Nematol. medit. (1977), 5: 281-289.

Commonwealth Institute of Helminthology, St. Albans, Hertfordshire, England

TELOTYLENCHUS OBTUSUS SP. N. AND *HISTOTYLENCHUS SUDANENSIS* SP. N. (NEMATODA: TYLENCHIDA: TELOTYLENCHINAE)

by

M. R. SIDDIQI

Two new species of plant parasitic nematodes are described, one in the genus *Telotylenchus* Siddiqi, 1960 and the other in the genus *Histotylenchus* Siddiqi, 1971, of the subfamily Telotylenchinae Siddiqi, 1960. Specimens were fixed in F.A.A. 4:10 and mounted in dehydrated glycerine after processing through warm lactophenol; some specimens of *Telotylenchus* collected in Malawi in 1963 were fixed in TAF.

Differential keys to 8 nominal species of *Telotylenchus* and to 5 of *Histotylenchus* are provided. Of the four species of *Telotylenchus* described from India, *T. aerolatus* Baqri *et* Jairajpuri, 1969 and *T. tonkiensis* Mulk *et* Jairajpuri, 1975 are very similar to *T. indicus* Siddiqi, 1960 and *T. paaloofi* Tikyani *et* Khera, 1970, respectively. Type-specimens of these were not available for study, but they are included in the key on characters which when studied carefully may prove to be unstable.

TELOTYLENCHUS OBTUSUS SP. N.
(Fig. 1, A-J)

Measurements: Holotype ♀ : L = 0.8 mm; a = 38; b = 7.8; b' = 5.3; c = 17.4; c' = 3.2; V = $^{18}53^{20}$; spear = 16.5 µm; m = 50.

20 ♀ ♀ paratypes: L = 0.63-0.79 (0.7) mm; a = 31-36 (35); b = 6.0-7.8 (6.9); b' = 4.3-5.4 (5); c = 18-22 (20.8); c' = 2.4-3.4 (2.7); V = 52-56 (54); spear = 16-18 (16.9) µm; m = 45-50 (48).

15 ♂♂ paratypes: L = 0.61-0.75 (0.7) mm; a = 36-45 (40); b = 6.0-7.5 (7.1); b' = 4.5-4.9 (4.7); c = 15.0-17.5 (16.6); c' = 2.7-3.6 (3.1); T = 45-55 (48); spear = 15-17 (16) μm; spicules = 22-28 (24) μm; gubernaculum = 12-15 (13) μm.

Description: *Female*: Body arcuate to 'C' shaped when relaxed by heat; striae 0.7-1.1 (0.8) μm apart near middle. Lateral fields not areolated, with 4 smooth incisures, about 0.3 times body-width. Lip region hemispheroidal, slightly offset from body by a depression, with 5 to 7 distinct annules; framework lightly sclerotized, with its outer margins extending from basal plate 2 to 3 body annules posteriorly and the basal plate pushed into head 1-2 annules anteriorly (Fig. 1, B and C).

Spear slender, about 2.7 times lip region width; its anterior part sharply pointed and appears nontubular, needle-like, in distal half; basal knobs rounded with flat to indented anterior surface, 3 μm across. Orifice of dorsal oesophageal gland about 3 μm behind spear base.

Median oesophageal bulb spheroidal, with a prominent valvular apparatus at or anterior to centre. Distance from anterior end to centre of median bulb 63-70 μm. Oesophageal glands typical of the genus, extending back over intestine for 35-45 (38) μm. Deirids absent. Excretory pore opposite or a little behind level of oesophago-intestinal junction, usually in region of poorly developed hemizonid which is 2-3 body annules long, 97-106 μm from anterior end. Fasciculi or serpentine canals present in the intestinal region. Intestine may partially extend over rectum, but a true post-anal sac is absent.

Vulva a transverse slit 6.5 μm long; vagina extending at right angles to body axis half-way into body, slightly dilated: epiptygma indistinct, sunken. Spermathecae rounded, axial, with sperms in fertilized females. Ovaries symmetrical, outstretched, with one or two rows of oocytes. Tail subcylindrical, ventrally arcuate, slightly tapering to a broadly obtuse terminus which is smooth but sometimes has a single indentation joining the ends of lateral fields of opposite sides; usually about 2.7 times anal body-width long; 28-36 (31) annules ventrally. Phasmids pore-like, near middle of tail.

Male: Similar to female for details of cuticle, lip region, spear and oesophagus. Testis single, anteriorly outstretched; spermatogonia in two rows. Bursa large, finely crenate, enveloping tail; incisures of lateral fields spread out on tail as illustrated (Fig. 1, G). Spicules slightly arcuate ventrally, distinctly cephalated, with large distal

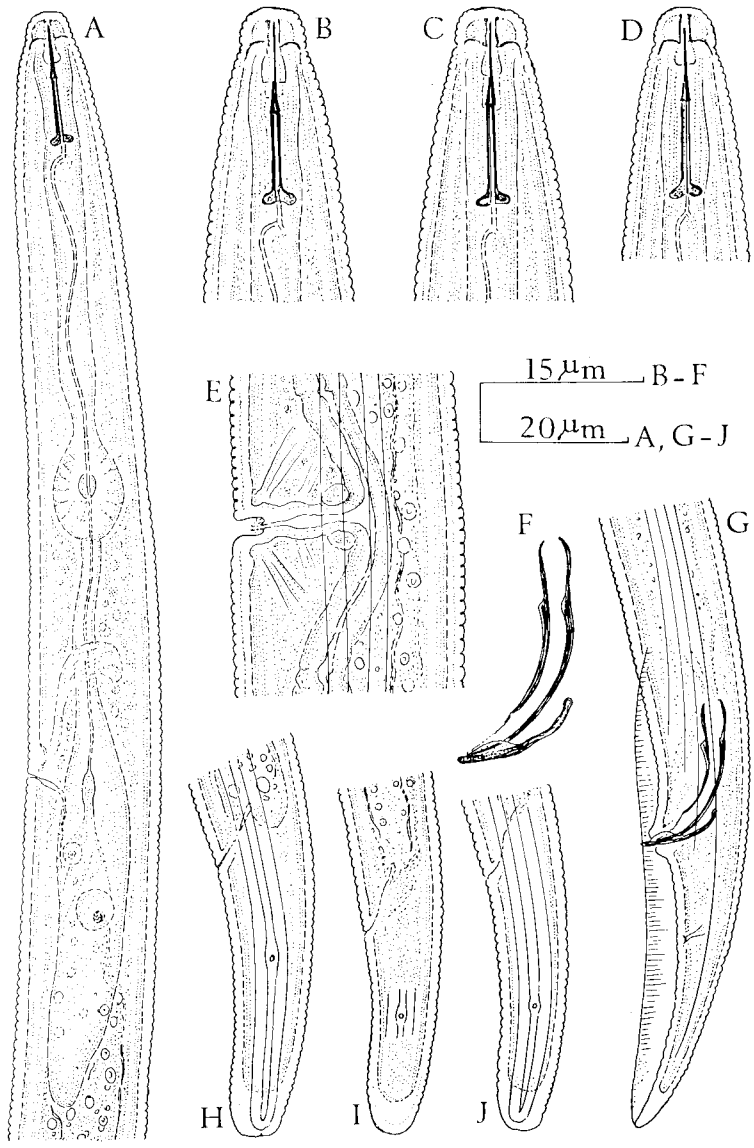

Fig. 1 - *Telotylenchus obtusus* sp. n.: A, oesophageal region of the holotype female; B-D, head ends (B = holotype; D, male); E, vulval region; F, spicule and gubernaculum; G-J, tail ends

flanges. Gubernaculum also arcuate, with rounded proximal end and distal half having raised sides forming a trough-like structure. Hypoptygma absent. Phasmids near or anterior to middle of tail, slightly extending into bursa. Tail 1.6-1.9 times spicule length; clear terminal hyaline portion about 6 μm long.

Type host and locality: Cotton plants at Bvumbwe Experimental Station, Limbe, Malawi. Male and female specimens were also recovered from samples collected by D.C.M. Corbett on 13th August, 1963 in Malawi from soil around the roots of *Euphorbia nyikae* growing along roadside in virgin Mopane bush, Ndakwela, Nkombezi Wofodya Stream, Chikwawa; and around roots of *Acacia* sp. by Ft. Johnston Markey Bay Road, midway between Malemia Mission and Nkudzi Bay.

Type material: Holotype ♀ and 15 ♀♀, 15 ♂♂ paratypes at C.I.H., St. Albans, England; 3 ♀♀, 3 ♂♂ paratypes at each of these centres: Rothamsted Experimental Station, Harpenden, England; Nematology Department, University of California, Riverside; U.S.D.A. Nematode Collection, Beltsville, Maryland, U.S.A.; Nematology Department, Landbouwhogeschool, Wageningen, The Netherlands; Division of Nematology, I.A.R.I., New Delhi, India.

Relationship: *Telotylenchus obtusus* sp. n. is recognized by its less set off lip region; subcylindrical, obtusely rounded female tail which is usually less than three anal body-widths long and by the male tail measuring less than two spicule lengths. Its relationship with other species of *Telotylenchus* is indicated in the following key. See Siddiqi (1971) for transfer of certain species of *Telotylenchus* to *Telotylenchoides* and *Histotylenchus*; Jairajpuri's (1971) action in synonymizing *Telotylenchus* with *Trichotylenchus* Whitehead, 1959 is not accepted.

KEY TO SPECIES OF *TELOTYLENCHUS*
(Based on Females)

1. Tail terminus striated 2
   Tail terminus not striated 4

2. Lateral fields areolated along entire body length; tail 2.6-3.0 anal body widths long . . . . *T. avaricus* Kleynhans, 1975
   Lateral fields not areolated along entire body length; tail more than 3 anal body widths long 3

3. Spear 15-17 µm long, knobs anchor-shaped . . . . . *T. tonkiensis* Mulk *et* Jairajpuri, 1975
Spear 19-21 µm long, knobs backwardly sloping . . . . . *T. paaloofi* Tikyani *et* Khera, 1970

4. Spear 24-26 µm long; vulva flanked by a pair of subventral longitudinal cuticular folds . . . *T. verutus* Kleynhans, 1975
Spear less than 20 µm long; vulva not flanked by subventral longitudinal cuticular folds 5

5. Body cuticle in front of vulva thickened and body behind vulva constricted for one body width. . . . *T. ventralis* Loof, 1963
Body cuticle in front of vulva not thickened, body not constricted behind vulva 6

6. Lip region slightly set off by a depression; tail 2.4-3.4 (2.7) anal body widths long, with a broadly obtuse terminus . . . . . *T. obtusus* sp. n.
Lip region well set off by a constriction; tail usually more than 3 anal body widths long, with conoid-rounded terminus 7

7. Outer bands of lateral fields irregularly areolated along entire body length; conus 43-44% of spear length . . . . . *T. aerolatus* Baqri *et* Jairajpuri, 1969
Outer bands of lateral fields not areolated along entire body length; conus 49-50% of spear length. . . *T. indicus* Siddiqi, 1960

HISTOTYLENCHUS SUDANENSIS SP. N.

(Fig. 2, A-H)

Measurements: Holotype ♀: L = 1.18 mm; a = 44; b = 6.8; b' = 5.6; c = 28; c' = 2.1; V = $^{24}53^{24}$; spear = 23 µm; m = 44.5.

10 ♀♀ paratypes: L = 1.07-1.25 (1.17) mm; a = 38-46 (43); b = 6.8-9.0 (7.9); b' = 5.6-6.3 (5.9); c = 25-31 (27.5); c' = 1.8-2.3 (2.1); V = 50-56 (53); spear = 22-24 (23) µm; m = 44-50 (46).

4 ♂♂ paratypes: L = 1.03-1.14 (1.11) mm; a = 41-50 (44); b = 6.8-8.1 (7.4); b' = 5.1-5.6 (5.4); c = 22-27 (24); c' = 2.3-2.9 (2.6); T = 37-44 (41); spear = 21.0-22.5 (21.8) µm; m = 41-45 (43); spicules = 30-33 (31) µm; gubernaculum = 12.5-13.5 (13) µm.

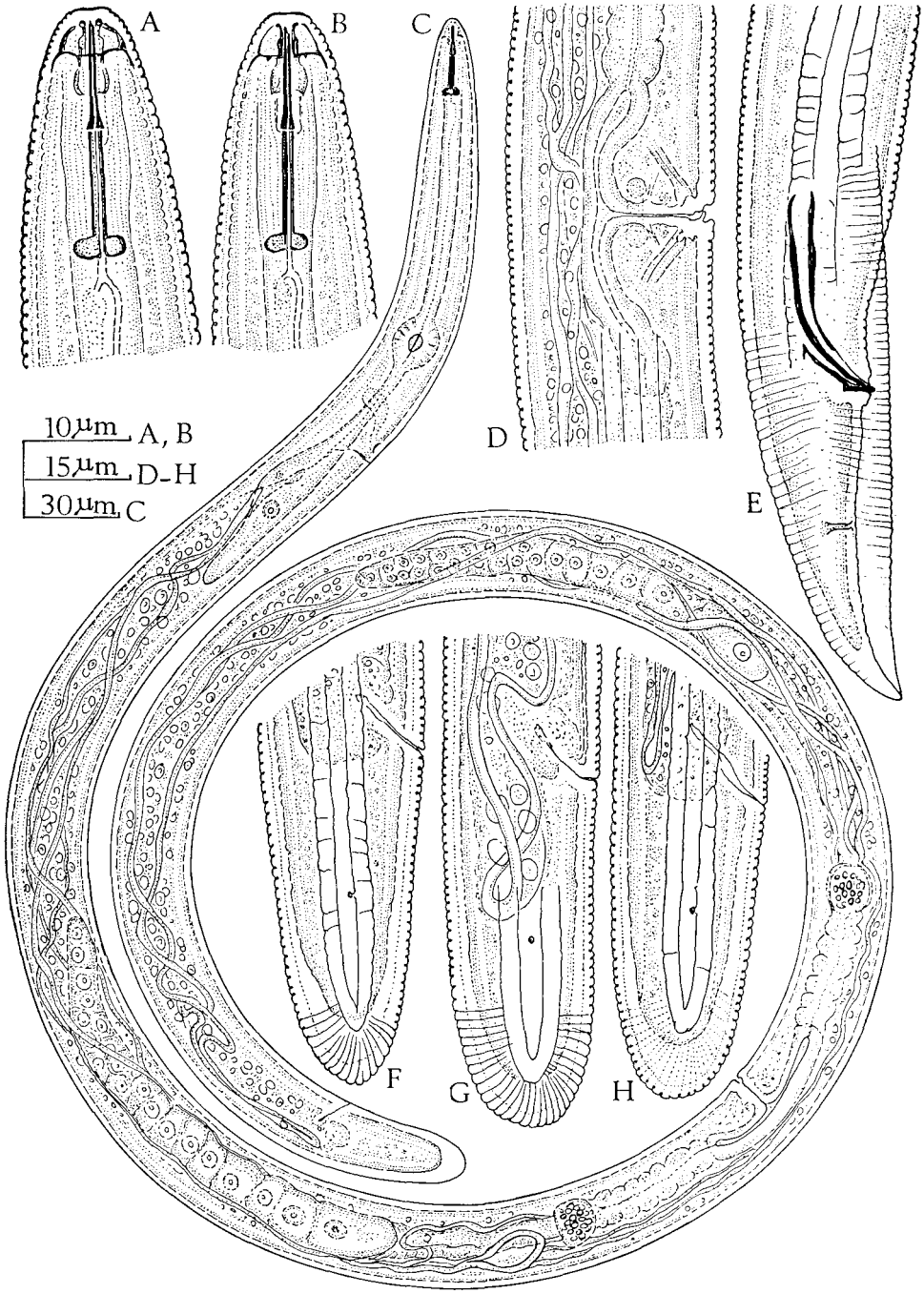

Fig. 2 - *Histotylenchus sudanensis* sp. n.: A and B, head ends (A = holotype female, B, male); C, entire holotype female; D, vulval region of the holotype; E-H, tail ends (H = holotype).

Description: *Female*: Body slender, straight to arcuate, transverse striae distinct, 1.0-1.1 µm apart near middle. Lateral fields about 0.37 times body width, with 4 incisures, without areolations except in oesophageal region and for a few irregular ones in the outer band over rest of body. Lip region continuous with body contour, conoid-rounded in lateral and conoid-truncate in dorsal or ventral view, about 9.5 µm wide at base and 5 µm high, with 7-9 distinct but fine annules; framework moderately sclerotized, cheilorhabdions prominent (Fig. 2, A).

Spear fairly robust, long 2.3-2.7 times maximum width of lip region; conus tubular with angular lumen near its base; basal knobs smoothly rounded, 5.0-5.5 µm across and 2.0-2.5 µm high. Orifice of dorsal oesophageal gland about 2.0-2.5 µm behind spear base. Median oesophageal bulb oval, 19-22 x 12-15 µm, occupying 14-18 body annules; inner cuticular thickening 6 x 4 µm, located at or just anterior to its centre. Distance from anterior end to centre of median bulb 97-105 (101) µm. Nerve ring at middle of isthmus. Excretory pore 138-149 µm from anterior end, 2-5 annules behind hemizonid which is indistinct and 2-3 annules long. Deirids indistinct, on inner ventral incisure near level of excretory pore. Oesophageal glands typical; dorsal gland with large nucleus, extending over intestine for 1.5-2.0 body widths; nuclei of subventral glands small, opposite or anterior to oesophago-intestinal junction. Intestine with large refractive globules and prominent fasciculi throughout, extending over rectum, usually not beyond anus, but sometimes up to 2/5 of tail (Fig. 2, C, F-H).

Vulva transverse, with double indistinct epiptygma (Fig. 2, D). Spermatheca rounded, axial, with sperms. Ovaries outstretched, with oocytes in one or two rows. Uterine egg 78 x 21 µm. Tail subcylindrical with obtusely rounded, annulated tip; 1.8-2.3 times anal body-width long; 29-42 (36) annules ventrally. Phasmids pore-like, usually anterior to middle of tail at 13-22 µm from anus, sometimes located on ventral inner incisure.

Male: Similar to female for most details. Testis single, outstretched. Bursa distinctly but finely crenate, enveloping tail. Spicules indistinctly cephalated, arcuate near middle. Gubernaculum large, with broad trough-shaped distal portion and posteriorly recurved proximal tip, protrusible. Hypoptygma absent. Phasmids near middle of tail. Outer bands of lateral fields irregularly areolated on and near tail (Fig. 2, E).

Type host and locality: Collected by Dr. Osman Khalifa in December, 1974 around roots of a weed (*Cymbopogon nervatus*) at Kenana Research Station's field, Abu Naama, Sudan.

Type material: Holotype ♀ and 5 ♀♀, 1 ♂ paratypes at C.I.H., St. Albans, England; 1 ♀, 1 ♂ paratypes at R.E.S., Harpenden, England; at University of California, Riverside, U.S.A.; at Landbouwhogeschool, Wageningen, The Netherlands; and 2 ♀♀ paratypes at I.A.R.I., New Delhi, India.

Relationship: *Histotylenchus sudanensis* sp. n. is recognized by its non-areolated lateral fields on most of the body, a conoid-rounded lip region, a less robust spear and the intestine extending up to 2/5 into the tail of female. Its relationship with other species of the genus is shown in the key.

KEY TO SPECIES OF *HISTOTYLENCHUS*
(Based on Females)

1. Postanal intestinal sac extending to middle of tail . . . 2
   Postanal intestinal sac not extending to middle of tail . . 3
2. Inner incisures of lateral fields coalescing with each other at several places on body . . . . . *H. baoulensis* (Netscher *et* Germani, 1969) Siddiqi, 1971
   Inner incisures of lateral fields not coalescing with each other . . . . . *H. hedys* Kleynhans, 1975
3. Lateral fields areolated near middle of body, lip region broadly rounded 4
   Lateral fields not areolated near middle of body, lip region conoid rounded . . . . . *H. sudanensis* sp. n.
4. Tail indented or flattened terminally . . . . . *H. historicus* (Jairajpuri *et* Baqri, 1968) Siddiqi, 1971
   Tail rounded terminally . . . *H. histoides* Siddiqi, 1971

SUMMARY

Telotylenchus obtusus sp. n. described from specimens obtained in soil samples around the roots of cotton, *Euphorbia nyikae* and *Acacia* sp. from Malawi.

It is recognized by its less set off lip region, subcylindrical, obtusely rounded female tail and male tail measuring less than two spicule lengths. *Histotylenchus sudanensis* sp. n. is described from around roots of a weed (*Cymbopogon nervatus*) at Abu Naama, Sudan. It is characterized by non-areolated lateral fields on most of the body, a conoid-rounded lip region, a less robust spear and the intestine extending up to 2/5 into the female tail. Keys to 8 nominal species of *Telotylenchus* and to 5 of *Histotylenchus* are given.

RIASSUNTO

Telotylenchus obtusus *sp. n. e* Histotylenchus sudanensis *sp. n.* (*Nematoda*: *Tylenchida*: *Telotylenchinae*).

Vengono descritte due nuove specie appartenenti alla sottofamiglia Telotylenchinae: *Telotylenchus obtusus* trovato nella rizosfera di cotone, *Euphorbia nyikae* ed *Acacia* sp. in Malawi e *Histotylenchus sudanensis* raccolto nei pressi di radici di *Cymbopogon nervatus* in Sudan. Sono riportate le chiavi per l'identificazione di otto specie di *Telotylenchus* e cinque specie di *Histotylenchus*.

LITERATURE CITED

BAQRI Q. H. and JAIRAJPURI M. S., 1969 - Two known and three new species of nematodes associated with fibrous crops in India. *Ann. Zool. Ecol. anim., 1*: 327-337.

JAIRAJPURI M. S., 1971 - On the synonymy of *Telotylenchus* Siddiqi, 1960 with *Trichotylenchus* Whitehead, 1959 (Nematoda: Tylenchida). *Indian J. Nematol., 1*: 3-6.

MULK M. M. and JAIRAJPURI M. S., 1975 - Nematodes of leguminous crops in India. I. A new species of *Telotylenchus* Siddiqi, 1960 (Telotylenchinae: Belonolaimidae). *Indian J. Nematol., 4*: 167-170.

SIDDIQI M. R., 1960 - *Telotylenchus*, a new nematode genus from North India (Tylenchida: Telotylenchinae n. sub-fam.). *Nematologica, 5*: 73-77.

SIDDIQI M. R., 1971 - On the plant-parasitic nematode genera *Histotylenchus* gen. n. and *Telotylenchoides* gen. n. (Telotylenchinae), with observations on the genus *Paratrophurus* Arias (Trophurinae). *Nematologica, 17*: 190-200.

TIKYANI M. G. and KHERA S., 1970 - A new species of *Telotylenchus* (Nematoda: Tylenchida). *Labdev. J. Sci. Tech., 8* (B): 27-29.

Accepted for publication on 30 September 1977.