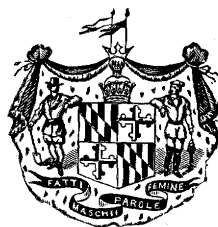


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**A Survey of The Marine Nematodes
of Chesapeake Bay, Maryland**

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A SURVEY OF THE MARINE NEMATODES OF CHESAPEAKE BAY, MARYLAND

INTRODUCTION

Few investigators have studied the free-living marine and brackish water nematodes of the North American coasts. Leidy (1855) reported two species; Cobb (1914, 1915, 1917, 1920, 1922, 1928a, 1928b, 1929a, 1929b, 1929c, 1930, 1932, 1933) has done monumental work in this field; Steiner and Albin (1933), Chitwood (1935a, 1935b, 1936a, 1936b, 1937, 1951), Chitwood and Chitwood (1938), Allgén (1947a, 1947b), and Timm (1951b, 1952) complete the list of investigators. The marine nematodes of North America have been collated systematically with a key to identification by Chitwood (1951).

The only report of the nematode fauna of Chesapeake Bay is that of Cobb (in Cowles, 1930), based on a collection of several hundred nemas made by the United States Fisheries Commission Steamers "Albatross" and "Fish Hawk." In this preliminary report Cobb states that at least a dozen genera are represented and more than twenty species, some of them new. No further record was published. Thanks to Dr. G. Steiner of the Division of Nematology, Bureau of Plant Industry, Beltsville, Maryland, we have had the opportunity to sample this collection. We found that most of the nematodes were the larger and more common forms already present in our own collection. Since the locations in the Bay were not given, we have not used the material in our survey. A survey of the Norfolk Peninsula by Ferguson and Jones (1949) lists five species of nematodes, but the spelling errors betray an unfamiliarity with this group.

The study here reported is a survey of the most common non-parasitic nematode families of Chesapeake Bay, Maryland, with descriptions and figures, so that ecological workers and students of invertebrate zoology may be encouraged not to pass over this highly interesting and abundant invertebrate phylum. This survey is not a complete account of the free-living nematode population of the Bay, however, since only the middle section of the Bay was sampled and since the collections were not made systematically throughout the year.

The physical and chemical factors of Chesapeake Bay may be found in several publications of the Chesapeake Biological Laboratory, Solomons Island, Maryland, and in the records of the Chesapeake Bay Institute, Annapolis, Maryland. How and to what extent the variations in these conditions affect the nematode fauna will be a problem for future workers.

It is desired at this point to express the author's appreciation to the institutions and persons who helped in this investigation. Gratitude is expressed to Dr. B. G. Chitwood who served as Major Professor, to Dr. E. G. Reinhard and Dr. E. R. Kennedy who served as readers, to Mr. Rudolf Scheltema, staff member of the Chesapeake Biological Laboratory, for collecting many of the samples analyzed, and to the Chesapeake Biological Laboratory for substantial cooperation in the study. The research was pursued in, and is a contribution from the Department of Biology, The Catholic University of America. This paper is based on the author's dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy.

METHODS OF COLLECTION AND STUDY

1. Collection.

Selective sampling. In this method various objects are collected—a snail, a barnacle, a hydroid, a certain alga, etc.—and the nemas associated with them are recorded. By this means specific associations may be determined; e.g. *Syringolaimus smaragdus* Cobb, 1928, is a constant associate of the snail *Nassa obsoleta*, living in the algae on its shell (cf. Timm, 1951a).

Screening. In this method bottom dredgings or offshore sand are roiled in a pail with sea water, allowed to settle about 15 seconds, and the supernatant is poured through a series of fine mesh screens, 40 to 320 meshes/ inch. Sieves of 80 and 150 mesh make a highly serviceable series. The final cleaned sediment is washed off into a beaker or jar, from which it can be pipetted into Syracuse dishes for examination under a 20x dissecting binocular microscope.

Screening and Baermann. In this modification of the Baermann technique by Christie and Perry (1951) the sediment after screening is placed in a Baermann apparatus and allowed to stand overnight. A large number of worms is obtained in this way free from debris.

2. Preservation and mounting.

Study of nematodes in the living state is superior to the study

of fixed specimens. Living nematodes can be picked up easily under the dissecting microscope with a finely sharpened bamboo pick and transferred to a drop of sea water on a slide for detailed study. A no. 1 or no. 0 cover slip is used, with small pieces of glass wool or hair as supports to keep from flattening the worms. The cover slip does not have to be ringed if a drop of water is added occasionally from a pipette; in this way specimens can be dismounted quickly for evaporation to glycerin. The nemas can be quieted by heating the slide gently over a lamp. Finer study of specimens can be obtained by using a two-sided mount, prepared after the technique of Courtney (1936).

Nematodes are best preserved in 4% formalin in sea water, and satisfactory temporary mounts can be made in this medium by ringing the cover slip with an equal mixture of paraffin (53°C M. P.) and vaseline, heated to melting. If the slide and cover slip are clean these mounts may even last for years. Permanent mounts can be made by fixing the specimens in AFA (alcohol-formol-acetic) fixative containing a few drops of glycerin and evaporating slowly down to glycerin; the specimens are mounted in a drop of pure glycerin with supports and ringed with lactophenol-gum arabic.

3. Identification.

Although some genera and even species may be recognized by the trained observer under the dissecting microscope, most species have to be determined with the aid of an oil immersion objective. Specific identification requires certain measurements which are commonly expressed as de Man ratio formulae. Large measurements are made with the aid of a camera lucida and finer measurements with an ocular disc micrometer. Relatively straight projection lines may be measured with a flexible celluloid ruler and sharp curves with a pair of draftsman's dividers. In the de Man for-

mula α or $a = \frac{\text{total body length}}{\text{maximum body diameter}}$; β or $b =$

$\frac{\text{total body length}}{\text{length of esophagus}}$; γ or $c = \frac{\text{total body length}}{\text{length of tail}}$. Another type of

formula was employed by Cobb but has not found favor; it can easily be converted into a demanian formula. The range of variation in demanian values which may occur in different families and genera without distinction of species is learned only by experience.

For aid in identification of many common marine nemas the

studies of Schuurmans Stekhoven (1935; hereafter referred to simply as Stekhoven) and W. Schneider (1939) are invaluable. Most of the genera included in this report can be keyed out in the recent study of Chitwood (1951). A simple account of the general anatomy of nematodes may be gained from Chitwood and Timm (1952). A more detailed account will be found in Chitwood and Chitwood (1950) and a summary in Hyman (1951).

COLLECTING STATIONS

Collection of bottom material or of various objects has been made at the following stations. The collection dates, depth (over one foot), and approximate bottom salinities are given for each station.

Annapolis—Mean Salinity 9/51, 11.4 o/oo

Plum Point—10/51, 11 o/oo

Chesapeake Beach—10/51, 11 o/oo

Solomons Island—Mean Salinity 11/51, 16.9 o/oo, 45-50'

Sandy Point—11/22/51, 9.5 o/oo (Anne Arundel County)

Crisfield—11/30/51, 16.5 o/oo, 8-10'

Kent Narrows, Kent Island—11/29/51, 11.1 o/oo, 5'

Baltimore, Broening Park—11/29/51, 8.7 o/oo, 5'

Cambridge, Choptank River—12/1/51, 12.2 o/oo, 10'

Rock Creek, (lower Patapsco River)—1/4/52, 8 o/oo, 6-8'

Gibson Island, Inner Harbor—1/4/52, 8 o/oo, 12'

Annapolis Yacht Club—1/4/52, 9.6 o/oo, 6'

Chesapeake Beach—2/11/52, 10.5 o/oo, 1'

North Beach—2/11/52, 10.5 o/oo

Solomons Island—3/5/52, 11.9 o/oo, 50'

TAXONOMY

We have followed the taxonomy of Chitwood (1951) in this study. All drawings and measurements were made on specimens in the living condition or after mild heat fixation.

Class Aphasmidia

Order—Enoplida

Suborder—Enoplina

Superfamily—Tripyloidea Chitwood, 1937

Family—Ironidae de Man, 1876

Subfamily—Ironinae Micoletzky, 1922

Ironella cobbi new species

Description: Cuticle smooth. Lateral alae not observed. 6 small lips. Long heavily-sclerotized stoma, .15 of the esophageal length,

with 3 large odontia at the anterior end. 6 labial setae, .5 head diameters long. 6 cephalic setae, .6 head diameters long. Amphid probably transverse linear, difficult to observe. Excretory pore at the extreme anterior. Esophageal gland ducts very prominent, opening at the level of the odontia. Nerve ring 38%.

Male unknown.

Female: 1.47 mm; a, 34; b, 3.8; c, 11.9; vulva 50%. Ovary₁ 20%, ovary₂ 22.4% of the body length. Tail $\frac{3}{4}$ conoid, $\frac{1}{4}$ cylindrical, with slightly swollen tip; 6 anal body diameters long. One egg/uterus, 33 x 100u.

Habitat: Bottom mud, Solomons Island, Md.

Remarks: The length and demanian values are all smaller than for *I. prismatolaima* Cobb, 1920, from Woods Hole, Mass., of which only the male has been described (2.1mm; a,50; b,5; c,16.7). Usually the female is somewhat larger than the male. The labial setae as pictured for *I. prismatolaima* are less than $\frac{1}{3}$ the head diameter, while in *I. cobbi* they are $\frac{1}{2}$ the head diameter.

This species is named in honor of N. A. Cobb, late distinguished American nematologist.

Family—Enoplidae Baird, 1853

Subfamily—Leptosomatinae Micoletzky, 1922

Anticoma limalis Bastian, 1865

Description: Cuticle smooth. 6 lips. Slight stoma without sclerotization. 10 cephalic setae, .6 head diameters long. Scattered fine somatic setae. Amphids inconspicuous, pocket-like.

Juvenile: 1.07 mm; a, 32.5; b, 4.3; c, 9.7. Tail 5.5 anal body diameters long.

Habitat: Bottom mud, Cambridge, Md.

Subfamily—Oxystomininae (Micoletzky, 1924)

Halalaimus gracilis de Man, 1888

Description: Cuticle smooth, without lateral alae. Extreme anterior set off by a slight constriction. Anterior circle of 6 cephalic setae, 1 head diameter long; posterior circle of 4 setae, 1 head diameter long. Amphids 18u long or as long as the distance from the forward rim to the anterior of the body.

Male: 1mm; a, 45; b, 4.4; c, 9.2. Spicules 16-24u long, with velum. Gubernaculum small, 2-pieced. Tail 10 anal body diameters long.

Female (immature): 852u; a, 47.3; b, 3.8; c, 7.4; vulva 50%. Tail 10.5 anal body diameters long.

Habitat: Offshore mud, Chesapeake Beach, Md.

Halalaimus alatus new species

Description: Thin pale body with smooth cuticle. Prominent lateral alae extending from the anal region to a point halfway down the tail where they end at a surface groove or pit surrounded by heavy sclerotization. Very narrow tapering head. 6 papillae at extreme anterior. Anterior circle of 6 very short cephalic setae, .25-.3 head diameters long; posterior circle of 4 setae, almost 1 head diameter long. Amphids 18u long, a little longer than the distance from the anterior to the forward rim. Esophagus expands uniformly to the base.

Male: 856u; a, 47.6; b, 3.3; c, 6.3. Testis 42% of the body length from the anterior. Spicules slightly arcuate with a ventral bulge. Gubernaculum compound with a thickened portion between the spicules.

Female: 763-847u; a, 47.1-56.5; b, 3.3-3.4; c, 6.2-7.1; vulva 54%. Both ovaries 32.4% of the body length; 2 eggs, 7.5 x 33u and 10.5 x 45u. Tail 13 anal body diameters long.

Habitat: Bottom mud, Annapolis, Md.

Remarks: In the demanian formula this species resembles *H. gracilis* but differs in the shape of the spicules and in the characteristic lateral alae of the male.

Halalaimus scleratus new species

Description: Cuticle finely striated, at least on tail; thickly sclerotized except at the very anterior, with the sclerotization broken at the anus and not extending up the rectum. Anterior circle of 6 cephalic setae, almost 3 head diameters long; posterior circle of 4 setae, 2 head diameters long. Amphids 26u long or .9 the distance from the anterior to the forward rim of the amphid.

PLATE I

- Fig. 1. —*Ironella cobbi* n.sp., female head.
Fig. 2. —*Anticomma limalis*, juvenile head.
Fig. 3. —*Halalaimus gracilis*, male copulatory apparatus.
Figs. 4-5. —*Halalaimus alatus* n.sp.: 4, male head; 5, male tail.
Fig. 6. —*Halalaimus scleratus* n.sp., female head.
Figs. 7-8. —*Anoplostoma viviparum*: 7, female head; 8, male tail.
Fig. 9. —*Anoplostoma demani* n.sp., female head.

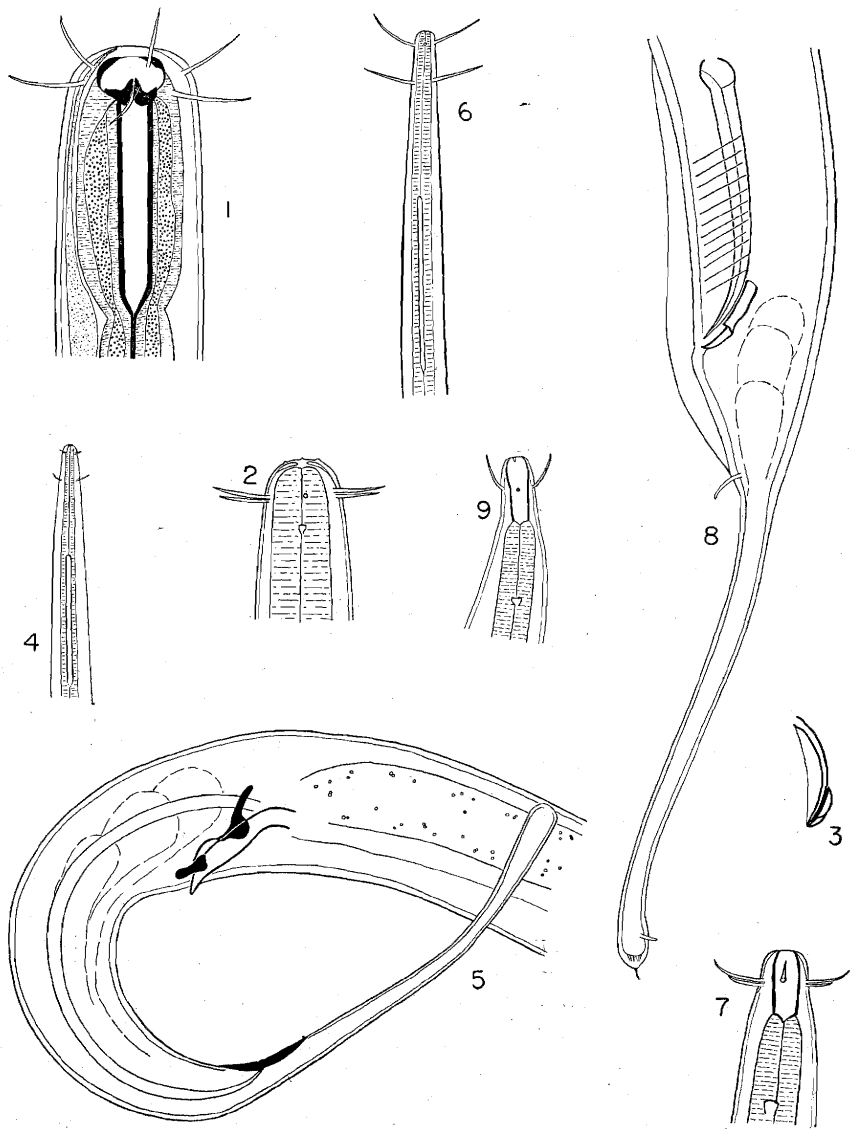


PLATE I

Male unknown.

Female: 1.8mm; a, 80.2; b, 4.7; c, 11.2; vulva 55.3%. Tail conoid-cylindrical with slightly swollen tip, 12.7 anal body diameters long.

Habitat: Bottom mud, Solomons Island, Md.

Remarks: This species is distinctive both in the prominent sclerotization of the cuticle and in the length of the cephalic setae.

Oxystomina elongata (Bütschli, 1874) de Man, 1907

Syn. *Oxystoma elongata* Bütschli, 1874

Description: Cuticle smooth, without lateral alae. Very small and lightly sclerotized stoma. 6 cephalic setae in the anterior circle, about .65 head diameters long; posterior circle of 6 setae, about .25 head diameters long. Amphids 8u long, 6-8 head diameters posterior. Nerve ring 44.4-46%.

Male: 1.6mm; a, 74.6; b, 4.3; c, 19.5. Spicules strongly arcuate with velum, 24u long or 1.9 anal body diameters. Copulatory muscles unusually conspicuous and oblique. Tail 6 anal body diameters long.

Juvenile: 748u; a, 57.5-90; b, 3.5-4.4; c, 10.4-19.6. Tail 5.6-7.2 anal body diameters long.

Habitat: Bottom mud, Annapolis and Solomons Island, Md.

Family—Oncholaimidae Baylis & Daubney, 1926

Subfamily—Oncholaiminae Micoletzky, 1922

Anoplostoma viviparum (Bastian, 1865)

Syn. *Symplocostoma vivipara* Bastian, 1865

Oncholaimellus heterurus Cobb, 1914

Description: Cuticle smooth without lateral alae. Stoma sclerotized, 10.5u deep. 10 curved cephalic setae, the lateral and longer submedian .8 head diameters long, the shorter submedian .65 of the longer. Esophagus slightly expanded at the base. Nerve ring 54%. Tail conoid-cylindrical, slightly swollen at the tip.

Male: 1.06-1.73mm; a, 36.5-54; b, 5.3-6.8; c, 8.8-9.9. Testis extending to the esophageal base. Spicules cephalated, transversely divided, 40u long or 2.3 anal body diameters. Gubernaculum consisting of 2 pieces, 11.3u total length. A prominent blunt seta at the junction of the conoid and cylindrical portions of the tail. Tail 4.3 anal body diameters long.

Female: 1.43-1.51mm; a, 31.1-52.1; b, 6.1; c, 12.5; vulva 48%. Paired reflexed ovaries, 14.5-16% of the body length each. One ovic juvenile/ uterus, 23 x 65u. Tail 7.3 anal body diameters long.

Habitat: Very abundant on barnacles and from bottom material, Plum Point and Solomons Island, Md.

Anoplostoma demani new species

Description: Cuticle smooth. 6 inconspicuous lips. Stoma 9u long, the anterior part with slightly curved walls. 6 cephalic setae, 1 head diameter long. Amphids inconspicuous. Tail .2 conoid, .8 cylindrical, with slightly expanded tip.

Male unknown.

Female: 910u; a, 30.3; b, 4.2; c, 7; vulva 47%. One egg/ uterus, 32 x 45u. Tail 10 anal body diameters long.

Habitat: Bottom mud, Annapolis, Md.

Remarks: This species differs significantly from *A. viviparum* in demanian values and in the presence of only 6 cephalic setae. *A. blanchardi* de Man, 1888 and *A. elegans* Kreis, 1929 are the only other species with 6 cephalic setae. *A. blanchardi* has a *c* value of 14 and the stoma is shorter in relation to its width than in *A. demani*. *A. elegans* has a *b* value of 8.9-10.3.

This species is named for the late J.-G. de Man, an outstanding marine nematologist.

Adoncholaimus lepidus (de Man, 1889)

Syn. *Oncholaimus lepidus* de Man, 1889. *Description:* Cuticle smooth. 3 lips, well set off. Distinct cephalic groove. Large heavily sclerotized stoma, 26-33u long, with 3 well-developed teeth, the large subventral tooth reaching to the base of the cephalic setae, the dorsal and the small subventral tooth reaching beyond the midregion of the stoma. 10 cephalic setae, extremely short; 2 short setae on tail tip. Amphids bowl-shaped, .25-.3 head diameters wide. Excretory pore 1.5-2 stoma lengths from the anterior. Nerve ring 44-46%.

Male: 1.87-2.66mm; a, 34-51; b, 6-7.8; c, 18-23. Long narrow spicules, cephalated, 86u long or 2.3 anal body diameters. Simple gubernaculum. About 7 adanal subventral setae. Tail 3-5 anal body diameters long.

Female: 1.5-2.2mm; a, 21.9-30.7; b, 5.5-6.4; c, 14.5-26.7; vulva

53.4-55%. Ovaries reflexed, ovary₁ 23-26%, ovary₂ 18.7-21.2% of the body length. Demanian system opening 1-1.8 anal diameters anterior to the anus through 2 prominent sclerotized exit pores. Tail 3-3.8 anal body diameters long.

Habitat: Throughout the Bay, but in small numbers.

Remarks: There are minor differences in our specimens from de Man's description: the amphids are larger, the nerve ring is more anterior, and the tail is longer in relation to the spicules.

Oncholaimium oxyure (Ditlevsen, 1911) var. *domesticum*
(Chitwood & Chitwood, 1938)

Syn. *O. oxyuris* (Ditl., 1911) var. *domesticus* Chitw. & Chitw., 1938.

Description: Cuticle smooth. Conspicuous sclerotized stoma, 30u long, with 3 large teeth, the large subventral tooth extending to the base of the cephalic setae and the dorsal and small subventral teeth with their tips at the same level. 10 cephalic setae, the longest .4 head diameters long. Scattered fine somatic setae. Amphids elliptical, .25 head diameters wide. Excretory pore 75u or 2.5-3 stoma lengths from the anterior. Nerve ring 44%.

Male: 3.29-3.37mm; a, 67.5-73.2; b, 7.4-8.9; c, 57-60. Spicules narrow, cephalated, 48u long or 1.7 anal body diameters. Gubernaculum absent. 3 stout subventral setae immediately preanal, 4 postanal. Prominent ventral projection immediately anterior to the tail tip. Tail 1.8-2 anal body diameters long, with inflated cuticle at tip.

Female: 3.5-4.7mm; a, 58.5-71.4; b, 8-8.9; c, 70-78; vulva 61.4-63%. Single anterior ovary, 52% of the body length; one female with about 30 eggs in the ovary and 20 mature eggs in the uterus. Demanian system opening behind the anus; uvette about 1/3 the anus-vulva distance posterior to the vulva. Tail 2 anal body diameters long, with prominent spinneret but with cuticle at tip not inflated.

Habitat: Common and abundant in offshore sand and on barnacles throughout the Bay, but not found there during the winter months.

PLATE II

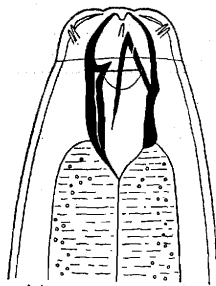
Figs. 11-12.—*Adoncholaimus lepidus*: 11, male head; 12, male tail.

Figs. 13-14.—*Oncholaimium oxyure* var. *domesticum*: 13, male head; 14, male tail.

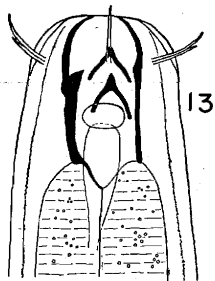
Figs. 15-16.—*Oncholaimus nigrocephalatus*: 15, male head; 16 male tail.

Figs. 17-18.—*Viscosia brachylaimoides*: 17, female head; 18, male tail tip.

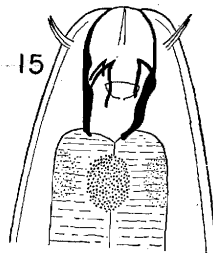
Figs. 19-20.—*Eurystomina paralittorale* n.sp.: 19, juvenile head; 20, juvenile tail tip.



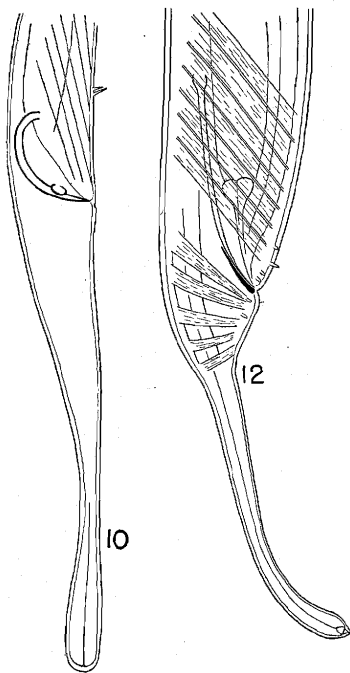
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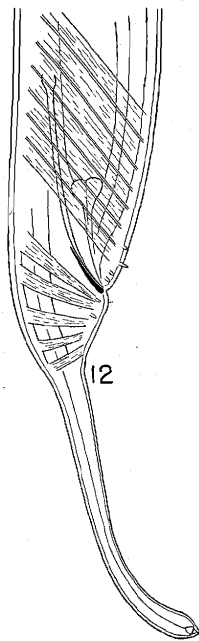
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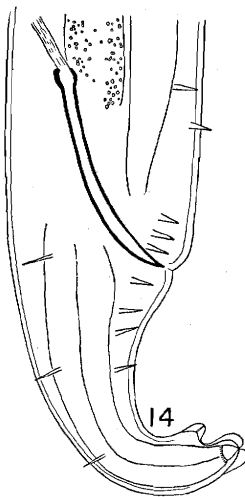
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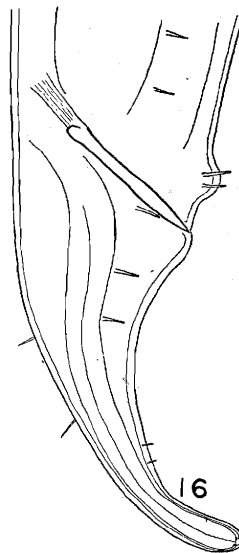
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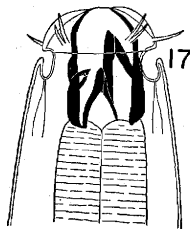
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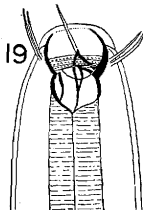
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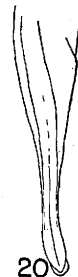
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PLATE II

Oncholaimus nigrocephalatus Cobb, 1930

Description: Cuticle smooth. Stoma heavily sclerotized, 24u deep, the large subventral tooth extending .6 of the stoma length forward, the tips of the other two teeth at the same level about the middle of the stoma. 10 cephalic setae, .3 head diameters long; few scattered somatic setae. Amphids .23 of the head width. Esophagus with 3 dark masses of pigment granules at the base of the stoma (in the living condition). Excretory cell 1.5 esophageal lengths from the anterior; excretory pore 2.5 stoma lengths from the anterior. Nerve ring 50-52%. Tail conoid tapering.

Male: 2.78-3.08mm; a, 52.4-71; b, 7.3-8.3; c, 38.5-39.5. Spicules short and thick, 1.8 anal body diameters long. Gubernaculum lacking. Ventral preanal bump, flanked by 2 subventral setae. About 4 submedian preanal, 6 adanal, and 4 postanal setae. Tail 2.6-2.7 anal body diameters long.

Female: 3.6-3.92mm; a, 51-54.5; b, 8-10.3; c, 40-43.3; vulva 64-67.5%. Prodelphic ovary, 36-38% of the body length; 1-8 eggs, 50 x 70u, with a thick layered shell (3u). Demanian system opening by lateral pores 3 anal body diameters anterior to the anus; uvette 20% of the vulva-anus distance anterior to the anus. Tail 3.6-3.8 anal body diameters long.

Habitat: Abundant and ubiquitous, most common on barnacles and in places where decaying organic matter forms a tangled net.

Remarks: Although Cobb gave no drawings of *O. nigrocephalatus* the nema is easily recognized by the pigmented head and "immobile hemispheroid preanal bump" on the male.

Viscosia brachylaimoides Chitwood, 1937

Description: Cuticle smooth, thin. 6 lips. Distinct cephalic groove. Stoma 13 x 20u, with a large left subventral tooth and small right subventral and dorsal teeth, not reaching to the middle of the stoma. 10 cephalic setae, the longest .2 head diameters long. Amphids .3 head diameters wide, very prominent in lateral view. Nerve ring 42-43.3%. Tail in both sexes ending in a swelling, with inflation of the cuticle at the tip.

Male: 1.87-2.2mm; a, 21-56.7; b, 5; c, 20.3-20.8. Spicules slightly more than 1 anal body diameter. Gubernaculum lacking. Tail 3.5-3.7 anal body diameters long.

Female: 2.37-2.7mm; a, 28.6-31.7; b, 6-7.6; c, 23.7-26.9; vulva

41.3-47%. Ovary¹ 17-19.6%, ovary² 17% of the body length. Demanian system lacking. Tail 3.7-3.9 anal body diameters long.

Habitat: Bottom mud, Solomons Island, Md.

Viscosia papillata Chitwood, 1951

Description: Stoma 18 x 6.5u, with a large right subventral tooth and small left subventral and dorsal teeth. Cephalic sensory organs papilloid. Amphids .3 head diameters wide. Nerve ring 50%. Excretory pore immediately behind nerve ring. Tail attenuated.

Male: 1.5-1.66mm; a, 34.5-46.1; b, 5.1-5.9; c, 11.7-12.9. Spicules; 21u long or 1.2 anal body diameters. 5-6 adanal papillae. Tail 6.4 anal body diameters long.

Habitat: Bottom mud, Kent Narrows, Md.

Subfamily—Eurystomininae (Filipjev, 1934)

Eurystomina minutisculae Chitwood, 1951

Description: Cuticle smooth. Conspicuous sclerotized stoma, 13u deep, with a band of 2 rows of very fine denticles at the anterior third; 1 large subventral tooth and a smaller tooth. 10 cephalic setae, .6 head diameters long. Amphids elliptical, slightly oblique. Small distinct excretory cell 1.5 esophageal lengths from the anterior, with a long fine duct opening opposite the middle of the stoma. Ocelli 40u or 3 stoma lengths from the anterior, the red pigment surviving formalin fixation. Nerve ring 43%.

Male: 3.1mm; a, 72.2; b, 5; c, 25.5. Spicules 58u long or .7 tail lengths. Gubernaculum heavy, 26u long. 2 short subventral setae immediately preanal. 2 preanal supplements, 23u wide, equal; the 1st. supplement .6, the 2nd. 1.1 tail lengths anterior to the anus. Tail 3 anal body diameters long.

Juvenile: 2.1mm; a, 45.3; b, 5.6; c, 25.7. Tail 3.2 anal body diameters long.

Habitat: Sponge, Solomons Island, Md.

Remarks: Our specimens correspond closely to Chitwood's description except in the position of the excretory cell and in the absolute distance of the ocelli from the anterior (60u in his); however, the position of the ocelli in relation to the stoma length is the same.

Eurystomina paralittorale new species

Description: Cuticle smooth. Stoma 12 x 15u, with 3 band of den-

ticles at progressively deeper levels posteriad. 10 cephalic setae, .6 head diameters long. Amphids pocket-like. Excretory cell 2.3 esophageal lengths from the anterior; excretory pore 3 stoma lengths from the anterior. Nerve ring 45%. Ocelli absent.

Juvenile: 1.24-1.5mm; a, 26-31; b, 3.7-4.1; c, 15.1-18.3. Tail 3.7-3.8 anal body diameters long, with slightly swollen tip with cuticular expansion.

Habitat: Bottom mud, Plum Point and Chesapeake Beach, Md.

Remarks: There is much confusion over synonymy in this genus, and specimens are relatively scarce. In Allgén's (1929) meager description of *E. littorale* the *c* value is 40. Bresslau (in Stekhoven, 1935) gives a better description, in which the excretory pore is 1.7 stoma lengths from the anterior and the stoma is 25.5u deep or 2 times as long as wide. These are the chief differences from *E. paralittorale*.

Polygastrophora heptabulba new species

Description: Cuticle smooth. Conspicuous sclerotized stoma, 7.5 x 14u, with a large right subventral tooth extending .7 the length of the stoma and 2 smaller teeth. Sexual dimorphism in the cephalic setae; papilloid in the male and 1 head diameter long in the female. Amphids elliptical, .3 head diameters wide, situated at mid-stoma. Esophagus expanded in the posterior third, with 7 internal and external divisions forming 7 bulbs (obscure in some specimens); width at the base of the esophagus 7 times the width at the stoma. Excretory pore 3.2 stoma lengths from the anterior, with a prominent ampulla near the pore. Nerve ring 46%.

Male: 2.4-3mm; a, 35-39.5; b, 4-4.5; c, 17.5-18.9. Testis 58% of the body length from the anterior. Spicules 74u long or 2.2 anal body diameters. Prominent copulatory muscles extending 6 tail lengths forward from the anus. One preanal seta close to the anus and numerous submedian setae on tail. Tail 2/3 conical, 1/3 cylindrical with slightly swollen tip, 4-4.6 anal body diameters long.

PLATE III

- Figs. 21-22.—*Eurystomina minutisculae*: 21, male head; 22, male tail.
Figs. 23-25.—*Polygastrophora heptabulba* n.sp.: 23, female head; 24, male tail; 25, male esophageal region.
Fig. 26. —*Dorylaimus aestuarii* n.sp., female head.
Fig. 27. —*Chromadora* sp., female head.
Figs. 28-29.—*Chromadorita crassa* n.sp.: 28, female head; 29, male tail.

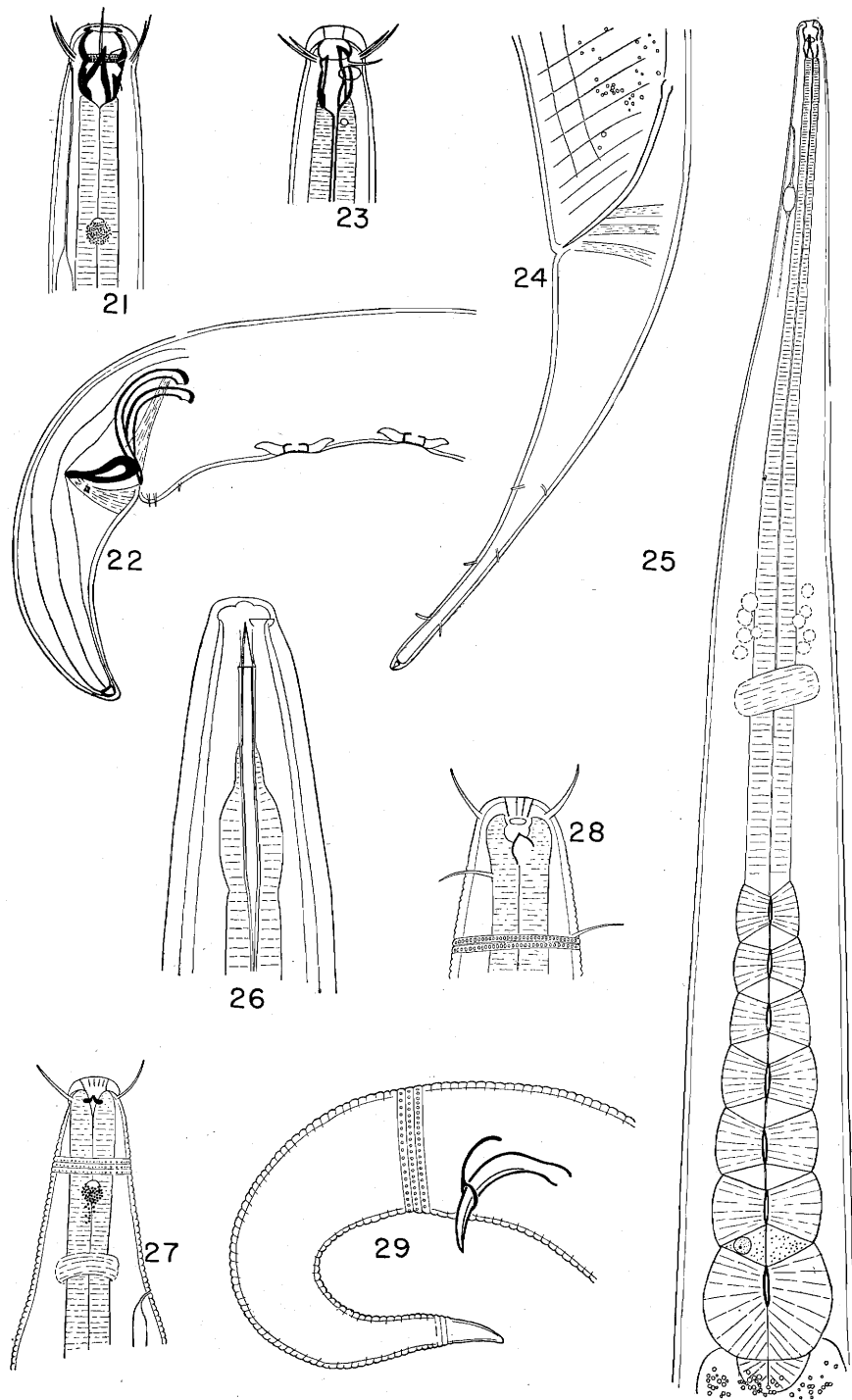


PLATE III

Female (immature): 2.4-2.5mm; a, 39.5-45; b, 4-4.2; c, 17-18; vulva 58-58.7%. Tail 4.4 anal body diameters long.

Habitat: Bottom mud, Plum Point, Md.

Remarks: This species most closely resembles *P. major* Schulz, 1932, in having a 7-bulb esophagus. However, the latter is 1/13-1/15 as narrow at the anterior as at the maximum head diameter, the longest setae are .5 head diameters, the stoma is 3 times as long as wide, the nerve ring is at 66%, and the spicules are 4/5 the tail length (.56 tail lengths in ours).

Suborder—Dorylaimina

Superfamily—Dorylaimoidea Thorne, 1934

Family—Dorylaimidae de Man, 1876

Subfamily—Dorylaiminae Filipjev, 1928

Dorylaimus aestuarii new species

Description: Body very clear and transparent. Cuticle smooth, without longitudinal ridges. Lip region set off by a slight constriction. Spear 19.5u long, aperture 1/3 its length, a little more than 1½ times as long as the lip width, ¼ as wide; extensions 22.5u long. Amphids near lip region. Expanded portion of the esophagus a little less than one-half. Tail tapering uniformly to tip. Intestinal cells with closely packed pale to bright green globules. Pre-rectum 4 times the length of the rectum, 7.5 anal body diameters long. Ovaries reflexed almost to the vulva. Vulva with two large sclerotized pieces.

Male unknown.

Female: 1.7mm; a, 30.6; b, 5; c, 16; vulva 45%. Ovary₁ 21%, ovary₂ 21.2% of the body length; egg at ovarian reflex 27 x 225u.

Habitat: Green algae growing on barnacles from piling, Annapolis, Md.

Remarks: Although the genus *Dorylaimus* is exceedingly large, only three other marine species have been reported: *D. marinus* Dujardin, 1845; *D. maritimus* Ditlevsen, 1913; and *D. teres* Thorne & Swanger, 1936.

Order—Chromadorida

Suborder—Chromadorina

Superfamily—Chromadoroidea Stekhoven & de Coninck, 1933

Family—Chromadoridae Filipjev, 1917

Subfamily—Chromadorinae Micoletzky, 1922

Chromadora quadrilineoides Chitwood, 1951

Syn. *C. quadrilinea* of Chitwood & Chitwood, 1938, nec Filipjev, 1948. *Description*: Cuticle punctate, with 4 rows of larger dots on the lateral fields. Stoma with 3 small sclerotized teeth. Pigment spots posterior to base of stoma. (Specimens lost.)

Male: 544u; a, 20; b, 5.6; c, 6.6. Testis 32.2% from the anterior extremity. Spicules distally forked. 5 preanal supplements.

Female: 552u; a, 17.5; b, 6; c, 6.4; vulva 45.7%.

Habitat: Sponge and *Membranipora*, Solomons Island, Md.

Chromadorita crassa new species

Syn. *C. tentabunda* of Chirwood, 1951, nec de Man, 1890. *Description*: Dense block punctation, not interrupted laterally. Stoma with large dorsal tooth. 12 labial rugae. 4 cephalic setae, 7.5u long or 1 head diameter. Cervical setae, 13-15u long. Somatic setae .3 body diameters long. Amphids transverse, inconspicuous. Esophageal bulb very large, .25 of the esophageal length. Ocelli absent. Excretory cell 33-66u long; excretory pore 2 stoma lengths from the anterior. Tail bluntly tapering.

Male: 351-461u; a, 11.8-15; b, 5.6-5.7; c, 4.9-5.1. Testis 34% from the anterior. Spicules arcuate, cephalated, 26-30u long or 1 anal body diameter. Gubernaculum with distal ring surrounding the spicules. Tail 3-4 anal body diameters long.

Female: 381-526u; a, 8.1-11; b, 5-6; c, 4.7-5.3; vulva 43-47%. Vagina heavily muscled. Ovaries almost .85 body diameters wide; ovary₁ 20.4-22.2%, ovary₂ 20.3-23.6% of the body length. Tail 2.5-3.8 anal body diameters long.

Habitat and Bionomics: Barnacles, Annapolis, Md., and bottom mud, tidepool, Plum Point, Md. In one specimen the intestinal cells were almost entirely filled with round olive-brown solid inclusion bodies, 1.5u in diameter; several of these were in a dividing state. Though stationary in position these inclusion bodies were vibratile within the intestinal cells. Undoubtedly they represent brown algae of the group Zooxanthellae; although the non-flagellated stage of Zoochlorellae and Zooxanthellae is motionless, the vibratory movement we observed was non-flagellar. As far as we are aware this is the first report of Zooxanthellae in the Nematoda. Buchner (1921) does not record any cases of Zoochlorellae or Zooxanthellae in nematodes, although they are found in many lower and higher

phyla. De Man (1884) found yellow-green granules in the anterior part of the caudal region of *Odontolaimus chlorurus* de Man, 1880 and in the lateral fields of *Bastiania gracilis* de Man, 1876, which Dollfus (1946) suggests may possibly be Zoochlorellae; both species were obtained by de Man from damp soil.

Remarks: This species closely resembles *C. tentabunda* (de Man, 1890) Filipjev, 1930, but is distinguished especially by the smaller size and much greater body width; the vulva is not heavily sclerotized as in *C. tentabunda*. Chitwood (1951) called attention to the fact that it might be necessary to separate this species later; our demanian values emphasized this necessity.

Chromadorita schuurmans-stekhoveni new species

Description: Cuticle very coarsely punctate on head and tail regions; finer and closer punctations on the remainder of the body, not interrupted laterally. Stoma shallow, with a large dorsal tooth. 4 cephalic setae, 1.2 head diameters long; very numerous somatic setae, up to .5-.7 body diameters long. Esophagus with prominent bulb. Head $\frac{4}{9}$ the width at the esophageal bulb. Ocelli absent.

Male: 1.02mm; a, 25.4; b, 8.8; c, 10.2. Spicules slightly curved dorsad at proximal end, 1.4 anal body diameters long. Testis extending almost to the esophageal base, $\frac{3}{4}$ body diameters wide. 9 small preanal supplements. Tail conoid tapering, with slightly inflated cuticle at tip, 3 anal body diameters long.

Female unknown.

Habitat: Bottom mud, Chesapeake Beach, Md.

Remarks: This species closely resembles *C. longisetosa* de Coninck & Stekhoven, 1933 in the length of the cephalic setae and in the number of preanal supplements. However, in the latter *c* is 6.46 and the tail is 8.8 anal body diameters long; there is also a difference in the shape of the spicules and gubernaculum.

This species is named after Dr. J. H. Schuurmans-Stekhoven, Jr., Dutch nematologist.

PLATE IV

Figs. 30-31.—*Chromadorita schuurmans-stekhoveni* n.sp.: 30, male head; 31, male copulatory apparatus.

Fig. 32.—*Euchromadora* sp., male head.

Figs. 33-34.—*Hypodontolaimus carinatus*: 33, male head; 34, female vulvar region.

Fig. 35.—*Prochromadorella viridis*, male copulatory apparatus.

Figs. 36-37.—*Prochromadorella chitwoodi* n.sp.: 36, male head; 37, male tail.

Figs. 38-39.—*Parachromadora parva* n.g., n.sp.: 38, male esophageal region; 39, male tail.

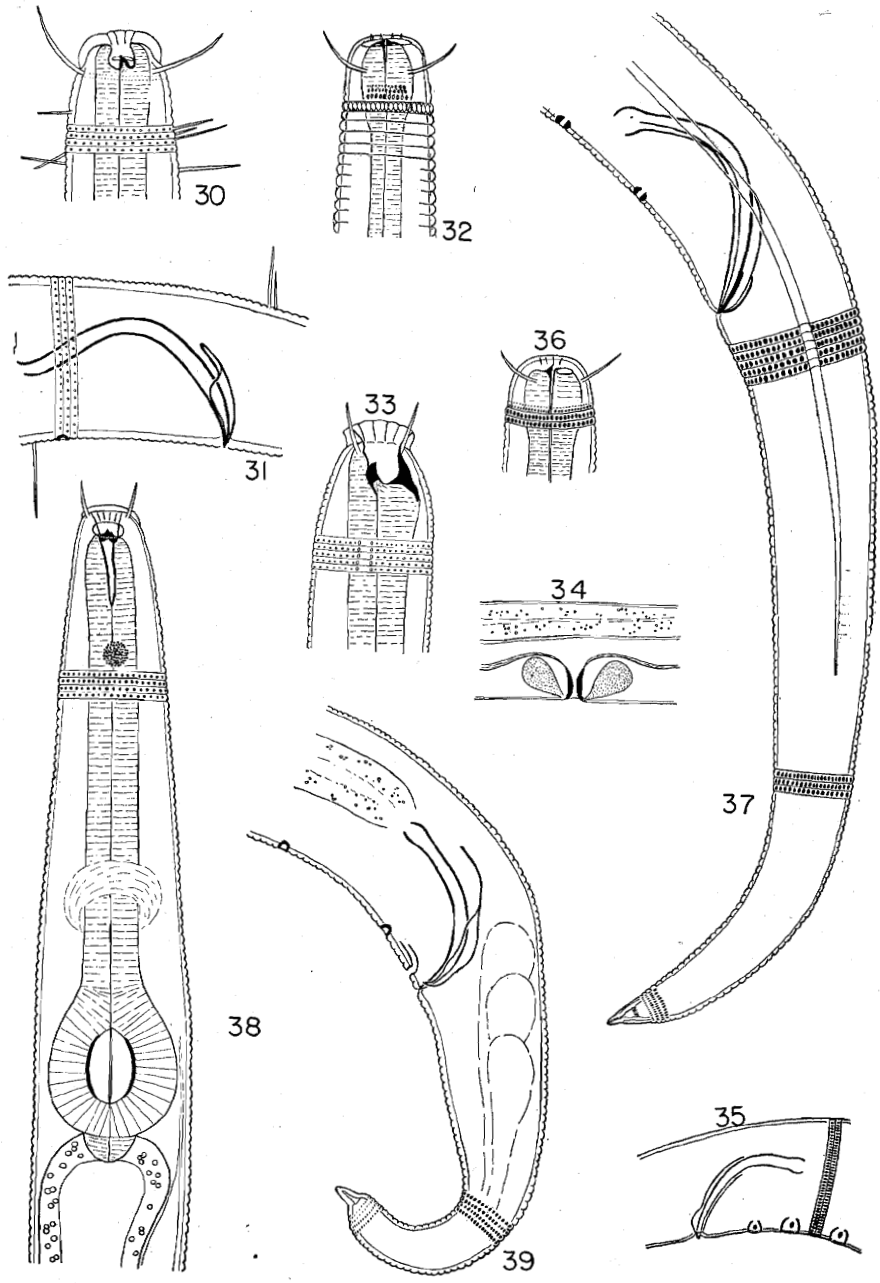


PLATE IV

Euchromadora sp.

Description: Cuticle with coarse hexagonal punctations, arranged in a basketwork; no lateral alae. Stoma with 3 small solid teeth. 4 cephalic setae, .85 head diameters long. Ocelli absent. Tail uniformly conoid.

Male: 1.09mm; a, 28; b, 7.3; c, 8.3. 9 small chromadorid preanal supplements. Spicular apparatus undertermined. Tail 6 anal body diameters long.

Female: 961-986u; a, 35-37; b, 7.3-7.5; c, 8.1-9.9; vulva 48-50%. Ovary₁ 16%, ovary₂ 12.8%; 1 egg/ uterus, 26 x 30u.

Habitat: Pile scrapings and *Membranipora*, Solomons Island, Md.

Hypodontolaimus carinatus (Cobb, 1920) new combination

Syn. *Ptycholaimellus carinatus* Cobb, 1920; *H. zosteræ* Allgén, 1929.

Description: Cuticle with light block punctations, interrupted by lateral alae which are bordered by 2 rows of heavier punctations. Stoma wide and heavily sclerotized, with a long dorsal tooth and a heavy apophysis from the middle of the stoma wall. 4 cephalic setae, .5 head diameters long. Amphids half-moon shaped. Esophagus with elongated bulb, .36 the length of the esophagus, divided into 2 portions internally and externally. Elongated excretory cell extending one esophageal length or more posterior to the base of the esophagus, .5 body diameters wide; excretory pore 2 stoma lengths from the anterior. Nerve ring 52%.

Male: 711-766u; a, 17.7-25.5; b, 6.4-6.6; c, 9.6-10.4. Testis 38% of the body length from the anterior. Spicules broad, slightly cephalated, 1.3 anal body diameters long. Gubernaculum a thin parallel strip along the spicule, over .5 the spicule length. Preanal supplements absent. Tail 3.7 anal body diameters long.

Female: .85-1.03mm; a, 25.8-32.8; b, 6-7.5; c, 9.4-10.7; vulva 50-52%, sclerotized, with prominent vaginal glands. Ovary₁ 18.3-19%, ovary₂ 16-20% of the body length; 1 egg/ uterus, 45 x 135u. Tail 4 anal body diameters long.

Habitat: Bottom mud, Kent Narrows, Cambridge, and Annapolis, Md.

Remarks: Cobb's detailed description can leave little doubt as to the synonymy of *H. carinatus* with *H. zosteræ*. His specimens are slightly larger than Allgén's (1929, 1947b) and ours, but the demanian formulae coincide exactly. Cobb questions the position of

the excretory pore opposite the base of the stoma, and, indeed, we have found it to be slightly more posterior.

Prochromadorella viridis (von Linstow, 1876)

Syn. *Chromadora viridis* von Linstow, 1876. *Description:* Cuticle with block punctations, longer on the esophageal region; lateral alae absent. Stoma rather slight. Dorsal tooth somewhat heavier than the 2 subventral teeth. 4 cephalic setae, .5 head diameters long. Amphid small, just above the teeth. Esophagus with distinct bulb, $\frac{3}{4}$ of the body width. Faint greenish-pigment spots, 1.2 head diameters posterior, fading in glycerin. Excretory cell 41u long; excretory pore 40%. Nerve ring a short distance above bulb.

Male: 458-528u; a, 20-24.4; b, 6.4-7.6; c, 8.8-10.8. Testis 35% of the body length from the anterior. Spicules arcuate, slightly cephalated, 22u long or .7 anal body diameters. Sheath-type gubernaculum with a small expansion at the posterior base. 16 chromadorid supplements, extending 3 tail lengths anterior to the anus (one specimen with only 15). Tail 2.9-3.1 anal body diameters long.

Female: 457u; a, 17.6; b, 10; c, 10; vulva 49%. Tail 2.8 anal body diameters long.

Habitat: Offshore sand, Sandy Point, Md. This is an abundant freshwater species in Europe.

Prochromadorella chitwoodi new species

Description: Cuticle coarsely punctate, especially on head; punctations oblong except for the most anterior on the head which are much smaller and almost round. Lateral alae extending distinctly from tail to head but not interrupting the punctation. 4 cephalic setae, 1 head diameter long. Stoma with 12 labial rugae, and 3 equal forward-thrusting teeth. Amphids transverse, inconspicuous. Esophageal bulb lacking but posterior of esophagus swollen. Ocelli absent. Tail conical attenuated.

Male: 796-969u; a, 23.7-42; b, 6.4-8.3; c, 7.2-11. Spicules 45u long or 2.5 anal body diameters. Gubernaculum 19u long. 5 chromadorid supplements. Tail 3.7-5.4 anal body diameters long.

Female: 825-919u; a, 25-30; b, 5.1-7.7; c, 6.7-8; vulva 45-47%. Ovary₁ 16%, ovary₂ 16.7% of the body length; one egg/ uterus, 21 x 23u. Tail 4.5-6 anal body diameters.

Habitat: Abundant in bottom mud, Chesapeake Beach and Plum Point, Md.

Remarks: This species corresponds in many respects to *P. micolitzkyi* Chitwood, 1951, but differs in the presence of lateral alae for the entire length of the body. The heavy block punctation appears interrupted at the adanal region but in favorable view it can be seen to be continuous. The presence of lateral alae is disconcerting to generic characters, but the absence of complete lateral interruption of punctation causes us to retain this species in *Prochromadorella*.

This species is named in honor of Dr. B. G. Chitwood, American nematologist, who has made numerous important contributions to every branch of nematology.

Parachromadora new genus

Diagnosis: Chromadorinae.—Cuticle with rather light block punctation, not interrupted laterally. Stoma with 3 nearly equal sclerotized teeth. 4 cephalic setae. Transverse amphids. Esophagus with well-developed bulb. Male with a small tubular curved supplement immediately preanal, in addition to regular chromadorid supplements. Female with 2 reflexed ovaries.

Type species: *Parachromadora parva* new species.

Parachromadora parva new genus, new species

Description: 4 cephalic setae, .66 head diameters long. Large esophageal bulb, almost .25 of the esophageal length long and .85 of the body width. Ocelli 16u, posterior, consisting of reddish or brownish-green pigment (one specimen with 1 red and 1 greenish ocellus) and a vaguely-suggested lens. Excretory cell 66u, posterior to the base of the esophagus; excretory pore opposite the teeth. Tail conical attenuated.

Male: 626-802u; a, 21-34.8; b, 6.3-7.7; c, 8.4-10.7. Spicules arcuate, 26u long or 1.6 anal body diameters. Gubernaculum over .7 the length of the spicule, with terminal teeth. 2 chromadorid supplements and 1 curved tubular supplement immediately preanal. Tail 3.8 anal body diameters long.

Female: 626-808u; a, 25.2-32.1; b, 6.6-7.8; c, 6.6-7.5; vulva 42-49%. Ovaries 15% each. Tail 5.3 anal body diameters long.

Habitat: Very abundant and widespread on barnacles and *Membranipora* throughout the Bay, disappearing in winter.

Remarks: *Parachromadora bipapillata* (Chitwood, 1951) new combination (syn. *Prochromadorella bipapillata* Chitwood, 1951) belongs in this genus; Chitwood pointed out that a new genus would probably have to be created for his species. Our species differs from *P. bipapillata* chiefly in size. We have examined a large number of specimens and their length never exceeds 850u, while Chitwood's specimens are 1.33-1.35mm long. We have examined his specimens and find the greenish pigment spots and the tubular curved supplement, somewhat difficult to see in glycerin mounts.

Spilophorella paradoxoides new species

Description: Cuticle coarsely punctate; broad and prominent lateral alae, bordered by 2 longitudinal rows of larger punctations. Stoma 8u long, with a large dorsal tooth at the base. 4 cephalic setae, .45 of the head diameter long; scattered fine somatic setae; 2 tiny setae at the tail tip. Esophagus with a broadly-expanded double bulb, the first portion of which is smaller than the second, 1/3 the esophageal length. Ocelli absent. Excretory cell extending to the beginning of the anterior ovary in the female, 110u long; excretory pore opposite tooth.

Male: 748-962u; a, 17-26.2; b, 5-5.6; c, 8.6-9.1. Testis 37.4% from the anterior. Spicules slightly cephalated, 31u long or 1.5 anal body diameters. Gubernaculum .5 the spicule length, with 2 small teeth distally, one directed laterad, the other anteriad. Preanal supplements absent. Tail 4.5 anal body diameters long.

Female: .8-1.2mm; a, 17-26.2; b, 5.6-7; c, 6.8-8.1; vulva 50%. Ovaries 16% of the body length each. Tail 4 anal body diameters long.

Habitat: Cavity in tree at water's edge, Plum Point, Md.; very abundant in bottom mud, Chesapeake Beach, Annapolis, and Kent Narrows, Md.

Remarks: This species is close to *S. paradoxa* (de Man, 1888) but differs in the much shorter tail tip (7-10u) and in the smaller teeth of the gubernaculum (we have compared our specimens with Chitwood's specimens of *S. paradoxa*).

Subfamily—Cyatholaiminae Micoletzky, 1922

Paracanthonchus caecus (Bastian, 1865)

Syn. *Cyatholaimus caecus* Bastian, 1865. *Description:* Cuticle with coarse dot punctations and numerous hypodermal gland pores;

lateral alae absent. Hypodermis usually with grape-like clusters of cell inclusions. Stoma with large dorsal tooth. 10 cephalic setae, the longest 4-5 head diameters long. Amphid $4\frac{1}{4}$ spiral, situated above the dorsal tooth, .33 head diameters wide. Excretory cell small, up to 35u long.

Male: 1-1.1mm; a, 20.5-29; b, 6.9-7.8; c, 10.7-12.3. Spicules arcuate, slightly cephalated, 32u long. Gubernaculum ornate, almost as long as the spicules, with 4 large distal teeth. 5 setose pre-anal supplements, 2 of which are close together just anterior to the anus. Tail 3 anal body diameters long.

Female: 1.2-1.4mm; a, 17.6-34; b, 6.4-8.6; c, 11.1-17.1; vulva 51-58%. Vagina well-developed. Ovary₁ 18.2-21%, ovary₂ 17-21.8% of the body length. Tail 3.3-3.6 anal body diameters long.

Habitat and Bionomics: Present in every collection, the most abundant species in the Bay. This species is ovoviviparous, with up to 4 cleaving eggs and 4 fully-developed ovic juveniles in a gravid female. The blastula has a large blastocoele, and there is a typical "tadpole" stage in the course of development. Although Allgén (1947b) regarded ovoviviparity as a facultative condition, we have found living embryos in all fully mature females and therefore consider ovoviviparity to be the normal condition.

Subfamily—Choanolaiminae Filipjev, 1934

Halichoanolaimus duodecimpapillatus new species

Description: Cuticle with coarse dot punctations, set rather widely apart; lateral alae absent. 6 inconspicuous lips. Funnel-shaped buccal cavity with 3 heavy distally knobbed rod-like supporting pieces. 10 blunt cephalic papillae. Amphids $3\frac{1}{2}$ spiral, .17 head diameters wide, situated between the base of the buccal cavity and the knobs of the supporting pieces. Excretory pore a little over 50%. Intestinal cells distinct and packed with dark inclusions, appearing under low power like short lateral caeca. Tail $5/6$ filiform.

Male: 2.53mm; a, 38.4; b, 7.1; c, 15.7. Testis 17.4% of the body

PLATE V

- Figs. 40-41.—*Spilophorella paradoxoides* n.sp.: 40, male head; 41, male tail.
Figs. 42-43.—*Paracanthochus caecus*: 42, male head; 43, male copulatory apparatus.
Fig. 44. —*Halichoanolaimus duodecimpapillatus* n.sp., male head.
Fig. 45. —*Bathylaimus assimilis*, juvenile head.
Fig. 46. —*Bathylaimus parafilicaudatus* n.sp., female head.
Fig. 47. —*Triploides gracilis*, female head.

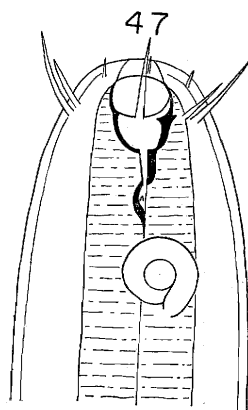
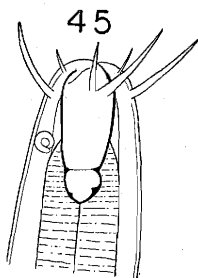
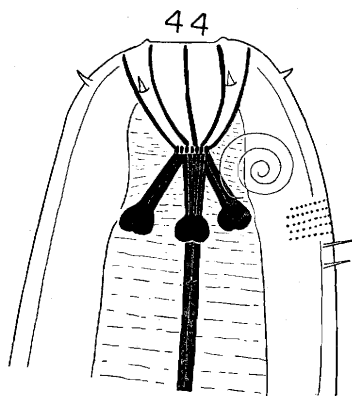
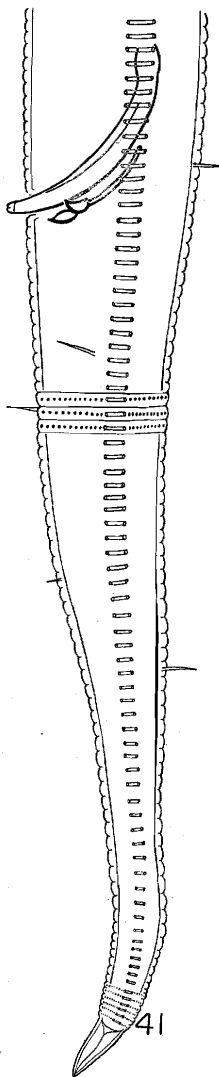
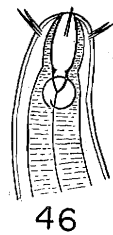
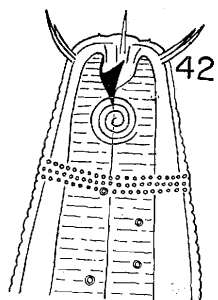
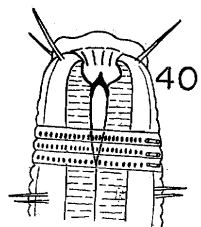


PLATE V

length from the anterior. Spicules 82.5u long or 1.4 anal body diameters. Gubernaculum simple, curved along spicule, 33u long. 12 preanal papilloid supplements.

Female: 2.67mm; a, 45; b, 6.7; c, 15.7; vulva 46.1%. Ovaries 13% of the body length each; 1 egg/ uterus, 56 x 89u. Tail 5.8 anal body diameters long.

Habitat: Bottom mud, Annapolis, Md.

Remarks: This species most closely resembles *H. longicauda* Ditlevsen, 1919, but is distinguished by the presence of 12 preanal supplements and equal *c* values in both sexes.

Family—Tripyloididae Stekhoven & de Coninck, 1933

Subfamily—Tripyloidinae Micoletzky, 1924

Bathylaimus assimilis de Man, 1922

Description: Cuticle smooth. Stoma of 2 compartments with lightly sclerotized walls; relation of anterior chamber to posterior 3:1. Small teeth in the second compartment. 6 labial setae; 10 cephalic setae, the longest 1 head diameter. Amphids spiral, .3 head diameters wide, situated over the posterior half of the anterior chamber.

Male: 1.07-1.77mm; a, 30-44.1; b, 4.5-5.6; c, 12-17.6. Spicules cephalated with transverse division. Gubernaculum swollen, as long as the spicule, with a distal side plate bearing a distal tooth. Tail 2.8-3.7 anal body diameters long.

Female: 1.7mm; a, 39; b, 5.1; c, 15; vulva 50%. Tail 3.8 anal body diameters long.

Habitat: Shore sand, Sandy Point, Md.

Bathylaimus parafilicaudatus new species

Description: Cuticle smooth. Stoma consisting of 2 parts, with small teeth at the second part; relation of the anterior chamber to the posterior 7:3. 10 cephalic setae, .6 head diameters long. 4 small spines on tail. Amphids single spiral, .3 head diameters wide, situated over the base of the second part of the stoma. Tail 2/3 filiform.

Male unknown.

Female: .74-1.1mm; a, 30.7-44; b, 9-12; c, 3.6-5.2; vulva 52-56%. 2 eggs/ uterus, 10 x 20u. Tail 12.1-12.3 anal body diameters long.

Habitat: Bottom mud, Cambridge, Md.

Remarks: This species differs from *B. flicaudatus* (Stekhoven & Adam, 1931) in the shorter cephalic setae, the wider amphid, the longer and more filiform tail, and the different relation of the parts of the stoma.

Tripylodes gracilis Ditlevsen, 1919

Description: Cuticle smooth. Sclerotized stoma of 3 compartments, 1.1 head diameters deep; small teeth at the base of each compartment. 6 small labial setae. 10 cephalic setae, the longest of which are .6 head diameters. Amphids double spiral, .3 head diameters wide, 1.2 head diameters from the anterior. Excretory pore 3.3 stoma lengths from the anterior. Nerve ring 47.2%. Tail with bluntly expanded tip.

Male: 1.67mm; a, 25.7; b, 7.1; c, 16.7. Testis swollen, with large triangular sperm. Spicules .8 anal body diameters long, longer than the gubernaculum. Gubernaculum with distal tooth. Tail 2.6 anal body diameters long.

Female: 1.45-1.5mm; a, 36; b, 7-7.2; c, 14.1-14.4; valva 51.5%. Ovary₁ 14.6%, ovary₂ 15.3% of the body length. Tail 3.6-4 anal body diameters long.

Habitat: Shore sand, Sandy Point, Md.

Superfamily—Desmodoroidea Steiner, 1927

Family—Desmodoridae Micoletzky, 1924

Subfamily—Desmodorinae Micoletzky, 1924

Micromicron luticola new species

Description: Cuticle coarsely striated, with prominent lateral alae extending from the base of the esophagus to the anal region. Helmet unstriated, heavily sclerotized, with a definite break in the sclerotization about halfway down the helmet. Lips absent. Stoma very narrow with a small non-protrusible dorsal tooth. 4 short cephalic setae; scattered somatic setae. Amphids circular with a central fleck, internally broken. Esophageal bulb pyriform, 2/7 of the esophageal length, the heavy sclerotized lining divided into 2 parts. Excretory pore 2.4 helmet lengths from the anterior. Tail incurved just behind the anus and then tapering uniformly.

Male: 798-864 μ ; a, 30.7-38.4; b, 7.7-9.9; c, 14-14.9. Spicules arcuate, cephalated, transversely divided. Gubernaculum compound, consisting of a straight piece between the spicules and a

sclerotized ring around the anus with a double posteriad-projecting blunt tooth. 29-33 small preanal supplements. Submedian setae all along the body; 4 heavy submedian postanal setae. Tail 3 anal body diameters long.

Female: 677-849 μ ; a, 15; b, 7.4; c, 9.4; vulva 40-42%. Ovaries 12.6% each, reflexed. Tail 3 anal body diameters long.

Habitat and Bionomics: Common in bottom mud, Annapolis and Plum Point, Md. Coils into a tight ball and remains motionless when disturbed. Decaying specimens turn a deep violet in color and are sometimes filled with small ellipsoidal sporozoans, often encysted. An occasional suctorian was found on the cuticle.

Remarks: The only other species of this genus is *M. cephalatum* Cobb, 1920, described on the basis of a single male from the Pacific coast of Costa Rica. Our species differs in the presence of lateral alae and in the absence of lips and cuticular inflation at the tail tip.

Subfamily—Monoposthiinae Filipjev, 1934

Monoposthia ornata new species

Description: Cuticle highly ornamented with transverse plates interrupted by 12 longitudinal rows of V-shaped hooks, forming the edges of the plates. The second annule is enlarged. 6 small lips with an internal circle of papillae. Pre-stomatal ring of 12 longitudinal sclerotized pieces. Stoma heavily sclerotized, with moderately large dorsal tooth. 4 cephalic setae, .8 head diameters long. Amphids cryptic spiral, within second annule. Anterior of esophagus constricted behind stoma, terminated in an ovoid swelling.

Juvenile: 769 μ ; a, 19.2; b, 5.2; c, 8.5. Tail conical, 3.5 anal body diameters long.

Habitat: Bottom mud, Solomons Island, Md.

Remarks: This species is close to *M. duodecimalata* Chitwood, 1936 but differs in the smaller *b* and *c* values, the shorter cephalic setae and the pre-stomatal ring of sclerotized markings.

Subfamily—Richtersiinae Cobb, 1933

PLATE VI

Figs. 48-50.—*Micromicron luticola* n.sp.: 48, juvenile head with suctorian; 49, male esophageal region; 50, male tail.

Fig. 51. —*Monoposthia ornata* n.sp., juvenile head.

Figs. 52-54.—*Metachromadora parasitifera* n.sp.: 52, female esophageal region; 53, female tail with suctorian; 54, female tail tip.

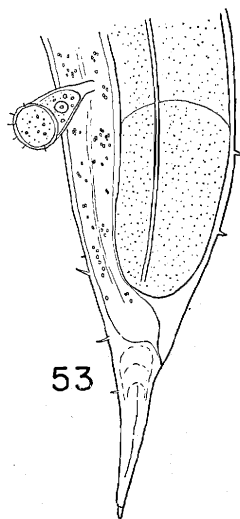
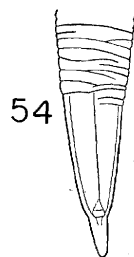
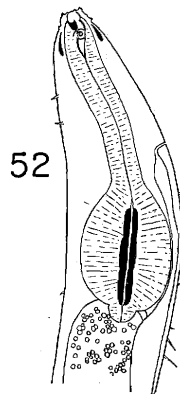
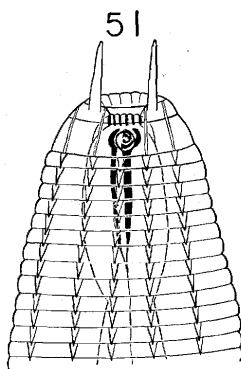
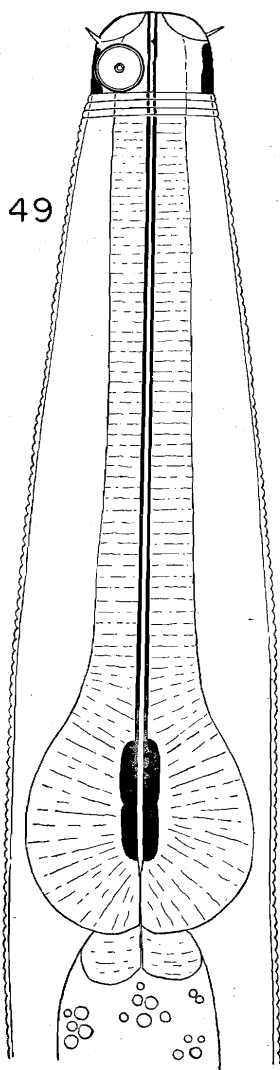
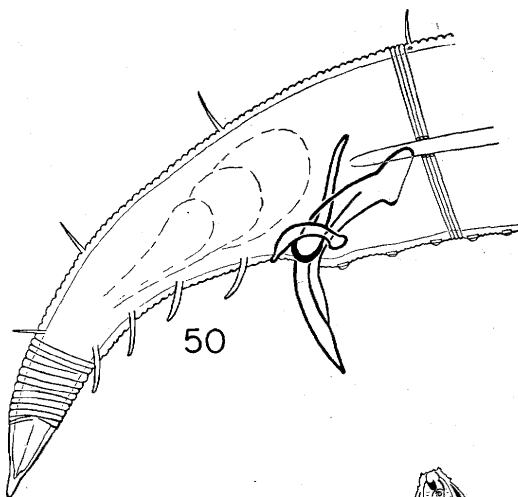
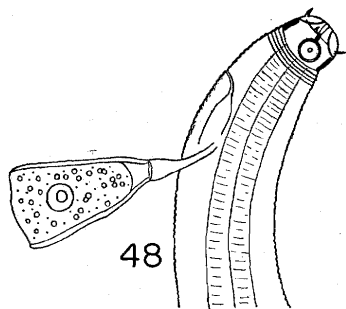


PLATE VI

Revision of the genus *Metachromadora* Filipjev, 1918

According to the original description of Filipjev (1918), *Metachromadora* is characterized by lateral alae and a short head capsule, marked with coarse longitudinal annulations; the esophageal bulb has a 3-fold division of the internal sclerotization. These features apply both to *M. macroutera* Filipjev, 1918, the type species, and to *M. cystoseirae* Filipjev, 1918. However, none of the other species which have been included in the genus has a head capsule with longitudinal annulations. Therefore, we are separating them from the genus *Metachromadora*. The true species include *M. macroutera*, *M. cystoseirae*, and *M. parasitifera* new species, for which the following key is given.

Key to the species of *Metachromadora*

1. Sexual dimorphism of amphids.....*M. parasitifera* n. sp.
No sexual dimorphism of amphids.....2
2. Male with 2 postanal ventral bumps on tail.....*M. macroutera*
Filipjev, 1918
- Male without postanal bumps; thickened cuticle
around amphids.....*M. cystoseirae* Filipjev, 1918

Metachromadora parasitifera new species

Description: Cuticle very coarsely striated; longitudinal striations entirely surrounding the non-rigid helmet. Prominent lateral alae extending until just before anus. 6 lips bearing probably 12 large labial rugae. Anterior circle of 4 short setae, posterior circle of 4 longer setae. Female with blunt lateral projections of the cuticle halfway down the helmet. Amphids diverse in the 2 sexes: in the male a large double overlapping spiral, in the female a smaller $1\frac{1}{2}$ spiral. Stoma wide with a very large protrusible dorsal tooth. Wall of the anterior chamber opposite the dorsal tooth singly curved. Fine somatic setae, about 10u long. Esophageal bulb .4 the length of the esophagus, with a triple internal division of the sclerotization. Excretory pore 47%.

Male: 1.27-1.35mm; a, 21.6-22.5; b, 6.4-7.6; c, 13.9-16.6. Spicules arcuate, transversely divided. At least 12 preanal supplements,

PLATE VII

- Figs. 55-57.—*Metachromadora parasitifera* n.sp.: 55, male head; 56, female head; 57, male tail.
Figs. 58-59.—*Neomyx obesus*: 58, male head; 59, male copulatory apparatus.

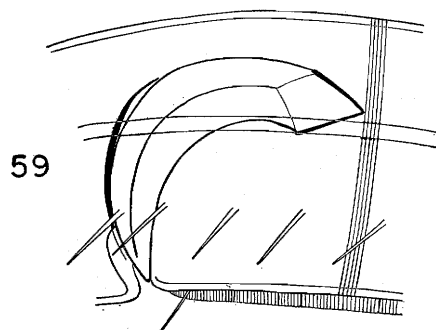
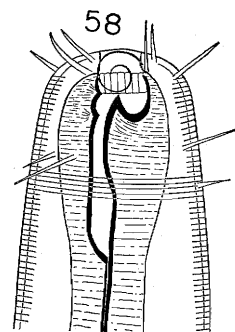
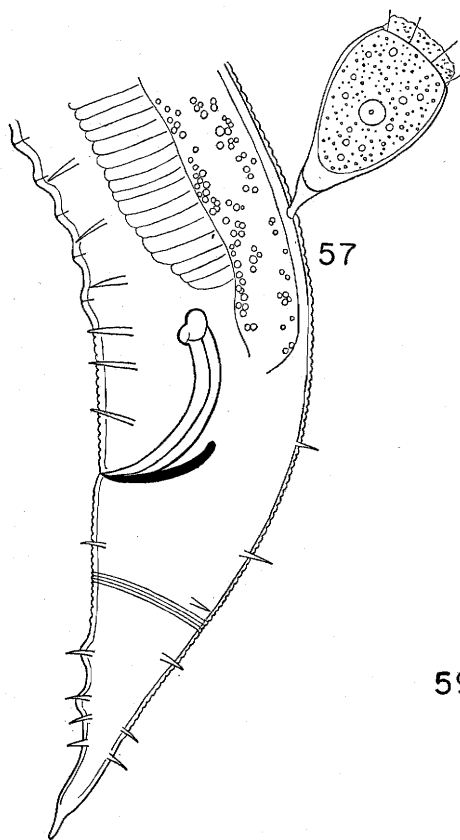
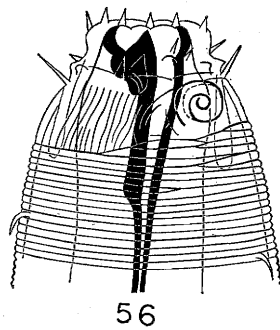
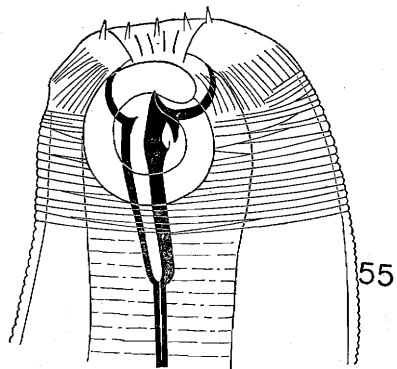


PLATE VII

consisting of hemispheroid expansions of the ventral body surface over which the striae pass. 2 ventral postanal bumps. Coarse submedian setae on tail and extending all along the body. Tail 2.2-3.4 anal body diameters long.

Female: 1.25-1.36mm; a, 12-19; b, 5.6-6; c, 9.2-15.7; vulva 66%. 2 reflexed ovaries; 1 egg/ uterus, 43 x 73u. Uterus very swollen when gravid. Tail 4.6-5 anal body diameters long.

Habitat and Bionomics: Bottom mud near Annapolis. *M. parasitifera* is rather abundant in the rich bottom detritus but is difficult to observe because of its extremely sluggish movements and habit of coiling when disturbed. All specimens observed had 2-15 suctorian commensals on the cuticle (genus *Thecacineta*). Dollfus (1946) has recorded a number of similar commensals among the desmodorids, and de Man (1890) has postulated that they are relatively species specific.

Neonyx Cobb, 1933

The genus *Neonyx* was synonymized with *Metachromadora* by Chitwood (1936) but differs in the finer striation, in the absence of a non-rigid cephalic capsule marked with coarse longitudinal striations, and in the double curvature of the stoma wall opposite the dorsal tooth. *Neonyx* includes the species *N. cancellatus* Cobb, 1933, the type species; *N. alatus* Cobb, 1933 sp. inq.; *N. campycoma* Cobb, 1933; *N. onyxoides* (Chitwood, 1936) new combination; and *N. obesus* (Chitwood, 1936) new combination. Cobb's posthumous article (1933) was not illustrated; we have examined his original sketches of *N. cancellatus* and find the copulatory apparatus and preanal supplements as in *N. obesus*.

Neonyx obesus (Chitwood, 1936) new combination

Description: Cuticle moderately striated. Prominent lateral alae. Oral opening retractile or eversible depending on the thrust of the large dorsal tooth. Stoma and esophageal lining heavily sclerotized. Anterior circle of 6 short cephalic setae, posterior circle of 4 longer setae. Somatic setae rather numerous. Esophagus expanded somewhat around the stoma and greatly enlarged at the base, the swelling being .4 of the esophageal length, with the sclerotized lining divided into 3 distinct regions. Amphids spiral. Anterior region 1/3 as wide as the maximum body diameter.

Male: 724-878u; a, 18.1-22; b, 6.3-6.5; c, 10-10.7. Testis 25% of the body length from the anterior; large round spermatocytes,

10u in diameter. Thick spicules, 1.3 anal body diameters long. Thin gubernaculum extending .5 the length of the spicule. Striated preanal cuticular elevation with 8 or 9 setose supplements. 1 ventral seta directly preanal. About 10 thick postanal subventral setae. Tail 2-2.5 anal body diameters long.

Female: 863u; a, 18.8; b, 4.5; c, 10.6; vulva 57.7%. Ovary₁ 20.8%, ovary₂ 20.4% of the body length. Tail 3.5 anal body diameters long.

Habitat: Bottom mud, Crisfield and Cambridge, Md.

Chromadoropsis Filipjev, 1918

The present *Metachromadora vivipara* (de Man, 1907) is widely different in many important respects from the true species of *Metachromadora* and from the genus *Neonyx*. Filipjev (1918) created the genus *Chromadoropsis* for this species, but it seems to have been almost completely ignored (Chitwood, 1936, synonymizes it with *Metachromadora*). De Man (1907) states that the cuticle of his *Chromadora vivipara* is "probably very finely annulated"; hence he has not actually seen annulations, and they have not been reported by subsequent observers (Allgén, 1929, 1934; Stekhoven, 1931). As Allgén (1929) points out, the male preanal supplements are markedly different from those of any other species of *Metachromadora*. The internal sclerotization and musculature of the esophageal bulb are divided into only 2 parts. Moreover, as pictured by de Man, Allgén, and Stekhoven, the wall of the stoma opposite the dorsal tooth is straight, while in *Metachromadora* there is an anterior curved portion corresponding to the curve of the opposite wall. For these reasons we consider that *M. vivipara* must be separated from all other recognized genera and we revive the name *Chromadoropsis vivipara* (de Man, 1907) Filipjev, 1918. *Chromadoropsis* is similar to *Oistolaimus* Ditlevsen, 1921, but the latter has 3 circles of 4 setae.

Ichthyodesmodora Chitwood, 1951

Ichthyodesmodora chandleri Chitwood, 1951 has a triply-divided esophageal bulb, lateral alae, and a non-rigid helmet with heavy longitudinal annulations as in *Metachromadora*. (Since the helmet is not sharply set off and is unlike the rigid helmet of the Desmodorinae we believe that *Ichthyodesmodora* also belongs in the Richtersiinae.) We have found specimens of *Metachromadora parasitifera* with the head drawn in so that they resemble Chitwood's single larval specimen. We differ with him over the interpretation of the anterior chamber of the stoma ("dorsal and ventral jaws") and be-

lieve that *Ichthyodesmodora* should remain a *genus inquirendum* until confirmed by further collections from the Gulf of Mexico.

Pseudometachromadora new genus

This genus is created to embrace *Metachromadora longilaima* Stekhoven, 1950 and *M. papillata* Stekhoven, 1950, which therefore become *Pseudometachromadora longilaima* (Stekhoven, 1950) new combination and *P. papillata* (Stekhoven, 1950) new combination. *P. longilaima* is designated as the type species. Both species differ from *Metachromadora* in the absence of longitudinal striations on the head, from *Neonyx* in the straight wall of the stoma opposite the dorsal tooth, and from *Metachromadora*, *Neonyx* and *Chromadoropsis* in the absence of an esophageal bulb.

Suborder—Monhysterina

Superfamily—Plectoidea Chitwood, 1937

Family—Leptolaimidae Oerley, 1880

Subfamily—Leptolaiminae

Leptolaimus papilliger de Man, 1876

Description: Cuticle coarsely striated, the striae appearing finely double with good resolution. Conspicuous lateral alae. Stoma long and narrow, 18u long or 1/6 the esophageal length. External circle of setae represented by 4 small papillae. Scattered somatic setae; submedian setae on tail. Amphids spiral, appearing as a broken circle, .33 head diameters wide, 2 head diameters from the anterior. Esophagus slightly swollen at base. Excretory pore 1.5 stoma lengths from the anterior.

Male: 378u; a, 23.6; b, 33; c, 5.6. Spicules arcuate, cephalated. Gubernaculum with an arcuate median piece. 4 tuboid preanal supplements immediately before the anus (1 specimen with only 3) and 23-24 small cup-like supplements extending forward beyond the base of the esophagus. Tail 4.9 anal body diameters long.

PLATE VIII

Figs. 60-61.—*Leptolaimus papilliger*: 60, male head; 61, male copulatory apparatus.

Fig. 62. —*Aphanolaimus pulcher*, female head.

Fig. 63. —*Nemella ocellata*, female head.

Fig. 64. —*Axonolaimus spinosus*, male head.

Fig. 65. —*Axonolaimus demani*, female head.

Figs. 66-67.—*Axonolaimus steineri* n.sp.: 66, male head; 67, male copulatory apparatus.

Figs. 68-69.—*Axonolaimus filipjevi* n.sp.: 68, male head; 69, male tail.

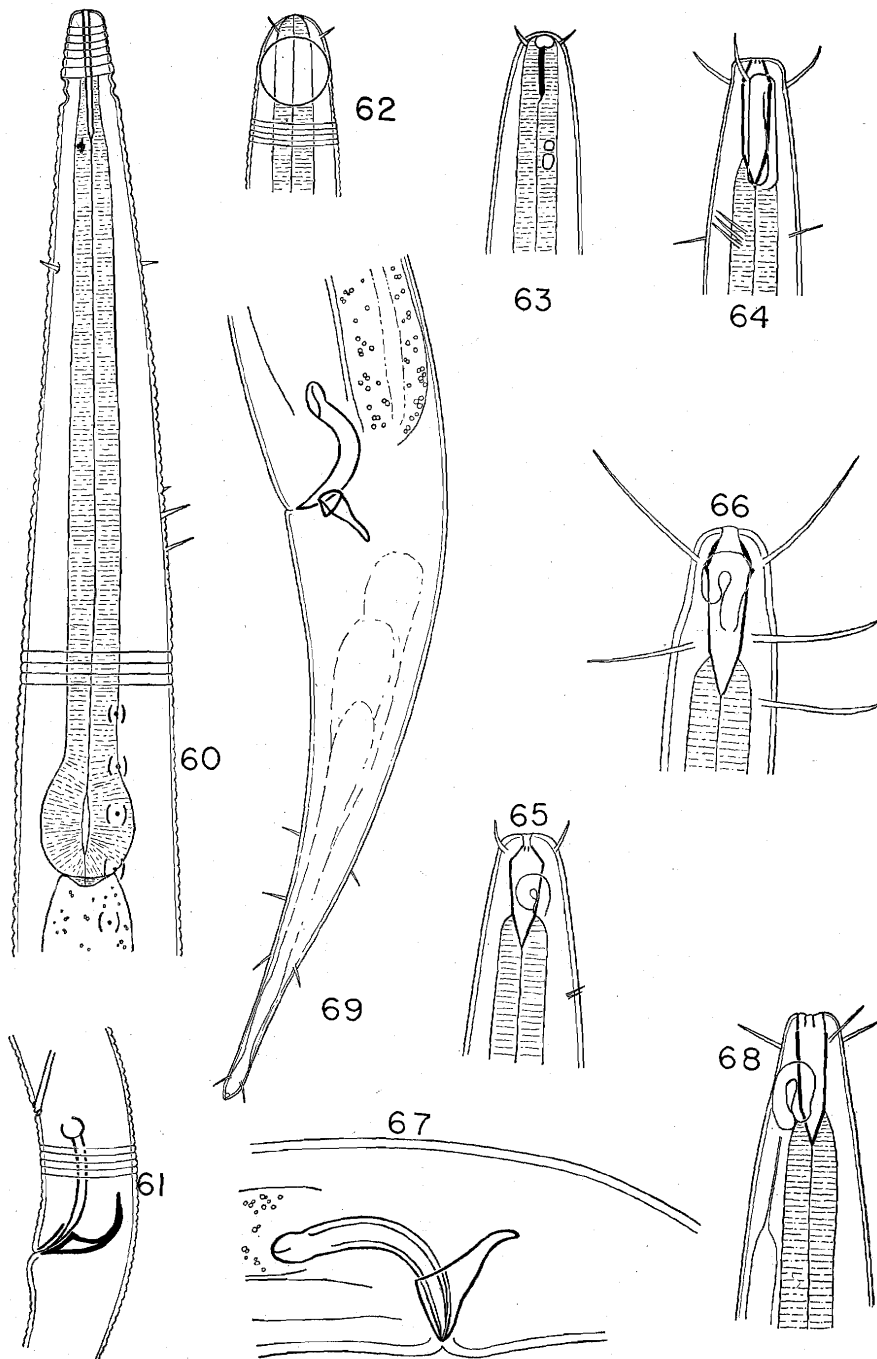


PLATE VIII

Female: 495-525u; a, 29.1-30; b, 5; c, 5-6.7; vulva 48.5-50%. Ovaries 16.5% each. Tail 5 anal body diameters long.

Habitat: Bottom mud near Annapolis, Md.

Family—Camacolaimidae Stekhoven & de Coninck, 1933

Subfamily—Aphanolaiminae Chitwood, 1935

Aphanolaimus pulcher G. Schneider, 1906

Description: Cuticle finely striated. Stoma absent. 4 cephalic setae, .25 head diameters long. Amphids large circular, 8u wide or 6/7 of the head diameter, situated a short distance behind the setae.

Female (immature): 866u; a, 33.3; b, 10.6; c, 10.2; vulva 50%. Tail bluntly rounded, 6 anal body diameters long.

Habitat: Offshore sand, Sandy Point, Md.

Remarks: This species seems to be a typical estuarine dweller; all the other species of *Aphanolaimus* are found in fresh water. G. Schneider gave the amphids as 9u wide but pictured them as considerably smaller than the head diameter. Our specimen was not striated as coarsely as a fresh water species we have observed, *A. aquaticus* Daday, 1898.

Subfamily—Camacolaiminae Micoletzky, 1924

Camacolaimus propinquus Allgén, 1929

Description: Cuticle finely striated. Cylindrical tooth fused to the dorsal wall of the mouth cavity, 6.5u long. 4 small cephalic setae. Amphids 1½ spiral, .25 head diameters wide, situated between the setae. Nerve ring 44.8%.

Female: 1.06mm; a, 35.4; b, 5.8; c, 13.6; vulva 51.5%. Tail 3.9 anal body diameters long.

Habitat: Bottom mud, Cambridge, Md.

Nemella ocellata Cobb, 1920

Description: Striae or lateral alae not observed. Long heavy tooth at the anterior with a blunt tip, 1.2 head diameters long. 4 small cephalic setae, 4 head diameters long. Amphids very conspicuous, flattened circular with a median posterior indentation. Ocelli consisting of 2 separated parts: the lens and the part corresponding to the pigment, but both of the same glassy olive appear-

ance, 2 head diameters posterior. Intestine filled with large colorless globules.

Female (immature): 1.15mm; a, 39.4; b, 5.9; c, 13.2; vulva 56%. Ovary₁ 14%, ovary₂ 11.5% of the body length; 1 egg at the ovarian reflex, 16 x 60u. Tail 5.8 anal body diameters long.

Habitat: Bottom mud, Cambridge, Md.

Remarks: Cobb (1920) described the male of this species from Biscayne Bay, Fla. The male is much more slender (*a* is 83.3).

Superfamily—Axonolaimoidea Chitwood, 1937

Family—Axonolaimidae Stekhoven & de Coninck, 1933

Subfamily—Axonolaiminae Micoletzky, 1924

Axonolaimus spinosus (Bütschli, 1874)

Description: Cuticle with regular indentations at the edges, as of striae. 6 lips. Stoma with sclerotized tapering walls, 18u long. 4 cephalic setae, 1 head diameter long; circle of fine sub-cephalic setae, .5 head diameters long. 3 long spines on tail tip; relatively few scattered somatic setae. Amphids collapsed shepherd's crook, overlying the stoma. Esophagus swollen at the base to nearly 2/3 the body diameter. Excretory cell 75u long; excretory pore 2 stoma lengths from the anterior.

Male: 1.1-1.9mm; a, 28-37; b, 7-8.3; c, 9-11.2. Spicules cephalated and transversely divided, 33u long or 1 anal body diameter. Gubernaculum with a median piece projecting posteriad and a smaller side piece. Numerous fine preanal ventral setae extending far anterior along the body, each with an internal nerve passing through a faint "gland cell" and then bending sharply anterior and passing into the hypodermal chord. Tail 5 anal body diameters long.

Female: 1.48-1.5mm; a, 30-44.9; b, 7.4-8.8; c, 11.1-14; vulva 56.5%. Ovary₁ 19%, ovary₂ 24% of the body length; 1 egg/ uterus, 33 x 59u. Tail 4.1 anal body diameters long.

Habitat and Bionomics: Very abundant in bottom mud throughout the Bay. One ovoviviparous female was observed.

Axonolaimus demani de Coninck & Stekhoven, 1933

Description: Stoma 12u long. 4 cephalic setae, .4 head diameters long, Amphids compact shepherd's crook, .4 head diameters wide, 1¼ as long as wide. Nerve ring 61%.

Male: 1.05mm; a, 45.5; b, 8; c, 13.4. Spicules as in *A. spinosus*. Tail 4.3 anal body diameters long.

Female: .99-1.19mm; a, 29.6-49.3; b, 7.9-8.8; c, 10.8-11.1; vulva 50.4-53%. Ovary₁ 22%, ovary₂ 26% of the body length. 3 eggs/uterus, 17 x 22u. Tail 5.3 anal body diameters long.

Habitat: Offshore sand, Sandy Point, Md.

Remarks: This species was created for *Axonolaimus* sp. of de Man, 1928. It is similar to *A. typicus* de Man, 1922, except for the absence of the small setae accompanying the cephalic setae in the latter. It is a typical estuarine form, reported by de Man from a brackish canal.

Axonolaimus steineri new species

Description: Stoma 18u long, more heavily sclerotized at the anterior part but without odontia. 4 cephalic setae, 1.8 head diameters long. 4 subcephalic setae, a little over 1.2 head diameters long. Long setae on tail absent. Amphids shepherd's crook, 8u long, overlying the anterior part of the stoma. Nerve ring 55.4%.

Male: 1.39-1.6mm; a, 50; b, 8.5-8-6; c, 12.5-13. Spicules 29-34u long or 1-1.7 anal body diameters. Tail conically attenuated with blunt tip, 4.6 anal body diameters long.

Female unknown.

Habitat: Offshore sand, Sandy Point and Chesapeake Beach, Md.

Remarks: In many respects this species resembles *Odontophora*, particularly *O. longisetosa* Allgén, 1928. However, it lacks the heavy tooth-like plates at the anterior of the stoma which are characteristic of *Odontophora*. Probably this species is transitional between *Axonolaimus* and *Odontophora*. Chitwood (1936) described a similar species, *Axonolaimus odontophoroides*, but the cephalic setae are much shorter than in *A. steineri*.

This species is named in honor of Dr. G. Steiner, Swiss-American nematologist.

Axonolaimus filipjevi new species

Description: Stoma 14.5u long (posterior chamber). 4 cephalic setae, .9 head diameters long. Paramphidial setae absent. Amphids 8u long, situated over the posterior part of the stoma. Tail conical tapering. Nerve ring 64%.

Male: 1.64mm; a, 25.2; b, 8; c, 10.4. Testis extending almost to base of esophagus.

Female unknown.

Habitat: Bottom mud, Solomons Island, Md.

Remarks: This species resembles *A. ponticus* Filipjev, 1918 in the shape of the amphids but the measurements are significantly different. In demanian values it resembles *A. paraspinosus* Stekhoven & Adam, 1931 but the cephalic setae are longer and paramphidial setae are lacking.

This species is named for I.N. Filipjev, Russian nematologist.

Odontophora setosa (Allgén, 1929)

Description: Cuticle smooth. Stoma heavily sclerotized, V-shaped, with 6 eversible odontia. 4 cephalic setae, 1.5 head diameters long. 4 subcephalic setae, .5 head diameters long. 2 setae near tail tip. Amphids shepherd's crook, 7.2u long, situated above odontia, .4 head diameters wide.

Juvenile: 990u; a, 24.2; b, 12.4; c, 14.7.

Habitat: Bottom mud, Annapolis, Md.

Odontophora setosoides new species

Description: Stoma 24u long from the base of the odontia. 4 cephalic setae, .66 head diameters long. 4 paramphidial setae, .35 head diameters long. 2 spines near tail tip. Amphids shepherd's crook, 8u long, .5 head diameters wide. Excretory pore at anterior of stoma, opening into a prominent ampulla.

Male: 1.5-1.8mm; a, 33-35; b, 15.2-16.3; c, 16.8-18.3. Spicules 1.75 anal body diameters long. Gubernaculum with prominent dorsal apophysis. 7-8 subventral setae on tail. Tail conoid, 2.5-3.5 anal body diameters long.

Female unknown.

Habitat: Bottom mud, Kent Narrows, Md.

Remarks: This species differs from *O. setosa* (Allgén, 1929) especially in the shorter cephalic setae and odontia, the greater length of the spicules, and the position of the excretory pore. The cephalic pattern resembles that of *O. angustilaima* (Filipjev, 1918) but the tail of the latter is shorter and the odontia are much longer in relation to the rest of the stoma.

Odontophora axonolaimoides new species

Description: Stoma 9u long from the base of the odontia. 6 odon-

tia, 5u long. 4 cephalic setae, 1.4 head diameters long. Amphids collapsed shepherd's crook, overlying the anterior part of the stoma. Excretory cell 66u, long; excretory pore 1.5 stoma lengths from the anterior. Nerve ring 54-60%.

Male unknown.

Female: 2.6-2.9mm; a, 40.6-60.6; b, 10.6-12.2; c, 16-21.5; vulva 54-56.3%. Ovary₁ 13.8-28%, ovary₂ 13-13.6% of the body length. Tail conoid, 3-5 anal body diameters long.

Habitat: Bottom mud, Kent Narrows, Md.

Remarks: The stoma of this species resembles that of *Axonolaimus* except for the presence of odontia, and the collapsed shepherd's crook amphids are somewhat similar to those of *A. spinosus*.

Subfamily—Campylaiminae Chitwood, 1937

Pseudolella cobbi new species

Description: Cuticle very finely striated; lateral alae absent. 6 lips. Sclerotized stoma with parallel walls, 19.5-22u long from the base of the odontia. 6 large protrusible odontia. 4 cephalic setae, about .5 head diameters long. Scattered somatic setae. Amphids shepherd's crook, 80-82.5u long or 4.3 stoma lengths. Large excretory cell, 105u long.

Male: 1.4-1.5mm; a, 27-31; b, 6-8.6; c, 7.4-8.9. Testis 52...% of the body length from the anterior. Spicules slightly cephalated, with a transverse division of the head, 44-46u or 1.6 anal body diameters long. Gubernaculum with dorsal apophysis.

Female (immature): 1mm; a, 21.8; b, 8.8; c, 7.6; vulva 47%. Prominent vaginal glands. Tail conoid-attenuated, 7.8 anal body diameters long.

Habitat and Bionomics: Bottom mud, Annapolis, Plum Point and Solomons Island, Md. In the juveniles, although the stoma has attained its full length, the amphids lengthen at each molt: 47.5u

PLATE IX

- Fig. 70. —*Odontophora setosa*, juvenile head.
Figs. 71-72.—*Odontophora setosoides* n.sp.: 71, male head; 72, male tail.
Fig. 73. —*Odontophora axonolaimoides* n.sp., female head.
Figs. 74-75.—*Pseudolella cobbi* n.sp.: 74, male head; 75, male tail.
Figs. 76-77.—*Pseudolella brevamphida* n.sp.: 76, male head; 77, male copulatory apparatus.
Fig. 78. —*Pseudolella paraganulifera* n.sp., female head.
Figs. 79-80.—*Dorylaimopsis metatypicus* var. *brevisetosus* n.var.: 79, male head; 80, male copulatory apparatus.

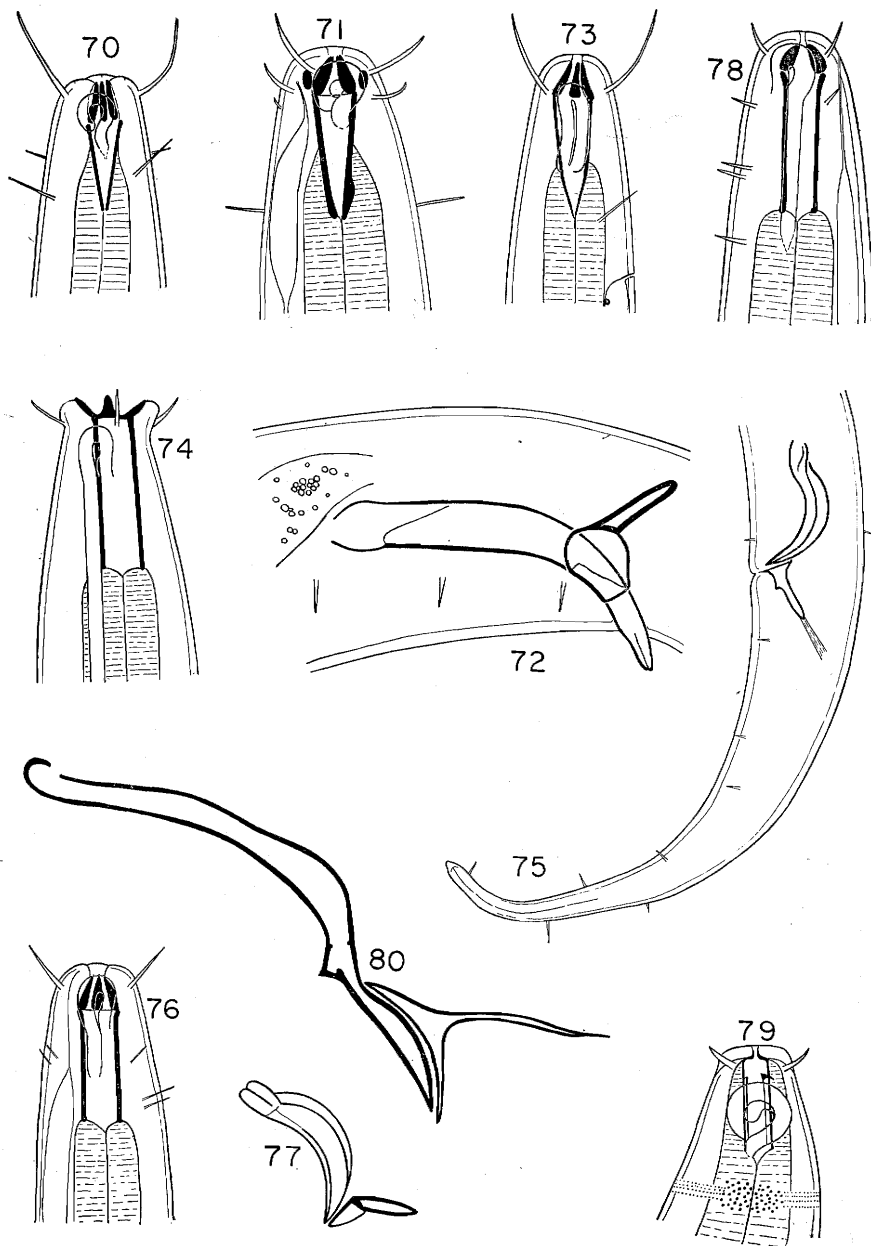


PLATE IX

(second molt?), 60u (third molt?), 82.5u (adult). In one molting specimen we actually observed the shorter amphids of the molt being cast off.

Remarks: The original species of the genus *Pseudolella* are *P. granulifera* Cobb, 1920 from New Caledonia and *P. cephalata* Cobb, 1920 from Costa Rica. In the latter the amphids are even longer than in the present species, extending to somewhat in front of the middle of the body. Two species of Stekhoven belong in this genus also. They are *Pseudolella quadristica* (Stekhoven, 1950) new combination (= *Odontophora quadristica* Stekhoven, 1950) and *Pseudolella breviseta* (Stekhoven, 1950) new combination (= *Odontophora breviseta* Stekhoven, 1950). Stekhoven compares his *O. quadristica* with *P. cephalata* Cobb, 1920 and decides that it is not in the same genus because it lacks lateral alae and has shorter amphids. However, the type species, *P. granulifera*, lacks lateral alae and has a much shorter amphid than *P. cephalata*. In addition to lengthy amphids the parallel walls of the stoma are distinctive of the genus *Pseudolella*, whereas *Odontophora* has a funnel-shaped stoma.

This species is named after N. A. Cobb, author of the genus.

Pseudolella brevamphida new species

Description: Striation not observed; lateral alae absent. 6 indistinct lips. Stoma with parallel walls, 18-20u long from the base of the odontia. 6 large protrusible odontia. 4 cephalic setae, about .7 head diameters long. Irregular subcephalic setae; scattered somatic setae. Amphids short shepherd's crook, extending about .8 of the stoma length or 12-16.5u. Large excretory cell 64u long, .3-.6 body diameters wide. Nerve ring 60-63%. Tail $\frac{3}{4}$ conical, $\frac{1}{4}$ cylindrical tapering.

Male: 1.34-1.37mm; a, 26.6-28; b, 8.2-8.5; c, 9.2-10.3. Testis 46% of the body length from the anterior. Spicules flatly cephalated with transverse division of the head and blade. Gubernaculum with 2 dorsal apophyses projecting posteriad at a 45° angle, connected by a stout mid-piece. Tail 4.4-5 anal body diameters long.

Female: 1.55-1.6mm; a, 25.8-28.5; b, 8.4-9; c, 9.1-10.5; vulva 47-47.7%. Ovary¹ 13%, ovary² 14.2% of the body length. 1 egg/uterus, 22 x 33u. Tail 5 anal body diameters long.

Habitat: Bottom mud, Solomons Island, Md.

Remarks: This species is very similar to *P. quadristica* (Stekhoven, 1950) and *P. breviseta* (Stekhoven, 1950) in demanian values

and in the length of the amphids, but differs from the former in the cephalic pattern and from the latter in the longer cephalic setae and in the different position of the nerve ring and excretory pore. All 3 species in the shortness of the amphids show the close relationship of the genus *Pseudolella* with *Odontophora*.

Pseudolella paragramulifera new species

Description: Pale body with light greenish-yellow intestinal cell inclusions. Lateral alae absent. Dense fine hypodermal granules. Sclerotized stoma with parallel walls, 22-22.5u long. 6 large odontia, doubled. 4 cephalic setae, .3 head diameters long. Subcephalic setae irregularly disposed. Scattered somatic setae, especially abundant on tail. Amphids shepherd's crook, the staff arm extending a short distance behind the stoma, 32.4-40u long. Large excretory cell with distinct nucleus behind the esophagus, a few small cells immediately behind the excretory cell; excretory pore opposite the odontia. Nerve ring 62%. Tail 2/3 conical, 1/3 cylindrical tapering, with rounded spinneret. Prominent caudal glands in tail.

Male: 1.1-1.33mm; a, 30-33.3; b, 6.9-8.5; c, 7.2-8.3. Spicules as in *P. cobbi*, 45u long. Apophysis of gubernaculum 18u long. Tail 4.5-5.5 anal body diameters long.

Female: 1.3-1.4mm; a, 30.3-33.2; b, 7.6-8.6; c, 8.2-8.3; vulva 47.2-49%. Ovaries 15% of the body length each. Tail 6-6.7 anal body diameters long.

Habitat: Rock Creek (lower Patapsco River), Md.

Remarks: This species corresponds very closely in demanian values and quite exactly in the proportion of stoma to amphid length with *P. granulifera* Cobb, 1920. However, in the latter there are 4 sets of 3 subcephalic setae, and there are very large cells behind the excretory cell.

Key to the species of *Pseudolella*

1. Amphids shorter than stoma.....2.
Amphids longer than stoma.....4.
2. 4 sets of 3-4 subcephalic setae... *P. quadristica* (Stekhoven, 1950),
Subcephalic setae otherwise.....3:
3. Cephalic setae .25 head diameters; nerve ring 76%,
P. breviseta (Stekhoven, 1950)
Cephalic setae .7 head diameters; nerve ring 60-63%,
P. brevamphida n.sp..

4. Amphids extending just behind stoma.....5
 Amphids extending at least 4 stoma lengths.....6
5. 4 sets of 3 subcephalic setae.....*P. granulifera* Cobb, 1920
 Subcephalic setae irregularly disposed, *P. paragr anulifera* n.sp.
6. Amphids less than 1 esophageal length.....*P. cobbi* n.sp.
 Amphids almost to mid-body.....*P. cephalata* Cobb, 1920

Family Comesomatidae (Stekhoven & de Coninck, 1933)

Dorylaimopsis metatypicus Chitwood, 1936.

Var. *brevisetosus* new variety

Description: Cuticle finely punctate, with punctations spread out and irregular on the lateral field, especially on the head and tail. Stoma narrow, tapering to a point at the base and with 6 small odontia at the anterior. 4 stout submedian cephalic setae, 4 head diameters long. Fine scattered somatic setae; 4 setae on tail tip. Amphids dispiral, situated above the base of the stoma. Esophagus clavate. Body 6 times wider at the base of the esophagus than at the head.

Male: 1.16mm; a, 23.2; b, 8.3; c, 9.3. Testis 36% of the body length from the anterior. Spicules jointed, with little hooklets on either side just above and to the inside of the large tooth on the blade of the spicule; spicules 87u long or 2.5 anal body diameters. Gubernaculum 3-pronged, 26u long. 15 tiny preanal supplements. Tail 3.6 anal body diameters long.

Habitat: Bottom mud, Solomons Island, Md.

Remarks: The head setae of our specimen are smaller than those described by Chitwood for *D. metatypicus* (.7 head diameters long).

Sabatieria punctata (Kreis, 1924)

Syn. *Parasabatieria punctata* Kreis, 1924. *Description:* Cuticle with fine uniform punctation. Stoma shallow, very lightly sclero-

PLATE X

- Fig. 81. —*Sabatieria punctata*, male copulatory apparatus.
 Figs. 82-83.—*Sabatieria americana* n.sp.: 82, female head; 83, male tail.
 Figs. 84-85.—*Diplolaimella punicea* n.sp.: 84, male head; 85, male copulatory apparatus.
 Fig. 86. —*Diplolaimella allgeni* var. *ophthalmophora* n.var., male copulatory apparatus.
 Fig. 87. —*Diplolaimella schneideri* n.sp., female head.
 Fig. 88. —*Monhystera elegantula*, female head.
 Figs. 89-90.—*Monhystera luisae*: 89, male head; 90, male copulatory apparatus.

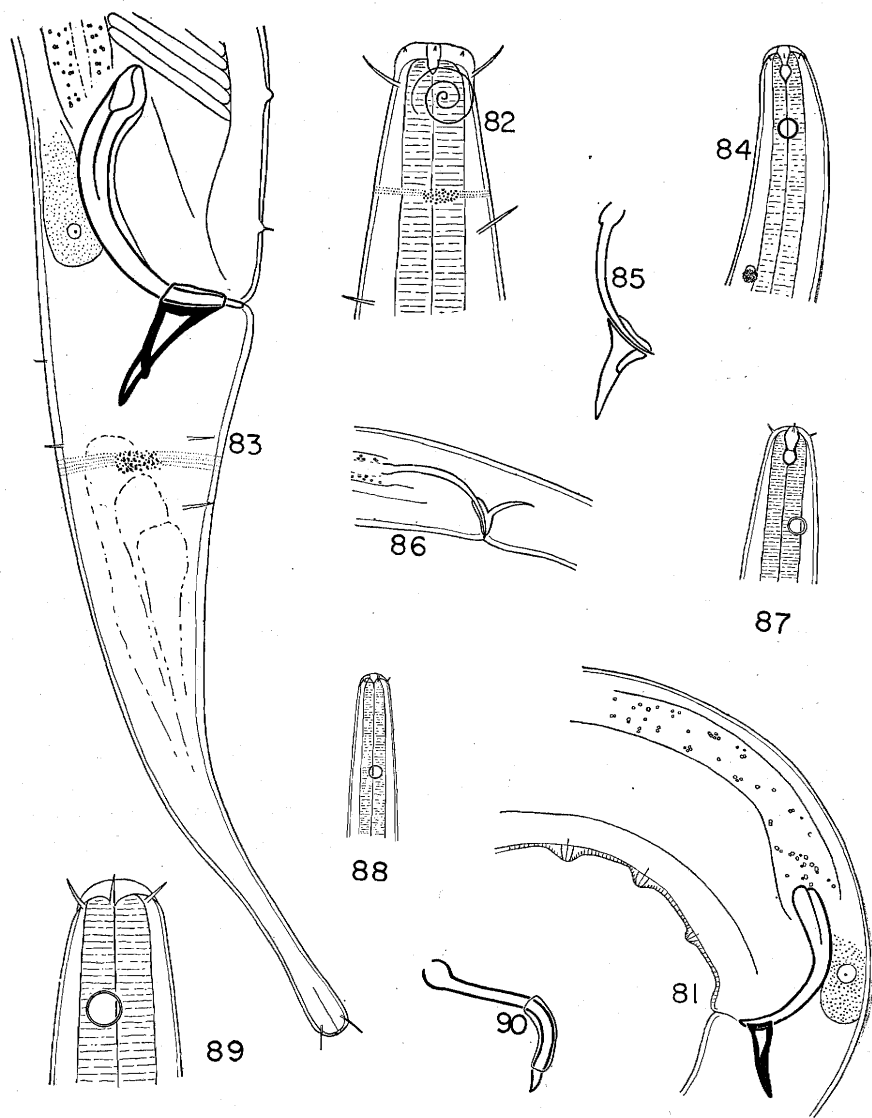


PLATE X

tized. 4 cephalic setae, .3 head diameters long. Scattered submedian postanal setae; 4 setae at rail tip. Amphids 3- spiral, .6 head diameters wide. Excretory pore 67%. Nerve ring 58%. Large "gland cell" above anus.

Male: 1.6-1.9mm; a, 22-35.2; b, 9.3-10.8; c, 13.3-14.5. Testis 40% of the body length from the anterior. Spicules proximally cephalated with transverse division, 60u long or 1.3 anal body diameters. Gubernaculum with dorsal apophysis 48u long or 1 anal body diameter. 5-8 large preanal supplements, with the 4 most anterior equally distant and closer together than the posterior; all can be retracted flush with the body. Tail $\frac{1}{2}$ conical, $\frac{1}{2}$ cylindrical, swollen at the tip, tip flexible on itself, 3-3.7 anal body diameters long.

Habitat: Bottom mud, Solomons Island, Md.

Sabatieria americana new species

Description: Cuticle punctate, with larger irregular punctations on the lateral fields; curved rod-like punctations scattered on tail. Stoma shallow, with slight dorsal tooth. 4 cephalic setae 4 head diameters long. Amphids $2\frac{1}{2}$ spiral, .6-.7 head diameters wide. Excretory pore 65%.

Male: 1.17-1.23mm; a, 25.4-34.1; b, 6.8-7.5; c, 9.4-10. Spicules 45.5u long or 1.5 anal body diameters. 7 tiny preanal supplements and a median seta on a small elevation just before the anus. Tail 3.7-3.8 anal body diameters long.

Female: 1.25-1.9mm; a, 25-30.2; b, 8.5-9; c, 9.5-14.4; vulva 50%. Ovaries 18% each. Prominent seminal receptacle. Tail 3.8-4.8 anal body diameters long.

Habitat: Bottom mud, Solomons Island, Md.

Remarks: This species is quite similar to one or two species within the group of *Sabatieria* having uniform punctation. Among those with irregular larger punctations on the lateral fields it seems to resemble most closely *S. praedatrix* de Man, 1907. However, the latter is larger and lacks preanal supplements.

Superfamily—Monhysteroidea Stekhoven & de Coninck, 1933

Family—Monhysteridae Oerley, 1880

Subfamily—Monhysterinae Micoletzky, 1922

Diplolaimella punicea new species

Syn. *Monhystera ocellata* of de Man, 1888 nec Bütschli, 1874.
Description: Cuticle smooth. Typical 2-part stoma, the anterior part funnel-shaped and the posterior part rounded, 4.8u deep. Probably 6 tiny cephalic setae. Ocelli with crystalline lens and bright red pigment, 1/3 the esophageal length from the anterior. Amphids circular, .28 head diameters wide, 2 head diameters from the anterior. Nerve ring 64%. Tail 5/7 filiform.

Male: .75-1.17mm; a, 44-50; b, 7.5-8.3; c, 4.5. Spicules arcuate, prominently cephalated, 20-22.8u long or 1.1-1.5 anal body diameters. Gubernaculum with broad sheath and tapering posterior apophysis. Tail 12.7-12.8 anal body diameters long.

Female: 851u; a, 32.6-32.8; b, 6-7.6; c, 3.3-3.7; vulva 54.3%. Ovary anterior, outstretched, containing over 10 eggs. Tail 18 anal body diameters long.

Habitat and Bionomics: Offshore sand Sandy Point, Md. In the specimens from Sandy Point the body was a beautiful pink due to the fine clear pink solid intestinal cell inclusions, dense and almost red near the esophago-intestinal valve. It would be interesting to learn the source of this pigment. Specimens in every way similar were obtained from floating debris, Chesapeake Beach, Md., but containing light green globular inclusions.

Remarks: This species is similar to *D. ocellata* Chitwood, 1951 in many respects, but differs in that the tail is relatively longer and the esophagus is relatively shorter. *Monhystera ocellata* of de Man, 1888 nec Bütschli, 1874 belongs in the genus *Diplolaimella*, since it is pictured with a 2-part stoma and de Man could not see the cephalic setae; he points out numerous differences of his species from *M. ocellata* Bütschli, 1874. De Man's species has no standing according to the Rules of Zoological Nomenclature and it is therefore synonymized with *D. punicea*; it is not to be confused with *D. ocellata* Chitwood, 1951.

Diplolaimella allgeni W. Schneider, 1937

Var. *ophthalmophora* new variety

Description: Body colored a deep clear green by reason of the intestinal inclusions. Probably 6 fine setae. Dark or bright red ocelli with crystalline lens, 4 the esophageal length from the anterior. Amphids .33 head diameters wide, 1.2 head diameters posterior. Tail 2/3 filiform with 2 small subterminal spines.

Male: 523u; a, 37.4; b, 6; c, 3.5. Spicules arcuate, cephalated, 19.5u long or 2 anal body diameters. Tail 11.4 anal body diameters long.

Female: 791-939u; a, 38-41; b, 7.6-8.7; c, 3.2-3.5; vulva 43-48%. Tail 19-20 anal body diameters long.

Habitat: Offshore sand, Sandy Point and bottom mud, Kent Narrows and Cambridge, Md.

Remarks: This species is similar to *D. punicea* in demanian values but differs in the shape of the spicule head and gubernaculum and in the position of the ocelli. In the shape of the spicular apparatus and in demanian values it closely resembles *D. allgeni*, obtained from the outflowing material of saline calcareous springs at Kuripan, West Java.

Diplolaimella schneideri new species

Description: Body pale and fragile-looking. 2-part stoma, 4.9u deep, both parts lightly sclerotized. 6 short but definite cephalic setae, about .16 head diameters long. Amphids .25 head diameters wide and 2.5 head diameters from the anterior. Ocelli ovoid with crystalline lens and bright red pigment, 38u from the anterior or .25 the esophageal length.

Male unknown.

Female: 816u; a, 32.6; b, 6.2; c, 3.6; vulva 50%, sclerotized. Ovary 18.1% of the body length; 1 rectangular egg, 18 x 42u. Tail 16.5 anal body diameters long.

Habitat: Bottom mud, Plum Point and Kent Narrows, Md.

Remarks: Although this species is similar in demanian formula to both *D. punicea* and *D. allgeni* var. *ophthalmophora*, it is distinguished by the distinct cephalic setae, the position of the ocelli, and the sclerotization of the stoma and vulva.

This species is named after Dr. W. Schneider, German nematologist.

Monhystera elegantula Stekhoven, 1935

Description: Very small form, dark in appearance due to dense intestinal cell globules. Cuticle smooth. Stoma slight, non-sclerotized. 6 cephalic setae, about .25 head diameters long. Somatic setae not observed. Amphids circular, .33 head diameters wide, 4 head diameters posterior. Ocelli absent. Excretory cell 15u long. Tail attenuated, 13 anal body diameters long.

Female: 430u; a, 36; b, 4.8; c, 3.6; vulva 52%. Single prodelphic ovary.

Habitat: Abundant from fine organic detritus, Solomons Island, Md.

Remarks: Stekhoven (1935) pictures the amphids as 2.5 head diameters posterior but gives 4.4 in the text; the latter is probably correct.

Monhystera filicaudata Allgen, 1929

Description: Cuticle smooth. 10 cephalic setae, .9 head diameters long. Small submedian paramphidial setae. 2 spines on tail tip. Amphids .5 head diameters wide, .75 head diameters posterior. Ocelli absent. Tail $\frac{3}{4}$ filiform.

Male: 923u; a, 58.2; b, 11.3; c, 12.7. Spicules very narrow, 46u long or 3.4 anal body diameters. Gubernaculum with slight dorsal apophysis. Tail 12.7 anal body diameters long.

Habitat: Bottom detritus, Cambridge, Md.

Monhystera luisae Bresslau & Stekhoven, 1935
(in Stekhoven, 1935)

Description: Cuticle smooth. 6 cephalic setae, .4 head diameters long. Amphids .3 head diameters wide, 15 head diameters posterior. Ocelli absent.

Male: 968u; a, 24.2; b, 6.3; c, 9.3. Spicules strongly arcuate and cephalated, 27u long or 1 anal body diameter. Gubernaculum sheath-like. Tail 3.5 anal body diameters long.

Habitat: Bottom mud, Crisfield, Md.

Remarks: The male *c* value as given by Stekhoven is 28 but this is probably an error, judging by fig. 320B; the *c* of the female is 7.2-9. The position of the gubernaculum is somewhat different in our specimen than in Bresslau's illustration, but in the text Stekhoven describes it as irregularly shaped and hence it may have been somewhat distorted.

Monhystera heteroparva Micoletzky, 1924

Syn. *M. parva* and *M. parva* var. *meridiana* (preempted) of Micoletzky, 1922. *M. parva* of de Conick & Stekhoven, 1933, nec Bastian, 1865. *Description:* Cuticle smooth. 6 cephalic setae, about .33 head diameters long. Male with submedian rows of setae along body. Amphids circular, .25-.3 head diameters wide, 1 head diameter posterior. Ocelli absent.

Male: 556-661u; a, 24.5-26.5; b, 6.6-6.8; c, 6.2-7.2. Spicules

arcuate, with prominent ventral denticle at proximal third, 20-24u long or 1-1.5 anal body diameters. Gubernaculum with posterior apophysis, 14u long. Tail 4.5 anal body diameters long.

Female: 578-725u; a, 22-28; b, 6.8-7.2; c, 6-6.7; vulva 57-60%. Ovary 34% of the body length; 1 egg, 16 x 35u. Tail 6.2 anal body diameters long.

Habitat: Decaying algae on shore, Plum Point, and bottom mud, Crisfield, Md.

Remarks: De Coninck & Stekhoven (1933) considered that *M. heteroparva* is conspecific with *M. parva* Bastian, 1865, as described by de Man (1888), saying that the latter probably overlooked the spicular denticle and submedian body setae. However, de Man was a remarkably careful observer and these features are conspicuous. Moreover, Chitwood's (1951) specimens of *M. parva* lack denticles and submedian setae also.

Monhystera denticulata new species

Description: Cuticle finely striated on the tail. Stoma rather deep and roomy, unsclerotized. 10 cephalic setae, .6 head diameters long. Somatic setae absent. Amphids .25 head diameters wide, 2 head diameters posterior. Cylindrical tail with slightly rounded tip.

Male: 1.16mm; a, 50.3; b, 6.7; c, 10.1. Spicules strongly arcuate, cephalated, with ventral denticle, and having a small dorsal prominence at the top of the arc, 20u long or 1 anal body diameter. Gubernaculum forming a sheath around the spicules and with an almost lateral apophysis, ventrally open and anchored by a retractor muscle to the ventral body wall. Tail 7 anal body diameters long.

Female unknown.

Habitat: Bottom mud, Crisfield, Md.

PLATE XI

- Fig. 91. —*Monhystera heteroparva*, male copulatory apparatus.
Figs. 92-93. —*Monhystera denticulata* n.sp.: 92, male head; 93, male copulatory apparatus.
Figs. 94-95. —*Monhystera chesapeakensis* n.sp.: 94, male head; 95, male tail.
Fig. 96. —*Monhystera microphthalmalma* var. *caeca* n.var., female head.
Fig. 97. —*Theristus oxycercus*, male copulatory apparatus.
Figs. 98-99. —*Theristus oxyuroides*: 98, male head; 99, male copulatory apparatus.
Fig. 100. —*Theristus normandicus*, male copulatory apparatus.
Figs. 101-102. —*Theristus paranormandicus* n.sp.: 101, male head; 102, male copulatory apparatus.

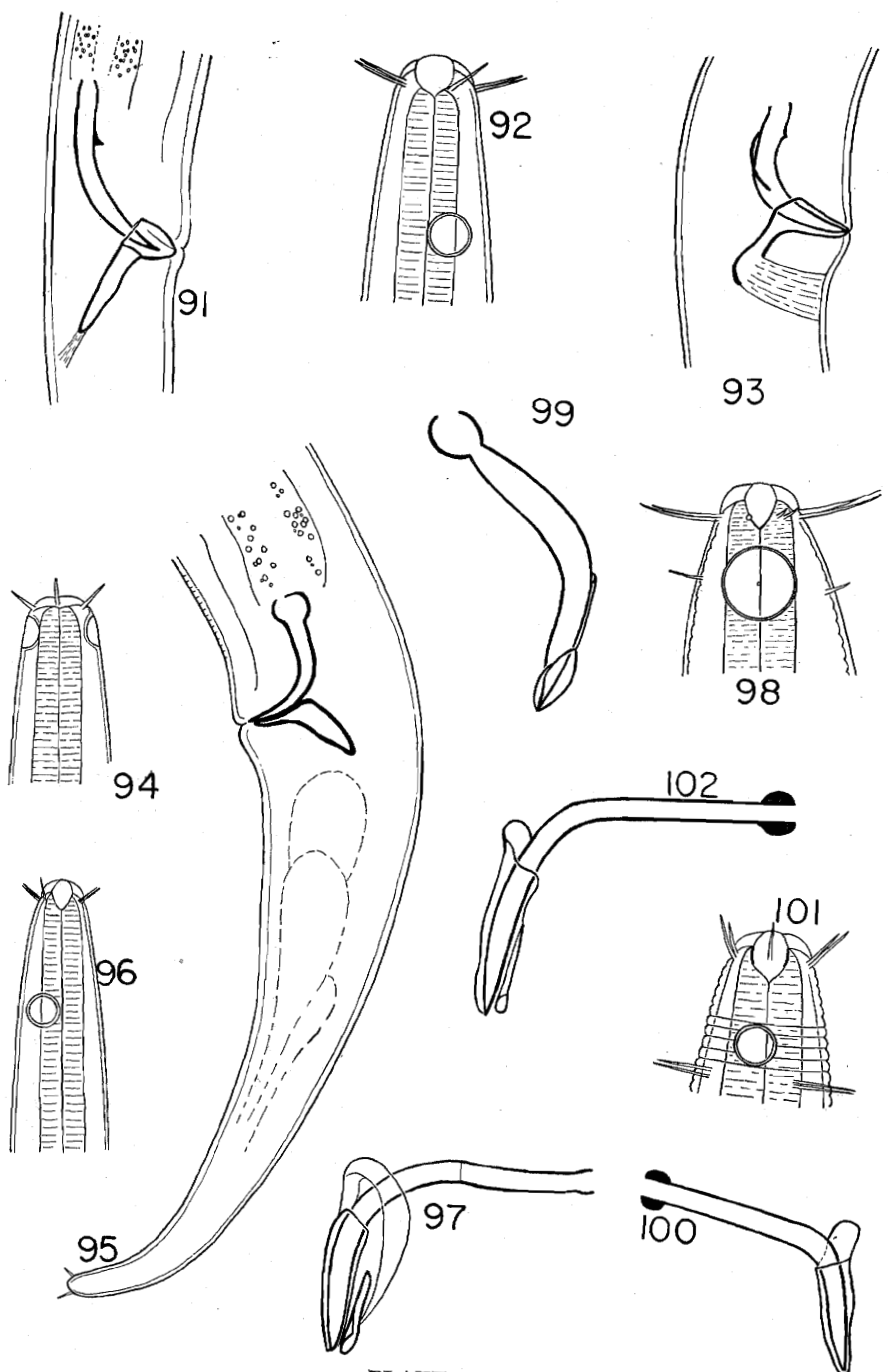


PLATE XI

Remarks: This species has denticles on the spicule head as in *M. heteroparva* but is larger and is unusual particularly in the form of the spicules and gubernaculum.

Monhystera chesapeakeensis new species

Description: Cuticle finely striated. 10 cephalic setae, .4 head diameters long. Somatic setae absent. 2 fine setae on tail tip. Amphids 2u from the anterior, .45-.5 head diameters wide. Ocelli absent. Esophagus with typical *Monhystera* valve.

Male: 989u; a, 49.5; b, 7.5; c, 9.2. Spicules thick, strongly cephalated, 19u long or 1 anal body diameter. Tail 5.6 anal body diameters long.

Female unknown.

Habitat: Offshore debris, Chesapeake Beach, Md.

Remarks: The large number of species in this genus with many fine differences between them, due largely to poorly-preserved or poorly-described material, makes one hesitate to create a new species. However, the present species seems to be distinctive in the forward position of the amphids and in the shape of the copulatory apparatus. There are many other species of *Monhystera* in Chesapeake Bay, but thus far we have been unable to identify them or to distinguish them adequately from existing species.

Monhystera microphthalma de Man, 1880.

Var. *caeca* new variety.

Description: Cuticle smooth, without somatic setae. 6 cephalic setae, .4-.5 head diameters long. Amphids .3 head diameters wide, 2 head diameters posterior. Ocelli absent. Nerve ring 55%. Tail 2/3 filiform.

Male: 587u; a, 29.4; b, 5.5; c, 3.4. Spicules arcuate, 1.5 anal body diameters long. Gubernaculum with small apophysis. Tail 11 anal body diameters long.

Female: 585u; a, 29.3; b, 5.6; c, 3.3; vulva 50%. Tail 18 anal body diameters long.

Habitat: Bottom mud, Cambridge, Md.

Remarks: *M. microphthalma* is characterized by distinct violet ocelli directly behind the amphids. Though we have not observed these, even in living specimens, the other details correspond rather exactly and hence we present our specimens as a variety. *M.*

microphthalma is a typical estuarine form, having been reported from the Zuidersee and the Gulf of Finland.

Theristus oxycercus (de Man, 1888)

Syn. *Monhystera oxycerca* de Man, 1888. *Description:* Coarsely striated. Extreme narrowing at the anterior to 1/5 the width at the esophageal base. 10 cephalic setae, .33-.4 head diameters long. 2 short spines on tail. Amphids circular, .25 head diameters wide, 1.3 head diameters posterior.

Male: 786 μ ; a, 15.7; b, 5.9; c, 6.3. Spicules strongly arcuate, slightly cephalated, 27 μ long or .95 anal body diameters. Gubernaculum with a non-sclerotized "hood" over the arc of the spicules. Tail 3.1 anal body diameters long.

Habitat: Bottom mud, Cambridge, Md.

Theristus oxyuroides (Stekhoven, 1931)

Syn. *Monhystera oxyuroides* Stekhoven, 1931. *Description:* Cuticle moderately striated. 12 cephalic setae, the longest 1 head diameter long, the shortest .75 head diameters. Somatic setae absent; 2 spines on tail. Short paramphidial setae. Amphids faint, .56 head diameters wide, .8 head diameters posterior. Nerve ring 48%.

Male: .72-1.12mm; a, 17.9-30; b, 6.2-7.4; c, 7.8-8.8. Spicules arcuate, strongly cephalated, 1.35 anal body diameters long. Gubernaculum with small side piece. Tail 3.5-4.3 anal body diameters long.

Female: .99-1.12mm; a, 17.9-23.7; b, 7.1; c, 7.1-7.5; vulva 62.1-62.5%. Tail 4-4.5 anal body diameters long.

Habitat: Bottom mud, Cambridge, Md.

Theristus normandicus (de Man, 1890)

Syn. *Monhystera (Penzanica) normandica* de Man, 1890. *Description:* Cuticle coarsely striated. Slight stoma. 12 cephalic setae, .8 head diameters long (male), .6 (female). Postamphidial setae 1 head diameter long. 2 long setae (22.5 μ) and 2 shorter setae on tail tip. Amphids .27-.33 head diameters wide, .9 head diameters posterior.

Male: 1.16-1.45mm; a, 20-21.1; b, 4.2-4.3; c, 6.3-6.6. Spicules

arcuate, proximally knobbed, 45 μ long or 1.2 anal body diameters. Gubernaculum with very short dorsal apophysis. Tail 5 anal body diameters long.

Female: 1.4-1.9mm; a, 20.1-24; b, 3.7-4.2; c, 7.7-8; vulva 62-69.7%. Anterior ovary, extending to esophageal base. Tail 5.3 anal body diameters long.

Habitat: Barnacles, Annapolis, Md.

Theristus paranormandicus new species

Description: Cuticle coarsely striated. Stoma rather deep, with fine sclerotization of the side walls. 10 cephalic setae, the longest .6 head diameters long; the shortest .6-.7 as long. 4 pairs of very fine postamphidial setae, .5 head diameters long. 3 visible spines on tail, up to 17 μ long. Amphids .33 head diameters wide, 1 head diameter posterior. Nerve ring 46% (?36%). Anterior end $\frac{1}{4}$ as wide as at the esophageal base. Tail $\frac{4}{5}$ conoid, $\frac{1}{5}$ cylindrical with slightly swollen tip.

Male: 1-1.4mm; a, 21-26.9; b, 4.6-5.4; c, 7.2-7.4. Spicules strongly arcuate, knobbed proximally, and with a slight side tooth distally, 45.5 μ long or 1.25 anal body diameters. Gubernaculum with a small dorsal apophysis. Tail 4-5.4 anal body diameters long.

Female: 1-1.45mm; a, 22.3-26; b, 6.6-6.8; c, 8-8.3; vulva 60.2-61.5%. Ovary 24.8% of the body length. Rudiment of posterior ovary rather prominent. Tail 4.6-5.8 anal body diameters long.

Habitat: Bottom mud, Cambridge and Kent Narrows, Md.

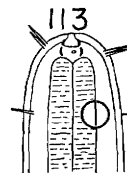
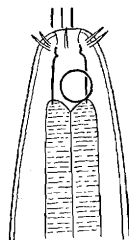
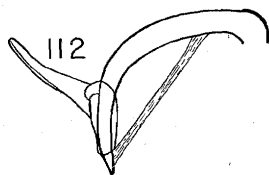
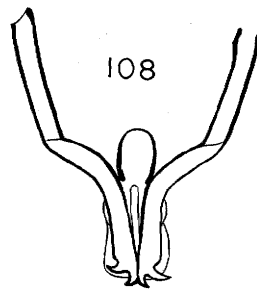
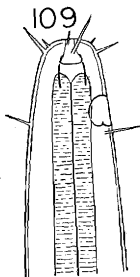
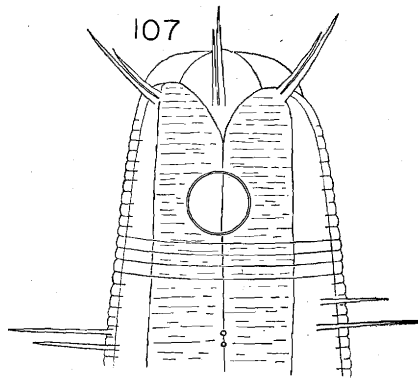
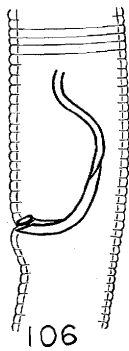
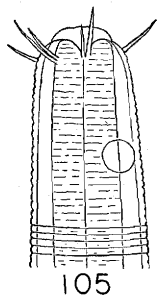
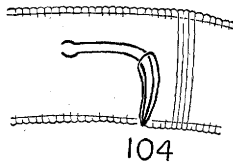
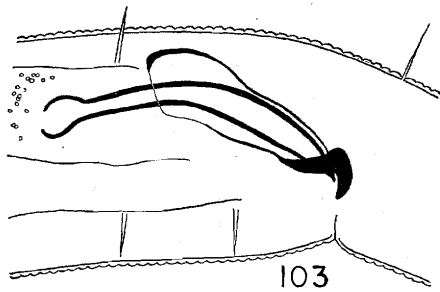
Remarks: This species is similar to *T. normandicus* in the possession of knobbed spicules, but has a shorter esophagus, only 10 cephalic setae, and shorter postamphidial setae.

Theristus marylandicus new species

Description: Cuticle moderately striated. 10 cephalic setae, .45

PLATE XII

- Fig. 103. —*Theristus parambronensis* n.sp., male copulatory apparatus.
Fig. 104. —*Theristus parvulus* n.sp., male copulatory apparatus.
Figs. 105-106.—*Theristus biarcospiculum* n.sp.: 105, male head; 106, male copulatory apparatus.
Figs. 107-108.—*Theristus paraelaboratos* n.sp.: 107, male head; 108, male copulatory apparatus.
Figs. 109-110.—*Eleutherolaimus stenostoma*: 109, male head; 110, male copulatory apparatus.
Figs. 111-112.—*Eumorpholaimus chesapeakeensis* n.sp.: 111, male head; 112, male copulatory apparatus.
Fig. 113. —*Paralinhomoeus conicaudatus*, juvenile head.



XII

head diameters long. 2 small spines on tail, 14u long. Amphids .33 head diameters wide, 1.7 head diameters posterior (male), 1.2 (female). Tail conoid attenuated.

Male: 861u; a, 21.5; b, 5.2; c, 7. Testis 40% of the body length from the anterior. Spicules narrow with forked tip, 40u long or 1.3 anal body diameters. Gubernaculum parallel with slight dorsal apophysis. Tail 4 anal body diameters long.

Female: 817u; a, 22.1; b, 5.5; c, 8.2; vulva 72%. Ovary 32.6% of the body length. Tail 5 anal body diameters long.

Habitat: Offshore sand, Sandy Point, Md.

Remarks: This species bears many resemblances to *T. paranormandicus* but is smaller and lacks the spicular knobs.

Theristus parambronensis new species

Description: Cuticle coarsely striated. 12 cephalic setae, .9 head diameters long. Somatic setae .25 body diameters long. 2 fine setae on tail tip. Amphids .4 head diameters wide, 1.2 head diameters posterior.

Male: .79-1.12mm; a, 30.4-37; b, 6.3-7.3; c, 6.7-9.6. Testis 28.4% of the body length from the anterior. Spicules cephalated, 49u long or 2 anal body diameters. Gubernaculum complex. Tail 6 anal body diameters long.

Female: 1.35mm; a, 31.8; b, 6; c, 6-8; vulva 83.4%, just anterior to the anus. Ovary 42.7% of the body length; 8 eggs, 26 x 40u. Tail 7 anal body diameters long.

Habitat: Bottom mud, Annapolis and Plum Point, Md.

Remarks: The spicules and gubernaculum are as in *T. ambronensis* Schulz, 1936 and *T. bipunctatus* G. Schneider, 1906, but there are significant differences, especially in the position of the vulva.

Theristus parvulus new species

Description: Cuticle moderately striated. 10 cephalic setae, .5 head diameters long. Few somatic setae. 2 spines on tail. Amphids .33 head diameters wide, 2.5 head diameters posterior. Tail conical attenuated.

Male: 380u; a, 20; b, 4.2; c, 6.5. Spicules L-shaped, distinctly cephalated, finely forked at the tip, 1.5 anal body diameters long. Gubernaculum sheath-like without dorsal apophysis, extending to

the bend in the spicule. Tail 4.5 anal body diameters long.

Female: 443u; a, 23.3; b, 4.4; c, 6; vulva 61.6%. Tail 5.7 anal body diameters long.

Habitat: Bottom mud, Cambridge, Md.

Remarks: This species is approached in size only by *T. aculeatus* Schulz, 1935 (.38-.46mm) but the cephalic setae of the latter are much longer.

Theristus biarcospiculum new species

Description: Cuticle moderately striated. 10 cephalic setae, .55 head diameters long, the shorter submedian setae $\frac{7}{8}$ of the longer. Amphids faint, .3 head diameters wide, 2 head diameters posterior. Anterior .4 the diameter at the esophageal base. Nerve ring 47%. Tail conical attenuated.

Male: 1.39-1.47mm; a, 23.6-44.5; b, 6.1-6.6; c, 8.5-9.4. Spicules doubly arcuate, consisting of a short arc at the proximal end and a broad arc posteriorly; spicules twisted at the height of the broad arc, 68u, long or 2.6 anal body diameters, with finely forked tip. Gubernaculum a small preanal piece. Tail 5.6-5.8 anal body diameters long.

Female unknown.

Habitat: Bottom mud, Solomons Island, Md.

Theristus paraelaboratus new species

Description: Cuticle very coarsely striated, striae 2.2u wide. 12 cephalic setae, the longest .65 head diameters long, the shortest $\frac{7}{8}$ of the longest. 6 pairs of postamphidial setae. Numerous fine body setae; 2 long spines on tail, 26u long and 2 short spines. Amphids .3 head diameters wide, slightly smaller in the female, 1 head diameter posterior (male), .8 (female). Nerve ring 35-40%. Tail $\frac{3}{4}$ conical, $\frac{1}{4}$ cylindrical.

Male: 1-1.36mm; a, 22.1-25; b, 4.6-4.8; c, 6.8-8.1. Spicules L-shaped, slightly cephalated, 32.5u long across the L, with forked tips. Gubernaculum with dorsal apophysis.

Female: 1.1-1.6mm; a, 18.7-22.1; b, 5.3-7.6; c, 7-8.1; vulva 56.3-63%. Ovary extending halfway up the esophagus in fully mature specimens. Tail 5 anal body diameters long.

Habitat and Bionomics: Bottom mud, Annapolis and Solomons Island, Md., abundant in the former locality. One female was seen

retracting the head within the cuticle as far back as the amphid, thus doubling the cuticle at the anterior; this action was alternated with extending the head normally.

Remarks: This species resembles *T. elaboratus* Chitwood, 1951 in general appearance but possesses 12 cephalic setae and has longer tail spines. The branching of the tail spines in Chitwood's specimens is due to formalin needles.

Family—Linhomoeidae Filipjev, 1929

Subfamily—Linhomoeinae Filipjev, 1929

Eleutherolaimus stenosoma (de Man, 1907)

Syn. *Monhystera stenosoma* de Man, 1907. *Description:* Cuticle finely striated. Stoma short with parallel sclerotized walls, partly embedded in the esophageal tissue. Small anterior chamber, at the base of which is a cuticular ring. Anterior circle of 4 short submedian setae; posterior circle of 4 longer setae, .75 head diameters long. Amphid cryptic spiral, .33 head diameters wide, a little over 1 head diameter posterior. Nerve ring 55%.

Male: 2.1mm; a, 63.8; b, 12.4; c, 13.4. Spicules arcuate with proximal enlargement, 24u long or 6 anal body diameters. Gubernaculum complex, with dorsal apophysis. Preanal supplements lacking. Tail 5.4 anal body diameters long.

Juvenile: 1.13mm; a, 56.6; b, 8; c, 10.6. Tail 6.7 anal body diameters long.

Habitat: Bottom mud, Crisfield and Solomons Island, Md.

Eumorpholaimus chesapeakeensis new species

Description: Cuticle smooth. Stoma with parallel walls, extending a short distance into the esophageal tissue (small anterior pieces of stoma difficult to see in glycerin mount). Anterior circle of 4 small cephalic setae; posterior circle of 10 setae, the longest of which are the lateral, .35 head diameters long. Fine cervical and tail setae. Amphids circular, .45 head diameters wide, situated over the posterior half of the stoma. Nerve ring 50%. Tail cylindrical with bluntly rounded tip.

Male: 3-3.7mm; a, 91.3-100; b, 12.7-14.6; c, 24.2-30. Spicules strongly arcuate, indistinctly cephalated, with velum, 35u long or 1.2 anal body diameters. Gubernaculum with long apophysis. Tail 4.1-4.3 anal body diameters long.

Female unknown.

Juvenile: 1.93mm; a, 71.6; b, 13.4; c, 25. Tail rounded, .5 anal body diameters wide at the tip, .5 anal body diameters long.

Habitat: Bottom mud, Cambridge and Crisfield, Md.

Remarks: This species is near *E. longisetosus* Allgén, 1935 (based on 1 juvenile) in demanian values, but the second circle of cephalic setae of the latter are much longer (1.3 head diameters).

Paralinhomoeus conicaudatus Allgén, 1930

Description: Cuticle very finely striated. Small sclerotized stoma of 2 parts divided by a ring. 10 cephalic setae, .3 head diameters long. 4 short paramphidial setae. Fine somatic setae. Amphids circular, .25-.3 head diameters wide, 1 head diameter posterior. Nerve ring 58%.

Juvenile: 718u; a, 38.6; b, 8; c, 11. Tail rounded at tip, 2/5 as wide as the anal body diameter, 4.5 anal body diameters long.

Habitat: Bottom mud, Cambridge, Md.

Paralinhomoeus paraconicaudatus new species

Description: Body dark by reason of the deep green intestinal cell globules. Hypodermis filled with thick pale inclusions. Shallow stoma with 2 pairs of short sclerotized pieces in the form of an hour glass. Teeth absent. 10 cephalic setae, the longest submedian setae .27 head diameters long. Subcephalic setae absent. A row of submedian setae on the male tail. Amphids circular, glassy in appearance, black-rimmed, 6u wide or .4 head diameters. Flat esophago-intestinal valve, 46u long. Sclerotized knobs at the base of the internal division of the esophageal bulb. Bulb 2/3 head diameters wide. Tail 2/3 conical, 1/3 tapering cylindroid.

Male: 1.55mm; a, 34.5; b, 9 (including valve); c, 12.5. Spicules 1 anal body diameter long. Gubernaculum 7/11 spicule length. Tail 3.1 anal body diameters long.

Female (immature): 1.4mm, a, 42.5; b, 9; c, 12.1; vulva 49.4%. Tail 5 anal body diameters long.

Habitat: Bottom mud, Kent Narrows, Md.

Remarks: This species is quite similar in measurements to *P. conicaudatus* but differs in stoma structure and lacks the paramphidial setae described for that species and also noted by us.

Terschellingia communis de Man, 1888

Description: Cuticle smooth. Appears to be a very fine tooth at

the anterior of the esophagus. 4 cephalic setae, .3 head diameters long. Amphids circular, .3 head diameters wide, situated between the cephalic setae. Large esophageal bulb, .25 the esophageal length. Sclerotized ring just above the base of the esophagus. Excretory pore just above bulb. Tail $\frac{1}{2}$ conical, $\frac{1}{2}$ cylindrical.

Male: 1.1-1.14mm; a, 29.2-30; b, 9.3-11.9; c, 5.5-6.5. Spicules slightly arcuate, 33-45u long or 1.4-1.5 anal body diameters. Gubernaculum triangular. Tail 6-8 anal body diameters long.

Female: .96-1.89mm; a, 24-32; b, 13.2-18; c, 5.8-7.3; vulva 50%. Ovary₁ 23.4%, ovary₂ 16.7% of the body length; 8 eggs, 50 x 55u. Tail 5 anal body diameters long.

Habitat and Bionomics: Bottom mud, Crisfield and Solomons Island, Md. One specimen was packed with elliptical sporozoans.

Terschellingia longicaudata de Man, 1907

Description: Cuticle finely striated. Fine tooth at anterior of esophagus. 4 cephalic setae, .45 head diameters long. Amphids .33 head diameters wide, a short distance behind the level of the setae. Tail $\frac{1}{4}$ conical, $\frac{3}{4}$ cylindrical-filiform.

Male: .77-1.24mm; a, 30-42; b, 11-13; c, 3.1-4.1. Spicules 29u long or 1.25 anal body diameters. Gubernaculum a small sheath with a short apophysis. Tail 9.5-17.3 anal body diameters long.

Habitat: Bottom mud, Solomons Island, Md.

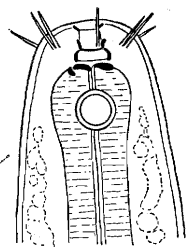
Subfamily—Sphaerolaiminae Filipjev, 1927

Sphaerolaimus balticus G. Schneider, 1906

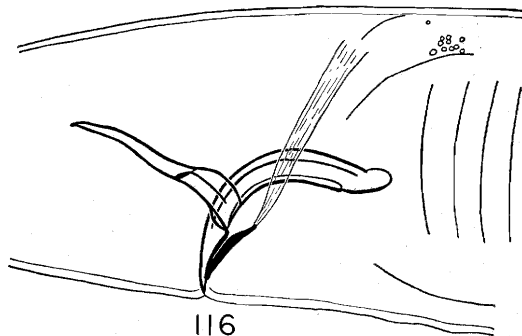
Description: Cuticle smooth. Dark uniformly-pigmented helmet at anterior in living condition, irregular longitudinal clearings in pigment after mounting in glycerin. Deep broad heavily-sclerotized stoma, 16u long by 13u wide. Anterior circle of 8 pairs of short setae, .27 head diameters long; posterior circle of 8 pairs of 2-3 setae, the longest of which are .7 head diameters. Circle of 4 pairs of paramphidial setae. Numerous cervical and tail setae. 2 small submedian spines at tail tip. Amphids circular, .3 head diameters

PLATE XIII

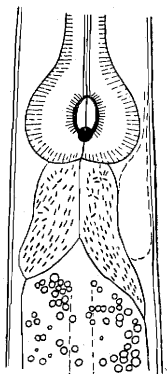
- Figs. 114-116.—*Paralinhomoeus paraconicaudatus* n.sp.: 114, male head; 115, male esophageal bulb region; 116, male tail.
Figs. 117-118.—*Terschellingia communis*: 117, male head; 118, male tail.
Fig. 119. —*Terschellingia longicaudata*, male copulatory apparatus.
Fig. 120. —*Sphaerolaimus balticus*, male head.



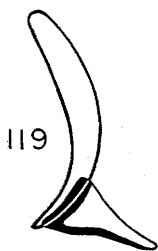
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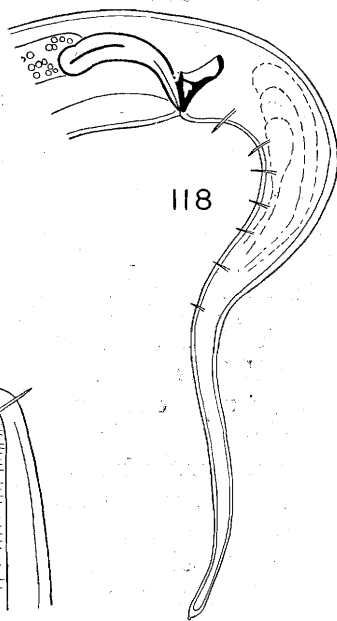
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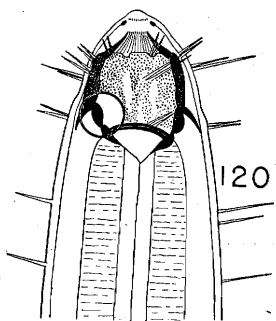
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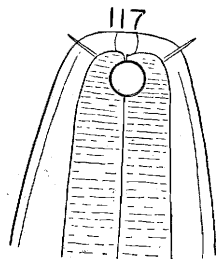
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118



120



117

PLATE XIII

wide, situated over the posterior of the stoma. Excretory pore about 65%. Clavate esophagus with a thick lining and heavy musculature.

Male: 1.69mm; am 21.9; b, 5.9; c, 8.5. Testis 43% of the body length from the anterior. Spicules broad, arcuate, with a broad open tip, 26u long or 1.2 anal body diameters. Gubernaculum parallel, 9u long. Tail conoid, 4.6 anal body diameters long.

Juvenile: 1.1mm; a, 18.5; b, 4.9; c, 8.8. Tail 3 anal body diameters long. Amphids 1.5 helmet lengths posterior; one very small juvenile was observed with amphids several helmet lengths posterior.

Habitat: Bottom mud; Crisfield, Md.

Remarks: The amphids are larger and slightly more anterior than in the illustrations of G. Schneider (1906) and Stekhoven (1935). Stekhoven synonymizes *S. ditlevseni* Kreis, 1924 with *S. balticu*. and doubts Kreis' illustration of the proximal end of the spicules. We have seen the spicules as Kreis pictures them; perhaps his species may later have to be restored.

LIST OF SPECIES

Seventy-eight species of forty-four genera are described in this paper, of which one genus, thirty-six species, and three varieties are new to science. Those marked with an asterisk are new records for North America.

**Ironella cobbi* n.sp.

Anticoma limalis Bastian, 1865

Halalaimus gracilis de Man, 1888

**Halalaimus alatus* n.sp.

**Halalaimus scleratus* n.sp.

**Oxystomina elongata* (Bütschli, 1874) de Man, 1907

Anoplostoma viviparum (Bastian, 1865)

**Anoplostoma demani* n.sp.

**Adoncholaimus lepidus* (de Man, 1889)

Oncholaimium oxyure (Ditlevsen, 1911) var. *domesticum* (Chitwood & Chitwood, 1938)

Oncholaimus nigrocephalatus Cobb, 1930

Viscosia brachylaimoides Chitwood, 1937

Viscosia papillata Chitwood, 1951

Eurystomina minutisculae Chitwood, 1951

**Eurystomina paralittorale* n.sp.

- **Polygastrophora heptabulba* n.sp.
- **Dorylaimus aestuarii* n.sp.
Chromadora quadrilineoides Chitwood, 1951
Chromadorita crassa n.sp.
- **Chromadorita schuurmans-stekhoveni* n.sp.
Euchromadora sp.
Hypodontolaimus carinatus (Cobb, 1920) n.comb.
- **Prochromadorella viridis* (von Linstow, 1876)
- **Prochromadorella chitwoodi* n.sp.
- **Parachromadora parva* n.g., n.sp.
- **Spilophorella paradoxoides* n.sp.
Paracanthonchus caecus (Bastian, 1865)
- **Halichoanolaimus duodecimpapillatus* n.sp.
- **Bathylaimus assimilis* de Man, 1922
- **Bathylaimus parafilicaudatus* n.sp.
- **Tripylloides gracilis* Ditlevsen, 1919
- **Micromicron luticola* n.sp.
- **Monoposthia ornata* n.sp.
- **Metachromadora parasitifera* n.sp.
Neonyx obesus (Chitwood, 1936) n.comb.
- **Leptolaimus papilliger* de Man, 1876
- **Aphanolaimus pulcher* G. Schneider, 1906
- **Camacolaimus propinquus* Allgén, 1929
Nemella ocellata Cobb, 1920
Axonolaimus spinosus (Bütschli, 1874)
- **Axonolaimus demani* de Coninck & Stekhoven, 1933
- **Axonolaimus steineri* n.sp.
- **Axonolaimus filipjevi* n.sp.
- **Odontophora setosa* (Allgén, 1929)
- **Odontophora setosoides* n.sp.
- **Odontophora axonolaimoides* n.sp.
- **Pseudolella cobbi* n.sp.
- **Pseudolella brevamphida* n.sp.
- **Pseudolella paraganulifera* n.sp.
- **Dorylaimopsis metatypicus* Chitwood, 1936 var. *brevisetata* n.var.
- **Sabatieria punctata* (Kreis, 1924)
- **Sabatieria americana* n.sp.
- **Diplolaimella punicea* n.sp.
- **Diplolaimella allgeni* W. Schneider, 1937 var. *ophthalmophora* n. var.
- **Diplolaimella schneideri* n.sp.
- **Monhystera elegantula* Stekhoven, 1935
- **Monhystera filicaudata* Allgén, 1929

- **Monhystera luisae* Bresslau & Stekhoven, 1935
- **Monhystera heteroparva* Micoletzky, 1924
- **Monhystera denticulata* n.sp.
- **Monhystera chesapeakeensis* n.sp.
- **Monhystera microphthalmalma* de Man, 1880 var. *caeca* n.var.
- **Theristus oxycercus* (de Man, 1888)
- **Theristus oxyuroides* (Stekhoven, 1931)
- **Theristus normandicus* (de Man, 1890)
- **Theristus paranormandicus* n.sp.
- **Theristus marylandicus* n.sp.
- **Theristus parambronensis* n.sp.
- **Theristus parvulus* n.sp.
- **Theristus biarcospiculum* n.sp.
- **Theristus paraelaboratus* n.sp.
- Eleutherolaimus stenosoma* (de Man, 1907)
- **Eumorpholaimus chesapeakeensis* n.sp.
- **Paralinhomoeus conicaudatus* Allgén, 1930
- **Paralinhomoeus paraconicaudatus* n.sp.
- Terschellingia communis* de Man, 1888
- Terschellingia longicaudata* de Man, 1907
- **Sphaerolaimus balticus* G. Schneider, 1906

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