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SOME TYLENCHIDA FROM THE ISTANBUL-AREA (TURKEY)

by

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Several soil samples taken around Istanbul contained representatives of interesting Tylenchid-species. One of those species was hitherto unrecorded and is described as a new one: *Merlinius pseudo-bavaricus* n. sp. Several large populations of what is considered *Merlinius nanus* (Allen, 1955) were studied to get an idea of the possible variability within this species. The species *Aprutides guidettii* Scognamiglio, 1974 was studied thoroughly. Some information will also be given on *Merlinius brevidens* (Allen, 1955) Siddiqi, 1970, *Merlinius macrurus* (Goodey, 1932) Siddiqi, 1970 and *Trophurus imperialis* Loof, 1955.

Aprutides guidettii Scognamiglio, 1974
(Figs. 1 and 2)

Measurements

Females (n = 9): L = 0.33-0.51 mm; a = 24-32; oesophagus = 47-58 μ m;
b = 7.2-9.6; tail = 34-42 μ m; c = 9.0-12.2; c' = 4.2-4.7; V = 65-69;
spear = 12.5-13.5 μ m.

Description

Body slightly curved to C-shaped when relaxed by gentle heat. Lateral field 2.5-3.5 μ m wide with two lines; elevated in the population

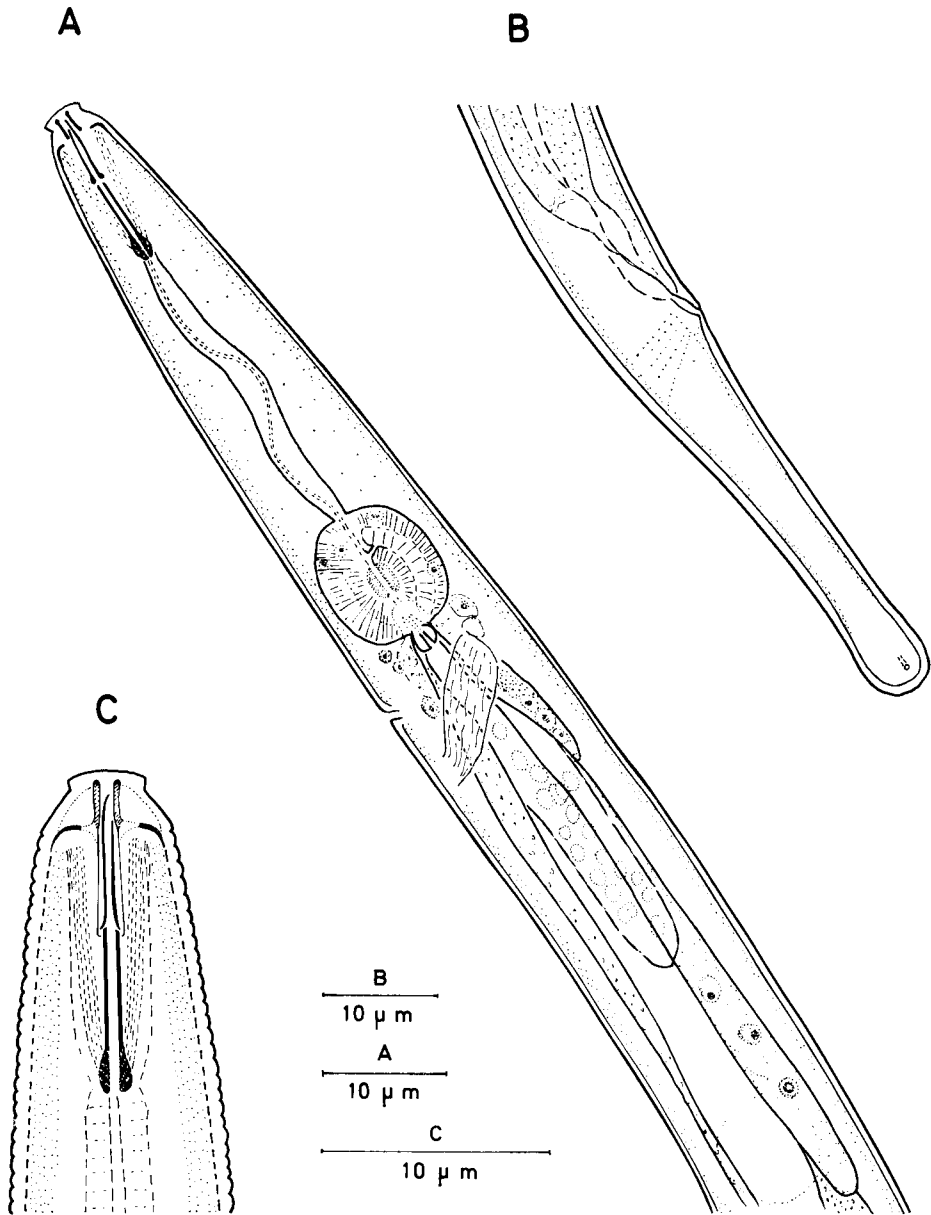


Fig. 1 *Aprutides guidettii* females; A = oesophageal region; B = tail; C = head.

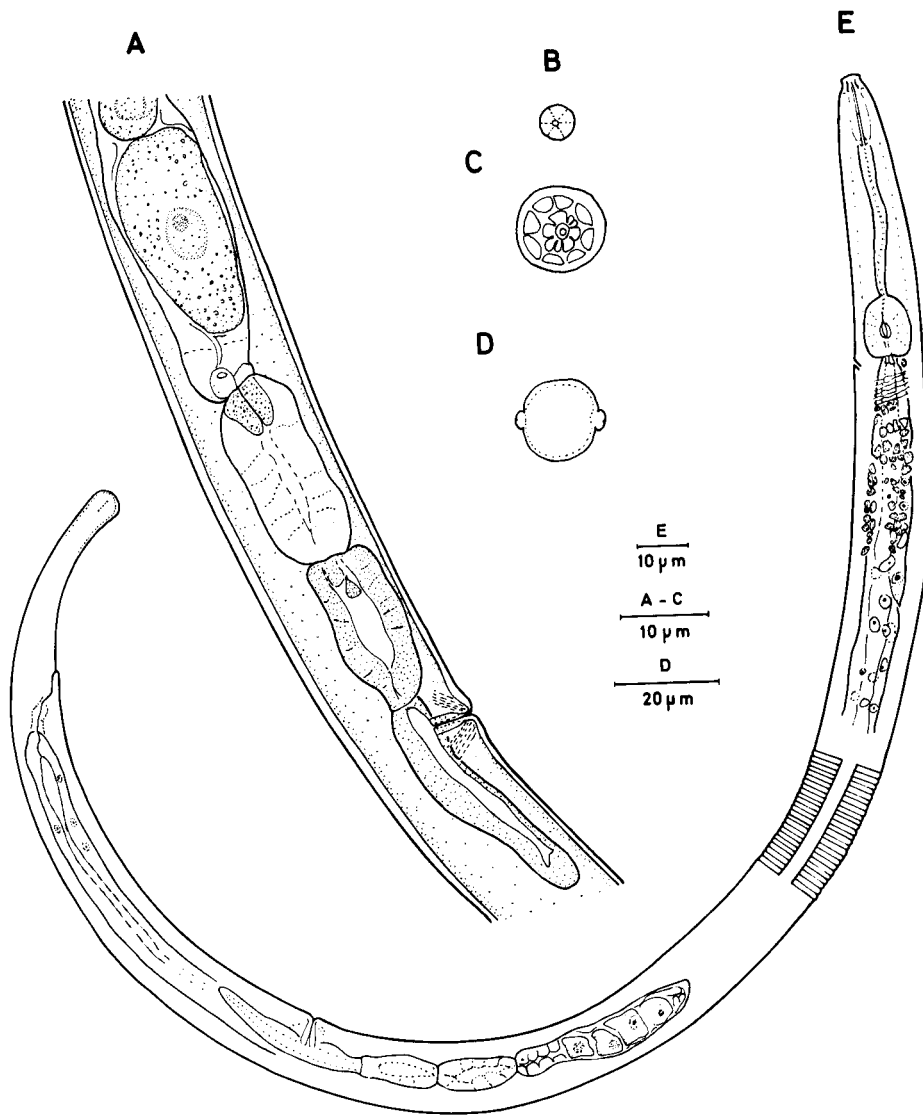


Fig. 2 - *Aprutides guidettii*, females; A = reproductive system; B = en-face view of head; C = section at level of stylet protractors; D = section at mid-body; E = general view.

from Kartal Maltepe; difficult to see in the other populations; between the two lines a very fine line was sometimes observed; also in cross-section a median involution is only slightly indicated. Annulation fine,

annules about 1 μm apart; cuticle about 0.7 μm thick. Lip region continuous with body, bearing a very distinct cap, no annulation, cheilorhabdia and basal part of the head framework well sclerotized. Stylet relatively long and delicate with small thickenings at its base. Anterior part of stylet cylindrical, shorter than posterior part and provided with a large, ventrally situated opening. Oesophagus with a narrow procorpus and a prominent metacarpus; valve apparatus shifted to the posterior side of the bulb; no isthmus; oesophago-intestinal junction starting immediately posterior to the metacarpus. Oesophageal gland lobe at the dorsal side of intestine, obscure, extending 52-62 μm posterior to the median bulb. Intestine with lumen of variable width; intestinal nuclei 2-2.5 μm large, often easily discernible. Rectum sigmoid, length 1.5-2 times the anal body diameter, i.e. = 12-17 μm . Excretory pore slightly posterior to the metacarpus, at 51-64 μm from the anterior end. Nerve ring surrounding the intestine and oesophagus gland lobe a few micrometers posterior to the oesophago-intestine junction, nervous nuclei of about 1-2 μm surround the intestine. Tail clavate, slightly tapering but widening again at the top; about 4-5 times anal body width long; cuticle at tail-tip not thickened; phasmids close to the top.

Female genital apparatus: vulva sometimes slightly protruding. Vagina about 5-6 μm long, mostly at a right angle with the body axis, sometimes slightly oblique. Posterior uterine sac more or less collapsed, 14-27 μm long (1-2 times vulval body diameter). Anterior genital branch composed of uterus, empty, non-offset spermatheca, oviduct and ovary; with a total length varying from 78 μm to 116 μm in a female with a mature oocyte.

Male: unknown. Females do not contain sperm, in one of them a mature oocyte was present in the oviduct, suggesting a parthenogenetic development.

Habitat: found in grassland at Kartal Maltepe, Camlica and Göztepe (16-5-1973).

Discussion

The females described by Scognamiglio (1974) from Italy are completely similar to the females found in the Istanbul-area.

This small nematode has a digestive and female reproductive

system comparable to that of the genus *Aphelenchoides* Fisher, 1894 but the head provided with a cap and the clavate tail are both unusual characteristics in that genus. A similar head was described for *Omemea maxbassiensis* Massey, 1971. A clavate tail was described for *Aprutides martuccii* Scognamiglio, Talamé *et s'* Jacob, 1970 but then with the usual *Aphelenchoides*-head. *A. guidettii* clearly takes an intermediate position between the genera *Omemea* and *Aprutides*.

Merlinius brevidens (Allen, 1955) Siddiqi, 1970

Measurements

Females (n = 2): L = 0.52-0.68 mm; a = 23-27; b = 4.3-4.9; tail = 42-60 μm ; c = 11.3-12.5; c' = 2.5-3.5; V = 55-56.5; spear = 14-15.5 μm .

Discussion

These females correspond rather well with the original description given by Allen (1955), except that the lip region is weakly offset by slight depression, and that the tail is slightly longer, and bears also more annules. These differences have also been seen in Iranian populations by Kheiri (pers. comm.).

Habitat: soil around roots of parsley (*Petroselinum*) at Küçük çekmece and cabbage (*Brassica oleracea* var. *capitata*) at Firuzköy (16-4-1972).

Merlinius macrurus (Goodey, 1932) Tarjan, 1973

Measurements

Females (n = 10): L = 0.94-1.02 mm; a = 27-35; oesophagus = 182-190 μm ; b = 4.9-5.6; tail = 54-57 μm ; c = 17-19; c' = 2.2-2.6; V = 55-56; G₁ = 31-33; G₂ = 23-33; spear = 23-24 μm .

Males (n = 10): L = 0.94-1.05 mm; a = 29-35; b = 5.2-5.9; c = 15-18; tail = 53-69 μm ; c' = 2.4-2.8; T = 28.5-40; spicules = 29-32 μm ; gubernaculum = 9-11 μm ; spear = 24 μm .

Discussion

These populations correspond with the description of Wallace and Greet (1964).

Habitat: uncultivated glassland at Kartal Maltepe (16-5-1973).

Merlinius nanus (Allen, 1955) Siddiqi, 1970
(Fig. 3)

M. nanus apparently shows a larger variability than has been accepted hitherto. In Turkish samples from the Istanbul-area numerous females and males were found that had characteristics intermediate between *M. nanus* and *M. microdorus* (Geraert, 1966). *M. microdorus* was differentiated from *M. nanus* by a shorter tail, a more posterior phasmid position and the absence of annules on the tail terminus. Turkish populations contained females with a similar tail-length and phasmid position as *M. nanus* but usually with a broadly rounded to truncated tail terminus, bearing no annules as in *M. microdorus*. In the 130 females examined four have, however, a truncated and annulated tail terminus.

In samples collected in Izmir (Turkey) by Borazanci a similar animal was present but the tail was slightly more conical and the tail annules continued almost to the terminus; on the other hand Kheiri (1973) reported a *M. microdorus* from Karadj (Iran) that after investigation showed a much larger, not annulated area of the tail terminus. In each population considered on its own, the tail variability was rather restricted and nowhere the typical and clearly annulated tail terminus of *M. nanus* was found, neither was the tail as short and the phasmids as posterior as in *M. microdorus*. Because, however, all these populations are completely similar from head to anus it becomes not so easy to evaluate the tail differences noticed; as it concerns only the morphology of the tail-terminus it would be advisable to consider all these populations as representative of *M. nanus*. In the usual keys great importance is however given to the annulation of the tail terminus, although it could very well be that this character is not so important. *M. microdorus* from Belgium can still be differentiated by its slightly shorter tail and more posterior phasmid position; *M. microdorus* from Iran is considered here as a *M. nanus*.

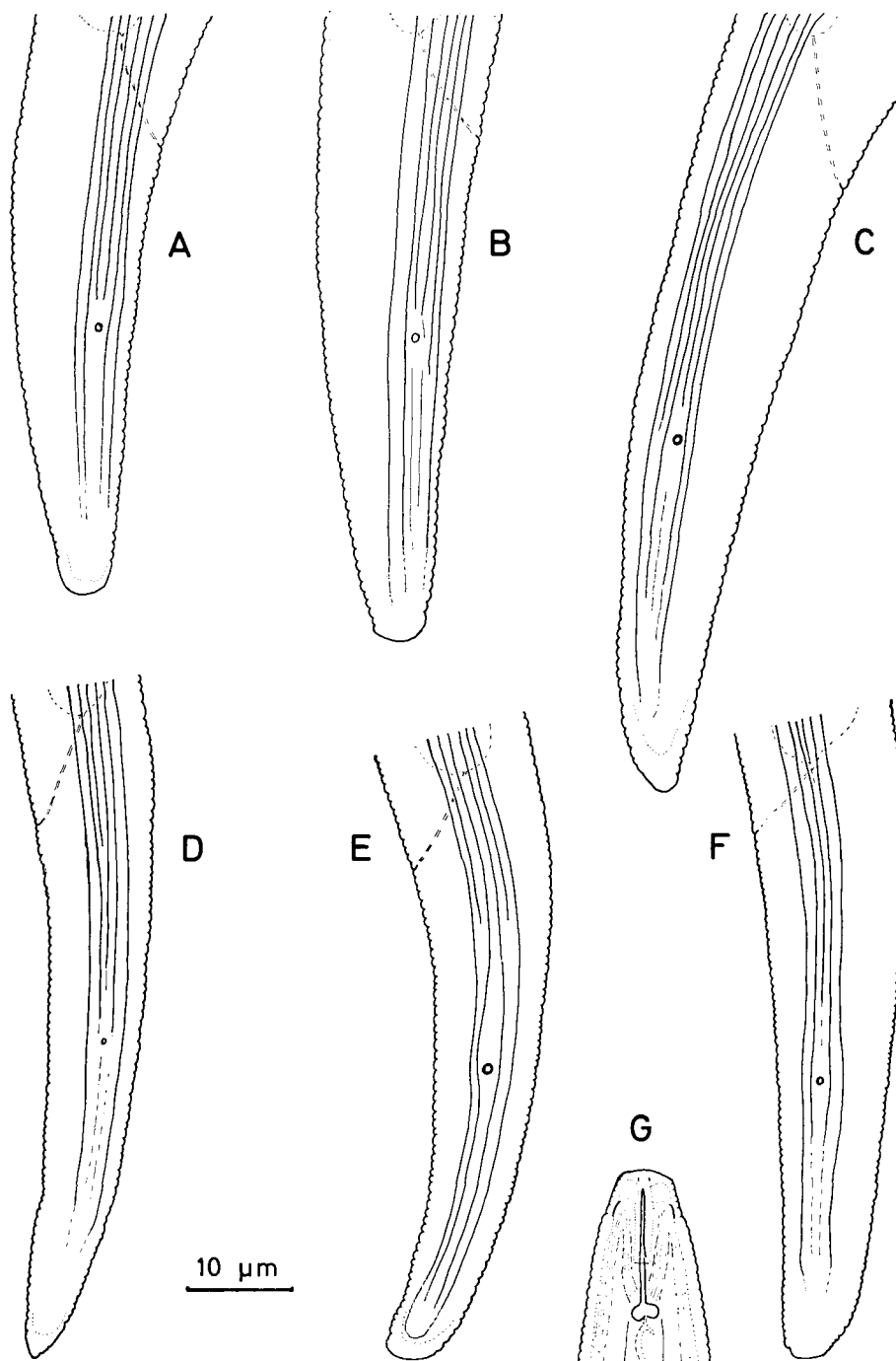


Fig. 3 - A-F: *Merlinius nanus*, female tail; A, B = from Iran (described as *M. microdorus* in Kheiri, 1973); C = from Izmir, Turkey (material from Bo-razanci); D-F = from Istanbul-area, Turkey; G = *M. nanus*, female head, from Istanbul-area, Turkey.

Habitat: *M. nanus* was found in soil around roots of cabbage (*Brassica oleracea* var. *capitata*), broad bean (*Vicia faba*), leek (*Allium porrum*) at Firuzköy (16-4-1972); lettuce (*Lactuca sativa*) at Bakirköy (16-4-1972); onion (*Allium cepa*) and parsley (*Petroselinum* sp.) at Küçük çekmece (16-4-1972); African violet (*Saintpaulia ionantha*) at Küçük yalı (25-7-1972); eggplant (*Solanum melongena*), pepper (*Capsicum frutescens*) and potato (*Solanum tuberosum*) at Cayirova (26-7-1972); eggplant and pepper at Bostanci (27-7-1972); eggplant at Tuzla (28-7-1972).

Merlinius pseudobavaricus n. sp.
(Figs. 4 and 5)

Measurements: see table 1.

Description

Females:

Body slightly ventrally curved when relaxed by gentle heat. Cuticle finely annulated, striae 0.8-1 μm apart in mid-body. Lateral field with six lines, 5-6 μm wide.

Lip-region continuous to slightly offset by depression, bluntly conoid, rounded (more or less hemispherical), 7.5-8.5 μm wide at the base and about 4 μm high; five to seven lip-annules, usually not easy to discern. Cephalic frame-work weakly sclerotized.

Spear fine with heavy knobs (4.5 μm wide); knobs rounded to angular, slightly sloping backwards. Stylet guiding apparatus lyriform.

Dorsal oesophageal gland opening at about 1 μm posterior to stylet knobs.

Median bulb oval, well-developed, with large, crescentic thickenings of the central lumen wall (5-7 μm long and 3.5-4.5 μm wide). Isthmus short. Terminal bulb short, pear-shaped with three large gland nuclei. Cardia rounded 4 μm long. Excretory pore fine, opens opposite the posterior half of the isthmus. Hemizonid about 2-3 annules long, 0-3 annules anterior to excretory pore. Deirids present, located at level of hemizonid.

Genital tract as usual in the genus ($G_1 = 11-22$; $G_2 = 15-22$); epiptygma double, rather thick; vaginal wall slightly thickened towards the vulva; spermatheca rounded, offset (usually dorsally), sperm large (about 2 μm diameter).

Tail subcylindrical with broadly rounded, striated tail terminus;

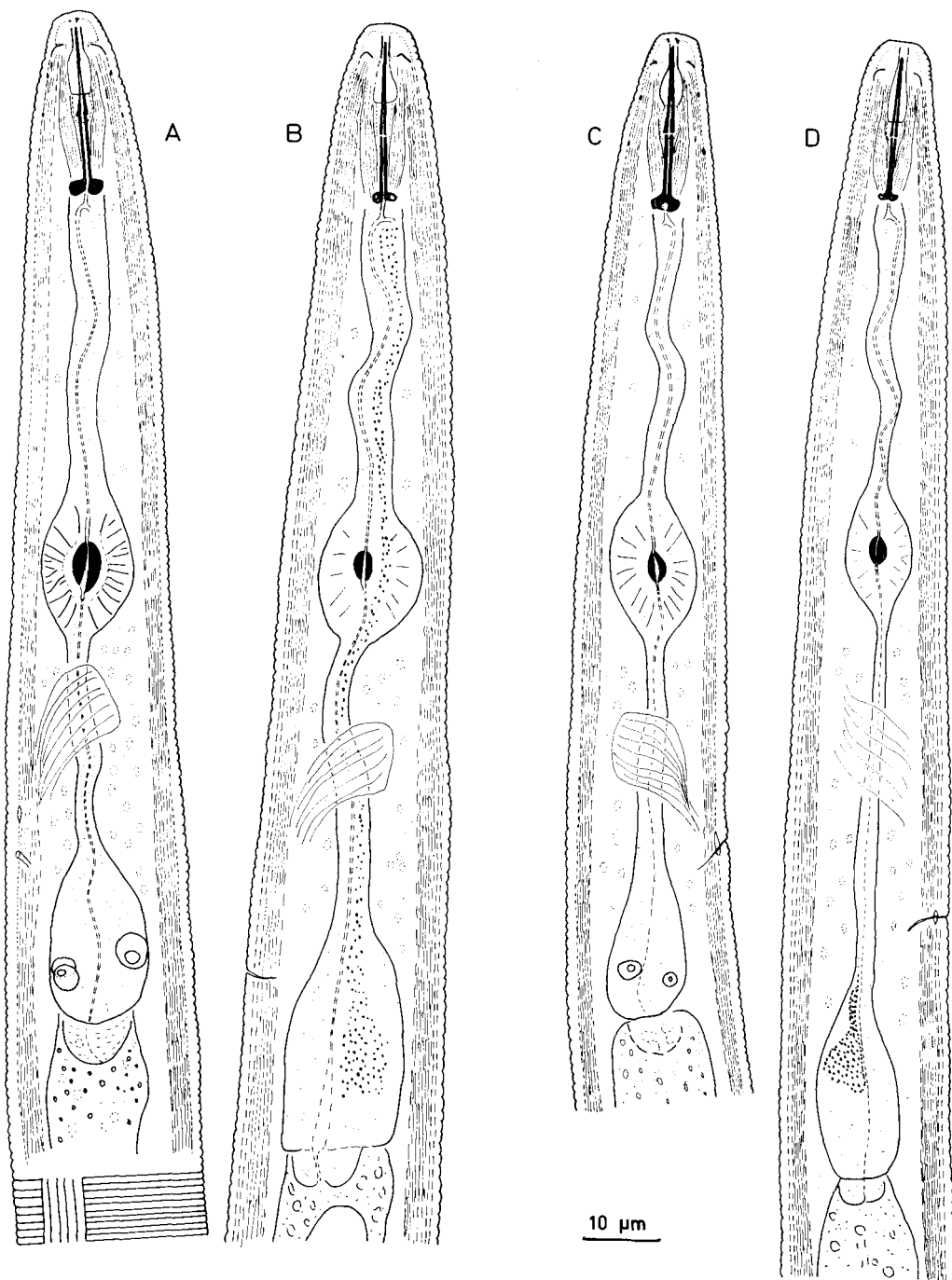


Fig. 4 - A. *Merlinius pseudobavarius*, female, oesophageal region; B = *M. bavarius*, idem; C = *M. pseudobavarius*, male, oesophageal region; D = *M. bavarius*, idem.

Table 1: Comparison of measurements between *M. bavaricus* and *M. pseudobavaricus*.

	<i>M. bavaricus</i>			<i>M. pseudobavaricus</i>		
	orig. 1 ♀	♀♀ n = 4	♂♂ n = 3	holotype ♀	♀♀ n = 3	♂♂ n = 4
L in μm	750	760-960	710-815	695	680-710	640-755
diameter in μm	27	24-29	19-27	25	23-26.5	24-25
a	28	30-34	30-37	28	26-30	25-30
oes. in μm	145	142-147	147-149	132	130-136	122-140
b	5.2	5.2-6.5	4.8-5.5	5.4	5-5.4	5.2-6.1
MB in %	48	47-49	45-47	55	50-54	53-54
tail in μm	58	54-69	57-66	53	42-50	54-59
c	13	11-14	12-13.5	13	14-16	11-13
c'	3	2.9-3.4	—	3.4	2.8-2.9	—
hyal. tail tip in μm	—	3.5-6	—	6	7-9.5	12-14
phasmid in % tail	—	42	41-56	40	37-48	43-49
V	57	51-57.5	—	56	54-56	—
spicules in μm	—	—	22-24.5	—	—	26-28
gubernaculum in μm	—	—	6-9	—	—	9-11
stylet in μm	21	19-22	19	21.5	21.5-22.5	20-22

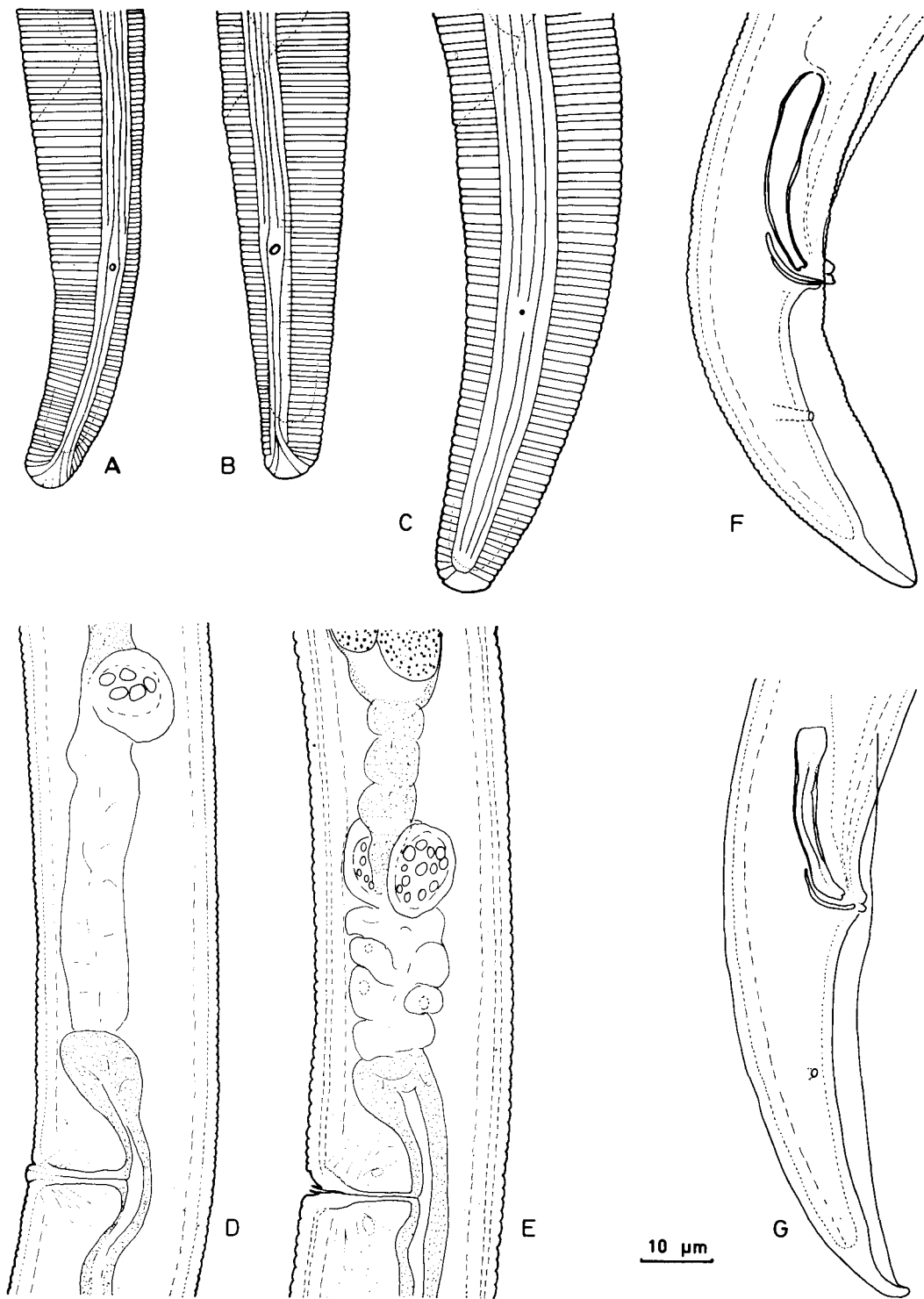


Fig. 5 - A, B, D, F = *M. pseudobavaricus*; C, E, G = *M. bavaricus*; A, B, C = female tail; D, E = female reproductive system; F, G = male, posterior end.

hyaline tail tip 6-9.5 μm long; lateral field with six lines anterior to phasmid, posteriorly only four lines are found; these four lines diverge and split at the tail terminus producing the striated appearance (lateral lines and striae at the tail terminus are not very pronounced); phasmids prominent at 37-48% of tail-length.

Males:

Anterior region similar to female except for less heavy knobs (3.5-4.5 μm wide) and smaller crescentic thickenings in the median bulb (4-6 μm long and 2.5-3 μm wide).

Tail region as usual in the genus *Merlinius* with a hyaline tail tip of 12.5-14 μm long, a phasmid anterior to the middle (at 43-49% of tail-length) and a bursa extending from tail tip to spicula tip. Spicula slightly curved, 26-28 μm long when measured on a straight line from tip to tip and 28-31 μm long when measured along the spicula; the same measurements for the slightly curved gubernaculum gave 9-11 μm and 10-12 μm . T = 35-39.

Holotype: female on slide 133 of the collection at the Museum voor Dierkunde, Ledeganckstraat 35, Gent, Belgium.

Paratypes: two males and one female on slides 134 to 136, same collection; one male, one female in USDA collection, Beltsville, Maryland, USA; one male, one female in the collection of University of California, Riverside, USA.

Type locality and habitat: soil around the roots of *Lactuca sativa* at Bakirköy (Turkey) at 16-4-1972.

Other habitats: cabbage at Firuzköy and parsley at Küçük çekmece, both in Turkey.

Discussion

These nematodes showed such striking similarities with *M. bavarius* (Sturhan, 1966) Siddiqi, 1970 that the differences noticed between the original description and the Turkish animals were considered as variations within that species. Study of new material of this species, kindly provided by Sturhan, showed, on one hand, that the original description is entirely applicable to the new material

except for the fact that no intestinal sac was found neither by Sturhan (pers. comm.) nor by us and on the other hand that the Turkish animals represent a different species. As can be observed from table I the measurements of *M. bavaricus* and *M. pseudobavaricus* are similar to each other; important morphological differences between both are listed below:

1° Usually four head-annules in *M. bavaricus* and five to seven in *M. pseudobavaricus*.

2° Stylet knobs heavier in *M. pseudobavaricus* than in *M. bavaricus*.

3° *M. bavaricus* has the usual small crescentic thickenings in the median bulb; in *M. pseudobavaricus* these structures are very large.

4° Isthmus and terminal bulb are much smaller in *M. pseudobavaricus*; this results in a higher MB value.

5° The spermatheca is bilobed in *M. bavaricus* and spherical in *M. pseudobavaricus*.

6° In *M. bavaricus* the tail is never annulated around the terminus and the hyaline tail terminus is slightly smaller than in *M. pseudobavaricus*.

The differences in relation to the oesophageal structure are perhaps on a higher level than species-differences.

M. bogdanovikatikovi (Kirjanova, 1941) Siddiqi, 1970 is almost identical to *M. bavaricus*: the shape of stylet, tail and vulval region is exactly the same; the head is usually interpreted as being offset and the terminal bulb is slightly more elongated. Study of type material will however be necessary to come to a conclusion.

Paratrophurus loofi Arias, 1970

Measurements

Females (n = 3): L = 0.74-0.81 mm; a = 33-35; b = 5.7-5.9; c = 19; c' = 1.7-2.6; V = 55-57; spear = 22-26 μ m; tail = 39-42 μ m; Ran = 35-40; MB = 52-53.

Males (n = 3): L = 0.70-0.77 mm; a = 34-37; b = 5.5-5.9; c = 17.5-19; c' = 2.0-2.3; T = 45-50; spear = 22-23 μ m; tail = 37-40 μ m; spicules = 23-26 μ m; gubernaculum = 13 μ m; MB = 49-55.

Discussion

No differences were noticed with the original description.

Habitat: soil around roots of radish (*Raphanus sativus*), sunflower (*Helianthus annuus*), eggplant (*Solanum melongena*) and watermelon (*Citrullus vulgaris*) at Büyük çekmece.

Trophurus imperialis Loof, 1955

Measurements

Females (n = 5): L = 0.92-1.01 mm; a = 36-44; oesophagus = 157-162 μm ; b = 5.7-6.2; MB = 55-60; tail = 32-38 μm ; c = 26-29; c' = 1.5-1.7; V = 56-59; spear = 18-20 μm .

Males (n = 3): L = 0.87-0.98 mm; a = 35-43; b = 5.4-6.1; tail = 38-45 μm ; c = 19-25; c' = 1.8-2.5; T = 42-46; spicules = 21 μm ; gubernaculum = 4-5 μm ; spear = 18-19 μm .

Discussion

No differences were noticed with the original description.

Habitat: soil around roots of melon (*Cucumis melo*), watermelon (*Citrullus vulgaris*) and sunflower (*Helianthus annuus*) at Büyük çekmece (1-10-1973).

S U M M A R Y

Tylenchids belonging to the genera *Aprutides*, *Merlinius* and *Trophurus* are reported from the Istanbul-area in Turkey. *Merlinius pseudobavaricus* n. sp. can be differentiated from *M. bavaricus* (Sturhan, 1966) Siddiqi, 1970 by a differently shaped oesophagus (*M. pseudobavaricus* has a more posteriorly situated median bulb with large crescentic thickenings). *Aprutides guidettii* Scognamiglio, 1974 takes an intermediate position between the genera *Aprutides* and *Omemea*. *Merlinius nanus* (Allen, 1955) shows a wider variation in tail shape than hitherto known.

R I A S S U N T O

Alcuni Tylenchida trovati nei pressi di Istanbul (Turchia).

Sono riportati dei Tylenchida appartenenti ai generi *Aprutides*, *Merlinius* e *Trophurus* trovati in Turchia, nei pressi di Istanbul. *Merlinius pseudobavaricus* n. sp. può essere distinto da *M. bavaricus* (Sturhan, 1966) Siddiqi, 1970 dalla forma differente dell'esofago (*M. pseudobavaricus* ha il bulbo mediano