

Descriptions of new species of *Dorylaimoides* and *Calolaimus* (Dorylaimida) from India

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SUMMARY

Three new species of Dorylaimoididae Siddiqi, 1969 are described and illustrated. *Dorylaimoides chamoliensis* n. sp. differs from the closely related *D. teres* and *D. indicus* in having wider body, longer spicules and short and differently shaped tail. *Dorylaimoides kalingus* n. sp. differs from the closely related *D. pretoriensis* in having smaller and narrower body, longer oesophagus, smaller spicules and longer and differently shaped tail, from *D. arcuatus* in having a set of basal oesophageal bulb, posterior vulva and smaller tail. *Calolaimus amphidius* n. sp. differs from the closely related *C. lenorus* and *C. notus* in having shorter body, thick-walled amphids and in the size of tail. A key to species of *Calolaimus* has been provided.

RÉSUMÉ

Descriptions de nouvelles espèces de Dorylaimoides et Calolaimus (Dorylaimida) découvertes en Inde

Trois nouvelles espèces de Dorylaimoididae Siddiqi, 1969 sont décrites et figurées. *Dorylaimoides chamoliensis* n. sp. diffère des espèces très voisines *D. teres* et *D. indicus* par leur corps plus large, leurs spicules plus longs et leur queue plus courte et de forme différente. *Dorylaimoides kalingus* n. sp. diffère de l'espèce voisine *D. pretoriensis* par son corps plus petit et plus mince, son oesophage plus long, ses spicules plus petits et sa queue plus longue et de forme différente et de *D. arcuatus* par son bulbe basal oesophagien défini, sa vulve postérieure et sa queue plus courte. *Calolaimus amphidius* n. sp. diffère des espèces très voisines *C. lenorus* et *C. notus* par son corps plus court, ses amphides aux parois épaisses et la taille de sa queue. Une clé des espèces de *Calolaimus* est proposée.

Two new species of *Dorylaimoides* Thorne & Swanger, 1936 viz., *D. chamoliensis* n. sp. and *D. kalingus*, n. sp. and a new species of *Calolaimus* Timm, 1965, *C. amphidius* n. sp. collected from different localities in India are being described below. The measurements were taken and the observations were made on the specimens mounted in anhydrous glycerine after being killed in hot 4% formalin and dehydrated by the slow method.

***Dorylaimoides chamoliensis* n. sp.**

(Fig. 1)

DIMENSIONS

Paratype (male). L = 1.52 mm ; a = 32 ; b = 6.2 ; c = 45 ; T = 54 ; odontostyle = 10 μ m ; odontophore = 16 μ m ; oesophagus = 245 μ m ; spicules = 49 μ m ; lateral guiding pieces = 10 μ m ; ventro-

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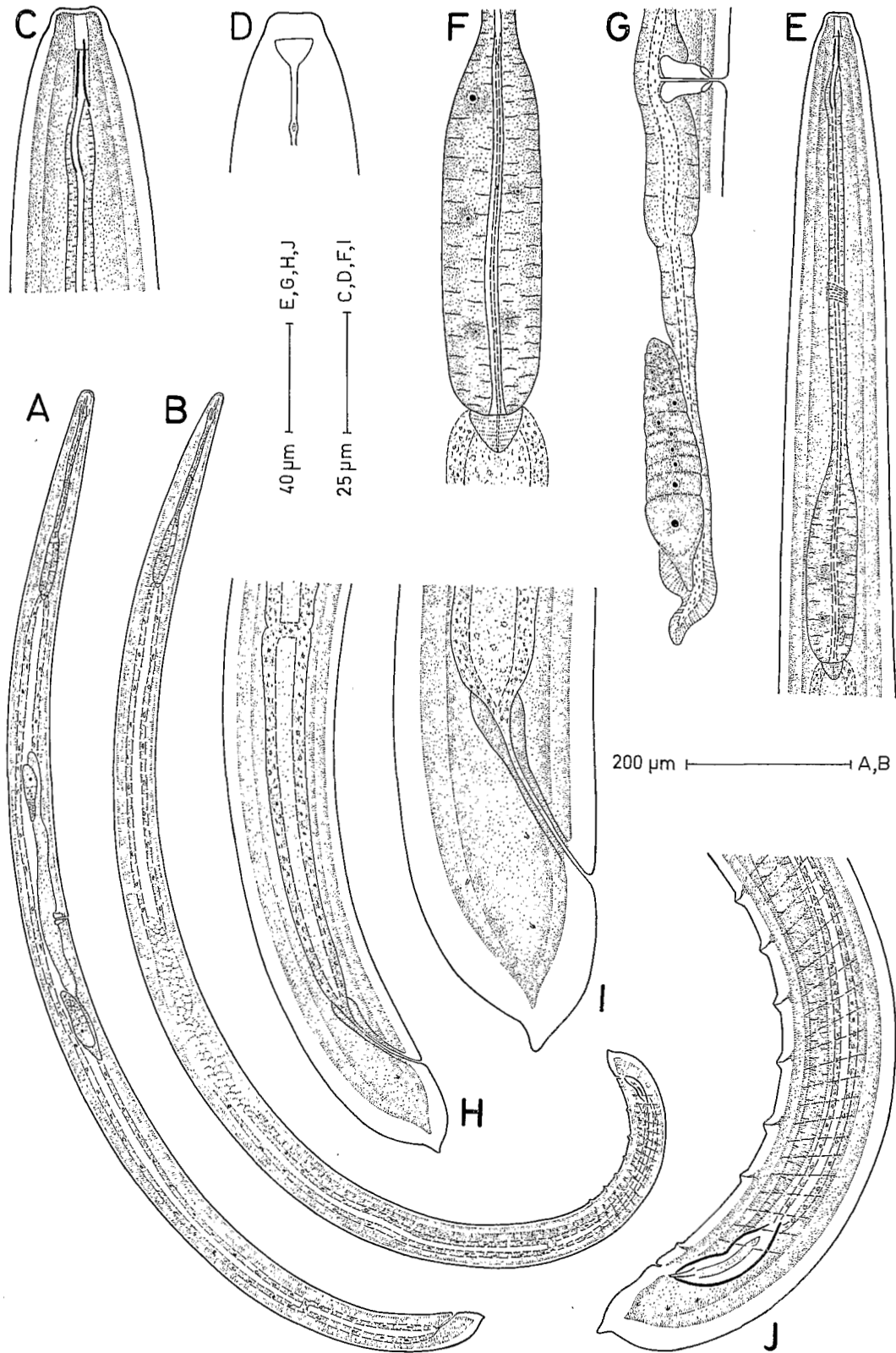


Fig. 1. *Dorylaimoides chamoliensis* n. sp. A : Entire female; B : Entire male; C : Anterior region; D : Anterior end showing amphid; E : Oesophageal region; F : Expanded part of oesophagus; G : Female genital branch (posterior); H : Female posterior region; I : Female posterior end; J : Male posterior region.

median supplements = 6; prerectum = 216 μm ; tail = 34 μm ; ABD = 36 μm .

Holotype (female). L = 1.41 mm; a = 29; b = 5.7; c = 39; V = 45; G_1 = 16; G_2 = 16; odontostyle = 10 μm ; odontophore = 16 μm ; oesophagus = 246 μm ; prerectum = 147 μm ; rectum = 36 μm ; tail = 36 μm ; ABD = 34 μm .

Fourth stage juvenile, L = 1.21 mm; a = 27; b = 4.8; c = 45; functional odontostyle = 8 μm ; odontophore = 13 μm ; replacement odontostyle = 9 μm ; oesophagus = 234 μm ; prerectum = 151 μm ; rectum = 35 μm ; tail = 25 μm ; ABD = 27 μm .

DESCRIPTION

Female: Body ventrally curved upon death, tapering slightly towards extremities. Cuticle finely striated, 3-4 μm thick at midbody and 8-9 μm on tail. Lateral chords about one-sixth of body width at midbody. Lateral, dorsal and ventral body pores indistinct.

Lip region continuous with the body contour, 11 μm or about one-fourth of body width at base of oesophagus. Amphids stirrup-shaped, their apertures 8 μm or about two-thirds of lip-width wide. Odontostyle about one lip width long, its aperture nearly one-third of its length. Basal guiding ring at 9 μm or slightly less than one lip width from anterior end. Odontophore arcuate, sclerotized, about 1.5 times the odontostyle length. Nerve ring encircling the anterior slender part of oesophagus at 114-117 μm from anterior end. Anterior slender part of oesophagus gradually expands to form the posterior expanded portion which is 70-73 μm long or occupies about 29% of total oesophageal length. Cardia conoid, 5 μm long. Location of oesophageal gland nuclei and their orifices as given below:

DO = 76-77 S_1N_1 = 82-84 S_2N = 9-91

DN = 78-79 S_1N_2 = 86-87 S_2O = 90-92

DO-DN = 2.5-2.7.

Vulva transverse. Vagina about one-third of corresponding body width. Cuticularized pieces present in its walls. Reproductive organs amphidelphic. Uterus short, separated from oviduct by a slight depression. Prerectum about four anal body widths long. Rectum slightly more than one anal body width long. Tail short rounded with digitate terminus giving it a mammilate appearance, slightly more than one anal body width long with two caudal pores on each side.

Male: Supplements an adanal pair and six regularly spaced ventromedians. Spicules about 1.4 anal

body widths long. Lateral guiding pieces about one-fifth of spicules length. Prerectum about six anal body widths long. Tail short, rounded with digitate terminus about one anal body width long with two caudal pores on each side.

Fourth stage juvenile: Similar to female except for the small size of body and other organs. Odontostyle about one lip width long. Odontophore about 1.6 times the odontostyle length. Replacement odontostyle slightly longer than the functional odontostyle. Expanded portion of oesophagus about 29% of oesophageal length. Genital primordia in advanced stage of development. Vulva and vagina not visible. Prerectum about five anal body widths long. Tail short rounded with digitate terminus, about one anal body width long.

TYPE HABITAT AND LOCALITY

Soil around roots of *Pinus* sp. Ghangaria, district Chamoli, Uttar Pradesh; collected in October 1979.

TYPE SPECIMENS

Holotype female on slide *Dorylaimoides chamoliensis* n. sp./1; paratype male and juvenile on slides *Dorylaimoides chamoliensis* n. sp./2-3; deposited in the nematode collection of Zoology Department, Aligarh Muslim University, Aligarh.

DIFFERENTIAL DIAGNOSIS

Dorylaimoides chamoliensis n. sp. keys with the key of Goseco, Ferris and Ferris (1976) to *D. teres* Thorne & Swanger, 1936 and *D. indicus* Jairajpuri, 1965; but differs from the former in having wider body, longer odontostyle and oesophagus, smaller expanded part of oesophagus, longer and differently shaped tail and longer spicules (a = 36; b = 6.7; c = 59; odontostyle = 6 μm ; expanded portion of oesophagus 32% of oesophageal length; spicules 38 μm and tail convex-conoid with rounded terminus in *D. teres*). From *D. indicus* it differs in having a wider body, longer and differently shaped tail and longer spicules (a = 40; c = 64; spicules = 38 μm and tail rounded in *D. indicus*). It also differs from *D. parateres* Siddiqi, 1964 and *D. enodis* Goseco, Ferris & Ferris, 1976 in the body size and in the size and shape of tail (L = 1.24-1.27 mm; c = 50-52; tail obtusely rounded in *D. parateres* and L = 1.08 mm; c = 34; tail short conoid with blunt terminus in *D. enodis*).

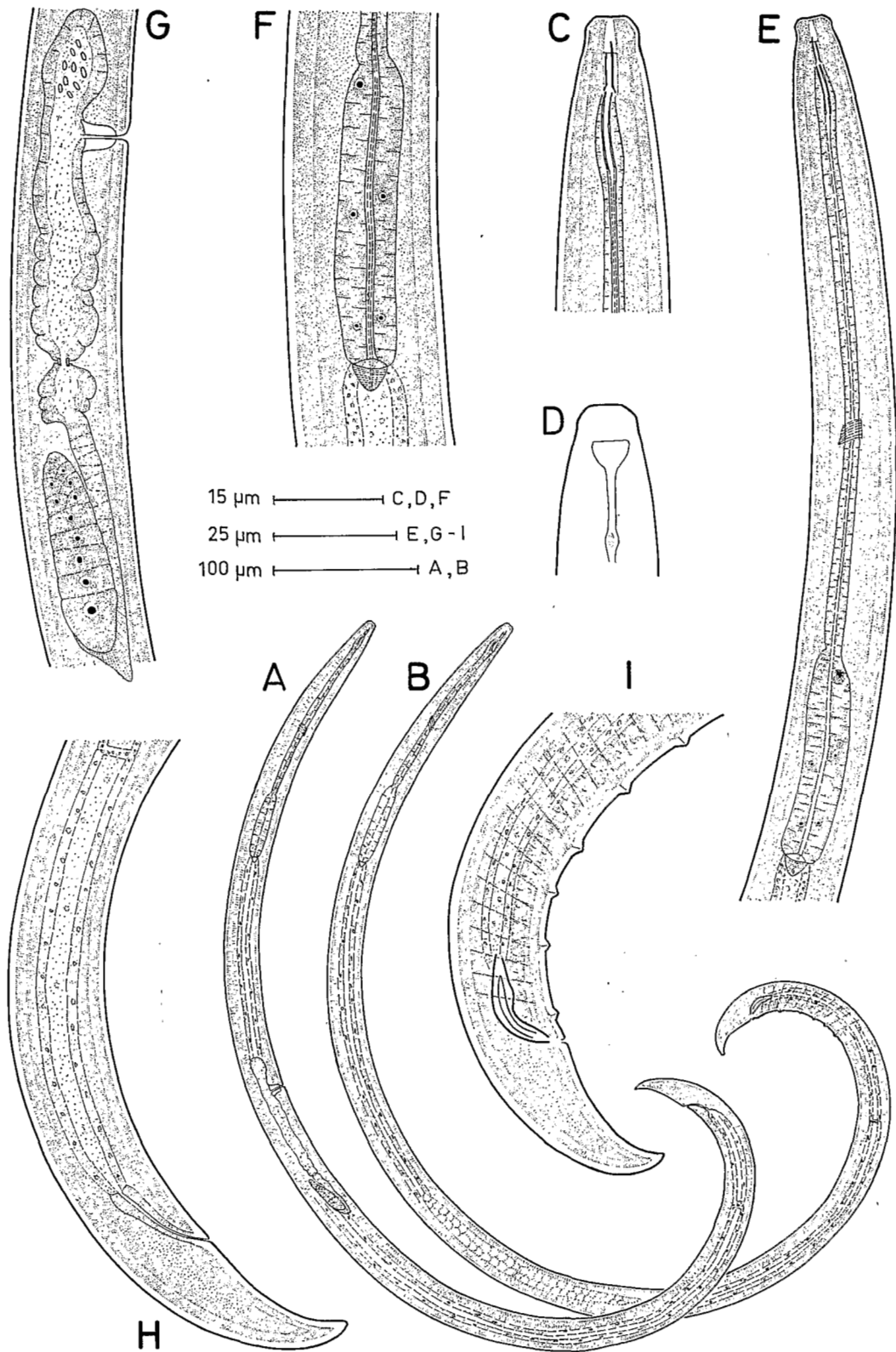


Fig. 2. *Dorylaimoides kalingus* n. sp. A : Entire female ; B : Entire male ; C : Anterior region ; D : Anterior end showing amphid ; E : Oesophageal region ; F : Expanded part of oesophagus ; G : Female gonad ; H : Female posterior region ; I : Male posterior region.

***Dorylaimoides kalingus* n. sp.**

(Fig. 2)

DIMENSIONS

Paratype females (3) : L = 0.86-0.97 (0.94) mm ; a = 41-42 (41) ; b = 5.2-5.8 (5.5) ; c = 28-32 (30) ; V = 36-38 (37) ; G₁ = 2.6-3.2 (2.8) ; G₂ = 13-17 (15) ; odontostyle = 7-8 (8) μm ; odontophore = 11-12 (12) μm ; oesophagus = 160-165 (163) μm ; prerectum = 98-112 (105) μm ; rectum = 18-20 (19) μm ; tail = 30-32 (31) μm ; ABD = 15-16 (15) μm.

Holotype (female). L = 0.87 mm ; a = 37 ; b = 5.4 ; c = 27 ; V = 39 ; G₁ = 3.6 ; G₂ = 15 ; odontostyle = 8 μm ; odontophore = 11 μm ; oesophagus = 162 μm ; prerectum = 100 μm ; rectum = 16 μm ; tail = 33 μm ; ABD = 16 μm.

Paratype males (2) : L = 0.93-0.96 mm ; a = 44-46 ; b = 5.3-5.6 ; c = 31 ; T = 51-55 ; odontostyle = 7-8 μm ; odontophore = 11-12 μm ; oesophagus = 171-174 μm ; spicules = 22-24 μm ; lateral guiding pieces = 5-6 μm ; ventromedian supplements 4-5 ; prerectum = 111-115 μm ; tail = 30-31 μm ; ABD = 17-19 μm.

DESCRIPTION

Female : Body C-shaped upon death, tapering gradually towards extremities. Cuticle finely striated, 2-3 μm thick at midbody and 4-5 μm on tail. Lateral chords about one-fifth to one-fourth of body width at midbody. Lateral dorsal and ventral body pores indistinct.

Lip region narrow, offset from body by a slight depression, 8 μm or about one-third of body width at base of oesophagus. Amphids cup-shaped, their apertures 5-6 μm or about two-thirds of lip width wide. Odontostyle about one lip width long. Basal guiding ring at 5 μm or about half lip width from anterior end. Odontophore arcuate, about 1.5 times the odontostyle length. Nerve ring encircling the anterior slender part of oesophagus at 78-85 μm from anterior end. Expanded portion of oesophagus offset by a constriction from the anterior slender part and occupies 25-27% on the oesophageal length. Cardia small, conoid. Location of oesophageal gland nuclei and their orifices as given below :

DO = 79-82 S₁N₁ = 87-88 S₂N = 94-95
 DN = 81-83 S₁N₂ = 88-89 S₂O = 95-96
 DO-DN = 1.6-1.9.

Vulva transverse. Vagina about one-third of corresponding body width. Reproductive organs mono-opisthodelphic. Anterior uterine sac rudimentary, 27-32 μm or 1.1-1.3 anal body widths long, packed with sperms. Posterior genital branch normal. Sphincter present at oviduct uterus junction. Ovary with few oocytes. Prerectum 6-7 anal body widths long. Rectum about one anal body width long. Tail short, conoid, ventrally curved, about two anal body widths long with one or two caudal pores on each side.

Male : Supplements an adanal pair and 4-5 irregularly spaced ventromedians. Spicules 1.3-1.4 anal body widths long. Lateral guiding pieces about one-fourth of spicules length. Prerectum 6-7 anal body widths long. Tail short, conoid, ventrally curved, 1.6-1.7 anal body widths long with two caudal pores on each side.

TYPE HABITAT AND LOCALITY

Soil around roots of paddy, *Oryza sativa* L., from Bhubaneswar, Orissa State ; collected in March, 1979.

TYPE SPECIMENS

Holotype : female and a paratype male on slide *Dorylaimoides kalingus* n. sp./1 ; other paratype males and females on slides *Dorylaimoides kalingus* n. sp./2-3 ; deposited in the nematode collection of Zoology Department, Aligarh Muslim University, Aligarh. A female paratype and a male paratype deposited at Muséum national d'Histoire naturelle, Laboratoire des Vers, Paris, France.

DIFFERENTIAL DIAGNOSIS

Dorylaimoides kalingus n. sp. keys with the key of Goseco, Ferris and Ferris (1976) to *D. pretoriensis* Heyns, 1963 ; *D. dactylurus* Heyns, 1963 and *D. arcuatus* Siddiqi, 1964 but differs from former two in having smaller and narrower body, smaller spicules and longer and differently shaped tail (L = 1.05 mm ; a = 30 ; c = 45 ; spicules = 30 μm ; tail bluntly conoid in *D. pretoriensis* and L = 1.07 mm ; a = 30 ; spicules = 36 μm ; tail digitate, dorsally convex-conoid in *D. dactylurus*). From *D. arcuatus* it differs in having constricted oesophageal bulb, posteriorly located vulva and smaller tail (c = 12 ; V = 33 ; oesophageal bulb not constricted in *D. arcuatus*).

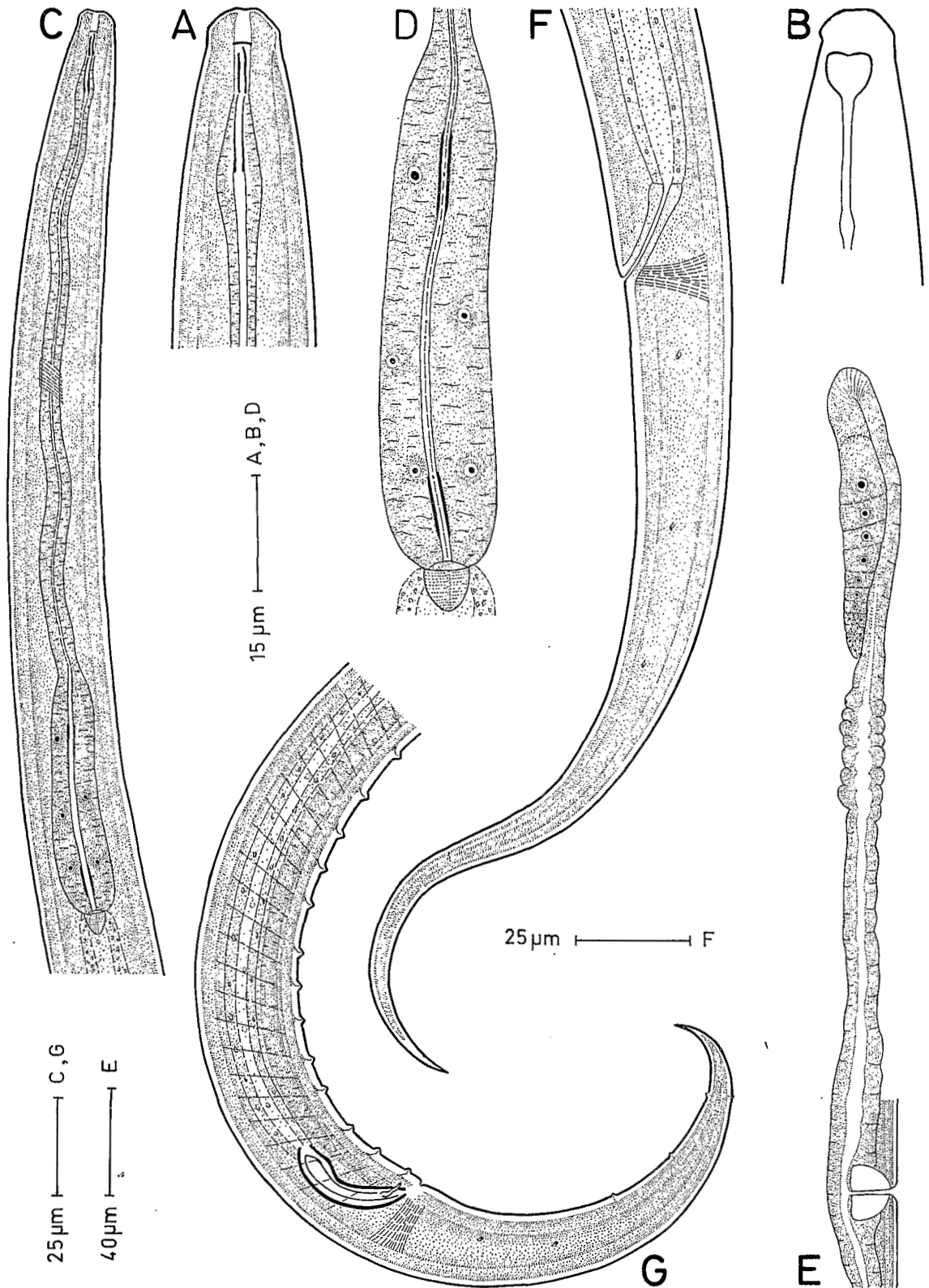


Fig. 3. *Calolaimus amphidius* n. sp. A : Anterior region ; B : Anterior end showing amphid ; C : Oesophageal region ; D : Expanded part of oesophagus ; E : Female genital branch (anterior) ; F : Female posterior end ; G : Male posterior region.

Calolaimus amphidius n. sp.
(Fig. 3)

DIMENSIONS

Paratype (female). L = 3.20 mm ; a = 103 ; b = 13.6 ; c = 16 ; V = 37 ; G₁ = 9 ; G₂ = 10 ; odontostyle = 6 μm ; odontophore = 9 μm ; oesophagus = 234 μm ; prerectum = 153 μm ; rectum = 24 μm ; tail = 205 μm ; ABD = 24 μm.

Holotype (female). L = 2.58 mm ; a = 80 ; b = 11.4 ; c = 15 ; V = 44 ; G₁ = 9 ; G₂ = 11 ; odontostyle = 6 μm ; odontophore = 9 μm ; oesophagus = 226 μm ; prerectum = 146 μm ; rectum = 23 μm ; tail = 171 μm ; ABD = 22 μm.

Paratype (males) (4) : L = 2.56-2.97 (2.71) mm ; a = 89-103 (96) ; b = 11.1-13.6 (11.4) ; c = 24-30 (26) ; T = 60-61 (60) ; odontostyle = 6-7 (6) μm ; odontophore = 9-10 (9) μm ; oesophagus = 226-246 (235) μm ; spicules = 31-32 (32) μm ; lateral guiding pieces = 8 μm ; ventromedian supplements = 12-13 (12) ; prerectum = 236-286 (263) μm ; tail = 99-109 (103) μm ; ABD = 23-24 (24) μm.

DESCRIPTION

Female : Body long slender, tapering posteriorly. Cuticle finely striated, 2-3 μm thick at midbody and 4-5 μm on tail. Lateral chords about one-third of body width at midbody. Lateral, dorsal and ventral body pores indistinct.

Lip region offset by slight depression, 9-10 μm or about one-third of body width at base of oesophagus. Amphids cup-shaped, thick-walled, their apertures 6-7 μm or about two-thirds of the corresponding body width wide. Odontostyle asymmetrical, 0.6-0.7 lip width long, its aperture one-third of its length. Basal guiding ring sclerotized, 3-4 μm from anterior end. Odontophore simple rod-like, about one lip width long. Nerve ring encircling the anterior slender part of oesophagus at 91-97 μm from anterior end. Expanded portion of oesophagus occupying 25-30% of total oesophageal length, its lumen thickened anteriorly and posteriorly. Cardia short, bluntly conoid. Location of oesophageal gland nuclei and their orifices as given below :

DO = 75-77 S₁N₁ = 84-86 S₂N = 92-93
DN = 76-77 S₁N₂ = 86-87 S₂O = 92-94
DO-DN = 1.1-1.5.

Vulva transverse. Vagina about one-third of corresponding body width. Reproductive organs amphidelphic. Uterus short, separated from oviduct by a slight depression ; ovary with few oocytes.

Prerectum 6-7 anal body widths long. Rectum about one anal body width long. Tail elongate-conoid with dorsally bent acute terminus, 8-9 anal body widths long. Caudal pores indistinct.

Male : Supplements an adanal pair and 12-13 regularly spaced ventromedians. Spicules dorylaimoid, about 1.3 anal body widths long. Lateral guiding pieces about one-fourth of spicules length. Prerectum 10-12 anal body widths long. Tail elongate-conoid, ventrally arcuate, 4-5 anal body widths long with 2-3 well developed caudal papillae.

TYPE HABITAT AND LOCALITY

Soil around roots of banana, *Musa paradisiaca* L., from Olavakat, district Palakat, Kerala state ; collected in September 1980.

TYPE SPECIMENS

Holotype : female and a paratype male on slide *Calolaimus amphidius* n. sp./1. Other paratype males and female on slides *Calolaimus amphidius* n. sp./2-4 ; deposited in the nematode collection of Zoology Department, Aligarh Muslim University, Aligarh. Paratype female and a male paratype deposited at Muséum national d'Histoire naturelle, Laboratoire des Vers, Paris, France.

DIFFERENTIAL DIAGNOSIS

Calolaimus amphidius n. sp. keys with the key of Goseco, Ferris and Ferris (1976) to *C. lenorus* (Siddiqi, 1965) Siddiqi, 1966 and *C. notus* Goseco, Ferris & Ferris, 1976 from which it differs by having a smaller body and thick walled amphids. It further differs from the former in having a wider body, longer oesophagus and tail (L = 3.95 mm ; a = 124 ; b = 19.6 ; c = 23 in *C. lenorus*). From *C. notus* it can further be differentiated in having a longer tail (L = 3.9 mm ; c = 11.65 in *C. notus*).

Key to species of *Calolaimus* Timm, 1964

1. Body 2.6-3.2 mm long ; amphids thick-walled
..... *amphidius* n. sp
Body 3.9-6.0 mm long ; amphids not thick-walled 2
2. Tail 9 anal body widths long or more ; c = 12-23 3
Tail 8 anal body widths long or less ; c = 25-37 4

3. Tail 9 anal body widths long ; c = 22-23
..... *lenorus* (Siddiqi, 1965) Siddiqi, 1966
Tail 15 anal body widths long ; c = 12
..... *notus* Goseco, Ferris & Ferris, 1976
4. Ventromedian supplements 8-12 5
Ventromedian supplements 19-22
..... *ditlevseni* (Micoletzky, 1922) Timm, 1964
5. Ventromedian supplements 8 ; spicules = 50 μm . . .
..... *papillatus* Timm, 1964
Ventromedian supplements 12 ; spicules = 40 μm . .
... *parapapillatus* Dhanachand & Jairajpuri, 1980

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