THE NEMATODES OF THE NETHERLANDS

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PART I: SURVEY OF MOST COMMON GENERA.

T1. Terrestrial nematodes with STYLET, MEDIAN BULB and VALVULAR APPARATUS.

Oesophagal glands overlapping

Two gonads

7 Hoplolaimidae; head frame strongly developed, body spiral-shaped
- 7.1 Helicotylenchus; tail often with little tip, ventrally overlapping
- 7.4 Rotylenchus; tail without tip, dorsal overlap

One gonad

9 Pratylenchidae; short stylet strongly developed, tail blunt
- 9.1 Pratylenchus; lip region flattened

18 Anguinidae; stylet weak, tail conical
- 18.5 Pseudhalenchus; median bulb weakly developed

21 Aphelenchoididae; median bulb light-refracting, stylet weak
- 21.3 Aphelenchoides; tail conical, often with mucro
- 20.1 Aphelenchus; tail bluntly rounded

Oesophagal glands not overlapping

Two gonads

6 Dolichodoridae; tail bluntly rounded
- 6.6 Dolichorynchus; with longitudinal grooves
- 6.4 Merlinius; lateral field with six lines
- 6.12 Tylenchorynchus (and 6.13 Bitylenchus); four lines

One gonad

* tail long, acute

4 Tylodoridae; stylet as long as half the distance from anterior to median bulb
- 4.1 Cephalenchus

1 Tylenchidae; stylet short, tail elongated conical
- 1.1 Coslenchus; with longitudinal grooves
- 1.8 Malenchus; cuticle strongly annulated, folded
- 1.7 Aglenchus; with vulva flaps
- 1.10 Filenchus; the large group for the remaining species

* body with conspicuously broad annules, little, plump nematodes

12 Criconematidae; several genera

* double, annulated cuticle

13 Hemicycliophoridae
- 13.1 Hemicycliophora; body behind vulva narrowing
- 13.2 Loofia; body behind vulva not narrowing

* little C-shaped nematodes, procorpus gently widens into median bulb

15 Paratylenchidae
- 15.1 Paratylenchus; stylet long

T2. Terrestrial nematodes with a SPEAR, WITHOUT MEDIAN BULB

Spear structure simple

broadened oesophagal part surrounded by a muscle-sheath

75 Belondiridae; spear short
- 75.1 Axonchium; oesophagus constricted, body tapering anteriorly

broadened oesophagal part is not surrounded by a muscle-sheath

74 Longidoridae; very long (3 - 12 mm) nematodes, extremely slender
- 74.1 Longidorus; guiding tube positioned anteriorly, extension not flanged
- 74.3 Xiphinema; guiding tube positioned posteriorly, extension flanged

73 Aporcelaimidae; short spear with large aperture
- 73.3 Aporcelaimellus; tail-cuticle obviously two-layered

Remaining Dorylaimids, heterogenous group
- 71.2 Pungentus; body straight, tail blunt, spear curved body content often gets loose from cuticle, light-refracting particle around oral aperture
- 70.3 Mesodorylaimus; large nematodes, female tail greatly extended, males with a bluntly rounded tail, guiding tube single
- 70.2 Prodorylaimus; tails of both sexes identical, longly extended, guiding tube double
- 72.2 Eudorylaimus-group; tail conical and bent ventrally

Spear structure complex

81 Trichodoridae; spear curved, tail blunt, anus almost terminal
- 81.1 Trichodorus; cuticle not swollen, males curved
- 81.2 Paratrichodorus; cuticle swollen, males straight

80 Diphterophoridae; spear short, "badly fixated animals"
- 80.1 Diphterophora; cuticle hangs loose around body
- 80.2 Tylolaimophorus; C-shaped, body contents not visible

78 Leptonchidae (heterogenous group)
- 78.6 Tylencholaimus; minute nematodes, spear extension with knobs, lip region cap-like

T3

T3. Terrestrial nematodes WITHOUT STYLET OR SPEAR

Mouth cavity clearly wide

Mouth cavity tubular

22 Rhabditidae; tail without spinneret, mouth cavity walls parallel
- 22.1.1 Rhabditis terricola; most common soil-inhabitor

42 Plectidae; tail with spinneret, mouth cavity slightly funnel-shaped
- 42.2 Plectus; amphid circular, mouth cavity anteriorly not widened
- 42.4 Wilsonema; with wing-like expansions in neck region
- 42.1 Anaplectus; amphid slit-like, inconspicuous, mouthcavity with saucer-shaped widening, males common

Mouth cavity barrel-shaped

58 Prismatolaimidae; tail hair-like elongated
- 58.1 Prismatolaimus; head setae present

66 Anatonchidae; mouth cavity strongly sclerotized, three teeth, base of mouth cavity flat, base of oesophagus with vesicles
- 66.1 Anatonchus; teeth in posterior half of mouth cavity
- 66.2 Miconchus; teeth in anterior half of mouth cavity

65 Mononchidae; mouth cavity strongly sclerotized, with one large dorsal tooth, at opposite of it usually an ridge, oesophagus base without vesicles
- 65.2 Clarkus; opposite of tooth there is a smooth edge
- 65.6 Coomansus; edge absent, tail curved, caudal glands absent
- 65.5 Mononchus; edge absent, tail straight, caudal glands present
- 65.1 Prionchulus; edge rasped
- 65.3 Mylonchulus; with little teeth in regular cross-rows
- 65.4 Granonchulus; with irregular arranged teeth

Mouth cavity closed or with a inconspicuous space

Lip region with outgrowths or bubbles

26 Cephalobidae; "mouth cavity" with a wide ring followed by four narrow rings
- 26.4 Acrobeles; lip ornaments conspicuous, forked, fringed
- 26.7 Cervidellus; lip ornaments finely forked, not fringed
- 26.5 Acrobeloides; small nematodes, oesophagus corpus spool-shaped
- 26.2 Eucephalobus; six lips
- 26.1 Cephalobus; three lips, tail blunt
- 26.3 Heterocephalobus; three lips, tail acute

31 Teratocephalidae; lip region with a crown
- 31.1 Teratocephalus; cuticle annulated, tail relatively long
- 31.3 Metateratocephalus; cuticle punctated, tail conical

Lip region without outgrowths

62 Tripylidae; spiral-shaped nematodes with a tooth in a closed mouth cavity
- 62.1 Tripyla; spiral-shaped after heat fixation

63 Alaimidae; nematodes conspicuously slender, little structure
- 63.1 Alaimus; amphid inconspicuous
- 63.3 Paramphidelus; amphid sickle-shaped

80 Diphterophoridae; "spear" hardly visible, covered by grains
- 80.2 Tylolaimophorus; plump nematodes with a bluntly rounded tail

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Z1. Freshwater nematodes with a **STYLET, MEDIAN BULB and VALVULAR APPARATUS.**

Stylet knobs conspicuous, median bulb not light-refracting

9 Pratylenchidae; oesophagus overlapping
- 9.5 Hirschmanniella; long slender nematodes, tail conical

Stylet knobs inconspicuous, median bulb light-refracting

21 Aphelenchoididae; tail often with mucro
- 21.3 Aphelenchoides; vulva not covered by a membrane

Z2. Freshwater nematodes with a **SPEAR, WITHOUT MEDIAN BULB**

Mouth cavity barrel-shaped

76 Actinolaimidae; mouth cavity with four teeth
- 76.1 Paractinolaimus; cavity wall with minute teeth

Mouth cavity inconspicuous, tubular

Spear like a tooth implantated on mouth cavity wall

67 Nygolaimidae; tooth on right subventral wall
- 67.3 Nygolaimus; nematodes slender, tail short

Spear axial

Remaining Dorylaimids (heterogenous group)
- 68.1 Dorylaimus; cuticle with longitudinal grooves
- 69.1 Chrysonemoides; guiding tube barrel-shaped, spear aperture minute
- 71.4 Enchodelus; spear extension pear-like swollen
- 71.1 Thornia; relative small, tail bluntly rounded

Z3. Freshwater nematodes WITHOUT SPEAR OR STYLET

Median bulb present

32 Diplogasteridae; mouth cavity with dorsal tooth, subventrally at most small teeth
- 32.1 Diplogasteritus; round chamber opposite of vulva
- 32.3 Butlerius; round chamber absent
- 32.7 Diplogaster; mouth cavity with a diagonal and a cross edge

33 Neodiplogasteridae; dorsal and right subventral large teeth, left subventral no tooth
- 33.2 Fictor; mouth cavity with one large chamber
- 33.5 Pareudiplogaster; two chambers, cheilostom without sculpture, tail relatively short, c' = 4
- 33.6 two chambers, cheilostom with longitudinal sculpture, tail longer, c' = 7-8

Median bulb absent

Terminal bulb well developed

* cuticle punctated

amphids slit-like

48 Hypodontolaimidae; oesophagus asymmetric around mouth cavity, ocelli absent
- 48.1 Chromadorita; one dorsal tooth, opposite 5-6 rows of little teeth

47 Chromadoridae; oesopahgus symmetric, ocelli present (pigment not always evident)
- 47.1 Chromadorina; mouth cavity with three teeth

amphids spiral-shaped

47 Chromadoridae; ocelli present, setea in one circle
- 47.3 Punctodera; excretion pore just behind lips

50 Achromadoridae; setea in two circles
- 50.1 Achromadora; setae in two circles

51 Ethmolaimidae; constricted oesophagus around mouth cavity
- 51.1 Ethmolaimus; mouth cavity with three teeth

31 Euteratocephalidae; lip region with a crown, mouth cavity without teeth
- 31.2 Euteratocephalus; amphids one and a half times coiled

TB

* cuticle not punctated

amphids hardly visible, caudal glands absent

22 Rhabditidae; mouth cavity tubular
- 22.5 Cuticularia; cuticle swollen
- 22.8 Pelodera; cuticle with longitudinal striae

28 Panagrolaimidae; mouth cavity funnel-shaped
- 28.3 Panagrolaimus; body behind vulva narrowing

amhids varying from round to slit-like, caudal glands present

43 Leptolaimidae; posterior from terminal bulb oesophagus with finger-like extension
- 43.1 Chronogaster; terminal bulb with "saw-teeth"
- 43.4 Paraplectonema; body before vulva indented

54 Microlaimidae; head swollen
- 54.1 Microlaimus, annulation coarse, amphid crypto-spiral

42 Plectidae; mouth cavity without teeth
- 42.1 Anaplectus; anteriorly mouth cavity globular widened, amphid slit-like
- 42.2 Plectus; mouth cavity not widened, amphid circular, (crypto-spiral)

46 Rhabdolaimidae; mouth cavity tubular, with small teeth
- 46.1 Rhabdolaimus; mouth cavity with a small dorsal tooth, subventrally two swellings

53 Desmodoridae; mouth cavity funnel-shaped, with small teeth
- 53.1 Prodesmodora; valvular apparatus divided by a cross groove

Terminal bulb absent

* mouth cavity barrel-shaped

65 Mononchidae; mouth cavity with dorsal tooth
- 65.5 Mononchus; no edge opposite dorsal tooth

58 Prismatolaimidae; mouth without conspicuous teeth
- 58.1 Prismatolaimus; head setae present, tail thread-like

* mouth cavity tubular or absent, not barrel-shaped

amphids spiral-shaped or circular

37 Monhysteridae; cuticle smooth, one gonad at righ-side of intestine, amphid circular
- 37.1 Monhystera; amphids at most one head diameter from front-side
- 37.2 Eumonhystera; amphids more than one head diameter from front-side

38 Xyalidae; cuticle annulation fine, one gonad at left side of intestine, amphids circular
- 38.1 Daptonema; tail tip with setae, tip swollen
- 38.2 Theristus; tail tip without setae

44 Aphanolaimidae; cuticle annulation coarse, two gonads, amphids spiral-shaped
- 44.2 Aphanolaimus; nematodes relatively slender

amphids inconspicuous, aperture slit-like

63 Alaimidae; nematodes extremely slender, hardly any structure visible
- 63.1 Alaimus; amphids pore-like
- 63.3 Paramphidelus; amphids sickle-shaped

59 Ironidae; mouth cavity tubular, with three teeth anteriorly, which can protrude
- 59.1 Ironus; lip region set off

60 Tobrilidae; mouth cavity funnel-shaped, with teeth
- 60.1 Tobrilus; three conspicuous cells at base of oesophagus

62 Tripylidae; nematodes spiral-shaped, when inactive mouth cavity closed, small tooth visible
- 62.1 Tripyla; females with two gonads
- 62.2 Trischistoma; posterior gonad degenerated

64 Bathyodontidae; mouth cavity tubular, with basal teeth
- 64.2 Cryptonchus; oesophagal lumen sclerotized

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PART II: KEY TO THE FAMILIES.

Key for the females.

1. Body strongly swollen: female completely or partly inside a plantroot.....2
- Body relatively slender: animals are mobile.....9
2. Tail tip is recognizable.....3
- Tail tip not recognizable: body round, oval or pear-shaped.....5
3. Body screw- or spiral-shaped, headframe not developed.....4
- Body C-shaped, headframe well developed.....8.1 Rotylenchulus
4. Ventral excretion-gland well developed.....16.1 Trophonema
- Ventral excretion-gland inconspicuous.....18 Anguinidae
5. Body-length less than 250 um.....14.1 Sphaeronema
- Body-length over 250 um.....6
6. Body irregular swollen, somewhat sausage- or kidney-shaped.....8.2 Verutus
- Body regularly swollen, at most three times longer than broad.....7
7. Deceased females forming brown cysts.....10 Heteroderidae
- Deceased females do not form cysts.....8
8. Excretion pore before median bulb.....11 Meloidogynidae
- Excretion pore behind median bulb.....14 Sphaeronematidae
9. At front side of the head there is a spear or stylet, which can protrude.....10
- Head without stylet or spear.....63
10. Mouth with a tylenchid stylet: oesophagus with a median bulb.....11
- Mouth with a dorylaimid spear: oesophagus cylindrical or bottle-shaped, without a median bulb.....35

tylenchids

11. Median bulb without valves.....12
- Median bulb with valves.....17
12. Body extremely slender: ratio a more than 60.....5 Ecphyadophoridae
- Body not as slender: a < 60.....13
13. Vulva-position more than two body-diameters before anus....14
- Vulva-position at most two body-diameters before anus.....15
14. Oesophagal glands within abutting bulb: glands do not overlap the intestine.....1 Tylenchidae
- Oesophagal glands overlapping.....18.5 Pseudhalenchus

15. Stylet curved, tail short,rounded. Gonads not developed.....19.2 Dotylaphus
- Stylet not curved, tail conical.....16
16. Lip region swollen, bodylength more than 2 mm.....19.1 Funchiotonchium
- Lip region not swollen, body shorter than 2 mm.....17 Neotylenchidae
17. Procorpus and median bulb shade off into one other, terminal bulb strongly reduced, cuticle conspicuously annulated.....18
- Procorpus clearly seperated from median bulb by a constriction.....12.....21

18. Cuticle-annulation not very coarse, constriction between median bulb and terminal bulb relatively long.....
.....15 Paratylenchidae
- Cuticle-annulation conspicuously coarse, already visible at 40x magnification. Median bulb a little constricted and immediately followed by the terminal bulb.....19
19. Cuticle two-layered, outer layer looks like a second cuticle.
.....20
- Cuticle one-layered, body plump, heavily annulated, annules often ornamentated.....12 Criconematidae
20. Stylet knobs pointing forward, body plump, ratio a < 20, vulva position more than 90%.....12.5 Hemicriconemoides
- Stylet knobs rounded, body relatively slender, ratio a > 20, vulva position at most 90%.....13 Hemicycliophoridae
21. One gonad.....22
- Two gonads.....29
22. Lip region with four setae.....2 Atylenchidae
- Lip region without setae.....23
23. Median bulb strongly musculated and conspicuously well developed, already distinct at low magnification, dorsal oesophagal gland empties into lumen of oesophagus within median bulb.....24
- Median bulb normal. Dorsal oesophagal gland empties into lumen of oesophagus just behind stylet.....26
24. Oesophagal glands within abutting bulb...20.2 Paraphelenchus
- Oesophagal glands overlap intestine dorsally.....25
25. Tail broadly rounded, stylet knobs absent....20.1 Aphelenchus
- Stylet knobs present, when absent, then tail not broadly rounded.....21 Aphelenchoididae
26. Headframe strongly developed, stylet conspicuously robust, tail commonly shorter than 2.5 anal body widths..9 Pratylenchidae
- Headframe weakly developed, stylet slender, tail commonly longer than 2.5 times anal bodywidth, seldom shorter.....27
27. Tail relatively short, conical, spermatheca oval, phasmids absent.....18 Anguinidae
- Tail longly drawn out, spermatheca round, phasmids near vulva, dorsally from lateral field.....28
28. Stylet long, more than 40% of the distance from anterior to median bulb.....4 Tylodoridae
- Stylet at most 30% of the distance from anterior to median bulb.....1 Tylenchidae
29. Oesophagal glands overlapping.....30
- Oesophagal glands not overlapping.....32
30. Headframe strongly developed.....31
- Headframe not developed.....6 Dolichodoridae
31. Lip region low, flattened at anteriorly.....9 Pratylenchidae
- Lip region high, anteriorly round or flattened.....
.....7 Hoplolaimidae
32. Tail long, c' more than 5, stylet knobs absent.3 Psilenchidae
- Tail short, bluntly rounded, stylet with knobs.....33
33. Headframe weak.....6 Dolichodoridae
- Headframe strongly developed.....34
34. Lateral field with four lines.....7.2 Pararotylenchus
- Lateral field with six lines.....6.1 Amplimerlinius

35. Long slender nematodes, longer than 2 mm, ratio a > 60, spear greatly elongated, straight, longer than 55 um.....74 Longidoridae
- Spear less than 55 um, or when longer, then nematode shorter than 2 mm and ratio a < 50.....36
36. Spear relatively long and strongly curved, tail almost absent.....81 Trichodoridae
- Spear straight, tail present.....37
37. Two gonads.....38
- One gonad reduced.....56
38. Mouthcavity large, broad and sclerotized.....39
- Mouthcavity inconspicuous.....40
39. Mouth with four big teeth, on cavity wall there are a number of small teeth, tail long, head slightly offset.....76.1 Paractinolaimus
- Large teeth lacking, cavity wall with six sclerotized ribs, tail short, head strongly offset.....77.1 Carcharolaimus
40. Lip region offset by a deep constriction, lip region disc- or sucker-shaped, lateral field usually with a conspicuous series of glands.....41
- Lip region not disc- or sucker-shaped.....42
41. Amphid aperture behind constriction.....77 Discolaimidae
- Amphid aperture before constriction.....72.7 Kochinema
42. Spear implantated in cavity wall.....43
- Spear axial.....44
43. Spear implantated on the right subventral cavity wall.....67 Nygolaimidae
- Spear implantated on the dorsal cavity wall....73.6 Sectonema
44. Small plump nematodes, "stylet" consists of several parts, but usually invisible as result of grains in the body. Cuticle often hangs loose around the body.....80 Diphterophoridae
- Body without grains, cuticle normal.....45
45. Broadened posterior part of oesophagus surrounded by a muscle-sheath.....75 Belondiridae
- Oesophagus proximal not surrounded by a muscle-sheath.....46
46. Spear surrounded by a membranous guiding tube, tail-cuticle obviously with several layers.....73 Aporcelaimidae
- Guiding tube not membranous, cuticle-layers on tail not clearly visible.....47
47. Spear asymmetric, dorsal side of spear longer than ventral side, spear extension curved and surrounded by dense oesophagal tissue.....78.1 Dorylaimoides
- Spear symmetric, or when asymmetric, spear extension not curved and not surrounded by dense oesophagal tissue.....48
48. Proximal part of oesophagus short, swollen pear-like, transition from intestine to prerectum near vulva.....78.3 Leptonchus
- Prerectum shorter, oesophagus not pearlike swollen.....49
49. Spear extension with knob-shaped outgrowths, body length less than 1 mm. Lip region cap-shaped offset.....78.6 Tylencholaimus
- Spear extension without knob-shaped outgrowths, when present, then lip region not offset cap-shaped or body length more than 1 mm.....50
50. Cuticle with longitudinal grooves, large nematodes.....68 Dorylaimidae
- Cuticle without longitudinal grooves.....51

51. Cuticle inside mouth cavity thickened, guiding tube barrel-shaped.....69 Chrysonematidae
- Guiding tube not barrel-shaped, cuticle not thickened.....52
52. Tail long, conical or fine thread-like elongated.....
.....70 Thornenematidae
- Tail short.....53
53. Spear conspicuously long, 1/6 of oesophagus length.....
.....71.3 Longidorella
- Spear at most two lip diameters.....54
54. Spear extension pear-shaped flanged.....71.4 Enchodelus
- Spear extension, when flanged, not pear-shaped.....55
55. Tail bluntly rounded, cylindrical, lipregion not offset, spear extension slightly flanged.....71.1 Thornia
- Tail not cylindrical, spear extension not flanged.....
.....72 Qudsianematidae
56. Posterior gonad reduced.....78.6 Tylencholaimus
- Anterior gonad reduced.....57
57. Broadened posterior part of the oesophagus surrounded by a muscle-sheath.....58
- Oesophagus not surrounded by a muscle-sheath.....59
58. Tail lenght more than 5 anal body widths.....
.....75.3.4 Oxydirus oxycephalus
- Tail length less than 1.5 anal body widths.....75.1 Axonchium
59. Spear extension with knob-shaped outgrowths.....60
- Spear extension without outgrowths.....61
60. Spear with a dorsal strengthening, lip region offset.....
.....78.5 Tylencholaimellus
- Spear without a dorsal strengthening, lip region not offset..
.....78.7 Doryllium
61. Spear extension curved and surrounded by dense oesophagal tissue.....78.1 Dorylaimoides
- Spear extension not curved, nor surrounded by dense oesophagal tissue.....62
62. Tail bluntly rounded, around oral aperture there are some light-refracting particles.....71.2 Pungentus
- Tail long or conical, no light-refracting particles around oral aperture.....70 Thornenematidae

without stylet or spear

63. Body caterpillar-like, with alternating broad and narrow annules, amphids vesicle-shaped.....41 Desmoscolecidae
- Body not caterpillar-like.....64
64. Body asymmetrical, right bodyhalf has a fine net-structure and/or a series of fins or shields.....25 Bunonematidae
- Body symmetrical, without conspicuous fins or shields.....65
65. Two gonads.....66
- One gonad.....101
66. Oesophagus with a bulb containing valves.....67
- Oesophagus without bulb or, when swollen, without valves...81
67. Bulb halfway along the oesophagus.....68
- Bulb at the base of the oesophagus.....70
68. Mouth cavity tubular and with "stylet-knobs", oesophagus tylenchid-like.....35 Tylopharynchidae
- Mouthcavity without knobs.....69
69. Mouth with a dorsal movable tooth, a large right-subventral tooth, a smooth or crenate left-subventral plate.....
.....33 Neodiplogasteridae
- Mouth with an immovable dorsal tooth, right and lefthand metastoom-swellings are identical.....15.....32 Diplogasteridae

70. Cuticle punctated.....71
- Cuticle not punctated.....75
71. Head at anteriorly with a crown.....31 Teratocephalidae
- Head without crown.....72
72. Anterior part of oesophagus, which surrounds mouth cavity, strongly offset by a constriction.....51 Ethmolaimidae
- Anterior part of oesophagus not offset.....73
73. Amphids slit-like, inconspicuous.....74
- Amphids spiral-shaped, conspicuous.....50 Achromadoridae
74. Mouth with one dorsal and some subventral teeth, oesophagus distally symmetrical.....47 Chromadoridae
- Dorsal tooth is a extension of the oesophagal tissue, subventral teeth inconspicuous, oesophagus distal asymmetrically. .....48 Hypodontolaimidae
75. Lip region with a crown.....31 Teratocephalidae
- Lip region without a crown.....76
76. Valvular apparatus divided into two parts by a cross-groove.. .....53 Desmodoridae
- Valvular apparatus not divided.....77
77. Oesophago-intestinal valve oblong, conspicuous, amphid large and circular.....40 Linhomoeidae
- Oesophago-intestinal valve not oblong, amphid not conspicuous large.....78
78. Mouth cavity regular cylindrical, caudal glands absent, amphids inconspicuous. Head setae absent.....79
- Mouth cavity at the base narrowing, caudal glands and spinneret present, amphid halfway along the mouth cavity, circular or slit-like, wing-like expansions in neck region present or absent, head setae usually present.....42 Plectidae
79. Mouth cavity walls not grown together, consisting of seperated rings, oesophagus with three subsequent swellings..... .....23 Alloionematidae
- Mouth cavity-walls grown together, oesophagus at most regularly swollen.....80
80. Submedian lips hook-shaped bent .....24 Diploscapteridae
- Lips regular, not hook-shaped bent.....22 Rhabditidae

without bulb

81. Mouth cavity large, barrel-shaped.....82
- Mouth cavity minute, oblong or absent.....85
82. Mouth cavity with one or more movable teeth.....61 Onchulidae
- Mouth cavity without movable teeth.....83
83. Tail thread-like elongated, mouth cavity little, with hardly sclerotized walls, head setae present.....58 Prismatolaimidae
- Tail never thread-like elongated, mouth cavity large with strongly sclerotized walls, head setae absent.....84
84. Base of mouth cavity flat, oesophagus-base with three vesicles, usually three identical teeth.....66 Anatonchidae
- Base of mouth cavity funnel-shaped, oesophagus-base without vesicles, subventral teeth, when present, never identical to dorsal tooth.....65 Mononchidae
85. Cuticle punctated.....86
- Cuticle not punctated.....88
86. Amphids absent, tail bluntly rounded. Mouth cavity tubular, cuticle-punctation very fine. Ratio b > 10.....82 Isolaimidae
- Amphids spiral- or funnel-shaped. Ratio b < 10.....87
87. Tail short, ratio c more than 30.....49 Choanolaimidae
- Tail long, ratio c at most 15.....52 Cyatholaimidae

88. Base of oesophagus bulb-like swollen, valvular apparatus absent.....89
- Base of oesophagus not swollen.....92
89. Mouth cavity absent, amphids conspicuously large.....
.....44.2 Aphanolaimus
- Mouth cavity present, amphids clearly smaller than half the corresponding body diameter.....90
90. Mouth cavity long, tubular, amphids inconspicuous, setae absent.....46 Rhabdolaimidae
- Mouth cavity not tubular, amphids obvious, head setae present.....91
91. Ratio c' more than 6.....55 Odontolaimidae
- Ratio c' less than 6.....45 Diplopeltidae
92. Mouth cavity formed by a long, thin tube, at minimum 1/3 as long as the distance between frontside and oesophagus-base.....
.....56 Aulolaimidae
- Mouth cavity shorter.....93
93. Amphids circular or spiral-shaped.....94
- Amphids cup-shaped.....97
94. Head with four setae. Body conspicuously annulated, tail never spatula-shaped, behind terminal bulb oesophagus has no extension inside intestine.....96
- Head with 10 setae, 6 long and 4 short, or without setae. Body not conspicuously annulated, tail spatula-shaped. Behind terminal bulb oesophagus narrows, and has an extension inside intestine.....95
95. Oesophagus with terminal bulb.....43 Leptolaimidae
- Oesophagus without terminal bulb.....44 Halaphanolaimidae
96. Mouth cavity tubular with sclerotized walls..45 Diplopeltidae
- Mouth cavity inconspicuous, very slender nematodes.....
.....57 Bastianiidae
97. Cuticle annulated, mouth cavity closed when resting, but one tooth is recognizable.....62 Tripylidae
- Cuticle smooth.....98
98. Mouth cavity tubular with three movable teeth anteriorly.....
.....59 Ironidae
- Mouth cavity, when tubular without movable teeth.....99
99. Mouth cavity tubular, with a small median tooth.....
.....64 Bathyodontidae
- Mouth cavity funnel-shaped or reduced.....100
100. Head without setae, mouth cavity inconspicuous.....
.....63.2 Amphidelus
- Head with 10 setae, mouth cavity wide with some small teeth.
.....60 Tobrilidae
101. Anterior gonad reduced.....63 Alaimidae
- Posterior gonad reduced.....102
102. Anterior gonad reflexed and passing the vulva.....103
- Anterior gonad, when reflexed, not passing the vulva.....105
103. Amphid conspicuous large, lip region offset, spherical-round
.....27 Osstellidae
- Amphid inconspicuous.....104

104. Anterior gonad passes vulva and has there a kink. Cuticle usually with coarse annulation, mouth cavity long and slender, equally sclerotized, cheilostom usually broader than other components. Head edge with incisions, lip ornaments present or absent.....26 Cephalobidae
- Anterior gonad passes vulva and has no kink. Cuticle annulation fine, mouth cavity exists of cheilo-, pro- en mesostom, which form together a more or less rectangular cavity, pro- and mesostom strongly sclerotized. Lips never with ornaments.....28 Panagrolaimidae
105. Oesophagus with bulb containing valvular apparatus.....106
- Oesophagus without bulb, when base slighly swollen, then no valvular apparatus.....113
106. Bulb in the middle of oesophagus.....34 Diplogasteroididae
- Bulb at base of oesophagus.....107
107. Mouth cavity tubular with parallel walls.....22 Rhabditidae
- Mouth cavity not tubular.....108
108. At front of the lip region is a crown....31.1 Teratocephalus
- Lip region without crown.....109
109. At front of the head are four long thin hairs, bulb in two parts: anterior part contains a number of little teeth. Oesophagus has an extension inside intestine.....43.1 Chronogaster
- Head without long, thin hairs. Oesophagus behind terminal bulb not extended.....110
110. Body more than 1 mm.....111
- Body less than 1 mm.....112
111. Vulva position 55-62%.....28.5 Turbatrix
- Vulva position 70-80%.....30.1 Plectonchus
112. Dorsal mouth cavity walls with a large tooth, anterior gonad reflexed, head setae absent, amphid cup-shaped and inconspicuous. .....79.1 Campydora
- Mouth cavity without teeth, gonad outstreched, head setae present, amphid conspicuous, circular.....37.4 Monhystrella
113. Mouth cavity barrel-shaped.....114
- Mouth cavity narrow.....116
114. Oesophagus in two parts, anterior part musculated, posterior part gland tissue, head setae absent, mouth cavity has a number of teeth.....36 Odontopharyngidae
- Oesophagus not differentiated, head setae present, mouth cavity at most with an inconspicuous tooth.....115
115. Tail thread-like extended, amphids slit-like..... .....58 Prismatolaimidae
- Tail not tread-like extended, amphids circular..... .....39 Sphaerolaimidae
116. Dorsal mouth cavity wall has a large tooth, head setae absent, amphids inconspicuous, cup-shaped.....79.1 Campydora
- Mouth cavity without teeth, head setae present, amphids conspicuous, circular.....117
117. Cuticle annulation conspicuous, gonad at left-side from intestine.....38 Xyalidae
- Cuticle smooth, gonad at right-side from intestine..... .....37 Monhysteridae

KEY FOR THE MALES.

1. Stylet or spear present.....2
- Stylet or spear absent.....30
2. Tylenchid stylet present, oesophagus usually with median bulb containing valvular apparatus, ventral supplements absent, bursa usually present.....3
- Dorylaimid spear present, oesophagus usually bottle-shaped, median bulb absent, supplements hardly ever absent, bursa seldom present.....86

tylenchids

3. Lip region with four setae.....2 Atylenchidae
- Lip region without setae.....4
4. Bursa absent.....5
- Bursa present.....11
5. Median bulb conspicuously well developed, already distinct at low magnification, dorsal oesophagal gland empties into lumen of oesophagus within median bulb, posterior body part strongly bent to ventral side.....21 Aphelenchoididae
- Median bulb not conspicuously developed, posterior body part at most slightly bent to ventral side.....6
6. Tail shorter than anal body width.....7
- Tail longer than one anal body width.....9
7. Body not twisted.....8.2 Verutus
- Body twisted.....8
8. Amphids conspicuous, halfway lip region.....11 Meloidogynidae
- Amphids at frontside of lip region, inconspicuous.....
.....10 Heteroderidae
9. Oesophagus differentiated, tail more than 5 anal body widths..
.....1 Tylenchidae
- Oesophagus reduced, tail shorter than 5 anal body widths.....
.....10
10. Median bulb recognizable.....16.1 Trophonema
- Median bulb entirely degenerated.....15 Paratylenchidae
11. Bursa with ribs.....20 Aphelenchidae
- Bursa without ribs.....12
12. Bursa adanal.....13
- Bursa tail envelopping.....22
13. Body conspicuous slender, looks like a glass fibre, body behind anus conspicuous narrower, bursa lobulate.....
.....5 Ecphyadophoridae
- Body more plump, ratio a < 100.....14
14. Oeseophagus and stylet degenerated.....15
- Oesophagus and stylet not degenerated.....16
15. Head frame slightly sclerotized.....8.1 Rotylenchulus
- Head frame not visible.....15 Paratylenchidae
16. Median bulb conspicuously strongly developed, dorsal oesophagal gland empties in oesophagus lumen just before valvular apparatus, bursa rudimentary.....20.2 Paraphelenchus
- Median bulb not conspicuously musculated, bursa well developed.....17
17. Anterior part of oesophagus spool-like swollen, true median bulb absent.....17 Neotylenchidae
- Median bulb well developed.....18
18. Oesophagal glands overlap intestine.....18.5 Pseudhalenchus
- Oesophagal gland not overlapping.....19

19. Anterior part of spicula broadened, tail conical, bursa reaches nearly tail tip.....18 Anguinidae
- Anterior part of spicula not broadened, tail thread-like extended, bursa adanal.....20
20. Stylet knobs absent, phasmid on tail, amphids slit-like, on lateral side of lip region.....3 Psilenchidae
- Stylet knobs present, phasmids at middle of body, amphids pore-like, in lateral view nearly invisible.....21
21. Stylet long, reaches to 40% of the distance from anterior to median bulb.....4 Tylodoridae
- Stylet shorter, at most to 1/3 of the distance from anterior to median bulb.....1 Tylenchidae
22. Oesophagal glands overlapping.....23
- Oesophagal glands not overlapping.....27
23. Median bulb and valvular apparatus absent.....17.1 Deladenus
- Median bulb present.....24
24. Head frame well developed.....25
- Head frame slightly developed.....26
25. Lip region flattened at front side.....9 Pratylenchidae
- Lip region sphaerical at front side, body after heat fixation usually C-shaped.....7 Hoplolaimidae
26. Lip region dorsally more developed than ventrally, spicula shorter than 20 um.....9.4 Hoplotylus
- Lip region symmetrical, spicula more than 20 um.....6.10 Telotylenchus
27. Oesophagus without median bulb.....17.3 Paurodontus
- Median bulb and valvular apparatus present.....28
28. Head frame slightly developed.....6 Dolichodoridae
- Head frame strongly developed.....29
29. Lateral field with four lines.....7.2 Pararotylenchus
- Lateral field with six lines.....6.1 Amplimerlinius

stylet or spear absent

30. Oesophagus with a conspicuous median bulb.....31
- Oesophagus at most with a weak median bulb.....33
31. Mouth cavity tubular, without conspicuous teeth.....34 Diplogasteroididae
- Mouth cavity with one or two large chambers, teeth conspicuous.....32
32. Dorsal tooth in mouth cavity immovable, both subventral metastom-swellings are identical.....32 Diplogasteridae
- Dorsal tooth is movable and can protrude, right metastom-swelling also has a large tooth, left swelling is smooth or carries a crenate plate.....33 Neodiplogasteridae
33. Body caterpillar-like, with alternating broad and narrow annules, amphids vesicle-shaped.....41 Desmoscolecidae
- Body not caterpillar-like.....34
34. Body asymmetrical, right bodyhalf has a fine net-structure and/or a series of fins or shields.....25 Bunonematidae
- Body symmetrical.....35
35. Bursa present.....36
- Bursa absent.....42
36. Bursa without ribs.....37
- Bursa with ribs.....38
37. Spicula with "elbow-shaped" outgrowth, bursa lobulate.....19.1 Fungiotonchium
- Spicula without outgrowths.....40

38. Spicula present, mouth cavity tubular.....39
- Spicula absent, mouth cavity with a massive dorsal tooth.....
.....29.1 Myolaimus
39. Submedian lips hook-shaped.....24 Diploscapteridae
- Submedian lips not so.....22 Rhabditidae
40. Spicula C-shaped.....13 Hemicycliophoridae
- Spicula weakly bent.....41
41. Body longer than 0.7 mm.....13.2 Loofia
- Body shorter than 0.7 mm.....12 Criconematidae
42. Lip region with crown.....31 Teratocephalidae
- Lip region without crown.....43
43. Oesophagus degenerated and without structure.....
.....14 Sphaeronematidae
- Oesophagus well developed.....44
44. Mouth cavity tubular, with "stylet knobs", tail thread-like extended.....35 Tylopharyngidae
- Mouth cavity without "stylet knobs", tail not thread-like extended.....45
45. Amphids absent, mouth cavity long and not differentiated, large nematodes, longer than 3 mm, tail bluntly rounded, oesophagus conspicuously short, ratio b > 10.....82 Isolaimidae
- Amphids present, ratio b < 10, tail not bluntly rounded, body less than 3 mm.....46
46. Cuticle punctated, amphids usually spiral-shaped.....47
- Cuticle not punctated, amphids not obviously spiral-shaped.53
47. Supplements trapezium-shaped, oesophagus anterior constricted
.....51 Ethmolaimidae
- Supplements, when present, not trapezium-shaped.....48
48. Amphid slit-like.....49
- Amphid spiral-shaped.....51
49. Cuticle not punctated.....27 Osstellidae
- Cuticle punctated.....50
50. Dorsal and subventral teeth are equally large, the part of the oesophagus which surrounds mouth cavity is symmetrical.....
.....47 Chromadoridae
- Small dorsal tooth is in fact an extension of oesophagal tissue, subventral teeth hardly developed, dorsal part of oesophagus is anteriorly broader than ventral part.....
.....48 Hypodontholaimidae
51. Tail blunt, conical and broadly rounded.....49 Choanolaimidae
- Tail more than 1.5 anal body width.....52
52. Supplements absent.....50 Achromadoridae
- Supplements present.....52 Cyatholaimidae
53. Supplements present.....54
- Supplements absent.....68
54. Tube-shaped supplements.....56
- Supplements not tube-shaped.....55
55. Urn-shaped supplements.....60 Tobrilidae
- Supplements not urn-shaped.....58
56. Anterior part of valvular apparatus internal with small teeth
.....43 Leptolaimidae
- Valvular apparatus, when present, without teeth.....57
57. Bulb with valvular apparatus, oesophagus has no extension behind terminal bulb.....42 Plectidae
- Bulb, when present, without valvular apparatus, oesophagus has behind terminal bulb a tongue-like extension.....
.....43 Leptolaimidae
58. Mouth cavity wide, barrel-shaped.....59
- Mouth cavity tubular, minute or almost absent.....62

59. Mouth cavity with large movable teeth.....61 Onchulidae
- Mouth cavity without movable teeth.....60
60. Mouth cavity small, with basal inconspicuous tooth, tail thread-like extended.....58 Prismatolaimidae
- Mouth cavity large with sclerotized walls and one or some large teeth, tail never thread-like extended.....61
61. Base of mouth cavity funnel-shaped, dorsal tooth not identical to subventral teeth, no vesicles at base of oesophagus.....
.....65 Mononchidae
- Base of mouth cavity flattened, dorsal tooth identical to subventral teeth, three vesicles at base of oesophagus.....
.....66 Anatonchidae
62. Mouth cavity tubular and longer than the half of the proper oesophagus.....56 Aulolaimidae
- Mouth cavity, when tubular, shorter.....63
63. Cuticle annulated.....64
- Cuticle smooth.....66
64. Nematodes conspicuously slender, ratio a > 40.57 Bastianiidae
- Body not as slender.....65
65. Amphids inconspicuous, cup-shaped, when not active, mouth cavity closed, but a tooth is visible, body spiral-shaped after heat-fixation.....62 Tripylidae
- Amphids circular and conspicuous, mouth cavity without teeth.
.....45 Diplopeltidae
66. Mouth cavity with some movable teeth.....59 Ironidae
- Mouth cavity without movable teeth.....67
67. Tail shorter than 2 anal body width's.....64.1 Bathyodontus
- Tail long, body slender, head region very slender: only amphids are visible.....63 Alaimidae
68. Terminal bulb clearly with a valvular apparatus.....69
- Terminal bulb, when present, without valvular apparatus....79
69. Wing-like outgrowths in neck-region present.....42 Plectidae
- Not so.....70
70. Valvular apparatus divided into two parts by a cross-groove..
.....53 Desmodoridae
- Valvular apparatus without cross-groove.....71
71. Tail with caudal glands and spinneret.....72
- Spinneret and caudal glands absent.....73
72. Setae absent, amphids inconspicuous, mouth cavity without cross-edges.....46 Rhabdolaimidae
- Setae on head and body, amphids circular, mouth cavity with three cross-edges.....40 Linhomoeidae
73. Lips with fringed or forked ornaments.....26 Cephalobidae
- Lips without ornaments.....74
74. Oesophagus corpus cylindric.....28 Panagrolaimidae
- Oesophagus corpus swollen.....75
75. Oesophagus corpus gradually broadened.....23 Alloionematidae
- Corpus cylindric or spool-shaped.....76
76. One spicula shorter than other.....30.1 Plectonchus
- Spicula equal in length.....77
77. Metastom with small teeth.....28 Panagrolaimidae
- Metastom without teeth.....78
78. Gubernaculum triangular with caudal outgrowth.....
.....28.2 Panagrobelus
- Gubernaculum slender, without caudal outgrowth.....
.....26 Cephalobidae
79. Head offset.....80
- Head not offset.....81

80. Mouth cavity minute, inconspicuous, amphids cross-oval.....
.....27 Osstellidae
- Mouth cavity large, egg-shaped, amphid circular.....
.....39 Sphaerolaimidae
81. Amphids circular.....82
- Amphids inconspicuous.....84
82. Cuticle smooth.....37 Monhysteridae
- Cuticle annulation fine.....83
83. Body more than 1 mm.....38 Xyalidae
- Body less than 1 mm.....45.2 Domorganus
84. Mouth cavity large, with teeth, right spiculum degenerated...
.....36 Odonthopharynchidae
- Mouth cavity minute or absent, both spicula of equal size....
.....85
85. Body and head conspicuously slender, (ratio a > 60), amphid slit- or pore-like, at several body width's from anterior.....
.....63 Alaimidae
- Body not conspicuously slender, amphid not visible in lateral view.....14.1 Sphaeronema or 15 Paratylenchidae

dorylaimids

86. Body with anteriorly a conspicuous sucker-shaped lip disc....
.....77 Discolaimidae
- Lip region not sucker-shaped.....87
87. Anterior to spear there is a large mouth cavity, bearing four large basal teeth and on its walls numerous small teeth and 24 longitudinal ridges.....76 Actinolaimidae
- Mouth cavity with teeth absent.....88
88. Spear and remaining body content hardly visible: covered by a large number of grains, cuticle hangs often loose around the body, spear structure complex.....80 Diphterophoridae
- Body content visible.....89
89. Tail long, ratio c < 15 and ratio c' > 2.....90
- Tail short, ratio c > 15 and ratio c' < 2.....95
90. Basal region of oesophagus surrounded by muscle-sheath.....
.....75.3 Oxydirus
- Oesophagus not surrounded by a muscle-sheath.....91
91. Nine or more supplements.....92
- Eight or less supplements.....93
92. Tail conical, four anal body width's long...72.2 Eudorylaimus
- Tail thread-like extended.....70.2 Prodorylaimus
93. Spear extension curved and surrounded by swollen oesophagal tissue.....78.1 Dorylaimoides
- Spear extension not surrounded by swollen oesophagal tissue..
.....94
94. Cuticle in mouth cavity swollenbarrel-shaped, ratio c > 9....
.....69.1 Chrysonemoides
- Cuticle in mouth cavity not swollen barrel-shaped, ratio c < 9.....70.1 Prodorylaimium
95. Spear and spear extension grown together to a curved "spear", before anus are three supplements, in oesophagal region there are some ventral papillae, sometimes bursa present...81 Trichodoridae
- Spear straight, no ventral papillae in oesophagal region...96
96. Spear longer than 70 um.....74 Longidoridae
- Spear shorter than 70 um.....97
97. Body longer than 3 mm.....98
- Body shorter than 3 mm.....101

98. Spear dorsally grooved and basally outgrown, implantated on ventral mouth cavity wall, ...73.6 Sectonema
- Spear axial.....99
99. Cuticle with longitudinal grooves, 35 - 45 supplements.....
.....68.1 Dorylaimus
- Cuticle without longitudinal grooves, less than 20 supplements.....100
100. Spicula longer than 80 um, spear aperture 30% of spear length, base of oesophagus constricted and surrounded by a muscle-sheath.....75.1 Axonchium
- Spicula shorter than 70 um, spear aperture 50%, base of oesophagus not surrounded by a muscle-sheath....73.5 Aporcelaimus
101. Spear extension with knob-shaped outgrowths.....
.....78 Leptonchidae
- Spear extension without knobs.....102
102. Spear sickle-shaped bent, anterior body part conspicuously narrowed, body width at base of oesophagus 4.5 times head width, guiding tube membranous, folded, 20 supplements visible, one stands apart.....73.1 Paraxonchium
- Body not conspicuously narrowed.....103
103. Spear extension pear-shaped flanged.....71.4 Enchodelus
- Spear extension not flanged.....104
104. Mouth cavity covered by six membranes.....73.2 Torumanawa
- Mouth cavity not covered by membranes.....105
105. Spear implantated on right subventral mouth cavity wall, base of oesophagus surrounded by a muscle-sheath, supplements weakly developed.....67 Nygolaimidae
- Spear axial.....106
106. Supplements, gubernaculum and lateral guiding pieces absent.
.....71.1 Thornia
- Supplements present.....107
107. Spear extension curved, oesophagal tissue behind spear swollen.....78.1 Dorylaimoides
- Spear extension not curved, oesophagus distally not swollen.
.....108
108. Guiding tube membranous, spear aperture not larger than 50%, gubernaculum absent, three seperate cuticle layers clearly visible on tail.....73 Aporcelaimidae
- Guiding tube not membranous, spear aperture not larger than 50%, no seperate cuticle layers visible on tail.....109
109. Tail conical, rounded or sharp, never broadly rounded.....
.....72 Qudsianematidae
- Tail bluntly rounded.....110
110. Mouth cavity covered by six shields, 19-24 supplements in close succesion, body over 2 mm long.....72.8 Labronema
- Mouth cavity without shields.....111
111. Tail with a number of "cuticle grains", lip region not offset, guiding tube consists of a musculated collar.....
.....72.1 Thonus
- Tail without grains.....70 Thornematidae

THE NEMATODES OF THE NETHERLANDS.
A.M.T. BONGERS & J.J. VAN DE HAAR (translation). 1989.

PART III: KEY TO THE GENERA AND SPECIES.

This key can be used to identify the nematode-species. Remember that it only deals with the Dutch species.

1. Family Tylenchidae.

1. Stylet relatively long, about half of distance from anterior to median bulb.....4.1 Cephalenchus (family Tylodoridae)
- Stylet shorter, at most one third of distance from anterior to median bulb.....2
2. Cuticle has besides lateral field a number of longitudinal grooves.....3
- Cuticle without longitudinal grooves.....4
3. Median bulb spool-like, without valvular apparatus, tail bluntly rounded.....1.3 Neothada
- Median bulb well developed, tail long.....1.1 Coslenchus
4. Cuticle conspicuously and deeply annulated, between annules are folds.....5
- Cuticle superficially annulated.....6
5. Posterior margins of cuticle annules crenated, terminal bulb oblong, tail to the end regularly annulated, males without bursa .....1.11 Miculenchus
- Cuticle annules smooth, terminal bulb pear-shaped, posterior part of tail, where lateral field absent, more finely annulated than anterior part, tail tip not annulated, males with bursa..... .....1.8 Malenchus
6. Vulva with lateral flaps, postuterin sac absent, cloaca lips form a tube.....1.7 Aglenchus
- Vulva without lateral flaps, postuterin sac present, males without cloaca tube.....7
7. Amphids slit-like, diagonal at base of lip region.....8
- Amphids inconspicuous, positioned anteriorly or longitudinal amphids at lateral side of lip region.....10
8. Body C- to spiral-shaped, median bulb spool-like..... .....1.4 Boleodorus
- Body at most slightly curved.....9
9. Mouth stylet tube-like, with a broad canal but without stylet knobs.....1.6 Neopsylenchus
- Mouth stylet with a narrow canal, knobs present....1.5 Basiria
10. Body conspicuously slender, tail more than 20 anal body width's.....1.2 Lelenchus
- Tail shorter than 20 anal body width's.....11
11. Body C-shaped curved, posterior part more curved than anterior part, posterior tube-shaped part of stylet and anterior conical part are equally long.....1.9 Tylenchus
- Body at most slightly curved, posterior tube-shaped stylet part is much longer than anterior conical part.....1.10 Filenchus

1.1 Coslenchus.

1. Outside lateral field are 16-18 longitudinal grooves, males unknown.....1.1.3 C. franklinae
- Cuticle with 14 longitudinal grooves outside lateral field...2

2. Vulva without lateral flaps: cuticle annulation not interrupted, males unknown.....1.1.2 C. rhombus
- Vulva with lateral flaps.....1.1.1 C. costatus

1.2 Lelenchus.
1.2.1 L. leptosoma.

1.3 Neothada.
1.3.1 N. cancellata.

1.4 Boleodorus.

1. Lip region anteriorly dented, body C-shaped curved, stylet 12 um.....1.4.1 B. thylactus
- Lip region anteriorly not dented, body spiral-shaped rolled up, stylet 8-9 um.....1.4.2 B. volutus

1.5 Basiria.

1. Median bulb at 34-42% of oesophagus.....2
- Median bulb futher backward.....3
2. Body length more than 700 um.....1.5.1 B. duplexa
- Body lenght less than 600 um.....1.5.2 B. flandriensis
3. Valvular apparatus at less than 53% of oesophagus length, lateral field with 2 lines.....1.5.5 B. gracilis
- Valvular apparatus at more than 53% of oesophagus length, lateral field with 4 lines.....4
4. Dorsal oesophagal gland empties into oesophagus at 5-7 um behind stylet base, body after heat-fixation slightly curved, stylet straight.....1.5.3 B. graminophila
- Dorsal oesophagal gland empties into oesophagus at 10-13 um behind stylet base, C-shaped curved after heat-fixation, stylet slightly curved.....1.5.4 B. aberrans

1.6 Neopsilenchus.

1. Body longer than 700 um, stylet longer than 12 um.....1.6.1 N. magnidens
- Body shorter than 700 um, stylet shorter than 12 um.....1.6.2 N. minor

1.7 Aglenchus.
1.7.1 A. agricola.

1.8 Malenchus.

1. Stylet 9.5-11 um.....1.8.3 M. andrassyi
- Stylet 7-9.5 um.....2
2. Anus at 46-52 um behind vulva, tail 76-88 um long, lateral field begins at level of stylet base, cuticle annulation of male 1.0-1.2 um broad.....1.8.1 M. bryophilus

- Anus at 53-56 um behind vulva, tail 70-76 um long, lateral field begins largely behind stylet base, cuticle annulation of male 0.7-0.9 um broad.....1.8.2 M. acarayensis

1.9 Tylenchus.

1. Tail 5-6 anal body width's long.....1.9.3 T. arcuatus
- Tail 7-9 anal body width's long.....2

2. Stylet 16-18 um long, margin of lateral field smooth, lip region slightly offset, female tail longer than 130 um, tail tip acute.....1.9.1 T. davainei
- Stylet 14-15 um long, margin of lateral field crenated, lip region not offset, female tail shorter than 130 um, tail tip finely rounded.....1.9.2 T. elegans

1.10 Filenchus.

1. Tail extemely long, ratio c' more than 20.....
.....1.2.1 Lelenchus leptosoma
- Tail shorter, ratio c' less than 20.....2
2. Stylet longer than 10 um.....3
- Stylet shorter than 10 um.....6
3. Ratio c more than 6, c' less than 9.....1.10.5 F. orbus
- Ratio c less than 6, c' more than 9.....4
4. Tail more than 170 um.....1.10.8 F. thornei
- Tail less than 170 um.....5
5. Length 0.41-0.56 mm, postuterin sac 50% of corresponding body width, stylet well developed.....1.10.6 F. quartus
- Length 0.52-0.81 mm, postuterin sac equals corresponding body width, stylet weakly developed.....1.10.9 F. vulgaris
6. Length more than 0.5 mm.....7
- Length less than 0.5 mm.....9
7. Cuticle annules narrower than 1 um, ratio c less than 4.....
.....1.10.7 F. terrestris
- Cuticle annules more than 1 um, ratio c more than 4.....8
8. Ratio c' less than 11, cuticle annulation broader than 1.5 um, lateral field bordered by two lines.....1.10.4 F. polyhypnus
- Ratio c' more than 11, cuticle annulation narrower than 1.5 um, lateral field totally with four lines.....1.10.8 F. quartus
9. Stylet shorter than 7 um.....10
- Stylet longer than 7 um.....12
10. Lateral field with two lines, postuterin sac as long as corresponding body width.....1.10.2 F. helenae
- Lateral field with four lines, postuterin sac shorter than corresponding body width.....11
11. Length less than 0.4 mm, ratio c' less than 9, postuterin sac 1/2 corresponding body width long.....1.10.3 F. misellus
- Body longer than 0.4 mm, ratio c' more than 9, postuterin sac absent.....1.10.10 F. ditissimus
12. Body annulation broader than 1.5 um.....1.10.11 F. baloghi
- Body annulation narrower than 1.5 um.....13
13. Lateral field with two lines, ratio c less than 5.....
.....1.10.1 F. discrepans
- Lateral field with four lines, ratio c more than 5.....
.....1.10.12 F. zaphari

1.11 Miculenchus.
1.11.1 M. salvus.

2. Family Atylenchidae.

2.1 Atylenchus.
A. decalineatus.

3. Family Psilenchidae.

3.1 Psilenchus. Brzeski 1989

1. Lateral field with two lines, tail not spatula-shaped.....
.....3.1.1 P. terextremus
- Lateral field with four lines, tail spatula-shaped.....2
2. Rectum rises from dorsal intestine wall, tail narrowing halfway, ratio c' less than 8.5, anterior half of tail filled with protoplasm.....3.1.3 P. aestuarius
- Rectum rises from central part of intestine, tail gradually tapering, ratio c' more than 8.5, tail entirely filled with protoplasm.....3.1.2 P. hilarulus

4. Family Tylodoridae.

1. Cuticle outside lateral field with longitudinal grooves, vulva with a overhanging anterior vulval lip.....4.2 Pleurotylenchus
- Cuticle without longitudinal grooves, anterior vulval lip not outgrown.....4.1 Cephalenchus

4.1 Cephalenchus.

1. Tail thread-like extended, more than 20 anal body width's, ratio c less than 3.5.....4.1.2 C. leptus
- Tail shorter, shorter than 20 anal body width's, ratio c more than 3.5.....2
2. Length less than 0.6 mm, stylet 15-17 um, tail 9-14 anal body width's long.....4.1.1 C. hexalineatus
- Length more than 0.7 mm, stylet 17-20 um, tail 16-20 anal body width's long.....4.1.3 C. illustris

4.2 Pleurotylenchus.
4.2.1 P. sachsi.

5. Family Ecphyadophoridae.

1. Body behind vulva or spicula strongly narrowed, lip region not flattened dorsoventrally, tail relatively short, ratio c = 10-12.
.....5.2 Ecphyadophora
- Body behind vulva or spicula hardly narrowed, lip region dorsoventrally flattened, tail relatively long, ratio c = 4-5....
.....5.1 Tenunemellus

5.1 Tenunemellus.
5.1.1 T. eurycephalus.

6. Family Dolichodoridae.

1. Oesophagal glands overlap intestine.....2
- Oesophagal glands within abutting terminal bulb.....3
2. Cuticle thickened just before vulva, body 0.8 - 1.3 mm.....
.....6.10 Telotylenchus
- Cuticle regular, body shorter than 0.7 mm, males unknown.....
.....6.12.2 Tylenchorynchus clarus
3. Stylet longer than 90 um.....6.3 Macrotrophurus
- Stylet shorter than 70 um.....4

4. Body annulation inconspicuous, head frame weakly developed, posterior gonad reduced, cuticle of tail tip of female swollen... .....6.11 Trophurus
- Cuticle obviously annulated, head frame moderately or strongly developed.....5
5. Cuticle besides lateral field with longitudinal grooves.....6
- Cuticle without grooves outside lateral field.....8
6. Lateral field with four lines.....6.6 Dolichorynchus
- Lateral field with six lines.....7
7. Front of lip region with a disc, stylet conspicuously thin.... .....6.2 Geocenamus
- Lip disc absent.....6.9 Scutylenchus
8. Halfway along body lateral field has 6 lines.....9
- Lateral field with 4 or 5 lines.....11
9. Head frame well developed.....6.1 Amplimerlinius
- Head frame slightly developed.....10
10. Lip region with six radial grooves, to deirids lateral field has 4 lines.....6.4 Merlinius
- Lip region without radial grooves, to deirids lateral field has 6 lines.....6.5 Nagelus
11. Lateral field with 5 lines.....6.8 Quinisulcius
- Lateral field with 4 lines.....12
12. Lip region strongly narrowed, female's tail tip with a thickened cuticle, it looks like a bursa.....6.7 Paratrophurus
- Lip region broad, female tail without a "bursa".....13
13. Lateral field partially areolated, cuticle of tail tip slightly thickened, stylet longer than 18 um.....6.13 Bitylenchus
- Lateral field not areolated, cuticle of tail tip not thickened, stylet at most 17 um long.....6.12 Tylenchorynchus

6.1 Amplimerlinius.

1. Length more than 1.25 mm.....6.1.1 A. icarus
- Length less than 1.25 mm.....6.1.2 A. caroli

6.2 Geocenamus.

1. Stylet longer than 30 um.....6.2.1 G. arctidus
- Stylet shorter than 30 um.....6.2.2 G. tenuidens

6.3 Macrotrophurus.
6.3.1 M. arbusticola.

6.4 Merlinius.

females:
1. Body longer than 0.9 mm.....2
- Body shorter than 0.9 mm.....3
2. Stylet shorter than 50 um.....6.5.3 Nagelus hexagrammus
- Stylet longer than 50 um.....6.9.2 Scutylenchus longus
3. Tail with a mucro-like outgrowth.....6.4.6 M. processus
- Tail without mucro-like outgrowth.....4
4. Stylet longer than 16 um.....5
- Stylet shorter than 16 um.....6
5. Stylet longer than 19 um.....6.4.7 M. bavaricus
- Stylet shorter than 19 um.....6.4.5 M. nothus
6. Tail regularly conical, tip acute.....6.4.2 M. joctus
- Tail bluntly rounded.....7
7. Tail tip crenated.....6.4.4 M. nanus
- Tail tip smooth.....8

8. Between lines in lateral field are punctated lines.....
.....6.4.3 M. microdorus
- No punctation pattern on lateral field.....6.4.1 M. brevidens

males:
1. Tail thread-like extended.....6.4.6 M. processus
- Tail without thread-like extension.....2
2. Stylet 16-18 um.....6.4.5 M. nothus
- Stylet shorter.....3
3. Spicula 23 um, stylet 11-12 um.....6.4.4 M. nanus
- Spicula shorter, stylet 13 um or longer.....4
4. Bursa does not envelop tail tip.....6.4.2 M. joctus
- Bursa envelops tail tip.....5
5. Lateral field without punctation pattern....6.4.3 M. brevidens
- Lateral field punctated.....6.4.1 M. microdorus

6.5 Nagelus.

1. Lip region offset by constriction.....2
- Lip region not offset.....3
2. Tail with 66-85 annules, spermatheca filled with sperm, males present.....6.5.1 N. alpensis
- Tail with 63-69 annules, males absent, spermatheca empty.....
.....6.5.4 N. leptus
3. Stylet 24-27 um.....6.5.2 N. obscures
- Stylet 33-36 um.....6.5.3 N. hexagrammus

6.6 Dolichorynchus.

1. Lip region not offset.....6.6.1 D. lammelliferus
- Lip region offset by a constriction.....2
2. Stylet 21-22 um, tail tip crenated.....6.6.3 D. judithae
- Stylet 24-28 um, tail tip smooth.....6.6.2 D. microphasmis

6.7 Paratrophurus.
6.7.1 P. bursifer.

6.8 Quinisulcius.
6.8.1 Q. capitatus.

6.9 Scutylenchus. Rev. Nemat. 7 : 87-93 (1984)

1. Stylet longer than 50 um.....6.9.2 S. longus
- Stylet shorter than 30 um.....2
2. Tail tip crenated, anterior vulval lip not a membranous outgrowth, spicula longer than 30 um.....6.9.3 S. tessellatus
- Tail tip smooth, anterior vulval lip a membranous outgrowth, spicula shorter than 30 um.....3
3. Tail of female ventrally with 17-25 annules, c' = 1.6-2.7.....
.....6.9.1 S. quadrifer
- Tail ventrally with 26-33 annules, c' = 2.6-3.5.....
.....6.9.4 S. tartuensis

6.10 Telotylenchus.
6.10.1 T. ventralis.

6.11 Trophurus.

1. Stylet 18-21 um.....6.11.1 T. imperialis
- Stylet 14-16 um.....6.11.2 T. sculptus

6.12 Tylenchorynchus.

1. Cuticle with 23-29 longitudinal grooves.....6.12.1 T. claytoni
- Cuticle without longitudinal grooves.....2
2. Stylet longer than 20 um.....3
- Stylet shorter than 20 um.....4
3. Body length less than 0.9 mm, spicula 23-29 um.....
.....6.13.3 B. bryobius
- Body longer than 0.9 mm, spicula 30-34 um....6.13.2 B. maximus
4. Lip region offset by constriction.....6.13.1 B. dubius
- Lip region not offset.....5
5. Terminal bulb slightly overlapping, males unknown.....
.....6.12.2 T. clarus
- Terminal bulb not overlapping.....6.12.3 T. striatus

6.13 Bitylenchus.
see 6.12.

7. Family Hoplolaimidae.

1. Oesophagal glands are in a non-overlapping terminal bulb.....
.....7.2 Pararotylenchus
- Oesophagal glands overlapping.....2
2. Phasmids saucer-shaped, before anus.....7.3 Peltamigratus
- Phasmids relatively small.....3
3. Oesophagal glands overlap intestine dorsally, dorsal oesophagal gland empties in oesophagus lumen at at most 1/4 of stylet length behind stylet base, female tail symmetrical.....
.....7.4 Rotylenchus
- Longest overlap at ventral side, dorsal oesophagal gland empties in oesophagus lumen at more than 1/4 of stylet length behind stylet base, female tail not symmetrical.....
.....7.1 Helicotylenchus

7.1 Helicotylenchus.

females:
1. Stylet longer than 36 um.....7.1.2 H. coomansi
- Stylet shorter than 34 um.....2
2. Lip region anteriorly flattened.....3
- Lip region anteriorly spherical.....5
3. Tail tip ventrally rectangular, stylet shorter than 28 um.....
.....7.1.3 H. digonicus
- Tail tip rounded, stylet longer than 28 um.....4
4. Tail tip with narrow annules or a broad annule with scratches.
.....7.1.8 H. vulgaris
- Tail tip annules of equal breadth.....7.1.1 H. canadensis
5. Spermatheca with sperm.....6
- Spermatheca empty.....7
6. Phasmids at 3-8 annules before anus, ratio a = 26-32.....
.....7.1.4 H. exallus
- Phasmids at most 3 annules before anus, ratio a = 18-26.....
.....7.1.7 H. varicaudatus
7. Tail tip rounded, or slightly outgrown ventrally.....
.....7.1.7 H. varicaudatus
- Tail clearly outgrown ventrally.....8

8. Dorsal oesophagal gland empties into lumen of oesophagus less than 1/3 of stylet length behind stylet base.....7.1.5 H. paxilli
- Eduction-canal at more than 1/3 stylet length behind stylet base.....7.1.6 H. pseudorobustus

males:
1. Stylet 35-36 um.....7.1.2 H. coomansi
- Stylet shorter than 30 um.....2
2. Stylet 25-30 um.....7.1.7 H. varicaudatus
- Stylet 23-26 um, spicula 24-28 um.....7.1.4 H. exallus

7.2 Pararotylenchus.
7.2.1 P. blothrotylus.

7.3 Peltamigratus.
7.3.1 P. parapachyuris.

7.4 Rotylenchus.

1. Stylet 41-50 um.....7.4.4 R. robustus
- Stylet shorter than 38 um.....2
2. Stylet 20-26 um.....7.4.5 R. pumilus
- Stylet longer than 26 um.....3
3. Lip region with 3-5 annules.....4
- Lip region with 6-8 annules.....5
4. Spermatheca filled, tail rounded, spicula 27-31 um.....
.....7.4.3 R. goodeyi
- Spermatheca empty, tail ventrally weakly outgrown, males unknown.....7.4.1 R. buxophilus
5. Phasmids behind anus, spermatheca filled, stylet 26-33 um.....
.....7.4.6 R. quartus
- Phasmids before anus, spermatheca empty, stylet 33-37 um, males unknown.....7.4.2 R. fallorobustus

8. Family Rotylenchulidae

1. Anus of adult female terminal; males without bursa.....
.....8.2 Verutus
- Anus not terminal, males with bursa.....8.1 Rotylenchulus

8.1 Rotylenchulus.
8.1.1 R. borealis.

8.2 Verutus.

9. Family Pratylenchidae.

1. Oesophagal glands overlap intestine dorsally.....2
- Oesophagal glands overlap intestine ventrally.....3
2. Female with two gonads, males with a symmetrical lip cap.....
.....9.3 Pratylenchoides
- Female with one gonad, males with an asymmetrical lip cap.....
.....9.4 Hoplotylus
3. Body length more than 1 mm.....9.5 Hirschmaniella
- Body length less than 1 mm.....4
4. Female with one gonad, a dorsal pore at distal end of spiculum.....9.1 Pratylenchus
- Female with two gonads, a ventral pore at distal end of

spiculum.....9.2 Zygotylenchus

9.1 Pratylenchus.

females:
1. Lip region with two annules.....2
- Lip region with more than 2 annules.....3
2. Tail tip crenated.....9.1.1 P. flakkensis
- Tail tip smooth.....9.1.2 P. neglectus
3. Tail tip crenated.....4
- Tail tip smooth.....7
4. Spermatheca empty, lateral field with 6 lines.....
.....9.1.3 P. crenatus
- Spermatheca filled, lateral field with 4 lines.....5
5. Spermatheca oblong, stylet 15 um.....9.1.4 P. pratensis
- Spermatheca round or broadly oval, stylet 17 um.....6
6. Tail tip finely crenated, rounded, tail at ventral side with 16-26 annules.....9.1.5 P. fallax
- Tail tip coarsly crenated, club-shaped, sometimes incised, tail at ventral side with 16-20 annules.....9.1.6 P. convallariae
7. Spermatheca empty.....8
- Spermatheca full.....9
8. Lip region high, not offset, oesophagus overlap of intestine shorter than 55 um.....9.1.7 P. thornei
- Lip region low, not offset by constriction, overlap longer than 55 um.....9.1.8 P. pinguicaudatus
9. Spermatheca oval.....10
- Spermatheca round.....9.1.9 P. penetrans
10. Body slender, ratio a about 33, median bulb oblong, central lane in lateral field is narrower than the two outside lanes, stylet 17 um.....9.1.10 P. vulnus
- Body more plump, ratio a about 23, median bulb round, central lane not narrower than the other lanes, stylet 15 um.....
.....9.1.11 P. pseudopratensis

9.2 Zygotylenchus.
9.2.1 Z. guevarai.

9.3 Pratylenchoides.

1. Overlap of oesophagus more than one corresponding body width..
.....9.3.2 P. maritimus
- Overlap less than one corresponding body width.....2
2. Tail cylindrical, six lines in lateral field at level of oesophagus-intestinal junction.....9.3.3 P.laticauda
- Tail conical, lateral field with four lines.....
.....9.3.1 P. crenicauda

9.4 Hoplotylus.
9.4.1 H. femina.

9.5 Hirschmaniella.

1. Stylet 31-37 um.....9.5.1 H. loofi
- Stylet 20-24 um.....9.5.2 H. gracilis

10. Family Heteroderidae.

females:

1. Female, when dead, turns into a brown cyst.....2
- Female does not form a cyst.....10.5 Meloidodera
2. Cysts round or oval.....3
- Cysts lemon-shaped.....4
3. Cysts round.....10.4 Globodera
- Cysts oval.....10.3 Punctodera
4. Vulva a round aperture, fenestra absent.....10.2 Cactodera
- Vulva slit-like, accompanied by two round or half-moon-like fenestera.....10.1 Heterodera

males:

1. Body length less than 0.6 mm.....10.5 Meloidodera
- Body length more than 0.6 mm.....2
2. Distal ends of spicula not divided.....3
- Distal ends of spicula divided.....4
3. Spicula distally broadly rounded.....10.3 Punctodera
- Spicula distally pointed.....10.4 Globodera
4. Spicula obviously shorter than stylet.....10.3 Cactodera
- Spicula as long or longer than stylet.....10.1 Heterodera

species level:

juveniles and cysts:

1. Vulva of cysts on a dais, cysts lemon-shaped.....2
- Vulva not on a dais, cysts round or oval.....5
2. Vulval fenestra large, anal fenestra small, cysts oval to pear-shaped, (on grasses and cereals).....10.3.1 Punctodera punctata
- Vulval fenestra and anal fenestra equally large, cysts round.3
3. Vulva glands present, anus relatively close to fenestrae, distance from anus to fenestra-margin at most 1.9 times diameter of vulva fenestra, (on Millefolium)...10.4.1 Globodera millefolii
- Vulva glands absent, distance between anus and fenestra more than two fenestra diameters.....4
4. Between anus and vulva fenestra are 12.2(8-20) cuticle edges and a fine regular punctation pattern, anus at 2.5 times diameter of vulva fenestra, distance between anus and vulva fenestra is 43.9 um (22-67), stylet of juveniles on average 23.6 um.....10.4.2 Globodera pallida
- Between anus and vulva fenestra are 21.6(16-31) cuticle edges and a coarse irregular punctation pattern, anus at 4.5 times diameter of vulva fenestra, distance between anus and vulva fenstra is 68 um (29-116), stylet of juveniles 22 um long.....10.4.3 Globodera rostochiensis
5. Vulval pattern consists of one large aperture, vulval glands absent, vuval slit short (12-25 um), cuticle pattern at lateral side of cyst with straight or weakly waving lines, they are interrupted by short cross-lines, juveniles 440 um (368-554) and lateral field with four lines.....6
- Vulva with two fenestrae, vulval glands present or absent, cyst wall with zig-zag pattern, vulval slit short (6-24 um) or longer than 30 um.....7
6. Cyst oblong, 2.3 times as long as broad, stylet of juveniles 22.8 um long.....10.2.1 Cactodera estonica
- Cyst shorter, at most 1.7 times as long as broad, stylet of juveniles 20.4 um long.....10.2.1 Cactodera weissi

7. Vulval slit short, 6-24 um, fenestrae usually oval to round..8
- Vulval slit longer than 30 um, fenestrae usually half-moon-shaped.....12
8. Vulval fenestrae far form each other, vulval bridge 18-39 um broad, underbridge strongly developed.....
.....10.1.10 Heterodera hordecalis
- Vulval fenestrae close to each other, underbridge slightly developed.....9
9. Vulval glands usually absent, juveniles 426 um long, lateral field with three lines.....10.1.9 Heterodera bifenestra
- Vulval glands strongly developed, juveniles on average at least 575 um long, lateral field with four lines.....10
10. Cysts cream, underbridge present, tail of juveniles 83-103 um long, hyalin part 51-71 um.....10.1.12 Heterodera iri
- Cyst dark, brown to black, underbridge seldom present, tail of juveniles 45-77 um, hyalin part 28-48 um long.....11
11. Cyst dark-brown to black, vulval slit typically 9.6 um long, stylet knobs of juveniles slightly bent forward, tail 54-58 um long, (on cereals).....10.1.13 Heterodera avenae
- Cyst brown, vulval slit typically 6.5 um long, stylet knobs of juveniles strongly bent forward, tail 67 um long, (on grasses)
.....10.1.11 Heterodera mani
12. Vulval glands present, underbridge well developed, fenestrae semi-circular.....13
- Vulval glands usually absent, underbridge present or absent, fenestrae semi-circular or cicular.....15
13. Length of fenestra typically 32 um, stylet of juveniles 25.6 um.....10.1.1 Heterodera schachtii
- Length of fenestra typically 36 um or more.....14
14. Stylet of juveniles typically 25 um long.....
.....10.1.2 Heterodera daverti
- Stylet 27.5 um or longer.....10.1.3 Heterodera trifolii
15. Fenestra almost round, whole pattern two times as long as broad.....10.1.4 Heterodera humuli
- Fenestra hemi-circular, pattern as long as broad.....16
16. Stylet of juveniles typically 27 um long, outer lines of lateral field crenated, outer field parts areolated.....
.....10.1.7 Heterodera urticae
- Stylet typically 24 um, outer lines not crenated and outer field parts not areolated.....17
17. Vulval slit typically 39 um, length of juveniles 486 um, tail length 60 um.....10.1.6 Heterodera goettingiana
- Vulval slit typically 45 um or more, juveniles shorter than 0.45 um, tail length 50 um.....18
18. Cyst large, spherical, stylet knobs of juveniles at front flattened or slightly curved forward, hyalin part of tail 25 um long.....10.1.5 Heterodera cruciferae
- Cyst small, lemon-shaped, stylet knobs of juveniles curved forward, hyalin part of tail 28 um long.....
.....10.1.8 Heterodera carotae

<u>10.1 Heterodera</u>.

juveniles of the genera Heterodera, Punctodera, Globodera and Cactodera:
1. Hyalin part of tail more than 1.8 times as long as stylet....2
- Hyalin part of tail at most 1.8 times as long as stylet.....4

2. Body longer than 0.6 mm, hyalin part of tail typically 2.5 times as long as stylet, (on Gramineae).....10.1.12 H. iri
- Body shorter than 0.6 mm, length hyalin part 2 times stylet length.....3
3. Body length typically between 0.40 and 0.45 mm, lateral field with three lines, (on Gramineae).....10.1.9 H. bifenestra
- Body length typically longer than 0.50 mm, lateral field with four lines, (on Gramineae).....10.3.1 P. punctata
4. Hyalin part of tail is typically 20 um long, lateral field only areolated anteriorly, (on Polygonum and Oxalis?).....
.....10.2.1 C. weissi
- Hyalin part typically longer than 24 um.....5
5. Middlest lane of lateral field areolated, (on Gramineae).....
.....10.1.10 H. hordecalis
- Lateral field not, or only outer lanes areolated.....6
6. Tail length typically 67 um, (on Gramineae)....10.1.11 H. mani
- Tail length typically at most 60 um.....7
7. Body shorter than 0.40 mm, (on Urticaceae, Moraceae and some other plants).....10.1.4 H. humuli
- Body longer than 0.40 mm.....8
8. Stylet knobs curved backward, anteriorly rounded.....9
- Stylet knobs anteriorly flat or hollow.....10
9. Tail typically 44 um, (on Solanaceae)..10.4.3 G. rostochiensis
- Tail typically 53 um, (on Compositae).....10.4.1 G. millifoli
10. Stylet typically 27 um.....11
- Stylet typically at most 25 um.....13
11. Hyalin part of tail shorter than 1.2 times stylet length, (on Urtica).....10.1.7 H. urticae
- Hyalin part longer than 1.2 times stylet length.....12
12. Hyalin part 1.3 stylet lengths.....10.1.3 H. trifolii
- Hyalin part 1.5 stylet lengths.....10.1.13 H. avenae
13. Lateral field areolated, (on Daucus).....10.1.8 H. carotae
- Lateral field not areolated.....14
14. Hyalin part of tail at least 1.3 stylet lengths, (on Papilionaceae).....10.1.6 H. goettingiana
- Hyalin part shorter than 1.3 stylet lengths.....15
15. Stylet typically 24 um.....16
- Stylet typically 25 um.....17
16. Hyalin part 1.1 stylet lengths, (on Solanaceae).....
.....10.4.2 G. pallida
- Hyalin part as long as stylet, (on Cruciferae).....
.....10.1.5 H. cruciferae
17. On Chenopodiaceae and Cruciferae.....10.1.1 H. schachtii
- On Papilionaceae.....10.1.2 H. daverti

males of genera Heterodera and Cactodera:
1. Spicula obvious shorter than stylet, lateral field areolated only anteriorly (difficult to find, on Polygonum).....
.....10.2.1 C. weissi
- Spicula longer than stylet.....2
2. Lateral field not areolated.....3
- Lateral field areolated.....6
3. Gubernaculum absent, (on Urticaceae, Moraceae and some other crops).....10.1.4 H. humuli
- Gubernaculum present.....4
4. Spicula typically 26 um, (on Papilionaceae).....
.....10.1.6 H. goettingiana
- Spicula typically longer than 30 um.....5

5. Spicula 36 um, stylet 29 um, (on Chenopodiaceae and Cruciferae).....10.1.1 H. schachtii
- Spicula 31 um, stylet 27 um, (on clover).....10.1.2 H. daverti
6. Stylet as long as spicula, (on Daucus).....10.1.8 H. carotae
- Ratio spicula/stylet at least 1.2.....7
7. Spicula typically 29 um, (on Gramineae)...10.1.9 H. bifenestra
- Spicula longer than 33 um.....8
8. Ratio spicula/stylet typically 1.5, (on Gramineae).....
.....10.1.11 H. mani
- Ratio spicula/stylet at most 1.4.....9
9. Gubernaculum conspicuously small, (on Cruciferae and Labiatae)
.....10.1.5 H. cruciferae
- Gubernaculum not conspicuously small, typically 10 um or longer.....10
10. Spicula 39 um, stylet typically 30 um, (on Gramineae).....
.....10.1.12 H. iri
- Spicula at most 37 um, stylet 29 um.....11
11. Ratio spicula/stylet less than 1.3, (on Gramineae).....
.....10.1.13 H. avenae
- Ratio spicula/stylet more than 1.3.....12
12. Dorsal oesophagal gland empties in lumen of oesophagus at typically 4.3 um behind stylet base, (on Gramineae).....
.....10.1.10 H. hordecalis
- Dorsal oesophagal gland empties in lumen of oesophagus at typically 7 um behind stylet base, (on Urtica).....
.....10.1.7 H. urticae

cysts:
1. Vulval slit longer than 30 um.....2
- Vulval slit shorter than 20 um.....9
2. Vulval glands present.....3
- Vulval glands absent.....5
3. Fenestra larger than 40 um.....4
- Fenestra 24-38 um.....10.1.1 H. schachtii
4. Underbridge not branched.....10.1.2 H. daverti
- Underbridge at end branched.....10.1.3 H. trifolii
5. Vulval pattern bifenestral, vulval bridge broad.....
.....10.1.4 H. humuli
- Vulval pattern ambifenestral, vulval bridge narrow.....6
6. Fenestra bow low, L/M more than 2.....10.1.5 H. cruciferae
- Fenestra bow higher, L/M less than 1.5.....7
7. Vulval slit typically 39 um.....10.1.6 H. goettingiana
- Vulval slit typically 46 um.....8
8. Length of fenestra typically 38 um.....10.1.7 H. urticae
- Length of fenestra typically 31 um.....10.1.8 H. carotae
9. Vulval glands present.....10
- Vulval glands absent.....10.1.9 H. bifenestra
10. Vulval bridge broader than 15 um.....10.1.10 H. hordecalis
- Vulval bridge narrower than 15 um.....11
11. Vulval slit typically 7 um.....10.1.11 H. mani
- Vulval slit typically 11 um.....12
12. Underbridge strongly developed.....10.1.12 H. iri
- Underbridge absent.....10.1.13 H. avenae

10.2 Cactodera.
10.2.1 C. weissi.

10.3 Punctodera.
10.3.1 P. punctata.

10.4 Globodera.

males:
1. Spicula proximally broad and then tapering to 50%.....
.....10.4.2 G. pallida
- Spicula proximally broadening and then tapering to 80%.....
.....10.4.3 G. rostochiensis

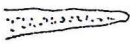
cysts:
1. Vulval glands present, anus relatively close to fenestrae, distance anus to margin of fenestrae at most 1.9 fenestrae diameters.....10.4.1 G. millifolii
- Vulval glands absent, distance between anus and fenestrae more than 2 fenestra diameters.....2
2. Young cysts cream, typically 12.2 cuticle edges between vulva and anus.....10.4.2 G. pallida
- Young cysts goldbrown, typically 21.6 cuticle edges between vulva and anus.....10.4.3 G. rostochiensis

10.5 Meloidodera.

11. Family Meloidogynidae.

11.1 Meloidogyne.

juveniles:
1. Tail longer than 50 um.....2
- Tail shorter than 50 um.....4
2. Stylet 14 um, just before valvular apparatus in median bulb are some small vesicles.....11.1.4 M. naasi
- Stylet at most 13 um, vesicles in median bulb absent.....3
3. Length typically 0.37 mm, tail 5.3 anal body width's long.....
.....11.1.6 M. decononcki
- Length typically 0.47 mm, tail 7.7 anal body width's long.....
.....11.1.2 M. graminis
4. Stylet longer than 11 um, tail shorter than 4 anal body width's.....11.1.5 M. ardenensis
- Stylet shorter than 11 um, tail longer than 4 anal body width's.....5
5. Length typically 0.34 mm, tail acute.....11.1.3 M. hapla
- Length typically 0.39 mm, tail tip characteristically rounded.
.....11.1.1 M. chitwoodi




males:
1. Stylet 25 um long.....11.1.6 M. deconincki
- Stylet at most 22 um long.....2
2. Spicula longer than 30 um.....11.1.5 M. ardenensis
- Spicula at most 30 um.....3
3. Ratio spicula/stylet 1.25.....11.1.3 M. hapla
- Ratio spicula/stylet 1.55.....4
4. Before valvular apparatus in median bulb are five small vesicles.....11.1.4 M. naasi
- Vesicles in median bulb absent.....5
5. Lip region slightly offset, body length typically 1.42 mm long.....11.1.2 M. graminis
- Lip region not offset, length typically 1.07 mm.....
.....11.1.1 M. chitwoodi

females, based on perineal pattern and stylet length:

1. Distance from vulva to point where obvious dorsal striae begin is at least 2.7 times vulva breadth.....2
- Distance from vulva to dorsal striae at most 2.3 times vulva breadth.....3
2. Phasmids conspicuous, distance between phasmids typically 18 um, around tail tip cuticle not punctated, (on cereals).....
.....11.1.4 M. naasi
- Phasmids inconspicuous, distance between phasmids typically 25 um, punctation pattern present around tail tip, (not on cereals).
.....11.1.3 M. hapla
3. Stylet 11-13 um.....11.1.1 M. chitwoodi (on cereals and potatoes) or 11.1.2 M. graminis (on bent grass)
- Stylet 15-19 um.....11.1.5 M. ardenensis or 11.1.6 M. deconincki

12. Family Criconematidae.

Key to species level:

explanation of the codes:
R : number of rings
R ex : ring, from front, which contains excretion pore
RV : ring, from end, which contains vulva
R an : ring, from end, which contains anus
RVan : number of rings between vulva and anus
VL/VB : ratio between body part behind vulva and body width at height of vulva

1. Cuticle double.....12.5.1 Hemicriconemoides pseudobrachyuris
- Cuticle single.....2
2. Posterior margins of body rings with shields, thorns or other ornaments.....3
- Rings smooth or slightly crenated.....6
3. Rings with irregular arranged ornaments.....4
- Ring ornaments placed in longitudinal rows.....5
4. Tail bluntly rounded, with 3-8 rings.....
.....12.4.3 Crossonema multisquamatum
- Tail acute, with 8-16 rings.....12.4.1 Crossonema menzeli
5. Body with longitudinal rows of groups of 4 thorns, which may be branched, present on both ends.....12.3.1 Ogma cobbi
- Body with longitudinal rows of single thorns or shields, which are absent on both anterior and posterior part of body.....
.....12.3.2 Ogma murrayi
6. Second and third ring narrower than lip ring.....
.....12.7.1 Criconema annuliferum
- Not so.....7
7. Tail acute.....8
- Tail blunt.....16
8. Rings of tail tip are fused together.....
..... 12.7.5 Criconema longulum
- Tail rings not fused together.....9
9. Stylet longer than 85 um.....10
- Stylet shorter than 85 um.....12
10. Rings lateral with triangular pattern, body with less than 65 rings.....12.7.3 Criconema princeps
- Rings lateral without pattern, body with more than 65 rings..
.....11

11. Stylet shorter than 100 um.....12.7.2 Criconema loofi
- Stylet longer than 100 um.....12.7.7 Criconema sphagni
12. Behind vulva are 13-17 rings.....12.7.4 Criconema demani
- Behind vulva are at most 12 rings.....13
13. At lateral side of body at least 5 rings are grown together..
.....12.6.8 Macroposthonia raskiensis
- At most 3 rings grown together.....14
14. Posterior margins of body rings crenate.....
.....12.6.11 Macroposthonia solivaga
- Posterior margins smooth.....15
15. Anterior vulval lip with two thorns, submedian lobes broader than 2/3 of lip disc.....12.6.1 Macroposthonia annulata
- Vulval lips without thorns, submedian lobes narrower than 1/2 of lip disc.....12.6.2 Macroposthonia annulatiformis
16. Vulva closed.....17
- Vulva open.....23
17. Body with less than 80 rings.....18
- Body with more than 80 rings.....~~20~~ 19
18. Tube-shaped part of stylet about 1/3 of total stylet length
.....12.2.2 Criconemoides informis
- Tube-shaped part of stylet about 1/5 of total stylet length
.....12.2.1 Criconemoides amorphus
19. Anterior vulval lip extended.....12.7.7. Criconema spagni
- Anterior vulval lip not extended.....20
20. Stylet 1/3 of total body length.....
.....12.1.1 Criconemella macrodora
- Stylet at most 1/4 of total body length.....21
21. Body rings regularly crenated.....
.....12.2.3 Criconemoides morgensis
- Body rings smooth.....22
22. More than 130 body rings, tail more or less trapezium-shaped.
.....12.1.2 Criconemella parva
- Less than 130 rings, tail regularly rounded.....
.....12.7.6 Criconema mutabile
23. Lateral side of body has a zig-zag line, because rings grown together, over a distance of at least 5 rings.....24
- At most 3 rings grown together.....25
24. Posterior margins of body rings smooth.....
.....12.6.12 Macroposthonia sphaerocephala
- Posterior margins crenated.....
.....12.6.7 Macroposthonia pseudosolivaga
25. Posterior margins of body rings crenated.....
.....12.6.3 Macroposthonia crenata
- Posterior margins smooth.....26
26. Anterior vulval lip has two thorns.....
.....12.6.5 Macroposthonia dherdei
- Vulval lips without thorns.....27
27. Submedian lobes broader than 2/3 of lip disc.....28
- Submedian lobes narrower than 1/2 of lip disc.....30
28. Excretion pore behind 27th ring.....
.....12.6.10 Macroposthonia rustica
- Excretion pore before 27th ring.....29
29. More than 85 body rings.....12.6.14 Macroposthonia involuta
- Less than 82 body rings.....12.6.13 Macroposthonia vadensis
30. Vagina S-shaped.....12.6.15 Macroposthonia xenoplax
- Vagina straight.....31
31. Less than 75 body rings.....32
- More than 75 body rings.....33

32. Tail rounded, posterior margins of rings smooth.....
.....12.6.9 Macroposthonia rotundicauda
- Tail conical, rings with laterally a triangular outgrowth....
.....12.6.6 Macroposthonia irregularis
33. Stylet longer than 68 um.....12.6.16 Macroposthonia maritima
- Stylet shorter than 68 um.....12.6.4 Macroposthonia curvata

13. Family Hemicycliophoridae.

explanation of the codes:
R : number of rings
R ex : ring, from front, which contains excretion pore
RV : ring, from end, which contains vulva
R an : ring, from end, which contains anus
RVan : number of rings between vulva and anus
VL/VB : ratio between body part behind vulva and body width at level of vulva

1. Body behind vulva or spicula narrowed, females with extended cuticle surrounding vagina, males with U-shaped bent spicula.....
.....13.1 Hemicycliophora
- Body not narrowed behind vulva or spicula, vulval lips rounded, cuticle extension lacking, spicula slightly curved.....
.....13.2 Loofia

13.1 Hemicycliophora.

females:
1. Stylet longer than 110 um.....2
- Stylet shorter than 110 um.....4
2. Stylet shorter than 120 um.....13.1.1 H. macristhmus
- Stylet longer than 120 um.....3
3. Tail narrowing halfway, spermatheca without sperm, lip region conical.....13.1.2 H. nucleata
- Tail conical, spermatheca full, lip region flat and broad.....
.....13.1.3 H. micoletzkyi
4. Spermatheca with sperm.....5
- Spermatheca without sperm.....6
5. Stylet shorter than 80 um.....13.1.4 H. typica
- Stylet longer than 80 um.....13.1.5 H. thornei
6. Less than 210 body annules, RVan less than 12.....7
- More than 210 body annules, RVan more than 12.....8
7. Tail annulated, lateral field slightly marked by scratches....
.....13.1.6 H. epicharoides
- Tail not annulated, lateral field with oval marks.....
.....13.1.8 H. conida
8. Stylet shorter than 79 um.....13.1.7 H. triangulum
- Stylet longer than 79 um.....13.1.8 H. conida

males:
1. Length more than 0.85 mm.....2
- Length less than 0.85 mm.....3
2. Length less than 1.2 mm.....13.1.5 H. thornei
- Length more than 1.2 mm.....13.1.3 H. micoletzkyi
3. Tail longer than 100 um.....13.1.4 H. typica
- Tail shorter than 100 um.....13.1.8 H. conida

13.2 Loofia.

1. Tail cylindrical with a regularly triangular end, RV = 33-49.. .....13.2.2 L. robustus
- Tail just before end suddenly narrowed and conical extended, RV = 58-79.....13.2.1 L. thienemanni

14. Family Sphaeronematidae.

1. Adult female with a conspicuous "neck".....14.1 Sphaeronema
- Adult female without neck.....14.2 Meloidoderita

14.1 Sphaeronema.
14.1.1 S. rumicis.

14.2 Meloidoderita.

15. Family Paratylenchidae.

15.1 Paratylenchus.

females:
1. Stylet shorter than 35 um.....2
- Stylet more than 40 um.....10
2. Stylet shorter than 20 um.....3
- Stylet longer than 20 um.....4
3. Lip region conical.....15.1.7 P. microdorus
- Lip region square at lateral view.....15.1.12 P. tateae
4. Lip region slightly offset, tail tip dorsally dented..... .....15.1.10 P. projectus
- Lip region continuous, tail tip not dorsally dented.....5
5. Lateral vulval flaps absent, tail conspicuously annulated..... .....15.1.8 P. nanus
- Lateral vulval flaps present, tail weakly annulated.....6
6. Stylet shorter than 26 um.....7
- Stylet longer than 26 um.....8
7. Males with stylet.....15.1.11 P. bukowinensis
- Males without stylet.....15.1.13 P. dianthus
8. Lip region trapezium-shaped, tail regularly conical, acute.... .....15.1.9 P. neoamblycephalus
- Lip region rounded, tail tip finely rounded.....9
9. Lip region hardly tapered, stylet 28-33 um...15.1.6 P. hamatus
- Lip region at front tapering, stylet 22.29 um..... .....15.1.11 P. bukowinensis
10. Stylet longer than 70 um.....11
- Stylet shorter than 70 um.....12
11. Head conical, rounded, submedian lobes not developed..... .....15.1.2 P. macrodorus
- Head angular, submedian lobes strongly developed..... .....15.1.5 P. peraticus
12. Stylet 65-69 um.....15.1.4 P. steineri
- Stylet shorter.....13
13. Spermatheca oval, tail tip rounded.....15.1.1 P. goodeyi
- Spermatheca round, tail tip acute.....15.1.3 P. straeleni

males:
1. Stylet present.....2
- Stylet absent.....3

2. Spicula surrounded by a sheath or tube.....15.1.6 P. hamatus
- Spicula not surrounded by a tube.....6
3. Oesophagus recognizable, valvular apparatus visible.....
.....15.1.13 P. dianthus
- Oesophagus degenerated, without structure.....4
4. Spicula 17-18 um.....15.1.5 P. peraticus
- Spicula more than 19 um.....5
5. Cloacal lips stick out.....
.....15.1.2 P. macrodorus or 15.1.7 P. microdorus
- Cloacal lips not sticking out.....15.1.8 P. nanus
6. Tail regularly conical.....15.1.11 P. bulkowinensis
- Tail convex.....15.1.1 P. goodeyi

16. Family Tylenchulidae.

16.1 Trophonema.

17. Family Neotylenchidae.

1. Dorsal oesophagal gland much longer than the subventral one and overlaps intestine over a long distance.....17.1 Deladenus
- Dorsal oesophagal gland as long as the subventral and overlaps intestine over a short distance.....17.2 Hexatylus

17.1 Deladenus.
17.1.1 D. durus.

17.2 Hexatylus.
17.2.2 H. viviparus.

18. Family Anguinidae.

1. Median bulb not musculated, without valvular apparatus.....
.....18.3 Nothotylenchus
- Median bulb musculated, with valvular apparatus.....2
2. Oesophagal glands overlapping.....18.5 Pseudhalenchus
- Oesophagal glands not or hardly overlapping.....3
3. Anterior gonad outstretched, no constriction between ~~isthmus~~ and ~~terminal~~ bulb, colums of the crustaformeria consists of 4 cells, species do not form galls.....18.2 Ditylenchus
- Anterior gonad with one or two reflexions, between ~~isthmus and terminal~~ bulb is a constriction, colums of crustaformeria consists of 8-12 cells or, crustaformeria is tube-like, species cause galls on seeds and on roots.....4
4. Gonads with rachis, several rows of developing eggs, body spiral-shaped after heat-fixation, crustaformeria consists of a long multinucleated tube with more or less six-angular cells, testes of males at the end two times reflexed.....18.1 Anguina
- Gonad without rachis, developing eggs in two rows, body stretched or slightly curved after heat-fixation, colums of crustaformeria consists of 8-12 cells, the end of the testes are not reflexed.....18.4 Subanguina

18.1 Anguina.

females:
1. Body length 0.7-0.9 mm.....18.1.2 A. brenani
- Body length more than 1 mm.....2

2. Postuterin sac longer than half vulva-anus distance.....
.....18.1.5 A. graminis
- Postuterin sac shorter than half vulva-anus distance.....3
3. Body more than 3 mm.....18.1.1 A. tritici
- Body less than 3 mm.....4
4. Stylet 8-9 um long.....18.1.4 A. agrostis
- Stylet 10-11 um long.....18.1.3 A. millefolii

males:
1. Body less than 0.7 mm.....18.1.2 A. brenani
- Body longer than 0.9 mm.....2
2. Spicula proximally thickened and ventrally curved.....
.....18.1.1 A. tritici
- Spicula proximally not thickened, straight.....3
3. Spicula shorter than 40 um.....4
- Spicula longer than 40 um.....18.1.4 A. agrostis
4. Tail tip bluntly rounded.....18.1.5 A. graminis
- Tail tip acute.....18.1.3 A. millefolii

18.2 Ditylenchus. Revue 14 (1) 9-59

1. Stylet shorter than 9 um.....2
- Stylet longer than 9 um.....4
2. Ratio a = 45 or more.....18.2.4 D. intermedius
- Ratio a at most 44.....3
3. Postuterin sac longer than corresponding body width.....
.....18.2.5 D. myceliophagus
- Postuterin sac shorter than corresponding body width.....
.....18.2.6 D. brevicauda
4. Lateral field with 4 lines.....18.2.3 D. dipsaci
- Lateral field with 6 lines.....5
5. Tail tip acute.....18.2.1 D. convallariae
- Tail tip finely rounded.....18.2.2 D. destructor

18.3 Nothotylenchus.
18.3.1 N. acris.

18.4 Subanguina.

1. Length less than 1.3 mm (galls on mosses).....
.....18.4.1 S. askenasyi
- Body more than 1.3 mm.....2
2. Stylet longer than 12 um, vulva at 76-84% (galls on grass roots).....18.4.3 S. radicicola
- Stylet shorter than 12 um, vulva at 86-90% (leaf galls on grasses).....18.4.2 S. graminophila

18.5 Pseudhalenchus.
18.5.1 P. minutus.

19. Family Iotonchiidae.

1. Stylet curved, tail short, rounded, gonads not developed.....
.....19.2 Dotylaphus
- Stylet not curved, tail conical, normal anterior gonad.....
.....19.1 Fungiotonchium

19.1 Fungiotonchium.
19.1.1 F. fungorum.

19.2 Dotylaphus.
19.2.1 D. ruehmi.

20 Family Aphelenchidae.

1. Oesophagal glands overlapping, tail tip without mucro, males with bursa.....20.1 Aphelenchus
- Oesophagal glands not overlapping, tail tip with or without mucro, males without bursa.....20.2 Paraphelenchus

20.1 Aphelenchus.
20.1.1 A. avenae.

20.2 Paraphelenchus.

1. Tail tip with mucro.....20.2.2 P. pseudoparietinus
- Tail tip without mucro.....2
2. Ratio b more than 6.....20.2.1 P. batavicus
- Ratio b less than 6.....20.2.3 P. tritici

21. Family Aphelenchoididae.

1. Body strongly annulated, lip region sucker-shaped.....
.....21.1 Anomyctus
- Body slightly annulated, lip region not sucker-shaped.....2
2. At front of lip region is a conspicuous lip disc, tail club-shaped.....21.2 Aprutides
- No conspicuous lip disc at front of lip region.....3
3. Tail thread-like extended, median bulb oblong.....21.6 Seinura
- Tail not thread-like extended, median bulb round.....4
4. Males with a bursa-rudiment at tail tip, only visible when nematode is lying on his back, males also have one pair of preanal sex papillae and three pairs of papillae halfway along the tail (females indistinguishable from Aphelenchoides, in that case, go to 5).....21.4 Bursaphelenchus
- Males without bursa-rudiment, preanal sex papillae and midtail paired papillae absent.....5
5. Tail tip ends with a number of branched little tubes, which are placed on a little chimney.....21.5 Laimaphelenchus
- Tail tip rounded or ending in one or more mucros.....
.....21.3 Aphelenchoides

21.1 Anomyctus.
21.1.1 A. xenurus.

21.2 Apruditus.
21.2.1 A. guidetti.

21.3 Aphelenchoides.

females:
1. Stylet 14-17 um.....2
- Stylet 6-13 um.....3
2. Stylet knobs well developed, tail with mucro.....
.....21.3.3 A. blastophthorus
- Stylet knobs weakly developed, tail without mucro.....
.....21.3.7 A. kuehni

3. Stylet 6-8 um.....21.3.13 A. sinodendroni
- Stylet 8-13 um.....4
4. Tail ending into two or more points or crown.....5
- Tail rounded or with a single mucro.....7
5. Tail ending into two points.....21.3.2 A. bicaudatus
- Tail with four points.....6
6. Tail with a offset crown, 2 lines in lateral field, body length less than 0.7 mm, ratio a less than 30.....
.....21.3.1 A. asterocaudatus
- Tail tip not offset, lateral field with 4 lines, body more than 0.7 mm, ratio a more than 40.....21.3.11 A. ritzemabosi
7. Tail tip rounded.....8
- Tail acute or with a mucro.....10
8. Postuterin sac absent.....21.3.8 A. limberi
- Postuterin sac present.....9
9. Tail bluntly rounded, lateral field with 4 lines.....
.....21.3.14 A. subtenuis
- Tail relatively acute, lateral field with 3 lines.....
.....21.4.1 Bursaphelenchus hunti
10. Large nematodes, longer than 0.8 mm.....11
- Small nematodes, less than 0.8 mm.....13
11. Stylet 12.5 um, mucro needle-shaped.....21.3.6 A. helophilus
- Stylet 11 um, mucro more blunt.....12
12. Tail 5-6 anal body width's long, lateral field with 2 lines..
.....21.3.5 A. fragariae
- Tail 3 anal body width's long, lateral field with 4 lines....
.....21.3.14 A. subtenuis
13. Lateral field with 2 lines, tail 5-6 anal body width's.....
.....21.3.5 A. fragariae
- Lateral field with 3-4 lines, tail at most 4 anal body width's long.....14
14. Lateral field with 3 lines.....21.3.4 A. composticola
- Lateral field with 4 lines.....15
15. Tail 2-3 anal body width's long, postuterin sac 2 corresponding body width's long, lip region anteriorly dented, cuticle annules 1.0-1.3 um broad.....21.3.10 A. parietinus
- Tail 3-4 anal body width's long, postuterin sac 3 corresponding body width's long, lip region spherical, cuticle annules 0.7-0.9 um broad.....21.3.12 A. saprophilus

males:

1. Stylet 14-17 um.....2
- Stylet at most 13 um.....3
2. Spicula 30 um long, dorsal side characteristical flattened....
.....21.3.3 A. blastophtorus
- Spicula 18 um.....21.3.7 A. kuehni
3. Stylet 6-8 um.....21.3.13 A. sinodendroni
- Stylet 8-13 um.....4
4. Tail tip ending into several mucro's, spicula without cross bars.....21.3.11 A. ritzemabosi
- At most a single mucro, spicula with cross bar.....5
5. Spicula 13-17 um long.....6
- Spicula 21-26 um.....8
6. Body length less than 0.5 mm.....21.3.2 A. bicaudatus
- Body more than 0.5 mm.....7
7. Lateral field with 2 lines, body shorter than 0.85 mm.....
.....21.3.5 A. fragariae
- Lateral field with 4 lines, body longer than 0.85 mm.....
.....21.3.14 A. subtenuis

8. Body less than 700 um.....9
- Body more than 700 um.....21.3.6 A. helophilus
9. Lateral field with 3 lines, spicula ventrally curved distally.
.....21.3.4 A. composticola
- Lateral field with 4 lines, spicula not curved distally.....
.....21.3.12 A. saprophilus

21.4 Bursaphelenchus.
21.4.1 B. hunti.

21.5 Laimaphelenchus.

females:
1. Anterior vulval lip outgrown and covers vulva.....
.....21.5.1 L. penardi
- Both vulval lips identical.....2
2. Body less than 0.7 mm, postuterin sac less than three corresponding body width's.....21.5.3 L. pini
- Body more than 0.7 mm, postuterin sac more than three corresponding body width's.....21.5.2 L. pannocaudus

males:
1. Lateral field with 3 lines.....21.5.1 L. penardi
- Lateral field with 4 lines.....2
2. Body less than 0.7 mm, spicula shorter than 17 um.....
.....21.5.3 L. pini
- Body more than 0.7 mm, spicula longer than 17 um.....
.....21.5.2 L. pannocaudus

21.6 Seinura.

1. Stylet longer than 25 um.....21.6.3 S. winchesi
- Stylet shorter than 20 um.....2
2. Postuterin sac absent, ratio c' of males more than 4.....
.....21.6.1 S. demani
- Postuterin sac present, ratio c' of males less than 4.....
.....21.6.2 S. tenuicaudata

22. Family Rhabditidae.

key to species level

females:
1. Posterior gonad reduced, vulva at more than 65%.....2
- Gonads paired, vulva at less than 65%.....8
2. Mouth cavity longer than 25 um, cuticle with cross-annules and longitudinal lines, which gives an areolated cuticle.....
.....22.10.1 Cruznema tripartitum
- Mouth cavity shorter than 25 um.....3
3. Lips seperated by strongly sclerotized incisions.....
.....22.13.1 Teratorhabditis dentifera
- Lips not seperated by incisions.....4
4. Distance vulva-anus less than one anal body width.....
.....22.6.2 Mesorhabditis juglandicola
- Vulva-anus distance more than one anal body width.....5
5. Rudiment posterior uterus with two blind sack's.....
.....22.6.3 Mesorhabditis ultima
- Uterus rudiment without blind sack's.....6

6. Body width at base of oesophagus less than two lip width's....
.....22.6.4 Mesorhabditis belari
- Body width at base of oesophagus more than two lip width's...7
7. Cuticle with longitudinal lines, vulva more than 79%.....
.....22.6.1 Mesorhabditis spiculigera
- Cuticle without longitudinal lines, vulva less than 79%.....
.....22.7.1 Bursilla monhystera
8. Tail rounded with a narrow tail thread.....9
- Tail conical.....18
9. Lips with bundles of fine hair-shaped papillae.....
.....22.11.1 Ablechroiulus paraciliatus
- Lips with at most single paplillae.....10
10. Phasmids bar-shaped extended.22.3.1 Phasmarhabditis papillosa
- Phasmids not bar-shaped extended.....11
11. Cuticle conspicuously wide, sack-like, tail shorter than the anal body width.....22.5.1. Cuticularia oxycera
- Cuticle not wide, tail longer than anal body width.....12
12. Oesophagal corpus not swollen.....22.1.3 Rhabditis intermedia
- Oesophagal corpus swollen (this group is difficult to distinguish when you have got only females).....13
13. Tail shorter than 2 anal body width's.....14
- Tail longer than 2 anal body width's.....16
14. Tail shorter than anal body width.....
.....22.9.1 Coarctadera icosiensis
- Tail longer than anal body width.....15
15. Tail 1-1.5 anal body width's long.....
.....22.8.3. Pelodera strongyloides
- Tail 1.5-2 anal body width's long.....22.8.2 Pelodera teres
16. Lip region strongly offset.....22.4.1 Curviditis curvicaudata
- Lip region not or slightly offset.....17
17. Tail thread shorter than 3.5 anal body width's.....
.....22.1.4 Rhabditis producta
- Tail thread longer than 3.5 anal body width's.....
.....22.2.4 Pellioditis buetschlii
18. Tail longer than 9 anal body width's.....19
- Tail shorter than 9 anal body width's.....20
19. Metastom not swollen, without teeth, oesopagal corpus swollen
.....22.12.1 Protorhabditis filiformis
- Metastom swollen, with teeth, oesophagal corpus cylindrical..
.....22.1.2 Rhabditis gracilicauda
20. Tail longer than 6 anal body width's.....21
- Tail shorter than 6 anal body width's.....23
21. Lip region offset.....22.2.2 Pellioditis pellioides
- Lip region not offset.....22
22. Ratio c more than 7.....22.1.1 Rhabditis terricola
- Ratio c less than 7.....22.1.5 Rhabditis longicaudata
23. Oesophagal corpus not swollen.....
.....22.14.1 Dolichorhabditis dolichura
- Oesophagal corpus swollen.....24
24. Small nematodes, body shorter than 1 mm.....
.....22.12.2 Protorhabditis oxyuroides
- Larger nematodes, longer than 1 mm.....25
25. Mouth cavity more than two times lip region width.....
.....22.8.1 Pelodera punctata
- Mouth cavity less than two lip region width's.....26
26. Tail more than 3 anal body width's.....27
- Tail less than 3 anal body width's.....30
27. Mouth cavity as long as the lip region width.....
.....22.2.1 Pellioditis pellio
- Mouth cavity longer than 1.5 lip region width's.....28

28. Tail somewhat club-shaped, 3-4 anal body width's long.....
.....22.2.3 Pellioditis marina
- Tail conical, 4-6 anal body width's long.....29
29. Lip region flattened, not offset, each lip has a bundle of
fine hair-like papillae.....22.15.1 Rhabditoides longispina
- Lip region with spherical lips, offset, each lip with a
hair-like papil.....22.9.2 Coarctadera cystilarva
30. Tail blunt, tapering into a fine point.....31
- Tail regularly conical.....32
31. Mouth cavity as long as 1.5 lip region width's, mouth cavity
surrounded by oesophagal tissue.....22.8.3 Pelodera strongyloides
- Mouth cavity at most 1.2 lip region width's long and
partially surrounded by oesophagal tissue...22.8.2 Pelodera teres

32. Plump nematodes, ratio a less than 15.....
.....22.1.6 Rhabditis maupasi
- Body more slender, ratio a more than 15.....
.....22.8.4 Pelodera parateres

males:
1. Bursa does not surround tail tip.....2
- Bursa envelopes tail tip.....12
2. Lips with bundles of hair-like papillae.....3
- Lips with single (hair-like) papillae.....4
3. Tail rounded with a pointed extension.....
.....22.11.1 Ablechroiulus paraciliatus
- Tail conical.....22.15.1 Rhabditoides longispina
4. Oesophagal corpus not swollen.....5
- Oesophagal corpus swollen.....7
5. Spicula proximally hook-shaped, bursa rudimentary.....
.....22.5.1 Cuticularia oxycerca
- Spicula proximally not hook-shaped, bursa well developed.....6
6. Free part of tail 1-1.5 times as long as postanal part of
bursa.....22.1.3 Rhabditis intermedia
- Free part of tail 6-7 times as long as postanal part of bursa.
.....22.1.2 Rhabditis gracilicauda
7. Only a minute part of tail is not enveloped by bursa.....
.....22.1.6 Rhabditis maupasi
- Free tip of tail clearly visible.....8
8. Spicula longer than 45 um.....9
- Spicula shorter than 35 um.....22.7.1 Bursilla monhystera
9. Spicula distally blunt, dorsally with a thorn.....
.....22.4.1 Curviditis curvicaudata
- Spicula not conspicuously blunt, without thorn.....10
10. Bursa envelopes more than half of the tail.....
.....22.1.1 Rhabditis terricola
- Bursa envelopes less than half of the tail.....11
11. Ratio c = 13-21, mouth cavity two times as long as lip width.
.....22.1.4 Rhabditis producta
- Ratio c = 9-14, mouth cavity 1.5 lip width's.....
.....22.1.5 Rhabditis longicaudata
12. Bursa anteriorly closed.....13
- Bursa anteriorly open.....15
13. Spicula shorter than 30 um..22.12.2 Protorhabditis oxyuroides
- Spicula longer than 30 um.....14
14. Ratio c more than 25.....22.9.2 Coarctadera cystilarva
- Ratio c less than 20.....22.9.1 Coarctadera icosiensis
15. Spicula shorter than 30 um.....16
- Spicula longer than 30 um.....18

16. Bursa strongly reduced.....22.7.1 Bursilla monhystera
- Bursa well developed.....17
17. Bursa with 9 pairs of ribs..22.6.2 Mesorhabditis juglandicola
- Bursa with 7 pairs of ribs..22.12.1 Protorhabditis filiformis
18. Incisions between lips strongly sclerotized.....
.....22.13.1 Teratorhabditis dentifera
- Incisions hardly sclerotized.....19
19. Spicula distally grown together.....20
- Spicula free.....26
20. Three pairs of preanal bursa ribs...22.8.4 Pelodera parateres
- Two pairs of preanal bursa ribs.....21
21. Mouth cavity shorter than 25 um.....22
- Mouth cavity longer than 25 um.....24
22. The three middlest bursa ribs of the second or middlest group are grown together at the base.....
.....22.6.1 Mesorhabditis spiculigera
- Median bursa ribs not grown together.....23
23. Body width at the base of oesophagus three times lip width
.....22.6.3 Mesorhabditis ultima
- Body width at the base of oesophagus 1.5 times lip width.....
.....22.6.4 Mesorhabditis belari
24. Bursa with 3 pairs of preanal ribs.....22.8.2 Pelodera teres
- Bursa with 2 pairs of preanal ribs.....25
25. Mouth cavity longer than two lip width's.....
.....22.8.1 Pelodera punctata
- Mouth cavity shorter than two lip width's.....
.....22.8.3 Pelodera strongyloides
26. Nine pairs of bursa ribs and also a pair of bar-shaped phasmids.....22.3.1 Phasmarhabditis papillosa
- Only nine pairs of bursa ribs.....27
27. Spicula dorsolaterally thorned..22.2.4 Pellioditis buetschlii
- Spicula dorsally not thorned.....28
28. Spicula shorter than 35 um, oesophagus not swollen.....
.....22.14.1 Dolichorhabditis dolichura
- Spicula longer than 35 um, oesophagal corpus swollen.....29
29. Two pairs of preanal bursa ribs, cuticle areolated.....
.....22.10.1 Cruznema tripartitum
- Three pairs of preanal bursa ribs, cuticle not areolated...30
30. Bursa crenated and has a "shield-pattern".....
.....22.2.3 Pellioditis marina
- Bursa not crenated and without pattern.....31
31. Spicula longer than 60 um.....22.2.1 Pellioditis pellio
- Spicula shorter than 60 um.....22.2.2 Pellioditis pellioides

23. Family Alloionematidae.

23.1 Rhabditophanes.
23.1.1 R. schneideri.

24. Family Diploscapteridae.

24.1 Diploscapter.
24.1.1 D. coronatus.

25. Family Bunonematidae.

1. Right body part without fins or keel, but with a number of flat shields or scales.....25.3 Craspedonema
- Right body part with fins or keel.....2
2. Behind lip region at right is a collar.....25.1 Bunonema
- No collar behind lip region.....25.2 Rhodolaimus

25.1 Bunonema.

1. Body has 6-10 pairs of fins.....25.1.1 B. ditlevseni
- More than 18 pairs of fins.....2
2. Less than 25 pairs of fins, fins strongly developed.....
.....25.1.3 B. richtersi

- More than 25 pairs of fins, fins weakly developed.....
.....25.1.2 B. reticulatum

25.2 Rhodolaimus.

1. Fins in oesophagal region paired, fins from posterior body part fused together and form a keel.....25.2.2 R. poligraphi
- Fins neither paired or fused.....25.2.1 R. goffarti

25.3 Craspedonema.

25.3.1 C. zeelandicum.

26. Family Cephalobidae.

cuticle heavily punctated → Zeldia

1. Lip ornaments forked.....2
- Lip ornaments not forked or absent.....4
2. Lip ornaments with lashes.....26.4 Acrobeles
- Lip ornaments Y-shaped, without lashes.....3
3. Head margin finely toothed.....26.7 Cervidellus
- Head margin smooth.....26.6 Acrobelophis
4. Lip ornaments incised, in total there are six points.....
.....26.8 Chiloplacus
- Lip ornaments not incised.....5
5. Head margin incised, oesophagal corpus spool-shaped swollen...
.....26.5 Acrobeloides
- Head margin not incised, oesophagal corpus cylindrical.....6
6. Three lips.....7
- Six lips.....8
7. Tail conical, acute.....26.3 Heterocephalobus
- Tail blunt.....26.1 Cephalobus
8. Lip ornaments sharp, lip region not offset...26.2 Eucephalobus
- Lip ornaments lobe-shaped, lip region offset....26.9 Acrolobus

26.1 Cephalobus.

26.1.1 C. persegnis.

26.2 Eucephalobus.

females:
1. Tail tip rounded, usually with a mucro.....2
- Tail slender, conical.....26.2.2 E. oxyuroides
2. Lip ornament 2 cuticle annules high.....26.2.3 E. paracornutus
- Lip ornament at most 1 cuticle annule high.....3

3. Tail often club-shaped, more than 3 anal body width's.....
.....26.2.4 E. striatus
- Tail conical, shorter than 3 anal body widht's.....
.....26.2.1 E. mucronatus

males:
1. Body shorter than 0.5 mm, spicula shorter than 20 um.....
.....26.2.4 E. striatus
- Body longer than 0.5 mm, spicula longer than 20 um.....2
2. Lip ornament as high as an half head diameter.....
.....26.2.2 E. oxyuroides
- Lip ornament less than a half head diameter high.....3
3. Spicula 24 um.....26.2.3 E. paracornutus
- Spicula 22 um.....26.2.1 E. mucronatus

26.3 Heterocephalobus.

1. Ratio a more than 40, mouth cavity 8 um long.....
.....26.3.2 H. filiformis
- Ratio a less than 40.....2

2. Ratio c more than 10, mouth cavity 13-15 um long.....
.....26.3.1 H. elongatus
- Ratio c less than 10, tail thread-like extended.....
.....26.3.3 H. longicaudatus

26.4 Acrobeles.

1. Length more than 0.6 mm, postuterin sac longer than corresponding body width, excretion pore at level of isthmus, spicula longer than 30 um.....26.4.2 A. complexus
- Length less than 0.6 mm, postuterin sac shorter than corresponding body width, excretion pore at level of corpus, spicula at most 25 um long.....2
2. Cuticle consists of two layers, annule width 1.5-2.2 um, excretion pore at most at 1/3 of oesophagus length, lateral field with 4 lines, central two are zigzag.....
.....26.4.3 A. mariannae
- Cuticle with one layer, annule width 2.5-3.0 um, excretion pore halfway along oesophagus, lateral field with 2 lines, punctated.....26.4.1 A. ciliatus

26.5 Acrobeloides.

1. Tail conical, 2 anal body width's long....26.5.4 A. apiculatus
- Tail tip rounded, shorter than 2 anal body width's.....2
2. Lip ornaments high, ending in a sharp point, tail one anal body width long.....26.5.3 A. tricornis
- Lip ornaments low, not pointed, tail longer than one anal body width.....3
3. Postuterin sac absent, lateral field with 5 lines.....
.....26.5.2 A. nanus
- Small postuterin sac present, lateral field with 3 lines.....
.....26.5.1 A. buetschlii

26.6 Acrobelophis.
26.6.1 A. minimus.

26.7 Cervidellus.

1. Lobes of head margin crenated.....26.7.1 C. serratus
- Lobes of head margin smooth.....26.7.2 C. vexilliger

26.8 Chiloplacus.

1. Body shorter than 0.5 mm.....26.8.2 C. dekonincki
- Body longer than 0.5 mm.....2
2. Subventral lips acute, dorsal lip dentated, distally broad....
.....26.8.4 C. propinquus
- Subventral lips identical to dorsal lip.....3
3. Every lobe of head margin with four fine points, tip of lip ornament with two secondary branches.....26.8.3 C. demani
- Head margin not ending in four points, lip ornament with a point.....4
4. Lip ornaments slender, three times higher than broad.....
.....26.8.1 C. bisexualis
- Lip ornaments as high as broad.....26.8.5 C. symmetricus

26.9 Acrolobus.
26.9.1 A. emarginatus.

27. Family Osstellidae.

27.1 Drilocephalobus.

1. Tail four anal body width's long, tail tip acute.....
.....27.1.2 D. goodeyi
- Tail at most two anal body width's long, tail tip finely rounded.....27.1.1 D. moldavicus

28. Family Panagrolaimidae.

females:
1. Lips seperated by deep incisions.....28.2 Panagrobelus
- Lips not seperated by deep incisions.....2
2. Reflexed part of anterior gonad not extended to vulva.....
.....28.5 Tubatrix
- Reflexed part of anterior gonad passes vulva.....3
3. Reflexed part of gonad has another reflexion behind vulva, vulval lips protruding, body behind vulva narrowed.....
.....28.3 Panagrolaimus
- Reflexion behind vulva absent, vulval lips not protruding, body not immediately narrowed behind vulva.....4
4. Six lips, vagina musculated and forward directed, oesophagal corpus not bulb-like swollen.....28.1 Panagrellus
- Three lips, vagina not musculated, nor forward directed, posterior part of oesophagal corpus bulb-like swollen.....
.....28.4 Tricephalobus

males:
1. Lips seperated by deep incisions.....28.2 Panagrobeles
- Lip region not incised.....2
2. Spicula S-shaped.....28.5 Tubatrix
- Spicula not S-shaped.....3

3. Spicula proximally hook-shaped, distally split.....
.....28.1 Panagrellus
- Proximal hook absent, distally not split.....4
4. Six lips, spicula with a ventral membrane...28.3 Panagrolaimus
- Three lips, spicula without membrane.....28.4 Tricephalobus

28.1 Panagrellus.
28.1.1 P. redivivus.

28.2 Panagrobelus.
28.2.1 P. stammeri.

28.3 Panagrolaimus.

females:
1. Vulva far back, at more than 70%.....28.3.3 P. thienemanni
- Vulva at less than 70%.....2
2. Tail longer than 4 anal body width's.....3
- Tail shorter than 4 anal body width's.....4
3. Body length more than 0.8 mm.....28.3.5 P. hygrophilus
- Body length less than 0.8 mm.....28.3.1 P. paetzoldi
4. Tail longer than 3 anal body width's.....28.3.2 P. rigidus
- Tail shorter than 3 anal body width's.....5
5. Mouth cavity 9-10 um long, corpus 3 times as long as isthmus, tail concave.....28.3.4 P. detritophagus
- Mouth cavity 10-14 um long, corpus 2 times as long as isthmus, tail convex.....28.3.6 P. subelongatus

males:
1. Tail longer than 4 anal body width's.....28.3.1 P. thienemanni
- Tail shorter than 4 anal body width's.....2
2. Mouth cavity 9-10 um long, spicula 20-32 um, beside anal pair of pre-anal papillae are another two pairs.....
.....28.3.4 P. detritophagus
- Mouth cavity 10-14 um long, spicula 29-32 um, two pairs of preanal papillae including adanal pair.....3
3. Both pairs of papillae before spicula...28.3.6 P. subelongatus
- One pair adanal, on level of spicula.....28.3.2 P. rigidus

28.4 Tricephalobus.

28.5 Turbatrix.
28.5.1 T. aceti.

29. Family Myolaimidae.

29.1 Myolaimus.
29.1.1 M. heterurus.

30. Family Brevibuccidae.

30.1 Plectonchus.
30.1.1 P. wyganti.

31. Family Teratocephalidae.

1. Posterior gonad reduced, amphids small, at base of mouth cavity.....31.1 Teratocephalus
- Posterior gonad well developed, amphids large, spiral-shaped and far behind mouth cavity.....2
2. Lip region slightly offset, lip region with four setae, oesophagus narrowed close before terminal bulb, body longer than 0.6 mm.....31.2 Euteratocephalus
- Lip region conspicuously offset, lip region without setae, body shorter than 0.6 mm.....31.3 Metateratocephalus

31.1 Teratocephalus.

1. Cuticle deeply annulated, with longitudinal lines, annule breadth more than 1.8 um, vulva depressed.....31.1.1 T. costatus
- Cuticle without longitudinal lines, annules less than 1.8 mm broad, vulva not depressed.....2
2. Ratio c' more than 10, postuterin sac shorter than body width. .....31.1.2 T. terrestris

- Ratio c' less than 10, postuterin sac longer than corresponding body width.....31.1.3 T. tenuis

31.2 Euteratocephalus.

1. Head setae longer than 1/2 lip region breadth, lobes long and finely extended, amphids at 2-2.5 lip width's behind anterior.... .....31.2.1 E. hirschmannae
- Head setae shorter than 1/2 lip region breadth, lobes at front hardly extended, amphids at 1.5-2 lip widht's behind anterior.... .....31.2.2 E. palustris

31.3 Metateratocephalus.
31.3.1 M. crassidens.

32. Family Diplogasteridae.

1. Median bulb oblong, two times longer than broad, dorsal tooth is plate-shaped and is close to bottom of metastom swelling.....2
- Median bulb round, dorsal tooth thorn- or claw-shaped, tip not against metastom swelling.....3
2. At front of mouth cavity are six movable and projectable teeth, females with two gonads.....32.2 Demaniella
- Cheilostom not changed into projectable teeth, posterior gonad reduced.....32.5 Metadiplogaster
3. Cheilostom divided into bars or plates by longitudinal grooves subventral metastom swellings smooth or crenate.....4
- Cheilostom at most slightly striated, each subventral metastom swelling carries a small comma-shaped tooth.....5
4. Mouth cavity square, metastom crenate.....32.6 Paroigolaimella
- Mouth cavity two times longer than wide, each metastom swelling carries a small, inconspicuous tooth..... .....32.1 Diplogasteritus
5. Between cheilo- and promesostom are two cross-edges, posterior edge moves obliquely backward.....32.7 Diplogaster
- No cross-edges between cheilo- and promesostom.....6
6. Lip papillae hair-like, metastom teeth relatively large.....7
- Lip papillae not hair-like, metastom teeth inconspicuous.....8

7. Females with one gonad, gubernaculum keel-shaped.....
.....32.4 Monobutlerius
- Females with two gonads, gubernaculum gutter-shaped.....
.....32.3 Butlerius
8. Opposite vulva is a seperate chamber, which acts as spermatheca, females with two gonads, cuticle with longitudinal grooves, gubernaculum longer than half spicula length.....
.....32.1 Diplogasteritus
- Females without seperate chamber, posterior gonad reduced, cuticle without longitudinal grooves, gubernaculum shorter than half spicula length.....32.8 Acrostichus

32.1 Diplogasteritus.

1. Cheilostom not divided into plates.....32.1.2 D. dendrophilus
- Cheilostom divided into plates.....2
2. Metastom with 3 edges.....32.1.1 D. consobrinus
- Metastom with a large dorsal tooth and 2 edges.....3

3. Base of dorsal tooth 8 um from front, gubernaculum with two pairs of thin thorns, spicula 10 times as long as broad.....
.....32.1.4 D. superbus
- Base of dorsal tooth 11 um from front, gubernaculum with two pairs of broad thorns, spicula 5 times as long as broad.....
.....32.1.3 D. nudicapitatus

32.3 Butlerius.

1. Lip region with double hair-like papillae.....
.....32.3.1 B. filicaudatus
- Hair-like papillae on lip region single.....32.3.2 B. micans

32.4 Monobutlerius.
32.4.1 M. degrissei.

32.5 Metadiplogaster.
32.5.1 M. graciloides.

32.6 Paroigolaimella.

1. Ratio c less than 5, vulva at 50-52%, spicula fused.....
.....32.6.1 P. bernensis
- Ratio c more than 5, vulva at 37-40%, spicula free.....
.....32.6.2 P. coprophaga

32.7 Diplogaster.
32.7.1 D. rivalis.

32.8 Acrostichus.
32.8.1 A. mikuschi.

33. Family Neodiplogasteridae.

1. Tail shorter than two anal body width's.....33.1 Diplenteron
- Tail longer than two anal body width's.....2
2. Mouth cavity consists of two chambers.....3
- Posterior mouth cavity chamber is inconspicuous.....5
3. Cheilostom with longitudinal bars.....4
- Cheilistom without longitudinal bars.....33.5 Pareudiplogaster

4. Mouth cavity with two large teeth, tail longer than 8 anal body width's.....33.4 Mononchoides
- Mouth cavity with one large tooth, tail shorter than 8 anal body width's.....33.6 Glauxinema
5. Plump nematodes, ratio a less than 20.....33.3 Pristionchus
- Slender nematodes, ratio a more than 20.....33.2 Fictor

33.1 Diplenteron.
33.1.1 D. colobocercus.

33.2 Fictor.
33.2.1 F. fictor.

33.3 Pristionchus.
33.3.1 P. lheritieri.

33.4 Mononchoides.

1. Vulva behind middle of body, spicula 35 um...33.4.1 M. elegans
- Vulva before middle of body, spicula 40-44 um.....
.....33.4.2 M. striatus

33.5 Pareudiplogaster.

1. Tail 4 anal body width's long.....33.5.1 P. pararmatus
- Tail 10-15 anal body width's long.....33.5.2 P. striatulus

33.6 Glauxinema.
33.6.1 G. armata.

34. Family Diplogasteroididae.

34.1 Diplogasteroides.
34.1.1 D. spengelii.

35. Family Tylopharyngidae.

35.1 Tylopharynx.
35.1.1 T. foetida.

36. Family Odonthopharyngidae.

36.1 Odontopharynx.
36.1.1 O. longicaudata.

37. Family Monhysteridae.

1. Vulva halfway along body, gonad short, oesophagus proximally with a bulb-like swelling, amphids at more than two head width's, tail spineret usually long.....37.4 Monhystrella
- Vulva positioned posteriorly, gonad long, oesophagus proximally without a bulb-like swelling, tail with a short spineret.....2

2. Vulva at more than 75%, rectum strongly musculated, 2-3 times the anal body width, eduction-canals of caudal glands come together close before tail tip, their common cavity is large and sclerotized, tail tip not swollen.....37.3 Geomonhystera
- Vulva at 50-75%, rectum thin, not musculated and usually as long as anal body width, caudal glands form a small cavity, tail tip swollen.....3
3. Spicula longer than 2.3 anal body width's, amphids usually less than one head width behind front, body filled with crystals, tail ususally shorter than vulva-anus distance...:37.1 Monhystera
- Spicula shorter than 2.2 anal body width's, amphids relatively far from front, at least one head width, tail longer than vulva-anus distance, males rare.....37.2 Eumonhystera

37.1 Monhystera.

females:
1. Body length less than 0.8 mm.....37.1.3 M. paramacramphis
- Body length more than 0.8 mm.....2
2. Half of total tail length is thread-like...37.1.1 M. stagnalis
- Thread-like part of tail is only 25-30% of tail length.....3
3. Uterus of egg-carrying females has no juveniles, head forward hardly tapering.....37.1.2 M. paludicola
- Uterus contains juveniles and eggs, head forward tapering.....
.....37.1.4 M. riemanni

males:
1. Spicula shorter than 40 um.....37.1.3 M. paramacramphis
- Spicula longer than 45 um.....2
2. Tail at most 1.5 times as long as spicula, spicula longer than 4 anal body width's.....37.1.2 M. paludicola
- Tail at least 1.5 times as long as spicula, spicula shorter than 4 anal body width's.....3
3. Spicula longer than 3.5 anal body width's, amphid diameter more than 5 um.....37.1.1 M. stagnalis
- Spicula shorter than 3.5 anal body width's, amphid diameter less than 5 um.....37.1.4 M. riemanni

37.2 Eumonhystera.

females:
1. Anterior margin of amphid at least 1.6 head width's from anterior.....2
- Anterior margin of amphid at most 1.6 head width's from anterior.....4
2. Head setae as long as corresponding body width, c' = 15-17....
.....37.2.6 E. simplex
- Head setae shorter than 1/2 corresponding body width, c' = 6-12.....3
3. Amphids at 1.6-2.2 head width's, behind vagina there is a conspicuous gland.....37.2.3 E. filiformis
- Amphids at 2.0-3.5 head width's, vagina without gland cell....
.....37.2.5 E. similis
4. Tail shorter than distance between vulva and anus.....
.....37.2.1 E. dispar
- Tail longer than vulva-anus distance.....5
5. Tail longer than twice vulva-anus distance, body conspicuously slender, ratio a = 55.....37.2.4 E. gracilior
- Tail shorter than twice vulva-anus distance, ratio a less than 35.....37.2.2 E. vulgaris

37.3 Geomonhystera.
37.3.1 G. villosa.

37.4 Monhystrella.

1. Length more than 0.4 mm, ratio c less than 4.....
.....37.4.1 M. macrura
- Length less than 0.4 mm, ratio c more than 6.....
.....37.4.2 M. bulbifera

38. Family Xyalidae.

1. Tail with a terminal pair of setae.....38.1 Daptonema
- Tail without terminal setae.....38.2 Theristus

38.1 Daptonema.
38.1.1 D. dubium.

38.2 Theristus.
38.2.1 T. agilis.

39. Family Spaerolaimidae.

39.1 Sphaerolaimus.
39.1.1 S. gracilis.

40. Family Linhomoeidae.

40.1 Desmolaimus.
40.1.1 D. zeelandicus.

41. Family Desmoscolecidae.

41.1 Desmocolex.
41.1.1 D. vinealis.

42. Family Plectidae.

1. Wing-like extensions in neck region present.....2
- Wing-like extensions in neck region absent.....3
2. Neck wings crenate, head ornaments not feathered.....
.....42.3 Tylocephalus
- Neck wings smooth, head ornaments feathered.....42.4 Wilsonema
3. Amphids slit-like, mouth cavity at front globular widened.....
.....42.1 Anaplectus
- Amphids circular, mouth cavity cylindrical.....42.2 Plectus

42.1 Anaplectus.

1. Anterior body part contains, besides lateral cuticle canals,
9-11 dorsal and ventral canals.....42.1.4 A. porosus
- Ventral and dorsal canals absent.....2

2. Lip region not offset by constriction, males with 4-5 supplements.....42.1.1 A. grandepapillatus
- Lip region offset by constriction, males with 2-3 supplements. 3
3. Body length more than 1.5 mm.....42.1.3 A. magnus
- Body length less than 1.5 mm.....42.1.2 A. granulosus

42.2 Plectus.

1. Head setae horn-shaped, pointing forward and reaching to or passing front.....2
- Head setae hair-like, pointing sideways and not reaching front 4
2. Body less than 0.6 mm.....42.2.2 P. armatus
- Body more than 0.6 mm.....3
3. Mouth cavity 20-27 um long, head setae reaching just to front of head, lateral field with 3 lines.....42.2.3 P. assimilis
- Mouth cavity 32 um long, head setae passing front, lateral field with 5 lines.....42.2.14 P. thornei
4. Body length more than 1.5 mm.....42.2.8 P. palustris
- Body length less than 1.5 mm.....5
5. Mouth cavity 3-3.5 lip width's long.....6
- Mouth cavity at most 2 lip width's long.....7
6. Body longer than 1 mm.....42.2.13 P. tenuis
- Body about 0.5 mm.....42.2.11 P. pusillus
7. Lip region clearly offset by constriction.....8
- Lip region not offset.....9
8. Tail 3-4 anal body width's long.....42.2.9 P. parietinus
- Tail 9 anal body width's long.....42.2.5 P. elongatus
9. Tail 8-10 anal body width's long.....42.2.7 P. longicaudatus
- Tail at most 7 anal body width's long.....10
10. Body length less than 0.6 mm.....11
- Body length more than 0.6 mm.....12
11. Amphid before middle of mouth cavity.....42.2.6 P. geophilus
- Amphid behind middle of mouth cavity.....42.2.10 P. parvus
12. Tail 6-7 anal body width's long, amphid 1/4 of corresponding body width.....42.2.12 P. rhizophilus
- Tail 4-5 anal body width's long, amphid 1/5-1/6 of corresponding body width.....13
13. Body 0.6-0.9 mm long, tail 4 anal body width's long..... .....42.2.1 P. acuminatus
- Body 0.9-1.5 mm long, tail 5 anal body width's long..... .....42.2.4 P. cirratus

42.3 Tylocephalus.

1. Neck wings entirely annulated, amphid 1/3 of corresponding body width.....42.3.1 T. auriculatus
- Only posterior part of neck wings annulated, amphid 1/5 of corresponding body width.....2
2. Neck wings narrow, more than 3.5 times as long as broad..... .....42.3.2 T. annulatus
- Neck wings broad, at most 3 times as long as broad..... .....42.3.3 T. latticollis

42.4 Wilsonema.

1. Anal aperture covered by a skin fold, head ornaments 10 um long.....42.4.2 W. schuurmansstekhoveni
- Anal aperture not covered by a skin fold, head ornaments 8 um long.....42.4.1 W. otophorum

43. Family Leptolaimidae.

1. Anterior part of terminal bulb saw-like crenated.....
.....43.1 Chronogaster
- No saw-like teeth in anterior half of terminal bulb.....2
2. Tail relatively short, ratio c more than 10..43.2 Deontolaimus
- Tail longer, ratio c less than 10.....3
3. Oesophagal lumen with two tooth-like structures at three corresponding body width's behind front, lateral field conspicuous, body dented before vulva.....43.4 Paraplectonema
- Oesophagal lumen without tooth-like structures, lateral field inconspicuous, body not dented before vulva.....43.3 Leptolaimus

43.1 Chronogaster.

1. Tail 20-25 anal body width's long.....43.1.3 C. tenuis
- Tail shorter than 12 anal body width's.....2
2. Tail longer than 8 anal body width's, amphids slit-like.....
.....43.1.2 C. typica
- Tail shorter than 8 anal body width's, amphids circular.....
.....43.1.1 C. boettgeri

43.2 Deontolaimus.
43.2.1 D. papillatus.

43.3 Leptolaimus.

1. Setae absent in lip region.....43.3.1 L. papilliger
- Lip region with setae 5 um long.....43.3.2 L. setiger

43.4 Paraplectonema.
43.4.1 P. pedunculatum.

44. Family Halaphanolaimidae.

1. Amphids with several coils, mouth cavity very minute or absent.....44.2 Aphanolaimus
- Amphids with a single coil, mouth cavity short and wide.....
.....44.1 Paraphanolaimus

44.1 Paraphanolaimus.
44.1.1 P. behningi.

44.2 Aphanolaimus. Nema 36(1) 1990 Rashi + Coomans

1. Head setae longer than 6 um.....2
- Head setae shorter than 6 um.....3
2. Males with 7-11 supplements, setae longer than corresponding body width.....44.2.1 A. aquaticus
- Males with 4 supplements, setae shorter than corresponding body width.....44.2.3 A. pseudoattentus

3. Ratio a less than 30, cuticle annulation in middle of body broader than 2 um.....44.2.2 A. attentus
- Ratio a more than 30, cuticle annulation in middle of body narrower than 2 um.....44.2.4 A. deconincki

45. Family Diplopeltidae.

1. Mouth cavity extends beyond amphids, oesophagus has no obvious median bulb, excretion pore before base of oesophagus.....
.....45.1 Cylindrolaimus
- Mouth cavity inconspicuous, cup- or short tube-shaped, excretion pore behind base of oesophagus.....45.2 Domorgamus

45.1 Cylindrolaimus.

1. Body shorter than 1 mm, amphids 3 um.....45.1.1 C. communis
- Body longer than 1 mm, amphids 5 um....45.1.2 C. melancholicus

45.2 Domorganus.
45.2.1 D. macronephriticus.

46. Family Rhabdolaimidae.

46.1 Rhabdolaimus.

1. Terminal spineret on tail two times as long as broad, males not yet found, fresh water inhabitant.....46.1.2 R. aquaticus
- Spineret at least four times as long as broad, males common, soil inhabitant.....46.1.1 R. terrestris

47. Family Chromadoridae.

1. Dorsal and subventral teeth of equal size.....
.....47.1 Chromadorina
- Subventral teeth are smaller than dorsal one.....2
2. Amphids cross-oval, males with 1-3 supplements, cuticle punctation coarser in lateral field.....47.3 Punctodora
- Amphids slit-like (half-moon), males with 15-18 supplements, cuticle punctation homogenous.....47.2 Prochromadora

47.1 Chromadorina.

1. Males without supplements, mouth cavity without longitudinal ribs.....47.1.1 C. bioculata
- Males with supplements, mouth cavity with 12 longitudinal ribs, which are grown together at base.....47.1.2 C. germanica

47.2 Prochromadora.
47.2.1 P. orleji.

47.3 Punctodora.
47.3.1 P. ratzeburgensis.

48. Family Hypodontholaimidae.

1. Lateral field punctated.....48.1 Chromadorita
- Lateral field smooth.....48.2 Dichromadora

48.1 Chromadorita.
48.1.1 C. leuckarti.

48.2 Dichromadora.
48.2.1 D. geophila.

49. Family Choanolaimidae.

49.1 Choanolaimus.
49.1.1 C. psammophilus.

50. Family Achromadoridae.

50.1 Achromadora.

1. Body longer than 0.8 mm.....50.1.6 A. terricola
- Body shorter than 0.8 mm.....2
2. Rectum 2-3 times as long as anal body width.....3
- Rectum as long as anal body width.....5
3. Amphid at level of middle of mouth cavity.....
.....50.1.4 A. semiarmata
- Amphid at base of or behind mouth cavity.....4
4. Amphid at 1-1.5 body width's, measured at of setae, behind front of body.....50.1.1 A. micoletzkyi
- Amphid further backward, at 2-2.5 body width's.....
.....50.1.5 A. tenax
5. Tail 3-4 anal body width's long, amphids at level of middle of mouth cavity.....50.1.2 A. pseudomicoletzkyi
- Tail 5-7 anal body width's long, amphids at base of or behind mouth cavity.....50.1.3 A. ruricola

51. Family Ethmolaimidae.

51.1 Ethmolaimus.
51.1.1 E. pratensis.

52. Family Cyatholaimidae.

52.1 Paracyatholaimus.
52.1.1 P. intermedius.

53. Family Desmodoridae.

53.1 Prodesmodora.
53.1.1 P. circulata.

54. Family Microlaimidae.

54.1 Microlaimus.
54.1.1 M. globiceps.

55. Family Odontolaimidae.

55.1 Odontolaimus.
55.1.1 O. chlorurus.

56. Family Aulolaimidae.

1. Amphids circular to oval, tail tip acute.....56.1 Aulolaimus
- Amphids spiral- to question mark-shaped, tail tip tassel- or anchor-shaped.....56.2 Pseudoaulolaimus

56.1 Aulolaimus.
56.1.1 A. oxycephalus.

56.2 Pseudoaulolaimus.
56.2.1 P. anchilocaudatus.

57. Family Bastianiidae.

1. Cuticle coarsly annulated, annule width 2-3 um, ratio b less than 6.....57.1 Bastiania
- Cuticle finely annulated, annule width 1.6 um, ratio b more than 6.....57.2 Dintheria

57.1 Bastiania.

1. Ratio c more than 15.....57.1.1 B. gracilis
- Ratio c less than 15.....57.1.2 B. longicaudata

57.2 Dintheria.
57.2.1 D. tenuissima.

58. Family Prismatolaimidae.

58.1 Prismatolaimus.

1. Mouth cavity very narrow, only 1/3 of corresponding body width, 3-4 times as long as broad.....58.1.3 P. stenolaimus
- Mouth cavity broader, at most twice as long as broad.....2
2. Only anterior gonad developed, vulva at more than 50%, subventral swellings in mouth cavity not obvious.....58.1.2 P. intermedius
- Gonads paired, vulva at less than 50%, subventral swellings in mouth cavity obvious.....3
3. Body more than 1.5 mm, mouth cavity wall thick and strongly sclerotized.....58.1.4 P. verrucosus
- Body less than 1.5 mm, mouth cavity wall thin.....58.1.1 P. dolichurus

59. Family Ironidae.

59.1 Ironus.

1. Tail long, ratio c less than 6.....2
- Tail shorter, ratio c more than 6.....3
2. Length more than 3 mm.....59.1.4 I. macramphis
- Length less than 2 mm.....59.1.2 I. longicaudatus
3. Mouth cavity 100-150 um long, body longer than 3 mm.....
.....59.1.3 I. tenuicaudatus
- Mouth cavity 75-90 um long, body shorter than 2.5 mm.....
.....59.1.1 I. ignavus

60. Family Tobrilidae.

60.1 Tobrilus.

females:
1. Head setae longer than 40% of corresponding body width.....2
- Head setae shorter than 30% of corresponding body width.....5
2. Mouth cavity teeth at the same level.....60.1.2 T. gracilis
- Teeth not at the same level.....3
3. Head setae longer than 1/2 body width.....60.1.5 T. steineri
- Head setae shorter than 1/2 body width.....4
4. Ratio b more than 5.....60.1.8 T. altherri
- Ratio b less than 5.....60.1.9 T. medius
5. Spaces with teeth overlapping each other, cuticle in vulval region wave-like.....60.1.6 T. stefanskii
- Spaces with teeth clearly behind each other, cuticle smooth..6
6. Ratio b less than 5.....60.1.1 T. allophysis
- Ratio b more than 5.....7
7. Ratio a less than 35, before and behind vulva are some conspicuous setae.....60.1.7 T. diversipapillatus
- Ratio a more than 35, in vulval region are no conspicuous seatae.....60.1.3 T. pellucidus

males:
1. Head setae long, 40-60% of corresponding body width.....2
- Head setae at most 30% of corresponding bodu width.....5
2. Mouth cavity teeth at the same level, body shorter than 2.1 mm, 8 supplements, small and depressed.....60.1.2 T. gracilis
- Not 8 depressed supplements, length more than 2.1 mm, mouth cavity teeth not at the same level.....3
3. Supplements not grouped.....60.1.9 T. medius
- Supplements in one group of 4 and one group of 2.....4
4. All supplements of the same seize.....60.1.5 T. steineri
- The first and the two hindmost supplements are smaller than the remaining three.....60.1.4 T. grandepapillatus
5. All supplements small and depressed.....60.1.3 T. pellucidus
- Some of the supplements are large and not depressed.....6
6. Six large supplements, cuticle wave-like between supplements..
.....60.1.6 T. stefanskii
- Three large and three small supplements, cuticle smooth.....
.....60.1.7 T. diversipapillatus

61. Family Onchulidae.

1. Mouth cavity with a dorsal tooth, subventral teeth absent, body longer than 2 mm.....62.2.1 Onchulus nolli
- Mouth cavity with a dorsal and two subventral teeth, body shorter than 2 mm.....61.1.1 Stenonchulus troglodytes

61.1 Stenonchulus.
61.1.1 S. troglodytes.

61.2 Onchulus.
61.2.1 O. nolli.

62. Family Tripylidae.

1. Posterior gonad reduced.....62.2 Trischistoma
- Females with two gonads.....2
2. Mouth cavity, when non-active, closed, one tooth in mouth cavity.....62.1 Tripyla
- Mouth cavity with two teeth, as result lumen widened.....
.....62.3 Paratripyla

62.1 Tripyla.

1. Setae of the first crown shorter than 1/4 of corresponding body width.....2
- Setae of the first crown longer than 1/4 body width.....4
2. Amphid aperture smaller than 1/4 of corresponding body width..
.....62.1.2 T. cornuta
- Amphid aperture more than 1/4 body width.....3
3. Spiculum length 35-45 um, 11-15 supplements, amphid aperture 5 um, amphid without internal structure, body annules 2 um broad, setae of crown of six as long as following crown.....
.....62.1.1 T. affinis
- Spiculum length 70-80 um, 19-21 supplements, amphid aperture 8-9 um, amphids with internal longitudinal structure, body annules 3-4 um broad, setae of crown of six longer than setae of crown of four.....62.1.4 T. glomerans
4. Tail long and thin, ratio c less than 6..62.1.3 T. filicaudata
- Tail short and thick, ratio c more than 6...62.1.5 T. setifera

62.2 Trischistoma.

1. Length more than 1.2 mm, vulva at more than 70%.....
.....62.2.1 T. monohystera
- Length less than 1.2 mm, vulva at less than 70%.....
.....62.2.2 T. arenicola

62.3 Paratripyla.
62.3.1 P. intermedia.

63. Family Alaimidae.

1. Amphids pore-shaped, inconspicuous.....63.1 Alaimus
- Amphids with a conspicuous transverse, oval aperture.....2
2. Amphids with an ellipse-like aperture, at most two body width's, measured at level of the papillae, from anterior.....63.2 Amphidelus
- Amphids with a sickle-shaped aperture at least at three body width's behind front.....63.3 Paramphidelus

63.1 Alaimus.

1. Length more than 4 mm, ratio b more than 8.....63.1.1 A. elongatus
- Length less than 3 mm, ratio b less than 8.....2
2. Length more than 1 mm.....3
- Length less than 1 mm.....4
3. Ratio a more than 70, length more than 1.5 mm.....63.1.2 A. simplex
- Ratio a less than 70, length less than 1.5 mm.....63.1.3 A. primitivus
4. Length less than 0.8 mm.....5
- Length more than 0.8 mm.....6
5. Vulva at more than 45%.....63.1.5 A. mucronatus
- Vulva at less than 45%.....63.1.7 A. parvus
6. Body shorter than 1 mm, tail longer than 10 anal body width's.....63.1.6 A. meyli
- Body longer than 1 mm, tail shorter than 10 anal body width's.....63.1.4 A. proximus

63.2 Amphidelus.

63.2.1 A. elegans.

63.3 Paramphidelus.

1. Ratio c less than 8.....2
- Ratio c more than 8.....3
2. Female with pre-uterin sac, males with 4 supplements.....63.3.1 P. lemani
- Female without pre-uterin sac, 2 or 3 supplements.....63.3.2 P. dolichurus
3. Pre-uterin sac absent.....63.3.5 P. hortensis
- Pre-uterin sac present.....4
4. Length more than 2 mm.....63.3.4 P. exilis
- Length less than 2 mm.....5
5. Pre-uterin sac less than 2 body width's long.....63.3.6 P. paramonovi
- Pre-uterin sac longer than 2 body width's..63.3.3 P. uniformis

64. Family Bathyodontidae. Nemas 35 (1909) 167-164

1. Tail shorter than two anal body width's.....64.1 Bathyodontus
- Tail longer than two anal body width's.....64.2 Cryptonchus

64.1 Bathyodontus.

64.1.1 B. mirus.

64.2 Cryptonchus.
64.2.1 C. tristis.

65. Family Mononchidae.

1. Mouth cavity with dorsal tooth only.....2
- Mouth cavity with dorsal tooth and additional fine teeth.....4
2. Opposite dorsal tooth there is a smooth ridge.....65.2 Clarkus
- Opposite dorsal tooth there is no ridge.....3
3. Tail conical, curved, caudal glands absent.....65.6 Coomansus
- Tail straight, cylindrical, caudal glands present.....
.....65.5 Mononchus
4. Mouth cavity with 4-6 regular cross-rows of fine teeth.....
.....65.3 Mylonchulus
- Fine teeth not arranged in 4-6 regular cross-rows.....5
5. Fine teeth on two longitudinal edges opposite dorsal tooth....
.....65.1 Prionchulus
- Fine teeth form a cross-row and a group of irregularly arranged teeth opposite dorsal tooth.....65.4 Granonchulus

65.1 Prionchulus.

1. Egg shell smooth, tip of dorsal tooth at 24-28% from front of mouth cavity, mouth cavity more than 27x45 um.....
.....65.1.1 P. muscorum
- Egg shell rough, thorned, tip of dorsal tooth at 13-21% from front of mouth cavity, mouth cavity smaller than 27x45 um.....
.....65.1.2 P. punctatus

65.2 Clarkus.
65.2.1 C. papillatus.

65.3 Mylonchulus.

1. Tail halfway strongly curved to ventral, curved part finger-like.....2
- Tail without finger-like end.....3
2. Finger-like part of tail is more than 3 times as long as broad, lip region strongly offset.....65.3.1 M stigmaturellus
- Finger-like part of tail at most 2 times as long as broad, lip region at most slightly offset.....65.3.2 M. stigmaturus
3. Eduction canal on tail with terminal opening.....
.....65.3.3 M. subtenuis
- Eduction canal with dorsal or ventral opening.....4
4. Eduction canal with subventral opening.....
.....65.3.4 M. rotundicaudatus
- Eduction canal with subdorsal opening.....
.....65.3.6 M. brachyuris

65.4 Granonchulus.
65.4.1 G. schulzi.

65.5 Mononchus.

1. Mouth cavity longer than 40 um, broader than 18 um.....2
- Mouth cavity shorter than 40 um, narrower than 18 um.....3
2. Dorsal tooth at 72-78% from base.....65.5.2 M. truncatus
- Dorsal tooth further forward, at 83-88% from base.....
.....65.5.1 M. niddensis

3. Mouth cavity shorter than 25 um, narrower than 10 um.....
.....65.5.3 M. tunbridgensis
- Mouth cavity longer than 25 um, broader than 10 um.....
.....65.5.4 M. aquaticus

65.6 Coomansus.
65.6.1 C. parvus.

66. Family Anatonchidae.

1. Teeth in posterior half of mouth cavity, pointing forward.....
.....66.2 Miconchus
- Teeth pointing backward, in adult females positioned in anterior part of mouth cavity, in adult males positioned in midregion of mouth cavity.....66.1 Anatonchus

66.1 Anatonchus.
66.1.1 A. tridentatus.

66.2 Miconchus.
66.2.1 M. studeri.

67. Family Nygolaimidae.

1. Mouth cavity large, cup-shaped.....67.1 Aetholaimus
- Mouth cavity tube-shaped.....2
2. Vulva longitudinal (broad at lateral view).....67.4 Paravulvus
- Vulva transverse.....3
3. Body plump, ratio a less than 30.....67.2 Nygolaimoides
- Body more slender, ratio a more than 30.....67.3 Nygolaimus

67.1 Aetholaimus.
67.1.1 A. rotundicauda.

67.2 Nygolaimoides.
67.2.1 N. borborophilus.

67.3 Nygolaimus.

females:
1. Body longer than 5 mm, lip region more than 25 um.....
.....67.3.7 N. loofi
- Body shorter than 5 mm.....2
2. Lip region breadth more than 19 um.....3
- Lip region less than 19 um.....4
3. Tooth conical, 12-15 um long.....67.3.8 N. macrobrachyuris
- Tooth cylindrical, 18-22 um long.....67.3.2 N. aquaticus
4. Tooth 17-19 um, cylindrical.....67.3.5 N. intermedius
- Tooth less than 14 um, conical.....5
5. Body longer than 1.6 mm.....6
- Body shorter than 1.6 mm.....9
6. Tail cuticle 8-10 um thick.....67.3.9 N. trophurus
- Cutticle thinner.....7
7. Tooth shorter than 9 um.....67.3.10 N. anneckei
- Tooth longer than 9 um.....8
8. Lip region offset by constriction.....67.3.3 N. brachyuris
- Lip region not offset.....67.3.6 N. laevis

9. Lip region offset by constriction.....67.3.11 N. europaeus
- Lip region not offset.....10
10. Lip region less than 11 um, rectum extends into dorsal body half.....67.3.4 N. clavicaudatus
- Lip region broader than 11 um, rectum normal.....
.....67.3.1 N. altherri

males:
1. Tooth more than 17 um, cylindrical, 5 or more supplements....2
- Tooth shorter than 17 um, conical, less than 5 supplements...3
2. Lip region broader than 18 um.....67.3.2 N. aquaticus
- Lip region less than 18 um.....67.3.5 N. intermedius
3. More than 3 supplements.....67.3.6 N. laevis
- Less than 2 supplements.....4
4. Lip region broader than 20 um.....67.3.8 N. macrobrachyuris
- Lip region less than 20 um.....5
5. Spicula 25-27 um, lip region 11-12 um.....67.3.1 N. altherri
- Spicula longer than 35 um, lip region more than 14 um.....6

6. Supplements absent.....67.3.3 N. brachyuris
- One large supplement present.....
.....67.2.1 Nygolaimoides borborophilus

67.4 Paravulvus.
67.4.1 P. hartingii.

68. Family Dorylaimidae.
68.1 Dorylaimus.
68.1.1 D. crassus.

69. Family Chrysonematidae.
69.1 Chrysonemoides.
69.1.1 C. holsaticus.

70. Family Thornematidae.

females:
1. Both gonads developed.....2
- Anterior gonad reduced.....17
2. Tail regularly conical.....3
- Anterior part of tail strongly tapering, posterior part longly extended and hardly tapering.....4
3. Tail 10 anal body width's long.....
.....70.3.2 Mesodorylaimus attenuates
- Tail 3-4 anal body width's long.....
.....70.3.6 Mesodorylaimus spengelii
4. Tail longer than 5 anal body width's.....5
- Tail short, at most 5 anal body width's.....7
5. Tail 5-8 anal body width's long.....6
- Tail longer than 8 anal body width's.....11
6. Animals conspicuously slender, ratio a more than 50.....
.....70.4.1 Laimydorus filiformis
- Body less slender, ratio a = 30-40.....
.....70.4.3 Laimydorus parabastiani
7. Tail at most 3 anal body width's long.....
.....70.4.2 Laimydorus doryuris
- Tail longer than 3 anal body width's.....8

8. Body less than 1.2 mm.....70.3.7 Mesodorylaimus mesonyctius
- Body more than 1.5 mm.....9
9. Lip region not offset, spear slightly curved.....
.....70.3.1 Mesodorylaimus aberrans
- Lip region offset, spear straight.....10
10. Spear 14-16 um.....70.3.3 Mesodorylaimus bastiani
- Spear 11-12 um.....70.3.5 Mesodorylaimus litoralis
11. Spear 13-15 um long, guiding tube single, ratio c' less than 10.....70.3.4 Mesodorylaimus derni
- Spear longer than 15 um, ratio c' more than 10.....12
12. Spear longer than 30 um.....
.....70.2.3 Prodorylaimus longicaudatoides
- Spear shorter than 28 um.....13
13. Spear longer than 22 um.....14
- Spear shorter than 21 um.....15
14. Lip region not offset, rounded, vulva at 39-44%, guiding tube single.....70.2.6 Prodorylaimus uligonosus
- Lip region slightly offset, angular, vulva at 43-48%, guiding tube double.....70.2.4 Prodorylaimus mas
15. Spear extension 27 um or longer, ratio c' = 12-16.....
.....70.2.2 Prodorylaimus filiarum
- Spear extension shorter than 27 um, ratio c' = 15-20.....16
16. Lip region not offset, rounded, vulva longitudinal, tail asymmetrical with a thickened cuticle.....
.....70.2.5 Prodorylaimus rotundiceps
- Lip region offset by a constriction, vulva transverse.....
.....70.2.1 Prodorylaimus acris
17. Tail at most 2 anal body width's long.....
.....70.5.1 Ecumenicus monohystera
- Tail longer than 10 anal body width's.....
.....70.6.1 Opisthodorylaimus sylphoides

males:
1. Tail long, ratio c less than 15.....2
- Tail short, ratio c more than 30.....7
2. Less than 10 supplements.....3
- More than 10 supplements (13-25).....4
3. Posterior supplement at level of tip of proximal spiculum, body length 1.9-2.5 mm.....70.1.2 Prodorylaimium stenosoma
- Posterior supplement some distance before spicula, body length 1.2-1.5 mm.....70.1.1 Prodorylaimium brigdammense
4. 13 or 14 supplements.....70.2.5 Prodorylaimus rotundiceps
- More than 16 supplements.....5
5. Spicula longer than 60 um.....
.....70.2.3 Prodorylaimus longicaudatoides
- Spicula shorter than 60 um.....6
6. Spear shorter than 22 um.....70.2.2 Prodorylaimus filiarum
- Spear longer than 22 um.....70.2.4 Prodorylaimus mas
7. Lip region not offset, spear slightly curved.....
.....70.3.1 Mesodorylaimus aberrans
- Lip region offset, spear straight.....8
8. At most 11 supplements.....9
- More than 11 supplements.....11
9. Body 0.9-1.1 mm long.....70.3.1 Mesodorylaimus mesonyctius
- Body length 1.3-1.8 mm.....10
10. Spicula 36 um, 4 supplements..70.3.6 Mesodorylaimus spengelii
- Spicula 43-44 um, 6-11 supplements.....
.....70.3.3 Mesodorylaimus bastiani
11. Body conspicuously slender, ratio a more than 50.....12
- Body less slender, ratio a less than 50.....13

12. Guiding tube single, c' = 0.8.....
.....70.3.2 Mesodorylaimus attenuatus
- Guiding tube double, c' = 1.0....70.4.1 Laimidorus filiformis
13. Spear 11-15 um.....14
- Spear longer than 18 um.....15
14. Spear 11-12 um.....70.3.5 Mesodorylaimus litoralis
- Spear 13-15 um.....70.3.4 Mesodorylaimus derni
15. Tail rounded, spear 18-21 um...70.4.3 Laimydorus parabastiani
- Tail with a finger-shaped outgrowth, spear 21-24 um.....
.....70.4.2 Laimydorus doryuris

71. Family Nordiidae.

1. Spear 4-5 lip width's long, equals with 1/6 of oesophagus length.....71.3 Longidorella
- Spear at most 3 lip width's.....2
2. Spear extension pear-shaped flanged.....71.4 Enchodelus
- Extension not flanged.....3
3. Females with two gonads, tail cylindrical.....71.1 Thornia
- Anterior gonad reduced, males not known.....71.2 Pungentus

71.1 Thornia.

1. Tail two anal body width's long.....71.1.2 T. steatopyga
- Tail at most 1.5 anal body width's long....71.1.1 T. propinqua

71.2 Pungentus.

1. Body shorter than 1.2 mm, spear shorter than 20 um.....
.....71.2.1 P. engadinensis
- Body longer than 1.3 mm, spear longer than 20 um.....2
2. Spear longer than 30 um.....71.2.2 P. silvestris
- Spear shorter than 28 um.....71.2.3 P. alpinus

71.3 Longidorella.

1. Spear 42 um.....71.3.2 L. microdorus
- Spear longer than 45 um.....2
2. Posterior broadened part of oesophagus is offset by constriction.....71.3.3 L. parva
- Oesophagus without constriction.....71.3.1 L. macramphis

71.4 Enchodelus.

71.4.1 E. macrodorus.

72. Family Quadsianematidae.

females:
1. Tail longer than 2.5 anal body width's.....2
- Tail shorter than 2.5 anal body width's.....5
2. Spear 9-11 um long.....72.4.3 Epidorylaimus lugdunensis
- Spear 16-21 um long.....3
3. Body length 0.4-0.7 mm.....72.6.3 Microdorylaimus parvus
- Body length 1.2-1.6 mm.....4
4. Tail 4 anal body width's long.72.4.1 Epidorylaimus consobrinus
- Tail 7 anal body width's long.....72.4.2 Epidorylaimus agilis

5. Little nematodes, at most 1 mm long.....6
- Medium to large nematodes, more than 1 mm.....9
6. Tail as long as one anal body width.....
.....72.1.1 Thonus ettersbergensis
- Tail longer than 1.5 anal body width's.....7
7. Spear 13-16 um long with a 2 um aperture.....
.....72.5.2 Dorydorella bryophila
- Spear 10-12 um with a 4 um aperture.....8
8. Tail straight, spear 12 um long...72.6.2 Microdorylaimus miser
- Tail curved, spear 10 um long..72.6.2 Microdorylaimus modestus
9. Tail hemispherical, shorter than one anal body width.....10
- Tail cylindrical or conical, more than one anal body width..14
10. In tail cuticle are some grains.....72.1.2 Thonus circulifer
- Tail without grains.....11
11. Spear 16-17 um, lip region slightly offset, hindpart of body spatula-shaped.....72.1.2 Thonus rhopalocercus
- Spear 20-32 um, lip region offset by a constriction.....12
12. Spear 20-23 um, oesophagus halfway suddenly widened.....
.....72.1.3 Thonus laticollis
- Spear 24-32 um, oesophagus slowly widening.....13
13. Spear 24 um.....72.8.1 Labronema paesleri
- Spear 27-32 um.....72.8.2 Labronema vulvapapillatum
14. Tail hemispherical with a finger-shaped outgrowth (see also 70.4.2).....72.2.4 Eudorylaimus centrocercus
- Tail at most dented dorsally.....15
15. Lip region almost disus-shaped outgrown, amphid aperture before constriction.....72.7.1 Kochinema ~~longum~~ N. sp.
- Lip region not broadly outgrown, amphid aperture behind constriction.....16
16. Tail two times as long as anal body width.....17
- Tail 1.5 anal body width's.....18
17. Lip region not offset, spear 11-15 um, body length 1.3 mm....
.....72.2.5 Eudorylaimus iners
- Lip region offset, spear 19-21 um, body longer than 2 mm.....
.....72.2.6 Eudorylaimus similis
18. Tail spherical, dorsally dented.....19
- Tail conical.....20
19. Spear aperture 75%, body relatively plump, ratio a less than 40, lip region offset.....72.1.4 Thonus minutus
- Spear aperture 25%, body slender, ratio a more than 40, lip region slightly offset.....72.5.1 Dorydorella pratensis
20. Spear longer than 18 um.....21
- Spear shorter than 18 um.....22
21. Ratio c' = 1.4-1.8, vulva transverse, spear 22-23 um.....
.....72.2.2 Eudorylaimus carteri
- Ratio c' = 1.1-1.3, vulva longitudinal, spear 18-20 um.....
.....72.3.1 Allodorylaimus andrassyi
22. Tail tip bluntly rounded, body 1.2 mm long.....
.....72.1.5 Thonus productus
- Tail acute, body 1,6 mm long.....23
23. Ventral side of tail curved, ratio c more than 30.....
.....72.2.1 Eudorylaimus acuticauda
- Tail ventrally straight, only tip is curved, ratio c less than 30.....72.2.3 Eudorylaimus leuckarti

males:
1. Body less than 1 mm.....2
- Body longer than 1 mm.....3
2. Spear 12 um, 3 supplements.....72.6.1 Microdorylaimus miser
- Spear 16 um, 5-8 supplements.....72.6.3 Microdorylaimus parvus

3. Lip region discus-like outgrown.....72.7.1 Kochinema longum
- Lip region not conspicuously outgrown.....4
4. Tail at most one anal body width, ratio c more than 50.....5
- Tail longer than one anal body width, ratio c less than 50...8
5. Less than 15 supplements.....6
- More than 15 supplements.....7
6. Tail conical, 7-9 supplements.....72.1.3 Thonus laticollis
- Tail bluntly rounded, 10-14 supplements.....
.....72.1.6 Thonus circulifer
7. Body length 1.3-1.7 mm.....72.2.4 Eudorylaimus centrocercus
- Body length 2.0-3.2 mm.....72.8.2 Labronema vulvapapillatum

8. Body longer than 2 mm (see also 70.4.2).....
.....72.2.6 Eudorylaimus centrocercus
- Body shorter.....9
9. Tail 4 anal body width's long.72.4.3 Epidorylaimus lugdunensis
- Tail at most 2 anal body width's long.....10
10. More than 10 supplements.....11
- Less than 10 supplements.....13
11. Posterior supplement connected with adanal pair of papil-
lae.....72.3.1 Allodorylaimus andrassyi
- Posterior supplement further forward, to proximal tip of
spiculum.....12
12. Spear longer than 20 um, 6-11 supplements.....
.....72.2.2 Eudorylaimus carteri
- Spear shorter than 20 um, 12-18 supplements.....
.....72.2.1 Eudorylaimus acuticauda
13. Posterior supplement connected with adanal pair.....
.....72.1.5 Thonus productus
- Posterior supplement well before proximal tip of spiculum..14
14. Lip region offset by a constriction, body longer than 1.5 mm.
.....15
- Lip region not or slightly offset, body shorter than 1.5 mm..
.....16
15. Posterior supplement at two spiculum length's before cloaca,
spear shorter than 20 um.....72.2.3 Eudorylaimus leuckarti
- Posterior supplement at one spiculum length before cloaca,
spear longer than 20 um.....72.2.2 Eudorylaimus carteri
16. Lip region not offset, ratio c' = 1.6.....
.....72.2.5 Eudorylaimus iners
- Lip region slightly offset, ratio c' = 1.1.....
.....72.5.1 Dorydorella pratensis

73. Family Aporcelaimidae.

1. Body longer than 3 mm.....2
- Body length less than 3 mm.....4
2. Between oesophagus and intestine is a disc.....3
- Oesophagal disc absent.....73.4 Aporcelaimium
3. Spear axial.....73.5 Aporcelaimus
- Spear placed ventrally in mouth cavity.....73.6 Sectonema
4. Body relatively slender, ratio a more than 40.....
.....73.2 Torumanawa
- Body more plump, ratio a less than 40.....5
5. Body at front side strongly narrowed, bottle-like.....
.....73.1 Paraxonchium
- Body not conspicuously narrowed.....73.3 Aporcelaimellus

73.1 Paraxonchium.
73.1.1 P. laetificans.

73.2 Torumanawa.
73.2.1 T. litoralis.

73.3 Aporcelaimellus.

1. Spear aperture 70% of total spear length.....73.3.4 A. simplex
- Spear aperture at most 50% of total spear length.....2
2. Lip region not offset.....73.3.2 A. tritici
- Lip region offset by constriction.....3
3. Cuticle layers on tail clearly visible, kernel of tail does not reach tail tip.....73.3.3 A. obtusicaudatus
- Cuticle layers not clearly visible, kernel of tail reaches tail tip.....73.3.1 A. paraobtusicaudatus

73.4 Aporcelaimium.
73.4.1 A. labiatum.

73.5 Aporcelaimellus.

1. Body length less than 5 mm.....73.5.2 A. superbus
- Body longer than 5 mm.....2
2. Spear aperture as long as ventral side of spear.....
.....73.5.1 A. regius
- Spear aperture obviously shorter than ventral side of spear..3
3. Cuticle behind head consists of two layers, vulva behind middle of body.....73.5.3 A. vorax
- Cuticle consists of three layers, vulva before middle of body.
.....73.5.4 A. eurydoris

73.6 Sectonema.

1. Body longer than 6 mm.....2
- Body shorter than 6 mm.....3
2. Tail shorter than a half anal body width.....73.6.3 S. demani
- Tail longer than a half anal body width.....
.....73.5.3 Aporcelaimus vorax
3. Spear 9 um, spicula 90-95 um.....73.6.2 S. pseudoventrale
- Spear 12 um, spicula 61-65 um.....73.6.1 S. barbatoides

74. Family Longidoridae.

1. Guiding tube around spear base, spear extension flanged, tail of Dutch species always with a finger-shaped outgrowth.....
.....74.3 Xiphinema
- Guiding tube around anterior quarter of spear, extension not flanged, tail without finger-shaped extension.....2
2. Lip region offset by a deep constriction...74.2 Paralongidorus
- Lip region not offset by a constriction.....74.1 Longidorus

74.1 Longidorus.

females:

1. Body width at height of guiding tube more than 1.5 times breadth of lip region.....2
- Body width at height of guiding tube at most 1.5 times breadth of lip region.....8
2. Distance from anterior to guiding tube more than 2.5 times breadth of lip region.....3
- Distance to guiding tube at most 2.5 lip width's.....5
3. Ratio c' less than 1.....74.1.11 L. profundorum
- Ratio c' more than 1.....4
4. Spear 128-140 um.....74.1.2 L. cylindricaudatus
- Spear 105-125 um.....74.1.5 L. intermedius
5. Ratio c' more than 1.....74.1.6 L. leptocephalus
- Ratio c' less than 1.....6
6. Lip region not offset, hemispherical (lip region width was difficult to measure).....74.1.1 L. caespiticola
- Lip region offset or flattened.....7
7. Spear 96-109 um, prerectum 6-13 anal body width's.....74.1.4 L. goodeyi
- Spear 113-150 um, prerectum 20-30 anal body width's.....74.1.7 L. macrosoma
8. Distance from anterior to guiding tube at most 1.5 lip region width's.....74.1.12 L. kuiperi
- Distance from anterior to guiding tube more than 1.5 lip region width's.....9
9. Tail shorter than anal body width.....10
- Tail longer than anal body width.....11
10. Spear 90-101 um.....74.1.9 L. vinaecola
- Spear 102-112 um.....74.1.8 L. proximus
11. Tail 1.5-1.8 anal body width's.....74.1.10 L. attenuatus
- Tail 1.0-1.3 anal body width's.....12
12. Lip region not offset, amphid bag-shaped.....74.1.3 L. elongatus
- Lip region slightly offset, amphid bilobed.....74.1.13 L. dunensis

males:

1. Spicula longer than 100 um.....74.1.7 L. macrosoma
- Spicula shorter than 100 um.....2
2. Spear longer than 100 um.....3
- Spear shorter than 100 um.....4
3. Spicula shorter than 80 um, less than 15 supplements.....74.1.12 L. kuiperi
- Spicula longer than 80 um, more than 15 supplements.....74.1.1 L. caespiticola
4. Spicula shorter than 50 um.....74.1.10 L. attenuatus
- Spicula longer than 50 um.....5
5. Less than 10 supplements, spicula shorter than 60 um.....74.1.3 L. elongatus
- More than 10 supplements, spicula longer than 60 um.....6
6. Spicula 66-79 um, lip region not offset.....74.1.11 L. profundorum
- Spicula 54-67 um, lip region weakly offset.....74.1.9 L. vinaecola

74.2 Paralongidorus.

74.2.1 P. maximus.

74.3 Xiphinema.

females:
1. Spear and spear extension together shorter than 180 um.....
.....74.3.4 X. pseudocoxi
- Spear and spear extension longer than 180 um.....2
2. Body length more than 4 mm.....74.3.2 X. diversicaudatum
- Body length less than 4 mm.....3
3. Tail longer than 1.3 anal body width's.....74.3.1 X. coxi
- Tail at most 1.3 anal body width's long.....4
4. Finger-like outgrowth on tail placed ventrally, tail more than anal body width.....74.3.3 X. index
- Tail with a weak terminal outgrowth, tail shorter than anal body width.....74.3.5 X. vuittenezi

males:
1. Spicula longer than 69 um.....74.3.2 X. diversicaudatum
- Spicula shorter than 69 um.....2
2. Two supplements, spicula shorter than 55 um.....
.....74.3.4 X. pseudocoxi
- More than four supplements, spicula longer than 55 um.....3
3. Tail with a ventrally placed finger-like outgrowth.....
.....74.3.3 X. index
- Tail with a short terminal outgrowth.....74.3.5 X. vuittenezi

75. Family Belondiridae.

1. Posterior wide part of oesophagus much longer than anterior part and offset by a constriction.....75.1 Axonchium
- Posterior wide part not longer than anterior part, they merge gradually into each other.....2
2. Around mouth aperture are four sclerotized pieces, spear extension wing-like broadened, tail relatively short, less than 5 anal body width's.....75.2 Dorylaimellus
- No sclerotized pieces around mouth aperture, spear extension not broadened, tail longly extended, c' more than 5.....
.....75.3 Oxydirus

75.1 Axonchium.

1. Lip region offset by constriction, body after heat fixation strongly curved.....2
- Lip region not offset by constriction, body after heat fixation straight or slightly curved.....3
2. Body longer than 2.5 mm, spear spool-like, spicula longer than 80 um, vagina sclerotized.....75.1.1 A. coronatum
- Body shorter than 2.5 mm, spear cylindrical, spicula shorter than 50 um, vagina not sclerotized.....75.1.2 A. propinquum
3. Spear aperture 4-5 um, body less than 2 mm, oesophagus before nerve ring not widened.....75.1.3 A. coomansi
- Spear aperture 3 um, body more than 2 mm, part of oesophagus before nerve ring spool-shaped widened and contains a structure which looks like a valvular apparatus.....75.1.4 A. nairi

75.2 Dorylaimellus.

1. Body longer than 0.8 mm, oesophagus with "transparent spherical grains".....75.2.2 D. globatus
- Body shorter than 0.8 mm.....2
2. Tail conical.....75.2.3 D. montenegricus
- Tail bluntly rounded.....75.2.1 D. parvulus

75.3 Oxydirus.

females:
1. Anterior gonad reduced.....75.3.4 O. oxycephalus
- Both gonads developed.....2
2. Body longer than 2 mm, tail longer than 350 um, spear longer than 9 um.....75.3.5 O. oxycephaloides
- Body shorter than 2 mm, tail shorter than 300 um, spear shorter than 8 um.....3
3. Tail longer than 200 um, without swellings, oesophagus shorter than 250 um.....75.3.1 O. amplicephalus
- Tail shorter than 200 um, with irregular swellings, oesophagus longer than 250 um.....75.3.2 O. nethus

males:
1. More than 12 supplements.....2
- Less than 12 supplements.....3
2. Spear 9-11 um, spicula 53-56 um.....75.3.3 O. oxycephaloides
- Spear 4-6 um, spicula 26-32 um.....75.3.1 O. amplicephalus
3. Tail 14-16 anal body width's.....75.3.2 O. nethus
- Tail 6-12 anal body width's.....75.3.4 O. oxycephalus

76. Family Actinolaimidae.
76.1 Paractinolaimus.
76.1.1 P. macrolaimus.

77. Family Discolaimidae.

1. Mouth cavity basket-like and provided with sclerotized longitudinal ribs.....77.1 Carcharolaimus
- Broadened mouth cavity absent.....2
2. Anterior slender part of oesophagus not musculated.....77.2 Discolaimium
- Anterior slender part musculated.....3
3. Lip region sucker-shaped, much wider than following body part, anterior oesophagus part, at level of spear extension, spool-like swollen, lateral field has a series of conspicuous glands.....77.3 Discolaimus
- Lip region broad, not sucker-shaped and not wider than following body part, glands of lateral field not obvious.....77.2.2 Discolaimium dubium

77.1 Carcharolaimus.
77.1.1 C. banaticus.

77.2 Discolaimium.

1. Spear 15-16 um.....77.2.3 D. symmetricum
- Spear up to 10 um.....2
2. Lateral field without conspicuous glands, anterior part of oesophagus not swollen.....77.2.2 D. dubium
- Lateral field with glands, anterior part of oesophagus swollen .....77.2.1 D. filiforme

77.3 Discolaimus.

1. Body shorter than 1.5 mm, spear 15-16 um, vulva at 40%..... .....77.3.2 D. texanus
- Body longer than 1.5 mm, spear 23 um, vulva at 50%..... .....77.3.1 D. major

78. Family Leptonchium.

1. Spear extension with knob-shaped swellings.....2
- Extension not knob-shaped swollen.....4
2. Spear with dorsal strengthening.....78.5 Tylencholaimellus
- Spear without dorsal strengthening.....3
3. Oesophagus with short broadened part, this "bulbus" is 1/4 of total oesophagus length, lip region not offset.....78.7 Doryllium
- Oesophagal widening half of total oesophagus length, lip region offset.....78.6 Tylencholaimus
4. Terminal bulb cylindrical, spear surrounded by swollen oesophagal tissue.....5
- Terminal bulb short or pear-shaped, oesophagus at height of spear not swollen.....6
5. Spear narrow, dorsally and ventrally of the same length..... .....78.2 Funaria
- Dorsal side of spear longer than ventral side..... .....78.1 Dorylaimoides
6. Mouth cavity bottle-shaped, oesophagal bulb constricted, posterior gonad reduced.....78.4 Proleptonchus
- Mouth cavity cylindrical, oesophagal bulb not constricted, gonads paired.....78.3 Leptonchus

78.1 Dorylaimoides.

females:
1. Females with two gonads.....2
- Anterior gonad reduced.....3
2. Tail shorter than 2 anal body width's, ventrally a finger-like outgrown.....78.1.2 D. elegans
- Tail longer than 2 anal body width's, conical..... .....78.1.4 D. micoletzkyi
3. Pre-uterine sac 3 correspondign body width's long..... .....78.1.1 D. bulbosus
- Pre-uterin sac shorter than corresponding body width..... .....78.1.3 D. limnophilus

males:
1. Tail relatively long, ratio c = 13-14.....78.1.1 D. bulbosus
- Tail shorter, ratio c more than 19.....2
2. Tail ventrally outgrown.....78.1.2 D. elegans
- Tail regularly conical.....78.1.4 D. micoletzkyi

78.2 Funaria.
78.2.1 F. maryannae.

78.3 Leptonchus.
78.3.1 L. scintillans.

78.4 Proleptonchus.
78.4.1 P. weischeri.

78.5 Tylencholaimellus.

1. Body shorter than 1 mm.....78.5.3 T. striatus
- Body longer than 1 mm.....2
2. Ratio c less than 40, vulva at 25%.....78.5.2 T. sagittifer
- Ratio c more than 40, vulva at 27-37%.....78.5.1 T. affinis

78.6 Tylencholaimus.

females:
1. Females with two gonads.....2
- One gonad reduced.....4
2. Body plump, a = 16-24.....78.6.1 T. crassus
- Body slender, a more than 30.....3
3. Oesophagus gradually widening, around mouth aperture are no sclerotized pieces.....78.6.6 T. teres
- Basal oesophagal part offset by constriction, around mouth aperture are some sclerotized pieces.....78.6.9 T. paradoxus
4. Anterior gonad reduced.....78.6.7 T. zeelandicus
- Posterior gonad reduced.....5
5. Posterior rudiment of gonad relatively large, and functions as sperm reservoir.....6
- Posterior rudiment of gonad minute or absent.....7
6. Oesophagus with constriction before terminal bulb.....78.6.2 T. formosus
- Oesophagus without constriction.....78.6.8 T. stecki
7. Gonad rudiment present.....78.6.4 T. mirabilis
- Gonad rudiment absent.....8
8. Most inside lips form a cap-like structure on lip region.....78.6.3 T. minimus
- Inside lips inconspicuous.....78.6.5 T. proximus

males:
1. Terminal bulb constricted.....2
- Oesophagus gradually merges into terminal bulb.....4
2. Constriction at 70-74% of oesophagus length.....78.6.9 T. paradoxus
- Constriction at most at 65% of oesophagus length.....3
3. Tail conical, with transparent tip.....78.6.2 T. formosus
- Tail rounded.....78.6.4 T. mirabilis
4. Body length about 1 mm, spear with extension twice as long as lip region width.....78.6.6 T. teres
- Body length about 0.8 mm, spear with extension 1.5 times as long as lip region width.....78.6.8 T. stecki

78.7 Doryllium.
78.7.1 D. uniforme.

79. Family Campydoridae.

79.1 Campydora.
79.1.1 C. demonstrans.

80. Family Diphtherophoridae.

1. Spear anteriorly swollen, mouth cavity wide, cuticle hangs loose around body.....80.1 Diphtherophora
- Spear anteriorly not swollen, "mouth cavity" absent, cuticle not conspicuously wide.....80.2 Tylolaimophorus

80.1 Diphtherophora.

1. Tail bluntly rounded, oesophagus short, b = 6.....80.1.1 D. brevicollis
- Tail with a terminal outgrowth, oesophagus relatively long, b = 3-4.....2
2. Body conspicuously plump: a = 11, tail one anal body width long.....80.1.3 D. obesa
- Body relatively slender: a = 25-36, tail longer than 1.5 anal body width's.....80.1.2 D. communis

80.2 Tylolaimophorus.
80.2.1 T. typicus.

81. Family Trichodoridae.

1. Males without bursa, posterior body part usually strongly bent to ventral, females with a strongly sclerotized vagina, lateral cuticle canals present within one body width behind vulva, cuticle of dead animals not swollen.....81.1 Trichodorus
- Males with weakly developed bursa, posterior body part straight, females' vagina slightly sclerotized, lateral cuticle canals absent within one body width behind vulva, cuticle after dead strongly swollen.....81.2 Paratrichodorus

81.1 Trichodorus.

females:
1. Distance between light-refracting pieces at both sides of vagina is at most 2 um.....2
- Distance between light-refracting pieces more than 3 um.....4
2. Conspicuously large light-refracting pieces, round to square with a diameter more than 3 um...81.1.6 T. variopapillatus
- Light-refracting particles' diameter less than 3 um.....3
3. Vagina barrel-shaped, entirely surrounded by orbicular muscles .....81.1.2 T. cylindricus
- Vagina rounded to trapezium-shaped, orbicular muscles surrounding posterior vagina part.....81.1.4 T. similis
4. Light-refracting pieces broad, in lateral view like two bars, parallel to vagina.....81.1.1 T. primitivus
- Light-refracting pieces thinner.....5
5. Cuticle layers seperated by irregularly waving line, in lateral view vagina is rectangular.....81.1.5 T. sparsus
- Cuticle layers not clearly seperated, vagina regularly hexagonal.....81.1.3 T. viruliferus

males:
1. Cervical papillae absent at level of spear base.....
.....81.1.5 T. sparsus
- Cervical papillae present at level of spear base.....2
2. Spicula distally very thin: gubernaculum evidently before spicula.....81.1.1 T. primitivus
- Gubernaculum behind spicula.....3
3. Spicula with cross striae, bursal rudiment present, proximal part of spicula with thorns, body in cloacal region hardly curved
.....81.1.2 T. cylindricus
- Spicula without cross striae, bursal rudiment absent, body in cloacal region strongly curved.....4
4. Spicula in the middle constricted, proximal part of spiculum with a hardly offset widening.....81.1.3 T. viruliferus
- Spicula smooth, not constricted, widening sharply offset proximally.....5
5. Spear 35-45 um, spicula 35-40 um.....81.1.4 T. similis
- Spear 41-58 um, spicula 40-45 um.....81.1.6 T. variopapillatus

81.2 Paratrichodorus.

females:
1. Oesophagal glands partially overlapping.....2
- Oesophagal glands not overlapping.....5
2. Tail tip with subterminal cuticle canals.....3
- Tail tip without subterminal citicle canals....81.2.2 P. minor
3. Spermatheca present.....4
- Spermatheca absent.....81.2.1 P. pachydermus
4. Tail with two pairs of subterminal papillae.....
.....81.2.7 P. weischeri
- Tail with one pair of subterminal papillae.....
.....81.2.5 P. anemones
5. Tail tip with subterminal cuticle canals.....81.2.4 P. teres
- Tail tip without subterminal cuticle canals.....6
6. Spear 21-23 um.....81.2.3 P. nanus
- Spear 31-34 um.....81.2.6 P. renifer

males:
1. One supplement present.....2
- Two or three supplements present.....3
2. Spicula 42-44 um, spear 21-23 um.....81.2.3 P. nanus
- Spicula 48-65 um, spear 28-39 um.....81.2.2 P. minor
3. One pair of large subventral papillae on tail.....4
- Two pairs of large subventral papillae on tail.....5
4. Spicula 34-37 um.....81.2.7 P. weischeri
- Spicula 45-57 um.....81.2.4 P. teres
5. Spicula 46-53 um.....81.2.5 P. anemones
- Spicula 40-45 um.....81.2.1 P. pachydermus

82. Family Isolaimiidae.
82.1 Isolaimium.
82.1.1 I. multistriatum.

83. Animal parasites.

Infective larvae of animal parasites occur regularly in soil samples, but usually only juveniles of the species, which have to find a host. The nematodes are slender, slightly curved after heat-fixation and with an almost invisible mouth cavity. The oesophagus is swollen, with a small bulb at the base containing a valvular apparatus. The tail is conical and 4-5 anal body width's long. Juveniles of these insect-parasites have, behind the oesophagus, a characteristic small bag with clearly visible bacteria. The infective larvae are distuinguished as follows:

1. Excretion pore behind nerve ring, cuticle with longitudinal grooves.....Heterorhabditis
2. Excretion pore before nerve ring, cuticle without longitudinal grooves.....Steinernema