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FREE-LIVING MARINE NEMATODES FROM A SUBLITTORAL STATION IN THE NORTH SEA OFF THE BELGIAN COAST

by

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ABSTRACT. — Five new species of free-living marine nematodes from a station in a sublittoral region in the North Sea off the Belgian Coast are described: *Anomonema deconincki* n. sp., *Stephanolaimus gandavensis* n. sp., *Paramesonchium belgicum* n. sp., *Rhabdodemania birgittae* n. sp. and *Microlaimus annelisae* n. sp. Adults of *Microlaimus ostracion* STEKHOVEN, 1935 are described for the first time. New details on *Perepsilonema crassum* LORENZEN, 1973, are given. A key to the species of *Stephanolaimus* DITLEVSEN, 1918 is provided.

INTRODUCTION

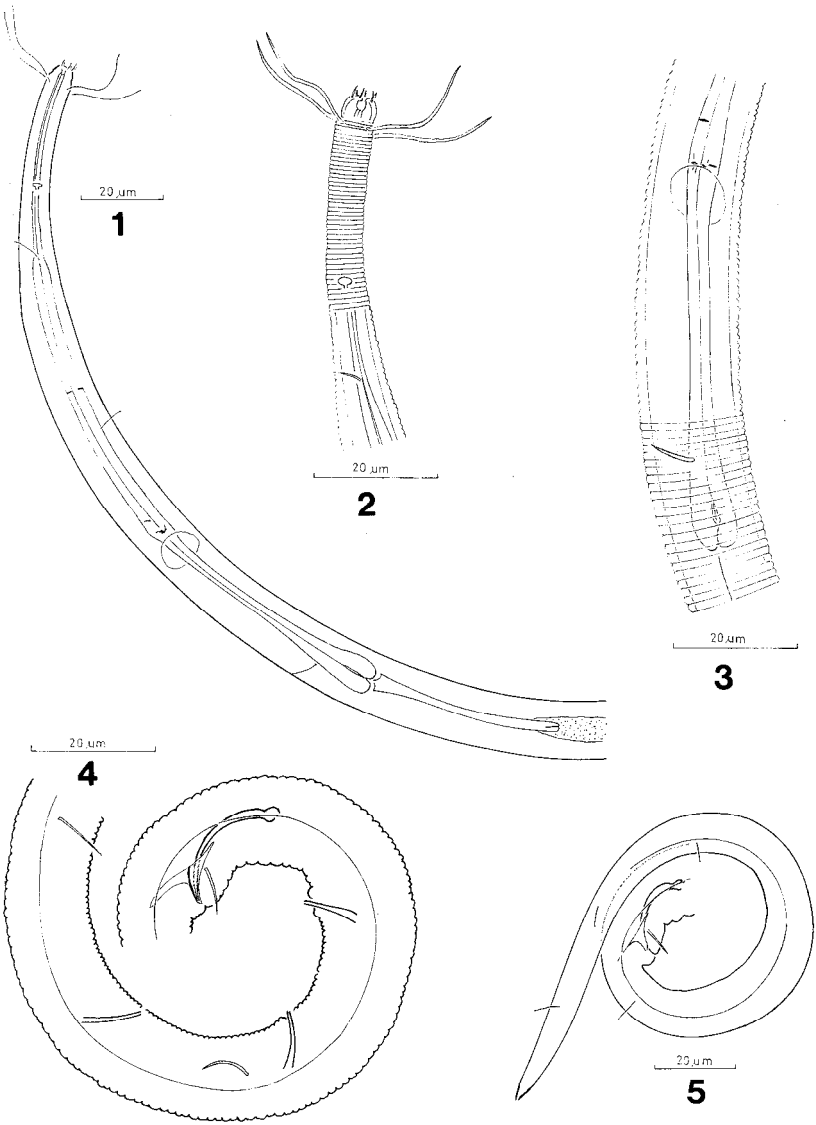
Earlier investigations on free-living marine nematodes off the Belgian Coast were all done in the littoral region (STEKHOVEN & ADAM, 1931, DE CONINCK & STEKHOVEN, 1933, STEKHOVEN & DE CONINCK, 1933 and STEKHOVEN, 1935a). During an extensive study of the benthos off the Belgian Coast, begun in 1971, many slides of free-living nematodes have been deposited in the Instituut voor Dierkunde, Rijksuniversiteit, Gent, Belgium. The study-area covers both littoral and sublittoral regions.

The present paper describes free-living marine nematodes from a station in a sublittoral region within the study-area.

MATERIAL AND METHODS

The nematode material originates from locality M 14 (51°50'50" N; 02°51'08" E), 32-40 m deep, sand (medium diameter 300-350 µm) with only 0.25% or less silt-clay fraction; collected 8-11 January 1973.

All observations were made on preserved specimens mounted in glycerol on Cobb-slides.



FIGS. 1-5. — *Anomonema deconincki* n. sp. ; ♂ ; 1. Oesophagus region ; 2. Anterior end ; 3. Cardia region ; 4. Cloacal region ; 5. Tail.

Anomonema deconincki n. sp. (Figs. 1-5).

Material.

1 ♂ (holotype), collected 9 January 1973. Slide No. 401.

Measurements.

♂ L = 1.42 mm a = 89 b = 7.7 c = 7.7

$$\frac{-\ 123\ \ 185\ \ M\ \ 1237}{6\ \ 16\ \ 16\ \ 16\ \ 15}\ 1422\ \mu m$$

Body slender, cylindrical from nerve ring to cloaca ; it tapers sharply in the anterior region to a beak-like neck region.

Cuticle annulated, annules about 1 μm in the neck region and about 1.5 μm in the rest of the body. A narrow lateral wing runs from the end of the bulb region aver the body length. Oesophagus region with three pairs of somatic setae, 7.5 μm long (two pairs laterodorsal and one pair latero-ventral). The somatic setae on the body measure 9 μm and are only situated lateroventrally, not in pairs, apart from a single pair on the anterior lip of the cloaca.

Head slightly demarcated from the neck by a construction just in front of the insertion of the cephalic setae. Cephalic sense organs in 6 + 6 + 4 arrangement, i.e. six small internal labial papillae, six thin external labial setae 2 μm long and four slender cephalic setae 21 μm long. Buccal cavity 2 μm deep, shallow and without armature.

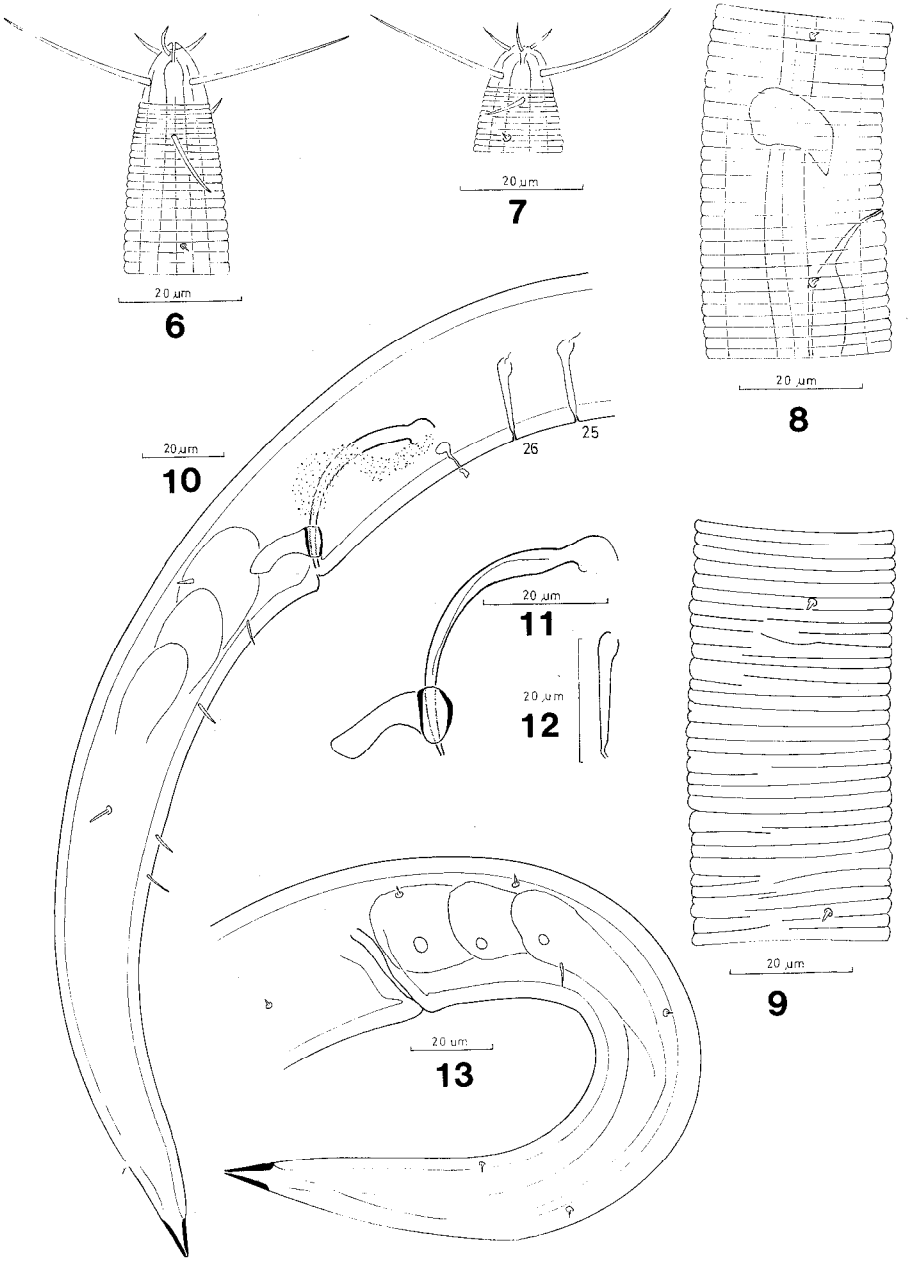
Amphid opening transversely oval (Enoplid-like), 29 μm behind the anterior end. Its width is 2.5 μm, i.e. 2/5 of the corresponding body diameter. The amphid-pouch is short and very narrow.

Oesophagus composed of four portions, beginning anteriorly with a narrow cylindrical procorpus, 43 μm long, followed by a 78 μm long, expanded muscular corpus ; posteriorly the corpus is sligthly dilated, forming a median bulb. The corpus is followed by a narrow, non-muscular isthmus which posteriorly joins the muscular, non-valvated terminal bulb. A narrow cardia is about 45 μm long.

Nerve ring crosses the oesophagus at the anterior part of the isthmus. It is situated at 66% of the oesophagus-length.

Excretory pore and renette cell not observed.

Gonad monorchic with outstretched testis reaching till 216 μm behind the terminal bulb. Two equal spicules, 23 μm long measured along the arc,



FIGS. 6-13. — *Stephanolaimus gandavensis* n. sp. ; 6. Head end of ♂ ; 7. Head end of ♀ ; 8. Nerve-ring region of ♂ ; 9. Cuticular ornamentation at the cardia level of ♂ ; 10. Posterior end of ♂ ; 11. Right copulatory apparatus ; 12. Supplement ; 13. Tail of ♀.

21 µm measured from tip to tip ; proximal part cephalated, tapering distally. Gubernaculum with a 9 µm long caudal apophysis. Three sclerotized, tuboid, 11 µm long pre-cloacal supplements. The posterior-most supplement is located 23 µm anterior to the cloaca, the second 19 µm anterior to the first and the last supplement 26 µm in front of the second one. A pair of somatic setae are situated subventrally on the anterior cloacal lip.

Tail elongated, conoid, about 13 times as long as the cloacal diameter. Caudal setae scattered, unpaired and measuring 6.3 µm. Spinneret 4 µm long and sclerotized (*Stephanolaimus*-like).

Differential diagnosis.

The described specimen is included in *Anomonema* HOPPER, 1963 (see genus diagnosis p. 852 of HOPPER, 1963). *Anomonema deconincki* n. sp. genus diagnosis p. 852 of HOPPER, 1963). *Anomonema deconincki* n. sp. conforms to the type species and formerly the only known species *A. haplostoma* HOPPER, 1963 in the following characters : general appearance, cephalic setae, buccal cavity, oesophagus and supplements. The new species differs however in the following features : lips, cuticular annules, somatic setae, amphidial pouch, cardia and proximal part of the spicules. In *A. haplostoma* it is unclear in which region the lateral wings arise ; in *A. deconincki* n. sp. the wings arise at the end of the terminal bulb. Furthermore, the localities differ : *A. haplostoma* is found in coarse sand at 90 cm depth in Gulf Shores, Alabama, USA, whereas *A. deconincki* n. sp. occurs in median sand at 40 m depth in the North Sea off the Belgian Coast.

Stephanolaimus gandavensis n. sp. (Figs. 6-13).

Material

1 ♂ (holotype) and 1 ♀ (paratype) ; collected respectively 9 January and 8 January 1973. Slide No. 402 (holotype), 403 (paratype).

Measurements.

♂ L = 2.66 mm	a = 81 b = 7.8 c = 13.5		
	- 230 340 M 2463 / 9 28 33 33 31	2660	µm
♀ L = 2.90 mm	a = - b = 8.5 c = 14.6		
	- 230 340 1340 2704 / 9 30 34 (50) 36	2900	µm

Male : Body slender and cylindrical, regularly attenuating towards the extremities.

Cuticle 5 µm thick, annulated with 3 µm broad rings, which are regular in the oesophagus region and irregular over the rest of the body. Small somatic papillae are inserted on the cuticle laterally in the oesophagus region and scattered over the rest of the body.

Head with a distinct lipregion and three crowns of cephalic sense organs, i.e. one crown of six internal labial papillae, one crown of six external labial setae 5 µm long inserting just behind the lips, and one crown of four submedian cephalic setae 26 µm long (three times the corresponding head diameter). A pair of subcephalic setae 11 µm long are situated laterally 16 µm behind the anterior end. The amphid has not been observed. Buccal cavity narrow, tuboid and 3 µm deep.

The oesophagus is cylindrical ; just behind the buccal cavity it is sligthly expanded ; posterior part without bulb. Nerve ring situated at 2/3 of the oesophagus length. Excretory pore situated 350 µm behind the anterior end, i.e. 10 µm behind the nerve ring. Renette cell not observed.

Gonads diorchic : one outstretched and one reversed testis. Copulatory apparatus with two slender sickle-shaped spicules, measuring 53 µm along the arc and 43 µm from tip to tip. Proximal part cephalated, median part with ribs and tapering distally. Gubernaculum with a strongly sclerotized corpus, 8 µm long and with a single 15 µm long caudal apophysis. A gland-like structure with fine granules is situated along the spicules. Precloacally are situated 26 sclerotized, tuboid supplements ; the anterior seven supplements are 40 µm apart, the last nineteen about 16 µm, the last one situated 57 µm in front of the cloaca. A fine ventral duct is present, 43 µm anterior to the cloaca ; the duct is associated with a small gland. Tail about six times as long as the cloacal diameter, conical and ending in a non-annulated, strongly sclerotized spinneret. Three caudal glands are all situated within the tail.

Female : Similar to the male for many items, but differs in the following features : the cephalic setae are 24 µm long, the subcephalic setae measure 7 µm. The vulva is situated at 46% of the body length. The reproductive system is didelphic-amphidelphic, with reflexed ovaries. No pre- or post-vulval supplements. The tail bears only a single 2 µm long seta besides the scattered somatic papillae.

Differential diagnosis.

Stephanolaimus gandavensis n. sp. is most closely related to *S. flevensis* STEKHOVEN, 1935, *S. paraflevensis* GERLACH, 1953 and *S. spartinae* LORENZEN, 1969 (cephalic sense organs in 6 + 6 + 4 arrangement and

tuboid buccal cavity). Those four species differ from the type species *S. elegans* DITLEVSEN, 1918, in which the external crown of labial setae is reduced and the buccal cavity structure is as in *Camacolaimus*. *S. gandavensis* n. sp. is primarily differentiated from the most closely related species *S. spartinae* by the presence of the somatic papillae on the cuticle, which are not depicted nor mentioned by Lorenzen in *S. spartinae*. Further differentiating characters are the total length 2660-2900 µm vs. 880-900 µm, the length of the cephalic setae 24-26 µm vs. 10 µm and the number of precloacal supplements 26 vs. 9-10.

Discussion.

Among the five descriptions of *S. elegans* syn. *S. armatus* SCHULZ, 1932 (see p. 46 in GERLACH & RIEMANN, 1974) the text and the drawings of the description by STEKHOVEN, 1935 are in discordance. This statement is mainly based on the arrangement of the cephalic sense organs in the fig. 268 a, which are depicted as seven even long setae in two crowns, whereas only four cephalic setae are mentioned in the text. Furthermore, in the same figure, an amphid-like structure is situated just behind the buccal cavity at the level where the cephalic setae are inserted, whereas in the text it is mentioned that the amphid has not been observed. The second drawing (fig. 268 b), of the tail, gives no more information than that the species may belong to *Stephanolaimus* DITLEVSEN, 1918. No locality is mentioned in the text. This description without any doubt does not belong to *S. elegans*. I prefer to consider *S. elegans* sensu STEKHOVEN, 1935 as spec. inq.

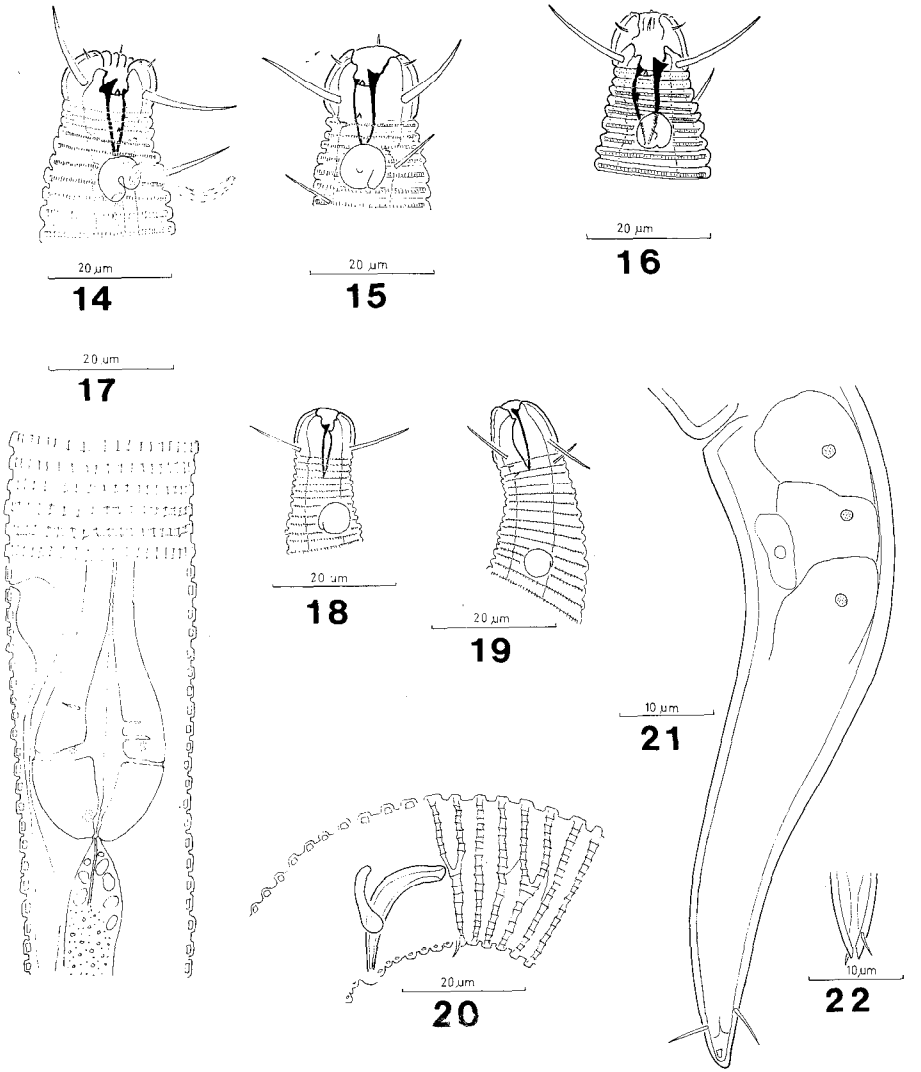
Stephanolaimus filicaudatus STEKHOVEN, 1946 is described on the basis basis of a single juvenile specimen. Text and drawings do not give enough information to establish this specimen as a new species and even not enough diagnostic characters to include it in *Stephanolaimus*. I therefore prefer to consider *S. filicaudatus* as spec. inq.

Conclusion.

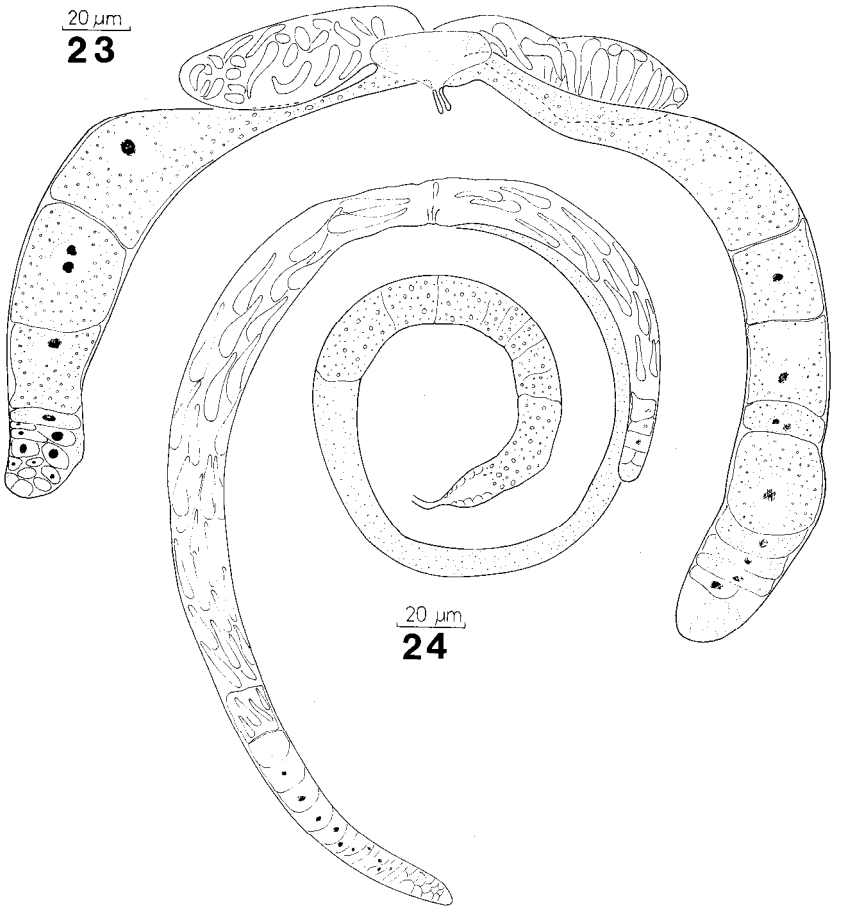
At the present time the genus *Stephanolaimus* includes five species, which have been reported only from European waters ; they are distinguished in the following key :

Key to the species of *Stephanolaimus* DITLEVSEN 1918

1. Without external labial setae (i.e. 6 + 0 + 4), camacolaimid buccal cavity ..... *S. elegans*.
   With external labial setae (i.e. 6 + 6 + 4), tuboid buccal cavity 2.



FIGS. 14-22. — *Microlaimus ostracion* STEKHOVEN, 1935 ; 14. Head end of δ_1 ; 15. Head end of φ_1 ; 16. Head end of φ_2 ; 17. Bulb region of δ_1 ; 18. Head end of juv.$_1$; 19. Head end of juv.$_2$; 20. Cloacal region of δ_1 ; 21. Tail of φ_1 ; 22. Spinneret of juv.$_1$.



FIGS. 23-24. — *Microlaimus ostracion* STEKHOVEN, 1935 ; Reproductive systems ; 23. ♀$_2$; 24. ♂$_1$.

2. Subcephalic setae less than one head diameter long ..... 3.
   Subcephalic setae more than one head diameter long ..... 4.
3. No somatic papillae, cephalic setae 1.4 head diam. long, 9-10 pp. ..... *S. spartinae.*
   Somatic papillae present, cephalic setae 3 head diam. long, 26 pp. ..... *S. gandavensis.*
4. Cuticle weakly annulated, gubernaculum with short apophysis, 6-7 pp., only males known ..... *S. paraflevensis.*
   Cuticle strongly annulated, gubernaculum with long apophysis (about the same length as the corpus), 12-14 pp., only males known ..... *S. flevensis.*

Microlaimus ostracion STEKHOVEN, 1935 (Figs. 14-24).

Material.

3 ♂♂ (♂$_1$-♂$_3$) and 4 ♀♀ (♀$_1$-♀$_4$); collected 8 January 1973. Slide No. 404 (♂$_1$) and 405 (♀$_1$).

Measurements.

♂$_1$ L = 1.31 mm a = 45 b = 8.7 c = 9.9

-	80	150	M	1174
16	26	29	28	24

1307 µm

♀$_1$ L = 1.05 mm a = 28 b = 7.8 c = 10.0

-	71	134	525	947
15	30	33	38	26

1052 µm

	L	a	b	c
♂$_2$	1.15	42	7.7	10.6
♂$_3$	1.21	42	8.0	11.5
♀$_2$	0.99	38	6.5	10.5
♀♀$_{3-4}$	—	—	—	—

Males: Body slender and cylindrical, yellow-brown. The somatic setae are 13 µm long and only found in the anterior part of the oesophagus region.

Cuticle distinctly annulated; annules ornamentated with longitudinal bars. The rings are very close together between the neck and the amphid, and the bars are observed as punctuations in this region. Between the amphid and the terminal bulb the distance between the rings and between the bars becomes gradually larger; from there on it is about constant to the tail region, with irregular patterns here and there. On the tail region the annules and the bars are again closer together.

Amphids loop-shaped, 7 μm wide (i.e. 1/3 of the corresponding body diameter), on the level of the end of the buccal cavity, 19 μm behind the anterior end. A gelatinous rod arising from both amphids is visible in σ_1 and σ_2.

The head is set off, bearing six distinct internal labial papillae, six external labial setae measuring 3 μm, and 4 cephalic setae 17 μm long (1.1 head diameter long). The buccal cavity is large and sclerotized with a powerful dorsal tooth and two small subventral teeth at the same level as the dorsal one. A small subventral tooth is situated in the posterior half of the buccal cavity. The buccal cavity itself is divided into two parts by a ring situated at the base of the three anterior teeth. The oesophagus surrounds the buccal cavity and ends in a pear-shaped bulb.

Renette-cell situated opposite to the anterior part of the intestine, excretory duct ending in an ampulla near the excretory pore which penetrates the cuticle at 2/3 of the oesophagus-length (between the nerve ring and the bulb).

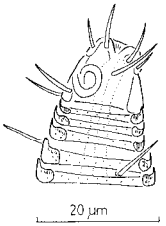
Reproductive system diorchic with anterior, outstretched and posterior, reversed testis. The anterior testis is 273 μm long, the posterior one 118 μm long. The sperms are cone-shaped, about 15 μm long. The spicules are slender and curved, 22 μm along the arc, 20 μm from tip to tip. The gubernaculum is 11 μm long, without apophysis. A single ventral seta, 2 μm long, is situated 15 μm in front of the cloaca.

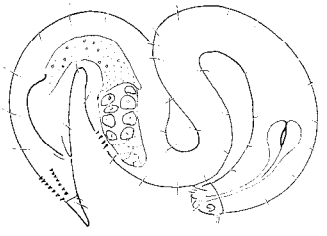
The tail is conical and five cloacal diameter long ; two terminal setae insert on the tip, each 8 μm long. Three caudal glands are situated within the tail ; spinneret present.

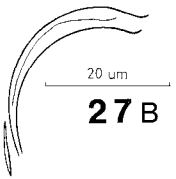
Female : Similar to the males for many items ; they differ, however, in the following features : the amphid is not so distinctly loop-shaped, but roundish in the outline, with a dorsal interruption and a curved line in the center, features which are an indication of the loop-shaped nature of the amphids. No amphidial gelatine rod could be observed.

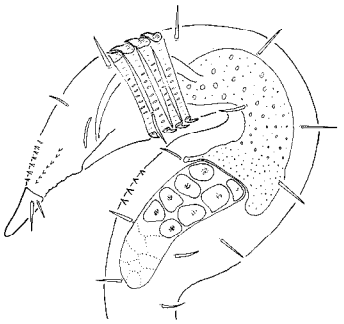
The reproductive system is didelphic-amphidelphic with outstretched ovaries ; the anterior part measures 194 μm, the posterior one 240 μm. The oviducts taper gradually towards the vaginal region. An uterus is not clearly observed ; two pocket-formed organs, spermathecae, are situated anteriorly and posteriorly to the vagina. Both spermathecae are filled with sperms. A granulated gland is situated in the vaginal region. The vulva is situated at 50% of total body length.

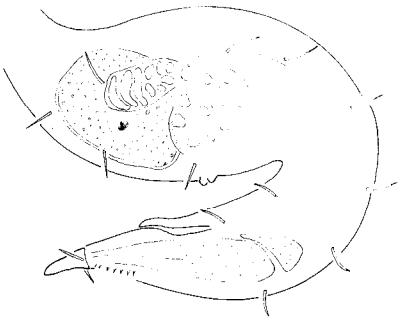
In φ_1 a supplementary cell (coelomocyte) is situated in the tail region, ventrally between the cell nuclei of the first and the second caudal gland. A











FIGS. 25-29. — *Perepsilonema crassum* LORENZEN, 1973 ; 25. Head end of ♂1 ; 26. Head end of ♀1 ; 27a. Total view of ♂1 ; 27b. Right spicule and gubernaculum of ♂1 ; 28. Posterior end of ♂1 ; 29. Posterior end of ♀1.

similar cell is described from *Chromadorina germanica* BÜTSCHLI, 1874 by LIPPENS, 1974.

$♀_2$ is a moulting female (distinct in the head region) with fully developed ovaries and fertilized eggs. $♀♀_{3\,4}$ are strongly coiled up.

Discussion.

Microlaimus ostracion STEKHOVEN, 1935 has up to now only been reported on the basis of juvenile specimens (STEKHOVEN, 1935, GERLACH, 1954 and RIEMANN, 1966. Comparing the present material and juvenile specimens (1) with the descriptions of STEKHOVEN, 1935 and RIEMANN, 1966, there is no doubt that the cuticle of this *Microlaimus* species is unique in both juveniles and adults within the 69 known *Microlaimus* species.

Perepsilonema crassum LORENZEN, 1973 (Figs. 25-29).

Material.

2 ♂♂, 2 ♀♀ and 1 juvenile ; collected 9-11 January 1973. Slide No. 411 ($♂_1$), 412 ($♀_1$).

Measurements.

	L (µm)	R (Numbers)	D	Spic. arc. (µm)	Vulva (%)
$♂_1$	360	139	12µm : 33µm = 1 : 2.8	38	—
$♂_2$	295	136	11µm : 37µm = 1 : 3.4	33	—
$♀_1$	251	113	14µm : 42µm = 1 : 3.0	—	68
$♀_2$	330	141	11µm : 44µm = 1 : 4.0	—	70

Remarks.

The present specimens have been compared with Dr. S. Lorenzen's Epsilonematid collection and found to belong to *Perepsilonema crassum* LORENZEN, 1973. The males in the present material have four pairs of small subventral copulatory spines in the posterior half of the body (at the widest body diameter). *Perepsilonema crassum*, as described and depicted by

(1) Materials collected June 17, 1971 ; depth, 10 m, medium sand ; coastal waters off the Belgian coast (unpublished thesis of Dr. W. Decraemer, University of Gent, Belgium).

LORENZEN, 1973, p. 76, fig. 20a, has no copulatory spines; this is a mistake. They have been overlooked, but are certainly both in numbers and position as described in the present material.

Paramesonchium belgicum n. sp. (Figs. 30-37).

Material.

1 ♂ (holotype), 4 ♀♀ (♀$_1$-♀$_4$), ♀$_1$ (paratype), 1 juvenile; collected 8-9 January 1973. Slide No. 406 (holotype), 407 (paratype).

Measurements.

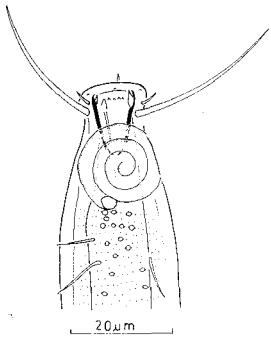
♂	L = 2.54 mm	a = 79	b = 8.2		c = 13.0	
		-	130	310 M	2343	2538 µm
		12	28	30 32	30	
♀$_1$	L = 2.55 mm	a = 61	b = 9.1		c = 12.2	
		-	125	280	1354 2344	2554 µm
		14	33	36	42 31	
♀$_2$	L + 2.47 mm	a = 52	b = 8.8		c = 13.0	
		-	126	280	1309 2274	2469 µm
		12	29	30	46 29	

	L	a	b	c
♀$_3$	2.40	60	9.7	13.6
♀$_4$	2.34	58	10.0	11.6
juv.	0.88	49	3.9	8.4

Male: Body slender and cylindrical, attenuating towards the extremities. Somatic setae arranged in four longitudinal rows (two dorsolateral rows, two ventrolateral rows). The first two setae in each row measure 12 µm, the rest are 5 µm long.

Punctuated cuticle with a 10 µm wide lateral field, coarsely and transversally punctuated; the lateral field is delimited by cuticular pores. Just behind the amphid the lateral field is irregular but from there on more regular. Sublateraliy the punctuation is minute and closely spaced in twice as many rows as laterally. Amphid a spiral, with 3.5 turns and 17 µm in diameter, which corresponds to the body diameter at that level. The amphid is situated 8 µm behind the anterior end.

Head with six distinct lips and cephalic sense organs in 6 + 6 + 4 arrangement, i.e. six internal labial papillae, six external labial setae 4 µm long, and 1.5 µm behind this crown four submedian 36 µm long cephalic setae. The buccal cavity is conical, 15 µm deep and sclerotized, with three



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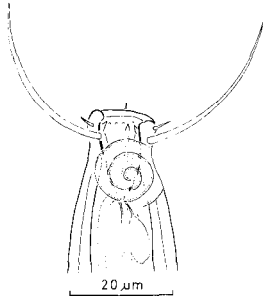

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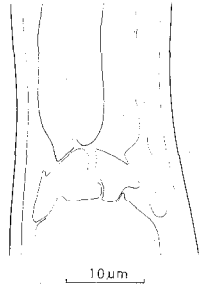

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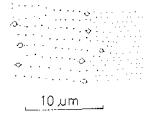

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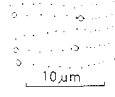
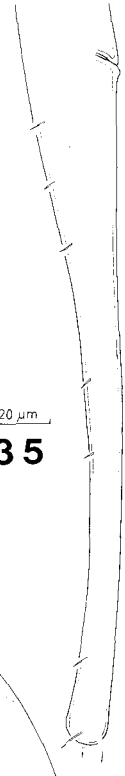


34 B



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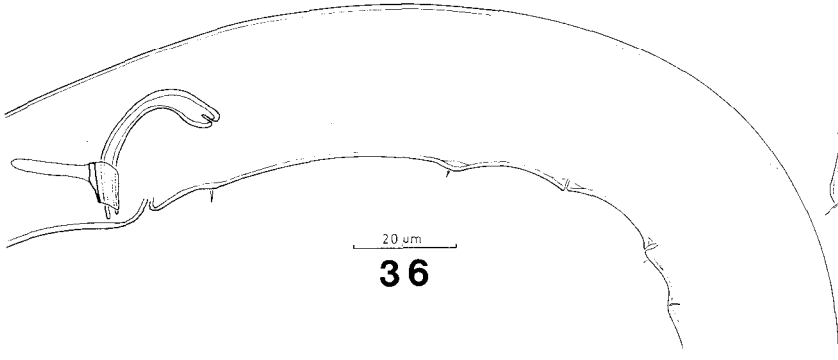

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FIGS. 30-36. — *Paramesonchium belgicum* n. sp. ; 30. Head end of ♂ ; 31. Head end of $♀_1$; 32. Head end of $♀_2$; 33. Cardia region of ♂ ; 34. Cuticular ornamentation of ♂ at mid-body, b. tail ; 35. Tail of $♀_2$; 36. Cloacal region.

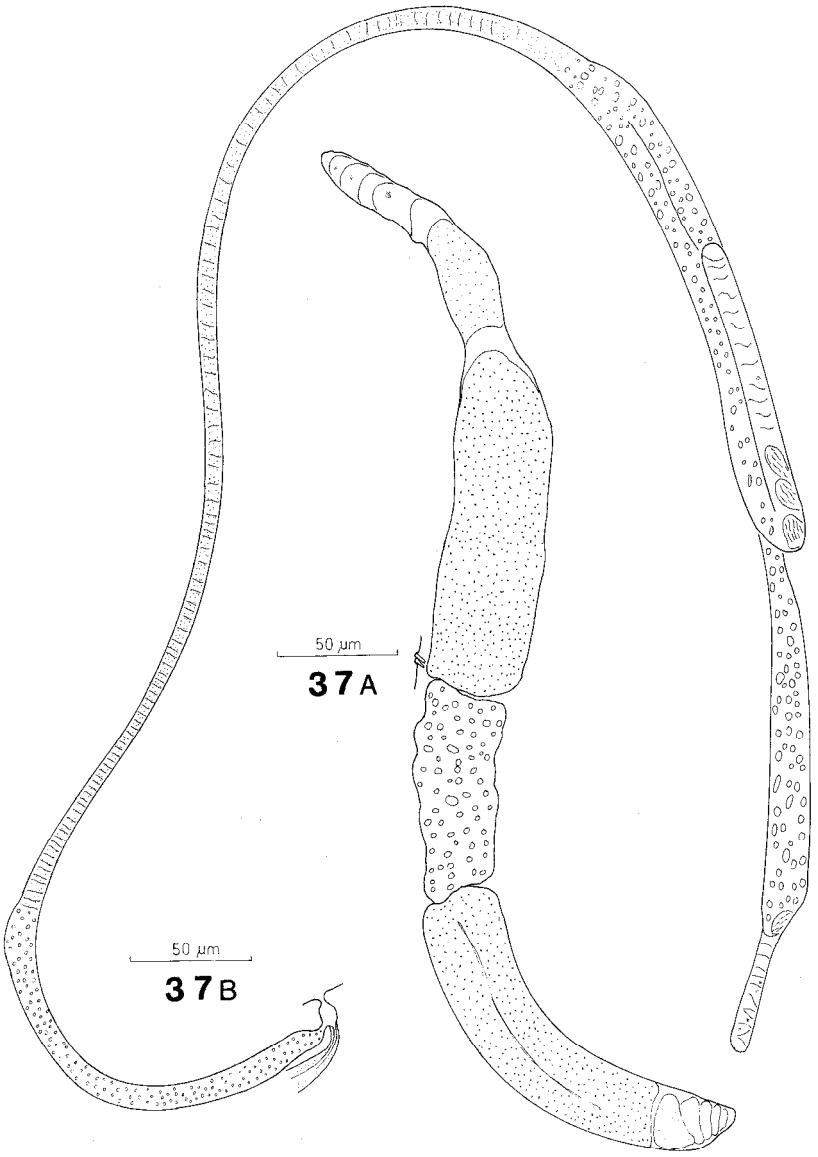


FIG. 37. — *Paramesonchium belgicum* n. sp. ; Reproductive systems : a. ♀ I, b. ♂.

acutely pointed ridges. The tips of these ridges are situated where the external labial setae insert ; at that level a crown of denticles is situated. The oesophagus surrounds the buccal cavity with a thin muscular tissue. The oesophagus-lumen contains three marginal tubes and expands sligthly terminally, without forming a bulb. The cardia is wide and short. The renette cell is situated at the cardia level ; the duct ends in an ampulla near the excretory pore, situated at 45 % of the oesophagus-length. Nerve ring situated undistinctly at 42 % of the oesophagus-length.

The reproductive system is diorchic with reversed and outstretched testis. The spicules are slender, curved and strongly sclerotized, measuring 38 µm along the arc, tapering distally. The gubernaculum is 8 µm long and has a 15 µm long caudal apophysis. Five precloacal ducts and small setae are situated respectively at 16 µm, 56 µm, 77 µm, 97 µm and 102 µm in front of the cloaca. At those sites, the cuticle is sligthly swollen.

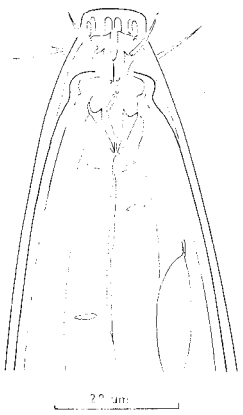
The tail measures 7 times the cloacal diameter ; the posterior two thirds form a cylindrical part with a sligthly swollen apex, on which three setae insert, each 12 µm long.

Females : They differ from the male specimen in the amphid which has only three turns. Furthermore, the buccal cavity of $♀_1$ and $♀_2$ is not so distinctly conical, the base of the buccal cavity is in those two specimens wide open and clearly continues into the oesophageal lumen with its three marginal tubes. Just behind the buccal cavity in $♀_2$, a thin 2 µm duct empties dorsally into the base of the buccal cavity (anterior-oesophageal lumen) through a toothlike structure situated within the oesophageal tissues. The duct is associated with a more or less oval ampulla, 4.5 µm long and 2 µm wide. The reproductive system is didelphic-amphidelphic with outstretched ovaries. A spermatheca is situated between the vagina and the posterior ovarium. The vulva is small, slit-like and situated at 53-56 % of the total body-length.

Juvenile : The only specimen does not differ significantly from the diagnostic features described in the adults. No gonads could be seen.

Differential diagnosis.

Paramesonchium belgicum n. sp. has the characteristical conoid buccal cavity, with pointed ridges in common with the only other species, *P. seriale* (WIESER, 1954). Further similarities are the shape of the tail and the cephalic sense organs. They differ, however, in the lateral cuticular ornamentation, and *P. belgicum* n. sp. is provided with a ring of denticles in



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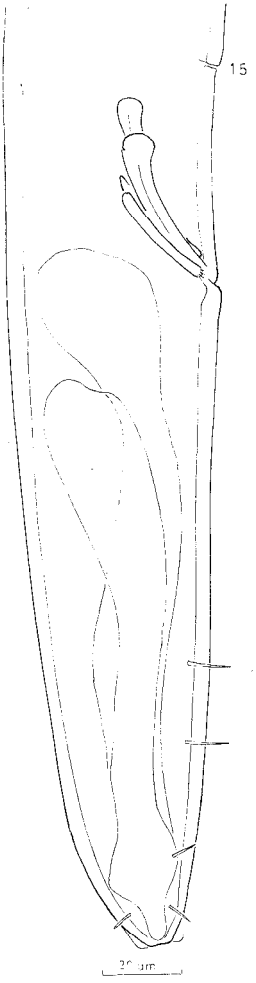

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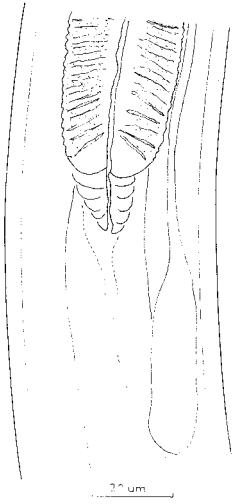

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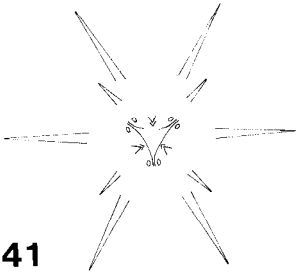

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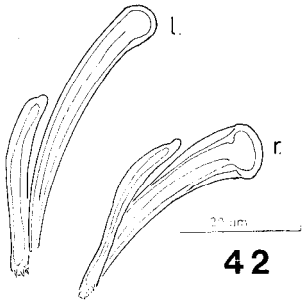

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FIGS. 38-43. — *Rhabdodemania birgittae* n. sp. ; 38. Head end of juv.$_3$; 39. Head end of σ_1 ; 40. Cardia region of σ_2 ; 41. Face view ; 42. Copulatory apparatus of σ_1 ; 43. Posterior end of σ_1.

the anterior part of the buccal cavity ; these denticles are lacking in *P. seriale*.

Rhabdodemania birgittae n. sp. (Figs. 38-43).

Material.

2 ♂♂ (♂$_1$ holotype, ♂$_2$ paratype) and 3 juveniles (juv.1-3) ; collected 8-11 January 1973. Slide No. 409 (holotype), 410 (paratype).

Measurements.

♂$_1$ L = 3.73 mm a = 68 b = 14.2 c = 21.3

-() 260 600 M 3550 / 18/22 48 49 55 52 — 3725 µm

♂$_2$ L = 3.34 mm a = 61 b = 12.8 c = 17.1

- 260 560 M 3165 / 18/21 47 51 55 54 — 3340 µm

	L	a	b	c
juv.$_1$ (♀)	2.85	98	14.7	25.9
juv.$_2$ (♂)	2.61	52	10.8	20.0
juv.$_3$ (♂)	(2.18)		Moulting	

Males : Body cylindrical, naked and sligthly tapering towards the extremities. Head with strongly developed lips, smooth and cushion-like. A first crown of internal labial papillae could not be seen. The second crown of cephalic sense organs consists of four submedian setae 5 µm long ; 1.5 µm behind this crown a third circle of six setae arises (2 subdorsal, 2 sublateral, 2 subventral) ; they measure 15 µm, i.e. 0.7 the corresponding head-diameter. Buccal cavity conical, 17 µm deep, provided with three pairs of stilet-like sclerotized mandibles at the anterior end ; the walls are strongly sclerotized. About in the middle of the buccal cavity plate-like projections arise (one dorsal, two sublateral) at the same level ; at the base of the buccal cavity three equal minute projections are situated. Amphid could not be seen.

Oesophagus cylindrical, anteriorly surrounding the posterior half of the buccal cavity ; the insertion line distinctly lies where the plate-like projections arise. The posterior part of the oesophagus forms no bulb ; it partly surrounds a conical cardia, which inserts in the intestine. Posterior half of the oesophagus with several interruptions and fine granules in the tissues.

(2) Measured where second and third crown of setae are inserted.

Nerve ring situated at 43 % of the oesophagus-length. Renette cell slender, situated just behind the cardia and emptying through a 15 µm long, sligthly curved duct, 18 µm behind the anterior end.

Gonads not distinctly observed ; it can not be made out whether there is a single testis or two testes in tandem formation. The copulatory apparatus consists of two unequal spicules with two equal gubernacula. The right spicule measures 35 µm along the arc, 32 µm from tip to tip. The left spicule measures 43 µm along the arc, 42 µm from tip to tip. The gubernacula measure 30 µm and distally are provided with denticles. 15 minute ventral papillae are situated in front of the cloaca. The posterior one is situated 53 µm in front of the cloaca.

The tail is about 3.5 times as long as the cloacal diameter, almost cylindrical, with spinneret. Three submedian pairs of 8 µm long caudal setae are situated at the posterior half of the tail. Subterminally there are four setae, 4 µm long. Two (?) well developed caudal glands are situated within the tail.

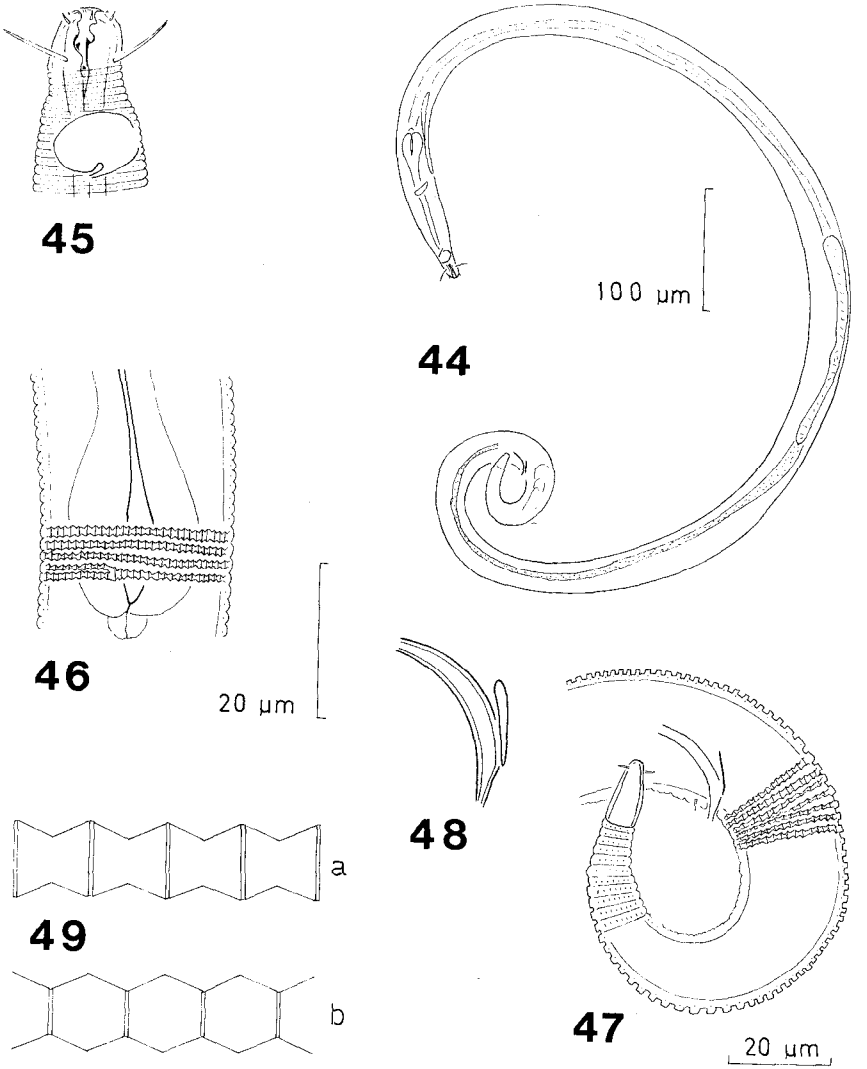
Juveniles : Juv.$_1$ is a young female with poorly developed gonads. The reproductive system is didelphic-amphidelphic with reflexed ovaries. The vulva is situated at 65 % of the body length. No caudal setae could be seen apart from the four subterminal setae. This specimen is relatively thin : maximal body diameter about 30µm. The buccal cavity is weakly sclerotized.

Juv.$_2$ is a young male with developed gonads and copulatory apparatus. The buccal cavity is well sclerotized. Body diameter as in adult males. Tail with three pairs of submedian setae, which are very thin ; with four subterminal setae.

Juv.$_3$ is a moulting male. The moulting process is distinct in the anterior region, where the whole buccal cavity is renewing. Gonads and copulatory apparatus weakly developed. Tail with three submedian pairs of thin setae ; four subterminal setae present.

Differential diagnosis.

Rhabdodemania birgittae n. sp. is closely related to the *Rhabdodemania* species with the cephalic sense organs arranged in 6 + 4 + 6 (six internal labial papillae, 4 cephalic setae, 6 external labial setae) : *R. major* (SOUTHERN, 1914), *R. coronata* GERLACH, 1952 and *R. illgi* WIESER, 1959. *Rhabdodemania birgittae* n. sp. differs from all known *Rhabdodemania* species by a buccal cavity provided with smooth lips, anteriorly with three pairs of stilet-like mandibles, three plate-like projections at the same level



FIGS. 44-49. — *Microlaimus annelisae* n. sp., ; ♂ ; 44. Total view ; 45. Head end ; 46. Bulbus region ; 47. Posterior end ; 48. Copulatory apparatus , 49. Cuticular ornamentation at mid-body — a : high focus, b : low focus (sketch, not drawn to scale).

in the middle part and three projections at the base of the buccal cavity. Furthermore, it is characterized by unequal spicules and by gubernacula distally provided with denticles.

Microlaimus annelisae n. sp. (Figs. 44-49).

Material.

1 ♂ (holotype); collected 10 January 1973. Slide no. 201.

Measurements.

L = 1.38 mm a = 41 b = 11.0 c = 13.7

$$\frac{-\ 76\ \ 125\ \ M\ \ 1279}{9\ \ 20\ \ \ 24\ \ 34\ \ \ \ 22}\ 1380\ \mu m$$

Body cylindrical with a narrow neck region and head set off. Somatic setae not observed. Cuticle annulated from head to tail tip with rings about 1.5 µm wide at mid body. The surface of the cuticle is ornamentated with punctuations in the neck and anteriormost cervical region and on the posterior part of the tail, the rest of the body has annules provided with longitudinal bars. The ornamentation is resolved in hexagons or honeycomb-like structures just below the surface structures. Some annules have an irregular pattern.

Head with six small internal labial papillae, six external labial setae 1.5 µm long and four cephalic setae 9 µm long. The cephalic setae are situated 7 µm behind the front end. Amphids with an elliptical aperture and a posteriorly situated fovea in a small and narrow protruding part of the aperture. The aperture itself is 11 µm wide, i.e. 81% of the corresponding body diameter, the anterior border at 13 µm from the front end. Vestibulum striated. Buccal cavity sclerotized with a pointed dorsal tooth and two small subventral teeth, a small sclerotized tip arises from the subventral wall in the posterior and narrow portion of the buccal cavity. Oesophagus surrounding the whole buccal cavity, anteriorly enlarged, posteriorly dilated to a pear-shaped bulbus. Cardia small. Nerve ring situated at 61% of the oesophagus length. Renette cell slender, posteriorly to the bulbus and emptying through a duct opening at a distance of 88 µm from the front end, i.e. just behind the nerve ring.

Gonads diorchic with an outstretched and a reversed testis. Copulatory apparatus with two equal spicules, 26 µm along the arc, 23 µm from tip to tip. The spicules are slender and sligthly curved with the distal part narrow and tapering. Half way the spicules have their largest width i.e. 3.5 µm.

Gubernaculum plate-shaped without apophysis. A small ventral seta 3 µm in front of the cloaca. Preanal papillae not observed. Tail conical with a 14 µm long smooth tail tip provided with two terminal setae 3 µm long.

Females and juveniles not found.

Differential diagnosis.

Amphids with elliptical aperture as present in *M. annelisae* n. sp. have never been described before within the genus, although elliptical amphids have been found in representatives of the closely related genus *Paramicrolaimus* WIESER, 1954. An ornamented cuticule with longitudinal bars has been described in *M. ostracion* STEKHOVEN, 1935 where however the annules are wider, in *M. teutonicus* RIEMANN, 1966 where the ornamented annules only could be established in the neck region and in *Paramicrolaimus primus* WIESER, 1954 in which the ornamented cuticle is described as having bars resolvable in honeycomb-like structures as in *Microlaimus annelisae* n. sp. Notwithstanding the similarities in the above discussed two features, *Microlaimus annalisae* n. sp. fits into the generic diagnosis of *Microlaimus* DEMAN, 1880 (buccal cavity and arrangement of the cephalic sense organs) ; the species certainly links the two genera by the shape of the amphids and the cuticular characteristics.

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REFERENCES

DE CONINCK, L. & J. H. SCHUURMANS STEKHOVEN (1933). The freeliving marine nemas of the Belgian Coast II. *Mém. Mus. r. Hist. nat. Belg.*, **58** : 1-163.

DITLEVSEN, Hj. (1918). Marine freeliving nematodes from Danish waters. *Vidensk. Meddr dansk naturh. Foren.*, **70** : 147-214.

GERLACH, S. A. (1952). Nematoden aus dem Küstengrundwasser. *Abh. math.-naturw. Kl. Akad. Wiss. Mainz*, **6** : 315-372.

IDEM (1953). Die Nematodenbesiedlung des Sandstrandes und des Küstengrundwassers an der italienischen Küste. I. Systematischer Teil. *Archo. zool. ital.*, **37** : 517-640.

IDEM (1954). Die freilebenden Nematoden der schleswig-holsteinischen Küsten. *Schr. naturw. Ver. Schlesw.-Holst.*, **27** : 44-69.

IDEM (1956). Brasilianische Meeres-Nematoden I. Bolm Inst. Oceanogr., S. Paulo, **5** : 3-69.

GERLACH, S. A. & F. RIEMANN (1973). The Bremerhafen checklist of aquatic nematodes. *Veröff. Inst. Meeresforsch. Bremerh. Suppl.*, **4** (1) : 1-404.

IDEM (1974). The Bremerhafen checklist of aquatic nematodes. *Veröff. Inst. Meeresforsch. Bremerh. Suppl.*, **4** (2) : 405-736.

HOPPER, B. E. (1963). Marine nematodes from the coast line of the Gulf of Mexico. III. Additional species from Gulf Shores, Alabama. *Can. J. Zool.*, **41** : 841-863.

IDEM (1976). Free-living marine nematodes from Biscayne Bay, Florida. I. Comesomatidae : the male of Laimella longicauda COBB, 1920, and description of Actarjania new genus. *Mar. Biol.*, **1** : 140-144.

LIPPENS, P. L. (1974). Ultrastructure of a marine nematode, Chromadorina germanica (BÜTSCHLI, 1874). I Anatomy and cytology of the caudal gland apparatus. *Z. morphol. Tiere*, **78** : 181-192.

LORENZEN, S. (1969). Freilebende Meeresnematoden aus dem Schlickwatt und den Salzwiesen der Nordseeküste. *Veröff. Inst. Meeresforsch. Bremerh.*, **11** : 195-238.

IDEM (1973). Freilebende Meeresnematoden aus dem Sublittoral der Nordsee und der Kieler Bucht. *Veröff. Inst. Meeresforsch. Bremerh.*, **14** : 103-130.

IDEM (1973). Die Familie Epsilonematidae (Nematoda). *Mikrofauna Meeresbodem*, **25** : 1-86.

PLATONOVA, T. A. (1974). Volume and systematic status of the genus Rhabdodemania (Nematoda, Enoplida). *Zool. Zhur.*, **53** (9) : 1295-1303. In Russian.

RIEMANN, F. (1966). Die interstitielle Fauna im Elbe-Aestuar. Verbreitung und Systematik. *Arch. Hydrobiol.* (Suppl.), **31** : 1-279.

ROUVILLE, E. DE (1903). Révision des Nématodes libres, marins, de la région de Cette. *C. R. hebd. Séanc. Acad. Sci.*, Paris, **137** : 1002-1003.

SCHULZ, E. (1932). Beiträge zur Kenntnis mariner Nematoden aus der Kieler Bucht. *Zool. Jb. (Syst.)*, **62** : 331-430.

SOUTHERN, R. (1914). Nemathelmia, Kinorhyncha and Chaetognatha (Clare Island Survey, part 54). *Proc. R. Ir. Acad.*, **31** : 1-80.

SCHUURMANS STEKHOVEN, J. H. (1935a). Nematoda : Systematischer Teil, Nematoda errantia. In : GRIMPE, G. and E. WAGLER, Die Tierwelt der Nord- und Ostsee (Leipzig, 1935), **5b** : 1-173.

IDEM (1935b). Additional notes to my monographs on the free-living marine Nemas of the Belgian coast I. and II. *Mém. Mus. r. Hist. nat. Belg.*, **72** : 1-36.

IDEM (1946). Freilebende marine Nematoden des Skagerraks und der Umgebung von Stockholm. *Ark. Zool.*, **37** : A (16) : 1-91.

SCHUURMANS STEKHOVEN, J. H. & W. ADAM (1931). The freeliving marine nemas of the Belgian Coast. *Mém. Mus. r. Hist. nat. Belg.*, **49** : 1-58.

SCHUURMANS STEKHOVEN, J. H. & L. DE CONINCK (1933). Diagnoses of new Belgian marine Nemas. *Bull. Mus. r. Hist. nat. Belg.*, **9** : 1-13.

VITIELLO, P. (1970). Nématodes libres marins des vases profondes du Golfe du Lion. II. Chromadorida. *Téthys*, **2** : 449-500.

WIESER, W. (1954). Free-living marine nematodes II. Chromadoroidea. *Acta Univ. Lund* (N. F. 2), **50** (16) : 1-148.

IDEM (1959). Free-living nematodes and other small invertebrates of Puget Sound beaches. Seattle (University of Washington Press), 1959 : 1-179.

WIESER, W. & B. HOPPER (1967). Marine nematodes of the east coast of North America. I. Florida. *Bull. Mus. comp. Zool. Harv.*, **135** : 239-344.

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CORRECTIONS

page	line	
233	5	change "aver" into: through
	1o	change "construction" into: constriction
235	12	cancel the whole line
237	24	cancel "basis"
241	26	change "Female" into:Females
243	4	change "♀♀$_{34}$" into:♀$_3$, ♀$_4$
244	11	change "♀$_2$ L + 2.47 mm" into: ♀$_2$ L = 2.47 mm
249	5	change "3 juveniles (juv. 1_3) into:3 juveniles (juv.$_{1-3}$)
	9	change "()" into:(2)