BEAUFORTIA

SERIES OF MISCELLANEOUS PUBLICATIONS

ZOOLOGICAL MUSEUM . AMSTERDAM

No. 93 Volume 8 June 7, 1961

The Nematode Collection of Dr. J. G. de Man
1

by

P. A. A. LOOF

(Landbouwhogeschool, Wageningen)

INTRODUCTION

One of the pioneers of nematology was the Dutch zoologist Dr. J. G. DE MAN (1850—1930). His contribution to this science consisted of 44 papers (VAN BENTHEM JUTTING, 1951), which were largely taxonomic and faunistic in character. The total number of new nematode genera described by him is 50, of new species 229.

Apart from the publication on marine nematodes from the Gulf of Naples (DE MAN, 1876—c), his earlier papers (1876—a, 1880, 1881 and 1884) are devoted to the free-living, soil and freshwater nematodes of the Netherlands, while his later publications also deal with marine forms and are not confined to the Dutch fauna.

DE MAN left his collection to the Zoological Museum of the University of Amsterdam. The present Director of this institution, Prof. Dr. H. ENGEL, very kindly put it at the disposal of the Nematology Sections of the Plantenziektenkundige Dienst and the Landbouwhogeschool at Wageningen. During the past four years the author has studied the material. Some results have been published already (LOOF & OOSTENBRINK, 1958; LOOF, in CHITWOOD, 1960; LOOF, 1960); now a review of the whole collection is given.

DE MAN's nematode collection is composed of two parts:

1. The "Hollandsche Collectie", containing soil and freshwater nematodes from the Netherlands (and a few from Italy);
2. The "Algemene Collectie", comprising mainly marine and foreign nematodes. In this division is included the "Zuiderzee Collectie".

It is not known in what medium DE MAN mounted his specimens. According to DITLEVSEN (1911) he used for fixation a mixture of 9 parts glycerin and 4 parts acetic acid.

The slides in the "Hollandsche Collectie" and part of the "Algemene Collectie" are sealed with a black substance, probably some bituminous petroleum residue. The remainder of the "Algemene Collectie", including the whole "Zuiderzee Collectie" and, in general, the slides made after

Appeared also as Mededeling no 190 of the Laboratorium voor Fytopathologie of the Landbouwhogeschool, Wageningen.

about 1915, are sealed with a yellow substance (Goldsize?). In these latter preparations the mounting fluid is still present and the nematodes are generally in a good state. The others are quite dried out and the condition of these specimens is highly variable. Some are nearly as good as recent nematodes, while others — especially marine forms — are mere empty skins.
Where possible, the nematodes were remounted on aluminium perforated slides of the modern COBB type. The sealing ring was removed and fluid added: at first 30% alcohol was used, but later F.A.A. was found to give better results. In some preparations the bitumen of the ring had penetrated considerably between slide and coverglass, which. consequently, were glued tightly together. These slides were kept in dioxane for 24—48 hours, by which time the bitumen had dissolved sufficiently, so that the coverglass could be lifted safely. The nematodes were not damaged by dioxane. The specimens were then, via F.A.A. and alcohol-glycerin, transferred to pure glycerin and remounted.
Most nematodes in DE MAN's collection are more or less flattened. because the coverglasses were not supported by glass rods.

PART 1: HOLLANDSCHE COLLECTIE.

The "Hollandsche Collectie" consists of slides of the ordinary 76 × 26 mm size, with square coverglasses of about 20 × 20 mm. It was stored in two boxes, each fitted to contain a hundred of such slides. The sealing rings of the preparations were very thick, so that in several cases the nematodes were invisible until the ring had been removed.
The slides are numbered 1—255, but the actual number present is 195. A few of these had lost coverglass and nematodes.
The "Hollandsche Collectie" was catalogued by DE MAN himself. The slides bear no label, but only numbers which correspond to entries in the catalogue. Wherever in the present section the expression "labelled" is used, it therefore means that the data in question are present in the catalogue under the corresponding number.
Of the missing slides some are not mentioned in the catalogue and thus were already lost in DE MAN's time. Others must have been lost later, because they are referred to in the catalogue. This latter group comprises type material of *Cephalobus nanus, Tylenchus macrophallus* and *Tylolaimophorus typicus,* which is regrettable as the taxonomic status of these species is somewhat uncertain.

It was stated formerly (LOOF & OOSTENBRINK, 1958) that the "Hollandsche Collectie" contained the specimens used by DE MAN for his papers on the Dutch nematode fauna (1876—a, 1880, 1881 and 1884). This statement needs some restrictions: in the first place it has become evident that DE MAN did not make permanent preparations of the nematodes collected prior to 1876, and secondly all the evidence points to November 1879 as the closing date of the "Hollandsche Collectie". The question of the closing date is important. The 1884 book is essentially an enlargement of the purely descriptive papers of 1880 and 1881, although some additional new species are described in it. If the collection were finished before 1880, then nearly all the material of species described as new in 1880 would have type status. The following data are relevant:

1. 32 slides are dated, all from 1879. Eight of these are lost.
2. Between 1880 and 1883 DE MAN received soil samples from several colleagues from foreign countries. These localities are not mentioned in the catalogue. The only (two) foreign specimens present are from Ischia (Italy) and were collected about 1876 by DE MAN himself.
3. 22 slides with specimens belonging to species described as new in 1880 bear the indication "n.sp.". Thus these specimens were collected before the 1880 paper went to press, i.e. before September 1879. It should be noted that DE MAN used the indication ' n.sp." only for the first collection of specimens of a new species, at least in those days.
4. 20 slides bear names unknown in the literature, most of them with the indication "n.sp.". The specimens on these slides could be identified as belonging to species described (most of them as new) in 1880 under different names. The only exception is *Amphidelus uniformis* THORNE, 1939 which, however, bears the same provisional name as *Alaimus primitivus* DE MAN, 1880, and thus evidently was not recognized by DE MAN as being different from the latter. The specimens on these 20 slides must therefore also have been collected prior to September 1879. To avoid confusion, these "nomina in collectione" will not be published in the present paper, except two which occur as nomina nuda in the literature, viz. *Plectus coronatus* and the generic name *Protomonhystera* (DE MAN, 1876—b).
5. Several slides bear names dropped in 1880, so these were also collected prior to September 1879. See sections on *Eucephalobus oxyuroides*, *Monhystera filiformis* and *Prionchulus muscorum*; cf. also *Tobrilus gracilis*. For *Dorylaimus tritici* see under *Eudorylaimus* spec. (2), *Nygolaimus brachyuris* and *N. intermedius*. Here also slide H 46 may be mentioned: it contains a male labelled *Dorylaimus rhopalocercus*; in 1880 DE MAN recorded only females of the latter species and placed the male in question in *D. obtusicaudatus*.
6. With regard to the species described as new in 1884, the collection does not contain specimens of *Ironus longicaudatus*. Material of *Tylenchus agricola* is present; this was not a new species, but merely a new name. The slide bears the name *T. filiformis* BÜTSCHLI, under which name the species was described in 1880. The holotype of *Dorylaimus crassus* is present: it was collected in November 1879.
7. In DE MAN's personal notes we find the statement "preserved" several times between 1876 and 1879, but never after 1880.
8. Nor are there other indications that DE MAN preserved specimens after 1880. The only case which requires some comment is that of *Turbatrix aceti*. This species was not treated in 1876 or 1880; it was described shortly in a footnote in the book of 1884. This footnote is a translation of a note written by DE MAN in his own copy of the 1880 paper. But this does not prove that the material of this species, present in the collection, was collected after 1880, for the 1880 paper is a preliminary, purely descriptive paper on free-living, soil and freshwater nematodes, to which categories the vinegar eelworm does not belong. So it is quite possible that the specimens were collected before 1879, although DE MAN did not study them more closely until the preparation of the 1884 book, which is a systematic monograph.
9. The catalogue arrangement suggests that the slides were numbered

more or less chronologically. It seems that DE MAN in 1879 started noting date and locality in the catalogue, because these particulars are present on all slides of the Algemene Collectie, which was started in 1884. Data about collecting time and locality are scarce in the Hollandsche Collectie. The table shows that the higher numbered slides

TABLE I

Series number of slides	Actual number of slides present (in catalogue)	Slides bearing date		Slides bearing locality	
		number	%	number	%
1— 50	47	—	—	21	44,7
51—100	31	—	—	14	45,2
101—150	42	1	2,4	14	33,3
151—200	34	1	2,9	20	58,8
201—255	55	30	54,5	38	69,1

are more consistently provided with these particulars than were the lower ones. Slides nr. 178—222 could be deduced to be from 1879, and slides 223—255 bear this year themselves. The arrangement is as follows:

February : 178—192; 207;
March : 199—200; 203—206; 208—211;
April : 195—197; 212; 214;
May : 202; 213; 215—216; 220;
July : 201; 218—219; 221—222; 239;
August : 223—237; 240—250;
November: 251—255.

As to the 88 slides without locality and the 163 without date, the following sources furnished information which, in a number of cases, made deduction possible:

a. DE MAN's own copy of the 1876 paper. A number of specimens belonging to species described in that paper and collected between 1876 and 1879 are recorded there with date, locality, detailed dimensions and sometimes further particulars, such as number of preanal supplements in male Dorylaimidae, and number of eggs. Several specimens in the collection could be identified as such specimens.
b. DE MAN's own copy of the 1880 paper, where in a similar manner specimens were recorded that were collected between 1880 and 1883. As mentioned above, no indications were found that any of these specimens is present in the "Hollandsche Collectie". This negative evidence is, however, valuable and important.
c. A notebook containing detailed lists of habitats for each of the 142 species treated in the book of 1884, and agreeing completely with the table on p. 193—194 of the latter publication. The notebook also contains detailed lists of collecting localities of these 142 species except for the genera *Alaimus, Bastiania* and *Deontolaimus*. The findings are specified according to month and sex. This information proved extremely useful, the more so because there are several localities where DE MAN apparently only made a single collection, e.g. Apeldoorn in July 1879.

Summarizing:
The arrangement of the slides in the catalogue indicates that the „Hollandsche Collectie" was closed in November 1879. It appears also that from 1879 onwards DE MAN noted date and locality on his slides. It was possible to check date and locality for about half of the slides and these were all found to be made between 1876 and November 1879. There are no indications that the collection contains material from after 1879. The writer therefore thinks it justifiable to assume that the "Hollandsche Collectie" was closed in November 1879.

As the Hollandsche Collectie was not started before 1876, the types of all species described in the 1876 paper exist no more. That DE MAN did not make permanent mounts of these specimens is corroborated by some taxonomic details (see e.g. *Tylenchus agricola*). Many of these species are represented in the "Hollandsche Collectie" by specimens collected after 1876, and it would have been possible to designate neotypes for them. This has been done, however, in only a few cases, because in the first place the Rules recommend that neotypes not be designated as a matter of routine, but only in cases where it is desirable for the solution of a taxonomic or nomenclatorial problem (Copenhagen Decision Nr. 34); secondly, compared with recent preparations the nematodes in DE MAN's collection are always in an inferior state of preservation, so that it seems more appropriate to designate, if necessary, a recent specimen as neotype. Although the specimens in the "Hollandsche Collectie" were collected by DE MAN himself within a short time after publication of the 1876 paper, we should bear in mind that even DE MAN could not compare them with the primary types; the case of *Tylenchus agricola* shows that in 1876 and 1880 he sometimes described different species under one and the same name; see also under *Nygolaimus intermedius*. Only in cases of rare species, the taxonomic status of which is uncertain and the material of which is in a fair condition, the present author has selected neotypes from the material in the collection.

In the following pages the species present in the "Hollandsche Collectie" are discussed; taxonomic observations are made where the material gives rise to it. The DE MAN system of measurements is retained, with one addition: in male Adenophori the letters VD indicate the distance from junction of testes with vas deferens to anus, expressed as percentage of total body length, while the symbols T_1 and T_2 indicate the length of the testes only. In male Secernentes the letter G is used to indicate the length of the whole male reproductive system, expressed as percentage of of total body length. The slides are indicated by the letter H followed by the catalogue number. The scale lines in the illustrations correspond to 50 μ.

Dimensions:	H 102 ♂	H 212 ♀
L	1,70 mm	2,22 mm
a	61	46
b	7,4	9,3
c	8,4	7,1
V		44 %

In both specimens the three ridges in the posterior part of the mouth cavity are distinctly visible. The amphids are also distinct. The female bears seven embryos in the anterior uterus and six in the posterior one.

H 212 bears the indication: freshwater, Leiden. As the notebook shows that this is the only locality where DE MAN found the species, H 102 must be from Leiden too. The date must in both cases have been April.

Family **Cephalobidae**.

2. *Turbatrix aceti* (MÜLLER, 1774) PETERS, 1927.

H 68: many specimens, most of them broken into fragments.
H 69: one female, broken into two fragments, bearing many eggs with embryos.
Neither of these slides bears any indication. For further discussion see Introduction.

3. *Eucephalobus striatus* (BASTIAN, 1865) THORNE, 1937.

H 93: 1 ♀ in very poor condition: broken into four fragments, some of which were lost during remounting. Collected in a meadow near The Hague.
H 99: 1 ♀, badly flattened, head papillae indistinct; tail shape typical. No further indications.

4. *Eucephalobus oxyuroides* (DE MAN, 1876) STEINER, 1936.

H 98: 1 ♀ and 1 ♂. The head end of the female is lost; the male is broken into three fragments, middle part is lost. Tail of male slightly damaged, the female can be easily recognized. The present conception of this species appears correct.
The slide is labelled *Cephalobus rigidus* SCHNEIDER. *Eucephalobus oxyuroides* was described in 1876. In the personal notes of DE MAN's own copy of the 1876 paper he synonymized it with *C. rigidus* SCHNEIDER (now *Panagrolaimus rigidus* (SCHNEIDER)), but in 1880 he again separated these two species and clearly indicated the differences. This proves that H 98 was collected between 1876 and 1879. If necessary, a recent specimen could be selected for a neotype. Type locality: Leiden, soil near roots of plants.

5. *Eucephalobus elongatus* (DE MAN, 1880) THORNE, 1937 (Fig. 1 A and B).

H 89: 1 ♂. Dimensions: L = 0,70 mm; a = 24; b =4; c = 15. Body much flattened. Annulation of cuticle distinct on the dorsal side. Lateral field invisible. Lips rounded, without distinct projecting papillae. Anterior portion of mouth cavity about as wide as deep, with distinct prorhabdions; posterior portion narrow, with nearly parallel walls. Total length of mouth cavity about 1/13 of oesophageal length. Oesophagus slender, isthmus narrower than corpus. Excretory pore invisible. Tail plump, conoid, mucronate. Spicules slender, 22 μ in length, with ventral protuberance just anterior to middle. Gubernaculum 7.5 μ long; it was not possible to decide whether it was paired, as DE MAN stated. Of the five pairs of papillae mentioned by DE MAN the anterior one is invisible; the second (at level of proximal end of the spicules) is distinct, likewise the

third (adanal), fourth (on middle of the tail) and fifth (just before the tail tip).

Status. — This specimen was indicated by a name different from that under which the species was ultimately published. It is a primary type and is herewith designated lectotype. The slide does not bear indications about date or locality. DE MAN found *E. elongatus* in moist clayey soil near Leiden and on the island of Walcheren.

6. *Acrobeles complexus* THORNE, 1925 (Fig. 1, C—E).

H 78: 1 ♀. Dimensions: L = 0,65 mm; a = 13,1; b = 4,9 (isthmus coiled); c = 9,7; V = 58%. Annules distinct, 2,4 μ wide on middle of body. On the ventral side they show irregular anastomoses, especially near the vulva and the anus. Lateral field invisible. The exact shape of the cephalic probolae cannot be determined; they are fringed and reach the middle of the labial probolae, which are fringed, and furcate at the tip; the terminal branches are not recurved. Details of mouth cavity and ovary indistinct. Excretory pore opposite isthmus. Vulva transverse. Tail pointed, phasmids on middle of tail. The slide bears the locality Ischia, Italy. No date, but must have been collected in 1876.

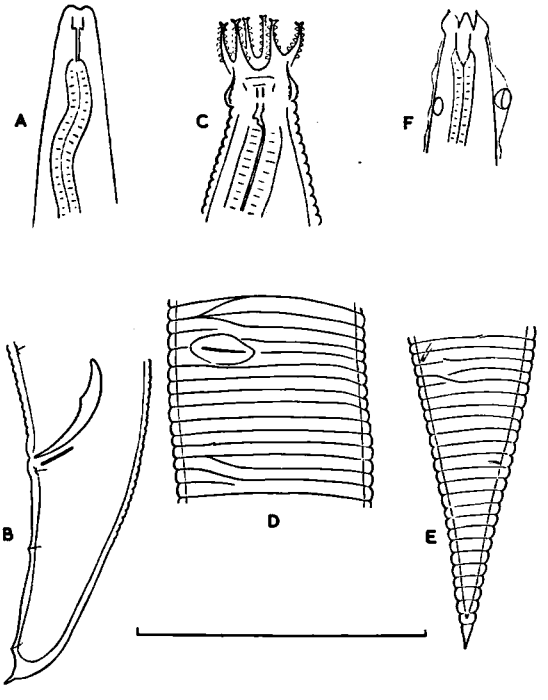

FIGURE 1. A-B: *Eucephalobus elongatus* male, H 89. A: head end, sublateral view; B: tail, sublateral view. C-E: *Acrobeles complexus*, female, H 78. C: head end, sublateral view; D: vulva, subventral view; E: tail, subventral view. F: *Euteratocephalus crassidens* female, H 94: head end, ventral view.

This species was recorded in 1880 by DE MAN under the name *Cephalobus ciliatus* v. LINSTOW, 1877. *A.ciliatus* as redescribed by THORNE (1937) and GOODEY (1951) differs from *A. complexus* by smaller size (0,5—0,64 mm against 0,7—0,9) and position of the excretory pore (at middle of neck; in *complexus* opposite nerve ring). The specimen on H 78 must be placed in *complexus* on the basis of size (mounted specimen!) and the position of the excretory pore. The female figured by DE MAN (1884), on the other hand, probably belongs to *ciliatus* (L = 0,5 mm, excretory pore opposite corpus). Thus THORNE (1925) was right in assuming that DE MAN's description was based on more than one species. The specimens described from Ischia by MEYL (1954-b) seem to belong to *ciliatus*. In the Netherlands *complexus* and *ciliatus* are regularly found together. The Dutch specimens of *ciliatus* do not show such a strong difference from *complexus* in shape of cephalic probolae as indicated in the illustrations of THORNE and GOODEY.

The slide is labelled *Plectus coronatus* n.sp. This name exists as *nomen nudum* (no description) in the literature (DE MAN, 1876-b).

Family **Teratocephalidae.**

7. *Euteratocephalus crassidens* (DE MAN, 1880) ANDRÁSSY, 1958 (Fig. 1 F).

Dimensions:	H 94 ♀	H 95 ♀
L	0,38 mm	0,42 mm
a	21,0	20,3
b	4,1	4,3
c	9,3	8,6
V	53,4%	53,6%
G_1	12,3%	
G_2	13,3%	

The cuticular annulation, which according to ANDRÁSSY should be present in this species, is not distinguishable. Transverse rows of granules in subcuticle well visible on posterior body half of H 94 and on the tail of H 95. The tail of H 94 also shows the differentiation of the granules on the lateral field. Head end in fairly good condition in both specimens, agreeing completely with DE MAN's description and illustrations. Amphids indistinct in H 95; in H 94 they are well visible, situated about two head widths from anterior end of body; large, appearing broadly oval instead of round as the result of a slight torsion of the body, and protruding from body contour. Stoma apparently panagrolaimoid. Denticular apparatus in the terminal oesophageal bulb distinct in H 94. In both specimens the excretory pore is situated at the beginning of the posterior third of the oesophagus. Ovaries paired; in H 95 the flexure of the anterior ovary is distinct. H 94 carries an egg, 52 × 23 μ in size, which greatly distends the body in the vulvar region. One cannot be sure of the presence of phasmids because several particles of detritus adhere to the tail.

The species was described in 1880 under the generic name of *Teratocephalus*. In 1958 ANDRÁSSY split up the genus, establishing the new genus

Euteratocephalus to receive *T. crassidens* DE MAN, 1880 and *T. palustris* DE MAN, 1880. *Euteratocephalus* is distinguished from *Teratocephalus* s.s. by the weak cuticular annulation, the paired ovaries, the large amphids and the presence in the male of a gubernaculum and a preanal tuboid organ.

Status. — Neither slide bears an indication of date. As the species was described as new in 1880 and there are no indications that DE MAN collected material after 1880, these specimens may be assumed to be primary types. The female on slide H 94 is herewith designated lectotype, H 95 paratype. Both specimens were collected from forest soil near The Hague.

Order Tylenchida.

Family Tylenchidae.

8. *Rotylenchus robustus* (DE MAN, 1876) FILIPJEV, 1936.

H 208: 1 ♀; H 209: 1 ♂: H 57: 1 larva. These specimens have been discussed in an earlier paper (LOOF & OOSTENBRINK, 1958).

9. *Helicotylenchus* spec.

H 58: 1 larva, labelled *Tylenchus robustus*. See LOOF & OOSTENBRINK, (1958).

10. *Pratylenchus pratensis* (DE MAN, 1880) FILIPJEV, 1936 (Fig. 2).

H 178: 1 ♀, discussed by the present author in an earlier publication

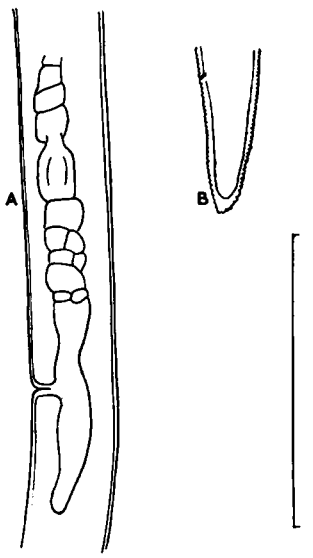

FIGURE 2. *Pratylenchus pratensis* female, H 178: A: vulvar region, lateral view; B: tail, lateral view.

(LOOF, 1960), where a neotype was designated, as the writer thought there were indications that this specimen possessed no type status, being presumably collected at Sydenham after 1880. However, it has, since, become evident that the „Hollandsche Collectie" was finished in November 1879. As the Sydenham collection was made in September, 1881, the specimen on H 178 cannot be from that locality. In 1884 DE MAN stated he had found only two females of this species in the Netherlands: one near Leiden in February, the other near Scheveningen in April. Both were collected before the 1880 paper went to press (LOOF, l.c.) and thus are primary types. H 178 must be one of these. As it is an adult specimen, whereas the Scheveningen one was young, and as moreover the arrangement of the slides in the collection indicates that H 178 was collected in February, we may safely assume that it is the female collected near Leiden. This is the specimen on which the 1880 and 1884 descriptions were mainly based. It is herewith designated lectotype. The neotype proposed by the author (l.c.) lapses. This change does not influence taxonomy, as H 178 and the neotype are conspecific. The fact that H 178 bears the author indication "DE MAN" instead of "n.sp." obviously means that the Scheveningen specimen was collected prior to the Leiden one (cf. p. 3), the collecting date of the latter being most probably February 1879.
It follows that H 178 is the specimen illustrated by DE MAN in 1884. Fig. 95 of that book indicates that a conspicuous spermatheca should be present. This organ was found to be indistinct in several species of the Hollandsche Collectie where it is known to be present. More close examination of H 178 showed that indeed a spermatheca is present, although no more conspicuous.

11. *Tylenchorhynchus dubius* (BÜTSCHLI, 1873) FILIPJEV, 1936.

H 59: 1 ♀. In poor condition; head and tail end, however, are undamaged and prove that this specimen belongs to the species that nowadays generally is considered to be BÜTSCHLI's species. The stylet is 19 μ in length.

H 61: 1 ♂. Dimensions: L = 0,68 mm; a = 24; b = 9,4; c = 11,7; G = 49,7%; stylet = 21 μ; spicules = 30 μ; gubernaculum = 14 μ. In fairly good condition. The shape of gubernaculum, cuticular annulation and lip region, together with the presence of four lateral incisures, suggest that this specimen too belongs to what is currently called *T. dubius*, although the stylet is rather long. These specimens agree well with BÜTSCHLI's description and indicate that the current interpretation of this species is correct.

12. *Tylenchorhynchus lamelliferus* (DE MAN, 1880) FILIPJEV, 1936 (Fig. 3).

Dimensions:	H 181 ♂	H 207 ♂	H 207 ♀
L	0,90 mm	0,73 mm	1,10 mm
a	24,8	24,1	20,2
b	5,5	5,6	13,0
c	23,9	24,1	21,1
V			51,1%
stylet	27 μ	27 μ	28 μ

H 181 is in good condition, H 207 is mediocre: the female is greatly flattened and its oesophagus is compressed, hence the abnormal value for b. In H 181 the details of cuticular sculpture, oesophagus and genitalia are well visible. Hemizonid 2,5 μ in length, distinct, situated immediately anterior to the excretory pore, which in turn is situated just anterior to the terminal oesophageal bulb. Lateral field with four incisures, which can be traced almost to the head end in H 181. The longitudinal striae originate at the level of middle of the stylet. Median oesophageal bulb large, nearly round; terminal bulb also large and broad. Bursal edge distinctly crenate. Shape of bursa not very distinct in H 207. In H 181 the edge is emarginate near tail tip; this proved to be the case also in the recent males examined, although the emargination is sometimes indistinct from lateral view. In H 181 the lateral incisures can be traced for some distance on the bursa. Phasmid slightly anterior to middle of tail. Gubernaculum 16 μ in length, its proximal end curved forward (according to ALLEN

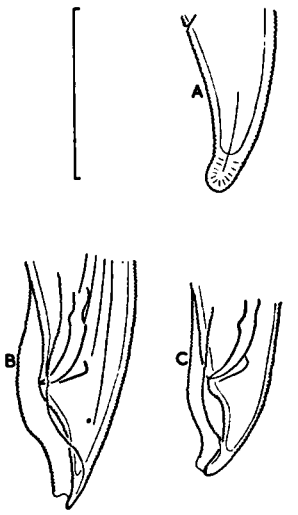

FIGURE 3. *Tylenchorhynchus lamelliferus:* A: H 207 female tail, lateral view; B: H 181 male tail, sublateral view; C: H 207 male tail, sublateral view.

(1955) it is the distal end that is curved, but his illustration shows that the gubernaculum has the same shape as in DE MAN's specimens).
The female shows much less detail. Longitudinal striae are visible only near the head end. Phasmid just anterior to middle of tail. Terminal part of tail bent ventrally, tip rounded; this distal part is annulated, but less distinct than the remainder of the body.

Status. — Neither slide bears indication of date or author. H 181 bears the locality Leiderdorp, H 207 also lacks indication of locality. DE MAN's notebook shows that he found the species only near Leiden and on the island of Walcheren. The personal notes in his own copy of the 1880 paper show he found *T. lamelliferus* on the latter island in November 1882, but only females, so H 207 cannot contain material from that date. There are no indications that DE MAN found more material after 1879,

so we may assume that both slides contain primary types, the more so as the arrangement of the slides indicates the date February 1879 for both. The wordings of the 1880 description suggest that DE MAN knew the species only from the vicinity of Leiden at that time, so that H 207 probably is from this locality. The three specimens are accordingly designated as follows: male on H 181 lectotype, male on H 207 paratype, female on H 207 allolectotype. Lectotype locality: moist meadow, Leiderdorp (near Leiden); locality of para- and allolectotype probably same. The neotype designated by ALLEN (1955) is invalid, because the primary type material is, at least partly, still existent and shows sufficient diagnostic details.

13. *Ditylenchus intermedius* (DE MAN, 1880) FILIPJEV, 1936.

H 171: 1 ♂. Dimensions: L = 0,70 mm; a = 45; b = 5,8; c = 8,7; G = 45,0%; stylet = 7,5 μ = 1/16 of oesophageal length. A second specimen, a female (H 62) was lost during remounting.
Middle part of body strongly flattened, the remainder in good condition. Oesophagus distinct, median bulb rather weakly developed, oval. Bursa probably enveloping anterior half of the tail, but not very distinct, because the tail cuticle is irregularly swollen by fixation. Length of spicules 16 μ, of gubernaculum 4,5 μ. The usual interpretation of this species appears correct. Tail very long and slender, much more so than the 1884 illustration indicates, but this may be a fixation artefact.

Status. — The slide bears the locality Domburg (Island of Walcheren), but no date. There is no reason to assume that it was collected after 1879, so that this specimen may be taken to be a primary type. However, the exact length of the bursa (an important specific diagnostic character) can no longer be determined in this specimen. The tail shape is different from the illustration. For these reasons the present author prefers to regard the type specimens of *D. intermedius* destroyed, so that, if necessary, a recent specimen may be designated neotype. Type locality: moist meadows near Leiden; brackish meadows and dune soil on the Island of Walcheren.

14—15. *Tylenchus davainei* BASTIAN, 1865; *T. elegans* DE MAN, 1876; *T. exiguus* DE MAN, 1876 and *T. filiformis* BÜTSCHLI, 1873 (Fig. 4).

Considerable confusion about the identities of these four species exists in DE MAN's early papers.
In 1876 he described:

a. *Tylenchus davainei* (determination somewhat doubtful). Dimensions of a male specimen: L = 0,84 mm; a = 33; b = 6; c = 8,75; stylet = 16 μ. Gubernaculum not so strongly curved as that illustrated by BÜTSCHLI (1873).

b. *Tylenchus elegans* n.sp. Very similar to *T. davainei*, with the same dimensions, but head end more obtuse, lips less distinct, stylet more slender, gubernaculum much weaker and smaller (BASTIAN (1865) and BÜTSCHLI (1873) give the gubernaculum of *T. davainei* as half as long as spicules) and hardly curved (strongly curved in *T. davainei*). Dimensions of three males and two females:

	Males			Females	
	1	2	3	4	5
L	0,82 mm	0,79 mm	0,81 mm	0,92 mm	0,83 mm
a	30	32	32	32	30
b	6	6	7	7	—
c	7	7,5	6	7	7
V				66,5 %	64.1 %
stylet	16 μ	16 μ	17 μ	17 μ	16 μ
spicules			19 μ		

In DE MAN's personal notes in his own copy of the 1876 paper fourteen more specimens of *T. elegans* are recorded, of which three were regarded as juvenile forms. Dimensions:

	Normal elegans		Juvenile form	
	Males	Females	Male	Females
n	4	7	1	2
L	0,82— 1,04 mm	0,71— 1,07 mm	0,60 mm	0,71— 0,93 mm
a	35 —40	32 —39	35	35
b	5,3 — 7	5 — 7,5	5	6 — 7
c	6 — 7,5	6 — 8	4	5 — 5,3
V		62 —67 %		62 —64 %

The juvenile form was stated to possess a weak stylet with knobs hardly thicker than shaft.

c. *T. exiguus* n.sp. Described from one female. Dimensions: L = 0,44 mm; a = 28; b = 6,3; c = 5,5; V = 66%. Very similar to *T. filiformis* BÜTSCHLI, but excretory pore situated at junction of oesophagus and intestine, whereas it occupies a more anterior position in *T. filiformis*.

d. *T. filiformis* BÜTSCHLI. Of this species DE MAN stated he had found three different forms:

1. A small form with distinctly knobbed stylet. Dimensions of male: L = 0,49 mm; a = 31; b = 5,5; c = 4. Dimensions of female: L = 0,49 mm; a = 31; b = 5; c = 4,3; V = 61,3%; stylet = 9 μ.
2. A slightly larger form with very small stylet knobs. Dimensions of male: L = 0,61 mm; a = 35; b = 5; c = 4; stylet = 12 μ. Dimensions of female: L = 0,64 mm; a = 37; b = 6; c = 3,6; V = 57,1%; stylet = 10 μ.
3. Larger than 2, stylet knobs distinct. Dimensions of female: L = 0,80 mm; a = 40; b = 5,7; c = 4,7; V = 61,5%; stylet length not given.

In the 1880 paper DE MAN synonymized *T. exiguus* with *T. elegans*. For *T. filiformis* he gave the following dimensions: L = 0,6 mm; a = 25—30; b = 5,6; c = 3—4; vulva slightly postequatorial; stylet knobs distinct. It is evident that this form is not identical with forms 2 and 3 described in 1876; from 2 it differs by the shape of the stylet and relative body width; from 3 body length and width. Furthermore the position of the vulva makes it doubtful whether form 1 of 1876 could be conspecific with *T. filiformis* of 1880. It is possible and from the text of 1880 even probable that in 1880 DE MAN did not stick to his earlier opinions, but made

a fresh start, the more so as we know that he did not make permanent preparations of the specimens used for the 1876 descriptions.
In 1884 DE MAN judged that up to that time he had interpreted *T. filiformis* BÜTSCHLI incorrectly. He renamed *T. filiformis* apud DE MAN, 1880 *Tylenchus agricola* nom. nov., and synonymized both *T. elegans* and *T. exiguus*, together with *T. pillulifer* v. LINSTOW, 1877, with *T. filiformis*. It is remarkable that *T. filiformis* apud DE MAN, 1876 was omitted from the synonymy of *T. agricola*.
BÜTSCHLI's original description of *T. filiformis*, based upon one female, gave the following dimensions: L = 0,47 mm; V "about $^2/_3$"; a = 28; b = 5; c = 4. Calculated from the illustration, the length taken as 0,47 mm: a = 28; b = 5,3; c = 3,5; V % 59%; stylet = 6,5 μ; basal knobs distinct. Comparison with the dimensions of *T. elegans* as given in 1876 shows that it is extremely improbable that *T. elegans* and *T. filiformis* are identical (body length, tail length, stylet length). As DE MAN himself stressed the great similarity between *elegans* and *davainei*, it is worthwhile testing the differences given by him:

1. The head end of *T. elegans* is more obtuse. Comparison with *T. davainei* showed that this does not hold.
2. The gubernaculum of *T. davainei* is half as long as the spicules; in *elegans* it is much shorter. However, in 1880 and 1884 DE MAN says that the gubernaculum of *T. davainei* measures $^1/_3$ spiculum length. MEYL (1954b) gives $^1/_4$—$^1/_5$; ANDRÁSSY (1954) $^1/_3$—$^1/_4$. The present author examined thirteen males from the P.D. Collection classified as *T. davainei* and found $^1/_3$—$^1/_4$.
3. In *T. elegans* the gubernaculum is curved much less than in *T. davainei*. ANDRÁSSY (1954) says that the gubernaculum of *davainei* is only weakly curved. The present author found the shape to be variable (Fig. 4C). It is possible that BASTIAN and BÜTSCHLI exaggerated the

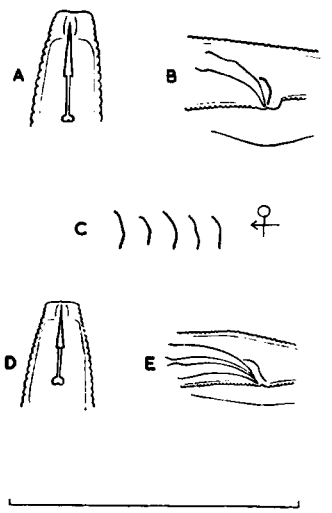

FIGURE 4. *Tylenchus davainei* male: A: H 236 head end, lateral view; B: H 236, anal region, lateral view; C: Gubernacula of five males from P.D.Collection; D: H 63 head end, sublateral view; E: H 63 anal region, sublateral view.

curvature; DE MAN (1876) considered BASTIAN's illustrations were generally unreliable.

4. In *T. davainei* the spicules are longer than in *T. elegans;* in the latter their length is 19 μ. ANDRÁSSY (1954) gives 21—24 μ for *T. davainei;* MEYL (1954b) 16—20 μ; the present author found 22—26 μ.

The Hollandsche Collectie contains one male of *T. elegans* (slide H 63) and one of *T. davainei* (H 236). The former is presumably one of the four specimens recorded in the personal notes in the 1876 paper. Dimensions:

Dimensions:	H 63 *(elegans)*	H 236 *(davainei)*
L	0,76 mm	0,94 mm
a	31,5	33,6
b	7,6	6,6
c	7,0	7,0
stylet	14 μ	17 μ
spicules	23 μ	24 μ
gubern.	7 μ	7,5 μ

The head end of H 63 (Fig. 4D) is hardly more obtuse than that of H 236 (Fig. 4A) and of the males of *T. davainei* seen by author. Neither was there a perceptible difference in stylet width. It seems therefore that the differences between these two species are not real.

The collection contains three more slides labelled *T. elegans*:

H 192: one female, broken into several fragments, some of which were lost during remounting; belonging to *T. davainei.* Collected from a meadow near The Hague;

H 238: one female, belonging to *Psilenchus magnidens* THORNE, 1949 and discussed below under that species;

H 235: three females, labelled "juvenile form". Dimensions:

Dimensions:	No. 1	No. 2	No. 3
L	0,60 mm	0,58 mm	0,60 mm
a	26,0	24,0	24,7
b	—	5,3	6,7
c	4,6	4,6	4,5
V	60,6%	60,5%	59,3%

The stylets of these specimens are very indistinct. They resemble *T. filiformis* BÜTSCHLI, but their identity can no longer be established with certainty. It seems that DE MAN, when synonymizing *T. elegans* with *T. filiformis,* had in mind this "juvenile form" rather than the *elegans* type represented by H 63 and H 192, from which H 235 is evidently different. H 235 was collected from dry clayey soil, Duiveland, August 1879.

Thus the species *Tylenchus elegans* as represented in the "Hollandsche Collectie" comprises three separate species, viz. *Tylenchus davainei* BASTIAN, 1865 (slides H 63 and H 192), *Tylenchus* spec. (H 235) and *Psilenchus magnidens* THORNE, 1949 (H 238). The question of the status of the name *Tylenchus elegans* DE MAN, 1876 thus arises. Only the original description is normative, not DE MAN's later views. The 1876 description stresses the great similarity between *T. davainei* and *T. elegans,* and it has been shown above that there probably exist no diffe-

rences between the male on slide H 63 (which fits the original description fairly well) and the male of *T. davainei*. As to the female, *T. davainei* differs from most other species of *Tylenchus* occurring in the Netherlands, especially *T. filiformis* s.l. and *T. agricola*, by the ratio vulva-anus distance: tail length, which in *davainei* is more than 1, in the others under 1. *T. davainei* is also distinguished by relative tail length (c = 6—8 against 3—5). In these respects the females of *T. elegans* described in 1876 agree completely with *T. davainei*. For these reasons the present author regards *Tylenchus elegans* DE MAN, 1876 as a junior synonym of *T. davainei* BASTIAN, 1865. The spiculum length of 19 μ cannot be used as a contrary argument, for variation in *T. davainei* is relatively large and DE MAN's calculation was rough.

As to *Tylenchus exiguus*, the values of L and c exclude the possibility that this species is identical with *T. elegans* = *T. davainei*. It is advisable to regard it *species inquirenda* until more data are available on the variation in position of the excretory pore in *Tylenchus*.

A further correction in the synonymy of *T. filiformis* as given by DE MAN (1884) regards *Tylenchus pillulifer* v. LINSTOW, 1877. It seems highly improbable that this species may be identical with *T. filiformis*, because the original description says it has a cylindrical mouth cavity and a spinneret ;moreover, its tail is much shorter (c = 6—7). Its systematic position is uncertain. The characters mentioned might indicate that it belongs to Monhysteridae or a related family; the oesophagus was illustrated as cylindrical without any indication of bulbs. The male possesses a bursa, but this character occurs in Monhysteridae as well *(Diplolaimelloides)*; an excretory pore is occasionally present in Monhysteridae too. Whether *T. pillulifer* possesses a true tylenchid stylet appears very questionable. Until new data are brought to light, *T.pillulifer* must be regarded *species incertae sedis*.

Finally it should be pointed out that the species described as *T. filiformis* by ANDRÁSSY (1954) is 0,54—0,65 mm in length (female) and possesses a very slender stylet with hardly visible knobs. The distance vulva-anus is about 80% of the tail length. As BÜTSCHLI's specimen had distinct stylet knobs and a vulva-anus distance measuring about 44% of the tail length, it must be concluded that ANDRÁSSY's specimens represent a different species. On the basis of the original description *T. filiformis* appears to be related to, or perhaps even identical with, *T. discrepans* ANDRÁSSY, 1954.

The "Hollandsche Collectie" further contains two females of *T. davainei* (slides H 237 and H 238). They are in good condition and do not require more comment. H 236 and H 237 were collected on the Island of Duiveland, August 1879, while H 238 does not bear any indication.

16. *Tylenchus agricola* DE MAN, 1884 (Fig. 5, A—C).

Dimensions:	H 205 ♂ 1	H 205 ♂ 2	H 205 ♀ 1	H 205 ♀ 2
L	0,47 mm	0,54 mm	0,50 mm	0,51 mm
a	24,7	28,0	19,7	23,6
b	7,2	9,3	7,8	6,2
c	3,6	3,2	—	3,3
V			—	53,5%
G			—	23,6%
stylet	10 μ	10 μ	11 μ	11 μ

♂ 1 and ♀ 2 are in good condition, while ♂ 2 and ♀ 1 are poor. Cuticle coarsely annulated. Stylet robust, with distinct basal knobs. Oesophagus more or less compressed except in ♀ 2. Vagina with thickened walls; vulva with distinct valva. Spicules strongly curved. Gubernaculum present; this contradicts DE MAN's statement, but his 1884 illustration shows something like it. The presence of a gubernaculum was also established by DE CONINCK (1939).

Status. — The slide is labelled *T. filiformis.* DE MAN's personal notes indicate that these specimens were collected between 1876 and 1879. The species was described in 1880 under the name *T. filiformis*, and in 1884 under the name *T. agricola* nom. nov., syn. *T. filiformis* apud DE MAN, 1880. It is noteworthy that DE MAN did not quote *T. filiformis* apud DE MAN, 1876 in the synonymy of *T. agricola*; as shown above, the 1876 specimens cannot belong to *T. agricola* and their identity is uncertain. Thus the specimens on which the 1880 description was based, constitute the primary type material of *T. agricola*. Accordingly, female nr. 2 on slide H 205 is herewith designated lectotype; male nr. 1 allolectotype; female nr. 1 and male nr. 2 paratype. Type locality: Leiden or Walcheren. Slide H 205 does not bear any indications.
As primary types of *T. agricola* are still existent, the neotype designated by ANDRÁSSY (1954) lapses.

17. *Tylenchus leptosoma* DE MAN, 1880 (Fig. 5, D—E).

H 64: 1 ♀. Dimensions: L = 0,56 mm; a = 43,9; b = 6,6; c = 4,2; V = 63,6%; G = 14,3%; stylet = 8 μ = $^1/_{10}$ of oesophagus length. Cuticle with fine annulation, somewhat loosened near head end. Lip region slightly conoid. Stylet indistinct, but basal knobs easily visible.

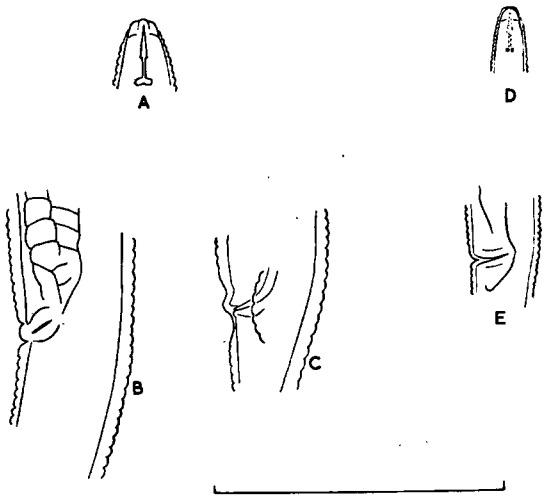

FIGURE 5. A-C: *Tylenchus agricola,* H 205: A: female nr. 1, head end; B: female nr. 2, vulvar region; C: male nr. 1, anal region. D-E: *Tylenchus leptosoma,* female H 64. D: head end, lateral view; E: vulvar region, lateral view.

Oesophagus indistinct except for the terminal bulb. Excretory pore situated at level of beginning of terminal oesophageal bulb. Vagina oblique, thin-walled.

Status. — The slide bears the indication "n.sp.". Therefore this specimen is a primary type and it is herewith designated lectotype. The locality is not indicated, but the text of 1880 and the notes suggest that the specimen was collected in a moist meadow in the vicinity of Leiden, in winter (November, December or January).

18. *Psilenchus magnidens* THORNE, 1949.

H 238: 1 ♀. Dimensions: L = 0,82 mm; a = 29,3; b = 6,9; c = 5,2; V = 63,6%; G = 38%. Stylet thin, without knobs; hence its length not determinable; the lumen is distinct. Amphid apertures distinct. Valvular apparatus of median oesophageal bulb situated halfway between head end base of oesophagus. This all indicates that this specimen belongs to *Psilenchus magnidens*, a species of fairly common occurrence in the Netherlands. The slide is labelled *Tylenchus elegans* and does not bear any indications about date or locality.

Family **Criconematidae.**

19. *Hemicycliophora similis* THORNE, 1955.

H 56: 1 larva. Dimensions: L = 0,75 mm; a = 20,5; b = 5,4; c = ?; stylet = 84 μ; number of annules about 320. The slide is labelled "*Tylenchus* sp., moulting". The specimen is undoubtedly a *Hemicycliophora*. Stylet length, number of annules, shape of head and tail ends place it in *H. similis*, which is the most common species of *Hemicycliophora* in the Netherlands. The slide does not bear any indications about date or locality. The species was not mentioned by DE MAN either in 1880 or 1884, most probably because he was uncertain about the identity of this specimen.

Subclass **Adenophori.**

Order **Chromadorida.**

Family **Plectidae.**

20. *Plectus granulosus* BASTIAN, 1865 (Fig. 6 C).

H 84: 1 ♂. Dimensions: L = 0,91 mm; a = 25; b = 5,3; c = 16,4; three preanal supplements. No indication of date or locality; DE MAN found this species at Katwijk, Leiden and on the island of Walcheren.

H 76: 1 male larva, labelled *Plectus schneideri* n.sp. Dimensions: L = 0,72 mm; a = 23,8; b = 4,4; c = 14,9. Lip region high, with sinuate sides. Four short cephalic setae, placed well behind anterior end of body. Mouth cavity with two enlargements near anterior end; these lie closer together than illustrated by DE MAN (1884), so that this specimen approaches *P. blanci* HOFMÄNNER, 1914. Spicules and gubernaculum only vaguely visible, so that their shape cannot be determined. Two preanal supplements. MICOLETZKY's views upon the identity of *P. granuloses* and

P. schneideri are evidently correct. The present writer has also found *P. schneideri* in populations of *P. granulosus*.

Status. — *The indication* "n.sp." on slide H 76 shows that this specimen is a primary type of *P. schneideri*. It is herewith designated lectotype of the latter species. The slide bears no further indication, but the text of the 1884 book shows that this specimen was collected in sandy soil on the Island of Ischia, Italy, in May 1876.

21. *Plectus submersus* HIRSCHMANN, 1952.

H 83: 1 ♂, labelled *P. granulosus*, with the note: "4 glands". Dimensions: L = 1,42 mm; a = 32,5; b = 5,1; c = 14,6. No indications about date or locality; see *P. granulosus*.
In 1952 HIRSCHMANN split off *P. submersus* from *P. granulosus*. The former species is distinguished by the presence of four preanal supplements in the male (two or three in *P. granulosus*), by the different shape of the spicules and gubernaculum, by the slenderer body and shorter tail (especially in the female) and cylindrical mouth cavity in the female (conoid in *P. granulosus*). HIRSCHMANN found *P. submersus* only in soil water. Examination of material of *P. granulosus* in the nematode collection of the Plantenziektenkundige Dienst (113 male specimens) showed that 109 possessed three preanal supplements, one specimen two. These 110 males showed the same shape of the spicules and gubernaculum as figured by HIRSCHMANN for *P. granulosus*. The remaining three spesimens possessed four supplements, and the spicules and gubernaculum were shaped as illustrated by HIRSCHMANN for *P. submersus*. The same holds for the male on H 83, which accordingly should be placed in *submersus*. The position of the four supplements with respect to each other and the anus shows some variation, as shown by the following table, in which the distance between the fourth (most posterior) supplement and the anus is taken as unity:

	HIRSCHMANN 1952 [1]	H 83	P.D. Collection 1	2	3	MICOLETZKY 1914	MICOLETZKY 1922 [2]
anus—4	1	1	1	1	1	1	1
4—3	2,8	2,5	2,7	2,9	2,7	2,7	1,7
3—2	3,2	5,3	5,3	3,6	6,7	5,1	3,3
2—1	4,2	4,7	4,4	4,3	6,0	5,4	2,2

[1]) Calculated from illustration.
[2]) Average of five specimens.

Thus only the male described by MICOLETZKY (1914) and one of the males from the P.D. Collection agree with those of HIRSCHMANN in that the distances between the supplements increase from anus to first supplement, while in the other specimens the distance from second to third is greater than that from first to second.
Of the three males from the P. D.Collection one was collected by the present author in decaying reed in a pond near Amsterdam; the young female found together with it had a cylindroid mouth cavity and thus

represented the *submersus* type too. The two others were collected in a meadow in the province of Groningen, where *submersus* occurs together with *granulosus*; typical *submersus* females have not yet been found there. Thus *P. submersus* also occurs in moist soil. DE MAN stated in 1884 he had not found *P. granulosus* in fresh water, hence the *submersus* male on H 83 was also found in soil.
As remarked above, the females of *P. submersus* are reported to be slenderer than the average *P. granulosus* (cf. e.g. MICOLETZKY, 1917, 1922 and 1925a; BÜTSCHLI, 1873; DE CONINCK, 1930; MEYL, 1954b; PAETZOLD, 1955). In this connection it is noteworthy that already MICOLETZKY (1922) hesitated whether *P. granulosus* should not be split up into two races: one more stout, males with 2—3 supplements, the other of slenderer build, males with 4—5 supplements.
It seems that BRAKENHOFF (1914) has also seen *P. submersus*.

22. *Plectus parietinus* BASTIAN, 1865 (Fig. 6, A—B).

Dimensions:	H 85 ♀	H 241 ♀
L	0,97 mm	1,27 mm
a	16.0	13,8
b	4,2	5,5
c	14,3	15,0
V	49,7%	51,1%
G_1	—	23,8%

H 85 is in moderately good, H 241 in good condition. Lip region set off, lips distinct. Amphids relatively very small (2,5 μ), in H 85 situated about middle of posterior portion of mouth cavity, in H 241 about base of anterior portion. Cephalic setae present in H 85, lost in H 241. Excretory pore invisible in H 85, in H 241 situated at about $^2/_3$ of oesophageal length from anterior end. Vulva transverse.
H 85 bears the locality Katwijk, H 241 Domburg; both from dune soil. Date not indicated. DE MAN was not quite sure whether his specimens were conspecific with *P. parietinus* of BASTIAN; they had a relatively shorter tail, but on the other hand they agree with BASTIAN's specimens by being much stouter than *P. cirratus*. It is desirable that *P. cirratus* and *P. parietinus* be collected again from the type localities and habitats and that the identities of both be established by careful comparison with BASTIAN's descriptions. ANDRÁSSY (1958) reports having found the male of *P. parietinus*; this indicates that the species is distinct from *P. cirratus*. The males of *P. cirratus* described by THORNE (1929) differ considerably from that described by DE MAN and might perhaps rather belong to *P. parietinus* (a= 23,8; c = 13,2; ventral papilla just anterior to anus; 4—6 preanal supplements; shape of gubernaculum).

23. *Plectus rhizophilus* DE MAN, 1880.

H 222: 1 ♀. Anterior part of body lost during remounting; posterior part not identifiable. Tail very long and slender. The specimen must have been very small (about 0,5 mm). Collected from heath soil near Apeldoorn; date not indicated, but must have been July 1879. Thus this specimen is a primary type, but it may be regarded as destroyed. If necessary, a recent specimen can be selected as a neotype. Type locality: soil from heathy field near Apeldoorn and forest soil near The Hague.

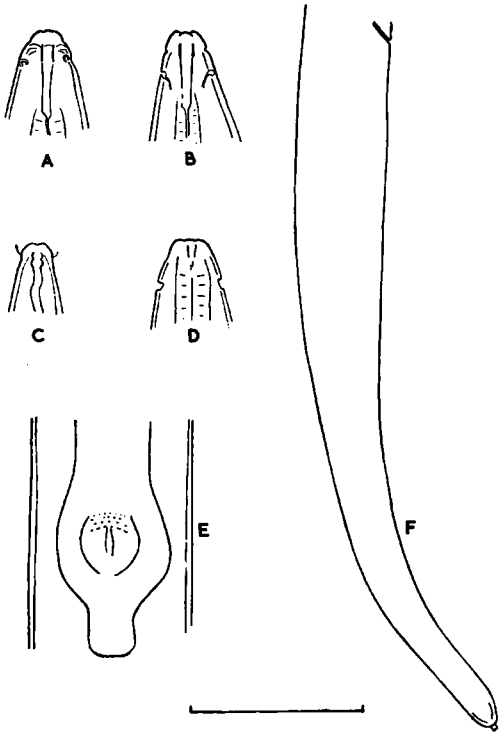

FIGURE 6. A-B: *Plectus parietinus* female. A: H 241 head end, slightly schematized; B: H 85 head end. C: *Plectus schneideri* male larva: head end. D-F: *Plectus palustris* female H 213: D: head end, ventral view; E: cardia; F: tail.

24. *Plectus palustris* DE MAN, 1880 (Fig. 6, D—F).

H 213: 1 ♀. Dimensions: L = 1,52 mm; a = 34,9; b = 5,2; c = 7,3; V = 45,7%. In fairly good condition. Cuticle annulated, width of annules on middle of body = 1,2 μ. Lips present but not very distinct. Mouth cavity collapsed, its depth cannot be determined with certainty. Distance of amphids from head end slightly more than diameter of lip region. The specimen lies on its back, so that both amphids are visible; their longitudinal diameter = 3,5 μ. Oesophageal bulb relatively weak, cardia relatively short. Vulva a transverse slit. Intra-uterine egg measures 69 × 36 μ. Tail tapering very little; spinneret tube no longer than wide.

Status. — The specimen was collected from a ditch near Leiden in May; date not indicated, but must have been before 1880 (almost surely 1879). Thus this specimen is a primary type and it is herewith designated lectotype.

The relation of this species to *P. tenuis* BASTIAN, 1865 has been much discussed. Most workers follow MICOLETZKY (1914), who regarded *palustris* and *tenuis* conspecific, observing that perhaps the long-tailed specimens could be called *forma palustris* DE MAN. The chief differences between *tenuis* and *palustris* as given by DE MAN (1880, 1884) are: size (*tenuis* 1,2 mm; *palustris* 1,7 mm); relative tail length (c = 11 in *tenuis*,

8 in *palustris*); amphids (in *tenuis* smaller than in *palustris*). DE MAN also mentioned that the head ends of these species were slightly different in shape, but MICOLETZKY showed that these differences might well be caused by different stages of contraction. In general *P. tenuis* and *P. palustris* have been synonymized because there is no sharp discontinuity in relative tail length (c ranges from 7 to 13). Only ALTHERR (1938), although also considering these species identical, mentioned that his specimens had larger amphids than usually occurred in *P. tenuis*, and in this respect approached *P. palustris*.
BASTIAN's original description of *P. tenuis* states: Length = $^1/_{33}$" = 0,77 mm; V about 50%; a = 30; b less than 4; 8,2. DE MAN said that BASTIAN's specimens were young ones. This is not *a priori* impossible, but if *P. tenuis* indeed consisted of young specimens of *P. palustris*, then one would expect *tenuis* to have a relatively longer tail than *palustris* instead of shorter. The difference in absolute tail length is large: *P. tenuis* 94 μ (BASTIAN) resp. 109 μ (DE MAN), *P. palustris* 213 μ; the specimen on slide H 213 has a tail length of 208 μ. The present author is of opinion that the conspecificity of *P. tenuis* and *P. palustris* has not yet been adequately proved; more studies on the variability of these species, also with respect to the amphids, are required. It would be useful if *P. tenuis* could be found back at the type locality and habitat, and these specimens carefully compared with BASTIAN's description. GADEA (1952, 1954) considers *tenuis* and *palustris* different species.

25. *Wilsonema auriculatum* (BÜTSCHLI, 1873) COBB, 1913.

Dimensions:	H 82 ♀	H 86 ♀
L	0,41 mm	0,40 mm
a	12,7	—
b	4,0	4,2
c	13,2	12,8
V	50,0%	48,4%

H 82 is in fair condition, while H 86 is very poor, being partly crushed. The head lamellae show the typical shape in H 82; in H 86 they are damaged, but body size and relative tail length show that this specimen also belongs to *W. auriculatum*. In H 82 the lateral field is clearly visible (width = 3 μ).
Both slides are labelled *Plectus auriculatus*. The specimens were collected from dune soil, H 82 at Scheveningen, April 1879 (this is the specimen illustrated in 1884), H 86 at Katwijk.

26. *Rhabdolaimus terrestris* DE MAN, 1880.

H 154: 2 ♀ ♀. The head end of one of them is missing. Dimensions of the other: L = 0,37 mm; a = 20,6; b = 4,5; c = 3,3; V = 50,8%. In poor condition; details of mouth cavity, oesophagus, amphids, vulva and ovaries are no longer visible; only the terminal oesophageal bulb is faintly perceptible. Intra-uterine egg measures 54 × 22 μ.

Status. — The slide bears the locality Walcheren, without date. It is fairly certain that these specimens are primary types. However, as they

hardly show any diagnostic details, they may be regarded as destroyed. If necessary, a recent specimen can be designated neotype. Type localities: meadow near Leiden; meadow near Scheveningen; heath near Apeldoorn and brackish meadow on the island of Walcheren.

Familie **Camacolaimidae.**

27. *Aphanolaimus attentus* DE MAN, 1880 (Fig. 7, A—B).

H 141: 1 ♂. Dimensions: L = 0,52 mm; a = 28.7; b = 5,5; c = 6,0. In good condition; even all the setae are preserved. Annulation of cuticle coarse (width of annules 2,2—2,7 μ). Length of cephalic setae = 5 μ; diameter of head at level of their insertion = 6 μ. Amphids large, with duplex walls and central bubble. The opening in the posterior edge, which should be present according to MICOLETZKY (1922), is present, but not very distinct. Longitudinal diameter of amphids = 4 μ, distance from their centre to head end = 5 μ. The amphids are larger than $^2/_5$ of the corresponding body width. Lateral field narrow. Oesophagus hardly widened posteriorly. Ventral gland, excretory pore, lateral glands and testes indistinct. Spicules 17 μ in length, slightly curved distally; gubernaculum curved. Four preanal supplements, distances apart (starting from anus) 16—18—19—18 μ. Tail tapering but little; its diameter at tip is $^1/_3$ of the anal diameter. One annule posterior to the fourth (most posterior) supplement is a pair of setae. Three postanal pairs of setae: two subventral, respecively at about 30% and 60% of tail length, the third subdorsal at about 70%. Tail tip rounded, with spinneret.

Status. — The slide is indicated n.sp., which shows that H 141 is a primary type. It is herewith designated lectotype. Locality: Leiden, moist meadow; collected probably in April.
The specimens described as *A. attentus* by MICOLETZKY (1922) seem to differ from the lectotype by smaller amphids and shorter cephalic setae.

28. *Leptolaimus papilliger* DE MAN, 1876.

H 233: 1 ♂ (lost during remounting); H 234: 1 ♀, in poor condition. The tail end is lost and the details of the mouth cavity are indistinct. Both were collected from brackish soil, Walcheren (the original type locality), August 1879. H 234 is completely unfit for neotype. If necessary, a recent specimen may better be designated as such.

29. *Bastiania gracilis* DE MAN, 1876.

H 144: 1 ♂; H 145: 1 larva; H 146: 1 larva. All three specimens are in poor condition; the head and tail ends of the male were lost during remounting. The slides do not bear any indication. The species was described in 1876, so the primary types are lost. The present specimens are wholly unfit for neotype; if necessary, a recent specimen can be designated as such. Type locality: moist meadows and forest soils near Leiden and on the Island of Walcheren.

30. *Deontolaimus papillatus* De Man, 1880 (Fig. 7, C—E).

Dimensions:	H 247 ♂	H 248 ♂
L	0,77 mm	0,93 mm
a	49	43
b	4,6	5,3
c	11.8	13.2
spic.	23 μ	?
nr. of papillae	24	27

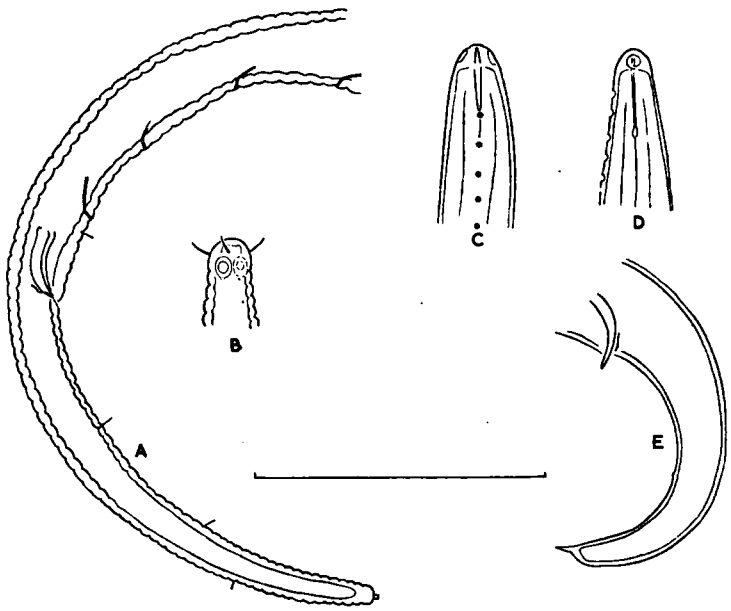

Figure 7. A-B: *Aphanolaimus attentus* male, H 141. A: posterior part of body; B: head end, subventral view. C-E: *Deontolaimus papillatus* male. C: head end of H 248; D: head end of H 247; E: tail of H 247.

Both specimens are in moderately good condition. H 247 lies on its side, H 248 is twisted so that head end occupies a medial position. Head end conical, agreeing in shape with De Man's illustration 3d of 1884; much less obtuse than indicated by the illustration of Meyl (1954-c). Ventral papillae conspicuous in both specimens; in H 248 they appear as double rings with a diameter of slightly more than 1 μ. In H 247 the last papilla is situated anterior to, in H 248 posterior to the base of the oesophagus. Mouth cavity tapering anteriorly to minute oral opening; the thickened walls of this part suggest a "stylet cap". In 1921 De Man indeed thought that *Deontolaimus* possessed a stylet. Meyl (1954-c), however, considered the stylet fictitious, which is probably correct. Depth of mouth cavity = 12—14 μ; the posterior portion is surrounded by oesophageal tissue. The widening of the lumen ("stylet knobs") at the junction with the oesophagus is visible in H 247, indistinct in H 248. Amphids large and distinct; in H 247 the open spiral shape is clearly perceptible. Anterior portion of oesophagus narrow; posteriorly it widens gradually. In both specimens the cuticular annulation is visible only in

the anal region. Spicules and gubernaculum indistinct in H 248; in H 247 they are easily visible. Ventral caudal papilla and spinneret distinct in both specimens.

Status. — Both specimens bear the indication August 1879; locality not indicated, but DE MAN (1884) stated he had collected the species only in brackish soil on the Island of Walcheren. The two males described above are primary types. H 247 is herewith designated lectotype, H 248 paratype.

Family **Axonolaimidae.**

31. *Cylindrolaimus communis* DE MAN, 1880 (Fig. 8, A—B).

Dimensions:	H 155 ♀	H 158 ♀
L	0,43 mm	0,52 mm
a	19,6	19,3
b	5,0	5,1
c	7,7	6,9
V	54,4%	54,1%

Both specimens are in moderately good condition. The anterior end of the body is wider and more flattened than in *C. melancholicus*; the cuticular annulation is more distinct than in the latter species. Amphids crypto-spiral in shape, 2,5 μ in diameter; distance to head end = 4 μ, i.e. slightly more than width of head end. Mouth cavity 17 μ in depth, i.e. nearly seven times diameter of amphids. Oesophagus widened slightly posteriorly, but without a true bulb; its base rounded. Details of ovaries indistinct. Examination of recent specimens showed that these possess paired ovaries, confirming the indications of MICOLETZKY (1922, 1925-a) and W. SCHNEIDER (1939) and opposing those of DE MAN (1884) and GOODEY (1951). Tail plump, diameter near tip = $^1/_4$ of anal diameter; tip rounded, with spinneret. Details of intestine invisible, so that it is not possible to find out whether the anterior end was structurally so different from the remainder as indicated by KRALL (1957). It may very well be so, because such a difference is indicated in DE MAN's fig. 48 b of 1884.

Status. — H 155 bears the indication n.sp., H 158 no author indication, but it appears fairly certain that the latter is a primary type as well. H 155 bears the locality Leiden, H 158 Walcheren. The female on slide H 155 is herewith designated lectotype, H 158 paratype.

32. *Cylindrolaimus melancholicus* DE MAN, 1880 (Fig. 8, C—D).

H 157: 1 ♀, broken into two parts. Dimensions: L = 0,91 mm; a = 25,1; b = 7,4; c = 10,9; V = 54,6%. Body slightly twisted so that the anterior end occupies a medial position. Head end tapering, rounded. Shape of amphids not determinable; their longitudinal diameter = 4,2 μ, distance from head end = 6 μ, i.e. 1,25 × width of head end. Cephalic setae preserved, but owing to the position of the head end their exact length could not be determined. Depth of mouth cavity = 18 μ, i.e. about four times the diameter of the amphids. A recent specimen from the P.D.

Collection had the amphids appearing circular, but really crypto-spiral. Cuticle with very fine transverse striation, width of annules = 0,8 μ. Oesophagus as in preceding species. Ovaries indistinct; the recent specimen possesses paired ovaries. Tail plump, diameter at end = $^1/_4$ of anal diameter. Spinneret tube absent, tail tip rounded. Orifice of caudal glands vaguely perceptible. In the recent specimen the duct in the cuticle was distinct.

Status. — The specimen does not bear indications of date or locality. It is indicated n.sp. and labelled with a specific name that was never published. This shows that it is a primary type; it is herewith designated lectotype. Type locality: dune soil near Katwijk or Scheveningen.

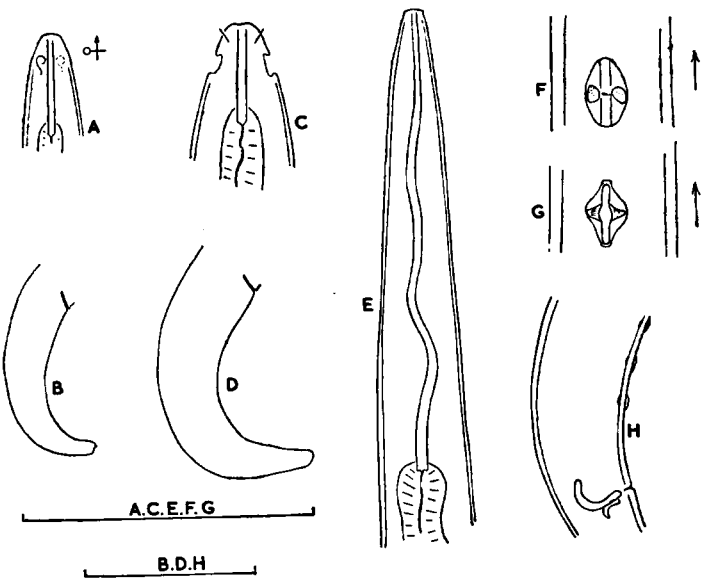

FIGURE 8. A-B: *Cylindrolaimus communis* female, H 155. A: head end, slighty schematized; B: tail, lateral view. C-D: *Cylindrolaimus melancholicus* female, H 157. C: head end, ventral view; D: tail, lateral view. E-H: *Aulolaimus oxycephalus*. E: female H 53, mouth cavity; F: female H 53, vulva, ventral view; G: female H 53, vagina 3,5 u below ventral surface; H: male H 52, anal region.

33. *Aulolaimus oxycephalus* DE MAN, 1880 (Fig. 8, E—H).

Dimensions:	H 52 ♂	H 53 ♀
L	0,73 mm[1])	0,62 mm
a	27,3[1])	29,9
b	5,3[1])	4,9
c	10,9[1])	7,8
V		55,9%

[1]) Tail tip of male is missing.

Both specimens in good condition. Longitudinal striation of cuticle distinct. Amphids elongate, situated about 2,5 × width of lip region from anterior end. Mouth cavity twice as long as oecophagus. At the "Uebergangsstelle" the lumen widens slightly, then narrows suddenly to lumen

of oesophagus. The hind wall of the chamber thus formed seems to be slightly thickened locally and it is even possible that three minute teeth are present, but the author is not sure upon this point and recent material of the species was not available. Distinct cardia present. Details of ovaries not distinguishable. The female lies on its back, so that a good view of the vulva is obtained; it is a transverse slit, with lateral sclerotized pieces and probably with a gland on either side in the midventral line. In the male the spicules, gubernaculum and preanal supplements — numbering three — are clearly visible and agree completely with DE MAN's description and illustration. Caudal papillae were not mentioned nor illustrated by DE MAN and could not be found in these specimens. Testes two. The systematic position of the genus is doubtful; MEYL (1954-b) pointed out that it resembles *Gymnolaimus* COBB, 1913 in several characteristics.

Status. — H 52 bears the indication n.sp., which probably refers to H 53 as well. Both specimens are, in any case, primary types. As the male possesses more generic and specific diagnostic characteristics than the female, the male on slide H 52 is herewith designated lectotype, the female on H 53 allolectotype. Both slides bear the locality indication Katwijk. The specimens were collected in October or November, prior to 1879.

The species appears never to have been found again. The specimens described by MEYL (1954-b) from Italy under the name *A. oxycephalus* differ notably from DE MAN's description and from the type specimens: they are much smaller (L = 0,51—0,58 mm against 0,8 mm), the lip region is more sharply offset, the tail is relatively longer, especially in the female (c = 4—6 against 9); in the "Uebergangsstelle" the lumen is not widened and three longitudinal ridges are present (the type specimens of *A. oxycephalus* show nothing of the kind); the spicules are right-angled, not semicircular; the caudal process of the gubernaculum is obtuse instead of pointed; there are six preanal supplements, which are much smaller than those of *A. oxycephalus*[1]). The Italian specimens obviously represent a new species which is herewith named *Aulolaimus meyli* nom. nov. KRALL (1957) quotes *A. oxycephalus* from Estonia, but the data presented do not allow one to decide whether the two specimens found belong to *oxycephalus* or *meyli*. According to the description c = 6,9, but from the illustration a value of 8,5 was computed. The drawing of the oesophagus gives too little detail. *A. meyli* has also been found in several localities in in the Netherlands.

Family **Monhysteridae.**

34. *Monhystera dispar* BASTIAN, 1865.

H 162: 1 ♀. Not remounted, as it was broken into nine fragments. No date or locality.

[1]) MEYL's statement that DE MAN described in *A. oxycephalus* six preanal and four postanal papillae, is incorrect.

35. *Monhystera similis* BÜTSCHLI, 1873.

Dimensions:	H 165 ♀	H 166 ♀
L	0,54 mm	0,62 mm
a	22,5	20,4
b	5,3	5,1
c	3,6	4,2
V	58,1%	61,6%

Both specimens broken into two fragments. H 165 is in poor condition: cephalic setae lost, amphids not definitely perceptible. Of H 166 the middle part of the body is strongly flattened, but on the whole this specimen is in a better state than H 165. Amphids 2,5 μ in diameter, their distance from head end = 14 μ; width of head end = 9 μ, i.e. half the body diameter at level of base of oesophagus. H 165 bears the locality Leiden, H 166 does not bear any indication.

36. *Monhystera agilis* DE MAN, 1880 (Fig. 9 B).

H 159, H 160 and H 161: each slide carries one female. H 161 is in poor condition. H 159 and H 160 are broken into two fragments each; especially H 159 is in good condition. Dimensions:

Dimensions:	H 159	H 160
L	1,55 mm	0,84 mm
a	32,1	30,1
b	5,7	4,9
c	8,4	7,9
V	62,7%	62,9%

Cuticular annulation invisible in H 160, distinct in H 159. Diameter of amphids in H 159: 6 μ; in H 160: 4 μ; their distance from head end in H 159: 18 μ, in H 160: 19 μ, i.e. about 1,2 × width of anterior body end. In H 159 all ten cephalic setae are preserved; the length of the longer ones is about $^1/_3$ diameter of head end. In H 160 one seta is still present. Setae stout and curved. Details of ovaries indistinct. H 160 carries an egg, dimensions 70 × 40 μ. Distance from vulva to anus in both specimens equal to twice tail length.

Status. — H 159 bears the indication DE MAN, H 160 n.sp., H 161 no author indication. It thus appears that H 160 was collected before the others, but it is certain that all three are primary types. H 159, being in the best condition, is herewith designated lectotype; H 160 and H 161 are paratypes. H 160 bears the indication Leiden, H 159 and H 161 bear no locality indication. The species was found by DE MAN near Leiden and on the Island of Walcheren.

37. *Monhystera filiformis* BASTIAN, 1865.

Dimensions:	H 163 ♂	H 164 ♀
L	0,52 mm	0,53 mm
a	27,1	23,2
b	5,9	5,5
c	4,4	4,3
V		59,8%
VD + T[1]	58,4%	

H 164 is in poor condition; amphids and details of oesophagus, intestine and gonad are invisible. H 163 is better. The cephalic setae are lost in both specimens. Distance from amphid apertures to anterior end of body equal to 1,5 × width of latter. Lips faintly indicated. Cuticle annulated in anal region. Spicules about 25 μ in length, thick, curved. Gubernaculum 4 μ long, pointed proximally, widened distally. Male reproductive system very long, the anterior testis originating 11 μ behind base of oesophagus. Both slides are labelled *M. rustica* BÜTSCHLI. This shows that these specimens were collected prior to September 1879, because in the 1880 paper DE MAN synonymized *M. rustica* BÜTSCHLI with *M. filiformis* BASTIAN. H 163 does not bear any further indication, H 164 was collected near Middelburg.

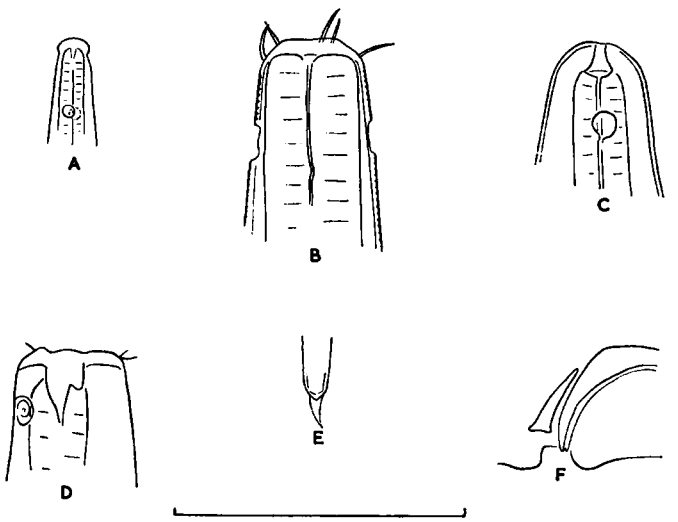

FIGURE 9. A: *Monhystera macrura* female, H 170, head end. B: *Monhystera agilis* female, H 159: head end. C: *Desmolaimus zeelandicus* female, H 246: head end. D-F: *Paracyatholaimus intermedius* male, H 138. D: head end; E: tail tip, lateral view; F: spicula and gubernaculum.

38. *Monhystera macrura* DE MAN, 1880 (Fig. 9 A).

H 170: four females, three of which are in very poor condition. Dimensions of the fourth: L = 0,56 mm; a = 33,1; b = 5,9; c = 3,3; V = 49,2%; G = 19,4%. Body tapering anteriorly so that lip region width is one-third of body diameter at base of oesophagus. Lip region set off from body by expansion .Cephalic setae lost. Amphids 2,5 μ in diameter, their distance from head end equal to nearly thrice diameter of head end. Oesophagus slightly widened posteriorly. Ovary outstretched; a rudiment of the posterior ovary seems to be absent.

Status. — The slide does not bear any indications of author or date; locality: Island of Walcheren. These specimens may be regarded as primary types, the more so as the only locality mentioned in DE MAN's personal notes, where he collected material of this species after 1879, is Leiden. The female described above is herewith designated lectotype. The three others are paratypes, but almost valueless.

39. *Monhystera vulgaris* DE MAN, 1880.

H 216: 1 ♀. In poor condition; broken into three fragments and the tail tip is missing. The label says: length = 1 mm. Amphids 11 μ behind head end, i.e. 1,1 × diameter of latter. The specimen is flattened rather badly, so that the degree of tapering of the anterior part of the body could not be determined.

Status. — The species was described as new in 1880. Slide H 216 does not bear indications of author or date; the specimen was collected at the bottom of a freshwater ditch near Leiden, almost certainly in May 1879. Thus it may be assumed to be a primary type. As, however, it is in poor state and the diagnostic characters are greatly obliterated, it is advisable to regard it as destroyed. If necessary, a recent specimen can be selected as neotype. Type locality: moist brackish meadow on the island of Walcheren and moist meadow and freshwater ditch in the vicinity of Leiden.

Family **Linhomoeidae.**

40. *Desmolaimus zeelandicus* DE MAN, 1880 (Fig. 9, C)

H 246: 1 ♀. Dimensions: L = 1,43 mm; a = 25,6; b = 10,2; c = 13,1; V = 51%. The specimen is broken into two fragments and extreme tip of the tail is missing, hence c is higher (13) than indicated by DE MAN (11). Apart from this the specimen is in good condition. Cuticle smooth, but here and there faint traces are visible of a very fine transverse striation. Anterior body end more rounded than illustrated by DE MAN (1884). Most cephalic setae are lost. Amphids not circular, but posterior edge interrupted, somewhat *Plectus*-like; transverse diameter = 5 μ, i.e. $^1/_4$ of corresponding body diameter; their distance from head end = 14 μ, i.e. about equal to width of head end. Mouth cavity 6 μ in depth, widened posteriorly; transverse ridges indistinct. Terminal oesophageal bulb measures $^1/_4$ of total oesophagus length. Cardia about as long as terminal bulb. Intestinal cells large, probably in only two or three rows. Tail tapering, tip lost. Each uterus contains an egg, dimensions 52 × 50 μ and 63 × 41 μ.

Status. — The slide bears the date August 1879 and thus this specimen is a primary type. It is herewith designated lectotype. No indication of locality, but DE MAN found the species only in brackish, moist clay soil on the Island of Walcheren.

41. *Sphaerolaimus gracilis* DE MAN, 1876 (Fig. 10 A—B)

H 217: 1 ♀; H 224: 1 ♂; H 225: 1 larva and three fragments of female specimens. Dimensions of H 217: L = 0,86 mm; a = 21,5; b = 5,2; c = 7,8; V = 62,5%. The middle part of H 224 was lost during remounting. In H 217 the punctuation of the middle part of the mouth cavity is indistinct, but the transverse ridges in the posterior part are clearly visible. Depth of mouth cavity = 15 μ. Amphids 5 μ in diameter, situated 26 μ behind head end. Cephalic setae lost. Ovary outstretched anteriorly. Vaginal gland distinct. Tail tip slightly clavate, bearing three setae, not two as DE MAN said. Recent specimens were also found to possess three setae.

Spicules and gubernaculum of H 224 agree with DE MAN's illustrations. Details of mouth cavity not distinct in this specimen. Ventromedian preanal supplements were not mentioned by DE MAN (1880, 1884, 1922), nor by SCHNEIDER (1939) nor by GOODEY (1951), but were found to be present. In two recent males there are seven; they are very small, the distances become greater in a forward direction; the second supplement from the rear lies about the level of the proximal end of the spicules. A few are visible in H 224, but the exact number cannot be determined.

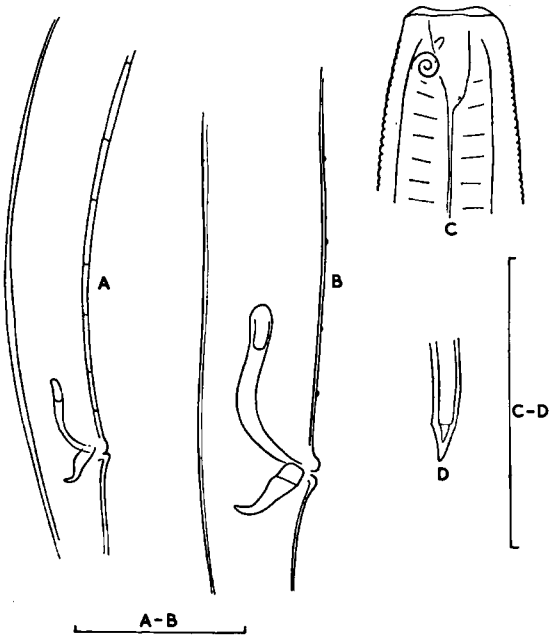

FIGURE 10. A-B: *Sphaerolaimus gracilis*, male. A: anal region of specimen from P.D. Collection; B: anal region of H 224. C-D: *Achromadora terricola* female, H 135-1. C: head end; D: tail tip, lateral view.

Status. — The primary types of this species are lost. The three slides in the Hollandsche Collectie bear the locality Walcheren; the date is not indicated on H 217, while H 224 and H 225 were according to the catalogue collected in August 1879. Although H 217 is in fairly good condition, the author thinks it preferable to select, if necessary, a recent specimen as neotype. Type locality: brackish clay soil on the Island of Walcheren, near roots of *Phragmites*.

Family **Chromadoridae.**

42. *Prochromadorella bioculata* (SCHULTZE, 1857) FILIPJEV, 1930.

H 215: 1 ♀. In poor condition; broken into four fragments. Labelled *Chromadora bioculata*. Collected from a freshwater ditch near Leiden, presumably in May 1879.

43. *Dichromadora geophila* (De Man, 1876) Kreis, 1929.

H 242: 5 ♂♂, 1 ♀ and 1 larva. The tail tip of one of the males is missing. Dimensions of the other adult specimens:

	♂ 1	♂ 2	♂ 3	♂ 4	♀
L	0,68 mm	0,73 mm	0,65 mm	0,71 mm	0,82 mm
a	13,0	14,3	14,2	13,3	14,4
b	6,5	6,6	6,4	6,6	6,9
c	8,9	8,9	8,0	8,1	6,4
V					45,9%
G_1					16,6%

In moderately good condition. Cephalic setae lost. The two rows of larger granules along the lateral field are distinct. Mouth cavity with a small dorsal tooth, no subventral teeth visible. Oesophageal apophyses visible in the female only. Terminal oesophageal bulb large, measuring $^1/_3$—$^1/_4$ of total oesophageal length. Ventral gland invisible. Female tail distinctly more slender than male tail. Spicules slender, curved, 31—36 μ in length, with triangular tip, as illustrated by De Man (1876). Gubernaculum slender, its length probably about 15 μ. Spinneret 6 μ in length, 2,5—3 × as long as wide. No preanal supplements in male. Details of gonads indistinct.

Status. — The slide is labelled *Spilophora geophila*; under this name the species was described in 1876. The primary types are lost. H 242 bears the date August 1879. No locality, but De Man found the species only in brackish, moist clay soil on the island of Walcheren. It is advisable to select, if necessary, a recent specimen as neotype. Type habitat: soil near *Phragmites* roots.

44. *Chromadorita leuckarti* (De Man, 1876) Filipjev, 1930.

H 137: 1 ♀. Dimensions: L = 0,92 mm; a = 23.6; b = 7,4; c = 6,4; V = 49,2%. In moderately good condition. Cephalic setae lost. Pharyngeal bulb not very distinct. Orifice of ventral gland invisible. Cuticular sculpture distinct; the difference between lateral and median punctuation is not very great. Vaginal chamber conspicuous, agreeing with the illustration given by Micoletzky (1925-a).

Status. — The slide does not bear any indication. It is labelled with the same unpublished name as that of the adjoining slides H 136 and H 138, which contain *Paracyatholaimus intermedius*. It is not a primary type. If necessary, a recent specimen may be selected as neotype. Type locality: clay soil around roots of plants near Leiden.

Family **Cyatholaimidae.**

45. *Paracyatholaimus intermedius* (De Man, 1880) Micoletzky, 1922 (Fig. 9. D—F).

Dimensions:	H 136 1 ♀	H 138 1 ♂	H 244 1 ♀
L	0,85 mm	0,98 mm	1,08 mm
a	26,0	28,8	23,4
b	?	6,7	7,7
c	9,9	9,7	12,3
V	50,2%		51,7%

The male is in fairly good condition, the females are rather poor. The cephalic setae are lost in H 136 and H 244, a few are preserved in H 138. Amphids hardly visible in H 136 and H 244, distinct in H 138; here they have a distinct spiral shape and their centre is situated 9 μ behind head end. Depth of mouth cavity = 13 μ, so that amphids are located opposite the posterior portion of the mouth cavity. Cuticular punctuation visible only near the head end of H 138. Oesophagus almost cylindrical, slightly narrowed in its middle, weakly widened posteriorly. Details of ovaries invisible. H 244 bears three eggs, dimensions 41 × 45 μ, 41 × 46 μ and 42 × 48 μ; thus the eggs are slightly wider than long. Spicules and gubernaculum agreeing completely with DE MAN's illustration (1884): gubernaculum widened distally (DE MAN's descriptions of 1880 and 1884 say: "nach vorne verbreitert"). Spinneret 6 μ in length, tip slightly bent to the ventral side. Caudal setae lost. Anterior to the anus is a row of minute papillae: five are visible, but the body is slightly twisted, so that there may be more. The number of these supplements is four after DE MAN, six after DITLEVSEN (1911), eight after PAETZOLD (1958) and nine after GERLACH (1953).

Status. — The species was described in 1880 as *Cyatholaimus intermedius*, syn. *C. dubiosus* apud DE MAN, 1876 nec BÜTSCHLI, 1874. This gives the impression that *C. intermedius* is a new name for the specimens described in 1876 erroneously as *C. dubiosus*, but this is not the case. We know that DE MAN did not preserve the specimens on which the 1876 descriptions were based, and that his later opinions were therefore not based on actual study of these specimens (cf. *Tylenchus agricola*). The 1876 description is short, so that we cannot say with certainty whether it indeed refers to *P. intermedius*. It was the specimens collected between 1876 and 1879 on which the concept of *P. intermedius* was based and the synonymy with *C. dubiosus* apud DE MAN, 1876 is subjective. Therefore the specimens collected between 1876 and 1879 are the primary types of *P. intermedius*.

H 136 and H 138 do not bear any indication, but are, like H 244, labelled with an unpublished specific name, thus they were collected before September, 1879. H 244 bears the locality Walcheren and the date August 1879. DE MAN's personal notes permit identification of the two others: H 136 was most probably collected in clayey soil near Leiden, October 1877, H 138 at the same locality in May 1877. The male on slide H 138 is herewith designated lectotype; the two females on H 136 and H 244 are paratypes, but do not possess much value.

46. *Achromadora terricola* (DE MAN, 1880) MICOLETZKY, 1925 (Fig. 10, C—D).

H 133: 1 ♀; H 134: 2 ♀♀; H 135: 2 ♀♀. One specimen on H 134 was broken into five fragments. Dimensions of the others:

	H 133	H 134	H 135—1	H 135—2
L	1,10 mm	0,92 mm	1,00 mm	0,79 mm
a	29,2	23,0	20,1	22,3
b	6,2	6,3	6,5	6,5
c	8,5	8,5	7,8	6,7
V	50,7%	49,3%	49,2%	52,0%

H 133 and H 135—1 are in fairly good condition; H 135—2 is broken into two parts but still reasonable; the head end of H 134 is badly damaged. Cuticular punctuation invisible in H 133, distinct in H 135—1. In these two specimens the amphids are located immediately behind the dorsal tooth in such a way that their anterior margin lies at the level of insertion of the tooth. Amphids distinctly spiral-shaped, with 1,5 to 2 convolutions. Longitudinal striation in anterior part of mouth cavity indistinct in H 135—1 but well visible in H 133. Nearly all cephalic setae are lost. Dorsal tooth distinct; H 135—1 shows one small subventral tooth, in the others nothing of the kind is visible. Anterior body end very plump, width of anterior margin = 18 μ. Oesophagus slightly swollen posteriorly. Vulva in H 135—1 with distinct lips. Rectum much longer than body diameter, best visible in H 135—1. Tail tip with well developed spinneret, about 5 μ long. H 133 bears an egg, dimensions 113 × 48 μ.

Status. — These three slides do not bear data about collecting time or locality. H 133 is indicated n.sp. The species is not recorded for September, October or November, so these five specimens may all be taken to be primary types. DE MAN's notes indicate that they were collected in a moist meadow near Leiden in April. H 135—1 is herewith designated lectotype, the others are paratypes.

47. *Achromadora* spec.

H 131: 1 ♀; H 132: 1 ♀. These slides are labelled *Cyatholaimus* with an unpublished specific name. The specimens are in poor condition: neither mouth cavity, nor amphids, nor rectum can be examined any longer, so that determination is impossible. Probably they belong to *Cyatholaimus tenax* DE MAN, 1876 = *Achromadora dubia* (BÜTSCHLI, 1873), or to *A. ruricola* (DE MAN, 1880).

48. *Odontolaimus chlorurus* DE MAN, 1880.

H 67: 1 specimen in very poor condition. Part of the tail is missing. Cuticular annulation invisible. Mouth cavity indistinct, only dorsal tooth conspicuous. Details of oesophagus fairly distinct: both swellings are easily visible. A few cephalic setae are preserved. Whether a vulva is present cannot be decided; the anus is also invisible. Tail of an intense brown colour. Amphids invisible.

Status. — The slide is labelled with an unpublished name and thus this specimen is a primary type. However, it is in such a poor condition (it cannot even be determined whether it is a larva or an adult female) that it may safely be regarded as destroyed. If necessary, a recent specimen can be selected as neotype. Type locality: moist meadows near Leiden and on the island of Walcheren.

49. *Choanolaimus psammophilus* DE MAN, 1880 (Fig. 11).

Dimensions:	H 128 1 ♂	H 129 1 ♂	H 130 1 ♀
L	1,27 mm	1,36 mm	1,29 mm
a	21,3	20,1	22,2
b	6,8	6,9	5,9
c	33,2	37,5	36,8
VD	35,9%	32,1%	V 62,2%
T_1	17,2%	15,7%	
T_2	14,9%	10,9%	

All three specimens are in fairly good condition. H 128 is broken into three fragments, H 130 into two; this latter specimen is flattened and has burst open in several places. In all three specimens a fine transverse annulation is visible; there are no traces of a dissolution of these striae into granules, neither of a differentiation of the sculpture on the lateral field. Therefore it seems probable that the cuticular sculpture has disappeared and only the subcuticular annulation is still present. Head end broadly truncate; papillae distinct. Mouth cavity composed of two parts, with sclerotized longitudinal thickenings as illustrated by DE MAN (1884); the posterior portion is surrounded by oesophageal tissue. Oesophagus swollen near anterior end. Amphids opposite the junction the of two sections of the mouth cavity; spiral-shaped, with slightly more than 1,5 convolution, the hind edge interrupted on the dorsal side. Oesophagus broadly attached to intestine. Cardia flat. Vulva a transverse slit, 10 μ in length, surrounded by distinct lips. Details of ovaries invisible; the only distinct feature is the presence of spermatozoa in the anterior uterus. Testes relatively long. Spermatozoa nearly round, diameter 10—14 μ. Spicules nearly straight, pointed distally, proximally with weakly separated knobbed haft. Gubernaculum slender, straight, 23 μ long. Ventromedian preanal supplements absent according to DE MAN, but CHITWOOD (1960) found a

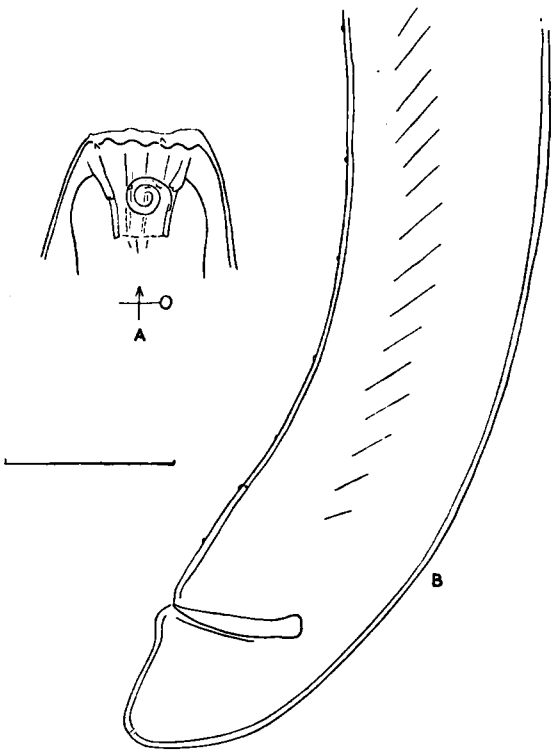

FIGURE 11. *Choanolaimus psammophilus* male, H 128. A: head end; B: posterior part of body.

series of seven in an American specimen. H 129 does not show many details in this body region, but in H 128 seven very small supplements can indeed be observed: their distances apart, expressed in tail length, are (starting with distance from anus to posterior supplement): 0,6—0,5—0,4—0,8—0,8—0,8—1,0. Spinneret tube absent, but all three specimens show clearly that the cuticle on the tail tip is traversed by a fine canal.

Status. — Neither of these slides bears any indication about date or author; the locality is dune soil near Katwijk. It is certain that they are primary types. They are herewith indicated as follows: Male on H 128: lectotype; male on H 129: paratype; female on H 130: allolectotype.

Family **Microlaimidae.**

50. *Microlaimus globiceps* DE MAN, 1880 (Fig. 12)

Dimensions:	H 250 ♂ 1	H 250 ♂ 2
L	0,60 mm	0,45 mm
a	27,3	24,8
b	6,9	5,6
c	11,2	10,1

In moderately good condition; No. 1 is better than No. 2. Anterior end of body half as wide as body at base of oesophagus. Cuticular annulation distinct; on the middle of the body the annules are 2,5 μ in diameter on the dorsal and 2 μ on the ventral side. The anterior, smooth part of the

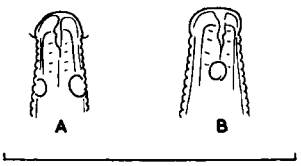

FIGURE 12. *Microlaimus globiceps* male, H 250. A: nr. 1 head end; B: nr. 2 head end.

head is 0,6 times as high as wide. Cephalic papillae absent according to DE MAN, but GERLACH (1950) says a circle of six very small papillae is present. In No. 2 two papillae are indeed visible. Cephalic setae 3 μ in length, inserted near the base of the smooth part of the head. Head slightly wider than neck. In No. 1 the head end is slightly twisted, so that both amphids are visible at the same time; their longitudinal diameter = 4 μ, their distance from anterior end of body = 12 μ, i.e. 1,7 times width of head end. In No. 2 the amphids are 3 μ in diameter and located 11 μ behind head end; apparently circular, but the hind edge is distinctly interrupted, agreeing with GERLACH's illustration. Mouth cavity narrow, walls thin but distinctly sclerotized. A relatively weak dorsal tooth is present, ventral denticles were not observed. No pharyngeal oesophageal "bulb". Length of terminal bulb equal to $^1/_6$ of total oesophageal length. Nerve ring and excretory pore invisible. Spicules 18 μ in length, hardly widened proximally. Gubernaculum rod-shaped, not very distinct, its length probably about 8 μ. Length of spicules twice, of tail thrice the anal body diameter.

These specimens fit the detailed description of GERLACH completely.

They are in such a good state that they can be recognized as *M. globiceps* amid the nineteen species of *Microlaimus* described by GERLACH.
Status. — The slide bears the date August 1879. These two specimens are therefore primary types. No. 1 is herewith designated lectotype, No. 2 paratype. The slide does not bear any indication of locality, but DE MAN found the species only in brackish soil on the Island of Walcheren.

Order **Enoplida.**

Family **Tripylidae.**

51. *Tripyla papillata* BÜTSCHLI, 1873 (Fig. 13, A—C).

Dimensions:	H 103 ♀	H 105 ♀	H 187 ♂	H 188 ♀
L	1,22 mm	1,25 mm	2,54 mm	1,54 mm
a	32,5	26,6	29,9	20,5
b	5,3	5.6	6,0	5,3
c	5,9	6,5	5,8	7,3
V	52,4%	54,1%		53,1%

Dimensions:	H 104 larva	H 111 larva
L	0,86 mm	1,54 mm
a	25,3	27,7
b	4,7	4,6
c	5,1	5,8

Some of these six specimens approach *T. affinis* in dimensions. The females of these two species are difficult to separate. DE MAN states that in *T. papillata* the papillae of the three circles are of the some size but that in *T. affinis* those of the second circle are larger than the others. This is indeed a reliable character. The orginal description of *T. papillata* was based on females only. BÜTSCHLI gave no dimensions, said only that *papillata* was larger than *T. setifera* and *T. intermedia*. The number of ventral papillae in H 187 cannot be determined with certainty. Length of spicules = 69 μ, of gubernaculum = 24 μ. For further discussion see under *T. affinis*. H 187 and H 188 bear the locality The Hague and were collected in February (almost certainly 1879). The others do not bear any indications, but DE MAN's notes indicate that they were collected in July in the vicinity of Leiden.

52. *Tripyla affinis* DE MAN, 1880 (Fig. 13, D—G).

Dimension:	H 229 ♂	H 229 ♀ 1	H 229 ♀ 2
L	1,03 mm	1,20 mm	1,07 mm
a	28,4	28,3	27,5
b	5,9	5,7	5,5
c	4,8	5,6	5,4
V		51,3%	48,9%

In addition, slide H 153 contains one male in poor condition: body badly flattened and tail tip lost.

The values of a, b and c are about the same as in the preceding species, although DE MAN says that all three are higher in *T. papillata*: a = 35—40 against 25—30; b = 6—7 against 5—6; c = 6—8 against 5—6.

In *T. papillata* as well as in *T. affinis* the dorsal denticle in the oesophagus is short triangular, and directed ventrally.

Status. — H 153 is indicated n.sp., while H 229 bears the date August 1879. Thus both slides contain primary types. They are herewith designated as follows: Male on H 229: lectotype; female nr. 2 on H 229: allolectotype; female nr. 1 on H 229 and male on H 153: paratypes. Locality:

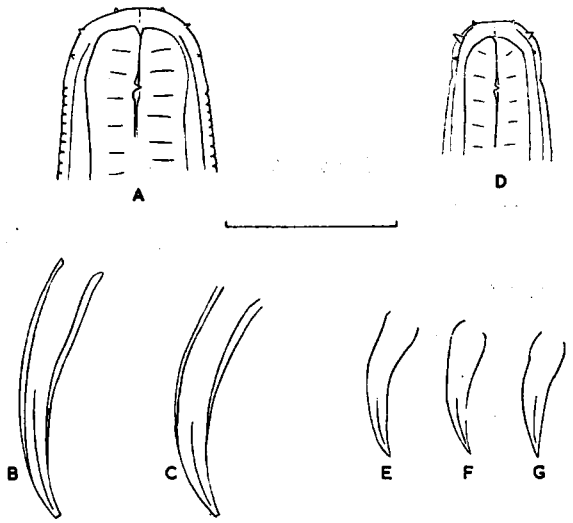

FIGURE 13. A-C: *Tripyla papillata* male. A: specimen from P.D. Collection, head end; B: same specimen as A, spicule. C: H 187 spicule. D-G: *Tripyla affinis* male. D: specimen from P.D. Collection, head end; E: specimen from P.D. Collection, spicule; F: H 153 spicule; G: H 229 spicule.

H 153 probably vicinity of Leiden (March); H 229 Duiveland.
The taxonomic position of *T. papillata* and *T. affinis* has been object of much controversy. MICOLETZKY (1922, 1925-a) declared them identical; according to him *papillata* represents the freshwater form, *affinis* the terrestrial; MICOLETZKY observed in many nematode species that specimens from freshwater were larger than specimens from soil. The difference indicated by DE MAN, viz. the presence or absence of a chitinous streak on the spicules MICOLETZKY thought insufficient and also wrong, because he found this streak in *affinis* as well as in *papillata*. The writer examined fresh specimens of both species and found MICOLETZKY's statement correct. There are, however, more differences. The cephalic papillae have been mentioned already. In recent (fixed and mounted) material *T. papillata* was found to possess a much more distinct and coarse cuticular annulation than *T. affinis*. The number of ventral papillae in the male is 19—21 in *papillata*, 12—15 in *affinis*. The length of the spicules is 70—80 μ in *papillata* against 36—46 μ in *affinis*; in the former species they are also much more slender than in the latter. Furthermore, in *papillata* the halft is hardly set off from the blade and its sides are straight; the tip is bifid. In *affinis* the haft is set off from the blade by a shallow constriction and its sides are convex; the tip is simple. The length of the gubernaculum

is 24—25 μ in *papillata*, 12—16 μ in affinis. In the two males of *T. affinis* in the Hollandsche Collectie the spicules measure 39 resp. 36 μ, the gubernaculum is indistinct in H 153 and measures 13 μ in H 229. The number of ventral papillae is uncertain in H 153; in H 229 twelve were counted, but there may be a few more. Thus *T. papillata* and *T. affinis* are both good species.

53. *Tripyla setifera* BÜTSCHLI, 1873 (Fig. 14, A—B).

Dimensions:	H 108 ♂	H 110 ♂	H 108 ♀ 1	H 108 ♀ 2	H 110 ♀
L	0,98 mm	1,57 mm	1,11 mm	1,14 mm	1,41 mm
a	33,4	36,1	27,9	31,3	31,5
b	4,5	5,7	4,8	4,8	5,0
c	6,8	6,3	6,7	6,5	6,3
V			53,4%	?	55,1%

All five specimens in good condition; the male on H 110 is broken into two fragments, the three specimens on H 108 into three each. Cephalic setae still present in the two females and the male of H 108. Two females bear an egg each: H 108-2 (99 × 40 μ) and H 110 (123 × 42 μ). In the anterior part of the intestine of H 108-2 the head skeleton and anterior part of the stylet of a nematode that has been swallowed (*Helicotylenchus* sp.) can be observed.
The dorsal oesophageal denticle is directed ventrally in *T. setifera*, as in the two preceding species, but it is longer and more pointed.
H 108 bears the indication: Westhove, August 1879; H 110 bears the locality Haagsche Bosch, without date.

54. *Tripyla filicaudata* DE MAN, 1880 (Fig. 14, C—D)

H 243: 1 ♂. Dimensions (extreme tip of tail missing): L = 1,64 mm; a = 48,2; b = 4,3; c = 5,1. In poor condition. Cephalic setae lost, papillae invisible. Hear end slightly offset. Cuticular annulation distinct. Spicules stout, proximal portion cannot be distinguished from surrounding tissue. The presence of a gubernaculum is also uncertain. Ventral preanal papillae invisible.

Status. — The slide bears the locality Westhove; no indication of date. The specimen may be assumed to be a primary type, but it is advisable to regard it as destroyed. If necessary, a recent specimen can be selected as neotype. Type locality: moist soil of forest and meadows near Leiden and The Hague, and the Island of Walcheren.
Investigation of five recent males of this species from the P.D. Collection showed that, contrary to DE MAN's statement, a well developed gubernaculum is always present. The number of preanal papillae varies in these specimens from 15 to 19. MICOLETZKY (1922) erected a variety *austriaca*, which was said to differ from typical specimens by the presence of a gubernaculum and of only five preanal papillae. The first point lapses; the second is uncertain, because the papillae are inconspicuous and become almost immediately invisible when the body is twisted. The number of these papillae is 14—15 according to DE MAN, 8—10 according to HOFMÄNNER. Their arrangement is unequal: near the head end three lie close together (might this account for the generic name *Tripyla*? Cf.

BÜTSCHLI, 1873) and also in the preanal region the distances between them diminish. The present writer is therefore inclined to regard var. *austriaca* as identical with the typical form.
Tripyla filicaudata var. *hoehnei* RAHM, 1928 has a very short tail (c = 9), so that it probably does not belong to *T. filicaudata*.
The oesophageal denticle is strongly developed in this species. In both sexes it is of the same size. It is not directed ventrally as in the three preceding species, but bent backward. This phenomenon could also be observed in the male on H 243.

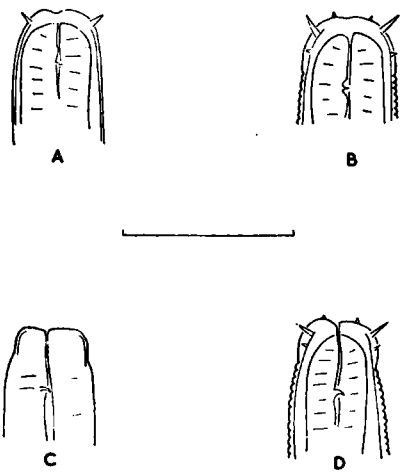

FIGURE 14. A-B: *Tripyla setifera*. A: H 108-1 female, head end; B: male from P.D. Collection, head end. C-D: *Tripyla filicaudata*. C: male H 243, head end; D: female from P.D. Collection, head end.

55. *Tripyla arenicola* DE MAN, 1880 (Fig. 15, A—B).

H 109: 1 ♀. Dimensions (extreme tip of tail appears to be missing): L = 0,99 mm; a = 22,8; b = 55; c = 18,2; V = 62,2%. The specimen is broken into two fragments but in fair condition. Most cephalic setae lost. Structure of anterior part of oesophagus not very clear: faint traces of subventral teeth seem to be present. Examination of recent specimens showed that *T. arenicola* possesses a small dorsal tooth, situated about $^2/_3$ width of head end from anterior end of body; 3 μ posterior to this tooth are two minute, subventral denticles. The dorsal tooth is much weaker than in the preceding four species (the "genuine" *Tripyla*'s of DE MAN); this may account for DE MAN's statement that in this species the thickening of the oesophageal lumen is absent. Cardia broad and flat. Details of ovary indistinct.

Status. — The slide bears the locality Katwijk and is indicated n.sp. Thus the specimen is a primary type and is herewith designated lectotype. DE MAN's notes make it probable that it was collected in March.

56. *Tripyla monohystera* DE MAN (fig. 15, C).

H 107: 1 ♀. Dimensions: L = 1,41 mm; a = 40,2; b = 4,3; c = 13,9;

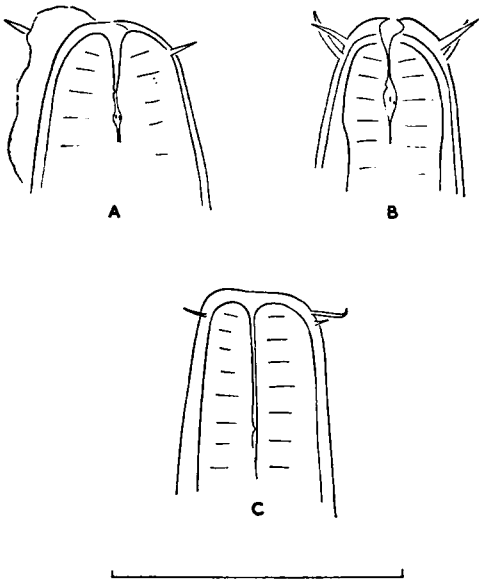

FIGURE 15. A-B: *Tripyla arenicola* female. A: H 109 head end; B: specimen from P.D. Collection, head end. C: *Tripyla monohystera* female H 107, head end.

V = 80,6%. In relatively good condition. Cephalic setae of both circles preserved; anterior ones bent forward, posterior ones also slightly curved. A small tooth seems to be present in the oesophagus at about $^4/_3$ head width from anterior body end, but it was not possible to be certain upon this point and no recent material of this species was available. According to DE MAN the thickening of the oesophageal lumen is absent in this species as well as in *T. arenicola*. Cardia as in preceding species, flatter than in the "genuine" *Tripyla*'s. Spinneret present.

Status. — The slide bears the indication n.sp. and thus contains a primary type, which herewith is designated lectotype. No locality, but DE MAN's notes show that he found the species only in moist meadows in the vicinity of Leiden. Collecting time probably May.
MEYL (1954-b) claims to have found the male of this species in Italy. His illustrations suggest that spicules and gubernaculum are much smaller than in the other species of this genus. There appears to be one pair of subventral preanal papillae. The tail is provided with setae and a spinneret. This seems to support DE MAN's idea that *T. arenicola* and *T. monohystera* should eventually be removed from *Tripyla*. In that case they would probably have to take the generic name *Trischistoma* COBB, 1913.

57. *Tobrilus gracilis* (BASTIAN, 1865) ANDRÁSSY, 1959.

H 214: 1 ♀. Dimensions: L = 1,90 mm; a = 33,8; b = 6,1; c = 7,2; V = 44,1%. Cephalic setae lost, amphids invisible; otherwise the specimen is in fairly good condition. Mouth cavity with slightly bent walls, the posterior portion with a distinct denticle. Cristalloids cannot be observed.

The anterior ovary contains an egg, dimensions 62 × 41 μ. Tail not filiform, distinctly clavate at tip.
The slide is labelled *Trilobus pellucidus*. Up to 1880 DE MAN confused the two *Trilobus* species described by BASTIAN: *T. pellucidus* apud DE MAN, 1880 = *T. gracilis* BASTIAN, 1865; *T. leptosoma* DE MAN, 1880 = *T. pellucidus* BASTIAN, 1865 (See DE MAN, 1881). Thus the specimen on H 214 was collected before the 1881 paper went to press. The shape of the mouth cavity and the tail shows that it belongs to *T. gracilis sensu lato*. The slide bears the indication: "freshwater, Leiden". This, too, shows that this specimen belongs to *T. gracilis*, because DE MAN (1884) stated he had found *T. pellucidus* only in soil. The generic name *Trilobus* BASTIAN, 1865, being a junior homonym, was replaced by the anagram *Tobrilus* by ANDRÁSSY (1959).

Family **Mononchidae.**

58. *Mononchus truncatus* BASTIAN, 1865.

Dimensions:	H 112 ♀	H 114 ♀	H 115 ♀	H 116 ♀
L	1,49 mm	1,86 mm	1,84 mm	2,00 mm
a	21,9	30,7	26,7	28.9
b	3,7	4,1	3,8	4.0
c	8,0	9,4	11,9	8.9
V	53,2%	53,9%	60,0%	56,0%

All slides are labelled *M. macrostoma*. The specimens are in fair condition; H 116 is broken into three fragments. H 112 bears three eggs (pressed against each other; dimensions 59 × 50 μ, 56 × 54 μ and 52 × 51 μ), H 114 one (71 × 61 μ) and H 115 two (70 × 53 μ and 70 × 51 μ).

Neither of these slides bears indications about date or locality DE MAN found the species in the Netherlands only in the vicinity of Leiden. According to ANDRÁSSY (1958) *M. macrostoma* is synonymous with *M. truncatus* BASTIAN, 1865, the latter name having priority.

59. *Mylonchulus sigmaturus* (COBB, 1917) ANDRÁSSY, 1958.

Dimensions:	H 120 ♀	H 123 ♂
L	1,22 mm	1,13 mm
a	27,6	29,6
b	3,4	3,7
c	36,8	31,7
V	62,3%	

In fairly good condition. The male possesses ten preanal ventromedian supplements. In the female there appears to be a ventromedian papilla 14 μ anterior to the vulva, and one at the same distance posterior to it. Both slides are labelled *Mononchus brachyuris* BÜTSCHLI, but the specimens clearly belong to *Mylonchulus sigmaturus*. H 120 does not bear indications. H 123 bears the locality Walcheren; the notes indicate that it was collected from sandy soil in a meadow near the road from Middelburg to Veere, January 1879.

60. *Anatonchus tridentatus* (DE MAN, 1876) DE CONINCK, 1939.

H 117: 1 ♀; H 119: 1 ♀. During remounting the tail tip of H 119

was lost. Dimensions of H 117: L = 2,79 mm; a = 30,7; b = 4,6; c = 8,5; V = 62,2%. This specimen is in a fairly good condition. It bears eight eggs, which are partly pressed against each other; dimensions 81 × 79 μ; 80 × 76 μ; 76 × 80 μ; 86 × 73 μ; 101 × 64 μ; 81 × 73 μ; 76 × 75 μ and 81 × 74 μ.

Status. — Neither of these slides bears any indication. The primary types of this species are lost. It is advisable to select, if necessary, a recent specimen as neotype. Type locality: clayey soil near roots of grasses, Leiden and Middelburg.

61. *Prionchulus muscorum* (DUJARDIN, 1845) CHITWOOD & CHITWOOD, 1937 (Fig. 16).

Dimensions:	H 121 ♀	H 124 ♀
L	2,34 mm	1,89 mm
a	25,8	23,3
b	5,0	4,0
c	21,5	14,0
V	64,2%	67,5%

Both specimens are in good condition. The denticles on the subventral ridges in the mouth cavity are easily visible. Both specimens bear one egg; dimensions 85 × 73 μ (H 121) and 90 × 64 μ (H 124).

H 121 bears the locality indication Leiden; H 124 has none. H 121 is labelled *Mononchus bastiani* DE MAN, H 124 *M.papillatus* BASTIAN. The former name has, up to now, been considered synonymous with *M. papillatus*, as DE MAN himself did (1880, 1884). However, DE MAN considered *M. papillatus* as probably identical with *P. muscorum*. The slides now prove that he overlooked the denticles and that what he called *M. papillatus* was really *P. muscorum*. So *M. bastiani* DE MAN, 1876 should be considered a synonym of *Prionchulus muscorum* (DUJARDIN, 1845). This is confirmed by the dimensions, see below.

The taxonomic status of *M. papillatus* and *P. muscorum* has been object of much controversy. Many authors have applied the name *muscorum* to specimens which have the subventral ridges distinctly denticulate, and the name *papillatus* to specimens where the denticles are weakly developed or absent; see e.g. MENZEL (1914). Later authors found all transitions between weak and strong denticles, and some of them, for this reason, synonymized the two species. In 1958 ANDRÁSSY showed that, up

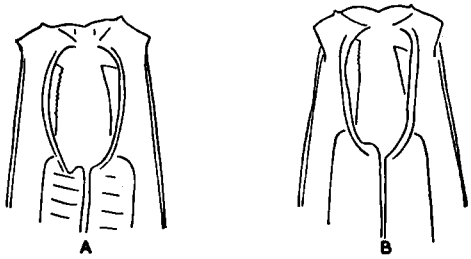

FIGURE 16. *Prionchulus muscorum* female. A: H 121, head end; B: H 124, head end.

to then, two species had been confused under the name *M. papillatus*: one with smooth subventral ridges, and one with fine denticles; the latter could not be distinguished from *P. muscorum* and should be placed in that species. As BASTIAN's illustration of *M. papillatus* did not show denticles, ANDRÁSSY called the non-denticulate species *M. papillatus*.
The present author found that the two species as distinguished by ANDRÁSSY differ not only in the character mentioned, but also in dimensions. Measurements of recent specimens (fixed and mounted) gave the following result:

	P. muscorum	*M. papillatus*
n	13	40
L	1,79— 2,08 mm	0,84— 1,37 mm
a	23,9 —34,4	19,0 —30,5
b	3,9 — 4,3	3,2 — 4,0
c	13,2 —23,4	11,9 —19,9
V	62,9 —67,0 %	59,6 —65,4 %

Among the *papillatus* specimens were twelve that bore eggs (one to four). so that the non-denticulate form is in no case a younger stage of the denticulate one, as some older authors supposed.
Allowing for an average shrinkage by fixation and mounting of 15—20%, we find that the maximum length of *M. papillatus* is about 1,64 mm and the minimum length of *P. muscorum* about 2,16 mm. It seems that body length is a fairly good character. In *M. papillatus* the vulva is generally located more anteriorly than in *P. muscorum*, but here is some overlapping. *P. muscorum* is mostly more slender, has a relatively shorter oesophagus and shorter tail than *M. papillatus*.
The non-denticulate form has been described by COBB (1917), GOODEY (1951), GADEA (1952) and ALTHERR (1950). Their combined dimensions are: L = 0,9—1,6 mm; a =22—25; b =3,1—4,1; c = 12—19; V = 58—65%. Dimensions of *P. muscorum*, compiled from DE MAN (1880), DUJARDIN (1845; cited from BASTIAN, 1865), MENZEL (1914), STEINER (1916), MICOLETZKY (1925-a) and ANDRÁSSY (1952): L = 1,6— 2,7 mm; a = 22—35; b = 3,5—4,5; c = 13—25; V = 58—68%. Thus the literature data confirm the above observations.
A further differentiating character is the depth of the mouth cavity, which in *P. muscorum* is about 36 μ (35—40 μ), in *M. papillatus* (95 adult females measured) about 25 μ (23—26 μ); or, taking the distance from the anterior end of the body to the bottom of the mouth cavity, the figures become 45 μ (42—49 μ) and 30 μ (29—33 μ), which shows that *P. muscorum* has higher lips than *M. papillatus*. It appears that depth of the mouth cavity is but little variable in both species and there is a distinct gap between the two sets of data.
Recently CLARK (1960) has pointed out that it is not quite certain which species BASTIAN had before him when describing *M. papillatus*. Some features from the original description point to *P. muscorum*, others to the non-denticulate species. He therefore selected a specimen of the latter, found at the type locality of *M. papillatus*, as neotype, because this is in harmony with the current interpretation of this species. This is indeed the most satisfactory solution.

Family **Dorylaimidae.**

62. *Dorylaimus stagnalis* DUJARDIN, 1845.

H 220: 2 ♀ ♀. One is broken into three fragments; the tail tip of the other is missing. Collected from a freshwater ditch near Wassenaar, presumably May 1879.

63. *Dorylaimus crassus* DE MAN, 1884 (Fig. 17 and 18).

H 21: 1 ♀. Dimensions: L = 4,25 mm; a = 23,7; b = 4,9; c = 14 (the tip of the tail is missing); V = 44,1%. From DE MAN's notes it can be

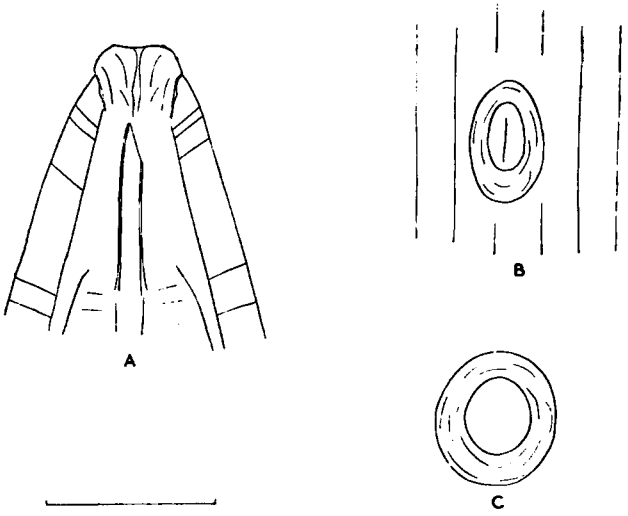

FIGURE 17. *Dorylaimus crassus* female H 21. A: head end, subventral view; B: vulva, ventral view; C: vagina 13 u below ventral surface.

concluded with certainty that this specimen is the holotype; the original description was based upon a single female and gives the following dimensions: L = 4,86 mm; a = 27; b = 4,75; c = 14; vulva slightly posterior to middle, which obviously is an error. Calculated from illustration: L = 4,9 mm; a = 26,1; b = 4,8; c = 13,5; V = 45,2%. The specimen is in fairly good condition, though broken into two fragments. The lips are slightly offset; the specimen lying on its back, the impression is given that the lips are separated from the body by a deep constriction. Lips almost completely amalgamated, with rounded contours; papillae low, rounded. Spear 48 μ in length, i.e. 2,2 times as long as the width of the lip region, the aperture occupying $^1/_4$ of its length. Guiding ring not distinct; DE MAN says it is double. Two circles of papillae at level of guiding ring, as in *D. stagnalis*. Cuticle increasing anteriorly in thickness to 14 μ near head end. Oesophagus widened gradually anterior to its middle. Body tapering considerably towards the head end. Vulva a longitudinal slit. Dimensions of the five eggs (see illustration of DE MAN, 1884: one egg in anterior uterus, four in posterior): 103 × 48 μ; 103 × 48 μ; 91 × 54 μ; 91 × 56 μ and 94 × 50 μ. Thus the eggs are indeed very small compared with body width (179 μ). Near the vulva are three

more eggs, two of which were figured by DE MAN, but evidently not recognized as eggs; dimensions 91 × 42 μ, 93 × 53 μ and 99 × 47 μ.
The taxonomic position of this species has been uncertain till now. MICOLETZKY (1917) considered it a variety of *D. stagnalis*. In 1925, however, he concluded that *D. crassus* differed from *D. stagnalis* by the absence of the longitudinal cuticular wings; he proposed the new name *D. stagnalis fecundus* var. *pseudocrassus* for the specimens described by him in 1922 as *D. stagnalis fecundus* var. *crassus* (DE MAN, 1884), because these specimens possessed such wings. W. SCHNEIDER (1939) also says that *D. crassus* can be distinguished from *D. stagnalis* by the absence of the longitudinal cuticular striation. In 1918 DE MAN collected three females, which he provisionally placed in *D. crassus*; in a letter to MICOLETZKY (see MICOLETZKY, 1925-b) he stated that one of these possessed longitudinal striae; at that time DE MAN himself doubted whether *D. crassus* was specifically distinct from *D. stagnalis*.
In 1884 DE MAN said nothing about longitudinal striation, but neither did he mention this feature in *D. stagnalis* until 1907. Now the holotype of *D. crassus* described here shows fairly distinct longitudinal striae; the number could not be determined with certainty, as it was of course inadmissible to make transverse sections of this specimen; probably the number is 35—40. In the oesophageal region there appear to be more (about 45). Near the head and tail ends the wings become indistinct.
Thus *D. crassus* is closely related to *D. stagnalis* and still more to *D. helveticus* STEINER, 1919; in this latter species the wings also increase in the oesophageal region, the dimensions are about the same (both *D. crassus* and *D. helveticus* are much plumper than *D. stagnalis*) and the spear aperture occupies $^1/_4$ of its length. *D. helveticus* seems to differ from *D. crassus* by the longer spear (three times the width of the lip region) and the more slender and slightly larger eggs; future investigations will have to show whether these differences justify specific distinction.
Holotype of *D. crassus*: female on slide H 21. The slide does not bear any indication, but the personal notes show that the specimen was collected in November 1879 in moist clay soil, Hoge Morschweg, Leiden. The slide is labelled *Dorylaimus robustus*.
D. stagnalis fecundus var. *pseudocrassus* MICOLETZKY, 1925 was synonymized with *D. stagnalis* by ANDRÁSSY (1959), but in view of its stout body (a = 20—29) it appears rather to be identical with *D. crassus*.
Slide H 21 also contains a male, which was illustrated by DE MAN in 1884 (Fig. 107 A) as *Dorylaimus robustus*. The latter species, however, has, according to the original description, a much more slender body (a = 45). The male on slide H 21 shows such striking similarities to the holotype of *D. crassus*, that it is reasonable to regard it as belonging to that species, the more so as these two specimens were collected together. Dimensions: L = 3,58 mm; a = 26.1; b = 4,1; c = 62,4; VD = 52,8%; T_1 = 13,3%; T_2 = 16,7%. According to DE MAN's notes the original dimensions were: L = 4,2 mm; a = 25; b = 4,3; c = 70. Cuticle very thick (13—17 μ). With longitudinal striae, probably about 35—40 in number and increasing in the oesophageal region; invisible at both ends of body. Lip region nearly continuous, its width $^1/_6$ of body diameter at base of oesophagus. Lips almost amalgamated, papillae not prominent. Diameter

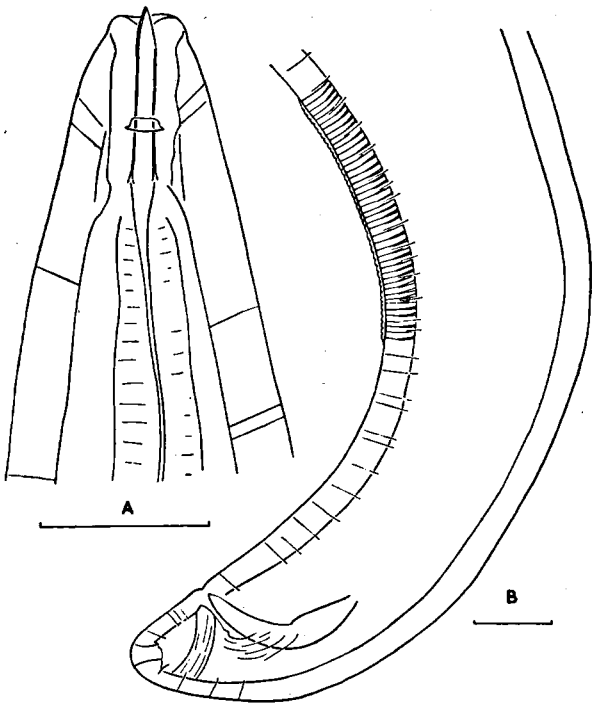

FIGURE 18. *Dorylaimus crassus* male, H 21. A: head end, subventral view; B: posterior part of body, lateral view.

of amphids slightly over half the corresponding body width. Spear 51 μ in length, i.e. 2,2 times width of lip region, the aperture occupying $^1/_4$ of its length. Guiding ring double. Two circles of papillae at level of guiding ring. Cardia triangular. Oesophagus widened gradually at the beginning of its middle third. Spicules 140 μ long, slender and curved; contours of guiding pieces not unambiguously definable. Eleven pairs of caudal papillae visible: three subdorsal, five subterminal and three subventral. Protractores spiculi and dilatator cloacae muscles very conspicuous. Apart from the preanal pair there is a contiguous series of 44 ventromedian supplements, the posterior one being located about three tail lengths anterior to the anus; they start from the epidermis alternately left and right of midventral line. 33 pairs of ventrosubmedian papillae are visible; the posterior ventromedian supplement lies between the 13th and 14th pairs (counted from behind), the anterior one at level of 27th pair. The distance between these ventrosubmedian papillae varies from 7 to 18 μ, except that the two posterior pairs lie 34 μ from each other.

These characters show that the male closely resembles that of *D. stagnalis* and *D. helveticus*. It differs from both by the oesophagus being widened more anteriorly and by one detail of the arrangement of the papillae: in *D. crassus* there are fourteen ventrosubmedian pairs in the region of the series of midventral supplements, while THORNE & SWANGER (1936) figure nineteen for *D. helveticus* and sixteen to eighteen for *D. stagnalis*. The present writer found eighteen in the *stagnalis* specimens

described by DE MAN (1907). Whether these differences are reliable, remains to be shown by future investigations.
Slide H 44, labelled *Dorylaimus longicaudatus*?, contains a female which also seems to belong to *D. crassus*. Dimensions: L = 3,64 mm; a = 25,9; b = 4,2; c = 11,7; V = 44,3%. Cuticle very thick (9 μ near head end, 13 μ near anus), with longitudinal striae, probably numbering 36—40. Lips almost completely amalgamated, papillae relatively well developed. Spear length = 50 μ, i.e. twice width of lip region, the aperture occupying $^1/_4$ of its length. Guiding ring double. Two circles of papillae at level of guiding ring. One lateral pore is visible posterior to base of spear. Vulva longitudinal. Anterior uterus with six eggs, two of which are deformed by being pressed against one-other. Dimensions of the others: 46 × 47 μ; 48 × 45 μ; 57 × 46 μ and 45 × 46 μ; thus the eggs are almost globular and very small. The chief difference between this specimen and the holotype is the size of the eggs, but this might be connected with a difference in developmental stage. The slide does not bear any further indications. The identity of the specimens mentioned by MICOLETZKY (1925-a) as *D. crassus* DE MAN is uncertain. Longitudinal striae are absent. The description is very short and consists of little more than dimensions. The identity of *D. crassoides* JÄGERSKIÖLD, 1908 should also be investigated. No longitudinal striae are mentioned, but they may have been overlooked. The species is smaller than *D. crassus*, the maximum length of the female being reported as 3,68 mm (i.e. same as H 44); it has a relatively longer tail (perhaps connected with smaller size), the vulva is situated preequatorially (as in *D. crassus*!) and the oesophagus is widened about middle (anterior to middle in *D. crassus*).

64. *Dorylaimus agilis* DE MAN, 1880 (Fig. 19):

Dimensions:	H 211 ♀	H 228 ♀
L	1,40 mm	1,32 mm
a	24,2	22,7
b	4,3	4,5
c	11,4	10,4
V	45,2%	44,6%
G_1	12,8%	11,9%
G_2	15,1%	14,5%

In addition, slide H 227 contains one larva in poor condition. Females fairly well preserved. Body tapering anteriorly, width of lip region about $^1/_3$ of body diameter at base of oesophagus. (DE MAN gives $^1/_3$ for this ratio, but the specimens described here are somewhat flattened, especially H 228). Lip region offset by constriction, lips distinct, papillae large and conspicuous, especially in H 211. Spear robust, its length 1,3—1,4 times the width of the lip region, the aperture occupying $^1/_3$ of its length. Guiding ring invisible in H 211, appearing double in H 228. Oesophagus widened suddenly just posterior to middle, the posterior portion being half as wide as the body in H 211, $^3/_4$ as wide in H 228. Cardia relatively long and narrow. Vulva longitudinal. Both specimens carry an egg, dimensions 70 × 36 μ (H 211) and 74 × 45 μ (H 228). Ovaries reflexed almost to vulva in H 228. Rectum slightly longer than anal body diameter; prerectum invisible in H 228, while in H 211 it is 1,2 times as long as rectum. Tail tip rounded; cuticle in H 228 with fine transverse striation.

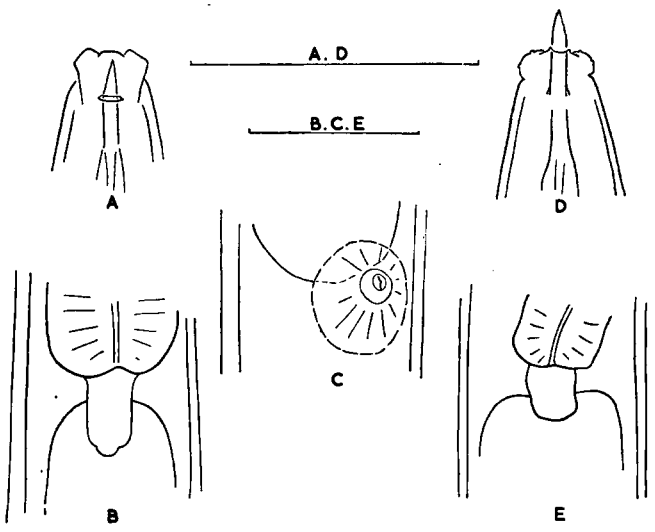

FIGURE 19. *Dorylaimus agilis*. A: H 228, female head, subventral view; B: H 228 cardia; C: H 228 vulva; D: H 211, head end, lateral view; E: H 211, cardia.

Status. — H 227 and H 228 are labelled with an unpublished specific name and thus contain primary types, wich is corroborated by the date August 1879. Locality: Duiveland, moist meadow; DE MAN's notebook shows that he indeed foudn *D. agilis* there. H 228 is herewith designated lectotype; it is probably the specimen illustrated in fig. 129 of 1884. H 211 is labelled „*Dorylaimus carteri*, long-tailed variety". In 1880 and 1884 DE MAN mentioned such a variety, but this had a much shorter tail than H 211 (c = 19—23; in the typical *D. carteri* c = about 30). The specimen most probably belongs to *D. agilis*. The shape of the tail is more like *D. lugdunensis*, but in 1880 as well in 1884 DE MAN stressed that the latter species does not exceed 1 mm in length. The slide bears the locality Leiderdorp; no date, but the specimen was most probably collected in March 1879. *D. agilis* was also found by DE MAN near Leiden.

65. *Dorylaimus parabastiani* PAETZOLD, 1958 (Fig. 20).

Dimensions:	H 41 ♂	H 42 ♂	H 46 ♂	H 151 ♂
L	2,10 mm	1,94 mm	1,84 mm	2,00 mm
a	31,0	28,6	33,8	26,6
b	4,9	4,8	4,5	4,9
c	82,7	76,2	76,0	86,9
VD	52,8 %	47,7 %	?	?
T_1	16,1 %	16,6 %	?	?
T_2	15,5 %	16,4 %	?	?

H 46 and H 151 are in moderately good condition, H 41 is fairly good, H 42 very good. Body tapering anteriorly, diameter at base of oesophagus equal to four times the width of the lip region. The latter is offset by a shallow constriction; lips well developed, bearing large, conspicuous papillae. Lip region 2,5 times as wide as high. Spear relatively slender, its length equal to 1,5 times width of lip region, the aperture occupying $^1/_3$

of its length. Guiding ring double. Oesophagus widened gradually at about its middle. Tail very short, with convex dorsal contour and very bluntly rounded tip. Length of spicules about 55 μ; they are curved, slender, only weakly expanded in the middle, with bluntly bifid tip. Traces of lateral guiding pieces are visible in H 41. Apart from preanal pair there is a contiguous series of ventromedian supplements: 19 in H 41, H 46 and H 151, 21 in H 42. The series begins nearly four tail lengths anterior to anus. Subventral papillae present, best visible in H 42; here at least sixteen pairs can be observed, of which five lie between supplements and

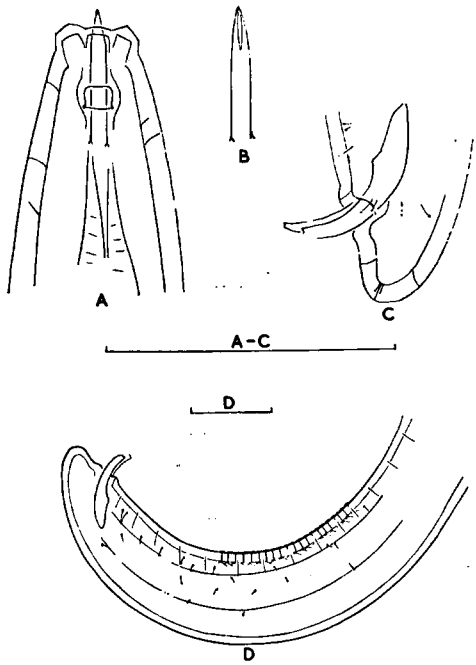

FIGURE 20. *Dorylaimus parabastiani* male. A: H 42 head end; B: H 42 tail; C: H 42 posterior body part; D: H 46 spear, ventral view.

anus, six within range of supplements and five anterior to them, their spacing about equidistant. Numerous conspicuous lateral papillae present. On the tail of H 42 nine pairs of papillae are visible: one subventral, three subterminal, one subdorsal and four sublateral.

H 41 and H 42 do not bear any indications, H 46 was collected on the Island of Walcheren, near road Middelburg — Veere, H 151 bears the locality Nadorst (also on Walcheren). These four males evidently represent the form described by DE MAN (1880) as *D. obtusicaudatus* form I, and in 1884 regarded by him as *D. obtusicaudatus* proper. This means that H 41 and H 42 must also have been collected on Walcheren, which is supported by the personal notes. In 1907 DE MAN expressed a different opinion, viz. that these males belonged to *Eudorylaimus centrocercus*. MICOLETZKY (1922) disagreed with this view and regarded them as *obtusicaudatus*. The above description thows that these males differ essentially from females of the latter species: lip region less distinctly offset,

spear aperture shorter, guiding ring double, oesophagus widened more gradually. The double guiding ring and the presence of subventral papillae indicate that the females belonging to them have a much longer and differently shaped tail, so that these males also do not belong to *E. centrocercus*. They correspond fairly well to the description of *D. parabastiani* PAETZOLD, 1958, and it seems best to assign them to this species, the more so as they were collected from brackish soil (see DE MAN, 1880). From the males of *Mesodorylaimus bastiani* described by THORNE & SWANGER (1936) they differ by larger size, stouter body and number of subventral papillae.
H 41 and H 42 are labelled *Dorylaimus* without specific name; H 46 is labelled *D. rhopalocercus*?; H 151 *D. obtusicaudatus*. The last slide bears the date 1879 and the notebook shows that it originated in August. Evidently the three others were collected earlier, for DE MAN was not sure about their identity. A note in the catalogue indicates that H 46 is the specimen illustrated on fig. 109 E (1884) as *D. obtusicaudatus*.

66. *Mesodorylaimus bastiani* (BÜTSCHLI, 1873) ANDRÁSSY, 1959.

H 26: 2 ♀ ♀; H 185: 2 ♀ ♀; H 199: 1 ♀, broken into five fragments, one of which was lost during remounting.

Dimensions:	H 26 ♀ 1	H 26 ♀ 2	H 185 ♀ 1	H 185 ♀ 2
L	1,40 mm	1,63 mm	1,75 mm	1,99 mm
a	44,5	40,8	32,9	32,5
b	4,3	4,6	4,8	5,4
c	18,6	19,0	"28,6"	?
V	53,1%	52,8%	51,5%	51,0%

Generally in moderate condition. Tail tip of both specimens of H 185 missing. Shape of vulva uncertain; in H 26-1 and the two specimens on H 185 it appears to be longitudinal. It is possible that these five specimens may represent more than one species. H 199 is remarkable for its long tail (seven times the anal body diameter). Neither of these slides bears any indications. The females on slide H 185 contain eggs: no. 1 two (79 × 41 μ and 81 × 41 μ), no. 2 six (partly pressed against one other, dimensions 67 × 41 μ; 68 × 46 μ; 68 × 50 μ; 73 × 47 μ; 65 × 46 μ and 76 × 45 μ); comparison with DE MAN's personal notes showed that these specimens were collected from a meadow near The Hague in February 1879; H 185-1 was figured in 1884. H 26 probably came from dune soil near Scheveningen, October 1877, while H 199 was collected near Leiden in March 1879.

67. *Eudorylaimus monohystera* (DE MAN, 1880) ANDRÁSSY, 1959.

H 38: 1 larva, without indication about date or locality, but with the note: n.sp. Thus it is a primary type, but as such useless, although the typical shape of head and tail is well shown, because the gonad primordium is not visible, so that without the label we should not have been able to determine whether the specimen belonged to a mono- or to a didelphic species. DE MAN's catalogue mentions a second type specimen, an adult female, but this slide is missing. If necessary, a recent specimen can be selected as neotype. Type locality: dune soil, Katwijk and Scheveningen.

68. *Eudorylaimus leuckarti* (BÜTSCHLI, 1873) ANDRÁSSY, 1959 (Fig. 21).

Dimensions:	H 24 ♂	H 24 ♀	H 204 ♀
L	1,69 mm	1,52 mm	1,81 mm
a	34,9	30,0	24,9
b	4,7	4,4	5,2
c	23,3	24,7	23,0
V		51,7%	49,2%
G_1		19,5%	22,5%
G_2		24,0%	29,1%

All three specimens are in fairly good condition. Lip region half as high as wide, offset by constriction. Lips and papillae well developed. Spear relatively slender, its length equal to, its width $^1/_6$—$^1/_8$ of width of the lip region, the aperture occupying about $^1/_3$ of its length. Oesophagus widened at about $^3/_5$ of its length. Vulva transverse. Tail tip very narrowly rounded. Posterior portion of male body slightly twisted, so that the ventromedian supplements are indistinct; there appear to be seven, the posterior one located at about two tail lengths anterior to the anus. Neither slide bears any indications. H 204 is most probably the specimen illustrated in 1884 on fig. 121 and in that case would have been collected in March in the vicinity of Leiden; the arrangement of slides in the catalogue also suggests the date March 1879. H 24 is labelled with an unpublished specific name; apparently DE MAN, on first examining these specimens, considered them to represent an undescribed species.

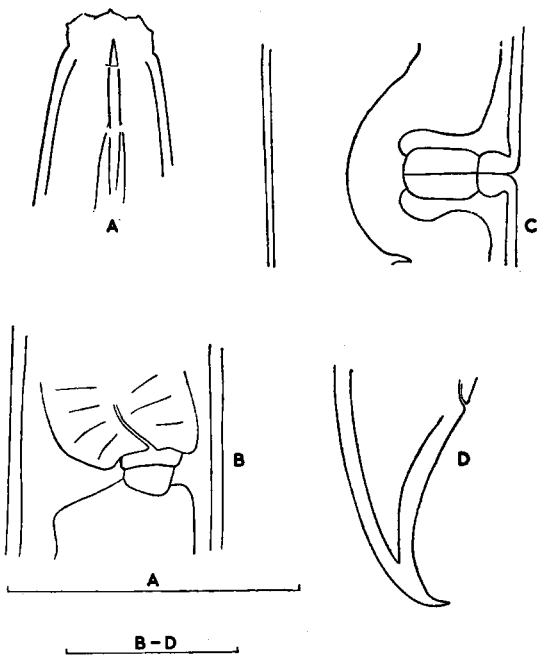

FIGURE 21. *Eudorylaimus leuckarti* female, H 204. A: head end; B: cardia; C: vulva; D: tail.

69. *Eudorylaimus similis* (DE MAN, 1876) ANDRÁSSY, 1959 (Fig. 22).

H 23: 1 ♀. Dimensions: L = 2,30 mm; a = 38,0; b = 4,5; c = 29,7; V = 50,4%. In moderately good condition; body twisted several times. Body tapering anteriorly only slightly, diameter at base of oesophagus thrice width of lip region. The latter is offset, lips well developed, with distinct papillae. Spear slender, slightly longer than width of lip region and $^1/_7$ as wide, the aperture occupying $^1/_3$ of its length. Guiding ring single. Oesophagus gradually widened in its posterior half until $^2/_3$ as wide as the body. Cardia triangular, of normal size. Ovaries invisible. Vulva a transverse slit, very nicely visible. Prerectum not distinct. Tail curved to ventral side, with acute tip.

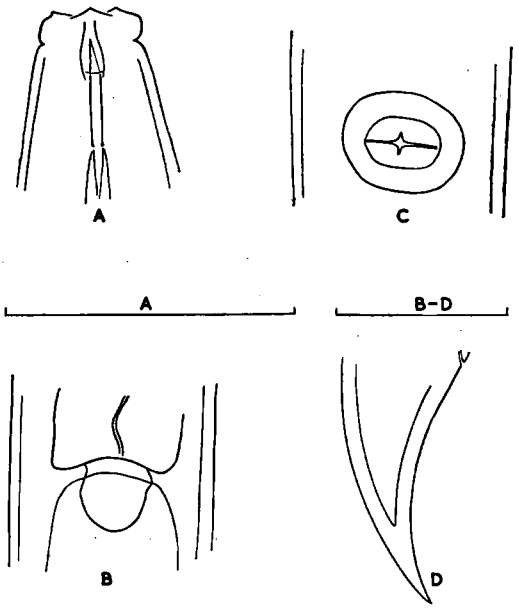

FIGURE 22. *Eudorylaimus similis* female, H 23. A: head end; B: cardia; C: vulva; D: tail.

Status. — The species having been described as new in 1876, the types are lost. H 23 does not bear any indications; DE MAN's personal notes suggest that this specimen was collected near Leiden, June 1877. If necessary, a recent specimen can be designated neotype. Type locality: rhizoids of moss, clayey soil near Leiden.

70. *Eudorylaimus iners* (BASTIAN, 1865) ANDRÁSSY, 1959 (Fig. 23).

Dimensions:	H 22 ♂	H 48 ♂
L	1,36 mm	1,32 mm
a	28,2	32,0
b	6,0	6,0
c	31,3	24,2

In addition, slide H 48 contains a female of which the head and tail ends are missing. H 22 is broken into four fragments. Cuticle with fine trans-

verse striation. Body tapering anteriorly, diameter at base of oesophagus four times width of lip region. The latter is offset slightly in H 22, almost continuous in H 48; lips amalgamated, papillae small, but distinctly visible in H 22. Spear very slender, slightly longer than width of lip region, the aperture occupying only $^1/_7$ of its length. Guiding ring single. Oesophagus widened at $^2/_3$ of its length until $^5/_7$ as wide as body. Cardia small. Vulva a transverse slit. Vagina directed slightly forward. Posterior uterus with egg, dimensions 85 × 34 μ. Anterior uterus with spermatozoa. Spicules plump, 42μ in length. Gubernaculum cannot be distinguished. Apart from the preanal pair there are six ventromedian supplements in H 48; in H 22 the number is uncertain. They are widely spaced, the series beginning far anterior to the proximal end of the spicules. Tail curved to ventral side, with acute tip.

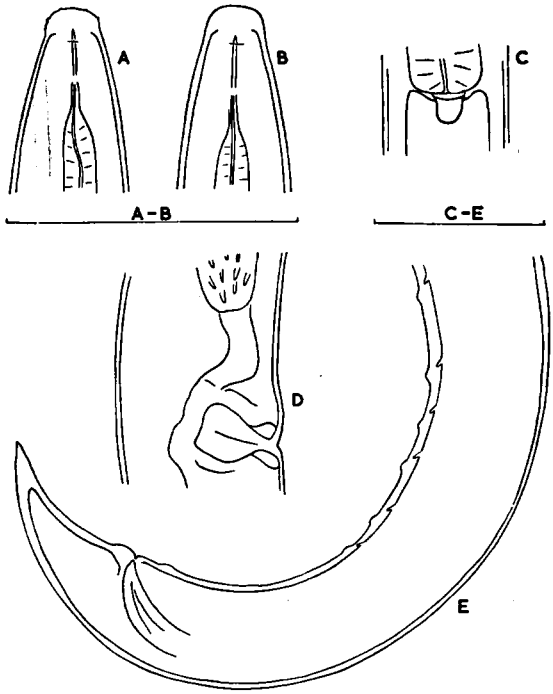

FIGURE 23. *Eudorylaimus iners*. A: H 22 male head end; B: H 48 male head end; C: H 48 male cardia; D: H 48 vulva; E: H 48 male, posterior body part.

Status. — Both slides are labelled *Dorylaimus gracilis* DE MAN. This species was described as new in 1876, so the types are lost; DE MAN's personal notes suggest that both H 22 and H 48 were collected in January 1879. H 48 bears the indication "type", but this term did not then have the nomenclatorial meaning it has to-day. What it means in this case is uncertain; it refers to the male only[1]). Perhaps DE MAN regarded

[1]) Slide H 48 was indicated in the catalogue as containing only a male; the female was hidden under the black edge and was apparently overlooked by DE MAN. His descriptions were made from fresh specimens in water, and only afterwards would he mount some specimens permanently.

males with six and seven supplements as "typical" and those with four and five as aberrant (the 1876 description states the number of supplements is seven). See also under *Eudorylaimus pratensis*. If necessary, a recent specimen can be selected as neotype. Type locality: rhizoids of moss in dry ditches, Island of Walcheren. Slide H 22 is labelled Middelburg, H 48 Veersche Weg, i.e. also Middelburg.

ANDRÁSSY (1952) suggested that *D. gracilis* DE MAN is identical with *Eudorylaimus iners* (BASTIAN, 1865). The differences between these two, listed by THORNE & SWANGER (1936) are: lip region offset distinctly in *gracilis*, slightly in *iners;* number of preanal supplements four to seven in *gracilis*, three to five in *iners*. The specimens described above resemble *gracilis* in the latter, *iners* in the former respect, so that it seems that these species are indeed identical. MICOLETZKY (1925a) synonymized *D. gracilis* with *D. vulvostriatus* STEFANSKI, 1924.

71. *Eudorylaimus acuticauda* (DE MAN, 1880) ANDRÁSSY, 1959 (Fig. 24, A—C).

Dimensions:	H 20 ♂	H 26 ♀	H 45 ♀	H 196 ♀
L	1,37 mm	1,40 mm	1,72 mm	1,20 mm
a	27,7	18,0	28,4	18,7
b	3,9	4,0	4,1	3,7
c	29,1	28,4	38,4	31,0
V		58,3%	57,5%	56,5%

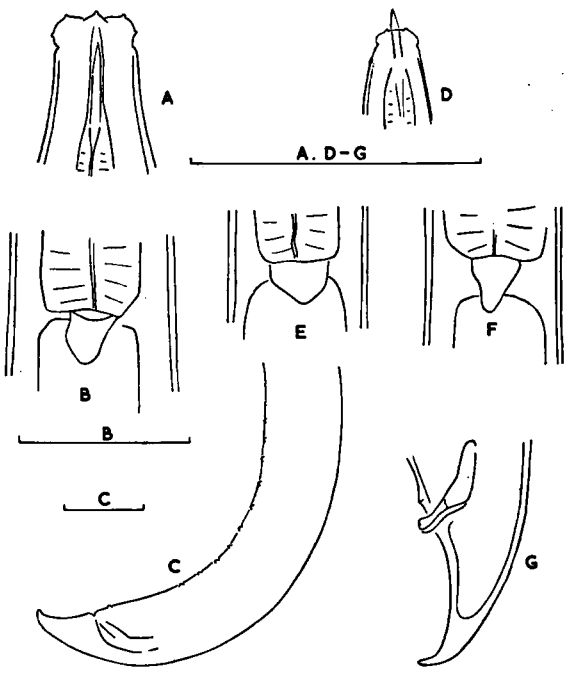

FIGURE 24. A-C: *Eudorylaimus acuticauda*. A: female H 196 head end; B: male H 20 cardia; C: male H 20 posterior body part. D-G: *Eudorylaimus parvus*. D: female H 19 head end; E: female H 19 cardia; F: male H 195 cardia; G: male H 195 tail.

In fairly good condition; H 26 and H 196 are much flattened. Body tapering anteriorly until lip region is $^2/_7$ as wide as body at level of base of oesophagus. Lip region 2,5 × as wide as high, offset by constriction. Lips well developed, with two circles of large, conspicuous papillae. Spear about as long as diameter of lip region, slender (about $^1/_7$ of lip region width), the aperture occupying about half its length. Guiding ring single. Oesophagus slender in anterior part, suddenly widened behind middle. Cardia triangular. Tail short, distinctly bent to ventral side in the male but hardly so in the female. Tail tip narrowly rounded in both sexes. Prerectum indistinct. In H 196 the anterior ovary is indistinct, the posterior measures about 21% of body length. Vulva probably a transverse slit. H 196 carries an egg in each uterus, dimensions 70 × 48 μ and 74 × 48 μ. Details of male gonads indistinct. Spicules slightly angular, plump, their proximal ends not clearly distinguishable from surrounding tissue. Apart from the preanal pair there are twelve ventromedian supplements, relatively evenly spaced; spacings varying from 12 to 18 μ; the posterior one is located slightly anterior to the proximal end of the spicules. Lateral papillae at $^2/_3$ of tail length. Cuticle on tail with very fine transverse striation.

Status. — H 26 is labelled *Dorylaimus bastiani*, the *acuticauda* specimen had probably initially not been recognized by DE MAN as belonging to a different species. For data of this slide see *Mesodorylaimus bastiani*. H 45 is labelled *Dorylaimus longicaudatus?* Locality Katwijk. H 20 is indicated n.sp., locality Katwijk. H 196 was collected at Scheveningen; this slide does not bear data about author or collecting time, but was most probably collected in April 1879. H 20 and H 196 are thus primary types; H 26 and H 45 are uncertain, because it is not sure whether DE MAN at the time of the description of *E. acuticauda* recognized them as belonging to that species. H 20 is herewith designated lectotype, H 196 allolectotype. H 196 is probably the specimen illustrated in 1884 in fig. 124.

72. *Eudorylaimus parvus* (DE MAN, 1880) ANDRÁSSY, 1959 (Fig. 24, D—G).

Dimensions:	H 19 ♀	H 195 ♂
L	0,47 mm	0,50 mm
a	18.5	20,7
b	3.3	3,6
c	15.5	16,6
V	54,9%	
G_1	17.8%	
G_2	16,8%	

The head end of H 195 was lost during remounting; the dimensions have been reconstructed from the length of the widened posterior portion of the oesophagus. In moderately good condition. Body small, plump, tail bent to ventral side. Body tapering but little anteriorly, the diameter at base of oesophagus being nearly thrice the width of the lip region. The latter is offset by a shallow constriction. Lips with distinct papillae. Spear slightly longer than, its diameter about $^1/_5$ of, the width of the lip region, the aperture occupying about half its length. Oesophagus widened posterior to its middle. In 1884 DE MAN mentioned an anterior dilation of the oesophagus, but nothing of the sort is visible in these specimens. Cardia short, relatively wide. Vulva probably transverse. Posterior uterus with egg, size 61 × 25 μ. Prerectum about 1,5 times as long as rectum. Tail

cuticle with distinct, fine, transverse striation. Male, apart from the preanal pair, with five ventromedian supplements, spaced irregularly, the posterior one located at about one tail length anterior to the anus. Spicules plump, apparently with obtuse, slightly spatulate tip, wholly agreeing with Fig. 125-c of 1884, but DE MAN evidently mistook the lateral guiding pieces for spicule tip; possibly the shape of the spicules is as illustrated by THORNE & SWANGER (1936).

Status. — H 19 is indicated n.sp., while H 195 lacks any indication. The latter was presumably collected in April 1879. Both specimens may be assumed to be primary types. The female on H 19 is herewith designated lectotype, the male on H 195 allolectotype. The female was collected in March. Lectotype locality: probably dune soil near Katwijk; allolectotype probably from sandy meadow, Scheveningen.

73. *Eudorylaimus carteri* (BASTIAN, 1865) ANDRÁSSY, 1959.

H 50: 1 ♀; H 152: 1 ♀; H 190: 3 ♀ ♀. In H 50 and H 190-1 the distal part of the tail is missing.

Dimensions:	H 152 ♀	H 190 ♀ 2	H 190 ♀ 3
L	1.55 mm	1.49 mm	1.56 mm
a	23.3	25.7	24.3
b	4.4	4.3	5.6
c	29.1	20.6	21.5
V	50.4%	47.6%	?
G_1	17.2%	13.4%	?
G_2	12.1%	11.6%	?

In addition, slide H 43, labelled *Dorylaimus* without specific name, contains some fragments of specimens probably also belonging to *E. carteri*. All five specimens are more or less flattened. Body tapering anteriorly, diameter at base of oesophagus about four times width of lip region. The latter is offset by depression; lips well developed with distinct papillae, which result in angular contours. Spear 16—20 μ long, i.e. about 1.3 times the width of the lip region, the aperture occupying about $^1/_3$ of its length. Guiding ring single. Oesophagus widened suddenly posterior to its middle. Cardia triangular, apparently wider than long. Vulva transverse. In all specimens the length of the posterior ovary is equal to, or less than, $^1/_3$ of the distance vulva — anus. H 50 carries two eggs (76 × 50 μ and 83 × 50 μ). H 190-1 three (70 × 46 μ, 67 × 47 μ and 70 × 48 μ). H 152 represents what DE MAN called the "typical form" (c about 30). H 190 the "long-tailed variety" c = 19—23). H 50 bears the locality Haagsche Bosch, H 152 dune soil near Domburg, Walcheren, and H 190 meadow near The Hague. It is noteworthy that BASTIAN gave spear length as $^1/_{450}$" = 56 μ; from his illustrations a value of 40 μ was computed.

74. *Eudorylaimus centrocercus* (DE MAN, 1880) ANDRÁSSY, 1959 (Fig 25).

H 184: 1 ♀. Dimensions: L = 1.30 mm; a = 25.0; b = 4.7; c = 41.4; V = 52.7%; G_1 = 17.3%; G_2 = 17.5%. In good condition. Body tapering anteriorly, the diameter at base of oesophagus four times the width of the lip region. The latter is offset by a shallow constriction; lips not

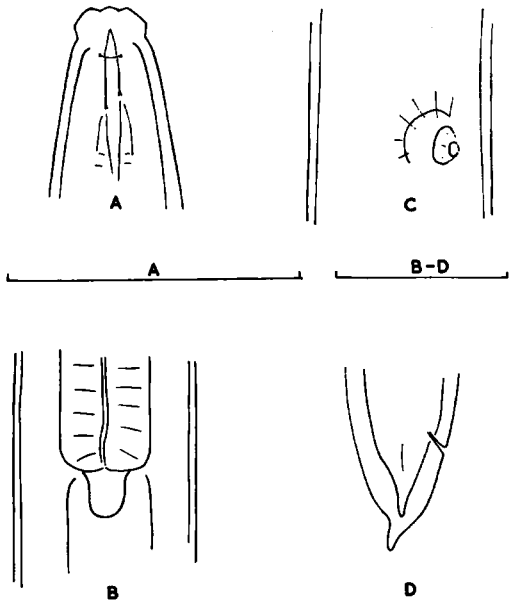

FIGURE 25. *Eudorylaimus centrocercus*, female H 184. A: head end; B: cardia; C: vulva; D: tail.

very distinct, with angular contours owing to the well developed papillae. Spear moderately slender, about as long as width of lip region, the aperture occupying about $^1/_3$ of its length. Guiding ring single. Oesophagus widened suddenly just posterior to its middle; posterior portion half as wide as body. Cardia small. Vulva apparently longitudinal, which is exceptional in this genus. Examination of recent specimens confirmed that the vulva is longitudinal in this species. Anterior ovary reflexed halfway to vulva, posterior slightly further. Posterior uterus with egg, dimensions 80 × 37 μ. Prerectum not distinguishable. Tail typical, agreeing completely with DE MAN's illustration of 1884.

Status. — The slide does not bear any indications. The specimen was certainly collected before 1880, and as the species is not recorded for September, October or November, it must have been found before the 1880 paper went to press. Thus it is a primary type; it is herewith designated lectotype. There are indications that this is the specimen illustrated in 1884 in fig. 119. If so, the locality would be meadow near The Hague and the date Februari 1879. This date is also suggested by the number of the slide.

75. *Eudorylaimus labiatus* (DE MAN, 1880) ANDRÁSSY, 1959 (Fig. 26).

Dimensions:	H 221 ♀	H 226 ♀
L	2,49 mm	3,75 mm
a	33,2	48,5
b	4,4	4,9
c	44,7	53,6
V	52,6%	53,1%
G_1	8,4%	10,3%
G_2	10,0%	11,5%

Both specimens are in fairly good condition; H 221 is much flattened. Cuticle in both specimens with distinct, although very fine, transverse striation, which here was found to be more distinct than in recent specimens. Lip region offset by constriction, its diameter $^1/_4$ - $^1/_5$ of body width at base of oesophagus. DE MAN says the neck is constricted behind the spear. This is, however, exaggerated: the neck is subcylindroid, but the strong development of the lips and the fact that the body widens suddenly at a short distance from the head end, suggest a constriction. Amphids nearly as wide as head. Spear slightly longer than the width of the lip region, the aperture occupying about $^2/_3$ of its length, not $^1/_2$ as stated by ANDRÁSSY (1959). Guiding ring weakly sclerotized. Oesophagus immediately behind spear very narrow, growing slightly wider at 4-5 times the width of the lip region from the anterior end of the body, and widening gradually into the posterior part slightly before its middle. Posterior part $^3/_5$ as wide as body. Cardia wider and flatter than in most other species of *Eudorylaimus*. Ovaries short. Prerectum more than thrice as long as rectum. Tail conical, with rounded tip. Vulva transverse.

Status. — H 221 bears the locality Apeldoorn, H 226 Domburg. H 221 has no indications about date, H 226 was collected in August 1879. H 221 is labelled "type" but the exact meaning of the word in this case is uncertain. In 1880 DE MAN mentioned the species from the province of Gelderland; his notebook shows that the only locality in this province where he collected nematodes, was Apeldoorn, and apparently he has collected there only once, viz. in July 1879. The arrangement of the slides

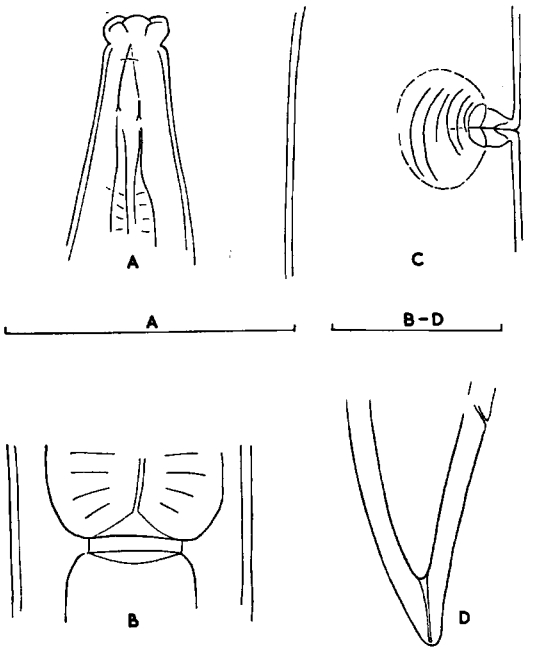

FIGURE 26. *Eudorylaimus labiatus* female, H 226. A: head end; B: cardia; C: vulva; D: tail.

in the catalogue also indicates the date July 1879. Thus both specimens are primary types. H 226 is herewith designated lectotype, H 221 paratype. Habitat of lectotype: dune soil, of paratype: soil from heath field.
In 1936 THORNE & SWANGER described a new species *Dorylaimus sublabiatus,* which was transferred by ANDRÁSSY (1959) to *Eudorylaimus.* This species seems very closely related to *E. labiatus.* In the type specimens of the latter species, described above, the posterior portion of the oesophagus is wider than THORNE & SWANGER computed from DE MAN's illustrations. Shape of head end, spear and oesophagus are the same in both species; they have also the cuticular striation in common. The presence of males in *E. sublabiatus* cannot yet be regarded a specific difference. *E. sublabiarus* seems to differ from *E. labiatus* by 1) stouter body; 2) much longer ovaries (perhaps these two points indicate that *E. sublabiatus* was described after older specimens than *E. labiatus*); 3) shape of cardia; 4) oesophagus being enlarged near end of anterior third and 5) the conspicuous lateral papillae which have not yet been found in *E. labiatus.*

76. *Eudorylaimus bryophilus* (DE MAN, 1880) ANDRÁSSY, 1959 (Fig. 27).

H 200: 1 ♀. Dimensions: L = 0,87 mm; a = 15,3; b = 3,5; c = 17,1; V = 57,4%; G_1 = 20%; G_2 = 18%. In fairly good condition. Body plump, tapering anteriorly so that diameter at base of oesophagus is four times width of lip region. The latter is offset by constriction. Anterior margin of lips covered with particles of some viscous substance, so that the papillae are indistinct. Spear slender, its length slightly more than, its width about $^1/_8$ of, width of lip region, the aperture occupying about

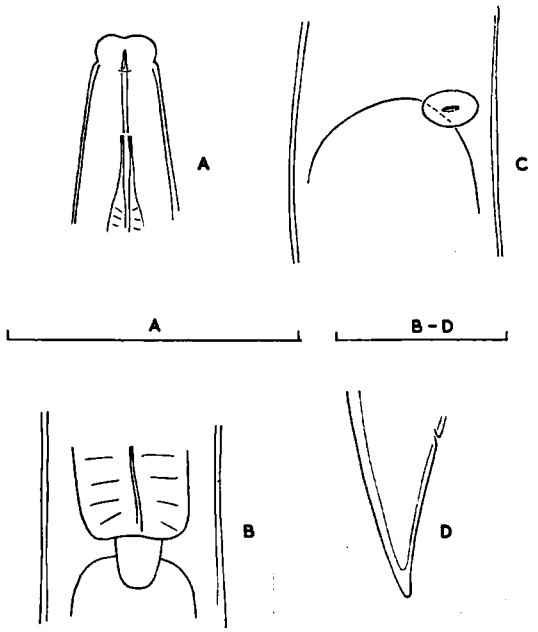

FIGURE 27. *Eudorylaimus bryophilus* female, H 200. A: head end; B: cardia; C: vulva; D: tail.

$^1/_7$ of its length. Anterior tapering part of spear more strongly sclerotized than posterior parallel part, giving the spear a "tylenchoid" appearance. Guiding ring single. Oesophagus slender in anterior portion, widened slightly posterior to its middle; diameter of posterior part $^3/_4$ body width. Cardia relatively narrow. Vulva transverse. Posterior uterus with large egg (75 × 48 μ). Posterior ovary occupies nearly half the distance vulva — anus. Tail conical, tip rounded. Prerectum probably twice as long as rectum.

Status. — The slide is not provided with particulars about date or locality. It is labelled *Dorylaimus* with an unpublished specific name, which shows that the specimen is a primary type; it is herewith designated lectotype. The position of the egg suggests that this is the specimen figured in the 1884 book, which specimen, according to the legend, was collected from dune soil between Leiden and Katwijk in March, probably 1879. The egg is about as large as that mentioned by ALTHERR (1955).

77. *Eudorylaimus pratensis* (DE MAN, 1880) ANDRÁSSY, 1959 (Fig. 28).

Dimensions:	H 47 ♀	H 49 ♀
L	1,42 mm	1,41 mm
a	33,5	31,4
b	4,2	4,1
c	55,9	58,1
V	50,4%	47,7%
G_1		17,0%
G_2	15,8%	18,8%

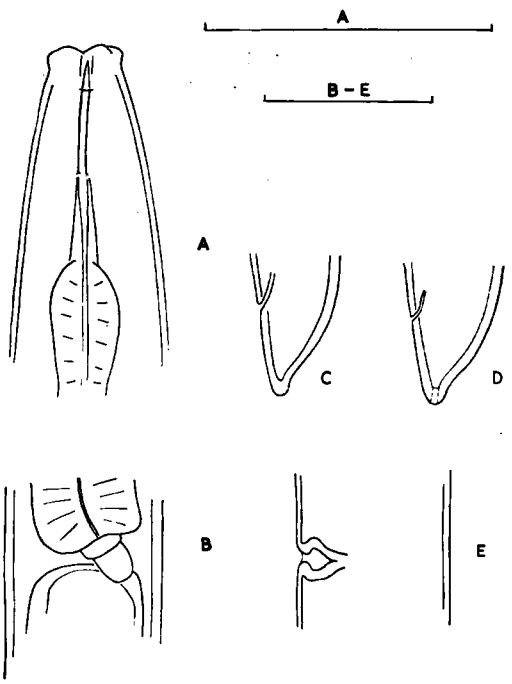

FIGURE 28. *Eudorylaimus pratensis* female. A: H 47 head end; B: H 47 cardia; C: H 47 tail; D: H 49 tail; E: H 47 vulva.

Both specimens are in good condition. Body tapering only slightly anteriorly; diameter at base of oesophagus thrice width of lip region. The latter is offset by a slight constriction; lips and papillae distinct. Spear slender, its diameter $^1/_7$ - $^1/_8$, its length 1,5 x width of lip region, the aperture occupying $^1/_3$ of its length. In H 47 the spear is slightly curved. Guiding ring single. Oesophagus widened slightly posterior to its middle, the expanded part being $^2/_3$ as wide as body. A weak pharyngeal "bulb" is present. Cardia small. Shape of vulva uncertain; in H 47 it might be longitudinal. Ovaries reflexed nearly to vulva. H 47 carries two eggs (70 × 39 μ and 73 × 39 μ). Prerectum indistinguishable. Tail subdigitate, the central chord on the tip is visible in H 49, but apparently absent in H 47.

Status. — H 47 is indicated n.sp., H 49 bears the author DE MAN. However, in 1884 DE MAN said that he had found the species only once, which shows that both specimens are primary types. Obviously DE MAN used the qualification "n.sp." sometimes only for one specimen of a new species. Both slides further bear the indication "type", but here again this expression means "typical form" as opposed to a short-tailed variety (see *Eudorylaimus* spec. 1). H 47 is herewith designated lectotype, H 49 paratype. Type locality: moist meadow on the Island of Walcheren, near road Middelburg-Veere. Collected in January. H 47 is probably the specimen figured in 1884 on fig 114 a and b (position of eggs, no central chord on tail tip), while H 49 might be the specimen of Fig. 114 c (shape of tail).

78. *Eudorylaimus rhopalocercus* (DE MAN, 1876) ANDRÁSSY, 1959 (Fig. 29).

Dimensions:	H 14 ♀	H 15 ♀
L	1,56 mm	1,36 mm
a	29,9	26,2
b	4,0	3,7
c	71,3	70,4
V	49,7%	45,1%

H 14 is in good, H 15 in moderately good condition; both specimens much flattened (the original description gives a = 39 - 40). Tail longer than indicated by DE MAN (in 1876 he gave c = 80 - 95, in 1880/1884 c = 80 - 120). Cuticle with fine but distinct transverse striation. Body tapering moderately anteriorly, diameter at base of oesophagus about 3,5 × width of lip region. The latter is continuous or slightly offset by depression. Lips not very distinct, papillae small, their position distinctly indicated by the nerves. Spear typically dorylaimoid, robust, slightly longer than width of lip region, the aperture occupying over $^1/_3$ of its length. Guiding ring single. Oesophagus gradually widened slightly anterior to middle. Cardia triangular. Vulva transverse. Ovaries paired, rather indistinct in H 15, measuring about 8% and 9% in H 14. Rectum slightly longer than $^2/_3$ of anal body diameter. Prerectum 3 - 3,5 × as long as rectum. Tail papillae excellently visible in H 14. Cuticle on tail tip slightly thickened.

Status. — The species was described as new in 1876, so that these specimens are not primary types. There occurs, in our country, a species of

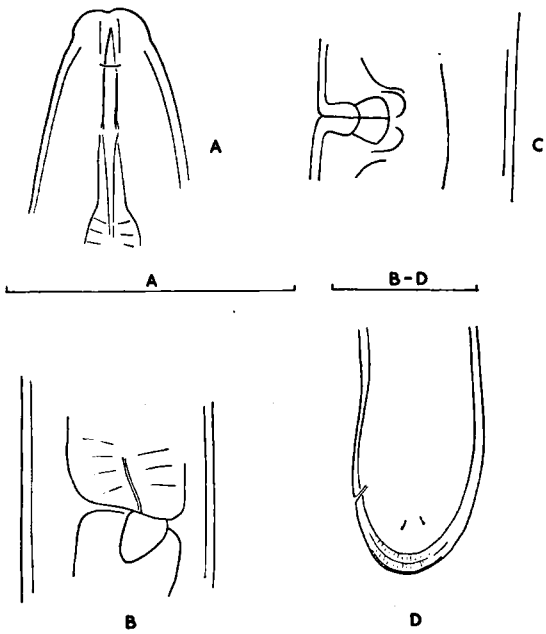

FIGURE 29. *Eudorylaimus rhopalocercus* female, H 14. A: head end; B: cardia; C: vulva; D: tail.

Nygolaimus with the same tail shape as *E. rhophalocercus,* which might easily be confused with the latter; DE MAN actually did this himself, for slide H 13 is labelled *D. rhopalocercus,* but contains a *Nygolaimus* female, which differs from H 14 and H 15 by a more anterior vulva position (41,8%, which DE MAN probably would have called "far forward", see *D. hartingii*). The original description of *rhopalocercus* says "vulva in or slightly anterior to middle" and in the three specimens described V = 46,5—48,8%. Thus H 14 and H 15 rather than H 13 represent the true *rhopalocercus.* It is important under these circumstances that a neotype be designated. H 14 and H 15 do not bear any indications, but in 1876 as well as in he notebook for 1884 DE MAN stated he had found the species only near Leiden, so that H 14 and H 15 were collected "as near as possible to the original type locality". The female on slide H 14, being in good condition, is herewith designated neotype. Habitat: moist meadow. It appears unlikely that the female described by MEYL (1954-a) belongs to *E. rhopalocercus*: the anterior ovary is illustrated as rudimentary and the lip region is strongly set off. The Jamaican specimens described by THORNE & SWANGER (1936) as well as the specimens described by MERZHEEVSKAYA (1953) appear to belong to the true *E. rhopalocercus.*

79. *Eudorylaimus obtusicaudatus* (BASTIAN, 1865) ANDRÁSSY, 1959.

Dimensions:	H 12 larva	H 151 ♀	H 197 ♀	H 218 ♀
L	1,41 mm	2,55 mm	1,67 mm	2,23 mm
a	18,0	20,7	21,0	21,7
b	3,1	5,2	3,8	3,9
c	49,2	70,3	59,5	73,8
V		47,9%	48,8%	54,7%

H 12 is in good condition, the three females less so. Lip region offset by a very distinct constriction. Body tapering considerably anteriorly, diameter at base of oesophagus equal to four times width of lip region. Lips well developed, with distinct papillae. Spear as long as, or slightly longer than, width of lip region, the aperture occupying 0,5 - 0,6 of its length. Guiding ring single. Oesophagus widened suddenly at its middle. Cardia triangular. Vulva transverse. All three females bear eggs: H 151 two (size 120 × 65 μ and 106 × 64 μ), H 197 two (87 × 58 μ and 98 × 48 μ). H 218 one (109 × 64 μ). Thus the eggs are 1,7—2 times as long as wide, and their length is equal to 1—1,5 times the width of the female body. H 12 and H 218 show the tail cuticle to be composed of several layers. Cuticle with fine, but fairly distinct transverse striation. H 12 does not bear any indication; H 151 bears the locality Nadorst (Island of Walcheren) and the date 1879; H 197 does not bear any indication, but DE MAN's personal notes show that this specimen was collected in dry sandy clay soil at Scheveningen, April 1879; H 218 was collected near Apeldoorn, July 1879. H 151 also contains a male, which has been discussed under *Dorylaimus parabastiani*.

80. *Eudorylaimus* spec. (1). (Fig. 30).

H 201: 1 ♀. Dimensions: L = 1,37 mm; a = 33,3; b = 3,8; c = 66,5; V = 52,2%; G_1 = 15,3%; G_2 = 12,3%. In fairly good condition. Body almost cylindrical, tapering but little anteriorly; diameter at base of oesophagus equal to 2,5 times the width of the lip region. The latter is offset by constriction; this may, however, be exaggerated, because the anterior

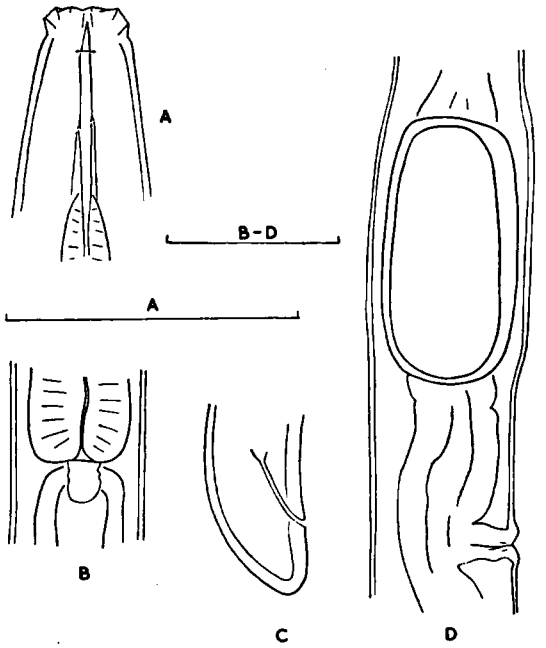

FIGURE 30. *Eudorylaimus* spec. (1) female, H 201. A: head end; B: cardia; C: tail; D: vulvar region.

end of the body is slightly twisted. Lips well developed, with distinct papillae. Spear slender (diameter $^1/_6$ of width of lip region), its length equal to 1,5 times the diameter of the lip region, the aperture occupying $^1/_3$ of its length. Guiding ring single. Anterior part of oesophagus slender, the expanded portion occupying slightly less than half its total length and being $^3/_4$ as wide as body; expansion fairly sudden. Cardia narrow. Tail slightly shorter than anal body diameter, faintly conoid with broadly rounded tip. Prerectum twice as long as rectum. Cuticle thin, thickened on tail, but not composed of distinct layers. Caudal papillae not observed. Vulva transverse. Posterior ovary reflexed about $^2/_3$ back to vulva. Anterior uterus with egg, dimensions 86 × 38 μ.
The slide is labelled "*Dorylaimus pratensis*, short-tailed variety". The specimen differs from *E. pratensis* by the rounded tail and the more robust spear. The subcylindrical body resembles that of *E. laticollis* (DE MAN, 1906), *E. confusus* (THORNE, 1939) and *E. projectus* (THORNE, 1939). From the first species H 201 differs by the shape of the lip region and tail, from the two others by the less strongly offset lip region. Locality: heathy field near Apeldoorn, July 1879.

81. *Eudorylaimus* spec. (2). (Fig. 31).

H 40: 1 ♀. Dimensions: L = 1,28 mm; a = 33,0; b = 3,9; c = 52,8; V = 47,0%. In moderately good condition. Body tapering anteriorly, the diameter at base of oesophagus equal to nearly four times the width of the lip region. The latter is almost continuous; lips well developed, papillae small but modifying the lip contours. Spear fairly robust, its length equal to the width of the lip region, the aperture occupying more than half its length. Guiding ring indistinct. Oesophagus widened gradually at about $^3/_5$ of its length. Cardia small, low. Shape of vulva uncertain. Prerectum

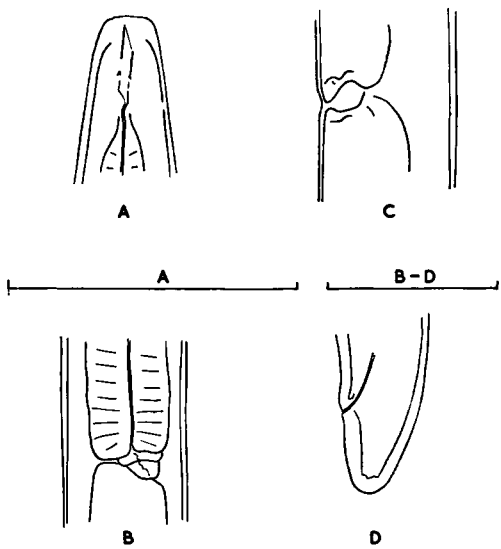

FIGURE 31. *Eudorylaimus* spec. (2) female, H 40. A: head end; B: cardia; C: vulva; D: tail.

slightly longer than rectum. Tail convex-conoid, broadly rounded, about as long as the anal body diameter.
The slide is labelled *Dorylaimus tritici*. The specimen differs from that species by the shape of the oesophagus and the cardia. From DE MAN's description of *D. intermedius* (1880) it differs by its smaller body, greater relative tail length and more robust spear. Locality: Katwijk, dune soil. No date.

82. *Eudorylaimus* spec. (3). (Fig. 32).

H 10: 1 ♂. Dimensions: L = 2,23 mm; a = 24,6; b = 5,7; c = 61,5. The specimen is broken into two fragments, but in fairly good condition. Oesophagus much coiled. Body tapering anteriorly, diameter at base of oesophagus equal to four times width of lip region. The latter is offset by constriction, as could be verified by careful observation at different levels of focus. Lips well developed, with distinct papillae. Spear moderately slender, its length equal to 1,1 ×, its diameter $^1/_6$ of, the width of the lip region, the aperture occupying about $^1/_3$ of its length. Oesophagus widened suddenly at its middle. Cardia compressed, its shape indeterminable. Tail digitate. Apart from the preanal pair there is a series of 15 spaced supplements, beginning two tail lengths anterior to the anus, i.e. slightly anterior to the proximal end of the spicules. Cuticle very thick, composed of two layers.
The slide is labelled *Dorylaimus obtusicaudatus*. The specimen clearly represents what DE MAN in 1880 called *D. obtusicaudatus* form II, but in 1884 regarded as belonging to some other species. The digitate tail and the short spear aperture indicate that H 10 does not belong to *E. obtusicaudatus*. It shows some resemblance to *E. paracentrocercus* (DE CONINCK, 1935).

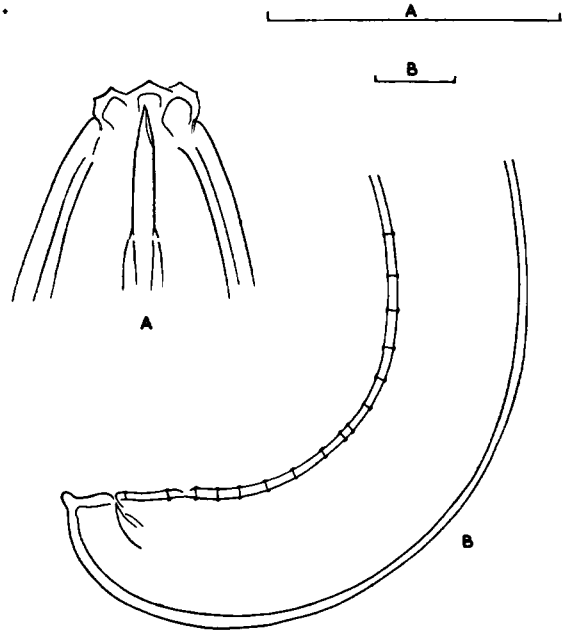

FIGURE 32. *Eudorylaimus* spec. (3) male, H 10. A: head end; B: posterior body part.

83. *Prodorylaimus longicaudatus* (BÜTSCHLI, 1874) ANDRÁSSY, 1959.

Dimensions:	H 29 ♀	H 30 ♂	H 31 ♂	H 31 ♀	H 32 larva
L	2,59 mm	1,92 mm	2,25 mm	3,05 mm	1,48 mm
a	28,9	38,7	29,5	20,7	24,4
b	4,8	5,0	5,0	5,2	3,8
c	4,9	13,0	10,6	6,2	4,6
V	45,4%			43,0%	
G_1	18,0%			16,6%	
G_2	22,0%			17,4%	

The tail end of the female on H 31 was lost during remounting, but the specimen could be identified with a specimen reported by DE MAN in his personal notes, which had c = 6,2, so that the length of the missing part could be determined and the dimensions reconstructed. H 30 is in poor condition, the others are better. Cuticle with fine, but distinct transverse striation, especially on the tail. Body tapering anteriorly, its diameter at base of oesophagus is equal to four times the width of the lip region. The latter is offset by a relatively deep depression; the lips are well developed, the papillae large, so that the lips have angular contours. Length of spear 33—42 μ, i.e. 1,7—2 times the width of the lip region, the aperture occupying $^1/_3$ to $^2/_5$ of its length. Tip of spear conspicuously blunt in the females. Guiding ring double. Oesophagus widened suddenly about its middle, the posterior portion being $^3/_5$ as wide as the corresponding body diameter. Cardia of normal size. Shape of vulva uncertain in H 29, longitudinal in H 31. In H 31 both uteri contain spermatozoa. H 29 bears two eggs (114 × 51 μ and 127 × 54 μ), H 31 three (109 × 63 μ, 109 × 65 μ and 97 × 67 μ). Length of spicules 76 μ; it could not be established with certainty whether lateral guiding pieces were present. Apart from the preanal pair H 30 possesses a series of 23 ventromedian supplements, H 31 a series of 25; they are contiguous. The posterior one is located 84 μ anterior to the anus in H 30, 119 μ in H 31. In the male on H 31 the following pairs of caudal papillae can be observed: one subdorsal and one subventral at beginning of distal slender portion of tail; two subdorsal postanal; one subdorsal adanal and one subdorsal preanal.
Neither of these slides bears indications about date or locality.

84. *Dorylaimus brigdammensis* DE MAN, 1876 (Fig. 33).

Dimensions:	H 28 ♂	H 231 ♀
L	1,87 mm	1,79 mm
a	42,8	37,8
b	5,8	5,2
c	6,7	5,1
V		42,1%

Both specimens are in good condition. Body tapering anteriorly, diameter at base of oesophagus equal to four times the width of the lip region. The latter is offset by a slight depression; the lips are almost completely amalgamated. Spear length 20 μ in H 28, 18 μ in H 231, i.e. 1,7—1,8 times the width of the lip region. Spear slender, the aperture occupying $^1/_3$ of its length. Guiding ring distinctly double in H 28, uncertain in H 231. Oesophagus widened suddenly just posterior to its middle. Cardia small, triangular. Vulva transverse. Posterior uterus with egg, size 102 × 40 μ. Male with six small ventromedian supplements.

Status. — The species was described as new in 1876, so these specimens are no types. H 28 does not bear any indication; H 231 is labelled Duiveland, August 1879; the personal notes state: from dry clay soil. When measured by DE MAN this specimen had the following dimensions: L = 1,99 mm; a = 46; b = 5,3; c = 5,3. Thus both specimens might represent what DE MAN, in 1876, provisionally regarded a different species *D. stenosoma* (longer and more slender than *D. brigdammensis* proper), but in 1880 declared to be identical with *brigdammensis*.
It is advisable to select, if necessary, a recent specimen as neotype. Type locality: moist clayey soil near Leiden, and near Brigdamme (Island of Walcheren). It is noteworthy that in DE MAN's 1876 illustrations the guiding ring of *brigdammensis* is drawn single, that of *stenosoma* single in lateral, but double in medial view.

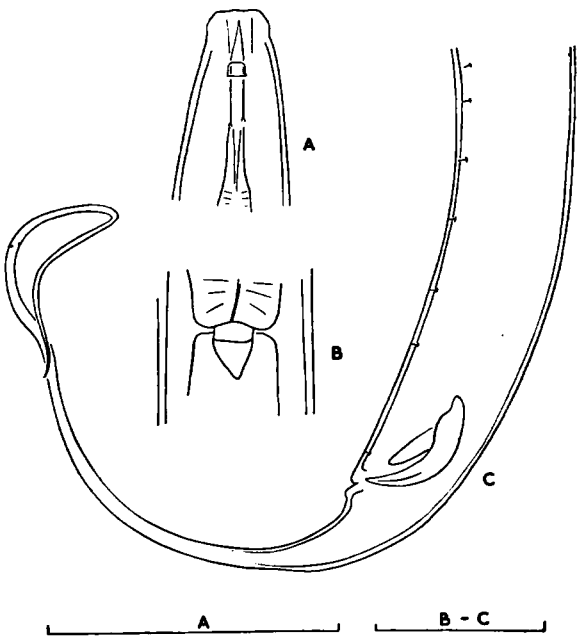

FIGURE 33. *Dorylaimus brigdammensis* male, H 28. A: head end; B: cardia; C: posterior body part.

85. *Aporcelaimus superbus* (DE MAN, 1880) GOODEY, 1951 (Fig. 34)

Dimensions:	H 33 ♂	H 34 ♂	H 35 ♂	H 36 ♀	H 191 ♂
L	3,16 mm	3,31 mm	3,64 mm	3,73 mm	3,67 mm
a	37,2	41,5	40,0	30,5	30,3
b	4,5	4,5	4,8	?	4,8
c	65,2	65,2	62,6	62,4	59,4
V				44%	

Most of these specimens are in fairly good condition. Body tapering considerably anteriorly, diameter at base of oesophagus equal to five times the width of the lip region. The latter is offset sharply by constriction; the lips are well developed, with fairly large, blunt papillae.

Spear robust, its length equal to 1,1—1,4 times the width of the lip region, the aperture occupying about $^2/_3$ of its length. There is no guiding ring, but in H 33 and H 35 the presence of this organ is suggested by a fold in the pharynx wall. Oesophagus widened gradually about its middle. Cardia of normal size, triangular. Details of ovaries invisible, the female being very dark and opaque; ten intra-uterine eggs are present, their length is about equal to $^3/_4$ of the width of the female body, while they are nearly twice as long as wide. Spicules about 100 μ in length, enlarged anteriorly to their middle, tapering towards both extremities. In H 35 they seem to end anteriorly in two blunt tips. No accessory pieces are visible. Apart from the preanal pair there are 18 ventromedian supplements in H 33, 19 in H 35 and 15 in H 191. Tail curved slightly to ventral side, conical with rounded tip. Cuticle with fine transverse striation. The above description shows that THORNE & SWANGER (1936) were right in supposing that this species would have to be placed in *Aporcelaimus*.

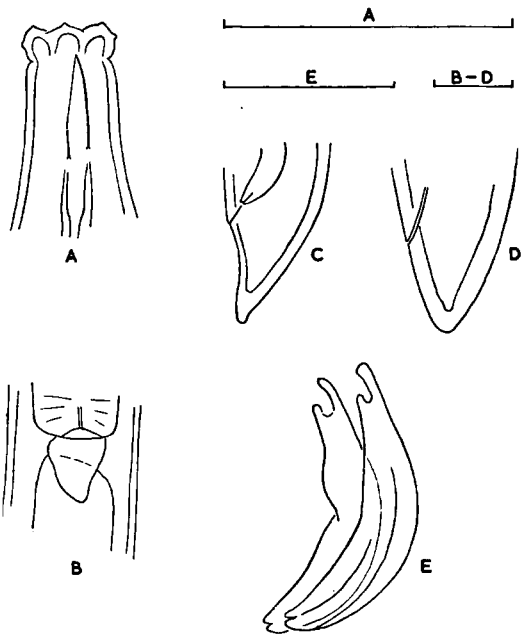

FIGURE 34. *Aporcelaimus superbus*. A: H 35 male head end; B: H 35 male cardia; C: H 35 male tail; D: H 36 female tail; E: H 35 male spicula.

Status. — All these slides are labelled *Dorylaimus superbus*. H 33, 34, 35 and 36 are indicated "n.sp.", while H 191 does not bear indications about date or author. The latter may, however, also be regarded as a primary type; it was probably collected in February 1879. H 33 is dirty, but the preanal supplements are distinct; H 34 lies on its back, the supplements are invisible; H 35 is in a very good state. The female on H 36 is herewith designated lectotype, the male on H 35 allolectotype, the males on H 33, H 34 and H 191 paratypes. Locality of H 191: meadow near The Hague; of the others: dune soil near Katwijk.

86. *Actinolaimus macrolaimus* (DE MAN, 1880) STEINER, 1916 (Fig. 35).

Dimensions:	H 4 ♀	H 5 ♀
L	3,16 mm	3,35 mm
a	40	42
b	4,6	5,1
c	11,1	11,8
V	46%	51%

Both specimens are in fairly good condition. The tail tip of H 5 is missing, so it is possible that the vulva was situated pre-equatorially in this specimen as well. Anterior end of body of H 5 twisted to median position. Lip region offset by a slight depression in H 4, by a distinct constriction in H 5, the latter phenomenon being evidently caused by the amphid aptertures, as THORNE (1939) supposed. Amphids less than half as wide as head. H 5 shows lateral pores in neck region: the anterior two lie close together, the first at level of spear guiding ring. The distance between

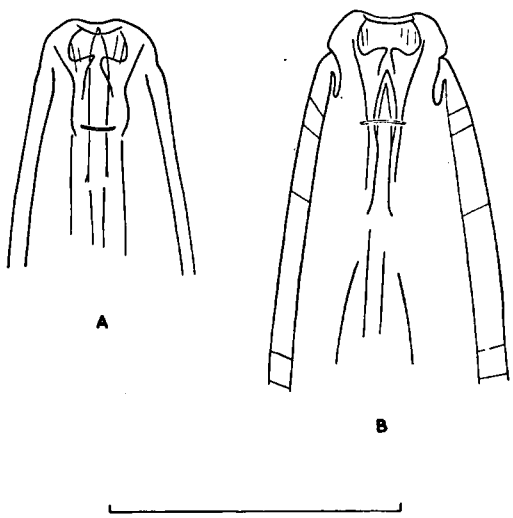

FIGURE 35. *Actinolaimus macrolaimus* female. A: H 4 head end lateral view; B: H 5 head end medial view.

2 and 3 is twice that between 1 and 2, 4 and 5 lie again closely together at about 70 μ from head end. Labial papillae very small, only nerves distinct. Spear of peculiar shape: in the anterior part the walls seem to be thickened. The sclerotized rings around the mouth cavity are distinct in both specimens, as well as the four large onchia in the posterior part of the mouth cavity. The longitudinal striation in the anterior section of the mouth cavity is vaguely visible in both specimens. Guiding ring appears single but is probably double. Oesophagus widened gradually near beginning of its middle third. Cardia indistinct. Vulva probably longitudinal. Ovaries indistinct. Length of rectum about equal to the anal body diameter. Prerectum 3,5 times as long as rectum.

Status. — Both slides are labelled *Dorylaimus* with an unpublished specific name and thus contain primary types. H 4 is herewith designated lectotype, H 5 paratype. Neither slide bears any indication about date or locality, but the notebook shows that DE MAN found the species in the Netherlands only in moist meadows near Leiden.

87. *Nygolaimus brachyuris* (DE MAN, 1880) THORNE, 1930 (Fig. 36).

H 39: 1 ♀. Dimensions: L = 1,76 mm; a = 36,3; b = 3,0; c = 60,4; V = 51,8%; G_1 = 7,7%; G_2 = 8,1%. The specimen is broken into three fragments, but is in good condition. Body tapering only slightly anteriorly, diameter at base of oesophagus not quite thrice the width of the lip region. The latter is offset sharply by constriction; lips well developed, rounded, with distinct papillae. Shape of anterior end of body somewhat reminiscent of *Eudorylaimus labiatus*. Oesophagus widened gradually anterior to its middle. The shape of the cardia cannot be determined, as the body is broken just at the end of the oesophagus. Tooth as long as the width of the lip region (14 μ), hollow over its whole length. Vulva transverse. Tail shorter than the anal body diameter, dorsally convex-conoid, with broadly rounded tip.

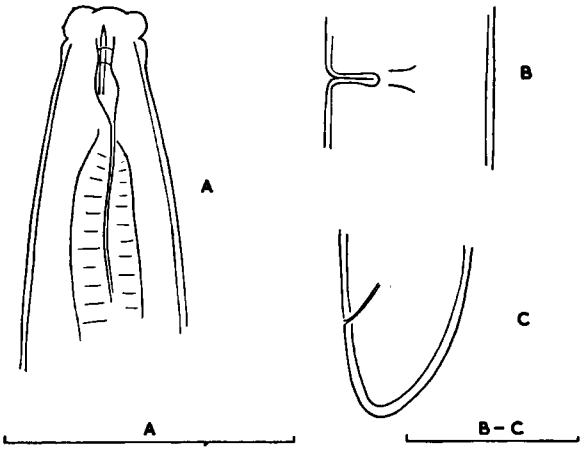

FIGURE 36. *Nygolaimus brachyuris* female, H 39. A: head end; B: vulva; C: tail.

Status. — The slide is labelled *Dorylaimus tritici*; locality Katwijk. The name shows that this specimen was collected before the 1880 paper went to press. The species described by DE MAN in 1876 as *D. tritici* was regarded in 1880 as identical with *D. intermedius*. The latter is not mentioned from Katwijk in the notebook, but *N. brachyuris* is. Moreover, in 1880 *D. intermedius* was mentioned as occurring in meadows, but not in dune soil. This indicates that already before 1880 DE MAN recognized the specimen as belonging to *N. brachyuris*, though he did not correct the entry in the catalogue. H 39 may therefore be regarded as a primary type of *N. brachyuris*. It is herewith designated lectotype. It is smaller than indicated by DE MAN (2,6 mm), but it is certain that DE MAN had more than one specimen before him, and in such cases he would mention only the length of the largest specimen; moreover, H 39, when fresh,

may very well have possessed a body length of 2 mm or more.
It should be noted that in the original description the specific name was spelt *branchyuris,* not *brachyurus.* The specimens described by THORNE (1939) had a much shorter tail (c = 111), but this is probably connected with greater body length (2,8—3,5 mm). H 39 resembles *N. tenuis* THORNE, 1930 and *N. amphigonicus* THORNE, 1930 in dimensions, but differs from these species by the length of the tooth.

88. *Nygolaimus hartingii* (DE MAN, 1880) THORNE, 1930 (Fig. 37).

Dimensions:	H 179 ♀	H 210 ♀
L	1,41 mm	1,51 mm
a	30,8	35,4
b	4,7	4,4
c	22,4	23,1
V	41,4%	41,0%
G_1	12,6%	?
G_2	13,3%	14,1%

Both specimens are in fairly good condition. H 179 is broken into two fragments, H 210 is very dark. Lip region almost continuous, in H 210 it appears to be offset slightly, but this is caused by the amphid apertures. Lip region knob-shaped, with two circles of minute papillae. Tooth about as long as width of lip region. Oesophagus robust, widened at about its middle; the contours of the posterior portion are somewhat irregular. Cardia probably triangular, but not very distinct from surrounding tissue. Cardiac glands distinct in H 179. Vulva longitudinal. Ovaries reflexed. Tail curved to ventral side, tip subacute in H 179, more blunt in H 210; its length is about thrice the anal body width. Prerectum twice as long as

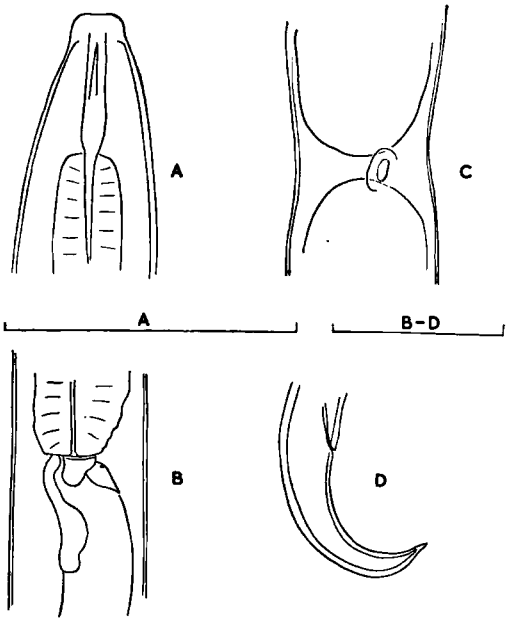

FIGURE 37. *Nygolaimus hartingii* female. A: H 179 head end; B: H 179 cardia; C: H 210 vulva; D: H 179 tail.

rectum. Both specimens carry two eggs, dimensions: H 179 84 × 42 μ and 87 × 41 μ; H 210 82 × 38 μ and 84 × 36 μ.

Status. — Neither slide bears indications about author or date. H 179 bears the locality Walcheren, H 210 Leiderdorp. There are no indications that DE MAN collected material of this species after 1879, nor did he record it for September, October or November. Thus the specimens were collected before the 1880 paper went to press and are primary types. In 1880 DE MAN already mentioned females with two eggs. H 179 is herewith designated lectotype. H 210 paratype. Type habitat: moist meadow.

89. *Nygolaimus intermedius* (DE MAN, 1880) nov. comb. (Fig. 38—39).

Dimensions:	H 254 ♂	H 254 ♀
L	1,61 mm	2,05 mm
a	34,2	31,4
b	3,8	4,3
c	58,0	73,7
VD	47,3%	V 47,5%
T_1	9,4%	G_1 11,3%
T_2	10,7%	G_2 11,8%

In addition, the slide contains one female the tail of which is lost. All three specimens are in fairly good condition. Body moderately slender, tapering anteriorly more than posteriorly; the diameter at the base of the oesophagus is equal to four times the width of the lip region, while the anal diameter is half as wide as body at vulva. Lip region rounded, offset by a slight depression; lips indistinct, papillae small and little interfering with

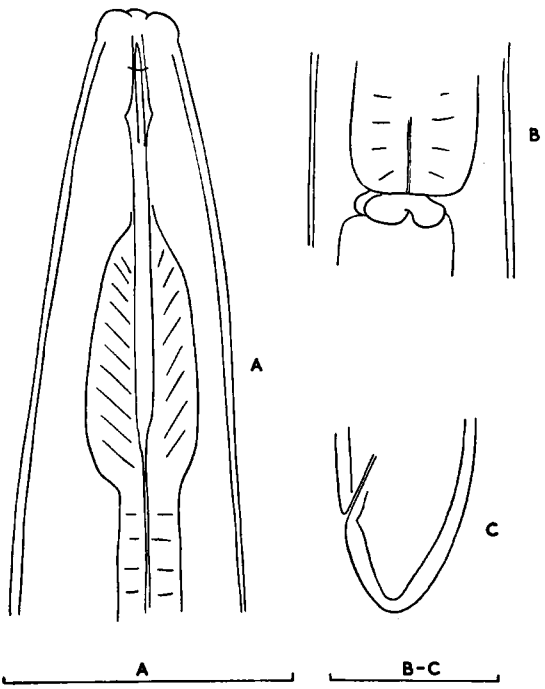

FIGURE 38. *Nygolaimus intermedius* female, H 254. A: head end; B: cardia; C: tail.

lip contours. Tooth inserted in ventrosubmedian wall of pharynx, slender, 18 μ in length, i.e. as long as width of lip region. Pharynx conical, narrowed posteriorly; the posterior portion is surrounded by a distinct "pharyngeal bulb" of the oesophagus. Oesophagus widened gradually at about its middle, width of posterior portion about $^2/_3$ of the corresponding body diameter. Gland nuclei not distinguishable. Nerve ring surrounds oesophagus at about $^3/_8$ of its length. Three distinct cardiac glands are present. Vulva a transverse slit. Vagina thin-walled, ovaries paired, reflexed halfway back to vulva. Female rectum $^3/_4$ as long as anal body diameter, prerectum 1,5 times as long as rectum. Tail elongate-hemispherical. Posterior portion of male body twisted, so that the shape of the spicules and gubernaculum cannot be determined with certainty. Length of spicules about 50 μ. Apart from the preanal pair there are six[1]) ventromedian supplements, arranged as in *Nygolaimus shadini* FILIPJEV, 1928, the series beginning about two spicule lengths anterior to the anus. Cuticle in all three specimens with fine transverse striation.

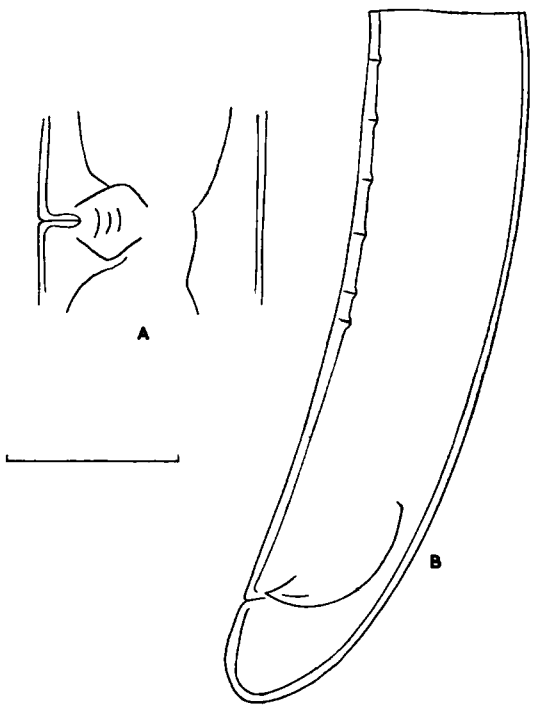

FIGURE 39. *Nygolaimus intermedius* H 254. A: Female, vulva; B: Male, posterior body part.

Status. — The slide is labelled *Dorylaimus intermedius*. In 1880 DE MAN gave as synonym: *Dorylaimus tritici* apud DE MAN, 1876. This suggests that *D. intermedius* is a new name for the species erroneously identified by DE MAN (1876) as *D. tritici*, but this is not the case. The con-

[1]) It is possible, and from the text of 1884 even probable, that the number of supplements is seven; the male body is broken just where the seventh should be.

cept of *D. intermedius* was based upon specimens collected between 1876 and 1879, which were assumed by DE MAN to represent the same species as the males described in 1876 as *D. tritici*, but actual comparison was not possible, because the latter specimens had not been preserved. Thus the primary types of *D. intermedius* are the specimens collected between 1876 and September 1879. The males described in 1876 as *D. tritici* possessed 10—11 ventromedian supplements. In the personal notes four males are recorded, collected between 1877 and 1879 and still called *D. tritici*. Two of these possessed respectively 7 and 9 supplements, while the number on the other two was not given. The description of *D. intermedius* says: males with 7—11 supplements, but whether the numbers 10 and 11 really occur in this species, remains doubtful. The fact that DE MAN found more males than females indicates that males of more than one species were included in his description of *D. intermedius* (cf. also MICOLETZKY, 1914). Slide H 254 bears the date November, 1879 and the locality Leiden. Thus these specimens are not primary types. The above description shows that they belong to the genus *Nygolaimus*. There are two ways of settling the status of *D. intermedius*:

a. We might regard *D. intermedius* a true dorylaim (see e.g. THORNE & SWANGER, 1936). The specimens on H 254 would in that case have to be transferred to *Nygolaimus* and given a new specific name. The writer thinks this not advisable, for the specimens on H 254 fit the 1880 description completely as far as it goes. The anterior swelling of the oesophagus was not mentioned in the original description of *D. intermedius*, but this does not prove that it was absent. It is possible that DE MAN did not note this feature until he prepared the more detailed description of 1884. The spear of *D. intermedius* as illustrated in 1884 appears to be dorylaimoid, but this does not say much, for the same holds for *N. hartingii* and the descriptions show that DE MAN was not aware that there were several types of spear among the species included by him in *Dorylaimus*. It is impossible to establish clear differences between the specimen described in 1880 and those on slide H 254. Moreover, the female figured in 1884 must have been either one of the specimens on H 254, or the one described in 1880, and this illustration clearly shows the "pharyngeal bulb".

b. Therefore the author follows the other way, viz. of taking H 254 to represent the true *D. intermedius*. The male specimen on H 254 is herewith designated neotype of *D. intermedius*, which species is herewith transferred to *Nygolaimus*.

Diagnosis. — *Nygolaimus intermedius* (DE MAN, 1880) nov. comb. differs from all other known nygolaims by the well developed "pharyngeal bulb". This was established by careful study of the published descriptions and illustrations, and verified for *N. brachyuris, N. borborophilus, N. teres, N. vulgaris, N. laevis* and *N. hartingii* by examination of specimens. With THORNE's key (1939) *N. intermedius* keys out, as well as *N. planposae* ALTHERR, 1952, with *N. thornei* SCHNEIDER, 1937. From *N. planposae* it differs in tail shape and much larger size, from *N. thornei* by more slender body, shorter tail and oesophagus, anterior vulva position and length of prerectum, and from *N. laevis* THORNE, 1939 by the truncate head end.

It is interesting to note that according to THORNE & SWANGER (1936) the male of *D. intermedius* described by MICOLETZKY (1914) also belongs to *Nygolaimus*.
The species described by THORNE & SWANGER (1936) as *D. intermedius* is a true dorylaim and is herewith renamed *Eudorylaimus circulifer* nom. nov. (from the circular markings on the cuticle of the female tail).
Dorylaimus tritici apud DE MAN, 1876 and *D. intermedius* var. *alpestris* MENZEL, 1914 are to be regarded *species inquirendae*.

90. *Nygolaimus* spec. (Fig. 40).

H 13: 1 ♀. Dimensions: L = 1,33 mm; a = 30,5; b = 3,9; c = 64,6; V = 41,8%. In moderately good condition. Cuticle with distinct transverse striation, especially on the head end. Body tapering moderately anteriorly, diameter at base of oesophagus about 3,5 times width of lip region. The latter seems to be offset, but this may be exaggerated. Lips relatively well developed with slightly angular contours. Lip region nearly half as high as wide. Tooth hollow almost to apex, shorter than width of lip region. Oesophagus enlarged anteriorly to its middle, diameter of posterior portion nearly $^2/_3$ of corresponding body diameter. Cardia broadly rounded, as long as wide. Cardiac glands not observed. Vulva a transverse slit. Tail shape as in *Eudorylaimus rhopalocercus;* cuticle thickened on tip. The slide is labelled *Dorylaimus rhopalocercus*. No date or locality, but must have been collected near Leiden. The specimen probably represents an undescribed *Nygolaimus* species, but the author prefers not to name it on the base of a single female specimen.

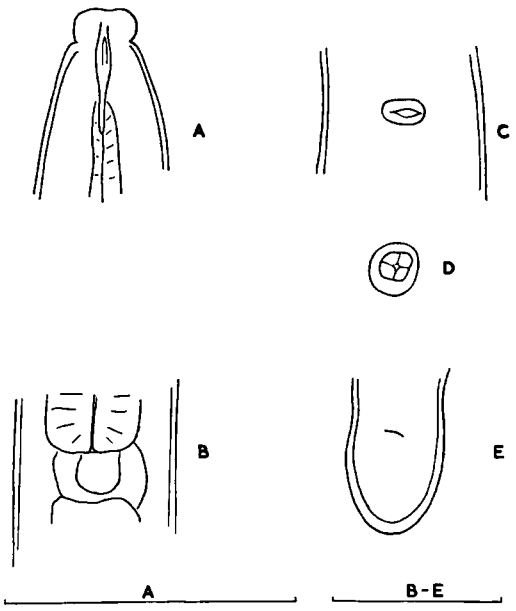

FIGURE 40. *Nygolaimus* spec. H 13 female. A: head end; B: cardia; C: vulva; D: vagina 6 μ below ventral surface; E: tail, ventral view.

91. *Tylencholaimus minimus* DE MAN, 1876 (Fig. 41).

Dimensions:	H 54 ♀	H 55 ♀
L	0,53 mm	0,48 mm
a	19,0	20,9
b	3,3	3,1
c	31.2	28,4
V	68,2%	71,3%
G	—	25%

H 54 is in moderately good, H 55 in good condition. Both specimens show distinct transverse striation on the cuticle. Lip region 6 μ wide, with angular contours, the apical portion offset in a disc-like manner. The specimens are somewhat flattened, so that the diameter of the body at base of oesophagus is 3,5 times width of lip region. Length of spear = 6 μ, of extensions 8 μ. In H 55 the basal knobs are distinct. Anterior part of oesophagus very slender. This feature was noted by THORNE (1939), although in the generic key he stated that in *Tylencholaimus* (as opposed to *Discomyctus)* the anterior part of the oesophagus was muscular, not set off (this character was dropped in the second edition of his paper (1957); see also TARJAN, 1953 and 1956). Oesophagus enlarged suddenly just posterior to its middle. Cardia oblong. Vulva transverse. Ovary reflexed about halfway back to vulva. No rudiment of posterior ovary. Rectum short, prerectum not distinguishable. Tail short, plump, broadly rounded.

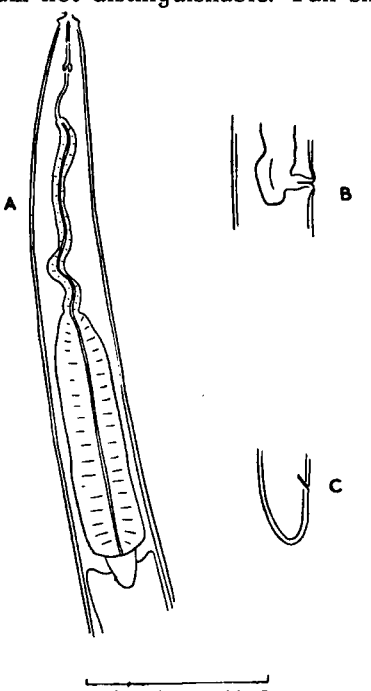

FIGURE 41. *Tylencholaimus minimus* female, H 55. A: head and oesophagus; B: vulva; C: tail.

Status. — The species was described as new in 1876, so that these specimens are not primary types. H 55 might eventually be designated neotype. The slides do not bear indications about locality, but DE MAN knew the species only from moist meadows near Leiden. The personal notes suggest that H 54 was collected in June 1877; H 55 in November 1878.

92. *Tylencholaimus brevicaudatus* (TARJAN, 1953) TARJAN, 1956 (Fig. 42).

Dimensions: H 239: 6 females

L	0,76 mm	0,76 mm	0,74 mm	0,72 mm	0,69 mm	0,72 mm
a	27.3	28,5	30,4	25,8	28,6	28,3
b	3.5	3,6	4,6	3,3	3,3	3,6
c	30,0	28,5	26,4	27,0	27,2	22,0
V	62,5%	63,9%	61,3%	62,9%	62,9%	58,9%

In moderately good condition; oesophagus much coiled in Nr. 3, hence the high value of b. Lip region about $^1/_4$ as wide as body at base of oesophagus; conoid, projecting, offset by constriction. Spear twice as long as width of lip region, with distinct basal knobs; in some specimens only the anterior portion is distinct, but the outline of the basal knobs is generally clearly distinguishable. Oesophagus very slender in its anterior half, widened suddenly just behind its middle, the two parts being offset sharply from each other. Cardia slightly longer than wide. Vulva a transverse slit. Anterior ovary reflexed; posterior rudimentary, less than one body width in length. Tail conical with rounded tip, sometimes slightly subdigitate. Prerectum indistinguishable.

Status. — The slide is labelled *Tylencholaimus mirabilis* and bears the locality Veluwe and the date July 1879. The present author has found specimens wholly agreeing with those on H 239 at the same locality (Apeldoorn).

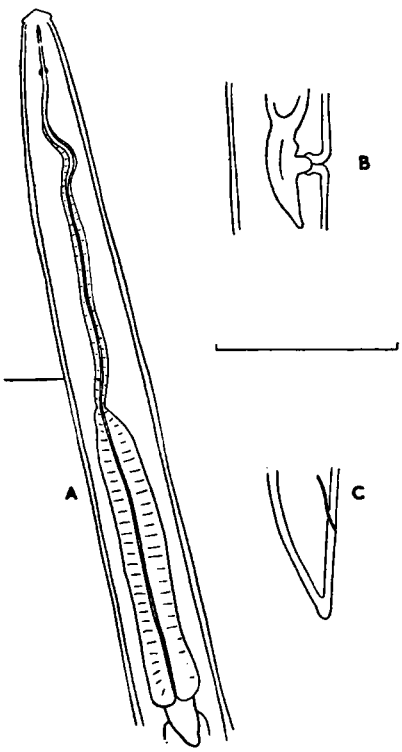

FIGURE 42. *Tylencholaimus brevicaudatus* female, H 229. A: head and oesophagus; B: vulva; C: tail.

THORNE (1939) was of opinion that the species figured by DE MAN in 1884 as *T. mirabilis* really belonged to *Dorylaimellus*; he accordingly renamed it *Dorylaimellus mirabilis* (DE MAN, 1884) n. comb. (It is evident that the 1880 and 1884 descriptions deal with the same species; the ecological data from the 1880 description indicate that the specimen figured in 1884 was collected before September 1879, and moreover there are no indications at all that DE MAN collected specimens of this species after 1879. So the correct name should have been *Dorylaimellus mirabilis* (DE MAN, 1880) n. comb.).
DE MAN stated he had found "*T. mirabilis*" on heath fields near Apeldoorn and in forest soil near The Hague. H 239 is from the former locality. These specimens undoubtedly belong to *Tylencholaimus* (spear with knobs but not with flanges; no muscular sheath around posterior portion of oesophagus; no oesophageal swelling behind base of spear; no cutinized pieces around vestibule). They cannot be distinguished from *T. brevicaudatus* (TARJAN, 1953) TARJAN, 1956. The specimen illustrated in 1884 in fig. 88 was collected near The Hague. According to THORNE, the shape of the spear and the oesophagus shows that this specimen is a *Dorylaimellus*. However, the spear illustrated might well be of the same type as that figured by TARJAN for *T. brevicaudatus*. The genus *Dorylaimellus* has a very slender oesophagus, but this phenomenon also occurs in some species of *Tylencholaimus* (e.g. *T. minimus* DE MAN, 1876; *T. brevicaudatus* (TARJAN, 1953); see TARJAN, 1956). Moreover, DE MAN's illustration does not show the swelling of the oesophagus behind the base of the spear, characteristic for *Dorylaimellus*. The posterior portion of the oesophagus of the specimen figured is, in proportion to its width, much shorter than that of the species of *Dorylaimellus* seen by the present writer (*D. aequalis* and *D. virginianus*). The spear of Fig. 88-a (1884) is about twice as long as the width of the lip region; that of Fig. 88 seems to be longer, but this figure is on a much smaller scale and therefore has not the same value as Fig. 88-a. For all these reasons DE MAN's figures 88, 88-a and 88-b may be taken to represent a true tylencholaim, and there are no reasons for regarding the latter specifically different from the specimens on H 239. Accordingly, *Dorylaimellus mirabilis* (DE MAN, 1880) THORNE, 1939 is to be regarded a synonym of *Tylencholaimus brevicaudatus* (TARJAN, 1953) TARJAN, 1956.
The identity of *T. mirabilis* (BÜTSCHLI, 1873) DE MAN, 1876 is uncertain. Apparently no authentic specimens are preserved. It seems to differ from *T. brevicaudatus* by the irregular shape of the tail. The present writer thinks it, however, quite possible that the two species may eventually prove to be identical.

93. *Longidorus elongatus* (DE MAN, 1876) MICOLETZKY, 1922 (Fig. 43).

Dimensions:	H 6 ♂	H 7 ♂	H 7 ♀	H 8 ♀	H 9 ♀
L	4,56 mm	4,94 mm	5,81 mm	4,35 mm	4,98 mm
a	105	102	102	92	77
b	17,8	11,0	18,8	18,1	12,3
c	108	105	155	120	96
VD	—	33,4%	V 49,6%	49,8%	52,0%
G_1 (T_1)	—	10,2%	7,4%	—	8,6%
G_2 (T_2)	—	8,2%	8,5%	—	8,2%
spear	85 μ	87 μ	87 μ	80 μ	82 μ

H 6 and H 8 are poor; they are flattened and strongly twisted. H 7 and H 9 are dirty, but in fairly good condition. Cuticle with fine transverse striation. Width of lip region slightly more than $^1/_4$ of body diameter at base of oesophagus. Papillae not prominent, nerves distinct. Distance of guiding ring from head end about 2,5 times the width of the lip region. Amphids distinct. Lip region hardly expanded, much less so than illu-

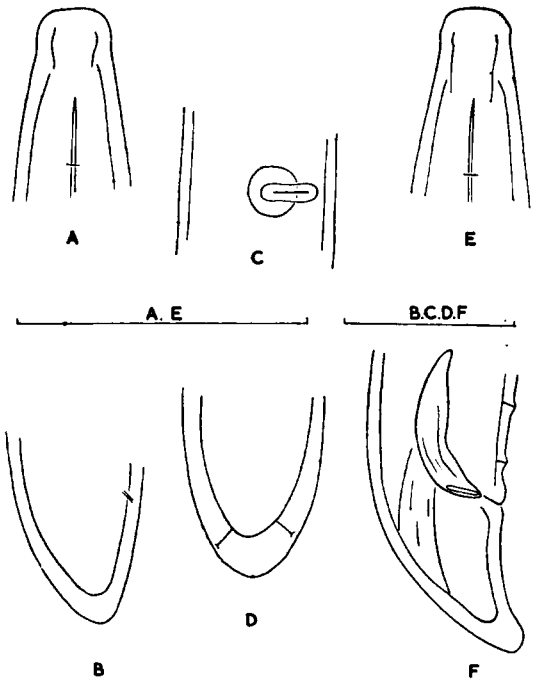

FIGURE 43. *Longidorus elongatus*. A: H 7 female head end; B: H 7 female tail sublateral view; C: H 8 female vulva; D: H 8 female tail, ventral view; E: H 7 male head end; F: H 7 male tail.

strated by DE MAN (1876), offset from body by slight depression; resembling that of *L. sylphus* THORNE, 1939, but the presence of males indicates that these specimens do not belong to the latter species. In most specimens the oesophagus is strongly coiled, resulting in higher values for b than given by DE MAN. Posterior third of oesophagus enlarged, its diameter half that of body. Vulva transverse. Ovaries reflexed over less than half their length. Spicules 53 μ in length, relatively slender, curved; gubernaculum conspicuous, broad, rod-shaped. Preanal supplements invisible in H 6, numbering eleven in H 7 and placed about equidistantly; the series beginning immediately anterior to the anus. In neither of these specimens could the length of the prerectum be defined.

Status. — The species was described under the generic name *Dorylaimus* in 1876, so the types are lost. Slides H 6 and H 8 bear the locality Katwijk, H 7 and H 9 are not provided with indications. It is advisable to select, if necessary, a recent specimen as neotype. Type locality: roots of grass in a garden at Middelburg, Island of Walcheren.

Family **Leptonchidae.**

94. *Tylencholaimellus magnidens* THORNE, 1939.

H 169: 1 ♀. Dimensions: L = 0,79 mm; a = 18,6; b = 5,2; c = 36,2; V = 31,6%. In mediocre condition; much flattened. The slide is laballed *Tylencholaimus zeelandicus*. From this species, which apparently is a true tylencholaim, H 169 differs by the round, nearly continuous lip region and the short, offset terminal oesophageal bulb. The structure of the spear (extra dorsal piece very distinct) and the large basal knobs, as well as the shape of the oesophagus, show that this specimen belongs to *Tylencholaimellus*. Vulva position and dimensions in general, place it in *T. magnidens* THORNE, 1939, but the shape of the lip region seems to be more like *T. sagittifer* (DE MAN, 1921). A recent specimen from the P.D. Collection also resembles *sagittifer* in shape of lip region and *magnidens* in dimensions (L = 0,87 mm; a = 33,0; b = 5,1; c = 34,6; V = 32,5%). H 169 bears the locality Walcheren, but no date. It is not a primary type of *Tylencholaimus zeelandicus*, because this species was described as new in 1876.

Family **Diphtherophoridae.**

95. *Trichodorus primitivus* (DE MAN, 1880) MICOLETZKY, 1922.

Dimensions:	H 17 ♂	H 18 ♀
L	0,65 mm	0,50 mm
a	18,6	18,4
b	4,4	5,5
c	41,5	99,2
V		56,0%
spear	49 μ	34 μ

In moderately good condition; H 18 is broken into two fragments. Subcuticle distinctly transversely striated in both specimens. Oesophageal bulb indistinguishable in H 17, while in H 18 it occupies less than half the length of the oesophagus. Excretory pore invisible. Male: No caudal alae. Spicules curved, about 37 μ in length. The gubernaculum is visible, but its size and shape are indeterminable, the specimen lying in sublateral position. Two preanal supplements are visible: the first lies 43 μ = 1,6 body widths anterior to the second, which is located 24 μ = 1 body width anterior to the anus. The ventromedian papillae near the excretory pore are invisible. Female: Anus situated more ventrally than is usual in this genus. Lateral hypodermal pores invisible. Cutinized pieces near vulva present; their exact shape cannot be determined, but the appearance agrees well with ALLEN's illustration 7-e (1957). Spermathecae invisible.

Status. — H 17 bears the locality Leiden and the indication n.sp. H 18 bears the locality Katwijk. H 17 is a primary type, H 18 probably also. Owing to the invisibility in these specimens of many features used in the modern *Trichodorus* system (ALLEN, 1957) exact determination with ALLEN's key is not possible. Therefore it would only create confusion if the name *Dorylaimus primitivus* DE MAN, 1880 should be linked with H 17 and H 18. The few diagnostic details that are still visible in the

type specimens (dimensions, spear length, shape of oesophageal bulb, vulva, spicules, absence of caudal alae in the male) indicate that they are conspecific with the specimens described as *T. primitivus* by ALLEN. It is therefore advisable to regard the primary types of this species as destroyed and to accept ALLEN's neotype, although the latter does not fulfill the requirement that the neotype should be collected as near as possible to the original type locality (meadows near Leiden and Katwijk).

Family **Alaimidae.**

96. *Alaimus primitivus* DE MAN, 1880.

H 148: 1 ♂, of which the head end and tail tip are missing. Spicules straight, 8 μ in length. Two or three preanal supplements. This is a primary type of *A. primitivus*, because it is labelled *Protomonhystera* with an unpublished specific name, and also indicated n.sp. The generic name *Protomonhystera* occurs as a *nomen nudum* in the literature (DE MAN, 1876-b).

H 149: 1 ♀, labelled with the same name. This specimen was so badly damaged that it could no longer be remounted. Both specimens may be regarded as destroyed. If necessary, a recent specimen may be designated neotype of *A. primitivus*. This is one of the few species for which no list of collecting localities is present. H 148 is labelled Middelburg, H 149 Katwijk. These two places may be regarded the type localities.

97. *Amphidelus uniformis* THORNE, 1939.

H 150: 1 ♀. Dimensions: L = 0,96 mm; a = 53,1; b = 4,7; c = 24,9; V = 47,7%. The slide is labelled with the same name as H 148 and H 149, so probably DE MAN did not recognize this specimen as specifically different from *Alaimus primitivus*. Details of oesophagus and ovary are invisible. The pre-equatorial position of the vulva might indicate that the anterior ovary is rudimentary. The dimensions and the relatively wide lip region suggest that this specimen belongs to *Amphidelus uniformis* THORNE, 1939, a species found by the present author several times in the Netherlands. The slide bears the locality Leiden, but no date.

Of all the species described by DE MAN in 1880, 1881 and 1884 that have not been treated in this paper, the types are lost.

SUMMARY OF TAXONOMIC CONCLUSIONS OF EXAMINATION OF THE HOLLANDSCHE COLLECTIE :

Plectus coronatus DE MAN, 1876 [1]) *nomen nudum* for *Acrobeles complexus* THORNE, 1925.
Tylenchus filiformis apud DE MAN, 1876: *species inquirenda.*
Tylenchus elegans DE MAN, 1876: synonym of *T. davainei* BASTIAN. 1865.
Tylenchus exiguus DE MAN, 1876: *species inquirenda.*
Tylenchus pillulifer v. LINSTOW, 1877: *incertae sedis.*
Aulolaimus oxycephalus apud MEYL, 1954 nec DE MAN, 1880: = *Aulolaimus meyli* nom. nov.
Tripyla filicaudata var. *austriaca* MICOLETZKY, 1922: = nominate form.
Tripyla filicaudata var. *hoehnei* RAHM, 1928: *species inquirenda.*
Mononchus bastiani DE MAN, 1876: synonym of *Prionchulus muscorum* (DUJARDIN, 1845) CHITWOOD & CHITWOOD, 1937.
Mononchus papillatus apud DE MAN, 1880 and 1884: synonym of *Prionchulus muscorum* (DUJARDIN, 1845) CHITWOOD & CHITWOOD, 1937.
Dorylaimus stagnalis fecundus var. *pseudocrassus* MICOLETZKY, 1925: synonym of *D. crassus* DE MAN, 1884.
Dorylaimus crassus apud MICOLETZKY, 1925: *species inquirenda.*
Dorylaimus obtusicaudatus ♂ form II apud DE MAN, 1880: *species inquirenda.*
Dorylaimus obtusicaudatus ♂ form I apud DE MAN, 1880 = *D. obtusicaudatus* ♂ apud DE MAN, 1884: synonym of *D. parabastiani* PAETZOLD, 1958.
Dorylaimus intermedius DE MAN, 1880; becomes *Nygolaimus intermedius* (DE MAN, 1880) nov. comb.
Dorylaimus intermedius apud THORNE & SWANGER, 1936: = *Eudorylaimus circulifer* nom. nov.
Dorylaimus intermedius var. *alpestris* MENZEL, 1914; *species inquirenda.*
Dorylaimus tritici apud DE MAN, 1876: *species inquirenda.*
Dorylaimellus mirabilis (DE MAN, 1880) THORNE, 1939: synonym of *Tylencholaimus brevicaudatus* (TARJAN, 1953) TARJAN, 1956.
Tylencholaimus mirabilis apud DE MAN, 1880 and 1884: synonym of *Tylencholaimus brevicaudatus* (TARJAN, 1953) TARJAN, 1956.
Protomonhystera DE MAN, 1876 [1]) *nomen nudum* for *Alaimus* DE MAN, 1880.

ACKNOWLEDGEMENT

The writer wishes to express his sincere thanks to Dr. J. B. GOODEY, Harpenden, England, who read the manuscript and offered many helpful suggestions for improvement of the English text.

[1]) As these names have no status under the Rules, it is not allowed to call them *synonyms* of *Acrobeles complexus* resp. *Alaimus.*

LITERATURE CITED

ALLEN, M. W.
1955 A review of the nematode genus Tylenchorhynchus. — Univ. Calif. Publ. Zool., 61: 129—166.
1957 A review of the nematode genus Trichodorus with descriptions of ten new species. — Nematologica, 2: 32—62.
ALTHERR, E.
1938 La faune des mines de Bex, avec étude spéciale des Nématodes. — Rev. Suisse Zool., 45: 567—720.
1950 Les nématodes du parc national suisse. — Erg. wiss. Unt. schw. Nat. Park, 3 (22): 1—46.
1955 Les nématodes du parc national suisse. 3e partie. — Erg. wiss. Unt. schw. Nat. Park, 4 (32): 319—328.
ANDRÁSSY, I.
1952 Freiliebende Nematoden aus dem Bükk-Gebirge. — Ann. hist. nat. Mus. Nat. Hung., 2: 13—65.
1954 Revision der Gattung Tylenchus Bastian. — Acta zool. Acad. Sci. Hung., 1: 5—42.
1958a Ueber das System der Mononchiden (Mononchidae Chitwood, 1937; Nematoda). — Ann. hist. nat. Mus. Nat. Hung., 50: 151—171.
1958b Erd- und Süsswassernematoden aus Bulgarien. — Acta zool. Acad. Sci. Hung., 4: 1—88.
1959a Neubenennungen einiger homonymen Nematodengattungen. — Nematologica, 4: 223—226.
1959b Taxonomische Uebersicht der Dorylaimen I. — Acta zool. Acad. Sci. Hung., 5: 191—240.
BASTIAN, H. Ch.
1865 Monograph on the Anguillulidae or free nematoids, marine, land and freshwater; with descriptions of 100 new species. — Trans. Linn. Soc. London, 25: 73—184.
BENTHEM JUTTING, W. S. S. VAN.
1951 Dr. Johannes Govertus de Man (Middelburg 2 Mei 1850 — Middelburg 19 Januari 1930). Een Zeeuwse zoöloog van internationale vermaardheid. Biol. Jaarb., 18: 130—259.
BRAKENHOFF, H.
1914 Beitrag zur Kenntnis der Nematodenfauna des nordwestdeutschen Flachlandes. — Abh. Nat. Ver. Bremen, 22: 267—311.
BÜTSCHLI, O.
1873 Beiträge zur Kenntnis der freilebenden Nematoden. — Nova Acta Acad. Leopold-Car., 36: 1—144.
CHITWOOD, B. G.
1960 Choanolaimus psammophilus J. G. de Man, 1880 rediscovered, and Synonchium obtusum N. A. Cobb, 1920, as a natural enemy of plant pathogens. — Nematologica, Suppl. 2: 56—60.
CLARK, W. C.
1960 Redescription of Mononchus truncatus Bastian. M. papillatus Bastian and Prionchulus muscorum (Dujardin) (Enoplida, Nematoda). — Nematologica, 5: 184—198.
COBB, N. A.
1917 The mononchs, a genus of free-living predatory nematodes. — Soil Science, 1: 431—486.
CONINCK, L. A. P. DE.
1930 Bijdrage tot de kennis der vrijlevende nematoden van België. — Natuurw. Tijdschr., 12: 106—140.
1939 Les Nématodes libres de la grotte de Han. — Bull. Mus. roy. Hist. nat. Belg., 15: 1—40.
DITLEVSEN, Hj.
1911 Danish free-living nematodes. — Vid. Medd. Dansk. naturh. Foren., 63: 213—256.
DUJARDIN, F.
1845 Histoire naturelle des Helminthes. — Paris. 654 pp.

FRANKLIN, M. T.
1955 A redescription of Aphelenchoides parietinus (Bastian, 1865) Steiner, 1932. — J. Helminth., 29: 65—76.
GADEA, E.
1952a Sobre algunos nematodos libres terrestres de la cierra de Albarracin. — Publ. Inst. Biol. Apl., 11: 157—172.
1952b Sobre algunos nematodos libres de agua dulce de la Plana de Castellón. — Publ. Inst. Biol. Apl., 11: 173—186.
1954 Nematodos dulceacuicolas de la Sanabria. — Publ. Inst. Biol. Apl., 18: 133—150.
GERLACH, S. A.
1950 Die Nematoden-Gattung Microlaimus. — Zool. Jb. Syst., 79: 188—208.
1953 Die Nematodenfauna der Uferzone und des Küstengrundwassers am finnischen Meerbusen. Acta Zool. Fenn., 73: 1—32.
GOODEY, T.
1951 Soil and Freshwater Nematodes. — London, Methuen, 390 pp.
HIRSCHMANN, H.
1952 Die Nematoden der Wassergrenze mittelfränkischer Gewässer. — Zool. Jb. Syst., 81: 313—407.
HOFMÄNNER, B. & MENZEL, R.
1914 Neue Arten freilebender Nematoden aus der Schweiz. — Zool. Anz., 44: 80—91.
JÄGERSKIÖLD, L. A.
1908 Ein neuer Nematode, Dorylaimus crassoides, aus dem Thuner See in der Schweiz. — Zool. Anz., 33: 673—677.
KRALL, E.
1957 Moningaid huvitavaid nematoodide leide Eesti NSV pinnesest. — Eesti NSV Teaduste Akad. Toim. 6, Ser. Biol., 3: 266—271.
LINSTOW, O. v.
1877 Helminthologica. — Arch. Naturgesch., 43: 1—3.
LOOF, P. A. A.
1960 Taxonomic studies on the genus Pratylenchus (Nematoda). — Tijdschr. Pl. Ziekt., 66: 29—90.
LOOF, P. A. A. & OOSTENBRINK, M.
1958 Die Identität von Tylenchus robustus De Man. — Nematologica, 3: 34—43.
DE MAN, J. G.
1876a Onderzoekingen over vrij in de aarde levende nematoden. — Tijdschr. ned. dierk. Ver., 2: 78—196.
1876b In: Verslag van de Gewone Huishoudelijke Vergadering der Nederlandsche Dierkundige Vereeniging gehouden te Rotterdam in de Directeurswoning der Rotterdamsche Diergaarde den 18en November 1876. — Tijdschr. Ned. dierk. Ver., 3: 74—87.
1876c Contribution à la connaissance des nématoides marins du Golfe de Naples. — Tijdschr. ned. dierk. Ver., 3: 88—118.
1880 Die einheimischen, frei in der reinen Erde und im süssen Wasser lebenden Nematoden. — Tijdschr. ned. dierk. Ver. 5: 1—104.
1881 Ueber einige neue oder noch unvollständig bekannte Arten von frei in der reinen Erde lebenden Nematoden. — Tijdschr. ned. dierk. Ver. 5: 138—143.
1884 Die frei in der reinen Erde und im süssen Wasser lebenden Nematoden der niederländischen Fauna. — Leiden, Brill, 206 pp.
1907 Contribution à la connaissance des nématodes libres de la Seine et des environs de Paris. — Ann-Biol. Lac., 2: 9—31.
1921 Nouvelles recherches sur les Nématodes libres terricoles de la Hollande. — Cap. Zool., 1 (1): 1—62.
MENZEL, R.
1914 Die mikroskopische Landfauna der schweizerischen Hochalpen. Inaugural-Dissertation, 100 pp.
MERZHEEVSKAYA, O. I.
1953 Nematody glavneishich poljevich kul'tur B.S.S.R. Minsk, 192 pp.
MEYL, A. H.
1954a Die Nematodenfauna höherer Pilze in Laub- und Nadelwäldern zwischen Braunschweig und dem Harz. — Mycopath. et Mycol. Appl., 7: 1—80.

1954b Die bisher in Italien gefundenen freilebenden Erd- und Süsswassernematoden. — Arch. Zool. Ital., 39: 161—264.
1954c Die Fadenwürmer (Nematoda) einiger Salzstellen südöstlich von Braunschweig. — Abh. Braunschw. Wiss. Ges., 6: 84—106.
1955 Nematoden aus einer Salzwiese bei Artern. — Zool. Anz., 154: 233—240.

MICOLETZKY, H.
1914 Freilebende Süsswasser-Nematoden der Ostalpen mit besonderer Berücksichtigung des Lunzer Seengebietes. — Zool. Jb. Syst., 36: 331—546.
1917 Freilebende Süsswassernematoden aus der Bukowina. — Zool. Jb. Syst., 40: 441—586.
1922 Die freilebenden Erd-Nematoden. — Arch. Naturgesch. A, 87; 1—650.
1925a Die freilebenden Süsswasser- und Moornematoden Dänemarks. — K. Dansk. Vid. Selsk. Skr., 8 (10): 55—310.
1925b Zur Kenntnis tropischer, freilebender Nematoden aus Surinam, Trinidad und Ostafrika. — Zool. Anz., 64: 1—28.

PAETZOLD, D.
1955 Untersuchungen an freilebenden Nematoden der Salzwiese bei Aseleben. — Wiss. Z. Univ. Halle, 4: 1057—1090.
1958 Beiträge zur Nematodenfauna mitteldeutscher Salzstellen im Raum von Halle. — Wiss. Z. Univ. Halle, 8: 17—48.

SCHNEIDER, W.
1935 Voyage de Ch. Allaud et P. A. Chappuis en Afrique Occidentale Francaise VI: Freilebende Nematoden. — Arch-Hydrobiol., 28: 1—20.
1939 Würmer II: Fadenwürmer oder Nematoden I: Freilebende und pflanzenparasitische Nematoden. — Tierwelt Deutschlands, 36, 260 pp.

STEINER, G.
1916 Beiträge zur geographischen Verbreitung freilebender Nematoden. — Zool. Anz., 46: 311—335.

TARJAN, A. C.
1953 Known and suspected plant-parasitic nematodes of Rhode Island I. — Proc. helm. Soc. Wash., 20: 49—54.
1956 Known and suspected plant-parasitic nematodes of Rhode Island II. Xiphinema americanum with notes on Tylencholaimus brevicaudatus n.comb. — Proc. helm. Soc. Wash., 23: 88—92.

THORNE, G.
1925 The genus Acrobeles von Linstow 1877. — Trans. Amer. Micr. Soc., 44: 171—210.
1929 Nematodes from the summit of Long's Peak, Colorado. — Trans. Amer. Micr. Soc., 48: 181—195.
1937 A revision of the nematode family, Cephalobidae Chitwood and Chitwood, 1934. Proc. helm. Soc. Wash. 4: 1—16.
1939 A monograph of the nematodes of the superfamily Dorylaimoidea. — Cap. Zool., 8 (5): 1—261.
1955 Fifteen new species of Hemicycliophora, with amended description of H. typica De Man 1921. — Proc. helm. Soc. Wash., 22: 1—16.

THORNE, G. & SWANGER, H. H.
1936 A monograph of the nematode genera Dorylaimus Dujardin, Aporcelaimus n.g., Dorylaimoides n.g. and Pungentus n.g. — Cap. Zool., 6 (4): 1—223.