

Two new species of the genus *Ottolenchus* Husain & Khan, 1967 (Nematoda : Tylenchidae) with a key to the species and observation on *O. facultativus* (Szczygiel, 1969) Brzeski, 1982 from Pakistan

Mohammad A. MAQBOOL and Fayyaz SHAHINA

National Nematological Research Centre, University of Karachi, Karachi-32, Pakistan.

SUMMARY

Ottolenchus azadkashmirensis n. sp. and *O. longicauda* n. sp., are described and illustrated herein. These two species differ from all the known species of the genus *Ottolenchus* Husain & Khan, 1967 by the presence of markedly tapering lip region with distinct labial disc at the apex; spindle-shaped, non muscular median bulb; prominent excretory pore with sclerotized duct and open vulva. *O. longicauda* n.sp. is recognized from *O. azadkashmirensis* n.sp. by its longer body size, smooth body cuticle, short stylet, anterior vulva and more elongated tail. *O. facultativus* (Szczygiel, 1969) Brzeski, 1982 is reported for the first time in Pakistan. A key to the species of the genus *Ottolenchus* is also presented.

RÉSUMÉ

Deux nouvelles espèces du genre *Ottolenchus* Husain & Khan, 1967 (Nematoda : Tylenchidae) ainsi qu'une clé des espèces et des observations sur *O. facultativus* (Szczygiel, 1969) Brzeski, 1982, provenant du Pakistan

Ottolenchus azadkashmirensis n. sp. et *O. longicauda* n. sp. sont décrits et illustrés. Ces deux espèces diffèrent des autres espèces du genre *Ottolenchus* Husain & Khan, 1967 par une région labiale nettement effilée comportant un disque labial bien distinct; un bulbe médian non musculé et naviforme; un pore excréteur ayant un conduit sclérotisé; et enfin une vulve « ouverte ». *O. longicauda* n.sp. diffère de *O. azadkashmirensis* n.sp. par la longueur plus grande du corps, la cuticule lisse, le stylet court, la vulve située plus antérieurement et la queue plus allongée. *O. facultativus* (Szczygiel, 1969) Brzeski, 1982 est signalé pour la première fois au Pakistan. Une clé des espèces du genre *Ottolenchus* est proposée.

During the study of nematodes belonging to the subfamily Duosulciinae two undescribed species related to the genus *Ottolenchus* Husain & Khan, 1967 were collected: *O. azadkashmirensis* n.sp. from soil around the roots of maize (*Zea mays*) from Muzaffarabad and *O. longicauda* n. sp. around the roots of surgacane (*Saccharum officinarum*) from Sind. *O. facultativus* (Szczygiel, 1969) Brzeski, 1982 collected from around the roots of potato (*Solanum tuberosum*) is reported for the first time in Pakistan. The diagnosis of *Ottolenchus* has been partially emended and a key of this genus consisting of six species is also presented.

Materials and methods

Examination has been made on the specimens killed by gentle heat, fixed in TAF transferred to glycerin solution containing traces of picric acid and allowed to dehydrate slowly. Processed specimens were mounted in dehydrated glycerin on permanent slides for observation and measurements. Figures were made with the help of

a drawing tube and the measurements were taken by an ocular micrometer.

Genus *Ottolenchus* Husain & Khan, 1967

DIAGNOSIS EMEND. (after Brzeski, 1982)

Body almost cigar-shaped, except for tail cuticle thin transversely striated sometimes smooth. Lateral fields with two incisures. Amphidial apertures as longitudinal slit, sometimes bent. Head low or markedly tapering with a distinct labial disc at the apex of lip region. Deirids present. Cephalic framework weak, basal plate not refractive. Stylet protractors attached to basal plate. Stylet thin; cone about half to one-third of stylet length; knobs rounded or elongated. Median bulb elongated, spindle-shaped, muscular or non muscular with small but distinct thickenings of lumen. Excretory duct narrow sometimes sclerotized with prominent opening. Spermatheca an offset or continuous pouch, vagina with thin walls, vulva closed or open. Spicules thin, anteriorly cephalated. Bursa small. Cloacal lips with or without protuberance. Hypoptygmata absent.

Ottolenchus azadkashmirensis n.sp.

(Fig. 1)

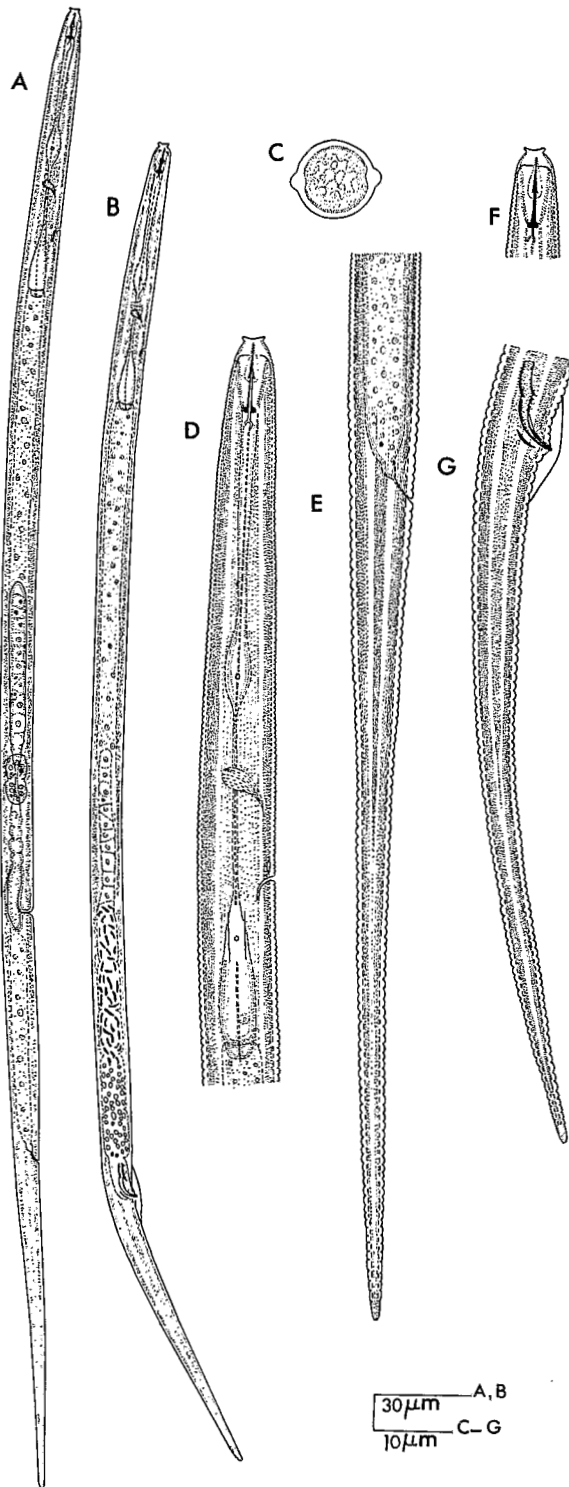


Fig. 1. *Ottolenchus azadkashmirensis* n.sp. Female (holotype). A: Animal *in toto*; C: Transverse section at mid-body; D: Oesophageal part; E: Tail. — Male. B: Animal *in toto*; F: Anterior part; G: Tail and spicule apparatus.

MEASUREMENTS

Female (paratype; n = 11): L = 0.43 mm ± 0.3 (0.35-0.46); a = 37 ± 5.10 (29-46); b = 4.6 ± 0.31 (4.0-5.1); c = 4.6 ± 0.29 (3.5-4.6); c' = 11.6 ± 1.02 (10.0-13.3); V = 60 ± 1.42 (57-61); MB = 47 ± 1.07 (45-50); stylet = 8.5 μm ± 0.34 (8.0-8.8).

Male (n = 5): L = 0.42 mm ± 0.04 (0.35-0.45); a = 37 ± 2.60 (31-42); b = 4.8 ± 0.52 (4.0-5.3); c = 4.5 ± 0.62 (4.0-4.8); c' = 11.7 ± 1.58 (10.2-13.2); T = 30.5 ± 2.70 (27-34); MB = 47 ± 2.23 (45-50); stylet = 8.4 μm ± 0.43 (8.0-8.8); spicules = 14.8 μm ± 1.50 (12-16); gubernaculum = 3.2 μm ± 0.43 (2.8-4.0).

Holotype (female): L = 0.46 mm; a = 44; b = 5.1; c = 4.3; c' = 13.3; V = 60; MB = 46; stylet = 8.8 μm.

DESCRIPTION

Female: Body almost straight when relaxed by gentle heat; maximum width 9.5-10.5 (10.0) μm. Cuticle marked by fine transverse striae less than 1 μm near mid body. Lateral fields smooth with two incisures occupying 2.5 μm or 1/4 of body width. Cephalic region continuous, smooth, tapering to a distinct disc at the apex measuring 3.0 μm in diameter. Amphids inconspicuous. Stylet of medium strength with distinct rounded basal knobs, 1.5-2.0 μm across. Cone 4 μm long. Orifice of dorsal esophageal gland 1-1.5 μm behind stylet base. Œsophagus 85-90 (88) μm long; procorpus slender, metacarpus spindle-shaped moderately developed with small valve 12-13 μm long, 2-3 μm wide; isthmus narrow less than 1 μm wide, 20-23 μm long. Nerve ring anterior to the middle of isthmus. Basal bulb elongated 18-22 μm long, 4-4.5 μm wide, with flat to rounded base with rounded cardia. Excretory pore prominent with sclerotized duct, usually opposite to the anterior end of basal bulb, 65-70 (68) μm from anterior end. Deirids 6.5-7.5 (6.0) μm behind the level of excretory pore. Hemizonid distinct, three to four annules long, just anterior to excretory pore. Vulva open, without epitygma. Vagina a transverse slit, at right angles to body axis, extending 1/2 into the body. Post uterine sac short; about half body width long. Ovary anteriorly outstretched. Spermatheca offset; elongated, packed with small rounded sperms. Ovary short with six to eight oocytes arranged in a single row. Vulva-anus distance 70-80 (76) μm. Phasmids dorso-sublateral in position, just opposite to vulva. Anus distinct. Tail straight, elongated, not filiform, 100-105 (102) μm long, tapering to a rounded tip.

Male : Similar to female as regards cuticle, cephalic region, stylet and esophagus. Testis anteriorly outstretched; spermatocytes arranged in a single row. Spicules arcuate, prominently cephalated, pointed at tip. Gubernaculum trough-shaped in lateral view. Bursa adanal. Tail smaller than female, 88-94 (92) μm long, more annulated posteriorly, cloacal lips protruding.

TYPE HABITAT AND LOCALITY

Soil, around the roots of maize (*Zea mays*); Muzafarabad, Azad Kashmir, Pakistan; March, 1984.

TYPE SPECIMENS

Holotype : female, slide No. NNRC/66.1. *paratypes* : eighth females and three males, on Slide No. NNRC/66.2-66.5, deposited in the NNRC National Nematode Collection, University of Karachi, Pakistan; two females and one male deposited in USDA Nematode Collection, Beltsville, Maryland, USA.

DIAGNOSIS AND RELATIONSHIP

Ottolenchus azadkashmirensis n.sp. differs from all the known species of the genus *Ottolenchus* except *O. longicauda* n.sp. by having markedly tapering lip region with a prominent disc at the apex. Median bulb spindle-shaped, non muscular, excretory pore prominent with sclerotized duct. Vulva open (in all species of the genus *Ottolenchus* with the exception of *O. longicauda* n.sp. head without disc, median bulb elongated, muscular; excretory duct narrow; vulva closed).

Ottolenchus longicauda n.sp.

(Fig. 2)

MEASUREMENTS

Female (paratype; n = 7) : L = 0.50 mm \pm 0.27 (0.48-0.55); a = 49 \pm 2.70 (43-53); b = 5.9 \pm 0.18 (5.8-6.3); c = 3.2 \pm 0.30 (2.9-3.7); c' = 25 \pm 4.77 (20-29); V = 52 \pm 1.2 (51-54); MB = 48 \pm 1.14 (47-50); stylet = 7.0 μm \pm 0.39 (6.5-7.5).

Male (n = 3) : L = 0.50 mm \pm 0.026 (0.50-0.51); a = 53 \pm 2.8 (49-53); b = 5.9 \pm 0.1 (5.8-5.9); c = 3.3 \pm 0.2 (3.1-3.4); c' = 18.5 \pm 0.35 (18-18.5); T = 28 \pm 1.41 (27-29); MB = 50 \pm 1.41 (48-50); stylet = 7.0 μm \pm 0.30 (7.0-7.5); spicules = 12.8 μm \pm 0.31 (12-12.8); gubernaculum = 3.2 μm \pm 0.52 (3.2-4).

Holotype (female) : L = 0.54 mm; a = 51; b = 5.9; c = 2.9; c' = 29; V = 52; MB = 48, stylet = 7.5 μm .

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DESCRIPTION

Female : Body straight upon fixation, maximum width 9-11 μm , cuticular annules indistinct. Lateral fields comprising a single ridge formed by two smooth incisions. Lip region continuous, smooth, markedly tapering to an offset distinct labial disc 2.5 μm in diameter. Cephalic framework lightly sclerotized. Stylet thin, cone 1/3 of its length, hardly showing any lumen, with rounded basal knobs sloping downwards 1.6 μm across. Orifice of dorsal esophageal gland less the 1 μm behind stylet knobs. Esophagus 80-90 (85) μm long. Procorpus slender. Median bulb spindle-shaped; 3.2 μm wide, with a small but distinct valve. Isthmus elongated, slender, crossed by nerve ring near its middle. Basal bulb elongated; 20-25 (22) μm long, 4-5 μm wide, with slight projection at base, enclosed by a distinct cardia. Excretory pore prominent; 60-67 (66) μm from anterior end with sclerotized duct. Deirids present. Hemizonid just anterior to excretory pore. Vulva transverse, open. Vagina extending about 1/2 into body at right angles to body axis. Post uterine sac about one body width rounded sperms. Ovary anteriorly outstretched; with a single row of oocytes. Vulva-anus distance 65-75 (70) μm . Anus distinct. Tail straight, elongated, filiform, 140-188 (165) μm long, gradually tapering to rounded tip.

Male : Similar to female in general appearance but tail usually bent ventrally. Testis outstretched. Bursa adanal, cloacal lips slightly protruding. Spicules arcuate. Gubernaculum trough-shaped.

TYPE HABITAT AND LOCALITY

Soil, around the roots of sugarcane (*Saccharum officinarum*); Sind, Pakistan; November, 1982.

TYPE SPECIMENS

Holotype : female, slide No. NNRC/66.10. *Paratypes* : four females, two males on slide No. NNRC/66.11, 66.12, deposited in the NNRC National Nematode Collection, University of Karachi, Pakistan; two females deposited in USDA Nematode Collection, Beltsville, Maryland, USA.

DIAGNOSIS AND RELATIONSHIP

Ottolenchus longicauda n.sp. differs from *O. azadkashmirensis* n.sp. by its longer body size, smooth cuticle, short stylet, anterior vulva, and more elongated tail.

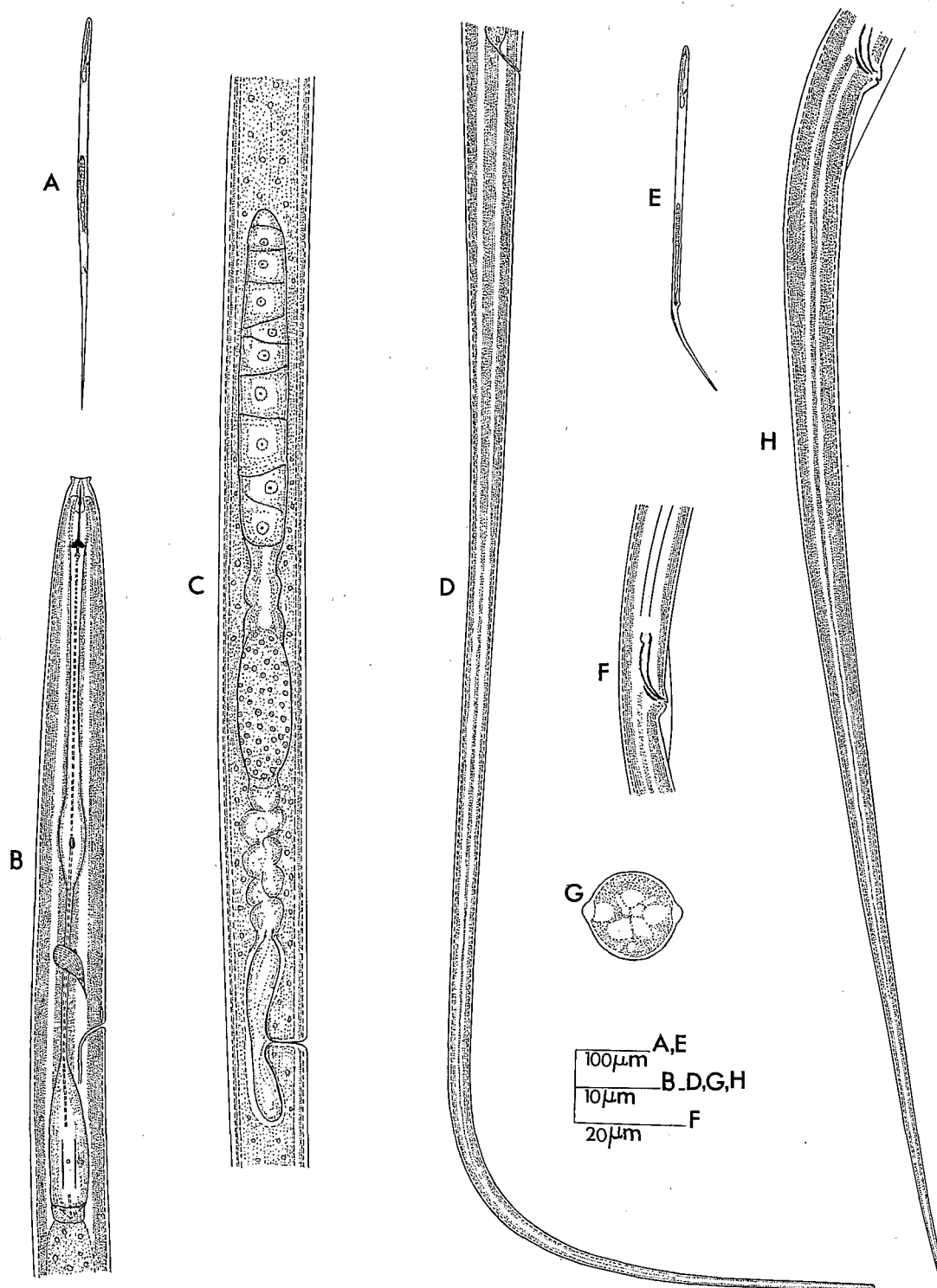


Fig. 2. *Ottolenchus longicauda* n. sp. Female (holotype). A : Animal *in toto*; B : Esophageal part; C : Genital tract; D : Tail; G : Transverse section at mid-body. — Male. E : Animal *in toto*; F : Spicule apparatus; H : Tail.

Ottolenchus facultativus
(Szczygiel, 1969) Brzeski, 1982

MEASUREMENTS

Female (n = 6) : L = 0.42 mm \pm 0.01 (0.42-0.44); a = 27 \pm 2.23 (25-29); b = 5.4 \pm 0.17 (5.2-5.6); c = 4.8 \pm 1.73 (4.4-5.1); c' = 8.5 \pm 0.62 (8.0-9.5); V = 68 \pm 2.6 (65-70); MB = 41 \pm 1.00 (40-41); stylet = 6.8 μ m \pm 0.46 (6.5-7.0).

Male (n = 1) : L = 0.40; a = 30; b = 5.2; c = 4.7; c' = 8.6; T = 41; MB = 41; stylet = 7.2 μ m; spicules = 13.0 μ m; gubernaculum = 5.6 μ m.

MORPHOLOGY/BIOMETRY

Body slightly arcuate. Cuticular annules flat about 1.6-2.0 μ m wide near mid-body. Head low, flat, unstriated, continuous with body contour. Stylet thin; cone about 1/3 of stylet length with minute rounded basal knobs. Oesophagus 74-78 (75) μ m long. Median bulb oval 12-13 \times 5-6 μ m. Excretory pore 58-65 (64) μ m or 58-68 annules from anterior end; excretory duct prominent, sclerotized. Basal bulb elongated; 15-17 μ m long, 6-7 μ m wide. Deirids 3-4 annules below the level of excretory pore. Vulva open. Vagina at right angles to body axis, extending 1/2 into the body. Post uterine sac short, about half of body width long. Genital tract 28-30 % of the body length. Spermatheca offset bilobed, elongated filled with small rounded sperms. Vulva-anus distance 40-50 (46) μ m. Tail elongated, filiform, gradually tapering 81-99 (86) μ m long or 8-9 times anal body width long. Male rare. Spicules arcuate 13.0 μ m long. Morphometric data and description as mentioned above is based on the specimens collected from around the roots of potato (*Solanum tuberosum*) from Karachi, Pakistan. The measurements of these specimens closely fit the description of *O. facultativus* by Brzeski (1982) with very little variations.

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Key to females of *Ottolenchus*

1. Cephalic region low; body cuticle distinctly annulated 2
Cephalic region markedly tapering with a distinct labial disc at the apex; body cuticle annulation very fine to smooth 5
2. Annule width 1.5 μ m or more 3
Annule width 1.2 μ m or less
..... *O. helenae* (Szczygiel, 1969) Brzeski, 1982
3. Head unstriated; genital tract long, 37 % of body length to extending upto basal oesophageal bulb
..... *O. parvus* (Siddiqi, 1963) Siddiqi, 1979
Head with 2-3 annules; genital tract shorter 4
4. Stylet 10-11 μ m
..... *O. vesiculosus* (Knobloch & Knierim, 1969)
..... Brzeski, 1982
Stylet 6-8 μ m
.... *O. facultativus* (Szczygiel, 1969) Brzeski, 1982
5. Body cuticle finely annulated; stylet long
..... (8.0-8.8 μ m); tail short 100-105 μ m long
..... *O. azadkashmirensis*, n. sp.
Body cuticle smooth; stylet short (6.5-7.5 μ m);
tail very long 140-188 μ m .. *O. longicauda*, n. sp.

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