

TAXONOMIC KEYS TO PLANT, SOIL AND AQUATIC NEMATODES

BRUCE E. HOPPER and ELDON J. CAIRNS

ALABAMA POLYTECHNIC INSTITUTE
AUBURN, ALA.

1959

Sponsored By The
SOUTHERN REGIONAL NEMATODE PROJECT
(S-19)

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PREFACE

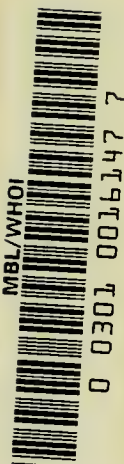
A few consolidated sources of descriptions and illustrations of plant and soil forms, in particular, are available and should be used along with the taxonomic keys. At best, keys are only attempted short cuts to the recognition of certain specimens. In all cases check the decisions by referral to descriptions and illustrations of the nematodes. There are some excellent volumes available to workers who do not have access to the necessarily large reprint files of the taxonomist. The book by Filipjev & Stekhoven, 1941 can still be purchased. The book by T. Goodey, 1951 is out of print, but can be found in some libraries; so useful a book should be reprinted soon. Fortunately, two other works that every nematologist should have are again available. These are the monographs by Thorne and Swanger, 1936 (reprinted 1957) and Thorne, 1939 (reprinted 1957). We have drawn heavily from all of these sources and want to point out that keys are by no means a substitute for the information contained in these sources.

The book, Introduction to Nematology by Chitwood & Chitwood, is probably the recognized standard work on morphology and will be of great help in understanding the morphological terms used in the keys. Volume III of the Invertebrate series by Hyman, 1951 may also be helpful in this respect, but to a lesser extent.

In utilizing the various sources of information available, a pattern for the reference headings was used. Thus, if a new key was developed by the authors, no reference to another source is given. If another author's key was used directly with only minor changes, it is acknowledged as being "from" that source. If key contains basically the same information as another source, but with changes having been made in content, it is referred to as being "modified" from the original. If only the form of a key is altered, it is referred to as being "after" the original source. In some cases material from other sources was used as a part of a new key and this is acknowledged by the word "including" in the reference heading.

The form in which this syllabus is printed and assembled will enable each owner to keep the information current with the steady outpouring of taxonomic work. As revisions of particular groups become necessary, new pages can be typed and inserted along with or instead of the old pages. Additional pages can be conveniently designated with alphabetical characters, for example, 17a. This system will keep the page references intact. A further suggestion to the user; insert labeled, tabbed divider sheets for quicker finding of particular groups.

The plan was to provide through this set of keys a foundation on which each person could continue to build and thus maintain a useful working tool.



ACKNOWLEDGEMENTS

It is a pleasant privilege to be able to call your attention to the source of help in the making of this syllabus.

The cost of printing and the initial typing costs were paid from a Rockefeller Foundation Grant awarded to the activities of S-19 Regional Nematology Project for making information more available to new workers and to students, particularly, in phytonematology. The work time allowed to the authors and Mrs. Glenda Barnes, who did much of the final manuscript typing, by Dr. J. A. Lyle, Head of the Department of Botany and Plant Pathology of this Institute, certainly deserves special mention. What had begun as a spare time effort took much more time than just that before it was finished.

The loaning and contribution of printed materials from various sources was of great help in completing and updating certain groups and the generosity of a number of people should be pointed out. Hence, our acknowledged gratitude to: E. Altherr, I. Andrassy, E. C. Dougherty; E. Gadea; S. A. Gerlach, H. A. Kreis, M. Luc, A. H. Meyl, F. Paesler, the late J. H. Schuurmans - Stekhoven, W. Stefanski, A. L. Taylor, and W. Wieser.

Special appreciation is due to a number of workers for their willingness to discuss the systematic positions of various taxa and the groups at all levels. For this and other help it seems like a small token, indeed, but to list their names: A. D. Baker, B. G. Chitwood, E. C. Dougherty, J. B. Goodey, A. H. Meyl, A. C. Tarjan, G. Thorne, and W. Wieser.

Finally, and especially, we want to point out that the great convenience and utility of the taxonomic syllabus prepared by M. W. Allen in 1950 impressed upon us through the years we have used it the value of producing another such compilation of keys extended and brought up as much as possible to the present time.

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Phyllum NEMATODA (Rud., 1808) Cobb, 1919
 (Key to the classes modified from Chitwood, 1950)

1. Phasmids present, amphid openings pore-like, labial in position, subventral esophageal glands never opening at or near anterior end of the esophagus. Hypodermal and caudal glands absent. Caudal alae or bursa and rectal glands commonly present.
 SECERNENTEA (v. Linstow, 1905) Dougherty, 1958 P.1
2. Phasmids absent, amphid openings spiral, circular, vesiculate, pocket-like, tuboid or rarely pore-like, sublabial (not on lips). Bursa absent except for Anoplostoma and Oncholaimellus; rectal glands usually absent. Hypodermal and caudal glands usually present
 ADENOPHORA (v. Linstow, 1905) Chitwood, 1958 P.75

Class SECERNENTEA (v. Linstow, 1905) Dougherty, 1958
 (Key to the orders modified from Chitwood, 1950)

1. Esophagus simple cylindrical, or composed of a narrow muscular anterior part and a wide glandular posterior part. Two or more well developed labial structures; if three or six are present, they are reduced in size SPIRURIDA Chitwood, 1933 P.2
 Esophagus divisible into three regions: corpus, isthmus, and bulbar region. Lips usually 3 or 6 in number.
2. Stoma not armed with a stylet, bulbar position of esophagus with or without sclerotized vulvular apparatus. . . . RHARDITIDA Chitwood, 1933 P.3
 Stoma armed with a protrusible spear or stylet, basal portion of esophagus glandular without a sclerotized vulvular apparatus.
 TYLENCHIDA Thorne 1949 P.4

Order SPIRURIDA Chitwood, 1933
(Key to the suborders from Chitwood, 1950)

1. Esophageal glands uninucleate (ex. *Philonema*); larvae without cephalic hook, phasmids of larvae large, pocket-like. (Intermediate hosts copepods.) CAMALLANINA Chitwood, 1933 P.2
2. Esophageal glands multinucleate; larvae commonly with cephalic hook, phasmids pore-like. (Intermediate hosts various, rarely copepods.) SPIRURINA Railliet and Henry, 1915 P.2

Suborder CAMALLANINA Chitwood, 1933
(Key to superfamilies from Chitwood, 1950)

1. Internal circle of cephalic papillae minute, external circle partially fused; stoma usually well developed; oviparous or viviparous; larvae with pocket-like phasmids. (Intestinal parasites of fish, amphibia, and reptiles.)CAMALLANOIDEA Travassos, 1920
2. Internal circle of cephalic papillae well developed, external circle of 8 well developed papillae; stoma rudimentary; vulva in mid-region; viviparous. (Intermediate host copepods.)
. DRACUNCULOIDEA Cameron, 1933

Suborder SPIRURINA Railliet and Henry, 1915
(Key to the superfamilies Chitwood, 1950)

1. Stoma distinctly developed and/or 2 lateral psuedolabia; vulva near middle or posterior of body . . . SPIRUROIDEA Railliet and Henry, 1915
2. Stoma usually rudimentary or reduced; psuedolabia and jaws absent; vulva near anterior end of body. (Tissue parasites of vertebrates except fish.)FILARIOIDEA (Weinland, 1858) Stiles, 1907

Order RHABDITIDA Chitwood, 1933
(Key to the suborders from Chitwood, 1950)

1. Lips 3, 2 or 0; corona radiata absent; adults with all gradations from rhabditoid to cylindrical esophagus; female reproductive system usually complex, vagina usually heavily muscled; bursa, if present, with papillae; spicules 2, 1 or 0
 ASCARIDINA Skrjabin, 1915 P.3
2. Lips 6, 3 or 0; corona radiata present or absent; female reproductive system usually complex, vagina often heavily muscled; adult with clavate type esophagus; bursa usually containing well-developed muscles forming the true or strongylatid bursa
 STRONGYLINA Railliet and Henry, 1913 P.4
3. Lips 6, 3, 2 or 0; corona radiata absent; spear present or absent; female reproductive system relatively simple, vagina usually transverse and usually not heavily muscled; esophagus may or may not be terminated by a valved bulb; bursa, if present, containing papillae rather than "rays"; spicules 2. RHABDITINA Chit., 1935 P.4

Suborder ASCARIDINA Skrjabin, 1915
(Key to the superfamily from Chitwood, 1950)

1. Stoma usually surrounded by esophageal tissue and collapsed (except Subulurinae); deirids present; mostly large, stout worms; males with 2 spicules
 ASCARIDOIDEA Railliet and Henry, 1915
2. Stoma cylindroid or short, not surrounded by esophageal tissue; deirids absent; mostly small or medium-sized transparent worms; males with 1 or 2 spicules. OXYUROIDEA Railliet, 1905

Suborder STRONGYLINA RAILLET & HENRY, 1913
(Key to the superfamilies modified from Chitwood, 1950)

1. Male with well-developed bursa, rays not fused; corona radiata present or absent; stoma well-developed, reduced, rudimentary or absent . . . 2
Male with bursa often reduced, rays somewhat fused; corona radiata absent; stoma reduced, rudimentary or absent
. METASTRONGYLOIDEA Lane, 1917
2. Corona radiata often present, lips absent; stoma usually well-developed, subglobular. . . .STRONGYLOIDEA (Weinland, 1858) Hall, 1913
Corona radiata absent, 6 or 3 inconspicuous lips, or lips absent; stoma reduced; rudimentary or absent; cuticle usually inflated in cephalic region TRICHOSTRONGYLOIDEA Cram, 1927

Suborder RHABDITINA Chitwood, 1935
(Key to the superfamilies from Chitwood, 1950)

1. Stoma commonly distinct, lips usually distinct; phasmids pore-like
. RHABDITOIDEA Travassos, 1920 P.5
Stoma greatly reduced, lips rudimentary or absent; phasmids large, pocket-like. (Parasites in the body cavity of earthworms)
. DRILONEMATOIDEA Chit., 1950

Order TYLENCHIDA Thorne, 1949
(Key to the superfamilies from Chitwood, 1950)

1. Dorsal esophageal gland orifice in precorpus
. TYLENCHOIDEA (Oerley, 1880) Chit. & Chit., 1937 P.27
Dorsal esophageal gland orifice in metacorpus
. APHELENCHOIDEA (Fuchs, 1937) Thorne, 1949 P.68

Superfamily RHABDITOIDEA Travassos, 1920
(Key to the families)

1. Esophagus terminated by a valvulated bulb 2
Esophagus not terminated by a valvulated bulb 9
2. Telorhabdions * absent or rudimentary 3
Telorhabdions present 4
3. Stoma conoid, protorhabdions fused; male with caudal alae
(parasites of molluscs and amphibians)
. ANGIOSTOMATIDAE Blanchard, 1896
Stoma collapsed, protorhabdions feebly sclerotized; male without
caudal alae (parasites of arthropods)
. STEINERNEMATIDAE Chit. & Chit., 1937
4. Telorhabdions in the form of a glottoid apparatus 5
Telorhabdions not in the form of a glottoid apparatus 6
5. Monogenetic; 2 or 1 ovary (free-living and parasitic)
. RHABDITIDAE Oerley, 1880 P.6
Heterogenetic; 2 ovaries (parasitic generation in amphidians and
reptiles) RHABDIASIDAE Railliet, 1915
6. Corpus elongate, metacarpus usually indistinct, sometimes faintly
fusiform. 7
Corpus short and thick or metacarpus bulbar 8
7. Lip region with six cephalic cirri, cheilorhabdions in form of buccal
hooks ("odontia" of Cobb). (free-living)
. CHAMBERSIELLIDAE Sanwal, 1957 P.8
Lip region w/o six cephalic cirri, cheilorhabdions not in form of
buccal hooks (free-living) CEPHALOBIDAE Chit. & Chit., 1934 P.14
8. Two lateral lips present (parasitic in gut of vertebrates)
. STRONGYLOIDIDAE Chit. & McIntosh, 1934
One lateral lip present (free-living or parasites of invertebrates)
. DIPLOGASTERIDAE Steiner, 1929 P.25
9. Telorhabdions plate-like, stoma cylindrical 10
Telorhabdions not plate-like 11
10. Esophagus made up of a procorpus and metacarpus blending into a
cylindrical muscular esophagus (free-living)
. CYLINDROCORPORIDAE Goodey, 1939 P.8
Esophagus without anterior swelling representing the corpus
(parasite of a slug) (Contains a single genus and species, Agfa
flexilis (Dujardin 1844) Chit., 1935 AGFIDAE Dougherty, 1955
11. Metacarpus indistinct, corpus elongated (free-living or consorts of
plants and land-dwelling invertebrates)
. CEPHALOBIDAE Chit. & Chit., 1934 P.14
Metacarpus bulbar, or corpus short and thick (free-living or parasites
of invertebrates) DIPLOGASTERIDAE Steiner, 1929 P.25

* For full discussion of terminology, see Dougherty, 1955.

Family RHABDITIDAE Oerley, 1880
(Key to subfamilies after Dougherty, 1955)

1. Dorsal and ventral lips replaced by paired hook-like structures
DIPLOSCAPTERINAE Micoletzky, 1922 P.6
 (Contains a single genus, Diploscapter Cobb, 1913)
 Dorsal and ventral lips not replaced by paired hook-like structures. 2
2. Cuticle highly ornamented; head retractile and with large bristles and lamellae. BUNONEMATINAE Micoletzky, 1922 P.7
 Cuticle not highly ornamented 3
3. Stoma terminated by a glottoid apparatus. RHABDITINAE Micoletzky, 1922 P.8
 Stoma not terminated by a glottoid apparatus. 4
4. Stoma cylindrical; broad and foreshortened
 POIKILOLAIMINAE Dougherty, 1955
 Stoma cylindrical; narrow PROTORHABDITINAE Dougherty, 1955

Incertia sedis: Macramphis Altherr, 1950

Genus Diploscapter Cobb, 1913

- D. coronata (Cobb, 1893) Cobb 1913
D. libycus Penso, 1938
D. pachys Steiner, 1942
D. rhizophilus v. cylindricus Rahm, 1928-1929

Subfamily POIKILOLAIMINAE Dougherty, 1955

Genera:

- Brevibucca Goodey, 1935
Poikilolaimus Fuchs, 1930

Pterygorhabditis Timm, 1957

P. pakistanensis Timm, 1957

Bunonema Jagerskiold, 1905

1. Bunonema (Jagerskiold, 1905) Sachs, 1949

B. ditlevseni Micoletzky, 1925

B. hessi Steiner, 1914

B. multipapillatum Stefanski, 1914

B. penardi Stefanski, 1914

B. reticulatum Richters, 1905

B. richtersi Jagerskiold, 1905

B. steineri Stefanski, 1924

B. tuerkorum Sachs, 1945

T. Goodey, 1951 also list:

B. dactylicum Cobb, 1915

B. impar Cobb, 1915

B. ineguale Cobb, 1915

B. reticulatum Richters, 1905

B. richtersi v. aberrans Steiner, 1914

B. richtersi v. cantareirensis Rahm, 1928

B. steineri Stefanski, 1924

2. Aspidonema Sachs, 1949

A. ruehmi Sachs, 1949

A. scheuchere Sachs, 1949

A. stammeri Sachs, 1949

A. weingaertnerae Sachs, 1949

3. Craspedonema Richters, 1908

C. javanicum Richters, 1908

C. styriacum Micoletzky, 1921

C. zealandicum de Man, 1926

T. Goodey, 1951 also lists:

C. elegans Rahm, 1928

C. elegans v. paulistanum Rahm, 1928

4. Rhodolaimus Fuchs, 1930

R. pini Fuchs, 1930

R. poligraphi Fuchs, 1930

R. ptergiosoma Fuchs, 1930

R. pusillus Fuchs, 1930

R. stoeckherti Sachs, 1949

5. Serronema Paesler, 1957

S. dentata Paesler, 1957

6. Stammeria Sachs, 1949

S. jakobii Sachs, 1949

S. goffarti Sachs, 1949

S. helena Sachs, 1949

Subfamily RHABDITINAE

(Key to genera modified from Osche, 1952 and following Dougherty, 1955)

1. Male pelodern (bursa not surrounding tail tip) 2
Male leptodern (bursa surrounding end of tail) 8
2. Spicules fused. 3
Spicules not fused. 5
3. Vulva posteriorly positioned. 4
Vulva more or less equatorially positioned. . Pelodera Schneider, 1966 P.9
4. Lip region Teratocephalus-like (moveable flap-like lips separated by deep furrows): males rare
. Teratorhabditis (Osche, 1952) Dougherty, 1953 P.13
Lip region otherwise. . . Mesorhabditis (Osche, 1952) Dougherty, 1953 P.12
5. Vulva posteriorly positioned. Pelodera Schneider, 1866 P.9
Vulva equatorially positioned 6
6. Distinct esophageal collar absent
. Pelodira plicata (Volk, 1950) Dougherty, 1955
Esophageal collar present 7
7. Glottoid apparatus with two teeth
. Caenorhabditis (Osche, 1952) Dougherty, 1953 P.12
Glottoid apparatus without teeth. Rhabditis Dujardin, 1844 P.10
8. Male without preanal papillae; lips Teratocephalus-like
. Teratorhabditis (Osche, 1952) Dougherty, 1953 P.13
Male with mostly 3 preanal papillae; lips otherwise
. Rhabditis Dujardin, 1844 P.10

Other genera:

Rhabditonema Korner, 1954

Family CHAMBERSIELLIDAE Sanwall, 1957

Genus Chambersiella Cobb, 1920

Single reflexed ovary rodens Cobb, 1920
Two opposed and reflexed ovaries. bakeri Cobb, 1920

Family CYLINDROCOPORIDAE Goodey, 1939

(Key to the genera)

Female gonad single, prodelphic Goodeyus Chitwood, 1933
Female gonads paired, opposed and reflexed
. Cylindrocopus Goodey, 1939
(Uncertain genus; no specimens or drawings
. Myctolaimus Cobb, 1920

Species Accepted in the RHABDITINAE
(From Dougherty, 1955)

1. Pelodera Schneider, 1866 (19 species).

a. Pelodera (Schneider, 1866) Dougherty, 1953 (9 species)

- I. Pelodera (P.) plicata (Volk, 1950) comb. nov.
- II. Pelodera (P.) stanmeri (Volk, 1950) comb. nov.
- III. Pelodera (P.) chitwoodi (Bassen, 1940) comb. nov.
- IV. Pelodera (P.) strongyloides (Schneider, 1860) Schneider, 1866
(type sp. of genus and subgenus (by selection - Stiles & Hassall, 1905)).
- V. Pelodera (P.) typica (Stefanski, 1922) comb. nov.
- VI. Pelodera (P.) teres Schneider, 1866.
- VII. Pelodera (P.) punctata (Cobb, 1914) comb. nov.
- VIII. Pelodera (P.) conica (Reiter, 1928) comb. nov.
- IX. Pelodera (P.) litoralis (Skwarra, 1921) comb. nov.

b. Cruznema (Artigas, 1927) Dougherty, 1953 (2 species) (syn. Epimenides Gutierrez, 1944).

- I. Pelodera (Cr.) lambdiensis (Maupas, 1919) Dougherty, 1953
(syn. Cruznema cruznema Artigas, 1927 - type sp. of subgenus (by designation)).
- II. Pelodera (Cr.) monhysteroides (Skwarra, 1921) comb. nov.

c. Coarctadera Dougherty, 1953 (5 species).

- I. Pelodera (Co.) coarctata (Leuckart, 1891) Dougherty, 1953
(type sp. of subgenus (by designation)).
- II. Pelodera (Co.) cystilarva (Volk, 1950) comb. nov.
- III. Pelodera (Co.) serrata (Korner in Osche, 1952) comb. nov.
- IV. Pelodera (Co.) tretzeli (Sachs, 1950) comb. nov.
- V. Pelodera (Co.) voelki (Sachs, 1950) comb. nov.

D. Cylindridera Dougherty, 1953 (3 species)

- I. Pelodera (Cy.) cylindrica (Cobb, 1898) Dougherty, 1953
(type sp. of subgenus (by designation)).
- II. Pelodera (Cy.) kolbi (Sachs, 1950) comb. nov.
- III. Pelodera (Cy.) icosiensis (Maupas, 1916) comb. nov.

2. Rhabditis Dujardin (1844) (67 species)a. Rhabditis (Dujardin(1844)) Osche, 1952 (17 species)

- I. R. (R.) brevispina (Claus, 1862) Butschli, 1873.
- II. R. (R.) terricola Dujardin (1844) (type sp. of genus and subgenus (by selection - Stiles and Hassall, 1905); syn. R. aspera Butschli, 1873).
- III. R. (R.) maupasi Seurat in Maupas, 1919
- IV. R. (R.) verneti Maupas, 1900
- V. R. (R.) aberrans Kruger, 1913
- VI. R. (R.) anomala Hertwig, 1922
- VII. R. (R.) caulleryi Maupas, 1919
- VIII. R. (R.) guignardi Maupas, 1900
- IX. R. (R.) lucianii Maupas, 1919
- X. R. (R.) terrestris Stephenson, 1942
- XI. R. (R.) marionis Maupas, 1900
- XII. R. (R.) wohlgemuthi Volk, 1950
- XIII. R. (R.) silvatica Volz, 1951 (syn. Rhabditis silvestris Volz, 1951 (lapsus for silvatica)).

b. Pellioiditis Dougherty, 1953 (19 species).

- I. R. (P.) seurati Maupas, 1916
- II. R. (P.) papillosa (Schneider, 1866) Orley, 1880.
- III. R. (P.) neopapillosa Mengert in Osche, 1952.
- IV. Rhabditis (P.) hermaphrodita (Schneider, 1859) comb. nov. (syn. R. caussaneli Maupas, 1900)
- V. R. (P.) mairei Maupas, 1919
- VI. R. (P.) pellio (Schneider, 1866) Butschli, 1873 (type sp. of subgenus (by designation)).
- VII. R. (P.) pellioides Butschli, 1873
- VIII. R. (P.) coffeae Rahm, 1928
- IX. R. (P.) butschlii de Man, 1876
- X. R. (P.) friderici Hirschmann in Osche, 1952
- XI. R. (P.) fluviatilis Butschli, 1876
- XII. R. (P.) craspedocerca Volk, 1950
- XIII. R. (P.) ehrenbaumi Bresslau and Schuurmans Stekhoven in Schuurmans Stekhoven, 1935
- XIV. R. (P.) velata Bresslau and Schuurmans Stekhoven in Schuurmans Stekhoven, 1935
- XV. R. (P.) voigti Rahm, 1925
- XVI. R. (P.) viguieri Maupas, 1900
- XVII. R. (P.) insolita Paesler, 1941
- XVIII. R. (P.) hartmanni Sachs, 1950
- XIX. R. (P.) marina Bastian, 1865

C. Choriorhabditis Osche, 1952 (23 species)

- I. R. (Ch.) longicaudata Bastian, 1865 (type sp. of subgenus (by designation)).
- II. R. (Ch.) producta (Schneider, 1866) Orley, 1880
- III. R. (Ch.) paraelongata Micoletzky, 1915
- IV. R. (Ch.) duthiersi Maupas, 1900
- V. R. (Ch.) brassicae Soughern, 1909
- VI. R. (Ch.) korneri Osche, 1952
- VII. R. (Ch.) macrospiculata Stefanski, 1916
- VIII. R. (Ch.) uliginosa Soos, 1938
- IX. R. (Ch.) cristata Hirschmann in Osche, 1952
- X. R. (Ch.) acarta Rahm in Osche, 1952
- XI. R. (Ch.) heteruroides Altherr, 1938
- XII. R. (Ch.) dubia Bovien, 1937
- XIII. R. (Ch.) heterurus Orley, 1880
- XIV. R. (Ch.) gracilicauda de Man, 1876
- XV. R. (Ch.) intermedia de Man, 1880
- XVI. R. (Ch.) filiformis Butschli, 1873
- XVII. R. (Ch.) lepida Kreis, 1929, emend. nov. (syn. R. lepidus Kreis, 1929).
- XVIII. R. (Ch.) pseudoelongata Micoletzky, 1914
- XIX. R. (Ch.) australis Cobb, 1893
- XX. R. (Ch.) guerneyi Potts, 1910
- XXI. R. (Ch.) sechellensis Potts, 1910
- XXII. R. (Ch.) lacustris Micoletzky, 1914
- XXIII. R. (Ch.) sergenti Maupas, 1916

d. Cephaloboides Rahm, 1928 (6 species) (syn. Cuticularia van der Linde, 1938; Curviditis Dougherty, 1953).

- I. R. (Ce.) curvicaudata (Schneider, 1877) Orley, 1885
- II. R. (Ce.) oxycerca de Man, 1895 (syn. Cuticularia mathesoni van der Linde, 1938) - type sp. of genus Cuticularia van der Linde, 1938 (by designation)).
- III. R. (Ce.) armata Fuchs, 1931
- IV. R. (Ce.) ciliata Fuchs, 1931
- V. R. (Ce.) paraciliata Goodey (1944)
- VI. R. (Ce.) musicola Rahm, 1928 (type of subgenus (by indication - monotypy); syn. R. pseudoxycerca Goodey, 1929).

e. Rhabditella Cobb, 1929 (2 species).

- I. R. (Rhabditella) octopleura Steiner, 1929, Feb. (syn. R. leptura Cobb, 1929, July - type sp. of subgenus (by designation)).
- II. Rhabditis (Rhabditella) axei (Cobbold, 1884) comb. nov. (syn. Leptodera elongata Schneider, 1877, non Baird, 1858; Pelodera axei Cobbold, 1884)

3. Rhabditoides Goodey, 1929 (6 species).

- a. Rhabditoides longispina (Reiter, 1928) Dougherty, 1953 (type sp. of genus (by designation)).
- b. Rhabditoides incisocaudata (de Coninck, 1935) comb. nov.
- c. Rhabditoides inermiformis (Osche, 1952) comb. nov.
- d. Rhabditoides inermis (Schneider, 1866) comb. nov.
- e. Rhabditoides giardi (Maupas, 1915) comb. nov.
- f. Rhabditoides hermaphrodita (Osche, 1952) comb. nov.

4. Caenorhabditis (Osche, 1952) Dougherty, 1953 (10 species)

- a. Caenorhabditis elegans (Maupas, 1900) Dougherty, 1953 (type sp. of genus (by designation)).
- b. Caenorhabditis kowalewskyi (Golovin, 1901) comb. nov.
- c. Caenorhabditis briggsae (Dougherty and Nigon, 1949) Dougherty, 1953
- d. Caenorhabditis clavopapillata (Kreis and Faust, 1933) comb. nov.
- e. Caenorhabditis perrieri (Maupas, 1900) comb. nov.
- f. Caenorhabditis dolichura (Schneider, 1866) comb. nov.
- g. Caenorhabditis pseudodolichura (Korner in Osche, 1952) comb. nov.
- h. Caenorhabditis carpathica (Soos, 1941) comb. nov.
- i. Caenorhabditis debilicauda (Fuchs, 1937) comb. nov.
- j. Caenorhabditis rara (Korner in Osche, 1952) comb. nov.

5. Mesorhabditis (Osche, 1952) Dougherty, 1958 (18 species)

- a. Mesorhabditis spiculigera (Steiner, 1936) Dougherty, 1953 (type sp. of genus (by designation)).
- b. Mesorhabditis oschei (Korner in Osche, 1952) comb. nov.
- c. Mesorhabditis ultima (Korner in Osche, 1952) comb. nov.
- d. Mesorhabditis tenuispicula (Korner in Osche, 1952) comb. nov.
- e. Mesorhabditis longespiculosa (Schuurmans Stekhoven, 1951) comb. nov.
- f. Mesorhabditis juglandicola (Fuchs, 1937) comb. nov.
- g. Mesorhabditis monhystera (Butschli, 1873) comb. nov.
- h. Mesorhabditis macrocheila (Kreis, 1932) comb. nov.
- i. Mesorhabditis cryptocercoides (Wollenweber, 1921) comb. nov.
- j. Mesorhabditis ocybodis (Chitwood, 1935) comb. nov.
- k. Mesorhabditis quercophila (Ruhm in Osche, 1952) comb. nov.
- l. Mesorhabditis graciliformis (Goffart, 1935) comb. nov. (syn. Rhabditis gracilis Goffart, 1935, non Shingareva, Demidova, and Kudrianstev, 1928)
- m. Mesorhabditis labiata (Volk, 1950) comb. nov.
- n. Mesorhabditis belari (Nigon, 1949) Dougherty, 1953
- o. Mesorhabditis irregularis (Korner in Osche, 1952) comb. nov.
- p. Mesorhabditis acris (Bastian, 1865) comb. nov.
- q. Mesorhabditis inarimensis (Meyl, 1953) comb. nov.
- r. Incertae sedis:? Mesorhabditis acuminata (Kreis, 1929) comb. nov.

6. Teratorhabditis (Osche, 1952) Dougherty, 1953 (4 species)
- a. Teratorhabditis dentifera (Volk, 1950) Dougherty, 1953 (type sp. of genus (by designation)).
 - b. Teratorhabditis coroniger (Altherr, 1938) comb. nov.
 - c. Teratorhabditis chitinolabiata (Schneider, 1938) comb. nov.
 - d. Teratorhabditis boettgeri (Meyl, 1953) comb. nov.
7. Protorhabditis (Osche, 1952) Dougherty, 1953 (12 species).
- a. Protorhabditis xylocola (Korner in Osche, 1952) Dougherty, 1953 (type sp. of genus (by designation)).
 - b. Protorhabditis janeti (de Lacaze-Duthiers in Janet, 1893) comb. nov.
 - c. Protorhabditis oxyuris (Claus, 1862) comb. nov.
 - d. Protorhabditis ornata (Bastian, 1865) comb. nov.
 - e. Protorhabditis anthobia (Schneider, 1938) comb. nov.
 - f. Protorhabditis elaphri (Hirschmann in Osche, 1952) comb. nov.
 - g. Protorhabditis tristis (Hirschmann in Osche, 1952) comb. nov.
 - h. Protorhabditis virgo (Korner in Osche, 1952) comb. nov.
 - i. Protorhabditis postneri (Korner in Osche, 1952) comb. nov.
 - j. Protorhabditis parvovelata (Korner in Osche, 1952) comb. nov.
 - k. Protorhabditis ruhmi (Korner in Osche, 1952) comb. nov.
 - l. Protorhabditis minuta (Cobb, 1893) comb. nov.
8. Parasitorhabditis (Fuchs, 1937) Chitwood, 1950 (2 species)
- a. Parasitorhabditis obtusa (Fuchs, 1915) Dougherty, 1953 (type sp. of genus (by indication - monotypy)).
 - b. Parasitorhabditis ateri (Fuchs, 1937) Skriabin. et al., 1954
9. Incertae sedis: Brevibucca Goodey, 1935 (2 species)
- a. Brevibucca saprophaga Goodey, 1935 (type sp. of genus (by designation)).
 - b. Brevibucca frugicola Goodey (1943)

Family CEPHALOBIDAE Chit. & Chit., 1934
(Key to the subfamilies adapted from Thorne, 1937)

1. Female with two ovariesALLOIONEMATINAE Chit. & McIntosh, 1934
Female with one ovary 2
2. Stoma much reduced, only cheilorhabdions developed. Basal esophageal bulb without valvular apparatusDAUBAYLINAE Chit. & Chit., 1934
Stoma not reduced. Basal esophageal bulb with valves 3
3. Pharyngeal armature cephaloboid. Double flexure in ovary posterior to vulva (except in occasional aberrant specimens). Spermatheca present at anterior flexure of ovary. Annules about 2u or more wide.
Pharyngeal armature panagrolaimoid. Ovary never with double flexure posterior to vulva. No spermatheca present at anterior flexure of ovary. Annules fine, much less than 2u wide.
. PANAGROLAIMINAE Thorne, 1937 P.16
4. Lip region bearing 3 labial, and frequently 6 cephalic probolae
. ACROBELINAE Thorne, 1937 P.19
Lip region without probolae CEPHALOBINAE Filipjev, 1934 P.14

Subfamily CEPHALOBINAE Filipjev, 1934
(Key to genera after Thorne, 1937)

- Wings extending to caudal terminus, female tails blunt and rounded
. Cephalobus Bastian, 1865 P.14
Wings extending only to phasmids, female tails attenuated
. Eucephalobus Steiner, 1936 P.15

Genus Cephalobus Bastian, 1865

- C. brevicaudatus Zimmermann, 1898
C. buchneri Meyl, 1953
C. cornis (Thorne, 1925) Thorne, 1937
C. dubius Maupas, 1900
C. nannus de Man, 1880
C. parvus Thorne, 1937
C. persegnis Bastian, 1865
C. strandi-cornutus Allgen, 1934
C. thermophilus Meyl, 1953

Genus Eucephalobus Steiner, 1936
(Key to species from Allen, 1950)

1. Lips distinct, pointed, not amalgamated 2
Lips completely amalgamated, low rounded 3
2. Terminus of female tail bluntly rounded, male tail mucronate
. striatus (Bastian, 1865) Thorne, 1937
Terminus of female tail not bluntly rounded, male tail without
mucronate process oxyuroides (de Man, 1876) Steiner, 1936
3. Lips separated by deep axils. laevis Thorne, 1937
Lip not separated by deep axils 4
4. Nerve ring surrounding base of corpus latus (Cobb, 1906) Thorne, 1937
Nerve ring encircling corpus about one neck width anterior to junction
with isthmus. teres Thorne, 1937

Other species:

- E. bipapillatus (Stefanski, 1915) Thorne, 1937
- E. bisimilis (Thorne, 1925) Thorne, 1937
- E. compus (Steiner, 1935) Thorne, 1937
- E. diversipapillatus Altherr, 1950
- E. elongatus (de Man, 1880) Thorne, 1937
- E. multicinctus (Cobb, 1893) Thorne, 1937
- E. mylakolaimus (Fuchs, 1930) Thorne, 1937
- E. nannus Steiner, 1936
- E. paracornutus de Coninck, 1943

Subfamily PANAGROLAMINAE
(Key to the genera)

1. Lip region bearing 6 inward-pointing, flap-like process with strongly sclerotized borders Panagrobelus Thorne, 1939 P.17
Lip region otherwise (2 species, both maybe beetle associates) 2
2. Circllet of 6 setose cephallic papillae present
. Macrolaimus Maupas, 1900 P.17
Cephalic papillae not setose 3
3. Post corpus of esophagus bulbar, separated by distinct break in the corporeal lining. Tricephalobus Steiner, 1936 P.17
Post corpus of esophagus not bulbar 4
4. Plate-like denticles present in pharynx 5
Plate-like denticles absent in pharynx. 6
5. Isthmus about as long as corpus Panagrodontus Thorne, 1935
(4 species, all maybe bark-boring beetle associates)
Isthmus much shorter than corpus. Turbatrix Peters, 1927
(T. aceti Muller, 1783) aceti Peters, 1927 is the vinegar eel-worm and T. aceti (Muller, 1783) dryophila (Leuckart, 1887) de Man, 1910 has been as an inhabitant of white slime-flux of oak.)
6. Ovary lying entirely anterior to vulva. Plectonchus Fuchs, 1930
(3 species bark beetle associates)
Ovary extending caudad past vulva 7
7. Cheilostom hexagonal, the rhabdions conspicuous
. Procephalobus Steiner, 1934
(Contains a single species P. mycophilus Steiner)
Cheilostom triquetrous, the rhabdions obscure 8
8. Tips of spicula bifid Panagrellus Thorne, 1938 P.18
Tips of spicula not bifid 9
9. Male with ventromedian, preanal papillae. Neocephalobus Steiner, 1939 P.17
Male without ventromedian, preanal papillae Panagrolaimus Fuchs, 1930 P.18

Genus Panaerobelus Thorne, 1939
(Key to the species)

Female 1.0 mm and male 0.9 mm in length; two pairs of preanal and two pairs of postanal ventrosubmedian male papillae

..... incisus Thorne, 1939

Male and female length 0.5 mm; three pairs of preanal and three pairs of postanal ventrosubmedian male papillae

..... coronatus (Fuchs, 1930) Thorne, 1939

Genus Macrolaimus Maupas, 1900
(Key to the species Allen, 1950)

Male and female tails with terminal hook, lips forming high arch over vestibule. hamatus Thorne, 1937

Tails without terminal hook, arch over vestibule slight
..... taurus Thorne, 1937

Other species:

M. aculeatus (Daday, 1905) Thorne, 1937

M. crucis Maupas, 1900

M. papillatus (Rahm, 1928) Goodey, 1951

Genus Tricephalobus Steiner

Contains:

T. acuminatus (Kreis, 1929) Goodey, 1951

T. labiatus (Kreis, 1929) Goodey, 1951

T. longicaudatus Steiner, 1936

Genus Plectonchus Fuchs, 1930

Contains:

P. ateri Fuchs, 1930

P. cuniculari Fuchs, 1930

P. ligniperdae Fuchs, 1930

All three species occurred in the frass of bark beetles in Europe.

Genus Neocephalobus (Steiner, 1929) Steiner, 1934
(Key to species)

Three lips, each consisting of 2 more or less distinctly amalgamated lips; in male ventromedian papilla adanal

..... peruensis Steiner, 1939

Six uniform lips; in male ventromedian papilla in latitude of proximal end of spicula aberrans (Steiner, 1929) Steiner, 1934

Genus Panagrellus Thorne, 1938
(Key to the species)
Males

1. Spicules without bifid tips . . . ludwigi (de Man, 1910) Goodey, 1945
Spicules with bifid tips 2
2. Spicules without ventral membrane expansion extending from head to tip
. leucocephalus (Steiner, 1936) Goodey, 1945
Spicules with ventral membrane expansion extending from head to tip
. 3
3. Spicule head without forward directed hook 4
Spicule head with forward directed hook 5
4. Distal end of gubernaculum folded over to form a kind of loop
. reclivivoides (Goodey, 1943) Goodey, 1945
Distal end of gubernaculum not formed into a loop
. nepenthicola (Menzel, 1920) Goodey, 1945
5. Spicule length about $4 \frac{1}{2}$ times length of gubernaculum
. pycnus Thorne, 1938
Spicule length less than 3 times length of gubernaculum 6
6. Hook on head of spicule swollen and knob-like
. redivivus (Linn., 1767) Goodey, 1945
Hook on head of spicule fairly uniform in width, not knobbed
. silusiae (de Man, 1913) Goodey, 1945

Genus Panagrolaimus Fuchs, 1930

Contains:

- P. annulatus (Skwarra, 1921) Thorne, 1937
- P. chalographi Fuchs, 1930
- P. detritophagus Fuchs, 1930
- P. halophilus Meyl, 1954
- P. heterocheilus Steiner, 1935
- P. hygrophilus Bassen, 1940
- P. obesus Thorne, 1937
- P. paralongicaudatus (Altherr, 1938) Goodey, 1951
- P. picei Fuchs, 1930
- P. piniperdae Fuchs, 1930
- P. rigidus (Schn., 1866) Thorne, 1937
- P. sexadentata Fuchs, 1930
- P. spondyli Korner, 1954
- P. subelongatus (Cobb, 1914) Thorne, 1937
- P. superbus Fuchs, 1930
- P. thienemanni Hirschmann, 1952
- P. venustus Fuchs, 1930

Subfamily ACROBELIINAE Thorne, 1937
(Key to genera after Thorne, 1937)

1. Labial probolae massive, low, rounded or furcate plates 2
Labial probolae slender, furcate or elaborately fringed 5
2. Cephalic axils dentate, female tails concave-conoid to acute or sub-acute terminus. Zeldia Thorne, 1937 P.19
Cephalic axils not dentate (except minutely in Chiloplacus trifurcatus), female tails bluntly-rounded, rarely convex-conoid. . 3
3. Labial probolae, at least the dorsal one, furcate, the submedian ones usually asymmetrical Chiloplacus Thorne, 1937 P.20
Labial probolae low, rounded, not furcate 4
4. Esophagus well developed with enlarged postcorpus, cuticle near head with simple annules Acrobeloides Cobb, 1924 P.21
Esophagus slender throughout, cuticle near head divided into plates Placodira Thorne, 1937
(Contains a single species P. lobata Thorne, 1937)
5. Labial probolae elaborately fringed Acrobeles von Linstow, 1877 P.22
Labial probolae slender, furcate, rarely with a few branches. . . . 6
6. Cuticle with transverse striae only Cervidellus Thorne, 1937 P.23
Cuticle with both longitudinal and transverse striae
Stegelleta Thorne, 1938 P.23

Genus Zeldia Thorne, 1937
(Key to the species after Allen, 1950)

1. Labial probolae low and rounded
. punctulata (Thorne, 1925) Thorne, 1937
Labial probolae plate-like, bifurcate 2
2. Annules marked by 4 lines of punctate dots
. punctata (Thorne, 1925) Thorne, 1937
Annules not marked by punctate dots 3
3. Excretory pore far in front of nerve ring
. glaphyra (Steiner, 1935) Thorne, 1937
Excretory pore located near the nerve ring
. setosa (Cobb, 1914) Thorne, 1937
(Description derived from an immature specimen)

Genus Chiloplacus Thorne, 1937
(Key to species from Allen, 1950)

1. Cephalic probolae low, rounded at axils 2
Cephalic probolae pointed at axils. 5
 2. Labial probolae bifurcate, branches bifurcate 3
Labial probolae bifurcate, branches not bifurcate 4
 3. Branches of labial probolae obscurely bifurcate
. demani (Thorne, 1925) Thorne, 1937
Branches of labial probolae distinctly bifurcate, inner branches
almost meeting. incurvis (Thorne, 1925) Thorne, 1937
 4. Submedian labial probolae asymmetrical
. propinquus (de Man, 1921) Thorne, 1937
Labial probolae symmetrical (genotype)
. symmetricus (Thorne, 1925) Thorne, 1937
 5. Labial probolae low, truncate, not bifurcate
. truncatus (Thorne, 1925) Thorne, 1937
Labial probolae bifurcate 6
 6. Labial probolae bifurcate, branches bifurcate
. trifurcatus (Thorne, 1925) Thorne, 1937
Labial probolae bifurcate, branches not bifurcate 7
 7. Wing area with 4 lines. . . quadricarinatus (Thorne, 1925) Thorne, 1937
Wing area with 2 or 3 lines 8
 8. Submedian labial probolae asymmetrical. . . . trilineatus Steiner, 1940
Submedian labial probolae symmetrical 9
 9. Labial probolae bifurcate 1/3 their length
. bisexualis (Micol., 1916) Thorne, 1937
Labial probolae bifurcate 1/2 their length. 10
 10. Labial probolae short, 2 lines in lateral fields
. denticulatus (Thorne, 1925) Thorne, 1937
Labial probolae moderately long, 3 lines in lateral fields
. lentus (Maupas, 1900) Thorne, 1937
- Others: C. obtusicaudatus (Kreis, 1930) Thorne, 1937

Genus Acrobeloides (Cobb, 1924) Thorne, 1937
(Key to species from Thorne, 1937)

1. Labial probolae low and rounded 2
Labial probolae not low and rounded 7
 2. Cephalic probolae setose. . . bodenheimeri (Steiner, 1936) Thorne, 1937
Cephalic probolae not setose. 3
 3. Tails of females clavate. . . clavicaudatus (Thorne, 1925) Thorne, 1937
Tails not clavate 4
 4. Labial probolae asymmetrical. . . cubaensis (Steiner, 1935) Thorne, 1937
Labial probolae not asymmetrical. 5
 5. Female tails pointed. apiculatus (Thorne, 1925) Thorne, 1937
Female tails blunt, rounded 6
 6. Length about 1.0 mm maximus (Thorne, 1925) Thorne, 1937
Length about 0.5 mm minor (Thorne, 1925) Thorne, 1937
 7. Labial probolae connate 8
Labial probolae with setose or cylindrical points 9
 8. Tail bluntly rounded (genotype)
. butschlii (de Man, 1884) Steiner & Buhner, 1933
Tail obliquely truncate obliquus (Thorne, 1925) Thorne, 1937
 9. Labial probolae conoid then cylindrical to lip
. tricornis (Thorne, 1925) Thorne, 1937
Labial probolae low, rounded with setose points. enoplus Steiner, 1938
- Others: A. emarginatus (de Man, 1880) Thorne, 1937 and A. variabilis
(Steiner, 1936) Goodey, 1951.



Genus Acrobeles von Linstow, 1877
(Key to species from Allen, 1950)

1. Labial probolae bifurcate, branches without terminal bifurcation
 cephalatus (Cobb, 1901) Thorne, 1925
 Labial probolae bifurcate, branches with terminal bifurcation 2
2. Cephalic probolae long and slender. 3
 Cephalic probolae short and triangular. 4
3. Membranes on cephalic probolae extending about 1/2 the distance to the
 apex serricornis Thorne, 1925
 Membranes on cephalic probolae extending to apex
 (genotype) ciliatus von Linstow, 1877
4. Terminal branches of labial probolae recurved 5
 Terminal branches of labial probolae not recurved 6
5. Membranes on labial probolae bluntly rounded, phasmid near middle of
 tail. ornatus Thorne, 1925
 Membranes on labial probolae triangular acute, phasmid near level of
 anal opening. elaboratus Thorne, 1925
6. Phasmids almost opposite anus ctenocephalus Thorne, 1925
 Phasmids near middle of tail. complexus Thorne, 1925

Others: A. complexus Thorne, 1925; A. sinensia Kreis, 1930;
A. soosi Andrassy, 1953.

Genus Cervidellus Thorne, 1937
(Key to the species from Allen, 1950)

1. Cephalic probolae serrate, edges sclerotized. 2
Cephalic probolae not serrate, but flap-like. 4
2. Labial probolae bifurcate $1/4$ their length
. serricephalus (Thorne, 1925) Thorne, 1937
Labial probolae bifurcate $1/2$ their length. 3
3. Branches of labial probolae slender, not rebranched
. serratus (Thorne, 1925) Thorne, 1937
Branches of labial probolae rebranched, 1 forward and 2 backward
pointing branches (genotype) cervus (Thorne, 1925) Thorne, 1937
4. Labial probolae doubly furcate, terminal branches recurved
. hamatus Thorne, 1937
Labial probolae bifurcate only. 5
5. Labial probolae bifurcate $3/4$ their length, branches recurved
. ankyurus (Thorne, 1925) Thorne, 1937
Labial probolae bifurcate less than $1/2$ their length. 6
6. Cephalic axils with sclerotized points at base
. similis (Thorne, 1925) Thorne, 1937
Cephalic axils without sclerotized points 7
7. Cephalic probolae ending in bristle-like points 8
Cephalic probolae flap-like, bifurcate
. insubricus (Steiner, 1914) Thorne, 1937
8. Gubernaculum triangular in shape
. kruguelensis (Steiner, 1916) Thorne, 1937
Gubernaculum slender, not triangular
. vexilliger (de Man, 1880) Thorne, 1937

Genus Stegelleta Thorne, 1938
(Key to the species from Allen, 1950)

1. Cephalic probolae low and rounded . incisa (Thorne, 1937) Thorne, 1938
Cephalic probolae flap-like, pointed. 2
2. Labial probolae bifurcate $1/2$ their length, outer branches recurved
. cancellata (Thorne, 1925) Thorne, 1938
Labial probolae bristle-like, bifurcate $1/4$ their length, branches
not recurved. lineata (Thorne, 1925) Thorne, 1938

Family DIPLOGASTERIDAE Steiner, 1929
(Key to subfamilies modified from Chitwood, 1950)

1. Stoma consisting of 2 well developed parts in tandem; teeth, if present, in posterior part of stoma. CEPHALOBIINAE Filipj., 1934 P.26
Stoma otherwise 2
2. Stoma narrow, with basal enlargements simulating a stylet
. TYLOPHARYNGINAE Filipj., 1939
(Contains a single species, Tylopharynx striata (de Man, 1876)
Goodey, 1951)
Stoma not simulating a stylet 3
3. Stoma very short and wide, retrose teeth at base present or absent
. PRISTIONCHINAE Chit., 1950 P.26
Stoma not short and wide. 4
4. Prostom wide, heavily sclerotized, containing large retrose teeth, metastoma collapsed or very weakly sclerotized; labial rugae prominent DIPLOGASTERINAE Micol., 1922 P.26
Stoma cylindrical to prismatoidal or collapsed; labial rugae absent or very weak. DIPLOGASTEROIDINAE Filipj. & Stek., 1941 P.25

Subfamily DIPLOGASTEROIDINAE Filipj. & Stekh., 1941
(Key to the genera modified from Allen, 1950)

1. Pharynx without teeth, denticles or glottoid apparatus
. Rhabditolaimus Fuchs, 1915
Pharynx armed with a dorsal tooth 2
2. Armature in anterior end of pharynx Neodiplogaster Cobb, 1924
Armature in basal portion of pharynx 3
3. Median bulb elongate, not distinctly set off from corpus of esophagus
. Demaniella Steiner, 1914
Median bulb rounded, distinctly set off from corpus of esophagus
. 4
4. Male tail without a bursa 5
Male tail with an obscure postanal bursa
. Rhabdontolaimus Fuchs, 1931
5. Stoma cylindrical Diplogasteroides de Man, 1912
Stoma barrel-shaped Goffartia Hirschmann, 1952

Subfamily CEPHALOBIINAE Filipjev, 1934
(Key to the genera)

1. Head bearing six setae. Butlerius Goodey, 1929
Head without setae. 2
2. Stoma with massive tooth in basal part, opposing denticles present or absent. 3
Stoma without massive tooth but with large dorsal tooth-like "glottoid organ" Cephalobium Cobb, 1920
3. Tooth opposed by denticles. Odontopharynx de Man, 1912
Tooth not opposed by denticles. Acrostichus Rahm, 1928

Others: (?) Loxolaimus Rahm, 1928

Subfamily PRISTONCHINAE Chitwood, 1950
(Key to the genera modified from Allen, 1950)

1. Stoma broad, shallow and unarmed. Lycolaimus Rahm, 1928
Stoma broad, armed at base. 2
2. Esophagus with a constriction behind the median bulb
. Paradiplogaster Stekhoven & Teunissen, 1938
Esophagus without constriction, stoma armed at base with 3 curved teeth Pristionchus Kreis, 1932

Others: (?) Peronilaimus Rahm, 1928 which contains a single species
P. saccai Rahm, 1928.

Subfamily DIPLOGASTERINAE Micoletzky, 1922
(Key to the genera modified from Allen, 1950)

Tooth well forward in stoma, thumb-like, a large fixed denticle arising from the pharyngeal wall at right of tooth
. Mononchoides Rahm, 1928
Dorsal tooth near base of pharynx, may be opposed by tooth on ventral side. Diplogaster Schulze, 1857

Superfamily TYLENCHOIDEA (Oerley, 1880) Chit. & Chit., 1937
(Key to the families)

1. Esophagus distinct; esophageal musculature present. 2
 Esophagus degenerate; esophageal musculature absent (animal para-
 sites). 5
2. Cuticle usually heavily annulated or squamous, often bearing
 spines; spear greatly elongated.
 CRICONEMATIDAE Thorne, 1943 (defined Thorne, 1949) P.28
 Cuticle finely to moderately annulated, plain; spear short. 3
3. Head with internal cephalic sclerotization
 HOPLOLAIMIDAE (Filipj., 1941) Wieser 1953 P.37
 Head without internal cephalic sclerotization 4
4. Female swollen to saccateTYLENCHULIDAE Raski, 1957 P.54
 Female vermiform. TYLENCHIDAE Oerley, 1880 P.55
5. Sucker-like vesicle at excretory pore MYENCHIDAE Pereira, 1932
 Terminal excretory duct tubular . ALLANTONEMATIDAE Chit. & Chit., 1937
 syn. (?) CONTORTYLENCHIDAE (Ruhm, 1956) Chitwood, 1958

Family CRICONEMATIDAE Thorne, 1943 (defined Thorne, 1949)
 (Key to the subfamilies modified from Chitwood, 1950)

1. Cuticular striations interrupted by 8 or more lateral incisures. . . . 2
 Cuticular striations not interrupted laterally by incisures
 CRICONEMATINAE Taylor, 1936 P.28
2. Cuticle finely annulated; females minute, elongate or short and thick
 PARATYLENCHINAE Thorne, 1949 P.28
 Cuticle coarsely annulated; both sexes of moderate size, very elongate, eel-shaped
 DOLICHODORINAE Chitwood, 1950 P.28

Subfamily CRICONEMATINAE Taylor, 1936
 (Key to the genera)

1. Mature female retaining last molt; body annules not retrose 2
 Mature female not retaining last molt; body annules retrose 3
2. Knobs of stylet with anteriorly directed processes
 Hemicriconemoides Chit. & Birchfield, 1957 P.30
 Knobs of stylet with posteriorly sloping processes
 Hemicycliophora de Man, 1921 P.29
3. Cuticular spines or scales present in adults
 Criconema Hofmanner & Menzel, 1914 P.31
 Cuticular spines or scales not present in adults
 Criconemoides Taylor, 1936 P.33

Subfamily PARATYLENCHINAE Thorne, 1949
 (Key to the genera)

1. Female body obese, swollen; male with adanal bursa
 Cacopaenus Thorne, 1943 P.35
 Female body not swollen or distorted; bursa absent in male
 Paratylenchus Micoletzky, 1922 P.36

Other genera:

Macroposthonia annulata, female unknown, appears more like males of criconematid genera.

Subfamily DOLICHODORINAE Chitwood, 1950
 (Key to the genera)

- Esophageal glands lying free in body cavity, overlapping the intestine; male with adanal caudal alae Belonolaimus Steiner, 1949 P.35
- Esophageal glands enclosed in terminal bulb, not overlapping the intestine; male with terminal caudal alae . . . Dolichodorus Cobb, 1914 P.35

Genus Hemicycliophora de Man, 1921
(Key to the species)

1. Annules of lip region distinctly separated. . . . hesperis Raski, 1958
Annules of lip region not separated 2
2. Terminus acute or subacute. 3
Terminus blunt, rounded 22
3. Length about 0.4 mm straeleni de Coninck, 1931
Length 0.7 mm or more 4
4. Tail long, attenuated 5
Tail not attenuated 7
5. Neck cylindroid to truncate lip region 6
Neck tapering to rounded lip region gigas Thorne, 1955
6. Spear 61-65 μ long; body annules 256-263 paradoxa Luc, 1958
Spear 132 μ long; body annules about 400
. micoletzki (Goffart, 1948) Goffart, 1952
7. Body slender, a= 33-36 8
Body more robust, a= 19-26 9
8. Length 1.0 mm, body arcuate arcuata Thorne, 1955
Length 1.4 mm, body not arcuate tenuis Thorne, 1955
9. Body marked by numerous longitudinal striae 10
Body not marked by longitudinal striae. 13
10. Tail concave conoid 11
Tail uniformly conoid 12
11. Lateral fields 1/3 the body width, transversely striated into rectangles. penetrans Thorne, 1955
Lateral fields 1/5-1/6 the body width, transversely striated into squares oostenbrinki Luc, 1958
12. Lateral fields a single line of rectangles. . . penetrans Thorne, 1955
Lateral fields with a double row of squares . . oostenbrinki Luc, 1958
13. Cuticle ornamented with delicate longitudinal markings
. aquaticum (Micoletzky, 1913) Loos, 1948
Cuticle not ornamented with longitudinal markings. 14
14. Body tapering rather uniformly from vulva to sub-acute terminus . . 15
Body not tapering uniformly, tail concave conoid. 18
15. Vulva-terminus distance three times spear length. parvana Tarjan, 1952
Vulva-terminus distance twice spear length or less. 16

16. Lip region narrowed, rounded. uniformis Thorne, 1955
Lip region broad, truncated 17
17. Lateral fields marked by 2 incisures. conidia Thorne, 1955
Lateral fields without incisures. paucianmulata Luc, 1958
18. Length near 1.2 mm. 19
Length near 1.7 mm. gracilis Thorne, 1955
19. Bisexual species with many males. typica de Man, 1921
Monosexual species as far as is known 20
20. Body narrowing rapidly behind vulva
. thienemanni (Schneider, 1922, 1925) Loos, 1948
21. Spear length 90-104u. similis Thorne, 1955
Spear length 112-122u vidua Raski, 1958
22. Terminus convex or irregular conoid to blunt terminus 23
Terminus hemispheroid 27
23. Tail uniformly convex conoid. 24
Tail irregularly conoid to blunt terminus 26
24. Vulva-terminus distance less than spear length 25
Vulva-terminus distance one and one-half times spear length
. obesa Thorne, 1955
25. Spear length 116-120u brevis Thorne, 1955
Spear length 69-83u epicharis Raski, 1958
26. About 20 annules between vulva and terminus . . . aberrans Thorne, 1955
About 55 annules between vulva and terminus . . . striatula Thorne, 1955
27. Length 1.2 mm rotundicauda Thorne, 1955
Length about 0.8 mm 28
28. Body with ventral contraction at vulva 29
Vulva continuous with body contour. nana Thorne, 1955
29. Spear length 86-100u. arenaria Raski, 1958
Spear length 120u obtusa Thorne, 1955

Genus Hemicriconemoides Chit. & Birchfield, 1957

(Key to the species)

1. Tail somewhat subdigitate wessoni Chit. & Birchfield, 1957
Tail blunt, conical, or pointed 2
2. Tail bluntly rounded. brachyurus (Loos, 1947) Chit. & Birchfield, 1957
Tail conical and/or pointed 3
3. Body annules 120 or more; spear length over 70u
. gaddi (Loos, 1949) Chit. & Birchfield, 1957
Body annules approximately 100; spear length 48-56u
. cocophilus (Loos, 1949) Chit. & Birchfield, 1957

Genus Criconema Hofmanner and Menzel 1914
(Key to species after Chitwood, 1957)

1. Annules 100 or more 2
Annules less than 100 3
2. Annules about 150; spines short and wide
. scuamosum (Cobb, 1913) Taylor, 1936
Annules probably 100-120; spines triangular, in 6 longitudinal rows
. quernei (Certes, 1889) Hofmanner & Menzel, 1914
3. Fringe continuous on each annule. 4
Fringe in strips or rows of distinct spines present (not over 16 per
annule) 6
4. Annules numbering 45; 70-80 spines in continuous fringe; stylet 98
microns (vide Sveshnikova 89 microns)
. multisquamatum (Kirjanova, 1948) Chitwood, 1957
Annules 53 or more. 5
5. Annules numbering 53; about 40 spines per annule in midregion; stylet
96 microns long fimbriatum Cobb 1936 in Taylor, 1936
Annules numbering 60-70; about 60 spines in fringe; stylet 96-130
microns long. menzeli (Stefanski, 1924) Taylor, 1936
6. Spines in a discontinuous fringe of 32-48 per annule in 8 longitudinal
bands civellae Steiner, 1949
Spines or scales in few (4-16) longitudinal rows. 7
7. Spines in only 4 longitudinal rows: 1 dorsal, 1 ventral, 2 lateral;
69-73 annules; stylet 55-60 microns long
. minutum (Kirjanova, 1948) Chitwood, 1957
Spines or scales in 8 or more longitudinal rows 8
8. Spines or scales in 16 longitudinal rows. 9
Spines in 4-12 longitudinal rows. 10
9. Spines rather blunt and scale like, not very narrow even in posterior
body region; annules 62-64; stylet 96 microns long
. cobbi (Micoletzky, 1925) Taylor, 1936
10. With 4-8 rounded scale rows; annules numbering 77; stylet about 52
microns long
. lentiforme (Stekhoven and Teunissen, 1938) Chitwood, 1957
With 8, 10, 12, or 8-12 longitudinal rows of spines or scales. . . . 11
11. Scales in 8-12 or 12 longitudinal rows. 12
Scales or spines in 8-10 longitudinal rows. 13

- 12. Scales in 8-12 rows; rounded at side dentate or wholly trifid; 67 annules; stylet 82 microns
 tripium (Stekhoven & Teunissen, 1938) Chitwood, 1957
 Scales in 12 longitudinal rows; bluntly triangular with side teeth, often somewhat tridentate; 42 annules; stylet 98.5 microns
 triconodon (Stekhoven & Teunissen, 1938) Chitwood, 1957

- 13. Spines in 10 longitudinal rows; annules; stylet 66-85 microns long
 decalineatum Chitwood, 1957
 Spines or scales in only 8 longitudinal rows. 14

- 14. Spines mostly longer than wide. 15
 Spines mostly wider than long or about equal. 16

- 15. Vulva at 15th annule from terminus; annules numbering 68-71
 murrayi (Southern, 1914) Taylor, 1936
 Vulva at 17th - 18th annule from terminus; annules numbering 89; stylet 40 microns long. spinalineatum Chitwood, 1957

- 16. Annules 65-75, large broad scale-like; vulva at 12th annule from terminus; stylet 63 microns long
 octangulare (Cobb, 1914) Taylor, 1936
 Annules 66; vulva at 10th annule from terminus; stylet 92 microns
 zernovi (Kirjanova, 1948) Chitwood, 1957



Genus Criconemoides Taylor, 1936
(Key to the species modified from Raski, 1958)

1. Spear length 90 microns or less 5
Spear length 100 microns or more. 2
2. Total body annules 95 or more 3
Total body annules 58-61. . . . annulifer (de Man, 1921) Taylor, 1936
3. Length .45 mm. or more; spear not very long and thin (less than 1/3 of body length). 4
Length .27-.30 mm.; spear very long and thin (more than 1/3 of body length) macrodorum Taylor, 1936
4. Spear 105 microns; total body annules 140; length .88-1.00 mm
. annulatum Taylor, 1936
Spear 122 microns; total body annules 95-103; length .46 mm
. sphagni (Micoletzky, 1925) Taylor, 1936
5. Tail rounded. 11
Tail pointed. 6
6. Total body annules less than 80 8
Total body annules 110 or more. 7
7. Length .70 mm.; vulva on 16-17 annule from terminus
. komabaensis (Inamura, 1931) Taylor, 1936
Length .55-.59 mm.; vulva on 8th annule from terminus
. morgense (Hofmanner and Menzel, 1914) Taylor, 1936
8. Total body annules 70 or more 9
Total body annules 65 heideri Stefanski, 1916
9. Vulva located on 12-15th annule from terminus; total body annules 70-76 10
Vulva located on 7th annule from terminus; total body annules 79
. peruense (Steiner, 1920) Taylor, 1936
10. Length .70 mm.; first annule larger than second annule
. crotaloides (Cobb, 1924) Taylor, 1936
Length .40-49 mm.; first annule smaller than second annule
. demani (Micoletzky, 1925) Taylor, 1936
11. No joints on lateral line, annules unbroken except occasional anastomosis 14
Joints on lateral line except on anterior end of body 12
12. Lateral line zig-zag; spear 57 microns or more 13
Lateral line with simple breaks; spear 50 microns citri Steiner, 1949

13. Length .30 mm.; spear 57 microns; annules 68-72 .
 sphaerocephalum Taylor, 1936
 Length .50 mm.; spear 85 microns; annules 89
 cylindricum (Kir'ianova) Raski, 1952
14. Total body annules 115 or less; spear 48 microns or more. 16
 Total body annules 142 or more; spear 25-41 microns 15
15. Total body annules 142-156, angular on posterior edge; vulva on 11-
 12th annule from terminus. parvum Raski, 1952
 Total body annules 200, rounded edges; vulva on 7-8th annule from
 terminus. zavadskii (Tulganov, 1941) Raski, 1958
16. Total body annules approximately 40 boettgeri Meyl, 1954
 Total body annules 60 or more 17
17. Total body annules 70 or more 19
 Total body annules 60-65. 18
18. First annule irregular in outline or divided into 4 indefinite sub-
 lateral lobes; anus located on 3rd or 4th annule from terminus
 informe (Micoletzky, 1922) Taylor, 1936
 Lips 6, large; anus on last annule very near terminus
 anura (Kir'ianova, 1948) Raski, 1958
19. Spear length 48-67 microns. 24
 Spear length 70-86 microns. 20
20. Sublateral lobes absent 22
 Sublateral lobes present. 21
21. Head bluntly rounded; amphids narrow, slit-like . xenoplax Raski, 1952
 Head sharply tapered; amphids small, rounded
 quadricorne (Kir'ianova, 1948) Raski, 1958
22. Total body annules 73-84; length .53-.72 mm 23
 Total body annules 106-113; length .34-.42 mm . . . teres Raski, 1952
23. Length .53 mm.; total body annules 73
 congolense (Stekhoven and Teunissen, 1938) Raski, 1952
 Length .72 mm.; total body annules 84
 beljaevae (Kir'ianova, 1948) Raski, 1958
24. Sublateral lobes absent, or if present are not prominent and flattened
 anteriorly. 25
 Sublateral lobes prominent, flattened anteriorly presenting a trun-
 cated head. lobatum Raski, 1952
25. First annule not well set off 26
 First annule well set off; cuticle of larvae provided with rows of
 spines. mutabile Taylor, 1936

26. Length .30-.45 mm.; head and tail not blunt-truncate (tail of *ornatum* somewhat truncate) 27
 Length .60 mm.; head and tail both blunt-truncate
 rusticum (Micoletzky, 1917) Taylor, 1936
27. Sublateral lobes absent 29
 Sublateral lobes present. 28
28. Anterior flap of vulva forming 2 definite points; larvae with longitudinal cuticular fringe; males unknown ornatum Raski, 1958
 Anterior flap of vulva bilobed, rounded; larvae without cuticular markings; males common curvatum Raski, 1952
29. Lip region plain; amphids small and round or indistinct 30
 Head with 6 indistinct lips; amphids large, oval; spear 53 microns; total body annules 70 tulaganovi (Kir'ianova, 1948) Raski, 1958
30. Single gonad; vulva on 5-6th annule from terminus; amphids indistinct pullum (Kir'ianova, 1948) Raski, 1958
 Paired gonads; vulva on 8th annule from terminus; amphids small, rounded on 2nd and 3rd annules
 tenuicute (Kir'ianova, 1948) Raski, 1958

Genus Cacopaurus Thorne, 1943
 (Key to species)

- Three lines in the wing area; punctations in cuticle
 pestis Thorne, 1943
 Four lines in the wing area; absence of punctations
 epacris Allen & Jensen, 1950

Genus Belonolaimus Steiner, 1949
 (Key to the species)

- Spear length 155u or more; tail length approximately 3 anal body diameters gracilis Steiner, 1949
 Spear length 135u or less; tail length approximately 5 anal body diameters longicaudatus Rau, 1958

Genus Dolichodoros Cobb, 1914
 (Key to the species)

1. Spear less than 90u long. similis Golden, 1958
 Spear more than 100u long 2
2. Mature female tail pointed; 3 incisures in lateral field
 heterocephalus Cobb, 1914
 Mature female tail rounded; 4 incisures in lateral field
 obtusus Allen, 1957

Genus Paratylenchus Micoletzky, 1922
(Key to the species from Tarjan, in press)

1. Males with distinct stylet. 2
Males without stylet or males not observed 3
2. Anterior end narrow, tapering; spear 48-56u in length
. goodeyi Oostenbrink, 1953
Anterior end more normal; spear 30u or less. Protrusible spicula
sheath bearing a posterior hook-like process
. hamatus Thorne and Allen, 1950
3. Stylet length greater than 45 4
Stylet length less than 45. 5
4. Larval stylet length as great as 67u, b= less than 3
. anceps Cobb, 1923
Stylet length 56u, b= greater than 3 tanyogarus n. sp.
5. Maximum body length of population 310u or less. 6
Maximum body length of population greater than 310u 9
6. Vulva usually situated at 70-80% of body length; post-vulvar annules
numbering about 70. minuseulus n. sp.
Vulva usually situated at 80-86% of body length; post-vulvar annules
less than 70. 7
7. Post-vulvar uterus sac present. . . besoekianus Billy and Reydon, 1931
Post-vulvar uterus sac absent 8
8. Male with protruding anal lips
. minutus Linford in Linford, Oliveira, and Ishii, 1949
Male with normal anus elachistus Steiner, 1949
9. Spear length 32-36u 10
Spear length 27u or less 11
10. Spear length 34-36u, vulva at 82-83%; spermatheca present; lip region
not offset. nanus Cobb, 1923
Spear length 32u, vulva at 83-87%; spermatheca absent; lip region
offset. projectus Jenkins, 1956
11. Short post-vulvar uterus sac present, b= 4.3
. bukowinensis Micoletzky, 1922
Post-vulvar uterus sac absent 12
12. Tail short (c= 16.5); anterior end narrowing sharply near stylet
guide; lip region strongly truncated. . curvitatatus van der Linde, 1938
Tail relatively longer (c= 12.7); anterior end not narrowing sharply;
lip region not as strongly truncated
. dianthus Jenkins and Taylor, 1956

Family HOPLALAIMIDAE (Filipj., 1941) Wieser, 1953
(Key to the subfamilies)

1. Females swollen 2
Females not swollen 3
2. Females swollen, pear to lemon-shaped; males with short bluntly rounded tail, anus subterminal. . . . HETERODERINAE Skarbilovich, 1947 P.37
Females saccate to reniform, preserving some elongate tendencies; male tails conoid, anus not subterminal.NACOBBINAE Chitwood, 1950 P.37
3. Females with one ovary.PRATYLENCHINAE Thorne, 1949 P.46
(Contains one genus, Pratylenchus Filipj., 1934)
Females with two ovaries. HOPLALAIMINAE Filipjev, 1941 P.47

Subfamily HETERODERINAE Skarbilovich, 1947
(Key to the genera)

1. Vulva equatorial. Meloidodera Chitwood, Hannon & Esser, 1956
(Contains one species M. floridensis Chit., Hannon & Esser, 1956)
Vulva terminal. 2
2. Female body forming cyst; body packed with eggs
. Heterodera Schmidt, 1871 P.38
Female body not forming cyst; body not packed with eggs
. Meloidogyne Goeldi, 1887 P.45

Subfamily NACOBBINAE Chitwood, 1950
(Key to the genera Chitwood, 1950)

1. Female with one ovary Nacobbus Thorne & Allen, 1944 P.37
Female with two ovaries Rotylenchulus Linford & Oliveira, 1940
(Contains one species R. reniformis Linford & Oliveira, 1940).

Genus Nacobbus Thorne and Allen, 1944
(Key to species after Thorne and Schuster, 1956)

1. Adult female anteriorly spheroid or ovate, then slender, elongated; infective female with vulva-anus distance equal to about three times the tail length; male tail about one and one-half times as long as anal body diameter. dorsalis Thorne and Allen, 1944
Adult female spindle-shaped or irregular in form; infective female with vulva-anus distance one to two times the tail length; male tails about as long as anal body diameter 2
2. Adult female with strongly developed median bulb and corpus; infective female with vulva-anus distance about equal to tail length and with phasmids near middle of tail. . bataiformis Thorne and Schuster, 1956
Adult female without strongly developed median bulb and corpus; infective female with vulva-anus distance twice tail length, and phasmids near terminus. aberrans (Thorne, 1935) Thorne and Allen, 1944

Genus Heterodera Schmidt, 1871
(Key to the species prepared by A.L. Taylor)

Note: This key is designed to facilitate identification of the species of Heterodera, using only characters of the mature cysts and their contents, that is, eggs with second stage larvae. Certain characters used in the key may not be visible on other than fully mature cysts.

1. Body of cyst ovoid to globular, that is with posterior portion rounded and vulva not located on a distinct protuberance (figs. 1 and 2). Heterodera rostochiensis group #4
2. Basic element of pattern of outer layer of cyst wall at middle portion of cyst short zig-zag lines with little or no trace of regular transverse arrangement (figs. 7 and 8) sometimes modified to appear as network (fig. 12). 3
Basic element of pattern at outer layer of cyst wall at middle portion of cyst straight or wavy lines (figs. 14 and 16) lines at right angles to axis of cyst; sometimes broken by short oblique or vertical lines outer layer of cyst may have grainy appearance (fig. 18).
. Heterodera cacti group 7
3. Mature cysts with dark bodies (brown knobs) and often sheaf-shaped object (lining of vagina) at posterior end (fig. 11). On immature cysts, these seldom visible, and then do not appear dark.
. Heterodera schachtii group 8
Mature cysts without brown knobs or sheaf-shaped object at posterior end Heterodera gottingiana group 11
4. H. rostochiensis group. Cyst often ovoid, anus located at a transparent spot on cyst so that anal and vulvar openings appear to be about the same size when seen by transmitted light (fig. 21). Hyaline portion of larval tail much longer than stylet . . . Heterodera punctata
Cyst ovoid to globular; anal opening appears much smaller than vulva opening (figs. 19 and 20). Hyaline portion of larval tail about the same length as stylet 5
5. Larvae very slender; length about 39 times greatest width; orifice of dorsal oesophageal gland about two-thirds stylet length posterior to stylet knobs. Heterodera leptonepia
Length of larvae about 22 times greatest width; orifice of dorsal oesophageal gland about one-fourth stylet length posterior to stylet 6
6. Distance between vulva and anus about one and one-half times diameter of vulva. Heterodera rostochiensis
Distance between anus and vulva about two and one-half times diameter of vulva. Heterodera tabacum
7. H. cacti group. Hyaline portion of larval tail about as long as stylet; stylet knobs concave anteriorly Heterodera weissii
Hyaline portion of larvae of larval tail usually shorter than stylet; stylet knobs convex anteriorly Heterodera cacti



8. H. schachtii group. Cyst always with distinct punctation consisting of dots of uniform size but not in rows (fig. 25); brown knobs closely clustered around vulva. Hyaline portion of larval tail at least one and one-half times longer than stylet Heterodera major
Cyst with or without punctation, mostly in rows if present; brown knobs not closely clustered around vulva. Hyaline portion of larval tail about as long as stylet. 9
9. Average length of larvae 480 u or more. 10
Average length of larvae about 460 u. Heterodera schachtii
10. Average length of larvae 484 u. Heterodera glycinis
Average length of larvae 502 u. Heterodera trifolii
Average length of larvae 518 u. Heterodera schachtii galeopsidis
11. Average length of larvae 414 u. Heterodera cruciferae
Average length of larvae 454 u. Heterodera carotae
Average length of larvae 474 u. Heterodera gottingiana
Average length of larvae 405 u. Heterodera humuli
Average length of larvae 406 u. Heterodera fici

Plate I. Shapes of cysts of Heterodera species. Fig. 1.
H. rostochiensis. Fig. 2. H. punctata. Fig. 3. H. schachtii
Fig. 4. H. avenae. Fig. 5. H. weissi, Fig. 6. H. cacti.

Plate II. Cyst patterns of Heterodera schachtii and related species.
Figs. 7 and 8. Zig-zag line pattern near middle of cysts of H. trifolii and H. schachtii respectively. Fig. 9. Pattern at junction of neck and body of cysts of H. schachtii. Fig. 10. Pattern near vulva of cyst of H. gottingiana. Fig. 11. Sheaf-shaped object and dark bodies at lower end of cyst of H. schachtii. Fig. 12. Network pattern, a variation of that shown in Figs. 7 and 8. Magnification of figure 11 is about 200X, all other about 410X.

Plate III. Cyst markings of Heterodera weissi and H. cacti. Fig. 13.
Lower part of cyst of H. cacti. Fig. 14. Pattern near middle of cyst of H. weissi. Fig. 15. Pattern at junction of body and neck of H. weissi. Fig. 16. Pattern near middle of cysts of H. cacti. Fig. 17. Lower end of cysts of H. cacti showing anus. Fig. 18. Grainy appearance of cyst of H. cacti. All about 410X.

Plate IV. Cyst patterns and punctation of Heterodera rostochiensis and H. punctata. Fig. 19. Pattern at vulva and anus of H. rostochiensis. Fig. 20. Same as Fig. 19, but with deeper focus to show punctation. Fig. 21. Anal and vulvar openings of cyst of H. punctata. (Cyst split in process of preparation). Fig. 22. Pattern at about middle of cyst of H. rostochiensis. Fig. 23. Pattern of upper part of cyst of H. punctata. Fig. 24. Punctation of H. rostochiensis. All about 410X.

Plate V. Cysts and eggs of Heterodera species. Fig. 25. Punctation of cyst of H. avenae. Fig. 26. Punctation and pattern of cyst of H. humuli. Fig. 27. Punctation of cyst of H. trifolii. Fig. 28. Punctation of egg shell of H. cacti.

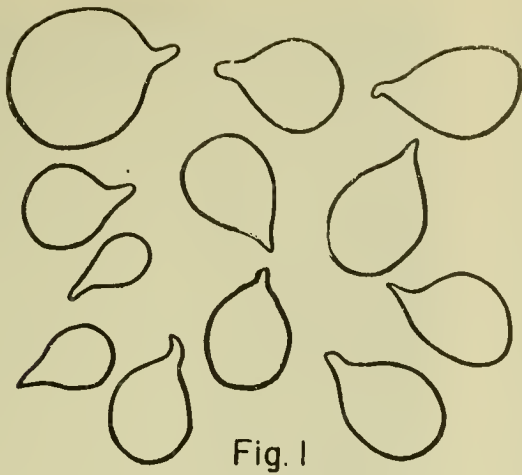


Fig. 1

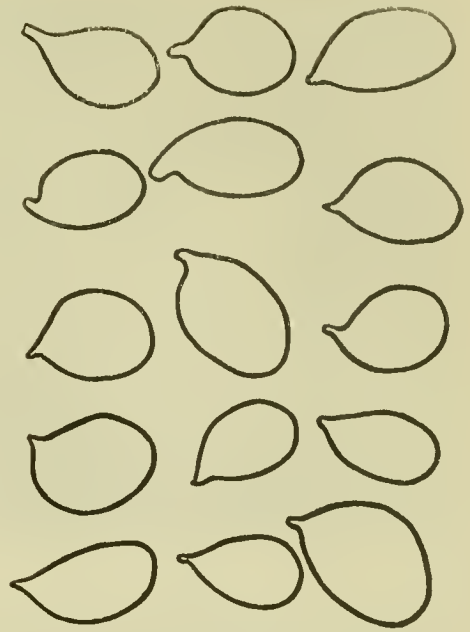


Fig. 2

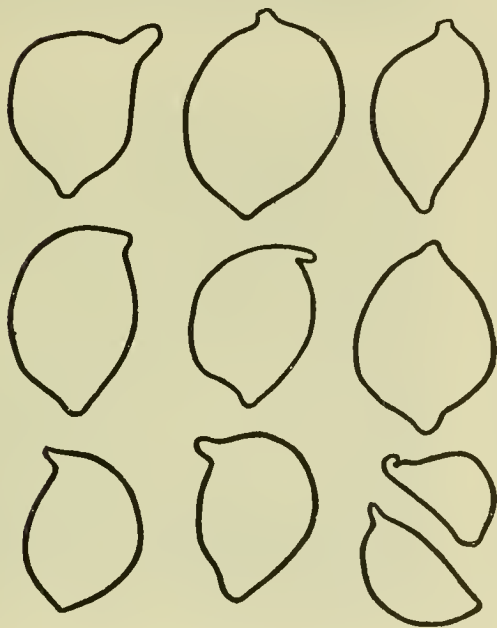


Fig. 3

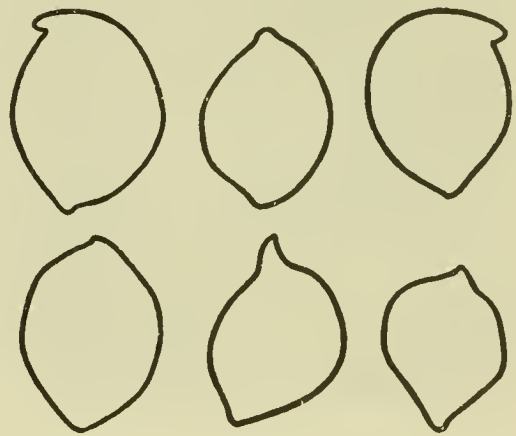


Fig. 4

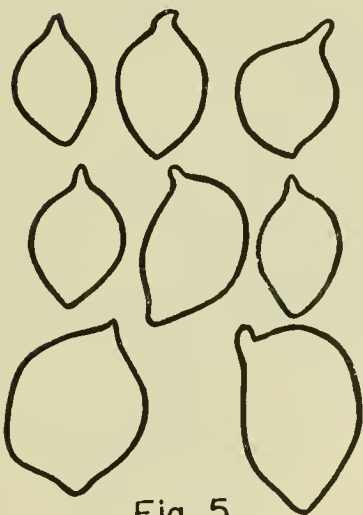


Fig. 5

0.5mm.

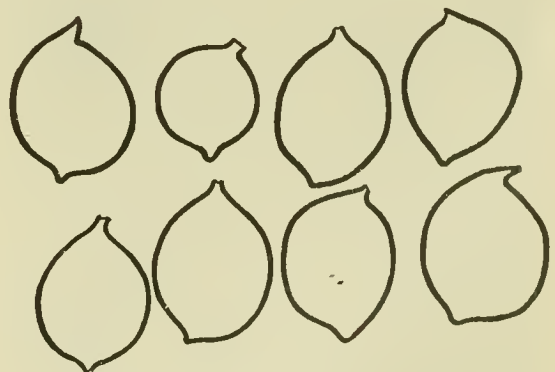
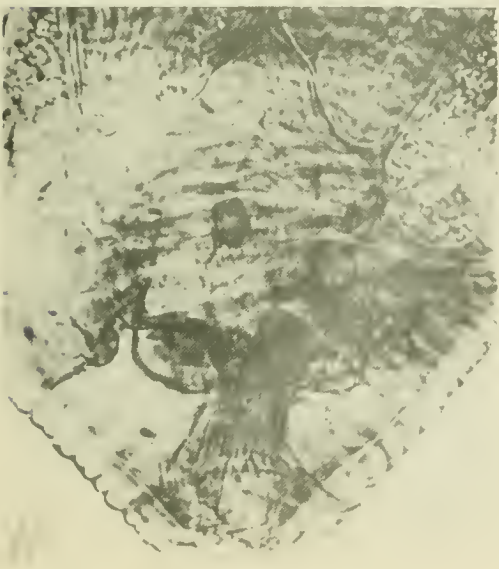
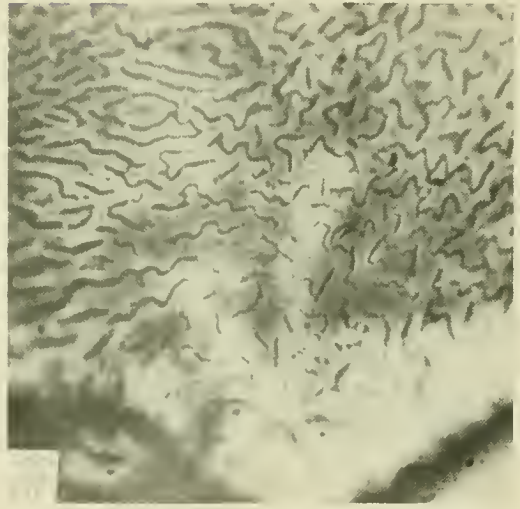
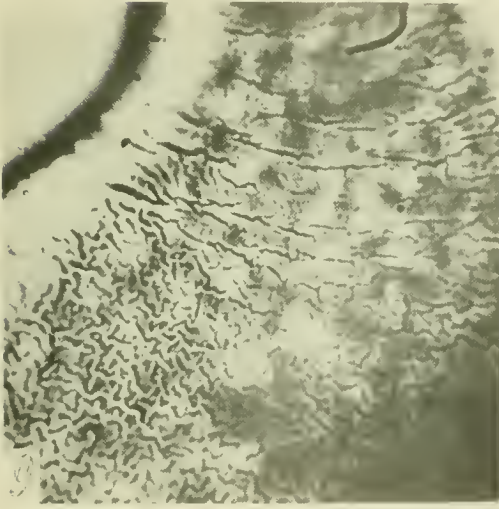
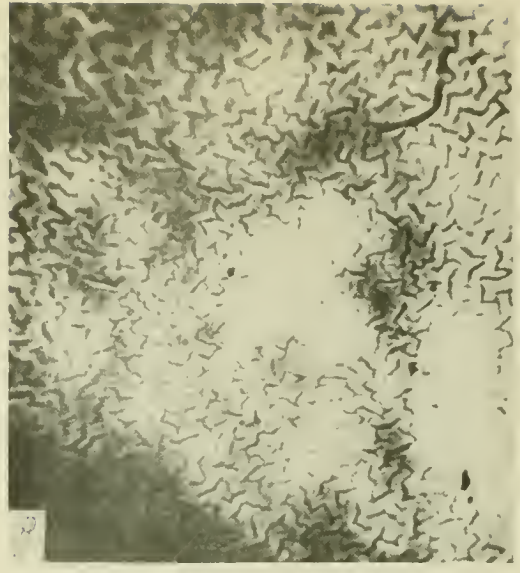
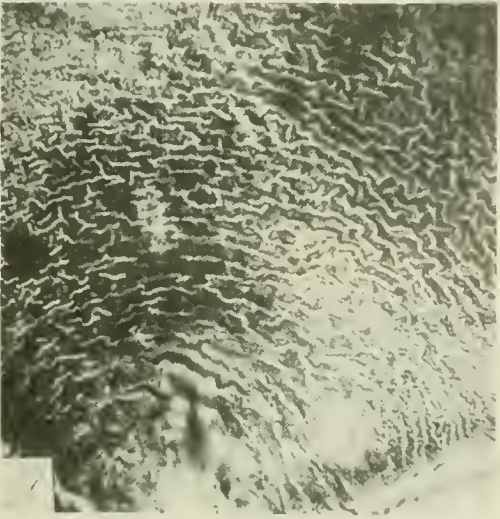
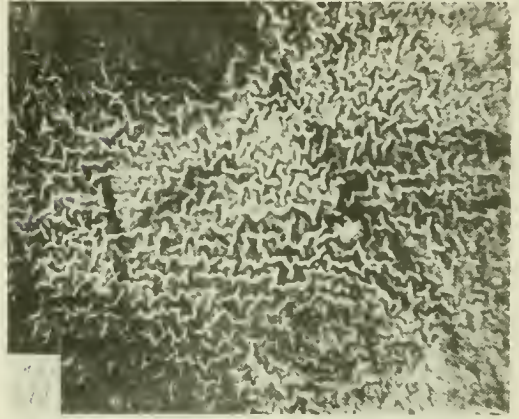
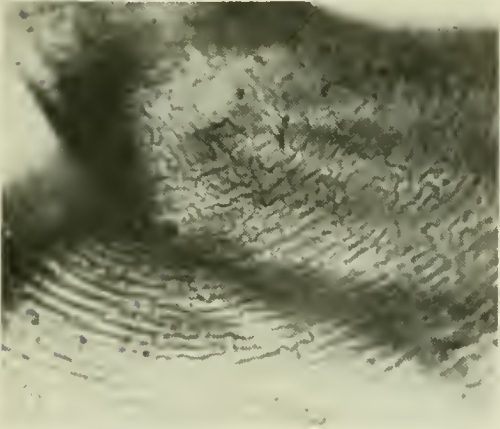
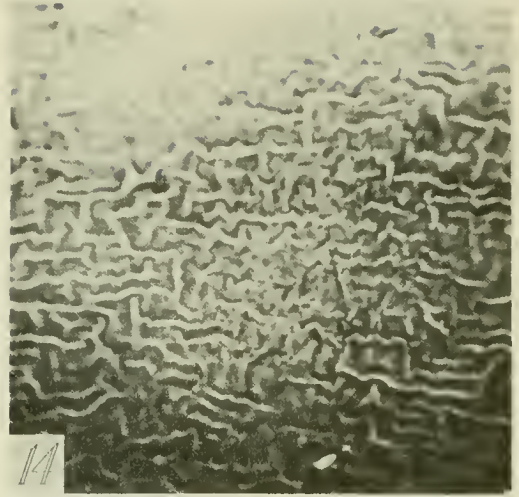
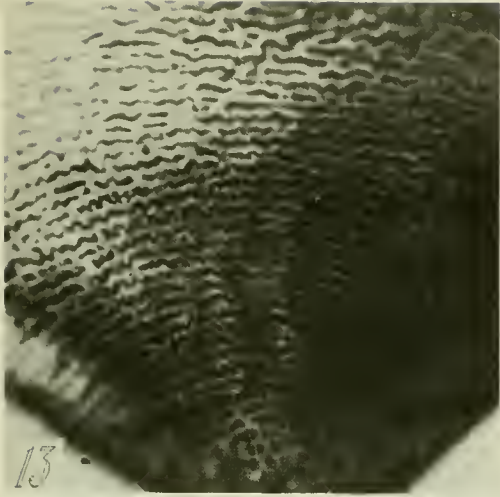
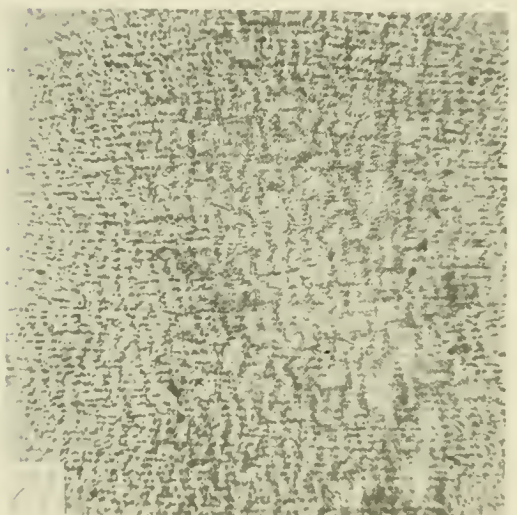
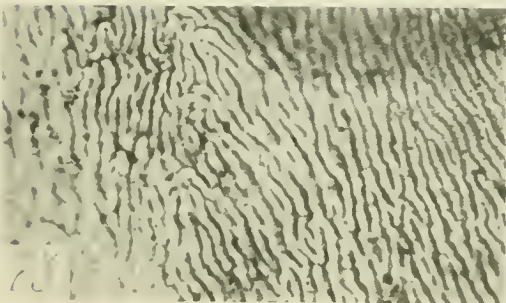
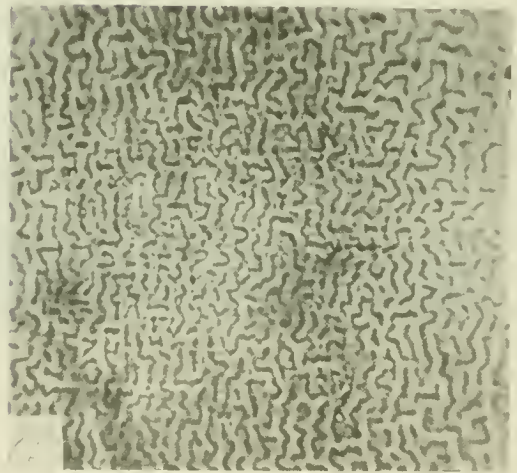
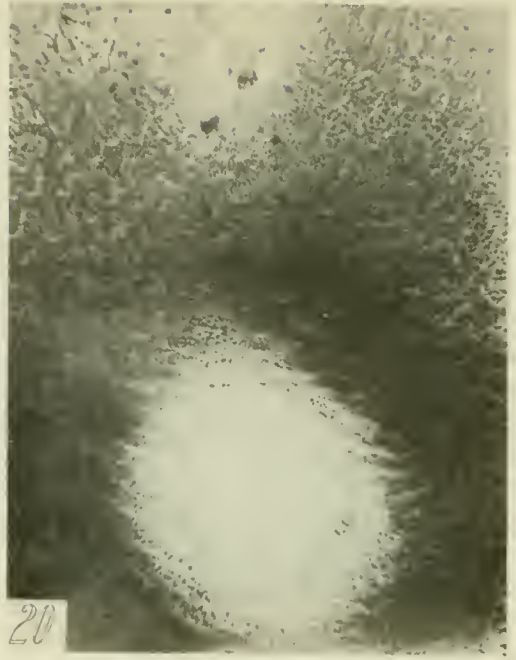
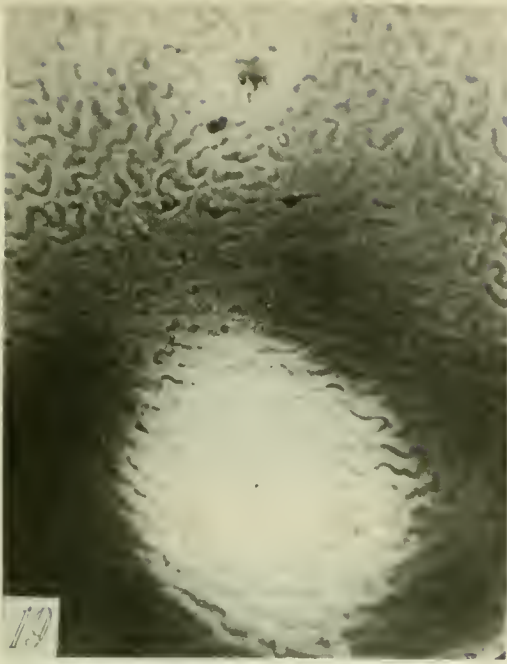
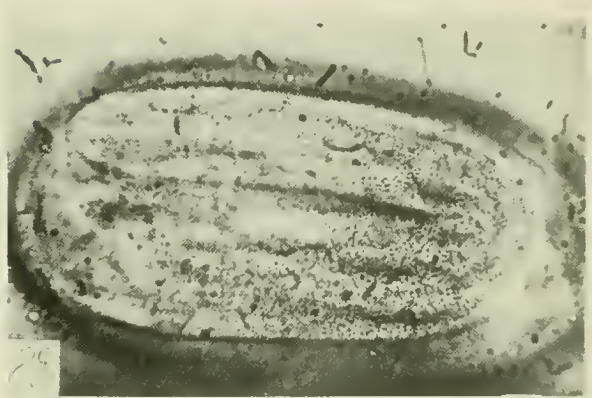
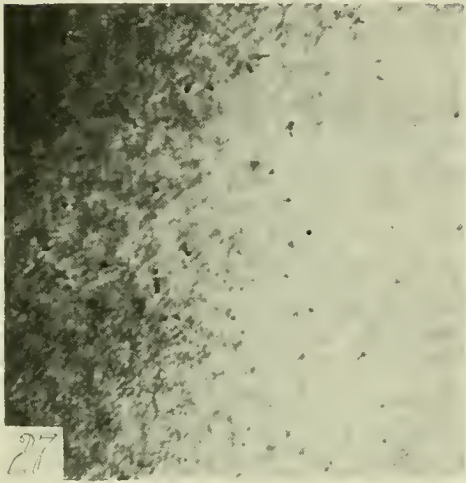
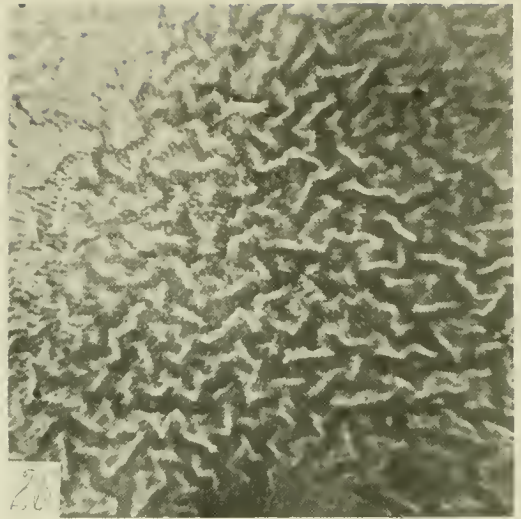
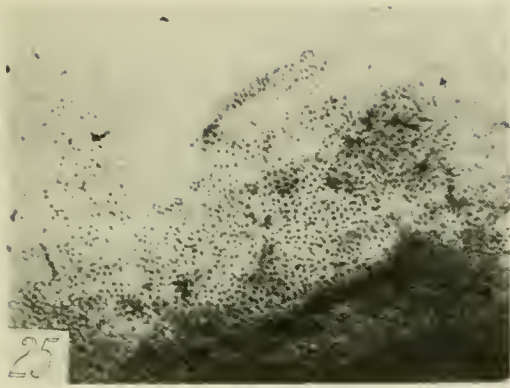


Fig. 6









Genus Meloidogyne Goldi, 1887
(Key to the species from Taylor, Dropkin & Martin, 1955)

perineal patterns

1. Arch low and rounded or flattened dorsally. 2
Arch high, pattern roughly oval or roughly rectangular. 6
2. Lateral lines distinct incisures often extending beyond edge of pattern. Few or no striae extending unbroken from dorsal to ventral sector. javanica (Treub, 1885) Chitwood, 1949
Lateral lines not distinct incisures, but marked only by irregularities or discontinuities in striae; or with striae meeting at an angle along lateral lines 3
3. Arch more or less rounded 4
Arch flattened. 5
4. Often with strippled or punctate area near tail tip. Without irregular striae near lateral lines hapla Chitwood, 1949
With irregular striae near lateral lines. Never with stippled or punctate area near tail tip arenaria (Neal, 1889) Chitwood, 1949
5. Striae folded near lateral lines. exigua Goldi, 1887
Lateral lines bordered by numerous short striae near tail tip arenaria thamesi Chitwood, 1952
6. Pattern roughly oval. 7
Pattern roughly rectangular brevicanda Loos, 1953
7. Dorsal striae closely spaced, wavy to zig-zag, arch often ill-formed incognita (Kofoid & White, 1919) Chitwood, 1949
Dorsal striae smooth to wavy, arch usually well-formed incognita acrita Chitwood, 1949

Other species:

M. acronea Coetzee, 1956

M. inornata Lordello, 1956

M. javanica bauruensis Lordello, 1956

Genus Pratylenchus Filipjev, 1934
(Key to the species from Sher & Allen, 1953)

1. Lip region with 2 annules (1 striation) 2
Lip region with 3 or 4 annules (2 or 3 striations). 5
2. Lateral margin of lips angular.
. brachyurus (Godfrey, 1929) Filipj. & Stakh., 1941
Lateral margin of lips rounded 3
3. Body long and slender ($L=0.4-0.7$, $a=25-40$), males numerous.
. coffea (Zimmerman, 1898) Filipj., & Stekh., 1941
Body short and stout ($L=0.3-0.67$, $a=18-26$), males rare. 4
4. Vulva (=V) at 75-80 per cent. scribneri Steiner, 1943
Vulva at 80-88 per cent minyus Sher & Allen, 1953
5. Striations around terminus of tail.
. pratensis (de Man, 1880) Filipjev, 1934
No striations around terminus of tail 6
6. Outer margins of cephalic framework prominent, extending posteriorly
about two body annules; tail bluntly rounded.
. thornei Sher & Allen, 1953
Outer margins of cephalic framework normal. 7
7. Vulva 68-76 per cent; tail tapering to narrow rounded terminus. 8
Vulva 78-84 per cent. 9
8. Three annules on lip region; males absent zeae Graham, 1951
Four annules on lip region; males numerous. goodeyi Sher & Allen, 1953
9. Postuterine branch short, length about equal to body width at vulva;
tail broadly rounded. penetrans (Cobb, 1917) Filipj. & Stekh., 1941
Postuterine branch long, two or three times body width at vulva; tail
tapering to narrow rounded terminus vulnus Allen and Jensen, 1951

Species Inquirendae:

P. sacchari (Soltwedel, 1888) Filipjev, 1936
Dolichodorus heterocercus Kreis, 1930

Other species:

P. coffea brasiliensis Lordello, 1956
p. neglectus (Rensch, 1924) Loof, 1957

P. pratensis bicondatus Meyl, 1953
P. pratensis tenuistriatus Meyl, 1953

P. tunidiceps Merzheyevakaya, 1951

Subfamily HOPLOLAIMINAE Filipjev, 1934
(Key to the genera)

1. Phasmids extremely large, scutellum-like 2
Phasmids normal, small, pore-like 3
2. Transverse striae continuing across lateral fields; spear knobs anteriorly furcate and pointed Hoplolaimus Daday, 1905 P.47
Central field of lateral field smooth, without transverse striae; spear knobs rounded Scutellonema Andrassy, 1958 P.48
3. Esophageal glands forming a distinct bulb Tylenchorhynchus Cobb, 1913 P.49
Esophageal glands free in body cavity, overlapping intestine 4
4. Tail length approximately equal to anal body diameter 5
Tail length at least twice as long as anal body diameter 7
5. Dorsal gland orifice usually less than 1/3 or more of stylet length from base of stylet 6
Dorsal gland orifice 1/3 or more of stylet length from base of stylet length from base of stylet Helicotylenchus Steiner, 1945 P.52
6. Lip region longitudinally striated; gubernaculum bear titillae Rotylenchus Filipjev, 1936 P.47
Lip region with transverse annules only; gubernaculum without titillae Gottholdsteineria Andrassy, 1958 P.53
7. Esophageal glands extending far back over intestine Radopholus Thorne, 1949 P.53
Esophageal glands only slightly overlapping intestine Pratylenchoides Winslow, 1958
(Contains a single species P. crenicauda Winslow, 1958)

Genus Hoplolaimus Daday, 1905
(Key to the species)

- No lateral field except at each end of body where annules are slightly interrupted in lateral line proporicus J. Goodey, 1957
- Lateral fields present tylenchiformis Daday, 1905
syn: Hoplolaimus coronatus Cobb, 1923

Genus Rotylenchus Filipjev, 1936
(Key to the species)

- Phasmid located slightly anterior to anus robustus (de Man, 1876) Filipjev, 1936
syn: Tylenchus robustus de Man, 1876
Tylenchorhynchus robustus (de Man, 1876) Micoletzky, 1929 partim
Hoplolaimus uniformis Thorne, 1949
- Phasmid located 2 anal body diameters anterior to anus gracilidens (Sauer, 1958) Sauer, 1958

Scutellonema Andrassy, 1958
(Key to species modified from Golden, 1956)

1. Phasmids not opposite each other, location of anterior one being at average of 79% of body length and posterior one at an average of 86%; lips of vulva protruding
 christiei (Golden & Taylor, 1956) Andrassy, 1958
 (syn. Rotylenchus christiei Golden & Taylor, 1956)
 Phasmids opposite each other and located on tail or in vicinity of anus; lips of vulva not protruding. 2
2. Tail as long as or longer than anal body diameter; head with seven or more annules. 5
 Tail much shorter than anal body diameter; head with five annules or less 3
3. Lateral field aerolated in esophageal region; five annules on head. 4
 Lateral field not aerolated in esophageal region; three annules on head, rarely four coheni (J. Goodey, 1952) Andrassy, 1958
 (syn. Rotylenchus coheni, J. Goodey, 1952)
4. Opening of dorsal esophageal gland is 1/9 of stylet length from base of stylet brachyurum (Steiner, 1938) Andrassy, 1958
 (syn: Rotylenchus brachyurus Steiner, 1938)
 Opening of dorsal esophageal gland is about 1/3 of stylet length from base of stylet boocki (Lordello, 1957) Andrassy, 1958
 (syn: Rotylenchus boocki Lordello, 1957)
5. Stylet knobs anteriorly flattened or slightly concave
 bradys (Steiner & LeHew, 1933) Andrassy, 1958
 (syn: Hoplolaimus bradys Steiner & LeHew, 1933)
 Stylet knobs ovoid, anteriorly convex
 blaberum (Steiner, 1937) Andrassy, 1958
 (syn: Rotylenchus blaberus Steiner, 1937)

Genus Tylonchorhynchus Cobb, 1913
(Key to the species)

1. Cuticle marked by longitudinal striae 2
Cuticle not marked by longitudinal striae 7
2. Lateral field marked by 4 lines 3
Lateral field marked by 6 lines 4
3. Lip region bearing 3 or 4 annules claytoni Steiner, 1937
Lip region bearing 6 or 7 annules
. lamelliferus (de Man 1880) Filipjev, 1936
4. Annules extending around terminus of tail
. tessellatus J. B. Goodey, 1952
Annules not extending around terminus of tail 5
5. Less than 35 longitudinal striae at middle of body. 6
About 60 longitudinal striae at middle of body.
. quadrifor Andrassy, 1954
6. Lip region set off by constriction. lenorus Brown, 1956
Lip region continuous with body contour ornatus Allen, 1955
7. Lateral field marked by 4 lines 8
Lateral field marked by 5 lines 24
Lateral field marked by 6 lines 26
8. Annules extending around terminus of tail 9
Annules not extending around terminus of tail 14
9. Lip region set off by constriction.
. dubis (Butschli, 1873) Filipjev, 1936
Lip region continuous body contour. 10
10. Lip region bearing 6 or 7 annules; tail cylindrical, bluntly rounded .
. 11
Lip region bearing 4 or 5 annules; tail tapering conoid
. eremicolus Allen, 1955
11. Lip sclerotization heavy, conspicuous 12
Lip sclerotization faint, inconspicuous 13
12. Tail length about 1 anal body diameter; phasmids opposite anal opening
. brevicaudatus Hopper, 1959
Tail length over 2 anal body diameter; phasmids at middle of tail . .
. magnicauda (Thorne, 1935) Filipjev, 1936
13. Tail less than 3 X anal body diameter parvus Allen, 1955
Tail more than 3 X anal body diameter maximus Allen, 1955

14. Lip region continuous with body contour 14
Lip region set off by constriction or depression. 22
15. Lip region bearing 2 annules. nudus Allen, 1955
Lip bearing more than 2 annules 16
16. Lip sclerotization faint, inconspicuous 17
Lip sclerotization strong, conspicuous. 20
17. Tail bearing 10 to 15 annules 18
Tail bearing 20 to 27 annules 19
18. Lip region bearing 5 annules; spear 15-17 as long. . clarus Allen, 1955
Lip region bearing 3 annules; spear 18-20 as long
. ewingi Hopper, 1959
19. Lip region bearing 5 annules; tail subcylindrical striatus Allen, 1955
Lip region bearing 3 annules; tail somewhat clavate
. martini Fielding, 1956
20. Spear less than 20 u long manubriatus Litvinova, 1946
Spear more than 20 u long 21
21. Spear not more than 31 u long, tail bearing 50 annules
. kegenicus Litvinova, 1946
Spear more than 31 u long, tail bearing 45 annules
. galeatus Litvinova, 1946
22. Spear more than 20 u long, lips rounded, sclerotization conspicuous . .
. cylindricus Cobb, 1913
Spear less than 20 u long, lips broadly rounded, sclerotization faint. 23
23. Lip region bearing 6 annules; tail conoid, bearing approximately 16
annules latus Allen, 1955
Lip region bearing 3 annules; tail somewhat clavate, bearing approxi-
mately 26 annules martini Fielding, 1956
24. Tail about 2 X anal body diameter, bearing less than 25 annules . . .
. acutus Allen, 1955
Tail about 3 X anal body diameter bearing more than 25 annules. . . 25
25. Tail bearing about 32 annules, terminal annule not enlarged
. capitatus Allen, 1955
Tail bearing about 42 annules, terminal annule enlarged
. acti Hopper, 1959
26. Annules extending around terminus of tail 27
Annules not extending around terminus of tail 31
27. Lip region set off by constriction or depression. . leptus Allen, 1955
Lip region not set off by constriction or depression. 28
28. Lip sclerotization well developed, conspicuous. . macrurus Allen, 1955
Lip sclerotization faint, inconspicuous 29

29. Spear more than 23u long obscurus Allen, 1955
Spear less than 22u long 30
30. Spear more than 15u long, tail less than 3 X anal body diameter . . .
. nothus Allen, 1958
Spear not more than 15u long, tail more than 3 X anal body diameter .
. nanus Allen, 1958
31. Lip region continuous with body contour 32
Lip region set off by constriction or depression. 34
32. Tail short, conoid, terminus pointed. . . . brachycephalus Allen, 1955
Tail subcylindrical, bluntly rounded. 33
33. Spear less than 20u long. brevidens Allen, 1955
Spear more than 20u long. affinis Allen, 1955
34. Lip sclerotization heavy, conspicuous 35
Lip sclerotization faint, inconspicuous 37
35. Tail more than 3 X anal body diameter alpinus Allen, 1955
Tail less than 3 X anal body diameter 36
36. Spear more than 35u macrodens Allen, 1955
Spear less than 35u long. grandis Allen, 1955
37. Spear less than 35u long lineatus Allen, 1955
Spear more than 35u long 38
38. Spear more than 55u long; tail less than 2 X anal body diameter . . .
. superbus Allen, 1955
Spear less than 55u long; tail more than 2 X anal body diameter . . .
. conicus Allen, 1955

Other species:

- T. paucus Kirjanova, 1951
T. graminicola Kirjanova, 1951
T. bucharicus (Tulaganov, 1949) Tulaganov, 1954
T. caromatus (Tulaganov, 1949) Tulaganov, 1954
T. spinicaudatus Schuurmans-Stekhoven, 1944

Genus Helicotylenchus Steiner, 1945
(Key to species modified from Golden, 1956)

1. Tail conical, ending in a flagellum-like structure
 africanus (Micoletzky, 1915) Andrassy, 1958
 syn: Tylenchus africanus Micoletzky, 1915
Tylenchorhynchus africanus (Micoletzky, 1915) Stekh. & Teunissen,
 1938
Rotylenchus africanus (Micoletzky, 1915) Filipj. & Stekh., 1941
 Tail not conical and without flagellum-like structure 2
2. Opening of dorsal esophageal gland usually less than 1/3 of stylet
 length from base of stylet; tail with distinct ventral terminal
 process melancholicus (Lordello, 1955) Andrassy, 1958
 syn: Rotylenchus melancholicus Lordello, 1955
 Opening of dorsal esophageal gland 1/3 or more of stylet length from
 base of stylet. 3
3. Tail generally rounded; stylet approximately 22u
 multicinctus (Cobb, 1893) Golden, 1956
 syn: Tylenchus multicinctus Cobb, 1893
Rotylenchus multicinctus (Cobb, 1893) Filipjev, 1936
Anguillulina multicincta (Cobb, 1893) Goodey, 1940
 Tail not rounded, with most of the curvature being on the dorsal side;
 stylet about 25-28u 4
4. Tail usually with long ventral terminal process; well developed
 spherical spermatheca present
 erythrinae (Zimmermann, 1904) Golden, 1956
 syn: Tylenchus erythrinae Zimmermann, 1904
Tylenchus psuedorobustus Steiner, 1914
Aphelenchus dubius var. peruensis Steiner, 1920
Tylenchus spiralis Cassidy, 1930
Tylenchorhynchus robustus var. erythrinae (Zimmermann, 1904)
 Bally & Reydon, 1931
Anguillulina multicincta in Goodey, 1932 nec Cobb, 1893
Tylenchorhynchus multicinctus in Stekh. & Teunissen, 1938 nec
 Cobb, 1893
Anguillulina erythrinae (Zimmermann, 1904) Goodey, 1940
Rotylenchus erythrinae (Zimmermann, 1904) Goodey, 1951 partim
 Tail with or without short, blunt ventral terminal process; well de-
 veloped spherical spermatheca absent
 nannus (Steiner, 1945) Andrassy, 1958

Other species:

- H. iperoiguensis (Carvalho, 1956) Andrassy, 1958
 syn: Rotylenchus iperoiguensis Carvalho, 1956

Genus Gottholdsteineria Andrassy, 1958

(Key to the species modified from Filip. & Stekh., 1941 and Golden, 1956)

1. Female tail very short, about 1/2 anal body width in length
 pararobusta (Stekh. & Teunissen, 1938) Andrassy, 1958
 syn: Tylenchorhynchus robustus Stekh., 1936 nec de Man, 1876
Tylenchorhynchus pararobustus Stekh. & Teunissen, 1938
Rotylenchus pararobustus (Stekh. & Teunissen, 1938) Filipj. &
 Stekh., 1941
 Female tail about one anal body width in length 2
2. Phasmids at about latitude of anus; stylet approximately 28u
 Goodeyi (Loof & Oostenbrink, 1958) Andrassy, 1958
 syn: Tylenchorhynchus robustus in Micoletzky, 1921 partim nec
 de Man, 1876
Rotylenchus robustus in Filipj. & Stekh., 1941 and in Thorne,
 1949 nec de Man, 1876
Rotylenchus goodeyi Loof & Oostenbrink, 1958
 Phasmids well forward of anus; stylet about 33u
 buxophila (Golden, 1956) Andrassy, 1958
 syn: Rotylenchus boxopholus Golden, 1956

Other species:

G. quarta Andrassy, 1958Genus Radopholus, Thorne, 1949

(Key to the species)

1. Marked sexual dimorphism; esophageal glands dorsally located; length
 less than 0.8 mm.2
 Slight sexual dimorphism; esophageal glands ventrally located; length
 more than 1.4mm4
2. Lateral field marked by 4-7 lines; annules extending around terminus
 of tail inequalis Sauer, 1958
 Lateral field marked by 4 lines only; annules not extending around
 terminus of tail.3
3. Tail length $2\frac{1}{2}$ times anal body diameter; c=14-16; terminus blunt. . .
 neosimilis Sauer, 1958
 Tail length 4 times anal body diameter, c=10; terminus conoid or irreg-
 ular. similis (Cobb, 1915) Thorne, 1949
4. Spear length more than 40u. lavabri Luc, 1957
 Spear length less than 30u. . gracilis (de Man, 1880) Hirschmann, 1955
 syn: igas (Andrassy, 1954) Hirschman, 1955.

Others:

R. oryzae (n. Breda De Haan, 1902) Thorne, 1949 and
R. zostericola (Allgen, 1934) Allen, 1955 appear to be identical
 to R. gracilis and are considered as synonyms in this work.

Family TYLENCHULIDAE Raski, 1957
(Key to subfamilies from Raski, 1957)

- Excretory pore located posterior to normal position near nerve ring;
male stylet degenerate. Subfamily TYLENCHULINAE Skarbilovich, 1947 P.54
Excretory pore normal, near nerve ring; male stylet lacking
. Subfamily SPHAERONEMATINAE Raski & Sher, 1952 P.54

Subfamily TYLENCHULINAE Raski & Sher, 1952
(Key to genera)

- Lip region with circumoral elevation; excretory pore not closely
approximated to vulva Trophotylenchulus Raski, 1957
(Contains a single species, T. floridensis Raski, 1957)
Lip region without circumoral elevation; excretory pore closely
approximated to vulva Tylenchulus Cobb, 1913
(Contains a single species, T. semipenetrans Cobb, 1913)

Subfamily SPHAERONEMATINAE Raski & Sher, 1952
(Key to genera)

- Female spiral, thickened. Trophonema Raski, 1957
(Contains a single species, T. arenarium (Raski, 1956) Raski,
1957)
Female spherical. Sphaeronema Raski & Sher, 1952 P.54

Genus Sphaeronema Raski & Sher, 1952
(Key to species)

- Lip region with circumoral elevation. minutissimum J.B. Goodey, 1958
Lip region without circumoral elevation
. californicum Raski & Sher, 1952

Family TYLENCHIDAE Oerley, 1880
(Key to the subfamilies adopted from Thorne, 1941)

1. Metacarpus fusiform with distinct internal sclerotization
TYLENCHINAE (de Man, 1876) Nicol., 1922 P.55
 Metacarpus not bulbous, with little or no internal sclerotization.2
2. Basal esophageal bulb bearing a stem-like basal extension
PAURODONTINAE Thorne, 1941 P.55
 Basal esophageal bulb not bearing a stem-like basal extension3
3. Head framework octagonal, esophageal glands overlapping intestine to a
 greater or lesser extent.NEOTYLENCHINAE Thorne, 1941 P.55
 Head framework hexagonal, esophageal glands not overlapping intestine
NOTHOTYLENCHINAE Thorne, 1941 P.55

Subfamily PAURODONTINAE Thorne, 1941
(Key to the genera from Thorne, 1941)

1. Spear knobs symmetrical Paurodontus Thorne, 1941 P.56
 Spear knobs asymmetrical, the ventrosubmedian knobs much larger than
 the dorsal knob. Stictylus Thorne, 1941 P.56

Subfamily NOTHOTYLENCHINAE Thorne, 1941
(Key to the genera from Thorne, 1941)

1. Cuticle abnormally thick and deeply striated. Thada Thorne, 1941 P.56
 Cuticle not abnormally thick, finely striated2
2. Spear with tylenchoid basal knobs Nothotylenchus Thorne, 1941 P.56
 Spear with flange-like basal projections. Beleodorus Thorne, 1941 P.57

Subfamily NEOTYLENCHINAE Thorne, 1941
(Key to genera from Thorne, 1941)

1. Esophagus base fused with intestine, not set off in any manner
 Hexatylus Goodey, 1926 P.58
 Esophagus base set off, bulb-like or with greatly developed glands.2
2. Intestine joining esophagus just back of nerve ring; glands lying free
 in the body cavity. Deladenus Thorne, 1941 P.58
 Intestine not joining esophagus near nerve ring; glands within a
 basal bulb. Neotylenchus Steiner, 1931 P.57

Genus Paurodontus Thorne, 1941
(Key to the species from Thorne, 1941)

1. Length about 0.7 mm gracilis Thorne, 1941
Length about 0.4 mm 2
2. Terminus subacute, tail somewhat arcuate. densus Thorne, 1941
Terminus acute, tail rather straight. 3
3. Head about half as wide as base of neck apiticus Thorne, 1941
Head almost as wide as base of neck niger Thorne, 1941

Genus Stictylus Thorne, 1941
(Key to the species)

1. Tail length equal to 1/2 the vulva-anus distance
. asymmetricus Thorne, 1941
Tail approximately equal to the vulva-anus distance 2
2. Tail cylindroid; terminus blunt, almost flat. . . mycophilus Ruhm, 1956
Tail tapering; terminus bluntly conoid to conoid. 3
3. Tail terminus dorsally convex-conoid. psuedobtusus Ruhm, 1956
Tail uniformly conoid 4
4. Basal bulb of esophagus ovate with triquetrous lumen
. obtusus Thorne, 1941
Basal bulb of esophagus elongate, conoid; lumen not triquetrous . . 5
5. Posterior uterine sac present . . . stammeri (Wachek, 1955) Ruhm, 1956
Posterior uterine sac absent. pini (Fuchs, 1929) Ruhm, 1956

Genus Thada Thorne, 1941
(Key to the species from Thorne, 1941)

- Cuticle marked by only transverse striae. striata Thorne, 1941
Cuticle marked by both transverse and longitudinal striae
. cancellata Thorne, 1941

Genus Nothotylenchus Thorne, 1941
(Key to the species modified from Thorne, 1941)

1. Basal esophageal bulb elongate-cylindrical
. cylindricollis Thorne, 1941
Basal esophageal bulb tapering 2
2. Terminus rounded, incisures 6 affinis Thorne, 1941
Terminus acute, incisures 4 3

3. Corpus of esophagus with ovoid valvular apparatus
 drymocolus Ruhm, 1956
 Corpus of esophagus without ovoid valvular apparatus
 acris Thorne, 1941

Genus Beleodorus Thorne, 1941
 (Key to the species Thorne, 1941)

- Terminus of female tail acute thylactus Thorne, 1941
 Terminus of female tail clavate clavicaudatus Thorne, 1941

Genus Neotylenchus Steiner, 1931
 (Key to species after Thorne, 1941)

1. Vulva almost terminal obesus Thorne, 1934
 Vulva well in front of terminus 2
2. Posterior uterine branch present 3
 Posterior uterine branch absent 5
3. Tail uniformly cylindrical from anus to bluntly rounded terminus; with
 peg-like terminal process italicus Meyl, 1954
 Tail conoid; without terminal process 4
4. Tail length less than 2.5 anal body diameters; uniformly conoid to
 acute terminus. latus Thorne, 1941
 Tail length more than 2.5 anal body diameters; latter 1/5 cylindrical
 with rounded terminus thornei Meyl, 1954
5. Female tails elongate conoid, a= 8-10 6
 Female tails not elongate conoid, a= 15-20 7
6. Oocytes arranged tandem in ovary. acutus Thorne, 1941
 Oocytes massed in ovary . . . coprophagus (Goodey, 1938) Thorne, 1941
7. Terminus acute. 8
 Terminus blunt, rounded 9
8. Lip region set off by constriction; male with normal spicula and
 spear consobrinus (de Man, 1906) Filipjev, 1936
 Lip region not set off; male with degenerate spicula and without spear
 albulbosus Steiner, 1931
9. Bursa enveloping tail; female tail sub-cylindroid, very blunt
 intermedius (Christie, 1938) Thorne, 1941
 Bursa not enveloping tail; female tail conoid to small, blunt terminus
 arcuatus Thorne, 1941

Genus Deladenus Thorne, 1941
 (Key to species from Andrassy, 1957)

1. Postvulvar uterine sac present, well developed
 saccatus Andrassy, 1954
 Postvulvar uterine sac absent or only slightly developed 2
2. Vulva-anus distance considerably shorter than tail length 3
 Vulva-anus distance as long or longer than the tail length. 4
3. Vaginal wall thickened, uterus with small postvulvar part; tail acute
 aridus Andrassy, 1957
 Vaginal wall thin, uterus without postvulvar part; tail terminus
 rounded durus (Cobb, 1922) Thorne, 1941
4. Vagina very short, much smaller than the corresponding body diameter;
 tail terminus digitate. norimbergensis Ruhm, 1956
 Vagina about as long as the corresponding body diameter; tail obtusely
 rounded obesus Thorne, 1941

Genus Hexatylus Goodey, 1926

- H. boettgeri Meyl, 1954
H. vigissi Skarbilovitch, 1952
H. viviparus Goodey, 1926

Subfamily TYLENCHINAE (de Man, 1876) Nicol., 1922
(Key to the genera)

1. Head armed with setae 2
Head not armed with setae 3
2. Cuticle with transverse striae only Eutylenchus Cobb, 1913
(Contains a single species E. setifersis (Cobb, 1893) Cobb, 1913)
Cuticle with transverse and longitudinal striae
. Atylenchus Cobb, 1913
(Contains a single species A. decalineatus Cobb, 1913)
3. Ovary one 4
Ovaries two 12
4. Base of spear furcate Chitinotylenchus Nicol., 1922 P.60
Base of spear amalgamated, with or without basal knobs. 5
5. Esophageal glands overlapping intestine 6
Esophageal glands in form of basal bulb, not overlapping intestine 7
6. Posterior portion of tails of both sexes characteristically hooked
(Habitat marine). Halenchus Cobb, 1933 P.60
Posterior portion of tail not hooked. (Habitat terrestrial)
. Pseudhalenchus Tarjan, 1958 P.60
7. Female with tail short, rounded and cuticle swollen
. Trophurus Loof, 1956 P.60
Female with cuticle on tail not swollen 8
8. Female tail attenuated. 9
Female tail conoid, subacute 10
9. Median bulb in first half of esophagus. Tylenchus Bastian, 1865 P.61,
Median bulb in latter half of esophagus Psilenchus de Man, 1921 P.66
10. Female body obese Anguina Scopoli, 1777 P.64
Female body slender 11
11. Lateral lips enlarged Sychnotylenchus, Ruhm, 1956 P.64
Lateral lips not enlarged Ditylenchus Filipj., 1934 P.65
12. Female tail attenuated. Psilenchus de Man, 1921 P.66
Female tail short, pointed or subacute. Tetylenchus Filipj., 1936 P.67

Others: Paranguina Kirjanova, 1955

Genus Chitinotylenchus Micoletzky, 1922

Genotype is C. paragracilis (Micol., 1922) Filipjev, 1936 and is inadequately described. The only other species is C. annulatus (Cassidy, 1930) Filipjev, 1936.

Genus Halenchus Cobb, 1933

(Key to the species)

Stylet 1/8 - 1/9 of total esophageal length; postanal parts of the caudal alae less than 1/4 tail length
 mediterraneus (Micoletzky, 1922) Cobb, 1933
 Stylet 1/13 - 1/15 of total esophageal length; postanal parts of the caudal alae more than 1/4 tail length
 fucicola (de Man & Barton in de Man, 1892) Cobb, 1933

Species inquirenda:

H. mexicanus Chitwood, 1951Genus Pseudhalenchus Tarjan, 1958

(Key to the species)

Four lines in lateral field minutus Tarjan, 1958
 Six lines in lateral field. anchilisposomus Tarjan, 1958

Genus Trophurus Loof, 1956

(Key to the species)

1. Length greater than 1 mm.; stylet 19-21u; cuticle on tail thickened but not swollen imperiolis Loof, 1956
 Length less than 0.8 mm; stylet 14-16u; cuticle on tail thickened and also swollen. 2
2. Terminal esophageal bulb constricted in or behind the middle
 sculptus Loof, 1956
 Terminal esophageal bulb not constricted in or behind the middle
 minnesotensis (Caveness, 1958) Caveness, 1959
 syn: Clavaurotylenchus minnesotensis Caveness, 1958

Genus Tylenchus Bastian, 1865
(Key to the subgenera from Andrassy, 1954)

1. Cuticle well annulated; spear heavy and well knobbed; metacarpus round 2
Cuticle finely annulated; spear weakly developed; metacarpus oval 3
2. Head hardly offset, tail relatively short, ventrally hooked Tylenchus (Bastian, 1865) Andrassy, 1954
Head well offset. Annules remarkably pronounced, tail thin and attenuated Aglenchus Andrassy, 1954
3. Average sized species. Annules clear. Bursa well developed. Filenchus Andrassy, 1954
Small species. Annules very fine. Bursa rudimentary Lelenchus Andrassy, 1954

Subgenus Tylenchus (Bastian, 1865) Andrassy, 1954
(Key to the species from Andrassy, 1954)

1. Cuticle marked with annules and longitudinal fields 2
Cuticle without longitudinal ridges 3
2. 18-24 longitudinal ridges; postvulval uterine sac very short or missing; males unknown. costatus de Man, 1921
Always only 10 longitudinal ridges; postvulval uterine sac about 2 body widths long; males appear to be as numerous as females sachsi Hirschmann, 19
3. Spear very delicate, not (or hardly noticeably) knobbed 4
Spear strong or weak, in the latter case the knobs are evident. 8
4. Bursa very rudimentary; small animals (about 0.4 mm). 5
Bursa normal, well developed; large animals (over 0.4 mm) 6
5. Tail finely attenuated, very long (c= 3.1-3.5); spear very delicate, 3.5-4.0 u infirmus (Andrassy, 1952) Andrassy, 1954
Tail not so long, shorter (c=4.8-6.5); spear longer, 8-9 u long minutus Cobb, 1893
6. Cuticle very coarsely annulated; gubernaculum obscure weidenbachi Rahm, 1924
Cuticle finely annulated; gubernaculum clear. 7
7. Cuticle finely annulated (annule width 0.9-1.2u); tail long and thin (c = 3.7-4.5) filiformis Butschli, 1873
Cuticle annules wide and even (annule width 1.7-1.8 u); tail shorter not so finely attenuated (c = 5.3-10.0) polyhypnus Steiner & Albin, 1946

- 8. Body very thin (a = 40 - 60).9
 Body not so thin (a = 38 highest) 10
- 9. Body very large (1.5-1.7 mm.); spear long; tail of normal length
 (c = 9-10.3) graciloides Nicoletzky, 1925
 Body much smaller (0.4-0.66 mm.); spear shorter; tail very attenuated
 (c = 2.7-4.0) leptosoma de Man, 1880
- 10. Bursa rudimentary or indistinguishable. 1
 Bursa normally developed (only females known for duplexus and orbis).
 13
- 11. Larger species (0.7 mm.); cuticle well annulated.
 nicoletzkyi Andrassy, 1954
 Smaller species (up to 0.41 mm.); cuticle very finely annulated . . 12
- 12. Bursa rudimentary but apparent; gubernaculum present; tail markedly
 attenuated, filiform. discrepans Andrassy, 1954
 Bursa and gubernaculum indistinguishable; tail shorter, not so thin .
 aberrans Altherr
- 13. Tail ventrally hooked, not finely acuminate, terminus hooked. . . . 14
 Tail mostly strongly attenuated, finely acuminate, not ventrally hook-
 ed. 16
- 14. Tail almost cylindrical, gradually tapering, alae with 3 inner ridges
 intactus Kirjanova, 1951
 Tail slimmer, more thin, alae with 2 inner ridges 15
- 15. Vulva at mid-body (48-50%); spear 10-11u long.
 kirjanovae (Kirjanova, 1951) Andrassy, 1954
 Vulva in latter third of body (64-70%); spear 15.8-17.6 u long. . . .
 davainii Bastian, 1865
- 16. Annules very striking; smaller species (up to 0.6 mm.). 17
 Annules finer, not so distinct; larger species (over 0.7 mm.) . . . 18
- 17. Wall of the vagina greatly thickened; posterior uterine-sac missing;
 spear roundly knobbed; annule width 1.7 u . . . agricola de Man, 1884
 Wall of vagina without unusual thickening; posterior uterine sac pre-
 sent; spear longitudinal knobbed; annule width 0.9-1.2 u
 bryophilus Steiner, 1914
- 18. Tail very thin, filiform (c = 4); metacarpus powerful and round . . .
 thornei Andrassy, 1954
 Tail shorter, not so attenuated (c = 6-12); metacarpus oval 19
- 19. Esophagus very thin, metacarpus very weak; spear well knobbed; body
 smaller (0.72-0.79. orbis Andrassy, 1954
 Esophagus bigger, metacarpus well developed; spear more weakly knobbed
 body larger (0.9-1.1 mm.)
 duplexus (Hagemeyer & Allen, 1952) Andrassy, 1954

Genus Tylenchus Bastian, 1865
(Key to the species adapted by Allen, 1950 from Filipjev
& Stekhoven, 1941)

- 1. Tail length 5 or more times anal diameter 2
Tail length not exceeding 4-1/2 times anal body diameter. 11
- 2. Body width at least 2.5 per cent of body length 3
Body width less than 2 per cent of body length. 10
- 3. Length usually exceeding 0.5 mm 4
Length usually less than 0.5 mm 9
- 4. Spear at least 1/7 of esophageal length 5
Spear less than 1/7 of esophageal length. 8
- 5. Tail length 5 times anal body diameter. uniformis Cobb, 1893
Tail length 7 times anal body diameter. davainei Bastian, 1865
- 6. Tail length not exceeding 7 times anal body diameter. 6
Tail length exceeding 10 times anal body diameter 7
- 7. Tail length 11 times anal body diameter emarginatus Cobb, 1893
Tail length 12 times anal body diameter agricola de Man, 1884
- 8. Longitudinal striations present costatus de Man, 1921
Longitudinal striations absent filiformis Butschli, 1873
- 9. Cuticle coarsely annulated. bryophilus Steiner, 1914
Cuticle finely annulated. minutus Cobb, 1893
- 10. Tail length 18 times anal body diameter leptosoma de Man, 1880
Tail length 5 times anal body diameter. foliicola Zimm., 1902
- 11. Adults 1.0 mm. or more in length. 12
Adults less than 1.0 mm. in length. 13
- 12. a = about 30. askenasyi Butschli, 1873
a = about 50 to 60. gracilioides Micol., 1925
- 13. a = 30 or less. 14
a = 35 or more. brevicauda Micol., 1925
- 14. Spear equal to 1/9 - 1/12 of esophageal length. terricola Bastian, 1865
Spear equal to 1/4 - 1/5 of esophageal length 15
- 15. Spear 2-1/2 times as long as width of head at base. farwicki Rahm, 1924
Spear 1-1/2 times as long as width of head at base.
. weidenbachi Rahm, 1924

Genus Anguina Scopoli, 1773

(Key to the species modified from Filipj. & Stekh., 1941)

1. Median esophageal bulb absent
 cecidoplastes (Goodey, 1934) Filipjev, 1936
 Median esophageal bulb present. 2
2. Median bulb not distinct.
 microlaenae (Fawcett, 1938) Filipj. & Stekh., 1941
 Median bulb distinct. 3
3. Tail obtusely rounded at apex; head not offset.
 tritici (Steinbuch, 1799) Filipjev, 1936
 Tail pointed at tip 4
4. Tail regularly conical. 5
 Tail swollen, although this swelling is sometimes feeble. 8
5. Bursa quite wrapping in the tail; esophageal glands not enlarged;
 posterior esophageal bulb not swollen spermophaga Steiner, 1937
 Bursa almost wrapping in the tail 6
6. Esophageal glands much enlarged, posterior esophageal bulb strongly
 swollen; spicula flat, widest in the middle, slightly arcuate
 agrostis (Steinbuch, 1799) Filipjev, 1936
 Esophageal glands hardly swollen; no definite posterior bulb. 7
7. Spicula regularly tapering to the tips
 tumefaciens (Cobb, 1932) Filipj. & Stekh., 1941
 Spicula widened in the middle australis Steiner, 1940
8. Spicula distinctly longer than anal diameter, provided with a narrow
 sheath. graminis (Hardy, 1850) Filipjev, 1936
 Spicula shorter than anal diameter, very broad.
 millefolii (Low, 1874) Filipjev, 1936

Other species:

- A. balsamophila (Thorne, 1926) Filipjev, 1936
 A. pustulicola (Thorne, 1934) Goodey, 1951

Genus Sychnotylenchus Ruhm, 1956

(Key to species)

1. Length more than 1.0 mm; tail conoid; terminus rounded to pointed
 ulmi Ruhm, 1956
 Length less than 1.0 mm; tail cylindroid; terminus truncate
 intricati Ruhm, 1956

Genus Ditylenchus Filipjev, 1934
(Key to the species modified from Filipj. & Stekh. 1941)

1. Tail pointed at the end in both sexes 2
Tail obtusely rounded at the end in the female sex. 16
2. Body slender (a=32-60); body width 1.7-3.2% of body length. 3
Body plump (a=20-31): body width 3.3-5% of body length. 8
3. Bursa rudimentary darbouxii (Cotte, 1912) Filipj., 1936
Bursa copulatrix well developed 4
4. Esophagus well developed; gubernaculum in profile very thin, but long
. intermedius (de Man, 1880) Filipjev, 1936
Esophagus in adult form, especially in males, is weak, not strongly
muscular; gubernaculum short and thick. 5
5. Bursa ending a short distance in front of tip of tail 6
Bursa quite wrapping in the tail
. procerus (Bally & Reydon, 1931) Filipjev, 1936
6. Lateral field with 4 incisures; tail terminus acute
. dipsaci (Kuhn, 1857) Filipjev, 1936
Lateral field with 6 incisures; tail terminus finely rounded. . . . 7
7. Postvulvar uterine sac about $2\frac{1}{2}$ times vulvar body diameter in length
. destructor Thorne, 1945
Postvulvar uterine sac less than 2 times vulvar body diameter in
length. myceliophagus J. Goodey, 1958
8. Bursa not quite wrapping in the tail. 9
Bursa quite wrapping in the tail. 15
9. Vulva (=V) between 75-85% of body length. 10
Vulva between 86-96% of body length 12
10. Spicula provided with a thick sheath; body long; V=71-81%
. radicicola (Greeff, 1872) Filipjev, 1936
Spicula not provided with such a sheath 11
11. Heads of spicula hardly offset; male tail about $2\frac{1}{3}$ anal body diam-
eters long. phyllobius (Thorne, 1934) Filipjev, 1936
Heads of spicula distinctly offset, barbed; male tail about $3\frac{1}{2}$ anal
body diameters long angustus (Butler, 1913) Filipjev, 1936
12. Vulva far posterior at 96% of body length
. pustulicola (Thorne, 1934) Filipjev, 1936
Vulva between 86-90% 13
13. Body length of both male and female less than 1000u
. arboricolus (Cobb, 1922) Filipjev, 1936
Body length over 1400u. 14

14. Postvulvar uterine sac absent; bursa extending far down tail
 graminophila Goodey, 1933 Filipjev, 1936
 Postvulvar uterine sac present; bursa extending about half way down
 the tail balsamophilus (Thorne, 1926) Filipjev, 1936
15. Median esophageal bulb inconspicuous; male tail with mucro; male
 slightly longer than female, the former not surpassing 1 mm.
 durus (Cobb, 1922) Filipjev, 1936
 Median esophageal bulb distinct; male tail without mucro; female
 distinctly longer than male, having a length of 2.5 mm
 pinophila (Thorne, 1935) Filipjev, 1936
16. Tail short, only $1\frac{1}{2}$ times as long as anal body diameter 17
 Tail medium, $2\frac{1}{2}$ times as long as anal body diameter 18
17. Head not distinctly offset; spear $1/10$ of esophageal length
 major (Fuchs, 1914) Filipjev, 1936
 Head distinctly offset; spear $1/15$ of esophageal length
 gallica (Steiner, 1935) Filipjev, 1936
18. Buccal spear $1/20$ of esophageal length
 dendrophilus (Marcinorvsky, 1909) Filipjev, 1936
 Buccal spear $1/12$ of esophageal length. ortus Fuchs, 1938

Other species:

- D. askenasyi (Butschli, 1873) Goodey, 1951
D. brenani (Goodey, 1945) Goodey, 1951
D. sycobius (Cotte, 1920) Filipjev, 1936
 (?) D. brevicauda (Micol., 1925) Filipjev, 1936

Genus Psilenchus de Man, 1921

(Key to species modified from Thorne, 1949)

1. Two ovaries present 2
 One ovary present 5
2. Spear with small basal knobs, tail clavate.
 clavicaudatus (Micol., 1922) Thorne, 1949
 Spear without basal knobs 3
3. Tail terminus filiform, lip region not striated
 terextremus Hagemyer & Allen, 1952
 Tail terminus bulbous or clavate. 4
4. Lip region striated striatus Thorne, 1949
 Lip region plain, not striated. hilarulus de Man, 1921
5. Spear plain without basal knobs magnidens Thorne, 1949
 Spear with distinct basal knobs 6
6. Spear curved, knobs asymmetrical. aberrans Thorne, 1949
 Spear straight, knobs symmetrical gracillis Thorne, 1949

Genus Tetylenchus Filipjev 1936
(Key to the species from Thorne, 1949)

1. Spear without basal knobs. abulbosus Thorne, 1949
Spear with basal knobs.2
2. Female tail eight times as long as anal body diameter
. tenius (Micoletky, 1922) Filipjev, 1936
Female tail only four or five times as long as anal body diameter . .3
3. Spear twice as long as lip region width joctus Thorne, 1949
Spear one and one-fourth times as long as lip region width.
. productus Thorne, 1949

Superfamily APHELENCHOIDEA (Fuchs, 1937) Thorne, 1949

Due to the diversity and inaccessibility to all the literature pertaining to the Aphelenchoidea, complete, up-to-date keys could not be included in this syllabus. However, a rather tentative key has been constructed to the various groups of Aphelenchs following the systematics of Chitwood, 1953, as presented to the 15th International Congress of Zoology. A section in the listing of reference deals specifically with literature pertinent to the classification of this group at and above the generic level. Thus, it is hoped that one may recognize at least those genera found in the soil in association with plant life.

Superfamily APHELENCHOIDEA (Fuchs, 1937) Thorne, 1949
(Tentative key to families)

1. Female uterus prolapsed
 SPHAERULARIIDAE (Lubbock, 1861) Skarbilovich, 1947
 (Contains 2 or 3 genera; Sphaerularia Dufour, 1837, Tripus,
 Chitwood, 1935 and questionably Scatonema, Bovien, 1932.)
 Female uterus not prolapsed 2
2. Male with a bursa with 4 pairs of ribs or papillae
 APHELENCHIDAE Steiner, 1949
 (Contains a single genus; Aphelenchus Bastian, 1865)
 Male without a bursa. . APHELENCHOIDIDAE (Fuchs, 1937) Paramonov, 1957 P.68
 A small bursa-like membrane but without ribs and or papillae is
 located on the tail tip of some species of Aphelenchoides (in the
 subgenus Bursaphelenchus).

Family APHELENCHOIDIDAE (Fuchs, 1937) Paramonov, 1957
(Tentative key to subfamilies)

- Posterior portion of esophagus a distinct structure containing the
 esophageal glands and not overlapping the intestine
 PARAPHELENCHINAE T. Goodey, 1951 P.69
- Posterior portion of esophagus not a distinct glandular bulb,
 esophageal glands considerably overlapping the beginning of the in-
 testine APHELENCHOIDINAE (Fuchs, 1937) P.69
 Skarbilovitch, 1947 and PARASITAPHELENCHINAE Ruhm, 1956 P.69

Subfamily PARAPHELENCHINAE T. Goodey, 1951
(Key to genera)

1. Post-bulbar region of esophagus set off from intestine by a constriction. Lateral field without longitudinal striae.
 Paraphelenchus (Micol., 1922) Micol., 1925 P.70
 Post-bulbar region of esophagus usually not set-off from intestine by a constriction. Lateral field with 10-12 incisures
 Metaphelenchus Steiner, 1943 P.70

Subfamily APHELENCHOIDINAE (Fuchs, 1937) Skarbilovitch, 1947
(Partial key to genera)

1. Head possessing a shallow sclerotized frontal disc
 (A single species, A. xenuris) Anomyctus Allen, 1940
 Head not possessing a shallow sclerotized frontal disc
 Aphelenchoides Fischer, 1894 . . 2
2. Tail tip with bursa-like membrane
 Subgenus Bursaphelenchus (Fuchs, 1937) Ruhm, 1956
 Tail tip without bursa-like membrane
 Subgenus Aphelenchoides s. str., Fischer, 1894 P.71

Others:

Cryptaphelenchus (Fuchs, 1937) Ruhm, 1956
Tylaphelenchus Ruhm, 1956

Subfamily PARASITAPHELENCHINAE Ruhm, 1956

Insect inhabiting genera:

Parasitaphelenchus (Fuchs, 1937) Ruhm, 1956
Ectaphelenchus (Fuchs, 1937)
Peraphelenchus Wachek, 1955
Entaphelenchus Wachek, 1955

Genus Paraphelenchus (Micol., 1922) Micol., 1925
(Key to species)

1. Key to females. 2
Key to males. 4
2. Tail without mucrons myceliophthorus J.B. Goodey, 1958
Tail with 1 or more mucrons 3
3. Nine incisures in lateral fields
. pseudoparietinus (Micol., 1922) Micol., 1925
Six incisures in lateral fields amblyurus Steiner, 1934
4. Tail with 4 or 5 papillae posterior to anus . . amblyurus Steiner, 1934
Tail with 2 or 3 papillae posterior to anus 5
5. Tail with 2 papillae posterior to anus
. myceliophthorus J.B. Goodey, 1958
Tail with 3 papillae posterior to anus 6
6. Tail with mucron. pseudoparietinus (Micol., 1922) Micol., 1925
Tail without a mucron arenaceus (de Man, 1921) T. Goodey, 1943

Genus Metaphelenchus Steiner, 1943
(Key to species)

1. Lateral field with ventral bulge in tail region
. rhopalocercus Steiner, 1943
Lateral field without ventral bulge in tail region
. micoletzkyi (Steiner, 1941) Steiner, 1943

Genus Aphelenchoides Fischer, 1894(Partial key to species of Subgenus Aphelenchoides, Fischer, 1894)

1. Buccal spear not split at its base, either swollen at base or without such basal swellings. Plant parasitic species or free living forms (a long-tailed species makes an exception to this rule and lives in the tunnels of bark beetles) 2
Spear split at its base up to the posterior third. Living in association with insects
. caprifica (Gasparrini, 1871) Filipjev & Stekhoven, 1941
2. Tails of both sexes not flagellate. 3
Tails of both sexes with a long slender flagellum 35
- 3.a) Body more or less cylindrical, female tail cylindrical, cylindro-conical, finger-shaped, with or without a mucron at tail tip. . . . 4
b) Female tail elongate, more or less effilate but with no typical flagellum; male tail conical, ending with an acute point. 11
c) Female tail as well as male tail short conoid, distinctly tapering to terminus; terminus with or without mucron 13
4. Tail without mucron; terminus uniformly smooth. 5
Tail with mucron; or terminus subhemispherical with a central "dimple" 9
5. Female tail cylindro-conoid 6
Female tail cylindrical or fingershaped 7
6. Esophageal bulb situated 3.5 X its length from anterior extremity; male tail terminus acute. talonus Thorne, 1935
Esophageal bulb large, situated 2 X its length from anterior extremity; male tail terminus rounded. macrobulbosa Ruhm, 1956
7. Female tail cylindrical 8
Female tail finger-shaped limberi Steiner, 1936
8. Head distinctly off-set, lips prominent xylophilus Steiner, 1934
Head not off-set, lips not prominent. solani Steiner, 1935
9. Female tail cylindrical with well developed truncate or filiform mucron. subtenuis (Cobb, 1926) Steiner & Buhrer, 1932
Female tail finger-shaped; terminus subhemispherical with a central "dimple". 10
10. Female 1.1 mm long; V = 66%
. abyssinicus (Filipjev, 1931) Filipjev & Stekhoven, 1941
Female 0.7 mm long; V = 77%. retusus (Cobb, 1927) Goodey, 1951

11. Female tail slender, 8.8; male tail 5.5 anal body diameters long
 cocophilus (Cobb, 1919) Goodey, 1933
 Female tail 5; male tail 2 anal body diameters long 12
12. Female length 590 microns or more; tail terminus round
 hunti Steiner, 1935
 Female length less than 500 microns; tail terminus acute
 steineri Fuhr, 1956
13. Tail simply conoid, without mucron or other structural modifications;
 spear with huge knobs; esophagus swollen immediately behind spear
 knobs, then tapering to the esophageal bulb . . . megadorus Allen, 1941
 Tail with mucron or other structural modifications; spear with small
 or without knobs; esophagus narrow from behind spear to esophageal
 bulb. 14
14. Tail with 4 sucker-like or 3 leaf-like appendages at terminus . . . 15
 Tail without sucker or leaf-like appendages at terminus; terminus
 provided with a mucron. 16
15. Tail with 4 sucker-like terminal appendages
 penardi (Steiner, 1914) McBeth, 1937
 Tail with 3 leaf-like terminal appendages
 sphaerocephalus Goodey, 1953
16. Head with internal framework. 17
 Head without distinct framework 22
17. Minute species, less than 320 microns long
 pusillus (Thorne, 1939) Filipjev & Stekhoven, 1941
 Body larger, not under 400 microns long 18
18. Tail terminus bifurcate or provided with a somewhat star-shaped mucron
 19
 Tail terminus provided with a simple mucron only. 21
19. Tail terminus bifurcate
 bicaudatus (Imamura, 1931) Filipjev & Stekhoven, 1941
 Tail terminus provided with a somewhat star-shaped mucron 20
20. Lateral fields $1/5$ as wide as body diameter, marked by four incisures
 which are equidistant from each other
 coffeae (Zimmermann, 1898) Steiner, 1937
 Lateral fields $1/4$ as wide as body diameter, the field formed by the
 inner 2 incisures narrower than the field on each side
 besseyi Christie, 1942
21. Head swollen, wider than neck, lateral fields marked by 4 incisures
 ritzema-bosi (Schwartz, 1911) Steiner & Buhner, 1932
 Head not swollen, lateral fields marked by 2 incisures
 fragariae (Ritzema Bos, 1891) Christie, 1932

22. Body slender, (female a=15-73); mucron slender and pointed. 23
 Body more or less thick, (female a=20-117); mucron short 24
23. Spear strong, with well developed basal knobs
 heliophilus (de Man, 1880) Goodey, 1933
 Spear delicate, without basal knobs
 naticochensis (Steiner, 1920) Filipjev & Stekhoven, 1941
24. Post-vulvar uterine sac well developed, extending at least 1/3 the
 vulva-anal distance 25
 Post-vulvar uterine sac poorly developed or absent. 31
25. Lip region expanded, forming a disk . . . brachycephalus Thorne, 1935
 Lip region otherwise. 26
26. Lateral fields marked by 2 or 3 incisures 27
 Lateral fields marked by 4 incisures. 29
27. Lateral fields marked by 2 incisures. ipidicola Ruhm, 1956
 Lateral fields marked by 3 incisures. 28
28. Tail 2 anal body diameters long; esophagus short (b=9-11)
 sacchari Hooper, 1958
 Tail 3.5 anal body diameters long; esophagus longer (b=8-10)
 composticola Franklin, 1957
29. Tail uniformly conoid, mucron centrally situated; body length 680-900
 microns; spear 17 microns long. blastophthorus Franklin, 1952
 Tail dorsally convex-conoid, mucron located ventrally; body length
 450-623 microns; spear 11 microns long. 30
30. Egg 4 times as long as broad; tail relatively thick conoid, rather
 sharply arcuate parietinus (Bastian, 1865) Steiner, 1932
 Egg 2.6 times as long as broad; tail somewhat thinner, only slightly
 arcuate saprophilus Franklin, 1957
31. Post-vulvar uterine sac poorly developed, less than 1 body diameter
 in length dactylocercus Hooper, 1958
 Post-vulvar uterine sac absent. 32
32. Body length more than 900 microns oxurus Paesler, 1957
 Body length less than 600 microns 33
33. Head wide, spear equal to or shorter than the width of the head; spear
 swollen at its base; head with distinct papillae
 goeldi (Steiner, 1914) Filipjev & Stekhoven, 1941
 Head narrow, spear much longer than head width; no cephalic papillae
 visible 34
34. Body short and slender (L=0.12mm; a=37-44); lips swollen, head set off
 from body ("button-like") . minor (Cobb, 1893) Steiner & Buhrer, 1933
 Body longer and stouter (L=0.5-0.55 mm; a=26-32); lips low, head
 bluntly conical, not set off from body
 chamaelocephalus (Steiner, 1926) Filipjev & Stekhoven, 1941

35. Female tail length at least twice as long as vulva-anal distance. . 36
 Female tail length not over 1 and $\frac{1}{2}$ times as long as vulva-anal distance. 37
36. Length of female, 0.8 mm; head distinctly set off from body
 longicaudatus (Cobb, 1893) Goodey, 1933
 Length of female, 0.5 mm; head not distinctly set off from body
 citri Andrassy, 1957
37. Stylet with small but distinct basal swellings or knobs 38
 Stylet without basal swellings or knobs 40
38. Postvulvar uterine sac well developed often extending nearly one-third distance from vulva to anus; male unknown . . oahuensis Christie, 1939
 Postvulvar uterine sac, if present, very short; both sexes usually encountered 39
39. Vagina with stout walls and presumably moderately large and conspicuous; excretory pore a short distance behind bulb but in front of nerve ring; c, in female, usually 5.3 to 6.5; posterior half of male set off demani (Goodey, 1928) Goodey, 1933
 Vagina small and inconspicuous; excretory pore opposite or slightly behind nerve ring; c, in female, 6.7 to 8.5; posterior half of male tail only faintly set off oliveirae Christie, 1939
40. Body of female with conspicuous and moderately coarse transverse striae forming distinct annules; male unknown
 linfordi Christie, 1939
 Body of female with inconspicuous transverse striae 41
41. Postvulvar uterine sac absent or very short; male tail with one pair of indistinct adanal and one pair of postanal papillae
 winchesi (Goodey, 1927) Goodey, 1933
 Postvulvar uterine sac well developed usually extending at least half way from vulva to anus. 42
42. Stylet short, about 10u long; vulva relatively far anterior, at about 62%; tail exceptionally long and slender, c, in female, about 4.5; male tail with one pair of preanal, one pair of adanal and two pairs of postanal papillae. elmiraensis van der Linde, 1938
 Stylet 14u long or longer; vulva at 66% or more; c, in female, 7 or more. 43
43. Lips faintly developed; tail of female relatively short, c, about 12; male unknown. oswegoensis van der Linde, 1938
 Lips well developed; tail of female slender and attenuated, c, 7.7 to 11; male with one pair preanal, one pair indistinct and two pairs of postanal papillae tenuicaudatus (de Man, 1895) Goodey, 1933

Others:

- | | |
|-------------------------------------------------|------------------------------------|
| <u>A. conurus</u> Steiner, 1932 | <u>A. martinii</u> Ruhn, 1955 |
| <u>A. cyrtus</u> Paesler, 1957 | <u>A. minimus</u> Meyl, 1953 |
| <u>A. elongatus</u> Stekhoven, 1951 (Juv.) | <u>A. mucronatus</u> Paesler, 1946 |
| <u>A. ferrandini</u> Meyl, 1954 | <u>A. spinosus</u> Paesler, 1957 |
| <u>A. hainanensis</u> (Rahn, 1938) Goodey, 1951 | <u>A. stammeri</u> Korner, 1954 |
| <u>A. lignophilus</u> Korner, 1954 | <u>A. taretiae</u> Steiner, 1941 |
| <u>A. mali</u> (Fuchs, 1931) Goodey, 1951 | |

Class ADENOPHOREA (V. Linstow, 1905) Chitwood, 1958
 (Key to the orders modified from Chitwood, 1950)

1. Amphids spiral, circular, vesiculate, or other forms derivable from spiral; subventral esophageal glands never opening near anterior end of esophagus; caudal glands nearly always present
 CHROMADORIDA Chitwood, 1933 P.76
 Amphids pocket-like, elongated, tuboid or pore-like; subventral esophageal glands opening in anterior end of esophagus posterior to nerve ring, caudal glands present or absent 2

2. Setae on head usually present (absent in Mononchidae, Alaimidae, and a few scattered genera of other families); typical stylet absent; esophageal gland orifices commonly in stomatal region, glands uninucleate; muscular caudal sucker absent; caudal glands usually present; ventral excretory cell usually present. ENOPLIDA Chitwood 1933 P.101
 Setae absent; stylet present or absent; esophageal gland orifices at anterior end of esophagus or posterior to nerve ring; muscular caudal sucker present or absent; caudal glands absent; excretory system absent or poorly developed. DORYLAIMIDA Pearse, 1942 P.120

Order CHROMADORIDA Chitwood, 1933
(Key to the suborders from Chit. & Chit., 1950)

- Esophago-intestinal valve dorsoventrally flattened or circular, moderately large to very large, never triradiate or vertically flattened; stoma if well developed, unarmed or containing 1 or 3 small teeth or 6 outwardly acting teeth; stoma may or may not be surrounded by esophageal tissue; ovaries outstretched or reflexed; papilloid or tuboid supplementary organs present or absent
 MONHYSTERINA (Filipjev, 1929) Chit. & Chit., 1937 P.76
- Esophago-intestinal valve triradiate or vertically flattened, usually very short; stoma if well developed containing a large dorsal tooth, 3 jaws or 6 inwardly acting teeth; stoma surrounded by esophageal tissue; ovaries reflexed; cup-like or tuboid supplementary organs present or absent. . . . CHROMADORINA (Filipjev, 1929) Chit. & Chit., 1937 P.76

Suborder MONHYSTERINA (Filipjev, 1929) Chit. & Chit., 1937
(Key to the superfamilies from Chit. & Chit., 1950)

1. Amphids circular; ends of esophageal radii convergent; ovaries outstretched MONHYSTEROIDEA Stek. & de Coninck, 1933 P.77
 Amphids "plectoid"; spiral or variants; ends of esophageal radii tuboid
 2
2. Amphids plectoid or 1-2 spiral; ovaries reflexed
 PLECTOIDEA Chitwood, 1937 P.82
 Amphids spiral or variants; ovaries outstretched (rarely reflexed).
 AXONOLAIMOIDEA Chitwood, 1937 P.86

Suborder CHROMADORINA (Filipjev, 1929) Chit. & Chit., 1937
(Key to the superfamilies modified from Chitwood, 1951)

1. Cuticle coarsely annulated or, if without distinct annules, covered by "hairy coat" (Marine except for one species)
 DESMOSCOLECOIDEA Stekhoven, 1935 P.90
 Cuticle annulated 2
2. Cuticle usually punctate, stilt setae and glandular paired setae absent; helmet absent. (Marine & fresh water.)
 CHROMADOROIDEA Stek. & Coninck, 1933 P.90
 Cuticle not punctate, glandular tube setae present or absent; helmet usually present. (Practically all marine)
 DESMODOROIDEA Steiner, 1927 P.97

Superfamily MONHYSTEROIDEA Chit. & Chit., 1937
(Key to families from Chitwood, 1951)

1. Stoma styletiform SIPONOLAIMIDAE Chitwood, 1937 P.77
Stoma not styletiform 2
2. Radial muscles of esophagus diffuse without cuticular attachment points MONHYSTERIDAE Oerley, 1880 P.77
Radial muscles of esophagus in six bands with cuticular attachment points often present. LINHOMOEIDAE Filipjev, 1929 P.77

Family SIPHONOLAIMIDAE Chitwood, 1937
(Key to genera after Wieser, 1956)

1. Spear present Siphonolaimus de Man, 1893
Spear absent 2
2. Pharyngeal portion of esophagus attenuated, esophagus very short (b= more than 50), isthmus extremely narrow . Solenolaimus Cobb, 1893
Pharyngeal portion of esophagus not attenuated; the latter of normal length (b= about 10), isthmus not much narrower than corpus, or, if so, bulb broken down and esophageal glands free 3
3. Bulbar region of esophagus well developed . . Southernia Allgen, 1929
Bulbar region of esophagus broken down, esophageal glands free Cyartonema Cobb, 1920

Family MONHYSTERIDAE Oerley, 1880
(Key to subfamilies from Chitwood, 1951)

- Stoma non-sclerotized, usually conoid into esophagus. Lips three, low, cuticle not ridged; internal circle of sensory organs papilloid. (Fresh water or marine). MONHYSTERINAE Micoletzky, 1922 P.78
Stoma sometimes sclerotized. Lips 3 or 6; cuticle striated XYALINAE Chitwood, 1951 P.79

Family LINHOMOEIDAE Filipjev, 1929
(Key to subfamilies from Chitwood, 1951)

- Stoma small; esophago-intestinal valve elongate LINHOMOEINAE Filipjev, 1929 P.80
Stoma massive, globoid; esophago-intestinal valve short SPHAEROLAIMINAE Filipjev, 1929 P.81

Subfamily MONHYSTERINAE
(Key to the genera modified from Wieser, 1956)

1. Six large, segmented cephalic setae present. 2
 Ten cephalic setae or more present; if seemingly only six, then
 papillose or indistinct, not segmented 3
2. Female with one posterior reflexed ovary Rhabdoeoma Cobb, 1920
 Female with two out-stretched ovaries. Cytolaimium Cobb, 1920
3. Amphid an open spiral. Spiramphinema Wieser, 1956
 Amphid circular or cryptospiral. 4
4. Stoma armed with three teeth or denticles 5
 Stoma unarmed 6
5. Stoma armed with three teeth Cobbia de Man, 1907
 Stoma armed with three denticles Monhystrella Cobb, 1918
6. Amphids vesicular, convex, thin-walled (hence sometimes indistinct). 7
 Amphids not vesicular, concave, thick-walled (always distinct). . . 9
7. Amphids circular; labial setae very long. . Promonhystera Wieser, 1956
 Amphids circular to transversely elliptical or irregular to
 longitudinally elliptical; labial setae not elongate. 8
8. Amphids circular to transversely elliptical; gubernaculum tubular
 Paramonhystera Steiner, 1916
 Amphids irregular to longitudinally elliptical, especially large;
 gubernaculum absent Amphimonhystera Allgen, 1929
9. Stoma tubular, very deep. Rhynchonema Cobb, 1920
 Stoma cup-shaped, shallow 10
10. Cuticle striated 11
 Cuticle smooth 13
11. Eight groups of subcephalic setae articulate on the same level as the
 cephalic setae, giving the impression of 8-radiate symmetry of the
 latter. Steineria Micoletzky, 1921
 If 8 groups of subcephalic setae present, then always articulating at a
 considerable distance behind the cephalic setae; the 6-radiate
 symmetry of the latter always obvious 12
12. Esophagus differentiated in posterior portion . Austronema Cobb, 1914
 Esophagus undifferentiated throughout Theristus Bastian, 1865
13. Stoma simple. Monhystera Bastian, 1865
 Stoma consisting of two small cavities in tandem. 14

14. Spicula long; no accessory piece. Diololaimella Allgen, 1929
 Spicula short; accessory piece present
 Gammarrinema Kinne & Gerlach, 1953

Others:

Monhystrium Cobb, 1920 - resembling Monhystera and is commensal in gills of the land crab.

Subfamily XYALINAE Chitwood, 1951
 (Key to genera after Wieser, 1956)

1. Stoma armed 2
 Stoma unarmed 3
2. Stoma armed with 2 plate-like teeth Gonionchus Cobb, 1920
 Stoma armed with 3 outwardly acting mandibles . Scaptrella Cobb, 1917
3. Cuticle with 12 longitudinal wings Xenolaimus Cobb, 1920
 Cuticle with numerous longitudinal ridges, sometimes indistinct. . .4
4. Stoma cylindrical, very large, walls strongly cuticularized
 Omicronema Cobb, 1920
 Stoma conical or cylindro-conical, walls less cuticularized. 5
5. Long cervical and somatic setae present Xyala Cobb, 1920
 Cuticle naked Dactylaimus Cobb, 1920



Subfamily LINHOMOEINAE

(Key to the genera modified from Wieser, 1956)

1. Cephalic setae absent. Metalaimus Kreis, 1926
Cephalic setae present 2
2. Cephalic setae 4 3
Cephalic setae 8, in two circles, 4 setae in each
Eleutherolaimus Filipjev, 1922
Cephalic setae 10-12, in 1-2 circles 13
3. Buccal cavity absent, or, if small vestibulum present, the latter not
cuticularized, cup-shaped, small 4
Buccal cavity present 5
4. Esophagus markedly differentiated into corpus, isthmus and bulb
. Paraterschellingia Kreis, 1924
Esophagus not markedly differentiated . . . Terschellingia de Man, 1888
5. Buccal cavity armed with one to several teeth. 6
Buccal cavity unarmed. 9
6. Buccal cavity long and narrow, regularly cylindrical
. Southerniella Allgen, 1932
Buccal cavity cup-shaped, irregular, never regularly cylindrical . . 7
7. Esophagus strongly dilated but no true bulb. Tail with flagellum
. Prosphaerolaimus Filipjev, 1918
Esophagus with true bulb. Tail conical, without flagellum 8
8. Buccal cavity with cuticular rings. Supplements slight elevations of
preanal cuticle Synonema Cobb, 1920
Buccal cavity without cuticular rings. Supplements big, cup-shaped
. Aponchium Cobb, 1920
9. Buccal cavity conical to cup-shaped, never longer than wide. . . . 10
Buccal cavity long and wide, cylindrical without constriction. . . 12
10. Esophageal bulb present. 11
Esophageal bulb absent Rhadinema Cobb, 1920
11. Buccal cavity with transverse cuticular bands
. Desmolaimus de Man, 1880
Buccal cavity without transverse cuticular bands
. Metalinhomoeus de Man, 1907
12. Amphids opposite posterior portion of buccal cavity
. Tubolaimus Allgen, 1929
Amphids opposite anterior portion of buccal cavity
. Latilaimus Allgen, 1933
13. Tail with sublateral rows of conoid appendages. . Halinema Cobb, 1920
Tail without conoid appendages. 14

14. Buccal cavity absent, indistinct, or a very short, narrow tube. . . 15
 Buccal cavity well developed. 18
15. All or some of the cephalic setae dilated distally. 16
 Cephalic setae normal 17
16. All 10 cephalic setae dilated distally. . . . Tubolaimella Allgen, 1934
 Only the 4 anterior setae dilated Linhomoella Cobb, 1920
17. 12 papillose cephalic setae; papillae on tail
 Anticyathus Cobb, 1920
 10 long cephalic setae; no papillae on tail
 Sphaerocephalum Filipjev, 1918
18. Buccal cavity cup-shaped, never longer than wide 19
 Buccal cavity cylindrical, longer than wide
 Eumorpholaimus Schulz, 1932
 Pandolaimus Allgen, 1929
 Filipjevinema Allgen, 1953
 Pulchranemella Cobb, 1932
19. Buccal cavity armed with teeth, or very thick cuticular plates
 Linhomoeus Bastian, 1865
 Buccal cavity unarmed, thin walled. 20
20. 12 cephalic setae Perilinhomoeus Stekhoven, 1950
 10 cephalic setae 21
21. "Labial palps" presence Crystallinema Cobb, 1920
 "Labial palps" absent Paralinhomoeus de Man, 1907

Subfamily SPHAEROLAIMINAE

(Key to genera modified from Chitwood, 1951)

1. Cephalic sensory organs papilloid or setose 2
 Cephalic sensory organs not observed. . . . Sphaerolaimus Bastian, 1865
2. Cephalic sensory organs papilloid Tripylium Cobb, 1920
 Cephalic sensory organs setose. 3
3. Female with one anterior out-stretched ovary. . . Omicronema Cobb, 1920
 Female with one posterior out-stretched ovary . Halanonchus Cobb, 1920

Superfamily PLECTOIDEA Chit. & Chit., 1937
(Key to the families after Chitwood, 1951)

1. Posterior region of esophagus muscular; stoma cylindrical or conoid .2
Posterior region of esophagus glandular; stoma minute or absent
. CAMACOLAIMIDAE Stekhoven & de Coninck, 1933 P.82
2. Esophagus terminated by a distinct "gamma" valved bulb
. PLECTIDAE Oerley, 1880 P.82
Bulbar region of esophagus with or without a "chromadoroid" valved
bulb. LEPTOLAIMIDAE Oerley, 1880 P.82

Appendix to PLECTOIDEA (after Chit. & Chit., 1950):

BASTIANIIDAE Stekhoven & Teunissen, 1938. Stoma very long and narrow, surrounded by esophageal tissue, or stoma rudimentary; esophagus cylindrical, greatly elongate; amphids circular to unispiral; ovaries reflexed. Contains one genus, Bastiania de Man, 1876.

Family CAMACOLAIMIDAE Stekhoven & de Coninck, 1933
(Key to the subfamilies after Chitwood, 1951)

- Amphids anterior to cephalic setae (Marine)
. CAMACOLAIMINAE Micoletzky, 1924 P.83
Amphids posterior to cephalic setae (Marine or fresh water)
. APHANOLAIMINAE Chitwood, 1935 P.83

Family PLECTIDAE Oerley, 1880
(Key to the subfamilies after Chitwood, 1951)

- Labial region with web-like or other modifications
. WILSONEMATINAE Chitwood, 1951 P.84
Labial region without specialized modifications
. PLECTINAE Micoletzky, 1922 P.84

Family LEPTOLAIMIDAE Oerley, 1880
(Key to the subfamilies after Chitwood, 1951 & 1956)

1. Amphids large, circular to unispiral. 2
Amphids minute, pore-like RHABDOLAIMINAE Chitwood, 1951 P.85
2. Esophagus with non-valved bulb LEPTOLAIMINAE Chitwood, 1951
Esophagus with a "chromadoroid" valved bulb
. HALIPECTINAE Chitwood, 1951 P.85

Subfamily CAMACOLAIMINAE Stekhoven & de Coninck, 1933
(Key to genera after Wieser, 1956)

1. Ocelli absent 2
Ocelli present 5
2. Stylet-like tooth absent. Neurella Cobb, 1920
Stylet-like tooth present 3
3. Whole tooth embedded in esophageal tissue . Camacolaimus de Man, 1889
Distal portion of tooth free in vestibulum. 4
4. Tooth blunt Aconthiolaimus Filipjev, 1918
"Tooth" needle-shaped . . Camacolaimoides de Coninck & Stekhoven, 1933
5. Stylet-like tooth absent. Jonema Cobb, 1920
Stylet-like tooth present Nemella Cobb, 1920

Subfamily APHANOLAIMINAE Chitwood, 1935
(Key to genera)

1. Ovaries paired. 2
Ovary single Alaimella Cobb, 1920
2. Stoma practically invisible Aphanolaimus de Man, 1880
Stoma short and broad, prismatic or cylindrical
. Paraphanolaimus Micol, 1923

Subfamily WILSONEMATINAE Chitwood, 1951
(Key to the genera from Cobb, 1935)

1. Terminal bulb valved. 2
Terminal bulb not valved Anonchus Cobb, 1913
2. Lips 6, distinct, revolute; striae fine; amphids semicircular
. Anthonema Cobb, 1906
Lips not revolute; head with dorso-ventral bladders; striae coarse;
amphids round 3
3. Cephalic appendages elaborately palmate Wilsonema Cobb, 1913
Cephalic appendages forming a closed, striated dome or cupola
. Bitholinema de Coninck, 1931

Subfamily PLECTINAE Micoletzky, 1922
(Key to the genera)

1. Esophagus short, cardia extremely long. . . Paraplectonema Strand, 1936
Esophagus not usually short, cardia moderate. 2
2. Stoma very short conoid; esophagus very long. . Chronogaster Cobb, 1913 P.84
Stoma not very short, esophagus not unusually long. 3
3. Male with conoid supplementary organs
. Anaplectus de Coninck & Stekhoven, 1933
Male with papilloid supplementary organs. Plectus Bastian, 1865

Genus Chronogaster Cobb, 1913
(Key to the species modified from Andrassy, 1958)

1. Longitudinal striations present 2
Longitudinal striations absent. 3
2. Tail terminus with 3 small appendages magnificus Andrassy, 1956
Tail terminus without appendages alatum Gerlach, 1954
3. Tail terminus with 4 appendages
. longicollis (Daday, 1899) Andrassy, 1958
Tail terminus with only 1 appendage 4
4. Body extremely thin (a=almost 100); mouth cavity symmetrically
constricted, funnel-shaped. subtilis Andrassy, 1958
Body not as thin (a=below 70); mouth cavity prismatoid. 5
5. Body cavity with numerous distinct crystals; lateral glands large,
striking. typicus (de Man, 1921) de Coninck, 1935
Body cavity without crystals; lateral glands indistinct 6
6. Amphid situated posterior to the mouth cavity, spiral; tail shorter
than 1/10 the body length boettgeri Kischke, 1956
Amphid situated at the level of the mouth cavity, buckle-shaped; tail
very long

Subfamily RHABDOCTAININAE^F Chitwood, 1951
(Key to the genera)

1. Stoma with 3 minute outwardly acting teeth. Syringolaimus de Man, 1888
Stoma without teeth Rhabdolaimus de Man, 1880

Subfamily HALIPECTINAE Chitwood, 1951
(Key to the genera modified from Cobb, 1935)

1. Lateral alae present. Aplectus Cobb, 1914
Lateral alae absent 2
2. Median bulb present Haliplectus Cobb, 1913 P.85
Median bulb absent 3
3. Head constricted at cephalic setae. Polylaimium Cobb, 1920
Head not constricted at cephalic setae. Linolaimus Cobb, 1933

Genus Haliplectus Cobb, 1913
(Key to species from Chitwood, 1956)

1. Amphids slightly more than 1 head diameter back from anterior
extremity 2
Amphids distinctly more than 1 head diameter back from anterior
extremity 3
2. Only female known, 1.9 mm. long (amphids 2/5 as wide as head, inter-
rupt 5 annules. conicephalum Cobb, in Chitwood, 1956
Only male known, 1.0 mm long dorsalis Cobb, in Chitwood, 1956
3. Male with 6 preanal supplements
. floridensis Cobb, in Chitwood, 1956
Male with no preanal supplements. pellucidus Cobb, 1913
Male with 4 preanal supplements bickneri Chitwood, 1956

Superfamily AXONOLAIMOIDEA Chit. and Chit., 1937
(Key to the families after Chitwood, 1951)

- Amphids unispiral, spiral to shephard's crook, rarely broken circle;
cuticle not punctate or minutely punctate, usually rather smooth;
gubernaculum usually with posterior apophyses
. AXONOLAIMIDAE Stekhoven & de Coninck, 1933 P.86
Amphids multispiral; cuticle often having minute to moderately coarse
punctations. Stoma cylindroid with three sclerotized points at an-
terior end or reduced; gubernaculum with or without a posterior apo-
physis
. COMESOMATIDAE (Stekhoven & de Coninck, 1953) P.89

Family AXONOLAIMIDAE Stekhoven & de Coninck, 1933
(Key to the subfamilies after Chitwood, 1951)

1. Stoma inconspicuous or cylindroid 2
Stoma conoid or cylindrical 3
2. Amphids located on cuticular plaques. . . DIPLOPELTINAE Rauther, 1930 P.87
Amphids much elongated, hook-like; plaque absent
. CAMPYLAIMINAE Chit. & Chit., 1937 P.87
3. Stoma conoid, stomatorhabdion's thick
. AXONOLAIMINAE Micoletzky, 1924 P.86
Stoma cylindrical, stomatorhabdion's thin
. CYLINDROLAIMINAE Micoletzky, 1922 P.88

Subfamily AXONOLAIMINAE
(Key to the genera from Chitwood, 1951)

1. Cephalic setae absent Margonema Cobb, 1920
Cephalic setae present 2
2. Amphids circular. Apodontium Cobb, 1920
Amphids spiral to shephard's crook. 3
3. Esophagus rather clavate, six well-developed, eversible odontia
. Odontophora Butschli, 1874
Esophagus more elongate; prorhabdions not clearly eversible as odontia
. 4
4. Female with one ovary Synodontium Cobb, 1920
Female with two ovaries Axonolaimus-de Man, 1889

Subfamily CAMPYLAIMINAE Chitwood, 1937
(Key to genera)

1. Mouth opening terminal. Pseudolella Cobb, 1920
Mouth opening on dorsal side of head Campylaimus Cobb, 1920

Subfamily DIPLOPELTINAE Rauther, 1930
(Key to genera after Gerlach, 1950)

1. Amphids loop-shaped 2
Amphids spiral or hidden spiral which appears as a closed loop. . . 3
2. Amphid situated on a cuticularized plaque . . . Diplopeltis Cobb, 1905
Amphid not situated on a cuticularized plaque
. Diplopeltula Gerlach, 1950
3. Amphids spiral. 4
Amphids hidden spiral appearing as a closed loop. 5
4. Amphids large almost occupying the entire width of the head
. Tarvaia Allgen, 1934
Amphids small Acmaeolaimus Filipjev, 1916
5. Amphid situated on a cuticularized plaque Didelta Cobb, 1920
Amphid not situated on a cuticularized plaque
. Disconema Filipjev, 1918

Subfamily CYLINDROLAIMINAE Micoletzky, 1922
(Key to the genera including material from Wieser, 1956)

1. Habitat marine. 2
Habitat fresh water or soil 6
2. Esophagus with distinct muscular bulbar region, glands not free. . 3
Esophagus posteriorly broken down with glands in tandem
. Pseudaraeolaimus Chitwood, 1951
3. Amphids shepherd's crook, with circular loop, or completely circular
in outline. 4
Amphids consisting of an oval loop. 5
4. Ocelli and bulbar swelling in mid-esophagus present
. Araeolaimus de Man, 1888
Ocelli and bulbar swelling in mid-esophagus absent
. Parachromagasteriella Allgen, 1933
5. Cervical region elongate, amphids about 10 head diameters behind
anterior end
. Metaraeolaimoides de Coninck, 1936
Cervical region not elongate, amphids at short distance behind
anterior end
. Araeolaimoides de Man, 1893
6. Male with caudal pocket; female unknown Colpurella Cobb, 1920
Male without caudal pocket; female known. 7
7. Head with cephalic setae; spinneret present 8
Head without cephalic setae; spinneret absent 10
8. Ovaries two 9
Ovary one Cylindrolaimus de Man, 1880
9. Cephalic setae 4. Domorganus Goodey, 1947
Cephalic setae 10 Greenia Hoeppele & Chu, 1932
10. Ovaries two 11
Ovary one Gymnolaimus Cobb, 1913
11. Tail conoid, acute Aulolaimus de Man, 1880
Tail short, rounded Isolaimium Cobb, 1920

Family COMESOMATIDAE Stek. & de Coninck, 1933
(Key to the genera after Wieser, 1954)

1. Spicula single-jointed, short or long 2
Spicula double-jointed. 9
2. Spicula arcuate, short; gubernaculum with caudal apophysis. 3
Spicula elongate; gubernaculum parallel, without caudal apophysis . 6
3. No teeth in buccal cavity 4
With 3 teeth in buccal cavity 5
4. Cephalic papillae setose, almost as long as the 4 cephalic setae;
Cervical region elongate. Cervonema Wieser, 1954
syn: Linhomoella Stekhoven 1950 nec Cobb 1920
Cephalic papillae papillose; cervical region not elongate
. Sabatiera de Rouville, 1903
syn: Parasabatiera de Man, 1907
5. Cephalic papillae papillose; cuticle differentiated laterally into
longitudinal rows of dots Mesonchuim Cobb, 1920
syn: Pepsonema Cobb, 1920
Cephalic papillae setose, immediately in front of cephalic setae; no
lateral differentiation of cuticle. Vasostoma Wieser, 1954
6. No teeth in buccal cavity 7
With 3 teeth in buccal cavity Laimella Cobb, 1920
syn: Paracomesoma Stekhoven, 1950
7. 10 cephalic setae in one circle Metacomesoma Wieser, 1954
4 cephalic setae in one circle plus one to several circles of
subcephalic setae 8
8. Supplements in male setose or absent. Comesoma Bastian, 1865
Supplements in male chromadoroid. Alaimonema Cobb, 1920
9. Cuticle differentiated laterally. Dorylaimopsis Ditlevsen, 1919
No differentiation of lateral dots. Xinema Cobb, 1920

Questionable genera:

- Cynura Cobb, 1920 (Comesomatidae or Leptolaimidae)
Manuolaimus Cobb, 1920 (Cyatholaimidae or Comesomatidae)
Dolichosomatium Allgen, 1951 (a Sabatiera?)

Superfamily DESMOSCOLECOIDEA Stekhoven, 1935
(Key to the families after Chitwood, 1951)

1. Body generally hirsute. GREEFFIELLIDAE (Filipjev, 1929)
(Contains a single genus Greeffiella (Greaf, 1869) Cobb, 1922)
- Body not generally hirsute. DESMOSCOLECIDAE Southern, 1914 P.90

Family DESMOSCOLECIDAE Southern, 1914
(Key to the families after Chitwood, 1951)

1. With opaque concretion annules. 2
Without opaque concretion annules Eudesmoscolex Steiner, 1916
2. Concretion annules 12-22. Desmoscolex Claparede, 1863
Concretion annules 29-76. Tricoma Cobb, 1894

Superfamily CHROMADOROIDEA de Coninck & Stekhoven, 1933
(Key to the families from Chit. & Chit., 1950)

1. Esophago-intestinal valve very small; cuticular punctation coarse
. CHROMADORIDAE Filipjev, 1917 P.90
- Esophago-intestinal valve well-developed. 2
2. Gubernaculum simple MICROLAIMIDAE de Coninck & Stek., 1933 P.93
(Contains a single subfamily, MICROLAIMINAE)
- Gubernaculum complicated. 3
3. Cuticular punctations fine, amphids 1-2 spiral
. TRIPYLOIDIDAE de Coninck & Stek., 1933 P.93
(Contains a single subfamily, TRIPLOIDINAE)
- Cuticular punctations coarse, amphids unispiral to multispiral
. CYATHOLAIMIDAE de Coninck & Stek., 1933 P.94

Family CHROMADORIDAE Filipjev, 1917
(Key to the subfamilies after Wieser, 1954)

- Amphids indistinct, if distinct then slit-like. (Actinonema)
. CHROMADORINAE P.91
- Amphids distinct, spiral. ETHMOLAIMINAE Filipj. & Stekhoven, 1941 P.91

Family CYATHOLAIMIDAE de Coninck & Stekhoven, 1933
(Key to the subfamilies Chitwood, 1951)

1. Stoma deep, two parts with 6 or 12 heavily sclerotized ridges
 CHOANOLAIMINAE Filipjev, 1934 P.96
 Stoma shallow 5
2. Stoma with 2 or 3 jaws bearing sclerotized complex mandibles
 SELACHINEMATINAE (Cobb, 1915) P.96

Subfamily ETHMOLAIMINAE Filipjev & Stekhoven, 1941
(Key to the genera after Wieser, 1954)

1. Three vigorous teeth; no lateral differentiation 2
 One dorsal tooth only; irregular lateral differentiation present
 Neotonchus Cobb, 1933
2. Supplements absent; no genuine pharyngeal bulb; buccal cavity shallow
 Spiliphora Bastian, 1865
 syn: Spilophora Bastian, 1865 nec. Boheman 1850, Statenia
 Allgen, 1930 and Spilophorum Cobb, 1933)
 Supplements present, numerous; pharyngeal bulb present; buccal cavity
 deep, cylindrical in posterior portion Ethmolaimus de Man, 1880

Subfamily CHROMADORINAE Micoletzky, 1922
(Key to the genera after Wieser, 1954)

1. Amphids slit-like, oval, or loop-shaped, not circularly spiral. 2
 Amphids circularly spiral, indistinct CHROMADOROPSIS Wieser, 1954
 syn. Chromadoropsis Filipjev, 1819 ex parte
2. Teeth hollow or absent. 3
 Teeth solid 14
3. Cuticle markings homogeneous 4
 Cuticle heterogeneous 9
4. Lateral differentiation present; tail short or elongate 5
 Lateral differentiation not present; tail not elongate. Chromodorita
 Filipjev, 1922 syn: Odontonema Filipjev, 1930, Algeniella
 Strand, 1934
5. Longitudinal rows present 6
 Longitudinal rows not present (lateral date enlarged)
 Denticulella Cobb, 1933
6. Two or 4 longitudinal rows; tail not elongate 7
 Three longitudinal rows; tail elongate. Trichromadora Kreis, 1929
7. Buccal cavity armed with teeth, rarely with additional denticles. 8
 Buccal cavity exclusively armed with denticles. Dasyllaimus Cobb, 1933

8. Dorsal tooth triangular, small. Dichromadora Kreis, 1929
 Dorsal tooth S-shaped, large. Hypodontolaimus de Man, 1886
 (syn. Jotadorus Cobb, 1920 and Psycholaimellus Cobb, 1920)
9. Ten cephalic setae. 10
 Four cephalic setae 11
10. Spicula simple Nygmatochus Cobb, 1933
 Spicula double. Rhyps Cobb, 1920
11. Amphids conspicuous, very large, with double contour
 Actinonema Cobb, 1920
 syn: Pareuchromadora Stekhoven & Adam, 1931
 Amphids inconspicuous, slit-like, with simple contour 12
12. No lateral differentiations Graphonema Cobb, 1893
 Lateral differentiations present. Neochromadora Micol., 1924, . 13
13. Tooth large, S-shaped; cervical and somatic setae longer than 1 head
 diameter. Subg. Trichodorina Wieser, 1954
 Tooth absent or small, triangular; cervical and somatic setae short
 Subg. Neochromadora s. str. Wieser, 1954
14. Cuticle markings homogeneous. 15
 Cuticle markings heterogeneous 17
15. No longitudinal rows. 10
 Four longitudinal rows Chromadora Bastian, 1865
16. One dorsal tooth. Prochromadora Filipjev, 1922
 Punctodora Filipjev, 1930
 (Punctodora is very closely related to Prochromadora and
 apparently distinguished from it only by the irregular outline of the
 dorsal tooth)
 Three teeth Chromadorina Filipjev, 1918
 syn. Heterochromadora Wieser, 1951
17. Esophageal bulb very large, double. 18
 Esophageal bulb mostly indistinct, if distinct then simply oval . . 19
18. Spinneret elongate; supplements absent. Spilophorella Filipjev, 1918
 Spinneret not elongate; supplements present
 Chromadorissa Filipjev, 1917
19. Buccal cavity large and deep; no supplements. Euchromadora de Man, 1886
 (also Odontocricus Steiner, 1918 and Dicriciconema Steiner &
 Hoppli, 1926, females only)
 Buccal cavity narrow and shallow; supplements present 20
20. No longitudinal rows. Prochromadorella Micoletzky, 1924
 Well developed longitudinal rows throughout the body
 Chromadorella Filipjev, 1918

Subfamily MICROLAIMINAE Micoletzky, 1922
(Key to the genera after Wieser, 1954)

1. Peribuccal portion of the esophagus of a structure different from that of the postbuccal part (cuticularized?), perhaps functioning as a sort of grinding apparatus; one exceedingly small tooth present Crassolaimus Kreis, 1929
No differentiation of the peribuccal tissues; buccal cavity and armature better developed 2
2. First circle of cephalic setae very small; amphids circular Microilaimus de Man, 1880
First circle of cephalic setae as long as second circle; amphids oval Paramicroilaimus Wieser, 1954

Subfamily TRIPYLOIDINAE Micoletzky, 1924
(Key to the genera after Wieser, 1956)

1. Buccal cavity large and deep; lips deeply incised Bathylaimus Cobb, 1893
syn: Cothinolaimus, Macrolaimus Ditlevsen, 1919
Parabathylaimus de Coninck & Stekhoven, 1933
Bathylaimoides Allgen, 1947
Buccal cavity more narrow; lips not deeply incised. 2
2. Buccal cavity with teeth or cuticular projections Tripyloides de Man, 1886
syn. Tripyla Butschli nec Bastian
Nannonchus Cobb, 1913
Buccal cavity unarmed; more shallow and more narrow than in the foregoing genus Paratripyloides Stekhoven, 1950

Subfamily CYATHOLAIMINAE Micoletzky, 1922
(Key to genera after Wieser, 1954)

1. Buccal cavity reduced Nannolaimus Cobb, . . 20
Buccal cavity well developed 2
2. Buccal cavity deeply conoid with a small tooth projecting from the
ventral wall. Heterocyatholaimus Allgen, 1935
Buccal cavity cyathiform with dorsal tooth, or dorsal tooth plus
subventral teeth, or devoid of armature 3
3. Supplements big, sucker-like, cup-shaped 4
Supplements setose, tubular, minutely papillose or absent 7
4. Supplements big, sucker-like, consisting of several elements,
numerous; spicules simple 5
Supplements big but simple, cup-shaped, inconspicuous; spicula
duplex, i.e. consisting of two lists which are separated by a median
lacuna. Biamrifer Wieser, 1954
5. No esophageal bulb; lateral differentiation of cuticle conspicuous,
longitudinal rows present; buccal cavity deep; accessory piece
complicated 6
Esophageal bulb or swelling present; no lateral differentiation ;
buccal cavity shallow with tooth absent or small; accessory piece
simple, plate-shaped. Choniolaimus Ditlevsen, 1919
. and Dispira Cobb, 1933
6. Buccal armature consisting of big dorsal tooth, two subventral teeth
and (always?) rows of small denticles; accessory piece not tubular
. Pomponema Cobb, 1917
. and Anaxonchium Cobb, 1920
Buccal armature consisting of big dorsal tooth; accessory piece
wholly or partly tubular. Haustrifera Wieser, 1954
7. Supplements setose or tubular 8
Supplements minutely papillose or absent 14
8. Buccal armature consisting of dorsal tooth and 4 accessory denticles;
supplements setose or tubular; accessory piece dentated distally
. Metacanthonchus Wieser, 1954
No buccal armature, or only dorsal tooth present. 9
9. Supplements setose; accessory piece weakly dilated distally, truncate
or notched but not dentated Paracyatholaimus Micoletzky, 1921
Supplements tubular; accessory piece mostly dentated distally . . . 10
10. Supplements of about equal length 11
Anteriormost supplement considerably bigger than the following ones
. 13

11. Accessory piece reduced to a small rectangular plate
 Paraseuratiella Stekhoven, 1950
 Accessory piece not reduced to a small rectangular plate. 12
12. Accessory piece proximally unpaired, shaped as in Cyatholaimus
 Praeacanthonchus Micoletzky, 1924
 Accessory piece proximally paired Paracanthonchus Micol., 1924
13. Tooth and lateral differentiation absent. . . Seuratiella (Ditl., 1921)
 Tooth and lateral differentiation present . . . Acanthonchus Cobb, 1920
14. Supplements mostly absent, sometimes present in form of minute
 papillose bodies which are neither sucker-like not setose or tubular;
 tail always elongate spicula simple 15
 No supplements; tail not elongate 16
15. Esophageal bulb absent; lateral differentiation of cuticle mostly
 irregular Longicyatholaimus Micoletzky, 1924
 Esophageal bulb present; lateral differentiation regular in
 longitudinal rows Metacyatholaimus Stekhoven, 1942
 and Paralongicyatholaimus Stekhoven, 1950
16. Cuticular annules resolvable into dots; no wings
 Cyatholaimus Pastian, 1815
 Cuticular annules without dots; 10 longitudinal wings present
 Xenocyatholaimus Gerlach, 1953

Regarding Dispirella Cobb, 1933, Wieser, 1954 writes, "In the above key I left out Dispirella Cobb, 1933 since data are too scarce as to draw definite conclusions; according to Chitwood, 1951 it should be distinguished from other genera by the almost sphaeroid buccal cavity."

Others: (Freshwater and/or soil inhabitants):

Achromadora Cobb, 1913 - is most closely related to Cyatholaimus, differing in not possessing cuticular pores.

Prodesmodora Micoletzky, 1923 - keys to Heterocyatholaimus above, but differs in having a cylindroid buccal cavity bearing 5 variously placed denticles and a circular amphid.

? Monochromadora Schneider, 1937 - doubtfully placed in the Cyatholaiminae by Goodey, 1951. Amphids of doubtful position, stoma without longitudinal ridges in walls, prismatic to cup-shaped, with two very small teeth. Esophagus cylindrical and ending in a valveless bulb.

Odontolaimus de Man 1880 - differing from all other genera in the form of the stoma. Stoma in two parts: a small anterior tubular cavity and an elongated posterior prismatic region. Amphids large, circular.

Subfamily CHOANOLAIMINAE Filipjev, 1934
(Key to the genera after Wieser, 1954)

- | | | | |
|----|------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|---|
| 1. | No sclerotized structures or teeth between anterior and posterior portion of stoma. | <u>Choanolaimus</u> de Man, 1880 | |
| | Sclerotized structures or teeth between anterior and posterior portion of stoma. | | 2 |
| 2. | Male supplements big, chromadoroid. | | 3 |
| | Male supplements absent, setose or papillose | | 4 |
| 3. | Anterior end with flap-like appendages; posterior apophyses of buccal cavity weakly developed | <u>Latronema</u> (Gerlach) Wieser, 1954 | |
| | Anterior end devoid of appendages; posterior apophyses well developed | <u>Trogolaimus</u> Cobb, 1920 | |
| 4. | Anterior end with flap-like appendages; supplements setose | <u>Gammanema</u> Cobb, 1920 | |
| | Anterior end devoid of appendages; supplements absent or papillose | | 5 |
| 5. | Cephalic setae in two circles, the anterior one consisting of four setae (which is the reverse of the usual); pharyngeal bulb strongly developed | <u>Cobbionema</u> Filipjev, 1922 | |
| | Cephalic setae if present in one circle; no pharyngeal bulb | <u>Halichoanolaimus</u> de Man, 1886 | |

Wieser adds:

"Bulbopharyngiella Allgen, 1929 and Demonema Cobb, 1893 are doubtful genera. By Chitwood, 1951, even Pteronium and Nunema Cobb 1933 were reckoned to this subfamily. Since, however, no figures are known and Cobb referred the two genera to the Richtersiinae and Chromadorinae respectively, a decision should be postponed until further data are known."

Subfamily SELACHINEMATINAE Cobb, 1915
(Key to the genera after Chitwood, 1951)

- | | | | |
|----|---------------------------------------------------------------------------------|--------------------------------|---|
| 1. | Paired lateral mandibles. | | 2 |
| | With three mandibles. | | 3 |
| 2. | Mandibles non-retractible, each with 4 longitudinal rows of denticles | <u>Selachinema</u> Cobb, 1915 | |
| | Mandibles retractible, each claw-like with 7 terminal denticles | <u>Cheironchus</u> Cobb, 1917 | |
| 3. | Mandibles with odd number of teeth | <u>Synonchium</u> Cobb, 1920 | |
| | Mandibles with even number of teeth | <u>Synonchiella</u> Cobb, 1933 | |

Superfamily DESMODOROIDEA Steiner, 1927
(Key to the families after Chitwood, 1951)

1. Glandular setae in subventral rows. . . . DRACONEMATIDAE Steiner, 1930
(Contains one genus, Draconema Cobb, 1912)
Glandular setae absent. 2
2. Body epsilonoid, ambulatory bristles present
. EPSILONEMATIDAE Steiner, 1927 P.97
Body not epsilonoid, ambulatory bristles absent
. DESMODORIDAE Micoletzky, 1924 P.97

Family DESMODORIDAE Micoletzky, 1924
(Key to the subfamilies after Chitwood, 1951)

1. Amphids minute, slit-like STILBONEMATINAE Chitwood, 1936 P.98
Amphids spiral or circular, not slit-like 2
2. Helmet present. 3
Helmet absent RICHTERSIINAE Cobb, 1933 P.98
3. Dorsal tooth present 4
Dorsal tooth absent CERAMONEMATINAE (Cobb, 1933) P.98
4. Amphids circular. MONOPOSTHIINAE Filipjev, 1934 P.98
Amphids spiral DESMODORINAE Micoletzky, 1924 P.100

Family EPSILONEMATIDAE Steiner, 1927

1. Ambulatory setae absent; amphids crescentic Epsilonella Steiner, 1930
Ambulatory setae present; amphids circular or monospiral. 2
2. Oesophagus with median and cardiac bulbs. Metepsilonema Steiner, 1927
Oesophagus with cardiac bulb only 3
3. Annules 80-112; ambulatory setae slender, falcate
. Bathyepsilonema Steiner, 1927
Annules 144-192; ambulatory setae straight or slightly arcuate. . . . 4
4. Body cylindroid, if crooked faintly so. . Archepsilonema Steiner, 1927
Body epsilon-like, i.e. body arches well developed. 5
5. Cuticular annules homogeneous in structure
. Prochaetosoma Baylis & Daubney, 1926
syn: Rhabdogaster Metsch., 1867
Cuticular annules not homogeneous in structure. 6
6. "Axial" part of the cuticular annules hollow ("frame rings")
. Epsilonema Steiner, 1927
"Axial" part of the cuticular annules vacuolated, etc.
. Epsilonoides Steiner, 1931

Subfamily STILBONEMATINAE Chitwood, 1936
(Key to the genera from Chitwood, 1951)

1. Cuticular pores present (on lateral lines) . . . Leptonemella Cobb, 1920
Cuticular pores absent. 2
2. Male with acorn-like supplements. Stilbonema Cobb, 1920
Male without acorn-like supplements Laxonema Cobb, 1920

Others:

Catanema Cobb, 1920

Subfamily RICHTERSIINAE Cobb, 1933
(Key to tribes after Chitwood, 1936)

1. Dorsal tooth absent; cuticle bearing longitudinal rows of hooks
. Tribe RICHTERSIACEA Kreis, 1929
(Contain one genus Richtersia Kreis, 1929)

Dorsal tooth present, very well developed; cuticle sometimes bearing
rows of bristles. Tribe METACHROMADORACEA Chitwood, 1936 P.99

Dorsal tooth minute or absent; cuticle smooth or nearly so, without
rows of bristles. Tribe SPIRINACEA Chitwood, 1936 P.99

Subfamily CERAMONEMATINAE (Cobb, 1933)
(Key to the genera from Chitwood, 1951)

1. Cuticle with transverse plates. 2
Cuticle with deeply overlapping plates. 3
2. Cephalic setae thick Dasynemoides Chitwood, 1936
Cephalic setae thin Dasynemella Cobb, 1933
3. Annules 700-1000 Pristionema Cobb, 1933
Annules 80-300. 4
4. Cephalic setae four Pselionema Cobb, 1933
Cephalic setae ten Ceramonema Cobb, 1920

Subfamily MONOPOSTHIINAE Filipjev, 1934
(Key to the genera after Wieser, 1951)

1. Ovary unpaired 2
Ovary paired. Rhinema Cobb, 1920
2. Spicula reduced; accessory piece unpaired, narrowed proximally
. Monoposthia de Man, 1889
Spicula present, paired, slender; accessory piece unpaired, large,
dilated distally. Nudora Cobb, 1920

Tribe METACHROMADOFACEA Chitwood, 1936
(Key to genera after Gerlach, 1951)

1. Male without cuticularized tube-like supplements. Only in the case of M. vivipara are the supplements cuticularized, however not tube-like. 2
Male with tube-like, cuticularized supplements 3
2. Esophageal bulb strongly developed; cuticular lining usually distinct Metachromadora Filipjev, 1918
Esophageal bulb weakly developed; cuticular lining faint or absent Chromaspirina Filipjev, 1918
3. Supplements strongly S-shaped; heavily cuticularized. 4
Supplements faintly S-shaped; cuticularization light. . Onyx Cobb, 1891
4. Cephalic and subcephalic setae present Sigmaphora Cobb, 1933
Cephalic setae present only Polysigma Cobb, 1920

Genus Metachromadora Filipjev, 1918
(Key to subgenera after Gerlach, 1951)

1. Somatic setae in 10 longitudinal rows over entire body Metonyx Chitwood, 1936
Somatic setae confined to cervical region; if and when on posterior portion then short and scattered. 2
2. Amphids strongly cuticularized; cephalic setae short and often reduced to papillae Metachromadora Filipjev, 1918
Amphids less strongly cuticularized; cephalic setae though often short, always distinctly setose 3
3. Supplements large Chromadoropsis Filipjev, 1918
Supplements lacking; only unthickened excretory ducts for the glands present 4
4. Lateral alae present. Neonyx Cobb, 1933
Lateral alae absent Bradylaimus Stekhoven, 1931

Tribe SPIRINACEA Chitwood, 1936

Genera:

Spirina Filipjev, 1918
Laxus Cobb, 1894
Eubostrichus Greef, 1869

Subfamily DESMODORINAE Micoletzky, 1922)
(Partial key to the genera after Chitwood, 1951)

1. Helmet with longitudinal markings or laterally etched 2
Helmet not internally etched nor with longitudinal markings 3
2. Helmet with longitudinal markings . . . Ichthyodesmodora Chitwood, 1951
Helmet internally etched Desmodorella Cobb, 1933
3. Amphids circular. 4
Amphids spiral. 8
4. Amphids single contour. Xenonema Cobb, 1933
Amphids double contour. 5
5. Teeth present Acanthopharyngoides Chitwood, 1936
Teeth absent. 6
6. Setae (4) at base of helmet Bolbonema Cobb, 1920
Setae (4) papilloid, at anterior part of helmet 7
7. Helmet wider than long. Micromicron Cobb, 1920
Helmet narrower than long Antomicron Cobb, 1920
8. Helmet setae numerous 9
Helmet setae few (1). (Soil!) Amphispira Cobb, 1920
9. Helmet setae 4 + 8. Heterodesmadora Micoletzky, 1924
Helmet setae more numerous. Croconema Cobb, 1920

Others:

Acanthopharynx Marion, 1870
Desmodora de Man, 1889 a
Paradesmodora Stekhoven, 1950
Brachydesmodora
Zalonema Cobb, 1920
Xanthodora Cobb, 1920
Mastodex Steiner, 1920 - listed as a syn. of Croconema by Wieser,
1954
Aculeonchus Kreis, 1926 - listed as a syn. of Croconema by
Wieser, 1954.

Order ENOPLIDA Chitwood, 1933
(Key to the superfamilies from Chit. & Chit., 1950)

- Cuticle of head duplicate; subventral esophageal gland orifices near anterior end of esophagus or through teeth; male supplementary organs 0, 1, or 2 ENOPLIDEA Stekh. & de Coninck, 1933 P.101
Cuticle of head not duplicate; subventral esophageal gland orifices anterior or posterior to nerve ring; esophago-intestinal valve usually large and thick; male supplementary organs usually 3 or more. (Fresh or brackish water and moist soil) TRIPYLOIDEA Chitwood, 1937 P.111

Superfamily ENOPLIDEA Stekhoven & de Coninck, 1933
(Key to families from Chitwood, 1951)

1. Stomatorhabdions poorly sclerotized; without distinct stomatal capsule; stoma surrounded by esophageal tissue . . . ENOPLIDAE Baird, 1853 P.101
Stomatorhabdions heavily sclerotized; stoma somewhat capsuliform, only the posterior part surrounded by esophageal tissue ONCHOLAIMIDAE Baylis & Daubney, 1926 P.101

Family ENOPLIDAE Baird, 1853
(Key to subfamilies)

1. Stoma provided with three bifurcate mandibles ENOPLINAE Micoletzky, 1922 P.102
Stoma without mandibles 2
2. Cephalic setae in one circle of 10 3
Cephalic setae in two circles of 6 plus 4 OXYSTOMININAE (Micoletzky, 1924) P.103
3. Posterior portion of esophagus cellular in appearance PHANODERMATINAE Filipjev, 1927 P.104
Posterior portion of esophagus not appearing to be cellular LEPTOSOMATINAE Micoletzky, 1922 P.105

Family ONCHOLAIMIDAE Baylis & Daubney, 1926
(Key to subfamilies)

1. Esophagus cylindroid ONCHOLAIMINAE Micoletzky, 1922 P.107
Esophagus conoid, crenate or multibulbar 2
2. Sexual dimorphism present; teeth slender, spine-like with narrow base ENCHELIDIINAE (Micoletzky, 1924) Filipjev, 1934 P.110
Sexual dimorphism absent; dorsal tooth broad with large base EURYSTOMINAE Filipjev, 1934 P.109

Subfamily ENOPLINAE Micoletzky, 1922
(Key to the genera after Wieser, 1953)

1. Lips low, labial sense organs papillose; no teeth
 Enoplus Dujardin, 1845
 Lips high, labial sense organs setose; teeth present. 2
2. Subventral teeth long, extending at least to the anterior end of the
 mandibles 3
 Teeth shorter than mandibles 6
3. Teeth surpassing anterior end of mandibles 4
 Teeth not surpassing anterior end of mandibles 5
4. Mandibles well developed Parasaveljevia Wieser, 1953
 Mandibles reduced or vestigial. Saveljevia Filipjev, 1925
5. Third tooth small; mandibles arch-shaped. . . Oxyonchus Filipjev, 1925
 Third tooth reduced; mandibles solid with posterior apophyses
 Enoploneuma Kreis, 1934
6. Teeth almost reduced, visible in juveniles only; mandibles simple,
 without claws Parenoplus Filipjev, 1925
 Teeth short but distinct; mandibles well developed, provided with
 claws 7
7. Mandibles arch-shaped, consisting of two pieces which are united by
 an anterior bar only 8
 Mandibles with whole anterior portion solid 11
8. Cephalic setae situated at posterior end of cephalic capsule
 Enoplolaimus de Man, 1893
 Cephalic setae further forward 9
9. Cephalic setae situated in front of anterior end of cephalic capsule
 Paramesacanthion Wieser, 1953
 Cephalic setae situated at middle or at anterior end of cephalic
 capsule 10
10. Columns of mandibles rod-like; spicula mostly short, if long
 (M. diplochma) then accessory piece with caudal apophysis
 Mesacanthion Filipjev, 1925
 Columns of mandibles plate-like; spicula long, accessory piece
 without caudal apophysis. Epacanthion Wieser, 1953
11. Lips unstriated Mesacanthoides Wieser, 1953
 Lips striated 12
12. Mandibles not extremely slender (ratio length: width not more than 10)
 Enoploides Saveljev, 1912
 Mandibles extremely slender (ratio length: width exceeding 10)
 Metenoploides Wieser, 1933

Genus related to Enoplidae and not mentioned above:

Labyrinthostoma Cobb, 1898; nomen nudum

Subfamily OXYSTOMATINAE (Micoletzky, 1924)
 (Key to the genera after Wieser, 1953)

1. Amphids elongated, slit-like 2
 Amphids pocket-like 5
2. Caudal glands present Halalaimus de Man, 1888. 3
 Caudal glands absent Halalaimoides Cobb, 1933
3. Amphids very large (40%) Subg. Pachydora Wieser, 1953
 Amphids narrow 4
4. Two distant circles of cephalic setae Subg. Halalaimus s. str.
 Two circles of cephalic setae close together
 Subg. Tycnodora Cobb, 1920
5. Amphids very large, almost circular, orifice narrow
 Thalassolaimus de Man, 1893
 Amphids never very large 6
6. Tail filiform Trefusia de Man, 1893
 Tail not filiform Oxystomatina Filipjev, 1918. . 7
7. Tail short, rounded Subg. Nemanema Cobb, 1920
 Tail long, conical Subg. Oxystomatina s. str.

Closely related to Oxystomatina are Porocoma Cobb, 1920 and Angustinema Cobb, 1933 which are insufficiently known.

Differences between genera of the PHANODERMATINAE Filipjev, 1927
(As tabularized by Wieser, 1953)

Genus	Cephalic Capsule	Ocelli	Supple-ments	Remarks
<u>Crenopharynx</u>	simple weak	0	0	
<u>Micotelzkyia</u>	" "	0	+	Head set off
<u>Nasinema</u>	" "		+	
<u>Phanoderma</u>	trilobed, strong often with cervical capsule and striation		+	Spicula short
Subg. <u>Phanoderma</u>		0	+	
Subg. <u>Alyncoides</u>				
<u>Phanodermatina</u>	trilobed, weak no cervical capsule	+	+	Supplement abnormal (like in <u>Thoracostoma</u>)
<u>Phanodermopsis</u>	trilobed, weak	0	0	
<u>Phanodermella</u>	weak, 3 movable labial lobes	0	+	Spicula short, no amphids (?)
<u>Klugea</u>		0	+	Labial papillae prominent

If not stated otherwise, the spicula are elongated.

Subfamily LEPTOSOMATINAE Micoletzky, 1922
(Key to the genera after Wieser, 1953)

1. Cephalic capsule and stomodaeal capsule absent or weakly developed, cephalic suture not or hardly visible. Buccal armature consisting at most of one small tooth. 2
Cephalic and stomodaeal capsule well developed, cephalic suture always conspicuous. Buccal armature as above or consisting of several teeth, plates, mandibles, or dentated ribs 11
2. Cephalic setae 3 head diameters long 3
Cephalic setae not more than 1 head diameter in length 4
3. Buccal cavity absent Barbonema Filipjev, 1927
Buccal cavity (and minute teeth?) present. . . Tubolaimella Cobb, 1933
4. Lateral cervical setae present 5
Lateral cervical setae absent 8
5. Cervical setae arranged in two to three transverse circles
. Platycomopsis Ditlevsen, 1926
Cervical setae arranged in two short longitudinal rows 6
6. Gubernaculum and supplementary organ in male well developed
. Anticoma Bastian, 1865
Gubernaculum present or absent, supplementary organ absent or vestigial 7
7. Gubernaculum present, supplement absent or vestigial. Excretory pore situated on a cuticular projection
. Paranticoma Micoletzky and Kreis, 1930
Gubernaculum and supplement absent. Excretory pore normal
Anticomopsis Micoletzky and Kreis, 1930
8. Two longitudinal rows of "pits" present. Antopus Cobb, 1933
"Pits" absent. 9
9. Tail clavate Leptosomella Filipjev, 1927
Tail cylindrical or conical, rounded or acute at tip 10
10. Ocelli present. Cephalic setae papillose. 11
Ocelli absent. Cephalic setae well developed
. Leptosomatina Allgen, 1951
11. Gubernaculum small, no supplements. Leptosomatium Bastian, 1865
Gubernaculum large, supplements present. Leptosomatides Filipjev, 1918
12. Buccal armature consisting of three mandibles each provided with an acute tip 13
Buccal armature never consisting of three mandibles 15
13. Tail filiform with acute tip. Triodontolaimus de Man, 1893
Tail short, cylindrical, rounded at tip or clavate. 14

14. Tail short, cylindrical, rounded at tip. Buccal cavity complex, oncholaimoid. Rhabdodemanina Baylis and Daubney, 1926
Tail clavate. Buccal cavity relatively simple
. Jagerskioldia Filipjev, 1916
15. Amphids covered by two plate-like setae Platycoma Cobb, 1893
Amphids not covered by setae 16
16. Tail conical with flagellum. Metacylicolaimus Stekhoven, 1946
Tail without flagellum. 17
17. Tail short, rounded Thoracostoma Marion, 1870
Tail clavate 18
18. Buccal cavity vast, armed with an spical dentated band
. Cylicolaimus de Man, 1890
Buccal cavity narrow, armed with plates Synonchus Cobb, 1893

Subfamily ONCHOLAIMINAE Micoletzky, 1922
(Key to the genera adapted from Kreis, 1934 by M.W. Allen)

1. Stoma without teeth 22
Stoma with teeth 2
2. Stoma with one tooth 3
Stoma with two or more teeth 4
3. Stoma with a large typical subventral tooth. Monocholaimus Kreis, 1924
Stoma with a long curved spear-like subventral tooth that arises from
the base of the stoma. Doryonchus Kreis, 1932
Stoma with a very small dorsal tooth Trileptium (Cobb, 1920)
4. Stoma with two teeth 5
Stoma with three or more teeth 6
5. Stoma with a dorsal tooth and a rudimentary submedian tooth
. Phaenoncholaimus Kreis, 1932
Stoma with two subequal dorsal teeth. Dioncholaimus Kreis, 1932
6. Stoma with three teeth. 7
Stoma with more than three teeth. 21
7. Subventral tooth much larger than the other two teeth; two ovaries,
spicula long; bursa present Oncholaimellus de Man, 1890
All three teeth well developed 8
8. Subventral teeth uniformly large 9
Subventral teeth not uniformly large 11
9. Tubiform organ present with an opening to the outside; one ovary
. Metaparoncholaimus de Coninck and Stekhoven, 1933
Tubiform organ absent; two ovaries. 10
10. Tail short, gubernaculum large Pontonema Leidy, 1885
Tail long, no gubernaculum Filoncholaimus Filipjev, 1925
11. Cuticle with a Trabelzeichnung, one ovary, spicula long
. Prooncholaimus Micoletzky, 1924
Cuticle without Trabelzeichnung, 12
12. Stoma walls distinctly different from one another 13
Stoma walls not distinctly different from one another 15
13. Dorsal wall with a large indentation before the dorsal tooth, stoma
very long, one ovary. Convexolaimus Kreis, 1928
Dorsal wall rudimentary 14
14. Ventral wall very thin, dorsal wall short, head region set off
distinctly from the rest of the body by a decrease in the cuticle
thickness around the head region. Cacolaimus Kreis, 1932
Ventral wall not thin, head not set off, amphids large
. Meroviscosia Kreis, 1932

15. Lip region distinctly set off by a constriction; amphids not visible; two ovaries; spicula short, no gubernaculum Steineriella (Ditlevsen), 1928
Lip region not distinctly set off; amphids can usually be seen. . . 16
16. One ovary 17
Two ovaries 20
17. Tubiform organ lacking Pseudoncholaimus Kreis, 1932
Tubiform organ present 18
18. Tubiform organ pouch-like and without excretory canal; spicula straight, no gubernaculum Oncholaimus Lujardin, 1945
Tubiform organ very complicated 19
19. Spicula very long, gubernaculum small . Metoncholaimus Filipjev, 1918
Spicula not very long, no gubernaculum; male with a large subventral papillae on tail Oncholaimium Cobb, 1930
20. Tubiform organ present; spicula long, gubernaculum present Adoncholaimus Filipjev, 1918
Tubiform organ lacking; spicula straight, no gubernaculum Viscosia de Man, 1890
21. Stoma with eight teeth Polydontus Schulz, 1932
22. Esophagus with a posterior bulb Pelagonemella Kreis, 1932
Esophagus without a posterior bulb 23
23. Cuticle thin but distinctly ringed Filipjevia Ditlevsen, 1928
Cuticle always smooth 24
24. Stoma cylindrical, more than twice as long as broad; amphids small; two ovaries; spicula long, bursa present. . Anoplostoma Butschli, 1872
Stoma not cylindrical; no bursa 25
25. Stoma funnel-shaped 26
Stoma cup-shaped 27
26. Stoma small; six lips; ten head setae; one ovary; spicula short but straight, gubernaculum lacking Krampia Ditlevsen, 1921
27. Stoma distinctly bipartite 28
Stoma not distinctly bipartite 29
28. Stoma very large with two cuticularized bodies at the base Vasculonema Kreis, 1928
Stoma very small (1/35 or less of the esophagus length) Pseudopelagonema Kreis, 1932

29. Stoma short, 1.4 times longer than broad, with thick walls; large gland accumulations in head region Anoncholaimus Cobb, 1920
 Stoma longer than 1.5 times the breadth, not smaller than 1/30 of the esophagus Pelagonema Cobb, 1893

Additions:

Wieser, 1953 includes the following:

A. genera without buccal armature:

Curvolaimus Wieser, 1953 differs from all other genera lacking buccal armature by its deeply cut lips, the curved walls of the buccal cavity, the large amphids, the asymmetrical ovary and the filiform tail.

B. genera possessing buccal armature:

Oncholaimoides Chitwood, 1937 differs from all other genera by its striated cuticle bearing longitudinal ridges broken by striae.

Metoncholaimoides Wieser, 1953 is distinguished from Metoncholaimus by its symmetrical ovaries and from Adoncholaimus by the enormously elongated spicula and the absence of the gubernaculum.

Subfamily EURYSTOMINAE Filipjev, 1934
 (Key to the genera after Wieser, 1953)

1. Esophagus with a number of distinct bulbi Bolbella Cobb, 1920
 Esophagus without bulbi 2
2. Cervical setae extremely long Ledovitia Filipjev, 1925
 Cervical setae not abnormally long 3
3. Two well developed supplements in male; buccal cavity with 1 to 2 small, acute, subventral teeth 4
 Supplements absent or built as simple elevations of the cuticle; buccal cavity oncholaimoid, i.e. the two subventral teeth strongly developed and with a broad base. 5
4. Caudal glands present Eurystomina Filipjev, 1918
 Caudal glands absent Pareurystomina Micol. and Kreis, 1930
5. Buccal cavity with transverse rows of denticles; accessory piece without caudal apophysis Thoonchus Cobb, 1920
 No transverse rows of denticles in the buccal cavity; accessory piece with strong apophysis Ditlevsenella Filipjev, 1925

Subfamily ENCHELIDIINAE Filipjev, 1934
(Key to the genera after Wieser, 1953)

1. Esophagus with a number of distinct bulbi. Polygastrophora de Man, 1922
Esophagus without bulbi 2
2. Buccal cavity narrow, almost cylindrical, transverse rings more or less regularly arranged so as to give rise to more than two apparent chambers 3
Buccal cavity of different shape, by a transverse band, ring or row of denticles divided into two unequal portions; other rings which might be present are faint and concentrated at the posterior end of the buccal cavity. 4
3. A transverse row of denticles in the anterior portion of the buccal cavity ; refractive bodies lacking
. Symplocostomella Micol. & Kreis, 1930
All transverse rings solid; refractive bodies present
. Symplocostoma Bastian, 1865
4. Posterior portion of the buccal cavity large, asymmetrical, almost ventricose; refractive bodies present. Calyptronema Marion, 1870. .5
Posterior portion of buccal cavity conical, symmetrical; refractive bodies absent Conistomella Stekhoven, 1942
5. Lumen of esophagus strongly dilated; tail elongated
. Subg. Calyptronema s. str.
Lumen of esophagus weakly or not at all dilated; tail conical
. Subg. Dilaimus Filipjev, 1925

Doubtful genera:

Asymmetrella Cobb, 1920
Illium Cobb, 1920
Pseudodilaimus Kreis, 1928
Chaetonema Filipjev, 1925
Fenestrolaimus Filipjev, 1925

Superfamily TRIPYLOTOIDA Chitwood, 1937
 (Key to families after Chitwood, & Chitwood, 1950)

1. Stoma somewhat reduced to rudimentary; stomatal walls not, or poorly sclerotized 2
 Stoma well developed; stomatal walls well sclerotized 3
2. Stoma conoid or collapsed conoid; esophago-intestinal valve bulb-like TRIPYLIDAE Oerley, 1880 P.111
 Stoma rudimentary; esophago-intestinal valve not bulb-like ALAIMIDAE Micoletzky, 1922 P.112
3. Stoma capsule-form; esophageal gland orifices posterior to nerve ring . (Contains a single genus, Monouchus) . . . MONONCHIDAE Chitwood, 1937 P.115
 Stoma cylindrical; esophageal gland orifices near base of stoma IRONIDAE de Man, 1876 P.119

Family TRIPYLIDAE Oerley, 1880
 (Key to the genera after Pennak, 1953)

1. Stoma a short, cylindrical cavity, about as long as head is wide Prismatolaimus de Man, 1880
 Stoma somewhat conoid or obscure 2
2. Lips massive, deeply cut, dividing head into three jaws Trischistoma Cobb, 1913
 Lips not massive, three or six, but head not appearing to be divided into jaws 3
3. Stoma collapsed Tripyla Bastian, 1865
 Stoma conoid, divided Trilobus Bastian, 1865

Family ALAIMDAE Micoletzky, 1922
 (Key to the genera after Thorne, 1939)

1. Esophageal basal enlargement reduced to a simple pyriform bulb
 (Contains a single species B. brevicolle Cobb, 1920
 Bolbinium Cobb, 1920
 Esophageal basal enlargement elongate-conoid to cylindrical 2
2. Amphid apertures minute, pore like. Alaimus de Man, 1880 P.113
 Amphid apertures large, ellipsoidal, elongate slits or crescentic . . 3
3. Amphid apertures ellipsoidal, almost circular, spicula dorylaimoid
 (Contains a single species A. tenuis (Cobb) Thorne, 1939
 Adorus (Cobb), Thorne, 1939
 Amphid apertures elongate slits or crescentic, spicula alaimoid
 Amphidelus Thorne, 1939 P.114

Genus Alaimus de Man, 1880
(Key to the species after Thorne, 1939)

1. Body tapering markedly both ways from near middle. Width, a= less than 50. Length under 1.5 mm. Males unknown, except for primitivus 2
Body subcylindrical from esophagus base to near tail. Width, a= well over 50. Length 2.0 mm or more, except similis and proximus under 1.5 mm. Males known, except for similis 99
2. Post rectal blind sac of intestine present . . . thamugadi Maupas, 1900
Post rectal blind sac of intestine not present 3
3. Esophagus, b= less than 4 4
Esophagus, b= 4 or more 5
4. Tail finely mucronated mucronatus Altherr, 1900
Tail without mucron minor Cobb, 1893
5. Terminus subdigitate glissus Thorne, 1939
Terminus acute or subacute 6
6. Tail length about four times anal body diameter 7
Tail length 7 - 10 times anal body diameter 8
7. Terminus acute, tail slightly arcuate acutus Thorne, 1939
Terminus subacute, tail somewhat hooked. arcautus Thorne, 1939
8. Female length 1.2 mm primitivus de Man, 1880
Female length 0.7 mm parvus Thorne, 1939
9. Length 4.0 mm elongatus de Man, 1906
Length 2.5 or less 10
10. Length under 1.5 mm 11
Length 2.0 - 2.5 mm 12
11. Esophagus enlarged in basal seventh similis Thorne, 1939
Esophagus enlarged in basal fourth proximus Thorne, 1939
12. Without supplements, with a single preanal papilla. Male only known
. modestus Stekhoven and Teunissen, 1938
With supplements. 13
13. Supplements 14, male only known . . . multipapillatus Wu & Hoeppli, 1929
Supplements 7 or less, both sexes known 14
14. Female tail length 12, male tail 8 times anal body diameter
. simplex Cobb, 1914
Female tail length 4.5, male tail 3 times anal body diameter
. tenuis Thorne, 1939

Species inquirenda:

- A. filiformis Daday, 1894
A. papillatus (Daday, 1899), Micol., 1922

Genus Amphidelus Thorne, 1939

(Key to the species including material from Thorne, 1939)

1. Male expanded in anal region, tail filiform, females undefinable
 lemani (Stefanski, 1916) Thorne, 1939
 Males known only for dolicurus and tasmaniensis, not expanded in anal
 region. Remaining species based on female descriptions. 2
2. Amphid apertures hook-like. . tasmaniensis (Allgen, 1929) Thorne, 1939
 Amphid apertures not hook-like 3
3. Tails attenuated or filiform, c = 5-10 4
 Tails conoid, c = 17 or more 58
4. Ovaries two. elegans (de Man, 1921) Thorne, 1939
 Ovaries one. 5
5. Terminus slender, acute 6
 Terminus abruptly conoid pusillus Thorne, 1939
6. Amphids at level of outer circle of cephalic papillae
 coronatus Andrassy, 1957
 Amphids situated 2-3 head diameters posterior to outer circle of
 cephalic papillae 7
7. Amphids 12u from head end dulichii Andrassy, 1957
 Amphids 27-33u from head end. . dolicurus (de Man, 1876) Thorne, 1939
8. Terminus rounded 9
 Terminus subacute or acute. 10
9. Lip region width one-fourth neck base eremitus Thorne, 1939
 Lip region width two-fifths neck base latus Thorne, 1939
10. Amphids goulet shaped lissus Thorne, 1939
 Amphids elongate-conoid 11
11. Anterior female sexual branches short, rudimentary. 12
 Both female sexual branches normal. 13
12. Esophagus expanded in latter 1/4. uniformis Thorne, 1939
 Esophagus expanded in latter 1/10 simulating a pseudo-bulb
 pseudobulbosus Altherr, 1953
13. Terminus ventrally hooked sylphus Thorne, 1939
 Terminus almost straight hyans Thorne, 1939

Genus Mononchus Bastian 1866
(Key to species from Allen, 1950)

1. Dorsal tooth midway in pharynx, or higher, usually massive. 2
Dorsal tooth basal or nearly so, small. 50
2. Tooth not opposed by denticles 3
Tooth opposed by numerous denticles 25
3. Dorsal tooth faced by 2 ventrally submedian teeth 4
Dorsal tooth not faced by submedian teeth 10
4. Teeth retrorse. tridentatus de Man, 1876
Teeth not retrorse 5
5. Tail conoid, then cylindroid; body 7.0 mm. long rex Cobb, 1904
Tail simply conoid; body 3.0 mm. long or less 6
6. Spinneret and caudal glands absent. 7
Spinneret and caudal glands present 8
7. Length about 2.0 mm exilis Cobb, 1917
Length about 4.0 mm trionchus Thorne, 1924
8. Contour of head angular; labial papillae 16 radiatus Cobb, 1917
Contour of head rounded; labial papillae 12 9
9. Pharynx longer than width of head palustris Cobb, 1917
Pharynx only as long as width of head. teres Cobb, 1917
10. Ovary 1; pharynx not much longer than wide monhystera Cobb, 1917
Ovaries 2; pharynx about twice as long as wide. 11
11. Tail simply conoid, 8 per cent or less 12
Tail conoid, then cylindroid, about 10 per cent or more 18
12. Spinneret absent 13
Spinneret present 15
13. Pharynx over half as wide as head vorax Cobb, 1917
Pharynx not over half as wide as the head 14
14. Length about 1 mm.; tooth midway, small, digitate . paruus de Man, 1879
Length 1.5 to 2.0 mm.; tooth beyond midway, massive
. papillatus Bastian, 1866
15. Body 2 mm. long 16
Body 3 to 4 mm. long. 17

16. Form of tail regular intermedius Cobb, 1893
 Form of tail somewhat irregular tenuicaudatus Stefanski
17. Tooth midway, amphids a little behind lips major Cobb, 1893
 Tooth and amphids at the base of the lips . . . gerlachei de Man, 1904
18. Esophagus 15 per cent fovearum (Dujardin) Bastian, 1866
 Esophagus 22 per cent 19
19. Buccal cavity about twice as long as head width 20
 Buccal cavity only half as long as width of head 21
20. Spinneret armed with 2 very small setae megalaimus Cobb, 1917
 Spinneret not armed with setae macrostoma Bastian, 1866
21. Labial papillae setose obtusus Cobb, 1917
 Labial papillae, at least the outer, not setose 22
22. Pharynx 1/3 as wide as head; body 1.5 mm. long
 tunbridgensis Bastian, 1866
 Pharynx at least 1/3 as wide as head, body 2 to 3 mm 23
23. Buccal cavity about twice as long as wide; tooth acute
 truncatus Bastian, 1866
 Buccal cavity about 3 times as long as wide 24
24. Inner labial papillae large; tail sub-conoid . . . dadayi Micol., 1904
 Inner labial papillae normal; tail finally cylindrical
 longicaudatus Cobb, 1893
25. Arrangement of the denticles irregular. 26
 Arrangement of the denticles orderly. 28
26. Spinneret absent; tooth behind midway recessus Cobb, 1917
 Spinneret present; tooth in front of midway 27
27. Denticles about 20; pharynx half width of head. . . dentatus Cobb, 1917
 Denticles about 50; pharynx 1/3 width of head . . . decurrens Cobb, 1917
28. Denticles along a ventral, longitudinal pharyngeal rib. 29
 Denticles in transverse rows. 33
29. Eggs punctate or echinulate punctatus Cobb, 1917
 Eggs not punctate or echinulate 30
30. Length 2.5 to 3.5 mm. 31
 Length 4 mm. or more. spectabilis Ditl., 1911
31. Denticles inward pointing longicollis Cobb, 1917
 Denticles forward pointing. 32
32. Pharynx twice as long as wide longus Thorne, 1929
 Pharynx 1.5 times as long as wide . . muscorum (Dujardin) Bastian, 1866

33. Ovary single. 34
Ovaries double. 35
34. Anterior ovary present, posterior absent. index Cobb, 1907
Posterior ovary present, anterior absent. reversus Cobb, 1917
35. Dorsal tooth somewhat digitate; small 36
Dorsal tooth not digitate; massive. 30
36. Spinneret terminal. obtusicaudatus Daday, 1901
Spinneret slightly dorsal 37
37. Caudal glands tandem parabrachyurus Thorne, 1924
Caudal glands grouped not tandem. brachyuris Butschli, 1873
38. Head rounded, denticles in about 12 rows. denticulatus Cobb, 1917
Head truncate, denticles in 2 to 6 rows 39
39. Rows of denticles 2 sparsus Cobb, 1917
Rows of denticles 4 to 6. 40
40. Denticles about 4 rows, spinneret small micrurus Cobb, 1917
Denticles about 6 rows, spinneret larger 41
41. Tail bent ventrally near middle 42
Tail arcuate or nearly straight 43
42. Caudal setae none, tail conoid incurvus Cobb, 1917
Caudal setae 3 pairs, tail not conoid sigmaturus Cobb, 1917
43. Width of adults 2.3 per cent subtenuis Cobb, 1917
Width of adults 2.7 per cent or more. 44
44. Spinneret absent. subsimilis Cobb, 1917
Spinneret present 45
45. Spinneret opening slightly dorsal 46
Spinneret opening terminal. 47
46. Eggs thick shelled. obliquus Cobb, 1917
Eggs thin shelled brericaudatus Cobb, 1917
47. Aquatic species lacustris Cobb, 1915
. polonicus Stefanski, 1915
Species not aquatic 48
48. Length over 1.5 mm montanus Thorne, 1924
Length under 1.5 mm 49
49. Width over 3 per cent minor Cobb, 1893
Width less than 3 per cent. japonicus Cobb, 1917
50. Teeth retrorse, small, basal. 51
Teeth not retrorse, small or minute. 53

51. Length 2 to 4 mm. teeth equal tridentatus de Man, 1876
 Length 5 to 6 mm. teeth sub-basal. 52
52. Submedian teeth equaling the dorsal gracilicaudatus Cobb, 1917
 Submedian teeth smaller than the dorsal dolichurus Dittl., 1911
53. Ovary single. 54
 Ovary double. 58
54. Tail digitate; 3 subequal vestigial teeth. digiturus Cobb, 1893
 Tail not digitate; 1 dorsal tooth 55
55. Tail setaceous. trichurus Cobb, 1917
 Tail slender, but not setaceous 56
56. Pharynx as long as wide bathybius Micoletzky, 1913
 Pharynx about 2 times as long as wide 57
57. Amphid simple; buccal wall thin, transversely striated
 gymnolaimus Cobb, 1893
 Amphid duplex; buccal wall thick, not striated. consimilis Cobb, 1917
58. Length 4 to 7 mm.; 3 teeth. 59
 Length 1 to 4 mm.; 1 tooth, sometimes denticles 61
59. Spinneret present; lips plain 60
 Spinneret absent; lips striated lengthwise. regius Cobb, 1917
60. Length 4 mm.; the 3 teeth subequal. rapax Cobb, 1917
 Length 6 to 7 mm.; submedian teeth smaller. rex Cobb, 1904
61. Anus at about 86 per cent 62
 Anus at about 94 per cent 64
62. Lips not set off by constriction; onchi unequal or one. 63
 Lips set off by a deep constriction; onchi three, equal
 fascoatis Cobb, 1917
63. Onchus with small companions; head rounded. bathybius Micol., 1913
 Onchus one only; head truncate. similis Cobb, 1893
64. Dorsal tooth small, others basal, minute. studeri Steiner, 1914
 Dorsal tooth moderate, distinct 65
65. Buccal cavity as wide as long, main tooth basal 66
 Buccal cavity longer than wide. 67
66. Spinneret present brachylaimus Cobb, 1917
 Spinneret absent. acutus Cobb, 1917
67. Length about 2.3 mm.; males with 10-12 supplements
 amphigonicus Thorne, 1924
 Length 2.5 to 3.5 mm.; males with 20 suppl. zschokkei Menzel, 1913

Family IRONIDAE de Man, 1876

(Key to subfamilies)

1. Teeth at anterior end of stoma. . . . Subfamily IRONINAE Micol., 1922 P.119
 Without teeth at anterior end of stoma
 Subfamily CRYPTONCHINAE Chit., 1937
 (Contains a single species, Cryotonchus nudus Cobb, 1913)

Subfamily IRONINAE Micol., 1922

(Key to genera modified from Cobb, 1935)

1. Female gonad monodelphic, opistodelphic. . . . Trissonchulus Cobb, 1920
 Female gonad didelphic, amphidelphic 2
2. Spinneret absent. Ironus Bastian, 1865
 Spinneret present (in Parironus rudimentary or none); marine 3
3. Cephalic setae absent or papilloid; pharyngeal swelling slight . . . 4
 Cephalic setae present 5
4. Pharyngeal wall thin; pharynx 3% Dolicholaimus de Man, 1888
 Pharyngeal wall thick; pharynx 1% Thalassironus de Man, 1889
5. Cephalic setae in two circles, 6 cephalic 8₄ subcephalic
 Ironella Cobb, 1920
6. Spicules paired Parironus Micol., 1930
 Spicules unpaired, one exceedingly long Conilia Gerlach, 1954

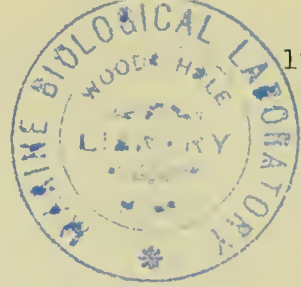
Order DORYLAIMIDA Pearse, 1942

(Key to suborders modified from Chit. & Chit., 1950)

- Stylet present; esophageal gland orifices posterior to nerve ring, glands uninucleate, esophagus consisting of narrow cylindrical anterior part and wider cylindrical posterior part or glands lying free in body cavity or 1 or 2 reduplicate series; muscular caudal sucker absent; excretory system absent or very poorly developed DORYLAIMINA (Chit., 1933) Pearse, 1936 P.120
- Stylet absent or stylet absent at least in adult stage; esophageal gland orifices at anterior end of esophagus, glands highly polynucleate, lying inside the cylindrical esophagus; male with one spicule and caudal sucker; caudal glands absent; ventral excretory cell apparently absent; eggs operculate. (Parasites of vertebrates) DIOCTOPHYMATINA Chit. & Chit. 1937

Suborder DORYLAIMINA (Chit., 1933) Pearse, 1936
(Key to superfamilies from Chit., & Chit., 1950)

1. Amphids pocket-like; esophageal glands not free in body cavity; intestine not extending anterior to base of esophagus; eggs not operculate DORYLAIMOIDEA (de Man, 1876) Thorne, 1934 P.121
Amphids modified, pocket-like to pore-like; esophageal glands free in body cavity, forming stichosome 2
2. Intestine extending anterior to base of esophagus, usually without lumen; male with 1 or 2 spicules and usually 2 testes; eggs modified but not operculate. (Parasites of land and fresh water arthropods in larval stages.) MENITHOIDEA Wulker, 1924
Intestine not extending anterior to base of esophagus, with well-developed lumen; male with 1 or 0 spicule and testis; eggs usually operculate. (Parasites of vertebrates in adult stage; life history direct or indirect.) TRICHUROIDEA Raillet, 1916



Superfamily DORYLAIMOIDEA Thorne, 1934
(Key to the families)

- 1. Esophagus with enlarged posterior third or more 2
Esophagus with only a pyriform or elongate basal bulb 4
- 2. Enlarged portion of esophagus surrounded by a sheath of spiral muscles
. BELONDIRIDAE Thorne, 1939 P.122
Enlarged portion of esophagus not surrounded by muscular sheath . . . 3
- 3. Amphids with obscure slit-like apertures; common
. DORYLAIMIDAE de Man, 1876 P.121
Amphids with moderately large to large circular apertures; rare (in
Russia) OPAILAIMIDAE Kirjanova, 1951 P.121
- 4. Amphid apertures obscure, slit-like; testes two; an adanal pair of
supplements present LEPTONCHIDAE Thorne, 1935 P.158
Amphid apertures ellipsoidal, conspicuous; testis one; adanal pair of
supplements absent. DIPHTHEROPHORIDAE Thorne, 1935 P.162

Family OPAILAIMIDAE Kirjanova, 1951
(Key to genera)

- Large circular amphids. Opailaimus
(Contains a single species (O. mirus.)
- Smaller circular amphids and bearing peculiar forward-pointing ex-
trusions of the cuticle on the head Ottolaimus, Kirjanova, 1951
(Contains a single species O. otiosus.)

Family DORYLAIMIDAE de Man, 1876
(Key to the subfamilies from Thorne, 1939)

- 1. Pharynx armed with a mural tooth. NYGOLAIMINAE Thorne, 1935 P.126
Pharynx armed with an axial spear 2
- 2. Vestibule and pharynx heavily cuticularized, often dentate
. ACTINOLAIMINAE Thorne, 1939 P.129
Vestibule and pharynx not heavily cuticularized
. 3
- 3. Spear greatly attenuated. LONGIDORINAE Thorne, 1935 P.133
Spear not greatly attenuated, or if so (rarely) the basal portion of
the esophagus is not set off by a constriction. 4
- 4. Spear with simple basal extensions. DORYLAIMINAE Filipjev, 1928 P.138
Spear compound, with knobbed basal extensions or flanges
. TYLONCHOLAIMINAE Filipjev, 1934 P.157

Family BELONDIRIDAE Thorne, 1939
(Key to the genera modified from Thorne, 1939)

1. Cuticularized pieces present about vestibule. Dorylaimellus Cobb, 1913 P.123
Cuticularized pieces not present about vestibule. 2
2. Tails bluntly rounded or conical. 3
Tails filiform. 6
3. Pharynx armed with a mural tooth. 4
Pharynx armed with an axial spear 5
4. Ovary one Nygellus Thorne, 1939
(Contains a single species, N. clavatus Thorne, 1939)
Ovaries two Nygolaimellus Loss, 1949
5. Anterior portion of esophagus set off by constriction
. Axonchium Cobb, 1920 P.124
Anterior portion of esophagus not set off by constriction
. Belondira Thorne, 1939 P.125
6. Basal portion of esophagus and cardia normal. . . Oxydirus Thorne, 1939 P.122
Basal portion of esophagus greatly reduced, cardia long, isthmus-like
. Swangeri Thorne, 1939
(Contains a single species S. fragilis Thorne, 1939)

Genus Oxydirus Thorne, 1939
(Key to the species from Thorne, 1939)

1. Ovaries two, supplements contiguous
. oxycephaloides (de Man, 1921) Thorne, 1939
Ovary one, supplements spaced
. oxycephalus (de Man, 1885) Thorne, 1939

Genus Dorylaimellus Cobb, 1913
(Key to the species modified from Thorne, 1939)

1. Cuticle with longitudinal and transverse striations 2
Cuticle transversely striated only. 3
2. Length over 6 mm. heteruriis Stekhoven Teunissen, 1938
Length less than 2 mm hedickii Paesler, 1941
3. Ovaries two 4
Ovary single. 10
4. Anterior portion of esophagus not constricted. nodochordus Thorne, 1939
Anterior portion of esophagus constricted to a narrow tube 5
5. Cuticle coarsely striated. striatus Thorne, 1939
Cuticle not coarsely striated. 6
6. Length about 1.0mm or over 7
Length about 0.6 mm 9
7. Tails bluntly rounded occidentalis Thorne, 1939
Tails somewhat elongate conoid 8
8. Preanal supplements 4; female known virginianus Cobb, 1913
Preanal supplements 14; female unknown.
. multipapillatus Stekhoven & Tennissen, 1938
9. Prerectum length five times body width. parvulus Thorne, 1939
Prerectum length less than twice body width . . . tenuidens Thorne, 1939
10. Ovary posterior to vulva. 11
Ovary anterior to vulva 12
11. Anterior uterine sac present. porosus Thorne, 1939
Anterior uterine sac absent. engadinensis (Altherr, 1950) Altherr, 1950
12. Tails subdigitate, b=4. mirabilis (de Man, 1884) Thorne, 1939
Tails conoid, b=6 13
13. Tails bluntly conoid. aequalis (Cobb, 1918) Thorne, 1939
Tails acutely conoid, arcuate . . . fuorni (Altherr, 1950) Altherr, 1950

Genus Axonchium Cobb, 1920
(Key to the species modified from Thorne, 1939)

1. Anterior female sexual branch normal. 2
Anterior female sexual branch rudimentary or absent 3
2. Length under 2.0 mm magnicollis (Cobb, 1906) Th. & Swang., 1936
Length near 3.0 mm. longicollis (Cobb, 1893) Th. & Swang., 1939
3. Inner portion of lips subspherical labiatum Thorne, 1939
Inner portion of lips conoid, hemispherical, or obscure 4
4. Lip region completely amalgamated, head bluntly conoid; length 1.0 mm.
. amalgans Thorne, 1939
Lip region not completely amalgamated; length about 1.5 mm or over
. 5
5. Amphids forming a deep pocket completely surrounding lips 6
Amphids not forming a deep pocket completely surrounding lips 7
6. Length over 4.0 mm. gigas Thorne, 1939
Length under 3.0 mm micans Thorne, 1939
7. Length about 1.5 mm 8
Length about 2.5 mm or more 9
8. Anterior female sexual branch as long as posterior; male known;
spicula very long macrophallum Thorne, 1939
Anterior female sexual branch a short pouch; males apparently non-
existent amplicolle Cobb, 1920
9. Inner portion of lips somewhat conoid; length about 4.0 mm; males
unknown 10
Inner portion of lips low, rounded, more obscure; length under 4.0 mm;
males generally known
10. Cuticle near head with prominent striae
. coronatum (de Man, 1906) T. & S., 1936
Cuticle near head not prominently striated. crassum Thorne, 1939
11. Anterior uterine branch only about twice as long as body width, males
non-existent. 12
Anterior uterine branch four times body width or more, males known
. 13
12. V = 44% solitare Thorne, 1939
V = 58-60% leptocephalus Altherr, 1953
13. Supplement series anterior to spicula 14
Supplement series beginning within range of spicula 15
14. Supplements adjacent to one another choristum Thorne, 1939
Supplements spaced. tenuicollis (Steiner, 1914) T. & S., 1939

15. Supplements adjacent to adanal pair and to each other
 serpens Thorne, 1939
 Supplements spaced. propinuum (de Man, 1921) Thorne, 1939

Species of undetermined position:

- A. dudichi Andrassy, 1952
A. parvum Steiner, 1927

Genus Belondira Thorne, 1939
 (Key to the species from Thorne, 1939)

1. Esophagus with well developed strong musculature. 2
 Esophagus with weak musculature, more glandular 3
2. Tail conoid apitica Thorne, 1939
 Tail hemispheroid ortha Thorne, 1939
3. Tail hemispheroid, body slightly clavate posteriorly
 clava Thorne, 1939
 Tail cylindrical, then hemispheroid caudata Thorne, 1939

Subfamily NYGOLAIMINAE Thorne, 1935
(Key to the genera modified from Thorne, 1939)

1. Esophagus with definitely set off basal portion 2
Esophagus without set off basal portion (cylindrical) 3
2. Tooth ventral submedian Nygolaimus Cobb, 1913 P.127
Tooth ventral Sectonema Thorne, 1930 *
3. Ovary one 4
Ovaries two Bathyodontus Fielding, 1950 P.126
4. Lips six Oionchus Cobb, 1913
(Monotypic O. obtusus Cobb, 1913)
Lips three Enoplocheilus Kreis, 1932
(Monotypic E. obtusicaudatus Kreis, 1932)

* To date two species of Sectonema have been described: S. ventralis Thorne, 1930 and S. rotundicauda Goodey, 1951. S. ventralis was described from females while S. rotundicauda is represented by a single male specimen. Regarding the differences between the two species Goodey, 1951 writes relative to S. rotundicauda: "differing from S. ventralis in the lips being less angular and more founded in outline, in the tooth being rather more developed, in the tail being shorter and more hemispherical in outline and in the sparseness of the lateral pores."

The genus Mirolaimus Andrassy, 1956 is a synonym of Bathyodontus Fielding, 1950. (Andrassy, personal communication)

Genus Bathyodontus Fielding, 1950
(Key to the species)

1. Length 1.1 mm, tail with one pair of caudal papillae
. cylindricus Fielding, 1950
Length 0.7 - 0.86 mm, tail with two pairs of caudal papillae
. mirus (Andrassy, 1956) Andrassy, unpublished

Genus Nygolaimus Cobb, 1913
(Key to the species modified from Thorne, 1939)

1. Length more than 7 mm husmanni Meyl, 1954
Length less than 4.5 mm 2
2. Pharynx without denticles 3
Pharynx with denticles. 28
3. Terminus blunt, rounded 4
Terminus acute or subacute 25
4. Lip region set off by constriction 5
Lip region not set off, continuous 17
5. Tooth hollow less than half its length, very slender 6
Tooth hollow almost to apex 7
6. Only females known. vulgaris Thorne, 1930
Bisexual species. bisexualis Thorne, 1930
7. Death position spiraled, $1\frac{1}{2}$ - 2 times spiralis, Loos, 1946
Death position not spiraled 8
8. Length 2.1 - 2.7 mm; V= 41 -45% cuniculus Altherr, 1950
Length above or below 2.1 - 2.7 mm; V= 45% or more. 9
9. Body length 2.0 mm or less. 10
Body length near 3.0 mm or more 16
10. Lip region one-third as high as wide 11
Lip region one-half or more as high as wide 12
11. Tail convex-conoid; V= 66%. pachydermatus Cobb, 1913
Tail conoid, ventrally arcuate; V= 52%. plan-posae Altherr, 1958
12. Tail swollen, clavate, hemispherical. clavicaudatus Altherr, 1953
Tail not swollen, conoid. 13
13. Tail dorsally-convex, slightly ventrally arcuate
. paramphigonicus Altherr, 1950
Tail uniformly convex-conoid 14
14. Tail obtusely convex-conoid, with 1 pair of caudal papillae 15
Tail uniformly conoid, with 2 pairs of caudal papillae
. paulbuchneri Meyl, 1956
15. Pharynx three times as deep as lip region tenuis Thorne, 1930
Pharynx twice as deep as lip region amphigoniaus Thorne, 1930
16. Tail symmetrically conoid rounded obtusus Thorne, 1930
Tail dorsally convex-conoid brachyurus (de Man, 1880) Thorne, 1930

17. Body length under 2.0 mm. 18
 Body length near 3.0 mm or over 22
18. Two glandular organs present near base of neck. . . . teres Thorne, 1930
 Glandular organs not present. 19
19. Ventromedian supplements one only borborophilus (de Man, 1876)
 Ventromedian supplements three or more. 20
20. Lip region hemispheroid laevis Thorne, 1939
 Lip region more truncate 21
21. Cephalic papillae distinct, projecting. kaburaki Imamura, 1931
 Cephalic papillae continuous, obscure thornei Schneider, 1937
22. Spicula curved proximally rapax Thorne, 1939
 Spicula not curved proximally 23
23. Depth of pharynx about four times width of lip region
 aquaticus Thorne, 1930
 Depth of pharynx less than three times width of lip region. 24
24. Head region subcylindrical. shadini Filipjev, 1928
 Head region more conoid, tapering ferox Thorne, 1930
25. Tooth half as long as width of lip region . acuticaudatus Thorne, 1930
 Tooth about as long as width of lip region. 26
26. Terminus very acute curvistilis (Stefanski, 1923)
 Terminus subacute 27
27. Tail length about twice anal body diameter. dubius Thorne, 1930
 Tail length about three times anal body diameter
 hartingii (de Man, 1880) Thorne, 1930
28. Body length under 3.0 mm menzeli Micoletzky, 1925
 Body length over 4.0 mm denticulatus Cobb, 1922

Subfamily ACTINOLAIMINAE Thorne, 1939
(Key to the genera modified from Thorne, 1939)

1. Pharynx armed with four large onchia. Actinolaimus Cobb, 1913 P.130
Pharynx without four large onchia but frequently dentate, corrugated
or ribbed 2
2. Vestibule and pharynx with several transverse rows of denticles
. Trachypleura Thorne, 1939 P.129
Vestibule and pharynx without denticles or, if present, they are not
arranged in regular transverse rows 3
3. Cuticularization limited to shallow, dish-like vestibular plate
. Mylodiscus Thorne, 1939
(Contains a single species, M. nanus Thorne, 1939)
Vestibular cuticularization more complicated, with rod-like processes
extending backward to or near the guiding ring. 4
4. Vestibular cuticularization forming a basket-like chamber or plates;
guiding ring single; tail blunt 5
Vestibular chamber without the above; guiding ring double; tail
attenuated. Brasilaimus Lordello and Zamith, 1958
(Contains a single species, B. subaquilus Lordello and Zamith,
1958)
5. Vestibular chamber basket-like. Carcharolaimus Thorne, 1939 P.132
Vestibular chamber with flat or rod-like plates
. Antholaimus Cobb, 1913 P.129

Genus Trachypleura Thorne, 1939
(Key to species from Thorne, 1939)

1. Tails somewhat spicate, short; female c = 20
. conformis (Schneider, 1935) Thorne, 1939
Tail attenuated; female c = 10
. labyrinthstoma (Cobb, 1893) Thorne, 1939

Antholaimus Cobb, 1913
(Key to the species from Thorne, 1939)

1. Tail blunt, rounded truncatus Cobb, 1913
Tail conoid, acute. antarcticus (Steiner, 1916) Th. & Swang., 1936

Genus Actinolaimus Cobb, 1913
(Key to the species modified from Thorne, 1939)

1. Cuticle marked by longitudinal wing-like striae 2
Cuticle without longitudinal striae 7
2. Number of striae 16 papillatus Schneider, 1935
Number of striae 24-40 3
3. Body length well over 3.0 mm 4
Body length under 3.0 mm. 5
4. Length near 4.0 mm, a = 50-60, V-39 costatus Schneider, 1935
Length 5.0 - 7.0 mm, a = 80-100, V-25 radiatus Cobb, 1913
5. Number of striae 24 striatus Thorne, 1939
Number of striae 32 or 40 6
6. Spear length more than twice head width
. tenuiacleatus (Kreis, 1924) Micol., 1925
Spear length less than twice head width . . ruwenzorii de Coninck, 1935
7. Key to females. 8
Key to males. 25
8. Length over 5.0 mm. africanus Filipjev, 1929
Length near 4.0 mm or less. 9
9. Vulva near 69%. hutchinsoni Filipjev, 1929
Vulva near 50% or less. 10
10. Body very slender, a = 67 tenuis Schneider, 1935
Body less slender, a = less than 60 11
11. Pharyngeal walls posterior to onchia, only lightly cuticularized. . 12
Pharyngeal walls posterior to onchia, heavily cuticularized . . . 15
12. Mural denticles present micoletzkyi Schneider, 1935
Mural denticles absent. 13
13. Width a = 50-60 michaelseni Steiner, 1916
Width a = 32-38 14
14. Head offset from body by slight constriction. . . poenis Gadea, 1950
Head without constriction 15
15. Pharyngeal walls ribbed surinamensis Micoletzky, 1925
Pharyngeal walls plain. neocyatholaimus Kreis, 1936
16. Mural denticles present 17
Mural denticles absent. 18
17. Tail filiform, c = 6.8 filipjevi Schneider, 1935
Tail attenuated, c = 10.7 microdentatus Thorne, 1939

18. Lip region continuous with neck contours. 19
Lip region set off by expansion or narrowing. 20
19. Tail concave conoid, attenuated omer-cooperi Filipjev, 1931
Tail uniformly conoid chitwoodi Moorthy, 1937
20. Lip region distinctly expanded. 21
Lip region slightly expanded or narrowed 22
21. Length over 4.0 mm. macrolaimus (de Man, 1884) Steiner, 1916
Length under 2.0 mm elaboratus (Cobb, 1906) T. & S., 1936
22. Vulva near 38%. nudus Wu and Hoeppli, 1929
Vulva from 45-53% 23
23. Tail concave conoid occalescens Schneider, 1937
Tail uniformly conoid 24
24. Tail comparatively short, $c = 18.5$ cinctus Thorne, 1939
Tail longer, $c = 11$ propinquus Cobb, M.V., 1915
25. Supplements questionable, not seen. nudus Wu and Hoeppli, 1929
Supplements known 25
26. Supplements in fascicles. 27
Supplements solitary. 29
27. Tail elongate, bluntly conoid omer-cooperi Filipjev, 1931
Tail hemispheroid 28
28. Pharyngeal walls lightly cuticularized posterior to onchia
. michaelseni Steiner, 1916
Pharyngeal walls heavily cuticularized throughout 29
29. Vulva 69% hutchinsoni Filipjev, 1929
Vulva 38% tenuis Schneider, 1935
30. Supplements contiguous. 31
Supplements separated by short spaces 33
31. Lip region set off by very slight expansion
. occalescens Schneider, 1937
Lip region set off by broad expansion 32
32. Body length near 4.0 mm macrolaimus (de Man, 1884) Steiner, 1916
Body length near 2.5 mm . cyatholaimus (Daday, 1905) Th. & Swang., 1936
33. Pharyngeal walls ribbed surenamensis Micoletzky, 1925
Pharyngeal walls massively cuticularized. ruwenzarii de Coninck, 1935

Other species: A. frostae Allgen, 1952

Genus Carcharolaimus Thorne, 1939
(Key to the species from Lordello, 1957)

1. Cuticularized labial structure dentate. 2
Cuticularized labial structure not dentate. 4
2. Vulva in front of middle of body ($V = 48\%$); glandular bodies at
base of esophagus dentatus Thorne, 1939
Vulva behind middle of body ($V = 56.2-57.4\%$); no glandular bodies at
base of esophagus 3
3. Larger and slenderer species (length of 2.4 mm, width 50 microns);
lips broadly expanded formosus Lordello, 1957
Shorter and wider species (length 1.6 mm, width 65 microns); lips
not expanded. pizai Lordello, 1953
4. Neck short, $b = 5$ teres Thorne, 1939
Neck longer, $b = 3.7$ rotundicauda (de Man, 1880) Thorne, 1939

Subfamily LONGIDORINAE Thorne, 1935
(Key to the genera modified from Thorne, 1939)

1. Labial region prominently set off as anterior, narrow discoid region and posterior wider labial region Xiphinemella Loos, 1950 P.133
Labial region not prominently set off and not clearly subdivided into anterior and posterior labial lobes 2
2. Spear extensions flanged Xiphinema Cobb, 1913 P.134,135
Spear extensions not flanged 3
3. Body short, plump, a = less than 25 Longidorella Thorne, 1939 P.133
Body elongated, slender, a = near 50 or more
. Longidorus Micoletzky, 1922 P.137

Genus Xiphinemella Loos, 1950
(Key to the species)

1. Spear 82-93u; supplements 3 ornatum Loos, 1950
Spear 72-75u; supplements 8 or 9 esseri Chitwood, 1957

Genus Longidorella Thorne, 1939
(Key to the species modified from Thorne, 1939)

1. Tail conoid, subacute or subdigitate 2
Tail blunt, rounded 4
2. Tail conoid, subacute slightly arcuate parva Thorne, 1939
Tail conoid subdigitate 3
3. Length of enlarged basal portion of esophagus two times neck diameter
. macramphis (Altherr, 1950) Altherr, 1950
Length of enlarged basal portion of esophagus three times neck diameter.
. murithi Altherr, 1950
4. Lip region continuous chappuisi (Schneider, 1935) Thorne, 1939
Lip region set off by constriction
. pygmaea (Steiner, 1914) Thorne, 1939

Genus Xiphinema Cobb, 1913
(Key to the species from Lordello, 1955)

1. Ovary one 2
Ovaries two 5
2. Tail rounded and short.ensiculiferum (Cobb, 1893) Thorne, 1939
Tail elongated, conoid or digitate. 3
3. Two pairs of caudal papillae present. 4
Three pairs of caudal papillae present.radicicola Goodey, 1936
4. Tail elongate, amphids narrow and long.chambersi Thorne, 1939
Tail distinctly digitate, amphids wide and short
.brasiliense Lordello, 1951
5. Tail short and rounded. 6
Tail elongate, conoid, subconoid or digitate. 9
6. Lip region set off by constriction. 7
Lip region continuous 8
7. Small species (1.616 mm.), V = 40.0%, oesophagus short, (b = 6)
.grande Steiner, 1914
Large species (4.0 mm.), V = 60%, oesophagus very long (b = 2)
.makrodorum (Vanha, 1893) Thorne, 1939
8. Small species (0.8 mm.)obtusum Cobb, 1939
Large species (4.1 mm.)rotundatum Stekhoven & Teunissen, 1938
9. Lip region expandedlineum (Grube, 1849) Thorne, 1937
Lip region not expanded 10
10. Head truncatetruncatum Thorne, 1939
Head more or less rounded, not truncate 11
11. Length 3.4 - 4.0 mm. or much larger (8.94 mm.). 12
Length 2.60 mm. or less 14
12. V = 38.9%index Thorne & Allen, 1950
V = 47.8% 13
13. Length 8.94 mm.cylindricaudatum Stekhoven & Teunissen, 1938
Length .40 mmdiversicaudatum (Micoletzky, 1927) Thorne, 1939
14. V = 51.0 - 54.0%.americanum Cobb, 1913
V = 29.8 - 47.0%. 15
15. Tail subconoid or digitate, not ventrally arcuate 16
Tail distinctly elongated, more or less deeply ventrally arcuated . 17

- 16. Tail distinctly digitate (55.5u long), V = 39.4%
 mamillatum Stekhoven & Teunissen, 1938
 Tail not digitate, subconoid (32u long), V = 33.4 - 34.2%
 krugi Lordello, 1955
- 18. Four pairs of caudal papillae present campinense Lordello, 1951
 More than 4 pairs of caudal papillae present. 18
- 18. Combined length of spear and spear extension shorter (123.4u)
 italiae Meyl, 1953
 Combined length of spear and spear extension longer (142.0-158.0u). 19
- 19. Six pairs of caudal papillae present; spear apparently consisting of
 two parts elongatum Stekhoven & Teunissen, 1938
 Seven pairs of caudal papillae present; spear consisting of only one
 part, as is usual 20
- 20. Tail long (77.0-102.0u); V = 29.8-31.6%; with a cuticular triangular-
 shaped structure in the anterior slender part of the oesophagus
 insigne Loos, 1949
 Tail short (48.0-57.0u); V = 39.0-42.0%; without such a triangular-
 shaped structure in the anterior portion of the oesophagus
 pratense Loos, 1949

Genus Xiphinema Cobb, 1913
 (Key to the species after Luc, 1958)

- 1. One ovary 2
 Two ovaries (the anterior one reduced and obscure in X. krugi) 5
- 2. Tail long (more than four times body width at anus)
 chambersi Thorne, 1939
 Tail short (less than four times body width at anus). 3
- 3. Tail hemispherical. ensiculiferum (Cobb, 1893) Thorne, 1939
 Tail mamillate (digitate) 4
- 4. Two pairs of caudal papillae. brasiliense Lordello, 1951
 Three pairs of caudal papillae. radicicola Goodey, 1936
- 5. Tail long (more than four times body width at anus) 6
 Tail short (less than four times body width at anus). 7
- 6. V = 29-32%; seven pairs of caudal papillae. insigne Loos, 1949
 V = 47%; three to five pairs of caudal papillae hallei Luc, 1958
- 7. Tail hemispherical or mamillate (digitate). 8
 Tail conical. 13
- 8. Tail hemispherical. 9
 Tail mamillate (digitate) 10

9. L = 0.8 mm; lip region not set off by constriction, i.e. continuous
 obtusum Thorne, 1939
 L = 3 mm; lip region set off by distinct constriction
 yapoense Luc, 1958
10. Lips distended, separated one from another
 mamillatum Stekhoven & Teunissen, 1938
 Lips smooth, united 11
11. Lips flattened; lip region not set off by a constriction
 index Thorne & Allen, 1950
 Lips rounded; lip region set off by distinct constriction 12
12. L = 2 mm; "organ Z"* in the females ebriense Luc, 1958
 L = 3-4 mm; without "organ Z"* in the females
 diversicaudatum (Micoletzky, 1927) Thorne, 1939
13. L = at least 8 mm cylindricaudatum Stekhoven & Teunissen, 1958
 L = at most 3 mm. 14
14. V = 54% americanum Cobb, 1913
 V = at most 47% 15
15. Length of tail one to one and one-half body width at anus; anterior
 ovary reduced krugi Lordello, 1955
 Length of tail longer than twice body width at anus; anterior ovary
 normal. 16
16. Head truncate truncatum Thorne, 1939
 Head rounded 17
17. Two-three pairs of caudal papillae. 18
 At least four pairs of caudal papillae. 20
18. Two pairs of caudal papillae 19
 Three pairs of caudal papillae pratense Loos, 1949
19. A = 50-55; ventral pores. setariae Luc, 1958
 A = 70; without ventral pores parasetariae Luc, 1958
20. Four pairs of caudal papillae campinense Lordello, 1951
 More than four pairs of caudal papillae 21
21. V = 40-42%; six pairs of caudal papillae
 elongatum Stekhoven & Teunissen, 1938
 V = 43-47% italie Meyl, 1953

* "Organ Z" in the females has reference to a structure seen in the genital tract of X. ebriense. This organ lies between the spermatheca and the uterus. It is globular in shape; very muscular; the lumen, which opens wider in the center of the bulb, is bounded by a cuticularized lining and possesses two to four moveable cuticularized "teeth." Generally, three "teeth" are seen, but it is difficult to distinguish the exact number because of the thickness of the musculature of the organ. Because of the unknown function of this organ M. Luc proposed the name "organ Z."

Genus Longidorus Micoletzky, 1922
(Key to the species)

1. Body length 3.8 mm or more. 2
Body length less than 1 mm. 9
2. Ovaries two 3
Ovaries one monohystera Altherr, 1953
3. Tail somewhat conoid, longer than anal body diameter. 4
Tail hemispherical, bluntly rounded, shorter than anal body diameter
. 6
4. Lip region expanded; length over 5 mm
. elongatus (de Man, 1876) Th. & Swang., 1936
Lip region continuous; length under 5 mm. 5
5. Body slender, a = 120-130 striola Merzheewskaja, 1951
Body wider, a = 88. syphus Thorne, 1939
6. Lip region set off by constriction 7
Lip region not set off in any manner. . tardicauda Merzheewskaja, 1951
7. Body length over 11.0 mm. maximus (Butschli, 1874) Th. & Swang., 1936
Body length under 6.0 mm. 8
8. Tail very short, c = 212; body length 5.8 mm
. georgiensis Tulaganov, 1937
Tail not as short, c = 94-111; body length 3.8 - 4.0
. nudus Kirjanova, 1951
9. Body with numerous papillae in cervical region and on the tail
. multipapillatus Stekhoven & Teunissen, 1938

Subfamily DORYLAIMINAE
(Key to the genera)

1. Lips with cuticularized pieces about vestibule
 Puugentus Th. & Swang., 1936 P.139
 Lips without cuticularized pieces 2
2. Lip region broadly expanded, disc-like. Discolaimus Cobb, 1913 P.140
 Lip region only about as wide as the adjacent neck. 3
3. Anterior portion of esophagus very slender, set off by alteration in
 tissues Discolaimium Thorne, 1939 P.140
 Anterior portion of esophagus normal, not set off 4
4. Spear without guiding ring. 5
 Spear with guiding ring 6
5. Anterior portion of spear distinctly curved
 Drepanodorus Altherr, 1954
 (Contains a single species, D. leptocephalus Altherr, 1954)
 Anterior portion of spear not curved. . Aporcelaimus Th. & Swang., 1936 P.141
6. Inner circle of papillae on outer margin of head. 7
 Inner papillae not marginal 8
7. Muscular ridge encircling entrance to vestibule
 Chrysonema Thorne, 1929 P.135
 Perioral muscular ridge absent. Thornia Meyl, 1954 P.143
8. Spear guiding ring double, tails of sexes similar, obtuse or bluntly
 conoid. Labronema Thorne, 1939 P.142
 Spear guiding ring not double or, if so, the male tail is short and
 rounded and that of the female elongated or filiform. 9
9. Anterior portion of spear distinctly curved
 Drepanodorus Altherr, 1954
 (Contains a single species, D. leptocephalus Altherr, 1954)
 Anterior portion of spear not curved. Dorylaimus Dujardin, 1845 P.144

Genus Chrysonema Thorne, 1929
(Key to the species from Thorne, 1939)

1. Length about 5.4 mm abyssinica Filipjev, 1931
 Length near 2.0 mm or less. 2
2. Length near 2.0 mm. aurum Thorne, 1929
 Length near 1.0 mm. thorni Filipjev, 1931

Genus Pungentus Th. & Swang., 1936
(Key to the species modified from Thorne, 1939)

1. Spear slender, generally slightly arcuate, its length nearly twice width of lip region or more 2
Spear straight, its length near width of lip region or less 10
2. Lips angular, very prominent. 3
Lips not angular, low or rounded. 4
3. Ovary one thornei Goodey, 1942
Ovaries two angulosus Thorne, 1939
4. Vestibular plates absent
. intertextus (Th. & Swang., 1936) Thorne, 1939
Vestibular plates present 5
5. Length 3.5 mm or over textilis (Th. & Swang., 1936) Thorne, 1939
Length 2.0 mm or less 6
6. Ovaries two 7
Ovary one 8
7. Tail with two caudal papillae pungens Th. & Swang., 1936
Tail with only one caudal papillae. marietani Altherr, 1950
8. Tail swollen, somewhat truncate
. ichthyaris (Cobb, 1906) Th. & Swang., 1936
Tail uniform, hemispherical or conoid 9
9. Tails bluntly conoid, supplements 3-4 sparsus Thorne, 1939
Tails elongate hemispherical, supplements 8
. monhystera Th. & Swang., 1936
10. Ovaries two brevidentatus Thorne, 1939
Ovary one 11
11. Anterior rudimentary uterine branch absent. parvus Thorne, 1939
Anterior rudimentary uterine branch present 12
12. Lips low, amalgamated microdentatus Thorne, 1939
Lips prominent, angular obscurus Thorne, 1939

Genus Discolaimus Cobb, 1913
(Key to species modified from Thorne, 1939)

1. Ovary one monhystera Thorne, 1939
Ovaries two 2
2. Lip region set off by expansion only
. bulbiferus (Cobb, 1906) Th. & Swang., 1936
Lip region set off by both constriction and expansion 3
3. Length about 4.0 mm albarossicus Merzheewskaja, 1951
Length 2.5 mm or less 4
4. Tail devoid of caudal papillae. auritus Lordello, 1955
Tail with caudal papillae 5
5. Length about 1.3 mm; vulva near 40%; males common . texanus Cobb, 1913
Length about 2.0 mm; vulva near 50%; males unknown. 6
6. Terminus obtuse major Thorne, 1939
Terminus subacute similis Thorne, 1939

Genus Discolaimium Thorne, 1939
(Key to species modified from Thorne, 1939)

1. Length under 1.0 mm, a= 25 or less. latum Thorne, 1939
Length 1.0 mm or over, a= 35 or more. 2
2. Tail obtuse, rounded. 3
Tail more conoid. 4
3. Tail longer than anal body diameter cylindricum Thorne, 1939
Tail much shorter than anal body diameter . pseudoporum Fielding, 1950
4. Tail arcuate, strongly convex dorsally. gracile Thorne, 1939
Tail rather uniformly conoid, not convex 5
5. Length over 2.0 mm; with four caudal pores. gigas Fielding, 1950
Length less than 1.5 mm; one caudal pore present. . conura Thorne, 1939

Genus Aporcelaimus Th. & Swang., 1936

(Key to the species including material from Thorne & Swanger, 1936)

1. Spear aperture continuous 2
Spear aperture angular. 17
2. Lips obscure or amalgamated 3
Lips prominent, conspicuous 4
3. Length 6.1 - 6.4 mm; supplements 23 paraspiralis Th. & Swang., 1936
Length 1.7 - 2.3 mm; supplements 8 - 9. minor Loos, 1945
4. Spear aperture about equal to length of spear 5
Spear aperture distinctly shorter than length of spear. 7
5. Tail distinctly conical, elongate; length 3.3 mm; males unknown
. conicaudatus Altherr, 1953
Tail round or subconoid; length 4.7 - 6.9 mm; male known. 6
6. Cuticle near head in 3 layers; length 5.8 - 6.9 mm
. regius (de Man, 1876)
Cuticle near head in 2 layers; length 4.7 - 4.9 mm
. pachydermus Thorne, 1937
7. Tail efilated, digitate 8
Tail round or subconoid, not digitate 10
8. Length 5.0 mm; female unknown cobbi Thorne, 1937
Length less than 3.5 mm 9
9. Tail with two caudal papillae gerlachi Meyl, 1956
Tail with four caudal papillae. digitalis Loos, 1949
10. Female pre-rectum 4-5 times length of rectum; lips lower than usual
for the genus spiralis (Cobb, 1893)
Female pre-rectum 3 times length of rectum or shorter; lips high. . 11
11. Length 5.0 - 8.0 mm 12
Length 4.4 mm or less 13
12. Cuticle near head with a thin outer layer
. eurydurys (Ditlevsen, 1911) Th. & Swang., 1956
Cuticle near head in three distinct layers
. americanus Th. & Swang., 1936
13. Expanded basal portion of esophagus about one-third as long as neck
. ferrugineus Lordello, 1953
Expanded basal portion of esophagus from one-half to two-thirds as
long as neck. 14
14. Length 1.4 mm; tail uniformly conoid. paraconicaudatus Meyl, 1956
Length 3.0 - 4.4 mm; tail obtusely conoid 15

15. Female rectum shorter than anal body diameter
 superbus (de Man, 1880) Goodey, 1951
 Female rectum equal or longer than anal body diameter 16
16. Inner cuticle corrugated; a= 38; cardia obscure
 cocophilus Loos, 1949
 Inner cuticle not corrugated; a= 28; discoid formation between conical
 cardia and esophagus. parvus Altherr, 1954
17. Vulva anterior to middle, eggs shorter than body width
 declinatoaculeatus (Kreis, 1924) Th. & Swang., 1936
 Vulva posterior to middle, eggs longer than body width
 vorax Th. & Swang., 1936

Genus Labronema, Thorne, 1939

(Key to the species modified from Thorne, 1939)

1. Length 1.5 mm or less 2
 Length well over 2.0 mm 3
2. Vulva near 70%; anterior ovary extending almost to base of esophagus
 ruttneri (Schneider, 1937) Thorne, 1939
 Vulva near 60%; anterior ovary extending half-way to base of
 esophagus octodurensis Altherr, 1950
3. Lip region almost continuous with neck contour
 pacificum (Cobb, 1906) Thorne, 1939
 Lip region set off by distinct depression or constriction 3
4. Aperture of spear occupying about one-half its length 5
 Aperture of spear occupying one-third or less of its length 6
5. Lip region broadly discoid. ferox Thorne, 1939
 Lip region more angular varicaudatum (Thorne, 1929) Thorne, 1939
6. Lip region narrowed 7
 Lip region somewhat expanded 8
7. Vulva bordered by minute membranes. fimbriatum Thorne, 1939
 Vulva not bordered by membranes uniforme Thorne, 1939
8. Lip region almost half as high as wide
 czernowitzensis (Micol., 1922) Thorne, 1939
 Lip region nearer one-fourth as high as wide. 9
9. Supplements 14 - 16; length 2.4 mm
 alticolum (Menzel, 1914) Thorne, 1939
 Supplements 24; length 3.3 mm
 hyalinum (Th. & Swang., 1936) Thorne, 1939

Genus Thornia Meyl, 1954
(Key to the species)

1. Female tail length 2 anal body diameters or more. 2
 Female tail length less than 2 anal body diameters 4
2. Spear length equal to 60% of the lip region width
 parathermophila (Meyl, 1953) Meyl, 1954
 Spear length equal to lip region width. 3
3. Female tail length about 2 anal body diameters
 steatopyga (Th. & Swang., 1936) Meyl, 1954
 Female tail length greater than 3 anal body diameters
 rhopaloceroides (Schneider, 1937) Meyl, 1954
4. Spear length 1/3 longer than lip region width
 juvenilis (de Coninck, 1935) Meyl, 1954
 Spear length equal to or less than lip region width 5
5. Spear length equal to 90-100% of lip region width 6
 Spear length equal to 50-60% of lip region width. 7
6. Female tail terminus clavate; basal esophageal enlargement abrupt
 propinqua (Paesler, 1941) Andrassy, 1957
 Female tail terminus hemispherical; basal esophageal enlargement
 gradual gubernaculifera Andrassy, 1957
7. Length 0.7 - 1.2 mm; spear aperture equaling 1/6 of spear length;
 amphid equaling 1/3 head width. pithecusana Meyl, 1954
 Length 0.5 - 0.72 mm; spear aperture equaling 1/3 of spear length;
 amphid equaling 1/4 head width. 8
8. Posterior half of spear extensions and beginning of esophageal lumen
 encircled by a bright oval zone . . . goffarti (Meyl, 1953) Meyl, 1954
 Bright oval zone absent from the regions mentioned above
 thermophila (Meyl, 1953) Meyl, 1954

The authors wish to express their appreciation for the considerable aid given by Dr. Arwed H. Meyl in the construction of this key. Regarding T. steineri (Schneider, 1925) Andrassy, 1957, Dr. Meyl considers this nema as not belonging to the genus Thornia Meyl, 1954 due to the presence of 3 small but distinct knobs on the spear.

Genus Dorylaimus Dujardin, 1845

(Key to the species from Thorne & Swanger, 1936 reprinted 1957)

1. Cuticle with 18--44 longitudinal wings or striae. 2
Cuticle plain without longitudinal wings or striae. 9
2. Lip region somewhat expanded; hermaphroditic
. liratus (Schn., 1866) Oerley, 1880 (s)
Lip region not expanded; bisexual 3
3. Wings 18--20. striatus Daday, 1894 (s)
Wings 25--44. 4
4. Wings about 25. libycus Pierantoni, 1915 (s)
Wings 30 or more. 5
5. Posterior third of esophagus enlarged . sulcatus Cobb, M. V., 1915 (s)
Posterior half or more of esophagus enlarged. 6
6. Spear aperture less than one-third the spear length
. helveticus (Steiner, 1919) Th. & Swang., 1936 (a)
Spear aperture at least one-third the spear length. 7
7. Wings about 44. montanus (Stef., 1923) Th. & Swang., 1936 (a)
Wings 32--35. 8
8. Length well over 3 mm stagnalis Duj., 1845 (a)
Length under 3 mm carinatus Th. & Swang., 1936 (s or a)
9. Female tails filiform, attenuated, conoid-cylindroid or spicate except
ten short tailed species keyed under sections 69--80; male tails
filiform or bluntly rounded with submedian papillae and with prerectum
extending opposite to, or anterior to, the supplement series; guiding
ring double but very frequently collapsed and appearing single. . . 10
Female tails conoid-arcuate, digitate, subdigitate, conoid to
hemispherical; male tails similar to those of females, without
submedian papillae, except ten species under sections 69--80; and with
prerectum extending within the range of the supplement series; guiding
ring single 71
10. Female tails filiform; male tails filiform or bluntly rounded . . . 11
Female tails attenuated, conoid-cylindroid or spicate; male tails
bluntly rounded 37
11. Lip region very narrow, conoid-rounded (tails of sexes similar) . . 12
Lip region more or less truncate. 19
12. Tails suddenly constricted near anus
. laevicapitatus Th. & Swang., 1936 (s)
Tails not suddenly constricted near anus. 13

13. Tail tapering uniformly from in front of anus
 fastigatus Th. & Swang., 1936 (s)
 Tail not tapering uniformly from in front of anus 14
14. Width over 3.0% 15
 Width under 2.5% 16
15. Ovary one limnophilus de Man, 1880 (s)
 Ovaries two japonicus Th. & Swang., 1936 (s)
16. Tail length 5.0%--10.0% 17
 Tail length about 20.0% 18
17. Terminus dentate, supplements within range of spicula
 denticaudatus Imamura, 1931 (s)
 Terminus not dentate, supplements far anterior to spicula
 leptus Th. & Swang., 1936 (s)
18. Ovaries two, supplements contiguous . oxycephaloides de Man
 Ovary one, supplements not contiguous . oxycephalus de Man
19. Tails of both sexes long and filiform 20
 Tails of females filiform; male tails, when known short and
 rounded 23
20. Length under 1.0 mm infecundus Th. & Swang., 1936 (s)
 Length well over 2.00 mm. 21
21. Supplements not contiguous, 6 or 7. . . brigdamensis de Man, 1876 (s)
 Supplements contiguous. 22
22. Supplements averaging about 17. . . paralongicaudatus Micol., 1925 (s)
 Supplements averaging about 25. . . longicaudatus Butschli, 1874 (s)
23. Width about 1.5% 24
 Width 2.0% or more. 25
24. Esophagus about 7.0% tambo Imamura, 1931 (s)
 Esophagus about 16.0% filiformis Bast., 1865 (a)
25. Lip region set off by constriction. 26
 Lip region not set off by constriction. 27
26. Male tail hemispherical-conoid. exilis Cobb, 1893 (s)
 Male tail blunt, ventrally arcuate. . . dadayi Th. & Swang., 1936 (s)
27. Length 1.0 mm. or less. 28
 Length distinctly over 1.0 mm 30
28. Lip region continuous with neck contour
 japonicus Th. & Swang., 1936 (s)
 Lip region set off by slight depression 29

29. Spear one-third width of lip region pusillus Cobb, 1893 (s)
Spear one-fifth width of lip region . arvensis Th. & Swang., 1936 (s)
30. Spear length much less than twice width of lip region 31
Spear length twice width of lip region or more 35
31. Amphid aperture equal to width of spear . marinus Duj., 1845 (marine)
Amphid aperture half the head width 32
32. Lip region rounded, not set off in any manner
. hofmanneri Menzel, 1914 (s)
Lip region truncate, set off by slight depression 33
33. Lip region one-third as high as wide. . tenuicaudatus Bast., 1865 (s)
Lip region less than one-fourth as high as wide 34
34. Supplements contiguous, 15--16. . . . tenellus Th. & Swang., 1936 (s)
Supplements spaced, 7--9. . . . subtilis Th. & Swang., 1936 (s or a)
35. Lips set off by a depression imamurae Th. & Swang., 1936 (s)
Lips continuous with neck contour 36
36. Length over 3.0 mm. serpentinus Th. & Swang., 1936 (s or a)
Length under 2.0 mm. filicaudatus Daday, 1905 (s)
37. Female tails attenuated 38
Female tails conoid-cylindroid or spicate 62
38. Spear length two or more times the width of lip region. 39
Spear length distinctly less than twice width of lip region 51
39. Length under 2.0 mm. chekiangensis WU & Hoeppli, 1929 (a & s)
Length over 2.0 mm. 40
40. Female tail length about equal to anal body diameter
. profundis Cobb, 1904 (a)
Female tail length three or more times anal body diameter 41
41. Spear one-half as wide as lip region. novae zealandiae Cobb, 1904 (a)
Spear distinctly less than one-half width of lip region 42
42. Cuticle heavily striated. annulatus Daday
Cuticle finely striated 43
43. Esophagus narrow throughout, tapering gradually, posterior portion
less than half the neck width 44
Esophagus with a distinct expansion 45
44. Body width less than 3.0% selangorensis de Man, 1929 (a or s)
Body width over 3.5%. unipapillatus Daday, 1905 (s or a)

45. Cuticle near head thicker than spear width
 callosus Skwarra, 1921 (s)
 Cuticle near head thinner than spear width. 46
46. Esophagus expanded before the middle. 47
 Esophagus expanded in posterior half. 49
47. Body width over 3.5%. crassus de Man, 1884 (a or s)
 Body width 2.5--3.0%. 48
48. Spear one-third as wide as lip region . . merogaster Steiner, 1916 (a)
 Spear one-fourth as wide as lip region
 prolificus Th. & Swang., 1936 (a)
49. Lips continuous with neck contour . . . flexus Th. & Swang., 1936 (a)
 Lips set off by a depression. 50
50. Width 2.0% or less. pseudostagnalis Micol., 1927 (a)
 Width near 4.0% crassoides Jagersk., 1908 (a)
51. Lip region definitely set off by constriction or expansion. 52
 Lip region not set off by constriction or expansion 54
52. Lip region broadly expanded; width 1.5% . attenuatus de Man, 1880 (s)
 Lip region set off by constriction; width 2.5% or more. 53
53. Lip region width about two and one-half times its height
 spengelii de Man, 1912 (s)
 Lip region width about three and one-half times its height
 gaussi Steiner, 1916 (s)
54. Head rounded. 55
 Head truncate 56
55. Body strikingly black atratus Linst., 1901 (a)
 Body not black. thermae Hoeppli, 1926 (a & s)
56. Lips prominent, somewhat angular. 57
 Lips not prominent and angular. 58
57. Female prerectum twice length of rectum; supplements two spicula
 lengths anterior to anus. agilis de Man, 1880 (s & a)
 Female prerectum as long as rectum; supplements beginning opposite
 ends of spicula proximus Th. & Swang., 1936 (s or a)
58. Lips conoid; length over 4.0 mm saprophilus Peters, 1930 (a)
 Lips low and inconspicuous; length under 4.0 mm 59
59. Vulvar region with sensillae; supplements spaced
 intervallis Th. & Swang., 1936 (s)
 Vulvar region without sensillae; supplements contiguous 60

60. Flavate bodies surrounding base of spear
 flavomaculatus Linst., 1876 (a)
 Flavate bodies absent 61
61. Length about 2.0 mm. or less. incae Steiner, 1920 (a)
 Length about 3.0 mm. or more. fecundus Cobb, 1914 (a)
62. Female tails conoid-cylindroid or slightly clavate. 63
 Female tails spicate. 65
63. Length 1.2 mm.; female tail slightly clavate
 clavicaudatus Th. & Swang., 1936 (s)
 Length 2.5 mm. or over; female tail conoid-cylindroid 64
64. Lip region continuous with neck contour . . . aquatilis Skwarra, 1921 (a)
 Lip region distinctly set off halophilus Daday, 1897 (a)
65. Length over 3.5 mm. zograffi de Man, 1885 (s)
 Length about 2.0 mm. or less. 66
66. Female tails uniformly convex-conoid, then spicate. 67
 Female tails dorsally convex-conoid, then spicate 68
67. Lips set off by a slight depression biroi Daday, 1899 (a or s)
 Lips continuous with neck contour doryuris Ditl., 1911 (s or a)
68. Lip region set off by a constriction. . . . africanus Daday, 1908 (s)
 Lip region not set off by a constriction. 69
69. Supplements contiguous; female tails longer than three times the anal
 body diameter bastiani Butschli, 1873 (s)
 Supplements not contiguous; female tails less than three-times the
 anal body diameter. 70
70. Lips distinct, set off by a depression
 subulatus Th. & Swang., 1936 (s)
 Lips almost continuous with neck contour. mesonyctius Kreis, 1930 (s)
71. Males with submedian papillae; guiding ring double though usually
 collapsed until appearing single (tails subdigitate, conoid to
 hemispherical). 72
 Males without submedian papillae; guiding ring single (tails conoid-
 arcuate to hemispherical) 81
72. Length 5.0-7.0 mm. 73
 Length under 4.0 mm. 74
73. Esophagus about 20.0% of body length. . robustus de Man, 1876 (s or a)
 Esophagus about 13.0% of body length. . . . bathybius Daday, 1906 (a)
74. Lip region broadly expanded corrii Liebermann, 1928 (a)
 Lip region not broadly expanded 75

75. Head rounded, lips completely amalgamated 76
 Head not rounded, lips not completely amalgamated 78
76. Tails cylindrical, blunt, more than twice anal body diameter
 steatopygous Th. & Swang., 1936 (a or s)
 Tails nearly hemispherical, length about equal to anal body
 diameter. 77
77. Spear length about equal to width of lip region
 teres Th. & Swang., 1936 (marine)
 Spear length about twice width of lip region
 acculeatus Th. & Swang., 1936 (s)
78. Lips almost continuous with neck contour. . . pacificus Cobb
 Lips set off by a depression or constriction. 79
79. Lips set off by a depression
 Lips set off by a constriction. 80
80. Width over 3.0% varicaudatus Thorne
 Width 2.0%. alticola Menzel
81. Tails of both sexes conoid-arcuate. 82
 Tails digitate, subdigitate, conoid to hemispherical. 112
82. Tail length 6.0%--15.0% 83
 Tail length under 5.0%, except 6.0% in consobrinus 91
83. Female length over 2.0 mm.; males with four pairs of submedian caudal
 papillae holsaticus Schn., 1925 (a)
 Female length under 1.5 mm.; males without submedian caudal
 papillae 84
84. Head papillae strikingly angular 85
 Head papillae not as strikingly angular 87
85. Tail length about five times anal body diameter
 angulosus Th. & Swang., 1936 (a)
 Tail length about three times the anal body diameter 86
86. Body width over 3.0% humilis Th. & Swang., 1936 (s)
 Body width under 3.0% incisus Th. & Swang., 1936 (s)
87. Length 0.5 mm. minor Th. & Swang., 1936 (s)
 Length near 1.0 mm. 88
88. Tail subcylindroid to blunt terminus. . . muscorum Skwarra, 1921 (moss)
 Tail uniformly conoid, apiculate 89
89. Esophagus with basal pseudo-bulb reisingeri Ditl., 1927 (s)
 Esophagus without basal pseudo-bulb 90

107. Supplements well separated acuticauda de Man, 1880 (s)
 Supplements closely approximated vestibulifer Micol., 1922 (s)
108. Lip region not set off, indistinct 109
 Lip region distinct 110
109. Vulvar region striated vulvostriatus Stef., 1923 (s)
 Vulvar region not striated luganensis Steiner, 1914 (moss)
110. Length about 2.0 mm.; supplements within range of spicula
 alpinus Steiner, 1914 (s)
 Length about 1.2 mm.; supplements anterior to spicula 111
111. Lips set off by constriction productus Th. & Swang., 1936 (s)
 Lips set off by depression arcus Th. & Swang., 1936 (s)
112. Tails digitate and subdigitate 113
 Tails conoid to hemispherical 125
113. Lips continuous with neck contour 114
 Lips distinct and prominent 115
114. Head abruptly truncate; terminus acute
 truncatus Th. & Swang., 1936 (?)
 Head somewhat rounded; terminus blunt . nitidus Th. & Swang., 1936 (s)
115. Tails digitate, usually dorsally recurved 116
 Tails subdigitate, usually with terminal core 119
116. Prerectum length twice the corresponding body width 117
 Prerectum length equal to, or less than, the corresponding body
 width 118
117. Lips angular, conspicuous irritans Th. & Swang., 1936 (s)
 Lips not angular centrocercus de Man, 1880 (s)
118. Terminus acute granuliferus Cobb, 1893 (s)
 Terminus bluntly digitate obesus Th. & Swang., 1936 (s)
119. Length 2.5--3.5 mm. 120
 Length under 2.0 mm 122
120. Spear aperture occupying one-third the spear length
 varicaudatus Thorne
 Spear aperture one-half or more of the spear length 121
121. Spear aperture one-half the spear length
 capitatus Th. & Swang., 1936 (s)
 Spear aperture three-fourths the spear length
 sublabiatus Th. & Swang., 1936 (s)

122. Ovary one monohystera de Man, 1880 (s)
Ovaries two 123
123. Tails shorter than anal body diameter
. paraobtusicaudatus Micol., 1922 (s)
Tails longer than anal body diameter 124
124. Spear aperture less than half the spear length
. pratensis de Man, 1880 (s)
Spear aperture three-fourths the spear length
. minutus Butschli, 1873 (s)
125. Tails uniformly conoid 126
Tails bluntly convex-conoid to hemispherical 145
126. Length about 1.0 mm. or less 127
Length about 1.5 mm. or more 133
127. Spear length three to four times width of lip region 128
Spear length less than twice width of lip region 129
128. Spear length three times width of lip region
. penetrans Th. & Swang., 1936 (s)
Spear length four times width of lip region
. microdorus de Man, 1880 (s)
129. Width under 3.0% brevidens Th. & Swang., 1936 (s)
Width 4.0%—6.0% 130
130. Spear length three-fourths width of lip region
. diminutivus Th. & Swang., 1936 (s)
Spear length equal to or longer than width of lip region 131
131. Spear aperture occupying one-seventh the spear length
. bryophilus de Man, 1880 (s)
Spear aperture occupying one-third or more of the spear length. 132
132. Lips rounded miser Th. & Swang., 1936 (s)
Lips angular productus Th. & Swang., 1936 (s)
133. Lip region continuous with neck contour 134
Lip region distinctly set off 135
134. Spear about one-fourth as wide as lip region
. angusticephalus Steiner, 1914 (s or a)
Spear about one-ninth as wide as lip region
. frigidus Steiner, 1916 (s)
135. Length well over 3.0 mm. 136
Length 2.5 mm. or less 138
136. Neck constricted posterior to spear labiatus de Man, 1880 (s)
Neck not constricted posterior to spear 137

137. Esophagus enlarged in posterior half. . . . superbus de Man
 Esophagus enlarged in posterior two-thirds
 sublabiatus Th. & Swang., 1936 (s)
138. Spear length about twice width of lip region
 tenuidens Th. & Swang., 1936 (s)
 Spear length about equal to width of lip region 139
139. Esophagus about 12.0% accentuatus Th. & Swang., 1936 (s)
 Esophagus about 20.0%—28.0% 140
140. Spear aperture occupying three-fourths the spear length
 simplex Th. & Swang., 1936 (s)
 Spear aperture occupying about one-half the spear length 141
141. Terminus subacute 142
 Terminus acute 143
142. Neck subcylindroid anteriorly capitatus Th. & Swang., 1936 (s)
 Neck more conoid anteriorly efficiens Th. & Swang., 1936 (s)
143. Lip region set off by depression acutus Th. & Swang., 1936 (s)
 Lip region set off by constriction 144
144. Esophagus 18.0% of total length cinctus Th. & Swang., 1936 (s)
 Esophagus 23.0%—25.0% of total length
 diadematus Th. & Swang., 1936 (s)
145. Ovary single 146
 Ovaries two 148
146. Spear length about equal to lip region width
 opisthodelphus Th. & Swang., 1936 (s)
 Spear length about four times lip region width 147
147. Body width 1.8% longidens Th. & Swang., 1936 (s)
 Body width 2.8% silvestris de Man, 1912 (s)
148. Length 5.0—7.0 mm. 149
 Length 4.0 mm. and under 150
149. Esophagus about 20.0% of body length. robustus de Man, 1876 (s or a)
 Esophagus about 13.0% of body length. bathybius Daday, 1906 (a)
150. Lip region broadly expanded corrii Liebermann, 1928 (a)
 Lip region not broadly expanded 151
151. Tails cylindrical, blunt, more than twice anal body diameter
 steatopygous Th. & Swang., 1936 (s or a)
 Tails bluntly convex-conoid to hemispherical 152
152. Spear length two to four times width of lip region 153
 Spear length less than twice width of lip region 156

153. Lip region not set off in any manner
 aculeatus Th. & Swang., 1936 (s)
 Lip region set off by a constriction 154
154. Length less than 1.0 mm. hawaiiensis Cobb, 1906 (s)
 Length well over 3.0 mm. 155
155. Spear length twice width of lip region
 intertextus
 Spear length two and one-third times width of lip region
 textilis
156. Lip region practically continuous with neck contour 157
 Lip region set off by depression or constriction 163
157. Body expanded near anus, tail bulbous . rhopalocercus de Man, 1876 (s)
 Body tapering posteriorly, not expanded 158
158. Length about 0.8 mm. parvulus Th. & Swang., 1936 (s or a)
 Length 1.3—4.0 mm. 159
159. Amphid aperture one-fourth width of lip region
 teres Th. & Swang., 1936 (marine)
 Amphid aperture one-half or more of lip region width 160
160. Lip region one-sixth width of neck base
 crassiformis Kreis, 1924 (moss)
 Lip region one-fourth or more of neck base width 161
161. Spear length considerably more than lip region width
 pacificus Cobb
 Spear length about same as lip region width 162
162. Spear about one-fourth lip region width . . . tritici Bast., 1865 (s)
 Spear about one-seventh lip region width
 intermedius de Man, 1880 (s)
163. Lip region more than one-third as wide as base of neck 164
 Lip region one-third or less than width at base of neck 166
164. Tails hemispherical laticollis de Man, 1906 (s)
 Tails longer than anal body diameter. 165
165. Lips distinct brachycephalus Thorne, 1939 (s)
 Lips amalgamated, **obscure** asymmetricus Th. & Swang., 1939 (s)
166. Length 0.7 mm. or **less** 167
 Length 1.0 mm. or **more** 168
167. Lips **obscure** minimus Steiner, 1914 (s)
 Lips **conspicuous** ettersbergensis de Man, 1885 (s)

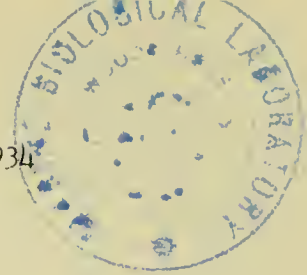
		155.
168.	Neck constricted behind spear <u>latus</u> Cobb, 1891 (s)	
	Neck not constricted behind spear	169
169.	Width over 7.5%; anus almost terminal <u>krygeri</u> Ditl., 1928 (s)	
	Width under 5.0%; anus more ventral	170
170.	Lips amalgamated, obscure	171
	Lips prominent, distinct	173
171.	Lip region width one-sixth that of neck base. <u>obtusus</u> Cobb, 1893 (s)	
	Lip region width one-fourth that of neck base	172
172.	Terminus conspicuously striated <u>striaticaudatus</u> Cobb, 1906 (s)	
	Terminus not conspicuously striated <u>subsimilis</u> Cobb, 1893 (s)	
173.	Esophagus tapering uniformly throughout its length	174
	Esophagus with definite expansion	175
174.	Eggs twice as long as body width <u>papillatus</u> Bast., 1865 (s)	
	Eggs about half as long as body width <u>condamni</u> Vanha, 1893 (s)	
175.	Tails blunt, uniformly conoid, about equal in length to anal body diameter	176
	Tail length distinctly less than anal body diameter	180
176.	Length near 3.0 mm. <u>obscurus</u> Th. & Swang., 1936 (s)	
	Length 1.0—2.0 mm.	177
177.	Amphids duplex <u>amylovorus</u> Th. & Swang., 1936 (s)	
	Amphids simple	178
178.	Esophagus 18.0% of total length <u>vitrinus</u> Th. & Swang., 1936 (s)	
	Esophagus 28.0%—30.0% of total length	179
179.	Supplements 6—8, anterior to spicula <u>nothus</u> Th. & Swang., 1936 (s)	
	Supplements more than 30, within range of spicula <u>propinquus</u> Th. & Swang., 1936 (s)	
180.	Spear aperture one-third or less of the spear length	181
	Spear aperture about half the spear length	183
181.	Lips set off by a depression <u>hyalinus</u>	
	Lips set off by a constriction	182
182.	Length 2.3 mm. or more <u>alticola</u> Menzel	
	Length about 1.3 mm. <u>steineri</u> Th. & Swang., 1939 (s)	
183.	Esophagus 17.0% of total length <u>ornatus</u> Fuchs, 1930 (frass)	
	Esophagus 23.0%—26.0% of total length	184
184.	Esophagus enlarged at middle <u>perfectus</u> Cobb, 1893 (s)	
	Esophagus enlarged anterior to middle <u>obtusicaudatus</u> Bast., 1865 (s)	

Some of the foregoing species are aquatic in habit, marked (a), while the majority have been reported from soil or humus, marked (s). There is no sharp distinction between aquatic and terrestrial forms and several species have been collected from stream-side and lake-side banks, marked (s or a). Information regarding habitat from Goodey, 1951.

Additional species described since the monograph on *Dorylaimus* was published in 1936:

- | | |
|---------------------------------------------------------|-----------------------------------------------------------|
| <u>D. acutiens</u> Stekhoven, 1951 | <u>D. metobtusicaudatus</u> Stekhoven and Teunisson, 1938 |
| <u>D. andrassyi</u> Meyl, 1955 | <u>D. modestus</u> Altherr, 1952 |
| <u>D. aphasalatus</u> Stekhoven, 1951 | <u>D. modicus</u> Kiryanova, 1951 |
| <u>D. beaumonti</u> Altherr, 1952 | <u>D. nivalis</u> Altherr, 1952 |
| <u>D. biroi</u> Daday var. <u>zeylanicus</u> Loos, 1945 | <u>D. opisthohystera</u> Altherr, 1953 |
| <u>D. brasiliensis</u> Meyl, 1956 | <u>D. paraconfusus</u> Altherr, 1952 |
| <u>D. brevispicatus</u> Stekhoven, 1951 | <u>D. paraagilis</u> Altherr, 1953 |
| <u>D. brunetti</u> Meyl, 1953 | <u>D. parathermophilus</u> Meyl, 1953 |
| <u>D. buchneri</u> Meyl, 1953 | <u>D. paulbuchneri</u> Meyl, 1956 |
| <u>D. carteri brevis</u> Altherr, 1952 | <u>D. piracicabensis</u> Lordello, 1955 |
| <u>D. cavalcantii</u> Lordello, 1955 | <u>D. pseudoagilis</u> Altherr, 1952 |
| <u>D. digiticaudatus</u> Stekhoven, 1951 | <u>D. quietus</u> Kiryanova, 1951 |
| <u>D. efillatus</u> Stekhoven and Teunisson, 1938 | <u>D. rionensis</u> Gerlach, 1954 |
| <u>D. exilicaudatus</u> Altherr, 1953 | <u>D. stenodorus</u> Altherr, 1953 |
| <u>D. gerlachi</u> Meyl, 1956 | <u>D. stilus</u> Kiryanova, 1951 |
| <u>D. goffarti</u> Meyl, 1953 | <u>D. stylidens</u> Stekhoven, 1951 |
| <u>D. insignis</u> Loos, 1945 | <u>D. subacutus</u> Altherr, 1952 |
| <u>D. intrastriatus</u> Loos, 1945 | <u>D. submissus</u> Kiryanova, 1951 |
| <u>D. jurassicus</u> Altherr, 1953 | <u>D. thermophilus</u> Meyl, 1953 |
| <u>D. laetificans</u> Andrassy, 1956 | |
| <u>D. lentifer</u> Stekhoven and Teunisson, 1938 | |
| <u>D. lourdesse</u> Lordello, 1955 | |
| <u>D. maximodorus</u> Stekhoven and Teunisson, 1938 | |

Subfamily TYLENCHOLAIMINAE Filiojev, 1934
(Key to the genera)



1. Ovary one 2
Ovaries two 3
2. Anterior portion of esophagus non-muscular, distinct from basal enlarged portion; spear with basal flanges. . . Discomyctus Thorne, 1939 P.157
Anterior portion of esophagus muscular, not distinct from enlarged portion; spear with basal knobs Tylencholaimus de Man, 1876 P.157
3. Spear extensions with small basal knobs . . Tylencholaimus de Man, 1876 P.157
Spear extensions rod-like or flanged. 4
4. Cuticularized guiding ring simple; lips with four cuticularized pieces about vestibule Heterodoros Altherr, 1952
(Contains a single species) H. manifestus Altherr, 1952
Cuticularized guiding ring double; lips without cuticularized pieces Enchodelus Thorne, 1939 P.158

Genus Discomyctus Thorne, 1939
(Key to the species from Thorne, 1939)

1. Vestibular disc set off by deep constriction. . cephalatus Thorne, 1939
Vestibular disc set off by depression only
. longicaudatus (Imamura, 1931) Thorne, 1939

Genus Tylencholaimus de Man, 1876
(Key to the species modified from Thorne, 1939)

1. Lip region set off distinctly 2
Lip region rounded, not set off in any manner 11
2. Body length near 1.0 mm 3
Body length near 0.5 mm 8
3. Tail dorsally convex and subdigitate
. brevicaudatus (Tarjan, 1953) Tarjan, 1956
Tail conoid to hemispherical. 4
4. Female tail irregularly conoid
. mirabilis (Butschli, 1873) de Man, 1876
Female tail uniformly conoid to hemispherical 5
5. Ovary single. 6
Ovaries two teres Thorne, 1939
6. Ovary posterior to vulva zeelandicus de Man, 1876
Ovary anterior to vulva 7

7. Lip region conoid, projecting stecki Steiner, 1914
Lip region low, rounded
. zimmermanni (Bally and Reydon, 1931) Th. and Swang., 1936
8. Inner portion of lip region set off minimus de Man, 1876
Inner portion of lip region not set off 9
9. Tail dorsally convex and subdigitate
. brevicaudatus (Tarjan, 1953) Tarjan, 1956
Tail hemispherical or bluntly conoid. 10
10. Tail hemispherical. nanus Thorne, 1939
Tail bluntly conoid proximus Thorne, 1939
11. Tails ventrally arcuate nikkoensis Kabruaki and Imamura, 1933
Tails blunt, rounded 12
12. Spear massive kirifuri Kabruaki and Imamura, 1933
Spear minute. steineri Schneider, 1935

Genus Enchodelus Thorne, 1939

(Key to the species modified from Thorne, 1939)

1. Tails hemispherical or rounded-conoid 2
Tails elongate, elongate-conoid, straight or ventrally arcuate. . . 10
2. Spear extensions broadly flanged 3
Spear extensions not broadly flanged, lineate 6
3. Lips somewhat angular hopedorus (Thorne, 1929) Thorne, 1939
Lips low, rounded 4
4. Length about 1.0 mm vesuvianus Cobb, 1893
Length 1.5 mm or over 5
5. Length near 1.5 mm. macrodorus (de Man, 1880) Th. & Swang., 1936
Length near 2.5 mm. groenlandicus (Ditlevsen, 1927) Thorne, 1939
6. Tail elongate conoid, 1.5 - 2.5 anal body diameters
. conicaudatus (Ditlevsen, 1927)^A
Tail bluntly conoid, equal to anal body diameter. . . Thorne, 1939. .7
7. Lips angular. 8
Lips rounded. 16
8. Tail with about 50 saccate bodies on each side, nearly uniformly
bluntly conoid. teres, Thorne, 1939
Tail with about 12 saccate bodies on each side, dorsally convex
bluntly conoid. vestibulifer Altherr, 1952
9. Spear length equal to lip region width. laevis Thorne, 1939
Spear length twice lip region width
. analatus (Ditlevsen, 1927) Thorne, 1939

10. Tail filiform; $c = 3.1 - 3.4$ dolichurus Loos, 1939
 Tail not filiform; $c = 25$ or more 11
11. Tail blunt, straight. . . . conicaudatus (Ditlevsen, 1927) Thorne, 1939
 Tail arcuate, acute or subacute. 12
12. Cuticle marked by heavy transverse striae. . . . striatus Thorne, 1939
 Cuticle comparatively smooth. 13
13. Spear length about equal to lip region width. 14
 Spear length about twice lip region width 17
14. Lips angular. 15
 Lips rounded. 16
15. Length over 1.5 mm. brevidentatus Thorne, 1939
 Length less than 0.6 mm minusculus Loos, 1945
16. Rectum shorter than anal body diameter. rhaeticus Altherr, 1952
 Rectum longer than anal body diameter arcautus Thorne, 1939
17. Lips set off by constriction
 macrodoroides (Steiner, 1914) Thorne, 1939
 Lips continuous with neck contour
 faeroensis (Ditlevsen, 1928) Thorne, 1939

Family LEPTONCHINAE Thorne, 1935
 (Key to the subfamilies from Thorne, 1939)

- Pharynx armed with an axial spear LEPTONCHINAE Thorne, 1935 P.160
 Pharynx armed with a mural tooth. CAMPYDORINAE Thorne, 1935
 (Contains a single species C. demonstratus Cobb, 1920)

Genus of uncertain position: Aulolaimoides Micoletzky, 1914

Subfamily LEPTONCHINAE Thorne, 1935
(Key to genera modified from Thorne, 1939)

1. Esophageal bulb not set off by constriction 2
Esophageal bulb set off by constriction 6
2. Bulb length twice the neck diameter or more
. Dorylaimoides Th. & Swang., 1936 P.161
Bulb length less than twice neck diameter 3
3. Bulb lumen in two sections. Tyleptus Thorne, 1939
(Contains a single species T. projectus Thorne, 1939)
Bulb lumen not divided into two sections. 4
4. Spear extensions flanged. Tylolaimophorus de Man, 1880 P.160
Spear extensions rod-like 5
5. Ovaries two Leptonchus Cobb, 1920 P.161
Ovary one Proleptonchus Lordello, 1955
(Contains a single species, P. aestivus Lordello, 1955)
6. Spear with additional stiffening piece
. Tylencholaimellus M.V. Cobb, 1915 P.162
Spear without additional stiffening piece Doryllium Cobb, 1920 P.160

Genus Tylolaimophorus de Man, 1880
(Key to the species)

1. Prerectum extending into caudal cavity; length 0.8 mm
. typicus de Man, 1880
Prerectum not extending into caudal cavity; length 0.37 - 0.43 mm
. rotundicauda Paesler, 1955

Genus Doryllium Cobb, 1920
(Key to the species from Thorne, 1939)

1. Spear small, more tylenchus-like
. bryophilum (Imamura, 1931) Thorne, 1939
Spear dorylaimoid with well developed extensions. 2
2. Female tail cylindroid then hemispherical uniforme Cobb, 1920
Female tail uniformly conoid to blunt terminus. orthum Thorne, 1939

Genus Dorylaimoides Th. & Swang., 1936

1. Ovary one conurus, Thorne, 1939
Ovaries two 2
2. Length 4-6 mm ditlevseni (Micol., 1922) Th. & Swang., 1936
Length under 2 mm 3
3. Tails blunt, rounded. teres, Thorne, 1939
Tails conoid, subdigitate, digitate, attenuate or filiform. 4
4. Tails conoid or subdigitate 5
Tails digitate, attenuate or filiform 6
5. Cuticle not in conspicuous layers
. elegans (de Man, 1880) Th. & Swang., 1936
Cuticle in distinct layers rhabdotus (Kreis, 1930) Th. & Swang., 1936
6. Tails digitate. micoletzkyi (de Man, 1921) Th. & Swang., 1936
Tails attenuated or filiform. 7
7. Tails filiform. longacaudatus (Immaura, 1931) Th. & Swang., 1936
Tails attenuated. 8
8. Male with 3-4 supplements parvus Thorne, 1939
Male with 6 supplements paulbuchneri Meyl, 1956

Dorylaimoides stenodorus Altherr, 1953 appears to have more characters of Dorylaimus than of Dorylaimoides and in this work is considered as a species of the former.

Genus Leptonchus Cobb, 1920

(Key to species modified from Thorne, 1939)

1. Vulva with lateral membranes. fimbriatus Thorne, 1939
Vulva without lateral membranes 2
2. Tail with two caudal papillae 3
Tail with one caudal papillae 4
3. Lip region off set; male with 14 preanal papillae
. multipapillatus Meyl, 1956
Lip region continuous; male with 3 preanal papillae
. paucipapillatus Meyl, 1956
4. Prerectum extending anteriorly to ovaries granulosus Cobb, 1920
Prerectum length about six times body width oetusus Thorne, 1939

Genus Tylencholaimellus M.V. Cobb, 1915
(Key to species modified from Thorne, 1939)

1. Neck very short, $b = 7$ or less. 2
 Neck longer, $b = 5.5$ or more. 3
2. Combined length of spear and its extensions equal to four times width
 of lip region diplodorus M.V. Cobb, 1915
 Combined length of spear and its extensions twice width of lip region
 affinis (Brakenhoff) Thorne, 1939
3. Oral opening surrounded by disc-like structure. 4
 Oral opening not surrounded by disc-like structure. 6
4. Disc cuticularized, refractive. coronatus Thorne, 1939
 Disc not cuticularized. 5
5. Tail subcylindroid, terminus hemispheroid striatus Thorne, 1939
 Tail convex-conoid to blunt terminus. montanus Thorne, 1939
6. Length 0.9 mm 7
 Length 1.4 mm sagittifer (de Man) Thorne, 1939
7. Ovary reflexed $1/2$ the way back to vulva. magnidens Thorne, 1939
 Ovary reflexed $3/4$ the way back to vulva
 alpinus (Altherr, 1950) Altherr, 1950

Family DIPHTHEROPHORIDAE Thorne, 1935
(Key to the subfamilies from Thorne, 1939)

- Spear with basal knobs, distally of complicated, arch-like structure
 DIPHTHEROPHORINAE Micoletzky, 1922 P.163
 Spear without basal knobs, slender, elongated
 TRICHODORINAE Thorne, 1935 P.164
 (Contains a single subfamily TRICHODORINAE Thorne, 1935)

Subfamily DIPHTHEROPHORINAE Micoletzky, 1922
(Key to the genera from Thorne, 1939)

1. Amphid apertures posterior to spear
 Brachynemella (Cobb, 1893) Cobb, 1933
 (Contains a single species B. obtusa (Cobb, 1893) Cobb, 1933)
 Amphid apertures near base of lips. 2
2. Arch-like structure occupying less than half of spear length
 Diphtherophora de Man, 1880 P.163
 Arch-like structure occupying more than half of spear length
 Triplonchium Cobb, 1920 P.165

Genus Diphtherophora de Man, 1880
(Key to the species from Thorne, 1939)

1. Esophageal enlargement subcylindroid. vanoyei de Coninck, 1931
 Esophageal enlargement pyriform or elongate-conoid. 2
2. Neck short; $b = 6$ brevicolle Thorne, 1939
 Neck longer; b near 4 3
3. Tail length about equal to anal body diameter . . . obesus Thorne, 1939
 Tail length nearly twice, or more than, anal body diameter. 4
4. Cuticle very thick forming membrane-like folds
 perplexans (Cobb, 1913) de Coninck, 1931

Other species: D. pseudoperplexans (van der Linde, 1938) Goodey, 1951

Genus Trichodorus Cobb, 1913
(Key to the species from Allen, 1957)

1. Females with one ovary (monodelphic) monohystera Allen, 1957
Females with two ovaries (amphidelphic) 2
2. Spear more than 130 microns long. elegans Allen, 1957
Spear less than 110 microns long. 3
3. Excretory pore posterior to base of the esophagus; spear less than 30
microns long; males not known nanus Allen, 1957
Excretory pore anterior to end of esophagus; spear more than 30
microns long; males known 4
4. Females with ventro-median or ventro-submedian pores near vulva; males
with 2 or 3 supplementary papillae. 5
Females without ventro-median or ventro-submedian pores near vulva;
males with 1 or 3 supplementary papillae. 6
5. Females with ventro-median pores, 2 anterior and 2 posterior to the
vulva; male with caudal alae, 2 supplementary papillae
. porosus Allen, 1957
Females with 2 ventro-submedian pores posterior to the vulva; male
with caudal alae, 3 supplementary papillae. . . atlanticus Allen, 1957
6. Females without caudal pores or lateral hypodermal pores; males with
a single supplementary papilla, caudal alae present
. christiei Allen, 1957
Females with one lateral hypodermal pores; males with or without
caudal alae, more than one ventral supplement 7
7. Females with three lateral hypodermal pores posterior to vulva; males
with caudal alae and three ventral supplements
. pachydermus Seinhorst, 1954
Females with one lateral hypodermal pore posterior to vulva; males
without caudal alae 8
8. Females with three lateral hypodermal pores, 2 anterior and one post-
erior to vulva; males with 3 or 4 ventro-median papillae anterior to
excretory pore. primitivus (de Man, 1880) Micoletzky, 1922
Females with not more than two lateral hypodermal pores; males with
0-2 ventro-median papillae anterior to excretory pore 9
9. Females with one lateral hypodermal pore posterior and one anterior
to vulva; 1st supplement in male about opposite proximal end of
spicules. 10
Females with one lateral hypodermal pore at level of vulva; males with
1st supplement near distal end of spicules. 11

10. Excretory pore in female slightly posterior to middle of esophagus; males with 2 ventro-median esophageal papillae anterior to the excretory pore. aequalis Allen, 1957
 Excretory pore in female near base of esophagus; male with one ventro-median papilla anterior to excretory pore proximus Allen, 1957
11. Male with one ventro-median papilla anterior to excretory pore californicus Allen, 1957
 Male without ventro-median esophageal papilla . . . obscurus Allen, 1957

Genus Triplonchium Cobb, 1920
 (Key to the species)

1. Tail length less than anal body diameter; intestine not extending into caudal cavity. obtusicaudatum Stek. & Teunissen, 1938
 Tail length more than anal body diameter; intestine extending into caudal cavity 2
2. Length 0.6 mm, tail conical, intestinal extension almost completely filling caudal cavity minor Thorne, 1939
 Length 1.0 mm or more, tail more cylindrical; intestinal extension just slightly extending into caudal cavity. . . cylindricum Cobb, 1920

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Errata & Addenda

- P. 1 Class ADENOPHORA to ADENOPHORMA
- P. 35 Criconemoides orantum Raski, 1958 should read ornatum (Raski, 1952) Raski, 1958. Reference: Proc. Helminth. Soc. Wash. 25(2):139-142.
- P. 121 The Opailaimidae Kirjanova, 1951, having a sheath of spiral muscles surrounding the basal portion of the esophagus, keys off with the Belondiridae and differs from it by the structure of the amphids.

LEPTONCHIDAE is on P. 159

DIPHTEROPHORIDAE is on P. 163

Under Dorylaimidae add: Genera of uncertain position; Miranema Thorne, 1939 and Utahnema Thorne, 1939.

- P. 159 Family Leptonchinae to Leptonchidae.
Subfamily Leptonchnae to Leptonchinae.
C. demonstratus to Campydora demonstratus.
- P. 163 TRICHODORINAE contains a single genus Trichodorus Cobb, 1913-p. 164.

Ecpthyadophora tenuissima de Man, 1921, retains its uncertain status within the Tylenchidae and is distinguishable by an extremely slender body with an apparently naked cucycle.

Tylenchida which came to our attention after the manuscript went to press (name, author, date and journal):

1. Aphelenchoides speciosus, Andrassy, 1953, Acta Zool. Budapest, 5(3):88.
2. Criconema limitaneum Luc, 1959, Nematologica 4(1):16-22.
3. Criconemoides ferniae Same as #2.
4. C. onoense Same as #2.
5. Ditylenchus misellus Same as #1.
6. Macrotrophurus arbusticola n.g., n. sp. Loff, 1958 Nematologica 3(4):301-7.
7. Nothanguina cecidoplastes n. comb. Whitehead, 1959 " 4(1):70-75.
8. Nothotylenchus thornei Same as #1.
9. N. exiguus Same as #1.
10. Paratylenchus aciculus Brown, 1959. Proc. Helm. Soc. Wash. 26(1):1-8.
11. P. aculentus Same as #10
12. P. audriellus Same as #10.
13. P. amblycephalus Reuver, 1959 Nematologica 4(1):3-15.
14. Rotylenchoides brevis n. g., n. sp. Whitehead, 1958 Nematologica 3(4):327-33
15. Pratylenchus convallariae Seinhorst, 1959 Nematologica 4(1):83-86.
16. P. nelophilus Same as #15.
17. Scutellonema clathricaudatum Whitehead, 1959 Nematologica 4(1):56-59.
18. Spirotylenchus ovejrozi n.g., n. sp. Lordello, 1958.
Rev. Brasil. Biol. 18(2):159-165.
19. Trichodorus bucrinus Lordello, 1958. Acad. Brasil. Ciencias 30(1):103-5.
20. Tylenchus (Tylenchus) baloghi Same as #1.
21. T. (Filenchus) valkanovi Same as #1.

