

Taxonomic studies on the genus *Prodorylaimus* Andrassy, 1959 (Nematoda : Dorylaimina)

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SUMMARY

The genus *Laimydorus* Siddiqi, 1969, is restricted to species in which males are known and have short round tails. Those species of the *Prodorylaimus-Laimydorus* complex in which males are unknown, are transferred to *Prodorylaimus*. *Drepanodorylaimus* Jairajpuri, 1966 is synonymized with *Prodorylaimus*. The exact identity of the type species of *Prodorylaimus*, *P. longicaudatus* (Bütschli, 1874), is uncertain; in order to promote nomenclatorial stability, the International Commission of Zoological Nomenclature has been asked to reject this species as *typus generis* and to designate in its place *P. longicaudatoides* Altherr, 1968 = *Dorylaimus longicaudatus* auctt. nec Bütschli. *Afrodorylaimus* *andrassyi* Zullini, 1973 and *A. ranzii* Zullini, 1973 are transferred to *Prodorylaimus*. The following species are redescribed: *P. longicaudatoides* Altherr, 1968; *P. paralongicaudatus* (Micoletzky, 1925); *P. acris* (Thorne, 1939); *P. filiarum* Andrassy, 1964; *P. dahli* (Altherr, 1960); *P. renwicki* (van der Linde, 1938); *P. picardi* (Altherr, 1963); *P. rionensis* (Gerlach, 1954) and *P. nyongi* (Altherr, 1960). Four new species are described: *P. uliginosus*, a monosexual species with transverse vulva and odontostyle length 23-25 µm; *P. mas*, a bisexual species, resembling *P. uliginosus* but differing by more posterior vulva and arrangement of oesophageal gland nuclei; *P. rotundiceps*, bisexual, lip region rounded, odontostyle length 17-20 µm, vulva longitudinal; and *P. dalmassoi*, an aberrant species: very long (over 4 mm) and slender, odontostyle very short (12 µm), prerectum very long; bisexual. A long-tailed male with sinuate odontostyle from Nigeria is also reported (identity unknown).

RÉSUMÉ

Étude taxonomique du genre *Prodorylaimus* Andrassy, 1959 (Nematoda : Dorylaimina)

Le genre *Laimydorus* Siddiqi, 1969 est limité aux espèces chez lesquelles les mâles sont connus et possèdent une queue courte et arrondie. Toutes les espèces de *Laimydorus* dont les mâles sont inconnus sont transférées au genre *Prodorylaimus*. Le genre *Drepanodorylaimus* Jairajpuri, 1966 est synonymisé à *Prodorylaimus*. Deux espèces d'*Afrodorylaimus* Andrassy, 1964, *A. andrassyi* Zullini, 1973 et *A. ranzii* Zullini, 1973, sont également transférées au genre *Prodorylaimus*. Les espèces suivantes sont redécrites: *P. longicaudatoides* Altherr, 1968; *P. paralongicaudatus* (Micoletzky, 1925); *P. acris* (Thorne, 1939); *P. filiarum* Andrassy, 1964; *P. dahli* (Altherr, 1960); *P. nyongi* (Altherr, 1960); *P. picardi* (Altherr, 1963); *P. rionensis* (Gerlach, 1954) et *P. renwicki* (van der Linde, 1938). Quatre espèces nouvelles sont décrites dont trois provenant de prairies humides des Pays-Bas; *P. uliginosus* n. sp. (femelles) est caractérisé par la vulve transversale et l'odontostyle long de 23-25 µm; *P. mas* n. sp. (mâles et femelles) ressemble à *P. uliginosus*, mais la vulve est située plus en arrière ($V = 45-48$ vs $39-43$) et la disposition des noyaux des glandes œsophagiennes est différente; *P. rotundiceps* n. sp. (mâles et femelles) est caractérisé par une tête arrondie, un odontostyle long de 17-20 µm et une vulve longitudinale; la base de la queue est fortement asymétrique. *P. dalmassoi* n. sp. (mâles et femelles), provenant de France, est très aberrant: le corps est très long (plus de 4 mm) et très fin; l'odontostyle est très court (12 µm) et le prérectum très allongé, comme chez les Longidorides, avec lesquels l'espèce montre une ressemblance superficielle. Un mâle unique, à queue longue et odontostyle sinueux, provenant de Nigéria, est décrit mais non identifié.

General considerations

THE GENERA *PRODORYLAIMUS*, *LAIMYDORUS* AND *DREPANODORYLAIMUS*

In the course of the sixties I collected material of several undescribed species of long-tailed dorylaims. Some of them clearly belonged in the genus *Prodorylaimus*, because both sexes were found and had elongate tails. Of other species, however, only females were found

— without sperm in the genital tract — of organization quite similar to *Prodorylaimus*, but absence of males makes it logically impossible to assign these species either to *Prodorylaimus* or to *Laimydorus*. I have elsewhere (Loof, 1983) discussed the taxonomic situation and in accordance with the opinion expressed in that paper I will adopt the following policy:

- *Laimydorus*, for historical reasons, is restricted to bisexual species in which males are short-tailed (insofar as they do not belong in the genus *Mesodorylaimus*).

- All monosexual species (again insofar they do not belong under *Mesodorylaimus*) are brought to *Prodorylaimus*. Some of these species probably do not have males, but others may well have them (sperm in uteri present), and finding of males may result in change of their taxonomic position.
- The genus *Drepanodorylaimus*, as a consequence of the above, is considered a junior synonym of *Prodorylaimus*.

I have adopted this policy because females of *Laimydorus*, *Prodorylaimus* and monosexual species are impossible to distinguish. Females can only be identified with the aid of a key (under construction) comprising all these three groups.

The genus *Prodorylaimus* is clearly artificial. For example, *P. dalmassoi* n. sp. is aberrant, resembling longidorids in its elongate body and very long pre-rectum. But I think it too early to split the genus. We should first try to understand the value of the commonly used diagnostic characters, and of eventual characters still to be discovered.

Among the numerous species two groups can roughly be distinguished :

- a group of large species (2-5 mm) with thick cuticle, long (over 20 µm) and often sinuate odontostyle, double guiding ring and often longitudinal vulva;
- a group of smaller species (under 2 mm) with thin cuticle, short and usually straight odontostyle (20 µm or less), double or single guiding ring and often transverse vulva.

These two organization types, these clusters of correlated character states, might well be more fundamental than the character : male tail short *vs* elongate. However, the separation is not strict. Several species show mixtures of character states, so I have refrained from splitting the genus on this base.

In accordance with the above, the following species are herewith transferred to *Prodorylaimus* :

a) From *Laimydorus* :

- P. acris* (Thorne, 1939) n. comb., syn. *Dorylaimus acris* Thorne, 1939;
- P. finalis* (Thorne, 1975) n. comb., syn. *Laimydorus finalis* Thorne, 1975;
- P. flexus* (Thorne & Swanger, 1936) n. comb., syn. *Dorylaimus flexus* Thorne & Swanger, 1936 (considered *Drepanodorylaimus* by Andrassy, 1969);
- P. longissimicaudatus* (Altherr, 1977) n. comb., syn. *Laimydorus longissimicaudatus* Altherr, 1977;
- P. serpentinus* (Thorne & Swanger, 1936) n. comb., syn. *Dorylaimus serpentinus* Thorne & Swanger, 1936;
- P. thornei* (Andrassy, 1969) n. comb., syn. *Laimydorus thornei* Andrassy, 1969;
- P. vixamictus* (Andrassy, 1962) n. comb., syn. *Dorylaimus vixamictus* Andrassy, 1962. This is provisional; the presence of sperm indicates that males do occur.

As to the other *Laimydorus* species in which females only are known :

L. effilatus (Schuurmans Stekhoven & Teunissen, 1938) was transferred to *Mesodorylaimus* by Baqri and Coomans (1973), with which I agree;

L. tenuicaudatus (Bastian, 1865) is considered *species incertae sedis*; hence I do not accept the synonymization of *L. sylphus* (Thorne, 1939) with it (Andrassy, 1969);

L. callosus (Skwarra, 1921) is transferred back herewith to *Dorylaimus sensu stricto*. Odontostyle length is 50 µm, the female tail is hooked, the cuticle is longitudinally striated (in view of the great thickness of the cuticle it appears improbable that Skwarra should have mistaken longitudinal muscles for surface crests). This implies that *D. callosus apud* Thorne & Swanger, 1936 is not identical with Skwarra's species; re-examination of specimens is necessary to determine its status.

I also regard the following as *species incertae sedis* : *L. halophilus* (Daday, 1897), *L. marinus* (Dujardin, 1844) and *L. saprophilus* (Peters, 1930). Mr. D. J. Hooper, Rothamsted, informed me that no type material of the last-named species exists.

The valid species of *Laimydorus* are thus : *L. conurus* (Thorne, 1939); *L. crassoides* (Jägerskiöld, 1908); *L. cryptosperma* (Loof, 1969); *L. dadayi* (Thorne & Swanger, 1936); *L. filiformis* (Bastian, 1865); *L. gazella* Andrassy, 1970; *L. luettichauvi* (Meyl, 1957); *L. marinus apud* Thorne & Swanger, 1936 (as *Dorylaimus marinus*); *L. parabastiani* (Paetzold, 1958); *L. parhomalopapillatus* (Schuurmans Stekhoven, 1944); *L. prolificus* (Thorne & Swanger, 1936); *L. proximus* (Thorne & Swanger, 1936); *L. pseudostagnalis* (Micoletzky, 1927); *L. reversus* Thorne, 1974; *L. stenopygus* (Andrassy, 1968); *L. sylphus* (Thorne, 1939) and *L. unipapillatus* (Daday, 1905); and provisionally the *flavomaculatus* group : *L. flavomaculatus* (Linstow, 1876), *L. incae* (Steiner, 1920), *L. paraincae* Thorne, 1974 and perhaps *L. fecundus* (Cobb, 1914). In addition, *Drepanodorylaimus insignis* Gagarin, 1981 is herewith transferred to *Laimydorus*, becoming *L. insignis* (Gagarin, 1981) n. comb. (see below).

b) From *Drepanodorylaimus* :

- P. arganoi* (Zullini, 1973) n. comb., syn. *Drepanodorylaimus arganoi* Zullini, 1973;
- P. brevicaudatus* (Andrassy, 1970) n. comb., syn. *Drepanodorylaimus brevicaudatus* Andrassy, 1970;
- P. filiformis* (Jairajpuri, 1966) n. comb., syn. *Drepanodorylaimus filiformis* Jairajpuri, 1966;
- P. maqsoodi* (Dhanachand & Jairajpuri, 1981) n. comb., syn. *Drepanodorylaimus maqsoodi* Dhanachand & Jairajpuri, 1981;
- P. picardi* (Altherr, 1963) n. comb., syn. *Dorylaimus picardi* Altherr, 1963;
- P. renwicki* (van der Linde, 1938) n. comb., syn. *Dorylaimus renwicki* van der Linde, 1938;
- P. szekessyi* (Andrassy, 1960) n. comb., syn. *Mesodorylaimus szekessyi* Andrassy, 1960.

As to the other species of *Drepanodorylaimus* :

D. insignis Gagarin, 1981 : the male is characterized by a short round tail, long prerectum and over 20 ventro-medial supplements. Therefore *D. insignis* is transferred to *Laimydorus*. The curvature of the odontostyle is very strange, being located in the posterior half of dorsal contour.

D. macramphidius Andrassy, 1971 : on account of shape of lip region and the very large amphidial apertures this species might rather belong in the genus *Oriverutus* Siddiqi, 1971.

D. similis Dhanachand & Jairajpuri, 1981 : this is considered a junior synonym of *P. hamatus* Loof, 1973.

c) Furthermore I consider the following species to belong to *Prodorylaimus*, for reasons given hereunder :

Dorylaimus nyongi Altherr, 1960, becoming *P. nyongi* (Altherr, 1960) n. comb.;

Afrodorylaimus andrassyi Zullini, 1973, becoming *P. andrassyi* (Zullini, 1973) n. comb.;

Afrodorylaimus ranzii Zullini, 1973, becoming *P. ranzii* (Zullini, 1973) n. comb.

With regard to *Drepanodorylaimus* I want to point out that Andrassy (1969) considered the type species *Dr. filiformis* Jairajpuri, 1966, a junior synonym of *Dr. picardi* (Altherr, 1963), though curiously he retained the specific name *filiformis*. However, the descriptions of these two species show several differences : odontophore 18-20 μm (shorter than odontostyle) in *filiformis*, 30 μm (longer than odontostyle) in *picardi*; $c' = 22$ in *filiformis*, 14 in *picardi*; odontostyle aperture 5-6 μm (= 20-25 %) in *filiformis*, 9 μm or 40 % in *picardi*; terminus straight in *filiformis*, hamate in *picardi*. I therefore consider them two distinct species.

THE GENERA *AFRODORYLAIMUS* AND *PRODORYLAIMUS*

Andrassy (1964) established the genus *Afrodorylaimus* with the following diagnostic characters : sexual dimorphism in tail shape, but male tail acute instead of rounded; male tail with very large, protruding caudal papillae; sperm ovoid instead of spindle-shaped; guiding ring single.

In 1973 Zullini described two new species in this genus, viz. *A. ranzii* and *A. andrassyi*. He brought these species to *Afrodorylaimus* because of the shape of the sperm, but in their further morphology they are typical *Prodorylaimus* species : the male tail is long (the short round male tail of some specimens of *A. andrassyi* is evidently an artefact), the caudal papillae are not particularly large; the guiding ring is double. I found that the sperm is distinctly spindle-shaped in *P. rotundiceps*, *P. mas* and *P. dalmassoi*; less so, thicker, in *P. filiarum* and *P. longicaudatooides*; not spindle-shaped, very small, in *P. ensis*. An undescribed species of *Afrodorylaimus* from the Sudan has the same shape of sperm as *P. filiarum*, whereas Zullini's two species have very small sperm like

P. ensis. It seems that sperm shape and size are specific rather than generic characters : strong differences occur within the genus *Tobrilus*, even within the *T. longus* group (Loof & Riemann, 1976); differences were also reported within the genera *Radopholus* (Sher, 1968), *Pratylenchoides* (Sher, 1970) and *Rotylenchus* (*R. calvus* Sher, 1965, now in a separate genus *Calvatylus*).

Therefore the two species of Zullini, *A. andrassyi* Zullini, 1973 and *A. ranzii* Zullini, 1973 are transferred to *Prodorylaimus*.

EMENDED DIAGNOSIS OF THE GENUS *PRODORYLAIMUS*

Dorylaimidae sensu lato. Body length 1-5 mm. Cuticle without longitudinal ridges. Odontostyle not greatly elongated, 12-44 μm long, usually 1.3-2.5 times as long as width of lip region; in some species sinuate. Odontophore simple. Oesophagus widened near its middle. DO and DN lie anteriorly in the bulb. The S_1N lie a small distance apart, K and K' are usually high. Guiding ring "single" or "double". The odontostyle aperture occupies mostly 35-40 % of odontostyle length. Females didelphic, amphidelphic, vulva longitudinal or transverse. Males, when present, with two testes, dorylaimid spicules with lateral guiding pieces, and a row of 9-31, usually contiguous, ventromedian supplements. Size and shape of sperm variable. Male caudal papillae small. Tail in both sexes elongate to filiform.

Type species : *Prodorylaimus longicaudatus* (Bütschli, 1874) Andrassy, 1959.

With regard to the problems around the identity of the type species, I refer to earlier work (Loof, 1980).

Goodey (1963) transferred *Dorylaimus brigdammensis* de Man, 1876 to *Prodorylaimus*, but Andrassy (1969) brought this species under a new generic name *Prodorylaimium*, on account of the ventromedian supplements being spaced, and low in number (7 or less against 13 or more). Loof and Coomans (1970) found that in this species DO-DN was longer (11-17 μm or 4-6 %) than in typical *Prodorylaimus* species (6-12 μm or 1-3 %). However, in 1978 Andrassy described *Prodorylaimium alpinum* with 10 supplements. Several *Prodorylaimus* species have now been found to have a long distance DO-DN, e.g. *P. paralongicaudatus* and *P. uliginosus*. There appears to exist no correlation between long DO-DN and low supplement number, nor between short DO-DN and high supplement number. Nor does the difference in guiding ring structure, which Andrassy gives as diagnostic character, appear reliable in view of the great variation within *Prodorylaimus*. I doubt whether the genus *Prodorylaimium* can be maintained.

Prodorylaimus longicaudatooides Altherr, 1968

= *Dorylaimus longicaudatus* apud de Man, 1876; 1880; 1884;

= *Prodorylaimus longicaudatus* apud Loof, 1961; apud Andrassy, 1964; 1969; apud Andrassy, 1959 partim.
(Figs. 1, 2)

Four adult specimens collected by de Man between 1876 and 1879 were redescribed by Loof (1961). Dimensions (specimens strongly flattened, especially the females; odontostyle length corrected):

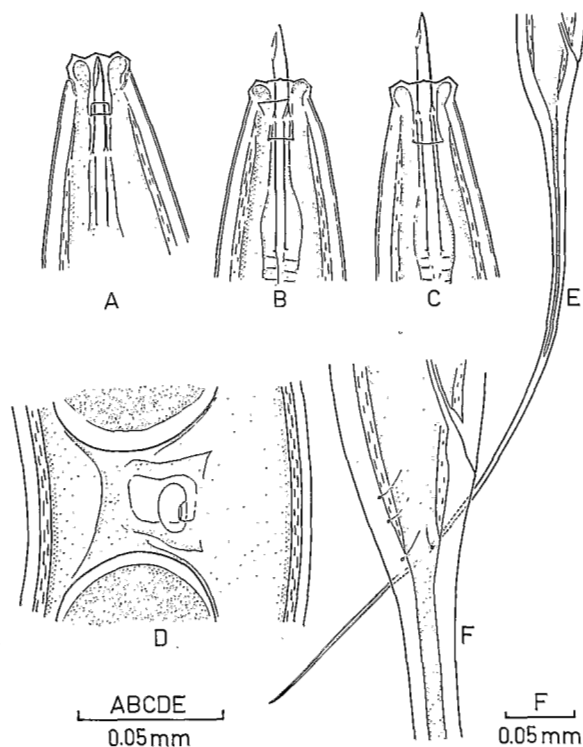


Fig. 1. *Prodorylaimus longicaudatoides* Altherr, 1968. A : anterior end of female (slide H 29 of de Man's collection); B : anterior end of male (slide H 31 of the same collection); C : anterior end of male lectotype (Altherr nr 2-1a); D : female, subventral view of vulva; E : female, tail; F : female, tail base. (D, E and F from de Man's collection).

Two males (slides H 30 and H 31) : L = 1.92-2.25 mm; a = 30-39; b = 5.0; c = 11-13; odontostyle = 34-35 μ m; spicules (along axis) = 76 μ m; supplement number = 23-25.

Two females (slides H 29 and H 31) : L = 2.59-3.05 mm; a = 21-29; b = 4.8-5.2; c = 4.9-6.2; V = ¹⁷⁻¹⁸43-45¹⁷⁻²²; odontostyle = 32-33 μ m.

Dimensions of the type specimens of *P. longicaudatoides*, from Altherr (1968) : Two males : L = 2.13-2.18 mm; a = 31-35; b = 5.3-5.8; c = 11; odontostyle = 30-33 μ m; odontophore = 45 μ m; spicules (along chord) = 60 μ m; supplement number = 21-22.

Own measurements of these specimens, which are flattened : L = 2.41-2.53 mm; a = 25-27; b = 5.2-6.0;

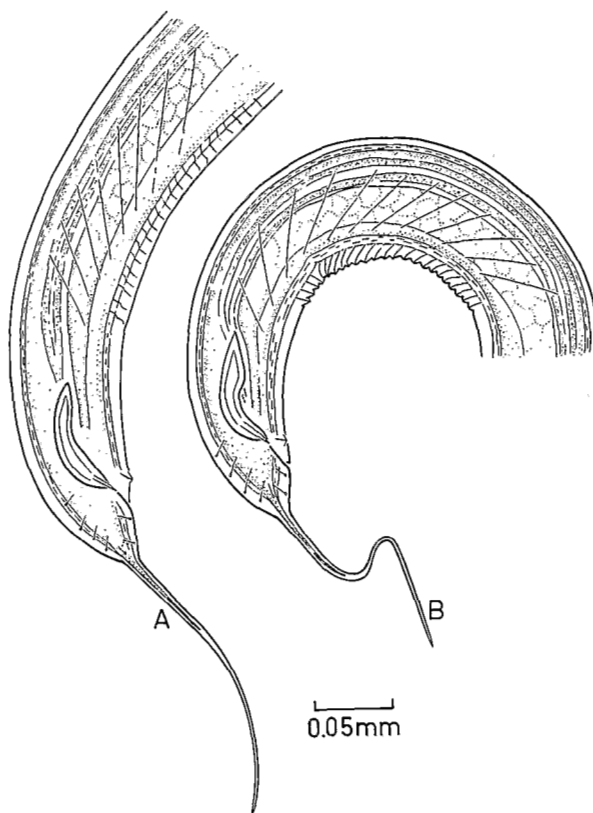


Fig. 2. *Prodorylaimus longicaudatoides* Altherr, 1968. Male tails. A : lectotype (Altherr nr 2-1a); B : slide H 31 of de Man's collection.

c = 10.4-10.6; c' = 5; odontostyle = 32-34 μ m; odontophore = 46-47 μ m; spicules (along axis) = 76-82 μ m; supplement number = 20-22.

This species shows several conspicuous characters. The cuticle is thick, in de Man's specimens 5 μ m in anterior part of neck, 8 μ m on base of female tail. Lips strongly developed, offset by constriction. Vulva longitudinal. Guiding ring double. Male tail conspicuously shorter than female tail; in the male the distal part is offset sharply.

Geographical distribution : The Netherlands (de Man, 1876, 1880, 1884); Eastern Germany (Altherr, 1968); Hungary and Kenya (Andrassy, 1964, 1969). It is curious that we have never found this species back in the Netherlands.

Lectotype : Male nr 2-1a. Dimensions : L = 2.41 mm; a = 27.3; b = 6.0; c = 10.4; c' = 5; odontostyle = 34 μ m; odontophore = 46 μ m; spicules (along axis) = 82 μ m; supplement number = 22; tail length = 232 μ m.

Altherr's slide contained also a juvenile specimen : L = 2.07 mm; a = 23; b = 4.9; c = 7.4; c' = 7.2;

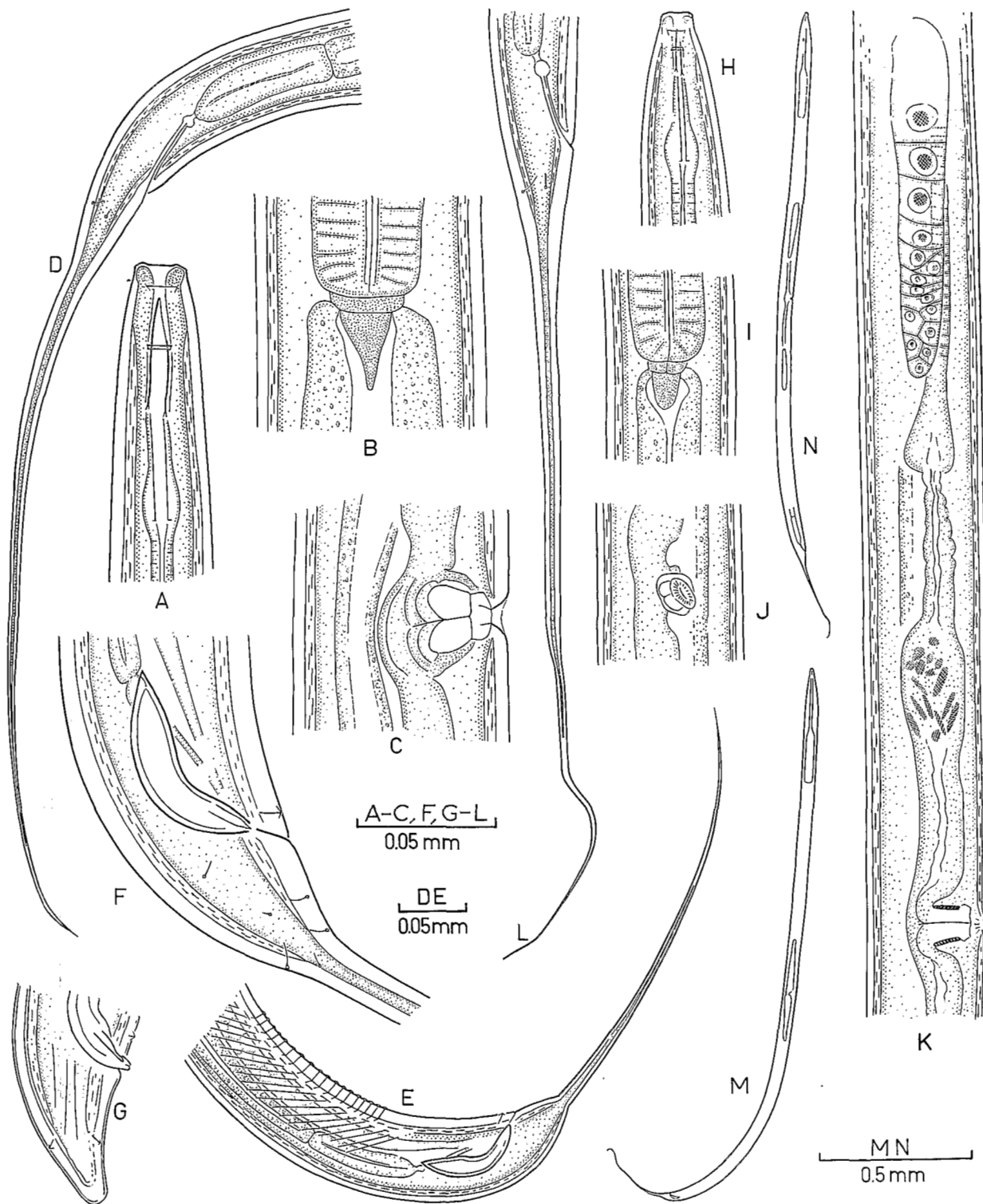


Fig. 3. A-G : *Prodorylaimus paralongicaudatus* (Micoletzky, 1925) Andrassy, 1959. A-F : type specimens. A : anterior end; B : cardia; C : vulva, lateral view; D : female tail; E : male tail and precloacal region; F : male, cloacal region; G : male tail with rounded terminus (specimen from Kenya). — H-N : *Prodorylaimus filiarum* Andrassy, 1964. H : anterior end; I : cardia; J : subventral view of vulva; K : female, anterior genital tube; L : female, tail; M : male entire; N : female entire.

odontostyle = 27 μm; spare odontostyle = 34 μm. Length of spare odontostyle shows that this specimen is a J-4.

Prodorylaimus paralongicaudatus

(Micoletzky, 1925) Andrassy, 1959
(Fig. 3 A-G; diagr. 1)

The original description is very scanty and gives little more than the characters separating this species from *P. longicaudatus* auctt. The only illustration is one of the female anal region showing the prerectum and two pairs of caudal papillae.

A type slide was available for study, bearing the locality : "Ostafrika", and containing seven males, two females and three juveniles. In many specimens the tail is incomplete. The nematodes are flattened, but otherwise in fair condition. Dimensions :

1 (female) : L = 2.48 mm; a = 25; b = 4.6; c = 4.1; c' = 12.4; V = ⁷43¹²; odontostyle = 38 μm; rectum = 58 μm = 1.2 ABW; prerectum = 132 μm.

2 (female) : L = 2.48 mm; a = 31; b = 4.5; c = 4.5; c' = 15.1; V = ¹²41¹²; odontostyle = 39 μm; odontophore = 43 μm; spear = 82 μm; rectum = 54 μm = 1.5 ABW; prerectum = 99 μm.

3 (male) : L = 2.41 mm; a = 31; b = 4.2; c = 6.5; c' = 9; odontostyle = 41 μm; spicules (along axis) = 78 μm; supplement number = 18. Herewith designated lectotype.

4 (male) : L = 2.03 mm; a = 36; b = 3.9; c = 7.3; c' = 8.5; odontostyle = 42 μm; odontophore = 40 μm; spear = 82 μm; spicules = 73 μm; supplement number = 20.

5 (male). Tail incomplete. Odontostyle = 35 μm; spicules = 75 μm; supplement number = 15.

6 (male). Tail incomplete. Odontostyle = 40 μm; spicules = 75 μm; supplement number = 19.

7 (male). Tail incomplete. Odontostyle = 42 μm; odontophore = 45 μm; spear = 87 μm; spicules = 82 μm; supplement number = 15.

8 (male). Tail incomplete. Odontostyle = 37 μm; spicules = 74 μm; supplement number = 15.

9 (male). L = 2.86 mm; a = 34; b = 5.3; c = 7.7; c' = 8; odontostyle = 42 μm; odontophore = 46 μm; spear = 88 μm; spicules = 77 μm; supplement number = 15.

Cuticle with sharply demarcated thin outer layer; its thickness 4 μm in mid-body, 6 μm in anterior part of neck and 9 μm on base of female tail. Lips partly amalgamated, slightly offset from neck; the papillae of the inner circle protrude slightly. Length of odontostyle equal to twice width of lip region; in specimens lying in lateral position the odontostyle is distinctly sinuate. Guiding ring "double". Anterior surface of lip region slightly concave.

Female : Vulva longitudinal. Details of genital tubes

invisible. Tail with two pairs of papillae as illustrated by Micoletzky.

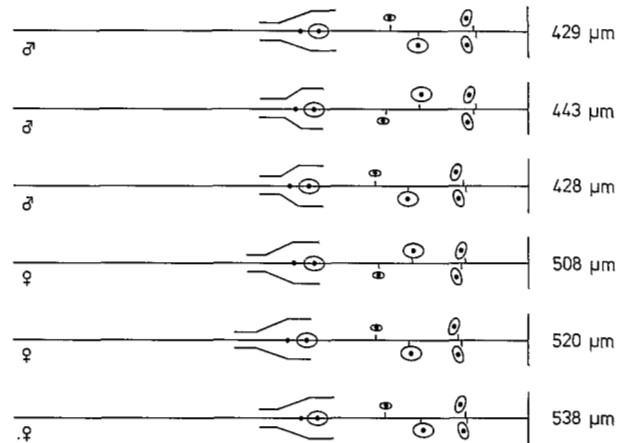
Male : Genital tubes invisible. Spicules dorylaimid, with lateral guiding pieces 22 μm long. Prerectum rather short, always joining the intestine proper within reach of the supplement series.

Micoletzky reported this species from East Africa : Kilimanjaro and East Usambura. I found it in Kenya. Dimensions :

Females (n = 15) : L = 1.83-2.57 mm; a = 29-44; b = 3.9-5.0; c = 3.7-6.0; V = ¹¹⁻¹⁵40-48¹³⁻¹⁸; odontostyle = 29-36 μm; odontophore = 30-33 μm; spear = 62-67 μm; c' = 10-16; tail = 371-535 μm.

Males (n = 13) : L = 1.60-2.03 mm; a = 26-41; b = 3.3-4.4; c = 6.0-10.5; odontostyle = 27-32 μm; odontophore = 27-34 μm; spear = 54-63 μm; c' = 4.3-6.1; tail = 175-266 μm; spicules = 56-77 μm; supplement number = 13-17; junction of prerectum with intestine proper from 32 μm anterior, to 70 μm posterior to anterior supplement; only in two specimens this junction lies anterior to first supplement.

Oesophageal characters (three females, three males) : The oesophagus begins to widen at 47-53 % and attains its full width at 53-58 % of its length from head end. DO lies at, or slightly anterior to, the former level, the distance DO-DN is 13-20 μm. The S₁N lie farther apart than in other species of the genus; the anterior one is small and indistinct. The S₂N are mostly elongate instead of round, and lie more or less transversely. DN measures 9-12 × 4-6 μm, nucleolus 3-4 μm; S₁N₁ 6 × 3 μm, nucleolus 2 μm (n = 1); S₁N₂ 10-14 × 5-7 μm, nucleolus 3-4 μm; S₂N 7 × 7 μm, nucleolus 3 μm, to 6-12 × 3-5 μm, nucleolus 3 μm.



1 *Prodorylaimus paralongicaudatus*

Locations .	dist. 5.4-7.6 %;
DO 53-56 %;	S ₂ N 86-89 %;
DN 57-59 %;	S ₂ O 87-90 %;
DO-DN 2.9-3.8 %;	K = 64-72;
S ₁ N ₁ 70-73 %;	K' = 70-76.
S ₁ N ₂ 77-80 %;	

The further morphology agrees well with the type specimens. The end of the protoplasmic core in the tail is indistinct in all males and in several females; the core becomes discontinuous and gradually merges into the cavity. In the other females the length of the core is 60-69 % of tail length.

The male tail is bent sharply ventrad at the apex of the tapering basal part. One male has a short tail with perfectly rounded tip, probably due to some trouble during the last moult. Zullini (1973) observed the same phenomenon in his *P. andrassyi*.

The above specimens were collected at Nairobi, Thika and Muguga. At Nairobi seven females were found of a smaller form with shorter odontostyle: L = 1.58-1.93 mm; a = 35-42; b = 4.2-4.9; c = 3.9-4.5; c' = 15-19; V = ¹¹⁻¹³42-47¹¹⁻¹³; odontostyle = 23-25 μ m; odontophore = 24-26 μ m; spear = 47-51 μ m; tail = 374-496 μ m.

Baqri and Coomans (1973) reported specimens from Zaïre (identified as *Dorylaimus filiformis* Bastian, 1865 by Schuurmans Stekhoven and Teunissen, 1938) with excessively long tails: male 505 μ m (but tail incomplete), females 845-895 μ m. I could examine the specimens. Only one female is in good condition, vulva position (37-40) is accounted for by the very long tail, the vulva does not look clearly different from that of the types and the Kenyan specimens; supplement number is 20. The further morphology agrees fairly well. Therefore I prefer to regard the Zaïre specimens as a long-tailed variant of *P. paralongicaudatus*.

Prodorylaimus filiarum Andrassy, 1964

= *Prodorylaimus* sp. *apud* Loof & Coomans, 1970
(Fig. 3 H-N; diagr. 2)

Male, holotype: L = 1.54 mm; a = 38; b = 5.2; c = 7.6; VD = ¹⁰49; odontostyle = 20 μ m; odontophore = 24 μ m; spear = 44 μ m; c' = 8.7; spicules = 48 μ m; supplement number = 17; prerectum extends 72 μ m anterior to anterior supplement; tail = 204 μ m.

In various localities in the Netherlands I found a *Prodorylaimus* species which was identified as *P. filiarum* despite the generally greater body length; the holotype is, however, not very well fixed, which may account for its relatively small size.

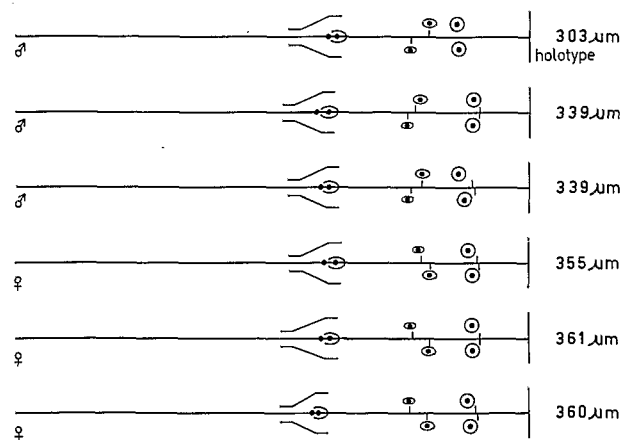
Females (n = 21); L = 1.75-2.25 mm; a = 41-52; b = 5.4-6.5; c = 5.5-7.9; c' = 10-16; V = ¹²⁻²¹42-48¹²⁻²⁰; odontostyle = 18-20 μ m; odontophore = 27-30 μ m; spear = 46-50 μ m; tail = 260-388 μ m.

Males (n = 16): L = 1.64-2.28 mm; a = 40-55; b = 5.4-6.7; c = 6.1-8.4; c' = 9-13; VD = ⁸⁻¹⁷37-42⁷⁻¹⁴; odontostyle = 18-20 μ m; odontophore = 27-30 μ m; spear = 46-50 μ m; spicules = 46-56 μ m; supplement

number = 16-21; length of prerectum = 136-212 μ m; prerectum-intestine junction 18-78 μ m anterior to anterior supplement; tail = 242-364 μ m.

Body outstretched except posterior part of male, which is curved ventrad. Body width at base of oesophagus is about equal to maximum body width, and about 4 \times width of lip region; maximum body width is 1.6-1.9 \times anal body width. Cuticle smooth, with sharply demarcated outer layer; its thickness 2 μ m, increasing to 4 μ m on base of female tail. Lateral chord about one-third of body width. Amphids goblet-shaped, two-thirds of corresponding body diameter wide; the aperture is slightly sinuate. Lip region offset by a depression, truncate; lips amalgamated, the papillae do not protrude, but give the lip region an angular contour. Length of odontostyle 1.6-1.8 \times width of lip region; the aperture occupies about one-third of its length. Odontophore linear. Guiding ring "double", anterior ring delicate and sometimes difficult to see. The nerve ring surrounds the oesophagus at 37-40 % of its length from head end. Cardia conoid, 18-22 μ m long, 10-12 μ m wide at base.

Oesophageal characters (two males, four females): The oesophagus begins to widen at 53-58 % and attains its full width at 59-60 % of its length from head end. DO lies at, or slightly anterior to, the latter level; the distance DO-DN is 4-7 μ m. The two S₁N lie a small distance apart, the anterior one is smaller. DN measures 6-7 \times 3-4 μ m, nucleolus 2.0-2.5 μ m; S₁N₁ 4 \times 2.5 μ m, nucleolus 1 μ m; S₁N₂ 8.5-9 \times 2.5-4 μ m, nucleolus 2 μ m; S₂N 4-5 μ m, nucleolus 2 μ m. Locations:



2. *Prodorylaimus filiarum*

DO 57-60 %;	dist. 2.2-4.0 %
DN 58-62 %;	S ₂ N 88-90 %
DO-DN 1.1-2.1 %	S ₂ O 89-92 %
S ₁ N ₁ 75-77 %	K = 80-88
S ₁ N ₂ 78-80 %	K' = 81-89.

Female: Vulva longitudinal, vagina sclerotized, about one-half body width deep. Genital tubes two, opposed,

reflexed, ovaries long. Uteri packed with sperm. Dimensions of two intra-uterine eggs : 90-96 × 33-34 μm. Tail convex first, then tapering to filiform terminus. Core 203 μm (182-275) or 73 % (66-80) of tail length. Three pairs of caudal papillae (one subventral, two subdorsal). Rectum 1.2-1.6 anal body diameter, prerectum 2.7-4.5 anal body widths long.

Male : Testes two, dorylaimid. Spicules dorylaimid, with lateral guiding pieces 9-11 μm long. Supplements contiguous. Tail bent at base over about 90°. Tail conoid first, then long filiform. Caudal papillae indistinct, except a subdorsal pair near the base of the filiform part. Submedian papillae very indistinct, probably about nine pairs.

The above description from specimens found in a moist meadow near Oegstgeest. Found also in similar habitats at Voorschoten, Leiderdorp, Geldermalsen and Deil, and on the island of Terschelling. Occurs often together with *P. acris*; the differentiating characters are exposed under that species.

Type habitat and locality : Bank of pond near *Carex* roots, Holdvilágárok, Hungary.

***Prodorylaimus acris* (Thorne, 1939) n. comb.**
(Fig. 4; diagr. 3)

DIMENSIONS

Females (n = 19) : L = 1.45-2.08 mm; a = 41-53; b = 4.7-5.5; c = 4.2-5.5; V = ⁷⁻¹¹40-43⁸⁻¹¹; odontostyle = 17-18 μm; odontophore = 22-25 μm; spear = 39-44 μm; c' = 14-20; tail = 306-419 μm.

Males not found.

DESCRIPTION

Body slender, almost straight in death; diameter at vulva equal to diameter at base of oesophagus and about 1.8 × anal body width; diameter at base of oesophagus is 3.5-4 × width of lip region. Cuticle with thin outer layer, the inner layer with very fine transverse striae; its thickness 2 μm, increasing to 4 μm on base of tail. Lateral chord one-fourth to one-fifth body width. Amphids goblet-shaped, just over one-half corresponding body width.

Lip region truncate with rounded edges, offset by a depression; lips partly amalgamated, the papillae not interfering with their contours. Length of odontostyle about 1.5-1.9 × width of lip region; the aperture occupies one-third of its length. Odontophore linear. Guiding ring "double". The nerve ring surrounds the oesophagus at 32-35 % of its length from head end. Cardia conoid, 18 × 12 μm.

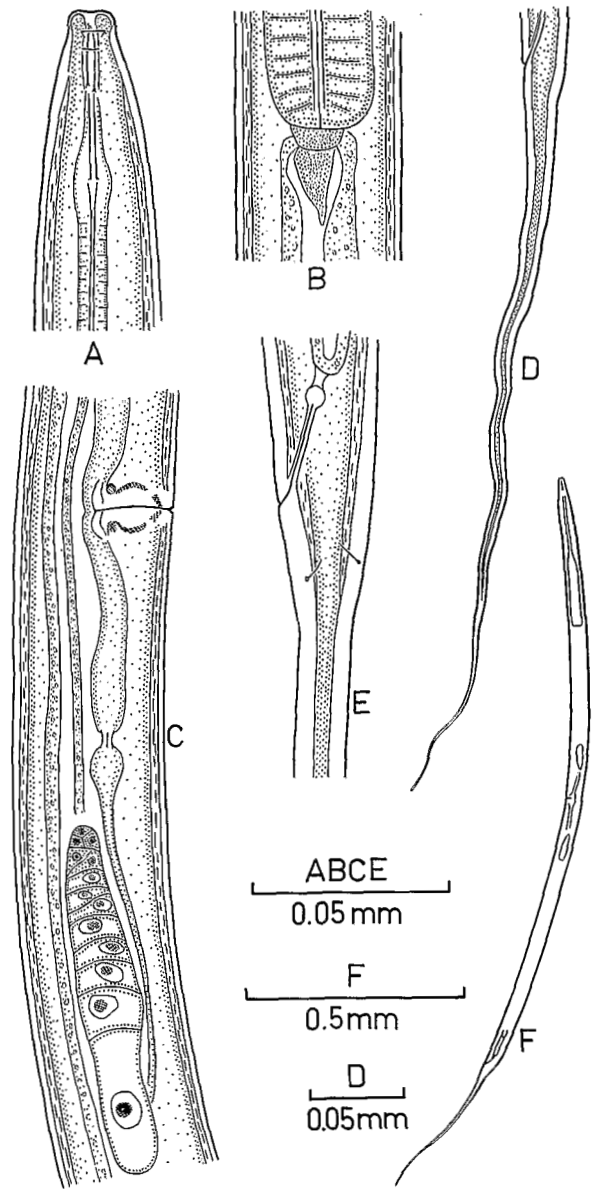
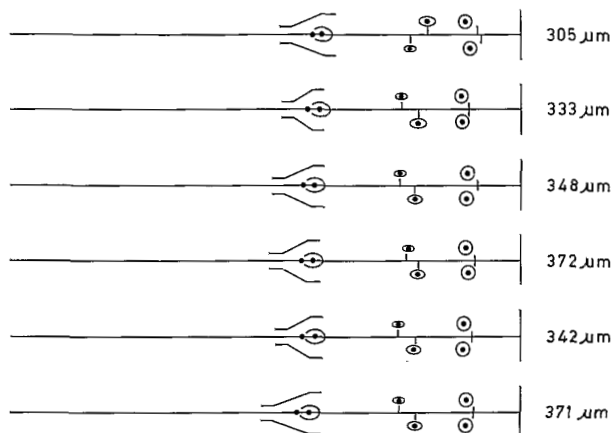


Fig. 4. *Prodorylaimus acris* (Thorne, 1939) n. comb. Female. A : anterior end; B : cardia; C : vulva and posterior genital tube; D : tail; E : tail base; F : entire specimen.

Oesophageal characters (five females) : The oesophagus begins to widen at 52-55 % and attains its full width at 58-59 % of its length from head end. DO lies slightly anterior to the latter level, the distance DO-DN is 7-8 μm. The S₁N lie a small distance apart, behind the middle of the distance DN-S₂N; the anterior one is smaller. DN measures 8.5 × 5 μm, nucleolus 4 μm; S₁N₁ 3 × 2 μm, nucleolus 1 μm; S₁N₂ 7 × 3 μm, nucleolus 2 μm; S₂N 4 μm, nucleolus 2 μm. Locations :

♀ 3. *Prodorylaimus acris*

DO 56-58 %	dist. 1.9-3.3 %
DN 59-60 %	S ₂ N 88-90 %
DO-DN 2.1-2.5 %	S ₂ O 90-92 %
S ₁ N ₁ 76-79 %	K = 84-90
S ₁ N ₂ 79-82 %	K' = 81-90

Vulva transverse, vagina about one-half body width deep. Genital tubes two, opposed, reflexed. Uteri rather short, without sperm. Dimensions of five intra-uterine eggs : 85-102 × 29-30 μm. Tail tapering first, then attenuated, becoming filiform distally. Core 259 μm long (213-311), or 72 % (68-75) of tail length. Two pairs of caudal papillae. Rectum 1.3-2.0 anal body widths long, prerectum 2.0-3.0 anal body widths.

Found in the Netherlands in moist meadows at Wassenaar, Voorschoten, Leiden, Oegstgeest, Olst, Middelburg, Zaltbommel, Emmeloord; furthermore in the Dolomites, Italy; Artern, German Democratic Republic; Marcelin, Switzerland; St. Emilion, France; and Hopfgarten, Austria. The vulva may lie as far forward as 38 %.

This species is very similar to *P. filiarum*, with which it often is found together. It is, however, monosexual. Females can be distinguished by the transverse vulva, uteri without sperm, shorter genital tubes, longer tail ($c = 4-6$ vs $6-8$); more anterior vulva (38-43 vs 42-48) and shorter prerectum (2-3 anal body widths vs 3-4.5).

***Prodorylaimus nyongi* (Altherr, 1960) n. comb.**
(Fig. 5; diagr. 4)

The holotype was available for study. It is in fair condition, though much flattened, being mounted in glycerin jelly without supporting glass rods. Dimensions : L = 3.82 mm; a = 39; b = 6.1; c = 14.4 (part of the tail is missing); V = ¹⁶41¹⁹; odontostyle = 34 μm; odontophore = 52 μm; spear = 86 μm. Cuticle in mid-body 5 μm thick, increasing towards head end to

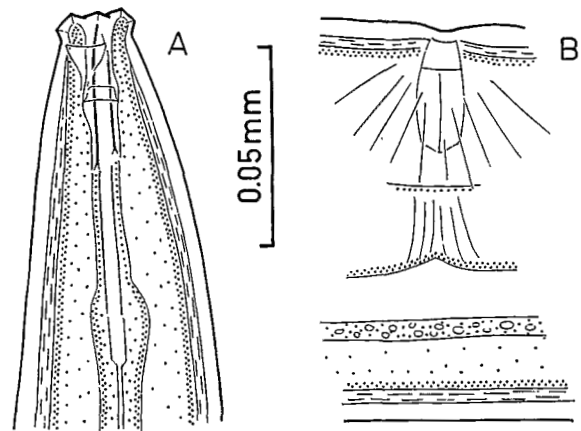
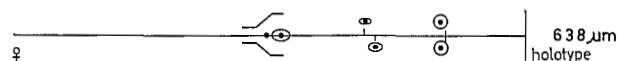


Fig. 5. *Prodorylaimus nyongi* (Altherr, 1960) n. comb. Holotype female. A : anterior end; B : vulva.

6 μm and on basal part of tail also to 6 μm. Layering weakly developed; inner layer with very fine transverse striae. Lateral chord now one-fourth body width (one-third according to original description). Amphids about one-half the corresponding body diameter wide. Lip region offset by a constriction, lips partly amalgamated; papillae of outer circle hardly protruding. Body width at base of oesophagus is now 5.3 × width of lip region. Length of odontostyle = 1.9 × width of lip region; the aperture occupies 40 % of its length. The nerve ring surrounds the oesophagus at 26 % of its length from head end. The oesophagus has a slight swelling anteriorly. It begins to widen at 47 % of its length, and attains its full width at 50 % of its length from head end. DO lies just anterior to the latter level, the distance DO-DN is 19 μm. The S₁N lie a small distance apart behind the middle of the distance DN-S₂N. The latter lie far from the base of the oesophagus. Locations :

4. *Prodorylaimus nyongi*

DO 50 %	dist. 2.1 %
DN 53 %	S ₂ N 83.5 %
DO-DN 3.1 %	S ₂ O 84 %
S ₁ N ₁ 69 %	K = 88
S ₁ N ₂ 71 %	K' = 90

Guiding ring "double", 4 μm long, posterior rim lying 20 μm or 1.1 × width of lip region from head end. Cardia conoid, 34 μm long. Vulva longitudinal, vagina 40 % of body width deep. Details of genital tubes indistinct owing to flattening. Uteri packed with sperm, separated from oviduct by a sphincter. Body pores invisible except the two anterior ventral ones. Rectum

as long as anal body width, prerectum 222 μm long or $6.3 \times$ rectum. The present tail length is 7.5 anal body widths; probably not much is missing.

Locality : River bank, Nyong, Cameroon.

Because of absence of longitudinal ridges on the cuticle this species is herewith transferred from *Dorylaimus s. str.* to *Prodorylaimus*.

Prodorylaimus dahli (Altherr, 1960) Andrassy, 1964
(Fig. 6; diag. 5)

One female and two males were available for study.
Dimensions :

Female : L = 3.31 mm; a = 43; b = 5.5; c = 7.8;
V = $^{13}39^{16}$.

Males : L = 2.86-2.90 mm; a = 41-44; b = 4.9-5.2;
c = 15; VD = $^{8-13}49-51^{8-13}$.

Specimens flattened, but generally in good condition. Cuticle 3 μm thick, increasing to 6 μm on basal part of tail; not thickened near the lip region. Transverse striae extremely fine and indistinct. No distinct layers visible. Lateral chord one-sixth of body width (one-fifth originally). No body pores seen except immediately behind lip region. The latter is offset by a very slight depression, angular, lips partly fused, the papillae protruding very little. Odontostyle 34-35 μm long, the aperture occupying about one-third of its length; its width 6 μm ; its length equal to twice the width of the lip region. Odontostyle slightly sinuate. Odontophore weakly demarcated, apparently 46 μm long. Characters of guiding ring uncertain, because all specimens have the odontostyle protruded, but species with such long odontostyles usually have a "double" guiding ring, though it must be remarked that Altherr says the guiding ring is single. The nerve ring surrounds the oesophagus at 35 % of its length from head end. Commissure fibers are visible ventrally, but a clear hemizonid is not visible. Cardia conoid, 30 μm long.

The oesophagus begins to widen at 49-53 % and attains its full width at 53-56 % of its length from head end. DO lies slightly anterior to the latter level, the distance DO-DN is 6-11 μm . The S_1N lie relatively far apart, behind the middle of the distance DN- S_2N ; both are distinct, though the anterior one is somewhat smaller. S_2N well developed. S_1N_1 measures $7 \times 3 \mu\text{m}$, nucleolus 1.5 μm ; S_1N_2 $10-11 \times 4 \mu\text{m}$, nucleolus 2-2.5 μm ; S_2N 6-8 μm , nucleolus 2.5 μm .

Female : Vulva longitudinal, vagina nearly one-half body width deep. Genital tubes paired, opposed, reflexed; sperm apparently present in vaginal part of uteri. No sphincter seen. Four intra-uterine eggs measure $73-80 \times 34-43 \mu\text{m}$. Tail tapering first, then filiform,

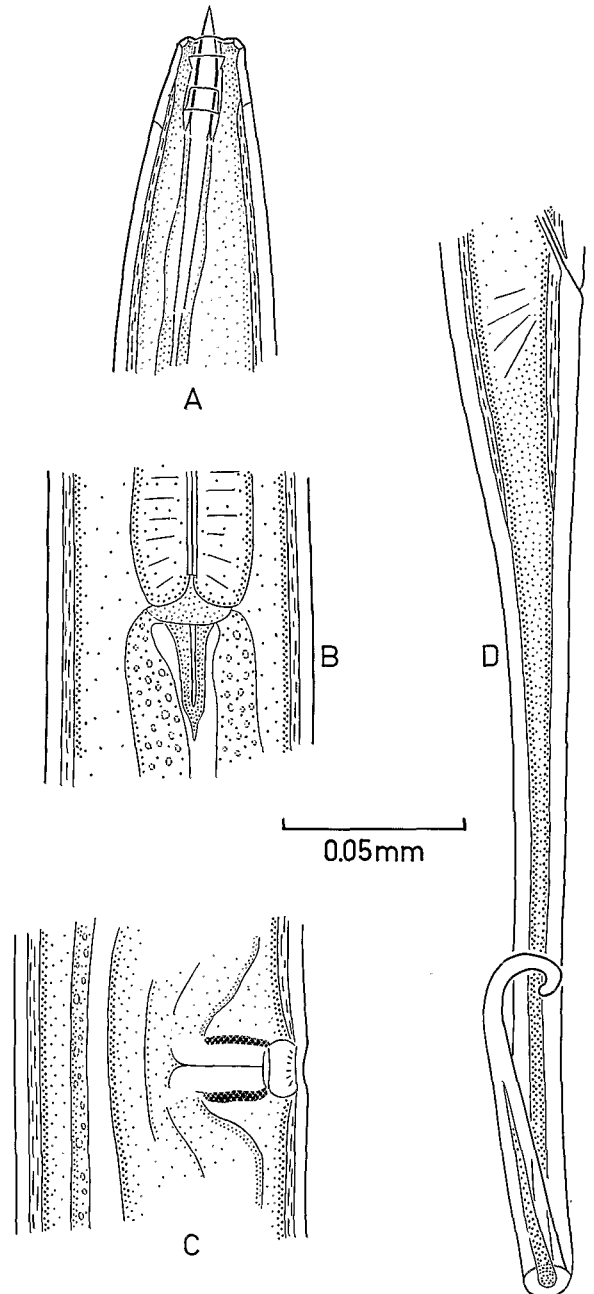
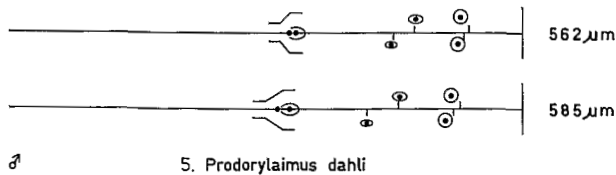


Fig. 6. *Prodorylaimus dahli* (Altherr, 1960) Andrassy, 1964. Female. A : anterior end; B : cardia; C : vulva; D : tail.

11.7 anal body widths long. Rectum and prerectum each 1.9 anal body diameters long.

Male : Testes two, dorylaimid; spicules dorylaimid, 68 μm long, lateral guiding pieces not visible. Apart from the adanal pair there is a row of 16-18 contiguous supplements, occupying a length of 113-119 μm ; the

5. *Prodorylaimus dahli*

Locations :

DO 52-55 %	dist. 4.9-6.6 %
DN 55-56 %	S ₂ N 85-88 %
DO-DN 1.3-2.3 %	S ₂ O 87-89 %
S ₁ N ₁ 69-75 %	K = 69-79
S ₁ N ₂ 76-80 %	K' = 72-83

posterior supplement lies 85-88 μm from the cloacal aperture. Submedian papillae 9 pairs. Length of pre-rectum 170-198 μm ; in one male it extends to the third supplement from anterior, in the other till 30 μm beyond the anterior supplement. Tail length equal to 4.3-5.1 anal body widths. Proximal part of tail conoid, the distal part filiform, offset sharply; at the junction the tail is bent ventrad sharply.

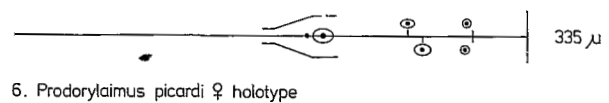
Described from vegetation cushions hanging from a rock, moistened by a fall, Nyong, Mpoumé, Cameroon.

***Prodorylaimus picardi* (Altherr, 1963) n. comb.**
(Fig. 7 A-E; diagr. 6)

The holotype was available for study. Dimensions :

Female : L = 1.46 mm; a = 35; b = 4.3; c = 4.4; V = ¹³43¹³; c' = 15; odontostyle = 23 μm ; odontophore = 28 μm ; spear = 61 μm ; tail = 332 μm . The specimen is in fairly good state, though here and there slightly deformed. The abnormal shape of the anterior part of the neck (as illustrated by Altherr) may be attributed to alcohol fixations : Altherr himself remarked that many specimens of the collection in question showed malformations. Odontostyle sinuate, guiding ring double. Cardia elongate-conoid, 11 μm wide at base. Vulva longitudinal. Ovaries very long, with numerous oocytes, the anterior ovary extending to vulva, the posterior one beyond it. No sperm.

Oesophageal characters : The oesophagus begins to widen at 51 % and attains its full width at 58 % of its length from head end. DO lies slightly anterior to the latter level, the distance DO-DN is 10 μm . The S₁N lie a small distance apart, behind the middle of the distance DN-S₂N; the anterior one is smaller than the posterior one.

6. *Prodorylaimus picardi* ♀ holotype

Locations :

DO 57 %	dist. 3.0 %
DN 60 %	S ₂ N 88 %
DO-DN 3.0 %	S ₂ O 89 %
S ₁ N ₁ 77 %	K = 85
S ₁ N ₂ 80 %	K' = 87

Found at Dogneville, France, bank of Moselle River.

***Prodorylaimus rionensis* (Gerlach, 1954)**
Andrássy, 1959
(Diagram 7)

Gerlach described this species from the bank of the lagoon Rodrigo de Freitas, near Rio de Janeiro, Brazil. Kleynhans (1970) redescribed it from specimens found in South Africa. There is good agreement between the two descriptions except in one point : Kleynhans gave odontostyle length as 27-30 μm and odontophore length as 42-46 μm , resulting in a total spear length of 70-75 μm , whereas Gerlach gave total spear length as 55 μm and from his illustrations lb and ld odontostyle length can be calculated as 20-21 μm . Dr F. Riemann, Bremerhaven, Germany, kindly lent me a type slide. The specimens are in poor condition. Dimensions :

One male : L = 2.99 mm; a = 45; b = 5.7; c = 28; VD = ⁶48⁷; odontostyle = 35 μm ; odontophore = 37 μm ; spear = 72 μm ; spicules (along axis) = 77 μm ; number of ventromedian supplements : 18; c' = 3.1; prerectum = 324 μm , extending to 218 μm anterior to anterior end of supplement series.

Three females : L = 2.50-3.23 mm; a = 37-39; b = 4.5-5.8; c = 21-27; V = ¹¹⁻¹⁶45-47¹⁴⁻¹⁵; odontostyle = 34-36 μm ; odontophore = 41-42 μm ; spear = 75-78 μm ; c' = 2.9-4.1; rectum/ABW = 1.2 (n = 1); prerectum/rectum = 5.0 (n = 1); prerectum = 228 μm (n = 1).

Dr Kleynhans also lent me some of his specimens. Dimensions :

Two males : L = 3.17-3.76 mm; a = 60-62; b = 5.3-6.3; c = 21-25; c' = 3.3-3.8; VD = ¹²⁻¹⁶47-49¹⁰⁻¹³; odontostyle = 31 μm ; odontophore = 36 μm ; spear = 67 μm ; spicules (along axis) = 74 μm ; number of ventromedian supplements = 20-22; prerectum = 451 μm , extending 210 μm anterior to anterior supplement (n = 1).

Two females : L = 3.05-3.26 mm; a = 47-52; b = 5.1-5.9; c = 25-26; c' = 3.2-3.3; V =

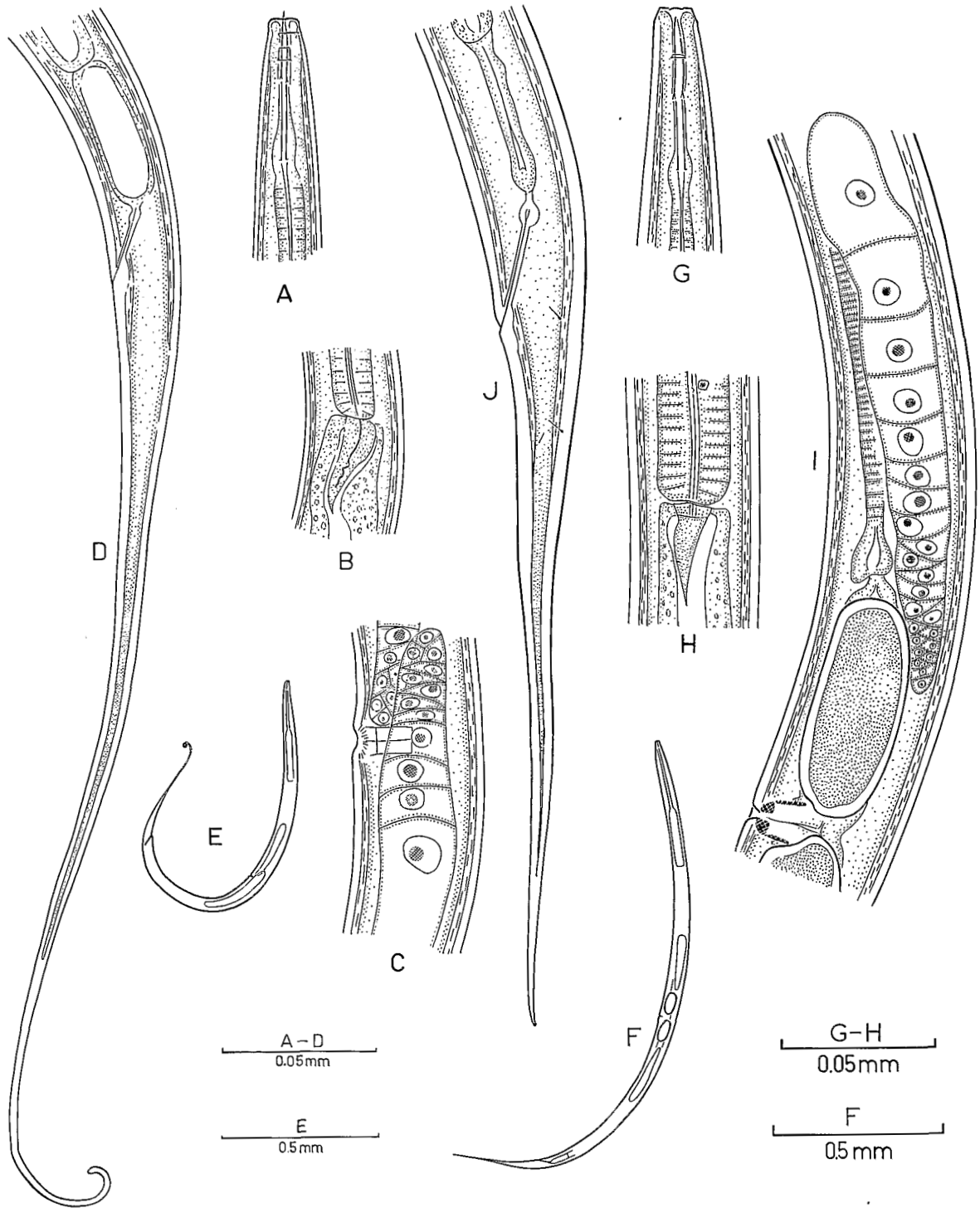
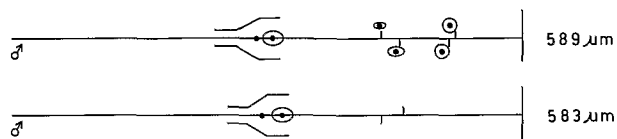


Fig. 7. A-E : *Prodorylaimus picardi* (Altherr, 1963) n. comb. Holotype female. A : anterior end; B : cardia; C : vulva region; D : tail; E : entire specimen. — F-J : *Prodorylaimus renwicki* (van der Linde, 1938) n. comb. Female. F : entire specimen; G : anterior end; H : cardia; I : vulva and anterior genital tube; J : tail.

¹⁴⁻¹⁵46-48¹⁵⁻¹⁶; odontostyle = 32 μm ; odontophore = 38-40 μm ; spear = 70-72 μm ; rectum/ABW = 1.3; prerectum/rectum = 5.6-6.1; prerectum = 282-300 μm .

Oesophageal gland nuclei and orifices, visible in two males from South Africa only:

The oesophagus begins to widen at 45-46 % and attains its full width at 48-49 % of its length from head end. DO lies about the latter level, the distance DO-DN is 17-23 μm . The S_1N lie a small distance apart behind the middle of the distance DN- S_2N ; the anterior one is smaller than the posterior one. DN measures 15 \times 10 μm , nucleolus 4 μm ; S_1N_1 7 \times 5 μm , nucleolus 2.5 μm ; S_1N_2 10 \times 6 μm , nucleolus 3 μm ; S_2N 6 \times 10 μm , nucleolus 3.5 μm . Locations:



7. *Prodorylaimus rionensis*

DO 48-49 %	dist. 2.8 %
DN 51-53 %	S_2N 84-85 %
DO-DN 2.8-3.9 %	S_2O 85-87 %
S_1N_1 72 % (n = 1)	K = 88 (n = 1)
S_1N_2 76 % (n = 1)	K' = 82-86.

Thus odontostyle length in the South African and in the South American specimens is identical. The former specimens are conspicuously slenderer, but the latter are in poor condition and flattened. Further morphology agrees well.

Prodorylaimus renwicki

(van der Linde, 1938) n. comb.

(Fig. 7 F-J; diagr. 8)

DIMENSIONS

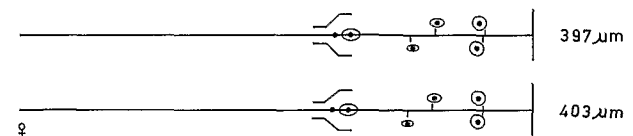
Two females: L = 1.60-1.64 mm; a = 35-37; b = 4.2-4.3; c = 7.7-8.1; V = ¹¹⁻¹⁵50-53¹⁰⁻¹⁵; odontostyle = 27-29 μm ; odontophore = 25-27 μm ; spear = 52-56 μm ; c' = 7.5-7.8; tail = 197-213 μm ; rectum = 39-41 μm or 1.5 anal body widths; prerectum = 51-56 μm .

One female with abnormally short (malformed) tail: L = 1.54 mm; a = 35; b = 4.1; c = 13.2; V = ¹⁸56¹⁴; odontostyle = 27 μm ; odontophore = 25 μm ; spear = 52 μm ; c' = 4.6; tail = 117 μm ; rectum = 39 μm ; prerectum = 48 μm .

Body moderately slender, curved ventrad in death; tail curved only slightly in proximal part, then straight. Cuticle smooth externally, with fine transverse striae internally; 3 μm thick in mid-body, 2.5 μm in anterior

part of neck and 6 μm on base of tail. Lateral chord one-fourth of body diameter. Width of amphids not exactly determinable, as all specimens have the head end slightly twisted. Lip region amalgamated, continuous, outer papillae large, giving lip region an angular contour. Length of odontostyle over twice width of lip region. The odontostyle is slightly sinuate, the aperture occupies less than one-quarter of its length. Odontophore simple, linear. Guiding ring double. The nerve ring surrounds the oesophagus at about 40 % of its length from head end. Cardia conoid, 10 μm wide at base, 30 μm long.

The oesophagus begins to widen at 59-60 % and attains its full width at 63 % of its length from head end. DO lies slightly anterior to the latter level, the distance DO-DN is 12-13 μm . The S_1N lie rather far apart, the anterior one is small and indistinct. Locations:



8. *Prodorylaimus renwicki*

DO 61-62 %;	dist. 4.5-4.6 %;
DN 65 %;	S_2N 89-90 %;
DO-DN 3.0-3.3 %;	S_2O 90-91 %;
S_1N_1 76-77 %;	K = 69-73;
S_1N_2 81-82 %;	K' = 75.

Intestine polycytous. Vulva longitudinal, vagina one-half body width deep. Genital branches two, opposed, reflexed, ovaries very long; uteri without sperm. Dimensions of three intra-uterine eggs: 70-73 \times 25-29 μm . Tail attenuated, tapering to finely rounded terminus. Length of core in the two normal specimens: 138-165 μm = 71-77 % of tail length.

Collected August 1967 by Mrs H. Sanders from moss along Lake of Brienz, Switzerland, southern shore, between Fuhren and Isch (municipality of Isseltwald).

Prodorylaimus sp.

(Fig. 8 A-C)

An isolated male was found in *Citrus* soil, Lagos, Nigeria, which is of interest because it combines a *Drepanodorylaimus*-shaped odontostyle with an elongated male tail and low supplement number. Dimensions:

L = 1.33 mm; a = 40; b = 4.6; c = 4.0; c' = 16; VD = ⁶32⁶; odontostyle = 23 μm ; odontophore = 25 μm ; spear = 48 μm ; tail = 330 μm ; spicules = 35 μm (along axis); number of ventromedian supplements = 9. The prerectum measures 97 μm and joins intestine proper at level of second supplement from

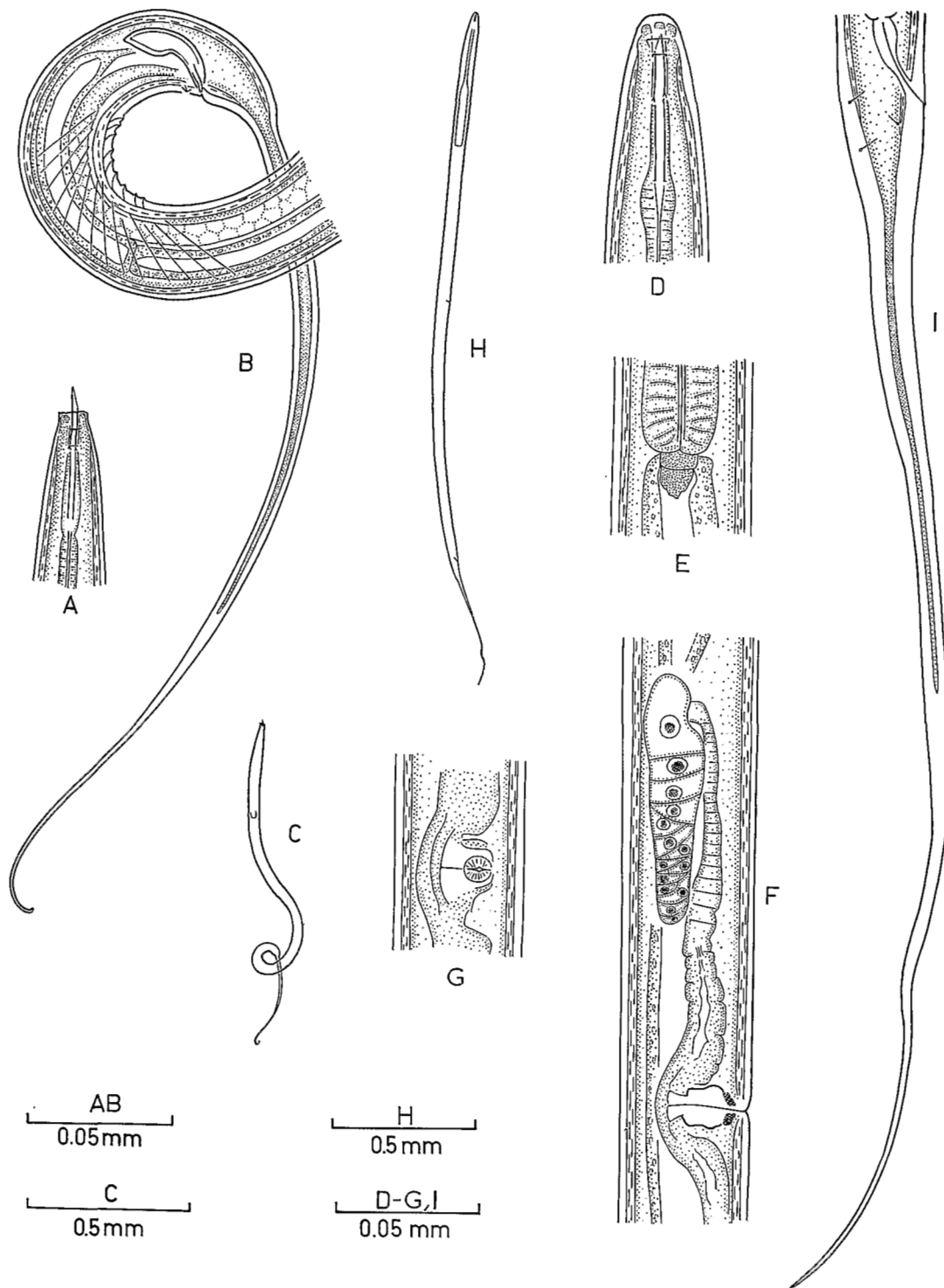


Fig. 8. A-C : *Prodorylaimus* sp. Male, from Nigeria. A : anterior end; B : posterior part; C : entire specimen. — D-I : *Prodorylaimus uliginosus* n. sp., Female. D : anterior end; E : cardia; F : vulva and anterior genital branch; G : ventral view of vulva; H : entire specimen; I : tail.

anterior. Length of odontostyle = $2.4 \times$ width of lip region; odontostyle distinctly sinuate. Lip region truncate, continuous, contour somewhat angular. The supplements are spaced, though this is masked by the very strong curvature of the body in the precloacal region.

The identity of this specimen is uncertain. It resembles *P. picardi* (Altherr, 1963) through general dimensions and hooked terminus, but *P. picardi* was described from the North of France, from females only.

***Prodorylaimus uliginosus* n. sp.**
(Fig. 8 D-I; diagr. 9)

DIMENSIONS

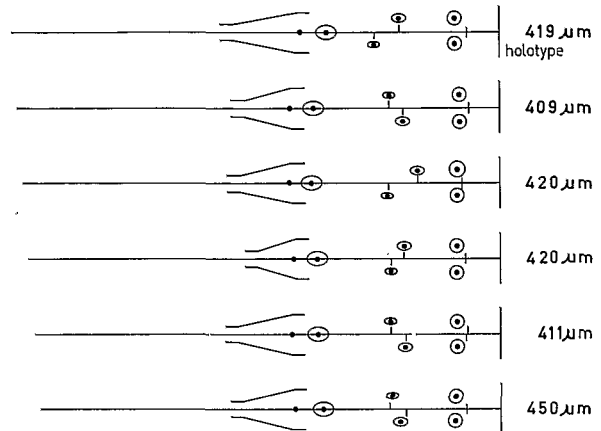
Females (n = 26) : L = 2.23 mm (2.03-2.44); a = 44 (39-49); b = 5.2 (4.6-5.9); c = 6.1 (5.2-7.9); V = 42 (39-44); G₁ = 10 (6-14); G₂ = 10 (7-13); odontostyle = 25 μ m (23-26); odontophore = 37 μ m (33-40); spear = 62 μ m (58-65); c' = 13.4 (10.9-15.7); tail length = 373 μ m (312-430).

Female, holotype : L = 2.20 mm; a = 46; b = 5.1; c = 5.5; V = ¹⁰41; odontostyle = 24 μ m; odontophore = 40 μ m; spear = 64 μ m; c' = 14.4; tail length = 397 μ m.

DDESCRIPTION

Body slender, almost straight when relaxed. Diameter at base of oesophagus about $3.4 \times$ width of lip region; anal body width 55-64 % of maximum body width. Cuticle with very fine transverse striae; with thin, sharply demarcated outer layer; its thickness 2.0-2.5 μ m in mid-body, 3 μ m on neck and 6 μ m on base of tail. Lateral chord one-fifth of body width in mid-body. Lip region continuous, lips amalgamated; papillae not protruding but giving lip region a slightly angular contour. Amphids goblet-shaped, half corresponding body width. Length of odontostyle equal to $1.7 \times$ width of lip region. In most specimens the odontostyle is slightly curved; the aperture occupies one-third of its length. Odontophore simple, linear. Guiding ring « single », located 12 μ m or less than lip region width, from anterior end. Oesophagus widened gradually. Cardia irregular, short, 12 μ m long. Intestine probably six cells to a circumference.

Oesophageal characters (six females) : The oesophagus begins to widen at 47-51 % and attains its full width at 59-61 % of its length from head end. DO lies about the latter level, the distance DO-DN is 17-28 μ m. The S₁N lie a small distance apart, behind the middle of the distance DN-S₂N. The latter lie close to the base of the oesophagus. S₁N₁ is smaller than S₁N₂ but distinct. DN measures 10-12 \times 4-7 μ m, nucleolus 3-6 μ m; S₁N₁ 5 \times 2 μ m, nucleolus 1 μ m; S₁N₂ 9-12 \times 5-6 μ m, nucleolus 3-4 μ m; S₂N 5-7 μ m, nucleolus 3 μ m. Locations :



9. *Prodorylaimus uliginosus*

DO 58-61 %;	dist. 2.9-5.8 %;
DN 62-66 %;	S ₂ N 91-93 %;
DO-DN 3.8-6.7 %;	S ₂ O 92-94 %;
S ₁ N ₁ 78 % (n = 2);	K = 72-83;
S ₁ N ₂ 81-84 % (n = 2);	K' = 77-87.

Vulva transverse, vagina sclerotized, about 60 % of body width deep. Genital tubes two, opposed, reflexed. Uteri without sperm. Dimensions of two intra-uterine eggs : 86-87 \times 36-38 μ m. Tail tapering first, then filiform; protoplasmic core 205 μ m (167-245) or 47 % (41-55) of tail length. Rectum 1.0-1.4 anal body widths long, prerectum 1.2-2.3 \times as long as rectum. Males not found and probably not occurring.

TYPE MATERIAL

Holotype : Female on slide WT 1315 of the collection of Wageningen Agricultural University, Wageningen, Netherlands. Paratypes : 22 females on slides WT 1316-1327 in the same collection; one female deposited at the USDA, Beltsville, Maryland, USA, and one at the Zoosystematical and Ecological Institute of the Eötvös Loránd University, Budapest, Hungary.

TYPE HABITAT AND LOCALITY

Soil on pond bank, overgrown with grasses and *Filipendula*, Deil, The Netherlands. Paratypes also from moist meadow soil, surroundings of Leiden. The species is widespread in the Netherlands in moist soil, and has been found also in Switzerland (banks of Morges River), Western Germany (Schwanheim Forest near Frankfurt am Main), Austria (Kufstein) and Northern Italy.

DIAGNOSIS

Prodorylaimus uliginosus resembles *P. mas* n. sp.; the

differentiating characters are exposed under that species.

Prodorylaimus mas n. sp.

= *P. longicaudatus* apud Loof & Coomans, 1970.

(Fig. 9; diagr. 10)

DIMENSIONS

Females (n = 9) : L = 1.85-2.39 mm; a = 42-51; b = 5.4-5.8; c = 5.8-7.7; V = ¹³⁻¹⁶43-48¹⁴⁻¹⁹; odontostyle = 22-25 μm; odontophore = 30-36 μm; spear = 52-61 μm; c' = 12.2-14.8; tail length = 292-366 μm.

Holotype, female : L = 2.30 mm; a = 51; b = 5.8; c = 6.7; V = ¹⁵48¹⁴; odontostyle = 24 μm; odontophore = 36 μm; spear = 60 μm; c' = 14.8; tail length = 341 μm.

Males (n = 4) : L = 2.17-2.28 mm; a = 52-58; b = 5.5-6.0; c = 6.4-6.9 (n = 3); VD = ¹²⁻¹⁵37-40⁹⁻¹⁶; odontostyle = 24-26 μm; odontophore = 31-36 μm; spear = 55-62 μm; c' = 12.0-13.3 (n = 3); tail length = 330-349 μm (n = 3); spicules (along axis) = 55-58 μm; number of supplements = 19-25; prerectum = 206-220 μm; prerectum extends 25-88 μm anterior to anterior supplement.

DESCRIPTION

Body outstretched when relaxed, except posterior part of male which is curved ventrad. Body tapering anteriorly, width of lip region is no more than one-quarter of body width at base of oesophagus. Cuticle with thin, sharply demarcated outer layer, with very fine transverse striae; its thickness only 1.5-2.0 μm in mid-body, increasing to 3 μm on neck and 4-6 μm on base of female tail. Lateral chord one-fourth of body width in midbody. Lip region offset by a depression; lips amalgamated, the papillae protrude so as to give the lip region an angular contour. Amphid aperture half corresponding body width. Length of odontostyle equal to twice width of lip region; the aperture occupies one-third of its length. Odontophore simple, linear. Guiding ring "double". The nerve ring surrounds the oesophagus at about 35% of its length from head end. Cardia small, conoid, 12 μm long.

Oesophageal characters (two males, four females) : The oesophagus begins to widen at 44-51% and attains its full width at 52-58% of its length from head end. DO lies near the latter level, the distance DO-DN is 7-12 μm. The S₁N lie a small distance apart, behind the middle of the distance DN-S₂N; the anterior one is smaller but generally distinct. S₂N relatively far from oesophagus base. DN measures 8-11 × 5-8 μm, nucleolus 4 μm; S₁N₁ 5 × 3 μm, nucleolus 2 μm; S₁N₂ 7-8 × 4 μm, nucleolus 3 μm; S₂N 6-7 μm, nucleolus 3 μm. Locations :

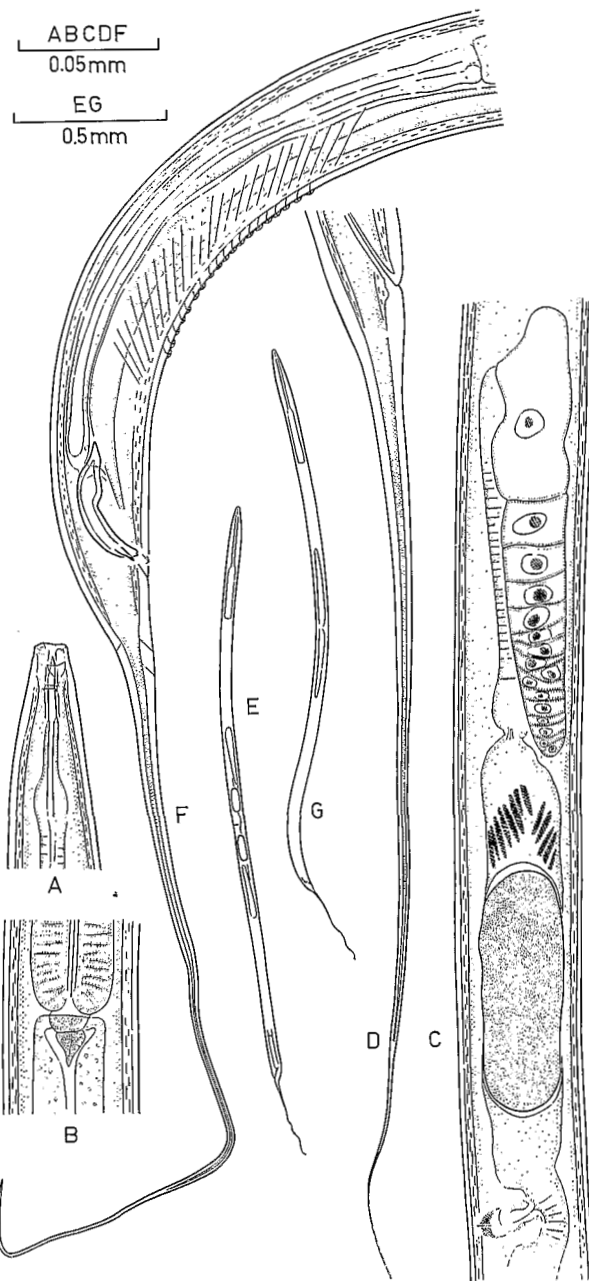
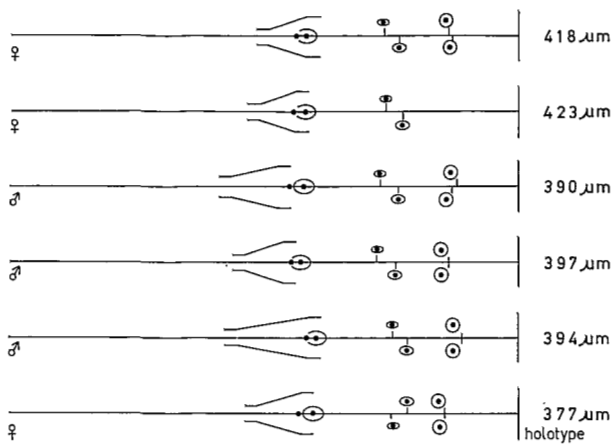


Fig. 9. *Prodorylaimus mas* n. sp. A : anterior end; B : cardia; C : vulva and anterior female genital tube; D : female tail; E : female, entire specimen; F : male, posterior part; G : male, entire specimen.

DO 55-58 %;	dist. 2.6-3.8 %;
DN 57-60 %;	S ₂ N 84-88 %;
DO-DN 1.8-3.1 %;	S ₂ O 85-89 %;
S ₁ N ₁ 72-76 %;	K = 75-85;
S ₁ N ₂ 76-79 %;	K' = 81-85.

10. *Prodorylaimus mas*

Female : Vulva transverse, vagina sclerotized, more than half body width deep. Genital tubes two, opposed, reflexed; ovaries very long; uteri filled with sperm. Dimensions of four intra-uterine eggs : 89-94 × 32-33 µm. Tail dorsally convex-conoid first, then filiform, tapering to very fine, terminus. Length of protoplasmatic core 282 µm (257-306) or 82 % (74-86) of tail length. Rectum slightly longer than anal body width, prerectum 89-105 µm long.

Male : Testes two, dorylaimid. Spicules dorylaimid, with lateral guiding pieces 13-15 µm long. The ventro-median supplements are contiguous, the posterior one lying almost three anal body width anterior to the cloacal aperture. Tail shape as in female; core 242-250 µm or 76-82 % of tail length.

TYPE MATERIAL

Holotype : Female on slide WT 1328. Paratypes : six females and four males on slides WT 1301, 1306, 1329-1335; one female deposited at the USDA, Beltsville, Maryland, USA and one at the Zoosystematical and Ecological Institute of the Eötvös Loránd University, Budapest, Hungary.

TYPE HABITAT AND LOCALITY

Ditch bank, one km northwest of Wageningen, The Netherlands. One female paratype from moist soil, Geldermalsen, Netherlands.

DIAGNOSIS

Through general dimensions and length of odontostyle this species resembles *P. uliginosus*. However, the two species differ by a number of clear-cut characters :

in *P. mas* n. sp. males are common, the female uteri contain sperm, the lip region is somewhat offset and more angular in shape; the odontostyle is slightly slenderer; the oesophagus is expanded more suddenly; the vulva is located more posterior, the female genital tubes and especially the ovaries are much longer, the distance DO-DN is much shorter, the S₂N are located more anteriorly, c and c' are lower, the prerectum is longer.

Prodorylaimus rotundiceps n. sp.

(Fig. 10; diagr. 11)

DIMENSIONS

Females (n = 21, four of which have the tail incomplete) : L = 2.53 mm (2.26-2.85); a = 56 (48-63); b = 6.1 (5.6-6.7); c = 5.1 (4.5-6.5); V = 38 (35-42); G₁ = 8 (5-13); G₂ = 10 (7-14); odontostyle = 20 µm (19-21); odontophore = 25 µm (22-26); spear = 45 µm (43-46); c' = 18.8 (15.2-22.6); tail length = 497 µm (407-561).

Holotype, female : L = 2.55 mm; a = 58; b = 6.0; c = 4.6; V = ⁶35⁸; odontostyle = 20 µm; odontophore = 26 µm; spear = 46 µm; c' = 20.8; tail length = 550 µm.

Males (n = 3; one within J-4 cuticle, one infested with fungi and large part of tail missing) : L = 2.04-2.65 mm; a = 51-60; b = 5.3-5.6; c = 6.3; VD = ¹⁰39¹¹; odontostyle = 19-20 µm; odontophore = 25-26 µm; spear = 45-46 µm; supplement number = 13-14; spicules = 58-60 µm; length of prerectum = 320 µm (n = 1), prerectum extends 165 µm anterior to anterior supplement (n = 1).

DESCRIPTION

Body very slender, slightly curved ventrad when relaxed; male body curved strongly ventrad in precloacal region. Cuticle with thin, sharply demarcated outer layer; with very fine transverse striae except on proximal part of tail where it is striated rather strongly; its thickness 3 µm in mid-body, increasing to 3.5 µm in neck region and 6-7 µm on base of tail. Lateral chord one-fourth of body width in mid-body. Body tapering strongly anteriorly, the diameter of the lip region being less than one-fourth of body width at base of oesophagus. Lip region wholly amalgamated, continuous, rounded, the papillae not interfering with its contour. Amphid apertures just over one-half of corresponding body diameter. Length of odontostyle about 1.5 × width of lip region, the aperture occupying one-third of its length. Odontophore simple, linear. Guiding ring "double". The nerve ring surrounds the oesophagus at 31-35 % of its length from head end. Cardia trapezoid, 13-14 µm long.

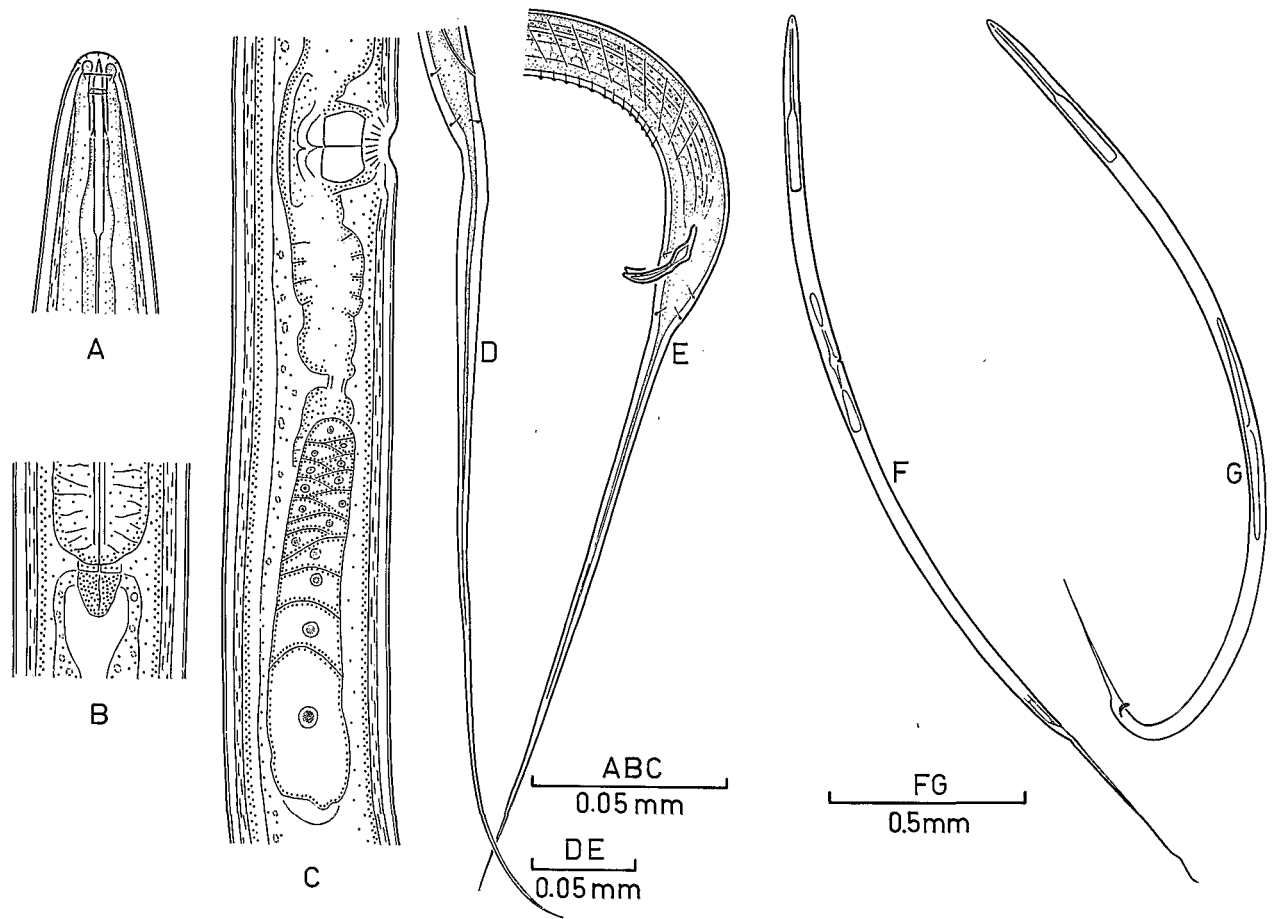
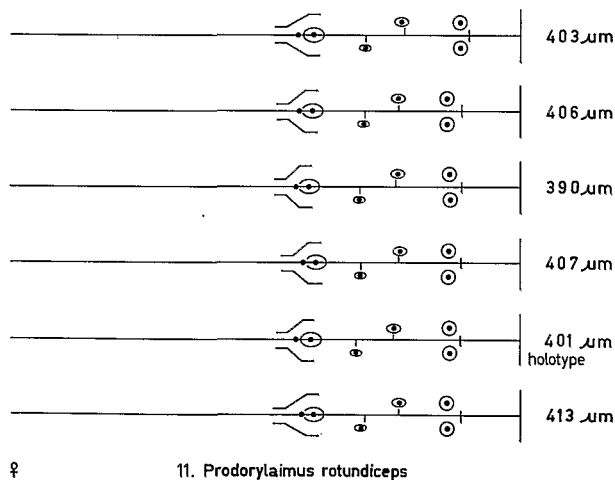


Fig. 10. *Prodorylaimus rotundiceps* n. sp. A : anterior end; B : cardia; C : vulva and posterior genital branch of female; D : female tail; E : male, posterior part; F : entire female; G : entire male.



♀

11. *Prodorylaimus rotundiceps*

Oesophageal characters (ten females) : The oesophagus begins to widen at 49-55 % and attains its full width at 51-60 % of its length from head end. DO lies slightly anterior to the latter level, the distance DO-DN is 9-12 μ m. The S_1N lie far apart; S_1N_1 is smaller, but both are mostly distinct. The S_2N lie relatively far anterior to the oesophagus base. DN measures 7-11 \times 5-6 μ m, nucleolus 2.5-3 μ m; S_1N_1 4 \times 2 μ m, nucleolus 1 μ m; S_1N_2 10-12 \times 4-5 μ m, nucleolus 3 μ m; S_2N 6-7 μ m nucleolus 2.5 μ m.

Locations :

DO 51-58 %;
 DN 54-61 %;
 DO-DN 2.0-3.0 %;
 S_1N_1 64-70 %;
 S_1N_2 73-77 %;

dist. 6.5-9.6 %;
 S_2N 85-88 %;
 S_2O 87-90 %;
 K = 54-61;
 K' = 59-66.

Female: Vulva longitudinal, vagina more than one-half body width deep. Genital tubes two, opposed, reflexed; uteri long, cellular, no sperm in uteri observed. Dimensions of six intra-uterine eggs: $113\text{-}134 \times 31\text{-}36 \mu\text{m}$. One of the eggs was in the anterior tube, so this is functional though generally shorter than the posterior one. Tail base strongly asymmetrical: the ventral contour is continuous with that of the body, the dorsal one is bent suddenly. Proximally the cuticle of the filiform part is much thicker than the core, especially ventrally. The tail ends in a setaceous terminus. Length of protoplasmic core $354 \mu\text{m}$ ($308\text{-}413$) or 72% ($69\text{-}77$) of tail length. Length of prerectum $97\text{-}134 \mu\text{m}$.

Male: Testes two, dorylaimid. Spicules dorylaimid, with lateral guiding pieces $14 \mu\text{m}$ long. Five pairs of caudal papillae: two subventral, two sublateral, one subdorsal.

TYPE MATERIAL

Holotype: Female on slide WT 1298. Paratypes: Three males and 18 females on slides WT 1299-1307; one female deposited at USDA, Beltsville, Maryland, USA, one female at the Zoosystematical and Ecological Institute of the Eötvös Loránd University, Budapest, Hungary.

TYPE HABITAT AND LOCALITY

Moist clay soil overgrown with grasses, ditch bank, Wageningen. Found also near Hillegom, Netherlands; and in moist soil near Morges River, Switzerland.

DIAGNOSIS

This species is easily recognized by the narrow, round, continuous lip region; longitudinal, anterior vulva; low value of K; and the very long tail with characteristic asymmetrical base.

Prodorylaimus dalmassoi n. sp.

(Fig. 11; diagr. 12)

DIMENSIONS

Females ($n = 4$): $L = 4.03\text{-}4.76 \text{ mm}$; $a = 73\text{-}81$; $b = 6.8\text{-}7.9$; $c = 9.4\text{-}14.1$ (the tail of the smallest female appears incomplete); $V = 9\text{-}1138\text{-}41^{9-10}$; odontostyle = $11\text{-}12 \mu\text{m}$; odontophore = $13\text{-}15 \mu\text{m}$; spear = $24\text{-}27 \mu\text{m}$; $c' = (9.6) 12.2\text{-}14.3$; tail length = (286) $404\text{-}504 \mu\text{m}$.

Holotype, female: $L = 4.76 \text{ mm}$; $a = 80$; $b = 7.9$; $c = 9.4$; $V = 1138^9$; odontostyle = $12 \mu\text{m}$; odontophore = $14 \mu\text{m}$; spear = $26 \mu\text{m}$; $c' = 14.3$; tail length = $504 \mu\text{m}$.

Males ($n = 2$): $L = 4.51\text{-}4.76 \text{ mm}$; $a = 65\text{-}80$ (one male appears somewhat flattened); $b = 7.8\text{-}8.1$; c

= $10.8\text{-}13.9$; $VD = 7\text{-}950\text{-}51^{6-9}$; odontostyle = $11\text{-}12 \mu\text{m}$; odontophore = $14 \mu\text{m}$; spear = $25\text{-}26 \mu\text{m}$; $c' = 8.5\text{-}10.1$; tail length = $317\text{-}442 \mu\text{m}$; spicules = $76\text{-}78 \mu\text{m}$; supplement number = $21\text{-}22$.

DESCRIPTION

Body extremely long and slender, curved about 90° in female, strongly bent ventrad in the precloacal region in

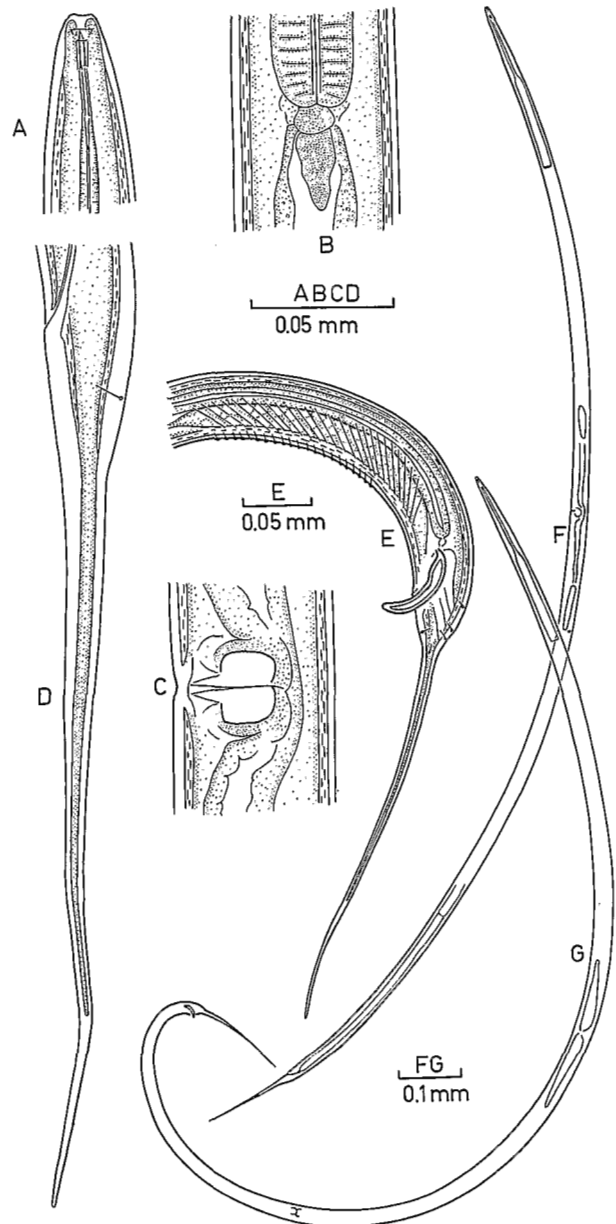
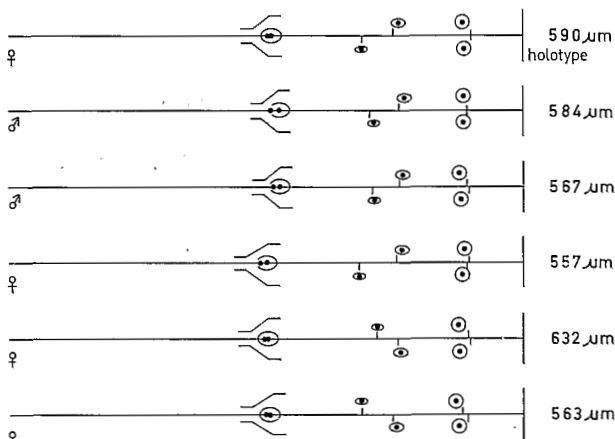


Fig. 11. *Prodorylaimus dalmassoi* n. sp. A: anterior end; B: cardia; C: vulva; D: female tail; E: male, posterior part; F: entire female; G: entire male.

male. Cuticle with thin, sharply demarcated outer layer; with very fine transverse striae; its thickness about 3.5 μm , increasing to 8.5 μm on base of tail. Lateral chord one-third of body width in mid-body. Lip region rounded, slightly offset, lips partly amalgamated. Length of odontostyle equal to width of lip region; the aperture occupies one-quarter to one-fifth of its length. Guiding ring "single", about 7 μm from head end. Diameter of body at base of oesophagus 4.2-4.5 \times width of lip region. Amphids slightly more than one-half corresponding body diameter. The nerve ring surrounds the oesophagus at about 27 % of its length from head end. Cardia conoid, 36 μm long, 12 μm wide.

Oesophageal characters : The oesophagus begins to widen at 47-50 % and attains its full width at 50-52 % of its length from head end. DO lies anterior to the latter level, DN lies hardly posterior to DO, the distance being 5-8 μm . The S_1N lie some distance apart, the anterior one is smaller, but S_1N_2 is also relatively small, whereas DN is large. DN measures 12-15 \times 6-8 μm , nucleolus 4-5 μm ; S_1N_1 3-4 \times 2 μm , nucleolus 1 μm ; S_1N_2 5-6 \times 3-5 μm , nucleolus 2-3 μm , S_2N 6-8 \times 6-8 μm , nucleolus 2.5-3 μm . Locations :

12. *Prodorylaimus dalmassoi*

DO 49-51 %;	dist. 4.8-8.2 %;
DN 50-53 %;	S_2N 87-89 %;
DO-DN 0.8-1.5 %;	S_2O 88-90 %;
S_1N_1 68-71 %;	$K = 69-81$;
S_1N_2 75-78 %;	$K' = 72-84$.

Female : Vulva longitudinal, vagina two-thirds corresponding body width deep. Genital tubes two, opposed, reflexed. Uteri large, in most specimens crowded with sperm; distal part sometimes offset, chamber-like. No eggs. Tail tapering first, then filiform; protoplasmic core (213) 321-396 μm or (75) 79-81 % of tail length; ending sharply. Rectum as long as anal body width; prerectum excessively long, 722-865 μm .

Male : Testes two, dorylaimid. Spicules dorylaimid,

lateral guiding pieces 19 μm long. The ventromedian supplements are almost contiguous, the posterior one lies about three anal body widths from cloacal aperture. Three pairs of caudal papillae : two subdorsal, one sublateral. Prerectum joining intestine proper at 741-763 μm anterior to anterior supplement; its length 974-998 μm .

TYPE MATERIAL

Holotype : Female on slide WT 1311. Paratypes : one female and two males on slides WT 1311-1313; one female deposited at the USDA, Beltsville, Maryland, USA; one female at the Zoosystematical and Ecological Institute of the Eötvös Loránd University, Budapest, Hungary.

TYPE HABITAT AND LOCALITY :

Terre de pature, Bois de Vergnes, France. Collected February 1968 by A. Dalmasso.

DIAGNOSIS

This species is distinctive by its very long and slender body, short odontostyle and very long prerectum.

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