

LABRONEMA NEODIVERSUM SP. N., A NEW DORYLAIMID NEMATODE SPECIES FROM WEST BENGAL, INDIA

S. Mondal², B. Manna² and V.V. Gantait^{1,3}

²Parasitology Laboratory, Department of Zoology, Calcutta University, B.C. Road, Kolkata-700019, West Bengal, India

³Nemathelminthes Section, Zoological Survey of India, M-Block, New Alipur, Kolkata-700053 West Bengal, India

Received: 24 May 2012; Accepted: 8 June 2012.

Summary. *Labronema neodiversum*, a new nematode species belonging to the order Dorylaimida from West Bengal, India is described and illustrated. *Labronema neodiversum* sp. n. is characterized by having bodies 1.36-1.58 mm (female) and 1.29-1.34 mm (male) long, curved ventrally. Lip region offset, somewhat angular. Odontostyle strong, longer than labial diameter; odontophore simple rod-like. Guide ring 'double'. Expanded portion of oesophagus occupying 43-45% of its length. Cardia tongue-shaped with thin cardiac disc. Vulva longitudinal. Short conoid dimorphic tail (with dorsally curved peg-like structure in female, rounded in male). Male possesses 25-27 contiguous ventromedian supplements with an adanal pair. It differs from other species of the genus and shows closest similarities with *L. varicaudatum* (Thorne, 1929) Thorne, 1939 and *L. diversum* Andrassy, 2002 by having the digitate tail in females. But it differs from *L. varicaudatum* in the following characters: shorter body, stylet longer than labial diameter, tip of the female tail dorsally bent. It differs from *L. diversum* in: tongue-shaped cardia, presence of an adanal pair of ventromedian supplements, caudal papillae inconspicuous, copulatory hump absent.

Key words: Description, new nematode species.

The genus *Labronema* was erected by Thorne (1939). It belongs to the family Qudsianematidae under the order Dorylaimida. Andrassy (1991) compared and provided a key to species of the genus, described and reported before 1989-90 (29 species). Jairajpuri and Ahmad (1992) listed 36 species under this genus. Andrassy (2011) made short comments on the nominal species of *Labronema*, described after 1989-90 (20 species). He opined that, out of the twenty species described under this genus in the last two decades, eleven belong in all probability to the genus but eight certainly do not. In July 2007, during a survey in the Alipur Zoo-garden of Kolkata, West Bengal, India, specimens of *Labronema* different from those previously described were collected. They are considered to represent a new species, which is described and illustrated herein.

MATERIALS AND METHODS

Nematode specimens were extracted from soil using the Cobb's sieving and decanting method (Cobb, 1918) combined with the modified Baermann's funnel technique (Christie and Perry, 1951). They were then processed by Seinhorst's slow dehydration method (Seinhorst, 1959), mounted on slides in anhydrous glycerin and sealed. Measurements were taken with the help of an ocular micrometer using an Olympus research microscope with drawing-tube attachment, model no. BX

41. Dimensions were presented in accordance with De Man's formula (De Man, 1884). Diagrams were drawn with the help of a camera lucida. Specimens were deposited to the National Zoological Collections of Zoological Survey of India, Kolkata, West Bengal, India.

DESCRIPTION

LABRONEMA NEODIVERSUM sp. n.

(Figs 1 and 2; Table I)

Female. Medium sized nematode, body more or less straight to ventrally arcuate upon fixation. Body slightly tapering towards both the extremities. Cuticle finely striated, 4-5 µm thick at midbody and 8-9 µm on tail. Lateral chords narrow, about one-sixth to one-fifth of body width at midbody. Dorsal and ventral body pores are distinct in anterior region of body, lateral body pore indistinct. Lip region well offset by a constriction, somewhat angular, with the usual complement of labial and cephalic papillae; lips moderately amalgamated. Mouth opening surrounded by six small inner liplets. Lip region wider than the adjoining body, 31-33% of body width at base of oesophagus. Amphid stirrup-shaped with slit-like aperture, opening about half as wide as corresponding body width. Odontostyle strong, longer than labial diameter, nearly as thick as cuticle; 7.8-8.5% of oesophageal length. Stylet aperture occupying about one-third of its length. Odontophore simple rod-like, about 0.7-0.8 times odontostyle length. Guide ring 'double', about 0.8 times lip region width from anterior end. Oesophagus occupying 20-26% of body

¹ Corresponding author: v.gantait@rediffmail.com

length, relatively broad in its anterior part. Pharyngeal expansion gradual; expanded portion occupying about 43-45% of its length. Nerve ring at about 35-36% of neck length from anterior end of the body. Cardia tongue-shaped, about half of the corresponding body width long; thin cardiac disc present. Glandularium occupying 37-42% of oesophageal length. Pharyngeal gland nuclei located as follows: D = 61-63%; AS₁ = 24-26; AS₂ = 42-44%; PS₁ = 64-66%; PS₂ = 69-70%. Genital system didelphic, amphidelphic. Vulva longitudinal with conoid, sclerotized inner lips. Vagina extending inwards about one-third of corresponding body width. Ovaries reflexed; anterior gonad longer than the posterior one. Oocytes arranged in a single row except at tip of the ovaries. One mature egg observed in each ovary measured 110-117 × 50-62 µm, longer than the corresponding body width. Pre-rectum about two anal body widths long. Rectum about 1.2-1.3 times anal body widths long. Tail short, 1.7-1.9% of body length; digitate, conoid with a dorsally curved peg-like structure.

Male. Similar to female in general morphology except

the posterior region, strongly curved ventrad because of the presence of copulatory muscles. Testes two. Spermatozoa fusiform. Spicules dorylaimoid, slightly curved ventrad, about two anal body widths long. Lateral guiding pieces arcuate, about one-fourth of spicule length. Supplements, an adanal pair and 25-27 contiguous ventromedians, of which the posterior ones lying within the range of spicules. Pre-rectum about two anal body widths long, reaching to about midway of the supplements. Rectum about 1.5-1.7 times anal body widths long. Tail short, conoid-rounded without digitate tip, about 0.6-0.7 times anal body widths long. Caudal papillae inconspicuous.

Etymology. The species epithet *neodiversum* (Latin) refers to the close relationship of this species to *Labronema diversum*.

Type habitat and locality. *Labronema neodiversum* sp. n. was found in soil around the roots of unidentified grass in the Alipur Zoo at Kolkata, West Bengal, India.

Table I. Measurements of *Labronema neodiversum* sp. n. (all measurements in µm except L in mm; n = number of specimens).

Character	Holotype female	Paratype females (n = 9)		Paratype males (n = 5)	
L	1.36	1.36-1.58	(1.45 ± 0.09)	1.29-1.34	(1.31 ± 0.02)
a	26.4	26.4-28.3	(27.4 ± 0.97)	27.4-28.0	(27.7 ± 0.25)
b	4.8	4.8-5.7	(5.2 ± 0.45)	4.8-5.6	(5.1 ± 0.40)
c	50.4	50.4-56.2	(53.6 ± 2.72)	52.8-54.4	(53.4 ± 0.80)
c'	1.1	1.1-1.4	(1.2 ± 0.15)	1.2-1.4	(1.3 ± 0.10)
V	50.4	50.5-54.0	(52.5 ± 1.56)	-	-
G ₁	32.4	32.4-34.2	(33.4 ± 0.91)	-	-
G ₂	30.6	30.6-33.5	(32.0 ± 1.18)	-	-
Lip region width	14.7	14.7-15.3	(15.1 ± 0.27)	14.5-15.3	(14.8 ± 0.38)
Lip region depth	4.9	4.9-5.2	(5.0 ± 0.15)	4.8-4.9	(4.8 ± 0.07)
Maximum body width	51.4	51.4-52.7	(52.2 ± 0.50)	50.4-51.3	(50.8 ± 0.45)
Body width at base of lip region	12.2	12.2-12.7	(12.4 ± 0.25)	12.2-12.5	(12.3 ± 0.15)
Body width at base of oesophagus	46.5	46.5-48.2	(47.3 ± 0.85)	41.6-44.5	(43.1 ± 1.45)
Body width at anus	24.7	24.7-26.1	(25.5 ± 0.73)	24.5-25.0	(24.8 ± 0.26)
Odontostyle length	22.0	22.0-23.7	(22.9 ± 0.71)	21.7-22.5	(22.2 ± 0.26)
Odontophore length	27.7	27.7-29.2	(28.4 ± 0.75)	25.0-27.2	(26.9 ± 1.70)
Amphid from anterior end	7.3	7.3-8.2	(7.7 ± 0.45)	7.3-7.5	(7.4 ± 0.10)
Guide ring from anterior end	12.2	12.2-13.7	(12.9 ± 0.61)	11.7-12.6	(12.1 ± 0.50)
Nerve ring from anterior end	102.3	102.3-110.8	(106.8 ± 3.55)	101.4-108.2	(105.3 ± 3.40)
Oesophageal length	281.7	281.7-292.7	(287.7 ± 4.58)	269.5-277.8	(273.50 ± 3.74)
Expanded part of oesophagus	122.5	122.5-127.9	(124.8 ± 2.31)	124.3-125.7	(124.9 ± 0.58)
Glandularium	107.8	107.8-110.3	(109.0 ± 1.07)	106.0-108.5	(107.2 ± 1.25)
Vulva from anterior end	686.2	686.2-694.4	(690.1 ± 3.60)	-	-
Anterior gonad	441.2	441.2-450.5	(446.4 ± 4.75)	-	-
Posterior gonad	416.5	416.5-429.0	(421.4 ± 5.41)	-	-
Prerectum	73.5	73.5-77.4	(75.5 ± 1.70)	74.5-76.2	(75.5 ± 0.90)
Rectum	41.6	41.6-42.7	(42.07 ± 0.46)	40.2-42.1	(41.2 ± 0.95)
Spicule	-	-	-	54.4-56.0	(55.4 ± 0.72)
Lateral guiding piece	-	-	-	13.7-14.2	(13.9 ± 0.25)
Tail length	26.9	26.9-28.3	(27.6 ± 0.60)	22.5-23.7	(23.0 ± 0.51)

Type specimens. Holotype female, three paratype females and a paratype male are under the Registration No. 1358, six paratype females under the Registration No. 1359 and four paratype males under the Registration No. 1360, all deposited in the National Zoological Collections of Zoological Survey of India, Kolkata, West Bengal, India.

Differential diagnosis and relationships. *Labronema neodiversum* sp. n. is characterized by having bodies 1.36-1.58 mm (female) and 1.29-1.34 mm (male) long; well offset lip region; odontostyle strong, longer than labial diameter; guide ring 'double'; cardia tongue-shaped with thin cardiac disc; longitudinal vulva with conoid inner lips; short conoid dimorphic tail (mammillate or digitate in female, rounded in male); male pos-

sesses 25-27 contiguous ventromedian supplements beginning within the range of spicula.

Labronema neodiversum sp. n. differs from other species of the genus and shows close similarities with *L. varicaudatum* (Thorne, 1929) Thorne, 1939 and *L. diversum* Andrassy, 2002 by having the digitate tail in female. This peculiar structure of female tail appears to be an atavistic character which may occur only in some larval stages in *L. thornei* Ferris, 1968, as illustrated by Ferris (1968), but not in the adult females. *Labronema rapax* Thorne, 1974 also has a digitate-subdigitate tail, but this shape occurs in both the sexes (no sexual dimorphism).

The proposed new species differs from *L. varicaudatum* in the following characters: shorter body (*vs.* 3.5-3.6 mm), odontostyle longer than labial diameter (*vs.* equal to

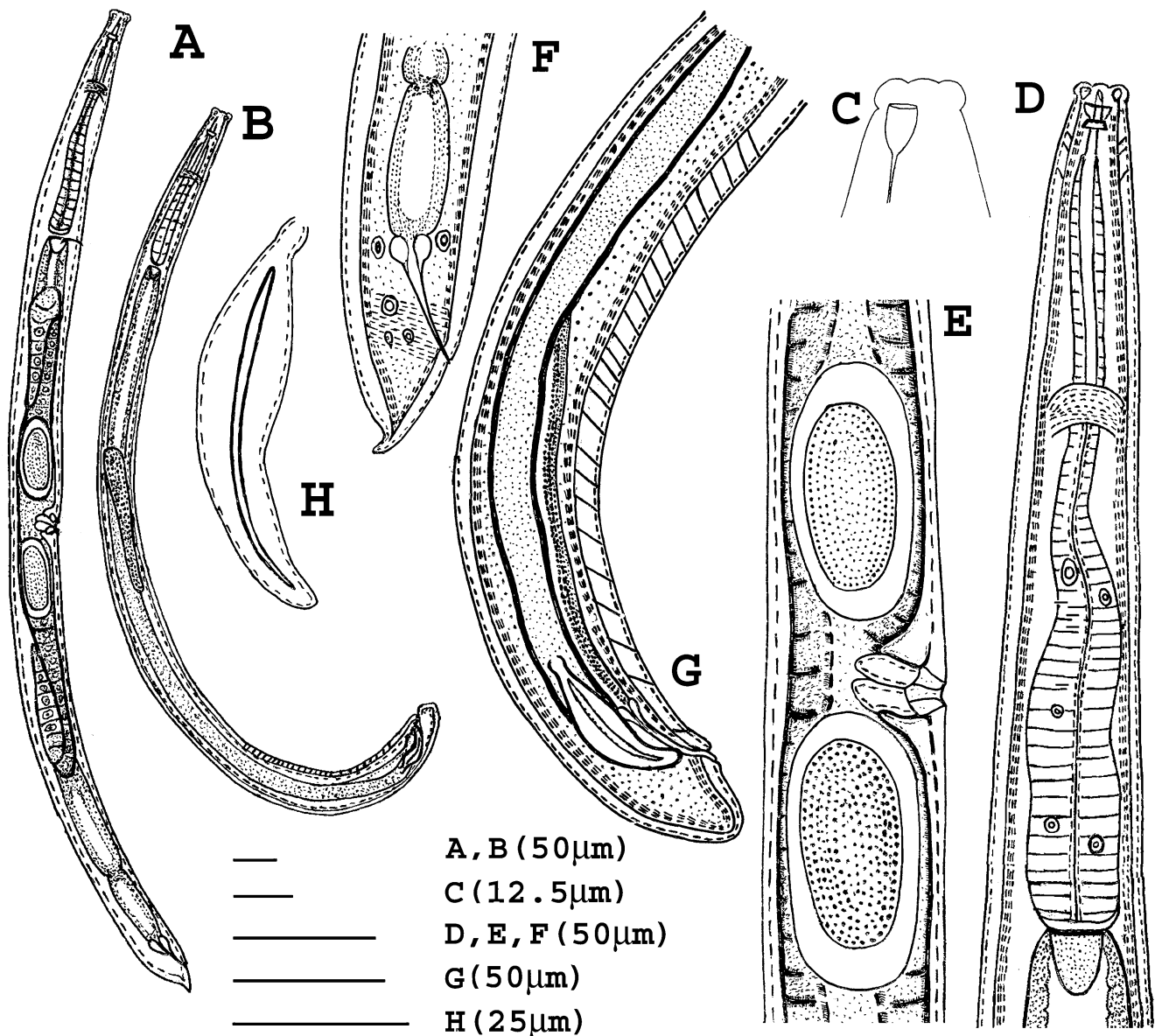


Fig. 1. *Labronema neodiversum* sp. n. (Camera lucida drawings). A, entire female; B, entire male; C, anterior portion of female; D, cephalic region of female; E, vulval portion; F, posterior portion of female; G, posterior portion of male; H, spicules.

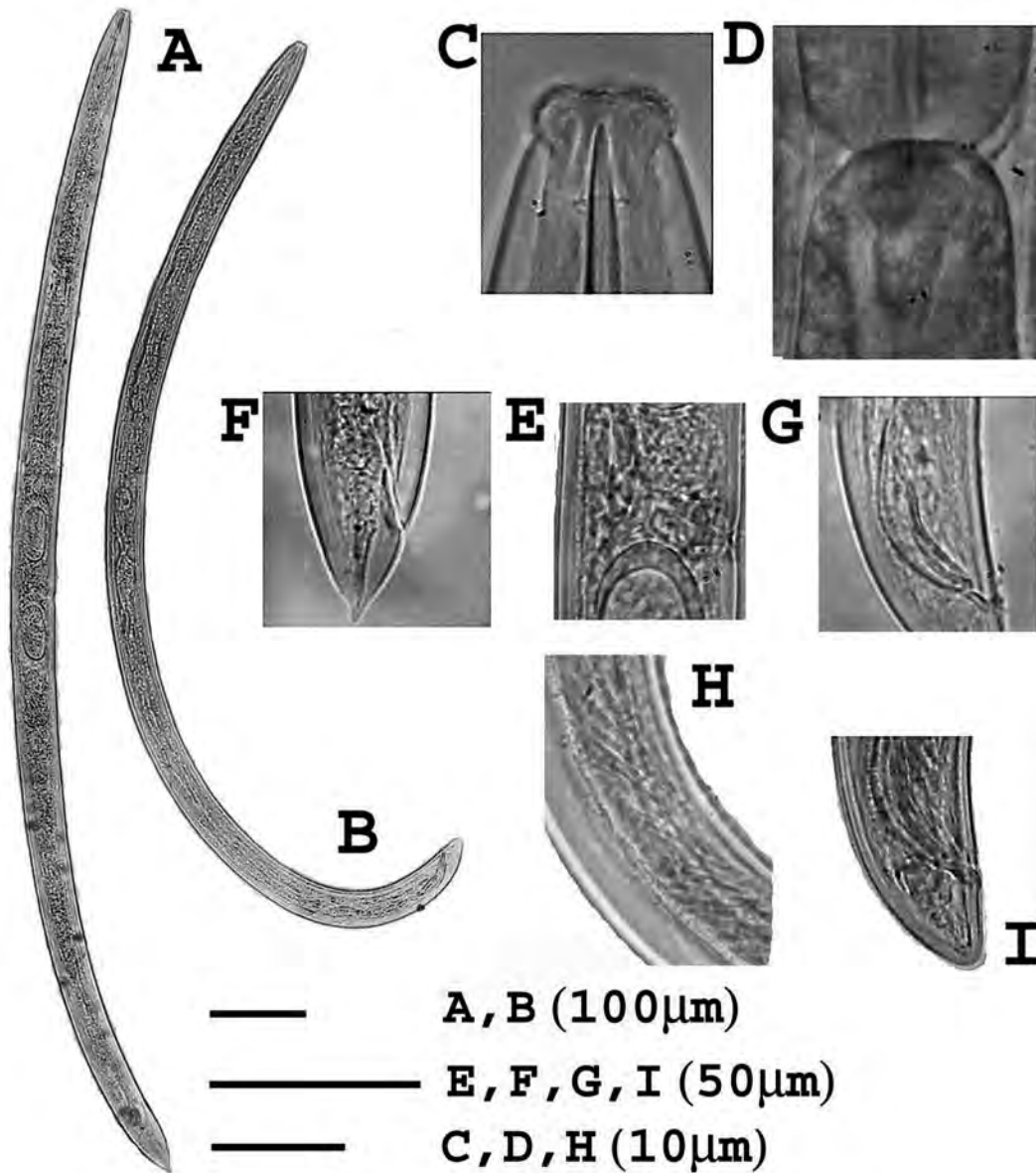


Fig. 2. *Labronema neodiversum* sp. n. (Photomicrographs). A, entire female; B, entire male; C, anterior portion of female; D, Oesophago-intestinal junction of female; E, vulval region; F, posterior portion of female; G, spicules; H, ventromedian supplements; I, posterior portion of male.

that), tip of the female tail dorsally bent (*vs.* straight). Besides dimorphism in tail shape, the proposed species also shows similarities with *L. diversum* in having odontostyle longer than labial diameter, guide ring 'double' at middle of the restricted stylet, prerectum reaching to about midway of the supplements. But it differs in the following characters: body shorter (*vs.* 2.17-2.44 mm in female, 2.56-2.85 in male), cardia tongue-shaped (*vs.* elongate-conoid), presence of some ventromedian supplements in the range of spicules, caudal papillae inconspicuous (*vs.* small, 5-6 pairs), copulatory hump absent (*vs.* present).

ACKNOWLEDGEMENTS

The authors are thankful to the Vice-chancellor, Cal-

cutta University, Kolkata, West Bengal, India and the Director, Zoological Survey of India, Kolkata, West Bengal, India for laboratory and other facilities. We are also grateful to the Director of Alipur Zoo-garden, Kolkata, West Bengal, India for giving permission to collect the specimens in the Zoo.

LITERATURE CITED

- Andrássy I., 1991. The superfamily Dorylaimoidea (Nematoda) – a review. Family Qudsianematidae, II. *Opuscula Zoologica Instituti Zoosystematici Universitatis Budapestinensis*, 24: 165-170.
- Andrássy I., 2011. Three new bisexual species of *Labronema* Thorne, 1939 (Nematoda: Qudsianematidae). *Opuscula Zoologica Budapestinensis*, 42 (2): 107-120.

- Christie J.R. and Perry V.G., 1951. Removing nematodes from soil. *Proceedings of Helminthological Society of Washington*, 18: 106-108.
- Cobb N.A., 1918. *Estimating the nema population of the soil*. Agricultural Technical Circular I. Bureau of Plant Industry, United States, Department of Agriculture, Washington, USA, 48 pp.
- Ferris V.R., 1968. Biometric analyses in the genus *Labronema* (Nematoda: Dorylaimida) with a description of *L. thornei* n. sp. *Nematologica*, 14: 276-284.
- Jairajpuri M.S. and Ahmad W., 1992. *Dorylaimida: free-living, predaceous and plant parasitic nmatodes*. Oxford and IBH Publishing Company Private Limited, New Delhi, India, 458 pp.
- Man J.G. de, 1884. *Die frei in der reinen Erde und im süßen Wasser lebenden Nematoden der Niederländischen Fauna – Eine systematisch-faunistische Monographie*. E.J.Brill, Leiden, The Netherlands, 206 pp.
- Seinhorst J.W., 1959. A rapid method for the transfer of nematodes from fixative to anhydrous glycerine. *Nematologica*, 4: 67-69.
- Thorne G., 1939. A monograph of the nematodes of the superfamily Dorylaimoidea. *Capita Zoologica*, 8: 1-261.

