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## Catalogue of snout mites (Acariformes: Bdellidae) of the world

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## Abstract

Bdellidae (Trombidiformes: Prostigmata) are moderate to large sized predatory mites that inhabit soil, leaves, leaf litter, and intertidal rocks. They are readily recognized by an elongated, snout-like gnathosoma and by elbowed pedipalps bearing two (one in *Monotrichobdella* Baker & Balock) long terminal setae. Despite being among the first mites ever described, with species described by Carl Linnaeus, the knowledge about bdellids has never been compiled into a taxonomic catalogue. Here we present a catalogue listing 278 valid species; for each species we include distribution information, taxonomic literature, and type depository institutions. The genus *Rigibdella* Tseng, 1978 is considered a junior synonym of *Cyta* von Heyden, 1826, and *Bdellodes* Oudemans, 1937 is considered a junior synonym of *Odontoscirus* Tohr, 1913. Illustrated keys to subfamilies and genera are presented, as well as keys to species of each genus.

**Key words:** mite, Eupodina, Bdelloidea, systematics, taxonomy, biodiversity, predatory mites, predators, soil mites

In memoriam of professors W. T. Atyeo, S. Thor, M.K.P.S. Meyer, and M.M.H. Wallace, for their dedication and inexhaustible work that ignites our curiosity and the expansion of the new frontiers in mite knowledge.

## Introduction

Bdellidae Dugès, 1834 (Acariformes: Trombidiformes: Bdelloidea) (**Fig. 1**) are soft-bodied predators of small arthropods. Because some species are relatively large (*e.g.*, 3500 µm), and therefore easily seen with the naked eye,

bdellids were among the first mites ever described (Linnaeus 1758). Those old, generally brief descriptions often provide little substance for reliable identification and it is often difficult to assign the oldest names to a current genus. Another common taxonomic problem concerning those early descriptions is that most of the type specimens no longer exist, either because they were not adequately preserved or even deliberately destroyed, such as those described by Sig Thor (K. Fauchald, pers. comm.). Despite the long history, this is the first time an exhaustive taxonomic catalogue, including distribution data, type depositories, keys to world species, and other information for this mite family has been made available to a broad audience.

**Historical review.** Bdellids have had an intense and complicated taxonomic history, with many species described during the 18<sup>th</sup> and 19<sup>th</sup> centuries, although many of these old species have been synonymized by many authors (e.g. Trägårdh 1904; Thor 1931a; Oudemans 1937). By the 10<sup>th</sup> edition of *Systema Naturae*, the official starting point of zoological nomenclature, Linnaeus (1758) had described 31 species of mites, all in a single genus (*Acarus* L.). Among those mites were two species that would later be included within Bdellidae: *Bdella longicornis* (L., 1758) and *Neomolgus littoralis* (L., 1758). Latreille (1795) erected *Bdella* and designated as type species “*La pince rouge*” of Geoffroy (1762). Confusingly, this latter species was described as *Chelififer* Geoffroy, whose type species by subsequent designation (Latreille 1795) is *Acarus cancroides* L., 1758, which is actually a pseudoscorpion (Arachnida: Pseudoscorpionida). Latreille (1796) synonymized “*La pince rouge*” Geoffroy with *Acarus longicornis* L., thus the type species of *Bdella* became *Bdella longicornis* (L.) (for opposing views regarding the interpretation of Geoffroy’s illustrations, see Vitzthum [1931: 38] and Atyeo [1960a: 366]). During years to come, several mites were described in *Bdella*, including members currently recognized in other families, such as *Cunaxa* von Heyden, 1826, *Scirula* Berlese, 1887 (Cunaxidae), and *Eupalus* Gistel, 1834 (Eupalopsellidae) (e.g., Banks 1915).

Dugès (1834) erected Bdellei (in those days, ending family names with the suffix “-idae” was not rigidly followed by every author) for two genera: *Bdella* Latreille, 1795 and *Scirus* Hermann, 1804. The taxonomy of Bdellidae was vague and obscure until the work of Thor (1902), who excluded from it several genera now regarded as belonging to different families (e.g. Eupodidae, Cunaxidae). Additional important contributions to the taxonomy and systematics of Bdellidae were made by Thor (1931a), Kramer (1876), Oudemans (1926a, b), Grandjean (1938), Wallace (1970, 1974) and Atyeo (1960a, 1963a, b).

**Habitat and distribution.** Bdellidae can be found in a variety of habitats, such as on plants, including leaf domatia (Pemberton & Turner 1989) and underneath foliage, caves (Hernandes *et al.* 2011), leaf litter (Aty eo 1960a; Den Heyer 1981), and intertidal rocks (Aty eo 1960a; Pugh & King 1985, 1986); a few species have also been reported from rodent (Oudemans 1914; Allred & Beck 1953; Allred & Roscoe 1957; Howell *et al.* 1957; Costa 1961) and bird nests (Gupta & Paul 1985; Philips *et al.* 1989; Bhattacharyya 1999). Species have been described from all continents except Antarctica (**Table 1**)—although bdellids have been found on Antarctic and sub-Antarctic islands (Trägårdh 1907; Atyeo 1963b; Dalenius 1965; Wallace 1970; Pugh 1993; Marshall *et al.* 1999) (e.g. *Spinibdella antarctica*, *Bdellodes georgianensis*, *B. petila*, *B. rhachia*)—ranging from the sea level (e.g. *Neomolgus littoralis*) to altitudes over 4,000 meters (e.g. *Neomolgus lacustris*) (Thor 1931a; Willmann 1951). Major revisions of the fauna from North and Central America (Aty eo 1960a), Australia (Womersley 1933a; Wallace & Mahon 1972, 1976; Atyeo 1963a, b), Taiwan (Tseng 1978), China (Lin & Zhang 2010; Lu *et al.* 1991), Africa (Meyer & Ryke 1959; van Der Schyff *et al.* 2003, 2004, 2005; Omukunda *et al.* 2007, 2012), and Iran (Ueckermann *et al.* 2007) have been published. Relatively few species have been described from the Neotropical region (Kramer 1898; Berlese 1888, 1916, 1923; Hernandez & Feres 2006; Hernandez *et al.* 2007, 2008, 2011). A few cosmopolitan species have been reported worldwide (e.g. *Cyta latirostris*, *C. caerulipes*, *Spinibdella cronini*, *Bdella longicornis*, *Neomolgus littoralis*), but it is uncertain whether they truly represent the same species or a complex of similar species. A few species are known from fossil records, notably from the late Cretaceous (76–79 Ma) and Eocene (44 Ma) (Koch & Berendt 1854; Spahr 1993; Baker *et al.* 2003; Dunlop *et al.* 2012).

**Biology.** Bdellids are predators of other small arthropods, including mites (“Acari”), springtails (Collembola), and small Insecta (e.g., Thysanoptera, Coccoidea, Diptera) as well as roundworms (Nematoda) (Gerson & Smiley 1990; Gerson *et al.* 2003; Pugh & King 1985; Hernandez *et al.* 2015). They produce silk from modified salivary glands (Alberti & Storch 1973) and use it for several purposes: 1) prey immobilization by entangling and tethering it to the substrate (somewhat like Jonathan Swift’s *Gulliver’s Travels*, see Alberti & Ehrnsberger 1977); 2) spinning a molting chamber, usually by folding one of the sides at the base of a leaf and sealing the entrance with silk (Wallace & Mahon 1972; Alberti 1973; Alberti & Ehrnsberger 1977; Hernandez & Feres 2006); or 3) as a drag line.



The use of silk as drag lines in Bdellidae was first observed for *Trachymolgus purpureus* Fisher & Dowling (2011) (Cytinae), and also for an undescribed species of *Neomolgus* from the southwestern United States (MJS and JRF, pers. obs.) (Odontoscirinae), which suggests that it may be widespread in the family. The former species has also been observed to be highly tolerant against both hot and very cold temperatures (Fisher *et al.* 2011).

**TABLE I.** Distribution of known bdellid taxa from each biogeographic domain.

Subfamily	Genus	Biogeographic region						
		Neotropical	Nearctic	Ethiopian	WP	EP	Australasian	Oriental
Bdellinae	<i>Bdella</i>	7	8	11	26	5	7	11
	<i>Hexabdella</i>	2	2	5	1	2	0	0
Cytinae	<i>Cyta</i>	4	6	4	7	5	2	2
	<i>Trachymolgus</i>	1	1	0	2	0	0	0
Spinibdellinae	<i>Tetrabdella</i>	1	0	0	0	0	0	0
	<i>Spinibdella</i>	8	13	6	11	6	7	12
	<i>Biscirus</i>	7	3	9	9	6	7	4
	<i>Monotrichobdella</i>	1	0	0	0	0	0	1
Polytrichinae	<i>Polytrichus</i>	0	0	0	1	0	0	0
Odontoscirinae	<i>Odontoscirus</i>	11	11	7	11	11	49	16
	<i>Neomolgus</i>	1	3	0	20	4	2	7
	total	43	47	42	88	39	74	53

**Nearctic:** North America excluding Florida;

**Neotropical:** South and Central America, Caribbean islands, Florida, and South Georgia;

**Oriental:** Taiwan, Malaysia, Philippines, India, Southern China, Okinawa, Japan, Thailand, South Korea;

**Australasian:** Australia, New Zealand, New Caledonia, Papua New Guinea, Pacific islands;

**Ethiopian:** sub-Saharan Africa including Madagascar;

**West Palearctic (WP):** Europe extending to Ural, Northern India and Northern Africa;

**East Palearctic (EP):** Asia from Ural to Japan excluding Southern China and Okinawa.

Some bdellids have been shown to reproduce by indirect sperm transfer (Alberti 1974), with the males gluing spermatophores to the substrate (Wallace & Mahon 1972).

Studies have investigated the potential role of bdellids in controlling agricultural or pasture pests, most notably lucerne fleas (Collembola: Sminthuridae, Hypogasthuridae) (Womersley 1933b; Currie 1934; Wallace 1967, 1974; Wallace & Mahon 1971; Wallace & Walters 1974; Ireson 1984; Bell & Willoughby 2003; Ji *et al.* 2007a, b, 2012; Roberts *et al.* 2011), but also scale insects (Hemiptera: Diaspididae) (Ewing & Webster 1912) and spider mites (Acariformes: Tetranychidae) (Chen *et al.* 2007, 2008, 2011). The study of Womersley (1933c), in which he reports *Odontoscirus lapidaria* (Kramer) as a potential predator of *Sminthurus viridis* (L.) in pastures of Australia is probably the first example of pest control by a mite. Other studies focusing on the development and other biological aspects were done by Snetsinger (1956), Soliman & Mohamed (1972a, b), Foster *et al.* (1979), Sorensen *et al.* (1983), and Ernst (1995).

**Morphology.** The first studies that investigated the internal anatomy of bdellids were done by Karpelles (1894), Michael (1896), and Grandjean (1938). More recent studies have focused on the ultrastructure of salivary glands and spermiogenesis (Alberti & Storch 1973, 1976). The elongated, elbowed pedipalps contain two long tactile setae apically (only one in *Monotrichobdella*). The prodorsal region may have one or two paired eyes (the posterior pair, when present, is occasionally without accompanying lenses), and may also have an unpaired median eye. Although the latter has often been cited as a character exclusive of the subfamily Cytinae, Alberti (1975) demonstrated other subfamilies (*e.g.* Spinibdellinae, Bdellinae, Odontoscirinae) also have an unpaired median eye, although the cuticular cornea may be missing. In those species, it is likely that the chloral hydrate present in Hoyer's medium—the most used medium for slide preparations—clears the already faint eye pigmentation (Hernandes 2013). Other authors had previously noticed a median fifth eye in species of Spinibdellinae (*e.g.* *Spinibdella arenosa* Willmann, 1939b), and some have even named them based on that attribute (*e.g.* *S.*

*quinqueoculata* Thor and *Biscirus quinqueoculatus* Willmann) (Thor 1931b; Willmann 1939b, 1956). For more details on bdellid internal morphology and anatomy, see the excellent papers of G. Alberti (1973, 1974, 1975; Alberti & Stoch 1973, 1976).



**FIGURE 1.** Photographs and photomicrographs of live bdellids. Figs. 1a, f. *Neomolgus* sp. Fig. 1b. *Trachymolgus purpureus*. Fig. 1c. *Odontoscirus* sp. Fig. 1d. Probably *Odontoscirinae*. Fig. 1e. *Cyta* sp. Figs. 1a, c, e © Jillian Cowles. Fig. 1b originally published in Fisher *et al.* 2011. Fig. 1d © Scott Justis. Figs. 1f © Kyron Basu. All photographs used with permission.



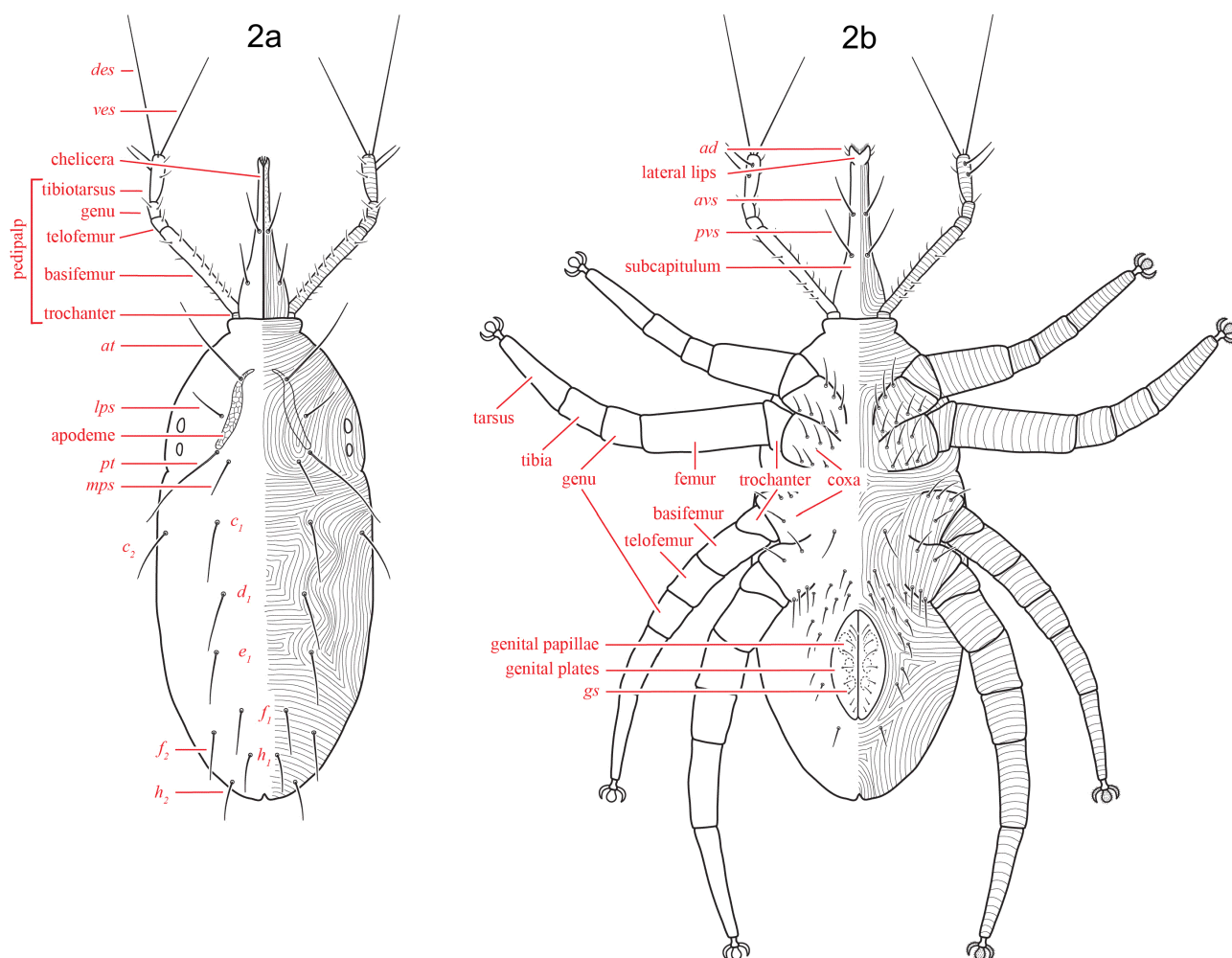


**FIGURE 1** (cont.). Photographs and photomicrographs of live bdellids. Figs. 1g–j, l. Undetermined species. Fig. 1k. *Odontoscirus*. Fig. 1g © Andy Murray. Figs. 1h, 1i © Kyron Basu. Fig. 1j © Ed Philips. Fig. 1k © Cutney Ozdas. Fig. 1l © Shannon Bowley. All photographs used with permission.

**Nomenclatural notes.** The common name “snout mites”, sometimes also applied to Cunaxidae, refers to the snout-like formed by the elongated subcapitulum and accompanying chelicerae (Pugh & King 1985; Gerson *et al.* 2003). Bdellidae and Cunaxidae are considered sister families and are grouped together in a single superfamily (Bdelloidea), which should not be mistaken with the homonymous group of parthenogenetic rotifers (Phylum

Rotifera: Eurotatoria) found in fresh water and moist soil (Segers 2007). Occasional attempts have been made to propose an alternate superfamily name, Cunaxoidea (*e.g.*, Meyer & Ryke 1959; van Der Hammen 1972), but Bdelloidea takes priority since Bdellidae Dugès, 1834 precedes Cunaxidae Thor, 1902. The vernacular *bdella* (Greek βδέλλα = leech) refers to the sucking habit of these mites when feeding on their prey. The junior homonym *Bdella* Savigny, 1822 has once been applied for a genus of leech (Anellida: Hirudinea), but it was preceded by the acarine name *Bdella* Latreille, 1795.

**Catalogue.** In this catalogue we have attempted to compile all taxonomic literature regarding Bdellidae, in particular the descriptions of new taxa and redescriptions. Some species or scattered reports of faunistic surveys, mostly from obscure literature might have been inadvertently overlooked. For those species where scientific synonymies were already proposed, we herein follow their most recent proposals. Although performing a comprehensive systematic and morphological revision is not our main purpose, in some cases we present comments toward that end. The main objective of this publication is to compile the taxonomic information available in the literature. Most of the information presented here represents the studied type specimens deposited at the USNM, University of Michigan, Ohio State University, DZJRRP, and the information available in the literature.



**FIGURE 2.** Generalized diagram of morphological characters. Fig 2a. Dorsum. Fig. 2b. Venter. Setae are generalized and do not represent exact chaetotaxy of any species. Leg setae excluding those on the coxae have been removed for clarity.

## Materials and methods

Acronyms of museums and depository collections follows the Insect and Spider Collections of the World, as listed by Evenhuis (2016) (<http://hbs.bishopmuseum.org/codens/codens-inst.html>). Where no standard abbreviations

could be found, the institutions were listed as mentioned in the original description. The following abbreviations were used:

- ACUA—Acari Collection of the University of Arkansas, Fayetteville, USA.  
ANIC—Australian National Insect Collection, CSIRO, Canberra, Australia.  
ASI—Acarological Collection, Acarological Society of Iran (ASI), Department of Plant Protection, Faculty of Agriculture, University of Tehran, Karaj, Iran.  
BMNH (=NHM)—The Natural History Museum, London, England, UK (formerly British Museum [Natural History]).  
BSMI\*—Bureau of Standards, Metrology and Inspection, Ministry of Economic Affairs, Taiwan, Republic of China. \* formerly referred to as Plant Quarantine Laboratory, Tainan Branch Office, B.I.C.Q., Taiwan. The types in this institution are probably in possession of the author, Dr. Y-H Tseng (Dr. C-C Ho, pers. comm.).  
BPBM—Bernice Pauahi Bishop Museum, Honolulu, Hawaii, USA.  
CAS—University of California Academy of Sciences, San Francisco, California, USA.  
CNC—Canadian National Collection of Insects, Arachnids and Nematodes, Ottawa, Ontario, Canada.  
CRA—Research Centre for Agrobiolology; formerly ISZA—Istituto Sperimentale per la Zoologia Agraria di Firenze (home of the Berlese Acaroteca), Florence, Italy.  
CSUC—Department of Zoology, Colorado Agricultural & Mechanics College, Fort Collins, Colorado, USA.  
CUE—Collection of Faculty of Agriculture, Cairo University, Cairo, Egypt.  
DZCU—Entomology and Wildlife Biology Research Laboratory, Calcutta University, Calcutta, India.  
DZSJRP—Collection of Acari of UNESP, São José do Rio Preto, São Paulo, Brazil.  
EIHU—Entomological Institute, Hokkaido University, Sapporo, Japan.  
FMNH—Field Museum of Natural History, Chicago, Illinois, USA.  
IRSN—Institut Royal des Sciences Naturelles de Belgique, Brussels, Belgium.  
IZRPU—Acarological Collection of the Institute for Zoological Research, Department of Zoology, North-West University, Potchefstroom, South Africa.  
MONZ—Museum of New Zealand Te Papa Tongarewa, Wellington, New Zealand (referred as Dominion Museum in original descriptions).  
NCA—National Collection of Acari, Plant Protection Research Institute, Department of Agricultural, Pretoria, South Africa.  
NBG—Nikita Botanical Gardens, laboratory of plant protection—National Scientific Center, Yalta, Crimea, Ukraine.  
OSAL—Ohio State University Acarology Collection, Columbus, OH, USA.  
QM—Queensland Museum, Brisbane, Australia (originally referred to as UQIC—University of Queensland Insect Collection, Brisbane).  
RMCA—Royal Museum for Central Africa (Musée Royal de l’Afrique Centrale), Tervuren, Belgium.  
ROME—Royal Ontario Museum, Toronto, Canada.  
SAM—South Australian Museum, Adelaide, South Australia, Australia.  
SEMC—Snow Entomological Museum, University of Kansas, Lawrence, Kansas, USA.  
SRIAUT—Science and Research Branch, Islamic Azad University, Tehran, Iran.  
UAF—Department of Entomology, University of Agriculture, Faisalabad, Pakistan.  
UNAM—Universidad Nacional Autónoma de México, Ciudad de México, Mexico.  
UGA—Museum of Natural History of University of Georgia, Athens, Georgia, USA.  
USNM—United States National Museum of Natural History, Smithsonian Institution, at United States Department of Agriculture, Beltsville, Maryland, USA.  
ZMB—Museum für Naturkunde (Zoological Collections), Berlin, Germany.  
ZMUH—Zoologischen Museum, Hamburg, Germany.  
ZMUC—Zoologisk Museum, University of Copenhagen, Denmark.  
ZSM—Zoologische Staatssammlung München, Munich, Germany.  
ZUNIN—Acarological Collection of the Department of Zoology and Biology, University of the North, Republic of South Africa.



Illustrations were mostly redrawn from the original publications following the methods outlined by Fisher & Dowling (2010). Low-temperature scanning electron micrographs (LT-SEM) were produced using the methods described in Dowling *et al.* (2010), Fisher & Dowling (2010), Fisher *et al.* (2011), Bolton *et al.* (2014).

## Results

Bdellidae includes five subfamilies and 278 currently valid species. 34 supraspecific names and 606 species names historically attributed to this family were found in the literature (see **appendix 2**). Supraspecific counts of taxa are as follows: Bdellinae includes *Bdella* (54 species) and *Hexabdella* (10 species); Cytinae includes *Cyta* (18 species) and *Trachymoligus* (4 species); Odontoscirinae includes *Odontoscirus* (92 species) and *Neomoligus* (28 species); Polytrichinae includes *Polytrichus* (1 species); Spinibdellinae includes *Biscirus* (32 species), *Monotrichobdella* (1 species), *Spinibdella* (37 species), and *Tetrabdella* (1 species). For each genus, species are listed alphabetically. Because some species (*e.g.* *Bdella longicornis*, *Cyta latirostris*, *Odontoscirus longirostris*) were long ago synonymized by different authors (*e.g.* Thor 1904b, 1931a; Oudemans 1937), we suspect that some of the old names may be valid; the tools for species differentiation nowadays are vastly broader than when those synonymies were made (*e.g.* molecular, behavioral, different microscopy techniques such as DIC, Phase Contrast, LT-SEM). Even so, we propose that all of those names be regarded as *nomina oblita* because they have not been used as valid since 1899 (ICZN, articles 23.3, 23.9.2) and in many cases the type specimens are lost.

**Biogeography.** Bdellids are cosmopolitan predatory mites found in all biogeographic domains excluding the Antarctica. However, a few species have been described from Antarctic islands, such as South Georgia—and considering the extreme tolerance to cold displayed by *Trachymoligus purpureus* (Fisher *et al.* 2011), it may not be a surprise to discover that bdellids may be present in the Antarctica as well. The West Palearctic and Australasian regions hold the highest number of described species (88 and 74 species, respectively), notably from *Bdella* (26 species) and *Neomoligus* (20 species). However, the diversity of *Bdella* from Europe is probably overestimated, as the same species has likely been described under various names, especially during the 18<sup>th</sup>, 19<sup>th</sup>, and early 20<sup>th</sup> centuries. Other regions have from 39 to 53 known species. Despite a single species of *Tetrabdella* from the Neotropical region, we have seen at least one species from South Africa remarkably similar to *T. neotropica* (pers. obs. by EAU).

**Nomenclatorial changes.** Wallace & Mahon (1976) synonymized *Odontoscirus* Thor, 1913 with *Bdellodes* Oudemans, 1937, but unfortunately chose to validate the junior name. In the present catalog we also consider the distinction between those genera to be poorly defined and treat both genera as synonyms. However, *Odontoscirus* has priority over *Bdellodes*, and is therefore proposed as the senior synonym herein. The distinction between those genera has been based solely on gnathosomal characters: cheliceral bases inflated/normal; inner surface of movable digit straight/curved and bearing/lacking teeth; and subcapitulum with prominent/normal lateral lips; the first option of each of these characters lead to *Odontoscirus*, while the counter states favor *Bdellodes*.

With regard to the first character, we argue that the cheliceral bases may present a continuum of states between “normal” and “inflated”, therefore not being obviously discrete characters and being highly susceptible to subjective interpretation by different authors. In addition, the position of the specimen on the flattened slides may strongly influence the proper visualization of the cheliceral structure. This latter factor also limits the proper judgment of the other cheliceral characters, so that it can be extremely difficult to detect whether the inner surface of the movable digit is straight or curved, and whether teeth are present or absent if the chelicera is not in a perfect lateral position. Finally, there are descriptions of *Bdellodes* species with prominent subcapitular lips (*e.g.* *B. dubitatus*, see Atyeo 1963a: 210) and several other species bearing teeth on chelicera (*e.g.* *B. bidentata*, *B. georgianensis*, *B. hadroseta*, *B. haramotoi*, *B. hessei*, *B. infrequens*, *B. kazeruni*, *B. multicia*, *B. odonata*, *B. rhachia*, *B. sabulosa*, *B. tasmaniensis*); both characters are supposed to occur only in *Odontoscirus*. These variations clearly corroborate our decision to treat both genera as synonyms.

Wallace & Mahon (1976) also considered under the same synonymy the genera *Hoploscirus* Thor, *Thoribdella* Grandjean, and *Octobdellodes* Atyeo, and herein we follow that decision. Species previously mentioned in the literature under the genus *Hoplomoligus* Berlese are herein referred to as *Neomoligus* Oudemans; for species which this is done for the first time, this is indicated as **comb. nov.**

Paktinat-Saej *et al.* (2015a) proposed *Neobiscirus* Gomelauri, 1963a to be considered a junior synonym of

*Biscirus* Thor, 1913. Gomelaury (1963a) considered *Neobiscirus* distinct primarily due to the presence of a median unpaired eye, which has since been found to be widespread not only within *Biscirus*, but also among multiple subfamilies. Therefore, we follow Paktinat-Saej *et al.* (2015a) and do not treat *Neobiscirus* as distinct from *Biscirus*.

*Rigibdella* Tseng, 1978 is herein synonymized with *Cyta* von Heyden, 1826. The sole species described in that genus was *R. ignea* Tseng, originally reported (Tseng 1978) as having intermediate characters between the two Cytinae genera, *Cyta* and *Trachymolgus*. Tseng (1978) mentioned that *R. ignea* was different from *Cyta* in having chelicerae “normal rather than massive”; the illustrations, however, depict a stocky chelicera, not dramatically different from what has been reported for other *Cyta* species, such as *C. coerulipes*, *C. murrayi*, and *C. leiliae* (Atyeo 1960a; Den Heyer 1981; Eghbalian *et al.* 2014). Conversely, it was similar to *Trachymolgus* in having dorsal integument sclerotized. This latter character was already reported for other *Cyta* species, like *C. coerulipes* and *C. leiliae*, which have heavily sclerotized, yet striated tegument. The true condition found in the integument of *Trachymolgus* is radically different, being much more sclerotized, blackish, crusty and rough (Fisher *et al.* 2011). Therefore, we have found the characters that once delimited *Rigibdella* to be consistent with *Cyta*, and thus propose *C. ignea* **comb. nov.**

The authority of Bdellinae has been repeatedly attributed to Grandjean (1938) in the literature (see Atyeo 1960a, 1963a; Wallace & Mahon 1972; van Der Schyff *et al.* 2004, 2005). However, according to the Principle of Coordination (ICZN, article 36), the authorship must be properly attributed to Dugès (1834), since the latter author erected the family name Bdellidae, and both taxa fall under the same nomenclatorial group.

Keys to subfamilies, genera and species in each genus are presented in **appendix 1**; an alphabetical index of Bdellidae taxa is presented in **appendix 2**; new combinations are compiled in **appendix 3**.

## Catalogue

### Bdellidae Dugès

Bdellei Dugès, 1834: 21; (for exhaustive reference list see Thor, 1931a: 1).

### Bdellinae Dugès

Bdellei Dugès, 1834: 21; Bdellinae Grandjean, 1938: 4; Meyer & Ryke, 1959: 373; Atyeo, 1960a: 371; Michocka, 1987: 21; *nec* Trägårdh, 1904: 45.

### *Bdella* Latreille

*Bdella* Latreille, 1795: 18; 1810: 133; Berlese, 1893: 42; Oudemans, 1929: 303; Meyer & Ryke, 1959: 373; Atyeo, 1960a: 372, 1963a: 120, 170; Soliman & Zaher, 1975: 79; Chaudhri *et al.*, 1979: 130; van Der Schyff *et al.*, 2005: 222. *nec* *Bdella* Savigny, 1822 (Anellida: Hirudinea) junior homonym.

*Chelifer* Geoffroy, 1762: 617 (*part.*); type species *Acarus cancroides* Linnaeus, 1762 (Pseudoscorpiones).

*Scirus* Hermann, 1804: 60 (*part.*) type species *Scirus vulgaris* Hermann, 1804: 61.

*Bdellidium* Oudemans, 1929: 449; type species *Scirus vulgaris* Hermann, 1804: 61; synonymy according to Atyeo (1960a).

*Caenobdella* Oudemans, 1937: 1227; type-species *Bdella crassipes* Koch, 1839 by original designation; synonymy according to Atyeo (1960a).

Type-species: *Acarus longicornis* Linnaeus, 1758 (= *La pince* Geoffroy), by subsequent designation (Latreille 1795).

1. *Bdella aloios* van Der Schyff, Theron & Ueckermann, 2005: 222; Limpopo province, South Africa, *ex Canthium mundianum* Cham. & Schltldl. (Rubiaceae).

**Remarks.** Male unknown. This species was misspelled as *B. alois* in van Der Schyff *et al.* 2005, pages 223, 224.

**Type deposition.** NCA.

2. *Bdella bakeri* Gupta & Paul, 1985: 14; West Bengal, Midnapur Dist., Patharkumkumi, India; *ex* nest of dove *Streptopelia chinensis* (Scopoli) (Aves, Columbidae).  
**Remarks.** Male unknown.  
**Type deposition.** NZSI.
3. *Bdella biroi* Supino, 1894: 197; Hungary.—Thor, 1931a: 37.  
**Type deposition.** Unknown.
4. *Bdella boskopensis* van Der Schyff, Theron & Ueckermann, 2005: 232; North West Province, South Africa; *ex* *Acacia karroo* Hayne (Fabaceae).  
**Type deposition.** NCA.
5. *Bdella calva* Hull, 1915: 122; on soil, England.—Hull, 1918: 39.  
**Remarks.** This species probably belongs to a different genus as indicated by the elongated palp tibiotarsus (Hull 1915, figure 6).  
**Type deposition.** Unknown.
6. *Bdella captiosa* Atyeo, 1963a: 170; Groverly, Queensland, Australia; *ex* unknown host.  
**Distribution.** Australia (Wallace & Mahon 1972), Hawaii (Swift & Goff 1987), Iran (Kamali *et al.* 2001; Ueckermann *et al.* 2007; Abbaszadeh *et al.* 2010).  
**Remarks.** Although Atyeo (1963a: 171) established a male as the holotype, Wallace & Mahon (1972: 546, footnote) analyzed the types and concluded it was actually a female; the male and other immatures were not reported until 1987 by Swift & Goff (1987: 43).  
**Redescriptions.** Swift & Goff (1987), Ueckermann *et al.* (2007).  
**Type deposition.** SAM.
7. *Bdella cardinalis* Banks, 1894: 219; *ex* wood under leaves, NY, USA; 1904a: 144; 1907: 596; 1908: 5; Ewing, 1909b: 68; Ewing & Webster, 1912: 129; Hartzell, 1918: 206; Hernandes, 2013: 61.  
**Distribution.** United States (Alabama, Florida, Texas, Illinois) and Mexico.  
**Type deposition.** MCZ.  
**Remarks.** This species has been considered as a junior synonym of *Bdella longicornis* (Linnaeus) by Thor (1931a), and as a junior synonym of *Bdella oblonga* by Jacot (1938); however, Hernandes (2013) revalidated the status of this species.
8. *Bdella carolae* van Der Schyff, Theron & Ueckermann, 2005: 235; Limpopo Province, South Africa; *ex* *Acacia karroo* Hayne (Fabaceae).  
**Type deposition.** NCA.
9. *Bdella consobrinae* van Der Schyff, Theron & Ueckermann, 2005: 234; North West Province, South Africa; *ex* *Acacia karroo* Hayne (Fabaceae).  
**Type deposition.** NCA.
10. *Bdella crassipes* Koch, 1839: 23; Germany.—Koch, 1842: 74; Walckenaer & Gervais, 1847: 532; Thor, 1931a: 31; *Caenobdella crassipes* (Koch), Oudemans, 1937: 1227.  
**Type deposition.** Unknown.
11. *Bdella distincta* Baker & Balock, 1944: 179; Morelos, Mexico, *ex* lichens.—Atyeo, 1960a: 381 (lectotype designation).  
**Distribution.** United States (Washington D.C., Hawaii, Texas), Puerto Rico (Guayama), Philippines, Indonesia, Japan, China, Indonesia, Thailand (Atyeo 1960a), Taiwan (Tseng 1978), Hawaii (Garret & Haramoto 1967; Swift & Goff 1987), Guadeloupe (Flechtmann & Etienne 2006), Brazil (Lawson-Balagbo *et al.* 2008).  
**Redescriptions.** Atyeo (1960a), Tseng (1978), Swift & Goff (1987).



**Type deposition.** Lectotype female, ex *Bambusa parvariabilis*, China (detected in Washington DC, USA), at USNM.

12. *Bdella distinguenda* Berlese, 1905: 157; Bogor (former Buitenzorg, Java). Other names: *Scirus distinguendus*; Thor, 1931a: 45.

**Remarks.** Suspected synonym of *Bdellodes longirostris* (Hermann) according to Thor (1931a: 45).

**Type deposition.** Lost (Castagnoli & Pegazano 1985).

13. *Bdella dorsata* Walckenaer & Gervais, 1844: 157; Paris, France on humid soil with small plants in gardens.—Berlese, 1893: 43; Thor, 1931a: 37; Oudemans, 1937: 1195.

**Type deposition.** Probably lost.

14. *Bdella farabii* Paktinat-Saej & Bagheri, 2015a: 524; Amol, Mazandaran Province, Iran (Paktinat-Saej *et al.* 2015a).

**Type deposition.** Holotype at the Acarological Collection, Department of Plant Protection, Faculty of Agriculture, University of Maragheh, Maragheh, Iran; one paratype at ASI.

15. *Bdella grandjeani* Thor, 1931b: 65; Northern Africa.

**Type deposition.** Lost.

16. *Bdella heliophila* Mihelčič, 1958a: 273; Cercedilla, Spain, on moss of pinus forest.

**Type deposition.** Laboratorio Faunistica y Ecología Animal, Instituto de Edafología, Madrid.

17. *Bdella helvetica* Schweizer & Bader, 1963: 232; Val Ftur, National Park, Switzerland, under stone. Original designation: *Bdella iconica helvetica* Schweizer & Bader.

**Type deposition.** NMB (NP 1931).

18. *Bdella horvathi* Karpelles, 1888: 275; Bulgaria.—Thor, 1931a: 37.

**Type deposition.** Unknown.

19. *Bdella humida* Wallace & Mahon, 1972: 546; Millstream, Fortescue River, West Australia, Australia; ex litter of *Acacia* sp. (Fabaceae) and *Eucalyptus* sp. (Myrtaceae).

**Distribution.** Australia, Iran (Kamali *et al.* 2001; Ueckermann *et al.* 2007).

**Redescription.** Ueckermann *et al.* (2007).

**Remarks.** Male unknown.

**Type deposition.** Holotype and paratypes at ANIC; paratypes at SAM, BMNH, USNM and OSAL.

20. *Bdella iconica* Berlese, 1923: 240; on plants, in Florence and Germany—Thor, 1931a: 32.

- a. *Bdella iconica* var. *veneta* Berlese, 1923: 240; Thor, 1931a: 32; Schweizer & Bader, 1963: 231.

- b. *Bdella sardoa* Berlese, 1923: 241; *B. iconica* var. *sardoa*; Thor, 1931a: 32. Synonymy according to Thor (1931a).

**Distribution.** Italy, Germany and Norway (Thor 1931a), Germany (Willmann 1955), Austria (Willmann 1951), France (Schmölzer 1956), Spain (Mihelčič 1958a), Iceland (Atyeo & Tuxen 1962), Georgia (Gomelauri 1963b), New Zealand (Atyeo 1963a), Switzerland (Schweizer & Bader 1963), Bulgaria (Sosnina *et al.* 1965), Bohemia (Lelláková-Dušková 1978), Ukraine (Kuznetsov & Livshits 1979a), Poland (Michocka 1987), China (Lin *et al.* 2006), Crimea (Bednarskaya 2009, 2010, 2011), Slovakia (Kaluz *et al.* 2013).

**Remarks.** Michocka (1987: 39) apparently figured trichobothria on tibiae II, a characteristic only found in the subfamily Odontoscirinae; therefore it is likely that the species reported from Poland might be the result of a misidentification.

**Redescriptions.** Atyeo & Tuxen (1962), Atyeo (1963a), Sosnina *et al.* (1965), Wallace & Mahon (1972), Lelláková-Dušková (1978), Michocka (1987).

**Type deposition.** CRA.

21. *Bdella interrupta* Evans, 1952: 668; Mid and North Wales, UK, on rocks above tide marks.  
**Type deposition.** Unknown.
22. *Bdella karajiensis* Ueckermann, Rastegar, Saboori & Ostovan, 2007: 133; Karaj, Iran, *ex* litter and soil beneath ornamental plant.  
**Type deposition.** Holotype at SRIAUT, paratypes at ASI.
23. *Bdella khasyana* Gupta, 1991: 221; Arunachal Pradesh, India; *ex* *Litsea khasyana* Meisn. (Lauraceae).  
**Redescription.** Gupta (2002).  
**Remarks.** Male unknown.  
**Type deposition.** NZSI.
24. *Bdella kuznetsovi* Maslov & Khaustov, 2013: 52; Arabatsky Nature Reserve, Crimea, Ukraine; *ex* storm detritus on shore of Sivash Gulf.  
**Type deposition.** NBG.
25. *Bdella lattakia* Soliman & Zaher, 1975: 79; Slinfa, Lattakia, Syria, *ex* moss.  
**Distribution.** Syria, Iran (Kamali *et al.* 2001; Ueckermann *et al.* 2007).  
**Redescription.** Ueckermann *et al.* (2007).  
**Remarks.** Male unknown.  
**Type deposition.** CUE.
26. *Bdella longicornis* (Linnaeus, 1758): 618; in Europe. Original designation: *Acarus longicornis* Linnaeus (= *Acarus petrarum ruber* L., 1746: 349).—Müller, 1776: 187; Johnston, 1845: 227; Oudemans, 1926b: 116.; Atyeo, 1962: 344 (neotype designation).
- a. *Chelififer totus ruber* Geoffroy, 1762: 618; synonymy according to Thor (1902).
- b. *Acarus rupestris* Linnaeus, 1758: 618; Hammer, 1775: 157; synonymy according to Thor (1931a).
- c. *Acarus citri* Hasselquist, 1757: 431; Oudemans, 1929: 306; synonymy according to Thor (1931a).
- d. *Acarus ruber* Linnaeus, 1746; Fabricius, 1775: 815.
- e. *Acarus velox* Müller, 1776: 187; Oudemans, 1929: 312; 1937: 1201.
- f. *Bdella rubra* Lamarck, 1801: 179; von Heyden, 1826: 608; synonym of *Bdellodes longirostris* according to Berlese (1893).
- g. *Scirus vulgaris* Hermann, 1804: 61; Oudemans, 1929: 313; *Bdella vulgaris*, Koch, 1839: 1851; Dugès, 1834: 21; Voigts & Oudemans, 1906: 242; Bäßler, 1910: 812; Oudemans, 1937: 1206; synonymy according to Thor (1904b).
- h. *Bdella decipiens* Thorell, 1871: 701; Trägårdh, 1902a: 7; 1904: 47; 1931: 47; Halbert, 1915: 113; Hull, 1918: 39; Banks, 1919: 11; Hull, 1922: 622; Trägårdh, 1931: 47; synonymy according to Thor (1902: 7); *Bdella longicornis* var. *decipiens* Thorell; Trägårdh, 1928: 8.
- i. *Bdella borealis* Kramer & Neuman, 1883: 525; Banks, 1899: 348; 1907: 596 synonymy according to Thor (1904b).
- j. *Bdella caeca* Berlese, 1905: 15; *Bdella longicornis* var. *caeca*; synonymy according to Thor (1931a: 28).
- k. *Bdella vestita* Koch, 1835: 23; 1842: 74; Walckenaer & Gervais, 1844: 157; Andersén, 1863: 184; Canestrini & Fanzago, 1877: 105.—*Scirus vestitus*, Murray, 1877: 146; synonymy according to Thor (1904b).
- l. *Bdella anguinesetosa* Ewing, 1909b: 72; synonymy according to Atyeo (1960a).
- m. *Bdella tessellata* Ewing, 1913: 112; Thor, 1931a: 36; synonymy according to Atyeo (1960a).
- n. *Bdella oblonga* Say, 1821: 19; Walckenaer & Gervais, 1847: 348; Gervais, 1849: 32; Banks, 1902a: 543; Oudemans, 1937: 1211; Jacot, 1938: 126; Baker & Balock, 1944: 180; Drummond, 1957: 142; synonymy according to Thor (1931a: 25); *Bdellodes oblongula*, Oudemans, 1937: 1221.
- o. *Bdella egregia* Koch, 1839: 23; synonymy according to Thor (1904b).
- p. *Bdella cruentata* Koch, 1839: 10; synonymy according to Thor (1904b).
- q. *Bdella tenuirostris* Koch, 1839: 18; synonymy according to Thor (1904b).

- r. *Bdella vivida* Koch, 1839: 19; synonymy according to Thor (1904b).
- s. *Bdella podurophila* White, 1852: 210; synonymy according to Thor (1904b).
- t. *Bdella arenaria* Kramer, 1881: 444; synonymy according to Thor (1904b).
- Distribution.** Germany (Voigts & Oudemans 1906), Sweden (Trägårdh 1910), England (Hull 1918), Switzerland (Schweizer 1922; Schweizer & Bader 1963), Canada (Summerhayes & Elton 1928), Norway (Thor 1930a), North Africa (Thor 1931b), Austria (Willmann 1951), France (Schmölzer 1956), Barro Colorado Islands, Panama Canal Zone, Costa Rica, Cuba, Mexico (Oaxaca, Distrito Federal, México, San Luis Potosí), United States (California, Texas, Utah, Arkansas, Illinois, Tennessee, Florida, Missouri, Michigan, New Hampshire, Vermont), Nova Scotia (Atyeo 1960a), Japan (Ehara 1960; Shiba & Morikawa 1966; Shiba 1969a), Canada (Sinha 1963), Taiwan (Tseng 1978), United States (Lehman 1982), Poland (Michocka 1987), Korea (Lee *et al.* 1997), China (Fujian) (Lin & Zhang 2000), Japan (Nakamura *et al.* 2006), Iran (Kamali *et al.* 2001, Ueckermann *et al.* 2007), Crimea (Bednarskaya 2011). **Redescriptions.** Walckenaer & Gervais (1844), Thor (1926, 1930a, 1931a), Trägårdh (1928), Oudemans (1929, 1937), Willmann (1956), Atyeo (1960a, 1962), Ehara (1961), Schweizer & Bader (1963), Shiba (1969a), Wallace & Mahon (1972), Tseng (1978), Michocka (1987), Ueckermann *et al.* (2007).
- Remarks.** *Bdella longicornis* is the type species of the genus *Bdella*, and is among the first members of the family ever described. As a consequence, it has appeared under various names in the 18<sup>th</sup> and 19<sup>th</sup> century literature.
- Type deposition.** Neotype of *B. longicornis* at USNM; type of *B. caeca* at CRA; type of *B. cardinalis* at MCZ; type of *B. anguinesetosa* at USNM.
27. *Bdella longipalpus* Mihelčič, 1958b: 41; Sierra Nevada, Spain.  
**Type deposition.** Unknown.
28. *Bdella longistriata* Atyeo, 1960a: 380; Llera, Tamaulipas, Mexico, *ex* pineapple epiphyte. Other records: Mexico (Llera, Tamaulipas; Ciudad del Maiz, San Luis Potosí; Antiguo Morelos, Tamaulipas), United States (Texas) (Atyeo 1960a).  
**Type deposition.** Holotype and paratypes at SEMC, paratypes at USNM.
29. *Bdella malaccensis* Shiba, 1978: 99; Malacca, Malaysia; under stones of intertidal zone.  
**Type deposition.** Biological Laboratory of Matsuyama Shinonome Junior College, Matsuyama, Japan.
30. *Bdella malawiensis* van Der Schyff, Theron & Ueckermann, 2005: 224; Malawi, Bangula, Mozambique; *ex* *Trichilia dregeana* Sond. (Meliaceae).  
**Remarks.** Male unknown.  
**Type deposition.** NCA.
31. *Bdella maldahanensis* Gupta, 1992: 121; West Bengal, India, *ex* *Mangifera indica* Linnaeus (Anacardiaceae).  
**Redescription.** Gupta (2002).  
**Type deposition.** NZSI.
32. *Bdella muscorum* Ewing, 1909a: 124; Muncie, Illinois, USA *ex* moss.—Thor, 1931a: 38.
- a. *Bdella recens* Ewing, 1934: 57 (= *Bdella lata* Ewing, 1909b: 69); Drummond, 1957: 142; synonymy according to Atyeo (1960a).
- b. *Bdella subnigra* Ewing, 1909b: 73; synonymy according to Atyeo (1960a).
- c. *Bdella muscorum* var. *minnesotensis* Ewing, 1913: 113; Thor, 1931a: 38; synonymy according to Atyeo (1960a).  
**Distribution.** United States (California, Colorado, New Mexico, Kansas, Arkansas, Tennessee, Michigan, Minnesota, Illinois, Maryland), Alaska (Point Barrow, Chandler Lake Region, Umiat, District of Mackenzie), Germany (Ost-Holstein), Czech Republic and Iceland (Atyeo 1960a), Iceland (Atyeo & Tuxen 1962), Georgia (Gomelauri 1963b), Bulgaria (Sosnina *et al.* 1965), Japan (Shiba & Morikawa 1966), Bohemia (Lelláková-Dušková 1978), Taiwan (Tseng 1978), Ukraine (Kuznetsov & Livshits 1979a), Pakistan (Chaudhri *et al.* 1979),

Canada (Danks 1980), United States (Lehman 1982), Korea (Lee *et al.* 1997), China (Fujian) (Lin & Zhang 2000), Hungary (Ripka *et al.* 2005), Japan (Nakamura *et al.* 2006), Iran (Ueckermann *et al.* 2007), Crimea (Bednarskaya 2009, 2010, 2011), Slovakia (Kaluz 2008).

**Redescriptions.** Atyeo (1960a), Atyeo & Tuxen (1962), Shiba & Morikawa (1966), Sosnina *et al.* (1965), Wallace & Mahon (1972), Lelláková-Dušková (1978), Tseng (1978).

**Type deposition.** USNM.

33. *Bdella neograndjeani* Meyer & Ryke, 1959: 373; Eastern Cape Province, South Africa; *ex* unidentified shrub.

**Redescription.** van Der Schyff *et al.* (2005).

**Type deposition.** NCA.

34. *Bdella nihoaensis* Swift & Goff, 1987: 29; Nihoa Island, Hawaii, *ex* litter.

**Remarks.** Female unknown.

**Type deposition.** BPBM.

35. *Bdella nylsvleyensis* van Der Schyff, Theron & Ueckermann, 2005: 226; Limpopo Province, South Africa, *ex* soil and debris.

**Type deposition.** NCA.

36. *Bdella obesa* Oudemans, 1937: 1211; unknown locality, Germany.

**Type deposition.** Unknown.

37. *Bdella pinicola* Cooreman, 1943: 7; on pines, near Brussels, Belgium.

**Type deposition.** IRSN.

38. *Bdella piggotti* Evans, 1953: 272; Kilimanjaro, Tanzania.

**Type deposition.** Unknown.

39. *Bdella pulchella* Berlese, 1923: 241; unknown plant and in soil, Italy (Florence and Forli).—Thor, 1931a: 33.

**Distribution.** Norway and Italy (Thor 1931a), Spain (Mihelčič 1958a).

**Type deposition.** Lost (Castagnoli & Pegazzano 1985).

40. *Bdella radhikae* Sadanandan *et al.*, 2009: 3; *ex* *Cocos nucifera*, Kerala, India.

**Type deposition.** Division of Acarology, Department of Zoology, University of Calicut, Kerala, India.

41. *Bdella robusta* Banks, 1894: 220; Sea Cliff, New York, USA, on ground.—Banks, 1907: 596. Other name: *Scirus robustus*, Thor, 1931a: 45.

**Distribution.** United States (Sea Cliff, New York) (Thor 1931a).

**Type deposition.** Unknown.

42. *Bdella semiscutata* Thor, 1930a: 92; Svalbard, Norway.—Thor, 1931a: 29; Willmann, 1939c: 431; 1956: 243.

**Distribution.** Svalbard Island (Norway), Norway, Germany, (Thor 1931a), North Africa (Thor 1931b), Austria (Willmann 1951), Spain (Mihelčič 1958b), Georgia (Gomelauri 1963b), Switzerland (Schweizer & Bader 1963), Bohemia (Lelláková-Dušková 1978), Poland (Michocka 1987), China (Xin *et al.* 1998), Crimea (Bednarskaya 2011).

**Redescriptions.** Wallace & Mahon (1972), Lelláková-Dušková (1978), Michocka (1987).

**Type deposition.** Unknown.

43. *Bdella septentrionalis* Atyeo, 1962 (in Atyeo & Tuxen, 1962: 284); Arnarnesháls, West Iceland.

**Redescription.** Wallace & Mahon (1972).

**Type deposition.** ZMUC.

44. *Bdella spinirostris* Koch, 1839: 9; unknown locality, Germany; Koch, 1842: 74; Walckenaer & Gervais, 1847: 532; Andersèn, 1863: 185; Berlese, 1893: 43; Thor, 1931a: 34; Oudemans, 1937: 214.  
**Type deposition.** Unknown.
45. *Bdella strandi* Berlese, 1923: 240; Norway.—Thor, 1931a: 33. Other name: *Bdella strandi* var. *vistosa* Berlese, 1923: 241; Thor, 1931a: 33.  
**Distribution.** Norway (Thor 1931a), Poland (Michocka 1987), Hungary (Ripka *et al.* 2005).  
**Remarks.** Michocka (1987: 31) apparently figured trichobothria on tibiae II, a characteristic only found in the subfamily Odontoscirinae; it is likely that the species reported from Poland might be the result of a misidentification.  
**Type deposition.** CRA.
46. *Bdella subulirostris* Berlese, 1923: 242; Vallombrosa, Italy, ex conifer leaves, with *Formica pratensis* Retzius (Insecta, Formicidae)—Thor, 1931a: 35.  
**Distribution.** Austria (Willmann 1951).  
**Redescription.** Thor, 1931a: 35.  
**Type deposition.** CRA.
47. *Bdella taurica* Kuznetsov & Livshits, 1979b: 608; Alupka town, Crimea, Ukraine, ex moss on rocky cliffs.  
**Type deposition.** NBG.
48. *Bdella tlascalana* Vitzthum, 1933: 226; Chilapa, Tlaxcala, Mexico.  
**Type deposition.** Unknown.
49. *Bdella tropica* Atyeo, 1960a: 378; Barro Colorado Island, Canal Zone, Panama, ex bark moss. Other records: Malaysia (Shiba 1978), China (Lin *et al.* 2006).  
**Redescription.** Wallace & Mahon (1972).  
**Type deposition.** Holotype and paratypes at SEMC, paratypes at USNM, BMNH, SAM.
50. *Bdella uchidai* Ehara, 1961: 249; Ranshima, Hokkaido, Japan, ex rocks in intertidal zones.  
**Distribution.** Japan (Shiba & Morikawa 1966), China (Lin *et al.* 2006).  
**Redescriptions.** Shiba & Morikawa (1966), Wallace & Mahon (1972).  
**Type deposition.** EIHU.
51. *Bdella ueckermanni* Hernandez, Daud & Feres, 2008: 262; Pariquera-Açu, São Paulo, Brazil, ex *Bactris gasipaes* Kunth (Arecaceae) leaves. Other records: *Musa* sp. leaves (Musaceae), Três Rios, Rio de Janeiro, Brazil; *Cocos nucifera* Linnaeus (Arecaceae) leaves, Ilhéus, Bahia, Brazil.  
**Type deposition.** DZSJRP.
52. *Bdella utilis* Banks, 1914: 55; South Africa, black scale.  
**Distribution.** California (McGregor 1956: 13).  
**Redescription.** Hernandez (2013).  
**Type deposition.** MCZ.
53. *Bdella validipes* Berlese, 1923: 240; Eastern Africa.—Thor, 1931a: 33.  
**Type deposition.** Lost (Castagnoli & Pegazzano 1985).
54. *Bdella vates* van Der Schyff, Theron & Ueckermann, 2005: 229; Free State Province, South Africa, ex soil.  
**Type deposition.** NCA.

## ***Hexabdella* van Der Schyff, Theron & Ueckermann**

*Hexabdella* van Der Schyff, Theron & Ueckermann, 2004: 14.

*Bdella*; Baker & Balock, 1944 (*part.*).

Type-species: *Hexabdella denheyeri* van Der Schyff, Theron & Ueckermann, 2004 by original designation.

55. *Hexabdella brevitarsis* Hernandez, 2013: 62; Covey Hill, Quebec, Canada. *Bdella brevitarsis* Banks (*in* Tothill 1919: 195–196) (*nomen nudum*).

**Type deposition.** MCZ.

56. *Hexabdella cinquaginta* Hernandez, Daud & Feres, 2007: 60; Itiquira, Mato Grosso, Brazil, *ex Hevea brasiliensis* M.Arg. (Euphorbiaceae). Other record: São Paulo, Brazil (Demite & Feres 2008).

**Remarks.** Male unknown.

**Type deposition.** DZSJRP.

57. *Hexabdella denheyeri* van Der Schyff, Theron & Ueckermann, 2004: 15; Angola, *ex Eugenia brasiliensis* Lam. (Myrtaceae).

**Type deposition.** NCA.

58. *Hexabdella maraugia* van Der Schyff, Theron & Ueckermann, 2004: 17; Kleinmond, Western Cape Province, South Africa, *ex* soil under dune vegetation.

**Remarks.** Male unknown.

**Type deposition.** NCA.

59. *Hexabdella mexicana* (Baker & Balock, 1944): 181; Valle del Bravo, Mexico, *ex* moss.—van Der Schyff *et al.*, 2004: 13. Original designation: *Bdella mexicana* Baker & Balock.

a. *Bdella willisi* Baker & Balock, 1944: 182; Drummond, 1957: 142; synonymy according to Atyeo (1960a: 383).

**Distribution.** Mexico (Valle del Bravo, México; Laguna de Zempoala, Morelos; San Luis Potosí, Veracruz), United States (Texas, Kansas, Illinois, Maryland, New York, Connecticut) (Atyeo 1960a) (Wisconsin) (Oatman 1963), Ukraine (Kuznetsov & Livshits 1979a), United States (Lehman 1982), Hawaii (Swift & Goff 1987).

**Redescriptions.** Atyeo (1960a), Swift & Goff (1987), van Der Schyff *et al.* (2004).

**Remarks.** Atyeo (1960a) set *Bdella willisi* as a synonym of this species, but mentions that individuals collected from the United States have hysterosomal setae pilose, whereas those of the Mexican specimens are nude.

**Type deposition.** USNM.

60. *Hexabdella miranda* van Der Schyff, Theron & Ueckermann, 2004: 20; Limpopo Province, South Africa, *ex Euphorbia ingens* E.Mey (Euphorbiaceae).

**Remarks.** Male unknown.

**Type deposition.** NCA.

61. *Hexabdella persiaensis* Paktinat-Saeed & Bagheri, 2014: 3; Mazandaran province, Iran, from soil and rotten leaves under *Corylus avellana* (Betulaceae).

**Remarks.** Male and immatures unknown.

**Type deposition.** Acarological Collection, Department of Plant Protection, University of Maragheh, Iran, and ASI.

62. *Hexabdella quercusi* Eghbalian, Khanjani, Safaralizadeh & Ueckermann, 2016: 292; *ex* litter under oak trees, Western Iran.

**Type deposition.** Holotype and paratypes at University of Bu-Ali Sina, Hamedan, Iran; paratype female at NCA.

63. *Hexabdella singula* van Der Schyff, Theron & Ueckermann, 2004: 14; Cape Town, South Africa, ex *Cassine peragua* L. (Celastraceae).  
**Remarks.** Male and immatures unknown.  
**Type deposition.** NCA.
64. *Hexabdella unusoculata* van Der Schyff, Theron & Ueckermann, 2004: 24; KwaZulu-Natal, South Africa, ex soil.  
**Remarks.** Male unknown.  
**Type deposition.** NCA.

## Cytinae Grandjean

Cytinae Grandjean, 1938; Meyer & Ryke, 1959: 375; Atyeo, 1960a: 416; 1963a: 121, 177; Michocka, 1987: 70.

## Cyta von Heyden

*Cyta* von Heyden, 1826: 608; Thor, 1930a: 89; 1931a: 16; Oudemans, 1937: 1232; Meyer & Ryke, 1959: 377; Atyeo, 1960a: 416; 1963a: 121, 177; Soliman & Zaher 1975: 74; Den Heyer, 1981: 32; Michocka, 1987: 72.  
*Amonia* Koch, 1836: 7; type species *Amonia cruciata* Koch, 1836: 7; Berlese, 1893: 43.  
*Ammonia*, Koch, 1842: 75.  
*Cytobdella* Mihelčič, 1958a: 271; type species *Bdella* (*Cytobdella*) *cytoides* Mihelčič, 1958a by original designation; synonymy according to Atyeo (1963a: 121).  
*Troglobdella* Oudemans, 1937: 1228; type species *Troglobdella obisium* (Gervais, 1841), *Scirus obisium* Gervais, 1841 by original designation; synonymy according to Atyeo (1960a: 417).  
*Rigibdella* Tseng, 1978; type-species *Rigibdella ignea* Tseng, 1978: 48 by original designation; **new synonym**.  
Type-species: *Scirus latirostris* Hermann, 1804 by original designation.

65. *Cyta americana* (Banks, 1902b): 171; Washington D.C., USA. Original designation: *Ammonia americana* Banks.—*Cyta americana*; Banks, 1907: 596; 1915: 25; Hernandez *et al.*, 2011: 808.

**Remarks.** Although Thor (1931a) treated this species as a synonym of *C. latirostris*, they have different chaetotaxy on the palpfemur (6–7 in the latter species and 4 in *C. americana*) (Hernandez 2013); also, the proximal setae of the chelicerae is approximately three times the length of the distal setae (2x in *C. latirostris*).

**Type deposition.** MCZ.

66. *Cyta brevipalpa* Ewing, 1909b: 73; Ewing & Webster, 1912: 129; under bark on soft maple tree, Illinois, USA.  
**Type deposition.** USNM.

67. *Cyta coerulipes* (Dugès, 1834): 21; Europe, unknown locality.—Thor, 1931a: 20; Willmann, 1939c: 431; 1956: 241; 227; Den Heyer, 1981: 32 (ssp.—*quadrisetosus*). Original designation: *Bdella coerulipes* Dugès.—Walckenaer & Gervais, 1844: 156.

- a. *Amonia chlorophana* Koch, 1836: 8; *Amonia chloropus*, Koch, 1842: 76; *Bdella chloropus* (Koch), Berlese, 1883: 214; synonymy according to Berlese (1891, 1893).  
b. *Amonia leucocephala* Koch, 1839: 1; Walckenaer & Gervais, 1847: 531; Oudemans, 1937: 1238; synonymy according to Thor (1931a: 20).  
c. *Bdella crassirostris* Kramer, 1881: 442; synonymy according to Thor (1931a).  
d. *Ammonia coerulipes*; Berlese, 1893: 44.  
e. *Cyta lutea* George, 1912: 236; synonymy according to Thor (1931a).  
f. *Bdella robustirostris* Ewing, 1913: 112; synonymy according to Thor (1931a).  
g. *Cyta coeruleipes*; Hull, 1918: 37.

**Distribution.** Morocco (Thor 1931b), Austria (Willmann 1951), Spain (Mihelčič 1958b), Panama, Haiti, Cuba, Mexico (San Luis Potosí, Guerrero, Tamaulipas, Hidalgo), United States (California, Colorado, Texas), Alaska (Umiat) and Sudan Bor (Atyeo 1960a), Georgia (Gomelauri 1963b), Switzerland (Schweizer & Bader 1963), Bulgaria (Sosnina *et al.* 1965), Egypt (Soliman 1975), Syria (Lattakia) (Soliman & Zaher 1975),

Ukraine (Kuznetsov & Livshits 1979a), Afrotropical (Natal) (Den Heyer 1981), Poland (Michocka 1987), Brazil (Hernandes *et al.* 2011), Iran (Beyzavi *et al.* 2011).

**Redescriptions.** Atyeo (1960a), Michocka (1987).

**Remarks.** There is confusion between the names *Amonia chlorophana* Koch and *A. chloropus* Koch—both names are present in Koch (1836) in the contents page and in text, respectively.

**Type deposition.** Unknown.

68. *Cyta cytoides* (Mihelčič, 1958a): 271 **comb. nov.**; in a damp cave in brown clay, Guadarrama Mountains, Cercedilla, Spain. Original designation: *Bdella (Cytobdella) cytoides* Mihelčič.

**Remarks.** Mihelčič (1958a) illustrates a massive and stout chelicera for this species, a key diagnostic feature for the genus *Cyta*; therefore this species is herein transferred to the latter genus.

**Type deposition.** Laboratorio Faunistica y Ecología Animal, Instituto de Edafología, Madrid.

69. *Cyta grandjeani* Gomelauri, 1963a: 169; Tbilisi, Georgia, *ex soil*, lichens, grass, oak and juniper tree. Kuznetsov & Livshits (1979a: 56).

**Remarks.** *Cyta veneta grandjeani* Lombardini, 1964: 106 is a junior homonym; although the date printed in Lombardini is 1962, the issue appeared only in 1964.

**Type deposition.** Unknown.

70. *Cyta flava* Mihelčič, 1958a: 270; between Ciempozuelos and Chinchón, Spain, on soil.

**Type deposition.** Laboratorio Faunistica y Ecología Animal, Instituto de Edafología, Madrid.

71. *Cyta ignea* (Tseng, 1978): 48 **comb. nov.**; Taipu, Chiayi Hsien, Taiwan, on litter. Original designation: *Rigibdella ignea* Tseng.

**Remarks.** The rationale for moving this species to *Cyta* was given in the discussion before the taxonomic section.

**Type deposition.** Supposedly at BSMI, but probably lost (C-C Ho, pers. comm.).

72. *Cyta kauaiensis* Swift & Goff, 1987: 38; Kauai I, Hawaii, *ex litter* in *Metrosideros* sp. (Myrtaceae) tree hole.

**Remarks.** Female unknown.

**Type deposition.** BPBM.

73. *Cyta latirostris* (Hermann, 1804): 62; France, *ex moss*. Original designation: *Scirus latirostris* Hermann.—Oudemans, 1929: 314. *Cyta latirostris*, Thor, 1902: 160; Oudemans, 1902: 54; Thor, 1904b: 72; Bähler, 1910: 812. Other names: *Leptus latirostris*, Lamarck, 1838: 63; *Ammonia latirostris*, Koch, 1839: 3; Koch, 1842: 76; Walckenaer & Gervais, 1847: 531; Berlese, 1891: 4; *Bdella latirostris*, Walckenaer & Gervais, 1844: 157; 1847: 531; Canestrini & Fanzago, 1877: 107; Berlese, 1883: 214.

- a. *Ammonia cruciata* Koch, 1836: 7; Andersén, 1863: 185; Berlese, 1893: 44; Oudemans, 1937: 1235; *Bdella cruciata*; Walckenaer & Gervais, 1844: 156 synonymy according to Berlese (1893).

- b. *Ammonia leucocephala* Koch, 1839: 23; 1842: 76; *Bdella leucocephala* (Koch), Canestrini & Fanzago, 1877: 106; synonymy according to Berlese (1893).

- c. *Ammonia megacephala* Koch, 1839: 23; 1842: 76; Walckenaer & Gervais, 1847: 531; Berlese, 1893: 44; Oudemans, 1937: 1239; synonymy according to Berlese (1893).

- d. *Bdella phoenicea* Koch, 1839: 7; 1842: 74; Walckenaer & Gervais, 1847: 531; Canestrini & Fanzago, 1877: 103; Thor, 1931a: 36; Oudemans, 1937: 1213; synonym of *Bdella vulgaris* according to Berlese (1893).

- f. *Bdella cruentata* Koch, 1839: 10; 1842: 74; Walckenaer & Gervais, 1847: 532; Andersén, 1863: 185; Canestrini & Fanzago, 1877: 102; Thor, 1931a: 37; Oudemans, 1937: 1192; synonym of *Bdella vulgaris* according to Berlese (1893).

- g. *Bdella crassirostris* Kramer, 1881: 442; synonymy according to Berlese (1891, 1893).

- h. *Bdella dispar* Koch, 1839: 23; 1842: 75; Walckenaer & Gervais, 1847: 532; Canestrini & Fanzago, 1877: 101; Thor, 1931a: 31; Oudemans, 1937: 1194; Willmann, 1951a: 148; 1952: 166; Michocka, 1987: 24; synonymy according to Thor (1931a).



- h. *Bdella amarantina* Koch, 1839: 17; 1842: 75; Walckenaer & Gervais, 1847: 532; Andersén, 1863: 185; Berlese, 1893: 42; Oudemans, 1937: 1191; synonymy according to Thor (1931a: 31).
- i. *Bdella tenuirostris* Koch, 1839: 18; 1842: 74; Walckenaer & Gervais, 1847: 532; synonym of *Bdella vulgaris* according to Berlese (1893).
- j. *Bdella vivida* Koch, 1839: 19; 1842: 75; Walckenaer & Gervais, 1847: 532; Berlese, 1893: 43; Thor, 1931a: 37; Oudemans, 1937: 1216; synonym of *Bdella vulgaris* according to Berlese (1893).
- k. *Bdella vulgaris* (Hermann 1804: 61), Koch, 1839: 8; 1842: 74; Walckenaer & Gervais, 1847: 531; Berlese, 1888: 187; Hull, 1918: 38.
- l. *Bdella robustirostris* Ewing, 1913: 112; synonymy according to Thor (1931a).
- m. *Cyta novangliae* Jacot, 1939: 326; synonymy according to Atyeo (1960a).
- n. *Cyta phaseoli* Meyer & Ryke, 1959: 377; Den Heyer, 1981: 32; synonymy according to Wallace & Mahon (1972: 571).
- o. *Amonia latirostris* var. *fusca* Canestrini, 1896: 92; *Cyta latirostris* var. *fusca* Thor, 1931a: 19.
- p. *Bdella brevirostris molissima* Koch, 1879: 132, *Cyta brevirostris*; Hull, 1922: 622; Banks, 1923: 237; *Ammonia brevirostris*; Trägårdh, 1900: 15; 1902a: 8; *Cyta latirostris* var. *brevirostris*; Trägårdh, 1904: 49; 1910: 480; 1928: 7; synonymy according to Thor (1904b).
- q. *Bdella arenaria* Kramer, 1881: 444; Berlese 1893: 42; Karpelles, 1894: 425; synonymy of *Bdella vulgaris* according to Berlese (1893).

**Distribution.** Paraguay, Brazil (Berlese 1888), Italy (Canestrini 1886), Sweden (Trägårdh 1910), Germany (Voigts & Oudemans 1906; Willmann 1952), Ireland (Halbert 1915), England (Hull 1918), Switzerland (Schweizer 1922), Canada (Summerhayes & Elton 1928), Germany, Norway (Thor 1930a, 1931a), Northern Africa (Thor 1931b), Australia (Womersley 1933a), Madeira Island (Willman 1939a), Austria (Willmann 1951), Germany (Wangerooge Island) (Willmann 1952), Germany (Willmann 1956), France (Schmölzer 1956), United States (Maryland) (Drummond 1957), Spain (Mihelčić 1958a), Georgia (Gomelauri 1961), South Africa (Meyer & Ryke 1959; Halliday 2005), Cuba, Jamaica, Mexico (Puebla, México, San Luis Potosí), United States (California, Utah, Idaho, Texas, Arkansas, Kansas, Nebraska, North Dakota, Michigan, Alabama, Tennessee, West Virginia, Maryland, Connecticut), Alaska (Point Barrow), Iceland, Italy, Germany and Australia (Atyeo 1960a), Iceland (Atyeo & Tuxen 1962), Switzerland (Schweizer & Bader 1963), Bulgaria (Sosnina *et al.* 1965), Japan (Shiba & Morikawa 1966; Shiba 1969a; Nakamura *et al.* 2006), New Zealand, Australia (Victoria, Tasmania, Western Australia) (Atyeo 1963a; Wallace & Mahon 1972), Egypt (Soliman 1975; Zaher 1986), Syria (Lattakia) (Soliman & Zaher 1975), Bohemia (Lelláková-Dušková 1978), Ukraine (Kuznetsov & Livshits 1979a), Afrotropical (Natal, Cape Province, Pietersburg Dist.) (Den Heyer 1981), United States (Lehman 1982), Hawaii (Swift & Goff 1987), Poland (Michocka 1987), Korea (Lee *et al.* 1997), China (Fujian) (Lin & Zhang 2000), South Africa (Halliday 2005), Hungary (Ripka *et al.* 2005), Iran (Ostovan & Kamali 1995; Kamali *et al.* 2001; Ueckermann *et al.* 2007; Abbaszadeh *et al.* 2010), Crimea (Bednarskaya 2009, 2010, 2011), Slovakia (Kaluz 2008).

**Redescriptions.** Atyeo (1960a, 1963a), Atyeo & Tuxen (1962), Sosnina *et al.* (1965), Shiba (1969a), Lelláková-Dušková (1978), Michocka (1987). Although Berlese (1893: 44) has considered *Ammonia leucocephala* Koch as a synonym of *Cyta latirostris*, Koch (1839) illustrated three leg trichobothria (on tibia I, tibia IV and tarsus III), while *C. latirostris* only has a trichobothrium on tibia IV.

**Type deposition.** Unknown (probably lost).

**Remarks.** Species with world-wide distribution; this species bears trichobothria only on tibia IV; Wallace & Mahon (1972: 579) reports an undescribed species of *Cyta* with no leg trichobothria at all.

74. *Cyta leiliae* Eghbalian, Khanjani & Ueckermann, 2014: 568; *ex* soil and litter under *Quercus brantii* Lindl (Fagaceae), Kurdistan province, Iran.

**Type deposition.** Holotype and paratypes at the Acarology Laboratory, University of Abu-Ali Sina, Hamedan, Iran, one paratype at NCA.

75. *Cyta kurdistanicus* Eghbalian, Khanjani & Ueckermann, 2014: 572; *ex* soil and litter under *Amygdalus lycioides* Spach (Rosaceae), Kurdistan province, Iran.

**Type deposition.** Holotype and paratypes at the Acarology Laboratory, University of Abu-Ali Sina, Hamedan, Iran, one paratype at NCA.

76. *Cyta longiseta* Wallace & Mahon, 1972: 575; Mt. Claremont, Perth, Australia, on *Banksia* sp. (Proteaceae) scrub. **Distribution.** Iran (Abbaszadeh *et al.* 2010).  
**Type deposition.** Holotype and paratypes at ANIC, paratypes at SAM, BMNH, BPBM, OSAL and USNM.
77. *Cyta magdalenae* Den Heyer, 1981: 34; Kleinmond, Cape Province, South Africa, in soil under dune vegetation.  
**Type deposition.** NCA, IZRPU, ZUNIN.
78. *Cyta murrayi* Den Heyer, 1981: 37; *ex litter* of *Dombeya rotundifolia* (Hochst.) (Malvaceae), UNIN, South Africa.  
**Distribution.** Afrotropical (Angola, South Africa, Zimbabwe) (Den Heyer 1981).  
**Type deposition.** NCA, ZUNIN, ANIC.
79. *Cyta reticulata* Soliman & Zaher, 1975: 74; Slinfa, Lattakia, Syria, *ex* moss.  
**Remarks.** Male unknown.  
**Type deposition.** CUE.
80. *Cyta spuria* Atyeo, 1960a: 421; 10 miles east of Xilitla, San Luis Potosí, Mexico, *ex* bamboo;  
**Distribution.** Mexico, USA (Texas) (Atyeo 1960a).  
**Type deposition.** Holotype and paratypes at SEMC, paratypes at USNM, BMNH and SAM.
81. *Cyta troglodyta* Hernandez, 2011: 801; *ex* feces of *Kerodon rupestris* Wied (Mammalia, Rodentia), Gruta do Janelão cave, Minas Gerais, Brazil (Hernandez *et al.* 2011).  
**Type deposition.** DZSJRP.
82. *Cyta veneta* (Lombardini, 1960): 241; Jesolo, Venice, Italy. Original designation: *Neomolgus venetus* Lombardini. *Cyta veneta*; Lombardini, 1964: 105.  
**Type deposition.** CRA.

### ***Trachymolgus* Berlese**

*Trachymolgus* Berlese, 1923: 242; Thor, 1931a: 40.

Type-species: *Bdella nigerrima* Canestrini & Fanzago, 1876 by original designation.

83. *Trachymolgus jesusi* Mejía-Recamier & Palacios-Vargas, 1999: 165; Jalisco, Chamela, México.  
**Type deposition.** Holotype and paratypes at UNAM, paratypes at UGA, CRA and CNC.
84. *Trachymolgus nigerrima* (Canestrini & Fanzago, 1876): 108; Italy. Original designation: *Bdella nigerrima* Canestrini & Fanzago.—Canestrini & Fanzago, 1877: 104; Canestrini, 1886: 189; Berlese, 1883: 214; Thor, 1931a: 40; *Trachymolgus nigerrimus*; Berlese, 1923: 242; Sosnina *et al.* (1965: 279).  
a. *Acarus citri* Hasselquist, 1757: 431; Oudemans, 1926b: 118; synonymy according to Thor, 1931a; *Bdella citri*, Thor (1931a).  
**Distribution.** Italy, Switzerland (Thor 1931a), Georgia (Gomelauri 1963b), Switzerland (Schweizer & Bader 1963), Bulgaria (Sosnina *et al.* 1965), Ukraine (Kuznetsov & Livshits 1979a).  
**Type deposition.** Unknown.
85. *Trachymolgus purpureus* Fisher & Dowling, 2011: 5 (in Fisher *et al.* 2011); Ozark Highlands, Arkansas, USA.  
**Type deposition.** Holotype and paratypes at ACUA, paratypes at OSAL, FMNH, USNM.
86. *Trachymolgus recki* Gomelauri, 1961: 69; Sukhumi and Tbilisi, Georgia, *ex* oak leaves and tree stocks in forest.

**Type deposition.** Unknown.

### **Polytrichinae van Der Schyff, Theron & Ueckermann**

Polytrichinae van Der Schyff, Theron & Ueckermann, 2003: 20

#### ***Polytrichus* van Der Schyff, Theron & Ueckermann**

Type-species: *Polytrichus yemenensis* van Der Schyff, Theron & Ueckermann, 2003 by original designation.

87. *Polytrichus yemenensis* van Der Schyff, Theron & Ueckermann, 2003: 21; Djebel An-Nabi Shuaib, Yemen.  
**Type deposition.** NCA.

### **Spinibdellinae Grandjean**

Spinibdellinae Grandjean, 1938: 3; Meyer & Ryke, 1959: 381; Atyeo, 1960a: 423; 1963a: 121; Michocka, 1987: 81.

#### ***Biscirus* Thor**

*Biscirus* Thor, 1913: 28; 1926: 135; 1931a: 45; Meyer & Ryke, 1959: 381; Atyeo, 1960a: 435; 1963a: 174; Soliman & Zaher, 1975: 77; Chaudhri *et al.*, 1979: 135; Michocka, 1987: 84.

Type-species: *Bdella silvatica* Kramer, 1881 by original designation.

88. *Biscirus amplexus* Omukunda, Theron & Ueckermann, 2007: 277; Western Cape, Kleinmond, South Africa, *ex* soil debris under *Didelta spinosa* Aiton (Asteraceae).

**Remarks.** Male unknown.

**Type deposition.** NCA.

89. *Biscirus anomalicornis* (Berlese, 1916): 130; La Plata, Argentina. Original designation: *Bdella anomalicornis* Berlese. Other name: *Biscirus (Biscirus) anomalicornis*, Thor, 1931a: 52.

**Type deposition.** CRA.

90. *Biscirus aquilonius* Wallace & Mahon, 1972: 558; Kununurra, Western Australia, *ex* grass.

**Remarks.** Reported as *Biscirus silvaticus* (Kramer) by Atyeo (1963a: 175).

**Type deposition.** ANIC.

91. *Biscirus arenarius* Wallace & Mahon, 1972: 556; Perth, Western Australia.

a. *Biscirus silvaticus* (Kramer) (*part.*); Womersley, 1933a: 106 (not Kramer, 1881); synonymy according to Wallace & Mahon (1972: 556).

b. *Biscirus silvaticus* (Kramer) (*part.*); Atyeo, 1963a: 175 (not Kramer, 1881); synonymy according to Wallace & Mahon (1972: 556).

**Distribution.** Australia (Wallace & Mahon 1972), Pakistan (Chaudhri *et al.* 1979), Iran (Jalaeian & Nourbakhsh 2005).

**Remarks.** Male unknown.

**Type deposition.** Holotype at SAM, paratypes at ANIC.

92. *Biscirus illinoisensis* (Ewing, 1909b): 65 **comb. nov.**; “under lumber from and old barn”, Urbana, Illinois, USA. Original designation: *Bdella illinoisensis* Ewing.

**Remarks.** Examination of types has shown that this species has only two ventral setae on the hypostome and palptarsus elongate (not truncate distally), therefore it is herein transferred to the subfamily Spinibdellinae, genus *Biscirus*.

**Type deposition.** USNM.

93. *Biscirus insularis* Willmann, 1939a: 14; Levada do Inferno, Madeira Island.

**Type deposition.** ZSM.

94. *Biscirus iranensis* Paktinat-Saej & Bagheri, 2015a: 520; Sari, Mazandaran, Iran.

**Type deposition.** Holotype at the Acarological Collection, Department of Plant Protection, Faculty of Agriculture, University of Maragheh, Maragheh, Iran; one paratype male at ASI.

95. *Biscirus kleinmondiensis* Omukunda, Theron & Ueckermann, 2007: 273; Western Cape, Kleinmond, South Africa, *ex* soil.

**Remarks.** Male unknown.

**Type deposition.** NCA.

96. *Biscirus kobachidzei* (Gomelauri, 1963a): 167; Tbilisi, Georgia, under stones. Original designation: *Neobiscirus kobachidzei* Gomelauri; *Biscirus kobachidzei*; Paktinat-Saej *et al.* 2015a: 520.

**Type deposition.** Unknown.

97. *Biscirus lootsi* Omukunda, Theron & Ueckermann, 2007: 270; Natal, South Africa, *ex* grass.

**Remarks.** Female unknown.

**Type deposition.** NCA.

98. *Biscirus magdalenae* Omukunda, Theron & Ueckermann, 2007: 279; Northwest Province, South Africa, *ex* soil.

**Remarks.** Male unknown.

**Type deposition.** NCA.

99. *Biscirus macfarlanei* Meyer & Ryke, 1959: 381; Munster, Natal, South Africa, *ex* unidentified wild herb.

**Type deposition.** North-West University, Potchefstroom campus, South Africa.

100. *Biscirus melanostoma* (Berlese, 1923): 241; Eastern Africa.—Thor, 1931a: 53. Original designation: *Bdella melanostoma* Berlese.

**Type deposition.** CRA.

101. *Biscirus nevadicus* Mihelčič, 1958b: 40; Sierra Nevada, Spain.

**Type deposition.** Unknown.

102. *Biscirus nixis* Chaudhri & Akbar, 1985: 115; Faisalabad, Pakistan, *ex* jute (*Corchorus capsularis* Linnaeus, Malvaceae).

**Type deposition.** UAF.

103. *Biscirus norvegicus* (Thor, 1905): 203; Gudbrandsdalen, Norway.—Thor, 1928: 216. Original designation: *Scirus norvegicus* Thor. Other names: *Bdella norvegica*, Hull, 1918: 40; *Biscirus* (*Biscirus*) *norvegicus*, Thor, 1931a: 47; *Biscirus* (*Biscirus*) *norvegicus* var. *sardica* Thor, 1931a: 48.

**Distribution.** Norway (Thor 1905), England (Hull 1918), Austria (Willmann 1951), Switzerland (Schweizer & Bader 1963).

**Type deposition.** Lost.

104. *Biscirus obliquus* Wallace & Mahon, 1972: 561; Mundiwindi, Western Australia, *ex* grass.

**Distribution.** Australia, Korea (Lee *et al.* 1997).

**Remarks.** The epithet was originally spelled as *ubliquus*, when it probably meant *obliquus*, referring to the oblique striae on the prodorsum; in the same and in subsequent pages the authors mention *obliquus*; male unknown.

**Type deposition.** ANIC.

105. *Biscirus opimus* (Berlese, 1923): 239; La Plata, Argentina, Montevideo, Uruguay.—Thor, 1931a: 53. Original designation: *Molgus* (*Hoplomolgus*) *opimus* Berlese.

**Type deposition.** CRA.

106. *Biscirus peragilis* (Berlese, 1923): 238; Eastern Africa.—Thor, 1931a: 53. Original designation: *Molgus* (*Hoplomolgus*) *peragilis* Berlese.

**Type deposition.** CRA.

107. *Biscirus psammina* Omukunda, Theron & Ueckermann, 2007: 270; Cape Town, South Africa, *ex* eroded sand debris.

**Remarks.** Male unknown.

**Type deposition.** NCA.

108. *Biscirus pseudothori* Shiba & Morikawa, 1966: 128; Marunuma, Okunikko, Japan.

**Type deposition.** Biological Laboratory of Matsuyama Shinonome Junior College, Matsuyama, Japan.

109. *Biscirus quinqueoculatus* Willmann, 1956: 242; Germany.

**Distribution.** Poland (Michocka 1987: 89).

**Redescription.** Michocka (1987).

**Type deposition.** ZSM.

110. *Biscirus sardicus* (Vitzthum, 1920): 2; *ex* nest of *Camponotus maculatus* (Fabricius) (Insecta, Formicidae), Sardinia, Italia. Original designation: *Scirus sardicus* Vitzthum. Other name: *Biscirus* (*Biscirus*) *var. sardica*; Thor, 1931a: 48.

**Type deposition.** Unknown.

111. *Biscirus silvaticus* (Kramer, 1881): 445; Thuringia, Germany.—Schweizer, 1922: 79; Willmann, 1939: 431; 1956: 242. Original designation: *Bdella silvatica* Kramer; Hull, 1918: 39. Other names: *Scirus silvaticus*; Thor, 1904b: 76; *Bdella sylvatica*, Moniez, 1890a: 30; *Biscirus* (*Biscirus*) *silvaticus*, Thor, 1931a: 46; *Biscirus silvaticus convexus* Willmann, 1941: 41.

**Distribution.** Germany (Voigts & Oudemans 1906), England (Hull 1918), Switzerland (Schweizer 1922; Schweizer & Bader 1963), Indonesia (Vitzthum 1931), Southern Dalmatia (Willmann 1941), Austria (Willmann 1951), Spain (Mihelčič 1958b), Mexico (Oaxaca, Durango, Nuevo León), Haiti, United States (California, Mississippi, Kansas, Colorado, Maryland, Tennessee), Iceland, Germany (Atyeo 1960a) (Willman 1956), United States (Maryland) (Drummond 1957), Iceland (Atyeo & Tuxen 1962), Australia (Womersley 1933a; Atyeo 1963a), Japan (Shiba & Morikawa 1966), Syria (Soliman & Zaher 1975), Bohemia (Lelláková-Dušková 1978), Ukraine (Kuznetsov & Livshits 1979a), Poland (Michocka 1987) Korea (Lee *et al.* 1997), China (Xin *et al.* 1998), Iran (Ostovan & Kamali 1995; Kamali *et al.* 2001), Slovakia (Kaluz 2008).

**Redescriptions.** Vitzthum (1931), Atyeo (1960a, 1963a), Shiba & Morikawa (1966), Lelláková-Dušková (1978), Michocka (1987).

**Type deposition.** Unknown.

112. *Biscirus simplexus* Soliman & Zaher, 1975: 77; Tabiat, Lattakia, Syria, *ex* moss.

**Distribution.** Iran (Kamali *et al.* 2001).

**Remarks.** Male unknown.

**Type deposition.** CUE.

113. *Biscirus skuinsbaaiensis* Omukunda, Theron & Ueckermann, 2007: 275; Western Cape, Skuinsbaai, South Africa.

**Type deposition.** NCA.

114. *Biscirus splendida* (Stoll, 1893): 15; Guatemala. Original designation: *Bdella splendida* Stoll. Other name: *Biscirus (Biscirus) splendidus*, Thor, 1931a: 51.

**Distribution.** Bolivia (Berlese & Leonardi 1902).

**Type deposition.** Unknown.

115. *Biscirus symmetrica* (Kramer, 1898): 14; Tierra del Fuego, Navarin Island, Puerto Toro (Chile), in forests. Original designation: *Bdella symmetrica* Kramer. Other names: *Biscirus symmetricus* [sic], Mihelčič, 1958b: 40; *Biscirus (Biscirus) symmetricus*, Thor, 1931a: 50.

**Distribution.** Chile (Kramer 1898), Australia (Womersley 1933a), Spain (Mihelčič 1958b).

**Type deposition.** Unknown.

116. *Biscirus thori* Womersley, 1933a: 106; Western Australia.—Atyeo, 1963a: 175.

**Distribution.** Australia, Korea (Lee *et al.* 1997).

**Redescriptions.** Atyeo (1963a), Wallace & Mahon (1972).

**Type deposition.** SAM.

117. *Biscirus uncinatus* (Kramer, 1898): 12; Ushuaia, Tierra del Fuego, Argentina. Original designation: *Bdella uncinata* Kramer. Other name: *Biscirus (Biscirus) uncinatus*, Thor, 1931a: 50; *Biscirus (Biscirus) uncinnatus* (Kramer), Womersley, 1933a: 106.

**Distribution.** Chile (Tierra del Fuego, Navarin Island, Puerto Toro), United States (California, Florida) (Thor 1931a), Australia (Womersley 1933a).

**Type deposition.** Unknown.

118. *Biscirus variegatus* (Gervais, 1849): 32; unknown locality, Chile; Original designation: *Bdella variegata* Gervais; *Biscirus variegata*; Oudemans, 1937: 1226.

**Type deposition.** Unknown.

119. *Biscirus vulgaris* Kuznetsov & Barilo, 1984: 936; Zeravshan mountain ridge, Uzbekistan, under stone.

**Type deposition.** NBG.

### ***Monotrichobdella* Baker & Balock**

*Monotrichobdella* Baker & Balock, 1944: 176.

Type-species: *Monotrichobdella maxosburni* Baker & Balock, 1944 by original designation.

120. *Monotrichobdella maxosburni* Baker & Balock, 1944: 176; near Tres Cumbres, Mexico-Cuernavaca Highway, Morelos, Mexico, ex lichens.

**Distribution.** Mexico (Morelos, Salazar, Distrito Federal) (Baker & Balock 1944; Atyeo 1960a), Taiwan (Tseng 1978).

**Redescriptions.** Atyeo (1960a), Tseng (1978).

**Type deposition.** USNM.

### ***Spinibdella* Thor**

*Spinibdella* Thor, 1930b: 22; 1931a: 39; Atyeo, 1960a: 424; Soliman & Zaher, 1975: 80; Tseng, 1978: 38; Chaudhri *et al.*, 1979: 133; Michocka, 1987: 82.

Type-species: *Spinibdella reducta* Thor, 1930b: 23 by original designation.

121. *Spinibdella ampulla* Wallace & Mahon, 1972: 568; Millstream, Western Australia, ex green herbaceous, couch grass, *Eucalyptus* sp. litter.

**Remarks.** Male unknown.

**Type deposition.** ANIC.

122. *Spinibdella ankylotricha* Omukunda, Theron & Ueckermann, 2012: 9; Limpopo Province, South Africa.

**Type deposition.** NCA.

123. *Spinibdella antarctica* (Trägårdh, 1907): 24; South Georgia, Grytviken Peninsula, Antarctica, under rocks.—Wallace, 1970: 107. Original designation: *Bdella antarctica* Trägårdh; Thor, 1931a: 33.

**Redescription.** Wallace (1970).

**Type deposition.** BPBM; USNM, BMNH, ANIC.

124. *Spinibdella arenosa* Willmann, 1939b: 532; Germany (Wangerooge Island) (Willmann, 1952: 165).

**Type deposition.** ZSM.

125. *Spinibdella atyeoi* Gupta & Paul, 1985: 14; West Bengal, Midnapur Dist., Patharkumkumi, India, *ex* nest of *Prinia inornata* (Sykes 1832) (Aves: Cysticolidae).

**Remarks.** Male unknown.

**Type deposition.** NZSI.

126. *Spinibdella bifurcata* Atyeo, 1960a: 430; 10 miles west of Tuxtla Gutierrez, Chiapas, Mexico, under rock.—Soliman, 1975: 48.

**Distribution.** Mexico (Chiapas, Oaxaca, Puebla, Michoacán, United States (Texas) (Atyeo 1960a), Egypt (Giza) (Soliman 1975; Zaher 1986), Malaysia (Shiba 1978), China (Lin *et al.* 2006).

**Redescription.** Shiba (1978).

**Type deposition.** Holotype and paratypes at SEMC, paratypes at USNM, BMNH and SAM.

127. *Spinibdella bioculata* Swift & Goff, 1987: 39; Kahoolawe Island, Hawaii, *ex* Kiawe duff and grasses.

**Remarks.** Male unknown.

**Type deposition.** BPBM.

128. *Spinibdella californica* McGregor, 1956: 12; California, USA, *ex* lemon.

**Type deposition.** Unknown.

129. *Spinibdella corticis* (Ewing, 1909a): 122; Urbana, Illinois, USA, under bark of cottonwood tree.—Atyeo, 1960a: 426. Original designation: *Bdella corticis* Ewing; Thor, 1931a: 36. Other name: *Spinibdella cortis* [sic]; Rack, 1961: 185.

**Distribution.** United States (Illinois, Texas, Utah, Nebraska), Mexico (Oaxaca), Guatemala (Atyeo 1960a), Japan (Shiba & Morikawa 1966), Australia (Wallace & Mahon 1972).

**Redescriptions.** Atyeo (1960a), Wallace & Mahon (1972).

**Type deposition.** USNM.

130. *Spinibdella cronini* (Baker & Balock, 1944): 178; Planada, California, USA, on lichens from fig tree.—Atyeo, 1960a: 432. Original designation: *Bdella cronini* Baker & Balock.

**Distribution.** United States (California, Texas, Utah, Colorado, Washington, Alabama, Maryland), Mexico (Tamaulipas, Guerrero, Nevo León, San Luis Potosí) (Atyeo 1960a), Australia (Atyeo 1963a; Wallace & Mahon 1972), Bulgaria (Sosnina *et al.* 1965), Egypt (Soliman 1975), Syria (Lattakia) (Soliman & Zaher 1975), Ukraine (Kuznetsov & Livshits 1979a), United States (Lehman 1982), Hawaii (Swift & Goff 1987), Hungary (Ripka *et al.* 2005), China (Li *et al.* 1992; Li & Fan 2007), Iran (Ostovan & Kamali 1995; Kamali *et al.* 2001, Jalaieian *et al.* 2005; Ueckermann *et al.* 2007; Abbaszadeh *et al.* 2010; Daneshnia & Akrami 2013; Majidi & Akrami 2013; Masoudian & Khanjani 2013), Brazil (Pinto-da-Rocha 1995; Hernandez *et al.* 2011), Slovakia (Kaluz 2008).

**Remarks.** this species was found in bat guano in USA (Webster & Whitaker 2005).

**Redescriptions.** Atyeo (1960a, 1963a), Sosnina *et al.* (1965), Wallace & Mahon (1972), Swift & Goff (1987), Ueckermann *et al.* (2007).

**Type deposition.** USNM.

131. *Spinibdella denheyeri* Hernandes, Daud & Feres, 2008: 265; *ex Coffea arabica* leaves (Linnaeus, Rubiaceae) Atibaia, São Paulo, Brazil.

**Type deposition.** DZSJRP.

132. *Spinibdella depressa* (Ewing, 1909a): 125; Arcola, Illinois, USA, under bark.—Aty eo, 1960a: 428. Original designation: *Bdella depressa* Ewing; Thor, 1931a: 38.

a. *Bdella virgata* Ewing, 1909b: 70; Hartzell, 1918: 206; Baker & Balock, 1944: 179 synonymy by Atyeo (1960a).

b. *Bdella chapultepecensis* Baker & Balock, 1944: 177 synonymy by Atyeo (1960a).

c. *Bdella riolermensis* Baker & Balock, 1944: 178 synonymy by Atyeo (1960a).

**Distribution.** United States (Maryland) (Drummond 1957), United States (Illinois, Texas, Maryland, Arkansas, Kansas, New Jersey, Connecticut), Mexico (México, Distrito Federal, San Luis Potosí, Morelos) (Aty eo 1960a), Australia (Aty eo 1963a; Wallace & Mahon 1972), Pakistan (Chaudhri *et al.* 1979), United States (Lehman 1982), Hawaii (Swift & Goff 1987), China (Fujian) (Lin & Zhang 2000), Iran (Kamali *et al.* 2001; Ueckermann *et al.* 2007; Abbaszadeh *et al.* 2010).

**Remarks.** this species has the posterior eye wanting, with circular striation where that eye should normally be.

**Redescriptions.** Baker & Balock (1944), Atyeo (1960a, 1963a), Wallace & Mahon (1972), Swift & Goff (1987), Ueckermann *et al.* (2007).

**Type deposition.** USNM.

133. *Spinibdella dusta* Shiba, 1969b: 150; tatami, Kuwabara-chô, Matsuyama, Japan, *ex* tatami.

**Type deposition.** Biological Laboratory of Matsuyama Shinonome Junior College, Matsuyama, Japan.

134. *Spinibdella gibberabdomen* (Thor, 1931b): 68; Tangier, Morocco; Paktinat-Saej *et al.* 2015: 695. Original designation: *Bdella gibberabdomen* Thor.

**Remarks.** The author mentions only two ventral setae on the hypostome, and illustrates a truncate palptarsus, which is why this species was transferred to the genus *Spinibdella*.

**Type deposition.** Lost.

135. *Spinibdella howarthi* Swift & Goff, 1987: 40; Mauna Kea Summit Cone, Hawaii, under stone.

**Remarks.** Male unknown; species known only from the holotype.

**Type deposition.** BPBM.

136. *Spinibdella iberica* Gomelaury, 1961: 68; close to the Turtle lake near Tbilisi, Georgia, *ex* lichens.

**Type deposition.** Unknown. **Remarks.** The choice of the epithet by the author is a mystery, since the type locality was not in the Iberian Peninsula.

137. *Spinibdella lignicola* (Canestrini, 1886): 184; Italy and Egypt.—Tseng, 1978: 47. Original designation: *Bdella lignicola* Canestrini.

**Distribution.** Italy (Canestrini 1886; Thor 1931a), England (Hull 1918), Egypt (Trägårdh 1905; Thor 1931a; Abdel-Shaheed *et al.* 1971), Spain (Mihelčič 1958b), Switzerland (Schweizer & Bader 1963), Taiwan (Tseng 1978), China (Sichuan) (Li *et al.* 1992), Czech Republic (Stejskal & Hubert 2008).

**Redescription.** Tseng (1978).

**Type deposition.** CRA.

138. *Spinibdella longistriata* Tseng, 1978: 42; Shandimann, Pingtung Hsien, Taiwan, *ex* litter.

**Type deposition.** Supposedly at BSMI, but probably lost (C-C Ho, pers. comm.).



139. *Spinibdella mali* Jorgensen, 1967: 98; Spring Lake, Utah Co, Utah, USA, *ex* bark of apple tree.  
**Remarks.** Male unknown.  
**Type deposition.** Unknown.
140. *Spinibdella namibiensis* Omukunda, Theron & Ueckermann, 2012: 15; Namibia and South Africa.  
**Type deposition.** NCA.
141. *Spinibdella novemsetosa* Tseng, 1978: 42; Tainan city, Taiwan, on shallot (*Alliaceae*).  
**Type deposition.** Supposedly at BSMI, but probably lost (C-C Ho, pers. comm.).
142. *Spinibdella ornata* Atyeo, 1960a: 434; Bear Lake, Rock Mountain National Park, Colorado, USA, *ex* moss and litter.  
**Distribution.** California, (Aty eo 1960a), Wisconsin (Oatman 1963).  
**Remarks.** Suspected synonym of *S. thori*, according to Atyeo (1963a: 174).  
**Type deposition.** Holotype and paratypes at SEMC, paratypes at CSUC, USNM.
143. *Spinibdella polyattenuata* Omukunda, Theron & Ueckermann, 2012: 6; Eastern Cape Province, South Africa.  
**Type deposition.** NCA.
144. *Spinibdella pongolensis* Omukunda, Theron & Ueckermann, 2012: 12; Kwazulu, Natal, South Africa.  
**Type deposition.** NCA.
145. *Spinibdella quinqueoculata* Thor, 1931b: 70; Tangier, Morocco, *ex* moss.  
**Type deposition.** Lost.
146. *Spinibdella rapida* Kuznetsov & Livshits, 1979b: 608; rocky cliffs in the vicinity of Alupka town, Crimea, Ukraine, *ex* moss.—Bednarskaya, 2011: 5.  
**Type deposition.** NBG.
147. *Spinibdella reducta* Thor, 1930b: 23; Norway, in coniferous forest litter.—Thor, 1931a: 39.  
**Distribution.** Norway (Thor 1931a), Poland (Michocka 1987).  
**Redescriptions.** Thor (1931a), Michocka (1987).  
**Type deposition.** Lost.
148. *Spinibdella smileyi* Tseng, 1978: 39; Taipei, Chiayi Hsien, Taiwan, *ex* litter.  
**Type deposition.** Supposedly at BSMI, but probably lost (C-C Ho, pers. comm.).
149. *Spinibdella subrufa* Rack, 1961: 183; Germany.  
**Type deposition.** ZMUH.
150. *Spinibdella tabarii* Paktinat-Saej & Bagheri, 2015b: 696; Amol city, Mazandaran Province, Iran; also citrus, Noor city, Mazandaran Province, Iran.  
**Type deposition.** Holotype and paratypes at the Acarological Collection, Department of Plant Protection, Faculty of Agriculture, University of Maragheh, Maragheh, Iran; paratypes at the Acarological Collection, Jalal Afshar Zoological Museum, Department of Plant Protection, Faculty of Agriculture, University of Tehran, Karaj, Iran; and also at ASI.
151. *Spinibdella tadjikistanica* Kuznetsov, 1984: 774; Kondara Canyon, Tadjikistan, *ex* hawthorn (*Crataegus* sp., *Rosaceae*) and grape.  
**Type deposition.** NBG.
152. *Spinibdella tenella* (Banks, 1896): 75; Sea Cliffs, Long Island, NY, USA. Original designation: *Bdella tenella* Banks; Banks, 1904c: 16; 1907: 596; Thor, 1931a: 31; *Spinibdella tenella*; Hernandes, 2013: 64.

**Type deposition.** MCZ.

153. *Spinibdella tenuirostris* (Ewing, 1917): 149; Xenia, Ohio, USA, under stones.—Atyeo, 1960a: 424. Original designation: *Bdella tenuirostris* Ewing; Berlese, 1893: 43.

a. *Spinibdella wilsoni* Jacot, 1938: 129; synonymy according to Atyeo (1960a: 424).

**Distribution.** Germany (Thor 1931a), United States (Ohio, Florida, Arkansas, Kansas, North Carolina, Vermont, Michigan, California) (Aty eo 1960a), Japan (Shiba & Morikawa 1966), Australia (Aty eo 1963a; Wallace & Mahon 1972), Russia (Wainstein *et al.* 1978, Ghilarov 1978), Taiwan (Tseng 1978), Korea (Lee *et al.* 1997), Mexico (Hoffmann & López-Campos 2000), Spain (Domingo-Quero *et al.* 2003).

**Redescriptions.** Atyeo (1960a, 1963a), Shiba & Morikawa (1966), Wallace & Mahon (1972), Tseng (1978).

**Remarks.** Ewing (1917, not 1914 as mentioned by both Atyeo [1960a] and Wainstein *et al.* [1978]) described *Bdella tenuirostris*, without noticing the preoccupied name erected by Koch (1839: 23).

**Type deposition.** USNM.

154. *Spinibdella thori* (Meyer & Ryke, 1959): 375; Bathurst, South Africa, *ex* grass and soil.—Atyeo, 1963a: 174. Original designation: *Bdella thori* Meyer & Ryke.

**Distribution.** South Africa (Meyer & Ryke 1959; Halliday 2005), Australia (Aty eo 1963a; Wallace & Mahon 1972; Halliday 2005), Hawaii (Swift & Goff 1987; 2001), Mexico (Hoffmann & López-Campos 2000), Iran (Abbaszadeh *et al.* 2010).

**Redescriptions.** Atyeo (1963a), Wallace & Mahon (1972), Swift & Goff (1987), Omukunda *et al.* (2012).

**Remarks.** Male unknown.

**Type deposition.** Institute for Zoological Research, Potchefstroom University, South Africa.

155. *Spinibdella trinomma* Omukunda, Theron & Ueckermann, 2012: 3; Kwazulu, Natal, South Africa.

**Type deposition.** NCA.

156. *Spinibdella trisetosa* (Jacot, 1938): 128 **comb. nov.**; Micanope, Florida, USA, *ex* leaf litter. Original designation: *Bdella trisetosa* Jacot.

**Remarks.** This species is herein transferred to the genus *Spinibdella* due to having two ventral setae on the hypostome, tricobothria present on tibiae I, IV, tarsi III and IV, setae *lps* present, and the palpal tibiotarsus truncate.

**Type deposition.** USNM.

157. *Spinibdella yeni* Tseng, 1978: 44; Taipu, Chiayi Hsien, Taiwan, *ex* litter.

**Type deposition.** Supposedly at BSMI, but probably lost (C-C Ho, pers. comm.).

### ***Tetrabdella* Hernandez & Feres**

Type-species: *Tetrabdella neotropica* Hernandez & Feres, 2006 by original designation.

158. *Tetrabdella neotropica* Hernandez & Feres, 2006: 60; Cedral, São Paulo, Brazil, *ex Hevea brasiliensis* M.Arg. (Euphorbiaceae).

**Type deposition.** Holotype and paratypes at DZSJRP, paratype at USNM.

### **Odontoscirinae Grandjean**

Odontoscirinae Grandjean, 1938; Meyer & Ryke, 1959: 378; Atyeo, 1960a: 385; 1963a: 122; Wallace & Mahon, 1976: 66; Michocka, 1987: 43

## ***Odontoscirus* Thor**

*Odontoscirus* Thor, 1913: 29; Thor, 1931a: 52 (as subgenus of *Biscirus*); type-species *Bdella virgulata* Canestrini & Fanzago by original designation; Meyer & Ryke, 1959: 379; Atyeo, 1960a: 386; Michocka, 1987: 50; Wallace & Mahon 1976: 67. *Bdellodes* Oudemans, 1937: 1217; Meyer & Ryke, 1959: 378; Wallace & Mahon, 1976: 67; Michocka, 1987: 56. Type-species: *Scirus longirostris* Hermann, 1804 by original designation.

*Scirus* Hermann, 1804: 61; Thor, 1931a: 41 (*part.*).

*Hoploscirus* Thor, 1937: 43; type-species *Scirus dubitatus* Womersley, 1933a by original designation; synonymy according to Wallace & Mahon (1976: 67).

*Thoribdella* Grandjean, 1938: 4 type-species *Biscirus meridionalis* Thor, 1931a by original designation; synonymy according to Wallace & Mahon (1976: 67).

*Octobdellodes* Atyeo, 1960a: 407 type-species *O. hurdi* Atyeo, 1960a; synonymy according to Atyeo (1963a: 118, 125).

159. *Odontoscirus affinis* (Atyeo, 1963a): 185 **comb. nov.**; Rottneest Island, Australia. Original designation: *Bdellodes (Hoploscirus) affinis* Atyeo.

**Distribution.** Australia (Atyeo 1963a; Wallace & Mahon 1976), Andaman Islands (Gupta & Ghosh 1980).

**Redescriptions.** Wallace & Mahon (1976), Gupta (2002).

**Type deposition.** Holotype and paratypes at SAM, paratypes at BMNH, USNM, ANIC.

160. *Odontoscirus agrestis* (Atyeo, 1963a): 152 **comb. nov.**; Auckland, New Zealand, *ex* moss and lichens. Original designation: *Bdellodes (Hoploscirus) agrestis* Atyeo.

**Remarks.** Male unknown.

**Type deposition.** Holotype and paratype at MONZ, paratype at NZFRI.

161. *Odontoscirus alacris* (Atyeo, 1963a): 193 **comb. nov.**; Glen Osmond, South Australia. Original designation: *Bdellodes (Hoploscirus) alacris* Atyeo.

a. *Biscirus symmetricus* (*part.*), Womersley, 1933a: 106 (not Kramer, 1898); synonymy according to Wallace & Mahon (1976: 103).

**Distribution.** Australia (Atyeo, 1963a, Wallace & Mahon, 1976).

**Redescription.** Wallace & Mahon (1976).

**Type deposition.** SAM.

162. *Odontoscirus alpinus* Atyeo, 1960a: 388; Piegan Pass, Glacier National Park, Montana, USA.

**Type deposition.** SEMC.

163. *Odontoscirus amamiensis* Shiba, 1985: 81; Southern Japan (Kyushu).

**Type deposition.** Biological Laboratory of Matsuyama Shinonome Junior College, Matsuyama, Japan.

164. *Odontoscirus ancalae* (Atyeo, 1963a): 148 **comb. nov.**; Wellington, New Zealand, *ex* leaf mold. Original designation: *Bdellodes (Hoploscirus) ancalae* Atyeo.

**Remarks.** Male unknown.

**Type deposition.** MONZ.

165. *Odontoscirus angustifolius* (Gupta, 1991): 221 **comb. nov.**; Moreh, Manipur, India, *ex* *Canthium angustifolium* (Rubiaceae)—Gupta, 2002: 31. Original designation: *Bdella angustifolius* Gupta. *Bdellodes angustifolius*, Gupta, 2002.

**Remarks.** Male unknown.

**Redescription.** Gupta (2002).

**Type deposition.** NZSI.

166. *Odontoscirus annona* (Tseng, 1978): 33 **comb. nov., new emendation**; Kuyin, Tainan Hsien, Taiwan, *ex* *Annona* sp. (Annonaceae). Original designation: *Bdellodes anona* Tseng.

**Remarks.** The etymology of the species refers to the host plant, originally misspelled as *Anona* sp. [sic] rather than *Annona* sp.; therefore this species is herein emended to *Odontoscirus annona*.

**Type deposition.** Supposedly at BSMI, but probably lost (C-C Ho, pers. comm.).

167. *Odontoscirus asiaticus* Kuznetsov & Barilo, 1984: 934; near Samarkand, Agalyk village, Uzbekistan, *ex* under stones on humid soil; 3 males and 1 female paratypes on low grass and under stones in Samarkand region near Zeravshan mountain ridge. **Type deposition.** NBG.

168. *Odontoscirus atro* (Gupta, 1991): 220 **comb. nov.**; Arunachal Pradesh, Siji, India, *ex* *Viburnum atrocyaneum* Clarke (Adoxaceae). *Bdellodes atro*, Gupta, 2002: 32. Original designation: *Bdella atro* Gupta.

**Remarks.** Male unknown.

**Redescription.** Gupta (2002).

**Type deposition.** NZSI.

169. *Odontoscirus atyeoi* Michocka, 1987: 54; Tatra, Poland.

**Type deposition.** In the author's collection.

170. *Odontoscirus augusta* (Roy & Saha, 2010): 121 **comb. nov.**; West Bengal, India. Original designation: *Bdellodes augusta* Roy & Saha.

**Type deposition.** DZCU.

171. *Odontoscirus australicus* (Womersley, 1933a): 107 **comb. nov.**; Waroona, Western Australia. Original designation: *Biscirus (Biscirus) australicus* Womersley. Other name: *Bdellodes (Hoploscirus) australica*, Atyeo, 1963a: 188 (neotype designation).

**Redescriptions.** Atyeo (1963a), Wallace & Mahon (1976).

**Type deposition.** Neotype female at SAM.

172. *Odontoscirus bidentata* (Wallace & Mahon, 1976): 94 **comb. nov.**; Omeo, Australia, in mountain gully. Original designation: *Bdellodes bidentata* Wallace & Mahon.

**Type deposition.** Holotype and paratypes at ANIC, paratypes at SAM, BPBM and MONZ.

173. *Odontoscirus bifurcata* (El-Sherif & Bolland, 1993): 2237 **comb. nov.**, from litter near railway in Amsterdam, The Netherlands. Original designation: *Bdellodes bifurcata* El-Sherif & Bolland.

**Type deposition.** Unknown.

174. *Odontoscirus bisetosa* (Atyeo, 1960a): 414 **comb. nov.**; 10 miles west of Tuxtla Gutierrez, Chiapas, Mexico, under rock. Original designation: *Bdellodes bisetosa* Atyeo.

**Type deposition.** Holotype and paratypes at SEMC, paratypes at USNM, BMNH and SAM.

175. *Odontoscirus brevicornis* (Cooremann, 1959): 30 **comb. nov.**; Muotathal, Switzerland, in cave. Original designation: *Thoribdella brevicornis* Cooremann.

**Type deposition.** IRSN.

176. *Odontoscirus bryi* (Atyeo, 1963a): 142 **comb. nov.**; Otago, New Zealand, *ex* moss on stones. Original designation: *Bdellodes (Hoploscirus) bryi* Atyeo.

**Remarks.** Male unknown.

**Type deposition.** MONZ.

177. *Odontoscirus californica* (Banks, 1904b): 366 **comb. nov.**; Claremont, LA, USA. Original designation: *Bdella californica* Banks; Banks, 1907: 596; *Thoribdella californica* (Banks), Atyeo, 1960a: 396; *Bdellodes californica*, Hernandez, 2013: 65.

*Bdella magna* Ewing, 1913: 123; synonymy according to Atyeo (1960a).

**Distribution.** United States (Los Angeles, California) (Atyeo 1960a).

**Redescription.** Atyeo (1960a). Thor (1931a) has strangely regarded *Bdella californica* Banks as both synonyms of *Bdellodes longirostris* and of *Biscirus uncinatus* (pages 42 and 50, respectively).

**Type deposition.** MCZ.

178. *Odontoscirus camellae* (Atyeo, 1963a): 145 **comb. nov.**; Wellington, New Zealand, *ex* leaf mold. Original designation: *Bdellodes (Hoploscirus) camellae* Atyeo.

**Remarks.** Female unknown.

**Type deposition.** MONZ.

179. *Odontoscirus communis* (Atyeo, 1960a): 399 **comb. nov.**; west slope of Cortez Pass, Mexico, under rock. Original designation: *Thoribdella communis* Atyeo. Other name: *Bdellodes (Hoploscirus) communis*, Atyeo, 1963a: 188.

**Type deposition.** Holotype and paratypes at SEMC, paratypes at BMNH, USNM and SAM.

180. *Odontoscirus conformis* (Atyeo, 1963a): 137 **comb. nov.**; Otago, New Zealand, beaten off ferns. Original designation: *Bdellodes (Hoploscirus) conformis* Atyeo.

**Remarks.** Male unknown.

**Type deposition.** MONZ.

181. *Odontoscirus consanguinea* (Atyeo, 1963a): 194 **comb. nov.**; Busselton, Western Australia. Original designation: *Bdellodes (Hoploscirus) consanguinea* Atyeo.

a. *Biscirus symmetricus* (*part.*), Womersley, 1933a: 106 (not Kramer, 1898); synonymy according to Wallace & Mahon (1976: 84).

b. *Biscirus intermedius* (*part.*) (Thor, 1928: 213); Womersley, 1933a: 104; synonymy according to Wallace & Mahon (1976: 84).

**Distribution.** Australia (Atyeo 1963a), (WA, SA, Victoria, Tasmania, NSW, south eastern Queensland, Kununurra area WA) (Wallace & Mahon 1976).

**Redescription.** Wallace & Mahon (1976).

**Type deposition.** SAM.

182. *Odontoscirus copiosa* (Atyeo, 1963a): 136 **comb. nov.**; Otago, New Zealand, under stone. Original designation: *Bdellodes (Hoploscirus) copiosa* Atyeo.

**Type deposition.** MONZ.

183. *Odontoscirus currax* (Atyeo, 1963a): 187 **comb. nov.**; Moount Toolbrunnup, Western Australia, on mealy litter and moss. Original designation: *Bdellodes (Hoploscirus) currax* Atyeo.

**Redescription.** Wallace & Mahon (1976).

**Type deposition.** SAM.

184. *Odontoscirus curvus* (Atyeo, 1963a): 140 **comb. nov.**; Auckland Islands, New Zealand, under stone at high tide mark. Original designation: *Bdellodes (Hoploscirus) curvus* Atyeo.

**Redescription.** Wallace (1970).

**Type deposition.** MONZ.

185. *Odontoscirus dubitatus* (Womersley, 1933a): 102 **comb. nov.**; Mount Nelson, Tasmania, under stone. *Bdellodes dubitata*, Wallace & Mahon, 1976: 78. Original designation: *Scirus dubitatus* Womersley. Other name: *Bdellodes (Hoploscirus) dubitata*, Atyeo, 1963a: 196.

**Redescriptions.** Atyeo (1963a), Wallace & Mahon (1976).

**Remarks.** Male unknown, species known only from the holotype.

**Type deposition.** SAM.

186. *Odontoscirus edentata* (Halliday, 2005): 22 **comb. nov.**; Port Elizabeth, Marine Protea Hotel, South Africa. Original designation: *Bdellodes edentata* Halliday.

**Remarks.** Male unknown.

**Type deposition.** Holotype and paratypes at NCA, paratype at ANIC.

187. *Odontoscirus exilicornis* (Berlese, 1910): 347 **comb. nov.**; Cape Town, South Africa. *Bdellodes exilicornis*, Meyer & Ryke, 1959: 379. Original designation: *Bdella exilicornis* Berlese. Other name: *Scirus exilicornis*, Thor, 1931a: 44.

**Type deposition.** Lost (Castagnoli & Pegazzani, 1985).

188. *Odontoscirus flexuosa* (Atyeo, 1963a): 139 **comb. nov.**; Campbell Island, New Zealand, under stone. Original designation: *Bdellodes (Hoploscirus) flexuosa* Atyeo; Atyeo, 1964: 167.

**Redescriptions.** Wallace (1970).

**Type deposition.** MONZ.

189. *Odontoscirus furcatus* (Shiba, 1969a): 73 **comb. nov.**; Shiga Heights, Japan. Original designation: *Bdellodes (Hoploscirus) furcatus* Shiba; Nakamura *et al.* (2006).

**Type deposition.** Unknown.

190. *Odontoscirus georgianensis* (Wallace, 1970): 109 **comb. nov.**; Royal Bay, Moltke Harbor, South Georgia, Antarctica, under moss and rocks. Original designation: *Bdellodes (Bdellodes) georgianensis* Wallace.

**Type deposition.** Holotype at BPBM, paratypes at ANIC and BMNH.

191. *Odontoscirus gleba* Chaudhri & Akbar, 1985: 118; 1 mile from W. Hassanabdal, Pakistan.

**Type deposition.** UAF.

192. *Odontoscirus graminis* (Wallace & Mahon, 1976): 105 **comb. nov.**; Pine Creek, Northern Territory, Australia, *ex* grass, *Eucalyptus* sp. Original designation: *Bdellodes graminis* Wallace & Mahon.

**Type deposition.** Holotype and paratypes at ANIC, paratypes at SAM, BPBM and MONZ.

193. *Odontoscirus grandiflora* (Gupta, 1991): 224 **comb. nov.**; Arunachal Pradesh, Garo, India, *ex Thunbergia grandiflora* Roxb. (Acanthaceae). Original designation: *Bdellodes grandiflora* Gupta.

**Type deposition.** NZSI. **Remarks.** Male unknown. **Redescription.** Gupta (2002).

194. *Odontoscirus gressitti* (Atyeo, 1964): 167 **comb. nov.**; Beeman Camp, Campbell Island, New Zealand, *ex* moss. Original designation: *Bdellodes (Hoploscirus) gressitti* Atyeo.

**Redescriptions.** Wallace (1970).

**Type deposition.** Holotype at MONZ; paratypes at BPBM.

195. *Odontoscirus guajavae* (Chatterjee & Gupta, 2002): 34 (in Gupta 2002) **comb. nov.**; Kalyani, West Bengal, India, *ex Psidium guajava* (Myrtaceae). Original designation: *Octobdellodes guajavae* Chatterjee & Gupta.

**Type deposition.** ZSI.

196. *Odontoscirus hadroseta* (Wallace & Mahon, 1976): 110 **comb. nov.**; Nyabing, Western Australia, Australia, on sand plain scrub on roadside. Original designation: *Bdellodes hadroseta* Wallace & Mahon.

a. *Biscirus symmetricus* (*part.*), Womersley, 1933a: 106 (not Kramer, 1898); synonymy according to Wallace & Mahon (1976: 110).

b. *Biscirus intermedius* (Thor 1928: 213) (*part.*), Womersley, 1933a: 104; synonymy according to Wallace & Mahon (1976: 110).

c. *Biscirus uncinatus* (Kramer 1898: 12), Womersley, 1933a: 106; synonymy according to Wallace & Mahon (1976: 110).

**Type deposition.** Holotype and paratypes at ANIC, paratypes at SAM, BPBM and MONZ.

197. *Odontoscirus haramotoi* (Swift & Goff, 1987): 35 **comb. nov.**; Koa, Hawaii, *ex* litter. Original designation: *Bdellodes haramotoi* Swift & Goff.

**Remarks.** Female unknown.

**Type deposition.** BPBM.

198. *Odontoscirus harpax* (Atyeo, 1963a): 128 **comb. nov.**; Woods Point, South Australia. Original designation: *Bdellodes (Bdellodes) harpax* Atyeo.

a. *Biscirus symmetricus (part.)*, Womersley, 1933a: 106 (not Kramer, 1898); synonymy according to Wallace & Mahon (1976: 115).

b. *Biscirus intermedius* (Thor 1928: 213) (*part.*), Womersley, 1933a: 104; synonymy according to Wallace & Mahon (1976: 115).

c. *Scirus longirostris* Hermann (*part.*), Womersley, 1933a: 101; synonymy according to Wallace & Mahon (1976: 115).

**Distribution.** Australia, New Zealand, Tasmania (Atyeo, 1963a, Wallace & Mahon, 1976).

**Redescription.** Wallace & Mahon (1976).

**Type deposition.** Holotype and paratypes at SAM, paratypes at NZFRI, MONZ, BMNH, USNM.

199. *Odontoscirus hessei* (Womersley, 1933c): 111 **comb. nov.**; Stellenbosch C.P., South Africa.—Meyer & Ryke, 1959: 379. Original designation: *Scirus hessei* Womersley. Other name: *Bdellodes (Bdellodes) hessei*, Atyeo, 1963a: 181.

**Distribution.** South Africa (Meyer & Ryke 1959; Atyeo 1963a; Halliday 2005), Australia (Perth, Nedland) (Atyeo 1963a), Western Australia (Wallace & Mahon 1976).

**Redescriptions.** Meyer & Ryke (1959), Atyeo (1963a), Wallace & Mahon (1976).

**Type deposition.** SAM.

200. *Odontoscirus hickmani* (Womersley, 1933a): 107 **comb. nov.**; National Park, Tasmania, Australia, under stones.—Wallace & Mahon, 1976: 81. Original designation: *Biscirus (Biscirus) hickmani* Womersley.

**Redescriptions.** Atyeo (1963a), Wallace & Mahon (1976).

**Remarks.** Male unknown.

**Type deposition.** SAM.

201. *Odontoscirus hospita* (Banks, 1916): 224 **comb. nov.**; Victoria, Australia, with *Polyrhachis hexacantha* (Insecta, Formicidae).—Wallace & Mahon, 1976: 91. Original designation: *Bdella (Scirus) hospita* Banks. Other name: *Bdellodes (Hoploscirus) hospita*, Atyeo, 1963a: 19.

a. *Biscirus symmetricus (part.)*, Womersley, 1933a: 106 (not Kramer, 1898); synonymy according to Wallace & Mahon (1976: 91).

b. *Biscirus intermedius* (Thor 1928: 213) (*part.*), Womersley, 1933a: 104; synonymy according to Wallace & Mahon (1976: 91).

**Redescriptions.** Atyeo (1963a), Wallace & Mahon (1976).

**Type deposition.** Cotypes at USNM and SAM.

202. *Odontoscirus hurdi* (Atyeo, 1960a): 408 **comb. nov.**; Point Barrow, Alaska, USA. Original designation: *Octobdellodes hurdi* Atyeo. Other name: *Bdellodes (Bdellodes) hurdi*; Atyeo, 1963a: 125.

**Type deposition.** Holotype and paratypes at SEMC, paratypes at BMNH, USNM, SAM, CAS.

203. *Odontoscirus hygrotus* (Swift & Goff, 1987): 32 **comb. nov.**; Oahu I, Maui I, Hawaii. Original designation: *Bdellodes hygrotus* Swift & Goff.

**Type deposition.** BPBM.

204. *Odontoscirus inflata* (Wallace & Mahon, 1976): 78 **comb. nov.**; Mandurah, Western Australia, coastal sand-dune vegetation. Original designation: *Bdellodes inflata* Wallace & Mahon.

**Type deposition.** Holotype and paratypes at ANIC, paratypes at SAM, BPBM and MONZ.

205. *Odontoscirus infrequens* (Atyeo, 1960a): 410 **comb. nov.**; Douglas County, Kansas, USA, on shagbark hickory. Original designation: *Octobdellodes infrequens* Atyeo.  
**Remarks.** According to Atyeo (1960a: 411), this species has 7 to 8 pairs of hypostomal setae rather than the usual 6 pairs.  
**Type deposition.** Holotype and paratypes at SEMC, paratypes at USNM.
206. *Odontoscirus insolita* (Atyeo, 1960a): 398 **comb. nov.**; 2 miles of west Oakville, Napa Co., California, USA, "Laurel association". Original designation: *Thoribdella insolita* Atyeo.  
**Type deposition.** SEMC.
207. *Odontoscirus intermedius* (Thor, 1928): 213 **comb. nov.**; Norway. Original designation: *Biscirus (Biscirus) intermedius* Thor; Thor, 1931a: 48. Other names: *Biscirus intermedius*, Schweizer & Bader, 1963: 236; *Thoribdella intermedius*, Grandjean, 1938: 4; *Bdellodes (Hoploscirus) intermedius*, Atyeo, 1963a: 128.  
**Distribution.** Norway (Thor 1931a), Georgia (Gomelaury 1963b), Switzerland (Schweizer & Bader 1963), Ukraine (Kuznetsov & Livshits 1979a).  
**Type deposition.** Lost.
208. *Odontoscirus intricata* (Atyeo, 1963a): 133 **comb. nov.**; Wellington, New Zealand, beaten from Mahoe. Original designation: *Bdellodes (Hoploscirus) intricata* Atyeo.  
**Type deposition.** Holotype and paratypes at MONZ, paratype at NZFRI.
209. *Odontoscirus iota* Atyeo, 1960a: 386; near Oakland, California, *ex* redwood. Wainstein *et al.*, 1978: 137.  
**Distribution.** United States (California) (Atyeo 1960a), Georgia (Gomelaury 1963b), Bulgaria (Sosnina *et al.* 1965), Ukraine (Kuznetsov & Livshits 1979a), Poland (Michocka 1987), China (Xin *et al.* 1998).  
**Redescriptions.** Sosnina *et al.* (1965), Michocka (1987).  
**Type deposition.** Holotype and paratypes at SEMC, paratypes at USNM.
210. *Odontoscirus iraniensis* (Ueckermann, Rastegar, Saboori & Ostovan, 2007): 129 **comb. nov.**; Karaj, Iran, *ex* litter. Original designation: *Bdellodes iraniensis* Ueckermann *et al.*  
**Type deposition.** Holotype at SRIAUT, paratypes at ASI.
211. *Odontoscirus japonicus* (Ehara, 1961): 258 **comb. nov.**; Sapporo, Hokkaido, Japan. Original designation: *Thoribdella japonica* Ehara; *Bdellodes japonicus*; Chen *et al.*, 2007. Other name: *Bdellodes (Hoploscirus) japonicus*, Shiba, 1969a: 73.  
**Distribution.** Japan (Ehara 1961; Shiba 1969a; Nakamura *et al.* 2006), China (Fujian) (Lin & Zhang 2000).  
**Redescription.** Shiba (1969a).  
**Type deposition.** EIHU.
212. *Odontoscirus kazeruni* (Ostovan & Kamali, 1995): 29 **comb. nov.**; wheat and barley remains in Kazerun, Iran. Original designation: *Bdellodes kazeruni* Ostovan & Kamali.  
**Redescription.** Ueckermann *et al.* (2007).  
**Type deposition.** Acari Collection of Islamic Azad University of Tehran, Science and Research Branch.
213. *Odontoscirus koloseta* (Wallace & Mahon, 1976): 107 **comb. nov.**; Waddi Forest, Western Australia, on pasture. Original designation: *Bdellodes koloseta* Wallace & Mahon.
- a. *Biscirus symmetricus* (*part.*), Womersley, 1933a: 106 (not Kramer, 1898); synonymy according to Wallace & Mahon (1976: 107);
  - b. *Scirus longirostris* Hermann, 1804 (*part.*), Womersley, 1933a: 101; synonymy according to Wallace & Mahon (1976: 107);
  - c. *Bdellodes harpax* Atyeo, 1963a: 128; synonymy according to Wallace & Mahon (1976: 107).
- Type deposition.** Holotype and paratypes at ANIC, paratypes at SAM, BPBM and MONZ.



214. *Odontoscirus lapidaria* (Kramer, 1881): 444 **comb. nov.**; Thuringia, Germany. Original designation: *Bdella lapidaria* Kramer.—Michocka, 1987: 67; Trägårdh, 1910: 474. Other names: *Biscirus lapidarius*, Baker & Balock, 1944: 177; Willmann, 1939a: 14; 1952: 166; 1956: 241; Mihelčič, 1958b: 40; *Biscirus (Biscirus) lapidarius*, Thor, 1931a: 49; *Bdellodes (Hoploscirus) lapidaria*, Atyeo, 1963a: 133, 188.

**Distribution.** Germany (Voigts & Oudemans 1906), Norway (Thor 1930a), Australia (Womersley 1933a), New Zealand (Dumbleton 1932), Madeira Island (Willmann 1939a), Mexico (Baker & Balock 1944), Germany (Wangerooge Island) (Willmann 1952), Spain (Mihelčič 1958b), Iceland (Atyeo & Tuxen 1962), New Zealand, Australia, Tasmania (Atyeo 1963a), Australia, Western Europe (Wallace & Mahon 1976), Ukraine (Kuznetsov & Livshits 1979a), Poland (Michocka 1987), South Africa (Halliday 2005), Iran (Ostovan & Kamali 1995; Kamali *et al.* 2001; Ueckermann *et al.* 2007), Syria (Barbar 2016).

**Redescriptions.** Baker & Balock (1944), Atyeo (1963a), Atyeo & Tuxen (1962), Wallace & Mahon (1976), Michocka (1987), Ueckermann *et al.* (2007).

**Type deposition.** Unknown.

215. *Odontoscirus livistonana* Ali Khan & Anwarullah, 1970: 192; Karachi, Pakistan, *ex* leaves of *Livistona chinensis* (Arecaceae).

**Type deposition.** Acarology Section, PCSIR Laboratories, Karachi, Pakistan.

216. *Odontoscirus longirostris* (Hermann, 1804): 62 **comb. nov.**; France, on moss.—Willmann, 1941: 58; 1952: 166. Original designation: *Scirus longirostris* Hermann; Thor, 1904b: 75; Schweizer, 1922: 78; Vitzthum, 1926: 134; Thor, 1931a: 42. Other names: *Bdella longirostris*, Koch, 1839: 4–5; 1842: 74; Walckenaer & Gervais, 1847: 531; Andersén, 1863: 185; Canestrini & Fanzago, 1877: 104; Moniez, 1890a: 30; Trägårdh, 1902a: 7; 1904: 47; Halbert, 1915: 113; *Bdellodes (Bdellodes) longirostris* (Hermann), Atyeo, 1977: 302; *Moligus longirostris*, Trouessart, 1888: 619.

a. *Bdella truncatula* Koch, 1839: 6; 1842: 74; Walckenaer & Gervais, 1847: 531; Oudemans, 1937: 1222; synonymy according to Berlese (1893).

b. *Bdella peregrina* Banks, 1894: 219; 1895: 433; 1907: 596; 1908: 6; Ewing, 1909b: 66; synonymy according to Thor (1931a: 44); *Scirus peregrinus* (Banks), Thor, 1931a: 44; *Bdella peregrina* var. *iowaensis* Ewing, 1917: 150; Hartzell, 1918: 206; synonymy according to Atyeo (1960a: 412).

c. *Bdella frigida* Banks, 1899: 348; 1907: 596; 1919: 11; 1923: 237; Thor, 1931a: 42; synonymy according to Trägårdh (1904: 47).

d. *Bdella ornata* Koch, 1835: 24; Koch, 1842: 74; Walckenaer & Gervais, 1844: 158; Andersén, 1863: 185; Berlese, 1893: 43; Oudemans, 1937: 1212; synonymy of *Bdellodes longirostris* according to Berlese (1893).

e. *Bdella dispar* Koch, 1839: 23; suspected synonymy of *Bdella longirostris* according to Berlese (1893).

f. *Bdellodes hexophtalmus* (Gervais, 1841: 7). *Scirus hexophtalmus* Gervais; Murray, 1877: 146. *Bdella hexophtalma*, Walckenaer & Gervais, 1844: 156; Oudemans, 1937: 1224; synonymy of *Bdella longirostris*—actually *Bdellodes longirostris*—according to Berlese (1893: 43) and Hull (1918: 38).

g. *Bdella histrionica* Koch, 1844: 24; Walckenaer & Gervais, 1847: 532; Andersén, 1863: 184; Canestrini & Fanzago, 1877: 106; Thor, 1931a: 37; Oudemans, 1937: 1198; suspected synonymy of *Bdellodes longirostris* according to Berlese (1893).

h. *Scirus pallidus* Cambridge, 1876: 260; synonymy according to Thor (1931a: 42).

**Distribution.** Paraguay, Argentina, Brazil (Berlese 1888), Italy (Canestrini 1886), Ireland (Hull 1915), England (Hull 1918), Canada (Herschel Island, Yukon Territory, Bering Island, The commander Islands) (Banks 1919), Alaska (Banks 1923), Australia (Womersley 1933a), Northern Bosnia (Balkan caves) (Willmann 1941), Austria (Willmann 1951), Germany (Wangerooge Island) (Willmann 1952), United States (Iowa, Missouri, Illinois, Indiana, Ohio) (Ewing 1917) (Texas, California, Kansas, Arkansas, Florida, Michigan, Montana), Mexico (Michoacán, Jalisco, Oaxaca, Guanajuato, México, Distrito Federal, Puebla, Nuevo León, Guerrero, Tamaulipas), Cuba, Costa Rica, Jamaica, Argentina, Denmark (Atyeo 1960a), Japan (Ehara 1961; Shiba 1969a), Switzerland (Schweizer & Bader 1963), Kure Island (Butler & Usinger 1963), Sainte-Hélène Island (Atyeo 1977), Bohemia (Lelláková-Dušková 1978), Taiwan (Tseng 1978), Hawaii (Garret & Haramoto 1967; Swift & Goff 1987), Poland (Michocka 1987), China (Fujian) (Lin & Zhang 2000), Iran (Ostovan & Kamali 1995; Kamali *et al.* 2001; Ueckermann *et al.* 2007), Crimea (Bednarskaya 2011).

**Redescriptions.** Atyeo (1960a, 1977), Shiba (1969a), Lelláková-Dušková (1978), Tseng (1978), Michocka (1987), Swift & Goff (1987), Ueckermann *et al.* (2007).

**Type deposition.** Unknown; type of *B. peregrina* at MCZ; type of *Bdella frigida* at USNM.

217. *Odontoscirus macquariensis* (Atyeo, 1963b): 445 **comb. nov.**; Finch Creek, Macquarie Island, New Zealand, *ex fern debris*. Original designation: *Bdellodes (Hoploscirus) macquariensis* Atyeo.

**Redescription.** Wallace (1970).

**Type deposition.** Holotype and paratypes at ANIC; paratypes at BMNH, USNM, SAM and BPBM.

218. *Odontoscirus malayensis* Shiba, 1978: 103; Pasoh Forest, Malaysia.

**Type deposition.** Biological Laboratory of Matsuyama Shinonome Junior College, Matsuyama, Japan.

219. *Odontoscirus manipurensis* (Gupta, 1991): 224 **comb. nov.**; Manipur, Imphal, India, *ex Mangifera indica*. Original designation: *Bdellodes manipurensis* Gupta.

**Redescription.** Gupta (2002).

**Remarks.** Male unknown.

**Type deposition.** NZSI.

220. *Odontoscirus meridionalis* (Thor, 1931b): 74 **comb. nov.**; near Tangier, Morocco, *ex vegetable debris under rock*.—Wallace & Mahon, 1976: 69. Original designation: *Biscirus (Biscirus) meridionalis* Thor. Other names: *Thoribdella meridionalis* (Thor), Atyeo, 1960a: 404; *Bdellodes (Hoploscirus) meridionalis* (Thor), Atyeo, 1963a: 132.

**Distribution.** Africa, United States (Maryland, Connecticut, Kansas, Michigan, California), Iceland, Sweden (Västerbotten), Germany (Atyeo 1960a), Iceland (Atyeo & Tuxen 1962), Georgia (Gomelaury 1963b), Australia (Western Australia) (Wallace & Mahon 1976: 69), Ukraine (Kuznetsov & Livshits 1979a), Poland (Michocka 1987), Hawaii (Swift & Goff 1987), China (Xin *et al.* 1998), South Africa (Western Cape Province) (Halliday 2005), Iran (Ueckermann *et al.* 2007), Crimea (Bednarskaya 2011), Slovakia (Kaluz 2008; Kaluz *et al.* 2013).

**Redescriptions.** Atyeo (1960a), Atyeo & Tuxen (1962), Wallace & Mahon (1976), Michocka (1987), Ueckermann *et al.* (2007).

**Remarks.** Wallace & Mahon (1976: 70) mentioned this species is widely distributed in Western Europe and North Africa, from Norway to Morocco.

**Type deposition.** unknown.

221. *Odontoscirus montanus* (Kuznetsov & Barilo, 1984): 936 **comb. nov.**; under stone in vicinities of Agalyk village near Zeravshan mountain ridge, and in Marankul', Samarkand region, Uzbekistan, under stone. Original designation: *Bdellodes (Bdellodes) montanus*.

**Type deposition.** NBG.

222. *Odontoscirus multicia* (Atyeo, 1963a): 149 **comb. nov.**; Auckland Islands, New Zealand, under logs on forest floor. Original designation: *Bdellodes (Hoploscirus) multicia* Atyeo.

**Distribution.** Campbell Island (Atyeo 1964).

**Redescription.** Wallace (1970).

**Remarks.** Female unknown.

**Type deposition.** MONZ.

223. *Odontoscirus nimia* (Atyeo, 1963a): 197 **comb. nov.**; Lake Eacham, Queensland, Australia. Original designation: *Bdellodes (Hoploscirus) nimia* Atyeo.

**Redescription.** Wallace & Mahon (1976).

**Type deposition.** SAM.

224. *Odontoscirus nipponicus* Shiba, 1985: 77, from Japan (Hokkaido, Honshu, Shikoku, Kyushu).

**Type deposition.** Biological Laboratory of Matsuyama Shinonome Junior College, Matsuyama, Japan.

225. *Odontoscirus odonata* (Wallace & Mahon, 1976): 98 **comb. nov.**; Adaminaby, Australia, ex woodland grasses. Original designation: *Bdellodes odonata* Wallace & Mahon.

**Type deposition.** Holotype and paratypes at ANIC, paratypes at SAM, BPBM and MONZ.

226. *Odontoscirus oraria* (Atyeo, 1963a): 126 **comb. nov.**; Marlborough, New Zealand, ex flax mold. Original designation: *Bdellodes (Bdellodes) oraria* Atyeo.

**Type deposition.** Holotype and paratypes at MONZ, paratypes at NZFRI.

227. *Odontoscirus pacifica* (Atyeo, 1963a): 183 **comb. nov.**; Low Island, Barrier Reef, Queensland, Australia, on beach rock exposed as tide recedes. Original designation: *Bdellodes (Bdellodes) pacifica* Atyeo.

**Redescription.** Wallace & Mahon (1976).

**Type deposition.** Holotype at QM, paratypes at SAM.

228. *Odontoscirus paganus* (Atyeo, 1963a): 198 **comb. nov.**; Mount Barker, South Australia. Original designation: *Bdellodes (Hoploscirus) paganus* Atyeo.

**Redescription.** Wallace & Mahon (1976).

**Type deposition.** SAM.

229. *Odontoscirus parvisetosa* (Atyeo, 1977): 303 **comb. nov.**; Prosperous Bay Plain, Sainte-Hélène Island. Original designation: *Bdellodes (Hoploscirus) parvisetosa* Atyeo.

**Type deposition.** RMCA.

230. *Odontoscirus petila* (Atyeo, 1963a): 135 **comb. nov.**; Otago, New Zealand, under stones. Original designation: *Bdellodes (Hoploscirus) petila* Atyeo.

**Distribution.** Campbell Island (Atyeo 1964), South Georgia (Wallace 1970), Iran (Abbaszadeh *et al.* 2010).

**Redescriptions.** Atyeo (1964), Wallace (1970).

**Remarks.** Male unknown.

**Type deposition.** MONZ.

231. *Odontoscirus pilahensis* (Shiba, 1978): 103 **comb. nov.**; Kuala Pilah, Malaysia, ex grassland. Original designation: *Bdellodes (Bdellodes) pilahensis* Shiba.

**Type deposition.** Biological Laboratory of Matsuyama Shinonome Junior College, Matsuyama, Japan.

232. *Odontoscirus porrectus* (Kramer, 1898): 11 **comb. nov.**; Viña Del Mar, Valparaiso, Chile. Other name: *Scirus porrectus*, Thor (1931a: 43); *Bdellodes porrectus*, Atyeo (1960: 412).

a. *Bdella magna* Ewing, 1913: 123; synonymy according to Thor (1931a).

b. *Molgus (Hoplomolgus) venustus* Berlese, 1923: 239; synonymy according to Thor (1931a).

**Type deposition.** Unknown.

233. *Odontoscirus procincta* (Atyeo, 1963a): 143 **comb. nov.**; Southeast Stewart Island, New Zealand, ex moss. Original designation: *Bdellodes (Hoploscirus) procincta* Atyeo.

**Remarks.** Male unknown.

**Type deposition.** MONZ.

234. *Odontoscirus quadrisetosa* (Atyeo, 1977): 303 **comb. nov.**; Sainte-Hélène Islands, Sandy Bay Beach. Original designation: *Bdellodes (Bdellodes) quadrisetosa* Atyeo.

**Type deposition.** RMCA.

235. *Odontoscirus raeticus* (Schweizer & Bader, 1963): 233 **comb. nov.**; National Park, S-charl-Tal, Switzerland, under stone. Original designation: *Bdellodes raeticus* Schweizer & Bader.

**Type deposition.** NMB (NP 1471).

236. *Odontoscirus reticulata* (Atyeo, 1960b): 289 **comb. nov.**; Stoke's Valley, Wellington, New Zealand, ex moss and lichens. Original designation: *Thoribdella reticulata* Atyeo. Other name: *Bdellodes (Hoploscirus) reticulata*, Atyeo, 1963a: 132.

**Redescription.** Atyeo (1963a).

**Remarks.** Male unknown.

**Type deposition.** MONZ.

237. *Odontoscirus rhachia* (Wallace, 1970): 111 **comb. nov.**; Royal Bay, Moltke Harbor, South Georgia, Antarctica, under rocks on beach. Original designation: *Bdellodes (Hoploscirus) rhachia* Wallace.

**Type deposition.** Holotype and paratypes at BPBM, paratypes at ANIC and BMNH.

238. *Odontoscirus sabulosa* (Wallace & Mahon, 1976): 96 **comb. nov.**; Mt. Barker, W.A., Australia, at sandy gravel bear roadside. Original designation: *Bdellodes sabulosa* Wallace & Mahon.

**Type deposition.** Holotype and paratypes at ANIC, paratypes at SAM and MONZ.

239. *Odontoscirus simplex* (Atyeo, 1960a): 405 **comb. nov.**; Clinton, Douglas Co., Kansas, USA, ex grass. Original designation: *Thoribdella simplex* Atyeo.

**Distribution.** United States (California, Florida, Kansas) (Atyeo 1960a), Japan (Ehara 1961).

**Type deposition.** Holotype and paratypes at SEMC, paratypes at USNM, BMNH and SAM.

240. *Odontoscirus spinosa* (Atyeo, 1960a): 395 **comb. nov.**; Sierra del Rosario, El Rangel, Cuba, ex leaf litter (hojarasca). Original designation: *Thoribdella spinosa* Atyeo.

**Type deposition.** SEMC.

241. *Odontoscirus serpentinus* (Atyeo, 1963a): 150 **comb. nov.**; Hawkes Bay, New Zealand, ex leaf mold. Original designation: *Bdellodes (Hoploscirus) serpentinus* Atyeo.

**Type deposition.** Holotype and paratypes at MONZ, paratypes at USNM and NZFRI.

242. *Odontoscirus subterranea* (Cooremann, 1959): 27 **comb. nov.**; Hochwald, Switzerland, in cave. Original designation: *Thoribdella subterranea* Cooremann.

**Type deposition.** IRSN.

243. *Odontoscirus tanta* (Atyeo, 1963a): 125 **comb. nov.**; Otago, New Zealand, ex seashoal debris. Original designation: *Bdellodes (Bdellodes) tanta* Atyeo.

**Distribution.** New Zealand (Atyeo 1963a), Australia (Atyeo 1963b; Wallace & Mahon 1976).

**Redescriptions.** Wallace (1970), Wallace & Mahon (1976).

**Remarks.** Male unknown.

**Type deposition.** Holotype and paratypes at MONZ, paratypes at USNM, BMNH and SAM.

244. *Odontoscirus tasmaniensis* (Wallace & Mahon, 1976): 101 **comb. nov.**; Bronte Park, Tasmania, Australia, ex grass and moss. Original designation: *Bdellodes tasmaniensis* Wallace & Mahon.

a. *Biscirus symmetricus* (Kramer 1898: 14) (*part.*), Womersley, 1933a: 106 (not Kramer, 1898); synonymy according to Wallace & Mahon (1976: 101).

b. *Biscirus australicus* Womersley, 1933a: 107; synonymy according to Wallace & Mahon (1976: 101).

**Type deposition.** ANIC, SAM, BPBM and MONZ.

245. *Odontoscirus tellustris* (Atyeo, 1963a): 146 **comb. nov.**; Wellington, New Zealand, ex foliage. Original designation: *Bdellodes (Hoploscirus) tellustris* Atyeo.

**Type deposition.** Holotype and paratypes at MONZ, paratypes at USNM, BMNH, NZFRI and SAM.

246. *Odontoscirus truncata* (Atyeo, 1960a): 402 **comb. nov.**; 38 miles northeast of Montemorelos, Nuevo Leon, Mexico, under rock. Original designation: *Thoribdella truncata* Atyeo.  
**Type deposition.** SEMC.
247. *Odontoscirus vireti* (Atyeo, 1963a): 130 **comb. nov.**; Otago, New Zealand. Original designation: *Bdellodes (Bdellodes) vireti* Atyeo.  
**Type deposition.** MONZ.
248. *Odontoscirus virgulata* (Canestrini & Fanzago, 1877): 103; on ivy, in Treviso, Italy—Wallace & Mahon, 1976: 76. Original designation: *Bdella virgulata* Canestrini & Fanzago; Canestrini, 1886: 186; Berlese, 1891; Berlese, 1893: 42; Trägårdh, 1910: 479. Other names: *Moligus virgulata*, Trouessart, 1888: 619; *Scirus virgulatus*, Thor, 1902: 160; 1904b: 75; Schweizer, 1922: 78; *Bdellodes (Odontoscirus) virgulata tridentata* Thor, 1931a: 53; *Biscirus (Odontoscirus) virgulatus*, Womersley, 1933a: 111; Willmann, 1939a: 15; Thor, 1931a: 52. *Odontoscirus virgulatus*, Meyer & Ryke, 1959: 381; Atyeo 1960a: 186; Schweizer & Bader, 1963: 234; Wainstein *et al.*, 1978: 137.  
**Distribution.** South Africa (Womersley 1933a; Meyer & Ryke 1959), Madeira Island (Willmann 1939a), Georgia (Gomelauri 1963b), Switzerland (Schweizer & Bader 1963), Australia (Western and Southern Australia), France (Wallace & Mahon 1976), Iran (Ostovan & Kamali 1995, Kamali *et al.* 2001; Ueckermann *et al.* 2007).  
**Redescriptions.** Thor (1931a), Schweizer & Bader (1963), Wallace & Mahon (1976), Ueckermann *et al.* (2007).  
**Type deposition.** CRA.
249. *Odontoscirus watsoni* (Atyeo, 1963b): 448 **comb. nov.**; First Gully, Macquarie Island, New Zealand, ex dead *Poa foliosa* shoots. Original designation: *Bdellodes (Hoploscirus) watsoni* Atyeo.  
**Redescription.** Wallace (1970).  
**Type deposition.** Holotype and paratypes at ANIC; paratypes at BMNH, USNM and SAM.
250. *Odontoscirus womersleyi* (Atyeo, 1963a): 191 **comb. nov.**; Morialta, South Australia. Original designation: *Bdellodes (Hoploscirus) womersleyi* Atyeo.  
**Redescription.** Wallace & Mahon (1976).  
**Type deposition.** SAM.

### ***Neomoligus* Oudemans**

- Moligus* Dujardin, 1842: 316 (*nomen nudum*); *Moligus* Trouessart, 1894: 118; Thor, 1913: 30; 1931a: 54.  
*Moligus (Hoplomoligus)* Berlese, 1923: 237.  
*Neomoligus* Oudemans, 1937: 1229; Atyeo, 1960a: 389; Soliman, 1975: 48; Soliman & Zaher, 1975: 78; Wallace & Mahon, 1976: 116; Michocka, 1987: 44.  
Type-species: *Acarus littoralis* Linnaeus, 1758 by original designation.
251. *Neomoligus aegyptiacus* Soliman & Mohamed, 1972b: 90; Faculty of Agriculture farm, Giza, Egypt, from clover field associated with *Bryobia cristata* (Acari, Tetranychidae).  
**Remarks.** Male unknown; although the species was formally described in 1975, three years earlier Soliman & Mohamed (1972b) published the biology of this species along with a morphological description of all stages. The authority and date must be therefore attributed to Soliman & Mohamed, 1972b.  
**Type deposition.** Probably at CUE.
252. *Neomoligus aequalis* (Schweizer & Bader, 1963): 238 **comb. nov.**; Kreuzlingen, Switzerland, ex moss. Original designation: *Hoplomoligus aequalis* Schweizer & Bader.  
**Type deposition.** NMB (A 211a).

253. *Neomolgus berlesei* (Trägårdh, 1902b): 17 **comb. nov.**; in humid areas and under stones, Italy. Original designation: *Bdella capillata* var. *berlesei* Trägårdh, 1902b: 17. Other name: *Molgus (Hoplomolgus) berlesei*, Thor, 1931a: 57.
- a. *Molgus (Hoplomolgus) tuberculatus* Berlese, 1923: 238 synonymy according to Thor (1931a: 57); *Hoplomolgus tuberculatus*, Schweizer & Bader, 1963: 242.  
**Type deposition.** Unknown.
254. *Neomolgus capillatus* (Kramer, 1881): 446; Germany—Willmann, 1939: 431; 1956: 243. Original designation: *Bdella capillata* Kramer; Canestrini, 1886: 188; Berlese, 1891; Michael, 1896: 514; Kramer, 1896: 447; Trägårdh, 1902b: 17; Bähler, 1910: 812; Halbert, 1915: 112; Hull, 1918: 40. Other names: *Molgus capillatus*, Trouessart, 1888: 619; Thor, 1904b: 77; 1909: 7; Oudemans, 1914: 123; Schweizer, 1922: 79; Thor, 1926: 139; Thor, 1930a: 95; *Hoplomolgus capillata*, Trägårdh, 1931: 49; *Molgus (Hoplomolgus) capillatus*, Vitzthum, 1929: 59; *Molgus (Molgus) capillatus*, Thor, 1931a: 60.  
**Distribution.** Germany (Voigts & Oudemans 1906), Ireland (Hull 1915), Germany, Switzerland, Italy, England, Ireland, Norway, Svalbard Islands (Thor 1931a), France (Schweizer 1922), Austria (Willmann 1951), Iceland (Atyeo & Tuxen 1962), Georgia (Gomelauri 1963b), Switzerland (Schweizer & Bader 1963), Australia (south western W.A.) (Wallace & Mahon 1976), Ukraine (Kuznetsov & Livshits 1979a), Poland (Michocka 1987), Iran (Ostovan & Kamali 1995; Kamali *et al.* 2001).  
**Redescriptions.** Atyeo & Tuxen (1962), Wallace & Mahon (1976), Michocka (1987).  
**Type deposition.** CRA.
255. *Neomolgus clypeatus* (Thor, 1930b): 17; Sjusörn (Lillehammer), Norway.—Atyeo & Tuxen, 1962: 290. Original designation: *Molgus clypeatus* Thor. Other name: *Molgus (Hoplomolgus) clypeatus*, Thor: 1931a: 55.  
**Distribution.** Iceland (Atyeo & Tuxen 1962), Syria (Lattakia) (Soliman & Zaher 1975), Australia (Wallace & Mahon 1976), Ukraine (Kuznetsov & Livshits 1979a), Iran (Ostovan & Kamali 1995; Kamali *et al.* 2001).  
**Redescriptions.** Atyeo & Tuxen (1962), Wallace & Mahon (1976).  
**Type deposition.** Lost.
256. *Neomolgus egregia* (Koch, 1839): 23 **comb. nov.**; in humid meadows, Europe. Original designation: *Bdella egregia* Koch; Koch, 1842: 74; Walckenaer & Gervais, 1847: 532; Andersén, 1863: 184; Canestrini & Fanzago, 1877: 101; Oudemans, 1937: 1196. Other name: *Molgus egregious*, Thor, 1931a: 63.  
*Bdella vulgaris*, Canestrini, 1886: 183; Berlese, 1888: 7; 1893: 43; Halbert, 1915: 113; Schweizer & Bader, 1963: 230; synonymy according to Thor (1931a: 63).  
*Bdella longitarsa* Karsch, 1881: 37; *Molgus egregius* var. *longitarsa*, Thor, 1931a: 63.  
**Distribution.** Middle Europe (Germany, France, Italy, Sweden) (Thor 1931a), Japan (Karsch 1881), Ireland (Hull 1915).  
**Type deposition.** Unknown; type of *B. longitarsa* in ZMB.
257. *Neomolgus helveticus* (Schweizer & Bader, 1963): 239 **comb. nov.**; Buffalora mountain, National Park, Switzerland, under stone. Original designation: *Hoplomolgus helveticus* Schweizer & Bader.  
**Type deposition.** NMB (NP 1471).
258. *Neomolgus iraniensis* Eghbalian, Khanjani, Safaralizadeh & Ueckermann, 2016: 296; *ex* soil and litter under wild almond trees, *Amygdalus scoparia* L. (Rosaceae), Palangan village, Kamyaran, Kermanshah Province, Iran.  
**Type deposition.** Holotype and paratypes at University of Bu-Ali Sina, Hamedan, Iran; paratype female at NCA.
259. *Neomolgus lacustris* (Hull, 1915): 121 **comb. nov.**; on soil, England. Original designation: *Bdella lacustris* Hull.—Hull, 1918: 40. Other name: *Molgus (Molgus) lacustris*, Thor, 1931a: 62.
- a. *Molgus (Hoplomolgus) sublimis* Berlese, 1923: 238 synonymy according to Thor (1931a: 62).  
**Type deposition.** Unknown.

260. *Neomolgus littoralis* (Linnaeus, 1745): 96; unknown locality.—Atyeo, 1960a: 390. Original designation: *Acarus littoralis* Linnaeus, 1745: 96; 1758: 618; Hammer, 1775: 158; Fabricius, 1775: 815; 1780: 225; 1781: 493; 1787: 374; Müller, 1776: 187; Oudemans, 1926b: 117; Johnston, 1845: 229; Oudemans, 1929: 316. Other names: *Bdella littoralis*, Neuman, 1875: 104; Hull, 1918: 40; 1922: 622; Oudemans, 1926a: 116; Trägårdh, 1904: 46; 1912: 419; *Bdella vulgaris* var. *littoralis* Moniez, 1890a: 30, 1890b: 196.
- a. *Bdella littoralis* + *capillata* var. *pallipediformis* Trägårdh, 1902b: 18; synonymy according to Thor (1931a: 61); *Moligus littoralis*, Thor, 1904a: 15; 1904b: 78; 1913: 30; 1928: 216; 1930a: 96; 1931a: 61; King, 1914: 138; Berlese, 1923: 237; Trägårdh, 1928: 8; 1931: 47. Trägårdh, 1928: 8; 1931: 47.
- b. *Bdella groenlandica* Trägårdh, 1904: 48; Hull, 1922: 622; synonymy according to Thor (1930a).
- c. *Moligus (Moligus) littoralis* var. *seurati* Berlese, 1923: 237; synonymy according to Thor (1931a).
- d. *Acarus petrarum ruber* L.; Ström, 1762: 196; Olafsen & Povelsen, 1772: 607; synonymy according to Thor (1904).
- e. *Acarus basteri* Johnston, 1836: 353; *Bdella basteri*; Michael, 1896: 478; synonymy according to Thor (1904).
- f. *Acarus longicornis*, Johnston, 1845: 227; synonymy according to Thor (1904).
- g. *Bdella podurophila* White, 1852: 210; synonymy according to Thor (1931a).
- h. *Bdella arctica* Thorell, 1871: 698; Kramer, 1897: 79; Trägårdh, 1900: 9; Banks, 1919: 11; *Moligus arcticus* (Thorell), Trouessart, 1888: 119; Thor, 1902: 162; synonymy according to Thor (1904).
- i. *Bdella marina* Packard, 1873: 544; 1884: 828; Banks, 1894: 220; Michael 1896: 479; Banks 1907: 596; 1908: 5; Thor, 1931a: 39; synonymy according to Thor (1904).
- j. *Moligus longicornis*, Murray, 1877: 143; synonymy according to Thor (1931a).
- k. *Bdella grandis* Kramer, 1879: 131; synonymy according to Trägårdh (1904: 46).
- l. *Bdella villosa* Kramer & Neuman, 1883: 525; Michael 1896: 479; Oudemans & Koenike, 1897: 238; Banks, 1899: 348; 1907: 596; *Moligus villosa*, Trouessart, 1888: 619; synonymy according to Thor (1904).
- m. *Eupalus sanguineus* Trouessart, 1888: 753; *Bdella sanguinea*, Trouessart, 1894: 119; Michael 1896: 478; Trägårdh, 1900: 9; *Moligus sanguineus*, Trouessart, 1894: 117; synonymy according to Thor (1904).
- n. *Bdella villosa* + *frigida* Banks, 1899: 348; synonymy according to Thor (1931a).
- Distribution.** England (Hull 1918), Canada (Nunavut) (Summerhayes & Elton 1928), Alaska, Hudson Bay Area, Greenland, Iceland, Spitsbergen, Bering Island, Russian Lapland (Kola-Hafvon), Novaya Zemlya (Matochkin Strait), Finland (Atyeo 1960a), Japan (Ehara 1960, 1961, Shiba 1971), Iceland (Atyeo & Tuxen 1962).
- Redescriptions.** Atyeo (1960a), Atyeo & Tuxen (1962).
- Remarks.** Atyeo (1960a: 391) reported specimens from Matochkin Strait lacking trichobothria on tibia IV, and having a long tactile seta in the position normally occupied by the trichobothria.
- Type deposition.** Unknown.
261. *Neomolgus longipalpis* (Karpelles, 1893): 106 **comb. nov.**; Maramures, Hungary, at Pop Ivan mountain. Original designation: *Bdella longipalpis* Karpelles. Other name: *Moligus longipalpis*, Thor, 1931a: 63.
- Type deposition.** Unknown.
262. *Neomolgus longipalpus* Kuznetsov, 1984: 774; park of the Nikita botanical garden, Yalta, Crimea, *ex litter*.
- Remarks.** Male unknown. According to ICZN (article 57.6), the one-letter difference in spelling in relation to the previous species is enough to prevent the homonymy.
- Type deposition.** NBG.
263. *Neomolgus lumarius* Atyeo, 1962: 292 in Atyeo & Tuxen; Háitindur, Southeast Iceland.
- Type deposition.** Holotype and paratypes at ZMUC; paratypes at USNM, BMNH and SAM.
264. *Neomolgus maculatus* (Karpelles, 1893): 26 **comb. nov.**; Sälaj, Hungary. Original designation: *Bdella maculata* Karpelles. Other names: *Moligus maculatus*, Thor, 1931a: 64; *Moligus maculatus* var. *pilosa*; Thor, 1931a: 64.
- Type deposition.** Unknown.

265. *Neomolgus monticola* Willmann, 1951: 162; Hohe Tauern, Switzerland. Other name: *Hoplomolgus monticola*, Schweizer & Bader, 1963: 240.  
**Type deposition.** ZSM.
266. *Neomolgus mutabilis* Atyeo, 1960a: 392; 2 miles south of Galena, Cherokee Co., Kansas, USA, under board.  
**Distribution.** United States (Kansas, Texas), Mexico (Distrito Federal) (Atyeo 1960a).  
**Type deposition.** Holotype and paratypes at SEMC, paratypes at USNM, BMNH and SAM.
267. *Neomolgus obsoletus* (Berlese, 1923): 238 **comb. nov.**; in Germany and Norway. Original designation: *Molgus* (*Hoplomolgus*) *obsoletus*, Thor, 1931a: 58; *Hoplomolgus obsoletus*, Schweizer & Bader, 1963: 242.  
**Type deposition.** CRA.
268. *Neomolgus ontakensis* Shiba, 1971: 99; Mt. Ontaké, Nagano pref., Japan.  
**Type deposition.** Biological Laboratory of Matsuyama Shinonome Junior College, Matsuyama, Japan.
269. *Neomolgus pallipes* (Koch, 1879): 131; Siberia, Russia. Original designation: *Bdella pallipes* Koch; Hull, 1918: 41; Hull, 1922: 622; *Neomolgus pallipes*; Mihelčič, 1958a; Willmann, 1952: 166.  
a. *Bdella hirta* Kramer, 1896: 447; synonymy according to Thor (1931a: 58).  
b. *Bdella basteri* Johnston forma *pallipes*, Trägårdh, 1901: 61; synonymy according to Thor (1931a: 58).  
c. *Bdella capillata* var. *pallipes*, Trägårdh, 1902b: 16; 1904: 47; synonymy according to Thor (1931a: 59).  
d. *Molgus* (*Molgus*) *pallipes*, Thor, 1931a: 58.  
e. *Molgus capillatus*, Thor, 1927: 139; 1930: 95; synonymy according to Thor (1931a: 59); *Molgus capillatus* var. *pallipes*, Trägårdh, 1928: 8; synonymy according to Thor (1931a: 59).  
**Distribution.** Canada (Summerhayes & Elton 1928), Northern Europe and Asia (Siberia, Novaja, Semlja, Sweden, Norway, Svalbard, England, Borkum Island) (Thor 1931a), Germany (Wangerooe Island) (Willmann 1952), Spain (Mihelčič 1958a).  
**Type deposition.** BMNH.
270. *Neomolgus paracapillatus* Michocka, 1987: 45; Warsaw, Poland, ex decayed grass.  
**Type deposition.** In the author's collection.
271. *Neomolgus pratensis* Shiba, 1971: 93; Namekawa, Kawauchi-chô, Ehime pref., Japan.  
**Type deposition.** Biological Laboratory of Matsuyama Shinonome Junior College, Matsuyama, Japan.
272. *Neomolgus pygmaeus* Shiba, 1969a: 74; Shiga Heights, Japan.  
**Distribution.** Japan (Shiba 1969a), China (Lin *et al.* 2006).  
**Redescription.** Shiba (1971).  
**Type deposition.** Biological Laboratory of Matsuyama Shinonome Junior College, Matsuyama, Japan.
273. *Neomolgus raeticus* (Schweizer & Bader, 1963): 238 **comb. nov.**; National Park, Mt. Mezdi, Switzerland. Original designation: *Hoplomolgus raeticus* Schweizer & Bader.  
**Type deposition.** NMB (NP 1845).
274. *Neomolgus raptor* Kuznetsov & Barilo, 1984: 934; near Samarkand (Tchapan-Atha), Uzbekistan, under stones.  
**Type deposition.** NBG.
275. *Neomolgus reticulatus* (Schweizer & Bader, 1963): 241 **comb. nov.**; S-chanf, Switzerland. Original designation: *Hoplomolgus reticulatus* Schweizer & Bader.  
**Type deposition.** NMB (NP 283).
276. *Neomolgus sabulosus* Shiba, 1971: 96; Shigenobu River, Matsuyama, Ehime pref., Japan.



**Type deposition.** Biological Laboratory of Matsuyama Shinonome Junior College, Matsuyama, Japan.

277. *Neomolgus seriatus* Shiba, 1971: 101; Otanomôsu-no-taira, Shigakôgen, Nagano pref., Japan.

**Type deposition.** Biological Laboratory of Matsuyama Shinonome Junior College, Matsuyama, Japan.

278. *Neomolgus thorianus* (Berlese, 1923): 239 **comb. nov.**; Corfu, Greece. Original designation: *Molgus* (*Hoplomolgus*) *thorianus* Berlese. Other name: *Molgus* (*Molgus*) *thorianus*, Thor, 1931a: 62.

**Distribution.** Greece (Corfu Island) (Thor 1931a), Georgia (Gomelauri 1963b).

**Type deposition.** CRA.

## Fossil BDELLIDAE

279. *Bdella vetusta* Ewing, 1934: 58; Manitoban amber (Cretaceous, ~76–79 Ma), Cedar Lake, Manitoba, Canada.

**Type deposition.** ROME.

280. *Bdella lata* Koch & Berendt, 1854: 872—not *Bdella lata* Ewing (1909b); Baltic amber (~44 Ma).

281. *Bdella bicincta* Menge in Koch & Berendt, 1854: 108—Baltic amber (~44 Ma).

282. *Bdella bombycina* Menge in Koch & Berendt, 1854: 108—Baltic amber (~44 Ma).

283. *Bdella obconica* Menge in Koch & Berendt, 1854: 108—Baltic amber (~44 Ma).

284. *Bdellidae* sp. (Aoki 1974 *apud* Dunlop *et al.* 2012).

## *Incertae sedis*

285. *Bdella kochi* Oudemans, 1937: 1198.

286. *Biscirus curtirostris* Oudemans, 1937: 1223.

## *Nomina nuda*

287. *Bdella lichenicola* Baker;

288. *Bdella planadensis* Baker. Although slides labeled as “holotype” for this and the former species are deposited in CAS, neither was ever described and represent manuscript names.

289. *Bdella longipilosa* Ewing, is also a manuscript name; two paratypes are at USDA.

290. *Bdella indicata*; mentioned in Banerjee & Gupta (2011). No reference to this species were found.

291. *Bdella calandroides* Murray, in Trägårdh, 1904: 9; Arctic region; *Molgus calandroides*, Thor, 1931a: 63.

**Type deposition.** Unknown.

**Remarks.** Feilden (1878) narrates the fauna collected in Arctic expeditions in the Baffin Bay, of which A. Murray was the specialist that studied the mites; apparently the latter, after determining and naming the mites, died before having published it (Trägårdh, 1904).

292. *Bdellodes* (*Hoploscirus*) *microsetosa*—In describing *Bdellodes* (*H.*) *parvisetosa*, Atyeo (1977: 303) compares the new species with *B. (H.) australica*. In the diagnosis (line 5 from bottom of page 303), the author used *B. (H.) microsetosa* instead of *B. (H.) parvisetosa*, which was likely one of the names considered, but ultimately

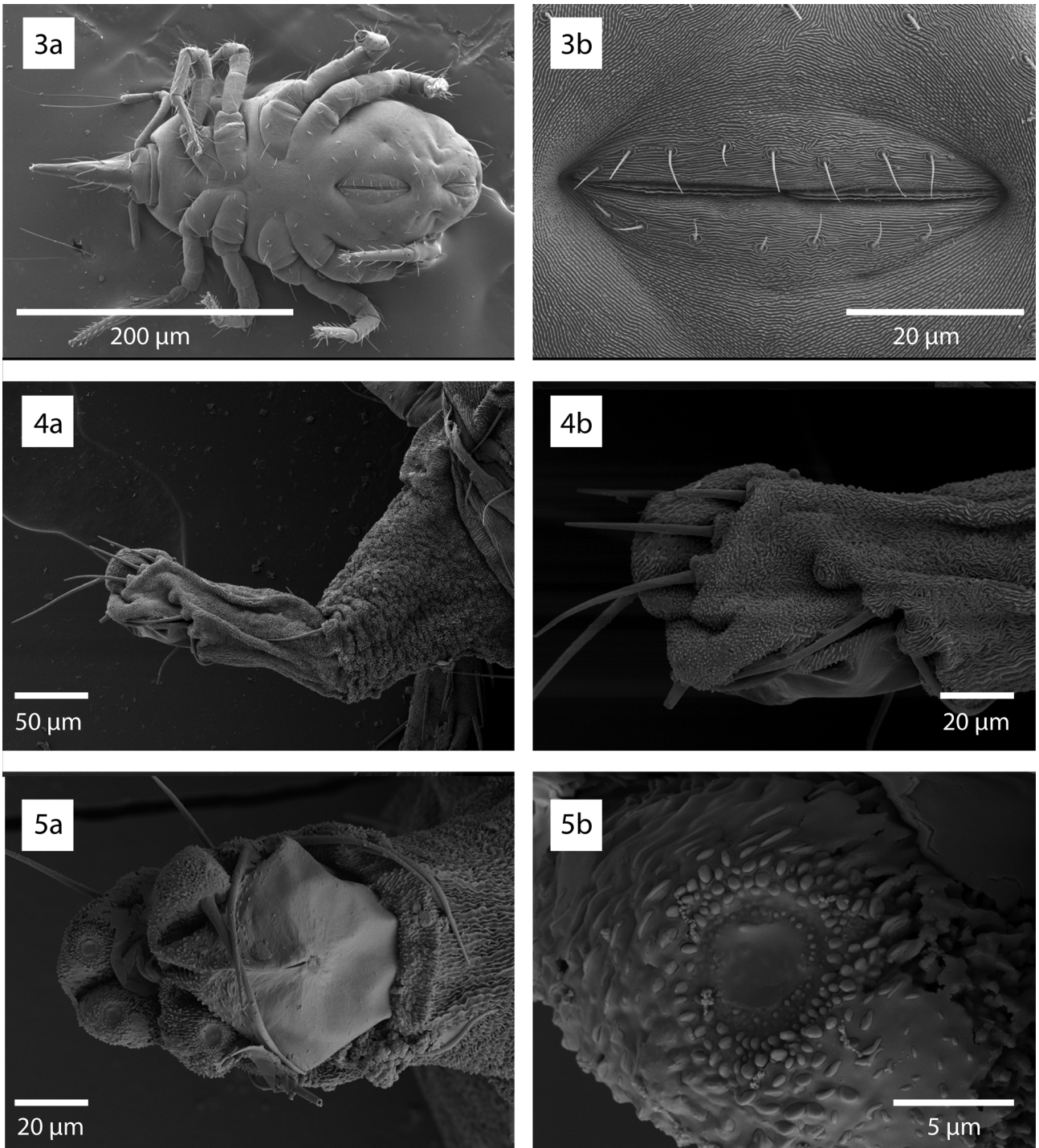
not chosen, for the new species. The etymology of *parvisetosa* means "the one with small seta" (from Latin *parvi* = small), which means exactly the same as *microsetosa*, the actual chosen and valid name of this species.

### **Incorrectly attributed name**

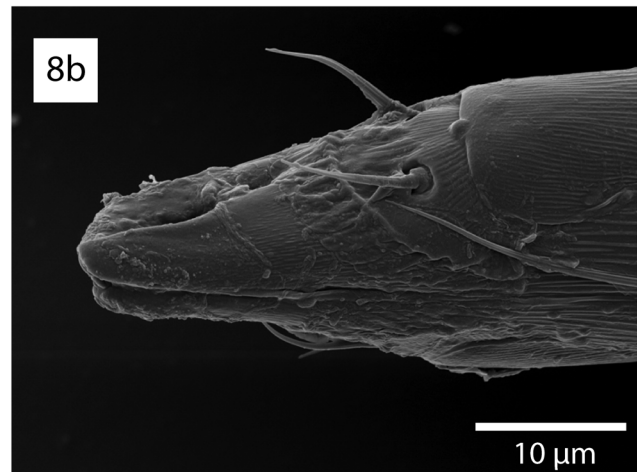
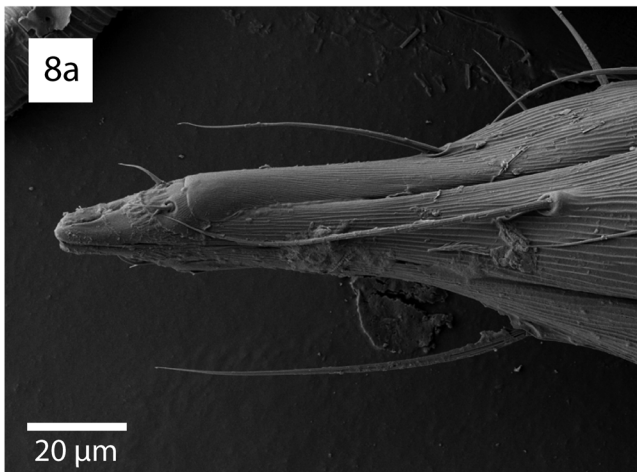
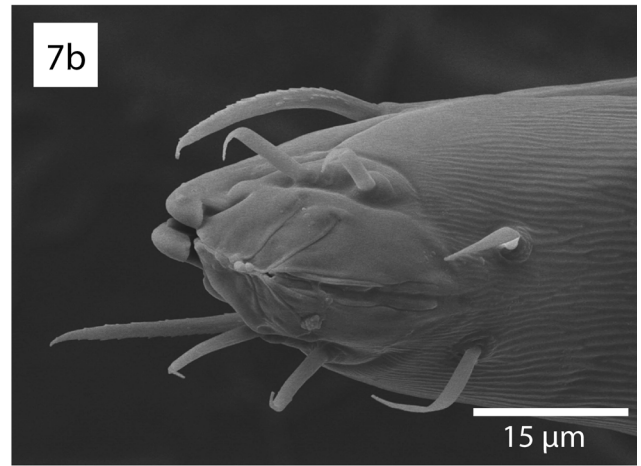
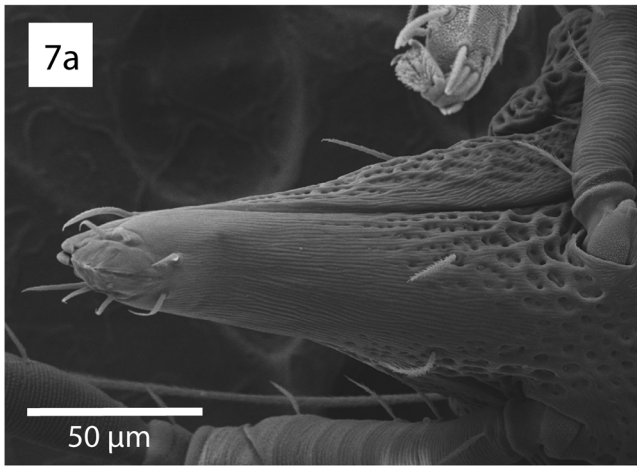
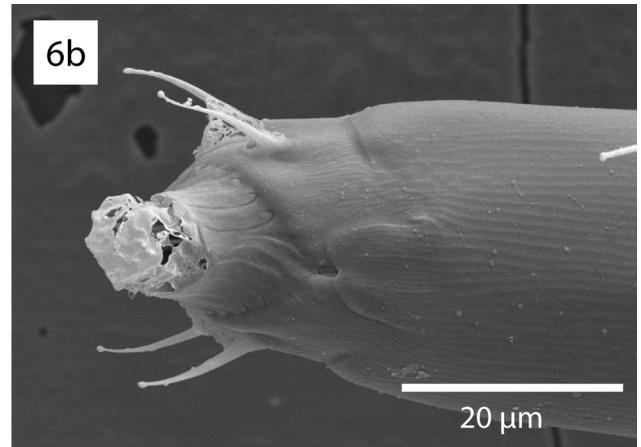
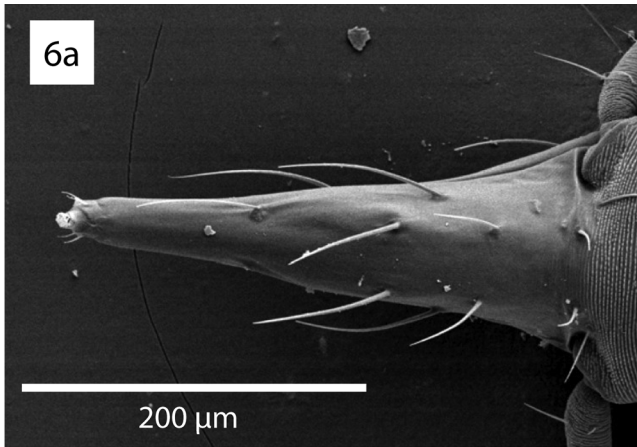
293. *Cyta heterocomus* (Michael, 1903)—despite mentioned in *Cyta* in a few web catalogs (e.g. [http://gni.globalnames.org/data\\_sources/show/30%3Fhelp=true&search\\_term=ssp%253Amajor?search\\_term=ns%3ACYT\\*](http://gni.globalnames.org/data_sources/show/30%3Fhelp=true&search_term=ssp%253Amajor?search_term=ns%3ACYT*)), this species actually belongs to Winterschmidtidae, *Czenspinksia* (Astigmata) (Oudemans 1937: 3118).

### **Acknowledgements**

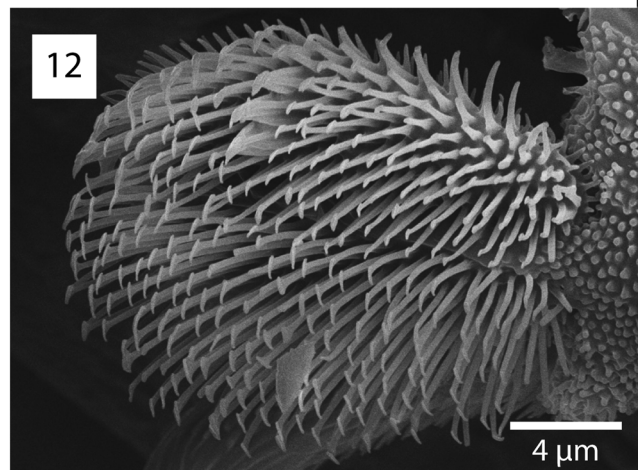
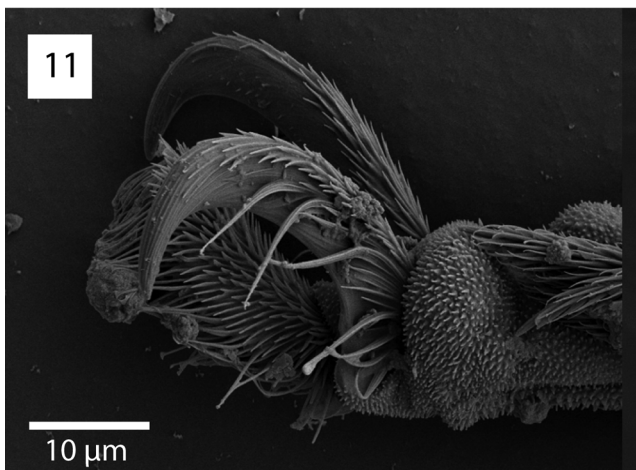
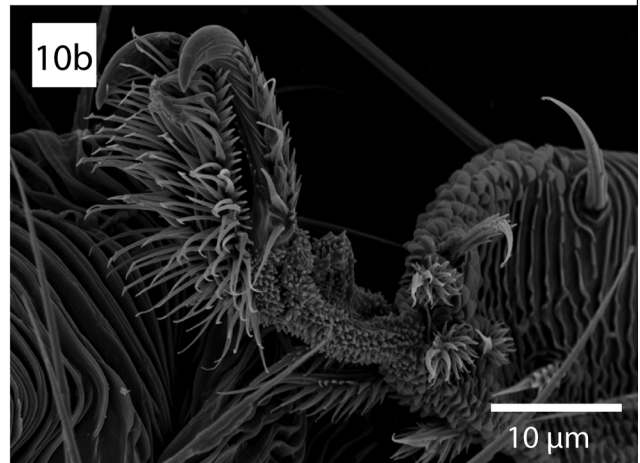
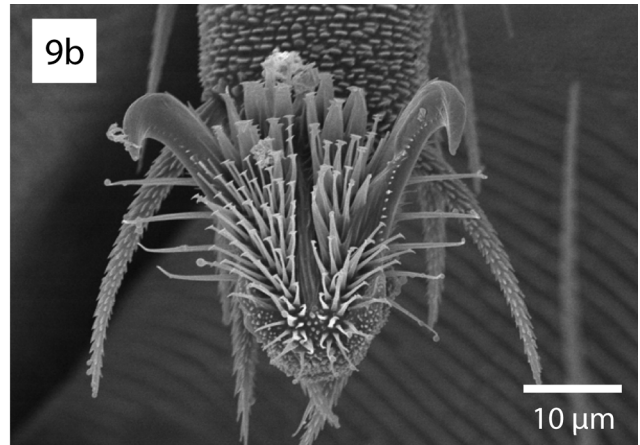
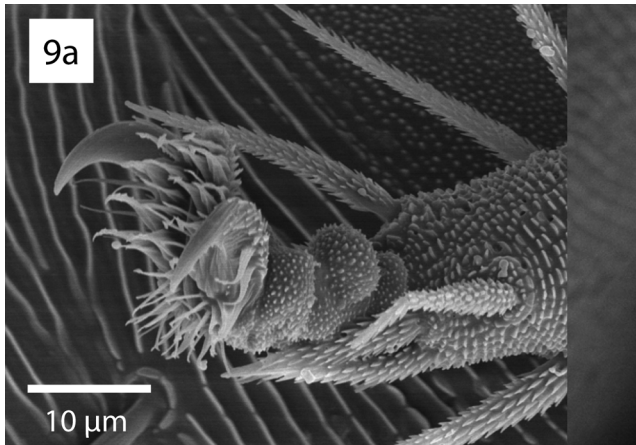
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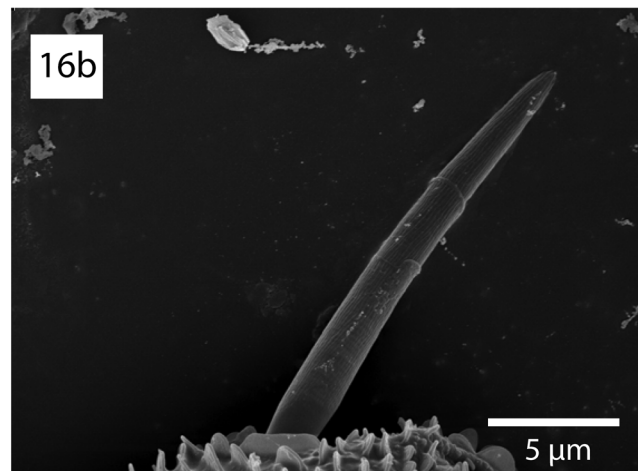
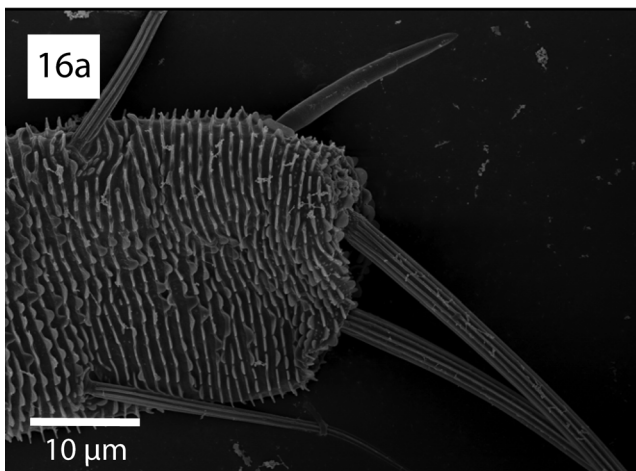
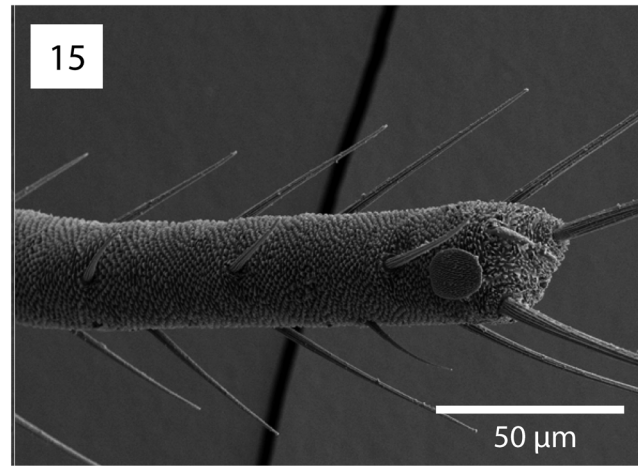
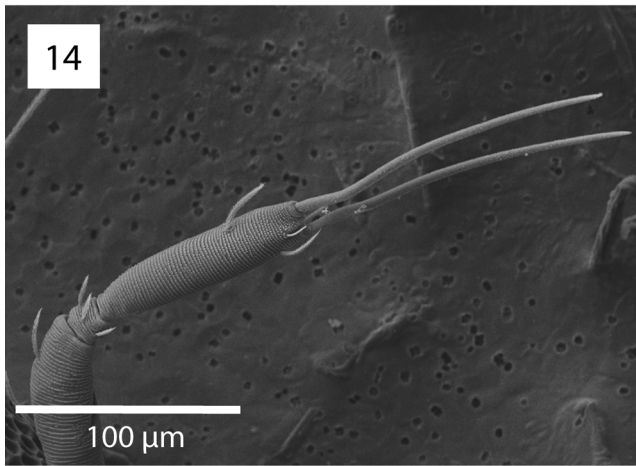
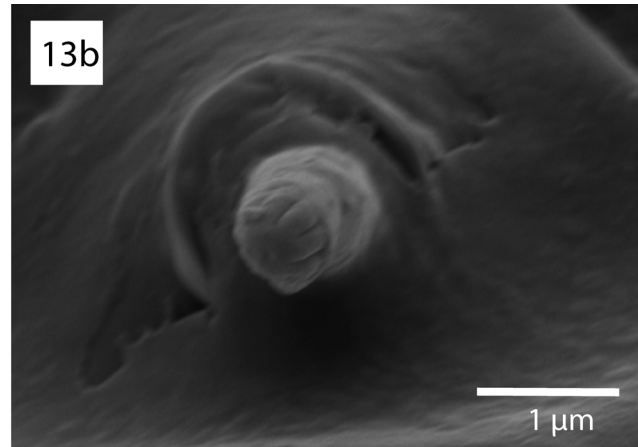
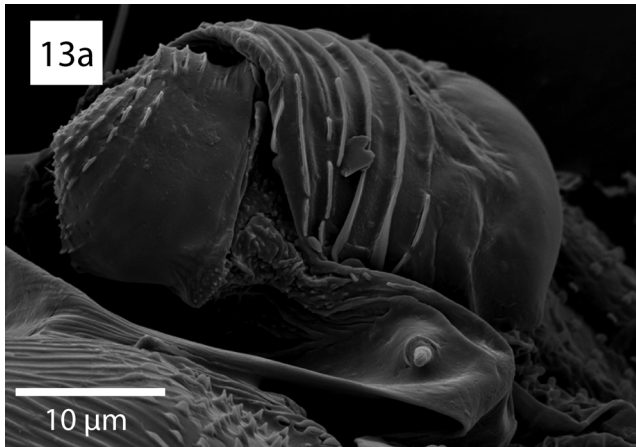
**FIGURES 3–5.** Low-temperature scanning electron micrographs, venter and ovipositor. Fig. 3. *Bdella* sp. 3a. Venter. 3b. Detail of genital valves. Note the two openings within the genital region, which are generally depicted as a single opening. Figs. 4, 5 represent two different *Odontoscirus* specimens collected from the same leaf litter sample and are likely the same species. Fig. 4a. Lateral ovipositor. 4b. Detail of tip of ovipositor. Fig. 5a. Ventral ovipositor. 5b. Detail of genital papillae.



**FIGURES 6–8.** Low-temperature scanning electron micrographs, ventral subcapitulum. Fig. 6. Undetermined genus. Note the drop of silk at the tip of the gnathosoma. Fig. 7. *Trachymolgus* sp. Note the chelicerae, which can be seen just above the lateral lips. Fig. 8. *Odontoscirus* sp. Note the chelicerae, which are extended through the lateral lips.

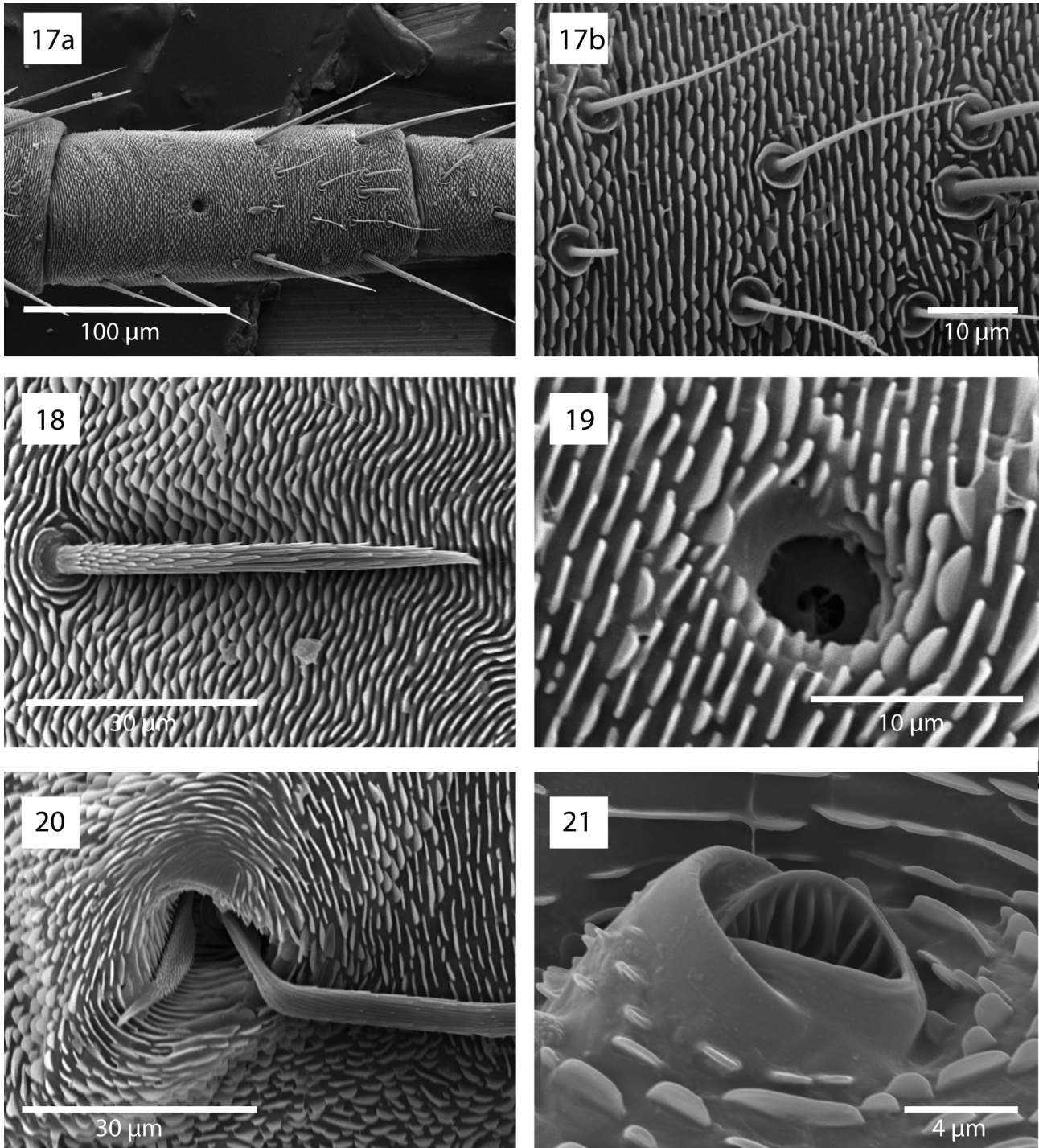


**FIGURES 9–12.** Low-temperature scanning electron micrographs, tarsus and empodium. Fig. 9. Undetermined genus. Fig. 10–11. *Odontoscirus* sp. Fig. 12. *Trachymolgus* sp. Close-up of tenent hairs

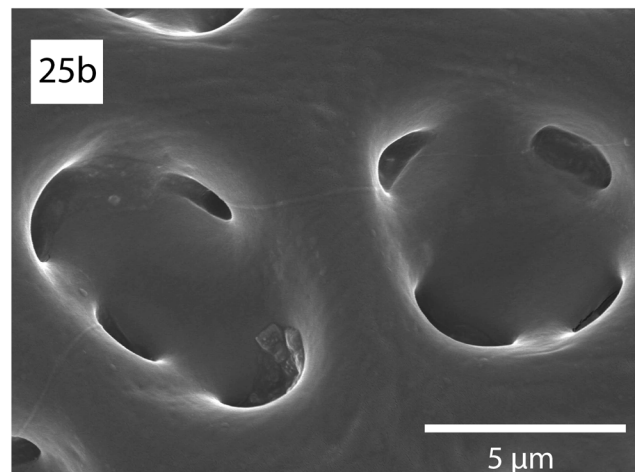
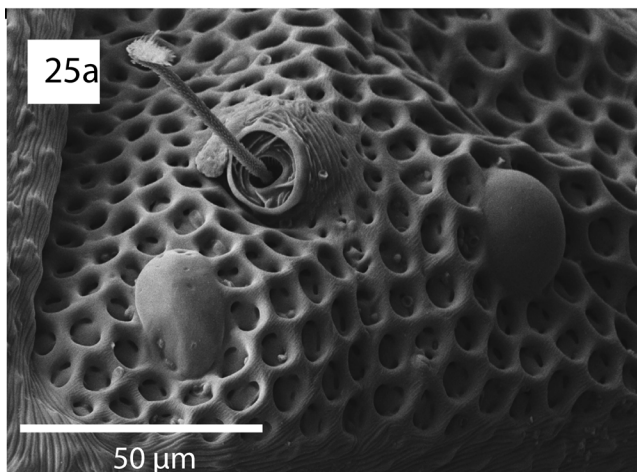
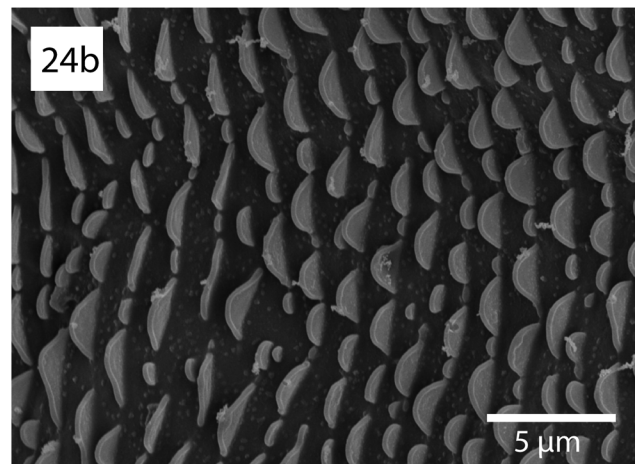
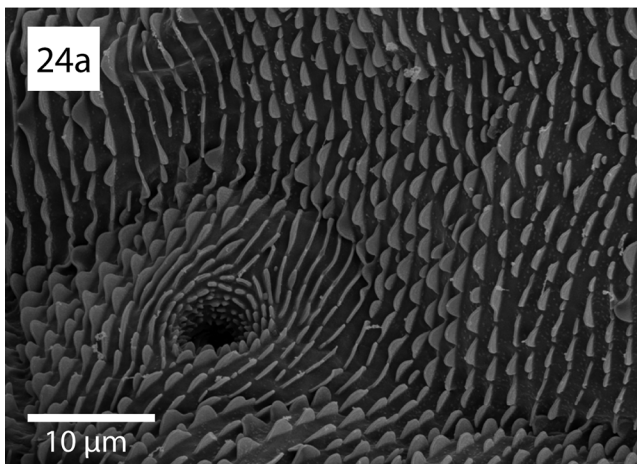
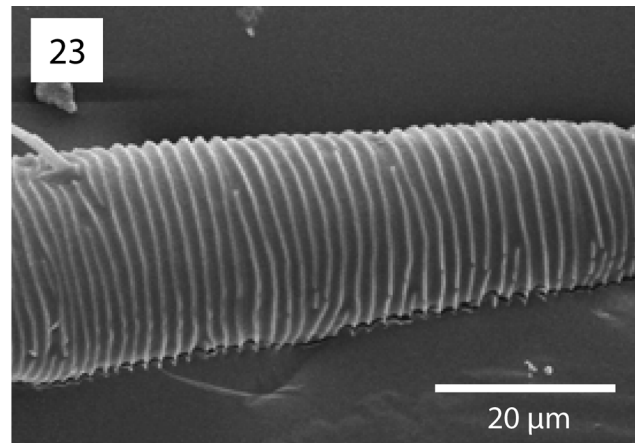
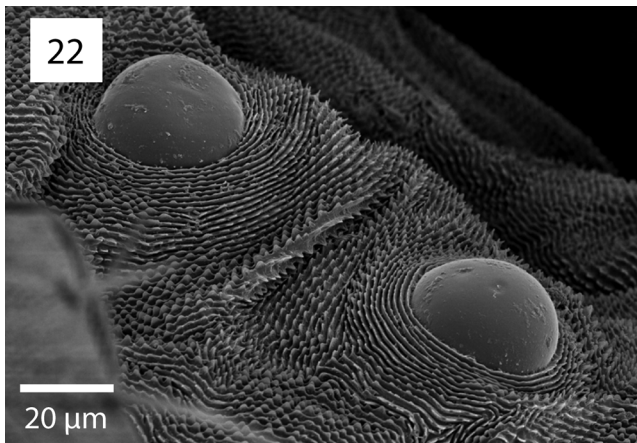


**FIGURES 13–16.** Low-temperature scanning electron micrographs, pedipalpal setae. Fig. 13. *Odontoscirus* sp. Solenidion located near the base of the pedipalp (pedipalp broken off in images). Fig. 14. *Trachymolgus* sp. Pedipalp. Fig. 15. Undetermined genus. Pedipalpal tibiotarsus. Note the flat disc-shaped seta located near the tip of tibiotarsus; this structure has not been described from any bdellid and is likely contamination. Fig. 16. *Odontoscirus* sp.. 16a. Tip of pedipalpal tibiotarsus. 16b. Detail of distal pedipalpal tibiotarsal solenidion.





**FIGURES 17–21.** Low-temperature scanning electron micrographs, setae. Figs. 17–20. Undetermined genus, same specimen. Fig. 17. Leg tibia III. 17b. Detail of solenidia. Fig. 18. Detail of setiform seta. Fig. 19. Tarsus IV trichobothrial socket. Note the missing trichobothrium. Fig. 20. Duplex setae, *pt* and *mps*. Fig. 21. *Odontoscirus* sp., *pt* socket. Note the missing trichobothrium.



**FIGURES 22–25.** Low-temperature scanning electron micrographs, eyes and cuticle. Fig. 22. *Odontoscirus* sp., eyes. Fig. 23. Undetermined genus. Pedipalpal tibiotarsus, showing uninterrupted cuticular ridges often found on appendages. Fig. 24. Undetermined genus. Fig. 24a. Prodorsum around *at*, illustrating interrupted cuticular ridges. Fig. 24b. Detail of cuticular ridges. Fig. 25. *Trachymolgus* sp. Fig. 25a. Eyes. Fig. 25b. Detail of cuticular pit.

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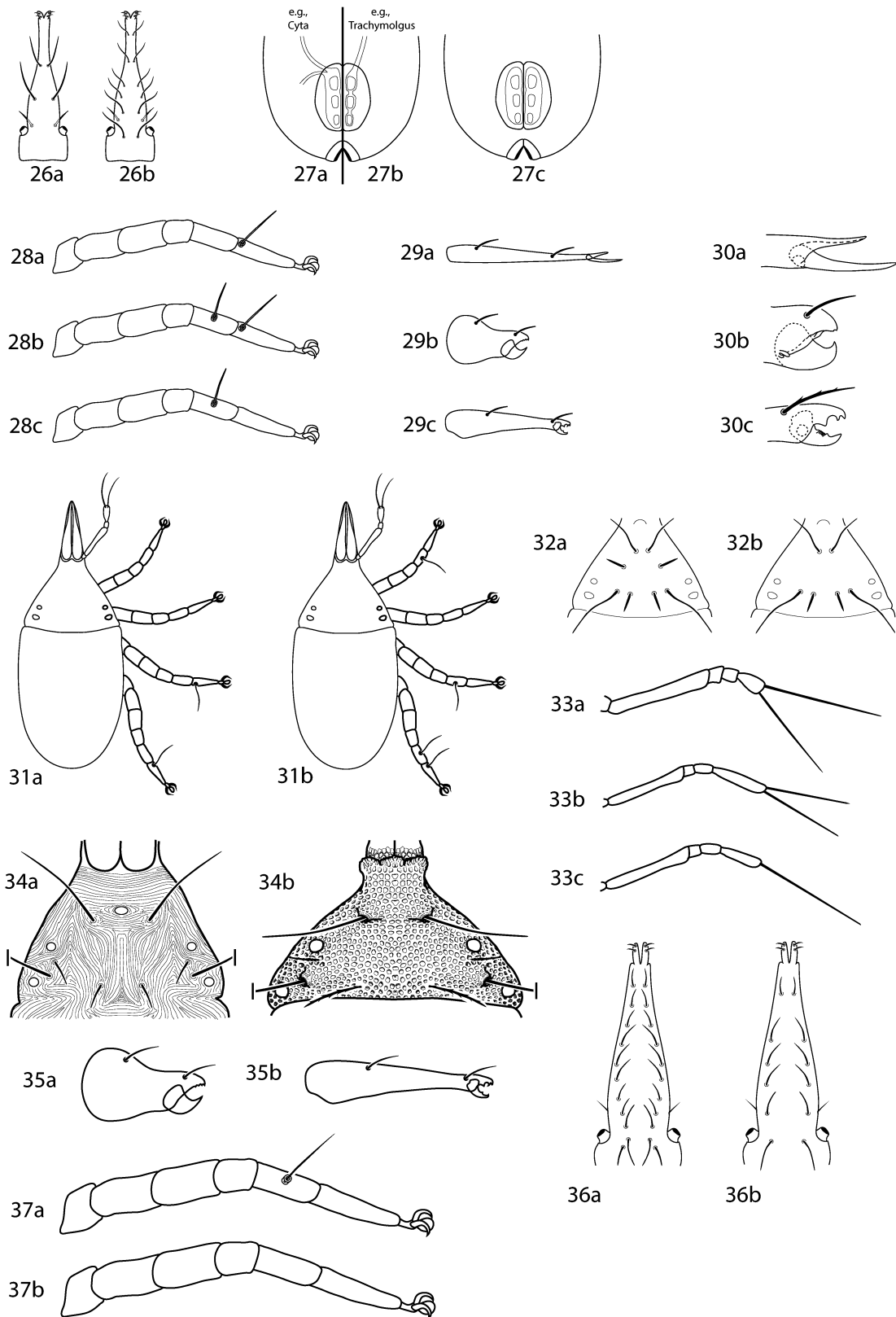
## APPENDIX 1

### Key to subfamilies and genera of Bdellidae of the world (Figs. 26–40)

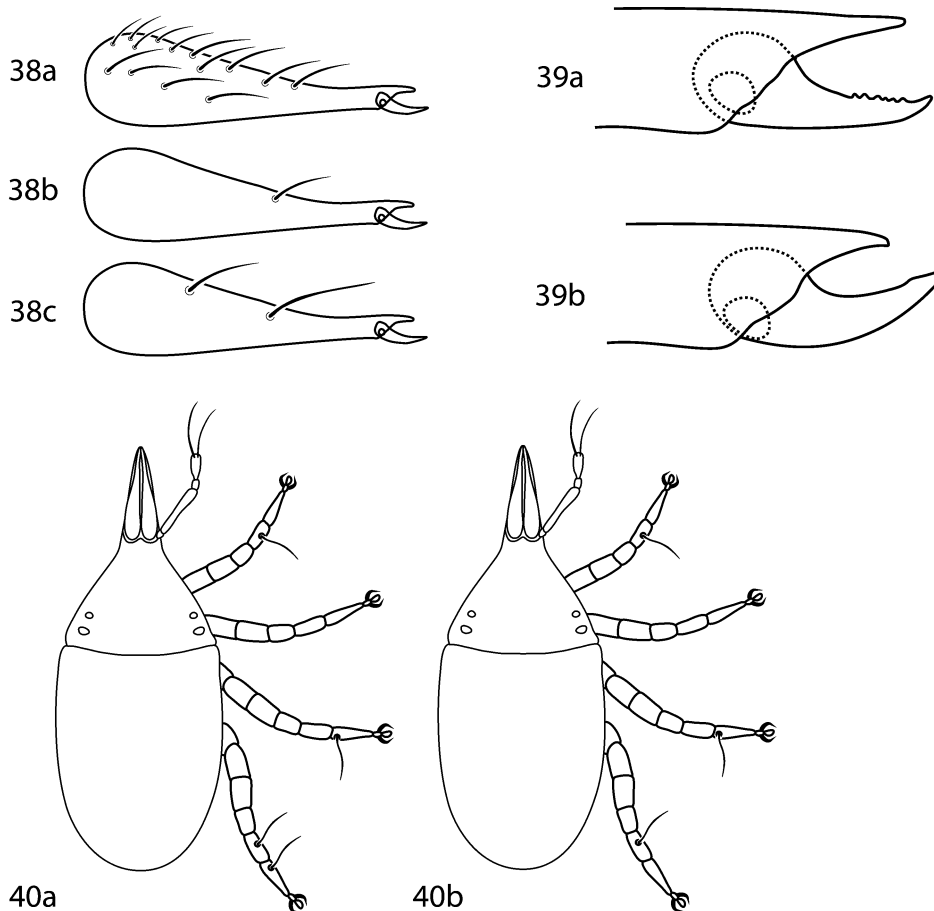
For some genera, diagnostic characters such as the number of setae on the ventral subcapitulum and number of leg trichobothria are not developed until the third nymphal instar (*i.e.*, tritonymph); immatures get an increasing number of those characters as they develop into subsequent stages (see Atyeo 1960: 354). For this reason, the key below must be applied for adults only.

(abbreviations: T = trichobothrium (leg); *at* = anterior trichobothrium; *pt* = posterior trichobothrium; *ps* = pseudanal seta; *lps* = lateral prodorsal seta; *mps* = median prodorsal seta; *des* = dorsal end seta (palp); *ves* = ventral end seta (palp); *sts* = simple tactile seta; *asl* = attenuate solenidion; *bsl* = blunt solenidion).

1. Subcapitulum with two pairs of prominent ventral setae, not including adorals (Fig. 26a); genital tracheae well developed (Figs. 27a, b) . . . . . 2
- 1'. Subcapitulum with five or more pairs of prominent setae, not including adorals (Fig. 26b); genital tracheae not evident (Fig. 27c) . . . . . 7
2. Trichobothrium present on tarsus IV (Figs. 28a, b); cheliceral bases elongate (Fig. 29a); digits thin and straight (Fig. 30a) . . . . . **Spinibdellinae**...3
- 2'. Trichobothrium absent from tarsus IV (Fig. 28c); cheliceral bases normal (Fig. 29b) or inflated (Fig. 29c); digits curved (Fig. 30b, c) . . . . . **Cytinae**...6
3. Trichobothrium present only on tarsi III and IV (Fig. 31a) . . . . . **Tetrabdella**
- 3'. Trichobothrium present on tibiae I, IV, tarsi III, IV (Fig. 31b) . . . . . 4
4. Lateral propodosomal setae present (Fig. 32a); pedipalpal tibiotarsus truncate (Fig. 33a) . . . . . **Spinibdella**
- 4'. Lateral propodosomal setae absent (Fig. 32b); pedipalpal tibiotarsus cylindrical, elongated (Figs. 33b, c) . . . . . 5
5. Pedipalpal tibiotarsus with two long apical setae (Fig. 33b) . . . . . **Biscirus**
- 5'. Pedipalpal tibiotarsus with a single long apical seta (Fig. 33c) . . . . . **Monotrichabdella**
6. Integument striated and usually unsclerotized (Fig. 34a), sclerotized only in *C. coerulipes*, *C. ignea* **comb.nov.**, and *C. leiliae*; unpaired median eye usually present (Fig. 34a) (absent in *C. magdalenae*, *C. ignea*); cheliceral bases inflated (Fig. 35a) . . . . . **Cyta**
- 6'. Integument heavily sclerotized, pitted (Fig. 34b); unpaired median eye absent (Fig. 34b); cheliceral bases normal (Fig. 35b) . . . . . **Trachymolgus**
7. Subcapitulum with eleven pairs of ventral setae (Fig. 36a) . . . . . **Polytrichinae, Polytrichus**
- 7'. Subcapitulum with six or seven pairs of ventral setae (Fig. 36b) . . . . . 8
8. Trichobothrium present on tibiae II (Fig. 37a) . . . . . **Odontoscirinae**...9
- 8'. Trichobothrium absent from tibiae II (Fig. 37b) . . . . . **Bdellinae**...10
9. Each chelicera with more than two setae, usually (8–20) (Fig. 38a) . . . . . **Neomolgus**
- 9'. Each chelicera with at most two setae (Figs. 38b, c) . . . . . **Odontoscirus**
10. Trichobothrium present on tarsus IV (Fig. 40a) . . . . . **Bdella**
- 10'. Trichobothrium absent on tarsus IV (Fig. 40b) . . . . . **Hexabdella**



**FIGURES 26–40.** Generic key illustrations. Fig. 26. Subcapitulum. Fig. 27. Genital tracheae evident or not. Fig. 28. Tarsus IV trichobothrium present or absent. Fig. 29. Chelicerae. Fig. 30. Cheliceral digits curved or not. Fig. 31. Leg trichobothria present or absent. Fig. 32. Lateral prodorsal setae present or absent. Fig. 33. Pedipalpal tibiotarsus. Fig. 34. Integument striated and unsclerotized or heavily sclerotized and pitted. Fig. 35. Cheliceral bases. Fig. 36. Subcapitulum. Fig. 37. Tibiae II trichobothrium present or absent. Fig. 38. Chelicera. Fig. 39. Cheliceral bases. Fig. 40. Leg trichobothria present or absent.



**FIGURES 38–40.** Generic key illustrations. Fig. 38. Chelicera. Fig. 39. Cheliceral bases. Fig. 40. Leg trichobothria present or absent.

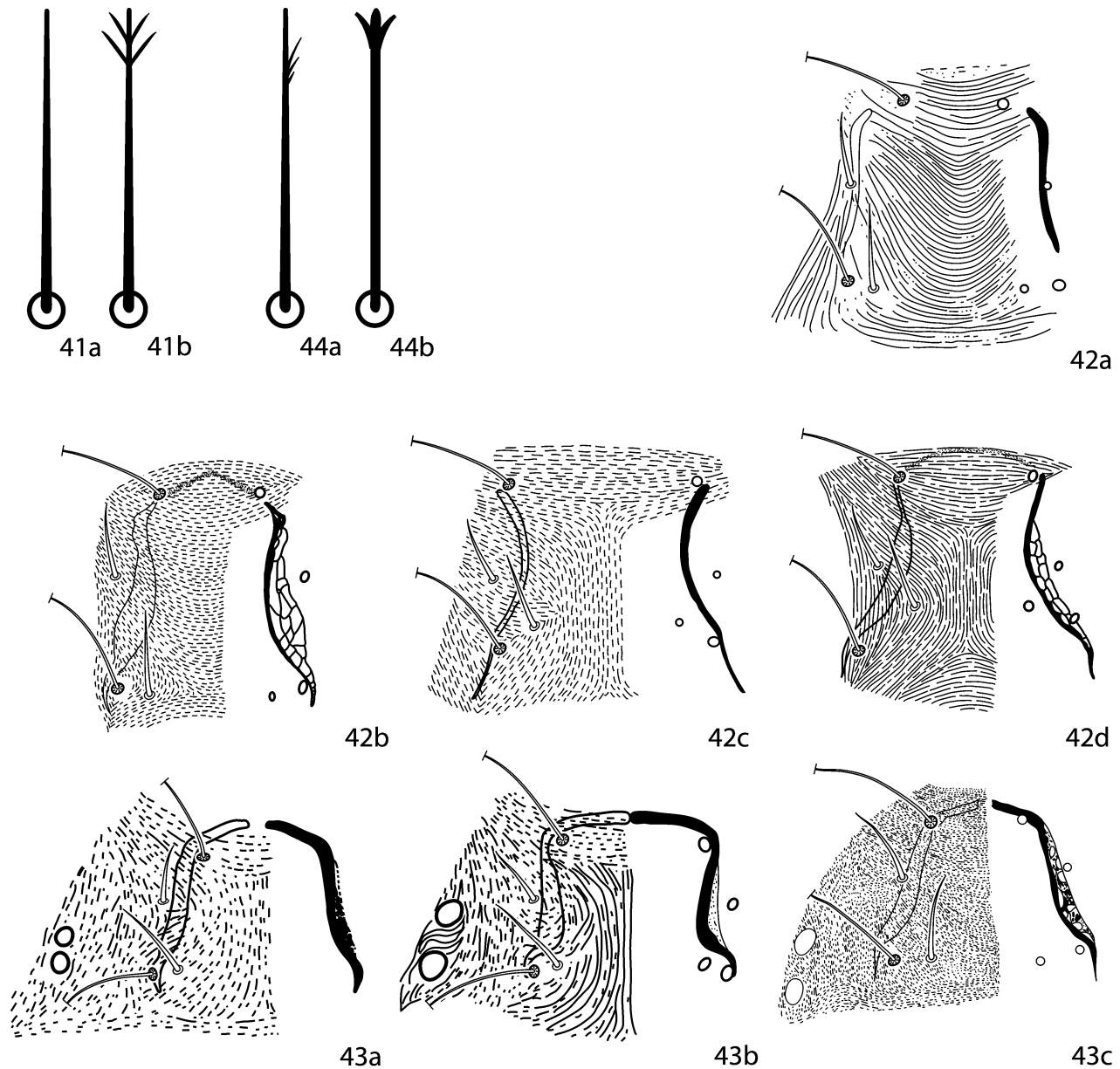
**Key to adult *Bdella* (Figs. 41–44).**

Species of *Bdella* have been continuously described since the 18<sup>th</sup> century. Many older descriptions contain few characters useful for identification and type material has subsequently been lost or species have not been redescribed. An initial attempt to create a key to world species excluded nearly half of the described species because of this problem. We have therefore elected to include regional keys where species are relatively well described.

**Key to adult *Bdella* of North America** (Modified from Atyeo 1960a).

*Bdella robusta* and *B. tlascalana* are not included in the key as the original descriptions lack sufficient characters. *Bdella tlascalana* is known only from the type series collected in Tlaxcala, Mexico and may not be present north of Mexico.

- 1 Hysterosomal setae branched distally (Figs. 41b, 44b) . . . . . *B. distincta*
- Hysterosomal setae setiform, not branched distally (Figs. 41a, 44a) . . . . . 2
- 2 (1) Prodorsal striae between *pt* convex posteriorly (Figs. 42a, b) . . . . . 3
- Prodorsal striae between *pt* longitudinal (Figs. 42c, d) . . . . . 5
- 3 (2) Pedipalpal basifemur with 8–11 setae; pedipalpal tibiotarsus with 6 setae (including two long terminal setae) . . . *B. muscorum*
- Pedipalpal basifemur with 13 or more setae; pedipalpal tibiotarsus with 7 setae (including two long terminal setae) . . . . . 4
- 4 (3) Prodorsal striae continuous, prodorsal apodeme simple (Fig. 42a) . . . . . *B. cardinalis*
- Prodorsal striae coarsely broken, prodorsal apodeme reticulated (Fig. 42b) . . . . . *B. longicornis*
- 5 (2) Prodorsal apodeme simple (Fig. 42c); leg I telofemur, genu, and tibia approximately of equal length; genu I without duplex setae . . . . . *B. tropica*
- Prodorsal apodeme reticulated (Fig. 42d); tibia I twice the length of genu I or telofemur I; genu I with duplex setae present . . . . . *B. longistriata*



**FIGURES 41–44.** *Bdella* key illustrations. Figs. 41, 44. Setae. Figs. 42, 43. Prodorsum, illustrating the striae pattern on the left and internal apodeme on the right. Figs. 41a,b, 42b–d redrawn from Atyeo (1960a); Fig. 42a redrawn from Hernandez (2013); Figs. 43a–c, 44a,b redrawn from van Der Schyff *et al.* (2005).

**Key to *Bdella* of South Africa** (Modified from van der Schyff *et al.* 2005).

- 1 Prodorsal striae between *at* and *pt* longitudinal (Figs. 43a, b) ..... 2
- Prodorsal striae between *at* and *pt* transverse (Fig. 43c)..... *B. aloios*
- 2 (1) Tibia II with 1 solenidion ..... *B. nylsvleyensis*
- Tibia II with 2 solenidia ..... 3
- Tibia II with 3 solenidia ..... 6
- 3 (2) Tibia I with 2 solenidia; genu I with 1 solenidion; tarsus III without solenidia ..... 4
- Tibia I with 3 solenidia; genu I with 3 solenidia; tarsus III with 1 solenidion ..... *B. boskopensis*
- 4 (3) Tarsus II with 2 solenidia, microseta absent; pedipalpal basifemur with 8 setae ..... 5
- Tarsus II with 2 solenidia and 1 microseta; pedipalpal basifemur with 9 setae ..... *B. carolae*
- 5 (4) Dorsal hysterosomal striae mainly finely broken, striae between eyes vague or absent (Fig. 43a) ..... *B. vates*
- Dorsal hysterosomal striae continuous to sparsely broken, striae between eyes distinct and transverse (Fig. 43b).....
- ..... *B. consobrinae*
- 6 (2) Dorsal hysterosomal setae slightly serrated but pointed distally (Fig. 44a) ..... *B. neograndjeani*
- Dorsal hysterosomal setae slightly serrated but branched distally (Fig. 44b)..... *B. malawiensis*

**Key to *Bdella* of Iran** (Modified from Ueckermann *et al.* 2007)

- 1 Prodorsal striae between *pt* convex posteriorly (as in Figs. 42a, b) . . . . . 2
- Prodorsal striae between *pt* longitudinal (as in Figs. 42c,d, 43a,b) . . . . . 4
- 2 (1) Pedipalpal basifemur with 8–11 setae; pedipalpal tibiotarsus with 6 setae (including 2 terminal setae) . . . . . 3
- Pedipalpal basifemur with 13 or more setae; pedipalpal tibiotarsus with 7 setae (including 2 terminal setae) . . . . . *B. longicornis*
- 3 (2) Prodorsal striae sparsely broken; genu II with duplex setae present . . . . . *B. muscorum*
- Prodorsal striae continuous; genu II with duplex setae absent . . . . . *B. lattakia*
- 4 (1) Pedipalpal basifemora with 6 or 7 setae . . . . . 5
- Pedipalpal basifemora with 15 setae . . . . . *B. karajiensis*
- 5 (4) Genua I–IV each with a pair of duplex setae present . . . . . 6
- Genua I–IV without duplex setae . . . . . *B. captiosa*
- 6 (5) Prodorsal striae longitudinal between *at*; seta *mps* long, surpassing bases of *at* . . . . . *B. humida*
- Prodorsal striae transverse between *at*; seta *mps* shorter, reaching only about halfway to *at* . . . . . *B. farabii*

**Key to adult *Hexabdella*** (Modified from Paktinat-Saeed *et al.* 2014)

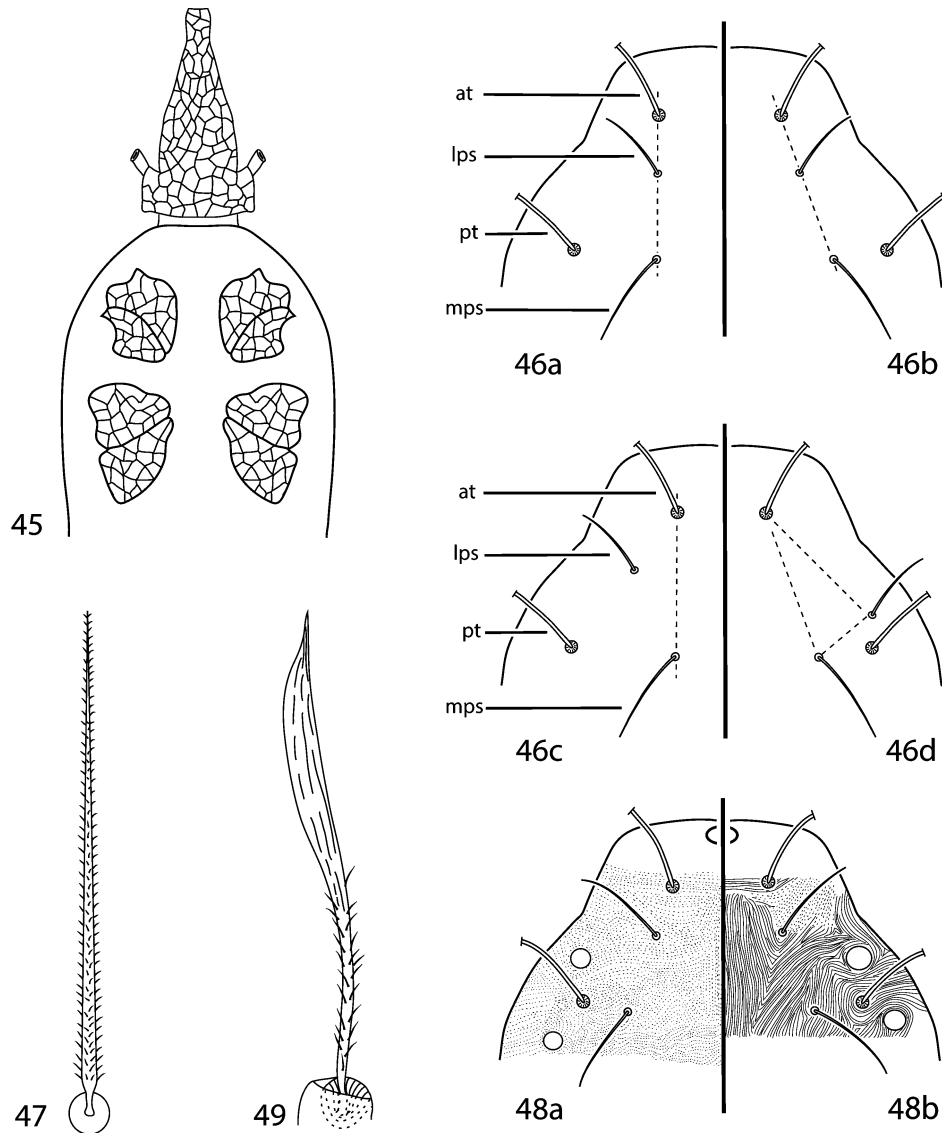
- 1 Eyes absent . . . . . *H. maraugia*
- One pair of eyes present . . . . . *H. unusoculata*
- Two pairs of eyes present . . . . . 2
- 2 (1) Pedipalpal basifemur with 4 setae . . . . . *H. brevitarsis*
- Pedipalpal basifemur with 5 setae . . . . . 3
- Pedipalpal basifemur with 6 setae . . . . . 4
- 3 (2) Dorsal opisthosomal setae smooth; solenidotaxy of tibiae I–III 1-1-1 . . . . . *H. miranda*
- Dorsal opisthosomal setae smooth; solenidotaxy of tibiae I–III 3-2-1 . . . . . *H. quercusi*
- Dorsal opisthosomal setae distally branched; solenidotaxy of tibiae I–III 3-2-0 . . . . . *H. singula*
- 4 (2) Solenidotaxy of tibiae I–II 2-1; seta *ps*<sub>1</sub> branched; coxa IV with serrated seta present . . . . . *H. denheyeri*
- Solenidotaxy of tibiae I–II 3-2; seta *ps*<sub>1</sub> smooth; coxa IV with serrated seta absent . . . . . 5
- 5 (4) Dorsal opisthosomal setae smooth; coxa II with 3 setae; telofemur IV with 5 setae . . . . . *H. persiaensis*
- Dorsal opisthosomal setae slightly plumose or distally branched; coxa II with 4 setae; telofemur IV with 4 setae . . . . . 6
- 6 (5) Dorsal opisthosomal setae slightly plumose; subcapitulum and chelicerae smooth; movable cheliceral digit with one tooth . . . . . *H. mexicana*
- Dorsal opisthosomal setae distally branched; subcapitulum and chelicerae striated; movable cheliceral digit with two teeth . . . . . *H. cinquaginta*

**Key to adult *Cyta* (Figs. 45–49)** (Modified from Eghbalian *et al.* 2014); the following three species are not included as the original descriptions lack sufficient standard comparative characters: *Cyta flava* Mihelčič, 1958, *Cyta grandjeani* Gomelauri, 1963, and *Cyta veneta* (Lombardini, 1960).

- 1 Coxae and subcapitulum with reticulations present (Fig. 45) . . . . . *C. reticulata*
- Coxae and subcapitulum without reticulations . . . . . 2
- 2 (1) Prodorsal seta *mps* not reaching the base of co-lateral *lps* . . . . . 3
- Prodorsal seta *mps* reaches or surpasses the base of co-lateral *lps* . . . . . 6
- 3 (2) Tibiae I and tarsus III each without trichobothria . . . . . 4
- Tibiae I and tarsus III each with a trichobothrium present . . . . . 5
- 4 (3) Coxae IV with 2 setae; basifemora III–IV with 7–4 setae . . . . . *C. latirostris*
- Coxae IV with 3 setae; basifemora III–IV with 5–3 setae . . . . . *C. kurdistanicus*
- 5 (3) Distance between *at*–*at* approximately equal to *pt*–*pt* (*at* and *pt* arranged in a square); seta *mps* much closer to *at* than to *pt* . . . . . *C. brevipalpa*
- Distance between *at*–*at* approximately one third that of *pt*–*pt* (*at* and *pt* arranged in a wide-based trapezoid); seta *mps* much closer to *pt* than to *at* . . . . . *C. americana*
- 6 (2) Prodorsal setae *at*, *lps*, and *mps* aligned in a transverse or oblique row (Figs. 46a, b) . . . . . 7
- Prodorsal setae *at*, *lps*, and *mps* not aligned (these setae forming the vertices of a triangle) (Fig. 46d) . . . . . 10
- 7 (6) Dorsal setae serrate (Fig. 47) . . . . . *C. murrayi*
- Dorsal setae smooth . . . . . 8
- 8 (7) Pedipalpal basifemur with four setae . . . . . 9
- Pedipalpal basifemur with seven setae . . . . . *C. longiseta*
- 9 (8) Tarsi I and II with proximal microseta present; prodorsal striae faint and finely broken (Fig. 48a) . . . . . *C. spuria*
- Tarsi I and II without proximal microseta; prodorsal striae strong and continuous (Fig. 48b) . . . . . *C. troglodyta*
- 10 (6) Eyes present; posterior trichobothria (*pt*) setiform . . . . . 11
- Eyes absent; posterior trichobothria (*pt*) spatulate (Fig. 49) . . . . . *C. magdalenae*
- 11 (10) Distal cheliceral setae minute, tip shorter than cheliceral apex . . . . . *C. ignea*
- Distal cheliceral setae normal, tip surpasses cheliceral apex . . . . . 12



- 12 (11) Integument heavily sclerotized (dark) and purple. . . . . 13  
 - Integument lightly sclerotized and not purple. . . . . 14  
 13 (12) Trochanter I with 2 setae; tarsi II and III with 19–21 and 20 tactile setae, respectively; genu I with 2 solenidia . . . . .  
 . . . . . *C. coerulipes* (including subspecies *C. c. quadrisetosus*)  
 - Trochanter I with 1 seta, tarsi II and III with 27 and 24 tactile setae, respectively; genu I with 3 solenidia . . . . . *C. leiliae*  
 14 (12) Prodorsal seta *mps* reaching at most the base of co-lateral *lps* . . . . . *C. kauaiensis*  
 - Prodorsal setae *mps* reaching well beyond the bases of co-lateral *lps* . . . . . *C. cytoides*



**FIGURES 45–49.** *Cyta* key illustrations. Fig. 45. *Cyta reticulata*, ventral, illustrating reticulated pattern coxae and subcapitulum. Figs. 46a–d. Arrangement of prodorsal setae *at*, *lps*, *pt*, and *mps*; dashed lines indicate setae in alignment. Figs. 47, 49. Setae. Fig. 48. Prodorsal striae broken or continuous. Figure 45 modified from Soliman and Zaher (1975). Figure 48a modified from Atyeo (1960a). Figure 48b modified from Hernandez *et al.* (2011). Figure 49 modified from Den Heyer (1981).

**Key to adult *Trachymolgus*** (Modified from Fisher *et al.* 2011; *T. recki* was not included, as it was most likely described based on immature stages, see discussion in Fisher *et al.* 2011)

- 1 Movable digit with 3 teeth; pedipalpal basi- and telofemur completely fused; leg basi- and telofemur III–IV completely fused; dark purple; Mexico . . . . . *T. jesusi*  
 - Movable digit with 1 tooth; pedipalpal basi- and telofemur either divided or only partially fused dorsally; leg basi- and telofemur divided; dark purple to black . . . . . 2  
 2 (1) Pedipalpal basi- and telofemur divided; black; Palearctic . . . . . *T. nigerrimus*  
 - Pedipalpal basi- and telofemur fused dorsally; dark purple; U.S.A . . . . . *T. purpureus*

### Key to adult *Biscirus*

The following nine species are not included as the original descriptions lack sufficient standard comparative characters: *Biscirus anomalicornis*, *B. kobachidzei*, *B. melanostoma*, *B. nevadicus*, *B. opimus*, *B. peragilis*, *B. sardicus*, *B. splendida*, *B. variegatus*.

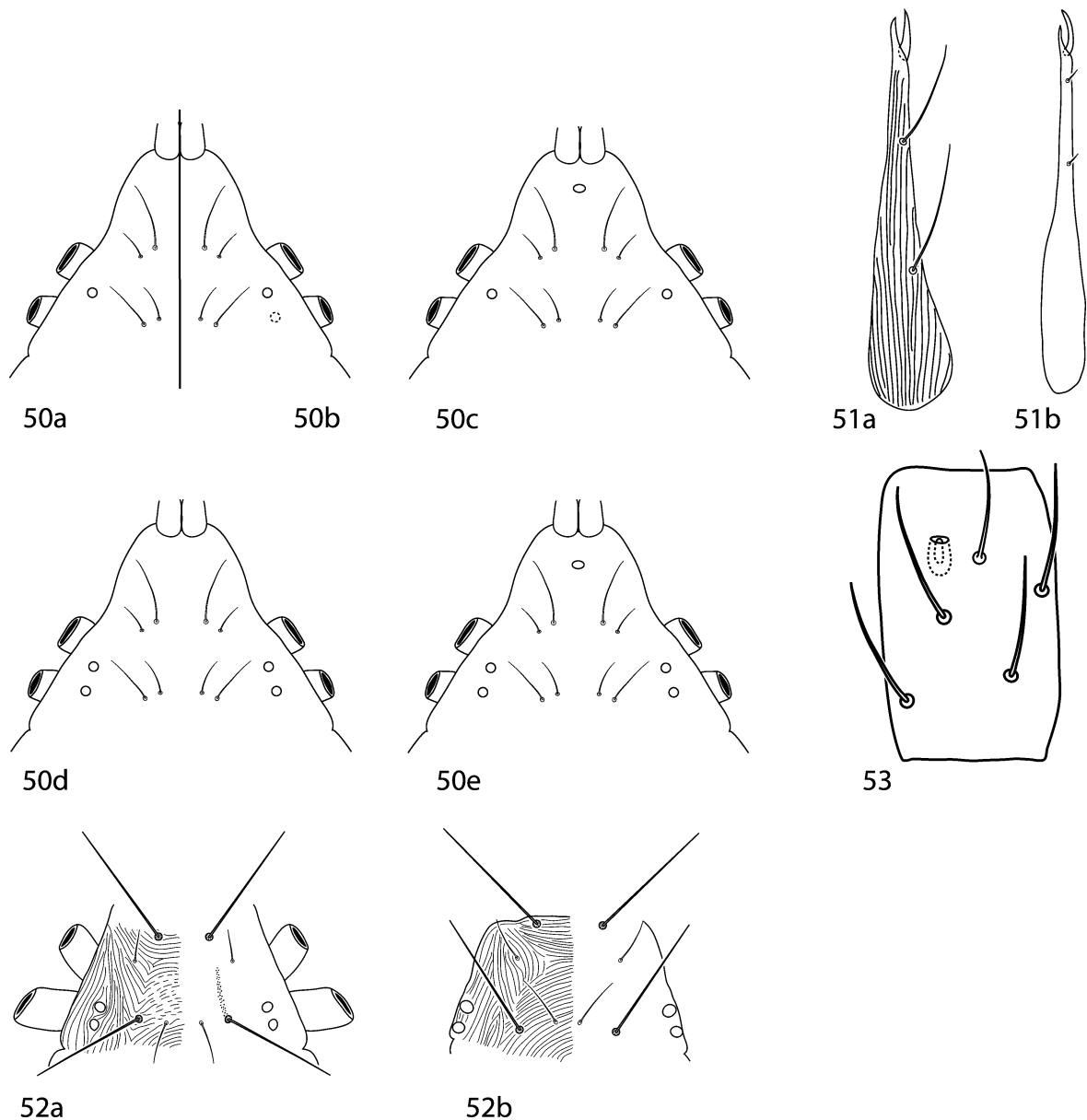
Setal counts of the pedipalpal tibiotarsus include both simple setae and solenidia as some authors did not differentiate between setal types in the original species descriptions.

1	Pedipalpal tibiotarsus with 2 setae, plus <i>des, ves</i> . . . . .	2
-	Pedipalpal tibiotarsus with 3 setae, plus <i>des, ves</i> . . . . .	<i>B. pseudothori</i>
-	Pedipalpal tibiotarsus with 4 setae, plus <i>des, ves</i> . . . . .	<i>B. norvegicus</i>
-	Pedipalpal tibiotarsus with 6 setae, plus <i>des, ves</i> . . . . .	<i>B. nixis</i>
-	Pedipalpal tibiotarsus with 8 setae, plus <i>des, ves</i> . . . . .	<i>B. uncinatus</i>
-	Pedipalpal tibiotarsus with 11 setae, plus <i>des, ves</i> . . . . .	<i>B. macfarlanei</i>
-	Pedipalpal tibiotarsus with 12 setae, plus <i>des, ves</i> . . . . .	<i>B. insularis</i>
2 (1)	Cheliceral setae minute (1/4 the distance between bases). . . . .	<i>B. simplexus</i>
-	Cheliceral setae of normal length (> 1/3 distance between bases) . . . . .	3
3 (2)	Pedipalpal basifemur with 2 setae. . . . .	4
-	Pedipalpal basifemur with 3 setae. . . . .	<i>B. thori</i>
-	Pedipalpal basifemur with 1 setae. . . . .	<i>B. illinoisensis</i> .
4 (3)	Unpaired median eye present . . . . .	5
-	Unpaired median eye absent . . . . .	6
5 (4)	Cheliceral setae separated by distance equal to 1.5 times length of distal seta. . . . .	<i>B. iranensis</i>
-	Cheliceral setae separated by distance equal to 3 times length of distal seta . . . . .	<i>B. quinqueoculatus</i>
6 (4)	Telofemur I with 3 setae . . . . .	<i>B. psammina</i>
-	Telofemur I with 4 setae . . . . .	7
-	Telofemur I with 5 setae . . . . .	8
7 (6)	Legs I-IV setal formula: coxae 5-4-5-5; basifemora 8-8-6-4; telofemora 4-5-4-4 . . . . .	<i>B. skuinbaaiensis</i>
-	Legs I-IV setal formula: coxae 3-3-6-4; basifemora 10-7-7-3; telofemora 4-4-3-3 . . . . .	<i>B. lootsi</i>
8 (6)	Leg telofemur IV with 3 setae. . . . .	9
-	Leg telofemur IV with 4 setae. . . . .	12
9 (8)	Pedipalpal genu about twice the length of telofemur . . . . .	<i>B. vulgaris</i>
-	Pedipalpal genu about the same length as telofemur . . . . .	10
10 (9)	Prodorsal seta <i>mps</i> reaching only halfway to <i>pt</i> . . . . .	<i>B. aquilonius</i>
-	Prodorsal seta <i>mps</i> reaching bases of <i>pt</i> . . . . .	11
11 (10)	Coxae IV with 4 setae; basifemora I-V setal formula 8-9-7-4 . . . . .	<i>B. silvaticus</i>
-	Coxae IV with 2 setae; basifemora I-V setal formula 7-7-4/5-3 . . . . .	<i>B. obliquus</i>
12 (8)	Legs I-IV setal formula: coxae 5-4-5-3; basifemora 7-7-6-3; telofemora 5-5-4/5-4 . . . . .	<i>B. arenarius</i>
-	Legs I-IV setal formula: coxae 4-4-5-3; basifemora 8-8-6-5; telofemora 5-5-3-4 . . . . .	<i>B. amplexus</i>
-	Legs I-IV setal formula: coxae 6-4-6-4; basifemora 10-9-7-4; telofemora 5-5-4-4. . . . .	<i>B. kleinmondiensis</i>
-	Legs I-IV setal formula: coxae 5-5-5/6-3; basifemora 9-7-6-4; telofemora 5-5-4-4 . . . . .	<i>B. magdalenae</i>

### Key to adult *Spinibdella* (Figs. 50–53)

The following six species are not included as the original descriptions lack the relevant discriminative characters: *S. atyeoi*, *S. californica*, *S. iberica*, *S. lignicola*, *S. tenella*, and *S. trisetosa*.

1	One pair of lateral eye lenses present (Fig. 50a, b) (may have a posterior pair of subcuticular eyes that lack lenses and are often obliterated upon clearing or slide mounting [Fig. 50b] or an unpaired median eye [Fig. 50c]). . . . .	2
-	Two pairs of lateral lenses present (Fig. 50d) (unpaired median eye may also be present [Fig. 50e]). . . . .	4
2 (1)	Unpaired median eye present (Fig. 50c) . . . . .	<i>S. trinomma</i>
-	Unpaired median eye absent (Figs. 50a,b) . . . . .	3
3 (2)	Leg tibia I with 14 sts, 13 solenidia, 1 famulus, 1 trichobothrium . . . . .	<i>S. polyattenuata</i>
-	Leg tibia I with 14 sts, 2 solenidia (1 <i>asl</i> , 1 <i>bsl</i> ), 1 trichobothrium . . . . .	<i>S. depressa</i>
-	Leg tibia I with 10 sts, 5 <i>asl</i> , 1 trichobothrium . . . . .	<i>S. antarctica</i>
4 (1)	Unpaired median eye present (Fig. 50e) . . . . .	5
-	Unpaired median eye absent (Fig. 50d) . . . . .	9
5 (4)	Cheliceral setae long (Fig. 51a). . . . .	6
-	Chelicera setae short, minute (sometimes barely perceptible) (Fig. 51b) . . . . .	8
6 (5)	Prodorsal striations between <i>at</i> and <i>pt</i> broken (Fig. 52a) . . . . .	<i>S. namibiensis</i>
-	Prodorsal striations between <i>at</i> and <i>pt</i> continuous (Fig. 52b) . . . . .	7
7 (6)	Prodorsal seta <i>lps</i> reaching to bases of <i>at</i> ; <i>lps</i> closer to <i>at</i> than to <i>pt</i> . . . . .	<i>S. thori</i>
-	Prodorsal seta <i>lps</i> not reaching bases of <i>at</i> ; <i>lps</i> closer to <i>pt</i> than to <i>at</i> . . . . .	<i>S. tadjikistanica</i>
8 (5)	<i>mps</i> and <i>pt</i> approximate (distance <i>mps-mps</i> about 10 times the distance <i>mps-pt</i> ). . . . .	<i>S. quinqueoculata</i>
-	<i>mps</i> and <i>pt</i> distant from each other (distance <i>mps-mps</i> equal to <i>mps-pt</i> ). . . . .	<i>S. arenosa</i>



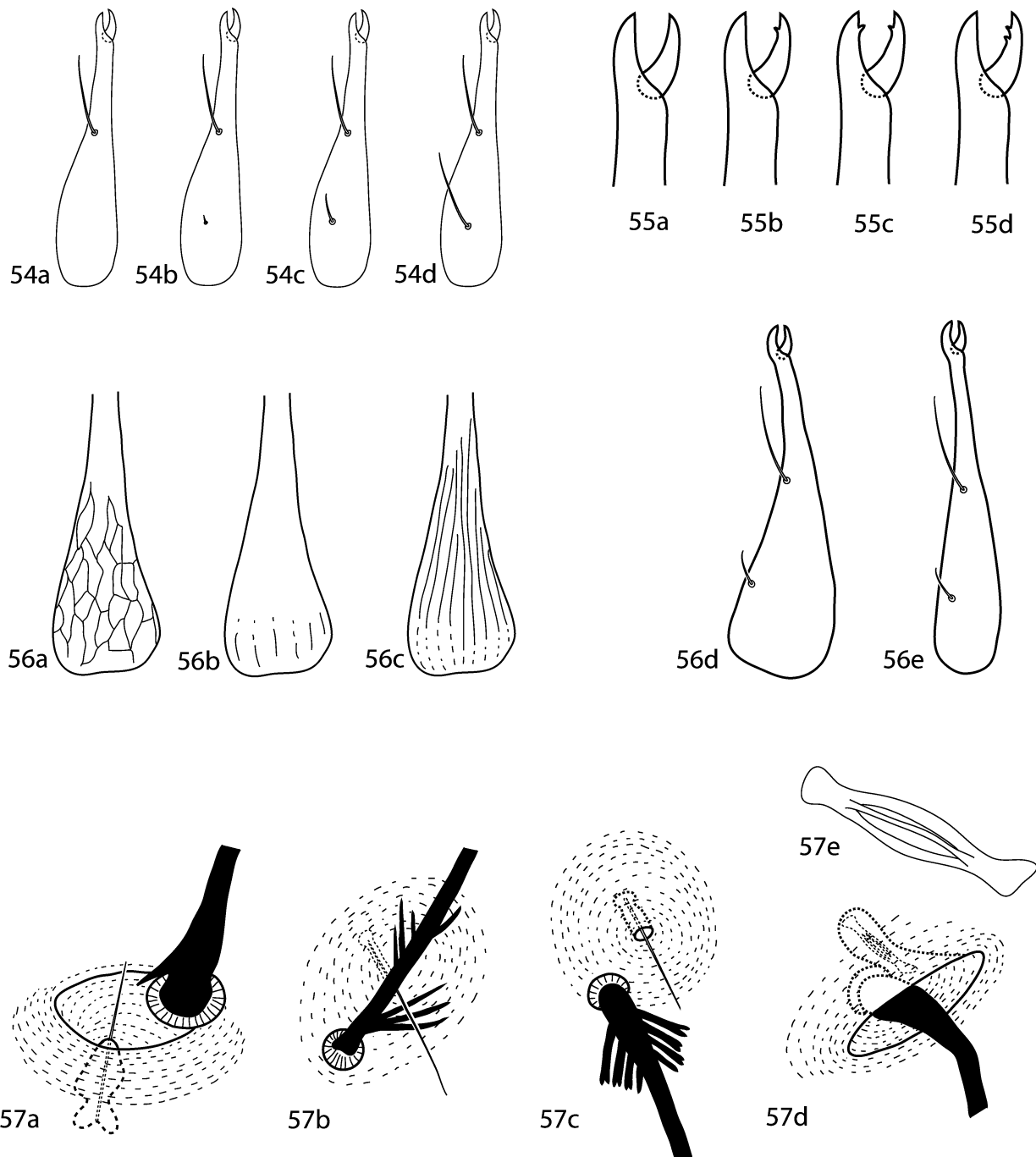
**FIGURES 50–53.** *Spinibdella* key illustrations. Fig. 50. Number of eye lenses present. Fig. 51. Chelicerae. Fig. 52. Prodorsal striations broken or continuous. Fig. 53. Tibia II recessed blunt solenidium. Figs. 52a,b modified from Omukunda *et al.* (2012).

- 9 (4) Chelicera with striations present, clearly visible; cheliceral setae long (as in Fig. 51a); pedipalps extend beyond gnathosoma. . . . . 10
- Chelicera with striations absent or poorly visible; cheliceral setae short (as in Fig. 51b); pedipalps do not extend beyond gnathosoma. . . . . 24
- Spinibdella gibberabdomen* keys here but no relevant information about cheliceral striation or chaetotaxy was provided.
- 10 (9) Central area of prodorsum with longitudinal striae. . . . . 11
- Central area of prodorsum with transverse striae . . . . . 14
- 11 (10) Blunt solenidium deeply recessed present on tibia II. . . . . *S. mali*
- Blunt solenidium deeply recessed absent on tibia II . . . . . 12
- 12 (11) Pedipalpal femur (basi + telofemur) with 11 setae . . . . . *S. longistriata*
- Pedipalpal femur (basi + telofemur) with 8 setae . . . . . 13
- 13 (12) Coxa I with 6 or 7 setae. . . . . *S. cronini*
- Coxa I with 9 setae . . . . . *S. subrufa*
- 14 (10) Tibia II with deeply recessed blunt solenidium (Fig. 53) present (other solenidia present or absent). . . . . 15
- Tibia II without deeply recessed blunt solenidium (other solenidia present or absent). . . . . 19
- 15 (14) Coxa I with 4 setae; coxa IV with 3 setae. . . . . *S. ampulla*
- Coxa I with 6 or more setae; coxa IV with 4 or more setae . . . . . 16
- 16 (15) Coxa I with 10 setae; telofemur III with 4 setae . . . . . *S. bioculata*

-	Coxa I with 9 setae; telofemur III with 4 setae	<i>S. bifurcata</i>
-	Coxa I with 8 or fewer setae; telofemur III with 5 or 6 setae	17
17 (16)	Genital plate each with 8 setae	<i>S. dusta</i>
-	Genital plate each with 10 setae	18
18 (17)	Pedipalpal telofemur with 1 seta	<i>S. smileyi</i>
-	Pedipalpal telofemur with 2 setae; leg coxa II with 8 setae	<i>S. tabarii</i>
-	Pedipalpal telofemur with 2 setae; leg coxa II with 7 setae	<i>S. denheyeri</i>
19 (14)	Tibia I with deeply recessed blunt solenidion	20
-	Tibia I without deeply recessed blunt solenidion	21
20 (19)	Leg basifemur I with 8 setae; telofemur I with 7 setae	<i>S. rapida</i>
-	Leg basifemur I with 6 setae; telofemur I with 5 setae	<i>S. yeni</i>
21 (19)	Leg basifemur I with 9 setae; telofemur I with 6 setae	<i>S. novemsetosa</i>
-	Leg basifemur I with 10 or more setae; telofemur I with 7 or more setae	22
22 (21)	Coxa IV with 3 or 4 setae	<i>S. pongolensis</i>
-	Coxa IV with 6 or 7 setae	23
23 (22)	Leg I–IV coxal formula 10-8-10-7; basifemora 10-10-5-4	<i>S. howarthi</i>
-	Leg I–IV coxal formula 8-7-7-6; basifemora 12-8-7-3	<i>S. ornata</i>
-	Leg I–IV coxal formula 10-8-8-7; basifemora 13-12-7-4	<i>S. corticis</i>
24(9)	Hysterosomal setae reaching bases of subsequent setae	<i>S. reducta</i>
-	Hysterosomal setae shorter, not reaching bases of subsequent setae	25
25 (24)	Tibia I with 4 <i>asl</i> , 1 <i>bsl</i>	<i>S. ankylotricha</i>
-	Tibia I with 8 <i>asl</i> , 0 <i>bsl</i>	<i>S. tenuirostris</i>

### Key to adult *Odontoscirus* (Figs. 54–60)

1	1 cheliceral seta present (Fig. 54a)	2
-	2 cheliceral setae present (proximal seta may be reduced, giving the appearance of a single seta) (Figs. 54b–d)	13
2(1)	Prodorsal seta <i>lps</i> present	<i>O. grandiflora</i>
-	Prodorsal seta <i>lps</i> absent	3
3(2)	Pedipalpal tibiotarsus with less than 10 setae (solenidia and terminal setae included)	4
-	Pedipalpal tibiotarsus with 10 or more setae (solenidia and terminal setae included)	6
4 (3)	Pedipalpal basifemur with 4 setae; pedipalpal tibiotarsus with 6 setae	<i>O. raeticus</i>
-	Pedipalpal basifemur with 5 setae; pedipalpal tibiotarsus with 7 setae	5
5 (4)	Coxae I–IV setal formula 6-3-6-2; telofemora I–IV setal formula 8-7-7-7	<i>O. bisetosa</i>
-	Coxae I–IV setal formula 5-3-4-2; telofemora I–IV setal formula 8-8-4-4	<i>O. amamiensis</i>
6(3)	Pedipalpal tibiotarsus with more than 20 setae (solenidia and terminal setae included)	7
-	Pedipalpal tibiotarsus with 16 or fewer setae (solenidia and terminal setae included)	8
7 (6)	Trochanters setal formula I–IV 2-2-2-3	<i>O. conformis</i>
-	Trochanters setal formula I–IV 1-1-1-1	<i>O. tanta</i>
8 (6)	Chelicera with reticulations (Fig. 56a)	9
-	Chelicera without reticulations (Figs. 56b, c, d, e)	10
9 (8)	Pedipalpal tibiotarsus with 16 setae (solenidia and terminal setae included); movable cheliceral digit with 1 tooth; telofemur IV with 7 setae; genu II with 4 <i>asl</i>	<i>O. graminis</i>
-	Pedipalpal tibiotarsus with 15 setae (solenidia and terminal setae included); movable cheliceral digit with 2 teeth; telofemur IV with 7 setae; genu II with 5 <i>asl</i>	<i>O. haramotoi</i>
-	Pedipalpal tibiotarsus with 15 setae (solenidia and terminal setae included); movable cheliceral digit with 1 tooth teeth; telofemur IV with 6 setae; genu II with 2 <i>asl</i>	<i>O. iraniensis</i>
10 (8)	Pedipalpal genu with 3 setae; pedipalpal femur with 10 setae	<i>O. annona</i>
-	Pedipalpal genu with 3 setae; pedipalpal femur with 9 setae	<i>O. augusta</i>
-	Pedipalpal genu with 4 setae	11
11 (10)	Coxal setal formula I–IV 4-3-4-3	<i>O. affinis</i>
-	Coxal setal formula I–IV 3-3-3-3	<i>O. livistonana</i>
-	Coxal setal formula I–IV 5-3-4-2	12
12 (11)	Pedipalpal tibiotarsus with 16 setae (solenidia and terminal setae included); basifemora I–IV setal formula 16-15-13-4; telofemora I–IV setal formula 7-8-6-5	<i>O. bifurcata</i>
-	Pedipalpal tibiotarsus with 15 setae (solenidia and terminal setae included); basifemora I–IV setal formula 15-14-11-6; telofemora I–IV setal formula 6-7-6-7	<i>O. longirostris</i>
13 (1)	Proximal cheliceral seta reaching or surpassing the base of distal seta	14
-	Proximal cheliceral seta not reaching the base of distal seta	31
14 (13)	Cheliceral setae approximate (distance between bases 1/6 of cheliceral length, or less)	15
-	Cheliceral setae distant (distance between bases 1/5 of cheliceral length, or more)	20
15 (14)	Both cheliceral seta of approximate the same length	16
-	Proximal cheliceral seta noticeably shorter than distal one (half its length or less)	17



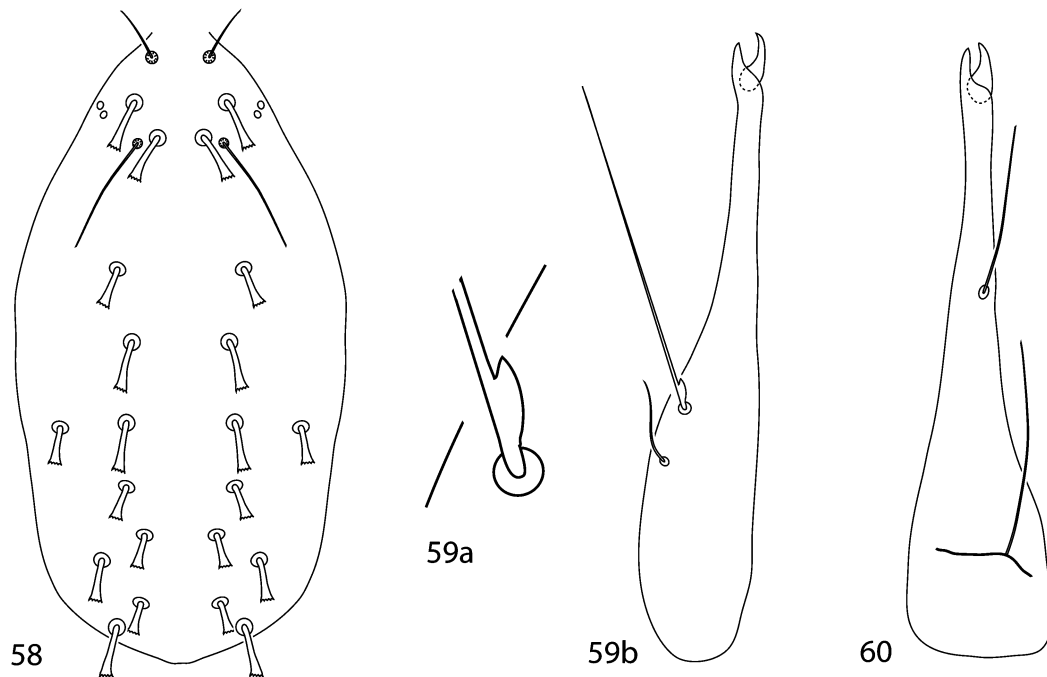
**FIGURES 54–57.** *Odontoscirus* key illustrations. Figures are schematic and not necessarily represent individual species; therefore, the addition or lack of characters not discussed in a specific figure (*e.g.*, teeth on the movable digit in Figs. 55a–d) are not diagnostic of species that key using that figure. Figs. 54a–d. Chelicera illustrating the cheliceral setae. Figs. 55a–d. Chelicera illustrating teeth on the cheliceral digits. Figs. 56a–e. Chelicera illustrating degrees of striations or reticulations. Figs. 57a–e. Modifications of the base of the posterior prodorsal trichobothria.

- 16 (15) Chelicera with reticulations basally; pedipalpal tibiotarsus with 16 setae ..... *O. edentata*
- Chelicera without reticulations; pedipalpal tibiotarsus with 10 setae ..... *O. gressitti*
- Chelicera without reticulations; pedipalpal tibiotarsus with 7 setae ..... *O. meridionalis*
- .....
- 17 (15) Proximal cheliceral seta one third the length of distal seta; distal seta bifid at base (Figs. 59a, b) ..... *O. spinosa*
- Proximal cheliceral seta half the length of distal seta; distal seta not bifid ..... 18
- 18 (17) Chelicera with suture at the base of proximal seta ..... *O. brevicornis*
- Chelicera without suture at base of proximal seta ..... 19
- 19 (18) Tibia I with 2 *asl* and 2 *bsl* ..... *O. malayensis*

- Tibia I with 3 <i>asl</i> and 1 <i>bsl</i> . . . . .	<i>O. nipponicus</i>
- Tibia I with 4 <i>asl</i> and 1 <i>bsl</i> . . . . .	<i>O. iota</i>
20 (14) Lateral prodorsal seta ( <i>lps</i> ) present . . . . .	21
- Lateral prodorsal seta ( <i>lps</i> ) absent. . . . .	22
21 (20) Posterior prodorsal trichobothrium ( <i>pt</i> ) modified, much shorter than <i>lps</i> . . . . .	<i>O. insolita</i>
- Posterior prodorsal trichobothrium ( <i>pt</i> ) unmodified, subequal in length to <i>lps</i> . . . . .	<i>O. manipurensis</i>
- Posterior prodorsal trichobothrium ( <i>pt</i> ) unmodified, shorter than <i>lps</i> . . . . .	<i>O. hurdi</i>
22 (20) Coxa IV with 2 setae . . . . .	23
- Coxa IV with 3 setae . . . . .	29
23 (22) Coxa II with 1 seta; trochanter III with 2 setae . . . . .	<i>O. gleba</i>
- Coxa II with 2 or more setae; trochanter III with 1 seta . . . . .	24
24 (23) Coxa I with 2 setae; pedipalpal tibiotarsus with 7 setae . . . . .	<i>O. reticulata</i>
- Coxa I with 3 or more setae; pedipalpal tibiotarsus with 9 or more setae . . . . .	25
25 (24) Pedipalpal tibiotarsus with 9 or 10 setae . . . . .	26
- Pedipalpal tibiotarsus with 12 or more setae . . . . .	27
26 (25) Posterior dorsal trichobothrium ( <i>pt</i> ) in contact with lateral prodorsal seta ( <i>lps</i> ) . . . . .	<i>O. communis</i>
- Posterior dorsal trichobothrium ( <i>pt</i> ) not in contact with lateral prodorsal seta ( <i>lps</i> ) . . . . .	<i>O. nimia</i>
27 (25) Coxa III with 2 setae . . . . .	<i>O. furcatus</i>
- Coxa III with 4 or 5 setae . . . . .	28
28 (27) Coxae I–IV setal formula 4-3-4-2; pedipalpal tibiotarsus with 14 setae . . . . .	<i>O. macquariensis</i>
- Coxae I–IV setal formula 5-2-4-2; pedipalpal tibiotarsus with 12 setae . . . . .	<i>O. montanus</i>
- Coxae I–IV setal formula 3-3-4-2; pedipalpal tibiotarsus with 12 setae . . . . .	<i>O. petila</i>
- Coxae I–IV setal formula 4-4-5-2; pedipalpal tibiotarsus with 12 setae . . . . .	<i>O. watsoni</i>
- Coxae I–IV setal formula 3-4-4-2; pedipalpal tibiotarsus with 19 setae . . . . .	<i>O. womersleyi</i>
29 (22) Lateral prodorsal seta ( <i>lps</i> ) present . . . . .	<i>O. atro</i>
- Lateral prodorsal seta ( <i>lps</i> ) absent. . . . .	30
30 (29) Pedipalpal tibiotarsus with 14 setae . . . . .	<i>O. californica</i>
- Pedipalpal tibiotarsus with 12 setae . . . . .	<i>O. simplex</i>
- Pedipalpal tibiotarsus with 9 setae . . . . .	<i>O. camellae</i>
31 (13) Lateral prodorsal seta ( <i>lps</i> ) present . . . . .	<i>O. infrequens</i>
- Lateral prodorsal seta ( <i>lps</i> ) absent. . . . .	32
32 (31) Proximal cheliceral seta vestigial (1/6 the length of distal seta or less, often only alveolus visible) . . . . .	33
- Proximal cheliceral seta normal (at least 1/3 the length of distal seta) . . . . .	36
33 (32) Chelicera with reticulate ornamentation . . . . .	34
- Chelicera with faint striation or smooth . . . . .	35
34 (33) Cheliceral movable digit edentate (Fig. 55a); coxa IV with 2 setae . . . . .	<i>O. pilahensis</i>
- Cheliceral movable digit with 1 tooth (Fig. 55b); coxa IV with 3 setae . . . . .	<i>O. koloseta</i>
35 (33) Pedipalpal tibiotarsus with 8 setae; coxae I–IV setal formula 5-3-4-2; basifemora I–IV setal formula 12-11-11-4. . . . .	<i>O. currax</i>
- Pedipalpal tibiotarsus with 18 setae; coxae I–IV setal formula 4-4-5-3/4; basifemora I–IV setal formula 16-14-12-8. . . . .	<i>O. georgianensis</i>
- Pedipalpal tibiotarsus with 15 setae; coxae I–IV setal formula 4-3-4-3; basifemora I–IV setal formula 14/15-15-11/12-7 . . . . .	<i>O. hadroseta</i>
- Pedipalpal tibiotarsus with 14 setae; coxae I–IV setal formula 4-3-4-3; basifemora I–IV setal formula 16-15-14-8 . . . . .	<i>O. harpax</i>
- Pedipalpal tibiotarsus with 21 setae; coxae I–IV setal formula 4-4-5-2; basifemora I–IV setal formula 26-24-20-14 . . . . .	<i>O. hospita</i>
36 (32) Proximal cheliceral seta distinctly longer than distal seta. . . . .	37
- Proximal cheliceral seta subequal or shorter than distal seta . . . . .	42
37 (36) Pedipalpal tibiotarsus with 6 setae . . . . .	<i>O. subterranea</i>
- Pedipalpal tibiotarsus with 9 or more setae . . . . .	38
38 (37) Posterior dorsal trichobothrium ( <i>pt</i> ) in contact with lateral prodorsal seta ( <i>lps</i> ) . . . . .	39
- Posterior dorsal trichobothrium ( <i>pt</i> ) not in contact with lateral prodorsal seta ( <i>lps</i> ) . . . . .	41
39 (38) Pedipalpal tibiotarsus with 11 setae (including <i>des</i> , <i>ves</i> ); chelicera with suture at the base of proximal seta (Fig. 60) . . . . .	<i>O. japonicus</i>
- Pedipalpal tibiotarsus with 9 setae (including <i>des</i> , <i>ves</i> ); chelicera without suture at the base of proximal seta . . . . .	40
40 (39) Coxae I–IV setal formula 4-3-4-2; basifemora I–IV setal formula 14-12-11-4 . . . . .	<i>O. australicus</i>
- Coxae I–IV setal formula 4-4-5-4; basifemora I–IV setal formula 17-13-10-6 . . . . .	<i>O. truncata</i>
41 (38) Pedipalpal tibiotarsus with 15 setae (including <i>des</i> , <i>ves</i> ); coxae I–IV setal formula 4-3-4-2/3; trochantera seta formula 1-1-1-1; basifemora I–IV setal formula 20/22-18-14-10 . . . . .	<i>O. bidentata</i>
- Pedipalpal tibiotarsus with 29 setae (including <i>des</i> , <i>ves</i> ); coxae I–IV setal formula 13-17-16-10; trochantera seta formula 4-4-6-6; basifemora I–IV setal formula 57-59-47-54 . . . . .	<i>O. curvus</i>
- Pedipalpal tibiotarsus with 16 setae (including <i>des</i> , <i>ves</i> ); coxae I–IV setal formula 4-3-4-2; trochantera seta formula 1-1-1-1; basifemora I–IV setal formula 18-15-15-10. . . . .	<i>O. sabulosa</i>
- Pedipalpal tibiotarsus with 21 setae (including <i>des</i> , <i>ves</i> ); coxae I–IV setal formula 6-4-4-2; trochantera seta formula 1-1-1-1; basifemora I–IV setal formula 21-20-16-9. . . . .	<i>O. serpentinus</i>
42 (36) Proximal cheliceral seta subequal to distal seta . . . . .	43

-	Proximal cheliceral seta shorter than distal seta	51
43 (42)	Lateral prodorsal seta ( <i>lps</i> ) present	44
-	Lateral prodorsal seta ( <i>lps</i> ) absent	45
44 (43)	Pedipalp tibiotarsus with 11 setae	<i>O. atyaei</i>
-	Pedipalp tibiotarsus with 6 setae (Fig. 58)	<i>O. guajavae</i>
45 (43)	Posterior prodorsal trichobothrium leaf-like	<i>O. lapidaria</i>
-	Posterior prodorsal trichobothrium either reduced or normal, but not leaf-like	46
46 (45)	Chelicera with reticulated ornamentation	<i>O. virgulatus</i>
-	Chelicera smooth, without reticulated ornamentation	47
47 (46)	Posterior dorsal trichobothrium ( <i>pt</i> ) in contact with lateral prodorsal seta ( <i>lps</i> )	48
-	Posterior dorsal trichobothrium ( <i>pt</i> ) not in contact with lateral prodorsal seta ( <i>lps</i> )	49
48 (47)	Pedipalp tibiotarsus with 11 setae (including <i>des</i> , <i>ves</i> ); coxae I–IV setal formula 4-3-4-3; basifemora I–IV setal formula 13-12-6-4	<i>O. kazeruni</i>
-	Pedipalp tibiotarsus with 14 setae (including <i>des</i> , <i>ves</i> ); coxae I–IV setal formula 5-3-4-2; basifemora I–IV setal formula 14-14-10-3	<i>O. parvisetosa</i>
49 (47)	Trochantera I–V setal formula 1-2-2-1	<i>O. oraria</i>
-	Trochantera I–V setal formula 2-2-2-2/3	<i>O. tellustris</i>
-	Trochantera I–V setal formula 1-1-1-1	50
50 (49)	Pedipalp tibiotarsus with 11 setae (including <i>des</i> , <i>ves</i> ); coxae I–IV setal formula 6-4-4-2; basifemora I–IV setal formula 20-15-10-5	<i>O. paganus</i>
-	Pedipalp tibiotarsus with 14 setae (including <i>des</i> , <i>ves</i> ); coxae I–IV setal formula 5-3-4-2; basifemora I–IV setal formula 17-14-11-5	<i>O. tasmaniensis</i>
-	Pedipalp tibiotarsus with 16 setae (including <i>des</i> , <i>ves</i> ); coxae I–IV setal formula 5-4-5-3; basifemora I–IV setal formula 16-14-11-7	<i>O. agrestis</i>
-	Pedipalp tibiotarsus with 16 setae (including <i>des</i> , <i>ves</i> ); coxae I–IV setal formula 6-4-5-3; basifemora I–IV setal formula 13-10-9-7	<i>O. procincta</i>
-	Pedipalp tibiotarsus with 17 setae (including <i>des</i> , <i>ves</i> ); coxae I–IV setal formula 5-4-4-2; basifemora I–IV setal formula 17-16-13-6	<i>O. alacris</i>
-	Pedipalp tibiotarsus with 18 setae (including <i>des</i> , <i>ves</i> ); coxae I–IV setal formula 7/6-6/5-5-4	<i>O. hygrotus</i>
-	Pedipalp tibiotarsus with 18 setae (including <i>des</i> , <i>ves</i> ); coxae I–IV setal formula 6-6-6-6; basifemora I–IV setal formula 14-14-10-5	<i>O. quadrisetosa</i>
-	Pedipalp tibiotarsus with 19 setae (including <i>des</i> , <i>ves</i> ); coxae I–IV setal formula 9-10-9-7; basifemora I–IV setal formula 17-15-13-8	<i>O. pacifica</i>
51 (42)	Proximal cheliceral seta about 1/4 the length of distal seta, or shorter	52
-	Proximal cheliceral seta about 1/3 the length of distal seta, or longer	56
52 (51)	Pedipalp tibiotarsus with 11 setae	<i>O. intermedius</i>
-	Pedipalp tibiotarsus with 15 or 16 setae	53
53 (52)	Basifemur III with 8 or fewer setae; basifemur IV with 5 setae	54
-	Basifemur III with 15 setae; basifemur IV with 8 or more setae	55
54 (53)	Coxae I–IV setal formula 6-5-5-4; basifemora I–IV setal formula 14-12-8-5	<i>O. bryi</i>
-	Coxae I–IV setal formula 6-4-5-2; basifemora I–IV setal formula 15-12-4-5	<i>O. multicia</i>
55 (53)	Posterior dorsal trichobothrium ( <i>pt</i> ) subequal in length to lateral prodorsal seta ( <i>lps</i> ), both setae about 100µm; <i>lps</i> not barbed basally	<i>O. odonata</i>
-	Posterior dorsal trichobothrium ( <i>pt</i> ) about 8 times shorter than lateral prodorsal seta ( <i>lps</i> ), about 30µm; <i>lps</i> barbed basally (Fig. 57c)	<i>O. intricata</i>
56 (51)	Trochanters I–IV setal formula 1-1-1-1	57
-	Trochanters I–IV with 2 or more setae each	60
57 (56)	Pedipalp tibiotarsus with 9 or 10 setae (including <i>des</i> , <i>ves</i> )	58
-	Pedipalp tibiotarsus with 13 or more setae (including <i>des</i> , <i>ves</i> )	59
58 (57)	Pedipalp tibiotarsus with 9 setae (including <i>des</i> , <i>ves</i> ); coxae I–IV setal formula 5-3-4-2; basifemora III-IV setal formula 9-3	<i>O. alpinus</i>
-	Pedipalp tibiotarsus with 9 setae (including <i>des</i> , <i>ves</i> ); coxae I–IV setal formula 5-2-4-2/5; basifemora III-IV setal formula 6-3/4	<i>O. asiaticus</i>
-	Pedipalp tibiotarsus with 10 setae (including <i>des</i> , <i>ves</i> ); coxae I–IV setal formula 5-4-5-2; basifemora III-IV setal formula 10-8	<i>O. dubitata</i>
59 (57)	Pedipalp tibiotarsus with 13 setae (including <i>des</i> , <i>ves</i> ); coxae I–IV setal formula 5-3-4-2; basifemora I-IV setal formula 13-13-11-6	<i>O. hessei</i>
-	Pedipalp tibiotarsus with 13 setae (including <i>des</i> , <i>ves</i> ); coxae I–IV setal formula 6-5-5-4; basifemora I-IV setal formula 14/19-15/18-11/12-10/12	<i>O. rhachia</i>
-	Pedipalp tibiotarsus with 15 setae (including <i>des</i> , <i>ves</i> ); coxae I–IV setal formula 5/6-3/4-4-2; basifemora I-IV setal formula 16-15/17-11/12-5/6	<i>O. inflata</i>
-	Pedipalp tibiotarsus with 16 setae (including <i>des</i> , <i>ves</i> ); coxae I–IV setal formula 4-3-4-2; basifemora I-IV setal formula 22-19-17-9	<i>O. consanguinea</i>
-	Pedipalp tibiotarsus with 19 setae (including <i>des</i> , <i>ves</i> ); coxae I–IV setal formula 5-3-4-2; basifemora I-IV setal formula 18-17-	

14-10	.....	<i>O. vireti</i>
60 (56)	Basifemora I-IV with over 100 setae each	<i>O. hickmani</i>
-	Basifemora I-IV with 60 or fewer setae each	61
61 (60)	Pedipalp tibiotarsus with 16 setae (including <i>des</i> , <i>ves</i> ); coxae I-IV setal formula 6-9-8-5; trochantera I-IV setal formula 2-2-2-2; basifemora I-IV setal formula 26-21-21-18	<i>O. ancalae</i>
-	Pedipalp tibiotarsus with 27 setae (including <i>des</i> , <i>ves</i> ); coxae I-IV setal formula 8-10-11-5; trochantera I-IV setal formula 2-3-3-3; basifemora I-IV setal formula 45-46-48-45	<i>O. flexuosa</i>
-	Pedipalp tibiotarsus with 32 setae (including <i>des</i> , <i>ves</i> ); coxae I-IV setal formula 7-11-6-4; trochantera I-IV setal formula 2-3/4-4-8/9; basifemora I-IV setal formula 54-54-57-48	<i>O. copiosa</i>



**FIGURES 58–60.** *Odontoscirus* key illustrations. Figures are schematic and not necessarily represent individual species; therefore, the addition or lack of characters not discussed in a specific figure (e.g., teeth on the movable digit in Figs. 55a–d) are not diagnostic of species that key using that figure. Fig. 58 illustrates the highly modified, truncate dorsal setae of *O. guajavae*. Fig. 59. illustrates the modified anterior cheliceral seta of *O. spinosa*. Fig. 60 illustrates the cheliceral suture of *O. japonicus*. Figures 57a, c–e modified from Atyeo (1963a). Figure 57b modified from Shiba (1969). Figure 58 modified from Gupta (2002). Figure 59 modified from Atyeo (1960a). Figure 60 modified from Ehara (1961).

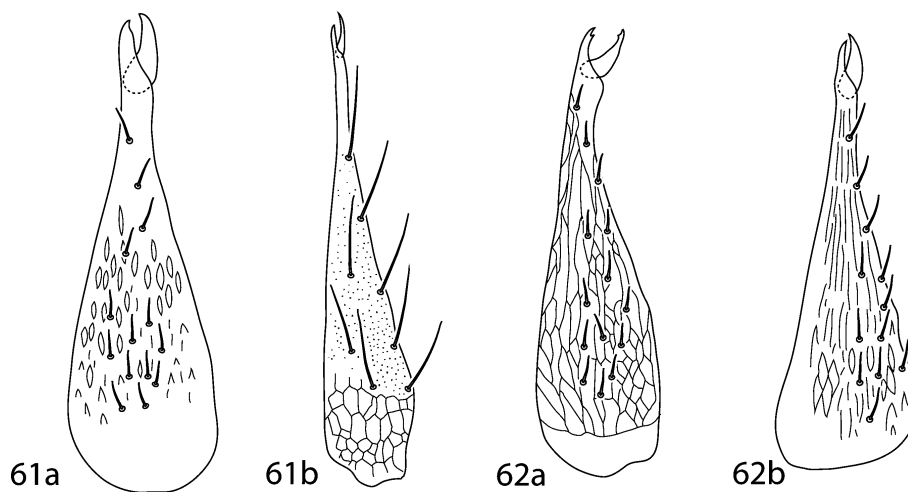
### Key to adult *Neomolgus* (Figs. 61–62)

*Neomolgus egregia* and *N. longipalpis* are not included as the original descriptions contain too few characters. Setal counts given for the pedipalpal tibiotarsus include the two long terminal setae and terminal solinidion.

1	4 setae on chelicera	.....	<i>N. maculatus</i>
-	6 or more setae on chelicera	.....	2
2	19 setae present on pedipalpal basifemora	.....	<i>N. longipalpis</i>
-	9 or fewer setae present on pedipalpal basifemora	.....	3
3 (2)	9 setae present on pedipalpal basifemora	.....	<i>N. paracapillatus</i>
-	7 or fewer setae present on pedipalpal basifemora	.....	4
4 (3)	Pedipalpal genua approximately the same length as pedipalpal telofemora	.....	5
-	Pedipalpal genua twice the length as pedipalpal telofemora	.....	15
-	Pedipalpal genua 1.5 times the length as pedipalpal telofemora	.....	<i>N. iraniensis</i>
5 (4)	Each chelicera with 15–17 setae	.....	<i>N. thorianus</i>
-	Each chelicera with 13 or fewer setae	.....	6
6 (5)	Chelicera without striations	.....	7
-	Chelicera with reticulated striations present, at least basally	.....	8
7 (6)	Each chelicera with 6–8 setae	.....	<i>N. mutabilis</i>
-	Each chelicera with 11–13 setae	.....	<i>N. aegyptiacus</i>
8 (6)	Pedipalpal tibiotarsus with 13 or 14 setae	.....	9



-	Pedipalpal tibiotarsus with 11 or fewer setae	10
9 (8)	Pedipalpal basifemur with 7 setae; chaetotaxy of coxae I–IV 5-5-4-3	<i>N. capillatus</i>
-	Pedipalpal basifemur with 5 setae; chaetotaxy of coxae I–IV 5-4-6-3	<i>N. clypeatus</i>
10 (8)	Cheliceral setae short, barely reaching the bases of subsequent setae	<i>N. lumarius</i>
-	Cheliceral setae long, tips surpassing the bases of subsequent setae	11
11 (10)	Each chelicera with 14 setae	<i>N. reticulatus</i>
-	Each chelicera with 11 or fewer setae	12
12 (11)	Pedipalpal basifemur with 3 setae	<i>N. aequalis</i>
-	Pedipalpal basifemur with 4 or more setae	13
13 (12)	Pedipalpal tibiotarsus with 11 setae	<i>N. pallipes</i>
-	Pedipalpal basifemur with 9 or fewer setae	14
14 (13)	Subcapitulum with 5 pairs of setae	<i>N. pratensis</i>
-	Subcapitulum with 6 pairs of setae	<i>N. pygmaeus</i>
-	<i>N. obsoletus</i> keys here but cannot be separated, as the number of subcapitular setae was not provided.	
15 (4)	Each chelicera with 16 or more setae	16
-	Each chelicera with 14 or fewer setae	17
16 (15)	Pedipalpal tibiotarsus with 12 setae	<i>N. seriatus</i>
-	Pedipalpal tibiotarsus with 15–17 setae	<i>N. sabulosus</i>
-	<i>N. lacustris</i> keys here in having 20 or more setae on the chelicerae, but cannot be separated as information on the tibiotarsus setae was not provided.	
17 (15)	Pedipalpal genu with 8 setae	<i>N. littoralis</i>
-	Pedipalpal genu with 4 setae	18
18 (17)	Pedipalpal basifemur with 4 setae	19
-	Pedipalpal basifemur with 6 setae	20
19 (8)	Pedipalpal tibiotarsus with 13 setae; each genital valve with 9 setae	<i>N. berlesei</i>
-	Pedipalpal tibiotarsus with 8 setae; each genital valve with 7 setae	<i>N. raptor</i>
-	Pedipalpal tibiotarsus with 8 setae; each genital valve with 10–12 setae	<i>N. monticola</i>
20 (18)	Chelicera with striations; each chelicera with 10–14 setae; pedipalpal tibiotarsus with 11–12 setae	<i>N. ontakensis</i>
-	Chelicera without striations; each chelicera with 7 setae; pedipalpal tibiotarsus with 9 setae	<i>N. raeticus</i>
-	Chelicera without striations; each chelicera with 11 setae; pedipalpal tibiotarsus with 11–13 setae	<i>N. helveticus</i>



**FIGURES 61–62.** *Neomolgus* key illustrations; chelicerae. Figure 61a modified from Schweizer & Bader (1963). Figure 61b modified from Shiba (1969). Figure 62a modified from Willmann (1951). Figure 62b modified from Schweizer & Bader (1963).

## APPENDIX 2.

### Supraspecific taxa

*Ammonia*  
*Amonia*  
*Bdella*  
*Bdellei*  
*Bdellidae*  
*Bdellidium*  
*Bdellinae*  
*Bdellodes*  
*Biscirus*  
*Caenobdella*  
*Chelifer*  
*Cyta*  
*Cytinae*  
*Cytobdella*  
*Hexabdella*  
*Hoplomolgus*  
*Hoploscirus*  
*Molgus*  
*Neomolgus*  
*Monotrichobdella*  
*Neomolgus*  
*Octobdellodes*  
*Odontoscirinae*  
*Odontoscirus*  
*Polytrichinae*  
*Rigibdella*  
*Scirus*  
*Scirus*  
*Spinibdella*  
*Spinibdellinae*  
*Tetrabdella*  
*Thoribdella*  
*Trachymolgus*  
*Troglobdella*

### Species taxa

*aegyptiacus*, *Neomolgus*  
*aequalis*, *Hoplomolgus*  
*aequalis*, *Neomolgus*  
*affinis*, *Bdellodes* (*Hoploscirus*)  
*affinis*, *Odontoscirus*  
*agrestis*, *Bdellodes* (*Hoploscirus*)  
*agrestis*, *Odontoscirus*  
*alacris*, *Bdellodes* (*Hoploscirusu*)  
*alacris*, *Odontoscirus*  
*aloios*, *Bdella*  
*alpinus*, *Odontoscirus*  
*amamiensis*, *Odontoscirus*  
*amarantina*, *Bdella*  
*americana*, *Ammonia*  
*americana*, *Cyta*  
*amplexus*, *Biscirus*  
*ampulla*, *Spinibdella*

*ancalae*, *Bdellodes* (*Hoploscirus*)  
*ancalae*, *Odontoscirus*  
*anguinesetosa*, *Bdella*  
*angustifolius*, *Bdella*  
*angustifolius*, *Bdellodes*  
*angustifolius*, *Odontoscirus*  
*ankylotricha*, *Spinibdella*  
*annona*, *Odontoscirus*  
*anomalicornis*, *Bdella*  
*anomalicornis*, *Biscirus* (*Biscirus*)  
*anomalicornis*, *Biscirus*  
*anona*, *Bdellodes*  
*antarctica*, *Bdella*  
*antarctica*, *Spinibdella*  
*aquiloniis*, *Biscirus*  
*artica*, *Bdella*  
*arcticus*, *Molgus*  
*arenaria*, *Bdella*  
*arenarius*, *Biscirus*  
*arenosa*, *Spinibdella*  
*asiaticus*, *Odontoscirus*  
*atro*, *Bdellodes*  
*atro*, *Odontoscirus*  
*atyeoi*, *Odontoscirus*  
*atyeoi*, *Spinibdella*  
*augusta*, *Bdellodes*  
*augusta*, *Odontoscirus*  
*australiana*, *Bdellodes* (*Hoploscirus*)  
*australicus*, *Biscirus* (*Biscirus*)  
*australicus*, *Biscirus*  
*australicus*, *Odontoscirus*  
*bakeri*, *Bdella*  
*basteri*, *Acarus*  
*basteri*, *Bdella*  
*berlesei*, *Bdella capillata* var.  
*berlesei*, *Molgus* (*Hoplomolgus*)  
*berlesei*, *Neomolgus*  
*bicincta*, *Bdella*  
*bidentata*, *Bdellodes*  
*bidentata*, *Odontoscirus*  
*bifurcata*, *Bdellodes*  
*bifurcata*, *Odontoscirus*  
*bifurcata*, *Spinibdella*  
*bioculata*, *Spinibdella*  
*biroi*, *Bdella*  
*bisetosa*, *Bdellodes*  
*bisetosa*, *Odontoscirus*  
*bombycina*, *Bdella*  
*borealis*, *Bdella*  
*boskopensis*, *Bdella*  
*brevicornis*, *Odontoscirus*  
*brevicornis*, *Thoribdella*  
*brevipalpa*, *Cyta*  
*brevirostris*, *Ammonia*  
*brevirostris*, *Cyta*

*brevirostris*, *Cyta latirostris* var.  
*brevitarsis*, *Hexabdella*  
*bryi*, *Bdellodes* (*Hoploscirus*)  
*bryi*, *Odontoscirus*  
*caeca*, *Bdella*  
*caeca*, *Bdella longicornis* var.  
*calandroides*, *Bdella*  
*calandroides*, *Molgus*  
*californica*, *Bdella*  
*californica*, *Bdellodes*  
*californica*, *Odontoscirus*  
*californica*, *Spinibdella*  
*californica*, *Thoribdella*  
*calva*, *Bdella*  
*camellae*, *Bdellodes* (*Hoploscirus*)  
*camellae*, *Odontoscirus*  
*cancroides*, *Acarus*  
*capillata*, *Bdella*  
*capillata*, *Hoplomolgus*  
*capillatus*, *Molgus* (*Hoplomolgus*)  
*capillatus*, *Molgus* (*Molgus*)  
*capillatus*, *Molgus*  
*capillatus*, *Neomolgus*  
*captiosa*, *Bdella*  
*cardinalis*, *Bdella*  
*carolae*, *Bdella*  
*chapultepecensis*, *Bdella*  
*chlorophana*, *Amonia*  
*chloropus*, *Amonia*  
*chloropus*, *Bdella*  
*cinquaginta*, *Hexabdella*  
*citri*, *Acarus*  
*citri*, *Bdella*  
*clypeatus*, *Molgus* (*Hoplomolgus*)  
*clypeatus*, *Molgus*  
*clypeatus*, *Neomolgus*  
*coeruleipes*, *Cyta*  
*coeruleipes*, *Ammonia*  
*coeruleipes*, *Bdella*  
*coeruleipes*, *Cyta*  
*communis*, *Bdellodes* (*Hoploscirus*)  
*communis*, *Odontoscirus*  
*communis*, *Thoribdella*  
*conformis*, *Bdellodes* (*Hoploscirus*)  
*conformis*, *Odontoscirus*  
*consanguinea*, *Bdellodes* (*Hoploscirus*)  
*consanguinea*, *Odontoscirus*  
*consobrinae*, *Bdella*  
*convexus*, *Biscirus sylvaticus*  
*copiosa*, *Bdellodes* (*Hoploscirus*)  
*copiosa*, *Odontoscirus*  
*corticis*, *Bdella*  
*corticis*, *Spinibdella*  
*cortis*, *Spinibdella*  
*crassipes*, *Bdella*

*crassirostris*, *Bdella*  
*cronini*, *Bdella*  
*cronini*, *Spinibdella*  
*cruciata*, *Ammonia*  
*cruciata*, *Amonia*  
*cruciata*, *Bdella*  
*cruentata*, *Bdella*  
*currax*, *Bdellodes* (*Hoploscirus*)  
*currax*, *Odontoscirus*  
*curtirostris*, *Biscirus*  
*curvus*, *Bdellodes* (*Hoploscirus*)  
*curvus*, *Odontoscirus*  
*cytoides*, *Bdella* (*Cytobdella*)  
*cytoides*, *Cyta*  
*decipiens*, *Bdella*  
*decipiens*, *Bdella longicornis* var.  
*denheyeri*, *Hexabdella*  
*denheyeri*, *Spinibdella*  
*depressa*, *Bdella*  
*depressa*, *Spinibdella*  
*dispar*, *Bdella*  
*distincta*, *Bdella*  
*distinguenda*, *Bdella*  
*dorsata*, *Bdella*  
*dubitata*, *Bdellodes* (*Hoploscirus*)  
*dubitata*, *Bdellodes*  
*dubitatus*, *Odontoscirus*  
*dubitatus*, *Scirus*  
*dubitatus*, *Scirus*  
*dusta*, *Spinibdella*  
*edentata*, *Bdellodes*  
*edentata*, *Odontoscirus*  
*egregia*, *Bdella*  
*egregia*, *Neomolgus*  
*egregious*, *Molgus*  
*exilicornis*, *Bdella*  
*exilicornis*, *Bdellodes*  
*exilicornis*, *Odontoscirus*  
*exilicornis*, *Scirus*  
*farabii*, *Bdella*  
*flava*, *Cyta*  
*flexuosa*, *Bdellodes* (*Hoploscirus*)  
*flexuosa*, *Odontoscirus*  
*frigida*, *Bdella*  
*frigida*, *Bdella villosa*+  
*furcatus*, *Bdellodes* (*Hoploscirus*)  
*furcatus*, *Odontoscirus*  
*fusca*, *Amonia latirostris* var.  
*fusca*, *Cyta latirostris* var.  
*georgianensis*, *Bdellodes* (*Bdellodes*)  
*georgianensis*, *Odontoscirus*  
*gibberabdomen*, *Bdella*  
*gibberabdomen*, *Spinibdella*  
*gleba*, *Odontoscirus*  
*graminis*, *Bdellodes*  
*graminis*, *Odontoscirus*  
*grandiflora*, *Bdellodes*  
*grandiflora*, *Odontoscirus*  
*grandis*, *Bdella*  
*grandjeani*, *Bdella*  
*grandjeani*, *Cyta*  
*grandjeani*, *Cyta veneta*  
*gressitti*, *Bdellodes* (*Hoploscirus*)  
*gressitti*, *Odontoscirus*  
*groenlandica*, *Bdella*  
*guajavae*, *Octobdellodes*  
*guajavae*, *Odontoscirus*  
*hadroseta*, *Bdellodes*  
*hadroseta*, *Odontoscirus*  
*haramotoi*, *Bdellodes*  
*haramotoi*, *Odontoscirus*  
*harpax*, *Bdellodes* (*Bdellodes*)  
*harpax*, *Bdellodes*  
*harpax*, *Odontoscirus*  
*heliophila*, *Bdella*  
*helvetica*, *Bdella*  
*helvetica*, *Bdella iconica*  
*helveticus*, *Hoplomolgus*  
*helveticus*, *Neomolgus*  
*hessei*, *Bdellodes* (*Bdellodes*)  
*hessei*, *Odontoscirus*  
*hessei*, *Scirus*  
*heterocomus*, *Cyta*  
*hexophtalma*, *Bdella*  
*hexophtalmus*, *Bdellodes*  
*hexophtalmus*, *Scirus*  
*hickmani*, *Biscirus* (*Biscirus*)  
*hickmani*, *Odontoscirus*  
*hirta*, *Bdella*  
*histrionica*, *Bdella*  
*horvathi*, *Bdella*  
*hospita*, *Bdella* (*Scirus*)  
*hospita*, *Bdellodes* (*Hoploscirus*)  
*hospita*, *Odontoscirus*  
*howarthi*, *Spinibdella*  
*humida*, *Bdella*  
*hurdi*, *Bdellodes* (*Bdellodes*)  
*hurdi*, *Octobdellodes*  
*hurdi*, *Odontoscirus*  
*hygrotes*, *Bdellodes*  
*hygrotes*, *Odontoscirus*  
*iberica*, *Spinibdella*  
*iconica*, *Bdella*  
*igneae*, *Cyta*  
*igneae*, *Rigibdella*  
*igneae*, *Rigibdella*  
*illinoisensis*, *Bdella*  
*illinoisensis*, *Biscirus*  
*indicata*, *Bdella*  
*inflata*, *Bdellodes*  
*inflata*, *Odontoscirus*  
*infrequens*, *Octobdellodes*  
*infrequens*, *Odontoscirus*  
*insolita*, *Odontoscirus*  
*insolita*, *Thoribdella*  
*insularis*, *Biscirus*  
*intermedius*, *Bdellodes* (*Hoploscirus*)  
*intermedius*, *Biscirus* (*Biscirus*)  
*intermedius*, *Biscirus*  
*intermedius*, *Odontoscirus*  
*intermedius*, *Thoribdella*  
*interrupta*, *Bdella*  
*intricata*, *Bdellodes* (*Hoploscirus*)  
*intricata*, *Odontoscirus*  
*iota*, *Odontoscirus*  
*iowaensis*, *Bdella peregrina* var.  
*iranensis*, *Biscirus*  
*iraniensis*, *Bdellodes*  
*iraniensis*, *Neomolgus*  
*iraniensis*, *Odontoscirus*  
*japonica*, *Thoribdella*  
*japonicus*, *Bdellodes* (*Hoploscirus*)  
*japonicus*, *Bdellodes*  
*japonicus*, *Odontoscirus*  
*jesusi*, *Trachymolgus*  
*karajiensis*, *Bdella*  
*kauaiensis*, *Cyta*  
*kazeruni*, *Bdellodes*  
*kazeruni*, *Odontoscirus*  
*khasyana*, *Bdella*  
*kleinmondiensis*, *Biscirus*  
*kobachidzei*, *Biscirus*  
*kobachidzei*, *Neobiscirus*  
*kochi*, *Bdella*  
*koloseta*, *Bdellodes*  
*koloseta*, *Odontoscirus*  
*kurdistanicus*, *Cyta*  
*kuznetsovi*, *Bdella*  
*lacustris*, *Bdella*  
*lacustris*, *Molgus* (*Molgus*)  
*lacustris*, *Neomolgus*  
*lapidaria*, *Bdella*  
*lapidaria*, *Bdellodes* (*Hoploscirus*)  
*lapidaria*, *Odontoscirus*  
*lapidarius*, *Biscirus* (*Biscirus*)  
*lapidarius*, *Biscirus*  
*lata*, *Bdella*  
*latirostris*, *Ammonia*  
*latirostris*, *Bdella*  
*latirostris*, *Cyta*  
*latirostris*, *Leptus*  
*latirostris*, *Scirus*  
*lattakia*, *Bdella*  
*leiliae*, *Cyta*  
*leucocephala*, *Ammonia*  
*leucocephala*, *Amonia*  
*leucocephala*, *Bdella*  
*lichenicola*, *Bdella*

*lignicola*, *Bdella*  
*lignicola*, *Spinibdella*  
*littoralis*, *Acarus*  
*littoralis*, *Bdella*  
*littoralis*, *Bdella vulgaris* var.  
*littoralis*, *Molgus*  
*littoralis*, *Neomolgus*  
*livistonana*, *Odontoscirus*  
*longicornis*, *Acarus*  
*longicornis*, *Bdella*  
*longicornis*, *Molgus*  
*longipalpis*, *Bdella*  
*longipalpis*, *Molgus*  
*longipalpis*, *Neomolgus*  
*longipalpus*, *Bdella*  
*longipalpus*, *Neomolgus*  
*longipilosa*, *Bdella*  
*longirostris*, *Bdella*  
*longirostris*, *Bdellodes* (*Bdellodes*)  
*longirostris*, *Bdellodes*  
*longirostris*, *Molgus*  
*longirostris*, *Odontoscirus*  
*longirostris*, *Scirus*  
*longiseta*, *Cyta*  
*longistriata*, *Bdella*  
*longistriata*, *Spinibdella*  
*longitarsa*, *Bdella*  
*longitarsa*, *Molgus egregius* var.  
*lootsi*, *Biscirus*  
*lumarius*, *Neomolgus*  
*lutea*, *Cyta*  
*macfarlanei*, *Biscirus*  
*macquariensis*, *Bdellodes* (*Hoploscirus*)  
*macquariensis*, *Odontoscirus*  
*maculata*, *Bdella*  
*maculatus*, *Molgus*  
*maculatus*, *Neomolgus*  
*magdalenae*, *Biscirus*  
*magdalenae*, *Cyta*  
*magna*, *Bdella*  
*malaccensis*, *Bdella*  
*malawiensis*, *Bdella*  
*malayensis*, *Odontoscirus*  
*maldahanensis*, *Bdella*  
*mali*, *Spinibdella*  
*manipurensis*, *Bdellodes*  
*manipurensis*, *Odontoscirus*  
*maraugia*, *Hexabdella*  
*marina*, *Bdella*  
*maxosburni*, *Monotrichobdella*  
*megacephala*, *Ammonia*  
*melanostoma*, *Bdella*  
*melanostoma*, *Biscirus*  
*meridionalis*, *Bdellodes* (*Hoploscirus*)  
*meridionalis*, *Biscirus* (*Biscirus*)  
*meridionalis*, *Biscirus*  
*meridionalis*, *Odontoscirus*  
*meridionalis*, *Thoribdella*  
*mexicana*, *Hexabdella*  
*microsetosa*, *Bdellodes* (*Hoploscirus*)  
*minnesotensis*, *Bdella muscorum* var.  
*miranda*, *Hexabdella*  
*molissima*, *Bdella brevirostris*  
*montanus*, *Bdellodes* (*Bdellodes*)  
*montanus*, *Odontoscirus*  
*monticola*, *Hoplomolgus*  
*monticola*, *Neomolgus*  
*multicia*, *Bdellodes* (*Hoploscirus*)  
*multicia*, *Odontoscirus*  
*murrayi*, *Cyta*  
*muscorum*, *Bdella*  
*mutabilis*, *Neomolgus*  
*namibiensis*, *Spinibdella*  
*neograndjeani*, *Bdella*  
*neotropica*, *Tetrabdella*  
*nevadicus*, *Biscirus*  
*nigerrima*, *Bdella*  
*nigerrima*, *Trachymolgus*  
*nigerrimus*, *Trachymolgus*  
*nihoaensis*, *Bdella*  
*nimia*, *Bdellodes* (*Hoploscirus*)  
*nimia*, *Odontoscirus*  
*nipponicus*, *Odontoscirus*  
*nixis*, *Biscirus*  
*norvegica*, *Bdella*  
*norvegicus*, *Biscirus* (*Biscirus*)  
*norvegicus*, *Biscirus*  
*norvegicus*, *Scirus*  
*novangliae*, *Cyta*  
*novemsetosa*, *Spinibdella*  
*nylsvleyensis*, *Bdella*  
*obconica*, *Bdella*  
*obesa*, *Bdella*  
*obisium*, *Scirus*  
*obisium*, *Troglobdella*  
*obliquus*, *Biscirus*  
*oblonga*, *Bdella*  
*oblongula*, *Bdellodes*  
*obsoletus*, *Hoplomolgus*  
*obsoletus*, *Molgus* (*Hoplomolgus*)  
*obsoletus*, *Neomolgus*  
*odonata*, *Bdellodes*  
*odonata*, *Odontoscirus*  
*ontakensis*, *Neomolgus*  
*opimus*, *Biscirus*  
*opimus*, *Molgus* (*Hoplomolgus*)  
*oraria*, *Bdellodes* (*Bdellodes*)  
*oraria*, *Odontoscirus*  
*ornata*, *Bdella*  
*ornata*, *Spinibdella*  
*pacifica*, *Bdellodes* (*Bdellodes*)  
*pacifica*, *Odontoscirus*  
*paganus*, *Odontoscirus*  
*pallidus*, *Scirus*  
*pallipediformis*, *Bdella*  
*littoralis+capillata* var.  
*pallipes*, *Bdella basteri* forma  
*pallipes*, *Bdella capillata* var.  
*pallipes*, *Bdella*  
*pallipes*, *Molgus* (*Molgus*)  
*pallipes*, *Molgus capillatus* var.  
*pallipes*, *Neomolgus*  
*pallipes*, *Neomolgus*  
*paracapillatus*, *Neomolgus*  
*parvisetosa*, *Bdellodes* (*Hoploscirus*)  
*parvisetosa*, *Odontoscirus*  
*peragilis*, *Biscirus*  
*peragilis*, *Molgus* (*Hoplomolgus*)  
*peregrina*, *Bdella*  
*peregrinus*, *Scirus*  
*persiaensis*, *Hexabdella*  
*petila*, *Bdellodes* (*Hoploscirus*)  
*petila*, *Odontoscirus*  
*phaseoli*, *Cyta*  
*phoenicea*, *Bdella*  
*piggotti*, *Bdella*  
*pilahensis*, *Bdellodes* (*Bdellodes*)  
*pilahensis*, *Odontoscirus*  
*pilosa*, *Molgus maculatus* var.  
*pinicola*, *Bdella*  
*planadensis*, *Bdella*  
*podurophila*, *Bdella*  
*polyattenuata*, *Spinibdella*  
*pongolensis*, *Spinibdella*  
*porrectus*, *Bdellodes*  
*porrectus*, *Odontoscirus*  
*porrectus*, *Scirus*  
*pratensis*, *Neomolgus*  
*procincta*, *Bdellodes* (*Hoploscirus*)  
*procincta*, *Odontoscirus*  
*psamma*, *Biscirus*  
*pseudothori*, *Biscirus*  
*pulchella*, *Bdella*  
*purpureus*, *Trachymolgus*  
*pygmaeus*, *Neomolgus*  
*quadrissetosa*, *Bdellodes* (*Bdellodes*)  
*quadrissetosa*, *Odontoscirus*  
*quercusi*, *Hexabdella*  
*quinqueoculata*, *Spinibdella*  
*quinqueoculatus*, *Biscirus*  
*radhikae*, *Bdella*  
*raeticus*, *Bdellodes*  
*raeticus*, *Hoplomolgus*  
*paganus*, *Bdellodes* (*Hoploscirus*)  
*raeticus*, *Neomolgus*  
*raeticus*, *Odontoscirus*  
*rapida*, *Spinibdella*  
*raptor*, *Neomolgus*

*recens*, *Bdella*  
*recki*, *Trachymolgus*  
*reducta*, *Spinibdella*  
*reticulata*, *Bdellodes* (*Hoploscirus*)  
*reticulata*, *Cyta*  
*reticulata*, *Odontoscirus*  
*reticulata*, *Thoribdella*  
*reticulatus*, *Hoplomolgus*  
*reticulatus*, *Neomolgus*  
*rhachia*, *Bdellodes* (*Hoploscirus*)  
*rhachia*, *Odontoscirus*  
*riolermensis*, *Bdella*  
*robusta*, *Bdella*  
*robustirostris*, *Bdella*  
*robustus*, *Scirus*  
*ruber*, *Acarus petrarum*  
*ruber*, *Acarus*  
*ruber*, *Chelifer totus*  
*rubra*, *Bdella*  
*rupestris*, *Acarus*  
*sabulosa*, *Bdellodes*  
*sabulosa*, *Odontoscirus*  
*sabulosus*, *Neomolgus*  
*sanguinea*, *Bdella*  
*sanguineus*, *Eupalus*  
*sanguineus*, *Molgus*  
*sardica*, *Biscirus* (*Biscirus*)*norvegicus*  
*var.*  
*sardica*, *Biscirus* (*Biscirus*) *var.*  
*sardicus*, *Biscirus*  
*sardicus*, *Scirus*  
*sardoa*, *Bdella iconica* *var.*  
*sardoa*, *Bdella*  
*semiscutata*, *Bdella*  
*septentrionalis*, *Bdella*  
*seriatus*, *Neomolgus*  
*serpentinus*, *Bdellodes* (*Hoploscirus*)  
*serpentinus*, *Odontoscirus*  
*seurati*, *Molgus* (*Molgus*)*littoralis* *var.*  
*silvatica*, *Bdella*  
*silvaticus*, *Biscirus* (*Biscirus*)  
*silvaticus*, *Biscirus*  
*silvaticus*, *Scirus*  
*simplex*, *Odontoscirus*  
*simplex*, *Thoribdella*  
*simplexus*, *Biscirus*  
*singula*, *Hexabdella*  
*skuinsbaaiensis*, *Biscirus*  
*smileyi*, *Spinibdella*  
*spinirostris*, *Bdella*  
*spinosa*, *Odontoscirus*  
*spinosa*, *Thoribdella*  
*splendida*, *Bdella*  
*splendida*, *Biscirus*  
*splendidus*, *Biscirus* (*Biscirus*)  
*spuria*, *Cyta*

*strandii*, *Bdella*  
*sublimis*, *Molgus* (*Hoplomolgus*)  
*subnigra*, *Bdella*  
*subrufa*, *Spinibdella*  
*subterranea*, *Odontoscirus*  
*subterranea*, *Thoribdella*  
*subulirostris*, *Bdella*  
*sylvatica*, *Bdella*  
*symetricus*, *Biscirus*  
*symmetrica*, *Bdella*  
*symmetrica*, *Biscirus*  
*symmetricus*, *Biscirus* (*Biscirus*)  
*symmetricus*, *Biscirus*  
*tabarii*, *Spinibdella*  
*tadjikistanica*, *pinibdella*  
*tanta*, *Bdellodes* (*Bdellodes*)  
*tanta*, *Odontoscirus*  
*tasmaniensis*, *Bdellodes*  
*tasmaniensis*, *Odontoscirus*  
*taurica*, *Bdella*  
*tellustris*, *Bdellodes* (*Hoploscirus*)  
*tellustris*, *Odontoscirus*  
*tenella*, *Bdella*  
*tenella*, *Spinibdella*  
*tenuirostris*, *Bdella*  
*tenuirostris*, *Spinibdella*  
*tessellata*, *Bdella*  
*thori*, *Bdella*  
*thori*, *Biscirus*  
*thori*, *Spinibdella*  
*thorianus*, *Molgus* (*Hoplomolgus*)  
*thorianus*, *Molgus* (*Molgus*)  
*thorianus*, *Neomolgus*  
*tlascalana*, *Bdella*  
*tridentata*, *Bdellodes*  
*(Odontoscirus)virgulata*  
*trinomma*, *Spinibdella*  
*trisetosa*, *Bdella*  
*trisetosa*, *Spinibdella*  
*troglogyta*, *Cyta*  
*tropica*, *Bdella*  
*truncata*, *Odontoscirus*  
*truncata*, *Thoribdella*  
*truncatula*, *Bdella*  
*tuberculatus*, *Hoplomolgus*  
*tuberculatus*, *Molgus* (*Hoplomolgus*)  
*uchidai*, *Bdella*  
*ueckermanni*, *Bdella*  
*uncinata*, *Bdella*  
*uncinatus*, *Biscirus* (*Biscirus*)  
*uncinatus*, *Biscirus*  
*uncinnatus*, *Biscirus* (*Biscirus*)  
*unusoculata*, *Hexabdella*  
*utilis*, *Bdella*  
*validipes*, *Bdella*  
*variegata*, *Bdella*

*variegata*, *Biscirus*  
*variegatus*, *Biscirus*  
*vates*, *Bdella*  
*velox*, *Acarus*  
*veneta*, *Bdella iconica* *var.*  
*veneta*, *Cyta*  
*venetus*, *Neomolgus*  
*venustus*, *Molgus* (*Hoplomolgus*)  
*vestita*, *Bdella*  
*vestitus*, *Scirus*  
*vetusta*, *Bdella*  
*villosa*, *Bdella*  
*villosa*, *Molgus*  
*vireti*, *Bdellodes* (*Bdellodes*)  
*vireti*, *Odontoscirus*  
*virgata*, *Bdella*  
*virgulata*, *Bdella*  
*virgulata*, *Molgus*  
*virgulata*, *Odontoscirus*  
*virgulatus*, *Biscirus* (*Odontoscirus*)  
*virgulatus*, *Odontoscirus*  
*virgulatus*, *Scirus*  
*vivida*, *Bdella*  
*vulgaris*, *Bdella*  
*vulgaris*, *Biscirus*  
*vulgaris*, *Scirus*  
*watsoni*, *Bdellodes* (*Hoploscirus*)  
*watsoni*, *Odontoscirus*  
*willisi*, *Bdella*  
*wilsoni*, *Spinibdella*  
*womersleyi*, *Bdellodes* (*Hoploscirus*)  
*womersleyi*, *Odontoscirus*  
*yemenensis*, *Polytrichus*  
*yeni*, *Spinibdella*

### APPENDIX 3. New combinations proposed in this catalog

- 1 *Cyta cytoides* (Mihelèti) **comb. nov.**
- 2 *Cyta ignea* (Tseng) **comb. nov.**
- 3 *Biscirus illinoisensis* (Ewing) **comb. nov.**
- 4 *Spinibdella trisetosa* (Jacot) **comb. nov.**
- 5 *Odontoscirus affinis* (Atyeo) **comb. nov.**
- 6 *Odontoscirus agrestis* (Atyeo) **comb. nov.**
- 7 *Odontoscirus alacris* (Atyeo) **comb. nov.**
- 8 *Odontoscirus ancalae* (Atyeo) **comb. nov.**
- 9 *Odontoscirus angustifolius* (Gupta) **comb. nov.**
- 10 *Odontoscirus annona* (Tseng) **comb. nov.**, new emendation
- 11 *Odontoscirus atro* (Gupta) **comb. nov.**
- 12 *Odontoscirus augusta* (Roy & Saha) **comb. nov.**
- 13 *Odontoscirus australicus* (Womersley) **comb. nov.**
- 14 *Odontoscirus bidentata* (Wallace & Mahon) **comb. nov.**
- 15 *Odontoscirus bifurcata* (El-Sherif & Bolland) **comb. nov.**
- 16 *Odontoscirus bisetosa* (Atyeo) **comb. nov.**
- 17 *Odontoscirus brevicornis* (Cooremann) **comb. nov.**
- 18 *Odontoscirus bryi* (Atyeo) **comb. nov.**
- 19 *Odontoscirus californica* (Banks) **comb. nov.**
- 20 *Odontoscirus camellae* (Atyeo) **comb. nov.**
- 21 *Odontoscirus communis* (Atyeo) **comb. nov.**
- 22 *Odontoscirus conformis* (Atyeo) **comb. nov.**
- 23 *Odontoscirus consanguinea* (Atyeo) **comb. nov.**
- 24 *Odontoscirus copiosa* (Atyeo) **comb. nov.**
- 25 *Odontoscirus currax* (Atyeo) **comb. nov.**
- 26 *Odontoscirus curvus* (Atyeo) **comb. nov.**
- 27 *Odontoscirus dubitatus* (Womersley) **comb. nov.**
- 28 *Odontoscirus edentata* (Halliday) **comb. nov.**
- 29 *Odontoscirus exilicornis* (Berlese) **comb. nov.**
- 30 *Odontoscirus flexuosa* (Atyeo) **comb. nov.**
- 31 *Odontoscirus furcatus* (Shiba) **comb. nov.**
- 32 *Odontoscirus georgianensis* (Wallace) **comb. nov.**
- 33 *Odontoscirus graminis* (Wallace & Mahon) **comb. nov.**
- 34 *Odontoscirus grandiflora* (Gupta) **comb. nov.**
- 35 *Odontoscirus gressitti* (Atyeo) **comb. nov.**
- 36 *Odontoscirus guajavae* (Chatterjee & Gupta) **comb. nov.**
- 37 *Odontoscirus hadroseta* (Wallace & Mahon) **comb. nov.**
- 38 *Odontoscirus haramotoi* (Swift & Goff) **comb. nov.**
- 39 *Odontoscirus harpax* (Atyeo) **comb. nov.**
- 40 *Odontoscirus hessei* (Womersley) **comb. nov.**
- 41 *Odontoscirus hickmani* (Womersley) **comb. nov.**
- 42 *Odontoscirus hospita* (Banks) **comb. nov.**
- 43 *Odontoscirus hurdi* (Atyeo) **comb. nov.**
- 44 *Odontoscirus hygrotus* (Swift & Goff) **comb. nov.**
- 45 *Odontoscirus inflata* (Wallace & Mahon) **comb. nov.**
- 46 *Odontoscirus infrequens* (Atyeo) **comb. nov.**
- 47 *Odontoscirus insolita* (Atyeo) **comb. nov.**
- 48 *Odontoscirus intermedius* (Thor) **comb. nov.**
- 49 *Odontoscirus intricata* (Atyeo) **comb. nov.**
- 50 *Odontoscirus iraniensis* (Ueckermann *et al.*) **comb. nov.**
- 51 *Odontoscirus japonicus* (Ehara) **comb. nov.**
- 52 *Odontoscirus kazeruni* (Ostovan & Kamali) **comb. nov.**
- 53 *Odontoscirus koloseta* (Wallace & Mahon) **comb. nov.**
- 54 *Odontoscirus lapidaria* (Kramer) **comb. nov.**
- 55 *Odontoscirus longirostris* (Hermann) **comb. nov.**
- 56 *Odontoscirus macquariensis* (Atyeo) **comb. nov.**
- 57 *Odontoscirus manipurensis* (Gupta) **comb. nov.**
- 58 *Odontoscirus meridionalis* (Thor) **comb. nov.**
- 59 *Odontoscirus montanus* (Kuznetsov & Barilo) **comb. nov.**

- 60 *Odontoscirus multicia* (Atyeo) **comb. nov.**  
61 *Odontoscirus nimia* (Atyeo) **comb. nov.**  
62 *Odontoscirus odonata* (Wallace & Mahon) **comb. nov.**  
63 *Odontoscirus oraria* (Atyeo) **comb. nov.**  
64 *Odontoscirus pacifica* (Atyeo) **comb. nov.**  
65 *Odontoscirus paganus* (Atyeo) **comb. nov.**  
66 *Odontoscirus parvisetosa* (Atyeo) **comb. nov.**  
67 *Odontoscirus petila* (Atyeo) **comb. nov.**  
68 *Odontoscirus pilahensis* (Shiba) **comb. nov.**  
69 *Odontoscirus porrectus* (Kramer) **comb. nov.**  
70 *Odontoscirus procincta* (Atyeo) **comb. nov.**  
71 *Odontoscirus quadrisetosa* (Atyeo) **comb. nov.**  
72 *Odontoscirus raeticus* (Schweizer & Bader) **comb. nov.**  
73 *Odontoscirus reticulata* (Atyeo) **comb. nov.**  
74 *Odontoscirus rhachia* (Wallace) **comb. nov.**  
75 *Odontoscirus sabulosa* (Wallace & Mahon) **comb. nov.**  
76 *Odontoscirus simplex* (Atyeo) **comb. nov.**  
77 *Odontoscirus spinosa* (Atyeo) **comb. nov.**  
78 *Odontoscirus serpentinus* (Atyeo) **comb. nov.**  
79 *Odontoscirus subterranea* (Cooremann) **comb. nov.**  
80 *Odontoscirus tanta* (Atyeo) **comb. nov.**  
81 *Odontoscirus tasmaniensis* (Wallace & Mahon) **comb. nov.**  
82 *Odontoscirus tellustris* (Atyeo) **comb. nov.**  
83 *Odontoscirus truncata* (Atyeo) **comb. nov.**  
84 *Odontoscirus vireti* (Atyeo) **comb. nov.**  
85 *Odontoscirus watsoni* (Atyeo) **comb. nov.**  
86 *Odontoscirus womersleyi* (Atyeo) **comb. nov.**  
87 *Neomoligus aequalis* (Schweizer & Bader) **comb. nov.**  
88 *Neomoligus berlesei* (Trägårdh) **comb. nov.**  
89 *Neomoligus egregia* (Koch) **comb. nov.**  
90 *Neomoligus helveticus* (Schweizer & Bader) **comb. nov.**  
91 *Neomoligus lacustris* (Hull) **comb. nov.**  
92 *Neomoligus longipalpis* (Karpelles) **comb. nov.**  
93 *Neomoligus maculatus* (Karpelles) **comb. nov.**  
94 *Neomoligus obsoletus* (Berlese) **comb. nov.**  
95 *Neomoligus raeticus* (Schweizer & Bader) **comb. nov.**  
96 *Neomoligus reticulatus* (Schweizer & Bader) **comb. nov.**  
97 *Neomoligus thorianus* (Berlese) **comb. nov.**