

**DESCRIPTION OF *LONGIDORUS DIMORPHICAUDATUS* SP. N.
(NEMATODA: DORYLAIMIDA) FROM ARUNACHAL PRADESH, INDIA**

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Summary. *Longidorus dimorphicaudatus* sp. n. is described from forest soil in Arunachal Pradesh, India. The new species is characterized by having 3.1-3.9 mm long body; lip region flattened, continuous or slightly offset by depression; amphids elongate, funnel shaped, not lobed; 117-132 μ m long, attenuated odontostyle with finely rounded base; odontophore simple, slightly enlarged at the base; and tail showing sexual dimorphism, elongate conoid in female and short conoid in male.

Key words: *Longidorus*, new species.

Soil samples collected in December 2003 from natural forests in Arunachal Pradesh, India, yielded an interesting new species of the genus *Longidorus* Micoletzky, 1922. This species is described and illustrated below.

MATERIALS AND METHODS

The nematodes were extracted from soil samples by Cobb's sieving and decantation method and a modified Baermann's funnel technique. Nematodes obtained in clear water were killed and fixed in hot 4% formalin, dehydrated to glycerine by a slow method and mounted on slides in anhydrous glycerine. Measurements were taken using an ocular micrometer and pharyngeal gland nuclei positions were calculated after Andrassy (1998). Drawings were made using a drawing tube attached to the microscope.

DESCRIPTION

LONGIDORUS DIMORPHICAUDATUS

sp. n.
(Fig. 1)

Measurements. See Table I.

Female. Body curved ventrally upon fixation, tapering gradually anteriorly, more abruptly posteriorly. Cuticle finely striated, 3.0-4.5 μ m thick at mid-body and 4.0-5.5 μ m on tail. Lateral hypodermal chords about one-fourth of body width at mid-body. Lateral, dorsal and ventral body pores indistinct.

Lip region flattened, continuous or slightly offset by

depression, about twice as wide as high and about one-fourth of body width at neck base. Amphids elongate, funnel shaped, not lobed; aperture pore-like. Odontostyle elongate, attenuated, with finely rounded base, about 8.5-10.5 times as long as lip region width with very fine aperture. Guide ring single, at 2.5-3.0 times lip region width from anterior end. Odontophore slightly enlarged at the base, 0.45-0.60 times the odontostyle length. Nerve ring at 61-66% of neck length from the anterior end. Pharynx typical of the genus, expanded portion occupying about 16.5-24% of the total neck length. Cardia one-fifth to one-fourth of corresponding body width at neck base. Pharyngeal gland nuclei located as follows: D = 81-85%; AS₁ = 37-41%; AS₂ = 39-44%; PS₁ and PS₂ lacking. Sub-ventral gland nuclei more developed than dorsal gland nucleus.

Gonads amphidelphic, genital branches almost equally developed. Ovaries reflexed, measuring 99-203 μ m (anterior) and 82-206 μ m (posterior) with oocytes arranged in a single row except near tip. Oviduct joining ovary subterminally, measuring 153-229 μ m (anterior) and 161-308 μ m (posterior). Sphincter present at oviduct-uterus junction. Uterus a wide tube, measuring 154-219 μ m (anterior) and 156-244 μ m (posterior). Vulva transverse. Vagina extending inwards about half of the corresponding body width; *pars proximalis vaginae* 16-20 μ m long with straight wall encircled by circular musculature; *pars refringens vaginae* absent; *pars distalis vaginae* 6-8 μ m long with curved walls. Pre-rectum 4.0-4.5 times anal body width long. Rectum 0.8-1.0 times the anal body width long. Tail elongate-conoid, ventrally arcuate with rounded tip, 6.5-8.0 anal body widths long, with a pair of caudal pores on each side.

Male. Testes two, dorylaimoid. An adanal pair and nine irregularly spaced ventro-median supplements. Spicules large, strongly built, ventrally bent near the middle, 1.5-2.1 times anal body width long; lateral guid-

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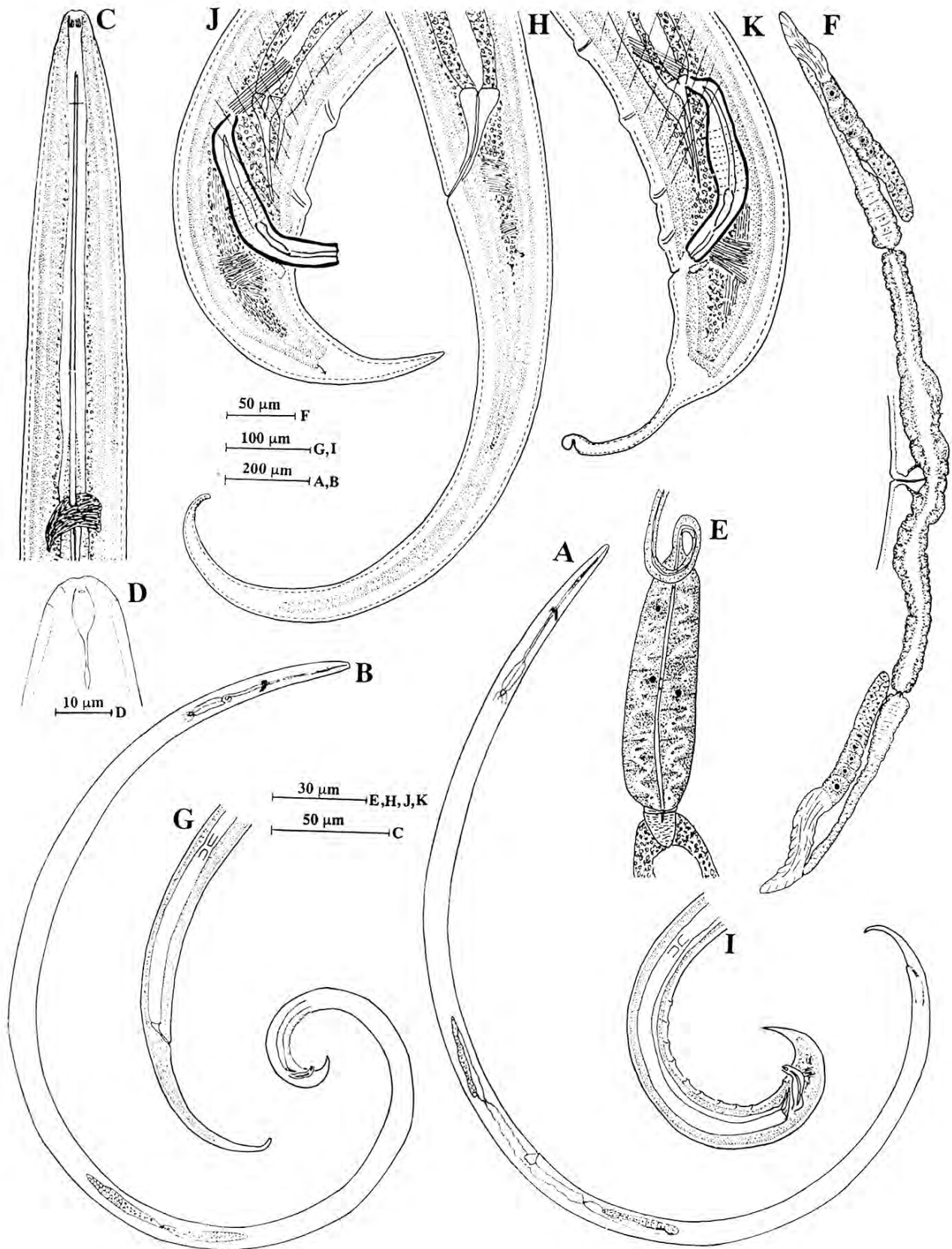


Fig. 1. *Longidorus dimorphicaudatus* sp. n. A: Entire female; B: Entire male; C: Anterior region of female; D: Anterior end of female showing amphid; E: Expanded part of pharynx of female; F: Female genital system; G: Female posterior region; H: Female posterior end; I: Male posterior region; J: Male posterior end; K: Male tail (abnormal).

Table I. Measurements of *Longidorus dimorphicaudatus* sp. n. (all measurements in μm except L in mm). Each character is reported as mean \pm standard deviation with the range in brackets.

Character	Holotype female	Paratype females	Paratype males
n		5	2
L (mm)	3.94	3.35 \pm 0.25 (3.11-3.76)	3.31, 3.12
a	56	56.5 \pm 2.1 (54-59)	58.5, 59.0
b	11	8.5 \pm 1.5 (7-11)	8.0, 8.5
c	17.5	15 \pm 1.5 (13.0-16.5)	39.5, 35.5
c'	6.5	7.1 \pm 0.65 (6.5-8.0)	2, 2
V	49	48.2 \pm 1.25 (47.0-50.5)	-
Lip region diam.	12.5	13.8 \pm 1.2 (12.5-15.5)	15.0, 13.5
Lip region height	6	7.6 \pm 1 (6.0-8.5)	7.5, 8.0
Odontostyle length	132	125 \pm 5.7 (117-132)	134, 124
Odontophore length	59	62.5 \pm 0.7.5 (55-71)	61, 60
Guide ring from ant. end	38	36.5 \pm 4.5 (34-45)	40, 38
Nerve ring from ant. end	226	233 \pm 36.5 (188-279)	287, 237
Neck length	366	401.5 \pm 67.5 (284-450)	397, 353
Pharyngeal bulb length	88	76 \pm 3 (71-79)	82, 67
Pharyngeal bulb diam.	25	24.5 \pm 2.07 (23-28)	23, 20
Cardia length	11	14.5 \pm 3.6 (12.5-18.0)	9, 10
Body diam. at neck base	55.5	51.9 \pm 3.79 (46.0-54.5)	53, 49
Body diam. at mid body	70.3	59.1 \pm 4.85 (53.5-66)	61.5, 53
Body diam. at anus	35	35 \pm 7.8 (30-50)	39.5, 43.5
Anterior genital branch	355	369 \pm 51.5(284-417)	-
Posterior genital branch	553	363 \pm 29 (324-403)	-
Ant. genital branch %	9	10.9 \pm 1.18 (9-12)	-
Post. genital branch %	14	10 \pm 0.97 (9.5-12.0)	-
Vulva from anterior end	1930	1615 \pm 126 (1466-1785)	-
Pre-rectum length	166	193 \pm 51 (134-225)	244, 339
Rectum length	39.5	38 \pm 4.03 (32-40)	63, 60
Tail length	224	225 \pm 14.5 (206-241)	83, 87
Hyaline portion of tail	50	59 \pm 14.5 (42-80)	40, 55
Spicules	-	-	84.5, 68.0
Lateral guiding pieces	-	-	38
Ventromedian supplements	-	-	9

ing pieces straight, about one-fourth of spicule length. Tail short, conoid, slightly ventrally arcuate with acute terminus, about two anal body widths long. Caudal pores two on each side.

Type habitat and locality. Soil from around the roots of grasses in Tawang, district Tawang, Arunachal Pradesh.

Type material. Holotype female on slide *Longidorus dimorphicaudatus* sp. n./1; paratype females and males on slide *Longidorus dimorphicaudatus* sp. n./ 2-5; deposited in the nematode collection of the Department of Zoology, Aligarh Muslim University, India.

Diagnosis. *Longidorus dimorphicaudatus* sp. n. is characterized by having 3.1-3.9 mm long body; lip region flattened, continuous or slightly offset by depression; amphids elongate, funnel shaped, not lobed; 117-132 μm long, attenuated odontostyle with finely rounded base;

odontophore simple, slightly enlarged at the base; and tail showing sexual dimorphism, elongate-conoid in female and short conoid in male. The code for identifying the new species using the polytomous key of Chen *et al.* (1997) is: A45, B2, C34, D3, E4, F2, G1, H6, I2.

Relationships. *Longidorus dimorphicaudatus* sp. n. is distinct from other species of the genus in the sexual dimorphism of the tail shape. However, because of the presence of an elongate-conoid female tail, it comes close to *L. longicaudatus* Siddiqi, 1962, *L. nirulai* Siddiqi 1965, *L. pini* Andrias *et* Arias, 1987 and *L. reisi* Roca *et* Bravo, 1993.

Longidorus dimorphicaudatus sp. n. differs from *L. longicaudatus* in having a longer body (3.11-3.94 mm *vs* 2.25-3.0 mm); longer odontostyle (117-132 μm *vs* 92-100 μm); more posterior guide ring position from anterior end (34-45 μm *vs* 21-24 μm); longer tail (c' = 6.5-8.0 *vs* 2.8-3.2; c = 13.0-17.5 *vs* 40-50), and in the presence of males (*vs* absent).

From *L. nirulai*, the new species differs in having a

comparatively robust body ($a = 54-59$ vs $88-104$); amphids elongate, funnel-shaped, not lobed (vs large, symmetrically bi-lobed); longer odontostyle ($117-132 \mu\text{m}$ vs $100-106 \mu\text{m}$); longer female tail ($6.5-8.0$ anal body widths long vs two and a half anal body widths long; $c = 13.0-17.5$ vs $54-64$), and longer spicules in males ($84.5, 68.0$ vs $55-60 \mu\text{m}$).

It differs from *L. pini* in having a $12.5-15.5 \mu\text{m}$ wide flattened lip region, continuous or slightly offset by depression (vs laterally rounded and slightly expanded lip region, $9.5 \mu\text{m}$ wide, offset from neck contour by a slight depression), elongate, funnel-shaped and not lobed amphids (vs large bi-lobed, with symmetrical lobes); longer odontostyle ($117-132 \mu\text{m}$ vs $65-70 \mu\text{m}$); more posterior guide ring position ($34-45$ vs $26-27 \mu\text{m}$) and in the presence of males (vs absent).

Longidorus dimorphicaudatus sp. n. differs from *L. reisi* in having smaller and robust body ($L = 3.11-3.76$ mm vs $6.9-10.5$ mm, $a = 54-59$ vs $157.5-246.5$); lip region flattened, continuous or slightly offset by depression (vs frontally flattened and laterally rounded expanded lip region, separated from the rest of the body by a wide and deep depression); elongate, funnel-shaped and not lobed amphids (vs bi-lobed amphidial pouches, with the ventral lobe slightly longer); longer odontostyle ($117-132 \mu\text{m}$ vs $103.5-112.5 \mu\text{m}$); more posterior guide ring position from anterior end ($34-45 \mu\text{m}$ vs $29.5-32.5 \mu\text{m}$); smaller b value ($7-11$ vs $16-25$); longer tail ($206-241 \mu\text{m}$ vs $70.0-93.5 \mu\text{m}$; $c = 13.0-17.5$ vs $87-126.5$; $c' = 6.5-8.0$ vs $2.1-2.9$); and in the presence of males (vs absent).

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LITERATURE CITED

- Andrássy I., 1998. Once more: the oesophageal gland nuclei in the dorylaimoid nematodes. *Opuscula Zoologica Budapest*, 31: 165-170.
- Andres M.F. and Arias M., 1987. A new species of *Longidorus* (Nematoda: Longidoridae) associated with forest soils and notes on *L. congoensis* Aboul-Eid, 1970 and *L. intermedius* Kozłowska et Seinhorst, 1979, new records for Spain. *Nematologica*, 33: 386-392.
- Chen Q., Hooper D.J., Loof P.A.A. and Xu J., 1997. A revised polytomous key for the identification of species of the genus *Longidorus* Micoletzky, 1922 (Nematoda: Dorylaimoidea). *Fundamental and Applied Nematology*, 20: 15-28.
- Roca F. and Bravo M.A., 1993. *Longidorus reisi* sp. n. (Nematoda: Longidoridae) from Portugal. *Fundamental and Applied Nematology*, 16: 401-405.
- Siddiqi M.R., 1962. Studies on the genus *Longidorus* Micoletzky, 1922 (Nematoda: Dorylaimoidea), with descriptions of three new species. *Proceedings of the Helminthological Society of Washington*, 29: 177-188.
- Siddiqi M.R., 1965. *Longidorus nirulai* n. sp., a parasite of potato plants in Shillong, India, with a key to species of *Longidorus* (Nematoda: Dorylaimoidea). *Proceedings of the Helminthological Society of Washington*, 32: 95-99.