

ONE HUNDRED NEW NEMAS

(Type Species of 100 New Genera)

CONTRIBUTIONS TO A SCIENCE OF NEMATOLOGY, IX

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The arrangement of the genera in the following pages will serve, to a considerable extent, to define and illustrate the orders proposed on page 214. This is especially true of all except the Litinia, Bolbinia, Mesonchs and Aponchs. In each order, a genus has been selected and given a name philologically connected with that of the order, in fact, the singular of the order name, and, in most cases, these genera may be considered as genera typical of the orders,—for instance, Axonchium may be taken as typical of the order Axonchia.

So far as it is found advisable to accept the classification proposed, it might be well to keep in mind in the establishment of the many new genera which the future will undoubtedly disclose, the application of similar names to those genera which most nearly represent the average structure of the order. In carrying out this idea, such names as Cytolaimella, Isolaimella, and other derivatives at once suggest themselves.

It is already becoming evident that some of these groups may probably early be advantageously subdivided; e.g., Cytolaimia, Anaxonchia. In case of subdivision, the principles alluded to in the footnote to page 213 might lead to some such action as the following: Amending the definition of the existing order and segregating the new order, and utilizing for the new order-name the roots already suggested (see p. 214, lines 27-28) together with appropriate prefixes. This would result in building up a comparatively simple, rather homogenous and characteristic nomenclature for the nema phylum.

In each order the genera are arranged somewhat in accordance with their relationships. Genera of doubtful relationship are usually placed near the beginning or near the end of the order series, and not infrequently appear, in the light of our present knowledge, to be intermediate, or indeterminate, forms. Thus, *Rhadinema flexile* at the beginning of the Isolaimia, p. 256, is doubtfully placed, and may be a cytolaim; so Nannolaimus, p. 255, may perhaps be a litinian form. Most of the order series present these special cases.

PHARYNX ABSENT, or so obscure as easily to escape notice*		New Genera
Oesophagus with median or posterior bulb or swelling, or both		
<i>Amphids none</i> , so far as known; or difficult to see and therefore easily overlooked		
Lateral wings to cuticle present; naked; striae fine; spinneret none; pharynx obscure		
Mouth depr.; faint apophyses in pharyngeal bulb; -f; excretory pore behind neck	<i>Hyalaimus</i>	13
Mouth not depr.; pharynx obscure, not apophysate; oesophagus faintly cephaloboid		
Head with papillae, minute lat. markings (amphids?); excret. pore front of nerve ring	<i>Litonema</i>	12
Head without papillae or lateral markings; excretory pore behind the nerve ring	<i>Choronema</i>	14
Lateral wings to the cuticle none		
Spinneret abs.; naked; oesoph. faintly cephaloboid; striae very fine; faint wings	<i>(Choronema)</i>	14
Spinneret present; cephalic setae present		
Amphids invisible, known only as outlets of secretion; striae coarse; setae long	<i>(Leptonemella)</i>	21
Amphids tiny, tubular, labial, forward-pointing, easily overlooked; striae plain		
Striae fine; male postanal tubular organs submedian; pharyngeal swelling present	<i>(Catanema)</i>	56
Striae coarse; pharyngeal swelling none; cephalic setae 4 or more; head nonstriate		
Mouth cavity present, very small; males without supp. organs; nema 10mm	<i>(Laxonema)</i>	20
Mouth cavity none; vent. row acorn-shaped organs toward head; setae numerous	<i>(Stilbonema)</i>	19
<i>Amphids present</i>		
Form of the amphids more or less irregular, symmetrical to at least one line		
The amphids linear; cephalic setae 12 + 6 small; striae coarse; spinneret present		
<i>(Leptonemella)</i>		21
The amphids not linear; no spinneret; naked; labial region with papillae only		
Winged; f; striae rather coarse; amphids semi-ellipses; oesoph. faintly cephaloboid	<i>(Iotalaimus)</i>	15
Wings none; striae very fine; amphids with large internal connections	<i>(Bolbinium)</i>	16
Form of the amphids spiral, circular, or elliptical; spinneret present		
Shape of the amphids distinctly spiral; striae fine, resolvable		
Pharynx devoid of teeth; head expanded; cephalic setae 4; body setose	<i>(Bolbonema)</i>	49
Pharynx with 3 minute teeth; setae in longitudinal rows	<i>(Alaimonema)</i>	107
Shape of the amphids circular; sometimes small, well forward on the head, and obscure		
Lateral wings present; cephalic setae 4; amphids large		
Striae coarse, altered on the lateral fields; lateral wing distinct	<i>(Antomicron)</i>	17
Striae fine, not altered on the lateral fields; lateral wing faint	<i>(Cyartonema)</i>	18
Lateral wings none or faint		
External amphid circular, at least apparently, well developed; head set off		
Body setose; amphids really spiral, on the head; striae rather fine, resolvable	<i>(Bolbonema)</i>	49
Body naked; amphid circular		
Position of amphid, on head; striae fine; contour not crenate; wings faint	<i>(Cyartonema)</i>	18
Position of amphid, behind head; striae coarse; contour crenate	<i>(Cincionema)</i>	22
External amphid minute, on the front of the head, tubular, easily overlooked; neck 2-5%		
Striae fine; male postanal tubular organs submedian; pharynx swelling present	<i>(Catanema)</i>	56
Striae coarse, plain; cephalic setae 4 or more; head without striae		
Mouth cavity very small; nema 10mm; males without supplementary organs	<i>(Laxonema)</i>	20
Mouth cavity none; cephalic setae in 3 or more circlets; males without caudal supplements		
Supplementary organs of acorn shape, found in a ventral row near the head	<i>(Stilbonema)</i>	19
Supplementary organs none, but with special pre- and postanal submed. setae	<i>(Stilbonema)</i>	19
Oesophagus plain, i.e. without median or posterior bulb or swelling of palpable size		
<i>Amphids none</i> so far as known, or difficult to see and easily overlooked		
Wings 10-12; spinneret present; f=; striae fine, plain; cephalic setae 6, subceph. 4	<i>(Porocoma)</i>	11
Wings 2, if any, lateral only, in any case faint		
Spinneret abs.; oesoph. faintly cephaloboid; striae very fine; no setae; faint wings	<i>(Choronema)</i>	14
Spinneret present; amphids minute if any, unclosed		
Female organ single, -f; 6 cephalic papillae only; spinneret doubtful; nema 0.28 mm	<i>(Litotes)</i>	1
Female organs double, f; striae fine, plain; cephalic setae 4; 2 huge somatic glands	<i>(Ionema)</i>	9
<i>Amphids present</i>		
Form of the amphids more or less irregular, often symmetrical to at least one line		
Contour of the amphids linear, i.e. long and narrow		
Lateral wings none; cephalic setae 6, subcephalic 4; f	<i>(Tycnodora)</i>	3
Lateral wings present; head naked or its setae irregular; spinneret present		
Wings prominent; striae coarse; f; inconspicuous pharynx (?)	<i>(Actinonema)</i>	117
Wings faint; striae fine; -f; mouth oblique	<i>(Campylaimus)</i>	5
Contour of the amphids not linear		
Striae interrupted on the lateral fields by wings, plain		
Spinneret absent; oesophagus faintly cephaloboid; f	<i>(Iotalaimus)</i>	15
Spinneret present; oesophagus narrow, one to two-fifths as wide as neck		
Anterior extremity mitriform, very distinctly set off; wings to the cuticle 6-8	<i>(Xennella)</i>	48
Ant. extremity not mitriform; coarse cuticular elements in rows like tiles; f	<i>(Ceramonema)</i>	6
Striae uninterrupted, fine, plain; spinneret present; slender nemas, up to 1.2%		
Head without setae; amphids relatively large and deep; not ocellate	<i>(Schistodera)</i>	4
Head with 4 cephalic setae; amphids small with obvious internal elements; ocellate	<i>(Nemella)</i>	10
Form of the amphids spiral, circular, or elliptical (doubtful in <i>Litotes</i>)		
Shape of the amphids spiral; striae resolvable, not altered on the lateral fields		
Spinneret absent; striae coarse; probably f (?) ; contour crenate	<i>(Alaimella)</i>	7
Spinneret present; striae rather coarse; amphids large		
Head expanded; lip-region elevated, not papillate; cephalic setae 6 plus 10; f	<i>(Nannolaimus)</i>	36
Head not expanded; lips 6, papillate; cephalic setae 4; f	<i>(Alaimella)</i>	7
Shape of the amphids circular or elliptical; spinneret present except perhaps in <i>Litotes</i>		
Lateral wings perhaps pres.; f; striae plain; lipless; pharynx very minute, conoid	<i>(Nemanema)</i>	2
Lateral wings none (or very faint); head rounded; striae none, or very fine		
Cephalic setae ten or more, in two circlets		
Contour of amphids unclosed behind; setae 12, 4 subcephalic; mouth a mere pore	<i>(Litinium)</i>	8
Contour of amphids closed; setae 10, no subcephalic; pharynx minute, conoid	<i>(Linhomoella)</i>	35
Cephalic setae none, or small (4 or 6)		
Setae 4, small; ocellate; amphids small, labial, unclosed; body contains huge glands	<i>(Ionema)</i>	9
Setae none; nemas of very simple structure; wings none or doubtful		
Papillae representing 6 setae; amphid (?) minute; -f; nema 0.28 mm; width 5%	<i>(Litotes)</i>	1
Papillae none; amphids fairly developed, closed; f; nema 2.5 mm; width 1.4%	<i>(Nemanema)</i>	2

*For abbreviations used in the Key, see foot-note p. 223.

PHARYNX PRESENT		New Genera
Wall of the pharynx unarmed (for alternative see page 221, midway)		
<i>Cavity of the pharynx conoid</i> , or irregular		
Oesophagus with median or posterior swelling or both		
Amphids none, or obscure; striae plain, not altered on the lateral fields		
Spinneret none; head subtruncate, naked; contour almost imperceptibly crenate	<i>(Cephalobellus)</i>	23
Spinneret present		
Striae coarse; pharynx minute (none?) without swelling; head non-striated	<i>(Leptonemella)</i>	21
Striae fine; pharynx narrow, enclosed in a swelling; amphids minute labial tubes	<i>(Catanema)</i>	56
<i>Amphids present</i>		
The amphids linear; pharynx (?) ; striae coarse, plain; no wings; setae, 3 circlets		
The amphids spiral, circular, or elliptical; when tubular, surface contour circular		
Form of the amphids a distinct spiral; spinneret present		
Striae coarse; oesophagus ± oxyuroid; wings 8; cephalic setae 6, subcephalic 4	<i>(Dasynema)</i>	34
Striae fine, plain		
Lateral wings only on tail of male; f; pharynx somewhat zigzag; setae minute	<i>(Zalonema)</i>	7
Lateral wings absent		
Head with numerous scattered setae; pharynx small, narrow; onchi vestigial	<i>(Alaimonema)</i>	107
Head not with numerous setae; pharynx fairly well developed; teeth unobvious; f		
Cheeks thickly cutinized; cuticle thick	<i>(Zalonema)</i>	57
Cheeks, if thick, not heavily cutinized; lips 2, large, lateral	<i>(Pseudonchus)</i>	58
Form of the amphids a circle or ellipse; striae unaltered laterally		
Spinneret absent; striae fine		
Intestinal cells with crystals; 6 lips, appendiculate; -f; cephalic setae 10	<i>(Crystallonema)</i>	67
Intestinal cells not with crystals; lips none; -f; cephalic setae papilloid	<i>(Anticyathus)</i>	24
Spinneret present		
Head swollen, unstriated; no pharyngeal swelling; striae coarse, plain		
Cephalic setae 4; lips none; no labial papillae; amphids a single circle	<i>(Cincionema)</i>	22
Cephalic setae none; lips 6, unipapillate; amphids two concentric circles	<i>(Micromicron)</i>	104
Head not swollen or set off; pharyngeal swelling anon present; striae fine, plain		
Pharynx narrow; amphids minute; male postanal organs tubular; setae 4 + 6	<i>(Catanema)</i>	56
Pharynx capacious; amphids well developed, opposite the pharynx or behind it		
Lips 2, lateral; pharyngeal ridges simulate teeth; f; cephalic setae 4	<i>(Pseudonchus)</i>	58
Lips 6, each with a digitate appendage; cephalic setae 10	<i>(Crystallonema)</i>	67
Oesophagus plain, i.e. without median or posterior bulb or swelling		
<i>Amphids irregular</i>		
Spinneret none; striae unaltered laterally; -f; spiral amphid placed on a deltoid part	<i>(Didelta)</i>	33
Spinneret present		
Striae altered laterally; f; head naked, set off; cuticle thick; pharynx armed (?)	<i>(Actinonema)</i>	117
Striae not altered on the lateral fields		
Cephalic setae 12 + 6, in two circlets; -f; amphid inconspicuous	<i>(Leptogastrella)</i>	28
Cephalic setae 6, in one circlet; amphid 1/2 the width of the head; spinneret (?)	<i>(Rhabdocoma)</i>	32
<i>Amphids spiral, circular, or elliptical</i>		
The amphids in the form of a spiral; striae not altered on the lateral fields		
Spinneret none (?) ; amphid 1/2 the width of the head; naked; wings two	<i>(Neurella)</i>	25
Spinneret present		
Buccal cavity with cutinous frame, and 3 apophyses with small apical teeth	<i>(Trogolaimus)</i>	75
Buccal cavity without distinct framework and without teeth of any kind; striae fine		
Ovaries f; striae resolvable; amphid of 4 winds; cephalic setae 6 + 10	<i>(Nannolaimus)</i>	36
Ovaries -f; striae plain; amphids simulating a circle		
Mouth cavity large and obvious; cephalic setae unknown, in any case few	<i>(Margonema)</i>	27
Mouth cavity small; head rounded; cephalic setae large, 4 (special) plus 6	<i>(Linhomoella)</i>	35
The amphids in the form of circles or ellipses		
Striae altered on the lateral fields by wings; spinneret present		
Head set off by a groove, its appendages varied; striae coarse; wings numerous	<i>(Xenolaimus)</i>	30
Head not strongly set off, though usually well developed		
Ovaries reflexed, f; naked; striae fine, plain; pharynx small, obsolescent	<i>(Nemanema)</i>	2
Ovaries outstretched; pharynx well developed, but not large; cephalic setae present		
Striae fine, plain; cephalic setae 6, segmented; -f	<i>(Cytolaimium)</i>	31
Striae coarse; -f		
Cuticle rough from subdivided wings; setae many; lips 3, mandibulate (?)	<i>(Xyala)</i>	72
Cuticle normal; lips 6, papillate, appearing somewhat fimbriate; striae plain	<i>(Daptonema)</i>	66
Striae not altered on the lateral fields		
Spinneret absent; striae fine, plain; female organs outstretched, except <i>Rhabdocoma</i>		
Ovaries two, -f		
Cephalic setae 6, plainly segmented; lips three, papillate	<i>(Cytolaimium)</i>	31
Cephalic setae 4, not segmented; lip-region punctate, amalgamated	<i>(Didelta)</i>	33
Ovary one, subcephalic setae 4		
Cephalic setae 6; f; lips 3, flattish, not digitate	<i>(Rhabdocoma)</i>	32
Cephalic setae 10; -f; lips 6, small, digitate		
Cells of intestine with crystals; amphids not raised; excretory pore labial	<i>(Crystallonema)</i>	67
Cells of intestine without crystals; amphids raised; tail with spicate setae	<i>(Zanema)</i>	68
Spinneret present		
Pharynx obscure		
Lips in two sets, outer large, low; inner soft extensions of the oesophagus	<i>(Zygonemella)</i>	26
Lips not in 2 sets, amalgamated; cephalic setae 4, 3-jointed; phar. prismoid cup	<i>(Rhadinema)</i>	37
Pharynx more or less obvious; striae plain		
Female organs reflexed, f; striae fine; head naked; pharynx small	<i>(Nemanema)</i>	2
Female organs outstretched		
Ovaries two; striae fine		
Mouth cavity small, inconspicuous; cephalic setae 4 (special) plus 6	<i>(Linhomoella)</i>	35
Mouth cavity moderate, in a swelling; cephalic setae 6, plainly segmented; -f	<i>(Cytolaimium)</i>	31
Ovary one, -f; striae coarse; setae 12; lips 6, striate		
Lips conoid, striated, large, tipped with setae, and with a seta near base	<i>(Dactylaimus)</i>	29
Lips flat, papillate, appearing fimbriate, three-ribbed	<i>(Daptonema)</i>	66
<i>Cavity of the pharynx more or less prismoid or cylindroid</i> (not conoid or very irregular)		

	<i>New Genera</i>
Oesophagus with median or posterior bulb or swelling, or both	
Amphids none so far as known, or difficult to see and easily overlooked	
Lateral wings present; spinneret absent	
Striae none; wings 2; naked; pharynx like oesophagus lumen	(<i>Litonema</i>) 12
Striae fine; wing 1; seta-like papillae 6; pharynx contains glottoid organ	<i>Cephalobium</i> 54
Lateral wings absent; striae plain	
Spinneret present	
Striae very coarse; phar. cupshaped; nema 10mm; male, no supplement. organs	(<i>Laxonema</i>) 20
Striae fine; phar. small, enclosed in bulb; male postanal tub. organs submedian	(<i>Catanema</i>) 56
Spinneret absent; setae none	
Phar. very long, nar., ending in cylindrical bulb; 'f'; nema 1mm; lips conoid	(<i>Myctolaimus</i>) 61
Pharynx very short; cardiac bulb oblate or spherical; 'f'	
Nema 3.3mm; width 9%; pharyngeal apophyses present; oesophagus clavate	<i>Blattophila</i> 55
Nema 6mm; width 3%; pharyngeal apophyses absent; oesophagus cylindrical	<i>Protrellus</i> 38
Amphids present.	
The amphids are somewhat irregular, symmetrical to one line; striae fine, plain; wingless	
Form of amphids not lin.; no spinneret, naked; lips 6; phar. tub.; amphids large	<i>Colpurella</i> 39
Form of amphids linear	
Ovary one, 'f'; spinneret absent; cephalic setae 6 plus 4; pharynx tubular	(<i>Myctolaimus</i>) 60
Ovaries two, -f-; spinneret present; ceph. setae 4; ventral (?) onchus near mouth	<i>Pseudolella</i> 53
The amphids are spiral, circular, or elliptical	
Shape of the amphids a distinct spiral	
Striae coarse; oesoph. = oxyurid; wings 8; ceph. setae 6, subceph. 4; head unstr.	(<i>Dasyntema</i>) 34
Striae fine	
Lateral wings present; striae plain; spinneret present; head thick-walled	(<i>Pycnolaimus</i>) 40
Lateral wings absent	
Spinneret none; -f-; cephalic setae 10, subcephalic 4; pharynx obscure	(<i>Laimella</i>) 44
Spinneret present	
Phar. armed in front with 3 obscure equal teeth; setae numerous on head.	(<i>Alaimonema</i>) 107
Pharynx without teeth; head rounded	
Lips 2, lateral; 'f'; striae plain; pharyngeal ridges simulating teeth	(<i>Pseudonchus</i>) 58
Lips none, or very indistinct	
Cephalic setae 10, subcephalic 4; pharynx obscure, has minute onchus	(<i>Laimella</i>) 44
Ceph. setae four? (or none); lips set off; phar. 2-chamb., 2d tapering	(<i>Polytalamium</i>) 59
Shape of the amphid circular or elliptical (anon tubular); striae unaltered laterally	
Spinneret absent; striae plain, fine	
Ovary one, -f-; ceph. setae 10, subceph. 6; amphids circular; pharynx broad	(<i>Crystallonema</i>) 67
Ovaries two	
Cuticle naked; spear (?) minute; ceph. setae 0, 6 pap.; amphids ellip.; 'f'	(<i>Triplonchium</i>) 80
Cuticle not naked; without spear; ceph. setae present; amphids circular; -f-	<i>Anticyathus</i> 24
Spinneret present	
Buccal cavity very small and easily overlooked; cephalic setae present; striae plain	
Striae coarse; phar. minute, cupshaped; males without supplementary organs	<i>Laxonema</i> 20
Striae fine; phar. narrow, bulbous; males with postanal rows of tubular organs	<i>Catanema</i> 56
Buccal cavity very long; 'f'; striae fine; cephalic setae small or none	
Cephalic setae four (?) or none; amphids large, deep; pharynx 2-chambered	<i>Polytalamium</i> 59
Cephalic setae 10, short; amphids small; ocellate; pharynx very long	(<i>Catalaimus</i>) 89
Oesophagus plain, i.e. without median or posterior bulb or swelling	
Amphids none so far as known, or difficult to see and easily overlooked	
Wings present; spinneret present; striae fine; ovaries two, f=; phar. vestigial	(<i>Porocoma</i>) 11
Wings absent; striae fine	
Ceph. setae 10, long, segmented; lips 6, thin, each with seta; amphid minute slit	(<i>Triplepta</i>) 92
Cephalic setae none, or not long or obviously segmented; lips without setae, or lipless	
Buccal cavity tubular; spinneret absent; 'f'; lipless; papillae depressed	(<i>Isolaimium</i>) 41
Buccal cavity not long and tubular; spinneret present	
Ceph. setae 10; lips 6, obvious; dorsal phar. element bent in at lips; 'f' (?)	(<i>Asymmetrella</i>) 70
Cephalic setae 6, papilloid; lipless; -f	(<i>Litotes</i>) 1
Amphids present	
Structure of the amphids more or less irregular, usually symmetrical to at least one line	
Contour of the amphids linear; striae not altered on the lateral fields	
Ceph. setae long, segmented; lips 6, thin, each with seta; amphid minute slit	(<i>Triplepta</i>) 92
Cephalic setae none, or not long and not obviously segmented	
Spinneret absent; 'f'; striae fine; phar. tub.; lips confluent; papillae depressed	(<i>Isolaimium</i>) 41
Spinneret present; female sexual organs double; striae fine	
Buc. cavity tub.; amphids long; striae resolve; onchus ventral (?), obscure	(<i>Pseudolella</i>) 53
Buccal cavity not tubular; amphids more or less stirrup form; striae not resolvable	
Ocellate; cephalic setae none; lips faint; amphids distinct, though small	(<i>Illium</i>) 45
Ocelli 0; setae 10; cutinized dorsal pharynx element bent inward at lips	(<i>Asymmetrella</i>) 70
Contour of the amphids not linear	
Striae altered on the lateral fields; ovaries two, reflexed; spinneret present	
Lateral wings present; striae coarse, like rows of tiles; pharynx narrow	(<i>Ceramonema</i>) 48
Lateral wings none; striae fine, plain; onchia vestigial; six cervical glands	(<i>Anoncholaimus</i>) 93
Striae not altered on the lateral fields, fine	
Spinneret none	
Cephalic setae 4, forward-pointing; amphids more or less deltoid	(<i>Didelta</i>) 33
Cephalic setae 0; amphids more or less reniform	(<i>Colpurella</i>) 39
Spinneret present	
Cheeks thickly cutinized; head conoid; small forward-pointing onchia (?)	(<i>Isonemella</i>) 109
Cheeks not thickly cutin.; head not prom. conoid; no small onchia exc. in	(<i>Anoncholaimus</i>)
Ovaries outstretched, -f-; ocellate; phar. tubular; nearly lipless; ceph. setae 4	(<i>Coinonema</i>) 42
Ovaries reflexed, 'f'; striae fine, plain; pharynx not tubular; head truncate	
Cephalic setae none; ocellate; lips faint; amphids distinct, though small	(<i>Illium</i>) 45
Cephalic setae 10; ocelli none; amphids indistinct	
Dorsal cutinized element of the pharynx bent inward at the lips	(<i>Asymmetrella</i>) 70
Dorsal wall of the pharynx not differentiated; onchia minute	(<i>Anoncholaimus</i>) 93
Structure of the amphids spiral, circular, or elliptical	

	<i>New Genera</i>
Form of the amphids a distinct spiral; spinneret present	
Winged; 'f'; striae coarse, plain; spinneret heavily cutinized; cephalic setae 4	(<i>Cynura</i>) 46
Wings none; female sexual organs double; striae fine, plain	
Ovaries reflexed; no lips; pharynx none or nearly obsolete; ocellate	(<i>Ionema</i>) 9
Ovaries outstretched, -f-; cephalic setae 4; pharynx tubular, narrow	
Spiral amphid of one wind, somewhat hook-form; ocellate; pharynx obscure	<i>Coinonema</i> 42
Spiral amphid of several winds; not ocellate; pharynx well developed	<i>Xinema</i> 47
Form of the amphids circular or elliptical	
Striae interrupted on the lateral fields; lateral wings present; spinneret present	
Female organs single, -f-; amphids 2 concentric circles; setae in groups of 3	(<i>Omicronema</i>) 50
Female organs double, 'f'; amphids not 2 concentric circles; setae not in groups	
Spinneret heavily cutinized; cephalic setae 4; amphids really spiral	(<i>Cynura</i>) 46
Spinneret simple, normal; cephalic setae 10; amphids small, elliptical	(<i>Anoncholaimus</i>) 93
Striae not interrupted on the lateral fields	
Spinneret none; striae fine, plain	
Ovaries 2, -f-; setae 4; amphids more or less deltoid; phar. irregularly papiform	(<i>Didelta</i>) 33
Ovary 1, outstretched; amphids not deltoid	
Amphids very small; ceph. setae in 3 circlets of 6; -f-; cuticle reticulated	(<i>Halanonchus</i>) 51
Amphids large; setae 10, with 6 subcephalic; -f-; lips with digitate processes	
Intestinal cells with crystals; caudal setae none; amphids not raised	(<i>Crystallonema</i>) 67
Intest. cells without crystals; amphids raised; about 10 thorn-like caudal setae	(<i>Zanema</i>) 68
Spinneret present	
Ceph. setae in 3s; coarse, transverse striae resolvable into elongated elements	<i>Omicronema</i> 50
Cephalic setae not in groups; striae, if resolvable, not into elongated elements	
Buccal cavity more or less obscure, easily overlooked; wings none	
Ceph. setae 4, 3-jointed; lips confluent; amphid $\frac{1}{2}$ wide as trunc. head, closed	<i>Rhadinema</i> 37
Cephalic setae 6 or more, minute or papilloid	
Lips none; amphid (?) unclosed behind, minute; head rounded; -f	(<i>Litotes</i>) 1
Lips soft and rather obscure; amphid fairly well developed, closed	(<i>Zygonemella</i>) 26
Buccal cavity obvious; setae only in <i>Halinema</i> long, then twice as long as head is wide	
Ocelli present; ceph. cuticle thick; head distinctly conoid; minute onchia (?)	(<i>Isonemella</i>) 109
Ocelli none; cephalic cuticle not thickened; head not distinctly conoid; no onchia	
Ovaries two, 'f'; striae fine, plain; onchia vestigial; 6 cervical glands	(<i>Anoncholaimus</i>) 93
Ovary one, -f-; striae usually rather coarse; pharynx quite unarmed	
Head end diminished to form a sort of beak; pharynx tubular	(<i>Rhynchonema</i>) 43
Head end not diminished to form a beak; pharynx not tubular	
Setae and amphids large; phar. shorter than head is wide; caudal setae pres.	<i>Halinema</i> 52
Setae and amphids medium size; lips conoid, tips with minute "claws"	(<i>Dactylaimus</i>) 29
Wall of the pharynx armed with teeth or onchia	
Armature spear-like; caudal glands and spinneret typically (usually) absent	
Spear with a bulbous base; striae fine, plain	
Oesophagus plain, faintly cephaloboid; -f-; cuticle with wings	(<i>Aphelenchulus</i>) 81
Oesophagus with a posterior bulb or swelling; cuticle without wings	
Amphids ellip., well devel. internally; 'f'; spear faint; lips 6, faint, unipapillate	<i>Triplonchium</i> 80
Amphids linear, transverse; oesophagus dorylaimoid; 'f'; no labial papillae	(<i>Doryllium</i>) 84
Spear plain, i.e. without bulbous base; striae fine, nearly always plain	
Oesophagus plain, i.e. without median or posterior swelling; spinneret present	
Amphids 0; -f-; cephalic setae 0; head truncate; lip-region set off; spear small "prod"	<i>Iotonchium</i> 82
Amphids present; lip-region not set off	
Amphids symmetrical to one line only; setae 10; pharynx long; spear toothlike	(<i>Catalaimus</i>) 89
Amphids spiral, sometimes faint; 'f'; striae unaltered laterally; cephalic setae 4	
Ocellate; amphids labial; "spear" slender in nar. phar.; lips and papillae none	<i>Onchulella</i> 87
Ocelli none; lips 3, papillate; "spear" toothlike, in an open cavity	(<i>Digitonchus</i>) 95
Oesophagus with posterior swelling which sometimes occupies $\frac{1}{2}$ the neck	
Spinneret present; amphids spiral (?); eyes present; ceph. setae 4; lipless	(<i>Onchium</i>) 83
Spinneret none; striae fine	
Amphids 0; -f-; no ceph. setae; head truncate; lip-region set off; spear a small prod	<i>Iotonchium</i> 82
Amphids present	
The amphids elliptical; spear-tip bent; 'f'; lips 6, bipapillate	(<i>Campydera</i>) 88
The amphids symmetrical to one line only; lips set off by constriction	
Female organs double, 'f'; spear long and very slender; pre-rectum very long	(<i>Leptonchus</i>) 85
Female organ single, 'f'; spear short, not slender; pre-rectum short	
Posterior oesophageal swelling short, not set off by constriction in front	(<i>Doryllium</i>) 84
Posterior oesophageal swelling long, set off by constriction from previous part	<i>Axonchium</i> 86
Armature of one or more teeth	
Tooth one (for alternative see top Page 223: "Teeth two-")	
Oesophagus with a median or posterior bulb or swelling, or both (for alternative see Page 222)	
Amphids none or unknown, or so inconspicuous or faint as to be difficult to see	
Striae fine, plain; spinneret none; 'f'; naked; lips 6, bipapillate; spear bent at apex	<i>Campydera</i> 88
Striae altered on the lateral fields	
Wingless; spinneret present; onchulus with large dorsal muscle; setae small	(<i>Iotadorus</i>) 115
Wings present	
Spinneret present; striae coarse, resolvable; 'f'; lips retractile; setae 4	(<i>Ptycholaimellus</i>) 116
Spinneret absent; striae fine, plain; 'f'; lips not retractile, naked; spear bent	(<i>Campydera</i>) 88
Amphids present	
Structure of amphids more or less irreg., often symmetrical to one line (for alternative see Page 222)	
Contour of the amphids not linear; spinneret present	
Striae altered laterally; onchus small, well forward; setae obscure; lips 12	(<i>Iotadorus</i>) 115
Striae unaltered laterally; 'f'	
Setae fasciculate; cuticle thick; lips faint	(<i>Xanthodora</i>) 98
Setae not fasciculate; cuticle not thick	(<i>Bobella</i>) 90
Contour of the amphids linear; appearing as transverse slits opposite the pharynx	
Striae altered laterally; spinneret present; 'f'; striae coarse, resolvable	

- New Genera
- Lip-region retractile; cephalic setae 4, rather obviously segmented. *Ptycholaimellus* 116
- Lip-region non-retractile; cephalic setae 10, not obviously segmented. *Rhrips* 118
- Striae not altered laterally, or very little; cephalic setae 10
- Lips thin and flap-like; cephalic setae long and obviously segmented. *Trilepta* 92
- Lips not thin or flap-like; cephalic setae shorter, not obviously segmented; 'f'
- Striae resolvable; pharynx not subdivided; onchus not spear-like; no cervical setae. *Rhrips* 118
- Striae plain; pharynx in distinct chambers; onchus spear-like; cerv. setae long (*Bolbella*) 90
- Structure of the amphids spiral, circular, or elliptical
- Form of the amphids more or less distinctly spiral; spinneret present, doubtful in *Laimella*
- Striae altered on the lateral fields; cephalic setae 4
- Wings present; striae fine, resolvable; lips 6, confluent, bipapillate; -f-. *Pepsonema* 77
- Wingless; tooth with apophysis faintly y-shaped; striae coarse; amphids labial. *Ypsilon* 96
- Striae not altered on the lateral fields
- Onchus one, with its apophysis somewhat y-shaped; striae coarse; setae 4. *Ypsilon* 96
- Onchus not y-shaped, often with small companions
- Amphids distinctly spiral
- Setae 0; body striated (exc. head); pharynx bulb faint, cardiac napiform. *Amphispira* 103
- Setae, cephalic 10, subcephalic 4; non-striated; -f-; onchus spear-like. (*Laimella*) 44
- Amphids appearing circular
- Lips 12-fold; onchus somewhat spear-like; cephalic setae small, 6 plus 10-12. *Mesodorus* 105
- Lips faint, not over 6; onchus not spear-like
- Ovaries -f-; phar. bulbous; amphids circular (?); setae 6 + 6; striae fine (*Bolbolaimus*) 100
- Ovaries reflexed, 'f'
- Striae fine, plain; onchuli minute; lips faint, 6; papillae conical; setae 4. (*Polysigma*) 106
- Striae coarse; head not striated; cuticle thick; cephalic setae fasciculate. *Xanthodora* 98
- Form of the amphids circular or elliptical
- Striae altered on the lateral fields; spinneret present
- Wingless; labial amphids elliptic; striae resolvable; pharyngeal bulb one-sided *Iotadorus* 115
- Wings present; striae coarse
- Female sexual organs single, -f; cephalic setae 4, labial setae 6; wings numerous. *Nudora* 113
- Female sexual organs double, 'f'
- Head expanded, naked; striae not retrorse; tooth small; lips minute, obscure. *Xenonema* 102
- Head not expanded, its setae 4; lips obvious; striae appar. retrorse throughout. *Rhinema* 114
- Striae not altered on the lateral fields
- Cephalic setae none
- Head hemispher. expanded; lips 6, conoid; spinneret pres.; onchus obscure (*Micromicron*) 104
- Head not expanded; lips set off, confluent; no spinneret; 'f'; "spear" bent. (*Campyidora*) 88
- Cephalic setae and spinneret present
- Onchus spear-like; amphids resemble concentric circles; setae in 2-3 rows. (*Mesodorus*) 105
- Onchus not spear-like; amphids not concentric circles; setae, if numerous, fascicled
- Female sexual organs outstretched
- Ovaries two; cephalic setae 6+6; submedian onchia present. (*Bolbolaimus*) 100
- Ovary single; ceph. setae 4; submed. onchia none or vestigial. *Synonema* 110
- Female sexual organs reflexed, 'f'; amphids really spiral
- Submedian onchi present; labial papillae conical; setae 4; striae fine. (*Polysigma*) 106
- Submedian onchi abs.; setae in fascicles; head non-striated; cuticle thick (*Xanthodora*) 98
- Oesophagus plain, i.e. without median or posterior bulb or swelling; amphids present
- Form of the amphids more or less irregular, usually symmetrical to at least one line
- The amphids linear; spinneret present; 'f'; striae coarse, altered laterally
- Striae plain; head naked, set off by constriction; wing 1, prom.; cuticle thick. *Actinonema* 117
- Striae resolvable into rods; ceph. setae 10; wingless; amphid 5-6 times as wide as long *Rhrips* 118
- The amphids not linear; striae not altered on the lateral fields
- Head conoid; cheeks thick; ocellate; onchus minute; phar. narrow; setae 10. (*Isonemella*) 109
- Head not conoid; cuticle of the cheeks not thick; 'f'; striae fine, plain
- Spinneret absent; lips 6, unipapillate; cephalic setae 6; amphid behind pharynx *Onchulus* 94
- Spinneret present
- Buccal cavity extending beyond the nerve-ring; onchus spear-like; ocellate *Catalaimus* 89
- Buc. cavity not unusually long, its dors. element bent at lips; not ocellate *Asymmetrella* 70
- Form of the amphids spiral, circular, or elliptical
- The shape of the amphids a more or less distinct spiral; spinneret present; 'f' or -f
- Striae altered laterally, fine, resolvable; wings present; cephalic setae 10; 'f'. *Acanthochus* 101
- Striae not altered on the lateral fields, coarse, plain
- Spinneret unknown, abs. (?); -f; setae 10; onchi submedian; contour crenate. (*Gonionchus*) 97
- Spinneret present; 'f'
- Lips three; setae 6; amphids labial; onchus digitate. *Digitonchus* 95
- Lips more than 3; setae num., scattered; amphids not lab.; onchi more than 1 (*Croconema*) 112
- The shape of the amphids circular or elliptical
- Striae altered laterally; wings numerous with retrorse bristles; cephalic setae 4. *Rhinema* 114
- Striae not altered on the lateral fields
- Head conoid; cephalic setae 10; spinneret present
- Ocelli none; 'f'; rear portion of oesoph. succession of bulbs; striae fine, plain (*Bolbella*) 90
- Ocelli present; no succession of bulbs in the posterior part of the oesophagus
- Cheeks thick; onchus appressed, minute; pharynx rather long and narrow (*Isonemella*) 109
- Cheeks not thick; onchus digitate, well developed; pharynx not narrow, short *Cophonchus* 108
- Head not conoid; not ocellate; pharynx not long and narrow
- Spinneret unknown; amphids spiral; -f; setae 10; onchisubmed.; contour crenate (*Gonionchus*) 97
- Spinneret present
- Onchi 3, clustered; phar. unobv.; setae scattered; cuticle thick; contour cren. (*Croconema*) 112
- Onchus single, dorsal; -f; cuticle thin
- Setae 4; pharynx small, closed; diameter of amphid $\frac{1}{2}$ the width of the head. *Synonema* 110
- Setae in 2s and 3s; phar. obv., open; diam. of amphid about $\frac{1}{2}$ width of head *Anticyclus* 111

- New Genera
- Teeth two or more
- The teeth more or less equal in size, and usually mobile
- Oesophagus with median or posterior bulb or swelling, or both
- Onchi or teeth have an outward throw; amphids circular; spinneret present; -f. *Aponchium* 79
- Onchi or teeth have an inward throw
- Amphids none, or so obscure as easily to escape notice; f-; teeth (?) 12. (*Synodontium*) 65
- Amphids present
- The amphids horse-shoe shaped, faint; striae fine, unaltered laterally; f-. *Synodontium* 65
- The amphids spiral, circular, or elliptical; striae fine, plain
- Shape of amphids spiral; winged; spinneret pres.; naked; head expanded. (*Pycnolaimus*) 40
- Shape of amphids round or elliptical
- Terminus hamate; amphid minute, $\frac{1}{10}$ the width of the head; winged. *Chamberiella* 64
- Terminus not hamate; amphid $\frac{1}{2}$ the width of the head; wingless; -f. (*Aponchium*) 79
- Oesophagus plain, i.e. without median or posterior bulb or swelling
- Onchi or teeth have an outward throw; amphids present; spinneret present
- Form of amphids symmetrical to one line only; striae fine, plain; pharynx bulbous
- Ovaries two, 'f'; onchi 3, duplex; cephalic setae 6 plus 6; head not set off. *Ironella* 63
- Ovary single, 'f'; lip-region set off; lips 6, bipapillate; spinneret ventral. *Trissonchulus* 78
- Form of the amphids spiral, circular, or elliptical
- The amphids spiral; winged; 'f' (or -f-); lips bipapillate; cephalic setae 4. *Mesonchium* 76
- The amphids elliptical; striae fine, resolvable, unaltered laterally; setae 4. *Apodontium* 62
- Onchi or teeth have an inward throw
- Amphids 0 or unknown; onchi small, apophysate, lips 12, appendiculate. *Gammanema* 74
- Amphids present; spinneret present (questionable in *Crystallonema*)
- Contour of the amphids circular
- Wings many; 3 mandibulate lips; setae in 3 circlets; cuticle rough. *Xyala* 72
- Wing one or none; striae not altered on the lateral fields
- Cephalic setae none; armature of three biting plates or hooks; wingless. *Trippylum* 71
- Cephalic setae ten
- Armature, 18 duplex radiating refractive ribs; winged; -f-. *Monhystrum* 69
- Armature, 6 talon-like or digitate labial elements; -f-. (*Crystallonema*) 67
- Contour of the amphids spiral; striae resolvable
- Winged; ovaries reflexed or outstretched; cephalic setae 4; pharynx cylindrical *Mesonchium* 76
- Wings absent; the 3 onchia enclosed in a bulb
- Onchi small, with heavy apophyses; encl. in swelling; amphid of 2 $\frac{1}{2}$ -3 $\frac{1}{2}$ winds *Trogolaimus* 75
- Onchi large, without apophyses; phar. bulb spheroidal; amphid of 1 $\frac{1}{2}$ winds. *Synonchium* 73
- The teeth usually unequal in size, not mobile
- Oesophagus plain, i.e. without median or posterior bulb or swelling
- Amphids none, or obscure and escaping notice; pharynx with many denticles; 'f'. (*Thoönchus*) 91
- Amphids present
- The amphids irregular, usually symmetrical to one line; spinneret present; 'f'
- Form of the amphids not linear; striae fine, plain; pharynx denticulate. *Thoönchus* 91
- Form of the amphids linear; striae coarse, resolvable; cephalic setae 10. (*Rhrips*) 118
- The amphids spiral, circular, or elliptical
- Form of the amphids spiral; striae coarse, plain, unaltered; spinneret present
- Pharynx and onchi minute, obsc.; lips not thin; setae scattered; amphids small. *Croconema* 112
- Pharynx obv.; onchi plate-like, submedian; lips thin; setae 10; amphids large. *Gonionchus* 97
- Form of amphids circular or elliptical; spinneret present (unknown in *Gonionchus*)
- Winged; amphids large, faint; lips appendiculate; striae coarse, resolvable. *Anazonchium* 99
- Wings none; cephalic setae 10; striae plain; lips thin
- Ovaries 'f'; striae fine; phar. with many denticles; amphids obscure, ellip. (*Thoönchus*) 91
- Ovary -f; striae coarse, contour cren.; onchi plate-like; amphids spiral. (*Gonionchus*) 97
- Oesophagus with median or posterior bulb or swelling, or both
- Amphids none or unknown; pharynx bulbous; striae fine, resolvable. (*Bolbolaimus*) 100
- Amphids present
- Form of the amphids linear; wingless; ovaries reflexed
- Spinneret present; 'f'; striae coarse, resolvable; cephalic setae 10. *Rhrips* 118
- Spinneret absent; 'f'; striae fine, plain; cephalic setae 6 plus 4. *Myolaimus* 60
- Form of the amphids spiral, circular, or elliptical
- Shape of the amphids circular; striae fine, unaltered laterally; spinneret present
- Ovaries reflexed, 'f'; lips bipapil.; setae 4; submed. onchi minute; striae plain (*Polysigma*) 106
- Ovaries outstretched
- Pharynx with distinct spherical bulb; striae resolvable; setae 6 + 6 + 4. *Bolbolaimus* 100
- Pharyngeal bulb a faint swelling; striae plain; cephalic setae 4. (*Aponchium*) 79
- Shape of the amphids a distinct spiral; cuticle wingless; spinneret present
- Onchus spear-like; lips minute, 12; cephalic setae 6 + 12 + 6; striae fine, plain *Mesodorus* 105
- Onchus very small, not spear-like; lips none or obscure
- Lips bipapillate, papillae conical; 'f'; amphids labial; cephalic setae 4. *Polysigma* 106
- Lips non-papillate
- Setae in 6 longitudinal rows; amphids opp. pharynx, $\frac{1}{2}$ the width of the head. *Alaimonema* 107
- Setae none; amphids not opposite the pharynx, $\frac{1}{2}$ the width of the head. *Amphispira* 103

Abbreviations used in Key, not found on p. 341

abs, absent	cutin, cutinized	lin, linear	sim, simple
apophys, apophysate	depr, depressed	nar, narrow	swol, swollen
appar, apparently	devel, developed	numer, numerous	spin, spinneret
arc, arcuate	digit, digitate	obsc, obscure	term, terminus
buc, buccal	dist, distally	obv, obvious	thr, through
chamb, chambered	ea, each	pap, papillae	tub, tubular
clav, clavate	encl, enclosed	pres, present	uni, uniform
col, colored	lab, labial	prom, prominent	unstr, unstriated
cren, crenate			

- New Genera
- BURSA PRESENT:** spicula two, equal; tail more or less arcuate-conoid; no spinneret
 Accessories pres.; no suppl.; spicula $1\frac{1}{2}$ long as anal body width, straightish; -m. *Aphelenchulus* 81
 Accessories none; spicula 2nd as long as anal body diameter, cephalated by constriction
 Supplements 0; spicula L-form; -m; post. half of tail cylindrical; terminus rounded *Iotonchium* 82
 Supplements 2(0)2,1;2, clav-digit, apic; ?m; spicula obtuse, straight; terminus blunt *Myctolaimus* 60
- BURSA NONE**
 Spiculum one, straight, uncephalated, 'm; spinneret none; tail acute
 Accessories pres.; 1;(0)1:1, simple (postanals, single); spicula 2nd anal body width. *Cephalobellus* 23
 Accessories none; supplements present, papilloid; found in insects
 Supplements 2(0)2; spiculum one-fourth as long as anal body diameter; tail conoid *Blattophila* 55
 Supplements simple; spiculum twice as long as anal body diameter
 Anus 90; 1(0)1:1; small access (?); tail hemispheroid, then conoid; terminus conical *Protellus* 38
 Anus 80; accessories (?); tail conical, its terminus pointed *Cephalobellus* 23
 Spicula two, equal, more or less arcuate (exc. *Cophonchus*, *Synonchium*, *Iotalaimus*, *Ironella*, *Bolbinium*, *Myctolaimus*?)
 The spicula jointed, long, not distinctly cephalated, of uniform width; spinneret present
 Supplements none; -m; terminus clavate; spinneret armed; accessories apophysate. *Xinema* 47
 Supplements 25, vent., preanal, simple, rather faint; -m; tail conoid; accs. not apophys. *Rhips* 118
 The spicula not jointed; tail conoid or subconoid (cylindroid posteriorly in *Anticyathus*, *Anticyclus*, *Cophonchus*, *Cyrtanema*, *Gonionchus*, *Daptonema*, *Halanonchus*, *Ironella*, *Anazonchium*, *Monhystrium*, *Schistodera*, *Pepsonema*, *Myctolaimus*, *Rhabdocoma*, *Bobella*, *Thoönchus*, *Trilepta*, *Mesonchium*, *Cytolaimium*, *Tripylum*, *Zygonemella*, *Synodontium* and (?) *Xennella*)
 Accessories to the spicula none, or very faint
 Supplements present; spinneret absent, except in *Synonchium*
 Supps. dorylaimoid; spic. cephalated by expans., width unif; -m; term. rounded *Doryllium* 84
 Supps. all ventral; spicula about $1\frac{1}{2}$ -2nd as long as anal body diameter, uncephalated
 Position of supps. not preanal only; 4 preanal, simple; 1 postanal, not simple; =m? *Colpusella* 39
 Position of supplements preanal only; supplements simple
 No. of supps. 4; spicula not of uniform width; ?=m; tail rather irreg. conoid *Colpusella* 39
 No. of supps. 2; spicula straight, width rather unif; tail conoid-hemispherical *Synonchium* 73
 Supplements none or exceedingly faint
 Spicula slightly cephalated by expansion, unif; tail conoid, then cylindrical; -m- *Zygonemella* 26
 Spicula not cephalated
 Width of the spicula not uniform; spinneret absent (?)
 Spicula straight; about $\frac{1}{2}$ as long as anal body diam.; tail short, bluntly conoid *Bolbinium* 16
 Spicula arcuate; -m; tail conoid, then cylindrical, its term. rounded, $\frac{1}{2}$ as wide as base. *Trilepta* 92
 Width of the spicula more or less uniform; spinneret present, except in *Tripilonchium*
 Spicula straight; tail conoid-hemispherical; term. broad; spinneret a pore. (*Synonchium*) 73
 Spicula arcuate
 Spinneret absent
 Spicula very strongly arcuate; bursa (?); terminus broad, rounded; -m. (*Tripilonchium*) 80
 Spicula not very strongly arcuate; no bursa; terminus not broad. (*Rhabdocoma*) 32
 Spinneret present; spicula not strongly arcuate; no bursa
 Anus 85; tail conoid, then cylindrical; width over 5%; spic. only slightly arcu. *Zygonemella* 26
 Anus 97; term. broad, rounded; width about 1%; -m; single questionable supp. *Nemanema* 2
- Accessories to the spicula present
 Supplementary organs present near the anus (for alternative see middle opposite page)
 The supplements not all ventral; spicula $1\frac{1}{2}$ -1 $\frac{1}{2}$ as long as anal body diameter
 Position, preanal; not simp.; 2 rows 38 ea.; non-unif. spic. uncephalated; -m. *Polystigma* 106
 Position, not preanal only; no spinneret (except in *Catanema* and (?) *Cytolaimium*)
 Form of supplements simple; -m; spicula uncephalated, width rather uniform
 Supplements papilloid, 5 preanal, 4 postanal in pairs. *Iotalaimus* 41
 Supplements discoid, 11 pre-, 5 postanal pairs; spic. $1\frac{1}{2}$ long as anal body diam. *Cytolaimium* 31
 Form of the supplements not simple
 Spicula not cephalated; 16 pairs of supplements; terminus barely swollen; -m- *Cytolaimium* 31
 Spicula cephalated
 Cephalated by constriction, straight?, width not uniform; 9 pairs papillae; 'm *Myctolaimus* 61
 Cephalated by expansion: width of spicula rather uniform
 Arrangement of papilloid supps. 1,1,1,1,1,1(1)2,1,1,3; 'm; term. hooked *Chambersiella* 64
 Arrangement of tub. supps. postanal, submed., about 7 prs.; -m; term. straight *Catanema* 56
 The supplements all ventral; spinneret present (exc. *Anticyathus*, (?) *Anticyclus*, *Neurella*)
 Position, preanal 17, postanal few, simple; spicula uncephalated, tapering (?); -m- *Anticyclus* 111
 Position of supplements preanal only
 Structure of supplements not simple (for alternative see page 225)
 Proximal ends of the spicula not cephalated
 Width not uniform, length $1\frac{1}{2}$ anal body diam.; 37 "campanulate" supps.; -m *Alaimonema* 107
 Width of the spicula more or less uniform
 No. of supplements 1; spicula $2\frac{1}{2}$ times as long as anal body diam., straight; =m (*Ironella*) 63
 No. of supplements 4 or more; terminus more or less blunt
 Apophysis present; spicula 3rd as long as anal body width; supps. 12; 'm. *Aponchium* 79
 Apophysis none; spicula long as anal body diam.; acc. prom.; supps. 4; -m *Acanthonchus* 101
- Proximal ends of the spicula cephalated
 Spicula cephalated by constriction, twice as long as anal body diameter
 Supplements 2, not simple; spicula rather uniform, their cephalation faint; -m- *Bobella* 90
 Supplements 6, mammiform; width of spicula not uniform; -m(?) *Xanthodora* 98
 Spicula cephalated by expansion or contraction; width of spicula rather uniform
 Cephalated by contraction, strongly arcuate, as long as anal body diam.; -m (*Stilbonema*) 19
 Cephalated by expansion
 Supplement one, tubular; spicula nearly straight; tail conoid, then cylindrical
 Length of spicula 5-6 anal body diameters; -m; spinneret bluntly conoid. *Cophonchus* 108
 Length of spicula $2\frac{1}{2}$ anal body diameters; =m; supplement bent toward anus. *Ironella* 63

- New Genera
- Supplements numerous, 8-21
 Length of spic. 2nd anal body width; proximae hooked; supps. 21, flat; -m- *Trogolaimus* 75
 Length of spicula $1\frac{1}{2}$ times as great as the anal body diameter
 No. of protrusile(?) tub. supps. 8; acc. $\frac{1}{2}$ as long as spic., bends away; -m'. *Antomicron* 17
 No. of faint, non-tubular supps. 16; acc. parallel, $\frac{1}{2}$ as long as spicula; -m- *Gammanema* 74
- Structure of supplements simple
 Proximal ends of the spicula not cephalated
 Width of spicula not uniform
 No. of supplements one, flat, faint; accessories, simple, faint; =m(?) *Newella* 25
 No. of supplements 17, low, papilloid; spinneret (?); term. slightly swollen. (*Anticyclus*) 111
 Width of spicula more or less uniform
 No. of supplements two, obscure; accessories stout; term. convex-conoid, acute *Nudora* 113
 No. of supplements 15-20; terminus not acute
 Length of the spicula twice as great as the anal body diameter; 'm. *Anazonchium* 99
 Length of the spicula as great as the anal body diameter; -m- *Halanonchus* 51
- Proximal ends of the spicula cephalated
 Cephalated by constriction, about $1\frac{1}{2}$ as long as anal body diameter; supplements 6-40
 Width of spicula rather uniform; accessories 2, apophysate; -m; term. blunt *Margonema* 27
 Width of spicula not uniform
 Accessory with apophysis; -m-; tail fine, cylindrical; term. blunt; no spin (*Anticyathus*) 24
 Accessories without apophysis, two; terminus convex-conoid, acute. *Bolbolaimus* 100
- Cephalated by expansion or contraction
 The cephalation is by expansion
 Width not unif.; supps. 5-6; -m-; accessory with apophysis; spinneret armed *Halinema* 52
 Width of spicula uniform or apparently so
 No. of supplements 3; spicula $\frac{1}{2}$ times as long as anal body diameter; -m *Rhynchonema* 43
 No. of supplements 25-65; spicula 1 or $1\frac{1}{2}$ times as long as anal body diameter
 Apophysis to the accessory present; -m-; spinneret armed, 3-lobed *Synodnchium* 65
 Apophysis to the accessory none; -m; spinneret unarmed; anus raised *Mesodorus* 105
- The cephalation is by contraction; width of the spicula not uniform
 No. of the supplements 1-3
 Spicula $1\frac{1}{2}$ times as long as the anal body diam.; supps. mere innervations. *Ypsilon* 96
 Spicula twice as long as the anal body diam.; single elevated supp.; -m- *Thoönchus* 91
 No. of the supplements 4 or more; spicula tapering both ways
 Spicula long as anal body diam.; accessory apophysate; -m-; no spinneret. *Anticyathus* 24
 Spicula twice as long as anal body diameter; accessory not apophysate
 Anus 98; width 1.6%; -m-; single elevated supp.; 2 dozen innervations. *Thoönchus* 91
 Anus 92; width 3.8%; -m-; series of ventral supps.; nar. spinneret-tube. *Micromicron* 104
- Supp. organs 0; spinneret pres. (exc. *Crystallonema*, *Tripilonchium*, *Iotalaimus*, *Cephalobium*)
 Inner ends of the spicula not cephalated, or not obviously so
 Width of spicula not uniform; spicula $1\frac{1}{2}$ times as long as anal body diameter
 Form of spic. subarcuate; spin. midway on tail, ventral; 'm-; term. rounded *Trissonchulus* 78
 Form of spicula arcuate
 Apophysis to accessory extends backward; spicula $1\frac{1}{2}$ long as anal body diameter
 Spinneret none; term. unarmed; -m; spic. strongly arcuate; no caudal setae *Crystallonema* 67
 Spinneret present; term. faintly armed; -m-; minute, inconspic. caudal setae *Linhomoella* 35
 Apophysis to accessory none
 Wings to the cuticle present, also in anal region; spicula strongly arcuate. *Xennella* 6
 Wings to the cuticle none
 Accessory inconspicuous; spinneret (?); terminus $\frac{1}{2}$ as wide as base of tail; -m. *Trilepta* 92
 Accessories parallel, then bent away; spin. armed; term. $\frac{1}{2}$ wide as base; -m. (*Stilbonema*) 19
- Width of the spicula more or less uniform
 Length of spicula 2-3 times as great as anal body diameter; acc. with backward apophysis
 Form of spic. straight thr. middle, arc. dist.; 3rd as long as anal body diam.; -m- *Mesonchium* 76
 Form of spicula arcuate throughout, about twice as long as anal body diam.; -m *Cyrtanema* 18
 Length of the spicula $1\frac{1}{2}$ times as great as the anal body diameter
 Accessories massive; supps. 2, obscure; term. convex-conoid; spin. large, acute. (*Nudora*) 113
 Accessories obscure; no supplements; terminus blunt
 Form of spic. very strongly arcuate; rudiment. bursa pres.; no spinneret; -m *Tripilonchium* 80
 Form of spic. not strongly arcuate, rather stout, blunt; no bursa; spinneret? *Rhabdocoma* 32
- Inner ends of spicula cephalated; spinneret present, except in *Iotalaimus* and *Cephalobium*
 Proximal ends of the spicula cephalated by constriction, width not uniform
 Length of the spicula twice or nearly twice as great as anal body diameter
 Apophysis to acc. tapering; tail not striated; spinneret swan's-head form, unarmed *Nemella* 10
 Apophysis to acc. none; tail striated; spin. elongated-conoid, armed; -m. *Ptycholaimellus* 116
 Length of the spicula $1\frac{1}{2}$ times as great as anal body diameter
 Form of spicula straightish; 'm; term. blunt, nearly $\frac{1}{2}$ as wide as base; no spin. *Iotalaimus* 15
 Form of spicula arcuate
 Spinneret none; -m; terminus acute, unarmed; width of the body 3%. *Cephalobium* 54
 Spinneret present
 Spinneret tub.; anus 90; width of body more than 3%; term. unarmed; -m. *Monhystrium* 69
 Spinneret simple; width of body less than 1%
 Terminus swollen; accessories 2; anus 95%; caudal setae faint, anal only; -m-? *Schistodera* 4
 Terminus not swol.; acc. 1, more massive dist.; anus 97.5; setae not anal only *Laxonema* 20
- Proximal ends of the spicula cephalated by contraction or expansion
 Ends of the spicula cephalated by contraction (for alternative see top next page)
 Width of the spicula uniform; spicula about as long as anal body diameter
 Anus 98; -m; cephalum short, faint; anal annules strongly modified ventrally. *Stilbonema* 19
 Anus 94; -m-; cephalum elongated, contraction distinct. *Cinctonema* 22
 Width of the spicula not uniform
 Length of the spicula twice the anal body diameter; -m-; terminus rounded (*Thoönchus*) 91
 Length of the spicula equaling anal body diameter
 Cuticle = $\frac{1}{2}$ radius; annules $\frac{1}{2}$ anal body width, elements not tile-shaped. *Actinonema* 117
 Cuticle less than $\frac{1}{2}$ radius; annules $\frac{1}{2}$ anal body width, elements tile-shaped. *Ceramonema* 48

	<i>New Genera</i>
Ends of the spicula cephalated by expansion	
Width of the spicula not uniform	
Length of spic. equal to 2 anal body diams.; -m-; tail finally cylindrical; spin.? <i>Gonionchus</i>	97
Length of spicula equal to 1½-1¾ anal body diameters	
Apophysis to acc. backward-pointing; spic. 1¼ long as anal body diam.; -m- <i>Coinonema</i>	42
Apophysis to accessory none	
Accessories 2, bending away from the spicula; spinneret unarmed; -m- <i>Zalonema</i>	57
Accessory 1, parallel to the spicula; spinneret armed; -m-(?) <i>Leptonemella</i>	21
Width of the spicula more or less uniform	
Length of the spicula about 1-1½ times the anal body diameter	
Form of the spicula only slightly arcuate	
Tail diminished to a narrow terminus; -m-; accessory ¼ as long as spicula. <i>Zygonemella</i>	26
Tail not diminished to a narrow terminus; accessory ¼ long as spicula, sigmoid. <i>Rhinema</i>	114
Form of the spicula distinctly arcuate, or bent	
Apophysis to the accessory present	
Term. swol.; spin. rounded, unarmed; -m-; proximal 3rd of spic. straight <i>Campylaimus</i>	5
Terminus apiculate; spinneret acute, armed; -m-; acc. soon bends away. <i>Alainema</i>	42
Apophysis to the accessory none	
Spicula not L-shaped; acc. slender, parallel, ¼ as long as the spicula; =m <i>Alainemella</i>	7
Spicula L-shaped; striae resolvable into elements	
Accessory ¼ as long as dark-colored spicula; tail without wings <i>Omicronema</i>	50
Accessory ½ as long as spicula; tail with wings <i>Xyala</i>	72
Length of the spicula about twice to thrice that of anal body diameter (<i>Tripylum</i> , 1½)	
Form of spic. normally straightish, arcuate in strong acc.; spinneret blunt (<i>Leptogastrella</i>)	28
Form of the spicula arcuate	
Apophysis to the accessory present	
The accessory surrounds posterior ¼ of hamate spicula; -m-; caudal setae few. <i>Iotadorus</i>	115
The accessory parallel to narrow spicula; -m-; caudal setae many, in 4 rows <i>Peponema</i>	77
Apophysis to the accessory none	
Accessory tub., strongly developed, enveloping spic.; numer. setae; -m <i>Leptogastrella</i>	28
Accessory not tubular	
Accessory bends away from spic., ¼ long as spic.; -m-; term. blunt, armed <i>Apodontium</i>	62
Accessory parallel to the spicula	
Anus 85; acc. surrounds laterally bent, dark-col. spic.; -m-; spin. armed <i>Daptonema</i>	66
Anus more than 90; spicula not laterally bent, not dark-colored; spinneret unarmed	
Spinneret blunt, tubular; anus 93; -m-; accessory ¼ as long as spicula. <i>Tripylum</i>	71
Spinneret conical, plain; anus 96; -m-; accessory parallel to distal halves <i>Pseudonchus</i>	58

THE NEMA FORMULA

Nema dimensions sometimes vary perceptibly with varying technique. As a rule, information conveyed in the keys, formulae and illustrations is not repeated elsewhere. Following other authors, the measurements for the ovaries are given separately instead of in the form of a single measurement as formerly. Furthermore, the oblique stroke indicating the presence and position of the excretory pore is here, in No. IX, placed below the formula line, the assumption being that the formula shows the nema ventral side down. The general form of the spicula and accessories is shown in the formula for the male, as is also the presence, number and position of the supplements,—indicated by small suffixes before and after the anal measurement figure. The spicula diagrams are of three different degrees of curvature, indicating nearly straight, arcuate and strongly arcuate spicula. The nature of the proximal ends of the spicula is indicated, i. e. whether cephalated, and if cephalated, whether by contraction, constriction or expansion. Also, if it exists, the presence of an apophysis to the gubernaculum is indicated. The short, horizontal marks indicating the wings and the presence and relative diameter of the oesophageal swellings are only dotted when these features are not of a pronounced nature. The mark indicating the presence of a spinneret is either plain or so conventionalized as to indicate that the spinneret is supplied with setae. The absence of any particular mark in the formula is practically always to be taken as indicating that the particular feature in question is non-existent. Doubt is expressed by a question mark. The reason

for calling attention to these special marks is that until one becomes accustomed to them they may appear rather insignificant. Once recognized, they may save the reader considerable time and trouble.

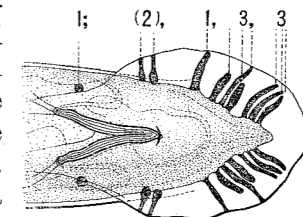
The adjacent table shows the various formula lines by which the number of striae per millimeter is indicated. See also pages 6 and 7, where the various signs used in the formula are explained in full.

Terminology Relating to Striation of Cuticle		
Number of Striae to the millimeter	Corresponding text term	Corresponding formula line
100 down	Very coarse	—
250 ±	Coarse	---
500 ±	Bather coarse	----
750 ±	Bather fine
1000 ±	Fine
1500 ±	Very fine
2000 ± to	None

In this number, the presence of a bursa is indicated by a curved stroke under the transverse anal measurement figure, and the number of bursal ribs in front of and behind the anus is indicated by suffixes in front of and behind the anal measurement figure. Furthermore, as already noted, the form of the spicula and gubernacula is indicated by conventionalized sketches appropriately placed. See, for instance, page 279.

BURSAL FORMULA FOR NEMAS

In the following rather arbitrary designations, which are expressed in a written formula, only the papillae and ribs on one side of the bursa are considered. They are designated according to their proximity to each other and not according to their anatomical and physiological characters. They are regarded as either anal, pre-anal, or post-anal, according as they are opposite to, in front of, or behind the anus. In the graphical bursal formula, the anus is represented by a pair of parenthesis marks; all papillae opposite the anus are indicated in the parenthesis, the pre-anal papillae are indicated in front of the parenthesis, and the post-anal papillae after the parenthesis. The papillae and ribs are considered as a single longitudinal series, and each group is indicated by a digit representing the number of ribs or papillae in the group. The longitudinal spaces separating the groups of papillae and ribs are indicated by commas and semicolons, the comma representing a short space, the semicolon a longer space. In some cases before and after the parenthesis, the punctuation mark may be omitted, thus indicating that the ribs or papillae are even nearer to the anus than in those cases where the separation is indicated by a comma or semicolon. A blank space in the type after the comma, or after the semicolon, indicates a longer space than is indicated by the comma or semicolon alone. By such simple means it is possible to indicate with considerable accuracy the grouping and latitude of these various organs and groups of organs. A glance at the above illustration, Fig. 0, and formula immediately underneath will make the matter clear.



i; (2), 1, 3, 3

GENERAL—Unless otherwise indicated,—

1. The species described under a generic name is to be regarded as the type species of the genus; where more than one species is described, the type species is specifically designated.
2. The text terms and formulae apply to the nemas as viewed in profile. References to stain are restricted to acid carmine.
3. The cuticle is colorless.
4. The cuticle is striated,—sometimes, however, so finely striated as to be resolvable only with the highest powers of the microscope used skillfully under favorable conditions. The division line of the formula is used to indicate approximately the number of striae per millimeter. (See page 227.)
5. The striae are approximately uniform in width throughout the length of the body except toward the extremities.
6. The contour is plain.
7. The striae are not resolvable into secondary elements. The presence of secondary elements is indicated in the formula. (See page 7.)
8. The longitudinal striations are due to the attachments of the musculature.
9. There are no obvious series of pores in the cuticle.
10. There are no eye-spots.
11. There are no definite valves in the oesophageal bulbs.
12. The lining of the oesophagus is a distinct, but not conspicuous, feature, practically throughout its length.
13. The intestine is set off from the oesophagus by a distinct constriction.
14. The arrangement of the granules in the cells of the intestine is not such as to give rise to a tessellated effect.
15. There is no pre-rectum.
16. The rectum extends inward and forward at an angle of about thirty to forty degrees.
17. The tail, at least that of the female, is straight, or nearly so.
18. The somatic, as well as the posterior cervical, setae, are perpendicular to the cuticle, or nearly so.
19. The renette cell lies behind the base of the neck.
20. The nerve-ring surrounds the oesophagus rather squarely.
21. Absence of the formula for either sex indicates that that sex is unknown at the present time.

FEMALE—Unless otherwise indicated,—

22. The vagina is understood to lead inward at right angles to the ventral surface.
23. The uterus is more or less straight.
24. The eggs are thin-shelled and smooth, and are deposited before segmentation begins.

MALE—Unless otherwise indicated,—

25. There is no bursa.
26. The tail of the male is similar to that of the female in form.
27. The spicula are two in number, equal in size, and appear moderately arcuate when viewed in profile, and are simple, i.e., without obvious extra component longitudinal stiffening elements.
28. The accessory piece (or pieces), gubernaculum, lies more or less parallel to the spicula, and has no inward or backward-pointing apophysis.


New Data

Apart from indicating that the nema phylum can be divided into valid, natural orders on the basis of the structure of the mouth parts and related organs, this article records numerous additions to our knowledge of the morphology of nemas. Facts announced in a sentence or two, or through the medium of illustrations, might perhaps have been advantageously made the subject of separate papers. Among these additions to our knowledge, the following may be mentioned:

1. In a miscellaneous lot of over one hundred new genera of nemas, thirty per cent prove to have jointed setae. Probably a much larger percentage have jointed setae. Among the nemas having setae, jointed setae are probably the rule rather than the exception.
2. The distal ends of the cephalic setae sometimes exhibit considerable complexity, indicating that they are specially developed sense organs; e.g., in *Linhomoella* and *Crystallonema*.
3. Additional evidence that bilateral mouth-parts arise by elimination of dorsal elements exists in *Pseudonchus*.
4. There is a large group of nemas with six well-developed onchia having an outward stroke, adapted for digging; e.g., *Apodontium* and relatives.
5. More than ever, it is clear that amphids are practically universal among the free-living nemas. They may be small and difficult to see; as in *Stilbonema* and *Laxonema*. In the past, they have been sometimes overlooked. Some Triplonchs possess amphids; e.g., *Onchium*, *Triplonchium*.
6. All amphids have backward connections,—often, perhaps always, tubular and containing coagulable substance. Of unusual interest are the huge glands of *Ionema*.
7. Lateral series of organs occur in so many of the genera described, as to lend additional weight to the opinion that such series are a normal element of the nema structure.
8. There is much additional evidence of differentiation of form and structure among the various cells of the intestine.
9. The presence of oesophageal glands is established for *Axonchium* and its relatives, (*Dorylaimus*, etc.) They occur in the posterior enlargement of the oesophagus, one emptying into the lumen dorsally in its anterior part, and often two others emptying into the lumen farther back.
10. Non-terminal spinnerets and mouth openings seem practically always ventral; e.g., *Trissonchulus*, *Campylaimus*.
11. A large unicellular gland is connected with each supplement of the males of *Bolbella* and *Eurystoma*.
12. The presence of pairs of cloacal glands in the male, first observed by de Man in *Euchromadora*, is established for many other genera.
13. Cytolaimian transition-forms exist between the parasitic and free-living nemas; e.g., *Monhystrium*.
14. The existence of double-jointed spicula is established for *Rhyps* and *Xinema*.
15. Nemas are disclosed in which the sperm cells are of extraordinary size; such species may prove useful in studies in genetics.
16. *Rhynchonemas* are distributed in various oceans. They are free-living nemas with beak-like heads, but otherwise normal in form. Presumably, this beak serves to extract food from receptacles the entrances to which are narrow.
17. There is a marked absence of syngonism in marine forms.
18. The existence is demonstrated of special spermatheca, in the form of special separate branches of the female sexual organs.

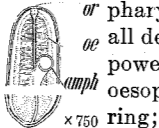
I. Order Litinia

1. *Litotes minuta* n. sp. $\frac{.4}{.7} \frac{13.4}{2.8} \frac{28.}{4} \frac{25-61}{5.1} \frac{88.}{3.2} > 2.8$ Cuticle thin, naked. The mouth opening is almost imperceptibly depressed. The conoid neck carries a conoid oesophagus. The presence of amphids is indicated by slight, narrow external markings of a very faint character. In the region of the nerve-ring the oesophagus is three-fifths as wide as the corresponding portion of the neck, while finally it is five-sixths as wide as the base of the neck; its lining is indistinct, its musculature fine and colorless. No oesophageal glands. The intestine becomes at once three-fourths as wide as the body, is thin-walled, and but few of its cells are required to complete its girth. The intestinal lumen is distinct.

or  $\times 750$ The distinct cardiac collum is two-thirds as wide as the body. Near its beginning the intestine is pressed well to one side by the renette cell, which is more or less ellipsoidal in form and granular in structure. It is about as long as the body is wide and about half as wide as long, and contains a very indistinct nucleus of medium size. There are few granules in the cells composing the intestine. The tail is conoid. Nothing is known concerning the longitudinal fields. The nerve-ring is medium-sized and accompanied by more or less distinct groups of nerve cells. The small indistinct vulva is more or less continuous with the ventral surface of the body. The rather weak, tubular, non-refractive vagina extends obliquely forward apparently about half way across the body. The ellipsoidal granular eggs are about three times as long as the body is wide, and nearly one-third as wide as long. The broad, tapering ovary contains six to eight ova arranged single file.

Habitat: Algae, near the lighthouse, Bahia, Brazil. Bears some resemblance to Monhystra and Oxystoma. Differs from Monhystra in having no pharynx and no distinct amphids; from Oxystoma in the form of the amphids and the form of the female sexual organs. Sublimate to balsam. Fig. 1.*

2. *Nemanema simplex* n. sp. Head with faint traces of papillae on the outer part, indicated by refractions in the cuticle. Possibly the exceedingly minute or pharynx contains an acute, forward-pointing projection or tooth, but all details are so exceedingly minute that even under the very highest powers of the microscope they are resolvable with difficulty. The oesophagus expands but little until after it passes through the nerve-ring; thereafter it expands until near its posterior extremity, where it is two-thirds as wide as the base of the neck; the posterior extremity of the oesophagus stains somewhat differently from the rest. Cardia large, conoid, half as wide as the base of the neck. From the distinct cardiac collum the intestine becomes at once two-thirds as wide as the body; its cross-section comprises about six cells. The lateral fields are about half as wide as the body. When viewed dorso-ventrally the amphids are seen to be connected with refractive, cutinized ducts which lead inward and backward for a short distance and then become indefinite. Tail conoid, its terminus three-fifths as wide as its base. The large, elongated, narrow caudal glands lie tandem on the ventral side in front of the anus, the foremost being removed from the anus a distance three to six times as great as the length of the tail. Observations on the ventral gland and excretory pore

or  $\times 750$

$\frac{.2}{.3} \frac{7.9}{.9} \frac{19.}{1} \frac{31.}{1.4} \frac{97.4}{.8} > 2.5$

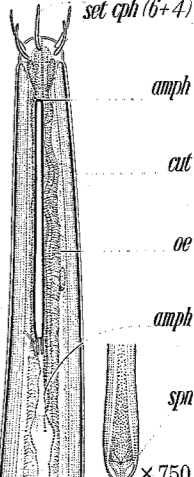
$\frac{.2}{.3} \frac{9.2}{.9} \frac{21.}{1} \frac{51.}{1} \frac{97.1}{1} > 2.2$

* Each figure is designated by the number of the genus it illustrates. If two species of the genus are illustrated, the figures are designated a and b, respectively.

have not been satisfactory, but it appears as if there is a small, narrow, elongated ventral gland a short distance behind the cardiac constriction, where the intestine lies a little to one side. Each lateral field contains large ellipsoidal cells, too large to be placed side by side within its limits; they are placed alternately to one side and then the other. Their size is such that, in the neck at least, if they were arranged single file they would make a continuous series a little more than half as wide as the field and about one-third as wide as the body. From the raised vulva, the vagina leads half way across the body, where it joins the single uterus, which extends backward. The ovary reaches about half way back to the vulva and contains a score or more of developing ova, which are arranged for the most part single file. Anterior branch rudimentary. The elongated eggs are about four times as long as the body is wide and about one-sixth as wide as long. The tail of the male is slightly more arcuate than that of his mate. Opposite the proximal ends of the spicula there is a very low, rounded, ventral elevation. Near the ventral line in front of the anus for a distance two to three times as great as the length of the tail there are a few minute setae, about one-eighth as long as the body is wide, and immediately behind the anus there are one or two similar setae; otherwise there are no indications of special papillae or setae. Spicula about one and one-half times as long as the anal body diameter. Their proximal ends lie near the dorsal side of the body.

Habitat: Algae and marine sand at their bases, in surf, Island off Port Royal, Jamaica. Sublimate to balsam. Fig. 2, p. 230.

3. *Tycnodora pachydermata* n. sp. $\frac{.14}{.36} \frac{13.}{1.2} \frac{23.}{1.5} \frac{13.52, 15}{1.8} \frac{89.6}{.84} > 2.2$ Cuticle thick, glassy; near the head more nearly colorless, sometimes smoky, at any rate after treatment with Flemming's solution; near the middle of the body, occupying one-sixth the radius; near the spinneret much thinner than elsewhere; rather suddenly diminishing in thickness near the nerve-ring. Lining of oesophagus sub-distinct; the musculature fine and colorless. There is no cardia. The thin-walled intestine is separated from the oesophagus by a collum one-fourth as wide as the body. The lumen of the intestine is faint. From the depressed anus the inconspicuous rectum extends inward a distance twice as great as the anal body diameter. Very few granules are to be seen in the intestinal cells. The contents of the intestine are finely granular. The more or less arcuate tail is first conoid, then cylindroid in the posterior fourth, where it is about one-fourth as wide as at the anus. The lateral fields are one-half as wide as the body. From the inconspicuous vulva, the cutinized vagina extends one-third the way across the body. The somewhat cylindroid ovaries extend two-fifths the way back to the vulva and carry twelve to twenty ova arranged more or less single file.

or  $\times 750$

Habitat: "Seagrass," shoal, two miles off Key West, Fla., U. S. A. Flemming to glycerine jelly. Resembles Halalaimus, but the female has two reflexed ovaries. Fig. 3.

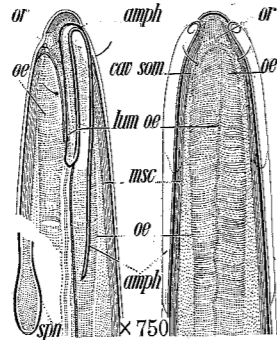
4. *Schistodera exilis* n. sp. $\frac{.1}{.2} \frac{8.2}{7} \frac{15.}{m/.8} \frac{12.4, 15.5}{9} \frac{95.}{7} > 2.7$ The naked cuticle is extremely thin. From the mouth about one-third the way to the anterior margin of the lateral organs, the lining of the oesophageal tube is a little more massive than farther back. The amphids are interesting on account of the presence

in the posterior portion of the cavity of each of a strongly staining body, which may be assumed to be protoplasmic. The bottoms of the amphids are strongly cutinized. Oesophagus conoid, finally about half as wide as the base of the neck; just where it joins the intestine it appears to expand suddenly, although this expansion could hardly be called a bulb. It is possible that this expansion indicates the presence of glands about the base of the oesophagus. The intestine becomes at once three-fourths as wide as the body and in cross-section appears to present only two cells. Little that is definite is known concerning the lateral fields, but it is presumed that they are well-developed. The median fields are rather distinct. They contain a series of cells, at any rate in the neck; these cells are about half as long as the neck is wide and are separated from each other by distances about twice as great as their length. Tail of the male at first conoid, then cylindroid in the posterior half, where it is about one-fourth as wide as at the base. The spinneret has a very minute pore. The caudal glands lie in front of the anus. A straight refractive piece appears to subtend the arc of the spicula. These latter are barely cephalated by an almost imperceptible expansion and a previous constriction. Immediately behind the anus there are two or three minute submedian setae; similarly, close to the anus, and in front, there is a pair of subventral setae,—all seen with considerable difficulty. The balance of evidence is in favor of the existence of two testes.

Habitat: Algae and sand at their bases, in surf, Island off Port Royal, Jamaica. Fig. 4.

5. *Campylaimus inequalis* n. sp. Striae more easily seen along the margin of the amphids. Wings are indicated by the presence in the lateral fields of two

longitudinal lines very close together and barely resolvable with high powers. Like the mouth-opening the cephalic setae are asymmetrically placed. The mouth is a simple, unarmed, conoid depression on the ventral side of the head a little behind the anterior extremity. There are no distinct lips, but the anterior extremity is modified so as to resemble a lip-region; it is set off by a minute constriction and presents a minute depression that takes acid-carminic stain more strongly than do the adjacent parts. No doubt this terminal "cap" serves some distinct function,—as tactile or gustatory. The conoid oesophagus finally becomes almost three-fourths as wide as the base of the neck. There does not appear to be any distinct cardia. Around the base of the oesophagus there is a circlet of small cells which stain in the same manner as do the cells of the intestine. This latter becomes at once about three-fourths as wide as the body. The lateral fields have not been distinctly seen. Nothing definite is known about the renette and excretory pore. Tail conoid to the simple terminus, which is set off by a broad, shallow constriction. The caudal glands appear to be located in front of the anus, probably a long distance in front of it. In the male the anus is slightly raised. Spicula

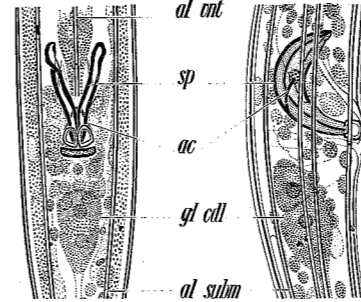
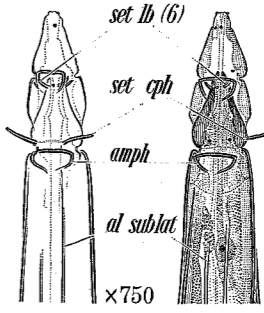


1.2	7.5	17.	21-50-28	85.	
2.1	3.2	4.1	4.5	2.9	> .7
1.3	9.4	17.	2-21	84.	> .6
2.	3.4	3.9	4.2	3.2	

about one and one-half times as long as the anal body diameter, their proximal ends slightly cephalated by expansion. They are rather markedly arcuate in their distal two-thirds, but nearly straight in the proximal third. There seems to be but a single testis.

Habitat: Marine sand and mud, San Pedro, California. Fig. 5.

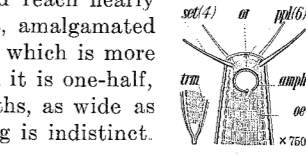
6. *Xennella cephalata* n. sp. The cuticle, which is of medium thickness, is traversed by six to eight longitudinal ribs or wings on each side. There are at least four cephalic setae, possibly six; otherwise the cuticle seems to be naked. The mitriform head is set off by a distinct constriction. The neck is cylindroid. The somewhat conoid oesophagus is at first one-ninth, near the nerve-ring one-fifth, and at last two-fifths as wide as the corresponding portion of the neck. A final obscure swelling contains one or more nuclei, which differ from all other nuclei in the organ. The lining of the oesophagus is indistinct. The intestine is separated from the oesophagus by a collum one-fourth as wide as the base of the neck, and becomes at once two-thirds as wide as the body, and in cross-section presents but few cells. The anterior part of the intestine for a distance about equal to the length of the corresponding body-diameter has a structure different from the portion that follows. The cells of the intestine contain numerous very minute granules. The elongated granular renette cell is about as long as the corresponding body diameter, and lies a little in front of the cardia. It is not reflexed. Apparently the excretory pore is located near the nerve-ring. This latter is oblique, distinct, and broad. The spicula when viewed dorso-ventrally appear to make an angle of about thirty degrees with each other. The specimens were molting.



Habitat: "Sea-grass," shoal, two miles off Key West, Florida. Figs. 6a and b. It is believed only the spinneret was missing from the single specimen measured.

The actual measurements are,—

7a. *Alaimella cincta* n. sp. Cuticle relatively thick. The secondary elements of the striae are on the limits of visibility and reach nearly across the annule. There are probably six, flat, amalgamated lips. The conoid neck contains an oesophagus which is more or less clavate at the rear end. Near the mouth it is one-half, at the nerve-ring two-fifths, and finally three-fifths, as wide as the corresponding portion of the neck; its lining is indistinct. There may be a faint, conoid cardia. Intestine at once about three-fourths as wide as the body, more or less thin-walled, and presenting but few cells in cross-section. The intestinal cells contain numerous, rather uniform granules, regularly placed. From the continuous anus, the cutinized rectum



.0	9.6	19.	22-15	92.5	1.3
4	1.1	1.3	1.5	1	> 1.3
.0	9.7	18.	M	90.3	> 1.3
5	1.1	1.5	1.4	1.1	

is about twice as long as the anal body diameter. Tail conoid. The eggs are two to three times as long as the body is wide. The ova are arranged more or less in single file, and the ovary extends two-thirds the way back to the vulva. The proximal ends of the slender, somewhat tapering, rather frail, subacute spicula lie opposite the body axis. There are two rather frail, simple accessory pieces.

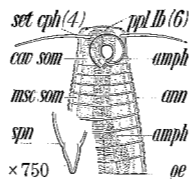
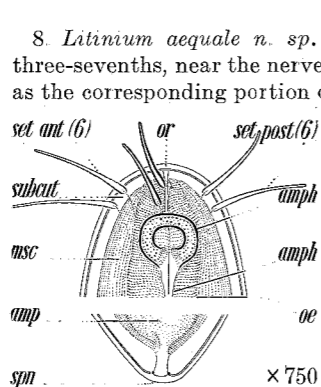
Habitat: Sand-bar, Biscayne Bay, Florida, U. S. A. Flemming to glycerine jelly. Fig. 7a, p. 233.

b. *Alaimella truncata* n. sp. $\frac{.0}{6} \frac{.83}{16} \frac{15.8}{1.5} \frac{39}{1.5} \frac{90}{1.5} > 1.3^{**}$ This, the type species of *Alaimella*, rather closely resembles *Alaimella cincta*. Secondary markings of the cuticle faint, if any. Oesophagus as in *cincta*, except relatively a trifle narrower. Intestine as in *cincta*, but narrow and displaying only two cells in cross-section, the cells containing minute inconspicuous granules. Proximally the slender, uniform, simple, frail and subacute spicula expand much and suddenly, to form flattish cephalae, located about opposite the body axis. There seem to be two simple, frail, sub-slender, more or less arcuate accessory pieces, which are probably joined together at the anus. There appear to exist throughout the length of the body an unusual $\times 750$ number of nuclei ventrad from the narrow intestine, which keeps well to the dorsal side. Both before and behind the anus there are some very slender ventrally submedian setae half as long as the body is wide. Ejaculatory duct about one-third as wide as the body. Forward-pointing testes two-fifths as wide as the body. In the single male examined, which appears to be immature, one testis ended four tail-lengths from the anus, the other five tail-lengths from the anus. At one tail-length in front of the anus there occurred one or two glands (?) with very brilliantly staining nuclei, whose connections remain unknown.

Habitat: Algae, near lighthouse, Bahia, Brazil. Sublimate to balsam. Fig. 7b.

8. *Litimum aequale* n. sp. $\frac{.8}{1.3} \frac{4.5}{1.7} \frac{9.5}{1.8} \frac{12.5^{29}}{1.8} \frac{98.}{1.7} > 1.9^{**}$ Oesophagus at first three-sevenths, near the nerve-ring one-third, and finally three-sevenths, as wide as the corresponding portion of the neck. Its lining is indistinct. There seems to be no distinct cardia. The intestine, which is separated from the oesophagus by a collum three-sevenths as wide as the neck, becomes at once half as wide as the body. Its walls are thick and its lumen faint. The granules contained in the cells of the intestine are numerous and more or less uniform. The anus is more or less continuous, the rectum inconspicuous. The hemispherical-conoid tail tapers from the anus to the terminus. There are no caudal setae. The caudal glands are located in front of the anus. The lateral fields are about one-fourth as wide as the body. The nerve ring is of medium size and on either side of it are obscure nerve cells. From the large, depressed, but rather conspicuous vulva, the vagina leads obliquely backward a distance two-thirds as great as the body diameter. Judging from the size of the ovum just before it leaves the ovary, the eggs are about one and one-half times as long as the body is wide. In the broad, cylindroid ovary are twenty to forty ova arranged single file except in the distal half, where they are arranged irregularly.

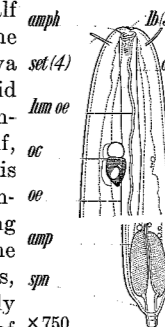
Habitat: Sand, Ocean Beach, Miami, Florida, U. S. A. Flemming to glycerine jelly. Fig. 8.



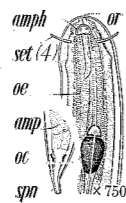
9. *Ionema ocellatum* n. sp. $\frac{.2}{4} \frac{5.9}{1} \frac{7.0}{1} \frac{10.57^{*}}{1.3} \frac{92}{1} > 2.1^{**}$ The thin cuticle is naked except for the cephalic setae. There are no traces of lips. The amphids are very inconspicuous. The neck is cylindroid posteriorly, and convex-conoid anteriorly, especially near the head. The eye-spots are light brown in color, and each has a refractive element in front. In the pigmented portion of each eye there is a more or less central nucleus with a subsidiary, small companion object. The cylindroid oesophagus is at first one-third, near the nerve-ring one-fourth, and finally one-fifth, as wide as the corresponding portion of the body. Its lining is indistinct. There is no cardia. Owing to the presence of large somatic glands, observation of the junction of the oesophagus with the intestine is difficult. The collum appears to be one-fifth as wide as the corresponding portion of the body. The intestine is two-thirds to three-fourths as wide as the corresponding portion of the body, and is thick-walled, and has a very faint lumen. The cells of the intestine, which appear somewhat as if overlapping, contain more or less uniform, yellowish, scattered granules; they have large, spherical, granular nuclei with conspicuous nucleoli. The arcuate, conoid tail tapers from the anus to the unarmed convex-conoid terminus. The conoid spinneret is simple in structure. The ellipsoidal caudal glands occur in a loose tandem series in the anterior half of the tail. There are no caudal setae. The lateral fields are two-fifths as wide as the body. The granular, elongated, pyriform renette is one and one-half times as long as the body is wide, and one-half as wide as long. It is not reflexed and lies near the middle of the body, a little in front of the flexure of the front ovary. The nerve-ring is of medium size and is accompanied by rather obscure nerve cells. From the small, elevated, more or less inconspicuous vulva the medium-sized vagina leads inward half way across the body; it is more or less strongly cutinized. The size, form and covering of the eggs is unknown, but the ripe ova are about as long as the body is wide. The broad, cylindroid ovaries extend five-sixths the way back to the vulva, and contain about twenty ova, arranged single file in the proximal half, but irregularly in the distal half. The duct of the renette is necessarily very long and is slender; there is a distinct, elongated ampulla, with a very long and very slender duct leading from it to the pore. This latter duct is about as long as the body is wide. This genus, of which there are several species, is made very remarkable by the possession of a pair of relatively huge glands filling most of the body cavity behind the base of

the neck and ending two and one-half times as far behind the neck as this latter is behind the head. The points of exit of these glands appear to be at the head end. Each gland has a nucleus near its blind end. In the vicinity of the nerve-ring the glands diminish in size, and half way from this point to the head appear to come to a narrow, rounded end, strictly lateral in position, and from thence there appear to be narrow ducts leading toward the lip-region to pores, where foreign particles are seen to cling, and which are designated in the drawing as amphids. Near the middle these glands are pressed to one side by two sub-dorsal cells, apparently nerve cells.

Habitat: Marine algae, Panama. Hot sublimate to balsam. This genus is of wide occurrence in tropical oceans; specimens from both the East and West Indies are known to the writer. While specifically different, these forms do not vary much one from another. Fig. 9.



10. *Nemella ocellata* n. sp. $\frac{.4}{4} \frac{8.4}{1} \frac{16.5}{1.1} \frac{4^m}{1.2} \frac{91}{1.2} > 1.7^{**}$ Except for the cephalic setae, the thin cuticle is naked. At a distance from the anterior extremity about equal to the width of the head, the striation of the cuticle ceases, so that the head is set off by an absence of striations, as well as by a slight thickening of the cuticle. The neck is cylindroid. From the faint amphids, an inner element can be traced backward to near the base of the head. The two eyespots are brownish in color, and each has a colorless lens. The oesophagus, which has an indistinct lining, is at first one-half, near the nerve-ring also one-half, and finally three-fifths, as wide as the corresponding portion of the neck. There is no cardia. The intestine, which is set off from the oesophagus by a collum one-half as wide as the neck, becomes at once three-fourths as wide as the body. Its wall is thick, its lumen faint, and it is made up of cells of such a size that probably only two are required to complete a circumference. These cells are packed with colorless granules of variable size, the largest of which are about one-twentieth as wide as the body. The tail is conoid to the convex-conoid spin-



neret, which at its base is one-third as wide as the base of the tail, and has somewhat the profile of a swan's head. No setae were seen on the tail. At their widest part the simple, frail, tapering, subacute spicula are about one-fifth as wide as the corresponding part of the body. Their proximal ends, which are minutely cephalated by contraction and constriction, appear to lie a little ventrad from the body axis. They are supported by a simple, frail, slender, faintly S-shaped accessory, with a tapering apophysis (?) extending backward from the spicula at an angle of about ninety degrees, and about one-third as long as the anal body-diameter, its proximal end lying opposite the caudal axis. Whether there is one testis or two remains to be determined.

Habitat: Eel-grass, Biscayne Bay, Miami, Florida, U. S. A. Flemming to glycerine jelly. Fig. 10.

11. *Porocoma striata* n. sp. $\frac{.3}{3} \frac{13}{1.5} \frac{28}{1.5} \frac{34.5^2}{1.7} \frac{90}{1} > .9^{**}$ The rather thin cuticle appears to be destitute of setae except at the extremities. The body is traversed nearly from end to end by about ten to twelve wings. Between the wings the transverse striae seem to be resolvable into excessively minute elements. In addition to the cephalic setae, there is a ventral seta-like organ, opposite the sub-cephalic setae and just behind the excretory pore. This is a little stouter, longer, and more blunt than the cephalic setae, and seems to have a special relation to the excretory pore. The mouth is surrounded by relatively thick, minute lips. It is possible that a more or less vestigial pharynx extends back to near the cephalic setae, its presence being indicated by a slight difference in the lining of the canal, and by a break in the musculature. Posteriorly the neck is cylindroid, anteriorly convex-conoid. No distinct traces of amphids have been seen, but possibly obscure ones exist opposite the bases of the lateral setae. The oesophagus is cylindroid, then conoid in its posterior eighth. Near the head it is one-half, near the nerve-ring two-sevenths, and finally three-fourths, as wide as the corresponding portion of the neck. Its lining is indistinct. There is a flattish cardia, one-half as wide as the base of the neck. The thick-walled intestine is separated from the oesophagus by a collum one-half as wide as the base of the neck and becomes at once two-thirds as wide as the body, and would present two to three cells in cross-section. Its cells contain scattered granules of variable size, the largest of which have a diameter about equal

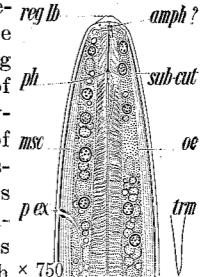
to the width of two of the adjacent annules; tessellated effect faint. The tail, which tapers from in front of the anus, is conoid, and then cylindroid in the posterior half, where it is about one-half as wide as at the base. Apparently the ellipsoidal caudal glands are packed in a close tandem in the anterior fourth of the tail. The lateral fields are one-half as wide as the body. The elongated, outstretched, granular renette cell lies one to two body-widths behind the base of the neck. It is two to three times as long as the base of the neck is wide and about one-fourth as wide as long. The broad oblique nerve-ring is accompanied by obscure nerve cells. While both ovaries are essentially behind the vulva, one of them extends forward a distance about twice as great as the corresponding body diameter, and is then reflexed, and extends backward, so as to lie parallel to the other. The medium-sized, but rather conspicuous vulva is continuous with the ventral surface. The rather strongly cutinized vagina extends inward two-fifths the way across the body. It is possible that the narrow, cylindroid ovaries are reflexed for a short distance near their blind ends.

Habitat: Biscayne Bay, from sponges and associated material. Flemming to glycerine jelly. Fig. 11.

II. Order Bolbinia

12. *Litonema nudum* n. sp. $\frac{1.3}{1.4} \frac{13}{3.5} \frac{21}{4.2} \frac{Y}{4.9} \frac{89}{2} .6^{**}$ The presence of the two wings, which begin on the neck and end near the anus, is indicated by two refractive, longitudinal markings, which occupy a space equal to one-fourth to one-third the width of the body. The cuticle is entirely naked. There appears to be a vestigial pharynx nearly as long as the base of the head is wide,—simple, narrow, tubular, obscure. The neck is conoid. Almost on the front of the head, but near its margin, there are two minute, lateral pores, which may possibly be amphids. Connected with these pores are inner tubular elements, which may be followed backward for a considerable distance. The more or less cephaloid oesophagus has a very faint, elongated, posterior swelling, one-fourth as wide as the base of the neck. Near the pharynx the oesophagus is one-third, near the nerve-ring one-eighth, and in front of the cardiac swelling one-seventh, as wide as the corresponding portion of the neck. The optical expression of the lining of the oesophagus consists of two distinct, refractive lines, having a distance apart about equal to one-tenth the width of the oesophagus. There is no cardia. The thick-walled intestine presents a faint lumen, and becomes at once five-sixths as wide as the body. Anus continuous; rectum inconspicuous. The cells of the intestine are packed with granules of rather uniform size, the largest of which are one-seventh $\times 750$ as wide as the body. The conoid tail tapers from in front of the anus. There are no caudal glands. The lateral fields are probably one-third as wide as the body. The excretory pore and the duct leading to it are so refractive as to be easily visible.

Habitat: About the roots of the lady's slipper, *Cypripedium acaule* Linn., sphagnum swamp, Wisconsin, U. S. A. Flemming to balsam. Fig. 12.



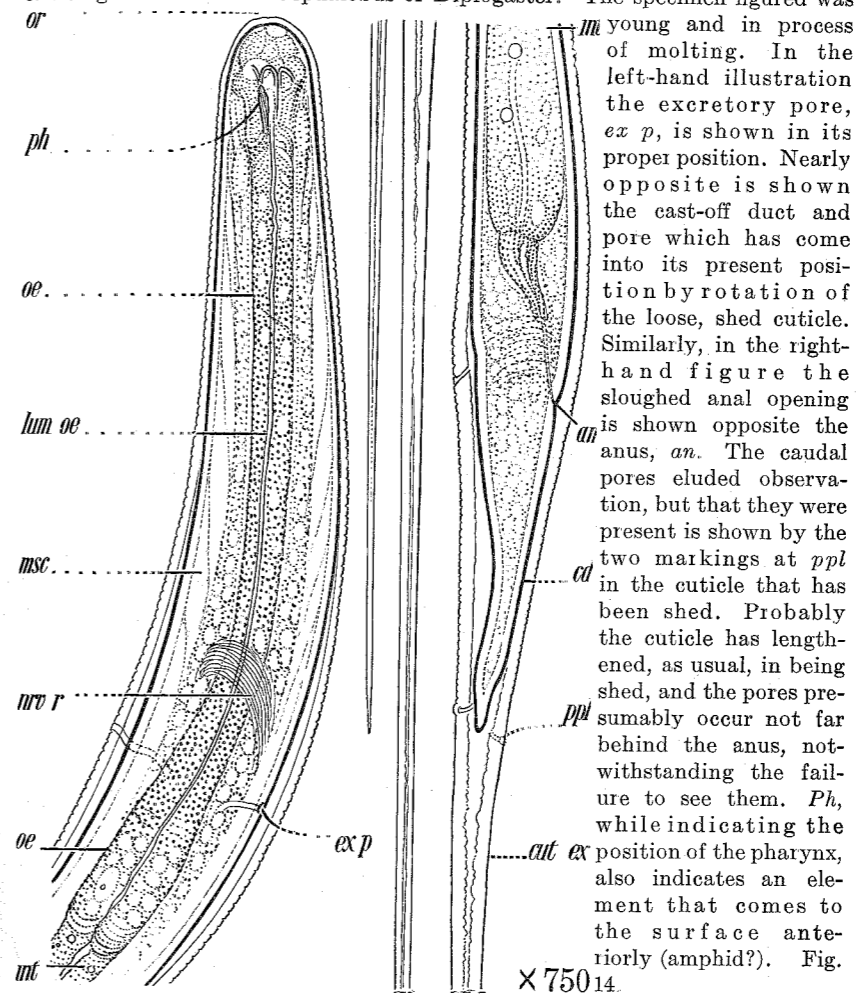
13. *Hyalaimus brevicollis* n. sp. $\frac{1.7}{1.2} \frac{2}{2} \frac{4.5}{2.7} \frac{25}{5.1} \frac{25}{1.7} \frac{90}{2.3}$ The colorless, naked skin displays irregular markings and a finely crenate contour. The colorless, transparent, conoid neck ends in a truncate head without setae and having very flat lips, if any. Six rather conspicuous, sub-marginal, wart-like papillae occur in a circlet on the front of the head. No amphids are to be seen. The mouth is a mere depression one-sixth as deep as the head is wide; from it faint apophyses, of which the ventral is the longest and most conspicuous, extend backward and seem to indicate that the real depth of the pharynx is equal to the length of the distinct pharyngeal bulb, and accordingly the dimensions are so given in the above formula. The somewhat phalangiform oesophagus begins with the bulb just mentioned as filling the head, and which is two-fifths as long as the neck. Behind this bulb there is a broad, shallow constriction, the remainder of the oesophagus being fusiform and in its widest part two-thirds as wide as the neck. For a short distance the irregular intestine, three-fourths as wide as the body and separated from the oesophagus by a not very deep constriction, appears transparent and almost bulbous. The cardiac cavity is small and the cardia very flat. The large cells composing the intestine are filled with small granules, displaying no very definite arrangement. The narrow, colorless, transparent rectum is thrice as long as the anal body-diameter, and has a distinct lining. The ventral excretory pore is situated as far behind the cardia as the head is in front of it, the duct in the immediate vicinity being very transparent and distinct, and having a distinct lining. The granular lateral fields are one-fourth as wide as the body, and from head to tail a finely crenulate, cuticular wing extends along each lateral line. The tail of the female is conical to the pointed terminus. The unusually large, flat, elevated vulva is two-thirds as wide as the body, and from it the vagina extends backward a distance greater than the body-diameter. The two straight uteri in the only specimen seen contained six to eight eggs, each a little longer than the body width, and measuring 56-60 x 132-140 microns. The ovaries extend two-thirds the distance to the cardia and anus respectively and contain ova arranged single file.

Habitat: Intestine of an earth-worm, Moss Vale, New South Wales, Australia, April, 1894. It is not certain that this nema may not be con-generic with one or more of those mentioned by earlier authors under the generic names *Anguilla*, *Nematodum*, etc., nemas also found in earth-worms, but insufficiently described; hence the proposal of a new genus for its reception.

14. *Choronema simplex* n. sp. $\frac{1.4}{1.6} \frac{10}{2.1} \frac{15}{2.6} \frac{Y}{2.6} \frac{67}{1.8} 1''$ The thin cuticle is entirely naked. The wing, which begins near the head and ends on the tail, is possibly double in structure. There is no cardia. The rather thick-walled intestine is separated from the oesophagus by an indistinct collum one-half as wide as the base of the neck, and becomes at once about three-fifths as wide as the body. It has a faint lumen and presents few cells in cross-section. Anus subcontinuous; rectum inconspicuous. The cells of the intestine contain scattered colorless granules of variable size, the largest of which are one-fifteenth as wide as the body. In the specimen examined the tail was destined at the next molt to become very much shorter, so that the anus would lie at about 90%, and the tail would therefore be about four times as long as the anal body-diameter. Two sublateral papillae existed on the tail nearly opposite each other.

Habitat: Soil about the roots of plants, Arlington Farm, Virginia, opposite

the city of Washington, U. S. A. Flemming to glycerine jelly. This species, of which but a single young specimen has been seen, has the general appearance of being a deteriorated *Cephalobus* or *Diplogaster*. The specimen figured was



15. *Iotalaimus striatus* n. sp. Cuticle naked; the striae interrupted by well-developed crenate wings one-fifth as wide as the body. Between the wings is a straightish refractive line, due to a continuous, cuticular structure. On some specimens the outer contour of the wings consists of a doubly refractive line. There appear to be four faint, submedian cephalic papillae. The amphids are faint. It is possible that there is a vestigial pharynx. The oesophagus is very faintly cephaloboid in form. The anterior two-fifths is cylindroid and averages only about half as wide as the corresponding portion of the neck; thence backward the oesophagus diminishes gradually so that opposite the nerve it is only about one-fourth as wide as the middle of the neck. It continues to have this diameter for some distance, but finally begins slowly to expand, so

