

THREE NEW SPECIES OF HOPLOLAIMID NEMATODES  
FROM SOUTH AMERICA

BY

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*Peltamigratus annulatus* sp.n. and *Dolichorhynchus parvus* sp.n. from Chile and *Helicotylenchus angularis* sp.n. from Belize have been described and illustrated.—*P. annulatus* is similar to *P. longistylus* and *P. perscitus* in having distinctly annulated lip region and areolated lateral fields at the phasmids, but differs from them in having a smaller body and shorter spear. *Helicotylenchus angularis* is unique in the genus in having an angular lip region. *Dolichorhynchus parvus* is the smallest species of the genus.

The three new species described in this paper were submitted for identification to the Commonwealth Institute of Helminthology in 1976. The specimens were heat relaxed, fixed in 3-5 per cent formaldehyde solution and mounted in dehydrated glycerine.

*PELTAMIGRATUS ANNULATUS* SP. N.

(Fig. 1, A-F)

*Measurements :*

4 ♀♀ (*Paratypes*) : L=0.69-0.81 (0.75) mm; a=26-29 (28); b=6.4-8.6 (8); c=32-63 (44); c'=0.6-1.2 (0.8); V=52-59 (55); spear=25-27 (26)  $\mu$ m.

4 ♂♂ (*Paratypes*) : L=0.67-0.71 (0.69) mm; a=26-33 (30); b=7-8 (7.5); c=34-36 (35); c'=1.2-1.3; T=49-56 (53); spear=25-26.5 (26)  $\mu$ m; spicules=30-31  $\mu$ m; gubernaculum=15-15.5  $\mu$ m.

*Female (Holotype)* : L=0.73 mm; a=27; b=6.4; c=42; c'=0.83; V=22-56-21; spear=25  $\mu$ m; left phasmid=64%; right phasmid=87%.

*Description :*

*Female* : Body arcuate to C-shaped, maximum width 25-29  $\mu$ m, (annules (1.6-1.7  $\mu$ m wide near middle). Lateral field with 4 smooth incisures extending to

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near tail tip, areolated only anteriorly at phasmids. Phasmids scutellum-like, postvulval, anterior and posterior phasmids at 64-70% and 84-92% of body, respectively. Lip region hemispherical, distinctly annulated and offset, with 4 to 5 annules. Spear well developed, conus 11-12.5  $\mu\text{m}$  long or 43-47 (45)% of spear length; knobs rounded, compact 4.5-5  $\mu\text{m}$  across. Orifice of dorsal oesophageal gland 7-8  $\mu\text{m}$  from spear base. Oesophagus typical of the genus. Median oesophageal bulb oval, about 11  $\times$  9  $\mu\text{m}$ . Oesophageal gland lobe about one body width long. Excretory pore opposite or at base of gland lobe, 1 to 2 annules behind indistinct hemizonid. Vulva with double epiptygma which may or may not be projecting beyond the body surface (Fig. 1, F). Spermathecae with sperm. Ovaries symmetrical, outstretched. Rectum shorter than anal body width. Tail hemispherical to conoid round, 0.6-1.2 anal body widths long, with 7-15 annules, terminal annules roughly about the same width as adjacent annules but slightly offset from them.

*Male*: Similar to female in most details. Body C-shaped. Anterior and posterior phasmids at 60-70% and 84-88% of body from anterior end, respectively.

The species name denotes the annulated lip region and lateral fields at the phasmids.

*Type Habitat and Locality*: Soil around roots (plant not known) at Isluga, Iquique province, Chile.

*Type specimens*: Collected by Maurice Jimenez Roco in 1976. *Holotype* ♀ and 2 ♀♀, 2 ♂♂ and 8 juvenile *paratypes* at C.I.P., St. Albans, England; 1 ♀, 1 ♂ each at USDA Nematode Collection, Beltsville, Maryland, USA and Indian Agricultural Research Institute, New Delhi, India.

*Differential diagnosis*: Only two other species, *P. longistylus* Doucet, 1980 and *P. perscitus* Doucet, 1980, are known to have areolated lateral fields at the phasmids and a distinctly annulated lip region. The new species differs from them in having a smaller body and shorter spear (body about 1 mm long and spear over 30  $\mu\text{m}$  long in the latter). These three species together form a subgroup within the genus *Peltamigratus* and which has a neotropical distribution. In the character of the annulated lip region and areolated lateral fields at the phasmids, this group resembles the genus *Aorolaimus* Sher, 1963 differing mainly in the postvulval location of both the phasmids. The indentation of the bursa in *Peltamigratus* as a diagnostic character (Sher, 1964) becomes invalid due to the occurrence of both indented and unindented bursa, in *P. annulatus* sp. n. and *P. perscitus*, respectively, of this group.

*HELICOTYLENCHUS ANGULARIS* SP. N.

(Fig. 1, G-I)

*Measurements :*

9 ♀♀ (*Paratypes*) : L=0.48-0.71 (0.6) mm; a=25-35 (30); b=4.8-5.8 (5.2); c=36-62 (49); c'=1-1.4 (1.2); V=57-69 (63); spear=23-26 (24.5)  $\mu$ m.

*Female (Holotype)* : L=0.69 mm; a=31; b=5.7; c=46; c'=1.4; V=23-69-18; spear=25.4  $\mu$ m.

*Description :*

*Female* : Body spirally coiled. Annules 1.5-1.8  $\mu$ m wide at midbody. Lateral fields one-fifth to one-fourth body width, with 4 smooth incisures. Lip region angular (hence the name), distinctly offset, wider than adjacent body, with 2-4 (3) annules (Fig. 1, H); framework heavily sclerotized. Spear well developed, conus 43-49% of spear length, basal knobs anteriorly flattened to concave. Orifice of dorsal oesophageal gland 10-11  $\mu$ m from spear base. Median oesophageal bulb oyal, muscular 10-12  $\times$  8-9  $\mu$ m. Oesophageal glands typical of the genus, making a wrapround over the anterior end of intestine. Excretory pore 85-110 (100)  $\mu$ m from anterior end. Vulva transverse, depressed, with reduced lateral membranes. Two branches of reproductive organs, symmetrical, outstretched, spermatheca empty. Rectum about one anal body width long. Tail dorsally convex-conoid to a well developed terminal peg-like projection, with 7-12 (9) annules ventrally. Phasmids 3-6 annules anterior to anal level.

*Male* : Not found.

*Type Habitat and Locality* : Soil around roots of *Citrus* sp. in Belize.

*Type specimens* : Collected by H. J. Fagan in 1970. *Holotype* ♀ and 3 ♀♀ *paratypes* at CIP, St. Albans, England. 2 ♀♀ *paratypes* each at Rothamsted Experimental Station, Harpenden, England; USDA Nematode Collection, Beltsville, Maryland, USA; Indian Agricultural Research Institute, New Delhi, India.

*Differential diagnosis* : *Helicotylenchus angularis* differs from all nominal species of the genus in having an offset, angular lip region.

Genus *Dolichorhynchus*. Mulk & Jairajpuri, 1974

Mulk & Jairajpuri (1974) proposed the genus *Dolichorhynchus* in the family Dolichodoridae to accommodate the type-species *D. phaseoli* (Sethi & Swarup, 1968) and *D. nigericus* Mulk & Jairajpuri, 1974. The genus was characterized by the body cuticle having longitudinal ridges or lamellae and the bursal flap with

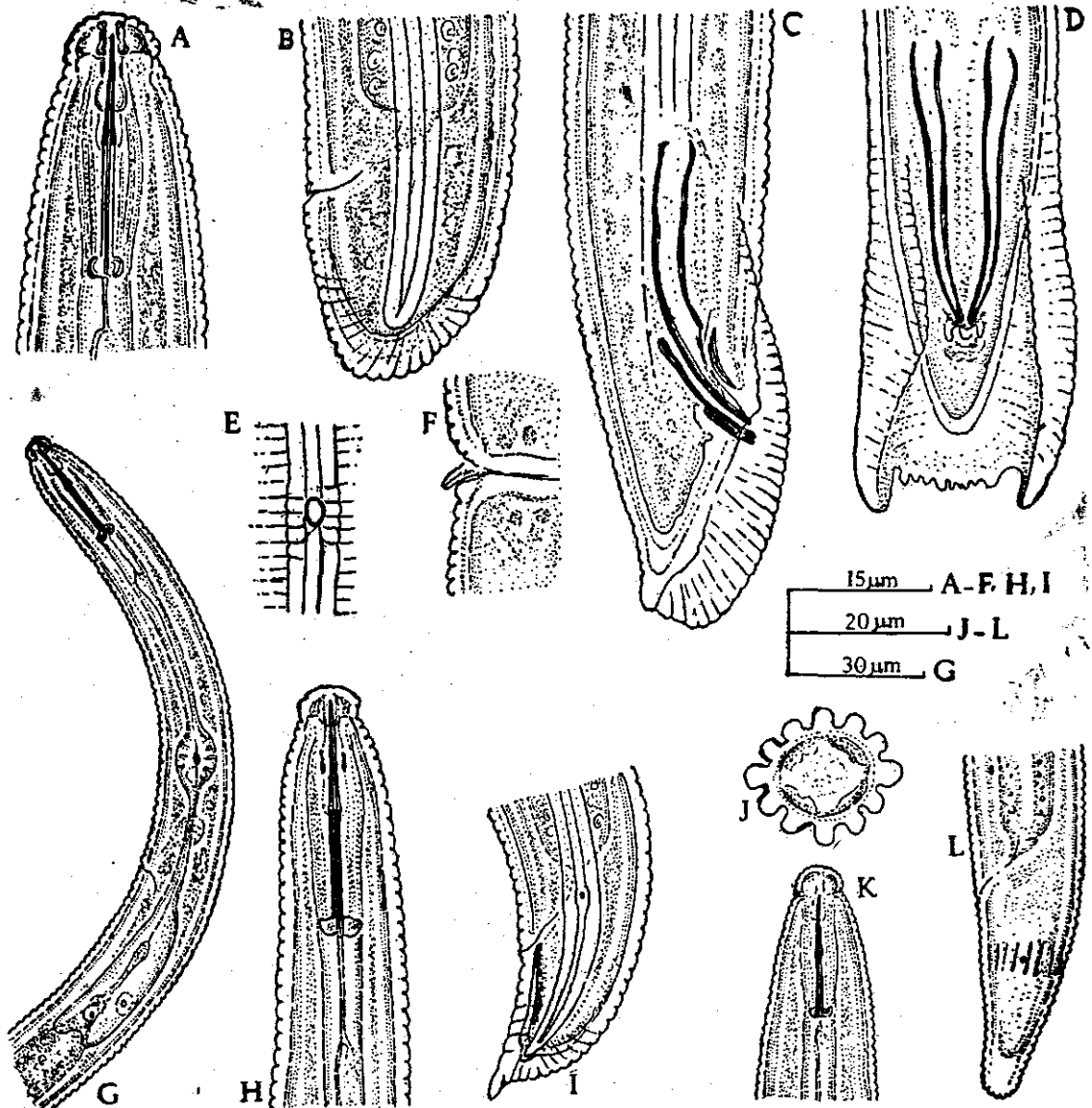


Fig. 1. A-F. *Pellamigratus annulatus* sp.n. G-I. *Helicotylenchus angularis* sp.n. J-L. *Dolichorhynchus parvus* sp.n. A, H & K. Head ends of female. B, I & L. Tail ends of female. C & D. Tail ends of male. E. phasmid. F. Vulval region. G. Oesophageal region of female. J. Cross-section of body of juvenile.

a subterminal notch. Five other species of the genus *Tylenchorhynchus* Cobb, 1913 are found to have similar cuticular ridges and are here transferred to *Dolichorhynchus* and a new species, *D. parvus* is described from Chile. The lamella-like cuticular ridges immediately distinguish *Dolichorhynchus* from other members of the family Dolichodoridae except the genus *Trilineellus* Lewis & Golden, 1981 which has only three incisures (=2 ridges) in the lateral field. The character of subterminally notched bursa is here considered unstable and hence the genus is rediagnosed below.

*Diagnosis* (emended). Tylenchorhynchinae, Dolichodoridae. Cuticle distinctly annulated, with 12-20 longitudinal ridges or lamellae over most of the body. Lateral fields with three ridges (=4 incisures) which are more raised than the remainder ridges, crossed by transverse striae. Lip region continuous or set off from body, with dorsal and ventral indentations giving it a bilobed appearance. Cephalic framework lightly to moderately sclerotized. Spear with thin pointed conus and distinct knobs. Deirids absent. Ovaries paired. Female tail tapering into a hyaline lobate bulb with smooth or annulated tip. Male with independently protrusible spicules which are distally flanged. Gubernaculum large, well developed protrusible. Bursa with crenate margins, may or may not be notched subterminally. Plant-parasitic and mostly inhabitant of sandy soils.

*Type-species*. *Dolichorhynchus phaseoli* (Sethi & Swarup, 1968) Mulk & Jairajpuri, 1974; syn. *Tylenchorhynchus phaseoli* Sethi & Swarup, 1961.

*Other species*: *D. gladiolatus* (Fortuner & Amougou, 1973) n. comb.  
syn. *T. gladiolatus* Fortuner & Amougou, 1973.

*D. judithae* (Andrássy, 1962) n. comb.  
syn. *T. judithae* Andrássy, 1962.

*D. lamelliferus* (de Man, 1880) n. comb.  
syn. *T. lamelliferus* (de Man, 1880) Filipjev, 1936.

*D. microphasmis* (Loof, 1959) n. comb.  
syn. *T. microphasmis* Loof, 1959.

*D. nigericus* Mulk & Jairajpuri, 1974.

*D. parvus* sp. n.

*D. sulcatus* (de Guiran) n. comb.  
syn. *T. sulcatus* de Guiran, 1967.

*Relationship and Discussion*: Among the Dolichodoridae, *Dolichorhynchus* comes close to *Tylenchorhynchus* and *Trilineellus*. From the former it differs in

body cuticle having prominent longitudinal ridges or bands all around the body and running over the entire length except at the tips. In *Tylenchorhynchus* spp. the body annules are smooth and the cuticle is not modified except at the lateral field areas where it has longitudinal ridges or bands. In some species e.g. *T. claytoni* and *T. pachys*, the cuticular annules are marked with longitudinal striae but the cuticle is not raised to form ridges as in *Dolichorhynchus* spp. From *Trilineellus* it differs only in having four incisures (3 ridges) in the lateral field.

Outside the Dolichodoridae the longitudinal ridges around the body occur in the genera *Aglenchus*, *Atylenchus*, *Eutylenchus*, and *Pleurotylenchus* which have a filiform tail in the sexes and an adanal bursa in male and belong to a different family.

*Dolichorhynchus* was placed in the family Dolichodoridae by Mulk & Jairajpuri (1974) without assigning it to any subfamily. Siddiqi (1976) placed it in Tylenchorhynchinae and this action is followed here. *Dolichorhynchus* and *Trilineellus* may merit a separate subfamily when more genera having similar cuticular ridges are found.

#### KEY TO THE SPECIES OF *Dolichorhynchus*

1. Lip region offset.....2  
Lip region continuous.....*lamelliferus* (de Man, 1880) n. comb.
2. Body more than 0.54 mm long.....3  
Body less than 0.45 mm long.....*parvus* sp. n.
3. Bursa distinctly notched at tail tip.....4  
Bursa not distinctly notched at tail tip.....5
4. Spear 17-21  $\mu\text{m}$  long; body with 12 cuticular longitudinal ridges.....  
*phaseoli* (Sethi & Swarup, 1968) Mulk & Jairajpuri, 1974.  
Spear 15-17  $\mu\text{m}$ ; body with 16 cuticular longitudinal ridges.....  
*nigericus* Mulk & Jairajpuri, 1974.
5. Spear more than 19  $\mu\text{m}$ .....6  
Spear 12-16  $\mu\text{m}$ .....*gladiolatus* (Fortuner & Amougou, 1973) n. comb.
6. Spear 19-22  $\mu\text{m}$ .....7  
Spear 24-27  $\mu\text{m}$ .....*microphasmis* (Loof, 1959) n. comb.
7. Body 0.88-0.97 mm long; tail terminus annulated..... *judithae*  
(Andrássy, 1962) n. comb.  
Body 0.54-0.71 mm long; tail terminus not annulated.....  
*sulcatus* (de Guiran, 1967) n. comb.

**DOLICHORHYNCHUS PARVUS SP. N.**

(Fig. 1, J-L)

**Measurements :**

7 Juveniles (paratypes) : L=0.265-0.345 mm; a=26-30; b=3.6-4.1; c=11.5-12.0; spear=14.5-15.0  $\mu$ m.

Female (Holotype) : L=0.445 mm; a=25; a'=23; b=4.9; c=18; V=53; spear=17.5  $\mu$ m.

**Description :**

Body ventrally curved, more tapering posteriorly than anteriorly. Cuticle marked with prominent transverse striae, 1.25-1.50  $\mu$ m apart and bearing 12 longitudinal ridges near middle of body; mid-lateral of each side being the broadest, about 3  $\mu$ m wide and 4  $\mu$ m high, than the others of each dorsal and ventral sectors which are 2.0-3.5  $\mu$ m wide and 2-3  $\mu$ m high and 1.5-2.5  $\mu$ m apart from each other. Lateral fields with 3 ridges, completely areolated.

Lip region rounded; set off from the body; about 7  $\mu$ m wide and 3  $\mu$ m high, bearing 6-7 annules; appearing bilobed anteriorly because of pronounced dorsal and ventral indentations; slight subdorsal and subventral indentations near the base of lip region make the appearance of six sectors. Cephalic framework moderately sclerotized. Spear 17.5  $\mu$ m long, knobs anteriorly flattened, about 4.5  $\mu$ m across. Median bulb, muscular, 11  $\mu$ m long and 9  $\mu$ m wide. Isthmus longer than precorpus. Excretory pore near the level of middle of isthmus, 63  $\mu$ m from anterior end of body. Hemizonid about two body annules wide, one annule above the excretory pore.

Vulva transverse, with poorly developed lateral cuticular membranes. Spermatheca axial, rounded, filled with sperm. Vagina about half body width long. Ovaries well developed, with oocytes arranged in single row. Tail conoid, 27  $\mu$ m long, with 25 annules, 1.8 body-widths long; ending in a blunt bulbar hyaline portion 8.5  $\mu$ m long and 6.5  $\mu$ m wide with annulated terminus (Fig. 1, L). Phasmids distinct pore-like anterior to middle of tail, 7 and 9 annules posterior to the anal level.

**Male :** Not found.

**Type Habitat and Locality :** From sandy soil around plant roots host (unknown) Isluge, Iquique province, Chile.

**Type specimens :** At CIP, St. Albans, England.

**Differential diagnosis :** *Dolichorhynchus parvus* sp. n. differs from all other species of the genus due to its smallest body size (hence the name). From

*D. judithae*, *D. nigericus* and *D. sulcatus* it also differs in shorter tail length and lower number of longitudinal cuticular ridges and from *D. phaseoli* in the annulated tail tip.

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