aeneus* & *Plethodon cinereus albagula* salamanders).

***Oswaldocruzia*** undet. sp. (in MO *Typhlotriton spelaeus* salamander).

***Oxydirus*** Thorne, 1939 (Soil- algy, grass & plant associated)  
Axonolaimidae nematodes, Subfamily Belonidirinae

***Oxydirus oxycephaloides*** (de Man, 1885) Thorne, 1939 (in NY hyporheic).

***Oxyonchus*** Filipjev, 1927 - Enoplidae nematodes

***Oxyonchus lynnae*** E.J. Keppner, 1987 (FL marine infauna)

***Oxyonchus striatus*** E.J. Keppner, 1988 (FL marine infauna)

***Oxystomina*** Filipjev, 1921 (= *Nemanemella*, *Oxystomella*, *Schistodera*) Oxystominidae  
nematodes

***Oxystomina beta*** Weiser (MA, NJ marine meiofauna).

***Oxystomina elongata*** (Buetschli, 1874) (MA marine meiofauna).

***Oxystomina*** undet. sp. (FL marine infauna)

***Oxyuris*** - Rankin, 1937 - Oxyuridae nematodes, Subfamily Oxyurinae (Intestinal parasites of mammals, especially of ungulata, occasionally in salamanders and woodrats).

***Oxyuris magnavulvaris*** (Rankin, 1937) Thorne, 1939 (endoparasite in non-cave GA, TN *Desmognathus fuscus*, AR *Desmognathus brimleyorum* & *Eurycea bislineata* salamanders).

***Oxyuris papillocauda*** Walton, 1940 (endoparasite in non-cave TN *Desmognathus fuscus* salamander),

***Oxyuris tetraptera*** (Nitzsch, 1821) (endoparasite in non-cave CO *Neotoma desertorum*, *Neotoma cinerea rupicola*, *N. mexicana fallax* & *N. cinera orolestes* woodrats)

***Panagrolaimus*** Fuchs, 1930 (Soil- algy, grass & plant associated) Panagrolaimidae nematodes,  
Subfamily Panagrolaiminae

***Panagrolaimus rigidus*** (Schneider, 1866) (NY hyporheic)

***Paracanthonchus*** Micoletzky, 1924- Cyatholaimidae nematodes (*Harveyjohnstonia*;  
*Paraseuratiella*)

***Paracanthonchus caecus*** Micoletzky, 1924 (CT marine meiofauna down to 5cm deep; GA salt marsh benthic)

***Paracanthonchus platypus*** Wieser & Hopper, 1967 (FL marine psammon)

***Paracanthonchus*** undet sp. (FL marine psammon)

***Paracanthonchus spectabilis*** Allgren (CT, MA, NY marine meiofauna down to 5cm deep)

*Paracomesoma* Hope & Murphy, 1972 - Comesomatidae nematodes  
*Paracomesoma hexasetosa* Hope & Murphy, 1972 (NY marine sandy meiofauna, interstitial?)  
*Paracomesoma* undet sp. (FL marine psammon)

*Paractinolaimus* Meyl, 1957 (Soil- algy, grass & plant associated) Actinolaimidae nematodes  
(once in Dorylaimidae, Subfamily Actinolaiminae)

*Paractinolaimus intermedius* (de Man, 1880) (in WA hyporheic).  
*Paractinolaimus macrolaimus* (Man, 1884) (in NY hyporheic)  
*Paractinolaimus* undet. sp. (NY freshwater sandy beach interstitial)

@*Paraecuchromadora* (spelling?) undet sp. (FL marine psammon)

*Paracyatholaimus* Micoletzky, 1922 - Cyatholaimidae nematodes  
*Paracyatholaimus occultus* Gerlach (AK marine meiofauna)  
*Paracyatholaimus pesavis* Wieser & Hopper, 1967 (NC marine meiofauna)

*Paracyatholaimus pugettensis* Weiser & Hopper, 1967 (AK marine meiofauna)  
*Paracyatholaimus* undet sp. (NY marine infauna)  
*Paracyatholaimus vancouverensis* Sharma & Vincx (BC marine infauna)

*Paraontophora* Timm, 1963 - Axonolaimidae nematodes  
*Paradontophora brevamphida* (*Pseudolella b.* Timm, 1952) (FL marine psammon)

*Paralinhomoeus* De Man, 1907 (Crystallonema; Paradesmolaimus) Linhomoeidae nematodes  
*Paralinhomoeus ostrearum* Filipjev, (CT marine meiofauna down to 5cm deep)

*Paralinhomoeus* undet. sp. (NJ marine meiofauna)  
*Paralinhomoeus strigosus* Wieser, 1956 (CT marine meiofauna down to 5cm deep)  
*Paralinhomoeus tenuicaudatus* (Butschli, 1874) (CT, NY marine meiofauna down to 5cm deep)

*Paralinhomoeus* undet species (MA, NY marine meiofauna; 2 species - NC deep-sea infauna))

*Parallintoshius* Araujo, 1940 (Intestinal parasites of chiroptera) Trichostrongylidae nematodes,  
Subfamily Trichostrongylinae

*Parallintoshius parallintoshius* Araujo, 1940 (endoparasite in TX *Myotis velifer incautus* & *M. volans* bats.

*Paramesacanthion* Wieser, 1953 - Enoplidae nematodes  
*Paramesacanthion* undet sp. (CT marine meiofauna down to 5cm deep)

*Paramicrolaimus* Wieser, 1954 - Microlaimidae nematodes  
*Paramicrolaimus* undet sp. (CT marine meiofauna down to 5cm deep)

*Paramonhystera* Wieser, 1956 (= *Paramonohystera*) - Monhysteridae nematodes, Subfamily Monhysterinae

*Paramonhystera biforma* Wieser, 1956 (NJ marine meiofauna)

*Paramonhystera canicula* Wieser & Hopper (FL marine infauna)

*Paramonhystera mystacoderma* Wieser, 1956 (MA, NJ marine meiofauna)

*Paramonhystera* (*Paramonhystera*) *proteus* Wieser ZR 115 (CT marine meiofauna down to 5cm deep)

*Paramonhystera* undet. sp. or species (FL, NY marine infauna)

*Paraphanolaimus* Micoletzky, 1923 (Soil- algy, grass & plant associated)  
Camacolaimidae nematodes, Subfamily Halaphanolaiminae

*Paraphanolaimus communis* (Cobb, 1915) Micoletzky, 1923 (in NY hyporheic).

*Paraterschellingia* Kreis in Stekhoven, 1924 - Siphonolaimidae nematodes

*Paraterschellingia* undet sp. (CT marine meiofauna down to 5cm deep)

*Pareurystomina* Micoletzky & Kreis, 1930 - Eurystominidae nematodes

*Pareurystomina ac(c)uminata* (NY marine infauna)

*Pareurystomina agubernacula* Keppner, 1986 (FL marine infauna)

*Pareurystomina flagellicaudata* Stekhoven, 1946 (MA, NJ marine meiofauna)

*Pareurystomina floridensis* Keppner, 1986 (FL marine infauna)

*Pareurystomina pugetensis* (WA marine interstitial?)

*Pareurystomina* undet. sp. (FL marine infauna)

*Pareurystomina typicum* Micoletzky (MA marine meiofauna)

*Parironus* Micoletzky, 1930 - Ironidae nematodes

*Parironus sandersi* Wieser (NJ, MA marine benthic meiofauna)

*Paroncholaimus* Filipjev, 1916 - Oncholaimidae nematodes

*Paroncholaimus camphylocercoides* (GA salt marsh benthic)

*Paroncholaimus paralangrunensis* (GA salt marsh benthic)

*Phanoderma* Bastian, 1865 - Phanodermatidae nematodes

*Phanoderma* undet sp. (FL marine infauna)

*Phanodermopsis* Ditlevsen, 1926 - Phanodermatidae nematodes

*Phanodermopsis* undet. sp. (FL marine infauna)

*Physaloptera* Rudolphi, 1819 (Parasites in digestive tract of mammals, birds, amphibians & reptiles) Physalopteridae nematodes, Subfamily Physalopterinae

*Physaloptera abjecta* Leidy, 1856 (endoparasite in AR *Desmognathus fuscus* salamanders).  
*Physaloptera brevivcaginata* Seurat, 1917 (endoparasite in TX, NM *Myotis septentrionalis* bats).

*Physaloptera leidy* Walton, 1927 (endoparasite in TX *Myotis lucifugus* bats)  
*Physaloptera massino* Shulz, 1928 (= *P. spinicauda* McLeod, 1933) (endoparasite in NM  
*Neotoma albigula* woodrats)

*Physaloptera* undet. sp. or species (endoparasite in TX (Tx), LA *Tadarida brasiliensis mexicana*  
& FL *Tadarida brasiliensis cynocephala* bats)

*Physocephalus* Diesing, 1861 (Parasites in stomach and intestinal tract of mammals, including  
bats). Spiruridae nematodes, Subfamily Ascarosinae

*Physocephalus sexalatus* (Molin, 1860) (endoparasite in *Eptesicus fuscus* f. ; MD *Lasiurus*  
*cinereus*, TX *Myotis velifer*; WV (Tx) *Myotis lucifugus* l. & OH bats).

*Physocephalus* undet. sp. (in CO hyporheic; ectoparasite on *Lasiurus cinereus* bats).

*Plectoidea* Oerley, 1880 - Plectidae nematodes  
*Plectoidea* undet sp. (FL marine psammon)

*Plectoides* de Man, 1904 = *Plectus*

*Plectus* Bastian, 1865 (= *Plectoides*, *Proteroplectus*) (Soil- algy, grass & plant associated)  
Plectidae nematodes, Subfamily Plectinae. Bibl.: Maggenti

*Plectus aquatilis* Andrassy, 1985 (ON hyporheic)  
*Plectus granulosus* Bastian, 1865 (= *Plectoides* g.) (in CO,MA hyporheic)  
*Plectus inquirendus* (ON hyporheic)

*Plectus parietinus* Bastian, 1865 (in NY hyporheic).  
*Plectus rhizophilus* de Man, 1880 (in CO,WA hyporheic).  
*Plectus granulosus* Bastian, 1865 (in NY hyporheic).

*Plectus tubier* Cobb, 1914 (in NY hyporheic).  
*Plectus* undet. sp. or species (Ttx? in Wind C.,SD; NY freshwater sandy beach interstitial)

*Polysigma* Cobb, 1920 - Desmodoridae nematodes  
*Polysigma uniforme* Cobb, 1920 (CT, NY marine meiofauna down to 10cm deep)

*Pomponema* Cobb, 1917 (= *Anaxonchium*, *Cobbiacanthonchus*, *Endolaimus*, *Haustrifera*,  
*Nummocephalus*) Cyatholaimidae nematodes

*Pomponema mirabilis* Cobb, 1917 (MA, NC marine infauna)  
*Pomponema multipapillatum* (AK marine infauna)  
*Pomponema segregata* Wieser (NC deep-sea infauna)



*Pomponema tautraense* (Allgen, 1933) (*Choniolaimus tautraense*; *Cyatholaimus tautraense*; *Nummocephalus tautraense*) (NY marine sandy meiofauna, interstitial?)

*Pontonema* Leidy, 1855 - Oncholaimidae nematodes

*Pontonema problematicum* Chitwood, 1960 (FL marine infauna)

*Porocoma* Cobb, 1920 - Oxystominidae nematodes

*Porocoma* undet. sp. (NC deep sea meiofauna)

*Prionchulus* Cobb, 1916 (Soil- algy, grass & plant associated)

Mononchidae nematodes, Subfamily Mononchinae

*Prionchulus muscorum* (Dujardin, 1845) Wu & Hoepplie, 1929 (NM hyporheic)

*Prionchulus* undet. sp. (sandy hyporheic in TX)

*Prismatolaimus* de Man, 1880 (Soil- algy, grass & plant associated)

Monhysteridae nematodes, Subfamily Monhysterinae

*Prismatolaimus dolichurus* de Man, 1880 (in CO, NY hyporheic)

*Prismatolaimus* undet. sp. or species (sandy hyporheic in VA, TX; ON hyporheic & groundwater ecotone; AB lake benthic)

*Procamacolaimus* Gerlach, 1954 - Leptolaimidae nematodes

*Procamacolaimus* 2 undet species (CT marine meiofauna down to 5cm deep)

*Prochromadora* Filipjev, 1922 - Chromadoridae nematodes

*Prochromadora* undet. sp. (NY marine meiofauna interstitial)

*Prochromadorella* Micoletzky, 1924 (= *Trichromadora*) Chromadoridae nematodes

*Prochromadorella attenuata* (*Neochromadora attenuata* Gerlach, 1952) (AK, MA, NJ marine meiofauna)

*Prochromadorella ditlevseni* (AK marine meiofauna)

*Prochromadorella neapolitana* ZR 121 (MA, NY marine sandy meiofauna, interstitial?)

*Prochromadorella paramucrodonta* (*Chromadora p.* Allgen, 1929) (CT marine meiofauna down to 5cm deep; NY marine sandy meiofauna, interstitial?)

*Prochromadorella* undet. sp. or species (MA marine meiofauna; FL marine psammon)

*Prochromadorella papillata* Jensen P., 1885 (interstitial? in TX marine sands)

*Prodesmodora* Micoletzky, 1923 (Soil- algy, grass & plant associated)

Cyatholaimidae nematodes, Subfamily Cyatholaimrina

*Prodesmodora fluviatilis* (Cobb, 1914) Micoletzky, 1923 (in CO hyporheic)

*Prodesmodora* undet. sp. (AB lake benthic)

*Prodesmodora* undescr. sp. (in NY hyporheic)

*Prodorylaimus* Andrassy, 1959 – Dorylaimidae, Subfamily Dorylaiminae  
*Prodorylaimus* undet. sp. (ON hyporheic groundwater/hyporheic ecotone)

*Prooncholaimus* Micoletzky, 1924 - Oncholaimidae nematodes  
*Prooncholaimus hastatus* Wieser & Hopper, 1967 (FL marine infauna)

*Propomponema* Ott, 1972 - Cyatholaimidae nematodes  
*Propomponema websteri* Sharma & Vincx (BC marine infauna)

*Pselionema* Cobb, 1933 - Ceramonematidae nematodes  
*Pselionema annulatum* (*Steineria annualta* Filipjev, 1922) (NC deep-see marine infauna)

*Pseudolella* Cobb, 1920 - Axonolaimidae nematodes  
*Pseudolella* undet. sp. (FL marine infauna)

*Pseudonchus* Cobb, 1920 - Choniolaimidae nematodes  
*Pseudonchus kosswigi* Murphy, 1964 (NY marine meiofauna interstitial)

*Pseudosteineria* Wieser, 1956 - Monhysteridae nematodes, Subfamily Monhysterinae  
*Pseudosteineria horrida* (*Theristus horridus* Steiner, 1916)

*Pterygodermatites* Wedl, 1861 (Intestinal parasites of insectivora, rodents, bats and lizards).  
Rictulariidae nematodes, Subfamily Rictulariinae

*Pterygodermatites bovieri* Blanchard, 1886 (= *Riticularia b.*) (endoparasite in IN, CA *Myotis lucifugus* bats).

*Pterygodermatites coloradensis* Holl, 1916 (Tx in KY,OH/ parasite on crickets)

*Pterygodermatites dipodomis* (*Riticularia d.* Tiner, 1948) Quentin, 1969 (endoparasite in NM  
*Neotoma albigula* woodrats)

*Pterygodermatites parkeri* Neovan, 1922 (endoparasite in MD *Neotoma pennsylvanica* woodrat).

*Pungentus* Thorne & Swanger, 1936 (Soil- algy, grass & plant associated) Nordidae nematodes  
(once in Dorylaimidae, Subfamily Dorylaiminae)

*Pungentus pungens* Thorne & Swanger, 1936 (in NY hyporheic).

*Pyncolaimus* Cobb, 1920 (Soil- algy, grass & plant associated) Plectidae nematodes, Subfamily Plectinae

*Pyncolaimus granulatus* (Bastian, 1865) Cobb, 1920 (in NY hyporheic).

*Rhabdias* Stiles & Hassall, 1905 (Abdominal and intestinal parasites of amphibians, including salamanders). Rhabdiasidae nematodes, Subfamily (1) Rhabdiasinae:

*Rhabdias entomelas* (Leidy, 1851) Stiles & Hassall, 1905 (in non-cave TN *Desmognathus fuscus* salamander).

*Rhabditis* Dujardin, 1845 (Soil- algy, grass & plant associated) Rhabditidae nematodes, Subfamily Rhabditinae

*Rhabditis aquatica* (Micoletzky, 1913) (in NY hyporheic).

*Rhabditis demani* Hntewytsch, 1929 (in NY hyporheic).

*Rhabditis oerlei* Volk, 1950 (in NY hyporheic).

*Rhabditis nudicapitata* Stefanski, 1922 (in NY hyporheic).

*Rhabditis oxycerca* (deMan, 1895 (in NY hyporheic).

*Rhabditis parapapillosa* Schuurmans Stekhoven, 1951 (in NY hyporheic).

*Rhabditis stalbergi* Allgen, 1950 (in NY hyporheic).

*Rhabditis variabilis* Fuchs, 1931 (in NY hyporheic).

*Rhabditis* undet. sp. (TTx? in SD).

*Rhabdochona* Railliet, 1916 (Intestinal parasites of fishes) Rhabdochonidae nematodes, Subfamily (1) Rhabdochoninae

*Rhabdochona longleyi* Moravec & Huffman, 1988 (endoparasite in TX *Trogloglanis pattersoni* & *Satan eurystomus* cavefish).

*Rhabdodemia* Baylis & Daubney, 1926 (= *Pendulumia*) Rhabdodemiidae nematodes

*Rhabdodemia minima* Chitwood, 1936 (MA, NJ marine meiofauna).

*Rhabdolaimus* deMan, 1880 - Rhabdolaimidae nematodes (also put in Leptolaimidae)

*Rhabdolaimus* undet. sp. (East coast marine meiofauna)

*Richtersia* Steiner, 1916 - Richtersiidae nematodes (also put in Selachinematidae)

*Richtersia kreisi* = *Dracograllus k.*?

*Richtersia* undet. sp. (FL marine infauna)

*Rhynchonema* - Xyalidae nematodes (also put in Monhysteridae)

*Rhynchonema megamphidum* Boucher (AK marine infauna)

*Rictularia* Froelich, 1802 (Intestinal parasites of insectivora, rodents, bats and lizards). Rictulariidae nematodes, Subfamily Rictulariinae

*Rictularia bovieri* (Blanchard, 1886) (endoparasite in CA *Myotis lucifugus* & Brazilian *Eumops perotis* bats).

*Rictularia dipodomis* = *Pterygodermatites d.*

***Rictularia lucifugus*** Douvres, 1956 (endoparasite in NJ, NM, WI (infrequent Tx); IN *Myotis keeni* & *Myotis sodalis*; IA, IN, NM, WV (Tx) *Myotis lucifugus* & WI *Eptesicus* bats)

***Rictularia*** undet. sp. (endoparasite in MD *Neotoma pennsylvanica* woodrats & IN *Myotis lucifugus* & TX (Tx) *Tadarida brasiliensis* bats).

***Rotylenchus*** Filipjev, 1936 (Soil- algy, grass & plant associated) Bibl.: Golden 1956  
Hoplolaimidae nematodes, Subfamily Hoplolaiminae

***Rotylenchus robustus*** (de Man, 1876) Filipjev, 1936 (NY hyporheic)

***Sabatieria*** de Roueville, 1903 (*Parasabatieria*) Comesomatidae nematodes

***Sabatieria americana*** Timm (NC deep-sea marine benthic)

@***Sabatieria ancudiana*** (NY marine sandy meiofauna, interstitial?)

***Sabatieria armata*** Gerlach, 1952 (CT marine interstitial up to 5 cm deep)

***Sabatieria celtica*** Southern, 1914 (= *Sabatieria cupida*) (AK, CT, NC, NY marine sandy interstitial up to 5 cm deep))

***Sabatieria chitwoodi*** Wieser, 1954 (NC, CT, NY marine interstitial up to 5 cm deep)

***Sabatieria effilata*** Stockhaven (CT marine interstitial up to 5 cm deep)

***Sabatieria falcifera*** Wieser (CT marine interstitial up to 5 cm deep)

***Sabatieria granifer*** Wieser, 1954 (CT marine interstitial up to 5 cm deep)

***Sabatieria hilarula*** DeMan, 1922 (CT, MA, NY marine interstitial up to 5 cm deep)

***Sabatieria longicaudata*** Filipjev, 1922 (MA marine interstitial up to 5 cm deep)

***Sabatieria ornata*** (Ditlevsen, 1918) (MA, NJ marine interstitial up to 5 cm deep)

***Sabatieria parabyssalis*** Wieser (CT marine interstitial)

***Sabatieria pulchra*** (G. Schneider, 1906) (NY marine sandy interstitial)

***Sabatieria*** undet. sp. (FL marine infauna)

***Sabatieria tenuicaudata*** (Bastian, 1965) (MA, NJ marine meiofauna).

***Sabatieria triplex*** Wieser (NC deep-see marine infauna)

***Sabatieria vulgaris*** (G. Schneider, 1906) (MA, NJ marine interstitial up to 5 cm deep)

***Scaptrella*** Cobb, 1917 - Scaptrellidae nematodes

***Scaptrella cincta*** Cobb, 1917 (CT marine meiofauna down to 5cm deep)

***Scaptrella*** undet. sp. (PQ Gulf of St. Lawrence sandy marine interstitial)

***Seuratium*** Hall, 1916 (Internal parasites of rodents and chiroptera) Seuratidae nematodes,  
Subfamily (1) Seuratinae

***Seuratium cancellatum*** Chitwood, 1938 (endoparasite in wTX *Antrozous pallidus*, *Eptesicus fuscus*, *Eumops perotis*, *Myotis californicus*, *M. yumanensis*, *Pipistrellus hesperus*, *Corynorhinus townsendii* & *Tadarida brasiliensis* bats )

*Seuratum chiropterorum* (Ortlepp, 1932) (endoparasite in non-cave WI (Sauk Co.) *Lasiurus cinereus* bats)

*Sigmophoranema* Hope and Murphy, 1972 - Desmodoridae nematodes  
*Sigmophoranema rufum* (Cobb, 1933) (NY marine meiofauna interstitial)

*Siphonolaimus* De Mann, 1893 - Siphonolaimidae nematodes  
*Siphonolaimus conicus* Chitwood, 1936 (NY marine infauna)  
*Siphonolaimus* undet. sp. (FL marine infauna)

*Sphaerolaimus* Bastian, 1865 - Sphaerolaimidae nematodes  
*Sphaerolaimus balticus* G. Schneider, 1906 (CT marine meiofauna down to 5cm deep)  
*Sphaerolaimus dispar* Filipjev, 1918 (MA, NJ marine meiofauna)

*Sphaerolaimus margaritatus* Wieser (MA, NJ marine meiofauna)  
*Sphaerolaimus nefastus* Wieser (MA, NJ marine meiofauna)  
*Sphaerolaimus* undet. species (NC deep-sea infauna; GA salt marsh benthic; FL marine infauna; PQ Gulf of St. Lawrence sandy marine interstitial))

*Spilophora* de Man, 1876 (Soil- algy, grass & plant associated) Chromadoridae nematodes,  
Subfamily Chromadorinae

*Spilophora impatiens* (Cobb, 1888) Filipj., 1930 (MA, WA hyporheic).

*Spilophorella* Filipjev, 1917 - Cyatholaimidae nematodes  
*Spilophorella paradoxa* DeMan, 1888 (AK, CT, FL, MA, NY marine meiofauna down to 5cm deep)

*Spilophorella* undet sp. (FL marine psammon)

*Spirinia* Gerlach, 1963 - Desmodoridae nematodes  
*Spirinia hamata* Gerlach, 1963 (GA salt marsh benthic)

*Spirinia parasitifera* (Bastian, 1865) (= *Spira p.*; *Spirina p.*) Wieser & Hopper (CT, MA, NY marine meiofauna down to 5cm deep; GA salt marsh benthic; FL benthic infauna)

*Spironoura* Leidy, 1856 - Kathlaniidae nematodes, subfamily Spironurinae  
(Intestinal parasites of reptiles, amphibians and fishes, including salamanders).

*Spironoura waltoni* (Ingles, 1936) Freitas & Lent, 1941 (endoparasite in non-cave CO *Ambystoma tigrinum* salamander).

*Spironoura papillocauda* Rankin, 1937 (in non-cave OH *Gyrinophilus porphyriticus*, non-cave NC *Desmognathus ochrophaeus* & *quadramaculatus*, AR *Eurycea multiplicata m.* & non-cave TN *Eurycea bislineata* salamanders).

***Spiroptera*** Rudolphi, 1819 (endoparasite in oesophagus, crop or gizzard of birds, exceptionally of reptiles and mammals). Acuariidae nematodes, Subfamily Acuariinae

***Spiroptera sexalatus*** (Molin, 1860) (endoparasite in Tx *Myotis* v. bats).

***Spiroxys*** Schneider, 1866 (Abdominal parasites of tortoises and intestinal of amphibians). Spiruridae nematodes, Subfamily Spiroxynae

***Spiroxys constricta*** (Leidy, 1856) Schneider, 1866 (endoparasite in AZ *Desmognathus fuscus* salamander)

***Spiroxys utahensis*** (endoparasite in non-cave OK,UT *Ambystoma tigrinum* salamanders)

***Steineria*** Micoletzky, 1922 - Monhysteridae nematodes

***Steineria phimifera*** Wieser, 1959 (WA marine interstitial?)

***Steineria*** undet. sp. (PQ Gulf of St. Lawrence sandy marine interstitial)

***Strongyloides*** Grassi 1879 (Intestinal parasites of vertebrates)

Trichostrongylidae nematodes, Subfamily Strongylinae

***Strongyloides robustus*** Chandler, 1942 (endoparasite in CA *Triturus viridescens* salamander)

***Strongyloides shastensis*** Schmidt, Duszynski & Martin 1992 (\*type locality cave in Mohave Co., AZ/ extinct endoparasite in *Nothrotheriopsis shastensis* ground sloth dung).

***Strongylus*** Mueller, 1780 (Parasites of mammals, including in bats). Strongylidae nematodes, Subfamily Strongylinae

***Strongylus delicatus*** Schwartz, 1927 (endoparasite in LA (non-cave),NM, OK & TX *Tadarida brasiliensis mexicana*, FL *Tadarida brasiliensis cynocephala* & TX *Myotis* v. bats).

***Synonchiella*** Cobb, 1933 - Selachinematidae nematodes

***Synonchiella bifaria*** Wieser (MA marine meiofauna)

***Syphacia*** Seurat, 1916 (Abdominal and intestinal parasites of rodents and man, including woodrats) Oxyuridae nematodes, Subfamily Syphaciinae

***Syphacia eutamii*** Tiner, 1948 (endoparasite in NM *Neotoma albigula* woodrats)

***Syphacia woodheadi*** Seurat, 1916 (endoparasite in AZ *Neotoma albigula a.* woodrats).

***Teratocephalus*** de Man, 1876 - Teratocephalidae neamtodes (once put in Plectidae)

***Teratocephalus*** undet. sp. or species (CA, FL marine benthic)

***Terschellingia*** De Man, 1888 - Linhomoeidae nematodes

***Terschellingia longicauda*** DeMan, (MA, FL, CT, NY marine meiofauna down to 5cm deep)

***Terschellingia pa xi*** W. Schneider, 1939 (MA,CT, NY marine meiofauna down to 5cm deep)

***Thelandros*** Wedl, 1862 (Endoparasites of reptiles and amphibians). Oxyuridae nematodes,  
/Subfamily Oxyurinae

***Thelandros magnavulvaris*** (Rankin, 1937) Schad., 1960 (endoparasite in KY cave (Trigg Co.)  
*Eurycea lucifuga*, non-cave IL *Desmognathus fuscus*, non-cave MI *Plethodon cinereus* c. & non-  
cave CA *Aneides aeneus* salamanders).

***Thalassironus*** De Man, 1889 - Ironidae nematodes  
***Thalassironus americanus*** Keppner, 1986 (FL marine infauna)

***Theristus*** Bastian, 1865 (Soil- algy, grass & plant associated)  
Monhysteridae nematodes, Subfamily Monhysterinae

***Theristus*** (*Theristus*) *acer* Bastian, 1865 (NY marine infauna)

***Theristus anticipans*** (Wieser, 1956) (WA marine sandy interstitial)

***Theristus bastiani*** Wieser (AK marine meiofauna)

***Theristus curvatus*** (NY marine infauna)

***Theristus elegans*** Kries, 1929 (NY marine infauna)

*Theristus horridus* Steiner = *Pseudosteineria horrida*

***Theristus duboisi*** (Bultschli, 1873) Micoletzky, 1925 (in MA hyporheic)

*Theristus erectus* = *Mesotheristus e.*

*Theristus fistulatus* = *Cylindrotheristus f.*

***Theristus*** (*Penzancia*) *flavensis* Schuurmans-Sterkhoven, 1935 (NY marine infauna)

***Theristus frictor*** (MA meiofauna benthic)

***Theristus floridens*** Wieser & Hopper, 1967 (FL marine infauna)

***Theristus longicaudatus*** Filipjev (NC deep-sea infauna)

***Theristus longisetosus*** Keppner, 1988 (FL marine infauna)

***Theristus multisetosus*** Wisser (MA marine meiofauna)

***Theristus ostentator*** Wieser & Hopper, 1967 (FL marine infauna)

***Theristus problematicus*** (Allgen, 1928) (NC (deep-sea), NY infauna)

***Theristus rezaki*** (interstitial? in TX marine sands)

***Theristus*** (*Mesotheristus*) *setosus* (Bultschli, 1874) (CT, MA marine meiofauna down to 5cm  
deep, NY marine infauna)

***Theristus*** undet. species (NY hyporheic; NC deep-sea infauna, (MA marine meiofauna))

***Theristus trecuspidatus*** (Wieser, 1959) (WA marine sandy burrower)

***Theristus wimmeri*** Wieser, 1959 (WA marine sandy interstitial)

*Theristus xyaliformis* = *Cylindrotheristus x.*

***Thoonchus*** Cobb, 1920 - Symplocostomatidae nematodes

*Thoonchus longisetosus* Keppner, 1988 (FL marine infauna)  
*Thoonchus* undet. sp. (NY, CT marine meiofauna down to 5cm deep)

*Thornenema* Andrassy, 1959 (Soil- algy, grass & plant associated) Dorylaimidae nematodes,  
Subfamily Dorylaiminae

*Thornenema curvicaudatus* Andrassy, 1959 (in CO hyporheic).

*Thornia* Meyl, 1954 (Soil- algy, grass & plant associated) Dorylaimidae nematodes, Subfamily  
Dorylaiminae

*Thornia steatopyga* (Thorne & Swanger, 1936) Meyl, 1954 (in NY hyporheic).

*Tobrilus* Andrassy, 1959 (*Trilobus*, *Paratrilobus*) (Soil- algy, grass & plant associated)  
Tripylidae nematodes, Subfamily Tripylinae

*Tobrilus altherri* (*Trilobus a.* Altherr, 1953) (in WA,MA hyporheic).

*Tobrilus allophysis* (Steiner, 1919) (in CO,WA hyporheic).

*Tobrilus delamarei* Altherr, 1963 (in CO hyporheic).

*Tobrilus graciliformis* Altherr & Deboutville, 1973 (in WA hyporheic).

*Tobrilus gracilis* (Bastian, 1865) Andrassy, 1959 (in MA, NY hyporheic).

*Tobrilus graciformis* (Goffart, 1935) (in WA hyporheic).

*Tobrilus longicaudatus* (Schneider, 1923) (in NY hyporheic).

*Tobrilus longus* (Bastian, 1865) Andrassy, 1959 (in WA hyporheic).

*Tobrilus* undet. sp. or species (AB lake benthic; ON groundwater & hyporheic ecotone; NY  
freshwater sandy beach interstitial)

*Trefusia* De Man, 1893 - Trefusiidae nematodes

*Trefusia honessi* Keppner, 1986 (FL marine infauna)

*Trefusia longicarpa* Keppner, 1986 (FL marine infauna)

*Trefusia* undet. sp. (AK marine meiofauna)

*Trileptium* Cobb, 1933 (= *Trilepta*)

*Trileptium iacobinum* Wieser, 1959 (WA marine interstitial?)

*Trileptium* undescr. sp. (NC marine infauna)

*Trischistoma* Cobb, 1913 (= *Tripylina*) (Soil- algy, grass & plant associated) Tripylidae  
nematodes, Subfamily Tripylinae

*Trischistoma monohystera* (*Tripylina m.* Vinciguerra & La Fauci, 1978 (NY hyporheic)

*Tricholeiperia* Skarbilovitch, 1934 (endoparasite in alimentary tract of bats) Trichostrongylidae  
nematodes, Subfamily Strongilacanthinae



***Tricholeiperia*** undet. sp. (endoparasite in OK (Tx),TX (Tx) *Tadarida brasiliensis mexicana* bats).

***Trichosoma*** Rudolphi, 1819 (endoparasite in digestive tract or urinary bladder of vertebrates)  
Trichocephalidae nematodes, Subfamily Capillariinae

***Trichosoma hirundinis*** (Skrjabin et al., 1957) (endoparasite in TX, NM *Hirundo fulva & urbica* swallows).

***Trichostrongylus*** Looss, 1905 (Parasites of birds and mammals, including man)  
Trichostrongylidae nematodes, Subfamily Trichostrongylinae

***Trichostrongylus capricola*** Ransom, 1907 (in MA *Myotis lucifugus* bats).

***Trichuris*** Roederer, 1761 (endoparasite intestinal of mammals) Trichocephalidae nematodes,  
Subfamily Capillariinae

***Trichuris elatoris*** Pfaffenberger & Best, 1989 (endoparasite in NM *Neotoma albigula* woodrats)

***Trichuris muris*** (Schrank, 1788) (endoparasite in OK *Neotoma floridanus* woodrat).

***Trichuris nodosus*** (Rudfolphi, 1809) (endoparasite in AZ *Neotoma floridanus* woodrat).

***Trichuroides*** Ricci, 1949 (endoparasite in urinary bladder of chiroptera)  
Trichosomoididae nematodes, Subfamily Trichosomoidinae

***Trichuroides chiropteri*** Ricci, 1949 (endoparasite in KS *Myotis septentrionalis* bats).

***Trichuroides myoti*** Ubelaker & Dailey, 1971 (endoparasite in *Myotis velifer incautus*; in KS *Myotis grisescens* & *M. velifer grandis* bats)

***Tricoma*** Cobb, 1894 - Desmoscolecidae nematodes

***Tricoma*** (*Tricoma0 similis* Cobb, 1912 (interstitial?, benthic in TX marine sands)

***Trilobus*** Andrassy, 1959 (Soil- algy, grass & plant associated)  
Tripylidae nematodes, Subfamily Tripylinae

***Trilobus pellucidus*** (Cobb, 1913) Andrassy, 1959 (in NY hyporheic).

***Trilobus*** undet sp. (MN lake infauna)

***Tripyla*** Bastian, 1865 - (Soil- algy, grass & plant associated) Tripylidae nematodes, Subfamily  
Tripylinae

***Tripyla affinis*** deMan, 1880 (in CO,MA hyporheic).

***Tripyla cornuta*** Skwarra, 1921 (in NY hyporheic).

***Tripyla filicaudata*** de Man, 1880 (in NY hyporheic).

***Tripyla filipjevi*** (Filipjev, 1930) (in MA hyporheic).

*Tripyla gracilis* (Bastian, 1865) Ohorato-di-Cillis, 1928 (in NY hyporheic).  
*Tripyla macroseta* Vinciguerra & La Fauci, 1978 (in NY hyporheic).

*Tripyla magna* Altherr & Deboutteville, 1973 (in WA hyporheic).  
*Tripyla papillata* Buetschli, 1873 (in NY hyporheic).

*Tripyla pellucidus* (Cobb, 1913) Micoletzky, 1925 (in NY hyporheic).  
*Tripyla setifera* Buetsch, 1873 (in MA hyporheic)  
*Tripyla* undet. sp. (in seVA hyporheic)

*Tripylina* = *Trischistoma*

*Tripyloides* De Man, 1886 (= *Nannonchus*) Tripyloididae nematodes  
*Tripyloides gracilis* (Ditlevsen, 1918) (FL, GA, MA, CT, NJ, NY marine meiofauna down to 5cm deep)

*Trissonchulus* Cobb, 1920 – Ironidae nematodes  
*Trissonchulus* undescr. sp. (NC marine infauna)

*Tylencholaimus* de Man, 1876 (Soil- algy, grass & plant associated) Dorylaimidae nematodes,  
Subfamily Tylencholaiminae

*Tylencholaimus teres* Thorne, 1939 (in WA hyporheic).

*Tylenchus* Bastian, 1865 (Soil- algy, grass & plant associated) Tylenchidae nematodes,  
Subfamily Tylenchinae

*Tylenchus davainei* Bastian, 1865 (in NY hyporheic).  
*Tylenchus erythrinae* Zimmermann, 1904 (in NY hyporheic).  
*Tylenchus filiformis* (Butschli, 1873) (in NY hyporheic).

*Tylenchus multicinctus* (Cobb, 1893) (in WA hyporheic).  
*Tylenchus olaae* (Cobb, 1906) (in NY hyporheic).

*Tylenchus pseudorobustus* Steiner, 1914 (in NY hyporheic).  
*Tylenchus.siralis* Cassidy, 1930 (in NY hyporheic).

*Viscosia* de Man, 1890 - Oncholaimidae nematodes  
*Viscosia bayensis* Keppner, 1987 (FL marine infauna)  
*Viscosia brachylaimoides* Chitwood, 1937 (NC marine infauna)

*Viscosia carnleyensis* (Ditlevsen, 1921)(CT, NY marine meiofauna down to 5cm deep)  
*Viscosia floridana* Keppner, 1987 (FL marine infauna)  
*Viscosia franzii* Boucher, 1977 (AK marine meiofauna)

*Viscosia glabra* (Bastian, 1865) (MA marine meiofauna)  
*Viscosia macrobursata* Keppner, 1987 (FL marine infauna)

*Viscosia macramphida* Chitwood, 1951 (interstitial? in TX marine sands; FL marine psammon)

*Viscosia paralinstowi* Chitwood, 1937 (FL marine infauna)

*Viscosia* undet sp. or species (MA, CT marine meiofauna down to 5cm deep)

*Walcherenia* deMan, 1921 - Leptolaimidae nematodes, subfamily Plectinae (Soil- algy, grass & plant associated)

*Walcherenia typicus* = *Chronogaster t.*

*Witoldinema* Brzeski, 1960 (Soil, grass & plant associated) Dorylaimidae nematodes, Subfamily Dorylaiminae

*Witoldinema stefanskii* Brzeski, 1960 (in WA hyporheic).

*Xenolaimus* Cobb, 1920- Monhysteridae nematodes

*Xenolaimus* undet sp. (FL marine psammon)

*Xiphinema* Cobb, 1913 (Soil, algy, grass & plant associated) Longidoridae nematodes (once put in Dorylaimidae, Subfamily Tylencholaiminae) **Bibl.:** Cho 1989

*Xiphinema americanum* Cobb, 1913 (in NY hyporheic; parasite on apple, corn, strawberry, spruce, bermudagrass) **Bibl.:** Addoh 1964

*Xyala* Cobb, 1920 - Monhysteridae nematodes

*Xyala oxybiotica* P. Jensen, 1986 (interstitial? in TX marine sands)

*Xyala striata* Cobb, 1920 (AK, NC, NY marine meiofauna)

## Onychophora Worms

A Protostomian animal phylum of about 90 species living under leaf litter, stones, etc. usually near to water. Not known from caves or aquatic interstitial habitats in NA but expected.

## Polychaete Worms

Class Polychaeta (polychaetes; bristle worms; lug, rag and sand worms)

Mostly marine annelids with distinct metameric segmentation. Bristles on parapodia of each body segment. Somewhat flattened body from few mm. to 3 m. with up to 700 segments. First 2-3 segments united to form the head, which carries an anterior lobe extending over the mouth, several pairs of antennae and sometimes a crown of long feathery tentacles. About 13,000 species.

Subclass Canalipalpata (or as Order, see below) (=Errantia?)

Clades Sabellida, Spionida & Terebellida

Order Canalipalpata (or as Subclass) (=Order Archiannelida (bristle-footed annelids)  
(mostly primitive & highly degenerate forms))

Polygordiidae (also put in Order Polygordiida) (*Chaetogordius*, *Polygordius*)

Protodrilidae (also put in Order Protodrilida) (*Protodriloides*, *Protodrilus*)

Saccocirridae (also put in Order Protodrilida) (*Saccocirrus*)

Suborder or Order Terebellida

Acrocirridae (also put in Order Flabelligerida)

(like cirratulids with frontal palps) (*Acrocirrus*, *Flabelligera*  
(now in own family), *Macrochaeta*)

Ampharetidae

(*Isolda*, *Melinna*, *Melinnexis*, *Mooresamytha*, *Paramage*, *Sabellides*,  
*Samytheta*, *Sosane*)

Subfamily Ampharetinae (*Amage*, *Ampharete*, *Amphisamytha*, *Anobothrus*,  
*Asabellides*, *Eclysippe*, *Glyphanostomum*, *Hobsonia*, *Lysippe*, *Mexamage*,  
*Mooresamytha*, *Mugga*, *Paralysippe*, *Pseudampharete*, *Samytha*,  
*Schistocomus*, *Sosanopsis*)

Cirratulidae (put in Suborder Cirratuliformia or Order Cirratulida)

Fauveliopsidae (also put in Order Flabelligerida) (*Fauveliopsis*)

Flabelligeridae (put in Order Flabelligerida)

Pectinariidae (= Amphictenidae) (*Cistena*, *Cistenides*, *Pectinaria*)

Sternaspidae (put in Sternaspida) (*Sternaspis*)

Terebellidae

(*Enplobranchus*, *Paralepidonotus*, *Ramex*,)

Subfamily Amphitritinae

*Amphitrite*, *Amphitritides*, *Betapista*, *Eupolymnia*, *Lanassa*, *Laphania*,  
*Loimia*, *Neoamphitrite*, *Neoleprea*, *Nicolea*, *Pista*, *Proclea*, *Scionella*,  
*Spinospaera*, *Terebella*

Subfamily Artacaminae (*Artacama*, *Artacamella*)

Subfamily Arctonoinae (*Hololepidella*)

Subfamily Iphioninae (*Iphione*)

Subfamily Polycirrinae

(*Amaeana*, *Enplobranchus*, *Hauchiella*, *Lysilla*, *Polycirrus*)

Subfamily Thelepodinae

(*Euthelepus*, *Rhinothelepus*, *Streblosoma*, *Telothelepus*, *Thelepus*)

Trichobranchidae (*Novobranchus*, *Terebellides*, *Trichobranchus*)

Order Spionida (or as suborder)

Suborder Chaetopteriformia

Chaetopteridae (also put in Order Chaetoptera)

(*Spiochaetopterus*, *Mesochaetopterus*, *Chaetopterus*, *Phyllochaetopterus*)

Suborder Cirratuliformia

Cirratulidae (also put in Suborder Terebellida)

(*Aphelochaeta*, *Caulleriella*, *Chaetozone*, *Cirriiformia*, *Cirratulus*, *Dodecaceria*,  
*Monticellina*, *Protocirrinera*, *Tharyx*, *Timarete*)

Suborder Spioniformia

Apistobranchidae (also put in Order Spionida) (*Apistobranchus*)

Longosomatidae (also put in Order Spionida) (*Heterospio*)

Magelonidae (also put in Order Megeloniida) (*Magelona*)

Poecilochaetidae (also put in Order Spionida) (*Poecilochaetus*)

Spionidae (also put in Order Spionida)

(*Aonides*, *Apoprionospio*, *Boccardia*, *Boccardiella*, *Carazziella*, *Dipolydora*,  
*Dispio*, *Laonice*, *Malacoceros*, *Microspio*, *Paraprionospio*, *Polydora*,  
*Prionospio*, *Pseudomalacoceros*, *Pseudatherospio*, *Pseudopolydora*, *Pygospio*,  
*Rhynchospio*, *Scolecoplepides*, *Scolelepis*, *Spionphanes*, *Streblospio*,  
*Tripolydora*)

Trochochaetidae (also put in Order Spionida) (*Trochochaeta*)

Order Capitellida

Capitellidae (also put in Order Scolecida)

(*Anotomastus*, *Barantola*, *Capitella*, *Capitellides*, *Capitomastus*, *Dasybranchus*,  
*Decamastus*, *Leiochrides*, *Heteromastus*, *Leiocapitella*, *Mastobranchus*,  
*Mediomastus*, *Neomediomastus*, *Notomastus*, *Parheteromastus*, *Peresiella*,  
*Pulliella*, *Scyphoproctus*)

Order Cossurida

Cossuridae (also put in Order Scolecida & Cossurida) (*Cossura*, *Cossurella*)

Order Ctenodrilida

Ctenodrilidae (also put in Order Cirratulida) (*Raricirrus*) (also put in Cirratulidae)

Subfamily Ctenodrilinae (*Ctenodrilus*)

Subfamily Raphidrilinae (*Raphidrilus*)

Order Flabelligerida

Flabelligeridae (also put in Order Terebellida)

(*Brada*, *Diplocirrus*, *Flabelliderma*, *Flabelligera* (also put in Acrocirridae))

*Pherusa, Piromis, Therochaeta*)

Order Oweniida

Oweniidae (*Galathowenia, Myriochele, Myriowenia, Owenia* )

Order (or Suborder) Sabellida

Oweniidae (put in Oweniida)

(*Galathowenia, Myriochele, Myriowenia, Owenia* )

Sabellariidae

(*Lygdamis, Monorchos, Mariansaellaria, Neosabellaria, Phragmatopoma*)

Sabellidae (*Amphiglana, Augeneriella, Bispira, Brachioma, Chone, Diallychone, Euchone Fabricinuda, Fabrisabella, , Hypsicomus, Idanthysus, Manayunkia, Myxicola, Novafabricia, Neosabellaria, Phalacrostemma, Phragmatopoma* (both put in Sabellariidae) *Potamethus, Potamilla, Pseudobranchiomma, Pseudofabricola, Pseudopotamilla, Sabella*)

Subfamily Fabriciinae *Fabricia, Fabriciola, Manayunkia*

Subfamily Sabellinae (*Chone, Demonax, Euchone, Jasmineira*)

Sabellariidae (*Sabellaria*)

Serpulidae

(*Hyalopomatus, Hydroides, Josephella, Megalomma, Neodexiospira, Pomatoceros, Pomatoleios, Pseudovermilia, Rhodopsis, Semivermilia, Simplicaria, Spirobranchus, Vermilia, Vermiliopsis*)

Subfamily Protulinae (*Apamatopsis, Apomatus, Protula*)

Subfamily Filoquininae (*Salmacina*)

Subfamily Hyalopomatinae (*Pseudochitinopoma*)

Subfamily Januinae (*Janua*)

Subfamily Serpulinae

(*Chitinopoma, Crucigera, Ficopomatus, Filoquinula, Serpula*)

Spirorbidae (*Eulaeospira, Janu, Leodora, Neodexiospira, Nidificaria, Protolaeospira, Simplicaria, Spirorbis*) (also put in Serpulidae), *Vinearia*)

Subfamily Circeinae (*Circeis, Paradexiospira*)

Subfamily Pileolariinae (*Bushiella, Jugaria, Pileolaria, Protileodora*)

Subfamily Romanchellinae (*Protolaeospira*)

Order Sternaspida

Sternaspidae (also put in Terebellida) (*Sternaspis*)

Subclass Palpata (or see above)

Order Aciculata

Suborder or Order Eunicida

Amphinomidae (now in Order Amphinomida)

(*Amphinome*, *Chloeia*, *Eurythoe*, *Hipponoe*, *Linopherus*, *Notopygos*,  
*Paramphinome*, *Pareurythoe*, *Pherecardia*, *Pseudeurythoe*)

Arabellidae

(*Amastigos* (also put in Oenonidae and Capitellidae), *Arabella Labrorostratus*,  
*Driloneries*, *Lysarete*, *Notocirrus*, *Oenone* (all now in Oenonidae))

Dinophilidae (now absorbed into Dorvilleidae) (*Dinophilus*, *Trilobodrilus*)

Diurodrilidae (*Diurodrilus*)

Dorvilleidae (*Apophryotrocha*, *Dinophilus* (also put in Dinophilidae), *Dorvillea*,  
*Meiodorvillea*, *Ophryotrocha* (now in Iphitimidae), *Parophryotrocha*,  
*Parougia*, *Pettiboneia*, *Protodorvillea*, *Schistomeringos*, *Staurocephalus*,  
*Trilobodrilus* (also put in Dinophilidae))

Euphrosinidae (*Euphrosine*)

Hartmaniellidae (*Hartmaniella*)

Histriobdellidae (*Histriobdella*)

Iphitimidae (*Ophryotrocha*, *Palpithitima*)

Oenonidae

(*Amastigos* (put in Capitellidae), *Arabella Drilonereis*, *Labrorostratus*, *Lysarete*,  
*Notocirrus*, *Oenone* (all once in Arabellidae))

Superfamily Eunicoidea

Eunicidae

(*Eunice*, *Euniphysa*, *Leodice*, *Lysidice*, *Marphysa*, *Nematonereis*, *Palola*,  
*Paramarphysa*)

Lumbrineridae

(*Augeneria*, *Eranno*, *Lumbrineris*, *Lumbrinerides*, *Lumbrinerineropsis*, *Ninoe*,  
*Paraninoe*, *Scoletoma*)

Onuphidae (*Epidiopatra*, *Paranothria*, *Sarsonyphia*)

Subfamily Hyalinoeciinae (*Nothria*)

Subfamily Onuphinae

(*Americonuphis*, *Diopatra*, *Mooreonuphis*, *Onuphis*, *Paradiopatra*  
(also put in Phyllodocidae), *Hyalinoecia*, *Kinbergonuphis*,  
*Rhamphobrachium*)

Order Aciculata (=Phyllodoceomorpha?)

Suborder Aphroditiformia

Superfamily Aphroditoidea

Acoetidae (= Polyodontidae) Dorsal scales & spinning glands, many in thick-walled tubes (also put in Order Phyllodocida)

(*Acotes*, *Panthalis*, *Polyodontes*)

Aphroditidae (also put in Order Phyllodocida)

(*Aphrodita*, *Aphrogenia*, *Laetmonice*, *Palaeonotus* (put in Palmyridae), *Pontogenia*)

Nephtyidae (also put in Superfamily Nephtyidacea)

(*Aglaophamus*, *Inermonephtys*, *Micronephtys*, *Nephtys*)

Polynoidae (also put in Order Phyllodocida)

(*Admetella*, *Antinoe*, *Antinoella*, *Drieschia*, *Enipo*, *Eucranta*, *Gorgoniapolynoe*, *Grubiopolynoe*, *Halosydna*, *Hololepidella*, *Iphione*, *Kermadecella*, *Lagisca*, *Lepidactylus*, *Lepidasthenia*, *Paralepidonotus*, *Perolepis*, *Subadyte*, *Ysideria*)

Subfamily Arctonoinae (*Arctonoe*)

Subfamily Harmothoinae

(*Arcteobia*, *Bylgides*, *Eunoe*, *Gattyana*, *Gaudichaudius*, *Harmothe*, *Hermadion*, *Hesperonoe*, *Malmgreniella*, *Tenonia*)

Subfamily Polynoinae (*Polyeunoa*, *Polynoe*)

Subfamily Lepidonotinae (*Halosydna*, *Lepidonotus*)

Superfamily Chrysopetaloidea

Chrysopetalidae (also put in Order Phyllodocida)

(*Bhawania*, (also put in Palmyridae), *Chrysopetalum*, *Dysponetus*, *Paleanotus* (put in Phyllodocidae))

Superfamily Pisionoidea

Pisionidae (*Pisione*, *Pisionidens*)

Suborder Glyceriformia

Superfamily Glycerea

Glyceridae (*Glycera*, *Hemipodus*)

Goniadidae (*Glycinde*, *Goniada*, *Goniadides*, *Goniadiella*, *Ophioglycera*)

Lacydoniidae (*Lacydonia*, *Paralacydonia*)

Suborder Phyllodociformia

Superfamily Phyllodocidacea



Phyllodocidae (*Anaitides*, *Diopatra* (now in Onuphidae), *Eulalia*,  
*Genetyllis*, *Lugia*, *Paleanotus* (also put in Chrysopetalidae), *Protomystides*,  
*Prophyllodoce*, *Pterocirrus*, *Sige*, *Steggoa*)

Subfamily Eteoninae

(*Eteone*, *Eulalia*, *Eumida*, *Hypereteone*, *Hesionura*, *Mysta*, *Mystides*, *Pterocirrus*)

Subfamily Notophyllinae (*Bergstroemia*, *Notophyllum*)

Subfamily Phyllodocinae (*Nereiphylla*, *Paranaitis*, *Phyllodoce*)

Tomopteridae (*Tomopteris*)

Order Amphinomida

Amphinomidae (also put in Order Aciculata)

(*Amphinome*, *Chloeia*, *Eurythoe*, *Hipponoe*, *Linopherus*, *Notopygos*,  
*Paramphinome*, *Pareurythoe*, *Pherecardia*, *Pseudeurythoe*)

Order or Suborder Phyllodocida (or in Aciculata (+Phyllodocidae & Eunicida)

Alciopidae (*Alciopa*, *Naiades*, *Vanadis*)

Eulepethidae (*Mexieulepis*)

Palmyridae (also subsumed in Aphroditidae) (*Palaeonotus*)

Pholoidae (also put in Order Phyllodocida) (*Pholoe*, *Pholoides*)

Pilargidae (proposed to be absorbed into Hesionidae)

(*Ancistrostylis*, *Litocorsa*, *Loandalia*, *Parandalia*, *Sigambra*, *Synelmis*)

Spintheridae (also put in Order Spintheridae) (*Spinthera*)

Sigalionidae

(*Euthalenessa*, *Ehlerssleanira*, *Fimbriosthenelais*, *Leanira*, *Pottsipelogenia*,  
*Psammolyce*, *Sigalion*, *Sthenelais*, *Sthenelanella*, *Thalenessa*)

Superfamily Glycera

Sphaerodoridae

(*Clavodorum*, *Ephesiella*, *Sphaerephesia*, *Sphaerodoridium*, *Sphaerodorum*,  
*Sphaerodoropsis*)

Suborder Nereidiformia

Superfamily Nereididacea

Hesionidae (*Amphiduros*, *Gyptis*, *Hesione*, *Hesionella*, *Hesionides*, *Hesiospina*,  
*Heteropodarke*, *Kefersteinia*, *Leocrates*, *Microphthalmus*, *Micropodarke*, *Nerimyra*,  
*Ophiodromus*, *Podarkeopsis*, *Syllida*)

Nereididae (= Nereidae) (*Ceratocephale*, *Gymnonereis*, *Hediste*, *Laeonereis*, *Leonnates*,  
*Lycastopsis*, *Namalycastis*, *Parahesione*, *Pseudonereis*, *Rullierinereis*, *Stenominereis*,  
*Syllidia*, *Websterinereis*)

Subfamily Nereidinae

(*Ceratonereis*, *Cheilonereis*, *Eunereis*, *Neanthes*, *Nereis*, *Nicon*, *Parinereis*,  
*Platynereis*)

Subfamily Notophycinae (*Micronereis*)

Pilargidae (*Ancistrosyllis*, *Cabira*, *Litocorsa*, *Loandalia*, *Parandalia*, *Pilargis*,  
Subfamily Sigambrinae (*Otopsis*, *Sigambra*)

Syllidae (*Amblyosyllis*, *Branchiosyllis*, *Brania*, *Dentatisyllis*, *Exogone*, *Exogonella*,  
*Grubeosyllis*, *Haplosyllis*, *Heterosyllis*, *Langerhansia*, *Myrianida*, *Opisthosyllis*,  
*Parasphaerosyllis*, *Parapionosyllis*, *Petitia*, *Plakosyllis*, *Sphaerosyllis*, *Streptospinigera*,  
*Trypanosyllis*, *Typosyllis*, *Xenosyllis*)

Subfamily Autolytinae (*Autolytus*, *Proceraea*)

Subfamily Eusyllinae

(*Ehlersia*, *Eusyllis*, *Odontosyllis*, *Opisthodonta*, *Pionosyllis*, *Streptosyllis*)

Subfamily Exogoninae (*Exogone*, *Sphaerosyllis*)

Subfamily Sigambrinae (*Sigambra*)

Subfamily Syllinae (*Eurysyllis*, *Geminosyllis*, *Syllis*, *Syllides*, *Trypanosyllis*, *Typosyllis*)

Order Scolecida (or as Subclass) or Nerilida

Aeolosomatidae (*Aeolosoma*)

Arenicolidae (*Abarenicola*, *Arenicola*, *Branchiomaldane*)

Bogueidae (also subsumed in Maldanidae) (*Boguea*)

Capitellidae (put in Order Capitellida or Spionida)

Cossuridae (now in Order Cossurida)

Maldanidae (bamboo worms) (also put in Order Spionida)

(*Asychis*, *Euclymene*, *Maldanopsis*, *Branchioasychis*,  
*Clymenella*, *Microclymene*, *Petaloclymene*, *Sabaco*)

Subfamily Lumbriclymeninae (*Notoproctus*)

Subfamily Clymenurinae (*Clymenura*)

Subfamily Euclymeninae

(*Axiothella*, *Clymenella*, *Isocirrus*, *Macroclymene*, *Maldanella*,  
*Praxillella*, *Praxillura*)

Subfamily Maldininae (*Maldane*, *Chirimia*, *Metasychis*)

Subfamily Nicomachinae (*Micromaldane*, *Nicomache*, *Petaloproctus*)

Subfamily Rhodininae (*Rhodine*)

Nerillidae (or uncertain placement in Aciculata or in Order Nerillida)  
(*Mesonerilla*, *Nerilla*, *Troglocanthus*, *Troglochaetus*)

Opheliidae (also put in Order Ophelida) (*Polyophthalmus*)  
Subfamily Ophelininae (*Armandia*)

Subfamily Traviisiinae (*Travisia*)  
Subfamily Opheliinae (*Euzonus*, *Ophelia*)

Orbiniidae (also put in Order Orbiniida) (*Haploscoloplos*)  
Subfamily Orbiniinae (*Leitoscoloplos*, *Naineris*, *Phylo*, *Scolopella*, *Scoloplos*)  
Subfamily Protoariciinae (*Orbiniella*)

Paraonidae (also put in Order Orbiniida) (*Cirrophorus*, *Levinsenia*, *Paraonella*, *Paraonis*)  
Parergodrilidae (*Stygocapitella*)

Paraonidae (*Aricidea*, *Paradoneis*)  
Questidae (also put in Order Cirratulida) (*Novaquesta*, *Questa*)  
Scalibregmatidae (also put in Order Ophelida)  
(*Asclerocheilus*, *Hyboscolex*, *Scalibregma*, *Sclerobregma*, *Sclerocheilus*)

***Abarenicola*** Wells, 1959 - Arenicolidae polychaete worms  
***Abarenicola claparedi oceanica*** Healy & Wells, 1959 (BC marine benthic)

***Abarenicola claparedi vagabunda*** Healy & Wells, 1959 (BC marine benthic)  
***Abarenicola pacifica*** Healy & Wells, 1959 (BC, OR marine infauna)

***Acoetes*** Audouin & Milne-Edwards, 1832 - Acoetidae polychaete worms  
***Acoetes mortenseni*** (*Polyodontes m.* Monroe, 1928) (CA marine infauna)

***Acoetes pacifica*** (*Panthalis p.* Treadwell, 1914) (CA marine infauna)  
***Acoetes pleei*** Audouin & Milne-Edwards, 1832 (FL marine infauna)

***Acrocirrus*** Grube, 1872 - Acrocirridae polychaete worms  
***Acrocirrus columbianus*** Banse, 1969 (BC marine benthic)  
***Acrocirrus frontifilis*** (*Heterocirrus f.* Grube, 1860) (CA, Gulf of Mex. marine benthic)

***Acrocirrus heterochaetus*** Annenkova, 1934 (FL marine benthic)  
***Acrocirrus occipitalis*** Banse, 1969 (BC marine benthic)

***Admetella*** - Polynoidae polychaete worms  
***Admetella longipedata*** = *Shinkai l.*?

***Aglaophamus*** Kinberg, 1866 - Nephtyidae polychaete worms  
***Aglaophamus circinata*** (Verrill, 1874) (Gulf of Mexico, New England marine infauna)

***Aglaophamus erectans*** Hartman, 1950 (CA marine infauna)

*Aglaophamus eugeniae* Fauchald, 1972 (CA marine infauna)

*Aglaophamus paucilamellata* Fauchald, 1972 (CA marine infauna)

*Aglaophamus rubella anops* Hartman, 1950 (AK, BC marine infauna)

*Aglaophamus verrilli* (*Nephtys* v. McIntosh, 1885) (CA, LA, SC, VA, New England marine benthic)

*Alciopa* Audouin & Milne-Edwards, 1833 – Alciopidae polychaete worms

*Alciopa pacifica* Kinberg, 1866 (HI marine infauna)

*Alciopa reynaudii* Audouin & Milne-Edwards, 1833 (HI marine infauna)

*Allia* Strelzov, 1973 = subgenus of Aricidea

*Amaeana* Hartman, 1959 - Terebellidae polychaete worms, Subfamily Polycirrinae

*Amaeana occidentalis* (*Amaea* o. Hartman, 1944) (FL, WA marine infauna)

*Amaeana trilobata* (Sars, 1863) (eFL, Gulf of Mex. marine benthic)

*Amage* Malmgren, 1866 - Ampharetidae polychaete worms, Subfamily Ampharetinae

*Amage anops* (*Sabellides* a. Johnson, 1901) (AK, BC, CA, WA marine benthic)

*Amastigos* Pilz, 1976 - Capitellidae polychaete worms (also put in Arabellidae & Oeononidae)

*Amastigos caperatus* R.M. Ewing & D.M. Dauer, 1981 (SC, VA marine infauna)

*Amblyosyllis* Grube, 1857- Syllidae polychaete worms

*Amblyosyllis circinnata* (Verrill, 1874) (New England marine benthic)

*Amblyosyllis* undet sp. (HI marine benthic)

*Americanuphis* Fauchald, 1973 - Onuphidae polychaete worms, Subfamily Onuphinae

*Americanuphis magna* (*Onuphis magna*) (New England marine infauna)

*Ammotrypane* Rathke, 1843 = *Ophelina*

*Ampharete* Malmgren, 1866 - Ampharetidae polychaete worms, Subfamily Ampharetinae

*Ampharete acutifrons* (*Amphicteis* a. Grube, 1860) (BC, C|A, NY, OR?, WA marine benthic)

*Ampharete arctica* Malmgren, 1866 (CA, WA marine benthic)

*Ampharete brazhnikovi* = *A. goeysi brazhnikovi*

*Ampharete crassiseta* Annenkova, 1929 (WA (nr., cf. *A.c.*) (WA marine infauna)

*Ampharete finmarchica* (M. Sars, 1866) (BC, CA, WA marine benthic)

*Ampharete goeysi* Malmgren, 1866 (BC marine benthic)

*Ampharete goeysi brazhnikovi* (*A.b.* Annenkova, 1929) (BC, WA marine benthic)

*Ampharete labrops* Hartman, 1961 (AK, BC, CA marine benthic)

*Ampharete parvidentata* Day, 1973 (Gulf of Mex. marine benthic)

*Ampharete* 2 undescr. species (Gulf of Mex. marine benthic)

*Ampharete* undet. sp. (AK marine infauna)

*Amphicteis* Grube, 1850 - Ampharetidae polychaete worms, Subfamily Ampharetinae

*Amphicteis glabra* Moore, 1905 (CA, WA marine benthic)

*Amphicteis gunneri* (Sars, 1835 (Gulf of Mex. marine benthic)

*Amphicteis gunneri floridus* Hartman, 1951 (= *Hypaniola florida*, *H. grayi*) (e,wFL, ME marine benthic)

*Amphicteis mucronata* Moore, 1923 (BC, CA, WA marine benthic)

*Amphicteis scaphobranchiata* Moore, 1906 (CA, BC, WA, Gulf of Mex. marine benthic)

*Amphicteis* undet. sp. (AK marine infauna)

*Amphictene* Savigny, 1818 - Amphictenidae polychaete worms

*Amphictene moorei* Annenkova, 1929 (BC marine benthic)

*Amphiduros* Hartman, 1958 – Hesionidae polychaete worms

*Amphiduros* 2 undescr. sp. (Gulf of Mex. marine infauna)

*Amphinome* Bruguere, 1789 – Amphinomidae polychaete worms

*Amphinome rostrata* (Pallas, 1766) (HI, New England marine infauna)

*Amphisamytha* Hessle, 1917 - Ampharetidae polychaete worms, Subfamily Ampharetinae

*Amphisamytha bioculata* (Moore, 1906) (CA marine infauna)

*Amphitrite* O.F. Mueller, 1771 - Terebellidae polychaete worms, Subfamily Artacaminae

*Amphitrite cirrata* O.F. Mueller, 1771 in 1776 (NY, NJ, WA marine infauna)

*Amphitrite edwardsi* = *Amphitritides gracilis*

*Amphitrite johnstoni* Malmgren (NJ, NY marine infauna)

*Amphitrite ornata* (Leidy) (MA, ME, NJ marine intertidal benthic)

*Amphitrite robusta* (*Neoamphitrite* r. Johnson, 1901) (CA, WA marine infauna)

*Amphitrite* undet. sp. (HI marine infauna)

*Amphitritides* Augener, 1922 - Terebellidae polychaete worms, Subfamily Amphitritinae

*Amphitritides gracilis* (*Amphitrite* g. Grube, 1860; *Amphitrite edwardsi*; *Terebella* g.) WA marine infauna)

*Amphiglana* Claparede, 1864 - Sabellidae polychaete worms

*Amphiglana* undet. sp. (HI marine infauna)

*Anaitides* Czerniavsky, 1882 - Phyllodocidae polychaete worms

*Anaitides groenlandica* Oersted, 1843 (AK, Gulf of Mex., New England marine infauna)

*Anaitides maculata* (New England marine benthic)

*Anaitides longipes* Kinberg, 1966 (LA, wFL Gulf of Mex. marine infauna)

*Anaitides madeirensis* Langerhans, 1880 (Gulf of Mex. marine infauna)

*Anaitides mucosa* (*Phylloce mucosa* Oersted, 1843) (ME, SC, VA marine benthic; PQ Gulf of St. Lawrence sandy, Gulf of Mex. marine interstitial)

*Ancistrosyllis* McIntosh, 1879 - Pilargidae polychaete worms

*Ancistrosyllis carolinensis* Gardiner, 1976 (Gulf of Mex. Carolinian, LA marine infauna)

*Ancistrosyllis commensalis* (Carolinian marine infauna)

*Ancistrosyllis groenlandica* (New England marine benthic)

*Ancistrosyllis hartmanae* Pettibone, 1966 (e,wFL, LA, VA marine benthic)

*Ancistrosyllis jonesi* Pettibone, 1966 (Virginian (rare), w,eFL, LA marine infauna)

*Ancistrosyllis papillosa* (Jones, 1961) (Gulf of Mex. marine infauna)

*Ancistrosyllis* undet. sp. (sCA marine infauna)

*Anobothrus* Levinsen, 1884 - Ampharetidae polychaete worms, Subfamily Ampharetinae

*Anobothrus gracilis* (*Ampharete* g. Malmgren, 1866) (AK, BC, sCA, WA marine infauna)

*Anotomastus* Hartman, 1947 - Capitellidae polychaete worms

*Anotomastus gordiodes* (*Eunotomastus* g. Moore, 1909) (sCA marine infauna)

*Antinoe* Kinberg, 1855 – Polynoidae polychaete worms

*Antinoe angusta* Verrell, 1874 (New England marine benthic)

*Antinoe sarsi* Kinberg in Malmgren, 1865 (New England marine benthic)

*Antinoella* Augener, 1928 - Polynoidae polychaete worms

*Antinoella angusta* (Verrill, 1874)(New England marine benthic)

*Antinoella macrolepia* (AK marine infauna)

*Antinoella sarsi* (Kinbeg, 1865) (Carolinian, New England marine infauna)

*Aonides* Claparede, 1864 - Spionidae polychaete worms

*Aonides glandulosa* J.A. Blake, 1996 (CA marine infauna)

*Aonides mayaguezensis* Foster, 1969 (AL, e,wFL marine infauna)

*Aonides oxycephala* (Sars, 1862) (HI marine infauna)

*Aonides paucibranchiata* Southern, 1914 (wFL marine infauna)

*Aphelochaeta* Blake, 1991 – Cirratulidae polychaete worms

*Aphelochaeta marioni* (Saint-Joseph, 1894) (Carolinian polychaete worms)

*Aphelochaeta monilaris* (Hartman, 1960) (CA marine infauna)

*Aphelochaeta* Blake, 1991 - Cirratulidae polychaete worms

*Aphelochaeta elongata* J.A. Blake, 1996 (CA marine benthic)

*Aphelochaeta glandaria* J.A. Blake, 1996 (CA marine benthic)

*Aphelochaeta monilaris* (*Tharyx m.* Hartman, 1960) (BC, CA, WA marine infauna)  
*Aphelochaeta multifilis* (Moore, 1909) (BC, CA, WA marine infauna)  
*Aphelochaeta parva* (E. Berkeley, 1929) (BC, WA marine infauna)

*Aphelochaeta pertersenae* J. A. Blake, 1996 (CA marine benthic)  
*Aphelochaeta phillipsi* J. A. Blake, 1996 (CA marine benthic)  
*Aphelochaeta* or *Monticellina* undet. sp. (sCA marine infauna)

*Aphelochaeta secunda* = *Monticellina* s.  
*Aphelochaeta serratiseta* = *Monticellina* s.

*Aphelochaeta tigrina* J.A. Blake, 1996 (CA marine benthic)  
*Aphelochaeta williamsae* J.A. Blake, 1996 (= *Caulleriella altata* (Souther, 1914)(CA marine benthic)

*Aphrodita* Linnaeus, 1758 - Aphroditidae polychaete worms  
*Aphrodita aculeata* Linnaeus, 1761 (WA, New England marine infauna)

*Aphrodita armifera* Moore, 1910 (CA marine infauna)  
*Aphrodita brevitentaculata* Essenberg, 1917 (CA marine infauna)

*Aphrodita castanea* Moore, 1910 (CA marine infauna)  
*Aphrodita hastata* Moore, 1905 (*A. aculeata*) (ME, VA, New England marine infauna)  
*Aphrodita japonica* Marenzeller, 1879 (BC, CA, WA marine infauna)

*Aphrodita negligens* Moore, 1905 (BC, CA, WA marine infauna)  
*Aphrodita parva* Moore, 1905 (BC, CA, OR, WA marine infauna)

*Aphrodita refulgida* Moore, 1910 (CA marine infauna)  
*Aphrodita* undet. sp. or species (sCA, HI marine infauna)

*Aphrogenia* Kinberg, 1855 - Aphroditidae polychaete worms  
*Aphrogenia* (LA, wFL Gulf of Mex. marine infauna)

*Apistobranchnus* Levinsen, 1883 - Apistobranchnidae polychaete worms  
*Apistobranchnus ornatus* Hartman, 1965 (BC, sCA, WA marine infauna)

*Apistobranchnus* undet. or undescr. sp. (nGulf of Mexico marine infauna)  
*Apistobranchnus tullbergi* (*Aricia t.* The'el, 1879) (Atlantic marine infauna)

*Apomatopsis* Saint-Joseph, 1894 - Serpulidae polychaete worms, Subfamily Protulinae  
*Apomatopsis geniculata* (Moore & Bush, 1904 (= *Apomatus g.*) (BC marine benthic)

*Apomatus* Philippi, 1884 - Serpulidae polychaete worms, Subfamily Protulinae  
*Apomatus* undet. or undescr. sp. (Gulf of Mex. marine benthic)  
*Apomatus timmsii* Pixell, 1912 (BC marine benthic)

***Apophryotrocha*** Jumars, 1974 - Dorvilleidae polychaete worms  
***Apophryotrocha*** undet. sp. (HI marine infauna)

***Apoprionospio*** Foster, 1969 - Spionidae polychaete worms  
***Apoprionospio dayi*** (Carolinian marine infauna)  
*Apoprionospio pygmaea* = *Prionospio* (A.) p.

***Arabella*** Grube, 1850 - Oeonidae polychaete worms (once in own family)

***Arabella*** (*Arabella*) *iricolor* (= *A. opalina*) (*Nereis i.* Montagu, 1804) (BC, CA, HI, ME, NC, SC, VA, Gulf of Mex. marine infauna)

***Arabella iridescens*** Treadwell, 1906 (HI marine infauna)

***Arabella*** (*Cenothrix*) *multidentata* (Ehlers, 1887) (eFL, Gulf of Mex. marine infauna)  
***Arabella mutans*** (Chamberlin, 1919) (Carolinian, e,wFL, LA marine infauna)  
***Arabella*** (*Arabella*) *pectinata* Fauchald, 1970 (BC, CA, SC, VA marine infauna)

***Arabella*** (*Arabella*) *protomutans* Orensanz, 1990 (BC, CA, SC, VA marine infauna)  
***Arabella semimaculata*** (Moore, 1911) (BC?, CA marine infauna)  
***Arabella*** undet. sp. (sCA, HI marine infauna)

***Arcteobia*** Annenkova, 1937 - Polynoidae polychaete worms, Subfamily Harmothoinae  
***Arcteobia anticostiensis*** (McIntosh, 1874) (BC, CA (cf.), WA, New England marine infauna)  
***Arcteobia spinielytris*** Annenkova, 1937 (BC marine infauna)

***Arctonoe*** Chamberlin, 1920 - Polynoidae polychaete worms, Subfamily Arctonoinae  
***Arctonoe fragilis*** Chamberlin, 1920 (BC, CA marine infauna)

***Arctonoe pulchra*** (*Polynoe p.* Johnson, 1897) (BC, CA, WA marine infauna)  
***Arctonoe tuberculata*** (Treadwell, 1906) (HI marine infauna)  
***Arctonoe vittata*** (Grube, 1855) (BC, CA marine infauna)

***Arenicola*** Lamarck, 1801 - Arenicolidae polychaete worms  
***Arenicola brasiliensis*** (Nonato, 1958) (HI marine benthic)

***Arenicola cristata*** Stimpson, 1856 (CA, e,wFL marine infauna)  
***Arenicola marina*** (Linnaeus, 1758) (BC, NC marine benthic; PQ Gulf of St. Lawrence, ME sandy marine interstitial)

***Aricidea*** Webster, 1879 - Paraonidae polychaete worms  
***Aricidea*** (*Allia*) *alisdairi* Hasan, 1960 (LA, Gulf of Mex. marine benthic)  
***Aricidea*** (*Allia*) *antennata* Annenkova, 1934 (CA, WA marine infauna)

***Aricidea*** (*Acmira*) *assimilis* Tebble, 1959 (BC marine benthic)



*Aricidea (Acmira) catherinae* Laubier, 1967 (CA, e,wFL, LA, MA, Virginian, WA marine infauna & NY surface deposit feeder, burrower)

*Aricidea (Acmira) cerrutii* Laubier, 1966 (Virginian (rare), CA, wFL Gulf of Mex. marine infauna)

*Aricidea fauveli* (FL marine intertidal benthic)

*Aricidea* cf. *finitima* Strelzow, 1973 (Gulf of Mex. marine infauna)

*Aricidea fragilis* Webster, 1879 (e,wFL, LA, SC, Gulf of Mex. marine intertidal benthic)

*Aricidea (Allia) hartleyi* Blake (CA marine infauna)

*Aricidea (Acmira) horikoshi* Imagima, 1973 (CA marine infauna)

*Aricidea jeffreysi* (McIntosh) (VA, TX marine benthic)

*Aricidea (Acmira) lopezi l.* Berkeley & Berkeley, 1956 (AK, BC, CA, LA, WA marine infauna)

*Aricidea (Aricidea) minuta* Southward, 1956 (BC, WA marine benthic)

*Aricidea (Allia) monicae* Laubier, 1967 (CA marine infauna)

*Aricidea neosuecica* Hartman, 1965 (AK, WA marine infauna)

*Aricidea (Allia) nolani* Webster & Benedict, 1887 (WA marine infauna)

*Aricidea (Aedicira) pacifica* Hartman, 1944 (CA marine infauna)

*Aricidea (Acmira) philibinae* Brown, 1976 (FL, LA marine infauna)

*Aricidea (A.) pseudarticulata* Hobson, 1972 (CA, Gulf of Mex. marine infauna)

*Aricidea (Allia) quadrilobata* Webster & Benedict, 1887 (BC, CA, WA, Gulf of Mex. marine benthic)

*Aricidea (Allia) ramosa* Annenkova, 1934 (CA, BC, WA marine benthic)

*Aricidea (Acmira) rubra* Hartman, 1963 (CA marine infauna)

*Aricidea (Acmira) simplex* Day, 1963 (CA, Gulf of Mex. marine infauna)

*Aricidea (Allia) suecica* (A.s. Eliason, 19200 (Carolinian, e,wFL, AK, LA, NC, WA, Gulf of Mex. marine infauna)

*Aricidea (Acmira) taylori* Pettibone, 1965 (LA, wFL Gulf of Mex. marine infauna)

*Aricidea (Acmira) trilobata* Imajima, 1973 (CA, LA, Gulf of Mex. marine infauna)

*Aricidea (A.) wassi* Pettibone, 1965 (CA, VA, WA, Gulf of Mex. marine infauna)

*Armandia* Filippi, 1861 - Opheliidae polychaete worms, Subfamily Ophelininae

*Armandia agilis* (Andrews, 1891)(wFL, LA, Brazil, SC marine infauna)

*Armandia brevis (Ammotrypane b.* Moore, 1906; *A. bioculata* Hartman, 1838) (AK, BC, sCA, OR, NY, WA marine infauna)

*Armandia intermedia* Fauvel, 1902 (HI marine infauna)

*Armandia maculata* (FL, SC, Gulf of Mex. marine infauna)  
*Armandia* undet. sp. (HI marine infauna)

*Artacama* Malmgren, 1866 - Terebellidae polychaete worms, Subfamily Artacaminae  
*Artacama conifera* Moore, 1905 (AK, BC, WA, CA marine infauna)

*Artacamella* Hartman, 1955 - Terebellidae polychaete worms, Subfamily Artacaminae  
*Artacamella hancocki* Hartman, 1955 (sCA, WA marine infauna)

*Asabellides* Annenkova, 1929 - Ampharetidae polychaete worms, Subfamily Ampharetinae  
*Asabellides lineata* (*Pseudosabellides l.* Berkeley & Berkeley, 1943) (BC, sCA, WA marine infauna)

*Asabellides oculata* (Webster) (NJ, VA marine benthic)  
*Asabellides sibirica* (Wiren, 1883) (AK, BC, WA marine infauna)

*Asclerocheilus* Ashworth, 1901 - Scalibregmatidae polychaete worms  
*Asclerocheilus beringianus* Ushakov, 1955 (BC, AK, Gulf of Mex., WA marine benthic)  
*Asclerocheilus californicus* Hartman, 1963 (CA marine benthic)

*Asychis* Kingberg, 1867 - Maldanidae polychaete worms  
*Asychis amphiglypta* (Ehlers) (CA (alien) marine benthic)

*Asychis biceps* (Sars, 1861) (Atlantic & Pacific north boreal infauna)  
*Asychis carolinae* Day, 1973 (FL marine benthic)  
*Asychis disparidentata* (Moore, 1904) (AK marine infauna)

*Asychis elongatus* (Verrill, 1873) Light, 1974 (CA (alien), AL, e,wFL, LA, MS, TX marine benthic)

*Asychis* undet sp. or species (TX, VA estuary marine benthic)

*Augeneria* Kinberg, 1865 - Lumbrineridae polychaete worms  
*Augeneria bidens* (Ehlers, 1887) (sCA, WA marine infauna)

*Augeneriella* Banse, 1957 - Sabellidae polychaete worms  
*Augeneriella dubia* Hartmann-Schroder, 1965 (HI marine benthic)

*Australospio* Blake & Kudenov, 1978 - Spionidae polychaete worms  
*Australospio mokapu* Ward, 1981 (HI marine benthic)

*Autolytus* Grube, 1850 - Syllidae polychaete worms, Subfamily Autolytinae  
*Autolytus alexandri* Malmgren, 1867 (BC, New England marine benthic)

*Autolytus cornutus* (A. Agassiz, 1863) (ME, NJ marine infauna)  
*Autolytus fasciatus* (*Proceraea fasciata*) (New England marine benthic)

*Autolytus dentalius* Imajima (FL marine benthic)  
*Autolytus magnus* Berkeley, 1923 (BC marine benthic)  
*Autolytus pictus* (New England marine benthic)

*Autolytus* undet. sp. or species (AK, sCA, HI, SC, wA marine infauna; PQ Gulf of St. Lawrence, Virginian sandy marine interstitial)

*Autolytus* undescr. sp. (Gulf of Mex. marine infauna)

*Autolytus prolifer* (Muller) (FL, New England marine benthic)  
*Autolytus verrilli* Marenzeller, 1892 (BC, New England marine benthic)

*Axiothella* Verrill, 1900 - Maldanidae polychaete worms, Subfamily Euclymeninae  
*Axiothella mucosa* (Andrews) (e,wFL, LA, SC marine infauna)

*Axiothella rubrocincta* (*Clymenella r.* Johnson, 1901) (BC, CA, WA marine infauna)  
*Axiothella* undescr. sp. (AL, FL marine benthic)

*Barantolla* Southern, 1921 - Capitellidae polychaete worms  
*Barantolla americana* Hartman, 1969 (BC, CA, OR, WA marine benthic)  
*Barantolla* undescr. sp. (FL marine benthic)

*Bergstroemia* Banse, 1973 - Phyllodocidae polychaete worms, Subfamily Notophyllinae  
*Bergstroemia nigrimaculata* (Moore, 1909) (BC marine infauna)

*Betapista* Banse, 1980 - Terebellidae polychaete worms, Subfamily Artacaminae  
*Betapista dekkeriae* Banse, 1980 (BC, WA marine infauna)

*Bhawania* Schmarda, 1861 - Palmyridae polychaete worms (also put in Chrysopetalidae)  
*Bhawania goodei* Webster, 1884 (SC marine infauna)  
*Bhawania heteroseta* (Hartman, 1945) (Carolinian, Virginian, e,wFL, LA marine infauna)

*Bispira* Kroeyer, 1856 – Sabellidae polychaete worms  
*Bispira* undet. sp. (CA marine benthic)

*Boccardia* Carazzi, 1895 - Spionidae polychaete worms  
*Boccardia basilaria* Hartman, 1961 (sCA marine infauna)  
*Boccardia columbiana* (E. Berkeley, 1927) (BC marine infauna)

*Boccardia polybranchia* (Hawell, 1885) (BC marine infauna)  
*Boccardia proboscidea* Hartman, 1940 (CA, OR marine benthic burrows)

*Boccardia pugettensis* Blake, 1979 (= *B. natrix* of Berkeley & Berkeley, 1936, not Soderstrom, 1920) (AK, BC, WA marine infauna)

*Boccardia* undet. sp. or species (East Coast interstitial marine sands; HI marine infauna)  
*Boccardia* undescr. sp.? (wFL marine infauna)

**Boccardiella** Blake & Kudenov, 1978 - Spionidae polychaete worms  
**Boccardiella hamata** (*Polydora h.* Webster, 1879; *B. uncata* E. Berkeley, 1927) (BC, sCA, Virginian marine infauna)

**Boccardiella ligerica** (Ferrounne, 1898)(Virginian, Gulf of Mexico, MA marine infauna)  
**Boccardiella** undescr. sp. (FL, LA marine infauna)

**Boguea** Hartman, 1945 – Bogueidae (also subsumed in Maldanidae) polychaete worms  
**Boguea enigmatica** Hartman, 1945 (e,wFL marine infauna)  
**Boguea 2** undescr. sp. (FL marine infauna)

**Boguella** Hartman & Fauchald, 1971 – Bogueidae (also subsumed in Maldanidae) polychaete worms

**Boguella** undescr. sp. (FL marine infauna)

**Brada** Stimpson, 1854 - Flabelligeridae polychaete worms  
**Brada granosa** (ME marine infauna)  
**Brada pluribranchiata** (*Stylaroides p.* Moore, 1923)(sCA marine infauna)

**Brada sachalina** Annenkova, 1922 (BC, WA marine infauna)  
**Brada villosa** (*Siphonostoma v.* Rathke, 1843) (Atlantic, BC, sCA, WA marine infauna)

**Branchioasychis** Monro, 1939- Maldanidae polychaete worms  
**Branchioasychis americana** (FL marine infauna)

**Branchioma** - Sabellidae polychaete worms  
**Branchioma** undet. sp. (SC marine infauna)

**Branchiomaldane** Langerhans, 1881 - Arenicolidae polychaete worms  
**Branchiomaldane simplex** Berkeley & Berkeley, 1932 (BC marine benthic)  
**Branchiomaldane vincenti** Langerhans, 1881 (HI marine benthic)

**Branchiomma** Koelliker, 1858 - Sabellidae polychaete worms  
**Branchiomma nigromaculata** (Baird, 1865) (FL, HI marine benthic)

**Branchiosyllis** Ehlers, 1887 (= *Brachiosyllis*) - Syllidae polychaete worms  
**Branchiosyllis exilis** (Gravier, 1900) (HI, Gulf of Mex. marine infauna)

**Branchiosyllis oculata** Ehlers, 1887 (Gulf of Mex. marine infauna)  
**Branchiosyllis uncinigera** Hartmann-Schroder, 1959 (HI marine infauna)

**Brania** Quatrefages, 1866 - Syllidae polychaete worms  
**Brania brevipharyngea** Banse, 1972 (BC, CA, WA marine infauna)  
**Brania californiensis** Kudenov & Harris, 1995 (CA marine benthic)

***Brania clavata*** (Claparede, 1863) (e,wFL, LA, SC, VA, New England marine infauna)

***Brania gallagheri*** T.H. Perkins, 1981 (FL marine infauna)

***Brania pusilla*** (New England marine infauna)

***Brania rhopalophora*** (Ehlers, 1897) (HI marine infauna)

***Brania*** undescr. sp. (Gulf of Mex. marine infauna)

***Brania swedmarki*** Gidholm, 1962 (Virginian (rare), e,wFL marine infauna)

***Brania wellfleetensis*** Pettibone, 1956 (VA, wFL Gulf of Mex., New England marine infauna)

***Bhawania*** Schmarda, 1861 - Chrysopetalidae polychaete worms

***Bhawania heteroseta*** Schmarda, 1861 (FL marine benthic)

***Bushiella*** Knight-Jones, 1973 - Spirorbidae polychaete worms, Subfamily Pileolariinae

***Bushiella abnormis*** (Bush, 1904) (BC marine benthic)

***Bushiella verruca*** (Fabricius, 1780) (*Spirorbis (Leodora) validus*) Bush, 1904) (BC marine benthic)

***Bylgides*** Chamberlin, 1919 - Polynoidae polychaete worms, Subfamily Harmothoinae

***Bylgides macrolepidus*** (Moore, 1905) (BC, CA, WA marine infauna)

***Cabira*** Webster, 1879 - Pilargidae polychaete worms

***Cabira incerta*** Webster, 1879 (Virginian (rare), e,wFL, LA marine benthic)

***Califia*** Hartman, 1957 - Orbiniidae polychaete worms

***Califia calida*** Hartman, 1957 (CA, Gulf of Mex., New England marine infauna)

***Califia schmitti*** (Pettibone, 1957) (New England marine infauna)

***Capitella*** Blainville, 1828 - Capitellidae polychaete worms

***Capitella capitata*** (*Lumbricus capitatus* Fabricius, 1780) (Arctic, FL, HI, LA, ME, NJ, NY, sCA, TX, VA, WA marine infauna, tube dwelling)

***Capitella dizonata*** Johnson, 1901 (BC marine benthic)

***Capitella jonesi*** (Carolinian marine infauna)

***Capitella ovincola*** Hartman, 1947 (CA marine benthic)

***Capitella*** undet. sp. (HI marine infauna)

***Capitellides*** Mesnil, 1897 - Capitellidae polychaete worms

***Capitellides jonesi*** Mesnil, 1897 (FL, TX marine benthic)

***Capitita*** ok - Capitellidae polychaete worms

***Capitita ambiseta*** = *Mediomastus a.*

***Capitita*** undet. sp. (HI marine infauna)

***Capitomastus*** Eisig, 1887- Capitellidae polychaete worms

***Capitomastus aciculatus*** Hartman, 1959 (VA marine infauna)

*Carazziella* J. A. Blake & Kudenov, 1978 - Spionidae polychaete worms

*Carazziella calafia* Blake, 1979 (CA marine infauna)

*Carazziella hobsonae* J.A. Blake, 1979 (LA, wFL Gulf of Mex., Virginian marine infauna)

*Carazziella reishi* (Woodwick, 1964 (HI marine infauna)

*Carazziella* undet. sp. (sCA marine infauna)

*Caulleriella* Chamberliln, 1919 - Cirratulidae polychaete worms

*Caulleriella alata* (Southern, 1914) (*Heterocirrus a*) (BC, sCA, FL(cf *C. a.*), WA marine infauna)

*Caulleriella apicula* J.A. Blake, 1996 (sCA marine infauna)

*Caulleriella cristata* J.A. Blake, 1996 (sCA marine infauna)

*Caulleriella gracilis* Hartman & Barnard, 1948 (sCA marine infauna)

*Caulleriella hamata* (*Tharux hamatus* Hartman, 1948) (BC, sCA, WA marine infauna)

*Caulleriella killariensis* (SC marine benthic)

*Caulleriella lajolla* J.A. Blake, 1996 (sCA marine infauna)

*Caulleriella pacifica* E. Berkeley, 1929 (sCA, WA marine infauna)

*Caulleriella* undet sp. or species (AK, FL, NC marine benthic)

*Caulleriella* 3 undescr. species (FL marine infauna)

*Caulleriella* undescr. species (CA marine infauna)

*Caulleriella* cf. *zetlandica* (Chaetozone z. McIntosh, 1911) (FL marine infauna)

*Ceratocephale* Malomgren, 1867 - Nereididae polychaete worms, Subfamily Nereidinae

*Ceratocephale loveni* Malmgren (New England marine infauna)

*Ceratocephale oculata* Banse, 1977 (TX, FL, NC intertidal marine infauna)

*Ceratonereis* Kinberg, 1866 - Nereididae polychaete worms, Subfamily Nereidinae

*Ceratonereis irritabilis* (Webster, 1879) (e,wFL, Virginian marine infauna)

*Ceratonereis longicirrata* Perkins, 1980 (FL, Gulf of Mex. marine benthic)

*Ceratonereis mirabilis* Kinberg, 1866 (CA, Gulf of Mex. marine benthic)

*Ceratonereis paucidentata* (Moore, 1903) (BC marine benthic)

*Ceratonereis pietschmanni* Holly, 1935 (HI marine benthic)

*Ceratonereis* undet. sp. (HI marine benthic)

*Ceratonereis tentaculata* Kinberg, 1866 (HI marine benthic)

*Ceratonereis versipedata* (Ehlers, 1887) (Gulf of Mex. marine benthic)

*Ceratonereis vulgata* Kinberg, 1866 (HI marine benthic)

***Chaetogordius*** - Polygordiidae polychaete worms

***Chaetogordius*** undet. sp. (HI marine infauna)

***Chaetopterus*** Cuvier, 1827 - Chaetopteridae polychaete worms (also put in Lutjanidae)

***Chaetopterus*** undet. sp. (HI marine infauna)

***Chaetopterus variopedatus*** (*Tricoelia* v. Renier, 1804; *C. pergamentaceus*) (BC, sCA, NC, e,wFL, HI, Virginian, WA marine infauna)

***Chaetozone*** Malmgren, 1867 - Cirratulidae polychaete worms

***Chaetozone acuta*** Banse & Hobson, 1968 (CA, BC, WA marine infauna)

***Chaetozone armata*** Hartman, 1963 (sCA marine infauna)

***Chaetozone berkeleyorum*** Banse & Hobson, 1968 (BC marine infauna)

***Chaetozone bansei*** J.A. Blake, 1996 (sCA marine infauna)

***Chaetozone columbiana*** J.A. Blake, 1996 (sCA marine infauna)

***Chaetozone commonalis*** J.A. Blake, 1996 (sCA, WA marine infauna)

***Chaetozone corona*** Berkeley & Berkeley, 1941 (= *C. spinosa* c.) (sCA marine infauna)

***Chaetozone gracilis*** (Moore, 1923) (AK, sCA, WA marine infauna)

***Chaetozone hartmanae*** J.A. Blake, 1996 (sCA marine infauna)

***Chaetozone hedgpethi*** J.A. Blake, 1996 (sCA marine infauna)

***Chaetozone lunula*** J.A. Blake, 1996 (sCA marine infauna)

***Chaetozone senticosa*** J.A. Blake, 1996 (sCA marine infauna)

***Chaetozone setosa*** Malmgren, 1867 (AK, BC, CA, FL, NY marine infauna)

***Chaetozone spinosa*** Moore, 1903 (BC, CA, WA marine infauna)

***Chaetozone*** undescr. species (CA marine infauna)

***Chaetozone*** 4 undet.or undescr. species (AL, FL, LA, TX marine infauna)

***Cheilonereis*** Benham, 1916 - Nereididae polychaete worms, Subfamily Nereidinae

***Cheilonereis cyclurus*** (Harrington, 1897) (BC, CA, WA marine benthic)

***Chirimia*** Light, 1991 - Maldanidae polychaete worms, Subfamily Maldininae

***Chirimia biceps*** (Sars, 1861) (BC, WA marine infauna)

***Chirimia similis*** (Moore, 1906) (BC, WA marine infauna)

***Chitinopoma*** Levinsen, 1884 – Serpulidae polychaete worms, Subfamily Serpulinae

***Chitinopoma groenlandica*** (*Hydroides norvegica* g. Morch, 1863) (CA marine benthic)

***Chloeia*** Savigny, 1818 - Amphinomidae polychaete worms

***Chloeia entypa*** Chamberlin, 1919 (BC marine infauna)

***Chloeia flava*** (Pallas, 1766) (BC marine infauna)

***Chloeia pinnata*** Moore, 1911 (sCA marine infauna)

*Chloeia viridis* Schmarda, 1861 (Gulf of Mex. marine infauna)

*Chone* Kroeyer, 1856 - Sabellidae polychaete worms, Subfamily Sabellinae (traditionally put in Fabriciinae)

*Chone* cf. *americana* (*C. americanus* J.H. Day, 1973) (wFL Gulf of Mex., eFL marine infauna)  
*Chone aurantiaca* (Johnson, 1901) (BC marine infauna)

*Chone duneri* Malgren, 1867 (BC, LA, WA marine infauna)  
*Chone ecaudata* (Moore, 1923) (BC, CA, WA marine infauna)

*Chone infundibiliformis* Kroyer, 1856 (BC marine infauna)  
*Chone magna* (Moore, 1923) (AK, BC, WA marine infauna)

*Chone minuta* Hartman, 1944 (sCA, WA marine infauna)  
*Chone mollis* (*Metachone m.* Bush, 1904) (sCA, WA marine infauna)

*Chone* undescr. sp. (Gulf of Mex. marine infauna)  
*Chone velorinis* Banse, 1972 (sCA marine infauna)

*Chrysopetalum* Ehlers, 1864 - Chrysopetalidae polychaete worms  
*Chrysopetalum occidentale* Johnson, 1897 (Gulf of Mex. marine infauna)

*Circeis* Saint-Joseph, 1894 - Spirorbidae polychaete worms, Subfamily Circeinae  
*Circeis armoricana* Saint-Joseph, 1894 (BC, WA marine infauna)  
*Circeis spirillum* (Linnaeus, 1758) (BC, WA marine infauna)

*Cirratulus* Lamarek, 1801 - Cirratulidae polychaete worms  
*Cirratulus capensis* (Schmarda, 1861) (HI marine benthic)

*Cirratulus cingulatus* Johnson, 1901 (CA marine benthic)  
*Cirratulus cirratus* (*Lumbricus c.* O.F. Muller, 1776) (BC, CA, ME, WA marine infauna, PQ Gulf of St. Lawrence sandy marine interstitial))

*Cirratulus dillonensis* J.A. Blake, 1996 (CA marine benthic)  
*Cirratulus grandis* Verrill, 1873 (ME, NJ marine benthic)  
*Cirratulus multioculatus* (Hartman, 1961 (CA marine benthic)

*Cirratulus robustus* Johnson, 1901 (CA, WA marine infauna)  
*Cirratulus* undet. sp. or species (sCA, HI marine infauna)

*Cirratulus spectabilis* (Kinberg, 1866) (BC, CA, WA marine infauna)  
*Cirratulus zebuensis* McIntosh, 1885 (HI marine benthic)

*Cirriformia* Hartman, 1936 (= *Audouinia*) Cirratulidae polychaete worms  
*Cirriformia capensis* (Schmarda, 1861) (HI marine infauna)  
*Cirriformia crassicollis* (Kinberg, 1866) (HI marine infauna)



*Cirriformia grandis* (Verrill) (FL marine infauna)  
*Cirriformia hawaiiensis* Hartman, 1956 (HI marine infauna)

*Cirriformia luxuriosa* (Moore, 1904) (sCA marine infauna)  
*Cirriformia moorei* J. Blake, 1996 (sCA marine infauna)  
*Cirriformia punctata* (Grube, 1856) (HI marine infauna)

*Cirriformia* undescr. sp. (FL, TX marine benthic)  
*Cirriformia* undescr. sp. (FL marine benthic)  
*Cirriformia* undescr. sp. (TX marine benthic)

*Cirriformia socialis* J.A. Blake, 1996 (sCA marine infauna)  
*Cirriformia semicineta* (Ehlers, 1905) (HI marine infauna)

*Cirriformia spirabrancha* (*Cirratulus s.* Moore, 1904) (sCA, WA marine infauna)  
*Cirriformia tentaculata* (*Terebella t.* Montagu, 1808) (sCA marine infauna)

*Cirrophorus* Ehlers, 1908 - Paraonidae polychaete worms  
*Cirrophorus americanus* V.E. Strel'tsov, 1973 (LA marine infauna)

*Cirrophorus branchiatus* Ehlers, 1908 (*Paradoneis b.*) (BC, sCA, Carolinian, Gulf of Mex. WA marine infauna)

*Cirrophorus forticirratu*s V.E. Strel'tsov, 1973 (LA marine infauna)  
*Cirrophorus furcatus* (*Arcidea (C.) f.* Hartman, 1957) (sCA marine infauna)

*Cirrophorus ilvana* (Virginian marine infauna)  
*Cirrophorus lyriformis* (SC marine infauna)

*Cirrophorus* undet. sp. or species (sCA, FL marine infauna)  
*Cirrophorus* undescr. sp. (Carolinian marine infauna)

*Cistena* Leach, 1816 Pectinariidae polychaete worms  
*Cistena gouldi* = *Cistenides g.*

*Cistenides* Malmgren, 1866 (= *Pectinaria*) - Pectinariidae polychaete worms (also put in Amphictenidae)

*Cistenides gouldii* (Verrill) (= *Cistena g.*) (MA to FL and West Indies marine sandy infauna)  
*Cistenides granulata* (Linnaeus, 1767) (AK, BC, WA marine infauna)

*Clavodorum* Hartman & Fauchald, 1971 - Sphaerodoridae polychaete worms  
*Clavodorum* undesr. sp. (Gulf of Mex. marine benthic)

*Clymenella* Verrill, 1873 - Maldanidae polychaete worms, Subfamily Euclymeninae  
*Clymenella complanata* Hartman, 1969 (sCA, WA marine infauna)

*Clymenella mucosa* (TX, VA estuary marine infauna)

*Clymenella torquata* (*Clymene torquatus* Leidy, 1855) (AL, e,wFL, LA, MA, ME, MS, NC, NJ, NY, SC, TX, VA, WA marine intertidal benthic & subsurface deposit feeder, tubiculous)

*Clymenella zonalis* (Verrill, 1874) (VA, NJ marine benthic)

*Clymenura* Verrill, 1900 - Maldanidae polychaete worms, Subfamily Clymenurinae

*Clymenura* (*Cephalata*) *columbiana* (Berkeley, 1929) (BC, WA marine infauna)

*Clymenura* (*Cephalata*) *gracilis* Hartman, 1969 (sCA, WA marine infauna)

*Cossura* Webster & Benedict, 1887 - Cossuridae polychaete worms

*Cossura bansei* J.A.Blake, 1996 (sCA, WA marine infauna)

*Cossura brunnea* Fauchald, 1972 (sCA, WA marine infauna)

*Cossura candida* Hartman, 1955 (sCA marine infauna)

*Cossura coasta* Kitamori, 1960 (HI marine infauna)

*Cossura delta* (LA, TX estuary marine infauna)

*Cossura longocirrata* Webster & Benedict, 1887 (BC, MA, Carolinian, Virginian, WA marine infauna)

*Cossura modica* Fauchald & Hancock, 1981 (BC, BC, WA marine infauna)

*Cossura* undet. sp. (sCA marine infauna)

*Cossura pygodactylata* Jones, 1956 (= *C. lepida*)(BC, CA, WA marine infauna)

*Cossura rostrata* Fauchald, 1972 = *C. candida*

*Cossura soyeri* Laubier, 1963 (Mediterranean, LA, NC marine infauna)

*Crucigera* Benedict, 1887 - Serpulidae polychaete worms, Subfamily Serpulinae

*Crucigera irregularis* Bush, 1905 (AK, BC marine infauna)

*Crucigera websteri* Benedict, 1887 (Gulf of Mex. marine infauna)

*Crucigera zygophora* (Johnson, 1901) (AK, BC, WA marine infauna)

*Ctenodrilus* - Ctenodrilidae polychaete worms, Subfamily Ctenodrilinae

*Ctenodrilus serratus* (Schmidt, 1857) (BC marine benthic)

*Dasybranchus* Grube, 1850 - Capitellidae polychaete worms

*Dasybranchus glabrus* Moore, 1909 (FL marine infauna)

*Dasybranchus lumbricoides* Grube, 1878 (FL, HI, TX marine infauna)

*Dasybranchus lunulatus* Ehlers, 1887 (CA marine infauna)

*Dasybranchus* undet. sp. or species (HI, LA marine infauna)

*Decamastus* Hartman, 1963 - Capitellidae polychaete worms

*Decamastus gracilis* Hartman, 1963 (AK, BC, FL, sCA, WA marine infauna)

*Decamastus?* undet. sp. (HI marine infauna)  
*Decamastus?* undescr. sp. (FL marine infauna)

*Demonax* Kinberg, 1867- Sabellidae polychaete worms, Subfamily Sabellinae  
*Demonax lacunosus* T.H. Perkins, 1984 (FL marine infauna)  
*Demonax leucaspis* Kinberg, 1867 (HI marine infauna)

*Demonax medius* (Bush, 1905) (BC, WA marine infauna)  
*Demonax microphthalma* (*Sabella m.* Verrill, 1873) (FL, NJ, VA, Gulf of Mex. marine benthic)  
*Demonax pacifica* = *Distylia volutacornis pacifica*

*Demonax japonicus* (Moore) (FL marine infauna)  
*Demonax pallidus* (Moore) (FL marine infauna)

*Demonax rugosus* (Moore, 1904) (FL, BC, WA marine infauna)  
*Demonax* undet. sp. (CA marine infauna)

*Dentatisyllis* Perkins, 1981 - Syllidae polychaete worms  
*Dentatisyllis carolinae* (Day, 1973) (e,wFL marine infauna)  
*Dentatisyllis* undescr. sp. (wFL marine infauna)

*Dexiospira* Caullery & Mesnil, 1897- Serpulidae polychaete worms  
*Dexiospira spirillum* (*Spirorbis spirillum* Linnaeus) (FL, ME marine benthic)

*Dialychone* Claparede, 1870 - Sabellidae polychaete worms  
*Dialychone* undescr. sp. (Gulf of Mex. marine infauna)

*Dinophilus* O. Schmidt, 1848 – Dorvilleidae polychaete worms (once put in Dinophilidae)  
*Dinophilus nipponicus* Uchida & Okuda, 1943 (BC marine benthic)

*Diplocirrus* Haase, 1915 - Flabelligeridae polychaete worms  
*Diplocirrus capensis* Day, 1961(Gulf of Mex. marine infauna)  
*Diplocirrus* undescr. sp. (Gulf of Mex. marine infauna)

*Diopatra* Audouin & Milne-Edwards, 1833 - Onuphidae polychaete worms, Subfamily  
Onuphinae (once in Phyllodocidae)

*Diopatra amboinensis* Audouin & Milne Edwards, 1833 (New England marine infauna in tube  
structures)

*Diopatra cuprea* (Bosc, 1802) (FL, LA, SC, TX, VA, New England marine infauna in tube  
structures)

*Diopatra leuckarti* Kinberg, 1865 (HI marine infauna)  
*Diopatra neotridens* Hartman, 1944 (Gulf of Mex. marine infauna)

*Diopatra ornata* Moore, 1911 (AK, BC, sCA, WA, New England marine infauna)  
*Diopatra* cf. *papillata* Fauchald, 1968 (Gulf of Mex. marine infauna)

*Diopatra* undescr. sp. (HI marine infauna)  
*Diopatra splendidissima* Kinberg, 1865 (sCA marine infauna)  
*Diopatra tridentata* Hartman, 1944 (sCA, Gulf of Mex. marine infauna)

*Dioplosyllis* Gidholm, 1962 - Syllidae polychaete worms, Subfamily Eusyllinae  
*Dioplosyllis lagunae* (Hartman, 1961) (CA marine infauna)

*Dioplosyllis octodentata* T.H. Perkins, 1981 (FL marine infauna)  
*Dioplosyllis* undet. sp. (WA marine infauna)  
*Dioplosyllis tridentata* Kudenov & Harris, 1995 (CA marine infauna)

*Dipolydora* Bosc, 1802 - Spionidae polychaete worms  
*Dipolydora akaina* J.A. Blake, 1996 (CA marine infauna)  
*Dipolydora armata* (*Polydora a.* Langerhans, 1880; *P. convexa* Blake & Woodwick, 1971) (CA marine infauna)

*Dipolydora barbilla* (Blake, 1981) (Carolinian marine infauna)  
*Dipolydora bidentata* (*Polydora b.* Zachs, 1933) (CA marine infauna)

*Dipolydora bifurcata* (*Polydora b.* Andrews, 1891; *P. monilaris* Ehlers, 1905) (BC, CA marine infauna)

*Dipolydora cardalia* (Berkeley, 1927) (AK, WA marine infauna)  
*Dipolydora caulleryi* (*Polydora c.* Mesnil, 1897; *P. brachycephala* Hartman, 1936) (CA, BC, TX, WA marine infauna)

*Dipolydora commensalis* (*Polydora c.* Andrews, 1891) (CA, WA, Virginian marine infauna)  
*Dipolydora elegantissima* (Blake & Woodwick, 1972) (BC, CA marine infauna)

*Dipolydora giardi* (*Polydora g.* Mesnil, 1896; *P. anoculata* Moore, 1907) (BC, CA marine infauna)

*Dipolydora quadrilobata* (*Polydora q.* Jacobi, 1883) (BC, CA, MA, WA marine infauna)

*Dipolydora socialis* (*Polydora s.* Schmarda, 1861; *P. caeca* of Berkeley & Berkeley, 1936, not Orsted, 1843; *P. carunculata* Radashevsky, 1993; *P. magna* of Berkeley & Berkeley, 1936; *P. neocardalia* Hartman, 1961) (common AL, AK, BC, CA, e,wFL, LA, MA, NC, TX, WA marine infauna)

*Disomides multisetosum* = *Trochochaeta m.*

*Dispio* Hartman, 1951 - Spionidae polychaete worms  
*Dispio uncinata* Hartman, 1951 (AL, CA, FL, HI, LA, Virginian marine infauna)

*Distylia volutacornis pacifica* Berkeley & Berkeley, 1954 (= *Demonax p.*; *Bispira v.*?) (BC, WA marine infauna)

*Diurodrilus* Remane, 1925 - Diurodrilidae polychaete worms (once put in Dinophilidae)

*Diurodrilus ankei* Ax, 1967 (BC marine benthic)

*Dodecaceria* Oersted, 1843 - Cirratulidae polychaete worms

*Dodecaceria coralii* (Leidy) (ME marine benthic)

*Dodecaceria concharum* Oersted, 1843 (BC, CA marine benthic)

*Dodecaceria fewkesi* Berkeley & Berkeley, 1954 (BC, CA marine benthic)

*Dodecaceria laddi* Hartman, 1954 (HI marine benthic)

*Dodecaceria oraria* McCammon & Stull, 1978 (CA marine benthic)

*Dodecaceria* undescr. sp. (FL marine benthic)

*Dorvillea* Parfitt, 1866 - Dorvilleidae polychaete worms

*Dorvillea angolana* (Augener, 1918) (HI? marine infauna)

*Dorvillea* (*Schistomeringos*) *annulata* (*Stauronereis a.* Moore, 1906) (CA, WA, New England marine infauna)

*Dorvillea* (*Schistomeringos*) *japonica* (Annenkova, 1937) (BC, WA marine infauna)

*Dorvillea* (*Schistomeringos*) *longicornis* (*Stauronereis l.* Ehlers, 1901; *S. articulatus* Hartman, 1938) (BC, sCA marine infauna)

*Dorvillea* (*Dorvillea*) *moniloceras* (Moore, 1909) (BC, HI marine infauna)

*Dorvillea* (*Dorvillea*) *pseudorubrovittata* E. Berkeley, 1927 (BC, WA marine infauna)

*Dorvillea* (*Schistomeringos*) *rudolphi* (*Stauronereis r.* Delle Chiaje, 1828) (CA, Carolinian, Virginian, e,wFL, LA, WA, New England marine infauna)

*Dorvillea sociabilis* (Webster, 1879) (SC, Gulf of Mex. marine infauna)

*Dorvillea* undescr. sp. (Gulf of Mex. marine infauna)

*Dorvillea* undet. sp. (HI marine infauna)

*Drieschia* Michaelsen, 1892 – Polynoidae polychaete worms

*Drieschia atlantica* Treadwell, 1936 (New England marine benthic)

*Drieschia pelagica* Michaelsen, 1892 (New England marine benthic)

*Drilonereis* Claparede, 1870 - Oeonidae polychaete worms (also put in Arabellidae)

*Driloneris caulleryi* (New England marine infauna)

*Drilonereis* cf. *debilis* (Ehlers, 1887) (Gulf of Mex. marine infauna)

*Driloneris falcata* Moore, 1911 (CA, WA, New England marine infauna)

*Driloneris falcata minor* Hartman, 1965 (AK, WA marine infauna)

*Drilonereis filum* (*Limbriconereis f.* Claparede, 1868) (CA, VA, New England marine benthic)  
*Drilonereis longa* Webster, 1979 (BC, e,wFL, SC, WA, Gulf of Mex., Virginian, New England marine infauna)

*Drilonereis magna* Webster & Benedict (SC, TX, VA, New England estuary marine benthic)

*Driloneris mexicana* Fauchald, 1970 (CA marine infauna)

*Driloneris nuda* Moore, 1909 (CA, WA marine infauna)

*Drilonereis* undet. sp. (sCA marine infauna)

*Drilonereis spatula* (Treadwell, 1911) (Gulf of Mex. marine infauna)

*Driloneris spectabilis* Hilbig, 1995 (CA marine infauna)

*Drilonereis* 4 undescr. species (Gulf of Mex. marine infauna)

*Dysponetus* Levinsen, 1879 - Chrysopetalidae polychaete worms

*Dysponetus pygmaeus* Levinsen, 1879 (BC, NJ, New England marine infauna)

*Eclysippe* Eliason, 1955- Ampharetidae polychaete worms, Subfamily Ampharetinae

*Eclysippe trilobata* (*Anobrothrus t.* Hartman, 1969) (sCA marine infauna)

*Ehlersia* Quatrefages, 1865 - Syllidae polychaete worms, Subfamily Eusyllinae (also treated as subgenus of *Syllis*)

*Ehlersia cornuta* = *Syllis c.*

*Ehlersia ferrugina* (Langerhans, 1881) (= *Syllis f.*) (Carolinian, Gulf of Mex. marine infauna)

*Ehlersia heterochaeta* (Moore, 1909) = *Typosyllis h.* (CA, WA marine infauna)

*Ehlersia hyperioni* (Dorsey & Phillips, 1987) = *Typosyllis h.*

*Ehlersia* undet. sp. (HI marine infauna)

*Enipo* Malmgren, 1865 - Polynoidae polychaete worms

*Enipo canadensis* (Ehlers, 1887) = *Polynoe c.*

*Enipo gracilis* – *Polynoe g.*

*Enipo kinbergi* Malmgren, 1865 (New England marine benthic)

*Enipo torelli* (New England marine benthic)

*Enoplobranchus* Webster, 1879 – Terebellidae polychaete worms

*Enoplobranchus sanguineus* (Verrill) (New England marine benthic)

*Erlersileanira* Pettibone, 1970 - Sigalionidae polychaete worms

*Erlersileanira incisa* (Grube, 1877) (Gulf of Mex. marine benthic)

*Enoplobranchus* Webster, 1879 (= *Chaetobranchus*) Terebellidae polychaete worms

*Enoplobranchus sanguineus* (Verrill) (ME, Carolinian marine infauna)

*Ephesiella* Chamberlin, 1919 - Sphaerodoridae polychaete worms

*Ephesiella brecicapitis* (*Sphaerodorum b.* Moore, 1909) (sCA marine infauna)

*Ephesiella minuta* (Ephesia m.)(New England marine benthic)

*Epidiopatra* Augener, 1918 – Onuphidae polychaete worms

*Epidiopatra hupferiana* (WA marine infauna)

*Eranno* Kinberg, 1865 - Lumbrineridae polychaete worms

*Eranno bicirrata* (*Lumbrineris bicirrata* Treadwell, 1929) (AK, sCA, WA marine infauna)

*Eranno lagunae* (*Lumbrineris l.* Fauchald, 1970) (sCA marine infauna)

*Eteone* Savigny, 1818 - Phyllodocidae polychaete worms, Subfamily Eteoninae

*Eteone alba* Webster, 1879 (New England marine benthic)

*Eteone balboensis* (WA marine infauna)

*Eteone barbata* = *Mysta b.*

*Eteone californica* Hartman, 1936 (BC, WA marine infauna)

*Eteone columbiensis* Kravitz & Jones, 1979 (BC marine benthic)

*Eteone dilatata* (WA marine infauna)

*Eteone fauchaldi* Kravitz & Jones, 1979 (CA, WA marine infauna)

*Eteone flava* (Fabricius) (Baffin Island (neCanada), New England marine infauna)

*Eteone foliosa* Quatrefages, 1865 (rare Virginian marine infauna)

*Eteone heteropoda* Hartmann, 1951 (FL, LA, MA, NC, NJ, SC, TX, VA, New England marine infauna)

*Eteone lactea* Claparede (= *E. alba*) (FL, Gulf of Mex., ME, NJ, VA marine benthic)

*Eteone leptotes* Blake, 1992 (CA, WA marine infauna)

*Eteone lighti* Hartman, 1936 (OR marine benthic)

*Eteone longa* (Fabricius) (*E. robusta*) (AK, BC, CA, Baffin Island (neCanada), FL, WA, New England marine infauna)

*Eteone pacifica* Hartman, 1936 (AK, BC, CA, OR, WA marine infauna)

*Eteone pigmentata* Blake, 1992 (CA, WA marine infauna)

*Eteone pusilla* Orsted, 1834 (New England marine benthic)

*Eteone* undet. sp. or species ( sCA, TX, MA marine infauna; East Coast interstitial marine sands)

*Eteone setosa* (New England marine benthic)

*Eteone spetsbergensis* Malgren, 1865 (BC, WA marine infauna)

*Eteone spilotus* Kravitz & Jones, 1979 (BC, WA marine infauna)

*Eteone trilineata* (New England marine benthic)

*Eteone tuberculata* Treadwell, 1922 (BC marine infauna)

*Euchone* Malmgren, 1866 - Sabellidae polychaete worms, Subfamily Sabellinae

*Euchone analis* (Kroyer, 1856 (AK, BC marine infauna)

*Euchone arenae* Hartman, 1965 (*E. barnardi* & *trisegmentata* Reish, 1965) (CA marine infauna)

*Euchone hancocki* Banse, 1970 (CA, WA marine infauna)

*Euchone incolor* Hartman, 1965 (*E. barnardi* & *trisegmentata* Reish, 1965) (AK, CA, WA, Gulf of Mex. (cf. *E.i.*) marine infauna)

*Euchone limnicola* Reish, 1960 (CA, WA marine infauna)

*Euchone rubrocincta* (ME marine benthic)

*Euchone* cf. *southerni* Banse, 1970 (Gulf of Mex. marine benthic)

*Euchone* undescr. sp. (Gulf of Mex. marine infauna)

*Euchone* undet. sp. (sCA marine infauna)

*Euchone velifera* Banse, 1972 (CA marine benthic)

*Euclymene* Verrill, 1900 - Maldanidae polychaete worms, Subfamily Euclymeninae

*Euclymene companula* Hartman, 1969 (CA marine infauna)

*Euclymene delineata* Moore, 1923 (CA marine infauna)

*Euclymene reticulata* (WA marine infauna)

*Euclymene zonalis* (Verrill, 1874) (BC (cf. *E.z.*), MA, VA, WA marine infauna)

*Euclymene* 2 undescr. species (AL, FL marine infauna)

*Euclymene* undet. sp. or species; (AK, CA marine infauna)

*Eucranta* Malmgren, 1865 - Polynoidae polychaete worms

*Eucranta anoculata* (Moore, 1910) (BC, WA marine benthic)

*Eucranta villosa* Malmbren, 1865 (New England marine benthic)

*Eudistylia* Bush, 1905- Sabellidae polychaete worms, Subfamily Sabellinae

*Eudistylia catharinae* Banse, 1979 (BC, WA marine infauna)

*Eudistylia polymorpha* (Johnson, 1901) (BC, CA marine benthic)

*Eudistylia vancouveri* (*Sabella v.* Kinberg, 1867; *E. abbreviata*, *tenella* & *plumosa* Bush, 1904) (CA, BC, WA marine benthic)

*Eulaeospira* Pillai, 1970 - Spirorbidae polychaete worms

*Eulaeospira orientalis* (Pillai, 1960) (HI marine infauna)



*Eulalia* Savigny, 1818 (= *Abarenicola*) Phyllodocidae polychaete worms, Subfamily Eteoninae  
*Eulalia anoculata* Fauchald, 1972 (New England marine infauna)  
*Eulalia (Eulalia) aviculiseta* (WA marine infauna)

*Eulalia (Eulalia) bilineata* (Johnston, 1840) (BC?, FL, Gulf of Mex., WA, New England marine infauna)

*Eulalia californiensis (Steggoa californiensis* Hartman, 1936) (CA, WA marine infauna)  
*Eulalia havaica* Kinberg, 1866 (HI marine infauna)

*Eulalia (Eulalia) levicornuta* Moore, 1909 (BC, CA, WA marine infauna)  
*Eulalia (Eulalia) macroceros* Grube, 1860 = *Pterocirrus m.*

*Eulalia macrocirrus* (FL marine infauna)  
*Eulalia parvoseta* Banse & Hobson, 1968 (BC marine infauna)

*Eulalia (Eulalia) quadrioculata* Moore, 1906 (BC, CA, New England marine infauna)  
*Eulalia sanguinea* Oersted, 1843 (FL, HI, SC, New England marine infauna)

*Eulalia* undet sp. or species (sCA, HI marine infauna)  
*Eulalia (Eulalia) viridis* (Linnaeus, 1767) (AK, BC, ME, WA, New England marine infauna)

*Eumida* Malmgren, 1865 - Phyllodocidae polychaete worms, Subfamily Eteoninae  
*Eumida caspersi* Hartmann-Schroder, 1965 (FL marine infauna)

*Eumida (Pirakia) hutchinsonensis* T.H. Perkins, 1984 (FL marine infauna)  
*Eumida longicornuta (Eulalia l.* Moore, 1906) (AK, BC, sCA marine infauna)

*Eumida parvicirrus* T.H. Perkins, 1984 (FL marine infauna)

*Eumida sanguinea (Eulalia s.* Oersted, 1843) (= *E. maculosa*) (e,wFL, Gulf of Mex., HI, NJ, VA, New England marine benthic)

*Eumida* undet. sp. (HI marine benthic)

*Eumida tubiformis* Moore, 1909 (WA, New England marine infauna)  
*Eunereis* Malmgren, 1865 - Nereididae polychaete worms, Subfamily Nereidinae

*Eunereis longipes* Berkeley & Berkeley, 1954 (CA marine benthic)  
*Eunereis wailesi* Berkeley & Berkeley, 1954 (BC, WA marine infauna)

*Eunice* Cuvier, 1817 - Eunicidae polychaete worms  
*Eunice afra* Peters, 1854 (HI marine infauna)

*Eunice afra* var. *paupera* (= *A.p.*) (HI marine benthic)  
*Eunice americana* Hartman, 1944 (sCA marine infauna)

*Eunice aphroditois* (Pallas, 1788) (BC, New England marine infauna)  
*Eunice antennata* (Savigny, 1820) (HI, Gulf of Mex. marine infauna)

*Eunice australis* Quatrefages, 1865 (HI marine benthic)  
*Eunice bilobata* Treadwell, 1908 (HI marine benthic)

*Eunice cariboea* Grube, 1865 (HI marine benthic)  
*Eunice filamentosa* Grube, 1865 (HI, Gulf of Mex. marine benthic)

*Eunice hawaiiensis* Treadwell, 1906 (HI marine benthic)  
*Eunice multicylindri* Shisko, 1981 (sCA marine infauna)

*Eunice multipectinata* Moore, 1911 (sCA marine infauna)  
*Eunice nicidioformis* Treadwell, 1906 (HI marine benthic)  
*Eunice paupera* = *E. afra* var. *p.*

*Eunice tenuis* (Treadwell, 1921) (Gulf of Mex. marine infauna)  
*Eunice valens* (Chamberlin, 1919) (AK, BC marine infauna)

*Eunice vittata* Deelle Chiaje, 1828 (HI, Gulf of Mex. marine benthic)  
*Eunice vittatopsis* Fauchald, 1970 (sCA marine infauna)  
*Eunice websteri* Fauchald, 1969 (Gulf of Mex. marine infauna)

*Euniphysa* Wesenberg-Lund, 1949 - Eunicidae polychaete worms  
*Euniphysa* undet. sp. (Gulf of Mex. marine infauna)

*Eunoe* Malgrn, 1865 - Polynoidae polychaete worms, Subfamily Harmothoinae  
*Eunoe depressa* Moore, 1905 (BC, WA marine infauna)  
*Eunoe nodosa* (Sars, 1861) (BC, New England marine infauna)

*Eunoe oerstedii* Malgren, 1865 (BC marine infauna)  
*Eunoe spinulosa* Verrill, 1879 (New England marine infauna)

*Eunoe senta* (Moore, 1902) (BC marine infauna)  
*Eunoe uniseriata* Banse & Hobson, 1968 (BC, WA marine infauna)

*Euphrosine* Lamarck, 1818 - Euphrosinidae polychaete worms  
*Euphrosine armadilloides* Ehlers, 1900 (*Euphrosyne armadillo*)(Gulf of Mex., New England marine infauna)

*Euphrosine arctia* Johnson, 1897 (BC, CA marine infauna)

*Euphrosine bicirrata* Moore, 1905 (BC, CA marine infauna)  
*Euphrosine borealis* (New England marine infauna)

*Euphrosine cirrata* (New England marine infauna)  
*Euphrosine heterobranchia* Johnson, 1901 (BC, WA, CA marine infauna)

*Euphrosine hortensis* Moore, 1905 (BC marine infauna)  
*Euphrosine myrtosa* (New England marine infauna)  
*Euphrosine* undescr. sp. (Gulf of Mex. marine infauna)

*Eupolymnia* Verrill, 1900 - Terebellidae polychaete worms, Subfamily Artacaminae  
*Eupolymnia heterobranchia* (BC, sCA, WA marine infauna)

*Eupolymnia nebulosa* (Montagu, 1818) (Gulf of Mex. marine infauna)  
*Eupolymnia* undescr. sp. (Gulf of Mex. marine infauna)  
*Eupolymnia* undet. sp. (Carolinian marine infauna)

*Eupolynoe* Bidekap, 1894 = *Eucranta*  
*Eupolynoe anticostiensis* = *Arcteobia anticostiensis*

*Eurythoe* Kinberg, 1857 - Amphinomidae polychaete worms  
*Eurythoe complanata* (Pallas, 1776) (HI marine infauna)  
*Eurythoe* 2 undescr. sp. (Gulf of Mex. marine infauna)

*Eurysyllis* Ehlers, 1864 Syllidae polychaete worms  
*Eurysyllis spicum* Kudenov & Harris, 1995 (CA marine infauna)  
*Eurysyllis tuberculata* Ehlers, 1864 (Gulf of Mex. marine infauna)

*Eusyllis* Malmgren, 1867 - Syllidae polychaete worms, Subfamily Eusyllinae  
*Eusyllis assimilis* Marenzeller, 1875 (BC, WA marine infauna)  
*Eusyllis blomstrandii* Malmgren, 1867 (BC, CA, WA, New England marine infauna)

*Eusyllis fragilis* (Webster, 1879) (ME marine infauna)  
*Eusyllis habei* Imagima, 1966 (CA, WA marine infauna)

*Eusyllis japonica* Imajima & Hartman (BC, WA marine infauna)  
*Eusyllis lamelligera* Marion & Bobertzky, 1875 (Gulf of Mex.?, New England marine infauna)  
*Eusyllis longicirrata* Imagima, 1966 (BC, CA marine infauna)

*Eusyllis magnifica* (Moore, 1906) (BC marine infauna)  
*Eusyllis transecta* Hartman, 1966 (sCA marine infauna)

*Euthalenessa* Darboux - Sigalionidae polychaete worms  
*Euthalenessa chacei* Pettibone, 1970 (HI marine benthic)

*Euthelepus* McIntosh, 1885 – Terebellidae polychaete worms, Subfamily Thelepodinae  
*Euthelepus* undescr. sp. (Gulf of Mex. marine benthic)

*Euzonus* Grube, 1866 - Opheliidae polychaete worms (tube dwelling), Subfamily Opheliinae  
*Euzonus mucronata* (Treadwell, 1914) (BC marine benthic)  
*Euzonus williamsi* (Hartman, 1938) (BC marine benthic)

***Exogone*** Oersted, 1845 - Syllidae polychaete worms, Subfamily Exogoninae

***Exogone atlantica*** T.H. Perkins, 1981 (LA marine infauna)

***Exogone arenosa*** T.H. Perkins, 1981 (e,wFL marine infauna)

***Exogone (Exogone) brevi antennata*** (Carolinian marine infauna)

***Exogone (Parexogone) breviseta*** J.D. Kudenov & L.H. Harris, 1995 (sCA marine infauna)

***Exogone dispar*** (Webster, 1879) = *E. lourei*

***Exogenes hebes*** (NY surface deposit feeder & burrower)

***Exogone (Exogone) dwisula*** J.D. Kudenov & L.H. Harris, 1995 (sCA, WA marine infauna)

***Exogone (Exogone) lourei*** Berkeley & Berkeley, 1938 (AK, BC, sCA, FL, LA, WA marine infauna)

***Exogone (Paraexogone) molesta*** Banse, 1972 (AK, BC, CA, WA marine infauna)

***Exogone occidentalis*** Westheide, 1974 (HI marine infauna)

***Exogone pseudolourei*** G. San Martin, 1991 (LA marine infauna)

***Exogone rolani*** G. San Martin, 1991 (Carolinian marine infauna)

***Exogone uniformis*** Hartman, 1961 (CA marine infauna)

***Exogone (Exogone) verugera*** (Claparede, 1869) (AK, HI, WA marine infauna)

***Exogonella*** Hartman, 1961 - Syllidae polychaete worms

***Exogonella brunnea*** Hartman, 1961 (CA marine infauna)

***Fabricia*** Blainville, 1828 (= *Amphicora*)- Sabellidae polychaete worms, Subfamily Fabriciinae

***Fabricia limnicola*** Hartman, 1951 (sCA marine infauna burrower)

***Fabricia oregonica*** Banse, 1979 (BC, WA, OR marine infauna burrower)

***Fabricia sabella*** (Ehrenberg, 1837) (BC, ME marine infauna burrower)

***Fabricia*** undet. sp. (LA marine infauna)

***Fabricia stellaris stellaris*** (O.F.Muller, 1774) (PQ Gulf of St. Lawrence sandy marine interstitial)

***Fabriciola*** Friedrich, 1939 - Sabellidae polychaete worms, Subfamily Fabriciinae

***Fabriciola berkeleyi*** Banse, 1956 (BC, CA, WA marine benthic)

***Fabriciola trilobata*** Fitzhugh, 1983 (e,wFL, LA marine benthic)

***Fabricinuda*** K. Fithugh, 1990 – Sabellidae

***Fabricinuda limnicola (Fabricia l.*** Hartman, 1951) (CA marine benthic)

***Fabricinuda trilobata*** (Fitzhugh, 1983) (Carolinian marine infauna)

***Fabrisabella*** Hartman, 1969 – Sabellidae polychaete worms

***Fabrisabella*** undet. sp. (CA marine benthic)

***Fauveliopsis*** McIntosh, 1922 - Fauveliopsidae amphipods

*Fauveliopsis armata* Fauchald & Hancock, 1981 (CA marine infauna)

*Fauveliopsis glabra* (*Brada g.* Hartman, 1960) (CA marine infauna)

*Fauveliopsis magna* Fauchald & Hancock, 1981 (CA marine infauna)

*Fauveliopsis* undescr. sp. (Gulf of Mex. marine infauna)

*Ficopomatus* Southern, 1921 - Serpulidae polychaete worms, Subfamily Serpulinae

*Ficopomatus enigmaticus* (= *Mercierella enigmatica* Fauvel, 1923) (HI (alien) marine infauna)

*Filogranula* Langerhans, 1888 - Serpulidae polychaete worms, Subfamily Serpulinae

*Filogranula* undescr. sp. (Gulf of Mex. marine benthic)

*Fimbriosthenelais* Pettibone, 1971 - Sigalionidae polychaete worms

*Fimbriosthenelais hobbsi* (Grube, 1877) (Gulf of Mex. marine benthic)

*Fimbriosthenelais minor* (Pruvot & Racovitza, 1895) (Gulf of Mex. marine benthic)

*Flabelliderma* Hartman, 1969 - Flabelligeridae polychaete worms

*Flabelliderma* undet. sp. (BC marine benthic)

*Flabelligera* Sars, 1829 - Flabelligeridae polychaete worms

*Flabelligera affinis* Sars, 1829 (CA, ME marine infauna)

*Flabelligera infundibularis* Johnson, 1901 (CA marine infauna)

*Galathowenia* Kirkegaard, 1959 - Oweniidae polychaete worms

*Galathowenia oculata* (Zachs, 1922) (BC, FL, WA marine infauna)

*Galathowenia* undet. sp. (HI marine benthic)

*Gattyana* McIntosh, 1900 - Polynoidae polychaete worms, Subfamily Harmothoinae

*Gattyana ciliata* Moore, 1902 (AK, WA marine infauna)

*Gattyana cirrosa* (Malmgren, 1865) (AK, WA, Baffin Island (neCanada), ME marine infauna; PQ Gulf of St. Lawrence sandy marine interstitial)

*Gattyana treadwelli* Pettibone, 1949 (BC, WA marine infauna)

*Gaudichaudius* Pettibone, 1986 - Polynoidae polychaete worms, Subfamily Harmothoinae

*Gaudichaudius iphionelloides* (= *Gattyana i.* in B.&H.) (BC, CA marine infauna)

*Geminosyllis* Imagima, 1966 - Syllidae polychaete worms, Subfamily Eusyllinae

*Geminosyllis ohma* (Imagima & Hartman, 1964) (CA marine infauna)

*Geminosyllis* undescr. sp. (Gulf of Mex. marine infauna)

*Genetyllis* Malmgren, 1865 - Phyllodocidae polychaete worms

*Genetyllis castanea* (= *Phyllodoce c.*) (e,wFL, Gulf of Mex. marine infauna)

*Glycera* Savigny, 1818 - Glyceridae polychaete worms

*Glycera abbranchiata* Treadwell, 1901 (Carolinian, Gulf of Mex. marine infauna)

*Glycera americana* Leidy, 1855 (*G. corrugata* Baird, 1863; *G. edentata* Hansen, 1852; *G. jucunda* & *laevis* Kinberg, 1866; *G. peruviana* Quatrefages, 1866; *G. rugosa* Johnson, 1901; *Rhynchobolus a.* Verrill & Smith, 1874) (bloodworm/ AK, BC, sCA, FL, LA, NC, NJ, SC, VA marine infauna)

*Glycera capitata* Hartman, 1950 (AK, CA, NJ, NY, SC marine infauna)

*Glycera convoluta* Keferstein, 1862 (BC, sCA, OR, WA marine infauna)

*Glycera dibranchiata* Ehlers, 1868 (GA, MA, ME, NJ, NY, SC, VA, Gulf of Mex. marine intertidal infauna)

*Glycera gigantea* Quatrefages, 1865 (BC marine infauna)

*Glycera nana* Johnson, 1901 (AK, BC, sCA, WA marine infauna)

*Glycera oxycephala* Ehlers, 1887 (CA, SC, WA marine infauna)

*Glycera papillosa* Grube, 1857 (Gulf of Mex. marine infauna)

*Glycera robusta* Ehlers, 1868 (CA, BC, OR, VA, WA, Gulf of Mex. marine infauna)

*Glycera sphyrabrancha* Schmarda, 1861 (Gulf of Mex. marine infauna)

*Glycera siphonostoma* (delle Chiaje, 1825) (BC, WA marine infauna)

*Glycera spongicola* (Grube, 1855) (HI marine infauna)

*Glycera tenujis* Hartman, 1944 (CA marine infauna)

*Glycera tessellata* Grube, 1863 (BC, CA, HI marine infauna)

*Glycinde* Mueller, 1858 - Goniadidae polychaete worms

*Glycinde armigera* Moore, 1911 (AK, BC, sCA, OR, WA marine infauna)

*Glycinde nordmanni* (Malmgren, 1866) (SC marine infauna)

*Glycinde picta* Berkeley, 1927 (BC, WA marine infauna)

*Glycinde polygnatha* Hartman, 1950 (AK, BC, CA, OR, WA marine infauna)

*Glycinde solitaria* (Webster) (FL, LA, SC, TX, VA estuary marine infauna)

*Glycinde* undet. sp. (AK marine infauna)

*Glyphanostomum* Levisenb, 1884 - Ampharetidae polychaete worms, Subfamily Ampharetinae

*Glyphanostomum pallescens* (Theel, 1879) (CA marine infauna)

*Goniada* Audouin & Milne-Edwards, 1833 - Goniadidae polychaete worms

*Goniada acicula* Hartman, 1940 (CA marine infauna)

*Goniada annulata* Moore, 1905 (AK, BC, CA, WA marine infauna)

*Goniada brunnea* Treadwell, 1906 (AK, BC, sCA, HI, WA marine infauna)

*Goniada littorea* Hartman, 1950 (sCA, Carolinian, wFL Gulf of Mex. marine infauna)

*Goniada maculata* Oersted, 1843 (AK, BC, sCA, NJ, WA, Gulf of Mex. marine infauna)  
*Goniada multidentopsis* T.H. Perkins, 1980 (FL marine infauna)  
*Goniada teres* Treadwell, 1931 (Gulf of Mex. marine infauna)

*Goniadella* Hartman, 19450 - Goniadidae polychaete worms  
*Goniadella* undet. sp. (NC marine infauna)

*Goniadides* Hartmann-Schroeder, 1960 - Goniadidae polychaete worms  
*Goniadides carolinae* J.H. Day, 1973 (e,wFL marine infauna)  
*Gonianides* undet. sp. (NC marine infauna)

*Gorgoniapolynoe* - Polynoidae polychaete worms  
*Gorgoniapolynoe caeciliae* (Fauvel, 1913) (FL marine infauna)

*Grubiopolynoe* Pettibone, 1969 - Polynoidae polychaete worms  
*Grubiopolynoe tuta* (Grube, 1855) (WA marine infauna)

*Grubeosyllis* Verrill, 1900 – Syllidae polychaete worms, Subfamily Exogoninae  
*Grubeosyllis augeneri* Pettibone, 1969 (Gulf of Mex. marine infauna)

*Grubeosyllis clavata* (Virginian (rare), Carolinian marine infauna)  
*Grubeosyllis* cf. *ecuadorensis* Pettibone, 1969 (Gulf of Mex. marine infauna)  
*Grubeosyllis mexicana* (Berkeley & Berkeley, 1939) (Gulf of Mex. marine infauna)

*Gymnonereis* Horst, 1919 - Nereididae polychaete worms  
*Gymnonereis crosslandi* (*Chaunorhynchus c. Monroe*, 1933; *Ceratocephale c.* Hartman, 1952)  
(sCA, Gulf of Mex. marine infauna)

*Gyptis* Marikno & Bobretycky, 1875 Hesionidae polychaete worms  
*Gyptis crypta* F. Pleijel, 1993 (Virginian (rare), Carolinian, wFL Gulf of Mex. marine infauna)

*Gyptis brevipalpa* = *Podarkeopsis b.*  
*Gyptis vittata* Webster & Benedict, 1887 (FL, LA, NJ, TX, VA estuary marine infauna)

*Halosydna* Kinberg, 1855 - Polynoidae polychaete worms, Subfamily Lepidonotinae  
*Halosydna brevisetosa* Kinberg, 1855 (BC, sCA marine infauna)

*Halosydna johnsoni* (*Lepidonotus j.* Darboux, 1899) (CA marine infauna)  
*Halosydna latior* Chamberlin, 1919 (CA marine infauna)

*Haploscoloplos* Monro, 1933 - Orbiniidae polychaete worms  
*Haploscoloplos elongatus* = *Leitoscoloplos e.*  
*Haploscoloplos foliosus* Hartman, 1951 (FL, LA, TX estuary marine benthic)

*Haploscoloplos fragilis* (Verrill) (LA, SC marine infauna)  
*Haploscoloplos pugettensis* = *Scoloplos p.*  
*Haploscoloplos robustus* (Verrill) (FL, SC marine infauna)

***Haplosyllis*** Langerhans, 1879 - Syllidae polychaete worms

***Haplosyllis spongicola*** (*Syllis s.* Grube, 1855) (BC, CA, FL, HI, Gulf of Mex., New England marine infauna)

***Harmothoe*** Kinberg, 1855 (= *Laenilla*, *Parmensis*, *Triscosmochaeta*) Polynoidae polychaete worms, Subfamily Harmothoinae

***Harmothoe aculeata*** Andrews, 1891 (Carolinian marine infauna)

***Harmothoe extenuata*** (Grube, 1840) (BC, VA (rare), WA marine infauna)

***Harmothoe fragilis*** Moore, 1911 (BC, CA, OR, WA marine infauna)

***Harmothoe haliaeti*** McIntosh, 1876 (HI marine infauna)

***Harmothoe hirsuta*** Johnson, 1897 (CA marine infauna)

***Harmothoe imbricata*** (*Aphrodita i.* Linnaeus, 1767) (AK, BC, CA, ME, NJ, WA Baffin Island (neCanada) marine infauna; PQ Gulf of St. Lawrence, Virginian (rare) sandy marine interstitial))

***Harmothoe lavis*** Hartman, 1961 (BC, CA marine benthic)

***Harmothoe multisetosa*** (*Lagisca m.* Moore, 1902) (BC, CA, OR, WA marine infauna)

***Harmothoe oerstedii*** (Malgrem) (NJ marine benthic)

***Harmothoe*** undet. sp. (Baffin Island (neCanada) marine infauna)

***Hartmaniella*** Imagima, 1977 - Hartmaniellidae polychaete worms

***Hartmaniella*** undet. or undescr. sp. (Gulf of Mex. marine infauna)

***Hauchiella*** Levinsen, 1893 – Terebellidae polychaete worms, Subfamily Polycirrinae

***Hauchiella*** undescr. sp. (Gulf of Mex. benthic)

***Hediste*** Malmgren, 1867 - Nereididae polychaete worms

***Hediste diversicolor*** (O.F. Muller, 1776) (PQ Gulf of St. Lawrence sandy marine interstitial)

***Hemipodus*** Quatrefages, 1865 - Glyceridae polychaete worms

***Hemipodus borealis*** Hartman, 1950 (= *H. roseus* Quatrefages, 1865) (AK, BC, CA, FL, WA marine infauna)

***Hemipodus roseus*** Quatrefages, 1865 (wFL Gulf of Mex. marine infauna)

***Hermadion*** Kinberg, 1855 - Polynoidae polychaete worms, Subfamily Harmothoinae

***Hermadion truncata*** (Moore, 1902) (BC marine benthic)

***Hesione*** Savigny 1818 – Hesionidae polychaete worms

***Hesione splendida*** Savigny 1818 (HI marine benthic)

***Hesionella*** Hartman, 1939 – Hesionidae polychaete worms

***Hesionella mccullochae*** Hartman, 1939 (CA marine benthic)



*Hesioneura* Hartmann-Schroder, 1958 - Phyllodocidae polychaete worms  
*Hesioneura* undet. sp. (CA marine beach interstitial)

*Hesionides* Friedrich 1937 - Hesionidae polychaete worm  
*Hesionides arenaria* Friedrich, 1937 (CA marine beach interstitial)

*Hesionides gohari* Hartmann-Schroder, 1960 (FL marine interstitial)  
*Hesionides riegerorum* W. Westheide, 1979 (sandy hyporheic in Chowan River, NC) Bibl.:  
Schmidt & Westheide 1999

*Hesionura* Hartmann-Schroder 1958 - Phyllodocidae polychaete worms, Subfamily Eteoninae  
*Hesionura coineaui difficilis* (*Eteonides c. d.* Banse 1963) (aquatic interstitial in BC, WA, CA,  
WA)

*Hesionura elongata* (Southern) (Carolinian marine infauna)  
(@*Hesionura lauberi* (FL marine infauna)

*Hesiospina* Imagina & Hartman, 1964 – Hesionidae polychaete worms  
*Hesiospina* 2 undescr. sp. (Gulf of Mex. marine infauna)

*Hesperonoe* Chamberlin, 1919 Polynoidae polychaete worms, Subfamily Harmothoinae  
*Hesperonoe adventor* (Skogsberg, 1928) (AK, BC, WA marine infauna)

*Hesperonoe complanata* (*Harmothoe c.* Johnson, 1901) (AK, BC, CA, OR, WA marine  
infauna)

*Hesperonoe laevis* Hartman, 1961 (CA, WA marine infauna)  
*Hesperonoe* undet. sp. (AK marine infauna)

*Heteromastus* Eisig, 1887 - Capitellidae polychaete worms

*Heteromastus filiformis* (*Capitella f.* Claparede, 1864) (AK, BC, CA, e,wFL, GA (brackish &  
marine), LA, MA, ME, NC, OR, SC, VA, WA common marine infauna)

*Heteromastus filibranchus* Berkeley & Berkeley, 1932 (AK, BC, sCA, WA marine infauna)

*Heteropodarke* Quatrefages, 1865 - Hesionidae polychaete worms  
*Heteropodarke formalis* T.H. Perkins, 1984 (FL marine benthic)  
*Heteropodarke heteromorpha* Hartmann-Schroder, 1962 (FL, Gulf of Mex., WA marine  
infauna)

*Heteropodarke lyonsi* T.H. Perkins, 1984 (FL marine benthic)  
*Heteropodarke* undet. sp. (BC marine benthic)

*Heterospio* Ehlers, 1874 – Longosomatidae (= Heterospionidae) polychaete worms  
*Heterospio catalinensis* (*Longosoma c.* Hartman, 1944) (CA marine benthic)

***Heterospio*** cf *longissima* Ehlers, 1874 (FL, TX marine benthic)

***Heterospio*** undescr. sp. (AL, FL marine infauna)

***Heterosyllis*** Kinberg, 1866 - Syllidae polychaete worms

***Heterosyllis havaica*** Kinberg, 1866 (HI marine benthic)

***Hipponoe*** – Amphinomidae polychaete worms

***Hipponoe gaudichaudi*** Audouin & Milne-Edwards, 1830 (HI marine infauna)

***Histriobdella*** van Beneden, 1858 – Histriobdellidae polychaete worms

***Histriobdella homari*** (ME marine benthic)

***Hobsonia*** Banse, 1979 - Ampharetidae polychaete worms, Subfamily Ampharetinae

***Hobsonia florida*** (Hartman, 1951) (BC, FL, LA, MA, NC, OR, SC, TX, WA estuary marine infauna)

***Hobsonia gunneri*** (*Amphicteis g. floridus* Hartman, 1951)(TX marine infauna)

***Hololepida*** Moore, 1905 - Polynoidae polychaete worms, unnamed subfamily

***Hololepida magna*** Moore, 1905 (BC, CA, OR, WA marine infauna)

***Hololepidella*** Willey, 1905 - Terebellidae polychaete worms, Subfamily Arctonoinae

***Hololepidella nigropunctata*** (Horst, 1915) (HI marine infauna)

***Hyalopomatus*** Marenzeller, 1878 – Serpulidae polychaete worms

***Hyalopomatus biformis*** (*Vermillopsis b.* Hartman, 1960) (CA, WA marine infauna)

***Hyalinoecia*** Malmgren, 1867 - Onuphidae polychaete worms

***Hyalinoecia juvenalis*** Moore, 1911 (sCA marine infauna)

***Hyboscolex*** Schmarda, 1861 - Scalibregmatidae polychaete worms

***Hyboscolex pacificus*** (Moore, 1909) (BC marine benthic)

***Hyboscolex longiseta*** Schmarda, 1861 (HI marine benthic)

***Hyboscolex*** undet sp. (Gulf of Mex. marine benthic)

***Hydroides*** Gunnerus 1768 - Serpulidae polychaete worms

***Hydroides bannerorum*** Bailey-Brock 1991 (deep marine interstitial muds off Oahu, HI)

***Hydroides bispinosa*** Bush, 1910 (Gulf of Mex. marine infauna)

***Hydroides crucigera*** (Morch, 1863) (HI (alien) marine infauna)

***Hydroides brachyacantha*** Rioja, 1941 (HI (alien) marine infauna)

***Hydroides dianthus*** (= *H. uncinata*) (Verrill, 1873) (LA, ME, NJ, VA, Gulf of Mex. marine infauna)

***Hydroides dirampha*** (Morch, 1863) (HI (alien) marine infauna)

**Hydroides elegans** Haswell, 1883 (HI (alien) marine infauna)

**Hydroides gracilis** (CA marine infauna)

**Hydroides hexagonus** Bose (NC marine infauna)

**Hydroides imbricata** (rare Virginian marine infauna)

**Hydroides lunulifera** (Claparede, 1868) (HI marine infauna)

**Hydroides microtis** Morch, 1863 (Carolinian, Gulf of Mex. marine infauna)

**Hydroides** undet. species (CA marine caves; HI marine infauna)

**Hydroides pacificus** Hartman, 1969(CA marine infauna)

**Hydroides protulicola** Benedict, 1887 (Virginian, Gulf of Mex. marine infauna)

**Hydroides sanctaecrucis** (Morch, 1863) (HI (alien) marine infauna)

**Hydroides uncinata** Phillipe, 1844 (HI (alien) marine infauna)

***Hypaniola*** Anenkova, 1927 - Ampharetidae polychaete worms

***Hypaniola florida*** = *Amphicteis floridus*

***Hypaniola florida*** (FL, MA marine infauna)

***Hypereteone*** - Phyllodocidae polychaete worms

***Hypereteone fauchaldi*** (Kravitz & Jones, 1979) (BC marine benthic)

***Hypereteone heteropoda*** (Carolinian marine benthic)

***Hypereteone lactea*** (Carolinian, wFL Gulf of Mex. marine infauna)

***Hypsicomus*** Grube, 1870 Sabellidae polychaete worms

***Hypsicomus phaeotaenia*** (Schmarda, 1861) (HI, Gulf of Mex. marine infauna)

***Idanthyrsus*** Kinberg, 1867 - Sabellariidae polychaete worms

***Idanthyrsus ornamentatus*** Chamberlin, 1919 (AK marine infauna)

***Idanthyrsus saxicavus*** (Baird, 1963) (BC, WA marine infauna)

***Inermonephtys*** Fauchald, 1968- Nephtyidae polychaete worms

***Inermonephtys inermis*** (Ehlers, 1887) (Gulf of Mexico marine infauna)

***Iphione*** Kinberg, 1855 - Terebellidae polychaete worms, Subfamily Iphioninae

***Iphione muricata*** (Savigny, 1818)(HI marine infauna)

***Isolda*** Mueller, 1858 - Ampharetidae polychaete worms

***Isolda pulchella*** Mueller, 1858 (e,wFL marine infauna)

***Isocirrus*** Arwidsson, 1907 - Maldanidae polychaete worms, Subfamily Euclymeninae

***Isocirrus longiceps*** (*Pseudoclymene l.* Moore, 1923) (BC, WA marine infauna)

***Janua*** Saint-Joseph, 1894 - Spirorbidae polychaete worms, Subfamily Januinae

*Janua pagenstecheri* (Quatrefages, 1865) (BC marine infauna)

*Jasmineira* Langerhans, 1880 - Sabellidae polychaete worms, Subfamily Sabellinae

*Jasmineira pacifica* Annenkova, 1937 (BC, Gulf of Mex. marine benthic)

*Jasmineira* undet. sp. (CA marine benthic)

*Josephella* Caullery & Mesnil, 1896 - Serpulidae polychaete worms

*Josephella marenzelleri* Caullery & Mesnil, 1896 (marine reef sandy interstitial off HI)

*Jugaria* Knight-Jones, 1973 - Spirorbidae polychaete worms, Subfamily Pileolariinae

*Jugaria quadrangularis* (Stimpson, 1854) (= *Spirorbis (Pileolaria) granulatus*) (BC marine benthic)

*Jugaria similis* (Bush, 1904) (BC marine benthic)

*Kefersteinia* Quatrefages, 1865 - Hesionidae polychaete worms

*Kefersteinia cirrata* (Deferstein, 1862) (BC, WA, Gulf of Mex. marine infauna)

*Kefersteinia haploseta* T.H. Perkins, 1984 (FL marine benthic)

*Kermadecella* Darboux, 1899 - Polynoidae polychaete worms

*Kermadecella magnipalpa* (McIntosh, 1885) (HI marine benthic)

*Kinbergonuphis* Fauchald, 1982 - Onuphidae polychaete worms

*Kinbergonuphis fragilis* (Kinberg, 1865) (Carolinian marine infauna)

*Kinbergonuphis simoni* (Santos, Day & Rice, 1981) (e,wFL marine infauna)

*Kinbergonuphis* 3 undescr. species (Gulf of Mex. marine infauna)

*Kinbergonuphis vexillaria* (Moore, 1911) (CA marine benthic)

*Labrorostratus* Saint-Joseph, 1888 - Oeononidae polychaete worms (once in Oeononidae)

*Labrorostratus luteus* Uebelacker, 1978 (Gulf of Mex. marine infauna)

*Lacydonia* Marion & Bobretzky, 1875 - Lacydoniidae polychaete worms

*Lacydoni* undescr. sp. (Gulf of Mex. marine benthic)

*Lacydoni* undet. sp. (CA marine benthic)

*Laeonereis* Hartman, 1945 - Nereididae polychaete worms

*Laeonereis culveri* (*Nereis c.* Webster, 1879) (FL, LA, NC, TX, VA marine infauna)

*Laeonereis* undet. sp. (HI marine benthic)

*Laetmonice* Kinberg, 1855 - Aphroditidae polychaete worms

*Laetmonice filicornis* Kinberg, 1955 (ME marine benthic)

*Laetmonice pellucida* Moore, 1903 (BC marine infauna)

*Lagisca* Malmgren, 1865 - Polynoidae polychaete worms

*Lagisca extenuata* (*Polynoe e.* Grube, 1840) (CA, PQ, New England, NB (Gulf of St. Lawrence)  
sandy marine interstitial)

*Lagisca impatiens* Webster, 1879 (New England marine benthic)  
*Lagisca propinqua* Malmgren, 1867 (New England marine benthic)  
*Lagisca rarispina* (Sars, 1861) (New England marine benthic)

*Lanassa* Malmgren, 1866 - Terebellidae polychaete worms  
*Lanassa gracilis*.(*Leaena g.* Moore, 1923) (sCA, WA marine infauna)

*Lanassa nordenskiöldi* Malmgren, 1866 (WA marine infauna)  
*Lanassa* undescr. sp. (Gulf of Mex. marine infauna)  
*Lanassa venusta* (Malm, 1874) (AK, WA marine infauna)

*Langerhansia* Czerniavsky, 1881- Syllidae polychaete worms  
*Langerhansia cornuta* (Rathke, 1843) (HI marine infauna)

*Lanice* Malmgren, 1886 – Terebellidae polychaete worms  
*Lanice conchilega* (*Nereis c.* Pallas, 1776) (CA, HI, WA, Gulf of Mex. marine infauna)

*Lanice expansa* Treadwell, 1906 (HI marine benthic)  
*Lanice flabellum* (Baird, 1865) (HI marine benthic)

*Laonice* Malmgren, 1867 - Spionidae polychaete worms  
*Laonice appelloefi* (CA marine infauna)  
*Laonice muchala* Blake, 1996 = *L. nuchala*

*Laonice cirrata* (*Nerine c.* Sars, 1850) (AK, BC, FL, LA, sCA, TX, WA marine infauna)  
*Laonice nuchala* Blake, 1996 (= *L. appelloefi* of authors NEP not Soderstrom, 1920)(CA marine infauna)

*Laonice papillibranchiae* Ward, 1981 (HI marine infauna)  
*Laonice pugettensis* Banse & Hobson, 1968 (BC, WA marine infauna)

*Laonome* Malmgren, 1866- Sabellidae polychaete worms, Subfamily Sabellinae  
*Laonome kroyeri* Malmgren, 1866 (BC, WA marine infauna)  
*Laonome* undet. sp. (Carolinian marine infauna)

*Laphania* Malmgren, 1866 - Terebellidae polychaete worms, Subfamily Artacaminae  
*Laphania boeckii* Malmgren, 1866 (BC, WA marine infauna)  
*Laphania* undet. sp. (C|A marine benthic)

*Leanira* Kinberg, 1855 - Sigalionidae polychaete worms  
*Leanira hystricis* Ehlers, 1874 (New England marine benthic)

*Leanira quatrefagesi* (New England marine benthic)  
*Leanira robusta* (New England marine benthic)

*Leanira tetragona* (*Sthenolepis tetragonum*) (New England marine benthic)

*Leiocapitella* Hartman, 1947 - Capitellidae polychaete worms

*Leiocapitella glabra* Hartman, 1947 (TX marine infauna)

*Leiocapitella* undescr. sp. (AL, FL marine infauna)

*Leiocapitella* undescr. sp. (FL marine infauna)

*Leiochrides* Augener, 1914 - Capitellidae polychaete worms

*Leiochrides* africans? (HI? marine infauna)

*Leiochrides hemipodus* Hartman, 1960 (CA marine infauna)

*Leitoscoloplos* Day, 1977 - Orbiniidae polychaete worms, Subfamily Orbiniinae

*Leitoscoloplos acutus* (Carolinian marine infauna)

*Leitoscoloplos elongatus* (*Haploscoloplos e.*) (AK, CA marine infauna)

*Leitoscoloplos foliosus* (Hartman) (FL marine benthic)

*Leitoscoloplos fragilis* (Carolinian, wFL Gulf of Mex. marine infauna)

*Leitoscoloplos panamensis* (*Haploscoloplos p.* Monroe, 1933) (BC, CA, WA marine benthic)

*Leitoscoloplos pugettensis* (*Scoloplos (S.) p.* Pettibone, 1957) (AK, sCA, BC, WA marine infauna)

*Leitoscoloplos robustus* (Verrill) (Carolinian, LA, MA marine infauna)

*Leocrates* Kinberg, 1866 – Hesionidae polychaete worms

*Leocrates chinensis* Kinberg, 1866 (HI marine benthic)

*Leocrates giardi* Gravier, 1900 (HI marine benthic)

*Leodice* - Eunicidae polychaete worms

*Leodice dubia* Verrill, 1885 (New England marine benthic)

*Leodice dubia* (HI marine benthic)

*Leodice polybranchia* Verrill, 1880 (New England marine benthic)

*Leodora* Saint-Joseph, 1894 - Spirorbidae polychaete worms

*Leodora knightjonesi* (De Silva, 1965) (HI marine infauna)

*Leonnates* Wesenberg-Lund, 1949 - Nereididae

*Leonnates* undet. sp. (HI marine benthic)

*Lepidasthenia* Malmgren, 1867 (= *Lepidametria*, *Nectochaeta*) Polynoidae polychaete worms, Subfamily Lepidastheniinae

*Lepidasthenia alba* (Treadwell, 1906) (HI marine infauna)

*Lepidasthenia berkeleyae* Pettibone, 1948 (BC, sCA, WA marine infauna)

*Lepidasthenia commensalis* (*Lepidametria c.* Webster, 1879) (Virginian marine infauna)  
*Lepidasthenia interrupta* Marenzeller, 1902 (CA marine infauna)

*Lepidasthenia longicirrata* Berkeley, 1923 (BC, CA, WA marine infauna)  
*Lepidasthenia lucida* (Treadwell, 1906) (HI marine infauna)  
*Lepidasthenia* undesr. sp. (Gulf of Mex. marine infauna)

*Lepidonotus* Leach, 1816 - Polynoidae polychaete worms  
*Lepidonotus havaicus* Kinberg, 1855 (HI marine infauna)

*Lepidonotus squamatus* (NY, WA marine infauna)  
*Lepidonotus spiculus* (*Polynoe s.* Treadwell, 1906) (CA marine infauna)

*Lepidonotus squamatus* (Linnaeus, 1767) (ME, NJ marine infauna)  
*Lepidonotus* undet. sp. (HI marine infauna)

*Lepidonotus sublevis* Verrill, 1873 (VA (rare), SC, Gulf of Mex., New England marine infauna)  
*Lepidonotus variabilis* Webster, 1879 (New England marine infauna)

*Levinsenia* Mesnil, 1897 (= *Levinsenia*, *Tauberia*) - Paraonidae polychaete worms  
*Levinsenia gracilis* (*Aonides g.* Tauber, 1879) (AK, CA, BC, CA, WA, Gulf of Mex. marine infauna)

*Levinsenia multibranchiata* (*Paraonis m.* Hartman, 1957) (CA marine infauna)  
*Levinsenia oculata* (*Paraonis gracilis o.* Hartman, 1957) (CA, WA marine infauna)  
*Levinsenia* undet. sp. (sCA marine infauna)  
*Levinsenia reducta* Hartman, 1965 marine infauna)

*Linopherus* Quatrefages, 1865 (= *Pseudeurythoe*) - Amphinomidae polychaete worms  
*Linopherus ambigua* (Monro, 1933) (*Pseudeurythoe a.*) (Virginian (rare) Carolinian marine infauna)

*Linopherus canariensis* (*Pseudeurythoe c.* Monro, 1933 (FL marine benthic)

*Linopherus canariensis* (FL marine benthic)  
*Linopherus paucibranchiata* (*Pseudeurythoe p.* Fauvel) (LA, VA rare marine infauna)

*Litocorsa* Pearson, 1970 – Pilargidae polychaete worms  
*Litocorsa* undesr. sp. (wFL Gulf of Mex. marine infauna)

*Loandalia* Monro, 1936 – Pilargidae polychaete worms  
*Loandalia americana* (wFL marine infauna)

*Loimia* Malmgren, 1866 1771 - Terebellidae polychaete worms, Subfamily Amphitritinae  
*Loimia crassifilis* (Grube, 1878) (HI marine infauna)

*Loimia medusa* (Savigny, 1818) (Virginian, MA marine infauna)  
*Loimia viridis* Moore, 1903 (wFL Gulf of Mex. marine infauna)

*Loimia medusa* (*Terebella m.* Savigny, 1818) (e,wFL, HI, VA marine infauna)  
*Loimia viridis* Moore (wFL Gulf of Mex., Carolinian marine infauna)

*Lugia* Quatrefages, 1865 - Phyllodocidae polychaete worms  
*Lugia uschakovi* Blake, 1992 (CA marine benthic)

*Lumbrinerides* Oresanz, 1974 - Lumbrineridae polychaete worms  
*Lumbrinerides ?acuta* (Verrill, 1875) (Gulf of Mex. marine infauna)

*Lumbrinerides ?jonesi* T.H. Perkins, 1979 (Gulf of Mex. marine infauna)  
*Lumbrinerides jonesi* T.H. Perkins, 1979 (FL marine infauna)

*Lumbrinerides platypygos* (*Lumbrineris p.* Fauchald, 1970) (sCA marine infauna)  
*Lumbrinerides verrilli* = *Lumbrineris v.*

*Lumbrineriopsis* Orensanz, 1974 - Lumbrineridae polychaete worms  
*Lumbrineriopsis paradoxa* (Saint Joseph, 1888)(Gulf of Mex. marine infauna)

*Lumbrineris* de Blainville, 1828 (= *Lumbrinereis*) - Lumbrineridae polychaete worms  
*Lumbrineris acicularum* Webster & Benedict, 1887(ME, MA marine infauna)  
*Lumbrineris acuta* Verrill (ME, MA marine infauna)

*Lumbrineris bicirrata* Treadwell, 1929 (AK,WA marine infauna)  
*Lumbrineris brevipes* (McIntosh,, 1903) (Gulf of Mex. marine infauna)

*Lumbrineris californiensis* Hartman, 1944 (AK, BC, CA, WA marine infauna)  
*Lumbrineris candida* (Treadwell, 1921) (Gulf of Mex.marine infauna)  
*Lumbrineris coccinea* (Renier, 1804) (SC, wFL Gulf of Mex., New England marine infauna)

*Lumbrineris cruzensis* Hartman, 1944 (BC, CA, WA marine infauna)  
*Lumbrineris dentata* Hartman-Schroder, 1965 (HI marine infauna)  
*Lumbrineris ernesti* Perkins, 1979 (Gulf of Mex.marine infauna)

*Lumbrineris fragilis* (Muller, 1776) (Baffin Island (neCanada), ME marine infauna)  
*Lumbrineris heteropoda* (Marenzeller, 1879) (HI marine infauna)

*Lumbrineris index* (*L. japonica i.* Moore, 1911) (sCA marine infauna)  
*Lumbrineris inflata* Moore, 1911 (sCA, HI, WA, Gulf of Mex., New England marine infauna)

*Lumbrineris impatiens* (Claparede, 1868) (SC marine infauna)  
*Lumbrineris japonica* (*Lumbriconereis j.* Marenzeller, 1879) (BC, CA marine infauna)

*Lumbrineris januarii* (Bruge, 1878) (wFL Gulf of Mex. marine infauna)  
*Lumbrineris lagunae* (WA marine infauna)



*Lumbrineris latreilli* Audouin & Milne Edwards, 1834 (BC, CA, FL, HI, WA, Gulf of Mex. , New England marine infauna)

*Lumbrineris limicola* Hartman, 1944 (BC?, CA, WA marine infauna)

■ *Lumbrineris luti* Berkeley & Berkeley, 1945 (BC, WA marine infauna)

*Lumbrineris medusa* (Verrill, 1873) (= *L. bassi*) (VA marine benthic)

*Lumbrineris minuscula* (Moore, 1911) (HI marine infauna)

*Lumbrineris pallida* Hartman, 1944 (BC, WA marine infauna)

*Lumbrineris sarsi* (Kinberg, 1865) (HI marine infauna)

■ *Lumbrineris similabris* Treadwell, 1926 (BC marine infauna)

*Lumbrineris sphaerocephala* (Schmarda, 1861) (HI marine infauna)

*Lumbrineris* undet. sp. or species (sCA, HI marine infauna)

*Lumbrineris* 5 undescr. species (Gulf of Mex. marine infauna)

*Lumbrineris tenuis* (Verrill, 1873) (LA, SC, Gulf of Mex., New England marine sandy infauna)

*Lumbrineris tetraura* (Schmarda, 1861) (CA, FL marine benthic)

*Lumbrineris verrilli* T.H. Perkins, 1979 (= *Lumbrinerides v.*) (e,wFL marine infauna)

■ *Lumbrineris zonata* (Johnson, 1901) (BC, AK, CA, WA marine infauna)

*Lycastis* = *Namalycastis*

*Lycastopsis* Augener, 1922 - Nereididae polychaete worms

*Lycastopsis augeneri* (New England marine infauna)

*Lycastopsis beaumeri* (New England marine benthic)

*Lycastopsis pontica* (Bobretzky) (MS, New England marine benthic)

*Lycastopsis tecolutlensis* Rioja, 1946 (New England marine infauna)

*Lygdamis* Kinberg, 1867 - Sabellariidae polychaete worms

*Lygdamis indicus* Kinberg, 1867 (Gulf of Mex. marine infauna)

*Lygdamis nesiototes* (Chamberlain, 1919) (HI marine infauna)

*Lysarete* Kinberg, 1865 - Oeononidae polychaete worms (once put in Lysaretidae)

*Lysarete brasiliensis* Kinberg, 1865 (Gulf of Mex. marine infauna)

*Lysidice* Savigny, 1818 - Eunicidae polychaete worms

*Lysidice ninetta* Audoin & Milne-Edwards, 1833 (HI, Gulf of Mex. marine benthic)

*Lysidice ninetta n.* (e,wFL marine infauna)

*Lysilla* Malmgren, 1866 - Terebellidae polychaete worms, Subfamily Polycirrinae

*Lysilla alba* Webster (New England marine benthic)

*Lysilla loveni* Malmgren, 1866 (BC marine benthic)

*Lysilla* 2 undescr. species (Gulf of Mex. marine infauna)

*Lysilla* undet. sp. (Carolinian marine infauna)

*Lysilla ubianensis* Caullery, 1944 (BC marine benthic)

*Lysippe* Malmgren, 1866 - Ampharetidae polychaete worms

*Lysippe* cf. *annectens* Moore, 1923 (Gulf of Mex. marine infauna)

*Lysippe labiata* Malmgren, 1866 (AK, BC, W marine infauna)

*Lysippe* undet. sp. (sCA marine infauna)

*Macrochaeta* Grube, 1850 - Acrocirridae polychaete worms

*Macrochaeta* cf. *clavicornis* (Nais c. Sars, 1835) (e,wFL marine infauna)

*Macrochaeta pege* Banse, 1969 (BC marine benthic)

*Macroclymene* Verrill, 1900 - Maldanidae polychaete worms, Subfamily Euclymeninae

*Microclymene* Arwidsoon, 1907- Maldanidae polychaete worms

*Microclymene caudata* M. Imajima & Y. Shiraki, 1982 (WA marine infauna)

*Macroclymene* undescr.? sp. (FL marine infauna)

*Macroclymene zonalis* (Verrill) (Carolinian, Virginian marine infauna)

*Magelona* Mueller, 1858 - Magelonidae polychaete worms

@*Magelona annulata* (Carolinian marine infauna)

*Magelona berkeleyi* Jones, 1971 (BC, CA, AK marine infauna)

*Magelona cincta* (LA marine infauna)

*Magelona hartmanae* Jones, 1978 (BC, CA marine infauna)

*Magelona hobsonae* Jones, 1978 (BC, CA marine infauna)

*Magelona longicornis* Johnson, 1901 (AK, BC, WA marine infauna)

*Magelona obockensis* (FL marine infauna)

*Magelona papillicornis* Muller (SC marine infauna)

*Magelona pettiboneae* Jones, 1963 (e,wFL, LA marine infauna)

*Magelona phyllisae* (SC marine infauna)

*Magelona pitelkai* Hartman, 1944(sCA marine infauna)

*Magelona polydentata* (FL marine infauna)

*Magelona riojai* Jones, 1963 (FL, CA marine infauna)

*Magelona rosea* (MD, NC, NJ, SC, VA marine infauna)

*Magelona sacculata* Hartman, 1961 (sCA, OR, WA marine infauna)

*Magelona* undet. sp. (HI marine infauna)

*Magelona* undescr. sp. A (FL, MS marine infauna)

*Magelona* undescr. sp. B (AL, FL, MS, TX marine infauna)

*Magelona* undescr. sp. C (AL, FL marine infauna)

*Magelona* undescr. sp. D (AL, FL, TX marine infauna)

*Magelona* undescr. sp. E (FL marine infauna)

*Magelona* undescr. sp. F (AL, FL marine infauna)

*Magelona* undescr. sp. F (AL, FL marine infauna)

*Magelona* undescr. sp. H (LA, MS, TX marine infauna)

*Magelona* undescr. sp. I (AL, FL, LA, MS, TX marine infauna)

*Magelona* undescr. sp. J (FL, TX marine infauna)

*Magelona* undescr. sp. K (FL marine infauna)

*Magelona* undescr. sp. L (FL, LA, TX marine infauna)

*Malacoceros* Quatrefages, 1843 - Spionidae polychaete worms

*Malacoceros* (*M.*) *fuliginosus* (Claparede, 1870) (BC, OR, WA marine infauna)

*Malacoceros* (*Rhynchospio*) *glutaeus* (Ehlers, 1897) (BC, WA marine infauna)

*Malacoceros indicus* (Fauvel, 1928) (CA marine infauna)

*Malacoceros punctata* (*Spio p.* Hartman, 1961) (CA marine infauna)

*Malacoceros* undet. sp. (HI marine infauna)

*Malacoceros vanderhorsti* (*Scolecolepis v.* Augener, 1927) (AL, FL, LA, NC, SC, TX marine infauna)

*Maldane* Grube, 1860 - Maldanidae polychaete worms, Subfamily Maldininae

*Maldane glebifex* Grube, 1860 (BC marine infauna)

*Maldane sarsi* Malgren, 1865 (AK, BC, sCA, NJ, WA marine infauna)

*Maldane* undet. sp. (FL marine benthic)

*Maldane* undescr. sp. (FL marine benthic)

*Maldanella* McIntosh, 1885 - Maldanidae polychaete worms, Subfamily Euclymeninae

*Maldanella harai* (Izuka, 1902) (BC marine benthic)

*Maldanella robusta* (Moore, 1906) (BC, WA marine infauna)

*Maldanopsis* (= *Maldane*) - Maldanidae polychaete worms

*Maldanopsis elongata* (Verrill, 1873) (ME, NY, VA marine infauna)

*Malmgreniella* Hartman, 1967 - Polynoidae polychaete worms, Subfamily Harmothoinae

*Malmgreniella baschi* M.H. Pettibone, 1993 (sCA marine infauna)

*Malmgreniella bansei* Pettibone, 1993 (BC, CA, OR, WA marine infauna)

*Malmgreniella berkeleyorum* Pettibone, 1993 (= *Harmothoe lanulata*) (CA, OR, BC, WA marine infauna)

*Malmgreniella galetaensis* M.H. Pettibone, 1993 (FL marine infauna)

*Malmgreniella liei* M.H. Pettibone, 1993 (BC, CA, OR, WA marine infauna)

*Malmgreniella macrarya* M.H. Pettibone, 1993 (Carolinian, wFL Gulf of Mex. marine infauna)

*Malmgreniella macginitiei* Pettibone, 1993 (CA, WA marine infauna)

*Malmgreniella nigralba* (*Malmgenia* n. E. Berkeley, 1923) (BC, CA, WA marine infauna)

*Malmgreniella scriptoria* (*Harmothoe* s. Moore, 1910) (BC, sCA, WA marine infauna)

*Malmgreniella* undescr. sp. (FL marine benthic)

*Malmgreniella taylori* M.H. Pettibone, 1993 (Carolinian, Virginian marine infauna)

*Manayunkia* Leidy, 1859 (= *Manukia*) (feather duster worm) - Sabellidae polychaete worms, Subfamily Fabriciinae

*Manayunkia aestuarina* (Bourne, 1887 or 1883) (hyporheic in NA streams; benthic in SC salt marsh & BC, OR, WA, Virginian marine infauna)

*Manayunkia* undet. sp. (VA tidal freshwater marsh interstitial)

*Manayunkia speciosa* Leidy, 1859 (alien E marine benthic)

*Marenzellaria* - Spionidae polychaete worms

*Marenzellaria viridis* (alien US (southern New England, NC, Virginian, & Carolinian) marine infauna)

*Mariansabellaria* D.W. Kirtley, 1994 – Sabellariidae polychaete worms

*Mariansaellaria harrisae* Kirtley, 1994 (CA marine benthic)

*Marphysa* Quatrefages, 1865 - Eunicidae polychaete worms

*Marphysa conferta* Moore, 1911 (CA, FL, NY, SC, VA, Gulf of Mex. (cf. *M.c.*) marine benthic)

*Marphysa corallina* Kinberg, 1865 (HI marine benthic)

*Marphysa disjuncta* Hartman, 1961 (CA marine benthic)

*Marphysa fallax* Marion & Bobretzky, 1875 (HI marine benthic)

*Marphysa macintoshi* Crossland, 1903 (HI marine benthic)

*Marphysa mortenseni* Monro, 1928 (alien FL, HI, NY, SC, VA, Gulf of Mex. marine benthic)

*Marphysa sanguinea* (Montagu, 1815) (alien FL, HI, NY, SC, VA, Gulf of Mex. marine benthic)

*Marphysa* undet. sp. or species (sCA, HI marine infauna)

*Mastobranchus* Eisig, 1887 - Capitellidae polychaete worms

*Mastobranchus* undescr. sp. (FL marine benthic)

*Mastobranchus variabilis* R.M. Ewing, 1984 (FL marine benthic)

***Mediomastus*** Harmann, 1944 - Capitellidae polychaete worms

***Mediomastus acutus*** Hartman, 1969 (CA marine infauna)

***Mediomastus ambiseta*** (*Capitita a.* Hartman, 1947) (AL, BC, CA, FL, HI, LA, MA, NC, NY, SC, TX, WA marine infauna & burrowing deposit feeder; PQ Gulf of St. Lawrence sandy marine interstitial)

***Mediomastus californiensis*** Hartmann, 1944 (AK, BC, CA, e,wFL, LA, NC, TX, WA marine infauna burrowing deposit feeder)

***Mediomastus*** undet. sp. or species (FL, HI, RI, sCA marine infauna)

***Megalomma*** Johansson, 1926 (= *Branchiomma* Kolliker, 1858) Sabellidae polychaete worms, Subfamily Sabellinae

***Megalomma bioculatum*** Ehlers, 1887 (Gulf of Mex. marine infauna)

***Megalomma heterops*** T.H. Perkins, 1984 (FL marine infauna)

***Megalomma intermedium*** (Montagu, 1815) (HI marine infauna)

***Megalomma pigmentum*** Reish, 1963 (e,wFL, sCA, WA marine infauna)

***Megalomma splendida*** (*Pseudopotamilla s.* Moore, 1905; *Branchiomma burrardum* E. Berkeley, 1930) (FL, sCA, WA marine infauna)

***Meiodorvillea*** Jumars, 1974 – Dorvilleidae polychaete worms

***Meiodorvillea*** 2 undescr. species (Gulf of Mex. marine benthic)

***Meiodorvillea*** undet. sp. (CA marine benthic)

***Melinna*** Malmgren, 1866 - Ampharetidae polychaete worms, Subfamily Melinninae

***Melinna cristata*** (Sars, 1851) (AK, BC, ME, NY, SC, WA, Gulf of Mex. marine infauna)

***Melinna elisabethae*** McIntosh, 1885 (AK, BC, WA marine infauna)

***Melinna heterodonta*** Moore, 1923 (sCA marine infauna)

***Melinna maculata*** Webster (e,wFL, LA, VA marine benthic)

***Melinna oculata*** Hartman, 1969 (AK, sCA, WA marine infauna)

***Melinnexis*** Annenkova, 1931 – Ampharetidae polychaete worms

***Melinnexis tentaculata*** (Treadwell, 1906) (HI marine infauna)

***Mercierella enigmatica*** Fauvel, 1923 = *Ficopomatus e.*

***Mesochaetopterus*** Potts, 1914 - Chaetopteridae polychaete worms

***Mesochaetopterus capensis*** (*Ranzania* (?) *c.* McIntosh, 1885) (AL, w,eFL marine infauna)

***Mesochaetopterus minutus*** Potts, 1914 (HI marine infauna)

***Mesochaetopterus sagittarius*** (Claparede, 1870) (HI marine infauna)

***Mesochaetopterus taylori*** Potts, 1914 (AK, CA, FL, BC, SC, TX, WA marine infauna)

*Mesochaetopterus* undet. sp. (sCA marine infauna)

*Mesonerilla* Remane, 1949 - Nerillidae polychaete worms

*Mesonerilla fagei* Swedmark, 1959 (HI marine infauna)

*Metasychis* W.J.H. Light, 1991 - Maldanidae polychaete worms, Subfamily Maldininae

*Metasychis disparidentatus* (*Asychis d.* Moore, 1904) (BC, sCA, WA marine infauna)

*Mexamage* Fauchald, 1972 - Ampharetidae polychaete worms, Subfamily Ampharetinae

*Mexamage corrugata* Fauchald, 1972 (CA marine infauna)

*Mexamage longibranchiata* (*Amage l.* Hartman, 1969) (CA marine infauna)

*Mexieulepis* Rioja, 1961 - Eulepethidae polychaete worms

*Mexieulepis weberi* (Horst, 1922) (Gulf of Mex. marine benthic)

*Micromaldane* Mesnil, 1897 - Maldanidae polychaete worms, Subfamily Nicomachinae

*Micromaldane caudata* or *Microclymene c.* (WA marine infauna)

*Micromaldane ornithochaeta* Mesnil, 1897 (BC marine benthic)

*Micronephthys* Friedrich, 1937 - Nephtyidae polychaete worms

*Micronephthys minuta* (The'el, 1879) (Gulf of Mexico marine infauna)

*Micronereis* Claparede, 1863 - Nereididae polychaete worms, Subfamily Notophycinae

*Micronereis arenaceodonta* Moore, 1903. (HI marine benthic)

*Micronereis nanaimoensis* Berkeley & Berkeley, 1953 (BC marine infauna)

*Microphthalmus* Mecznirow (=Metschinokow), 1865 - Hesionidae polychaete worms

*Microphthalmus aberrans* (Webster & Benedict 1885) (New England, WA marine interstitial)

*Microphthalmus coustalini* Fournier, 1991 (BC marine infauna)

*Microphthalmus hamosus* Westheide, 1982 (Gulf of Mex. marine infauna)

*Microphthalmus hartmanae* (FL marine infauna)

*Microphthalmus hystrix* Fournier, 1991 (BC, sCA, OR, WA marine infauna)

*Microphthalmus listensis* Westheide 1967 (NC marine infauna)

*Microphthalmus* undet. sp. or species (CA, WA marine beach interstitial)

*Microphthalmus* undescr. sp. or species (Gulf of Mex. marine beach interstitial)

*Microphthalmus szelkowitzii* Mescznikov, 1865 (MA marine caves; FL, WA, Virginian marine infauna)

*Micropodarke* Okuda, 1938 - Hesionidae polychaete worms

*Micropodarke dubia* (*Kefersteinia d.* Hessle, 1925) (AK, BC, sCA, OR, WA marine infauna)

*Microspio* Mesnil, 1896 - Spionidae polychaete worms

*Microspio granulata* J.A. Blake & J.D. Kudenov, 1978 (HI marine infauna)

*Microspio microcera* (Dorsey, 1977) (sCA marine infauna)  
*Microspio pigmentata* (*Spiophanes p.* Reish, 1959; *Nerinides p.* of Hartman, 1961) (AL, FL, LA, sCA, TX, WA marine infauna)

*Microspio* undet.sp. or species (BC, HI marine infauna)  
*Microspio spinosa* J.A. Blake, 1996 (sCA marine infauna)

*Monorchos* Treadwell, 1926 - Sabellariidae polychaete worms  
*Monorchos varians* Hartman & Fauchald, 1971 (HI marine infauna)

*Monticellina* Laubier, 1961 - Cirratulidae polychaete worms  
*Monticellina baptistea* J.A. Blake, 1991(MA marine infauna)

*Monticellina cryptica* J.A. Blake, 1996 (CA marine benthic)  
*Monticellina dorsobranchialis* (Kirkegaard, 1959) (WA, Virginian marine infauna)

*Monticellina luticastella* (Jumars, 1975) (CA marine benthic)  
*Monticellina secunda* (*Aphelochaeta s.* Banse & Hobson, 1968) (BC, CA marine benthic)  
*Monticellina serratiseta* (*Tharyx s.* Banse & Hobson, 1968) (BC, CA marine benthic)

*Monticellina sibilina* J.A. Blake, 1996 (CA marine benthic)  
*Monticellina* or *Aphelochaeta* undet. sp. (sCA marine infauna)  
*Monticellina tessellata* (*Tharyx t.* Hartman, 1960) (BC, CA, WA marine infauna)

*Mooreonuphis* Fauchald, 1982 - Onuphidae polychaete worms, Subfamily Onuphinae

*Mooreonuphis exigua* (*Nothria e.* Shisko, 1981) (CA marine infauna)  
*Mooreonuphis litoralis* (*Onuphis l.* Moore, 1911) (CA marine infauna)

*Mooreonuphis nebulosa* (*Onuphis n.* Moore, 1911) (CA marine infauna)  
*Mooreonuphis* cf. *nebulosa* (*Onuphis n.* Moore, 1911) (wFL Gulf of Mex. marine infauna)  
*Mooreonuphis pallidula* (Hartman, 1965) (Carolinian, Gulf of Mex. marine infauna)

*Mooreonuphis segmentispadix* (Shisko, 1981) (CA marine infauna)  
*Mooreonuphis stigmatis* (*Onuphis s.* Treadwell, 1922) (BC, CA, OR?, WA marine infauna)

*Mooresamytha* S.J. Williams, 1987- Ampharetidae polychaete worms, Subfamily Ampharetinae  
*Mooresamytha bioculata* (*Amphisamytha b.* Moore, 1906) (sCA, WA marine infauna)

*Mugga* Eliason, 1955 - Ampharetidae polychaete worms, Subfamily Ampharetinae  
*Mugga wahrbergi* Eliason, 1955 (CA marine infauna)

*Myrianida* H. Milne Edwards, 1845 - Syllidae polychaete worms  
*Myrianida crassicirrata* Hartmann-Schroeder, 1965 (HI marine infauna)  
*Myrianida* undescr. sp. (Gulf of Mex. marine infauna)

*Myriochele* Malmgren, 1867 - Oweniidae polychaete worms

*Myriochele gracilis* Hartman, 1955 (CA marine infauna)  
*Myriochele pygidialis* Hartman, 1960 (AK,BC marine infauna)

*Myriochele gracilis* Hartman, 1955 (CA, WA marine infauna)  
*Myriochele heeri* Malmgren, 1867 (WA marine infauna)  
*Myriochele hiruensis* Gibbs, 1971 (HI marine infauna)

*Myriochele oculata* Zachs, 1922 (wFL, LA, WA marine infauna)  
*Myriochele* undet. sp. (sCA marine infauna)

*Myriowenia* Hartman, 1960 - Oweniidae polychaete worms  
*Myriowenia californiensis* Hartman, 1960 (sCA marine infauna)

*Myriowenia oculata* Zaks, 1923 (Gulf of Mex. marine infauna)  
*Myriowenia* undescr. sp.(Gulf of Mex. marine infauna)

*Mysta* Malmgren, 1865 - Phyllodocidae polychaete worms, Subfamily Eteoninae  
*Mysta barbata* Malmgren, 1865 (*Eteone b.*) (BC, New England marine benthic)

*Mystides* Theel, 1879 - Phyllodocidae polychaete worms, Subfamily Eteoninae  
*Mystides borealis* (The'el, 1879) (BC, Gulf of Mex. marine infauna)  
*Mystides* undet. sp. (CA marine infauna)

*Myxicola* Koch in Renier, 1847 - Sabellidae polychaete worms  
*Myxicola aesthetica* (Claparede, 1870) (BC marine infauna)

*Myxicola infundibulum* (*Terebella i.* Renier, 1804) (BC, sCA, ME, WA marine infauna)  
*Myxicola* undet sp. (CA marine benthic)

*Naiades* delle Chiaje, 1830 – Alciopidae polychaete worms  
*Naiades cantrainii* delle Chiaje, 1836 (HI marine benthic)

*Naineris* Blainville, 1828 - Orbiniidae polychaete worms, Subfamily Orbiniinae  
*Naineris bicornis* Hartmann, 1951 (Gulf of Mex. marine infauna)

*Naineris bicornis minuta* Hartmann-Schroder, 1965 (HI marine infauna)  
*Naineris dendritica* (*Anthostoma d.* Kinberg, 1867) (CA, BC, Gulf of Mex. marine infauna)

*Naineris* cf. *grubei* (Gravier, 1908) (CA, Gulf of Mex. marine benthic)  
*Naineris laevigata* (Grube, 1855) (HI,Gulf of Mex. marine infauna)

*Naineris quadricuspida* (O. Fabricius, 1780) (BC, ME, WA marine infauna & NB, PQ Gulf of St. Lawrence sandy marine interstitial)

*Naineris uncinata* Hartman, 1957 (BC marine benthic)

*Namalycastis* Hartman, 1959 – Nereididae polychaete worms,



*Namalycastis abiuma* (Muller in Grube, 1871) (wFL marine infauna)

*Neanthes* Kinberg, 1866 - Nereidae polychaete worms, Subfamily Nereidinae

*Neanthes acuminata* Ehlers, 1868 (CA, FL, Gulf of Mex. marine infauna)

*Neanthes arenaceodentata* Moore, 1903 (Carolinian, Virginian marine infauna)

*Neanthes brandti* (Malgren, 1866) (BC marine benthic)

*Neanthes limnicola* Johnson, 1903 (BC, OR, WA marine benthic)

*Neanthes micromma* (Carolinian, wFL Gulf of Mex. marine infauna)

*Neanthes pelagica* Linnaeus (NJ marine benthic)

*Neanthes succinea* (*Nereis* s. Frey & Leuckart, 1847) (e,wFL, GA, HI (alien), LA, ME, MA, NJ, NC, SC, TX, VA, WA (alien?) marine infauna; Salton Sea benthic, CA)

*Neanthes virens* (*Nereis* v. Sars, 1835) (BC, CT, ME, NJ, WA marine benthic; NB, PQ Gulf of St. Lawrence sandy marine interstitial))

*Nematonereis* Schmarda, 1861 - Eunicidae polychaete worms

*Nematonereis hebes* Verrill, 1900 (wFL Gulf of Mex. marine infauna)

*Nematonereis unicornis* Schmarda, 1861 (HI marine benthic)

*Neoamphitrite* Hesse, 1917 - Terebellidae polychaete worms, Subfamily Artacaminae

*Neoamphitrite edwardsi* (Quatrefages, 1865) (BC, Gulf of Mex. marine benthic)

*Neoamphitrite* undet. sp. or species (Gulf of Mex. marine benthic)

*Neoamphitrite* undet. sp. or species (HI, WA marine benthic)

*Neodexiospira* Pillai, 1970 - Serpulidae polychaete worms

*Neodexiospira foraminosa* (Moore & Bush, 1904) (HI marine infauna)

*Neodexiospira nipponica* Okuda, 1934 (HI marine infauna)

*Neodexiospira preacuta* Vine, 1972 (HI marine infauna)

*Neodexiospira pseudocorrugata* (Bush, 1904) (HI marine infauna)

*Neoheteromastus* Hartman, 1960 - Capitellidae polychaete worms

*Neoheteromastus lineus* Hartman, 1960 (CA marine infauna)

*Neomediomastus* Hartman, 1969 - Capitellidae polychaete worms

*Neomediomastus glabrus* (Hartman, 1960) (CA marine infauna)

*Neoleprea* Hesse, 1917 - Terebellidae polychaete worms, Subfamily Artacaminae

*Neoleprea japonica* Hesse, 1917 (BC, CA, WA marine benthic)

*Neoleprea* 2 undescr. species (Gulf of Mex. marine benthic)

*Neoleprea spiralis* (Amphitrite Johnson, 1901) (BC, CA, WA marine benthic)

*Neosabellaria* D.W.Kirtley, 1994 - Sabellariidae Polychaete worms  
*Neosabellaria cementarium* (*Sabellaria c.* Moore, 1906) (BC, sCA, WA marine infauna)

*Nephtys* Cuvier, 1817 - Nephtyidae polychaete worms  
*Nephtys assignis* Hartman, 1950 (BC, CA, WA marine benthic)  
*Nephtys brachycephala* Moore, 1903 (BC, WA marine benthic)

*Nephtys bucera* Ehlers, 1868 (MA, ME, Virginian (rare) & Carolinian marine infauna)

*Nephtys caeca* (Fabricius, 1780) (AK, BC, MA, ME, OR, WA marine infauna; Baffin Island (neCanada) marine infauna; (NB, PQ Gulf of St. Lawrence sandy marine interstitial)

*Nephtys caecoides* Hartman, 1938 (BC, OR, sCA, WA marine benthic)  
*Nephtys californiensis* Hartman, 1938 (BC, OR, WA, CA marine benthic)  
*Nephtys ciliata* (Muller, 1776) (BC, ME, Baffin Island (neCanada), WA marine infauna)

*Nephtys cornuta c.* Berkeley & Berkeley, 1945 (AK, BC, sCA, WA marine infauna)  
*Nephtys cornuta franciscana* Berkeley & Berkeley, 1945 (BC, sCA marine infauna)  
*Nephtys cryptomma* D. Harper, 1986 (FL, VA marine infauna)

*Nephtys discors* (WA marine infauna)  
*Nephtys ferruginea* Hartman, 1940 (AK, BC, sCA, WA marine infauna)

*Nephtys glabra* Hartman, 1950 (WA marine infauna)  
*Nephtys incisa* Malmgren, 1865 (MA, NJ, NY, RI, SC, VA, Gulf of Mex. common marine infauna)  
*Nephtys cf. hombergii* Savigny, 1818 (wFL Gulf of Mex. marine infauna)

*Nephtys longosetosa* Oersted, 1843 (BC, WA marine benthic)  
*Nephtys magellanica* (Augener, 1912) (VA marine infauna)  
*Nephtys picta* (Ehlers) (GA, LA, NJ, SC, VA, Gulf of Mex. marine infauna)

*Nephtys punctata* Hartman, 1938 (AK, CA, WA marine infauna)  
*Nephtys rickettsi* Hartman, 1938 (BC marine benthic)

*Nephtys signifera* Hilbig, 1992 (WA marine infauna)  
*Nephtys simoni* Perkins, 1980 (BC, Gulf of Mex. marine benthic)  
*Nephtys squamosa* Ehlers, 1887 (Gulf of Mex. marine benthic)

*Nereimyra* Blaiville, 1828 – Hesionidae polychaete worms  
*Nereimyra* undescr. sp. (Gulf of Mex. marine infauna)

*Nereiphylla* Pleijel, 1991 - Phyllodocidae polychaete worms, Subfamily Notophyllinae  
*Nereiphylla castanea* (*Carobia c.* Marenzeller, 1879; *Phyllodoce* (*Genetyllis*) *c.* Berkeley & Berkeley, 1948; *G.c.* Bergstrom, 1914) (BC, sCA, Carolinian, WA marine infauna)

*Nereiphylla fragilis* (Carolinian, Virginian, Gulf of Mex. marine infauna)

*Nereis* Linnaeus, 1758 - Nereididae polychaete worms, Subfamily Nereidinae

*Nereis abbreviata* Holly, 1935 (HI (alien) marine infauna)

*Nereis arenaceodonta* Moore (= *N. caudata*) (NJ, VA marine benthic)

*Nereis* (*Neanthes*) *brandti* (Malmgren, 1866) (OR marine benthic)

*Nereis caudata* (MA marine sandy infauna)

*Nereis corallina* Kinberg, 1866 (HI (alien) marine infauna)

*Nereis cordata* (MA marine intertidal benthic)

*Nereis diversicolor* (Muller, 1766) (ME marine infauna)

*Nereis eakini* Hartman, 1936 (BC marine infauna)

*Nereis falsa* Quatrefages, 1865 (e,wFL, LA, NC marine infauna)

*Nereis grayi* Pettibone, 1956 (Gulf of Mex. marine infauna)

*Nereis grubei* (Kinberg, 1866) (CA, BC marine infauna)

*Nereis hawaiiensis* Holly, 1935 (HI marine infauna)

*Nereis jacksoni* Kinberg, 1866 (HI marine infauna)

*Nereis lamellosa* Ehlers, 1868 (FL, Gulf of Mex. marine infauna)

*Nereis latescens* Chamberlin, 1919 (sCA marine infauna)

*Nereis* (*Neanthes*) *limnicola* Johnson, 1903 (WA marine infauna)

*Nereis mariae* Holly, 1935 (HI marine infauna)

*Nereis myersi* Holly, 1935 (HI marine infauna)

*Nereis neoneanthes* Hartman, 1948 (BC marine infauna)

*Nereis pelagica* Linne<sup>♂</sup>, 1761 (AK, BC, MA, ME marine sandy infauna; NB, PQ Gulf of St. Lawrence, Gulf of Mex. sandy marine interstitial)

*Nereis procera* Ehlers, 1868 (AK, BC, sCA, WA marine infauna)

*Nereis riisei* (Virginian (rare), Carolinian, Gulf of Mex. marine infauna)

*Nereis succinea* = *Neanthes* s.

*Nereis unica* Holly, 1935 (HI marine infauna)

*Nereis vexillosa* Grube, 1851 (BC, CA, WA marine infauna)

*Nereis zonata* (AK marine infauna)

*Nereis virens* = *Neanthes* s.

*Nereis waikikiensis* Holly, 1935 (HI marine infauna)

*Nereis zonata* Malmgren (AK, Baffin Island (neCanada), CA, WA marine infauna)

*Nereis virens* = *Neanthes* v.

*Nerilla* O. Schmidt, 1848 - Nerillidae polychaete worms

*Nerilla antennata* O. Schmidt, 1848 (interstitial marine in Europe & Atlantic and Pacific NA (BC, HI, CA, WA))

*Nerilla digitata* Wisner, 1957 (BC marine infauna)

*Nerilla inopinata* Gray, 1968 (BC marine infauna)

*Nerinides* = *Pseudomalacoceros*

*Nicolea* Malmgren, 1866 - Terebellidae polychaete worms, Subfamily Artacaminae

*Nicolea venustula* (Montagu, 1818) (PQ Gulf of St. Lawrence sandy marine interstitial; ME marine infauna)

*Nicolea zostericola* (Oersted, 1844 in Grube, 1860) (BC, WA marine infauna)

*Nicomache* Malmgren, 1865 - Maldanidae polychaete worms, Subfamily Nicomachinae

*Nicomache lumbricalis* (*Sabella l.* O. Fabricius, 1780 (BC, ME, WA marine infauna; PQ Gulf of St. Lawrence sandy marine interstitial)

*Nicomache personata* Johnson, 1901 (BC, CA, WA marine infauna)

*Nicon* Kinberg, 1866 - Nereididae polychaete worms, Subfamily Nereidinae

*Nicon moniloceras* (*Leptoneris glauca m.* Hartman, 1940) (BC?, CA, Gulf of Mex. marine benthic)

*Nidificaria* - Serpulidae polychaete worms

*Nidificaria dalestraughanae* (Vine, 1972) (HI marine infauna)

*Ninoe* Kinberg, 1865 - Lumbrineridae polychaete worms

*Ninoe gemmea* Moore, 1911 (AK, CA, WA marine infauna)

*Ninoe nigripes* (MA, NY marine infauna)

*Ninoe palmata* Moore, 1903 (sCA, WA marine infauna)

*Ninoe tridentata* B. Hilbig, 1995 (sCA marine infauna)

*Nothria* Malmgren, 1866 - Onuphidae polychaete worms, Subfamily Hyalinoeciinae

*Nothria britannica* (McIntosh, 1903) (BC? marine infauna)

*Nothria elegans and iridescens* = *Onuphis e., i.*

*Nothria hawaiiensis* Pettibone 1970) (HI marine infauna)

*Nothria hawaiiensis* Pettibone 1970) (HI marine infauna)

*Nothria macrobranchiata* McIntosh, 1885 (HI marine infauna)

*Nothria occidentalis* Fauchald, 1968 (WA marine infauna)

*Notocirrus* Schmarda, 1861 - Oeonidae polychaete worms

*Notocirrus californiensis* Hartman, 1944 (BC, sCA, WA marine infauna)

*Notocirrus spiniferus* (Moore) (SC, VA marine infauna)  
*Notocirrus* undescr. sp. (Gulf of Mex. marine infauna)

*Notomastus* Sars, 1850 - Capitellidae polychaete worms (tube dwelling)  
*Notomastus americanus* J.H. Day, 1973 (sCA, e,wFL, TX estuary marine benthic)

*Notomastus (Clistomastus) anoculatus* Hartman-Schroder, 1965 (HI marine benthic)  
*Notomastus daueri* Ewing, 1982 (FL, LA, TX marine benthic)

*Notomastus giganteus* Moore, 1906 (BC, WA marine infauna)  
*Notomastus (Clistomastus) hemipodus* Hartman, 1947 (e,wFL, TX marine infauna)  
*Notomastus latericeus* M. Sars, 1850 (AK, CA, e,wFL, NJ, NY, SC, TX, VA, WA marine benthic)

*Notomastus lineatus* Claparede 1870 (sCA, FL, WA marine infauna)  
*Notomastus lobatus* Hartman, 1947 (LA, TX marine infauna)  
*Notomastus magnus* Hartman, 1947 (sCA marine infauna)

*Notomastus tenuis* Moore, 1909 (AK, BC, CA, e,wFL (cf. *N.t.*), TX?, WA marine benthic)  
*Notomastus variegatus* Berkeley & Berkeley, 1950 (BC, WA marine infauna)

*Notophyllum* Oersted, 1843 - Phyllodocidae polychaete worms, Subfamily Notophyllinae  
*Notophyllum imbricatum* Moore, 1905 (BC marine infauna)  
*Notophyllum tectum* (WA marine infauna)

*Notoproctus* Arwidsson, 1907 - Maldanidae polychaete worms, Subfamily Lumbriclymeninae  
*Notoproctus pacificus (Lumbriclymene (N.) p.* Moore, 1906) (AK, BC, sCA, WA marine infauna)

*Notopygos* Grube, 1855 – Amphinomidae polychaete worms  
*Notopygos albiseta* Holly, 1939 (HI marine infauna)

*Notopygos gergoryi* Holly, 1939 (HI marine infauna)  
*Notopygos labiatus* McIntosh, 1885 (HI marine infauna)  
*Notopygos megalops* McIntosh, 1885 (HI marine infauna)

*Novafabricia* – Sabellidae polychaete worms  
*Novafabrici* undet. sp. (CA marine benthic)

*Novaquesta* - Hobson, 1970 - Questidae polychaete worms  
*Novaquesta trifurcata* Hobson, 1970 (Gulf of Mex. marine benthic)

*Novobranchus* Berkeley & Berkeley, 1954 - Trichobranchidae polychaete worms  
*Novobranchus pacificus* Berkeley & Berkeley, 1954 (BC marine benthic)

*Odontosyllis* Claparede, 1863 - Syllidae polychaete worms, Subfamily Eusyllinae  
*Odontosyllis ctenostoma* Claparede, 1866 (HI marine benthic)

*Odontosyllis enopla* Verrill, 1900 (Carolinian, FL Gulf of Mex. marine infauna)

*Odontosyllis fragilis* J.D. Kudenov & L.H. Harris, 1995 (CA estuary marine benthic)

*Odontosyllis fulgurans* Claparede, 1863 (FL, ME, VA estuary marine benthic)

*Odontosyllis fulgurans japonica* Imajima (BC marine benthic)

*Odontosyllis gibba* (New England marine benthic)

*Odontosyllis longigulata* T.H. Perkins, 1981 (FL estuary marine benthic)

*Odontosyllis parva* Berkeley, 1923 (BC marine infauna)

*Odontosyllis octodentata* Treadwell, 1917 (Gulf of Mex. marine infauna)

*Odontosyllis phosphorea* Moore, 1909 (BC, WA, OR, sCA marine infauna)

*Oenone* Savigny, 1818 - Oeononidae polychaete worms (once put in Lysaretidae)

*Oenone fulgida* (Savigny, 1818) (HI marine infauna)

*Onuphis* Audouin & Milne-Edwards, 1833 - Onuphidae polychaete worms, Subfamily Onuphinae

*Onuphis affinis* Hilbig, 1995 (SC marine infauna)

*Onuphis conchylega* M. Sars, 1835 (Baffin Island (neCanada), New England marine infauna)

*Onuphis elegans* (AK marine infauna)

*Onuphis eremita* Audouin & Milne-Edwards, 1883 (LA, SC marine infauna)

*Onuphis eremita oculata* Hartman, 1951 (Gulf of Mex. marine infauna)

*Onuphis eremita parva* Berkeley & Berkeley, 1941 (CA marine infauna)

*Onuphis elegans* (*Northria e.* Johnson, 1901) (BC, CA, WA marine infauna)

*Onuphis geophiliformis* (*Northria e.* Moore, 1903) (BC, CA, WA marine infauna)

*Onuphis holobranchiatta* Marenzeller, 1879 (HI marine infauna)

*Onuphis iridescens* (*Northria i.* Johnson, 1901) (AK, BC, sCA, WA marine infauna)

*Onuphis jenneri* Gardiner, 1976 (SC marine infauna)

*Onuphis magna* = *Americonuphis magna*

*Onuphis microcephala* Hartman, 1944 (FL, GA, SC marine infauna)

*Onuphis multiannulata* Shisko, 1981 (CA marine infauna)

*Onuphis opalina* (New England marine infauna)

*Onuphis pallida* (*Nothria p.* More, 1911) (CA marine infauna)

*Onuphis quadricuspis* (New England marine infauna)

*Onuphis simoni* Santos, Day & Rice (FL marine infauna)

*Onuphis* undet. sp. (NY marine infauna)

*Ophelia* Savigny, 1818 - Ophelidae polychaete worms (tube dwelling), Subfamily Opheliinae

*Ophelia* cf. *acuminata* Oersted, 1843 (Gulf of Mex. marine benthic)

*Ophelia assimilis* (Treadwell, 1914) (OR marine benthic)

*Ophelia bicornis* Savigny, 1818 (ME marine benthic)

*Ophelia cylindricaudata* (Hanese, 1874) (Gulf of Mex. marine benthic)

*Ophelia denticulata* Verrill (ME, NC, Gulf of Mex. marine infauna burrower)

*Ophelia limacina* (Rathke, 1843) (BC, WA marine infauna)

*Ophelia pulchella* Tebble, 1953(sCA marine infauna)

*Ophelina* Oersted, 1843 - Ophelidae polychaete worms (tube dwelling), Subfamily Ophelininae

*Ophelina acuminata* Oersted, 1843 (*Ammotrypane aulogaster* Rathke, 1843) (AK, BC, sCA, WA marine infauna)

*Ophelina aulogaster* Rathke, 1843 (AK, ME marine infauna)

*Ophelina breviata* (Ehlers, 1913) (AK, WA marine infauna)

*Ophelina* undet. sp. (HI marine infauna)

*Ophiodromus* Sars, 1861 - Hesionidae polychaete worms

*Ophiodromus pugettensis* (*Podarke p.* Johnson, 1901) (AK, BC, sCA, HI, OR, WA marine infauna)

*Ophiodromus* undescr. sp. (Gulf of Mex. marine infauna)

*Ophioglycera* Verrill, 1885 - Goniadidae polychaete worms

*Ophioglycera gigantea* Verrill, 1885 (NJ, New England marine benthic)

*Ophioglycera* undescr. sp. (wFl Gulf of Mex. marine infauna)

*Ophryotrocha* Claparede & Mecznirow, 1869 Iphitimidae polychaete worms (once in Dorvilleidae)

*Ophryotrocha puerilis* Claparede & Mecznirow, 1869 (FL marine benthic)

*Ophryotrocha* undescr. sp. (Gulf of Mex. marine infauna)

*Ophryotrocha* undet. sp. or species (sCA, HI, WA marine infauna)

*Ophryotrocha* undescr. sp. (wFL Gulf of Mex. infauna)

*Ophryotrocha vivipara* Banse, 1990 (BC marine infauna)

*Opisthodonta* Langerhans, 1879 - Syllidae polychaete worms, Subfamily Eusyllinae

*Opisthodonta mitchelli* J.D. Kudenov & L.H. Harris, 1995 (CA estuary marine benthic)

*Opisthosyllis* Langerhans, 1879 - Syllidae polychaete worms

*Opisthosyllis brunnea* Langerhans, 1879(HI marine benthic)

*Opisthosyllis corallicola* Hartmann-Schroder, 1965 (HI marine benthic)

*Opisthosyllis papillosa* Hartmann-Schroder, 1960 (HI marine benthic)

***Orbinia*** Quatrefages, 1865 - Orbiniidae polychaete worms

***Orbinia americana*** Day, 1973 (Gulf of Mex. marine infauna)

***Orbinia felix*** (AK marine infauna)

***Orbinia johnsoni*** (*Aricia j.* Moore, 1909) (CA marine benthic)

***Orbinia michaelsoni*** (New England marine benthic)

***Orbinia norvegica*** (Sars) (NJ, New England marine benthic)

***Orbinia*** (*Aricia*) ***ornata*** (ME, NC marine benthic)

***Orbinia riseri*** (Pettibone, 1957) (wFL Gulf of Mex. marine infauna)

***Orbinia sertulata*** (Savigny, 1820) (New England marine benthic)

***Orbinia*** undet. sp. (WA marine infauna)

***Orbiniella*** Day, 1954 - Orbiniidae polychaete worms, Subfamily Protoariciinae

***Orbiniella nuda*** Hobson (BC marine infauna)

***Oriopsis*** Caullery & Mesnil, 1896 - Sabellidae polychaete worms, Subfamily Sabellinae

***Oriopsis gracilis*** Hartman, 1969 (BC marine benthic)

***Oriopsis minuta*** (Berkeley & Berkeley, 1932) (BC marine benthic)

***Otopsis*** Ditlevsen, 1917 - Pilargidae polychaete worms, Subfamily Sigambrinae

***Otopsis longipes*** Ditlevsen, 1917 (BC marine benthic)

***Owenia*** delle Chiaje, 1841 - Oweniidae polychaete worms

***Owenia collaris*** Hartman, 1955 = *O. fusiformis*

***Owenia fusiformis*** Delle Chiaje, 1841 (*O. collaris* Hartman, 1969; *O. fusiformis collaris* Hartman, 1955) (AK, BC, CA, LA, NY, SC, Virginian, WA marine infauna)

***Paleanotus*** Schmarda, 1861 - Phyllodocidae polychaete worms (also put in Palmyridae & Chrysopetalidae)

***Paleanotus bellis*** (*Heteropale b.* Johnson, 1897) (AK, BC, sCA, WA marine infauna)

***Paleanotus heteroseta*** Hartman, 1945 (SC, VA, Gulf of Mex. marine benthic)

***Paleanotus*** undet. sp. (HI marine infauna)

***Palola*** Gray, 1847 - Eunicidae polychaete worms

***Palola siciliensis*** (Grube, 1840) (HI marine benthic)

***Palpithitima*** Orensanz, 1990 - Iphitimidae polychaete worms

***Palpithitima*** undet. sp. (BC marine benthic)

***Panthalis*** Kinberg, 1855 - Acoetidae (=Polyodontidae) polychaete worms

***Panthalis mutilata*** (Treadwell, 1940) (HI marine infauna)

***Paradexiospira*** Caullery & Mesnil, 1897 - Spirorbidae polychaete worms, Subfamily Circeinae



*Paradexiospira violacea* (*Spirorbis* (*P.*) v. Levinsen, 1883) (BC marine infauna)  
*Paradexiospira vitrea* (*Spirorbis* (*Spirorbides*) v. Fabricius, 1780) (BC marine infauna)

*Paradiopatra* Ehlers, 1887 - Onuphidae polychaete worms  
*Paradiopatra parva* (*Onuphis* p. Moore, 1911) (sCA marine infauna)

*Paradoneis* Hartman, 1965 - Paraonidae polychaete worms  
*Paradoneis eliasoni* Mackie, 1991 (sCA marine infauna)

*Paradoneis lyra* (*Paranois* l. Southern, 1914) (BC, CA, WA marine infauna)  
*Paradoneis spinifera* (*Paraonella* s. Hobson, 1972) (BC, sCA, WA marine infauna)

*Parahesion* Pettibone, 1956 - Hesionidae polychaete worms  
*Parahesion luteola* (Webster) (Virginian (rare), e,wFL, SC, New England marine infauna)

*Paralacydonia* Fauvel, 1913 - Lacydoniidae polychaete worms  
*Paralacydonia paradoxa* Fauvel, 1913 (New England marine benthic)  
*Paralacydonia* undescr. sp. (Gulf of Mex. marine benthic)

*Paralepidonotus* Jorst, 1915 - Terebellidae polychaete worms  
*Paralepidonotus ampulliferus* (Grube, 1878) (HI marine infauna)

*Paralysippe* S.J. Williams, 1987 - Ampharetidae polychaete worms, Subfamily Ampharetinae  
*Paralysippe scutata* (Moore, 1923) (CA marine infauna)

*Paramage* Caullery, 1944 - Ampharetidae polychaete worms  
*Paramage scutata* (*Amage* s. Moore, 1923) (sCA marine infauna)

*Paramarphysa* Ehlers, 1887 - Eunicidae polychaete worms  
*Paramarphysa* undet. sp. (HI marine benthic)

*Paramphinome* Sars, 1869 - Amphinomidae polychaete worms  
*Paramphinome pulchella* (Sars) (FL, New England marine benthic)  
*Paramphinome* undescr. species (FL, Gulf of Mex. (2 species) marine benthic)

*Paranaitis* Southern, 1914 - Phyllodocidae polychaete worms, Subfamily Phyllodocinae  
*Paranaitis gardineri* T.H. Perkins, 1984 (FL marine infauna)  
*Paranaitis kosteriensis* (Malmgren) (New England marine infauna)

*Paranaitis polynoides* (*Anaitis* p. Moore, 1909) (sCA, wFL Gulf of Mexico, WA marine infauna)

*Paranaitis speciosa* (Webster, 1880) (FL, Gulf of Mex., NJ, VA, New England marine benthic)  
*Paranaitis wahlbergi* (WA marine infauna)

*Parandalia* Emerson & Fauchald, 1971- Pilargidae polychaete worms  
*Parandalia americana* (LA marine infauna)

*Parandalia fauveli* (*Loandalia f.* Berkeley & Berkeley, 1941) (AK, LA, WA marine infauna)

*Parandalia ocularis* Emerson & Fauchald, 1971 (CA, TX marine infauna)

*Parandalia* undescr. sp. (Gulf of Mex. marine infauna)

*Parandalia* undet. sp. (sCA marine infauna)

*Paraninoe* Levenstein, 1977 - Lumbrineridae polychaete worms

*Paraninoe fusca* (*Ninoe f.* Moore, 1911) (CA marine benthic)

*Paranothria* Kinberg, 1855 – Onuphidae polychaete worms

*Paranothria macrobranchiata* (HI marine infauna)

*Paraonella* Strelzov, 1973 - Paraonidae polychaete worms

*Paraonella platybranchia* (Hartman, 1961) (BC, CA, OR, WA marine infauna)

*Paraonella spinifera* = *Paradoneis s.*

*Paraonis* Cerruti, 1909 - Paraonidae polychaete worms

*Paraonis fulgens* (Levinsen, 1884) (e,wFL, LA, SC, Virginian, New England marine infauna)

*Paraonis gracilis* (Tauber, 1879) (CA, New England marine infauna)

*Paraonis lyra* Southern (New England marine infauna)

*Paraonis pygoenigmatica* Jones, 1968 (Gulf of Mex. marine infauna)

*Paraonis* undet. sp. (NY marine infauna)

*Parasphaerosyllis* Monro, 1937 - Syllidae polychaete worms

*Parasphaerosyllis indica* Monro, 1937 (HI marine benthic)

*Parapionosyllis* Fauvel, 1923 – Syllidae polychaete worms

*Parapionosyllis gestans* (ew England marine infauna)

*Parapionosyllis longicirrata* (Webster & Benedict, 1884) (Carolinian, Virginian, wFL Gulf of Mex., New England marine infauna)

*Parapionosyllis minuta* (ew England marine infauna)

*Parapionosyllis* undescr. sp. (Gulf of Mex. marine infauna)

*Paraprionospio* Caullery, 1914 - Spionidae polychaete worms

*Paraprionospio pinnata* (*Prionospio p.* Ehlers, 1901; *Paraprionospio tribranchiata* E. Berkeley, 1927; *Prionospio alata* Moore, 1923) (AL, BC, sCA, FL, LA, MS, SC, TX, VA, WA marine infauna)

*Paraprionospio pygmaea* (Hartman, 1961) (CA, Virginian marine infauna)

*Paraprionospio* undescr. sp. (FL Gulf of Mex. marine infauna)

*Pareurythoe* Gustafson, 1930 - Amphinomidae polychaete worms

*Pareurythoe americana* Hartman, 1951 (FL marine benthic)

*Pareurythoe californica* (*Eurythoe californica* Johnson, 1897)(CA marine benthic)

*Parheteromastus* Monro, 1937 - Capitellidae polychaete worms

*Parheteromastus* undet. sp. (HI marine infauna)

*Parinereis* Kinberg, 1866 - Nereididae polychaete worms, Subfamily Nereidinae

*Parinereis cultifera floridana* Iwajima, 1972 (HI marine infauna)

*Parinereis curvata* Holly, 1935 (HI marine infauna)

*Parinereis helleri* Grube, 1878 (HI marine infauna)

*Parinereis monterea* (Chamberlin, 1918) (BC marine benthic)

*Parinereis nigropunctata* (Horst, 1889) (HI marine benthic)

*Parinereis* undet. sp. (HI marine benthic)

*Parophryotrocha* Hartmann-Schroder, 1971 - Dorvilleidae polychaete worms

*Parophryotrocha brevicapititis* Hilbig, 1995 (CA marine infauna)

*Parougia* Wolf, 1986 - Dorvilleidae polychaete worms

*Parougia batia* (Jumars, 1974) (= *Dorvillea c.*) (sCA marine infauna)

*Parougia brevipalpa* Hilbig & Ruff, 1990 (sCA marine infauna)

*Parougia caeca* (Webster & Benedict, 1884) (= *Dorvillea c.*) (Virginian (rare), BC, sCA, WA marine infauna)

*Pectinaria* Malmgren, 1866 (= *Cystenides*) Pectinariidae polychaete worms (also put in Amphictenidae)

*Pectinaria californiensis* Hartman, 1941 (CA, BC, WA marine infauna)

*Pectinaria gouldii* (Verrill, 1873) (e,wFL, MA, ME, NJ, NY, RI, TX, VA marine benthic)

*Pectinaria granulata* (AK, WA marine infauna)

*Pectinaria regalis* (Verrill, 1901)(WA marine infauna)

*Peisidice* = *Pholoides*

*Peresiella* Harmelin, 1968 - - Capitellidae polychaete worms

*Peresiella* undescr. sp. (FL marine infauna)

*Perolepis* – Polynoidae polychaete worms

*Perolepis* undet. sp. (Gulf of Mex. marine infauna)

*Petaloclymene* K.D. Green, 1997 – Maldanidae polychaete worms

*Petaloclymene pacifica* Green, 1997 (CA marine infauna)

*Petaloproctus* Quatrefages, 1865 - Maldanidae polychaete worms, Subfamily Nicomachinae

*Petaloproctus borealis* = *P. tenuis b.*

*Petaloproctus neoborealis* Hartman, 1969 (CA marine benthic)

*Petaloproctus socialis* Anderws, 1891 (NC marine benthic)

*Petaloproctus* undescr.? sp. (e,wFL marine infauna)

*Petaloproctus* undet sp. or species (sCA, wFL Gulf of Mex. marine infauna)

*Petaloproctus tenuis* (*Maldane t.* Theel, 1879) (BC, WA marine infauna)

*Petaloproctus tenuis borealis* (*P.b.* Arwidsson, 1907) (BC, CA, WA marine infauna)

*Petititia* Siewing, 1955 - Syllidae polychaete worms

*Petititia amphophthalama* Siewing, 1955(CA marine beach interstitial)

*Pettiboneia* Orensanz, 1973 - Dorvilleidae polychaete worms

*Pettiboneia duofurca* P.S. Wolf, 1987 (Carolinian, wFL Gulf of Mex. marine infauna)

*Pettiboneia pugettensis* (Armstrong & Jumars, 1978) (BC, WA marine infauna)

*Pettiboneia* 3 undescr. species (Gulf of Mex. marine benthic)

*Pettiboneia* undet. sp. (CA marine benthic)

*Phalacrostemma* Marenzeller, 1895 - Sabellidae polychaete worms

*Phalacrostemma setosa* (Treadwell, 1906) (HI marine infauna)

*Pherecardia* Horst, 1886 - Amphinomidae polychaete worms

*Pherecardia striata* (Kinberg, 1857) (HI marine benthic)

*Pherusa* Oken, 1807 (= *Trophonia*) Flabelligeridae polychaete worms

*Pherusa affinis* (= *Trophonia a.*) (ME, NY, Virginian marine infauna)

*Pherusa capulata* (*Trophonia c.* Moore, 1909) (sCA marine infauna)

*Pherusa havaica* (Kinberg, 1867) (HI marine infauna)

*Pherusa inflata* (*Trophonia i.* Treadwell, 1914) (sCA marine infauna)

*Pherusa negligens* (Berkeley & Berkeley, 1950) (BC marine infauna)

*Pherusa papillata* (Johnson, 1901) (sCA marine infauna)

*Pherusa neopapillata* Hartman, 1961 (sCA marine infauna)

*Pherusa plumosa* (*Stylarioides p.* O.F. Muller, 1776) (AK, BC, NJ, WA marine infauna)

*Pholoe* Johnston, 1839 - Pholoidae polychaete worms

*Pholoe asperus* (*Peisidice aspera* Johnson, 1897; *Paraeupholoe fimbriata* Hartmann-Schroder, 1962; *Paraeupholoe tuberculata* Hartmann-Schroder, 1965) (sCA marine infauna)

*Pholoe glabra* Hartman, 1961 (sCA, SC marine infauna)

*Pholoe inflata* (SC marine infauna)

*Pholoe minuta* (Fabricius, 1780) (AK, Baffin Island (neCanada), CA, NY, New England, Gulf of St. Lawrence (NB, PQ), WA marine infauna)

*Pholoides* Pruvot, 1895 - Pholoidae polychaete worms

*Pholoides bermudensis* (Hartman & Fauchald, 1971) (Gulf of Mex. marine benthic)

*Pholoides asperus* (*Peisidice aspera* Johnson, 1897) (BC, sCA, AK, WA marine infauna)

*Phragmatopoma* Moerch, 1863 - Sabellariidae polychaete worms

*Phragmatopoma californica* (*Sabellaria c.* Fewkes, 1889) (CA marine infauna)

*Phragmatopoma moerchi* Kinberg, 1867 (HI marine infauna)

*Phylo* Kinberg, 1866 – Orbiniidae polychaete worms

*Phylo felix* Kinberg, 1866 (WA, Gulf of Mex. marine infauna)

*Phyllochaetopterus* Grube, 1863 - Chaetopteridae polychaete worms

*Phyllochaetopterus claparedii* McIntosh, 1885 (BC, WA marine infauna)

*Phyllochaetopterus* undet. sp. (HI marine infauna)

*Phyllochaetopterus limicolus* Hartman, 1960 (sCA marine infauna)

*Phyllochaetopterus prolifica* Potts, 1914 (BC, sCA, WA marine infauna)

*Phyllochaetopterus socialiis* (Claparede, 1870) (HI marine benthic)

*Phyllochaetopterus verrilli* Treadwell, 1943 (HI marine benthic)

*Phyllodoce* Savigny, 1818 - Phyllodocidae polychaete worms, Subfamily Phyllodocinae

*Phyllodoce arenae* (Webster, 1879) (FL, LA, MA, NJ, SC, Gulf of Mex., VA marine benthic; PQ Gulf of St. Lawrence, New England sandy marine interstitial)

*Phyllodoce castanea* (Marenzeller) (FL marine benthic)

*Phyllodoce cuspidata* (*P. (Anaitides) c.* McCammon & Montagne, 1979) (sCA, WA marine infauna)

*Phyllodoce badia* Malmgren, 1867 (New England marine benthic)

*Phyllodoce citrina* Malmgren, 1865 (BC marine infauna)

*Phyllodoce fragilis* Webster (FL marine benthic)

*Phyllodoce (Anaitides) groelandica* Oersted, 1842 (BC, Baffin Island (neCanada), CA, MA, ME, SC, WA marine infauna)

*Phyllodoce (Aponaitides) hartmanae* Blake & Walton, 1977 (AK, BC, CA, WA marine infauna)

*Phyllodoce (P.) hiatti* Hartman, 1966) (HI marine infauna)

*Phyllodoce kosteriensis* = *Paranaitis kosteriensis*

*Phyllodoce laminosa* Lamarck or Savigny, 1818 (New England marine benthic)

*Phyllodoce (Anaitides) longipes* (*Anaitides l.* Kinberg, 1866) (BC, CA, FL, WA marine infauna)

*Phyllodoce (Anaitides) maculata* (Linnaeus, 1767) (BC, NJ, WA, New England, Gulf of St. Lawrence (PQ) marine infauna)

*Phyllodoce (Anaitides) madeirensis* (Langerhans, 1880) (HI marine infauna)

*Phyllodoce (Anaitides) medipapillata* Moore, 1909 (BC, CA, OR?, WA marine infauna)

*Phyllodoce (Anaitides) mucosa* Oersted, 1843 (Carolinian, WA, New England marine infauna)

*Phyllodoce multiseriata* Rioja, 1941 (BC, CA, WA marine infauna)

*Phyllodoce mucosa* Oersted = *Anaitides m.*

*Phyllodoce (Anaitides) madeirensis* (Langerhans, 1880) (HI marine infauna)

*Phyllodoce panamensis* (SC marine infauna)

*Phyllodoce (Anaitides) papillosa* (WA marine infauna)

*Phyllodoce pettiboneae* J. A. Blake, 1988 (WA marine infauna)

*Phyllodoce parva* (Hartman-Schroder, 1965) (HI marine infauna)

*Phyllodoce (P.) tenerai* Grube, 1878 (HI marine infauna)

*Phyllodoce* undet. species (HI marine benthic)

*Phyllodoce williamsii* (Hartman, 1936) (AK, CA, BC, WA marine infauna)

*Phylo* Kinberg, 1866 - Orbiniidae polychaete worms, Subfamily Orbiniinae

*Phylo felix* Kinberg, 1866 (BC, WA, CA, New England marine benthic)

*Phylo nudus* (New England marine benthic)

*Phylo ornatus* (New England marine benthic)

*Pilargis* Saint-Joseph, 1899 - Pilargidae polychaete worms

*Pilargis berkeleyae* Monro, 1933 (= *P. berkeleyi* Monro, 1933) (BC, sCA, Gulf of Mex. marine infauna)

*Pilargis maculata* (AK, WA marine infauna)

*Pileolaria* Claparede, 1868 - Spirorbidae polychaete worms, Subfamily Pileolariinae (also put in Serpulidae)

*Pileolaria (P.) berkeleyana* (Rioja, 1942) (BC marine infauna)

*Pileolaria dalestraughanae* Vine, 1972 (= *Spirorbis (P.) langerhansi*) (BC marine infauna)

*Pileolaria (Simplicaria) potswaldi* Knight-Jones, 1978 (BC marine infauna)

*Pileolaria militaris* (Claparede, 1868) (HI marine infauna)

*Pileolaria pseudoclavus* Vine, 1972 (HI marine infauna)

*Pileolaria semimilitaris* Vine, 1972 (HI marine infauna)

*Pionosyllis* Malgren, 1867 - Syllidae polychaete worms, Subfamily Eusyllinae

*Pionosyllis articulata* Kudenov & Harris, 1995 (CA marine infauna)  
*Pionosyllis gesae* T.H. Perkins, 1981 (FL, Gulf of Mex. marine benthic)

*Pionosyllis gigantea* Moore, 1908. (BC, WA marine infauna)  
*Pionosyllis magnifica* Moore, 1906. (CA marine infauna)

*Pionosyllis* undet. sp. or species (HI, sCA marine infauna)  
*Pionosyllis uraga* Imagina, 1908 (BC, CA, OR?, WA marine infauna)  
*Pionosyllis weismanni* Longerhans, 1879 (Gulf of Mex. marine infauna)

*Piromis* Kinberg, 1867 - Flabelligeridae polychaete worms  
*Piromis eruca* (Claperede, 1869) (BC, SC marine benthic)

*Piromis hospitis* (Fauchald, 1972) (BC, SC marine benthic)  
*Piromis roberti* Kinberg, 1867 (e,wFL, LA, Virginian marine infauna)

*Pisione* Grube, 1857 - Pisionidae polychaete worms  
*Pisione africana* Day, 1963 (HI marine infauna)

*Pisione remota* (*Praegeria r.* Southern, 1914) (CA, FL, Gulf of Mex. WA marine beach interstitial, psammonbiotic)

*Pisionidens* Aiyar & Alikunhi, 1943 - Pisionidae polychaete worms  
*Pisionidens indica* (Aiyar & Alikunhi, 1940) (HI marine infauna)

*Pista* Malmgren, 1866 - Terebellidae polychaete worms, Subfamily Artacaminae  
*Pista alata* Hartman, 1969 (sCA marine infauna)  
*Pista bansei* Saphronova, 1988 (AK, BC, WA marine infauna)

*Pista brevibranchiata* Moore, 1923 (BC, WA marine infauna)  
*Pista cristata* (O.F. Muller, 1776) (AK, BC, FL, NJ, Gulf of Mex. marine benthic)

*Pista dibranchis* Gibbs, 1971 (HI marine infauna)  
*Pista disjuncta* Hartman, 1969 (*P. fasciata* of authors SCB not (Grube, 1870) (sCA, WA, Gulf of Mex. marine infauna)

*Pista elongata* Moore, 1909 (*P. maculata* Marenzeller, 1884; *P. marenzelleri* Hesse, 1917)  
(BC, CA, WA marine infauna)

@*Pista eschrichti* (AK marine infauna)  
*Pista estevanica* (Berkeley & Berkeley, 1942) (BC, WA marine infauna)  
*Pista expansa* (Treadwell, 1906) (HI marine infauna)

*Pista fasciata* Hartman, 1969 = *P. disjuncta*  
*Pista moorei* Berkeley & Berkeley, 1942 (BC, sCA, WA marine infauna)  
*Pista pacifica* (Berkeley & Berkeley, 1942) (BC, WA marine infauna)

*Pista palmata* (Verrill, 1873) (FL, NJ, NY, SC, Gulf of Mex. marine benthic)

@*Pista paracrista* (WA marine infauna)

*Pista quadrilobata* Augenir, 1918 (Carolinian, LA, e,wFL marine infauna)

*Pista wui* Saphronova, 1988 (AK, CA, BC, WA marine infauna)

*Placostegus* Philippi, 1844 – Serpulidae polychaete worms

*Placostegus californicus* Hartman, 1969 (CA marine infauna)

*Plakosyllis* Hartmann-Schroeder, 1956 - Syllidae polychaete worms

*Plakosyllis quadrioculata* T.H. Perkins, 1981 (e,wFL marine infauna)

*Platynereis* Kinberg, 1866 - Nereidae polychaete worms, Subfamily Nereidinae

*Platynereis australis* (New England marine infauna)

*Platynereis abnormis* Horst, 1924 (HI marine infauna)

*Platynereis bicanaliculata* (*Nereis b.* Baird, 1863) (AK, BC, sCA, HI, WA marine infauna)

*Platynereis dumerilii* (*Nereis d.* Audouin & Milne-Edwards, 1833) (CA, e,wFL, HI, NJ, New England marine benthic)

*Platynereis massillensis* (New England marine infauna)

@*Platynereis pestai* (HI marine benthic)

*Platynereis pulchella* Gravier, 1901 (HI marine benthic)

*Platynereis tongabuensis* McIntosh, 1885 (HI marine benthic)

*Podarke* Ehlers, 1864 - Hesionidae polychaete worms

*Podarke agilis* (New England marine benthic)

*Podarke caecas* (New England marine benthic)

*Podarke pugettensis* = *Ophiodromus p.*

*Podarke obscura* Verrill (e,wFL, Gulf of Mex., NJ, NY, SC, VA, New England marine benthic)

*Podarkeopsis* Laubier, 1961- Hesionidae polychaete worms

*Podarkeopsis brevipalpa* (*Gyptis b.* Banse & Hobson, 1968) (AK, BC, FL, LA, Gulf of Mex., Virginian, SC marine infauna)

*Podarkeopsis glabrus* (*Oxydromus arenicolus glabrus* Hartman, 1961) (= *Gyptis brevipalpa*) (AK, BC, sCA, OR, WA marine infauna)

*Podarkeopsis levifuscina* Perks, 1984 (eFL & wFL Gulf of Mex., Mid-Atlantic (somewhere sNJ to nSC) marine infauna)

*Poecilochaetus* - Claparede, 1875 - Poecilochaetidae polychaete worms

*Poecilochaetus johnstoni* Hartman, 1939 (AL, e,wFL, LA, MS, sCA, TX marine infauna)

*Poecilochaetus* undescr. sp. (e,wFL marine infauna)



***Polycirrus*** Grube, 1850 - Terebellidae polychaete worms, Subfamily Polycirrinae

***Polycirrus albicans*** (Malmgren, 1865) (Gulf of Mex. marine benthic)

***Polycirrus californicus*** Moore, 1909 (AK, CA, BC, WA marine infauna)

***Polycirrus carolinensis*** J.H. Day, 1973 (Carolinian, wFL Gulf of Mex. marine infauna)

***Polycirrus* cf. *denticulatus*** Saint Joseph, 1894) (Gulf of Mex. marine benthic)

***Polycirrus eximius*** (Leidy, 1855) (MA, ME, NJ, SC, VA, marine infauna & NY surface deposit feeder)

***Polycirrus eximius dubius*** Day, 1973 (Gulf of Mex. marine infauna)

***Polycirrus haematodes*** (Claparede, 1864) (Gulf of Mex. marine benthic)

***Polycirrus medusa*** Grube, 1950 (NJ marine benthic)

***Polycirrus plumosus*** (Wollebaek, 1912) (Gulf of Mex. marine benthic)

***Polycirrus* undet. sp. or species** (sCA, NY, HI, Virginian marine infauna)

***Polycirrus* 2 undescr. species** (wFL Gulf of Mex. marine infauna)

***Polydora*** Bosc, 1802 - Spionidae polychaete worms

***Polydora aggregata*** Blake, 1969 (TX (cf), WA marine infauna)

***Polydora anoculata*** (Moore, 1907) (FL marine infauna)

***Polydora armata*** Langerhans, 1980 (HI, WA marine infauna)

***Polydora biocipitalis*** Blake & Woodwick, 1972 (CA marine infauna)

***Polydora brachycephala*** Hartman, 1936 (BC, WA marine infauna)

***Polydora brevipalpa*** Zachs, 1933 (CA marine infauna)

***Polydora cardalia*** E.Berkeley, 1927 (BC, WA marine infauna)

***Polydora caulleryi*** Mesnil, 1897 (AL, CA, FL, TX marine infauna)

***Polydora cirrosa*** Rioja, 1943 (CA marine infauna)

***Polydora colonia*** Moore (Virginian marine infauna)

***Polydora commensalis*** = *Dipolydora c.*

***Polydora (Polydora) cornuta*** Bosc, 1802 (*P. amaricola* Hartman, 1936; *P. ciliatum* of A. Agassiz, 1867, not Johnston, 1838; *C. ligni* Webster, 1879; *P. littorea* Verrill, 1881)(CA, BC, FL, LA, NJ, MA, SC, TX, VA, WA marine infauna; PQ Gulf of St. Lawrence sandy marine interstitial)

***Polydora giardi*** Mesnil, 1896 = *Dipolydora g.*

***Polydora cirrosa*** Rioja, 1939 (CA marine infauna)

***Polydora cornuta*** Bose, 1802 (= *Polydora ligni*) (alien US (AL, LA, OR, TX, WA, Virginian) marine infauna)

***Polydora hartmanae*** Blake, 1971 (Carolinian marine infauna)

***Polydora heterochaeta*** Rioja, 1939 (CA marine infauna)

***Polydora kaneohe*** Ward, 1981 (HI marine infauna)

***Polydora ligni*** = *P. (P.) cornuta*

***Polydora limicola*** Annenkova, 1934 (AK, CA, WA marine infauna)

***Polydora muchalis*** Woodwick, 1953 (alien CA marine infauna)

***Polydora narica*** Light, 1969 (CA marine infauna)

***Polydora pilikia*** Ward, 1981 (HI marine infauna)

***Polydora pygidialis*** Blake & Woodwick, 1972 (CA, BC, WA marine infauna)

*Polydora quadrilobata* = *Dipolydora q.*

***Polydora rickettsi*** Woodwick, 1961 (CA marine infauna)

*Polydora socialis* = *Dipolydora s.*

***Polydora spongicola*** Berkeley & Berkeley, 1950 (BC, CA, WA marine infauna)

***Polydora*** undet. or undescr. sp. or species (AK, sCA, ME, TX marine infauna)

***Polydora websteri*** Hartmann, 1943 (CA, HI (alien), e,wFL, Virginian, WA marine infauna, PQ Gulf of St. Lawrence sandy marine interstitial)

***Polyeunoa*** McIntosh, 1885 - Polynoidae polychaete worms, Subfamily\_Polynoinae

***Polyeunoa tuta*** (Grube, 1855) (AK, BC marine infauna)

***Polygordius*** Schneider, 1868 - Polygordiidae polychaete worms

***Polygordius*** undet sp. or species (CA, ME, Virginian (rare), Carolinian, WA marine infauna)

***Polynoe*** Savigny, 1818 - Polynoidae polychaete worms Subfamily\_Polynoinae

***Polynoe acanellae*** (BC, New England marine benthic)

***Polynoe canadensis*** (McIntosh, 1874) (BC, New England marine infauna)

***Polynoe gracilis*** (Verrill, 1874) (BC, New England marine infauna)

***Polynoe tarasovi*** Annenkova, 1937 (New England marine benthic)

***Polyodontes*** Renier, 1832 – Acoetidae polychaete worms (also put in Polyodontidae)

***Polyodontes lupinus*** (Stimpson, 1856) (Gulf of Mex. marine benthic)

***Polyodontes panamensis*** (*Panthalis p.* Chamberlin, 1919) (CA marine benthic)

***Polyophthalmus*** Quatrefages, 1850 – Opheliidae polychaete worms

***Polyophthalmus pictus*** (*Nais p.* Dujardin, 1839) (CA, HI marine infauna)

***Pomatoleios*** Pixell, 1913 - Serpulidae polychaete worms

***Pomatoleios kraussii*** (Baird, 1865 (HI (alien) marine infauna)

***Pontogenia*** Claparede, 1868 - Aphroditidae polychaete worms

@*Pontogenia bartschi* (wFL Gulf of Mex. marine infauna)

*Pomatoceros* Philippi, 1844 – Serpulidae polychaete worms

*Pomatoceros americanus* J.H. Day, 1973 (wFL Gulf of Mex. marine infauna)

*Potamethus* Chamberlin, 1919 - Sabellidae polychaete worms

*Potamethus elongates* (Treadwell, 1906) (HI marine infauna)

*Potamethus* undescr. sp. (Gulf of Mex. marine infauna)

*Potamethus* undet. sp. (WA marine infauna)

*Potamilla* Malmgren, 1866 - Sabellidae polychaete worms, Subfamily Sabellinae

*Potamilla neglecta* (Sars, 1851) (BC, WA marine infauna)

*Potamilla intermedia* (Moore, 1905) (BC, WA marine infauna)

*Potamilla myriops* Marenzeller, 1884 (BC, WA marine infauna)

*Potamilla ocellata* Moore, 1905 (AK, BC, WA marine infauna)

*Potamilla reniformis* (Muller, 1771) (Virginian (rare), ME, Gulf of Mex. (cf. *P.r.*) marine infauna)

*Potamilla* undet. sp. (HI (alien?) marine infauna)

*Potamethus* Chamberlin, 1919 - Sabellidae polychaete worms

*Potamethus* undet. sp. (sCA marine infauna)

*Pottsipelogenia* M.H. Pettibone, 1997 – Sigalionidae polychaete worms

*Pottsipelogenia treadwelli* M.H. Pettibone, 1997 (HI marine infauna)

*Praxillella* Verrill, 1881 - Maldanidae polychaete worms, Subfamily Euclymeninae

*Praxillella affinis* (Sars, 1861) (AK, BC, WA marine infauna)

*Praxillella gracilis* (*Clymene* g. M. Sars, 1861) (AK, CA, WA, New England marine infauna)

*Praxillella pacifica* E. Berkeley, 1929 (BC, WA marine infauna)

*Praxillella praetermissa* (Malmgren, 1866) (BC, WA marine infauna)

*Praxillella* undet. sp. (HI marine infauna)

*Praxillura* Verrill, 1880 - Maldanidae Polychaete worms

*Praxillura maculata* Moore, 1923 (BC, sCA, WA marine infauna)

*Prionospio* Malmgren, 1867 - Spionidae polychaete worms

*Prionospio* (*Minuspio*) *cirrifera* Wire'n, 1883 (= *M.c.*) (AL, FL, HI, LA, MA, MS, SC, TX marine infauna)

*Prionospio* (*Minuspio*) *cirrobranchiata* Day, 1961 (FL, SC, TX marine infauna)

*Prionospio* (*Prionospio*) *crystata* Foster, 1971 (FL, LA marine benthic)

*Prionospio dubia* Day, 1961 (= *P. malmgreni* var. *d.* Day, 1961)(CA marine infauna)  
*Prionospio (Apoprionospio) dayi* (A. d. Foster, 1969) (FL, Gulf of Mex. marine infauna)

*Prionospio (Prionospio) ehlersi* Fauvel, 1928 (sCA marine infauna)  
*Prionospio (Prionospio) fallax* Soderstrom, 1920 (AL, FL, Gulf of Mex., HI marine infauna)  
*Prionospio (Prionospio) heterobranchia* Moore, 1907 (CA, FL, LA, SC, VA marine intertidal infauna)

*Prionospio (Prionospio) jubata* Blake, 1996 (CA, WA marine infauna)  
*Prionospio (Minusprio) lighti* Maciolek, 1985 (= *P. (Minusprio) cirrifera* of Light, 1977, not Wiren, 1883)(AK, BC, sCA, VA, WA marine infauna)

*Prionospio malmgreni* Claparede, 1870 (VA marine infauna)

*Prionospio (Prionospio) marsupialia* Blake, 1996 (CA marine infauna)  
*Prionospio (Minusprio) multibranchiata* Berkeley, 1927 (AK, BC, CA, OR, WA marine infauna)  
*Prionospio perkinsi* N.J. Maciolek, 1985 (FL, Virginian marine infauna)

*Prionospio (Minusprio) perkinsi* N.J. Mackiolek, 1985 (Carolinian, Virginian, FL Gulf of Mex. marine infauna)

*Prionospio pinnata* Ehlers, 1901 (CA marine infauna)  
*Prionospio (Apoprionospio) pygmaea* (A. p. Foster, 1969) (sCA, e,wFL, LA, TX, WA, Virginian marine infauna)

*Prionospio (Minusprio) undescr. sp.* (FL marine infauna)  
*Prionospio undet. sp.* (HI marine infauna)

*Prionospio (Prionospio) steenstrupi* (*P. s.* Malmgren, 1867) (AL, AK, BC, CA, e,wFL, LA, MA, NY, TX, WA marine infauna & surface deposit feeder)

*Proceraea* Ehlers, 1864 - Syllidae polychaete worms, Subfamily Autolytinae  
*Proceraea cornuta* (Agassiz, 1862) (BC, CA, Carolinian, Virginian, WA, Gulf of Mex. marine infauna)

*Proceraea fasciata* = *Autolytus fasciatus*  
*Proceraea prismatica* (Fabricius, 1776) (BC marine infauna)  
*Proceraea trilineata* (Berkeley & Berkeley, 1945) (BC marine infauna)  
*Proceraea undet. sp. or species* (sCA marine infauna)

*Proclea* Saint-Joseph, 1894 - Terebellidae polychaete worms, Subfamily Artacaminae  
*Proclea graffi* (Langerhans, 1884) (BC, WA marine infauna)  
*Proclea undet. sp.* (sCA marine infauna)

*Prophyllodoce* Hartman, 1966 - Phyllodocidae polychaete worms  
*Prophyllodoce hawaiiia* Hartman, 1966 (HI marine infauna)

*Protleodora* Pillai, 1970 1868 - Spirorbidae polychaete worms, Subfamily Pileolariinae  
*Protleodora asperata* (Bush, 1904) (*Spirorbis (Romanchella) medius*) (BC marine infauna)

*Protocirrineris* - Cirratulidae polychaete worms  
*Protocirrineris socialis* J. Blake, 1996 (CA marine infauna)

*Protodorvillea* Pettibone, 1961 - Dorvilleidae polychaete worms  
*Protodorvillea bifida* Perkins, 1979 (wFL Gulf of Mex. infauna)  
*Protodorvillea gaspeensis* Pettibone, 1961 (PQ Gulf of St. Lawrence sandy marine interstitial)

*Protodorvillea gracilis* (Hartman, 1938) (AK, BC, sCA, WA marine infauna)  
*Protodorvillea kefersteini* (Carolinian, Gulf of Mex. marine infauna)

*Protodriloides* Jouin, 1966 - Protodrilidae polychaete worms  
*Protodriloides chaetifer* (Remane, 1926) (BC, CA, Europe & Atlantic marine beach interstitial)

*Protodrilus* Hatschek, 1880 - Protodrilidae polychaete worms  
*Protodrilus chaetifer* Remane, 1926 = *Protodriloides c.*

*Protodrilus flabelliger* Wieser, 1957 (BC, WA marine infauna, interstitial)  
*Protodrilus gelderi* Riser, 1997 (MA marine interstitial)

*Protolaeospira* Pixell, 1912 - Spirorbidae polychaete worms, Subfamily Romanchellinae  
*Protolaeospira capensis* Day, 1961 (BC, HI marine infauna)  
*Protolaeospira eximia* (Bush, 1904) (*Spirorbis (P.) Ambilateralis*; *S. (P.) racemosa*) (BC, CA marine infauna)

*Protomystides* Czerniavsky, 1882 - Phyllodocidae polychaete worms  
*Protomystides bidentata* Langerhans, 1879 (Gulf of Mex. marine benthic)  
*Protomystides* undet. sp. (CA marine benthic)

*Protula* Saint-Joseph, 1894 - Serpulidae polychaete worms, Subfamily Protulinae  
*Protula atypha* Bush, 1904 (HI marine infauna)

*Protula pacifica* Pixell, 1912 (BC marine benthic)  
*Protula* undescr. or undet. sp. (Gulf of Mex. marine benthic)  
*Protula superba* Moore, 1909 (*P. tubularia* Berkeley & Berkeley, 1941) (CA marine benthic)

*Psammolyce* Kinberg, 1855 - Sigalionidae polychaete worms  
*Psammolyce ctenidophiora* Day, 1973 (Gulf of Mex. marine benthic)

*Pseudampharete* - Polynoidae polychaete worms  
*Pseudampharete mexicana* (*Subadyte m.* Fauchald, 1972) (sCA marine infauna)

*Pseudatherospio* Lavell, 1994 - Spionidae polychaete worms  
*Pseudatherospio fauchaldi* Lovell, 1994 (CA marine infauna)

*Pseudeurythoe* Fauvel, 1932 = *Linopherus*

*Pseudobranchiomma* Jones, 1962 - Sabellidae polychaete worms  
*Pseudobranchiomma* undet. sp. (Carolinian marine infauna)

*Pseudochitinopoma* Zibrowius, 1969 - Serpulidae polychaete worms, Subfamily Hyalopomatinae

*Pseudochitinopoma occidentalis* (Bush, 1904) (BC, WA marine infauna)

*Pseudofabriciola* Fitzhugh, 1990 – Sabellidae polychaete worms  
*Pseudofabriciola* undet. sp. (CA marine benthic)

*Pseudomalacoceros* Czerniavsky, 1881 - Spionidae polychaete worms  
*Pseudomalacoceros agilis* (MA marine intertidal benthic)

*Pseudonereis* Kinberg, 1866 - Nereidae polychaete worms  
*Pseudonereis anomala* Gravier, 1901 (HI marine benthic)  
*Pseudonereis gallapagensis* Kinberg, 1866 (HI marine benthic)

*Pseudopolydora* Czerniavsky, 1881 - Spionidae polychaete worms  
*Pseudopolydora antennata* (Claparede, 1870) (HI marine infauna)  
*Pseudopolydora corallicola* Woodwick, 1964 (HI marine infauna)

*Pseudopolydora kemp* (alien OR, WA marine infauna)  
*Pseudopolydora kemp japonica* Imagima & Hartman, 1964 (CA, WA marine infauna)  
*Pseudopolydora paucibranchiata* (*Polydora p.* Okuda, 1937) CA, WA marine infauna tube builder; alien US marine infauna))

*Pseudopolydora* undet. 3 species (Carolinian marine infauna)

*Pseudopotamilla* Bush, 1905 - Sabellidae polychaete worms  
*Pseudopotamilla socialis* Hartman, 1944 (CA marine infauna)  
@*Pseudopotamilla tortuosa* (Carolinian marine infauna)

*Pseudovermilia* Bush, 1907 – Serpulidae polychaete worms  
*Pseudovermilia occidentalis* (McIntosh, 1885) (HI, Gulf of Mex. marine infauna)

*Pterocirrus* Claparede, 1868 - Phyllodocidae polychaete worms, Subfamily Eteoninae  
*Pterocirrus californiensis* (*Sige californiensis* Chamberlin, 1919) (CA marine infauna)

*Pterocirrus macroceros* (Grube, 1860) (AK, BC, Gulf of Mex., WA marine infauna)  
*Pterocirrus montereyensis* (*Sige m.* Hartman, 1936) (CA marine infauna)

*Pulliella* Fauvel, 1929 - Capitellidae polychaete worms  
*Pulliella* undet. sp. (HI? marine infauna)

*Pygospio* Claparede, 1863 - Spionidae polychaete worms  
*Pygospio californicus* Ward, 1981 (HI, OR, WA marine infauna)

*Pygospio elegans* Claparede, 1863 (= *Spio rathbuni*) (BC, MA, ME, OR, WA (alien) marine benthic; NB, PQ Gulf of St. Lawrence sandy marine interstitial)

*Pygospio muscularis* Ward, 1981 (HI marine infauna)

*Pygospioopsis* Blake, 1983 - Spionidae polychaete worms  
*Pygospioopsis occipitalis* Blake, 1983 (CA marine benthic)

*Questa* Hartman, 1966 - Questidae polychaete worms  
*Questa caudicirra* Hartman, 1966 (BC, Gulf of Mex. marine benthic)  
*Questa* undescr. (wFL Gulf of Mex. marine infauna)

*Ramex* Hartman, 1963 - Terebellidae polychaete worms  
*Ramex californiensis* (Hartman, 1944)(CA marine infauna)

*Ramphobranchium* Ehlers, 1887 (= *Rhamphobranchium*) Onuphidae polychaete worms  
*Ramphobranchium atlanticum* Day, 1973 (Gulf of Mex. marine benthic)

*Ramphobranchium diversosetosum* Moore, 1937 (Gulf of Mex. marine benthic)  
*Rhamphobranchium longisetosum* Berkeley & Berkeley, 1938 (sCA marine infauna)  
*Ramphobranchium* undescr. sp. (Gulf of Mex. marine benthic)

*Raphidrilus* Monticelli, 1910 - Ctenodrilidae polychaete worms, Subfamily Raphidrilinae  
*Raphidrilus* undet. sp. (BC marine benthic)

*Raricirrus* Hartman, 1961 – Ctenodrilidae polychaete worms (also put in Cirratulidae)  
*Raricirrus maculatus* Hartman, 1961 (CA, WA marine infauna)  
*Raricirrus* undescr. sp. (CA marine infauna)

*Rhinothelepus* Hutchings, 1974 – Terebellidae polychaete worms, Subfamily Thelepodinae  
*Rhinothelepus* undescr. sp. (Gulf of Mex. marine benthic)

*Rhodine* Malmgren, 1865 - Maldanidae polychaete worms, Subfamily Rhodininae  
*Rhodine bitorquata* Moore, 1923 (AK, BC, sCA, WA marine infauna)  
*Rhodine gracilior* Tauber, 1879 (PQ Gulf of St. Lawrence sandy marine interstitial)

*Rhodopsis* Bush, 1905 - Serpulidae polychaete worms  
*Rhodopsis pusilla* Bush, 1905 (marine cave interstitial off HI)

*Rhynchospio* Hartman, 1936 - Spionidae polychaete worms  
*Rhynchospio arenicola* = *R. glutaea*

*Rhynchospio glutaea* (*Scolecoplepis* g. Ehlers, 1897; *R. arenicola* Hartman, 1936; *Scolecoplepis cornifera* Ehlers, 1913) (CA, East Coast marine infauna)

*Rhynchospio* undet. sp. (HI marine infauna)

*Rullierinereis* Pettibone, 1971 - Nereididae polychaete worms

*Rullierinereis mexicana* (Treadwell, 1942) (NC marine infauna)

*Rullierinereis* undescr. sp. (Gulf of Mex. marine infauna)

*Sabaco* Kinberg, 1867 - *Maldanidae polychaete worms*

*Sabaco elongatus* (bamboo worm/ alien E. marine infauna)

*Sabella* Linnaeus, 1767 - Sabellidae polychaete worms

*Sabella crassicornis* Sars (AK, NY marine infauna)

*Sabella melanostigma* Schmarda, 1861 (Gulf of Mex. marine infauna)

*Sabella microphthalma* = *Demonax m.*

*Sabella pavonina* Savigny, 1822 (PQ Gulf of St. Lawrence sandy marine interstitial)

*Sabella* undescr. sp. (Gulf of Mex. marine infauna)

*Sabella* undet. sp. (HI marine infauna)

*Sabellaria* Savigny, 1818 - Sabellariidae polychaete worms

*Sabellaria cementaium* Hartman, 1944 (AK marine infauna)

*Sabellaria floridensis* Hartman, 1944 (Carolinian, LA, FL marine infauna)

*Sabellaria* undescr. sp. (Gulf of Mex. marine infauna)

*Sabellaria vulgaris* Verrill (NC, VA marine infauna)

*Sabellastarte* Kroyer, 1856 - Sabellidae polychaete worms, Subfamily Sabellinae

*Sabellastarte indica* (Savigny, 1818) (HI marine infauna)

*Sabellastarte sanctijosephi* Gravier, 1906 (HI marine infauna)

*Sabellastarte* undet. sp. or species (BC, WA marine benthic)

*Sabellides* H. Milne Edwards in Malmgren, 1966 - Ampharetidae polychaete worms

*Sabellides manriquei* S.I.Salazar Vellejo, 1996 (sCA marine infauna)

*Sabellides octocirrata* (Sars, 1835)(Gulf of Mex. marine infauna)

*Sabellides* undescr. sp. (Gulf of Mex. marine infauna)

*Saccocirrus* Bobretzky, 1872n - Saccocirridae polychaete worms

*Saccocirrus eroticus* Gray, 1969 (BC, WA marine infauna)

@*Saccocirrus glabriellae* (BC marine infauna)

*Saccocirrus* undet. or undescr. sp. (Gulf of Mex. marine infauna)

*Saccocirrus* undet. sp. (CA marine infauna)

*Salmacina* Claparede, 1870 - Serpulidae polychaete worms, Subfamily Filograninae



*Salmacina dysteri* (Huxley, 1855) (HI (alien) marine infauna)

*Salmacina* undescr. Sp. (Gulf of Mex. marine infauna)

*Salmacina tribranchiata* (Moore, 1923) (BC, CA marine benthic)

*Samytha* Malgren, 1866 - Ampharetidae polychaete worms, Subfamily Ampharetinae

*Samytha californiensis* Hartman, 1969 (sCA, WA marine infauna)

*Samytha* undet. sp. (AK marine infauna)

*Samythella* Verrill, 1873 - Ampharetidae polychaete worms

*Samythella eliasoni* J.H. Day, 1973 (NC marine infauna)

*Sarsonuphia* Fauchald, 1982 – Onuphidae polychaete worms

*Sarsonuphia hartmanae* (Kirkegaard, 1980) (Gulf of Mex. marine benthic)

*Scalibregma* Rathke, 1843 - Scalibregmatidae polychaete worms

*Scalibregma inflatum* Rathke, 1843 (AK, BC, sCA, NY, WA marine infauna)

*Schistocomus* Chamberlin, 1919 - Ampharetidae polychaete worms, Subfamily Ampharetinae

*Schistocomus hiltoni* Chamberlin, 1919 (BC, CA, WA marine infauna)

*Schistomeringos* Jumars, 1974 - Dorvilleidae polychaete worms

*Schistomeringos pectinata* T.H. Perkins, 1979 (LA, Gulf of Mex. marine benthic)

*Schistomeringos rudolphi* (*Dorvillea* r. Dell Chiaje, 1828; *Stauronereis* r., *S. angolana*) (FL, Gulf of Mex. (cf. *S.r.*), New England marine benthic)

*Schistomeringos* undet sp. or species (HI, TX marine benthic)

*Schistomeringos* undescr. species (Gulf of Mex. marine benthic)

*Scionella* Moore, 1903 - Terebellidae polychaete worms, Subfamily Artacaminae

*Scionella japonica* Moore, 1903 (BC, CA, WA marine benthic)

*Sclerobregma* Hartman, 1965 - Scalibregmatidae polychaete worms

*Sclerobregma inflatum* Rathke, 1843 (Gulf of Mex. marine benthic)

*Sclerobregma stenocera* Hartman, 1965 (FL marine benthic)

*Sclerobregma stenocerum* Bertelsen & Weston, 1980 (Gulf of Mex. marine benthic)

*Sclerocheilus* Grube, 1863 - Scalibregmatidae polychaete worms

*Sclerocheilus* undescr. sp. (FL marine benthic)

*Scolecoides* Ehlers, 1907 - Spionidae polychaete worms

*Scolecoides viridis* (Verrill) (GA (brackish), Virginian (rare), CT, MA marine intertidal infauna)

*Scolelepis* Blainville, 1828 - Spionidae polychaete worms

***Scoelepis* (*Nerinides*) *bousfieldi*** Pettibone, 1963 (VA marine infauna)

***Scoelepis* (*S.*) *foliosa*** (Audouin & Milne-Edwards, 1833 (BC, WA marine infauna)

***Scoelepis* (*Scoelepis*) *occidentalis* (*Nerine foliosa* o. Hartman, 1961)** (sCA marine infauna)

***Scoelepis* (*Scoelepis*) *squamata*** (*Lumbricus* s. Mueller, 1806; *L. cirratulus* delle Chiaje, 1828; *Nerinides acuta* of Hartman, 1960; *Spio a.* readwell, 1914) (BC, FL marine infauna; PQ Gulf of St. Lawrence sandy marine interstitial)

***Scoelepis squamata*** (Muller, 1806) (HI, NC, WA marine infauna)

***Scoelepis* (*Scoelepis* or *Parascoelepis*) *texana*** Foster, 1971 (Carolinian, AL, CA, FL, LA, Virginian marine infauna)

***Scoelepis tridentata*** (*Nerinides t.* Southern, 1914) (sCA marine infauna)

***Scoletoma*** Blainville, 1828 - Lumbrineridae polychaete worms

***Scoletoma fragilis*** (Muller, 1776) (WA marine infauna)

***Scoletoma luti*** ("*Lumbrineris*" *luti* Berkeley & Berkeley, 1945) (AK, CA marine infauna)

***Scoletoma tenuis*** (Verrill, 1873) (Virginian, Carolinian marine infauna)

***Scoletoma tetraura*** (Schmarda, 1861) (CA marine infauna)

***Scoletoma verrilli*** (Carolinian marine infauna)

***Scolopella*** Day, 1963 - Orbiniidae polychaete worms, Subfamily Orbiniinae

***Scolopella*** undet. sp. (SC marine infauna)

***Scoloplos*** Blainville, 1828 - Orbiniidae polychaete worms (tube dwelling), Subfamily Orbiniinae

***Scoloplos* (*S.*) *acmeceps*** Chamberlin, 1919 (CA, BC, LA, WA, Gulf of Mex. marine infauna)

***Scoloplos acmeceps profundus*** (WA marine infauna)

***Scoloplos acutus*** (ME marine infauna)

***Scoloplos* (*S.*) *armigera*** (O.F. Muller, 1776) (AK, BC, sCA, MA, WA marine infauna)

***Scoloplos capensis*** (Day, 1961) (Gulf of Mex. marine infauna)

***Scoloplos fragilis*** Verrill (LA, ME, NJ marine infauna)

***Scoloplos kerguelensis*** (New England marine infauna)

***Scoloplos pugettensis*** = *Leiotoscoloplos p.*

***Scoloplos robustus*** Verrill (LA, NJ, VA marine infauna)

***Scoloplos* (*Leodamas*) *rubra*** (Webster, 1879) (w,eFL, LA, SC, Virginian marine infauna)

***Scoloplos* (*Scoloplos*) *riseri*** Pettibone, 1957 (New England marine infauna)

***Scoloplos* (*Scoloplos*) *schmitti*** Pettibone, 1957 (New England marine infauna)

*Scoloplos* undet. sp. (NC & PQ Gulf of St. Lawrence sandy marine interstitial)

*Scoloplos texana* Maciolek & Holland, 1978 (TX marine infauna)

*Scoloplos treadwelli* Eisinger, 1978 (TX marine infauna)

*Scyphoproctus* Gravier, 1904 - Capitellidae polychaete worms

*Scyphoproctus djiboutiensis* Gravier, 1906 (HI marine infauna)

*Scyphoproctus oculatus* Reish, 1959 (CA marine infauna)

*Scyphoproctus platyproctus* Jones, 1961 or undescr. sp. (FL, AL marine infauna)

*Scyphoproctus* undet. sp. or species (HI? & wFL Gulf of Mex. marine infauna)

*Semivermilia* Imagima, 1978 - Serpulidae polychaete worms

*Semivermilia pomatostegoides* (Zibrowius, 1969) (HI marine infauna)

*Serpula* Linnaeus, 1758 - Serpulidae polychaete worms, Subfamily Serpulinae

*Serpula columbiana* Johnson, 1901 (BC marine benthic)

*Serpula* undet. or undescr. sp. (Gulf of Mex. marine benthic)

*Serpula vermicularis* Linnaeus, 1758 (CA, HI, WA marine infauna)

*Shinkai* Miura & Laubier, 1990 - Polynoidae polychaete worms

*Admetella longipedata* = *Shinkai l. longipedata* T. Miura & AS. Ohta, 1991 (= ?*Admetella l.*)  
(HI marine infauna)

*Sigalion* Audouin & Milne-Edwards, 1832 - Sigalionidae polychaete worms

*Sigalion arenicola* Verill, 1879 (Virginian (rare), New England marine infauna)

*Sigalion mathildae* Audouin & Milne-Edwards in Cuvier, Fournier & Levings, 1830 (sCA, WA, New England marine infauna)

*Sigalion spinosus* (*Eusigalion s.* Hartman, 1939; *Thalanessa s.* Hartman, 1969) (sCA marine infauna)

*Sigambra* O.F. Mueller, 1858 - Pilargidae polychaete worms, Subfamily Sigambrinae

*Sigambra bassi* (Hartman, 1945 or 1947) (Virginian (rare), e,w,FL, LA, SC, WA marine infauna)

*Sigambra parva* (Day, 1963) (HI marine infauna)

*Sigambra tentaculata* (*Ancistrosyllis t.* Treadwell, 1941) (BC, e,wFL, sCA, LA, NY, SC marine infauna)

*Sige* Malmgren, 1865 - Phyllodocidae polychaete worms, Subfamily Eteoninae

*Sige bifoliata* Moore, 1909 (BC, WA marine infauna)

*Sige macrocirrus orientalis* = *Eulalia macrocirrus*

*Sige* undet. sp. (sCA marine infauna)

*Simplicaria* Knight-Jones, 1973 - Serpulidae polychaete worms (also treated as subgenus of *Pileolaria*)

*Simplicaria pseudomilitaris* (Thiriot-Quievreux, 1965) (HI marine infauna)

*Sosane* Malmgren, 1866 - Ampharetidae polychaete worms

*Sosane occidentalis* (Hartman, 1969) (sCA marine infauna)

*Sosane sulcata* Malmgren, 1865 (Gulf of Mex. marine infauna)

*Sosanopsis* Hessle, 1917- Ampharetidae polychaete worms, Subfamily Ampharetinae

*Sosanopsis hesslei* Banse, 1979 (BC marine benthic)

*Sosanopsis wireni* Hessle, 1917 (CA marine benthic)

*Sphaerephesia* Fauchald, 1972 - Sphaerodoridae polychaete worms

*Sphaerephesia* undet. sp. (CA marine benthic)

*Sphaerephesia* undesr. sp. (Gulf of Mex. marine benthic)

*Sphaerodoridium* Luetzen, 1961 - Sphaerodoridae polychaete worms

*Sphaerodoridium* undesr. sp. (Gulf of Mex. marine benthic)

*Sphaerodoropsis* Hartman & Fauchald, 1971 - Sphaerodoridae polychaete worms

*Sphaerodoropsis minuta* (*Ephesia m.* Webster & Benedict, 1887) (BC, CA, WA, OR?, WA marine benthic & PQ Gulf of St. Lawrence sandy marine interstitial)

*Sphaerodoropsis sphaerulifer* (Moore, 1909) (AK, BC, CA, WA, OR marine benthic)

*Sphaerodoropsis* undesr. sp. (Gulf of Mex. marine benthic)

*Sphaerodorum* Oersted, 1843 - Sphaerodoridae polychaete worms

*Sphaerodorum flavum* (New England marine infauna)

*Sphaerodorum gracilis* (New England marine infauna)

*Sphaerodorum papillifer* Moore, 1909 (BC, WA marine infauna)

*Sphaerosyllis* Claparede, 1863 - Syllidae polychaete worms, Subfamily Exogoninae

*Sphaerosyllis aciculata* T.H. Perkins, 1981 (e,wFL marine infauna)

*Sphaerosyllis bilineata* Kudenov & Harris, 1995 (Northeast Pacific marine benthic)

*Sphaerosyllis* (*S.*) *bilobata* Perkins, 1981 (Carolinian, FL Gulf of Mex. marine infauna)

*Sphaerosyllis brandhorsti* Hartmann-Schroder, 1965 (WA marine infauna)

*Sphaerosyllis brevidentata* T.H. Perkins, 1981 (FL marine benthic)

*Sphaerosyllis californiensis* Hartman, 1966 (BC, CA, WA marine infauna)

*Sphaerosyllis capensis* Hartman-Schroder, 1960 (HI marine benthic)

*Sphaerosyllis centroamericana* Hartman-Schroder, 1959 (HI marine benthic)

***Sphaerosyllis erinaceus*** Claparede, 1863 (TX estuary marine interstitial)

***Sphaerosyllis* (*Prosphaerosyllis*) *glandulata*** T.H. Perkins, 1981 (e,wFL, LA marine infauna)  
***Sphaerosyllis hystrix*** Claparede, 1863 (BC marine benthic)

***Sphaerosyllis labyrinthophila*** S.L. Gardiner & W.H. Wilson, Jr., 1979 (Carolinian, wFl Gulf of Mex., LA marine infauna)

***Sphaerosyllis longicauda*** Webster & Benedict, 1887 (e,wFL, LA marine infauna)  
***Sphaerosyllis perkinsi*** Webster & Benedict, 1887 (Carolinian marine infauna)

***Sphaerosyllis* (*Sphaerosyllis*) *piriferopsis*** T.H. Perkins, 1981 (e,wFL marine infauna)  
***Sphaerosyllis ranunculus*** Kudenov & Harris, 1995 (CA, WA, Northeast Pacific marine benthic)  
***Sphaerosyllis riseri* (*Prosphaerosyllis*)** T.H. Perkins, 1981 (FL marine benthic)

***Sphaerosyllis*** undet. sp. (sCA marine infauna)  
***Sphaerosyllis sublaevis*** Ehlers, 1913 (HI marine infauna)

***Sphaerosyllis taylori*** T.H. Perkins, 1981 (e,wFL marine interstitial?; LA marine benthic; Virginian marine infauna)

***Spinospaera*** Hessle, 1917 – Terebellidae polychaete worms, Subfamily Amphitritinae  
***Spinospaera oculata*** Hartman, 1944 (CA marine benthic)

***Spinther*** Johnston, 1845- Spintheridae polychaete worms  
***Spinther citrinus*** (Stimpson, 1854) (ME marine infauna)

***Spinther japonicus*** Imajima & Hartman, 1964 (HI marine infauna)  
***Spinther oniscoides*** Johnston, 1845 (New England marine infauna)

***Spio*** Fabricius, 1785 - Spionidae polychaete worms  
***Spio butleri*** Berkeley & Berkeley, 1954 (BC, WA marine infauna)  
***Spio cirrifera*** Banse & Hobson, 1968 (BC, WA marine infauna)

***Spio filicornis* (*Nereis f.* O.F.Muller, 1766)** (BC, CA, HI, WA marine infauna)  
***Spio limicola*** Verrill, 1879 (MA marine infauna)  
***Spio maciolekae*** J.A. Blake, 1996 (sCA marine infauna)

***Spio maculata* (*Nerinides m.* Hartman, 1961)** (sCA marine infauna)  
***Spio* (*Spio*) *pettiboneae*** Foster, 1971 (S.p. Day, 1973) (AL, FL, HI, Virginian (rare), TX marine infauna)

***Spio*** undet. sp. or species (sCA, HI marine infauna)  
***Spio setosa*** (Verrill, 1873) (DE, MA, MD, ME, NC, NJ, VA marine infauna)

***Spiochaetopterus*** Sars, 1853 - Chaetopteridae polychaete worms

*Spiochaetopterus costarum* (Claparede, 1868) (AK, AL, BC, sCA, FL, LA, SC, TX, WA common marine infauna)

*Spiophanes* Grube, 1869 - Spionidae polychaete worms

*Spiophanes anoculata* Hartman, 1960 (sCA marine infauna)

*Spiophanes berkeleyorum* Pettibone, 1962 (AK, BC, CA, HI, WA marine infauna)

*Spiophanes bombyx* (*Spio b.* Claparede, 1870) (AL, CA, BC, sCA, DE, FL, GA, HI, LA, MS, LA, NC, SC, TX, VA, WA marine intertidal infauna)

*Spiophanes duplex* (Chamberlin, 1919) (*S. missionensis* Hartman, 1941) (AL, sCA, FL, LA, MS, TX, WA marine infauna)

*Spiophanes fimbriata* Grube, 1860 (sCA marine infauna)

*Spiophanes kroyeri* Grube, 1860 (AL, CA, BC, FL, LA, TX marine infauna)

*Spiophanes missionensis* = *S. duplex*

*Spiophanes* undescr. sp. (TX marine infauna)

*Spiophanes wigleyi* Pettibone, 1962 (AL, sCA, FL, HI, LA, SC, TX marine infauna)

*Spirobranchus* Blainville 1817 - Serpulidae polychaete worms

*Spirobranchus giganteus* (Pallas, 1766) (HI marine infauna/ Christmas tree worms)

*Spirobranchus giganteus corniculatus* Grube, 1862 (HI marine infauna)

*Spirobranchus laticapus* Marenzeller, 1885 (HI marine infauna)

*Spirobranchus* undet. sp. (CA marine caves/feather duster worm)

*Spirorbis* Daudin, 1800 - Spirorbidae polychaete worms, Subfamily Spirorbinae (also put in Serpulidae)

*Spirorbis bifurcatus* Knight-Jones, 1978 (BC marine infauna)

*Spirorbis borealis* Daudin, 1800 (ME marine infauna)

*Spirorbis marioni* (Caullery & Mesnil, 1897) (HI marine infauna)

*Spirorbis* undet. sp. or species (CA marine cave; AK marine infauna)

*Spirorbis spirillum* = *Dexiospira s.*

*Spirorbis spirorbis* (Linne<sup>♁</sup>, 1758) (PQ Gulf of St. Lawrence sandy marine interstitial)

*Staurocephalus* Grube, 1855 - Dorvilleidae polychaete worms

*Staurocephalus rudolfi* (New England marine benthic)

*Stauronereis* = *Schistomeringos*

*Steggoa* Bergstroem, 1914 – Phyllodocidae polychaete worms

*Steggoa* undet. sp. (WA marine infauna)

*Sthenolepis* Pettibone, 1971 - Sigalionidae polychaete worms

*Sthenolepis* cf. *grubei* (Treadwell, 1901) (Gulf of Mex. marine benthic)

*Stenomitereis* Wesenberg-Lund, 1958 - Nereididae polychaete worms

*Stenomitereis martini* Wesenberg-Lund, 1958(NC marine infauna)

*Sternaspis* Otto, 1821 - Sternaspidae polychaete worms

*Sternaspis fossor* Stimpson, 1854 (*S. affinis* Sstimpson, 1864) (sCA marine infauna)

*Sternaspis scutata* (Renier, 1807 (AK, BC, CA, ME, WA marine infauna)

*Sternaspis* undet. sp. (HI marine benthic)

*Sthenelais* Kinberg, 1855 - Sigalionidae polychaete worms

*Sthenelais articulata* (New England marine infauna)

*Sthenelais berkeleyi* Pettibone, 1971 (BC, CA, WA marine infauna)

*Sthenelais boa* (Johnston, 1883) (= *S. picta*) (NJ, SC, Virginian, New England marine benthic)

*Sthenelais fusca* Johnson, 1897 (sCA marine infauna)

*Sthenelais limicola* Ehlers (SC, New England marine benthic)

*Sthenelais tertiaglabra* Moore, 1910 (*S. hancocki* Hartman, 1939) (AK, BC, CA, OR, WA marine infauna)

*Sthenelais verruculosa* Johnson, 1897 (sCA, WA marine infauna)

*Sthenelanella* Moore, 1919 - Sigalionidae polychaete worms

*Sthenelanella* undescr. sp.(Gulf of Mex. marine infauna)

*Sthenelanella uniformis* Moore, 1910 (CA, WA marine infauna)

*Streblosoma* Sars, 1872 - Terebellidae polychaete worms, Subfamily Thelepodinae

*Streblosoma bairdi* (Malmgren, 1866) (FL marine benthic)

*Streblosoma crassibranchia* Treadwell, 1914 (sCA, WA marine infauna)

*Streblosoma hartmanae* Kritzler, 1971 (e,wFL marine infauna)

*Streblosoma verillii* Teradwell, 1911(Gulf of Mex. marine infauna)

*Streblospio* Webster, 1879 - Spionidae polychaete worms

*Streblospio benedicti* Webster, 1879 (BC, CA (alien), HI (alien), LA, SC, TX, MA, ME, NC, NY, SC, TX, VA, WA (alien) common marine infauna)

*Streptospinigera* Kudenov, 1983 - Syllidae polychaete worms

*Streptospinigera heteroseta* Kudenov, 1983 (Gulf of Mex. marine infauna)

*Streptosyllis* Webster & Benedict 1884 - Syllidae polychaete worms, Subfamily Eusyllinae

*Streptosyllis arenae* Webster & Benedict 1884 (Virginian (rare), New England marine infauna)

*Streptosyllis floridanus* Webster & Benedict 1884 (FL marine caves))

*Streptosyllis latipalpa* Webster & Benedict 1884 (BC marine benthic, WA marine caves)  
*Streptosyllis pettiboneae* T.H. Perkins, 1981 (WA marine caves; Carolinian, Gulf of Mex. marine infauna)

*Streptosyllis verrilli* (Moore, 1907) (Carolinian marine infauna)

*Stygocapitella* Knoellner, 1934 - Parergodrilidae polychaete worms  
*Stygocapitella subterranea* Knollner, 1934 (BC, CA marine beach interstitial)

*Subadyte* Pettibone, 1969 - Polynoidae polychaete worms  
*Subadyte mexicana* = *Pseudampharete m.*

*Syllides* Oersted, 1845 - Syllidae polychaete worms, Subfamily Eusyllinae  
*Syllides bansei* T.H. Perkins, 1981 (FL, Gulf of Mex. marine infauna)  
*Syllides convoluta* (New England marine infauna)

*Syllides floridanus* T.H. Perkins, 1981 (e,wFL marine infauna)  
*Syllides fulvus* (Marion & Bobretsky, 1875) (Gulf of Mex. marine infauna)

*Syllides japonica* Imagima, 1966 (CA, FL, MA marine infauna)  
*Syllides longocirrata* Oersted, 1845 (CA, FL, MA, WA, New England marine infauna)  
*Syllides mikeli* Kudenov & Harris, 1995 (CA marine infauna)

*Syllides minutus* Blake & Walton, 1977 (CA marine infauna)  
*Syllides reishi* Dorsey, 1978 (CA marine infauna)

*Syllides setosa* Pettibone, 1963 (New England marine infauna)  
*Syllides verrilli* Moore, 1908 (FL, MA marine infauna)

*Syllidia* Quatrefages, 1866 - Nereididae polychaete worms  
*Syllidia armata* Quatrefages, 1865 (HI marine infauna)

*Syllis* Savigny in Lamarck, 1818 - Syllidae polychaete worms, Subfamily Eusyllinae (all species with subgenus *Typosyllis* also placed in generic *Typosyllis*)

*Syllis (Typosyllis) alternata* Moore, 1908 (BC, Carolinian, Gulf of Mex. marine infauna)  
*Syllis (Typosyllis) amica* Quatrefages, 1865 (Gulf of Mex. marine infauna)

*Syllis (Typosyllis) armillaris* (O. F. Muller, 1771) (BC, WA, Gulf of Mex. marine infauna)  
*Syllis (Typosyllis) corallicoloides* Augener, 1922 (Gulf of Mex. marine infauna)

*Syllis (Ehlersia) cornuta* Rathke (*Ehlersia c.*) = *Typosyllis c.*  
*Syllis (Syllis) elongata* Johnson, 1901 = *Typosyllis e.*

*Syllis farallonensis* Blake & Walton, 1977 = *Typosyllis f.*  
*Syllis ferrugina* (Langerhans, 1881) = *Ehlersia f.*



***Syllis* (*Typosyllis*) *gerlachi*** (Hartmann-Schroder, 1960)(Gulf of Mex. marine infauna)

***Syllis* (*Syllis*) *gracilis*** Grube, 1863 (CA, HI, ME, FL Gulf of Mex. marine infauna)  
***Syllis* (*Typosyllis*) *harti*** Berkeley & Berkeley, 1938 = *Typosyllis cornuta*

***Syllis* (*Typosyllis*) *hyalina*** Grube, 1863 (BC marine benthic)  
***Syllis* (*Ehlersia*) *hyperioni*** Harris, 1995 = *Typosyllis h.*

***Syllis* (*Typosyllis*) cf. *lutea*** (Hartmann-Schroeder, 1960) (FL Gulf of Mex. marine infauna)

***Syllis pallida*** Verrill, 1875 (New England marine infauna)  
***Syllis* (*Typosyllis*) *prolifera*** Kohn, 1852 (Gulf of Mex. marine infauna)  
***Syllis* (*Typosyllis*) *pulchra*** Berkeley & Berkeley, 1942 (BC marine benthic)

***Syllis* (*Syllis*) *spongiphila*** Verrill, 1885 = *Haplosyllis s.*  
***Syllis* (*Typosyllis*) *stewarti*** Berkeley & Berkeley, 1942 = *Typosyllis adamanteus*  
***Syllis* (*Typosyllis*) *variegata*** (WA marine benthic)

***Synelmis*** Chamberlin, 1919 - Pilargidae polychaete worms  
***Synelmis* cf. *albini*** (Langerhans, 1881) (FL marine benthic)

***Synelmis klatti*** (Freidrich, 1951) (Gulf of Mex. marine benthic)  
***Synelmis* 3 undescr. sp.** (Gulf of Mex. marine benthic)  
***Synelmis* undet. sp.** (NC marine infauna)

***Tauberia*** V.E. Strel'tsvo, 1973 = *Levinsenia*

***Telothelep*** Day, 1955 – Terebellidae polychaete worms, Subfamily Thelepodinae  
***Telothelep* cf. *capensis*** Day, 1955 (Gulf of Mex. marine benthic)

***Tenonia*** Nichols, 1969 - Polynoidae polychaete worms, Subfamily Harmothoinae  
***Tenonia priops*** (*Harmothoe p.* Hartman, 1961) (AK, BC, sCA, WA marine infauna)

***Terebella*** Linnaeus, 1767 - Terebellidae polychaete worms, Subfamily Amphitritinae or Artacaminae

***Terebella* (*Schmardanella*) *californica*** Moore, 1904 (CA marine benthic)  
***Terebella ehrenbergi*** Grube, 1870 (BC marine benthic)

***Terebella lapidaria*** Linnaeus, 1767 (HI marine benthic)  
***Terebella parvabranhiata*** Treadwell, 1906 (HI marine benthic)  
***Terebella rubra*** (Verrill, 1873) (wFL Gulf of Mex. marine infauna)

***Terebellides*** Sars, 1835 - Trichobranchidae polychaete worms (once in Terebellidae) (tube dwelling)

***Terebellides californica*** Williams, 1984 (AK, CA, BC, WA marine infauna)

*Terebellides horikoshii* (BC (nr. *T.h.*), WA marine benthic)

*Terebellides japonica* Moore, 1903 (= *T. stroemi* var. *j.*) (WA marine infauna)

*Terebellides kobei* Hessle, 1917 (WA marine infauna)

*Terebellides* nr. *lineata* (BC, WA marine infauna)

*Terebellides reishi* Williams, 1984 (BC, WA marine infauna)

*Terebellides* undet. sp. (sCA marine infauna)

*Terebellides stroemi* M. Sars, 1835 (BC, CA, e,wFL, ME, Carolinian, WA marine infauna)

*Terebellides stroemi* Sars, 1835 (AK, NJ marine infauna; NB, PQ Gulf of St. Lawrence sandy marine interstitial))

*Thalenessa* Baird, 1868 - Sigalionidae polychaete worms

*Thalenessa digitata* (HI marine infauna)

*Thalenessa piercei* (FL marine infauna)

*Thalenessa spinosa* (WA, Gulf of Mex. (cf. *T.s.*) marine infauna)

*Thalenessa* undescr. sp. (wFL Gulf of Mex. marine infauna)

Webster & Benedict, 1887 - Cirratulidae polychaete worms

*Tharyx acutus* Webster & Benedict, 1887 (MA, NJ, Carolinian, Virginian marine infauna)

*Tharyx* cf. *annulosus* Hartman, 1965 (FL, LA, TX marine infauna)

*Tharyx dorsobranchialis* Kirkegaard, 1959 (e,wFL, LA, NY, VA marine surface deposit feeder)

*Tharyx killariensis* (Carolinian marine infauna)

*Tharyx kirkegaardi* Blake, 1991 (sCA, NJ, NY marine infauna)

*Tharyx marioni* (Saint-Joseph, 1894) (SC marine infauna)

*Tharyx parvus* E. Berkeley, 1921 (sCA, WA (*T. nr. p.*) marine infauna)

*Tharyx secundus* (AK marine infauna)

*Tharyx setigera* Hartman, 1945 (TX, MA VA marine benthic infauna)

*Tharyx* undet. sp. or species (HI, LA marine infauna)

*Thelepus* Leuckart, 1849 - Terebellidae polychaete worms, Subfamily Thelepodinae

*Thelepus branchiatus* Treadwell, 1906 (HI marine infauna)

*Thelepus crispus* (CA, WA, New England marine infauna)

*Thelepus cincinnatus* (Fabricius, 1780) (BC marine infauna)

*Thelepus hamatus* Moore, 1905 (BC, CA, WA marine infauna)

*Thelepus japonicus* Marenzeller, 1884 (BC?, WA marine infauna)

*Thelepus setosus* (*Phenacia s.* Quatrefages, 1865; *Streblosoma verrilli* Traedwell, 1911) (BC, sCA, HI, Carolinian, WA, New England marine infauna)

*Therochaeta* Chamberlin, 1919 - Flabelligeridae polychaete worms

***Therochaeta*** undescr. sp. (Gulf of Mex. marine infauna)

***Thormora*** Baird, 1865 - Polynoidae polychaete worms

***Thormora atrata*** (Treadwell, 1940) (HI marine infauna)

***Timarete*** Kinberg, 1866 - Cirratulidae polychaete worms

***Timarete luxuriosa*** (*Cirratulus l.* Moore, 1904) (CA marine infauna)

***Timarete perebranchiata*** (Chamberlin, 1910) (CA marine infauna)

***Tomopteris*** Eschscholtz, 1835 – Tomopteridae polychaete worms

***Tomopteris helgolandica*** (ME marine benthic)

***Tomopteris*** undet. sp. (HI marine benthic)

***Travisia*** Johnston, 1840 - Opheliidae polychaete worms, Subfamily Traviisiinae

***Travisia brevis*** Moore, 1923 (BC, sCA, WA marine infauna)

***Travisia carnea*** Verrill, 1873 (PQ Gulf of St. Lawrence sandy marine interstitial; ME marine benthic)

***Travisia forbesii*** Johnson, 1840 (BC, AK & PQ Gulf of St. Lawrence sandy marine interstitial)

***Travisia gigas*** Hartman, 1938 (CA marine benthic)

***Travisia hobsonae*** (eFL & wFL Gulf of Mex. marine infauna)

***Travisia japonica*** Fujiwara, 1933 (BC marine infauna)

***Travisia parva*** J.H. Day, 1973 (SC, Virginian(rare) marine infauna)

***Travisia pupa*** Moore, 1906 (*T. foetida* Hartman, 1969) (BC, CA, WA marine infauna)

***Trichobranchus*** Malmgren, 1866 - Trichobranchidae polychaete worms

***Trichobranchus glacialis*** Malmgren, 1866 (AK, BC, WA, Gulf of Mex. marine infauna)

***Trichobranchus*** undet. sp. (HI marine infauna)

***Trilobodrilus*** Remane, 1925 - Dorvilleidae polychaete worms (also put in Dinophilidae)

***Trilobodrilus nipponicus*** Uchida & Okuda, 1942 (Japan, BC & Puget Sound (WA) marine interstitial)

***Tripolydora*** Woodwick, 1964 - Spionidae polychaete worms

***Tripolydora spinosa*** Woodwick, 1964 (HI marine infauna)

***Trochochaeta*** Levinsen, 1883 - Trochochaetidae polychaete worms

***Trochochaeta multisetosa*** (*Disoma m.* Oersted, 1844; *T. franciscanum* of Hartman, 1969; *Disomides m.*) (BC, CA, WA, New England marine infauna)

***Trochochaeta*** undescr. sp. (FL, TX marine infauna)

***Trochochaeta watsoni*** (*Disoma m.*) (New England marine infauna)

***Troglochaetus*** Delachaux, 1921 - Nerillidae polychaete worms

***Troglochaetus beranecki*** Delachaux, 1921 (common St in CO; St in Italy)

*Troglochaetus* undet. sp. or species (hyporheic in CO, NH, OH, PA)

*Trypanosyllis* Claparede, 1864 (= *Trypanedenta*) Syllidae polychaete worms, Subfamily Eusyllinae

*Trypanosyllis* (*Trypanedenta*) *coelicaca* Claparede, 1868 (Gulf of Mex. marine infauna)

*Trypanosyllis* (*Trypanedenta*) *coelicaca nipponica* Imagima & Hartman, 1964 (CA marine benthic)

*Trypanosyllis* (*Trypanedenta*) *gemmaipara* Johnson, 1901 (BC, CA marine benthic)

*Trypanosyllis* *hawaiiensis* Hartman-Schroder, 1978 (HI marine benthic)

*Trypanosyllis* (*Trypanedenta*) *ingens* Johnson, 1902 (BC marine benthic)

*Trypanosyllis* *parvidentata* T.H. Perkins, 1981 (wFL Gulf of Mex. marine infauna)

*Trypanosyllis* *savagei* T.H. Perkins, 1981 (FL marine infauna)

*Trypanosyllis* *vittigera* Ehlers, 1887 (Gulf of Mex. marine infauna)

*Trypanosyllis* *zebra* Grube, 1869 (HI marine infauna)

*Typosyllis* Langerhans, 1879 - Syllidae polychaete worms, Subfamily Syllinae

*Typosyllis* *aciculata* (CA marine infauna)

*Typosyllis* *adamanteus* (BC, WA marine infauna)

*Typosyllis* *alternata* Moore, 1908 (AK, CA marine infauna)

*Typosyllis* *bella* Chamberlin, 1919 (AK, CA marine infauna)

*Typosyllis* *corallicola* (= *Syllis corallicoloides*; *S. corallicoides*) (LA marine infauna)

*Typosyllis* *cornuta* Rathke (*Ehlersia* c.; *Syllis* (*E.*) c.; *Syllis heterochaeta*) (BC, e,wFL, LA, WA, New England marine infauna)

*Typosyllis* *crassicirrata* Treadwell, 1925 (HI marine infauna)

*Typosyllis* *elongata* (Johnson, 1901) (*Syllis e.*) (AK, BC, CA, OR?, WA marine benthic)

*Typosyllis* *farallonensis* (*Syllis f.* Blake & Walton, 1977) (CA marine infauna)

*Typosyllis* *hawaiiensis* Hartmann-Schroeder, 1965 (HI marine infauna)

*Typosyllis* *heterochaeta* (Moore, 1909) (= *Ehlersia h.*) (CA marine infauna)

*Typosyllis* *hyalina* (Grube, 1863) (CA, HI marine infauna)

*Typosyllis* *hyperioni* (*Ehlersia h.* Harris, 1995) (AK, BC, sCA, WA marine infauna)

*Typosyllis* cf. *lutea* Langerhans, 1879 (FL, LA marine benthic)

*Typosyllis magnapalpa* Hartmann-Schroeder, 1965 = *T. crassicirrata*

*Typosyllis microoculata* Hartmann-Schroeder, 1965 (HI marine infauna)

@*Typosyllis nigrescens* (HI marine infauna)

*Typosyllis ornata* Hartmann-Schroder, 1965 = *T. nigrescens*  
*Typosyllis pigmentata* (CA marine infauna)  
*Typosyllis prolifera* Krohn, 1852 (HI, wFl Gulf of Mex. marine infauna)

*Typosyllis pulchra* (Berkeley & Berkeley, 1938 = *T. pigmentata*)  
*Typosyllis* undet. sp. (HI marine benthic)  
*Typosyllis variegata* (Grube, 1860) (CA, HI marine infauna)

*Vanadis* Claparede, 1870 – Alciopidae polychaete worms  
*Vanadis formosa* (New England marine benthic)

*Vanadis longissima* (HI, New England marine benthic)  
*Vanadis minuta* Treadwell, 1906 (HI marine benthic)

*Vermilia* - Serpulidae polychaete worms  
*Vermilia* undet. sp. (HI marine infauna)

*Vermiliopsis* Saint-Joseph, 1894 - Serpulidae polychaete worms  
*Vermiliopsis annulata* (Schmarda, 1861)(Gulf of Mex. marine infauna)  
*Vermiliopsis hawaiiensis* (HI marine infauna)

*Vermiliopsis infundibulum* (*Vermilla i.* Philippi, 1944)(CA, HI marine infauna)  
*Vermiliopsis torquata* Treadwell, 1943 (HI marine infauna)

*Vinearia* – Spirorbidae polychaete worms  
*Vinearia koehleri* Caullery & Mesnil, 1897) (HI marine infauna)

*Websterinereis* Pettibone, 1971 – Nereididae polychaete worms  
*Websterinereis* undescr. sp. (Gulf of Mex. marine infauna)

*Xenosyllis* Marion & Bobretzky, 1875 – Syllidae polychaete worms  
*Xenosyllis* cf. *scabra* (Ehlers, 1864) (Gulf of Mex. marine infauna)

*Ysideria* Ruff, 1995 - Polynoidae polychaete worms  
*Ysideria hastata* Ruff, 1995 (CA marine infauna)

## **Priapulid Worms**

Priapulida, a small phylum of benthic marine worms.

*Priapulus* Lamarck, 1816 - Priapulidae priapulid worm  
*Priapulus caudatus* Lamarck, 1816 (AK, WA marine interstitial)

## **Spiny-headed Worms**

Phylum Acanthocephala (spiny-headed worms; thorny-headed worms) Bilaterally symmetric, pseudo-coelomate, lacking a gut, formerly a class of aschelminths (body wall ultrastructure, muscles, sperm similar) but different in embryology. From 2 mm to almost a meter. About 500 species, all endoparasites in invertebrates as larvae and in vertebrates as adults.

Kingdom Animalia  
Clade Bilateria  
Clade Protostomia  
Clade Lophotrochozoa

Phylum Acanthocephala  
Class Palaeacanthocephala  
Order Echinorhynchida

Family Echinorhynchidae  
Subfamily Echinorhynchinae  
(*Acanthocephalus* (once in Protocephalidae), *Fissisentis*?)

Order Polymorphida  
Family Polymorphidae (*Southwellina*)

***Southwellina*** Wittenberg, 1932 – Polymorphidae spiny-headed worms  
***Southwellina dimorpha*** Schmidt, 1973 (endoparasite in non-cave LA *Procambarus clarki* crayfish)

## Tapeworms

Class Cestoda (sometimes as order) (cestodes) of flatworms (Platyhelminthes). Adults almost always endoparasites. 2-3 larval stages. Eucestoda with rounded or egg-shaped “head” (scolex or holdfast). flattened, ribbon-like “body” (strobila) from few mm. to >10 meters; 3- several thousand segments. About 3,600 known species.

Subclass Cestodaria (not included with Cestoda according to some authors)  
Subclass Eucestoda  
Order Cyclophyllidea

Anoplocephalidae (*Oochoristica*) (once in Linstowiidae)  
Cyclophyllidae (*Canaania*)

Dilepididae  
Paruterininae (*Andrya*, *Paruterina*) (once in Paruterinidae)

Davaineidae (*Raillietina*)  
Hymenolepididae (*Hymenolepis*)  
Mesocestoidae (*Mesocestoides*)

Taeniidae (*Catenotaenia*, *Cylindrotaenia*, *Echinococcus*, *Hydatigera*, *Ophiotaenia*,  
*Taenia*, *Vampirolepis*)

Order Proteocephalidea Mola 1928

Proteocephalidae

Subfamily Proteocephalinae (*Neiochinorhynchus*, *Proteocephalus*)

Order Pseudophyllidea

Bothriocephalidae (*Bothriocephalus*)

Gymnorhynchidae (*Acanthocephalus*, *Gymnorhynchus*)

**Acanthocephalus** Cobbold 1879 - Gymnorhynchidae tapeworm (cestode)

**Acanthocephalus dirus** = *Gymnorhynchus rudolphi*

**Andrya** Railliet 1893 - Dilepididae tapeworms (cestodes), Subfamily Paruterinae

**Andrya neotomae** Voge, 1945 (endoparasite in CA *Neotoma fuscipes* woodrat),

**Bothriocephalus** Rudolphi 1808 -- Bothriocephalidae cestodes (once in Pseudophyllidae)

**Bothriocephalus euryciensis** Schaefer & Self 1978 (in OK (Adair Co.) *Eurycea longicauda* salamander).

**Bothriocephalus rarus** Thomas, 1937 (in non-cave NH *Eurycea bislineata* salamander),

**Echinococcus** Rudolphi 1801 - Taeniidae cestodes

**Echinococcus multilocularis** (Leuckart 1863) (endoparasite in WY *Neotoma cinerea rupicola* woodrat),

**Catenotaenia** Janicki 1904 - Dilepididae tapeworms (cestodes)

**Catenotaenia neotomae** Barbero & Cattán 1983 (endoparasite in NV *Neotoma cinerea rupicola* woodrat),

**Gymnorhynchus** Rudolphi, 1819 - Gymnorhynchidae tapeworms (cestodes)

**Gymnorhynchus rufolphi** (*Acanthocephalus dirus* VanCleave, 1931) (IL, MS, TN endoparasite on *Asellus intermedius* isopod)

**Hydatigera** Lamarck, 1816 - Taeniidae tapeworms (cestodes)

**Hydatigera (Hydatigera) taeniaeformis** Batsch, 1786 (endoparasite in OK *Neotoma floridanus* f. woodrats).

**Hymenolepis** Wienland 1858 - Hymenolepidae tapeworms (cestodes)

**Hymenolepis christensoni** (Macy, 1931) (endoparasite in CA, OR *Myotis yumanensis*; KS *Myotis grisescens*; MN *Myotis keeni*, OR *Myotis californicus* & *M. evotis*; IN, WI (Tx) *Eptesicus fuscus* & AK, IN, MN, OR, WI (rare Tx) *Myotis lucifugus* bats)

**Hymenolepis decipiens** (Diesing, 1850) (endoparasite in Paraguay, Brazil & CT *Myotis lucifugus* & Brazil *Eumops perotis* bats)

**Hymenolepis gertschi** Macy, 1947 (endoparasite in OR *Eptesicus fuscus*, *Myotis californicus* & *C. townsendii* & LA, TX (Tx) *Tadarida brasiliensis* bats)

**Hymenolepis** *lasionycteridis* Rausch, 1975 (endoparasite in IN (Tx) *Myotis keeni* & *M. sodalis*, HI *Lasiurus cinereus semotus*; OR, IN *Eptesicus fuscus*; OR *Lasionycteris noctivagans*, *Myotis californicus*, *M. yumanensis*, *M. evotis*, *M. volans* & IN, OH, OR *Myotis lucifugus* bats)

**Hymenolepis** *roudabushi* Macy & Rausch 1946 (Tx? in IA,OH/ endoparasite in OH, IA, IN, KS (Tx) *Eptesicus fuscus*, IA, IN *Myotis lucifugus*; KS *Myotis keeni*; IA, OH *Nycticeius humeralis* & OH *Lasionycteris noctivagans* bats)

**Hymenolepis** undet. sp(s). (endoparasites in HI *Lasiurus cinereus semotus*, AB *Eptesicus fuscus*, TX *Tadarida b.* & *Myotis v.* bats)

**Neochinorhynchus** Nickol & Whittaker 1978 - Protocephalide tapeworms (cestodes)  
**Neochinorhynchus** *cylindratus* (in KY *Amblyopsis spelaea*) Nickol & Whittaker 1978

*Cycloskrjabinia taborensis* = *Oochoristica t.*

**Cylindrotaenia** Jewell 1916 - Taeniidae tapeworms (cestodes)  
**Cylindrotaenia** *americana* Jewell 1916 (endoparasite in non-cave AR *Desmognathus bimleyorum* & non-cave AR *Plethodon cinereus albagula* salamanders)

**Oochoristica** Luhe 1898 - Anoplocephalidae cestode (once in Linstowiidae)  
**Oochoristica** *antrozoi* Voge, 1954 (endoparasite in CA *Antrozous pallidus* bats)

**Oochoristica** *taborensis* Loewen, 1934 (= *Cycloskrjabinia t.*) (endoparasite in DC, IA, IN, MA, KS, TN? *Lasiurus borealis* & MD *Lasiurus cinereus* bats)

**Paruterina** Fuhrmann, 1906 - Dilepididae tapeworms (cestodes), Subfamily Paruterininae  
**Paruterina** *candelabraria* (endoparasite in WY *Neotoma cinerea rupicola* & UT *Neotoma lepida* woodrats),

**Proteocephalus** Weinland 1858 - Proteocephalidae cestodes, Subfamily Proteocephalinae  
**Proteocephalus** *chologasteri* Whittaker 1968 (endoparasite in KY *Chologaster agassizi* cave fish)

**Proteocephalus** *poulsoni* Whittaker & Zober 1978 (\*?type locality cave in Breckenridge Co.,KY/ endoparasite in *Amblyopsis spelaea* cave fish)

**Raillietina** Fuhrmann, 1920 - Davaineidae cestodes  
**Raillietina** *bakeri* Chandler, 1942 (endoparasite in NM *Neotoma albigula* woodrats)

**Raillietina** *loeweni* Bartel & Hansen, 1964 (endoparasite in NM *Neotoma albigula* woodrats)  
**Raillietina** *retractilis* Stilesr, 1896 (endoparasite in NM *Neotoma albigula*, CO *N. cinerea*, CA *N. fuscipes* & UT *N. lepida* woodrats)

**Raillietina** *selfi* Buscher, 1975 (endoparasite in NM *Neotoma albigula* woodrats)  
**Raillietina** undet. sp. (endoparasite in FL *Neotoma floridana* woodrats)



**Taenia** Linnaeus 1758 - Taeniidae tapeworms (cestodes)

**Taenia** *crassiceps* (Zeder, 1800) (endoparasite in AZ *Neotoma* woodrat)

**Taenia** *obtusata* Rud. 1819 (endoparasite in TN *Lasiurus borealis* bats)

**Taenia** *pisiformis* (Bloch, 1780) (endoparasite in NH *Neotoma magister* & OR *Neotoma cinereus* woodrats)

**Taenia** *rileyi* Loewen 1929 (endoparasite in OR *Neotoma cinerea* woodrats),

**Vampirolepis** *Spasskii* 1954 - Hymenolepididae tapeworms (cestodes)

**Vampirolepis** *christiansoni* (Macy, 1931) (endoparasite in MN *Eptesicus fuscus* & KS *Myotis grisescens* bats)

**Vampirolepis** *decipiens* (Diesing 1850) (endoparasite in FL (Alachua Co.) *Tadarida b. cynocephala* bats)

**Vampirolepis** *gertschi* (Macy, 1947) (endoparasite in Tx *Myotis v.* bats)

**Vampirolepis** *roundabushi* (Macy & Rausch, 1946) (endoparasite in IA, OH *Nycticeius humeralis*, *Eptesicus fuscus*, *Lasionycteris noctivagans*, IA *Myotis lucifugus* & KS *Myotis keenii* bats)

## **Ribbon worms** - Phylum Nemertini (=Nemertea, Nemertina, Rhynchocoela)

Resemble thread-like flatworms but have a vascular system and alimentary canal with mouth at one end and anus at the other. Few mm. to over 30 m. long. Body epithelium is ciliated. About 800 known living species.

Order or Class Anopla

Order Heteronemertea

Family Baseodiscidae (*Baseodiscus*) (now in Valenciniidae)

Family Lineidae

(*Cerebratulus*, *Euborlasia*, *Lineus*, *Micrura*, *Parapolia*, *Zygeupolia*; undet. interstitial genus in Puget Sound, WA)

Family Valenciniidae (*Baseodiscus*) (see above)

Superfamily or Order Palaeonemertea

Family Carinomidae (*Carinoma*, *Carinomertes*)

Family Cephalothricidae (*Cephalothrix*, *Procephalotrix*)

Family Ototyphlonemertidae (*Ototyphlomertes*)

Family Tubulanidae (*Carinomella*, *Tubulanus*)

Superfamily Hoplonemertinea (now put in Suborder Monostylifera)

Class Enopla

Order Bdellonemertea

Malacobdellidae (*Malacobdella*)

Order Hoplonemertina (=Hoplonemertea) (once as Superfamily

Hoplonemertinea) (*Annulonemertes*) (uncertain family placement)

Undescribed genus (Interstitial in New England marine)

Carcinonemertidae (*Carcinonemertes*)

Suborder Monostylifera

Family Amphiporidae (*Amphiporus*, *Zygonemertes*)

Family Emplectonematidae (also put in Rhynchozoa: Hoplonemertea)

(*Cryptonemertes*, *Dichonemertes*, *Emplectonema*, *Nemertopsis*, *Paranemertes*)

Family Prosorhochmidae (*Pantionemertes*, *Prosorhochmus*)

Suborder Monostilifera

Family Tetrastemmatidae

(*Amphinemertes*, *Prostomatella*, *Prostoma*, *Stichostemma*, *Tetrastemma*)

Suborder Polystylifera

Drepanophoridae (*Drepanophorus*)

*Amphinemertes caeca* (*Tetrastemma caecum* Coe, 1901) (CA marine infauna)

*Amphiporus* Ehrenberg, 1831 - Amphiporidae nemertean worms

*Amphiporus angulatus* (O.F. Muller, 1774) (AK, BC, CA, ME marine infauna & NB, PQ Gulf of St. Lawrence sandy marine interstitial)

*Amphiporus bimaculatus* Coe, 1901 (AK, BC, CA marine benthic)

*Amphiporus bioculatus* McIntosh, 1873 (VA marine infauna)

*Amphiporus californicus* Coe, 1905 (CA marine benthic)

*Amphiporus cruentatus* (Hubrecht, 1879) (*Amphiporus leptacanthus* Coe, 1905) (CA, MA marine infauna)

*Amphiporus flavescens* Coe, 1905 (CA marine benthic)

*Amphiporus fulvus* Coe, 1905 (CA marine benthic)

*Amphiporus formidabilis* (= *A. leuciodus* Coe) (CA, BC, WA marine infauna)

*Amphiporus gelatinosus* Coe, 1905 (AK marine benthic)

*Amphiporus griseus* (Stimpson, 1857) (MA marine infauna)

*Amphiporus imparispinosus* Griffin, 1898 (= *A. leuciodus* Coe) (AK, BC, CA marine benthic)

*Amphiporus nebulosus* Coe (AK marine benthic)

*Amphiporus ochraceus* (Verrill, 1873) (FL, MA marine infauna)

*Amphiporus pacificus* Coe, 1905 (CA marine benthic)

*Amphiporus punctatulus* Coe, 1905 (CA marine benthic)

*Amphiporus rubellus* Coe, 1905 (CA marine benthic)

*Amphiporus* undet. sp. or species (MA, WA marine sandy infauna)

@*Amphiporus tigrinus* Coe (AK marine benthic)

*Annulonemertes* G. Berg, 1985 (uncertain family placement)

*Annulonemertes* undescribed sp. (Puget Sound interstitial marine)

*Argonemertes* J. Moore & R. Gibson, 1981 - Prosorhochmidae ribbon worms

*Argonemertes dendyi* (Dakin, 1915) (Australia, HI/ Tp in HI). Bibl. Howarth & Moore 1983

*Baseodiscus* Coe, 1934 – Valenciniidae ribbon worms (also put in Baseodiscidae)

*Baseodiscus delineatus* (Delle Chiaje, 1825)(FL marine infauna)

*Baseodiscus* undet. sp. (CA marine benthic)

*Carinoma* Oudemans, 1885 - Carinomidae ribbon worms

*Carinoma lactea* Coe, 1905 (Eastern Pacific marine benthic)

*Carinoma mutabilis* Griffin, 1898 (= *C. griffini* Coe, 1901) (BC, CA, OR, WA Eastern Pacific marine infauna)

*Carinoma tremophoros* Thompson, 1900 (uncommon FL, MA, MD, NJ, Virginian marine infauna in sand, clay, mud or under stones)

*Carinomella* Coe, 1905 - Tubulanidae ribbon worms

*Carinomella lactea* Coe, 1905 (CA, VA marine infauna)

*Carcinonemertes* Coe, 1902, Kolliker, 1845 - Carcinonemertidae ribbon worms

*Carcinonemertes epialti* Coe (CA marine benthic (parasite on Epialtus))

*Carcinonemertes carcinophila* (Kolliker, 1845) (MA marine infauna)

*Cephalothrix* Oersted, 1844- Cephalothricidae ribbon worms

*Cephalothrix linearis* (Rathke, 1799) Oersted (AK, north of MA, nEurope, Mediterranean marine infauna)

*Cephalothrix pacifica* Gerner, 1969 (San Juan Islands (WA) marine beaches interstitial)

*Cerebratulus* Renier, 1804 (flat worms; milky ribbon worms) Lineidae ribbon worms

*Cerebratulus alaskensis* Coe, 1901 (AK, CA marine benthic)

*Cerebratulus albifrons* Coe, 1901 (AK, BC, CA marine benthic)

*Cerebratulus californiensis* Coe, 1905 (CA marine benthic)

*Cerebratulus herculeus* Coe (AK marine benthic)

*Cerebratulus lacteus* (Leidy, 1851) (MA, ME, NJ, VA marine infauna)

*Cerebratulus lineolatus* Coe, 1905 (CA marine benthic)

*Cerebratulus longiceps* Coe (AK, BC marine benthic)

*Cerebratulus marginatus* Renier, 1804 (AK, BC, CA marine benthic)

*Cerebratulus montgomeryi* Coe, 1901 (AK, BC, CA marine benthic)

*Cerebratulus occidentalis* Coe (AK marine benthic)

*Cerebratulus* undet. sp. or species (WA, Baffin Island (neCanada) marine infauna)

*Cryptonemertes* Gibson, 1986 – Emplectonematidae ribbon worms

*Cryptonemertes actinophila* (*Nemertopsis a.* Burger, 1904; *Nemertopsella a.* of Friedrich, 1958)  
(CA marine infauna)

*Dichonemertes* Coe, 1938 – Emplectonematidae ribbon worms

*Dichonemertes hartmanae* Coe, 1938 (CA marine infauna)

*Drepanophorus* Egerton, 1872 - Drepanophoridae ribbon worms

*Drepanophorus ritteri* Coe, 1905 (sCA marine benthic)

*Emplectonema* Stimpson, 1857 - Emplectonematidae ribbon worms

*Emplectonema buergeri* Coe, 1901 (AK marine infauna)

*Emplectonema gracile* (Johnston, 1837) (green ribbon worm/ AK, BC, CA marine infauna)

*Emplectonema purpuratum* Coe, 1905 (AK marine infauna)

*Euborlasia* Friedrich, 1958 - Lineidae ribbon worms

*Euborlasia nigrocincta* Coe, 1901 (CA marine benthic)

*Lineus* Sowerby, 1806 - Lineidae ribbon worms

*Lineus arenicolus* Senz, 1993 (ME marine infauna)

*Lineus bicolor* Verrill, 1892 (MA marine subtidal benthic)

*Lineus bilineatus* (Renier, 1804) (*L. albolineatus* Coe, 1904) (CA marine benthic)

*Lineus flavescens* Coe, 1904 (CA marine benthic)

*Lineus pictifrons* Coe (CA marine benthic)

*Lineus ruber* (*Planaria r.* O.F. Muller, 1771) (= *L. viridus*) (OR, ME marine benthic)

*Lineus rubescens* Coe, 1904 (CA, WA marine infauna)

*Lineus sanguineus* (Rathke, 1799) (ME marine infauna, NB Gulf of St. Lawrence sandy marine interstitial)

*Lineus torquatus* Coe, 1901 (AK, CA marine benthic)

*Lineus vegetus* (CA marine benthic)

*Lineus viridis* (O.F.Mueller, 1774) (AK, eUS, Greenland, nEurope, Mediterranean marine benthic)

@*Lineus wilsoni* Coe (CA marine benthic)

*Malacobdella* Blainville, 1827 – Malacobdellidae ribbon worms

*Malacobdella* undet. sp. (CA marine benthic)

*Micrura* Ehrenberg, 1831- Lineidae ribbon worms

*Micrura affinis* (Girard, 1853) (MA marine infauna)

*Micrura alaskensis* Coe, 1901 (salmon white-headed ribbon worm/ AK, BC, OR, CA, WA marine infauna)

*Micrura albida* Verrill, 1879 (MA, ME marine benthic)

*Micrura caeca* Verrill, 1895 (MA marine stone & sandy infauna)

@*Micrura graffini* Coe, 1905 (CA marine benthic)

@ *Micrura kennerlyi* (WA marine infauna)

*Micrura leidyi* (Verrill, 1892) ((MA, VA marine sandy infauna)

*Micrura nebulosa* Coe, 1905 (AK marine benthic)

*Micrura nigrirostris* Coe, 1905 (CA marine benthic)

*Micrura olivaris* Coe, 1905 (CA marine benthic)

*Micrura pardalis* Coe, 1905 (CA marine benthic)

*Micrura* undet. sp. (Baffin Island (neCanada) marine infauna)

*Micrura verrilli* (AK, BC, CA, WA marine infauna)

*Micrura wilsoni* (*Lineus w.* Coe, 1904 (CA marine benthic)

*Nemertopsis* - Emplectonematidae ribbon worms

*Nemertopsis bivittata* (FL marine infauna)

*Nemertopsis gracilis* (CA marine infauna)

*Oerstedtia* Quatrefages, 1846 - Prosorhochmididae ribbon worms

*Oerstedtia dorsalis* (*Planaria d.* Abildgaard, 1806; *Tetrastemma d.* McIntosh, 1873; *T. (Oerstedtia dorsale* Coe, 1904)) (CA, Europe, eUS, WA marine infauna)

*Ototyphlonemertes* Diesing, 1863 - Ototyphlonemertidae ribbon worms

*Ototyphlonemertes americana* Gerner, 1969 (San Juan Islands (WA) marine beaches interstitial)

*Ototyphlonemertes evelinae* Correa, 1948 (VA Key & Marco Island (FL) marine beaches interstitial)

*Ototyphlonemertes fila* Correa, 1953 (VA Key (FL), Brazil marine beaches interstitial)  
*Ototyphlonemertes lactea* Correa, 1954 (VA Key (FL), Brazil, Columbia, Caribbean marine beaches interstitial)

*Ototyphlonemertes pellucida* Coe, 1943 (= *Carinella p.* Coe) (CA, VA Key (FL) & MA marine beaches interstitial)

*Ototyphlonemertes spiralis* Coe, 1940 (= *O. (Otohelicophora) s.* of Envall, 1996) (San Diego (CA) marine beaches interstitial)

*Ototyphlonemertes* undet. sp. or species (MA, NC marine interstitial)

*Pantinonemertes* Moore & Gibson, 1981 – Prosorhochmidae ribbon worms  
*Pantinonemertes californiensis* R. Gibson, J. Moore & F.B. Crandall, 1982 (WA marine infauna)

*Paranemertes* Emplectonematidae ribbon worms  
*Paranemertes californica* (CA, WA marine infauna)

*Paranemertes carnea* Coe (AK, BC, TX marine infauna)  
*Paranemertes pallida* Coe (AK marine infauna)

*Paranemertes peregrina* Coe, 1901 (dark or wandering ribbon worm/ Ttx in CA sea caves; AK, BC, CA, WA marine infauna)

*Paranemertes* undet. sp. (WA marine infauna)

*Parapolia* Coe, 1895 - Lineidae ribbon worms  
*Parapolia aurantiaca* Coe, 1895 (MA marine benthic)  
*Parapolia* undet. sp. (Baffin Island (neCanada) marine infauna)

*Procephalotrix* Junoy & Gibson, 1991 - Cephalothricidae ribbon worms  
*Procephalotrix spiralis* (Coe, 1930) (NB Gulf of St. Lawrence sandy marine interstitial)  
*Procephalotrix* undet. sp. (CA marine beach interstitial)

*Prosorhochmus* Keferstein, 1862 - Prosorhochmidae ribbon worms  
*Prosorhochmus albidus* (*Tetrastemma albidum* Coe, 1905) (CA, WA marine infauna)

*Prostoma* Duges, 1828 - Tetrastemmatidae ribbon worms  
*Prostoma canadiensis* Gibson & Moore, 1978 (ON lake benthic; cosmopolitan)  
*Prostoma eilhardi* (Montgomery, 1894) (US &/or Canada benthic; cosmopolitan)

*Prostoma graecense* (Bohmig, 1892; *P. rubrum*) (CA benthic; GA caves (near *P.g.*); cosmopolitan)

*Prostoma* undet. sp. or species (MA marine benthic; NH freshwater lake benthic)

***Prostomatella*** Friedrich, 1935 - Tetrastemmatidae ribbon worms

***Prostomatella arenicola*** Freidrich, 1935 (FL marine interstitial)

***Prostomatella*** underscribed sp.(FL marine interstitial)

***Ramphogordius*** Rathke, 1799

***Ramphogordius sanguineus*** Rathke, 1799 = *Lineus s.*

***Tetrastemma*** Ehrenberg, 1831- Tetrastemmatidae ribbon worms

***Tetrastemma bicolor*** Coe (AK marine benthic)

***Tetrastemma bilineatum*** Coe (CA marine benthic)

***Tetrastemma candidum*** (*Planaria candida* Muller, 1874) (CA, MA, ME, WA marine infauna)

***Tetrastemma*** (*Oerstedtia*) *dorsale* = *O.d.* (Abildgaard, 1806)

***Tetrastemma elegans*** (Girard, 1852) (MA marine benthic)

***Tetrastemma nigrifrons*** Coe, 1904 (CA, WA marine infauna)

***Tetrastemma quadrilineatum*** Coe (CA marine infauna)

***Tetrastemma reticulatum*** Coe, 1904 (CA marine benthic)

***Tetrastemma signifer*** Coe, 1904 (CA marine benthic)

***Tetrastemma vermiculus*** (Quatrefages, 1846) (MA marine benthic)

***Tetrastemma vittatum*** Verrill, 1874 (MA marine benthic)

***Stichostemma*** – Tetrastemmatidae ribbon worms

***Stichostemma*** undet. sp. (WA, NB, Great Lakes freshwater infauna)

***Tubulanus*** Renier, 1804 - Tubulanidae ribbon worms

***Tubulanus albocinctus*** (*Carinella albocincta* Coe, 1904)(CA marine infauna)

***Tubulanus capistratus*** (*Carinella capistrata* Coe, 1901) (AK, CA, WA, Eastern Pacific marine infauna)

***Tubulanus cingulatus*** (*Carinella cingulata* Coe, 1904 (CA marine infauna)

***Tubulanus frenatus*** (*Carinella frenata* Coe, 1904) (CA, Eastern Pacific, WA marine infauna)

***Tubulanus nothus*** (*Carinella n.* Burger, 1892) (CA, WA marine infauna)

***Tubulanus pellucidus*** (Coe, 1895) (Eastern Pacific, CA, MA, NY, VA, WA marine infauna)

***Tubulanus polymorphus*** (*Carinella p.* Renier, 1804; *C. pellucida* Coe, 1895, *C. rubra* Griffin, 1898; *C. speciosa* Coes, 1091) (AK, BC, CA, OR, WA marine infauna)

***Tubulanus rhabdotus*** Correa, 1954 (FL marine infauna)

***Tubulanus sexlineatus*** (Griffin) (*C. dinema* Coe) (CA, BC, OR, AK marine infauna)

***Zygeupolia*** C.B. Thompson, 1900 - Lineidae ribbon worms

***Zygeupolia littoralis*** C.B. Thompson, 1900 (CA marine benthic)

*Zygeupolia rubens* (*Valencinia r.* Coe, 1895; *Z. littoralis* Thompson, 1900) (MA marine sandy infauna)

*Zygeupolia* undet. sp. (ME marine benthic)

*Zygonemertes* Montgomery, 1897 - Amphiporidae ribbon worms

*Zygonemertes albida* Coe (BC marine infauna)

*Zygonemertes thalassina* Coe (AK marine infauna)

*Zygonemertes virescens* (*Amphiporus v.* Verrill, 1879) (CA, MA, WA marine infauna)

## Sipunculid Worms

(peanut worms) - Phylum Sipunculida (=Sipuncula) of the; Protostomia. About 320 species in 17 genera. 1-66 cm long, almost cylindrical and nonsegmented. Thick trunk often furrowed or covered with tubercles and a slender, protrusible trunk. Mouth almost always surrounded by wreath of small tentacle. Bibl.: Cutler 1994.

Class Phascolosomatidea

Order Aspidosiphoniformes

Family Aspidosiphonidae (*Aspidosiphon*)

Order Phascolosomatiformes

Family Phascolosomatidae (*Antillesoma*, *Phascolosoma*)

Class Sipunculidea

Order Golfingiiformes

Family Golfingiidae (*Golfingia*, *Phascolion*)

Family Phascolidae (*Phascolion*)

Family Themistidae (*Themiste*)

Order Sipunculiformes

Family Sipunculidae (*Siphonosoma*, *Siphonosomecus*, *Sipunculus*, *Thysanocardia*)

*Aspidosiphon* Diesing, 1851 - Aspidosiphonidae peanut worms

*Aspidosiphon fischeri* ten Broeke, 1925 (FL marine benthic)

*Aspidosiphon* (*Paraaspidosiphon*) *parvulus* Gerould, 1913 (FL marine benthic)

*Aspidosiphon* (*Paraaspidosiphon*) *steenstrupii* s. Diesing, 1859 (FL marine benthic)

*Antillesoma* Stephen & Edmunds, 1972 - Phascolosomatidae peanut worms

*Antillesoma antillarum* Stephen & Edmunds, 1972 (FL marine benthic)

*Golfingia* Lankester, 1885 - Golfingiidae sipunculid worms

*Golfingia gouldi* (*Phascolosoma g.* Pourtales, 1851) (MA, ME marine benthic)



***Golfingia improvisum*** (*Phascolosoma i.* Theel, 1905) = *P. minutum* (NJ marine benthic)

***Golfingia* (*G.*) *margaritacea*** (*Sipunculus m.* Sars, 1851) (AK, CA, WA marine infauna)

***Golfingia pugettensis*** (AK, BC, WA marine infauna)

***Golfingia* undet. sp.** (CA marine infauna)

***Golfingia vulgaris*** (*Sipunculus v.* de Blainville, 1827) (AK, WA marine infauna)

***Nephasoma*** Pergament, 1946 - Golfingiidae sipunculid worms

***Nephasoma diaphanes*** (*Phascolosoma d.* Gerould, 1913) (CA, WA marine infauna)

***Nephasoma emremita*** (*Sipunculus e.* M. Sars, 1851) (CA marine benthic)

***Nephasoma pellucida*** (FL marine benthic)

***Phascolion*** Theel, 1875 - Pascolidae peanut worms (once in Golfingiidae)

***Phascolion* (*Lesenka*) *cryptum*** (*Lysenka cryptus* Hendrix, 1975) Cutler & Cutler, 1985 (FL marine benthic)

***Phascolion* undet sp. or species** (e,wFL marine interstitial coarse shelly sand; CA marine infauna)

***Phascolion strombi*** (Montagu, 1804) (AK, e,wFL, Virginian (rare), TX marine infauna)

***Phascolosoma*** Leuckart, 1828 - Phascolosomatidae peanut worms

***Phascolosoma* (*P.*) *agassizii*** Keferstein, 1866 (CA, WA marine infauna)

***Phascolosoma minutum*** Keferstein, 1862 (= *Phascolosoma improvisum* Theel, 1905) (NJ marine benthic)

***Phascolosoma perlucens*** Baird, 1868 (FL marine benthic)

***Phascolosoma* (*P.*) *varians*** Keferstein, 1866 (FL marine benthic)

***Siphonomecus*** Fisher, 1947- Sipunculidae peanut worms

***Siphonomecus ingens*** = *Siphonosoma i.*

***Siphonosoma*** Spengel, 1912 - Sipunculidae peanut worms

***Siphonosoma* (*Dasmosiphon*) *cumanense*** (*Phascolosoma c.* Keferstein, 1867) (FL marine benthic)

***Siphonosoma ingens*** (= *Siphonomecus i.* Fisher, 1947) (FL, CA marine benthic)

***Siphonosoma polmyotis*** = *Sipunculus p.*

***Sipunculus*** Linnaeus, 1867 - Sipunculidae peanut worms

***Sipunculus nudus*** Linnaeus, 1766 (CA, NC marine infauna)

***Sipunculus polmyotus*** Fisher, 1947 (= *Siphonosoma p.*) (FL marine benthic)

***Themiste*** Gray, 1828 - Themistidae peanut worms.

***Themiste* (*T.*) *alutacea*** (Grube & Oersted, 1858) (FL marine benthic)

*Themiste (T.) dyscritum* (*Dendrostomum d.* Fisher, 1952 (CA marine benthic))

*Themiste lageniformis* Baird, 1868 (= *t. (Lagenopsis) l.*) (FL marine benthic)

*Themiste (T.) perimeces* (*Dendrostomum p.* Fischer, 1928) (CA marine benthic)

*Themiste pyroides* (*Dendrostoma p.* Chamberlain, 1928) (CA marine benthic)

*Thysanocardia* Fisher, 1950 - Sipunculidae peanut worms

*Thysanocardia margaritacea* = *Golfingia m.*

*Thysanocardia nigra* (*Phascolosoma n.* Ikeda, 1904) (CA, WA marine infauna)

## Spoon Worms

Echiura (=Echiurida) is a phylum of the Protostomia. About 140 species.

Order Echiuroidea

Bonelliidae (*Nellobia*)

Echiuridae

Subfamily Echiurinae (*Echiurus*)

Subfamily Thalassematinae

(*Arhynchite*, *Lissomyema*, *Thalassema* (put in Thalassematidae))

Thalassematidae (*Thalassema*) (also put in Echiuridae), Subfamily Thalassematinae)

*Arhynchite* Bird & Holdich, 1984 - Echiuridae spoon worms, Subfamily Thalassematinae

*Arhynchite californicus* Fisher, 1949 (sCA marine infauna)

*Arhynchite pugettensis* (WA marine infauna)

*Echiurus* - Echiuridae spoon worms, Subfamily Echiurinae

*Echiurus echiurus* (Pallas, 1767) (WA marine infauna)

*Echiurus echiurus alaskanus* (WA marine infauna)

*Lissomyema* Fisher, 1946 - Echiuridae spoon worms, Subfamily Thalassematinae

*Lissomyema muelitta* (*Thalassema m.* Conn, 1886) (NC marine infauna)

*Nellobia* Fisher, 1946 – Bonelliidae spoon worms

*Nellobia eusoma* Fisher, 1946 (WA marine infauna)

*Thalassema* Pallas, 1771 – Thalassematidae spoon worms, Subfamily Thalassematinae (also put in Echiuridae)

*Thalassema harmani* Fisher, 1947 (TX & Carolinian marine infauna)

*Thalassema melitta* Conn = *Lissomyema m.*

## Trematodes

Trematoda, a class of Phylum Platyhelminthes (flatworms). Known also as "Flukes" "Suckers" and "Flat worms" are internal parasites with unsegmented dorso-ventral flattened body, supplied with one or two suckers. Some cylindrical and threadlike species. Thick cuticle, often with spines or hooks, esp. at rear end. From 1mm to 7 mm long with most a few cm. Parasites in crickets, bats, woodrats, salamanders and other vertebrates living or occasionally visiting caves. Digenean trematodes are hermaphrodites (possessing both female and male reproductive systems in a single body) and have very complicated life cycle express by alternation of several generations (known as adult, egg, miracidia, sporocyst, redia, cercaria, metacercaria (adolescaria), and mesocercaria) and replacement of several host categories (known as final, first and second intermediate hosts). About 6,000 species.

**Bibl.:** Stiles & Hassall (1899); Rudolphi (1809, 1819); Diesing (1850, 1850); Looss (1899, 1901, 1907); Luehe (1909) Skrjabin 1923-1987; Yamaguti (1958, 1971, 1975), and many other authors and publications listed in the Index Catalog of Medical and Veterinary Zoology, Washington 1960-1984; Helminthological Abstract, London 1960- 1999; Referative Journal, Moscow, 1960-1999.

Phylum Platyhelminthes (flatworms)

Class Trematoda

Subclass Digenea

Order Strigeida

Superfamily Clinostomoidea

Family Clinostomidae

Subfamily Clinostominae: *Clinostomum*;

Superfamily Diplostomoidea

Family Diplostomidae

Subfamily Alariinae (*Alaria*)

Subfamily Diplostominae: *Diplostomum*;

Superfamily Brachylaimoidea

Family Brachylaimidae

Subfamily Brachylaiminae: *Brachylaema*, *Brachylaima*, *Brachylaemus*;

Order Paramphistomida

Superfamily Paramphistomoidea

Family Diplodiscidae

Subfamily Diplodiscinae

(*Diplodiscum*; *Megalodiscus*; *Opisthodiscus*; *Pseudopisthodiscus*)

Order Plagiorchiida

Suborder Plagiorchiata: Macroderoididae (*Alloglossoides*)

Superfamily Allocreadioidea

Family Allocreadiidae

Subfamily Allocreadiinae: *Allocreadium*;

Family Opecoelidae (*Cainocreadium*, *Distoma*)  
Subfamily Plagioporinae: *Plagioporus*;

Superfamily Opisthorchioidea  
Family Opisthorchiidae  
Subfamily Ratzinae: *Ratzia*

Superfamily Microphalloidea  
Family Anterotrematidae  
Subfamily Anterotrematinae: *Anterotrema*

Family Microphallidae  
Subfamily Microphallinae: *Microphallus*; *Levinseniella*;  
Subfamily Renischetrematinae: *Renischetrema*;

Superfamily Plagiorchioidea  
Family Allassogonoporidae  
Subfamily Allassogonoporinae: *Allassogonoporus*; *Myotitrema*

Family Brachycoelidae  
Subfamily Brachycoelinae: *Brachycoelium*;  
Subfamily Brachylecithinae: *Brachylecithum*;  
Subfamily Mesocoeliinae: *Mesocoelum*;

Family Cephalogonimidae  
Subfamily Cephalogoniminae: *Cephalogonimus*;

Family Dicrocoeliidae (*Lyperosomum*)  
Subfamily Dicrocoeliinae: *Dicrocoelium*; *Lutziella*, *Lutzitrema*; *Zyperosomum*;  
Subfamily Eutrematinae: *Conspicuum*;

Family Gorgoderidae  
Subfamily Gorgoderinae: *Gorgodera*; *Gorgoderina*  
Subfamily Phyllodistominae: *Phyllodistomum*;

Family Lecithodendriidae (*Ototrema*) (undet. Genus in TN *Myotis grisescens* bats)  
Subfamily Lecithodendriinae: *Lecithodendrium*;

Subfamily Gyrobascinae: *Gyrobascus*; *Limatulum*; *Limatuloides*; *Tremajoannes*;  
Subfamily Maxbarauniinae: *Maxbraunium*

Subfamily Parabascinae: *Parabascus*;  
Subfamily Paralecithodendriinae: *Paralecithodendrium*;

Subfamily Phaneropsolinae: *Phaneropsolus*;  
Subfamily Pleurogeninae: *Pleurogenes*; *Glyptoporus*;

Subfamily Prosthodendriinae

*Prosthodendrium*; *Ochoterenatrema*; *Travassodendrium*

Subfamily Pycnoporinae: *Pycnopus*;

Family Plagiorchiidae

Subfamily Plagiorchiinae: *Plagiorchis*;

Subfamily Styphlodorinae:

*Manodistomum*; *Paralepoderma*; *Plagitura*; *Pseudoreniifer*; *Zeugorchis*

Family Prosthogonimidae

Subfamily Prosthogoniminae: *Prosthogonimus*;

Family Stomilotrematidae

Subfamily Stomylotrematinae: *Stomylotrema*;

Family Telorchiiidae

Subfamily Telorchinae: *Telorchis*;

Family Urotrematidae

Subfamily Urotrematinae: *Urotrema*; *Urotrematulum*;

Subclass Monogenea

Order Monogenea

Suborder Polyopisthocotyle

Superfamily Polystomatoidea

Family Sphyanuridae

Subfamily Sphyanurinae: *Sphyanura*;

*Acanthatrium* (Faust, 1919) = subgenus of *Prosthodendrium* (Intestinal parasites of bats and other animals).

***Alaria*** Schrank, 1788 - Diplostomatidae trematodes, Subfamily Alariinae (Intestinal parasites of various animals, including salamanders).

***Alaria arisaemoides*** Augustinae & Urbie, 1927 (endoparasite in TX, MN *Triturus viridescens* salamanders)

***Alaria canis*** La Rue & Fallis, 1934 (endoparasite in OK, TX, MN *Triturus viridescens* salamanders)

***Allassogonoporus*** Olivier, 1938 - Allassogonoporidae trematodes, Subfamily Allassogonoporinae (Intestinal parasites of various animals, including bats)

***Allassogonoporus marginalis*** Olivier, 1938 (= *A. verspertilionis* Macy, 1940; *Myotitrema asymmetrica* Macy, 1940 (fide Gilford, 1955)) (endoparasite in KY *Myotis sodalis*, MN, OR &

WI *Eptesicus fuscus*), OR *Myotis californicus caurinus*, KS *Myotis grisescens*, KS, IN (Green Co.) *Myotis velifer*, MI, IN *Pipistrellus subflavus*, LA *Tadarida brasiliensis cynocephala*, IN, MN, MI, IA, OR, WI *Myotis lucifugus* & IN, MN, MI, IA, OR *Myotis evotis* bats)

*Allassogonoporus marginalis* Olivier, 1938 (endoparasite in IN (rare), MN, WI *Eptesicus fuscus* bats; in KS *Myotis velifer incautus*; KS?, OR *Myotis californicus caurinus*; IN, KS, MN, OR, WI (Tx) *Myotis lucifugus*, IN *Pipistrellus subflavus*, KS (Tx), KY *M. sodalis*; KS *Myotis velifer* & LA *Tadarida brasiliensis* bats)

*Allassogonoporus vespertilionis* Macy, 1940 (endoparasite in OR *Myotis californicus caurinus*, & MD, IN *Eptesicus fuscus* bats).

*Allocreadium* Looss, 1900 - Allocreadiidae trematodes, subfamily Allocreadiinae (Intestinal and abdominal parasites of various animals, including salamanders).

*Allocreadium pseudotritoni* Rankin, 1937 (endoparasite in non-cave OH *Gyrinophilus porphyriticus duryi*, *Pseudotriton ruber* & *montanus* salamanders)

*Alloglossoides* Corkum & Turner, 1977 - Macroderoididae trematodes (Internal parasites of various animals, including crayfish)

*Alloglossoides caridicola* Corkum & Turner, 1977 (endoparasite in non-cave LA *Procambarus acutus* a. crayfish)

*Brachycoelium* Stiles & Hassall, 1898 - Brachycoelidae trematodes, subfamily Brachycoelinae (endoparasite in blood vessels, mainly veins of liver and other abdominal organs of various animals, including salamanders)

*Brachycoelium ambystomae* Rankin et Hughes, 1937 (endoparasite in non-cave FL *Ambystoma opacum* salamanders)

*Brachycoelium* undet. sp. or species (endoparasite in AL, IL, TN *Eurycea lucifuga* salamanders  
*Brachycoelium dorsale* Byrd, 1937 (endoparasite in non-cave LA *Ambystoma opacum* salamanders)

*Brachycoelium elongatum* Cheng 1959 (endoparasite in VA (Giles Co.) *Demognathus phoca*, *D. quadrimaculatus* & *Plethodon glutenosus* salamanders).

*Brachycoelium hospitale* (Stafford, 1900) Looss, 1902 (endoparasite in LA *Plethodon glutenosus*, PA, VA *Triturus viridescens*, NC, PA, TX *Ambystoma maculatum*, *A. opacum*, *Demognathus fuscus*, *D. ochrophaeus*, *D. phoca*, & *Eurycea bislineata cirrigera* salamanders).

*Brachycoelium meridionalis* Harwood, 1932 (endoparasite in TX (Houston) *Triturus meridionalis*, GA *Demognathus fuscus* & *Plethodon glutenosus* salamanders).

*Brachycoelium mesorchium* Byrd, 1937 (endoparasite in GA *Demognathus fuscus* salamanders).

***Brachycoelium obesum*** Nicoll, 1914 (endoparasite in non-cave VA *Plethodon cinereus* salamanders).

***Brachycoelium ovale*** Byrd, 1937 (endoparasite in GA *Desmognathus fuscus* & *Plethodon glutinosus* salamanders).

***Brachycoelium salamandrae*** (Froelich, 1789) Luehe, 1909 (endoparasite in MO Tb *Typhlotriton spelaeus*, IL (Tx), KY (Trigg Co.) *Eurycea lucifuga*, non-cave OH *Gyrinophilus porphyriticus duryi*, non- cave LA,CT, WI *Ambystoma opacum* & *maculatum*, non-cave *Plethodon cinereus c. albaquia* & *glutinosus* & non-cave AR *Desmognathus brimleyorum* & *Eurycea multiplicata griseogaster* & LA, NY (Tx), PA (Tx), MA (Tx), NC (Tx) *Eurycea bislineata*, NY *Triturus viridescens*, MA *Ambystoma jeffersonianum* & *maculatum* salamanders),

***Brachycoelium storeriae*** Harwood, 1932 (endoparasite in GA *Opheodrys aestivus*, LA *Desmognathus fuscus* & non-cave NH *Eurycea bislineata* salamanders)

***Brachycoelium trituri*** Holl, 1928 (endoparasite in MD, OH, LA *Triturus meridionalis* & *viridescens*, GA *Desmognathus fuscus* salamanders).

***Brachylaema*** Yamaguti, 1958 - Brachylaimidae trematodes, subfamily Brachylaiminae (Parasites in small intestinae of various birds and rodents, including those found in caves).

*Brachylaema peromyscis* = *Brachylaemus p.*

*Brachylaema dolichodirus* = *Brachylaima d.*

*Brachylaema raushi* = *Brachylaima r.*

***Brachylaemus*** Blanchard, 1847 - Brachylaimidae trematodes, subfamily Brachylaiminae (Parasites in small intestine of various rodents and birds, including in woodrats)

***Brachylaemus peromyscis*** Reynolds, 1937 (endoparasite in NM, CA *Neotoma albigula* & *stephensi* woodrats).

***Brachylaima*** Dujardin, 1843 or 1845 (= *Brachylaemus*) Brachylaimidae trematodes, subfamily Brachylaiminae (Parasites in small intestine of various rodents and birds, including in woodrats)

***Brachylaima dolichodirus*** Mason, 1953 (endoparasite in Tx, TX, AZ *Neotoma micropus* & *albigula* woodrats)

***Brachylaima raushi*** McIntosh, 1950 (endoparasite in NM, TX, AZ *Neotoma albigula*, *micropus* & *stephensi* woodrats).

***Brachylecithum*** Storm, 1940 - Brachycoelidae trematodes, subfamily Brachylecithinae (Parasites in gall bladder and liver of various birds, including in swallows)

***Brachylecithum americanum*** Denton, 1945 (endoparasite in NM, CA *Hirundo rustica* & *fulva* swallows).

***Brachylecithum delicatum*** Denton & Byrd, 1951 (in MN, ND *Hirundo fulva* cave swallow).

***Cainocreadium*** Nicoll, 1909 - Opecoelidae trematodes, subfamily (Intestinal and abdominal parasites of various animals, including salamanders).

***Cainocreadium pseudotritoni*** (Rankin, 1937) Yamaguti, 1958 (endoparasite in non- cave OH *Gyrinophilus porphyriticus duryi*, *Pseudotriton ruber* & *montanus* salamanders)

***Cephalogonimus*** Poirier, 1886 - Cephalogonimidae trematodes, subfamily Cephalogoniminae (Intestinal parasites of various amphibians and reptiles, including salamanders).

***Cephalogonimus brevicirrus*** Ingles, 1932 (endoparasite in CA *Triton cristatus* salamanders)

***Cephalogonimus compactus*** Stunkard, 1924 (endoparasite in Fl *Triton palmatus* salamanders)

***Cephalogonimus vesicaudus*** Nicerson, 1912 (endoparasite in AZ, TX *Triton punctatus* salamanders)

***Clinostomum*** Leidy, 1856 - Clinostomidae trematodes, subfamily Clinostominae (Intestinal parasites of various birds, amphibians and reptiles, including salamanders).

***Clinostomum complanatum*** (Rudolphi, 1814) (endoparasite in TX (Real Co.) *Eurycea neotenes* salamander),

***Conspicuum*** (Bhalerao, 1936) Shtrom, 1940 - Dicrocoeliidae trematodes, subfamily Eutrematinae (Parasites in gall bladder of various birds and mammals, including bats).

***Conspicuum icteridorum*** Denton et Byrd, 1951 (endoparasite in LA, TX (Tx) *Tadarida brasiliensis* & TX *Myotis lucifugus* bats).

***Conspicuum macrorchis*** Denton et Byrd, 1951 (endoparasite in TX (San Antonio) *Tadarida brasiliensis* bats).

***Dicrocoelium*** (Dujardin, 1845) Blanchard, 1847 - Dicrocoeliidae trematodes, subfamily Dicrocoeliinae (Parasites in liver & biliary bladder & ducts of some mammals & birds, incl. bats)

***Dicrocoelium lasiuri*** McIntosh, 1933 (endoparasite in DC *Lasiurus borealis* bats)

***Dicrocoelium rileyi*** Macy, 1931 (endoparasite in LA, NM, OK, TX, KS *Myotis velifer*, *Nycticeius humeralis*; IA *Eptesicus fuscus*; FL, LA, OK *Tadarida brasiliensis cynocephala* & OK, TX (Tx) *Tadarida brasiliensis mexicana* bats)

***Diplodiscus*** Diesing, 1836 - Diplodiscidae trematodes, subfamily Diplodiscinae (Parasites in endgut of amphibians, including salamanders).

***Diplodiscus intermedius*** Hutner, 1930 (endoparasite in NC *Desmognathus fuscus* salamanders).



***Diplodiscus temperatus*** Stafford, 1905 (endoparasite in NC, NY, FL *Ambystoma opacum* & *tigrinum*, *Desmognathus fuscus*, & *Triturus granulatus* salamanders).

***Diplostomum*** (Nordmann, 1832) Brandes, 1892 - Diplostomidae trematodes, subfamily Diplostominae (Intestinal parasites of various birds and amphibians, including salamanders)

***Diplostomum ambystomae*** Rankin & Hughes, 1937 (endoparasite in NC (Durham), MI *Ambystoma apacum*, *maculatum* & *tigrinum* salamanders).

***Diplostomum desmognathus*** Rankin, 1937 (endoparasite in NC (Bent Creek *Desmognathus fuscus*, *phoca* & *quadramaculatus* salamanders).

***Diplostomum*** undet. sp. (endoparasite in VA *Triturus viridescens* salamander)  
**Bibl.:** Lautenschlager, 1958

***Diplostomum*** undet. sp. (endoparasite in PA *Triturus viridescens* salamander). **Bibl.:** Shaw 1933

***Distoma*** Zeder, 1800 (= *Orchipedium*) (liver fluke) Opicoelidae trematodes

***Distoma*** undet. sp. or species (endoparasite in TN? *Lasiurus borealis* & DC, WI *Lasiurus cinereus* bats)

***Distoma tubiformum*** Braun, 1900 (endoparasite in *Lasiurus borealis* bats)

***Glyptoporus*** Macy, 1936 - Lecithodendriidae trematodes, subfamily Pleurogeninae (Intestinal parasites of bats)

***Glyptoporus collaris*** nomen nudum (in CA intestine of *Macrotus californicus* bats)

***Glyptoporus noctophilus*** Macy, 1936 (endoparasite in IN, WI, MN *Myotis lucifugus*; WI, MN *E. fuscus*; WI *Myotis keeni*; IN (Tx) *Myotis sodalis* & TX *Tadarida brasiliensis mexicana* bats).

***Glyptoporus*** undet. sp. (endoparasite in AB *Eptesicus fuscus* & *Myotis lucifugus* bats).

***Gorgodera*** Looss, 1899 - Gorgoderidae trematodes, subfamily Gorgoderinae (Parasites in urinary bladder of amphibians, including salamanders).

***Gorgodera amplicava*** Looss, 1892 (endoparasite in *Pseudotriton ruber* & *montanus*, & *Ambystoma maculatum* salamanders).

***Gorgodera attenuata*** Stafford, 1902 (endoparasite in ME, NY *Triturus viridescens* & TX *Ambystoma tigrinum* salamanders).

***Gorgodera minima*** Cort, 1912 (endoparasite in IL, MI *Triturus viridescens* salamander).

***Gorgodera opaca*** Stafford, 1902 (endoparasite in ME, IL *Triturus viridescens* salamander).

***Gorgodera translucida*** Stafford, 1902 (endoparasite in ME *Triturus viridescens* salamander).

***Gorgoderina*** Looss, 1902 - Gorgoderidae trematodes, subfamily Gorgoderinae (Parasites in urinary bladder of amphibians and fishes, including salamanders).

***Gorgoderina attenuata*** (Stafford, 1902) Stafford, 1905 (endoparasite in ME, NY *Triturus viridescens* & TX *Ambystoma tigrinum* salamanders).

***Gorgoderina aurora*** Ingles, 1936 (endoparasite in NC *Desmognathus fuscus*, *Ambystoma opacum*, *Pseudotriton rubur* & *montanus*, & *Triturus viridescens* salamanders).

***Gorgoderina bilobata*** Rankin, 1937(in NC (Durham) *Ambystoma opacum*, *Desmognathus fuscus*, *Pseudotriton rubur* & *Triturus viridescens* salamanders).

***Gorgoderina intermedia*** Hall, 1928 (endoparasite in PA *Triturus viridescens* salamanders).

***Gorgoderina opaca*** (Stafford, 1902) Stafford, 1905 (endoparasite in ME, IL *Triturus viridescens* salamander).

***Gorgoderina tenuis*** Rankin, 1937(endoparasite in non-cave NC *Eurycea guttolineata* salamander).

***Gorgoderina translucida*** (Stafford, 1902) Stafford, 1905 (endoparasite in ME *Triturus viridescens* salamanders).

***Gyrabascus*** Macy, 1935 - Lecithodendriidae trematodes, subfamily Prosthodendriinae (Intestinal parasites of Chiroptera)

***Gyrabascus brevisgastrus*** Macy, 1935 (endoparasite in WI, MN *Myotis lucifugus* bats)

***Gyrabascus echinus*** McIntosh 1936 (endoparasite in CA, AZ *Myotis californicus* bats)

***Haematoloechus*** Looss, 1899 - Plagiorchiidae trematodes (Parasites in lungs of amphibians, including salamanders)

***Haematoloechus longiplexus*** Stafford, 1902 (endoparasite in TX *Desmognathus fuscus* & *Ambystoma tigrinum* salamanders).

***Haematoloechus pulcher*** Bravo-Hollis, 1943 (endoparasite in Az *Ambystoma tigrinum* salamanders)

***Lecithodendrium*** Looss, 1896 - Lecithodendriidae trematodes, subfamily Lecithodendriinae (Parasites of Chiroptera, occasionally of chameleons)

@***Lecithodendrium anticum (ascidioides)*** (endoparasite in Canadian *Myotis subulatus* bats)

***Lecithodendrium breckenridgeri*** Macy, 1936 (endoparasite in MN (St. Peter) *Pipistrellus subflavus* bats)

***Lecithodendrium linstowi*** Dollfus, 1931 (endoparasite in MN *Eptesicus fuscus* & TX *Tadarida mexicana* bats).

*Lecithodendrium nycteridis* (Faust, 1919) Pande, 1935 = *Prosthodendrium* n

@***Lecithodendrium posticum*** (endoparasite in Canadian *Myotis subulatus* bats)

***Lecithodendrium pricei*** Perez Viguera, 1940 (endoparasite in IN *Eptesicus fuscus*, MN *Pipistrellus subflavus* bats)

***Lecithodendrium*** undet. sp. or species (endoparasite in TN, WI *Lasiurus borealis* bats)

***Lecithodendrium vivianae*** (Groschafft & Valle, 1969) Odening, 1969 (endoparasite in IN, MN *Eptesicus fuscus*; IN, MN *Pipistrellus subflavus* bats).

@~***Lecithodendrium*** Cheng, 1959 (in VA (Albemarle Co) *Eptesicus fuscus* & DC *Lasionycteris noctivagans* bat).

***Levinseniella*** Stiles & Hassall in Ward, 1901 - Microphallidae trematodes, subfamily Microphallinae (Parasites in digestive tract of birds, including in cave swallow).

***Levinseniella amnicolae*** Etges, 1953 (endoparasite in KY *Hirundo fulva*, & NY *Hirundo rusticola* swallow birds).

***Levinseniella carcinidis*** Rankin, 1939 endoparasite (in MI, *Hirundo fulva* swallows).

***Limatum*** Travassos, 1921 - Lecithodendriidae trematodes, subfamily Lecithodendriinae (Gastrointestinal parasites of Chiroptera)

***Limatum diminutum*** Chandler, 1938 (endoparasite in TX (Houston) *Nycticeius humeralis* batw).

***Limatum gastroides*** Macy, 1935 (endoparasite in KY (Tx) *Myotis sodalis*; AB, OR *Myotis californicus caurinus*; IA, IN (Tx), MA, MI, MN, WI (Tx) *Myotis lucifugus* & *Tadarida brasiliensis*; WI *Myotis keeni*; IN *Lasionycteris noctivagans* & IN, WI *Eptesicus fuscus* bats)

***Limatum limatum*** (Braun, 1900) Travassos, 1921 (endoparasite in TX *Myotis velifer* bats)

***Limatum mcdanieli*** Brooks & Coggins, 1983 (endoparasite in WI *Myotis lucifugus* bats)

***Limatum noctophilum*** (*Glyptoporus* n. Macy, 1931) (endoparasite in US *Myotis lucifugus* & IN *Myotis sodalis* bats)

***Limatum oklahomense*** Macy, 1931 (endoparasite in KS *Myotis grisescens*, FL, KS, OK *Tadarida b. cynocephala* & TX (Tx) *Tadarida b. mexicana* bats)

**Lutziella** (Rodhe, 1966) Yamaguti, 1971 (also treated as subgenus of *Lutztrema*) - Dicrocoeliidae trematodes, subfamily Dicrocoeliinae (Parasites in liver and gall bladder of mammals, including bats)

**Lutziella microacetabulare** (Rodhe, 1966) Yamaguti, 1971 (= *Lutztrema (Lutziella) m.*) Byrd, 1937) (endoparasite in IN *Myotis lucifugus* bats),

**Lutztrema** Travassos, 1941 - Dicrocoeliidae trematodes, subfamily Dicrocoeliinae (Parasites in liver -gall bladder and bile ducts of birds and mammals, including in cave swallows).

**Lutztrema monenteron** (Price & McIntosh, 1935) Travassos, 1941 (endoparasite in LA *Hirundo fulva* swallow).

**Lyperosomum** Looss, 1899 - Dicrocoeliidae trematodes, subfamily (Parasites in liver -gall bladder and bile ducts of birds and mammals, including in cave swallows)

**Lyperosomum** sp. Humes, 1941 (endoparasite in LA *Hirundo fulva* swallows).

**Lyperosomum** sp. Denton, 1942 (endoparasite in TX *Hirundo fulva* swallow).

**Manodistomum** Stafford, 1905 - Plagiorchiidae trematodes, subfamily Styphlodorinae (Parasites in alimentary tract and lungs of amphibians and reptiles, including salamanders).

**Manodistomum intermedium** (Etges & Bonner, 1965) Yamaguti, 1971 (endoparasite in IN *Triturus veridescens* salamander).

**Manodistomum occultum** Stafford, 1905 (endoparasite in non-cave NC *Eurycea guttolineata* salamander),

**Manodistomum megacystis** (Steward, 1960) Yamaguti, 1971 (endoparasite in KS *Triturus veridescens* salamander).

**Manodistomum parvum** (Stunkard, 1933) Yamaguti, 1958 (endoparasite in OH *Triturus veridescens* salamander)

**Manodistomum salamandra** (Holl, 1928) Yamaguti, 1958 (in NC, NY, MD, VA *Triturus veridescens* & *Ambystoma opacum* salamanders).

**Maxbraunium** Caballero & Zerecero, 1942 - Lecithodendriidae trematodes, subfamily Pleurogeninae Maxbrauniinae (Gastrointestinal parasites of Chiroptera).

**Maxbraunium tubiporum** (Braun, 1900) Caballero & Zerecero, 1942 (endoparasite in TX *Pipistrellus subflavus*, *Lasiurus borealis*, *Myotis californicus* bats).

**Megalodiscus** Chandler, 1923 - Diplodiscidae trematodes, subfamily Diplodiscinae (Parasites in rectum, occasionally in bladder of amphibians, including salamanders).

***Megalodiscus americanus*** Chandler, 1923 (endoparasite in OR (Benton Co) *Triturus granulosus*, NC *Desmognathus fuscus* & NC, OR (Linn Co) *Ambystoma gracile* salamanders).

***Megalodiscus intermedius*** (Hutner, 1930) Harwood, 1932 (endoparasite in NC *Desmognathus fuscus* salamander).

***Megalodiscus rankini*** Bravo-Hollis, 1941 (endoparasite in VA, NC *Triturus viridescens* salamander).

***Megalodiscus temperatus*** (Stafford, 1905) Harwood, 1932 (in NC, NY, FL *Ambystoma opacum* & *tigrinum*, *Desmognathus fuscus*, & *Triturus granulosus* salamanders).

***Mesocoelium*** Odhner, 1910 - Brachycoelidae trematodes, subfamily Mesocoeliinae (Intestinal parasites of amphibians and reptiles, including salamanders).

***Mesocoelium americanum*** Harwood, 1932 (endoparasite in TX (Houston) *Triturus meridionalis* salamander).

***Microphallus*** Ward, 1901 - Microphallidae trematodes, subfamily Microphallinae (Intestinal and abdominal parasites of fishes)

***Microphallus fonti*** Overstreet, Head & Lotz, 1992 (endoparasite in non-cave LA *Procambarus clarki* crayfish).

***Myotitrema*** Macy, 1939 - Allassogonoporidae trematodes, subfamily Allassogonoporinae (Intestinal parasites of Chiroptera)

***Myotitrema asymmetricum*** Macy, 1939 (endoparasite in MN *Myotis licifugus* bats).

***Ochoterenatrema*** Caballero, 1943 - Lecithodendriidae trematodes, Subfamily Prosthodendriinae (Intestinal parasites of Chiroptera)

***Ochoterenatrema breckenridgei*** (*Lecithodendrium b.* Macy, 1936; *L. pricei* Perez Viguera, 1940; *O. p.* Odening, 1969; *L. viviana* Groschafft & Valle, 1969 (fide Odening, 1973)) Caballero, 1943 (endoparasite in Cuba, IN, MN, WI *Eptesicus fuscus*; Cuba *Artebius jamaicensis*; IN, MN *Pipistrellus subflavus* & FL *Tadarida brasiliensis cynocephala* bats)

***Ochoterenatrema costarricensis*** Caballero & Madrigal, 1958 (endoparasite in NM, TX *Eptesicus fuscus* & WI *Myotis keeni* bats).

***Ochoterenatrema diminutum*** (*Limatulum d.* Chandler, 1938; *O. caballeroi* Freitas, 1957; *Prosthodendrium n.* Williams, 1961; *P. nokomis* Groschafft & Valle, 1969; *P. bungerminii* Groschafft & Valle, 1969) Caballero, 1943 (endoparasite in Cuba, IN, MN, WI *Eptesicus fuscus*, MS *Lasiurus intermedius*), IN (Tx) *Myotis keeni* ; KY *Myotis sodalis*; TX, IN *Myotis lucifugus*; TX *Nycticeius humeralis* & IN *Pipistrellus subflavus* & *Tadarida b.* bats)

***Ochoterenatrema fraternum*** Teixeira de Freitas & Ibanez H., 1962 (endoparasite in NM *Tadarida b.* bats).

***Ochoterenatrema labda*** (Caballero, 1943) Yamaguti, 1958 (endoparasite in FL, LA, NM, TX *Tadarida brasiliensis*; LA *Myotis austroriparius*; MN, WI *Eptesicus fuscus* & FL, TX (Tx) *Tadarida brasiliensis cynocephala* bats).

***Ochoterenatrema travassosi*** (*Prosthodendrium t.* Macy, 1938; *Pycnopus t.* Yamaguti, 1938) (endoparasite in WI & MN *Eptesicus fuscus* bats)

***Ochoterenatrema*** undesc. sp. (Tx in IN *Eptesicus fuscus* bats).

***Opisthodiscus*** Cohn, 1904 - Diplodiscidae trematodes, subfamily Diplodiscinae (Parasites in large intestine of batrachians).

***Opisthodiscus amereicanus*** Holl, 1928 (endoparasite in OH *Triturus viridescens* salamanders).

***Ototrema*** Font, 1978 - Lecithodendriidae trematodes, subfamily (Intestinal parasites of bats).

***Ototrema schildti*** Font, 1978 (endoparasite in WI & MN *Myotis lucifugus* (Tx) & WI *Myotis keeni* bats)

***Parabascus*** Looss, 1907 - Lecithodendriidae trematodes, subfamily Parabascinae (Parasites of Chiroptera)

***Parabascus lepidotus*** Looss, 1907 (endoparasite in CA, TX *Myotis lucifugus* & *Eptesicus fuscus* bats).

***Paralecithodendrium*** (Odhner, 1911) Travassos, 1921 (= *Prosthodendrium* Dolfus, 1931; *Chiroptedendrium*, *Skryabinodendrium* *Travassodendrium* Skarbilovich, 1943; *Longitrema* Cheng, 1954) - Lecithodendriidae trematodes, subfamily Paralecithodendriinae (Intestinal parasites of mammals, especially of Chiroptera).

***Paralecithodendrium carlsbadensis*** Cain, 1966 (type locality in Carlsbad C. (NM)/ endoparasite on *Tadarida brasiliensis* bats)

***Paralecithodendrium chilostomum*** (*Distoma c.* Mehlis, 1831; *D. ascidiodes* Van Beneden, 1873; *Lecithodendrium cordiforme laxmii* Bhalerao, 1926; *Prosthodendrium oligolechithum* Manter & Debus, 1945; *Travassodendrium rhinolophi* Rsvavy, 1956; *T. raabei* Soltys, 1959) Travassos, 1921 (endoparasite in MN, IN & WI *Eptesicus fuscus*, FL *Tadarida b. cynocephala*, NE *Myotis californicus*; IN *Myotis lucifugus* & NB *Pipistrellus subflavus* bats),

***Paralecithodendrium longiforme*** (Bhalerao, 1926) Nortrup, 1928 (endoparasite in CA, TX *Eptesicus fuscus* bats).

***Paralecithodendrium lucifugi*** (Macy, 1937) (endoparasite in WI, MN *Myotis lucifugus* & *Eptesicus fuscus* bats)

***Paralecithodendrium macnabi*** (*Prosthodendrium m.* Macy, 1936; *Prosthodendrium mizellei* Seamster & Stevens, 1948; *P. duboisi* Neiland, 1962) Lotz & Font, 1983 (endoparasite in BC, MN, IN & WI *Eptesicus fuscus*; AK, IN (Tippecanoe Co.) *Myotis lucifugus*, & IN, BC *Lasionycteris noctivagans* bats).

***Paralecithodendrium naviculum*** (*Prosthodendrium n.* Macy, 1936; *P. mizellei* Seamster & Stevens, 1948; *P. duboisi* Neiland, 1962) (endoparasite in MN, IN & WI *Eptesicus fuscus*; IN *Myotis lucifugus*, *Myotis sodalis*, *Eptesicus fuscus*; MS *Lasiurus intermedius floridanus*; Mex. *Lasiurus cinereus*, *Tadarida brasiliensis* & BC *Myotis volans* bats).

***Paralecithodendrium nokomis*** ((*Prosthodendrium n.* Macy, 1935) (endoparasite in MN, IN & WI *Eptesicus fuscus*; MN & IA *Lasiurus borealis* & *Nycteris borealis* bats).

***Paralecithodendrium singularium*** (*Prosthodendrium s.* Byrd & Macy, 1942) (endoparasite in MS *Lasiurus intermedius floridanus* bats)

***Paralecithodendrium swansoni*** ((*Prosthodendrium s.* Macy, 1936) Lotz & Font, 1983 (= *P. lucifugi* (Macy, 1937)) (endoparasite in IA, IN, MN, WI *Eptesicus fuscus*, KS *Myotis grisescens*; IA *Lasiurus borealis*; LA *Tadarida cynocephala*; BC, IN (Tippecanoe Co.), Jamaica, *Tadarida brasiliensis*; BC, IA, IN, MN, WI *Myotis lucifugus* & IN (Greene Co.) *Myotis keeni* & *sodalis* bats).

***Paralecithodendrium transversum*** (*Prosthodendrium t.* Byrd & Macy, 1942) (endoparasite in Cuba, IA, IN, MN & WI *Eptesicus fuscus*; IA, IN, TN *Lasiurus borealis*, IA, IN (Tx) & WI *Myotis keeni*, IN, KY *Myotis sodalis* (Tx) & IN *Pipistrellus subflavus* & *Myotis lucifugus* bats).

***Paralepoderma*** Dollfus, 1950 - Plagiorchiidae trematodes, subfamily Styphlodorinae (Cloacal parasites of amphibians and reptiles)

***Paralepoderma cloacicola*** (Luehe, 1909) Dollfus, 1950 (endoparasite in TX *Ambystoma mexicana* & *Triturus viridescens* salamanders).

***Phaneropsolus*** Looss, 1899 - Lecithodendriidae trematodes, subfamily Prosthodendriinae Phaneropsolinae:

***Phaneropsolus orbicularis*** (Diesing, 1850) Braun, 1901 (endoparasite in CA, OR *Myotis* bats)

***Phyllodistomum*** Braun, 1899 - Gorgoderidae trematodes, subfamily Phyllodistominae (Parasites in urinary bladder of freshwater and marine teleosts and amphibians).

***Phyllodistomum americanum*** Osborn, 1903 (endoparasite in NM *Ambystoma punctatum*, *tigrinum* & *maculatum* salamanders).

***Phyllodistomum attenuata*** (Stafford, 1902) Pande, 1937 (in GA *Desmognathus fuscus* bats).

***Phyllodistomum coatneyi*** Meserve, 1941 (in WI *Ambystoma maculatum* salamander).

***Phyllodistomum solidum*** Rankin, 1937 (in PA, NC, NY non-cave sIL *Desmognathus fuscus* & *Triturus punctatus* salamander)

***Plagioporus*** Stafford, 1904 - Plagiorchiidae trematodes, subfamily Styphlodorinae (Parasites of marine, occasionally freshwater fishes and amphibians).

***Plagioporus gyrinophili*** Catalano & Etges, 1981 (endoparasite in non-cave OH *Gyrinophilus porphyriticus duryi* salamanders)

***Plagiorchis*** Luhe, 1899 Plagiorchiidae trematodes, subfamily Plagiorchiinae (Intestinal parasites of vertebrates, especially insectivores, including bats, and caves swallows).

***Plagiorchis maculosus*** Macy, 1931 (endoparasite in AB,CO,MI & NM *Myotis* bats)

***Plagiorchis* (*Plagioorchis*) *micracanthos*** Macy, 1931 (endoparasite in CA, NM, TX *Hirundo fusca*, *raparia* & *urtice* swallows & in NV *Pipistrellus hesperus*, KY (Tx) *Myotis sodalis*; MN,OH *Eptesicus fuscus*; MN,NM *Myotis lucifugus*; KS *Myotis grisescens*; CA *Myotis californicus*; TN *Myotis sodalis*, WA *Lasionycteris noctivagans* & NB *Pipistrellus subflavus* bats).

***Plagiorchis muris*** Tanabe, 1922 (endoparasite in Tx *Myotis velifer* bats).

***Plagiorchis*** undet. sp. (ectoparasite in TN *Nycticeius humeralis* bats)

***Plagiorchis* (*Plagiorchis*) *vespertilionis*** (Muller, 1784) Braun, 1900 (endoparasite in *Myotis grisescens*; IA, IN, KS, WI *Eptesicus fuscus*, IN *Lasiurus borealis*, *Lasionycteris noctivagans*, *Pipistrellus subflavus*, *Myotis sodalis*; IA, IN, WI *Myotis keeni*; IA, IN *Lasiurus cinereus*; LA, TX (Tx) *Tadarida b. mexicana* & *cynocephala*; Canadian *Myotis subulatus*, IA, IN, NB *Myotis lucifugus* & WA *M.l. alascensis* bats)

***Plagiorchis vespertilionis microcanthus*** (Macy, 1956) Odening, 1959 (endoparasite in OR, WA *Hirundo fusca* cave swallows & KY (Tx) *Myotis sodalis* & WA *Myotis lucifugus* bats).

***Plagiorchis vespertilionis parorchis*** Macy, 1956 (endoparasite in OR, WA, *Hirundo fusca* cave swallows; LA, TX (Tx) *Tadarida brasiliensis* & NB, WA *Myotis lucifugus* bats)

***Plagitura*** Holl, 1938 - Plagiorchiidae trematodes, subfamily Styphlodorinae (Parasites in alimentary tract and lungs of amphibians and reptiles, including salamanders).

***Plagitura intermedium*** (Etges & Bonner, 1965) Holl, 1938 (endoparasite in IN *Triturus veridescens* salamanders)

***Plagitura parvum*** (Stunkard, 1933) Holl, 1938 (endoparasite in OH, NY, MA *Triturus veridescens* salamanders)

***Plagitura salamandra*** Holl, 1928 (endoparasite in NC, NY, MD, VA *Triturus veridescens* & *Ambystoma opacum* salamanders).



***Plagitura*** sp. Etges & Patzer, 1956 (endoparasite in OH (Scioto CO) *Triturus veridescens* salamanders).

***Plagitura*** sp. Rankin, 1937 (endoparasite in NC *Ambystoma opacum* salamanders).

***Plagitura*** sp. Rankin, 1937 (endoparasite in NC *Triturus veridescens* salamanders).

***Pleurogenes*** Looss, 1896 - - Lecithodendriidae trematodes, subfamily Pleurogeninae (Intestinal parasites of amphibians, including salamanders).

***Pleurogenes medians*** (Olsson, 1896) Klein, 1905 (endoparasite in OR, *Triton palmatus* salamanders).

***Prosthodendrium*** Dollfus, 1931 (= *Prosthodendrium* Dollfus, 1931; *Chiroptodendrium*, *Travassodendrium* Skarbilovich, 1943; *Ochoterenatrema* Caballero, 1943; *Paralecithodendrium* Travassos, 1928; *Lecithodendrium* Looss, 1896) Lecithodendriidae trematodes, subfamily Prosthodendriinae (Intestinal parasites of mammals, especially of Chiroptera).

***Prosthodendrium*** (*Prosthodendrium*) *alaskense* or *alaskensis* Neiland, 1962 (endoparasite in AB *Eptesicus fuscus*, *Myotis lucifugus* & *Lasionycteris noctivagans* & non-cave? AK *Myotis lucifugus* bats)

***Prosthodendrium*** (*Acanthatrium*) *alicatai* Macy, 1940 (endoparasite in Tx *Tadarida b.* & DC, IN, MD, MN, TX *Eptesicus fuscus* bats).

***Prosthodendrium*** (*Acanthatrium*) *anticum* (Stafford, 1905) Dollfus, 1948 (endoparasite in MN *Eptesicus fuscus* bats)

***Prosthodendrium*** (*Acanthatrium*) *amphidymum* (*Acanthatrium amphidymum* Cheng, 1957) (endoparasite in VA *Eptesicus fuscus* bats)

***Prosthodendrium*** (*Acanthatrium*) *beuschleini* (*Acanthatrium b.* Cheng, 1957) (endoparasite in VA *Eptesicus fuscus* bats)

***Prosthodendrium*** *diminutum* Chandler, 1938 (endoparasite in IA, TX *Nycticeius humeralis* bats)

***Prosthodendrium*** (*Prosthodendrium*) *duboisii* Neiland, 1962 (endoparasite in MN *Eptesicus fuscus* & AK *Myotis lucifugus* bats)

***Prosthodendrium*** (*Acanthatrium*) *epesici* (*Acanthatrium e.* Alicata, 1932) Skarbilovich, 1948 (endoparasite in MA (Tx), DC *Myotis velifer* bats; BC, DC, IN, MA (Tx), MN, WI, VA *Eptesicus fuscus*; AB, IN (Tx), MI *Myotis keeni*; IA, IN *Lasiurus borealis*; IN *Myotis lucifugus* & *sodalis*, *Lasionycteris noctivagans*, *Pipistrellus subflavus*, *Nycticeius humeralis*, TX, OK *Tadarida brasiliensis mexicana*, FL *Tadarida brasiliensis cynocephala* & OH *P. subflavus* bats)

***Prosthodendrium*** (*Prosthodendrium*) *labda* (Caballero, 1943 ) (endoparasite in *Lasionycteris noctivagans* & non- cave? AK *Myotis lucifugus* bats).

***Prosthodendrium*** (*Prosthodendrium*) *longiforme* (Bhalerao, 1926) Macy, 1936 (endoparasite in KS, TX *Eptesicus fuscus* bats).

***Prosthodendrium*** (*Paralecithodendrium*) *lucifugi* Macy, 1937 (endoparasite in MN *Myotis lucifugus* & AB *Eptesicus fuscus* bats).

***Prosthodendrium*** (*Acanthatrium*) *lunatum* (A.I. Williams, 1960) (endoparasite in IA *Lasiurus borealis* & IA, KY, OH *Eptesicus fuscus* bats),

***Prosthodendrium*** (*Prosthodendrium*) *macnabi* Macy, 1936 (endoparasite in MN, WI *Eptesicus fuscus* & Mexico *Lasiurus cinereus* bats).

***Prosthodendrium*** (*Acanthatrium*) *macyi* (A. *macyi* Sogandareberrel (= Songadares-Bernal), 1956) (endoparasite in *Pipistrellus hesperus* bats)

***Prosthodendrium*** (*Acanthatrium*) *microacanthum* (Macy, 1940) (= *Acanthatrium microacanthum* Macy, 1940 (in part; *A. breuschleini* Cheng, 1959 (fied Dubois, 1961)) (endoparasite in AZ IN, MN, VA, WI *Eptesicus fuscus*; IN, VA *Myotis lucifugus*; IA *Lasiurus borealis*; OK *Tadarida brasiliensis* & IN *Pipistrellus subflavus* bats).

***Prosthodendrium*** (*Prosthodendrium*) *mizellei* Seamster & Stevens, 1948 (endoparasite in CA, IN *Eptesicus fuscus* bats)

***Prosthodendrium*** (*Prosthodendrium*) *naviculum* Macy, 1936 (endoparasite in AB, WI & MN *Eptesicus fuscus*, TX *Tadarida b.* & *Myotis velifer*, AB, IN & CO *Myotis lucifugus* & KY (Tx) *Myotis sodalis* bats).

***Prosthodendrium*** (*Paralecithodendrium*) *nokomis* Macy, 1936 (endoparasite in MN, WI *Eptesicus fuscus* bats).

***Prosthodendrium*** (*Acanthatrium*) *nycteridis* (A.n. Faust, 1919) (endoparasite in IL *Lasiurus borealis*, TX (Tx), MD (Tx) *Nycticeius borealis*; IL, TX (Tx) *Tadarida brasiliensis*; NM *Eptesicus fuscus* bat & IN MD *Myotis lucifugus* bats)

***Prosthodendrium*** (*Acanthatrium*) *oligacanthum* (A.o. Cheng, 1957) (endoparasite in IN, MN, OR, WI *Eptesicus fuscus*; IN *Nycticeius humeralis*, NB *Pipistrellus subflavus* & VA, IN *Myotis lucifugus*, *sodalis* & *keeni* bats)

***Prosthodendrium*** (*Prosthodendrium*) *oligolecithum* Manter et Debus, 1945 (endoparasite in NE *Pipistrellus hesperus* & *Myotis californicus*; VA *Myotis lucifugus* & VA, MN, WI *Eptesicus fuscus* bats).

***Prosthodendrium (Acanthatrium) oregonense*** (*Acanthatrium oregonense* Macy, 1939) Yamaguti, 1958 (endoparasite in Tx *Myotis velifer*, OR, TX *Eptesicus fuscus*, NW *Myotis lucifugus* M. & *evotis*, non-cave OR *Myotis californicus caurinus*; & *M. evotis* bats)

***Prosthodendrium (Acanthatrium) ovatum*** (Yamaguti, 1939) Yamaguti, 1958 (in CA, TX, NM *Eptesicus fuscus* & AB,MN *Myotis lucifugus* bats).

***Prosthodendrium (Acanthatrium) pipistrelli*** (*A.c.* Macy, 1940) (endoparasite in IA, KY (Tx), MN, OH & WI *Eptesicus fuscus*, IA *Lasiurus borealis*, MN, IN *Pipistrellus subflavus* & VA, IA, IN (Greene Co.) *Myotis lucifugus* bats)

***Prosthodendrium (Acanthatrium) undet. sp.*** Faster & Metrins, 1966 (endoparasite in FL,TX *Tadarida brasiliensis* bat; TX *Myotis velifer*, KS *Myotis grisescens* & IA,WI *Eptesicus fuscus* bats) Faster & Metrins, 1966

***Prosthodendrium (Acanthatrium) undescr. sp.*** (endoparasite in FL *Tadarida brasiliensis cynocephala* bats)

***Prosthodendrium undet. sp.*** (IL,IN,MO/ 2 Tx sp. in OR).

***Prosthodendrium (Prosthodendrium) swansoni*** Macy, 1936 (endoparasite in AB *Eptesicus fuscus*; AB,MN *Myotis lucifugus*, OK *Tadarida brasiliensis mexicana* & KS *Myotis velifer incautus* bats)

***Prosthodendrium (Prosthodendrium) transversum*** Byrd & Macy, 1942 (endoparasite in KY (Tx), IN *Myotis sodalis*, MN *Eptesicus fuscus* & DC,IN,TN *Lasiurus borealis* bats).

***Prosthodendrium (Prosthodendrium) travassosi*** Macy, 1938 (endoparasite in MN *Eptesicus fuscus* bats ).

**@*Prosthodendrium (Acanthatrium) umbraculati*** (endoparasite in OH *Myotis lucifugus* bats)

***Prosthodendrium volaticum*** Blankespoor & Szymusiak, 1974 (endoparasite in WI *Myotis keeni*; IA *Lasiurus borealis* & *Eptesicus fuscus* & WI *Myotis lucifugus* (Tx) bats)

***Prosthogonimus*** Luehe, 1899 - Prosthogonimidae trematodes, subfamily Prosthogoniminae (Parasitic in oviduct, bursa fabricii or cloaca of birds).

***Prosthogonimus ovatus*** (Rudolphi, 1803) Looss, 1899 (endoparasite in CA, TX, AZ *Hirundo nigrita* & *rustica* swallows).

***Pseudopisthodiscus*** Yamaguti, 1958 - Diplodiscidae trematodes, subfamily Diplodiscinae (endoparasite in colon of newts)

***Pseudopisthodiscus americanus*** (Holl, 1928) Yamaguti, 1958 (in NC *Triturus viridescens* salamander).

***Pseudorenifer*** Price, 1935 - Plagiorchiidae trematodes, subfamily Styphlodorinae  
(Parasites in mouth, oesophagus and lungs of reptiles and amphibians, including salamanders).

***Pseudorenifer syntomentera*** (Sumwald, 1926) Price, 1935 (endoparasite in CA, *Triturus viridescens* salamander).

***Pycnoporos*** Looss, 1899 - Lecithodendriidae trematodes, subfamily Pycnoporinae  
(Intestinal parasites of Chiroptera)

***Pycnoporos travassosi*** (Macy, 1938) Yamaguti, 1958 (endoparasite in MN *Eptesicus fuscus* bats)

***Ratzia*** Poche, 1926 - Opisthorchiidae trematodes, subfamily Ratzinae  
(Parasites in amphibians as progenetic larvae (metacercaria) and in reptiles as adult)

***Ratzia joyeuxi*** (Brumpt, 1922) Joyeux, 1927 (endoparasite in KS, OH *Ambystoma mexicanum* salamander).

***Renischetrema*** Rodhe, 1964 - Microphallidae trematodes, subfamily Microphallinae  
(Intestinal parasites of Chiroptera)

***Renischetrema malayai*** Rodhe, 1964 (endoparasite in WI *Pipistrellus subflavus* bats).

***Sphyranura*** Wright, 1879 - Sphyranuridae trematodes, subfamily Sphyranurinae  
(Parasites on skin or gills of vertebrates, including salamanders)

***Sphyranura euryceae*** Hughes & Moore, 1943 (endoparasite in AR (Marion Co.) *Eurycea multiplicata griseogaster* & NC *Eurycea* salamanders),

***Stomylotrema*** Looss, 1900 - Stomylotrematidae trematodes, subfamily Stomylotrematinae  
(Intestinal and cloacal parasites of birds)

***Stomylotrema tagax*** Braun, 1901 (endoparasite in TX *Hirundo fulva* cave swallows).

**Telorchis** Luehe, 1899 - Telorchidae trematodes, subfamily Telorchinae  
(Parasites in intestine, stomach or gall bladder of turtles, snakes and amphibians).

***Telorchis corti*** Stunkard, 1915 (endoparasite in non-cave MI *Ambystoma tigrinum* t.salamander)

***Travassodendrium*** Skarbilovich, 1943 - Lecithodendriidae trematodes, subfamily Prosthodendriinae (Intestinal parasites of mammals, especially of Chiroptera).

***Travassodendrium oligolecithum*** (Manter & Debus, 1945) Skarbilovich, 1943 (in LA, *Myotis californicus* bats)

***Tremajoannes*** Saoud, 1964 - Lecithodendriidae trematodes, subfamily Lecithodendriinae  
(Intestinal parasites of Chiroptera).

***Tremajoannes buckleyi*** Saoud, 1964 (endoparasite in TX (Val Verde Co.) *Myotis velifer*; on NM, TX *Tadarida brasiliensis* bats).

***Urotrema*** Braun, 1900 - Urotrematidae trematodes, subfamily Urotrematinae (Intestinal and internal parasites of mammals and reptiles).

***Urotrema lasiurensis*** Alicata, 1932 (endoparasite in non-cave DC *Lasiurus borealis* & non-cave NY *Myotis lucifugus* bats).

***Urotrema minuta*** Macy, 1933 (endoparasite in MN *Lasionycteris noctivagus* bats).

***Urotrema scabridum*** Braun, 1900 (= *Urotrematulium attenuatum* according to Caballero, 1942) (endoparasite in KS *Myotis grisescens*; FL, LA, TX (Tx) *Tadarida brasiliensis mexicana* & *cynocephala* & *Myotis velifer*; IN, MN, WI *Eptesicus fuscus*; IA, IN (Tx), IL, MI *Myotis lucifugus*; WI *Myotis keeni*; DC, IN *Lasiurus borealis*; MD, TX *Nycticeius humeralis* & IN, MN *Lasionycteris noctivagans* bats).

***Urotrema shilingeri*** Price, 1931 (endoparasite in TX (Houston) *Nycticeus humeralis*, & *Myotis lucifugus* bats)

***Urotrema*** undet. sp. (endoparasite in DC *Myotis lucifugus* bats)

***Urotrematulium*** Macy, 1933 - Urotrematidae trematodes, subfamily Urotrematinae (Intestinal parasites of Chiroptera).

***Urotrematulium attenuatum*** Macy, 1933 (in IN, MN, WA *Lasionycteris noctivagans* bats)

***Zeugorchis*** Stafford, 1905 - Plagiorchiidae trematodes, subfamily Styphlodorinae (Parasites in alimentary tract and lungs of amphibians and reptiles, including salamanders).

***Zeugorchis megacystis*** Steward, 1960 (endoparasite in KS *Triturus veridescens* salamanders).

***Zeugorchis syntomenteroides*** Sumwald, 1926 (endoparasite in CA *Triturus torosus* salamanders).

## **Turbellaria** (= flatworms in part)

Once a class of the free-living Platyhelminthes flatworms, now considered by most authors a phylum, at least in the Order Acoela. Acoelomate bilateria without anus. A freelifving flatworm with a ciliated skin, different from similar Gnathostomulida by being jawless. Most < 20 mm. from flattened to oval leaflike or lanceolate to spindle-shape or stringlike enlgated. Outside completely or partly covered with cilia for movement and creating currents to bring in food. Some extrude spines for defense or feeding. In most, intestines blind. Most hermaphroditic. About 3,000 species. A few are mammalian intestinal parasites. Cave-adapted ones (white & eyeless) most often in pools & streams. Most are carnivores & scavengers; *Sphalloplana* z. feeds on injured or morbund arthropods by removing soft internal parts. Negatively rheotactic & phototactic.

Flatworms are flat bodied, freshwater creatures that can regenerate their lost body parts. They live in lakes, streams, ponds, and other freshwater bodies The planarian is non-parasitic, and eats decaying meat. The body includes: a simple nervous system that includes a 'brain' muscle

bundles an internal reproductive system a blind gut branching through the body an excretory system that includes specialized cells called 'flame cells'. They can be conditioned to respond to stimuli, display the ability to master a two-choice maze, and can transfer the memory of training from one individual to another.

There are not any permanent cells in the head of a planarian. If a planarian is cut in half, the tail will grow a new head and the head will grow a new tail. That is called regeneration. So if the head and tail of a planarian are sliced down the middle, soon it will have two heads and two tails. Above the head are two organs called eye spots. It's eyes are not like true image giving eyes, they can only sense light. It's head is a triangular shape.

Planarians can find water in a maze. When a trained planarian is cut in half, the regenerated planarians learn more quickly than untrained ones. Planaria feed the body parts of trained flatworms also learn mazes more quickly.

(partial) syn: **flatworm**. Hyman 1937, 1939-a, 1965a; Carpenter 1970, 1971; Kenk 1970, 1972; Mock 1976; Reynierse 1967, 1967a; Tyler 1986; Walter 1907; Williams 1958; Wells & Harris 1954; I.R. Ball, 1978

**Bibl.:** I. Ball 1974; Gourbault 1994; Leml 1974; Areas: **AR:** Chandler & Darlington 1975; **FL:** Hyman 1955; KY: Schwank 1986; **MI:** Kenk 1944; NA: I. Ball 1969; Beauchamp 1931-2; Carpenter 1973; Kenk 1974b, 1989; Ruebush 1941; Walton 1912; **NY:** Kolasa, Strayer & Bannon-O'Donnell 1987; **TX:** R. Mitchell 1971; Mitchell & Kawakatsu 1971; Teshirogi & Mitchell 1976 **VA:** Kenk 1935; World: Cannon 1986; Schwank 1986.

#### Class Archoophora

Order Acoela (no true gut cavity or pharynx)

Otocelidae (*Otocelis*)

Order Alloecoela

Prorhynchidae (put in Order Lecithoepitheliata)

(Undet. Genus in cave in Richland Co., WI)

#### Class Catenulidea

Order Catenulida (=Notandropora) (=Archoophorans)

Catenulidae (now subsumed in Stenostomidae)

Stenostomidae

(*Catenula* (once put in own family), *Rhynchoscolex* (see above), *Stenostomum*)

Order Rhabdocoela = Neorhabdocoela

#### Class Rhabditophora

Order Lecithoepitheliata (undet. Genus in CA marine beach interstitial)

Prorhynchidae (*Geocentrophora*, *Prorhynchus*) R. Porter 1936

Subclass Eulecithophora

Order Rhabdocoela (=Neorhabdocoela)  
Suborder Kalyptorhynchia (CA marine beach interstitial)

Suborder Typhloplanoida (CA marine beach interstitial))

Typhloplanidae (also put in own order Typhloplanida)  
(*Limnoruanis*, *Mesostoma*, *Pseudophaenocora*, *Stronglostoma*)

Order Typhloplanida  
Suborder Typhloplanoida (see above)  
Typhloplanidae (see above)

Subclass Macrostromida  
Order Macrostromorpha  
Macrostromidae (*Macrostromum*)  
Microstromidae (*Microstromum*)

Subclass Neoophora  
Infraorder Eukalyptorhynchia

Order Neorhabdocoela (spr., St., wells) (subsumed in Macrostromida?)

Suborder Kalyptorhynchia (also as order or put in Subclass Archoophora)  
Polycystididae  
Subfamily Gytraticinae (*Gytratrix*)

Order Dalyelloida  
Dalyelliidae Graff, 1908 (*Dalyellia*)

Provorticidae  
Subfamily Provorticinae (*Vejdovskya*)

Order Seriata (often called planarians)

Suborder or Order Proseriata  
Bothrioplanidae (also put in Order Prolecithophora & Bothrioplanida)  
(*Bothrioplana*)

Infraorder or Order Tricladida  
Suborder Paludicola

Dendrocoelidae  
Subfamily Dendrocoelinae (*Dendrocoelopsis*, *Dendroecoelum*)

Planariidae (*Paraplanaria*, *Phagocata*, *Planaria*, *Polycelis*, *Procotyla*, *Speophila*,  
*Sphalloplana* (once in Dugesidae))

undescribed genus in Piedmont, PA & New England)

Suborder Terricola. **Bibl.:** Goubault 1986b; Hyman 1931; Kenk 1974, 1974a  
Bipaliidae von Graff, 1896 (*Bipalium*)

Dugesiidae (*Dugesia*, *Girardia*)  
Procerodidae (*Foviella*)

Rhynchodemidae (also put in Suborder Paludicola)  
(*Rhynchoscolex* (now in Stenostomidae)

Subfamily Microplaninae (*Microplana*)  
Subfamily Rhynchodeminae (*Rhynchodemus*)

Subfamily Kenkiinae (also suggested as family Kenkiidae)  
(*Kenkia*, *Macrocotyla*, *Sphalloplana*)  
**Bibl.:** Mitchell 1968; Kawakatsu & Mitchell 1981

Uteriporidae  
Subfamily Uteriporinae (*Uteriporus*)

Suborder Typhloplanida  
Typhloplanidae (also put in Infraorder or Order)

Subfamily Mesostominae (*Mesostoma*)  
Subfamily Typhloplaninae (*Limnoruanis*, *Stronglostoma*)

Infraorder or Order Prolecithophora  
Order Polycladida

Suborder Acotylea  
Superfamily Planoceroidea

Family Callioplanidae (*Discosolenia*)  
Family Emprosthoparyngidae (*Emprosthoparynx*)

Family Hoploplanidae (*Hoploplana*)  
Family Leptoplanidae (*Euplana*)  
Family Planoceridae (*Paraplanocera*)

Superfamily Stylochoidea  
Family Cryptocelididae (*Cryptocelis*)  
Family Plehniidae (*Plehnia*)

Family Pleioplanidae (*Pleioplana*)  
Family Stylochidae (*Imogine*, *Kaburakia*, *Stylochus*, *Stylochopsis*)



Suborder Cotylea

Superfamily Pseudocerotoidea

Family Euryleptidae (*Acerotisa*, *Eurylepta*, *Stylostomum*)

Family Prosthiosomidae (*Prosthiosomum*)

Family Pseudocerotidae (*Pseudoceros*)

*Acerotisa* – Euryleptidae Turbellaria (flatworms)

*Acerotisa alba* (Freeman, 1933) (WA marine infauna)

*Bipalium* Stimpson, 1857 - Bipaliidae Turbellaria (flatworms)

*Bipalium kewense* Moseley, 1878 (type locality cave in Hays Co., + caves in Bell Co., TX & FL C.?, Jackson Co., FL/ epigeal in AL, AK, CA DC, FL, GA, IL, KY, LA, ME, MA, MD, MI, NJ, NC, OH, PA, SC, TN, TX, UT, VA, WA, Manitoba, Ontario, Mexico; cosmopolitan ) **Bibl.:** Chandler 1976; Morton & Kleingina 1971; Ogren 1995

*Bothrioplana* Braun, 1881 - Bothrioplanidae Turbellaria (flatworms)

*Bothrioplana semperi* M. Brown, 1881 (NY/interstitial)

*Catenula* Duges, 1832 - Stenostomidae Turbellaria (flatworms) (also placed in Catenulidae )

*Catenula lemnae* Duges, 1832 (NY/interstitial)

*Catenula* undet. sp. (sandy hyporheic in TX)

*Cryptocelis* – Cryptocelididae Turbellaria (flatworms)

*Cryptocelis occidentalis* Hyman, 1953 (CA marine infauna)

*Dalyellia* Flemming, 1822 - Dalyelliidae Turbellaria (flatworms)

*Dalyellia* undet. sp. (MI interstitial; M N lake benthic)

*Dalyellia viridis* (G. Shaw, 1791) (MN lake benthic)

*Dendrocoelopsis* Beauchamp, 1919 - Dendrocoelidae Turbellaria (flatworms), Subfamily Dendrocoelinae. **Bibl.:** Kenk 1973a

*Dendrocoelopsis alaskensis* Kenk, 1953 (AK St., interstitial? in phreatic springs)

*Dendrocoelopsis americana* (= *Sorocelis a.* Hyman, 1939) (type locality & 2 other caves in Adair Co., neOK +AR (WA & Logan Cos.) & Rockwall Co., TX) + MO/ Tp (eyeless in TX), spr. G3G4). **Bibl.:** Gourbault 1975; Kawakatsu & Mitchell 1961, 1981a; Kawakatsu, Vaughn & Mitchell 1995; Levensgood 1939

*Dendrocoelopsis hymanae* (Kawakatsu, 1968) (\*Lake Tahoe, CA & NV/Pb?, white, blind St)

*Dendrocoelum* Oersted, 1844 - Dendrocoelidae Turbellaria (flatworms)

*Dendrocoelum percoecum* = *Sphalloplana p.*

***Discosolenia*** Heath & McGregor, 1912 – Callioplanidae Turbellaria (flatworms)  
***Discosolenia burchami*** = *Koinostylochus b.*

***Dugesia*** Girard, 1850 - Dugesiidae Turbellaria (flatworms) (also put in Planariidae)  
**Bibl.:** Chandler & Darlington 1984; Hyman 1939 (restricted to Old World)

*Dugesia diabolis* Hyman, 1956 = *Girardia dorocephala*  
*Dugesia dorocephala* & *tigrina* = *Girardia d.* & *t.*

***Emprostopharynx*** Bock, 1913 - Emprostopharyngidae Turbellaria (flatworms)  
***Emprostopharynx gracilis*** (*Stylochoplana g.* Heath & McGregor, 1912)

***Euplana*** Girard, 1983 - Leptoplanidae Turbellaria (flatworms)  
***Euplana gracilis*** (Girard, 1850) (FL, MA, ME, NJ marine benthic)

***Eurylepta*** Faubel, 1984 – Euryleptidae Turbellaria (flatworms)  
***Eurylepta alba*** (Freeman, 1933) (WA marine infauna)  
***Eurylepta*** undet. sp. (CA marine infauna)

***Foviella*** Beck, 1925 - Procerodidae Turbellaria (flatworms)  
***Foviella affinis*** (Oersted, 1843) (NB Gulf of St. Lawrence sandy marine interstitial)

***Geocentrophora*** de Man, 1876 - Prorhynchidae Turbellaria (flatworms)

***Geocentrophora cavernicola*** Carpenter, 1970 (type locality cave in Jackson Co., KY + cave each in Pendleton Co., WV + Tazewell Co., VA/ Tb/ VA T&E S1 rank; WV T&E SH rank & global G3G4 rank)

*Geodesmus* Metschnikoff, 1865 - subsumed in *Microplana*

***Girardia*** Ball, 1974 - Dugesiidae Turbellaria (flatworms)  
***Girardia dorocephala*** (*Planaria d.* Woodworth, 1897; *Dugesia d.* Hyman 1931; *P. agilis* Stringer 1909, *Euplanaria d. & a.* Kenk, 1930; *E. philadelphica* Kenk, 1931; *D. (Girardia) d.*) (PA, VA to West coast, sCanada, Mex./mostly springs; Pb & streams in TN; CO hyporheic; NV sinkhole) **Bibl.:** Best 1995; Hyman, 1925; Jenkins & Brown 1963; Morita & Best 1995

***Girardia tigrina*** (*Dugesia t.* Girard, 1850; *Planaria maculata*; *D. (Girardia) d.* Kenk) (type? locality cave in Manitoba/ NA to Brazil, alien to Australia, Europe, Israel, Japan/ pond, lake, river/ Tp or Tx in MO, MB, TN (prob.)) **Bibl.:** Abbott 1960; Bueno et al. 1995, 1995a; Folsom & Clifford 1978; Kenk 1941, 1970; Krichinskaya 1986; Nixon & Taylor 1977

***Gyatrix*** Ehrenberg, 1831 - Polycystididae Turbellaria (flatworms), Subfamily Gyatricinae  
***Gyatrix hermaphroditus h.*** Ehrenberg, 1831 (MI interstitial; MN lake benthic)

***Hoploplana*** – Hoploplanidae Turbellaria (flatworms)  
***Hoploplana*** undet. sp. (CA marine infauna)

**Hymanella** Castle, 1941 - Planariidae Turbellaria (flatworms)  
**Hymanella retenuova** Castle, 1941 (vernal pools and seepages in East US)

**Imogine** Girard, 1853 - Stylochidae Turbellaria (flatworms)  
**Imogine exiguus** (*Stylochus e.* Hyman, 1953)(CA marine infauna)

**Kaburakia** - Stylochidae Turbellaria (flatworms)  
**Kaburakia excelsa** Bock, 1925 (*Cryptophallus magnus* Freeman, 1933) (CA, WA marine infauna)

**Kenkia** Hyman, 1937 (= *Macrocotyla*) Dendrocoelidae Turbellaria (flatworms), Subfamily Kenkiinae (also suggested as family Kenkiidae)

**Kenkia glandulosa** (*Macrocotyla g.* Hyman, 1956) ( type locality (just below spring outlet) & 1 other cave in Boone Co.,MO & cave in Jackson Co.,IA/ Tp, spr./ type for genera/ MO T&E G3G4 /Pink Planarian) **Bibl.:** Kenk 1975

*Kenkia rhynchida* = *Macrocotyla r.*

**Koinostylochus** Faubel, 1983 – Callioplanidae Turbellaria (flatworms)  
**Koinostylochus burchami** (*Planocera b.* Heath & McGregor, 1912; *Discosolenia b.*) (CA marine infauna)

**Limnoruanis** J. Kolasa, 1977 - Typhloplanidae Turbellaria (flatworm), Subfamily Typhloplaninae

**Limnoruanis romanae** J. Kolasa, 1977 (NY/St)

**Macrocotyla** Hyman, 1956 - Dendrocoelidae Turbellaria (flatworms), Subfamily Kenkiinae (also suggested as family Kenkiidae) **Bibl.:** Kwakatsu & Mirchell 1981; Kenk 1975 (see Kenkia)

*Macrocotyla glandulosa* = *Kenkia g.*

**Macrocotyla hoffmasteri** (= *Speophila h.* Hyman, 1954; *Sphalloplana h.*) Kenk, 1975 (type locality cave in Tucker Co. + cave each in Pendleton, Tucker & Randolph Co.s & 2 caves in Greenbrier Co.,WV & caves in MD (WA Co.)/ Tb/ MD state rare T&E G3/ Hoffman's cave flatworm)

**Macrocotyla lewisi** Kenk, 1975 (\*\*\*)type locality & 2 other caves in Perry Co.,MO/ Tb)

**Macrocotyla rhynchida** (*Kenkia r.* Hyman, 1937) (\*type locality cave in Harney Co.,OR/ type for genus & family/ FC-2 T&E) Bénédict & McEvoy 1995; Bénédict 1973d; Hyman, Kawakatsu & Mitchell 1981

**Macrostromum** Schmidt, 1848 - Macrostromidae Turbellaria (flatworms) **Bibl.:** Ferguson 1940  
**Macrostromum** undet. sp. (MI interstitial)

*Mesostoma* Ehrenberg, 1831 - Typhloplanidae Turbellaria (flatworms), Subfamily Mesostominae  
*Mesostoma macropenis* Ehrenbertg, 1831 (MI interstitial)

*Microplana* Vejdowsky, 1890 - Rhynchodemidae Turbellaria (flatworms), Subfamily  
Microplaninae

*Microplana atrocyana* (*Rhyncodesmus a.* Walton, 1912; *Geodesmus a.* Ogren, 1955) (\*\*?type  
locality cave in Perry Co. & cave in Camden Co.,MO/ Tp?/ pink planaria/State T&E)

*Microstomum* Schmidt, 1848 - Microstomidae Turbellaria (flatworms)  
*Microstomum* undet. sp. or species (MI, NY interstitial; MN lake benthic)

*Notoplana* Laidlaw, 1903 – Leptoplanidae Turbellaria (flatworms)  
*Notoplana acticola* (Boone, 1929) (CA marine infauna)

*Notoplana* cf. *iniquieta* (WA marine infauna)  
*Notoplana rupicola* (CA marine infauna)

*Otocelis* Diesing, 1862 - Otocelidae Turbellaria (flatworms)  
*Otocelis* undet. sp. (marine in Anemone C., ME)

*Paraplanocera* Laidlaw, 1903 – Planoceridae Turbellaria (flatworms)  
*Paraplanocera oligoglana* (*Stylochus o.* Schmarda, 1859) (CA marine infauna)

*Parviplana* – Leptoplanidae Turbellaria (flatworms)  
*Parviplana californica* (*Stylochoplana c.* Woodworth, 1894) (CA marine infauna)

*Phagocata* Leidy, 1847 (= *Planaria* Muller, 1776; *Fonticola* & *Albiplanaria* Komarek, 1926).  
Planariidae Turbellaria (flatworms)

**Phagocata** **Bibl.:** Abbott 1960; Aycok 1942; Crawshaw 1974; R. Davis & Harris 1936;  
McWhinnie & O'Connor 1967; Bull & Mitchell 1970, 1972; Elliott 1971-2; Elliott & Mitchell  
1975; Kenk 1970, 1987; Norris et al., 1963; Peck 1985; M. Porter 1995; Poulson & Lavoie 1990;  
Sexton & Hunt, 1980; Studier & Lavoie 1991; Studier, Lavoie, Wares & Linn 1987; Phillipotts  
1989; Wiens & Armitage 1961

*Phagocata angusta* Kenk, 1977a (\*\*?type locality cave in Tucker Co.,WV + cave or caves in  
wNC/ Pb/ WV T& E SU G1G2)

*Phagocata bulbosa* Kenk, 1970 (NC seepage spr.,NC/ Pb)

*Phagocata bursaperforata* Darlington, 1959 (= *Fonticola b.* Ball, 1969) (pools on Mt. Panola &  
Stone Mt.,DeKalb Co.GA; Tp? In Eudy C., Marshall Co.,AL/,spr., rivulet) **Bibl.:**Carpenter 1977

*Phagocata carolinensis* Kenk, 1979b (= *P. cavernicola* Hyman, 1954; Kenk, 1974) (\*type locality  
cave in Burke Co.,NC/Tp or Tb/ G1G2) **Bibl.:** Kenk1987

*Phagocata cavernicola* - see *P. morgani*

*Phagocata crenophila* Carpenter, 1969 (SW epigeal/ spr. in CA, UT; Tp? in cave in Siskiyou Co.,CA)

*Phagocata gracilis* (*Planaria g.* Haldeman, 1840; *Euplanaria g.* Kenk, 1930; *Fonticola & Procotyla g.* Castle & Hyman, 1934; *Fonticola truncata* Hyman, 1931; *Phagocata subterranea & morgani* Hyman, 1937) Leidy, 1847 (type locality in spr. at Chickies (Near Columbia) , Lancaster Co., PA/ sprs., streams & caves in E from Canada to AL/ Pb, Tp, spr. in DC,PA; caves in IN (Lawrence, Monroe Cos.), sIL, KY (Pulaski, Jackson, Jessamine, Rockcastle Cos.), MO (Perry Co.), OH (Adams Co.), PA,VA,WV) **Bibl.:** A. Stewart 1968; Woodworth 1891

**Bibl.:** Abbott 1960; Chandler 1966; C. & Darlington 1984; Eddy & Glenn 1932; Griffard 1963; Hyman, 1970; Paslee 1910; Reynierse 1966, 1967a, 1973a, 1973a; R. & Ellis 1973; A. Stewart 1968; Weimer 1918; Weimer et al. 1938; Woodworth 1891

*Phagocata gracilis monopharyngea* = *P. velata*

*Phagocata holleri* Kenk, 1979a (\*type locality cave in Burke Co.,NC/ Tb G1G2)

*Phagocata monophryngea* Hyman, 1945 = *P. velata*

*Phagocata morgani m.* (*Planaria truncata* Leidy, 1851 (name preoccupied); *Planaria m.* Stevens & Boring, 1906; *Phagocata cavernicola* Hyman, 1954; *Dendrocoelum truncatum* Girard, 1893 & *superbum?* Girard, 1850; *Fonticola t.* Hyman, 1931; *F. morgani* Castle & Hyman, 1934) & *morgani m.* Ball, 1969) **Bibl.** Kenk, 1972

(type locality cave in Westmoreland Co.,& poss. cave in,Cumberland Co.,PA/ spr., cr. in Appalachia, MI, WI,Canada, introduced into CA/ Pb in cave each in PA (Giles Co.)& MD (WA, Garrett Cos. (Tp)), 3 caves in VA (Tazewell Co.),VA, 6 caves in IL +Greenbrier, Randolph, Pocahontas, & Pendleton Cos.,WV, Allen, Estill, Jackson, Pulaski, Powell Cos.,KY & Jackson Co.,AL)

*Phagocata nivea* (Kenk, 1953 (AK epigeal/ Pp in 2 AK c.)

*Phagocata oregonensis* Hyman, 1963 (*Fonticola o.* Ball, 1969) (OR,WA/ spr. near Portland, Multnomah Co.,OR)

*Phagocata procera* Kenk, 1984 (type locality cave in Jackson Co.,+Burke, McDowell, Mitchell & Yancey Cos., NC/ Pb)

*Phagocata pygmaea* Kenk, 1987 (\*type locality cave in Stokes Co.,NC/ Tb)

*Phagocata* undescr. sp. (IN/Pb)

*Phagocata* undet. sp. (WV hyporheic)

*Phagocata spuria* Kenk, 1987 (\*\*( type locality & 1 other cave in McDowell Co., NC/ Tb)

*Phagocata subterranea* = *P. gracilis*

***Phagocata velata*** (*Planaria* v. Stringer, 1909; *Fonticola* v. Kenk, 1930; *P. gracilis monopharyngea* Hyman, 1945; *P.m.* Kenk, 1972; *P. vernalis* Kenk, 1944 (in part); *Fonticola g. m.* Ball, 1969) Hyman, 1937 (type locality cave in Ontario/ Tp/ spr., cr. in IA, MI, MS Valley w. to NB, CO(prob.)/ Tp in ON, TN; Pb in IA). **Bibl.:** Castle 1927

***Planaria*** Muller, 1776 (= *Dendroplanaria* Komarek, 1926) Planariidae Turbellaria (flatworms). **Bibl.:** I. Ball & Goubault, 1978

***Planaria dactyligera d.*** Kenk, 1969 (= *P.d.* Kenk, 1935) (VA caves, spr., cr.)

***Planaria dactyligera musculosa*** Kenk, 1969 (= *P.m.*) (LA, NC, VA epigean/ streams, spr.),

*Planaria dorotocephala* = *Girardia d.*

*Planaria* Kenk, 1969 = *Paraplanaria o.*

***Plehnia*** – Plehniidae Turbellaria (flatworms)

***Plehnia caeca*** Hyman, 1953 (CA marine infauna)

***Pleioplana*** A. Faubel, 1983 – Leptoplanidae Turbellaria (flatworms) (also put in Pleioplanidae)

***Pleioplana atomata*** (O.F. Muller, 1776) (NB, PQ Gulf of St. Lawrence sandy marine interstitial)

***Pleioplana inquieta*** (*Leptoplana i.* Heath & McGregor, 1912) (CA marine infauna)

***Polycelis*** Ehrenberg, 1831 - Planariidae Turbellaria (flatworms) **Bibl.:** Kenk 1973

***Polycelis (P.) borealis (P. (P.) coronata b.*** Kenk, 1972) (Pp in Tx or Ac in 2 AK caves)

***Polycelis coronata c.*** (*Phagocata c.* Girard, 1891) Kenk, 1973 (AK, CO, ID, MT, NM, OR, SD, UT, WA, W Y/ cave, spr., cold cr., CO hyporheic). **Bibl.:** J. Chapman 1969; Hyman, 1928, 1931a; Nixon, 1974; N. & Taylor, 1977

***Polycelis coronata brevipenis (P.c.*** Hyman, 1931) Kenk, 1972 (SD, CO(Larimer Co.)/ Pb)

***Procerodes*** Girard, 1851 - Procerodidae Turbellaria (flatworms)

***Procerodes littoralis*** (Strom, 1768) (O.F. Muller, 1776) (NB Gulf of St. Lawrence sandy marine interstitial)

***Procotyla*** Leidy, 1857 (See *Phagocata g.*) Planariidae Turbellaria (flatworms) **Bibl.:** Chandler & Darlington 1984

***Procotyla fluviatilis*** Leidy, 1857 (NE to WI, IL, Canada, s. to NC/Tp? in wTN) **Bibl.:** Chandler, 1968; Hyman 1925; Kenk, 1935 (spr., pond, FL/Tp in VA) **Bibl.:** A. Stewart 1968

*Procotyla gracilis* - See *Phagocata g.*

***Procotyla typhlops*** Kenk, 1935 (FL, MD, VA/ Pb)

*Procotyla velata* - see *Phagocata v.*

*Paraplanaria* Ball & Gourbault, 1978 - Planariidae Turbellaria (flatworms)

*Paraplanaria occulta* (*Planaria occulta* Kenk, 1969) (VA/\*well/ heavily infested with protist *Sieboldiellina planariarum*)

*Prosthiostomum* - Prosthiostomidae Turbellaria (flatworms)

*Prosthiostomum latocelis* Hyman, 1953 (CA marine infauna)

*Pseudoceros* Lang, 1884 – Pseudocerotidae Turbellaria (flatworms)

*Pseudoceros* undet. sp. (CA marine infauna)

*Rhynchodemus* Leidy, 1851 - Subfamily Rhynchodeminae - See *Macroplana*

*Sorocelis* Grube, 1872 - See *Dendrocoelopsis*

*Speophila* Hyman, 1937 = *Sphalloplana*

*Sphalloplana* Beauchamp, 1931 (see *Dendrocoelum p.*) (= *Dendrocoelum* Orsted, 1844 (in part); *Fonticola* Komarek, 1926 (in part); *Speophila* Hyman, 1937) Planariidae Turbellaria (flatworms)

**Bibl.:** Kenk 1977

*Sphalloplana alabamensis* Hyman, 1945 (considered a junior syn. of *S. percoeca* by Carpenter 1971) (type locality & 1 other caves in Jackson Co.+ Campbell, Putnam Cos., AL & TN (Rutherford, Van Buren Cos.),TN; KY (Caldwell Co.) & WV (Pendleton Co.)/Tb)

*Sphalloplana buchanani* (*Speophila b.* Hyman, 1937) Mitchell, 1968 (Mammoth C., KY/ Edmonson Co.,KY & cave in Davidson Co.,TN/Tb) **Bibl.:** Hyman 1954

*Sphalloplana* (*S.*) *californica* Kenk, 1977 (\*type locality cave in Mariposa Co.,CA/ Pb)

*Sphalloplana chandleri* Kenk, 1977 (S.c.) (type locality cave in Claiborne Co. + caves in Davidson Co.,TN & IN(spr. in Floyd Co.; cave in Harrison Co. (IN S1)) & disjunct swVA (Tazewell Co.)/ Pb, one spr./VA T&E S1 rank/Chandler's Planarian or cave flatworm - IN T&E)

*Sphalloplana* (*S.*) *consimilis* Kenk, 1977 (type locality cave in \*Lee Co.,VA +adjacent TN /Tb/ VA Special Concern T&E/Powell Valley cave planarian/ G3G4)

*Sphalloplana* (*S.*) *culveri* Kenk, 1977 (\*type locality cave in Tucker Co.,WV/ Tb/ Fed. Species of Concern),

*Sphalloplana* (*S.*) *evaginata* Kenk, 1977 (\*\*\*\*type locality & 3 other caves in Perry CO.,MO/ G1G2/ Tb)

*Sphalloplana* (*S.*) *georgiana* Hyman, 1954 (\*\*\*)type locality & 2 other caves in Dade Co. & poss. 2 caves in Walker Co., GA/ Tb) **Bibl.:** Buhlmann, 1996

*Sphalloplana hoffmasteri* = *Macrocotyla h.*

*Sphalloplana* (*Speophila*) *holsingeri* Kenk, 1977 (Fairfax Co.,VA/Pb/VA Endangered T&E/ Holsinger's groundwater planarian)

*Sphalloplana hubrichti* (= *Speophila h.* Hyman, 1945) Mitchell, 1968 (type locality cave in Monroe Co. + Jackson, St. Clair & Union Cos., IL & Kohn's C. (Ste. Genevieve Co., MO) & spr. (Jefferson Co.), MO/ Tp/ G3G4) **Bibl.:** Kenk, 1972, 1977

*Sphalloplana hypogea* Kenk, 1984 (drains on Isle of Wight Co., VA/ Pb)

*Sphalloplana (S.) kansensis* Hyman, 1945 (\*Purity Spr., near Augusta, Butler Co., KS/ Pb)

*Sphalloplana kutscheri* Mitchell, 1968 (TX/ Tb/ geographically isolated but considered a junior syn. of *S. mohri*) by some authors)

*Sphalloplana (Polypharyngea) mohri* Hyman, 1938 (*S. kutscheri* Mitchell, 1968, *reddelli*, *zeschi* & *sloani* Mitchell, 1968) (type locality cave in Hays Co. + Kendall, Mason, San Saba, Travis Cos., TX + AR, OK, MO/ Tb) **Bibl.:** Mitchell 1968; Teshirogi & Mitchell 1976

*Sphalloplana (S.) percoeca* (*Dendrocoelum p.* Packard, 1879; *D. percaecum* Banta, 1907; *Fonticola p.* Hyman, 1931) Beauchamp, 1931 (type locality cave in Mammoth C., KY (parasitic in *Adelops hirtus* beetle larvae/ ecKY (Caldwell, Carter, Edmonson (Mammoth Cave), Estill, Hart, Jackson, Wayne Cos.), AL (Jackson, Madison Cos.) & TN (Campbell, Davidson, Putnam, Rutherford, Van Burne Cos.))/ Tb G4G5) **Bibl.:** de Beauchamp 1931; Buchanan 1936

*Sphalloplana (Speophila) pricei* (= *Speophila p.* Hyman, 1937; *Speophila buchmanani* Hyman, 1937; *Speophila hubrichti* Human, 1945; *Speophila hoffmasteri* Human, 1954; *Speophila hoffmeisteri* Ball, 1969)) Mitchell, 1968 (type locality cave in Lancaster Co. + Dauphin, Mifflin Cos., PA + caves in VA, KY, WV, w. to IL, MO/ Tb)

*Sphalloplana reddelli* Mitchell, 1968 (TX/Tb/geographically isolated but considered a junior syn. of *S. mohri* by some authors)

*Sphalloplana sloani* Mitchell, 1968 (type locality cave in San Saba Co., TX/Tb/geographically isolated but considered a junior syn. of *S. mohri* by some authors)

*Sphalloplana* undet. sp. or species (Pb in MD (WA Co.), Madison Co., AL & NC (Blount Co.))

*Sphalloplana* undet. or undescr. sp. (Tb in 2 caves in Walker Co., GA)

*Sphalloplana (S.) subtilis* Kenk, 1977 (Fairfax Co., VA/ Pb/ G1G2 VA T&E SX rank & global GH rank) (possibly extinct)

*Sphalloplana (Speophila) virginiana* Hyman, 1945 (\*type locality cave in Rockbridge Co., VA/ Tb/ G1G2 VA Endangered T&E or VA T&E S1 rank, Species of Concern & global G1 rank; cave filled in with dirt & rocks/Rockbridge Co. cave planarian))

*Sphalloplana weingartneri* Kenk, 1970a (type locality cave in Crawford Co., IN/ 10 sites s. of White River in Clark, Harrison, Jefferson, Lawrence & Orange Cos., IN/ Weingartner's cave flatworm/ Tb; IN T&E S2 G2G3)



*Sphalloplana zeschi* Mitchell, 1968 (\*type locality cave in Mason Co., TX/Tb/geographically isolated but considered a junior syn. of *S. mohri* by some authors),

*Stenostomum* Schmidt, 1848 - Stenostomidae Turbellaria (flatworms)

*Stenostomum leucops* von Graff, 1911 (highly questionable species according to Nuttycombe & Waters, 1938) (NY/interstitial)

*Stenostomum occultum* von Graff, 1911 (NY interstitial)

*Stenostomum pegephilum* Nuttycombe & Waters, 1938 (NY interstitial)

*Stenostomum* undet. sp. or species (MI interstitial; Tp or Tb in cave in Bell Co., TX)

*Stenostomum temporaneum* Kolasa, 1981 (NY interstitial)

*Stenostomum tenuicaudatum* von Graff, 1911 (Tp in cave in Hays Co., TX)

*Stenostomum unicolor* von Graff, 1911 (NY interstitial)

*Stylochoplana* Stimpson, 1857 – Leptoplanidae Turbellaria (flatworms)

*Stylochoplana longipenis* Hyman, 1953 (CA marine infauna)

*Stylochopsis* Verrill, 1873 - Stylochidae Turbellaria (flatworms)

*Stylochopsis ellipticus* (Girard, 1850) (PEI Gulf of St. Lawrence sandy marine interstitial)

*Stylochus* Ehrenberg, 1836 - Stylochidae Turbellaria (flatworms)

*Stylochus californicus* Hyman, 1935 (CA marine infauna)

*Stylochus exiguus* (WA marine infauna)

*Stylochus ellipticus* (Girard, 1850) (MA, NJ, Virginian marine sandy infauna)

*Stylochus franciscanus* Hyman, 1935 (CA marine infauna)

*Stylochus* undet. sp. (FL marine benthic)

*Stylochus tripartitus* Hyman, 1935 (CA marine infauna)

*Stylostomum* Lang, 1884 – Euryleptidae Turbellaria (flatworms)

*Stylostomum* undet. sp. (CA marine infauna)

*Uteriporus* - Uteriporidae, Subfamily Uteriporinae - Turbellaria (flatworms)

*Uteriporus vulgaris* Bergendal, 1890 (PQ Gulf of St. Lawrence sandy marine interstitial)

*Vejdovskya* L.V. Graff, 1905 - Provorticidae, Subfamily Provorticinae

*Vejdovskya parapellucida* Az, 1997 (SC brackish interstitial)

xeno(o)enic - Syn.: accidental.

xeric - Said of a habitat characterized by a low or inadequate supply of moisture.

xerophyte - A plant adapted to dry conditions.

xylophage - Animal guild dependent on plant detritus and/or associated decomposers for wood.

xylophilous - Adj. for species whose main habitat is woody debris.

**yearling** - An animal at the beginning of its second year of life.  
yeast - See fungi

**YOY** (young of the year) - Juveniles during the period from the last larval stage to adulthood, or one year of age--whichever comes sooner.

**zeitgeber** - An environmental clue (e.g. light) that synchronizes, entrains, or modifies a circadian rhythm.

**zonation** - The organization of a habitat into a more or less orderly series of distinctive plant & animal associations as a result of variations in environments. Zones in a cave are the twilight zone, the variable-temperature zone, & the constant temperature zone. The zone of aeration is the zone in permeable soil or rock that is above the zone saturated with water, the zone of vadose water.

*zoocology* - The study of the relationships of animals & their environment.

**zoogenic rock** - A biogenic rock produced by animals or directly attributable to the presence or activities of animals, such as shell limestone, coral reefs, guano & lithified calcareous ooze. Bibl. - See biokarst.

zoogeography - see biogeography

Zoraptera – Insect Order (angel insects) not known from US or Canadian caves or aquatic interstitial habitats. Bibl.: Gurney 1938; Riegal & Ferguson 1960

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