NULLONCHUS RAFIQI SP. N., A NEW MONONCHID SPECIES FROM WEST BENGAL, INDIA

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Summary. *Nullonchus rafiqi*, a new species of Mononchida from West Bengal, India, is described and illustrated. *Nullonchus rafiqi* sp. n. is characterized by a 2.7-2.9 mm long body, curved ventrally. Lip region offset from body; buccal cavity roomy, broad and flat, 56.6-60 × 33.3-36.3 µm; no dorsal or ventral tooth or denticle but two pairs of transverse ridges are found. Oesophago-intestinal junction tuberculate; genital system didelphic-amphidelphic with reflexed ovaries. Oesophagus cylindrical; tail elongated, five to six anal diameters long; caudal pores seven and caudal glands three in number; spinneret opening terminal. The new species can be distinguished from the other three species of the genus *Nullonchus* by the following combinations of characters: longer body and tail, larger buccal cavity, didelphic-amphidelphic genital system.

Key words: Description, guava, new nematode species.

Siddiqi (1984) erected the genus *Nullonchus* from Colombia and described three species: *Nullonchus levistomus, N. rapax* and *N. valens*. During a survey of a guava (*Psidium guajava* L.) orchard in the district South 24-Parganas, West Bengal, in July, 2004, specimens of *Nullonchus*, different from those previously described, were collected. They were considered to represent a new species, which is described here as *Nullonchus rafiqi*. The genus is reported for the first time from India.

MATERIALS AND METHODS

The nematode specimens were extracted by a modified Baermann's funnel technique (Christie and Perry, 1951), fixed in hot diluted 4% FA (formalin-acetic acid mixture) (Seinhorst, 1966), mounted on slides in anhydrous glycerin and sealed. Preserved specimens were observed under different magnifications with an Olympus BX-51 trinocular light microscope. Figures were drawn with the aid of a camera lucida attached to the microscope. Images were captured with a CCD digital camera (CoolSnapPro) integrated with the microscope. Body dimensions were tabulated using de Man's formula (de Man, 1880). Description is based on measurements of holotype female, values of which have been provided outside parentheses while measurement ranges of paratype females are given in parentheses.

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DESCRIPTION

NULLONCHUS RAFIQI **sp. n.**
(Figs 1, 2; Table I)

Female. Body long, 2.7 mm (2.7-2.9), tapering towards the posterior portion; maximum body width 83.2 µm (80.3-83.3). Cuticle smooth, thickness varies, 4.7 µm (4.5-4.8) at lip region, 3.49 µm (3.45-4.19) at oesophago-intestinal junction, 3.6 µm (3.5-4.2) at mid-body and 7.1 µm (7.0-7.5) at caudal region. Labial and cephalic papillae prominent; lip region offset from body. Buccal cavity spacious, broad and flat, its length more than 1.5 times its width. Amphids oval-shaped, opening almost at the level of the constriction of the lip region. Buccal cavity devoid of any tooth or denticle, only two pairs of transeverse ridges present; geusids are prominent at the subventral base of the buccal cavity. Oesophagus long, muscular, cylindrical; oesophago-intestinal junction tuberculate with medium-sized rounded valve. Outlets of oesophgeal glands: D = 30.94% (30.9-32.21%), AS_1 = 15.62% (15.6-18.81%), AS_2 = 19.91% (19.85-20.69%), PS_1 = 51.64% (51.58-62.63%), PS_2 = 61.0% (60.95-63.5%). Excretory pore situated behind the nerve ring and at 188.55 µm (172.43-188.63) from anterior end. Nerve ring at 173.2 µm (168.4-175.6) from anterior end. Lateral cord occupying 1/3rd - 2/5th of the mid-body width. Vagina slightly oblique. *Pars proximalis vaginae,* 8.3 µm (7.1-9.4), *pars refringes vaginae* with two triangular sclerotizations measuring 6.9 × 3.91 µm (5.84-6.94 × 3.7-3.91) and 5.89 × 3.52 µm (5.8-5.9 × 3.49-3.74), cw 10.5 (9.7-10.8) and *pars distalis vaginae*, 2.6 µm (2.6-2.8) are prominent. One pre- and one post-advulval papilla present. Genital system didelphic-amphidelphic, V = 57.6-58.6%, ovary short, reflexed, not reaching the oviduct-uterus junction. Oviduct consists of a distal part

and a well-developed proximal *pars dilatata.* Intra-uterine eggs three in number; two anterior to vulva, 102.9 × 58.8 µm and 122.5 × 53.9 µm; the other one posterior to vulva, 22.5 × 53.9 µm. Vagina cylindrical. Rectum 28.2 µm (26.5-28.23) long. Dorsal body pores at caudal region 7 (6-7) in number, among which six are posterior to anal opening and one anterior to anus. Tail 313 µm (310.0-334.5), slightly curved ventrally, gradually tapering, proximal third almost cylindrical; caudal glands three in number, spinneret terminal.

Male. Not found.

Etymology. The new species has been named after the renowned nematologist, Professor Mohammad Rafiq Siddiqi, Commonwealth Institute of Parasitology, UK.

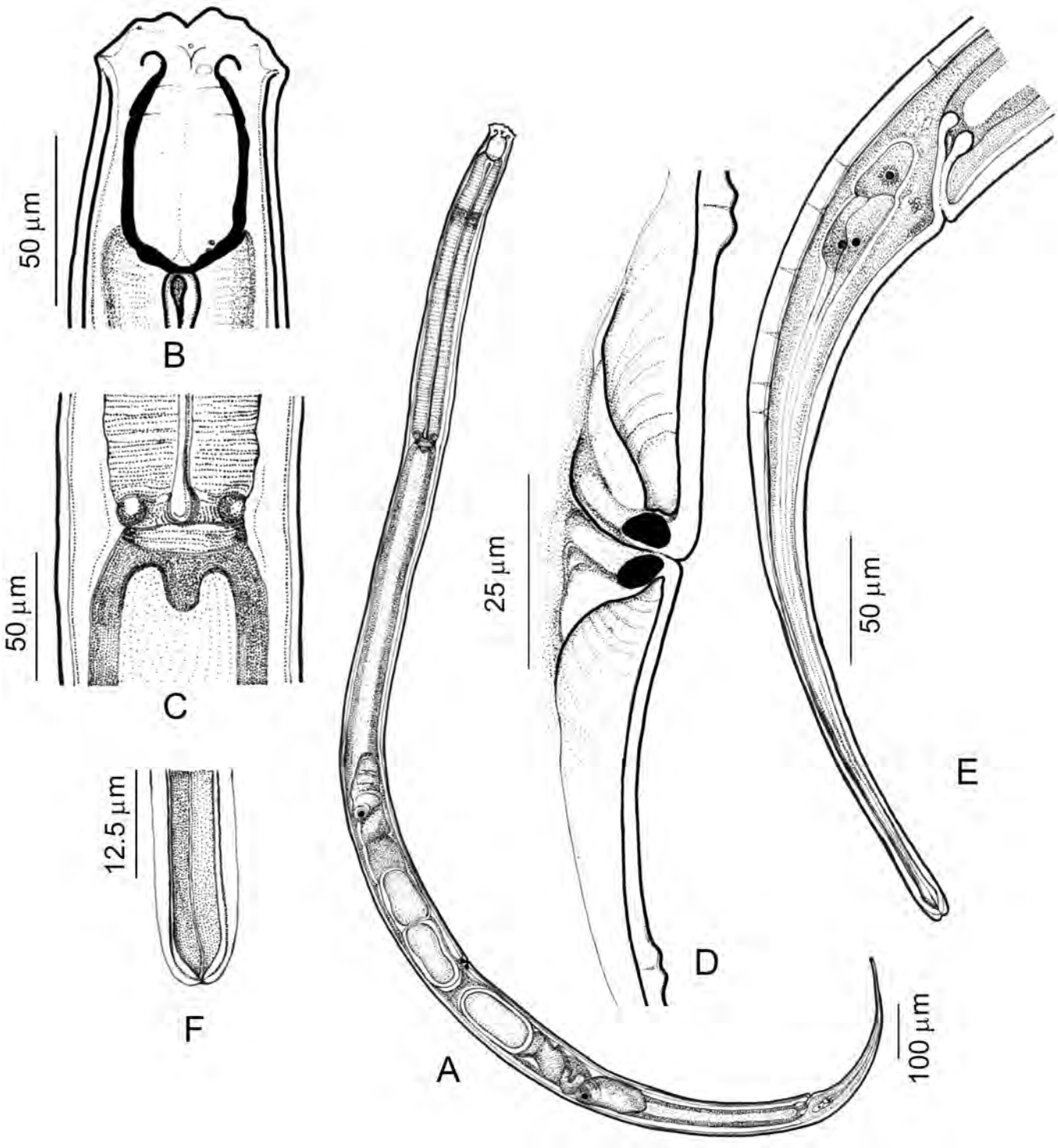

Fig. 1. *Nullonchus rafiqi* sp. n. (camera lucida drawings) A: entire female; B: buccal cavity; C: oesophago-intestinal junction; D: vulval region; E: tail region; F: tip of the tail.

Type habitat and locality. Nullonchus rafiqi sp. n. was found in soil around the roots of guava in a guava orchard located at South 24-Parganas (22°22.64' N, 88°25.7' E), West Bengal, India.

Type specimens. Holotype female on slide no. WN942 and four paratype females on slide no. WN941, deposited at the National type collection of Zoological Survey of India, Kolkata, India.

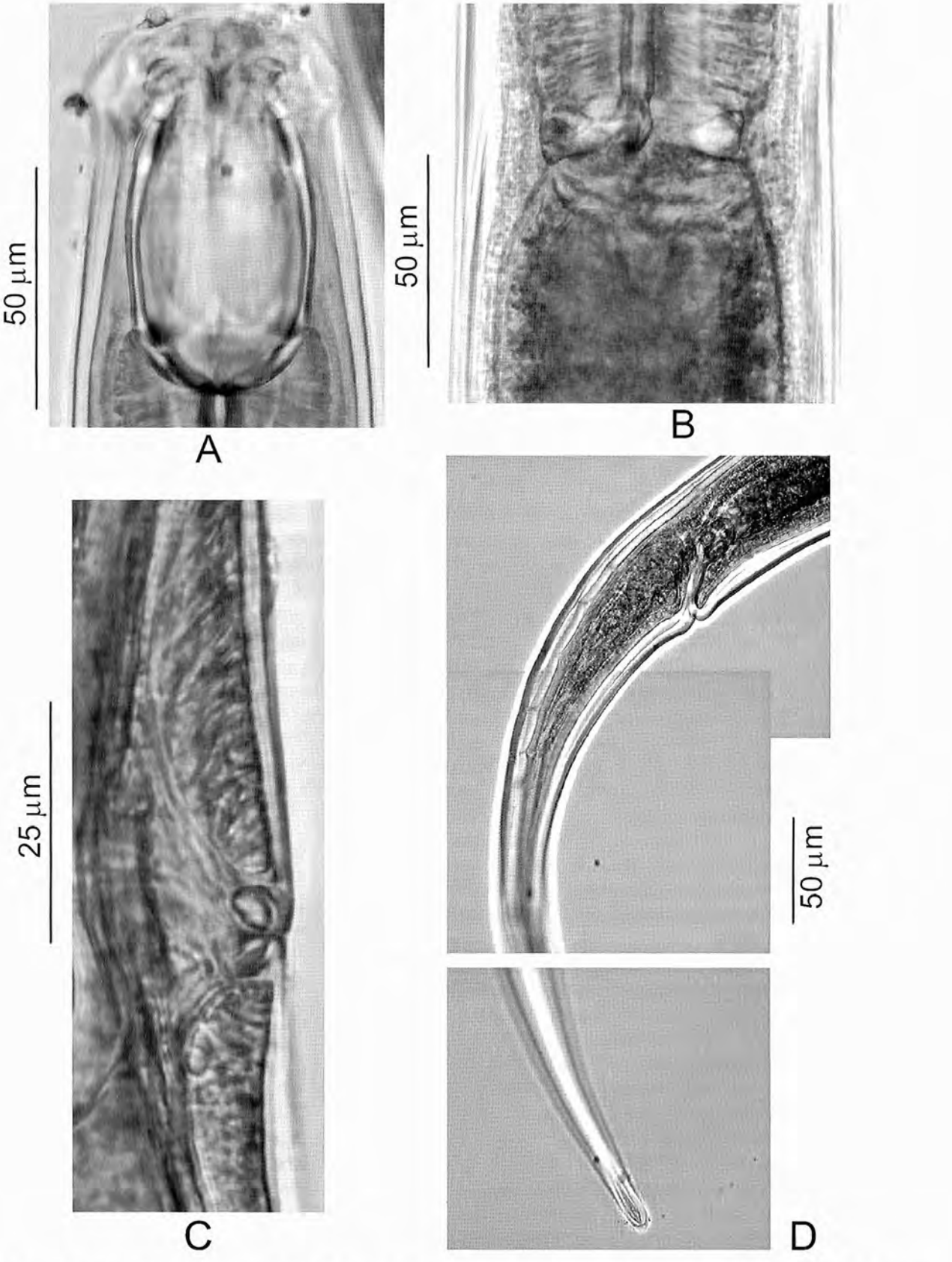

Fig. 2. *Nullonchus rafiqi* sp. n. (Photomicrographs) A: buccal cavity; B: oesophago-intestinal junction; C: vulval region; D; tail region.

Table I. Measurements of *Nullonchus rafiqi* sp. n. (n = number of individuals examined; all measurements are in µm except "L" which is in mm; values for paratypes are mean±SD).

Character	Holotype female	Paratype females No. = 4
L	2.7	2.8±0.096 (2.7-2.9)
a	32.7	33.6±0.97 (32.4-34.7)
b	5.5	5.7±0.12 (5.5-5.8)
c	8.7	8.5±0.09 (8.4-8.7)
c'	5.5	5.8±0.04 (5.5-5.9)
V%	58.6	58.2±0.44 (57.6-58.7)
Anterior gonad	439.6	433.9±8.74 (425.8-446.1)
Posterior gonad	429.6	428.3±6.96 (419.2-436.1)
Lip region diameter	53.3	53.3±0.49 (52.8-53.5)
Maximum body diameter	83.3	81.7±1.23 (80.3-83.3)
Length of buccal cavity	59.9	58.0±1.61 (56.6-60.0)
Width of buccal cavity	33.3	34.1±1.5 (33.3-36.3)
Length of oesophagus	499.5	481.7±17.94 (456.1-499.5)
Position of nerve ring	173.2	171.6±3.29 (168.4-175.6)
Vulva from anterior end	1595.1	1600.9±54.88 (1560.2-1681.1)
Tail length	313.0	322.7±10.30 (310.0-334.5)

Differential diagnosis and relationships. Nullonchus rafiqi sp. n. can be distinguished from all three species of genus *Nullonchus* (*N. valens, N. levistomus* and *N. rapax*) by its longer body (2.7-2.9 mm *vs* 1.9 mm, 1.0-1.5 mm and 1.4-1.7 mm) and tail (310-334.5 µm *vs* 180 µm, 60-90 µm and 147-153 µm, calculated from the drawing by Siddiqi, 1984); larger buccal cavity (56.6-60.0 × 33.3-36.3 µm *vs* 52 × 31.5, 30-35 × 17-22 µm and 33 × 21-22 µm); a higher 'a' (32.4-34.7 *vs* 31, 23-28), except for *N. rapax* (28-36); and 'b' values (5.5-5.8 *vs* 4, 3.3-4.1 and 4.0-4.1); a lower 'c' value (8.4-8.7 *vs* 10, 12-18 and 9.8-11.4); V% much lower (57.6-58.7 *vs* 72, 74-76 and 68-73); reproductive system didelphic-amphidelphic (*vs* monoprodelphic in all the other species); shape of the tail elongate (*vs* elongate conoid, conoid, ventrally arcuate); caudal pores seven in number, though there is no report of caudal pores in the three described species (Siddiqi, 1984).

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LITERATURE CITED

Christie J.R. and Perry V.G., 1951. Removing nematodes from soil. *Proceedings of the Helminthological Society of Washington, 18*: 106-108.

de Man J.G., 1880. Die Einheimischen. Frei in der reimen Erde und in seissen wasser lebende Nematoden Varlaufiger Bericht und de seriptiv systematischer. *Tijdschrift der Nederlandsche dierkundige Vereeniging. Leiden, 5(1-2)*: 1-104.

Seinhorst J.W., 1966. Killing nematodes for taxonomic study with hot F.A. 4:1. *Nematologica, 1*: 178.

Siddiqi M.R., 1984. *Nullonchus*, a new genus of toothless mononchs, with comments on the phylogenetic relationship of Nullonchulinae subfamily (Nematoda: Mononchida). *Nematologica, 30*: 11-21.