

# Three new species of Nygolaimidae\* (Nematoda : Dorylaimida) from India

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## SUMMARY

Three new species of the nematode family Nygolaimidae belonging to the genera *Nygolaimus* Cobb, 1913; *Clavicaudoides* (Heyns, 1968) Thorne, 1974; and *Laevides* (Heyns, 1968) Thorne, 1974 are figured and described. *Nygolaimus harishi* n. sp. (collected from around roots of *Phaseolus mungo* from Sirsa, Haryana) length = 1.09-1.23 mm; a = 48-51; b = 3.7-4.1; c = 64-69; V = 40-41. It comes close to *N. anneckei* Heyns, 1968 but differs from it in having a smaller body, differently shaped lip region and tail, and anteriorly located vulva. *Clavicaudoides longidens* n. sp. (collected from around roots of wild grasses from Pithoragarh, Uttar Pradesh) length = 0.93-0.99 mm; a = 35-39; b = 3.6-3.9; c = 70-75; V = 43-47; tooth = 10-12  $\mu$ m long. It is closely related to *C. clavicaudatus* (Altherr, 1953) Thorne, 1974 but can be differentiated from it by the wider body; longer tooth; smaller preectum and shorter tail. *Laevides imphalus* n. sp. (collected from around roots of wild grasses from Imphal, Manipur State) length = 2.09-2.30 mm; a = 49-54; b = 4.3-4.7; c = 71-92; V = 38-41; tooth = 10-11  $\mu$ m. It comes close to *L. laevis* (Thorne, 1939) Thorne, 1974, but differs from it in having a slender body and an anteriorly located vulva, and in the shape of the tooth. Two new combinations are proposed: *Clavicaudoides caudatus* (Jairajpuri, 1964) n.comb. for *Nygolaimus (Clavicaudoides) caudatus* (Jairajpuri, 1964) Heyns, 1968 and *Laevides rapax* (Thorne, 1939) n.comb. for *Nygolaimus (Laevides) rapax* Thorne, 1939.

## RÉSUMÉ

### Trois nouvelles espèces de Nygolaimidae (Nematoda : Dorylaimida) de l'Inde

Trois nouvelles espèces de Nygolaimidae appartenant aux genres *Nygolaimus* Cobb, 1913; *Clavicaudoides* (Heyns, 1968) Thorne, 1974 et *Laevides* (Heyns, 1968) Thorne, 1974 sont décrites et figurées. *Nygolaimus harishi* n.sp. provenant de la rhizosphère de *Phaseolus mungo* à Sirsa (Haryana) a les caractéristiques suivantes : L = 1,09-1,23 mm; a = 48-51; b = 3,7-4,1; c = 64-69 et V = 40-41; cette espèce, proche de *N. anneckei* Heyns, 1968 en diffère par une taille plus faible, la forme différente de la région labiale et de la queue et une vulve plus antérieure. *Clavicaudoides longidens* n.sp., provenant de la rhizosphère de graminées sauvages, à Pithoragarh (Uttar Pradesh) a les caractéristiques suivantes : L = 0,93-0,99 mm; a = 33-39; b = 3,6-3,9; c = 70-75; V = 43-47 et « dent » longue de 10-12  $\mu$ m. Très proche de *C. clavicaudoides* (Altherr, 1953) Thorne, 1974; il s'en différencie par un corps plus épais, une « dent » plus longue, un préectum et une queue plus courts. *Laevides imphalus* n.sp., provenant de la rhizosphère de graminées sauvages à Imphal (État de Manipur) a les caractéristiques suivantes : L = 2,09-2,30 mm; a = 49-54; b = 4,3-4,7; c = 71-92; V = 38-41 et « dent » = 10-11  $\mu$ m; proche de *L. laevis* (Thorne, 1939) Thorne, 1974, il s'en sépare par un corps plus mince, la forme de la « dent » et de la queue et par une vulve située plus antérieurement. Deux nouvelles combinaisons sont proposées : *Clavicaudoides caudatus* (Jairajpuri, 1964) n.comb. pour *Nygolaimus (Clavicaudoides) caudatus* (Jairajpuri, 1964) Heyns, 1968 et *Laevides rapax* (Thorne, 1939) n.comb. pour *Nygolaimus (Laevides) rapax* Thorne, 1939.

\* Ahmad, M. & Jairajpuri, M.S. (Second natn. Congr. Parasitol., Varanasi, 1979, p. 29) have proposed a new suborder Nygolaimina for superfamilies Nygolaimoidea and Campydoroidea.

A survey of plant-parasitic and soil-inhabiting nematodes from various localities in India yielded three new species of the family Nygolaimidae Thorne, 1935. The new species belong, one each to the genera *Nygolaimus* Cobb, 1913; *Clavicaudoides* (Heyns, 1968) Thorne, 1974 and *Laevides* (Heyns, 1968) Thorne, 1974. The new species are *N. harishi* n. sp., *C. longidens* n. sp., and *L. imphalus* n. sp.

Measurements were taken and observations made on specimens mounted in glycerine after they were killed in hot 4 % formalin and dehydrated by the slow method (Thorne, 1961).

***Nygolaimus harishi* n. sp.**

(Fig. 1)

**DIMENSIONS**

*Paratype females* (4) : L = 1.09-1.21 mm; a = 48-51; b = 3.7-4.1; c = 64-69; V = 40-41; G<sub>1</sub> = 4-5; G<sub>2</sub> = 6-7; tooth = 6-7 μm; oesophagus = 290-305 μm.

*Holotype female* : L = 1.23 mm; a = 53; b = 4.2; c = 77; V = 40; G<sub>1</sub> = 4; G<sub>2</sub> = 6; tooth = 7 μm; oesophagus = 290 μm.

**DESCRIPTION**

*Female* : Body almost straight upon fixation, tapering towards both extremities. Cuticle finely striated, 2 μm thick at midbody and 2-3 μm on tail. Lateral chords narrow, about one-third body-width near midbody. Dorsal, ventral and lateral body pores indistinct.

Lip region symmetrical, distinctly set off from body contour by constriction. Lips rounded and labial papillae not elevated. Amphids cup-shaped with slit-like apertures occupying about half or more of corresponding body-width. Mural tooth deltoid, curved dorsally; about two-thirds of lip-width long. Basal expanded part of oesophagus occupying about 52 % of oesophageal length. Nerve ring surrounding anterior slender part of oesophagus at 75-85 μm from anterior end. Cardiac glands small, ovoid, 4-5 × 6-7 μm. Cardia convex-conoid, 6-7 μm long. Dorsal oesophageal gland exceptionally

large. Location of oesophageal gland nuclei and their orifices are as follows : DO = 55-58; DN = 64-66; DO-DN = 6.5-8.5; S<sub>1</sub>N = 73-76; S<sub>1</sub>O = 72-75; S<sub>2</sub>N = 86-89; S<sub>2</sub>O = 85-87.

Vulva transverse, vagina about half vulval body-width long. Female reproductive system amphidelphic. Anterior genital branch less developed. Posterior genital branch normally developed; ovaries reflexed with 9-12 oocytes arranged in single row except at tip. Prerectum 24-30 μm or about 1.5-1.7 anal body-widths long. Rectum 21-25 μm or about 1.3-1.4 anal body-widths long. Tail straight, conoid with blunt terminus, 16-19 μm or about one anal body-widths long. Two caudal pores present on each side of tail.

*Male* : Not found.

**TYPE HABITAT AND LOCALITY**

Soil around roots of mung, *Phaseolus mungo* from Sirsa, Haryana, India.

**TYPE SPECIMENS**

Collected in March, 1978; holotype female on slide *Nygolaimus harishi* n. sp./1; 3 paratype females on slides *Nygolaimus harishi* n. sp./2 & 3; deposited in the Department of Zoology, Aligarh Muslim University. One paratype female deposited at Muséum national d'Histoire naturelle, Laboratoire des Vers, Paris, France.

**DIFFERENTIAL DIAGNOSIS**

*Nygolaimus harishi* n. sp. is distinct from all other species of the genus in having the vulva very anteriorly located. It comes close to *Nygolaimus annekei* Heyns, 1968 but differs from it in having a smaller body, differently shaped lip region and tail, and slightly smaller cardiac glands (L = 1.21-1.46 mm; V = 45; lip region asymmetrical; cardiac glands 5-6 × 7-9 μm; tail dorsally convex-conoid in *N. annekei*).

The new species is named after Dr. Harish K. Bajaj, Assistant Taxonomist, Haryana Agricultural University, Hissar, India.

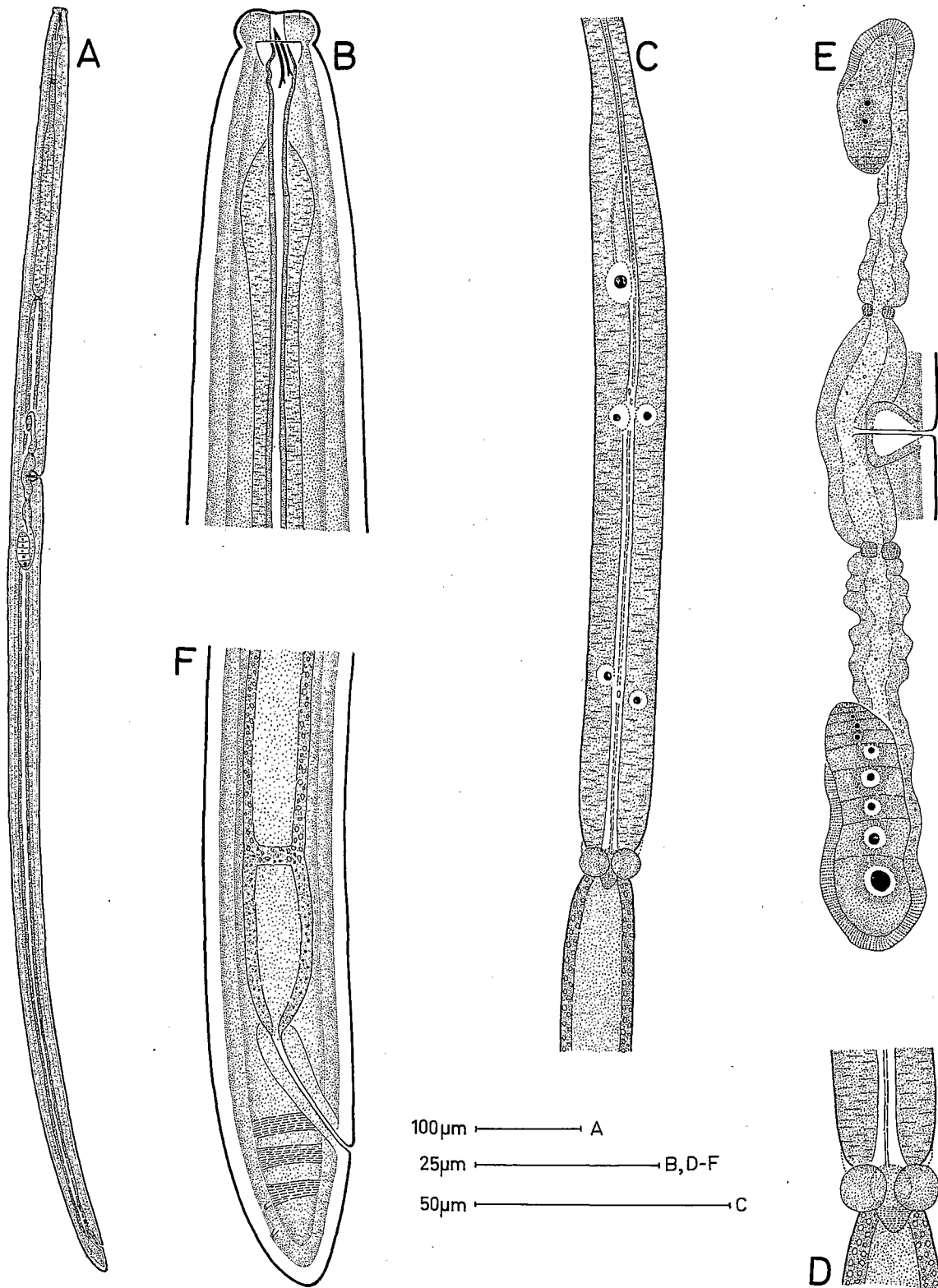


Fig. 1. *Nygolaimus harishi* n. sp. A : Entire female; B : Anterior region; C : Expanded part of oesophagus; D : Cardiac region; E : Female gonads; F : Posterior region of body.

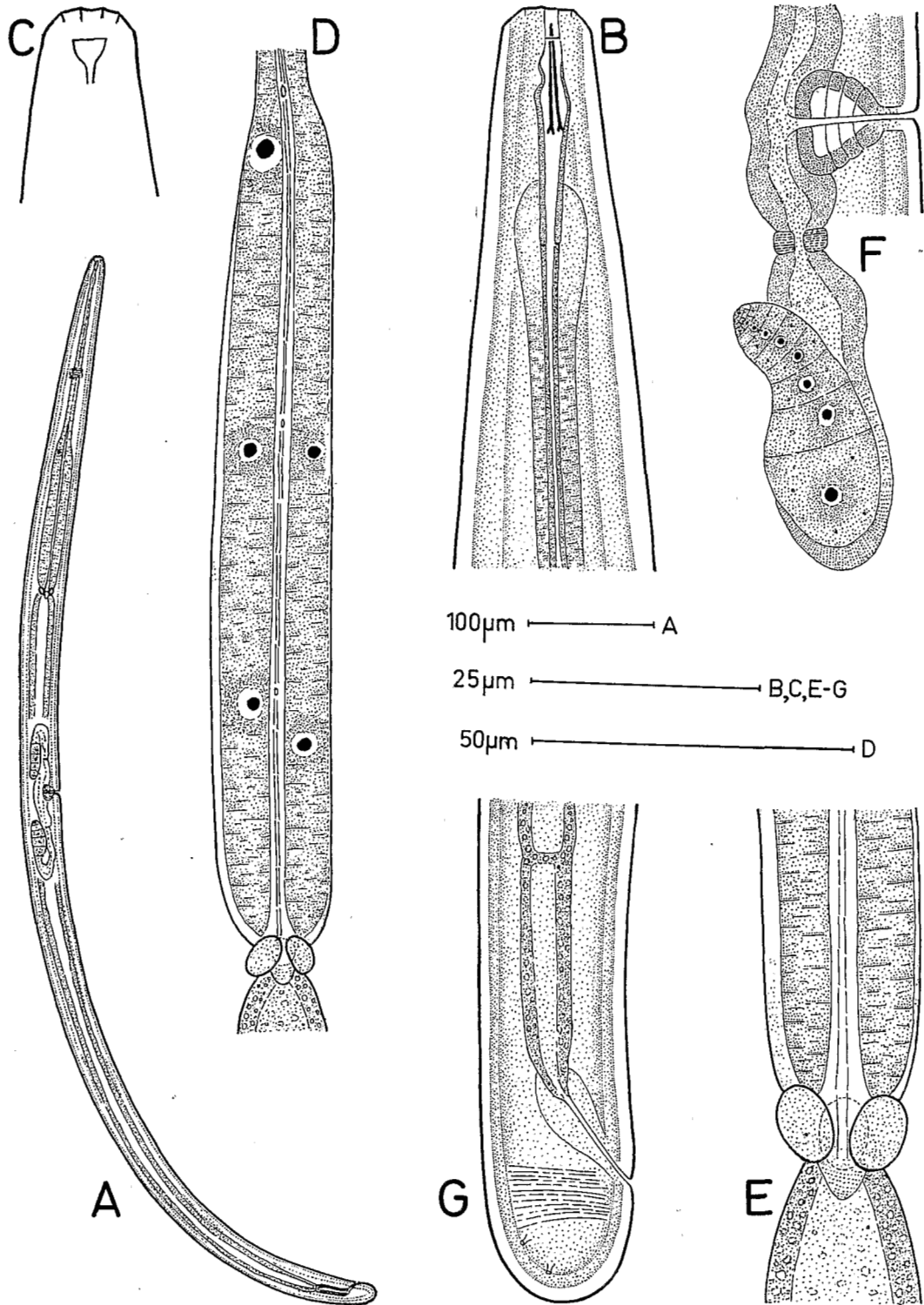


Fig. 2. *Clavicaudoides longidens* n. sp. A : Entire female; B : Anterior region; C : Anterior region showing amphid; D : Expanded part of oesophagus; E : Cardiac region; F : Female genital branch (posterior); G : Posterior region of body.

***Clavicaudoides longidens* n. sp.**  
(Fig. 2)

## DIMENSIONS

*Paratype females* (5) : L = 0.93-0.99 mm; a = 35-39; b = 3.6-3.9; c = 70-75; V = 43-47; G<sub>1</sub> = 5-6; G<sub>2</sub> = 5-7; tooth = 10-12 μm; oesophagus = 252-267 μm.

*Holotype female* : L = 0.94 mm; a = 38; b = 3.6; c = 73; V = 47; G<sub>1</sub> = 6; G<sub>2</sub> = 7; tooth = 11 μm; oesophagus = 267 μm.

## DESCRIPTION

*Female* : Body slightly curved ventrally, tapering anterior to base of oesophagus. Cuticle and subcuticle finely striated, 1.5 μm thick at midbody and 2-4 μm on tail. Lateral chords narrow, about one-fourth of body-width near midbody. Dorsal, ventral and lateral body pores indistinct.

Lip region continuous with body contour, lips angular and labial papillae elevated. Amphid small, cup-shaped with slit-like aperture, occupying less than half of corresponding body-width. Mural tooth linear, about equal to width of lip region. Basal expanded part of oesophagus occupying 48-55 % of oesophageal length. Nerve ring surrounding anterior slender part of oesophagus at 95-100 μm from anterior end. Cardiac glands ovoid, 6-7 × 8-10 μm. Cardia conoid, 7-8 μm long. Location of oesophageal gland nuclei and their orifices are as follows : DO = 54-56; DN = 60-63; DO-DN = 5.0-6.5; S<sub>1</sub>N = 75-77; S<sub>1</sub>O = 73-76; S<sub>2</sub>N = 85-89; S<sub>2</sub>O = 84-89.

Vulva transverse; vagina about half vulval body-width long. Female reproductive system amphidelphic. Uteri and ovaries small. Ovaries reflexed with 9-10 oocytes arranged in single row. A distinct sphincter present at oviduct-uterus junction. Prerectum 26-33 μm or about 1.6-2.0 anal body-widths long. Rectum 13-15 μm or about one anal body-width long. Tail small, hemispherical, slightly clavated, 12-14 μm or about 0.7-0.8 anal body-width long. Two caudal pores present on each side of tail.

*Male* : Not found.

## TYPE HABITAT AND LOCALITY

Soil around roots of unidentified wild grasses from Baste village, District Pithoragarh, Uttar Pradesh, India.

## TYPE SPECIMENS

Collected in May, 1976; holotype female on slide *Clavicaudoides longidens* n. sp. /1; 4 paratype females on slides *Clavicaudoides longidens* n. sp./2 & 3; deposited in the Department of Zoology, Aligarh Muslim University. One paratype female deposited at Muséum national d'Histoire naturelle, Laboratoire des Vers, Paris, France.

## DIFFERENTIAL DIAGNOSIS

*Clavicaudoides longidens* n. sp. is related to *C. clavicaudatus* (Altherr, 1953) Thorne, 1974 and *C. caudatus* (Jairajpuri; 1964) n.comb. From the former it differs in having a wider body, longer tooth, smaller prerectum and tail (a = 40-72; b = 4.2-4.7; c = 40-65; tooth = 7-9 μm; prerectum = 3.2-4.0 anal body-widths long; and tail 19-25 μm long in *C. clavicaudatus*). From *C. caudatus* it can be differentiated by the smaller body, longer oesophagus, posteriorly located vulva, smaller prerectum, and shorter tail (L = 1.3 mm; b = 4.6; c = 60; V = 39; prerectum 3.5 anal body-widths long; and tail 25 μm long in *C. caudatus*).

***Laevides imphalus* n. sp.**  
(Fig. 3)

## DIMENSIONS

*Paratype females* (7) : L = 2.05-2.30 mm; a = 49-54; b = 4.3-4.7; c = 71-92; V = 38-41; G<sub>1</sub> = 6-8; G<sub>2</sub> = 7-8; tooth = 10-11 μm; oesophagus = 450-520 μm.

*Holotype female* : L = 2.09 mm; a = 51; b = 4.3; c = 72; V = 39; G<sub>1</sub> = 8; G<sub>2</sub> = 8; tooth = 10 μm; oesophagus = 460 μm.

## DESCRIPTION

*Female* : Body slightly curved ventrally upon fixation, tapering anterior to base of oesophagus.

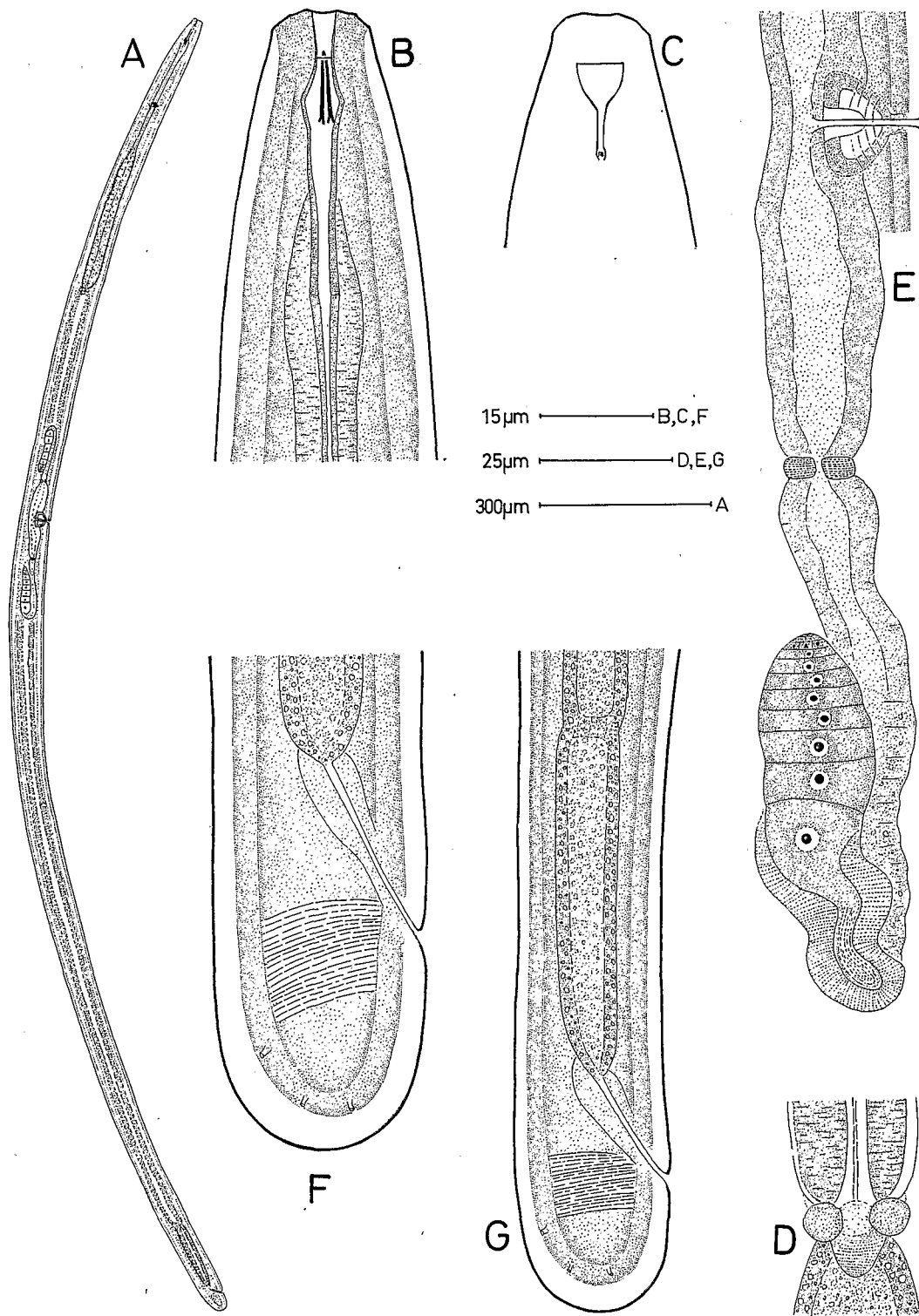


Fig. 3. *Laevides imphalus* n. sp. A : Entire female; B : Anterior region; C : Anterior end showing amphid; D : Cardiac region; E : Female genital branch (posterior); F : Tail; G : Posterior region of body.

Cuticle and subcuticle finely striated, 1-2  $\mu\text{m}$  thick at midbody, 3-5  $\mu\text{m}$  on tail. Lateral chords narrow, about one-third of body-width near midbody. Dorsal, ventral and lateral body pores indistinct.

Lip region continuous with body contour; lips angular and labial papillae elevated. Amphid cup-shaped with slit-like aperture occupying about half of corresponding body-width. Mural tooth dorylaimoid, broad, with dorsal sector much longer than ventral (*rapax*-type), about one lip-width long. Basal expanded portion of oesophagus occupying 50-52 % of oesophageal length, enclosed in thin sheath. Nerve ring surrounding anterior slender part of oesophagus at 150-160  $\mu\text{m}$  from anterior end. Cardiac glands small, ovoid, 4-5  $\times$  6-7  $\mu\text{m}$ . Cardia well developed, hemispherical, 10-12  $\mu\text{m}$  long. Location of oesophageal gland nuclei and their orifices are as follows : DO = 50-52; DN = 57-60; DO-DN = 6-7; S<sub>1</sub>N = 72-75; S<sub>1</sub>O = 71-74; S<sub>2</sub>N = 84-87; S<sub>2</sub>O = 84-86.

Vulva transverse, vagina about half vulval body-width long. Female reproductive system amphidelphic; ovaries reflexed, with 10-15 oocytes arranged in a single row. A distinct sphincter present at oviduct-uterus junction. Prerectum 61-72  $\mu\text{m}$  or about 2.3-2.4 anal body-widths long. Rectum 22-26  $\mu\text{m}$  or about 0.8-0.9 anal body-width long. Tail hemispherical, clavate, 24-30  $\mu\text{m}$  or about anal body-width long with three caudal pores on each side.

*Male* : Not found.

#### TYPE HABITAT AND LOCALITY

Soil around roots of unidentified grasses from Langthabal Kunja, District Imphal, Manipur state, India.

#### TYPE SPECIMENS

Collected in October, 1976; holotype female on slide *Laevides imphalus* n. sp. /1; 6 paratype

females on slides *Laevides imphalus* n. sp. /2-4; deposited in the Department of Zoology, Aligarh Muslim University. One paratype female deposited at Muséum national d'Histoire naturelle, Laboratoires des Vers, Paris, France.

#### DIFFERENTIAL DIAGNOSIS

*Laevides imphalus* n. sp. comes close to *L. laevis* (Thorne, 1939) Thorne, 1974 and *L. rapax* (Thorne, 1939) n. comb. From the former it differs in having a more slender body, in the differently shaped tooth and tail, and in having an anteriorly located vulva ( $a = 29$ ; tooth with equal sectors; tail less clavate;  $V = 44-55$  in *L. laevis*). From *L. rapax* it can be differentiated by the smaller body, tooth and oesophagus, and by the anteriorly located vulva ( $L = 3.7-4.5$  mm;  $b = 4.5-5.5$ ; tooth = 17-18  $\mu\text{m}$ ;  $V = 48$  in *L. rapax*).

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