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ON THE VALIDITY OF MERLINIUS RUGOSUS
(SIDDIQI, 1963) SIDDIQI, 1970 AND
THE DESCRIPTION OF *M. SIDDIQII* N.SP.

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S u m m a r y

Merlinius rugosus is distinct from *M. quadrifer* (syn. *M. ornatus*) by its tail-shape, absence of males and some measurements (L, oes., M.B., spear). *M. siddiqii* differs from *M. quadrifer* by tail shape, head sclerotization, number of longitudinal lines and some measurements (L, oes., M.B.). *M. jamalensis* (Nesterov, 1973) n.comb. is proposed.

I n t r o d u c t i o n

Three *Merlinius*-species (originally described as representatives of the genus *Tylenchorhynchus* Cobb, 1913) show rather similar characteristics: *M. quadrifer* (Andrássy, 1954), *M. ornatus* (Allen, 1955) and *M. rugosus* (Siddiqi, 1963).

Tarjan (1964) mentioned the idea of Dr. I. Andrássy about the possible similarity of *M. ornatus* with *M. quadrifer* and synonymized *M. rugosus* with *M. ornatus*. Andrássy (1966) re-described *M. quadrifer* correcting the number of longitudinal lines to about 30 instead of 60 mentioned in the original description and synonymized *M. ornatus* with *M. quadrifer*. This idea was accepted by Siddiqi (1970) while proposing the genus *Merlinius* but *M. rugosus* was considered as a valid species. Again, Kheiri (1973) synonymized *M. rugosus* with *M. quadrifer* but Tarjan (1973) reconsidered *M. rugosus* as a valid species and included it in the key to the genus.

M a t e r i a l s

During my stay with the Commonwealth Institute of Helminthology, St. Albans, England (1976-77), I received several populations of *Merlinius* spp., from England, Scotland, the Netherlands corresponding to *M. quadrifer* and a population from Syria similar to *M. rugosus*. The type specimens of *M. quadrifer*, *M. ornatus* and *M. rugosus* were studied and compared and the following results were obtained.

R e s u l t s

Measurements :

M. quadrifer (after Andrássy, 1954) : L = 0.648-0.732 mm;
a = 26.1-28.0; b = 5.0-5.9; c = 16.8-17.4; V = 57.2-58.8;
spear = 20.2-21.6 μ m.

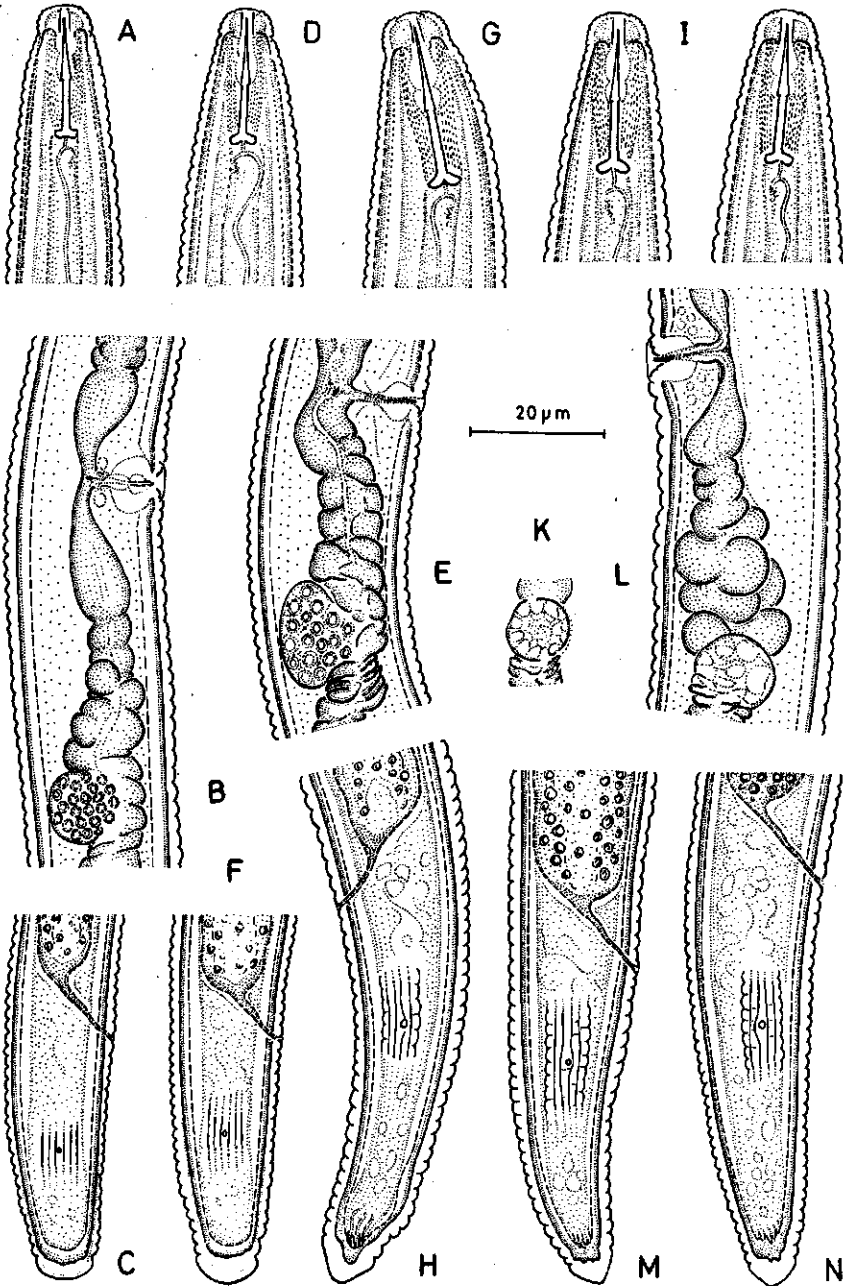


Fig. 1. A-F. *Merlinius quadrifer*

A-C. Budapest population. D-F. The Netherland population. A & D. Head ends. B & E. Vulva regions with part of gonad showing spermatheca. C & F. Female tails. G-N. *M. rugosus*. G-H. Holotype. G. Head end. H. Female tail. I-N. Damascus population. I & J. Head ends. K. Spermatheca. L. Vulva region with part of gonad showing spermatheca. M & N. Female tails.

(after Andrásy, 1966) : L = 0.69 mm; a = 30, b = 4.5; c = 16; V = 56.6; spear = 19 μ m.

Population from Budapest (4 ♀♀) : L = 0.56-0.71 mm; a = 26-31; b = 4.5-5.5; c = 15-17; V = 54.6-59.2; spear 18-19 μ m.

Population from the Netherlands (6 ♀♀) : L = 0.62-0.77 mm; a = 25-29; b = 5.7-6.1; c = 16.5-18.3; V = 53.2-58.0; spear = 18-19.5 μ m

M. ornatus (after Allen, 1955) 5 ♀♀ : L = 0.63-0.67 mm; a = 28-33; b = 4.0-4.8; c = 14-21; V = 54-56; spear = 18-19 μ m.

6 ♂♂ : L = 0.65-0.75 mm; a = 24-32; b = 4.8-5.5; c = 16-17; spear = 18 μ m.

M. rugosus (after Siddiqi, 1963) : L = 0.8-0.9 mm; a = 30-32; b = 4.4-5.1; c = 15.5-17.0; V = 55-56; spear = 23 μ m.

Damascus population (5 ♀♀) : L = 0.84-1.03 mm; a = 31-36; b = 5.4-6.1; c = 15-17.5; V = 52-56; spear = 22-23 μ m.

D i f f e r e n t i a l d i a g n o s i s

1. *M. quadrifer* is always shorter than *M. rugosus* and has smaller body annules.
2. Lip annules 5 or rarely 6 in *M. quadrifer* but 7 to 8 in *M. rugosus* that are comparatively smaller.
3. Spear 18-19 μ m or rarely 20 μ m in *M. quadrifer* but 22-23 μ m in *M. rugosus*.
4. Oesophagus shorter (119-137 μ m) with more posterior median bulb (47.0-49.2 %) in *M. quadrifer* than in *M. rugosus* which has a longer oesophagus (172-178 μ m) with a more anterior median bulb (about 42-44 %).
5. In *M. quadrifer* the spermatheca is well developed, filled with sperms although the males do not frequently occur while in *M. rugosus* the spermatheca is poorly developed, without sperms and males were never found.
6. The female tail of *M. quadrifer* is cylindroid; straight or rarely very slightly ventrally curved; with broad, rounded, smooth terminus; inner cuticular layer and the inner protoplasmic mass broadly rounded at the tail tip (Fig. 1-C & F); 2.0-2.3 anal body widths long with 18-20 annules.
The female tail of *M. rugosus* is elongate, markedly tapering, ventrally curved with conical terminus; inner cuticular layer irregular at the tail tip and the inner protoplasmic layer is irregularly fringed (Fig. 1-I, M & N); 2.6-3.1 anal body-widths long with 22-31 annules.
7. Phasmids more posteriorly situated (45-54 %) in *M. quadrifer* than they are in *M. rugosus* (32-35 %).

On the above mentioned points one can conclude that *M. ornatus* is synonym of *M. quadrifer* but *M. quadrifer* (Andrásy, 1954) Siddiqi, 1970 and *M. rugosus* (Siddiqi, 1963) Siddiqi, 1970 are two different species quite distinct from each other.

Merlinius siddiqi^{*} n.sp.Measurements :

20 ♀♀ (paratype) : L = 0.825-1.220 mm; a = 23-34; b = 4.8-6.4; c = 18-25; V = 52-60; spear = 20-23 μ m; m = 52-57; O = 12-15.

11 ♂♂ : L = 0.825-1.130 mm; a = 24-33; b = 5.6-6.8; c = 14-16; T = 33-42; spear = 20-33 μ m; m = 50-58; O = 14-21.

♀ (holotype) : L = 0.91 mm; a = 26.0; b = 5.4; c = 19.3; V = 52; spear = 21 μ m; m = 57; O = 15.

Description :

Female : Body slightly arcuate to open "C"-shape upon fixation, regularly tapering towards extremities. Cuticle marked with prominent transverse and longitudinal striae crossing each other to form small rectangles. Transverse striae 3.0-4.0 μ m apart near middle. Longitudinal striae vary in number in different regions of the body, about 36-40 in the middle. Lateral fields occupy 1/4 to 1/3 of the body width, originating with 2 incisures below the level of spear knobs, becoming four near median bulb and six about anterior end of basal bulb of oesophagus; all 6 incisures continue until tail terminus and end as illustrated in the figure (Fig. 2-L); areolations irregular and rare but throughout the body length, more numerous in oesophageal region and tail.

Lip region offset, distinctly separated from the body by a girdle-like ring bearing longitudinal markings; provided with a labial disc; 5-6 μ m high and 9-10 μ m wide, with 5-6 annules. Labial framework moderately sclerotized. Anterior and posterior cephalids 2 and 7 annules posterior to lip region respectively. Cross section of the mid body shows 18-20 longitudinal striae in each half of dorsal and ventral regions and 6 in each of the lateral field region. Number of dorsal and ventral striae usually does not correspond to either side. Prominent lateral hypodermal chords and inconspicuous dorsal and ventral chords; meromyarian somatic musculature, 5-7 platymyarian muscle cells in each quadrant present (Fig. 2-I).

Basal knobs of spear sloping backwards, 4-5 μ m across. Orifice of the dorsal oesophageal gland 2.5-3.0 μ m behind spear base. Oesophagus typical; median bulb oval, 19-21 μ m long and 12-14 μ m wide. Nerve ring about middle of isthmus, 97-124 μ m from anterior end. Excretory pore 112-137 μ m from anterior end. Hemizonid about 1 annule long, 0-5 annules anterior to excretory pore.

Vulva transverse, slit-like, appears to possess lateral cuticular flaps. Vagina extends about half of body width at vulva, surrounded distally by a thickened cuticular mass in vagina vera region. Spermatheca large, bilobed, filled with sperms. Oocytes arranged in a single row except at the anterior end where they sometimes become double in the region of multiplication. Tail elongate - conoid, regularly tapering, 2.0-2.2 anal body widths long, with 19-22 annules. Terminus blunt, usually knobbed due to slight constriction and smooth but

^{*} New species named after Dr. M.R. Siddiqi, Senior Nematologist, Commonwealth Institute of Helminthology, St. Albans, England.

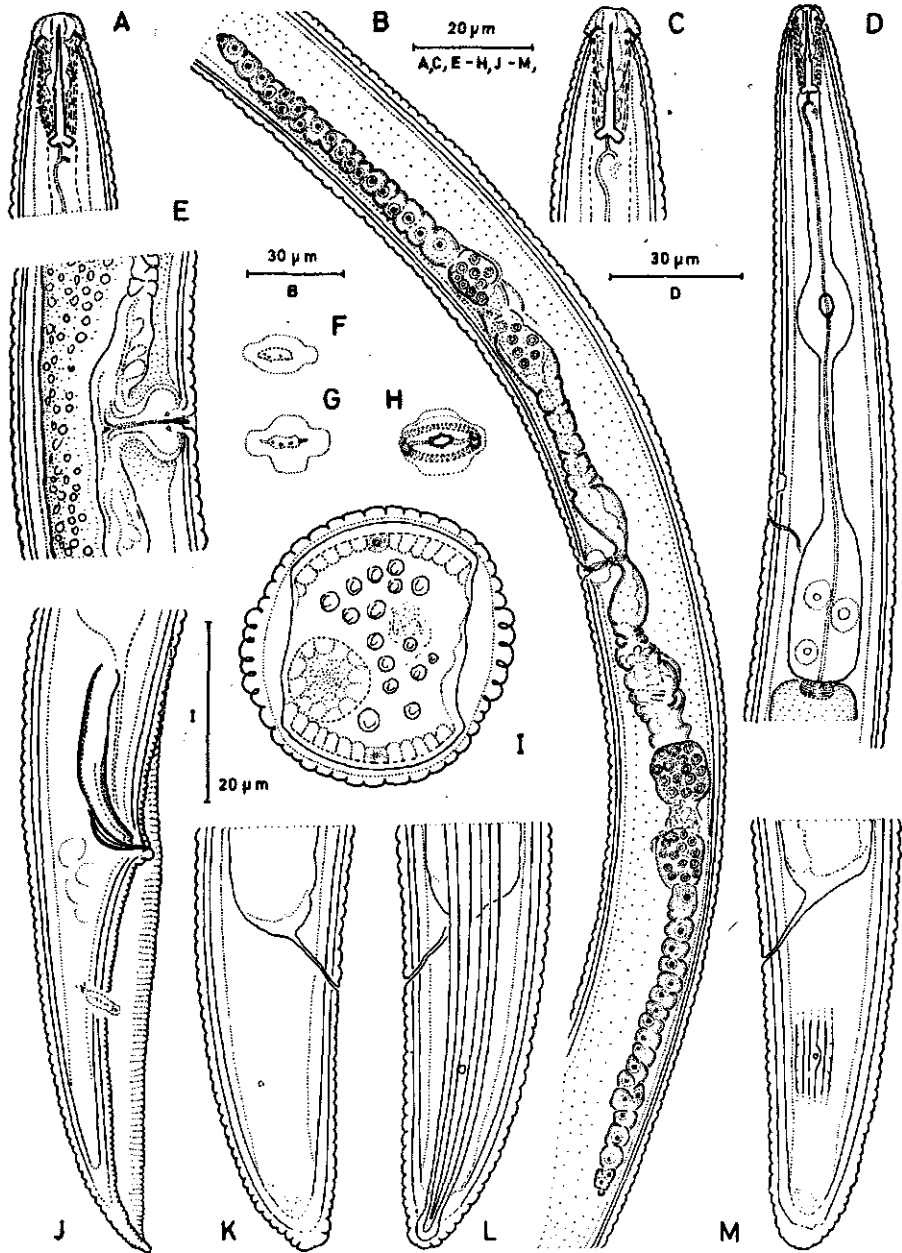


Fig. 2. A-M. *Merlinius siddiqii* n.sp.

A. Head end of male. B. Female gonad. C. Head end of female. D. Oesophageal region of female. E. Vulva region. Lateral. F. Vulva ventral view. G. Vagina. Ventral view, distal end. H. Vagina. Ventral view, proximal end. I. Cross section, mid body. J. Male tail. K-M. Female tails.

appears annulated when exactly lateral in position; terminal annules comparatively broader. Phasmids located in the anterior one-third region of the tail; at about 8-15 μ m or 5-10 annules posterior to anus.

Male : Spicules 30-36 μ m long medially. Gubernaculum 12-14 μ m long. Bursa moderately developed with crenate margin. Tail longer than female, annulated up to the tip; annules on the dorsal side wider than ventral side. Phasmids situated in anterior one-third of the tail.

Type habitat and locality : Soil around roots of *Cannabis sativa* from Kastamonu, Turkey.

Type specimens : Collected in July, 1973. Holotype female on slide MMM 4/74(8)a and 2 ♀♀ and 2 ♂♂ paratypes on slides MMM 4/74(8)b-c at the Commonwealth Institute of Helminthology, St. Albans, UK; 2 ♀♀ and 2 ♂♂ paratypes at Rothamsted Experimental Station, Harpenden, UK; 1 ♀ and 1 ♂ paratypes at each of these centres : Nematology Dept. at Riverside, Univ. of California, USA; Nematology Dept., Landbouwhogeschool, Wageningen, The Netherlands, Zoology Museum, Aligarh Muslim Univ., Aligarh, India and rest in CIH collection.

D i f f e r e n t i a l d i a g n o s i s

Merlinius siddiqii n.sp. comes close to *M. cylindricaudatus* (Ivanova, 1968) Siddiqi, 1970, *Merlinius quadrifer* (Andrassy, 1954) Siddiqi, 1970 and *M. sobolevi* (Mukhina, 1970) Tarjan, 1973. From *M. cylindricaudatus* it differs due to offset lip region and shorter tail; from *M. quadrifer*, a very similar species, it differs by a longer body size, stronger head sclerotization, longer oesophagus, more anterior median bulb, wider body annules, shape of tail, number of longitudinal lines and frequently occurring males. From *M. sobolevi* it differs due to head shape, more longitudinal striae and greater body length.

Addendum

M. jamalensis (Nesterov, 1973) n.comb. is proposed.

A c k n o w l e d g e m e n t s

I am thankful to Dr. I. Andrassy for the loan of *M. quadrifer* slide; to Dr. M.R. Siddiqi for the loan of *M. rugosus* (holotype), for his valuable suggestions and confirmation of the identity of the new species; to Prof. A. Coomans for going through the manuscript and providing necessary facilities to complete the paper and to Dr. Geraert for his help and general assistance.

R e f e r e n c e s

1. ALLEN, M.W.
A review of the nematode genus *Tylenchorhynchus*.
Univ. Calif. Publ. Zool. 61, 129-166 (1955).
2. ANDRÁSSY, I.
Drei neue Arten aus der Superfamilie Tylenchoidea.
Nematologische Notizen, 3.
Ann. Biol. Univ. Hung., 2, 9-15 (1954).

3. ANDRÁSSY, I.
Erd- und Süßwasser-Nematoden aus Ghana. Klasse Secernentea (Phasmidia).
Annls Univ. Scient. bpest Rolando Eötvös, sect. Biol., 8, 5-24 (1966).
4. IVANOVA, T.S.
Nematodes of Cereals from the Zeravshan Valley of Tajikistan. (in Russian, Eng. abs.).
Publishing house "Donish", Dushanbe, 84 p., 18 Figs., 11 Tabs. (1968).
5. KHEIRI, A.
Plant parasitic nematodes (Tylenchida) from Iran.
Biol. jaarb. Dodonaea, 40, 224-239 (1973).
6. MUKHINA, T.I.
A new species of the genus *Tylenchorhynchus* Cobb, 1913 (Nematoda : Tylenchoidea).
(in Russian) Parazitologiya, 4, 342-344 (1970).
7. NESTEROV, P.I.
[New species of Plant Nematodes from arctic tundra of the USSR [Yamal Peninsula].
Izv. Akad. Nauk Moldavskoi SSR, 4, 68-70 [Ru] (1973).
8. SIDDIQI, M.R.
Four new species in the subfamily Tylenchinae (Nematoda) from North India.
Z. Parasitenk., 23, 397-404 (1963).
9. TARJAN, A.C.
A compendium of the genus *Tylenchorhynchus* (Tylenchidae : Nematoda).
Proc. helminth. Soc. Wash., 31, 270-280 (1964).
10. TARJAN, A.C.
A synopsis of the genera and species in the Tylenchorhynchinae (Tylenchoidea, Nematoda).
Proc. helminth. Soc. Wash., 40, 123-144 (1973).

S a m e n v a t t i n g

M. rugosus kan onderscheiden worden van *M. quadrifer* (syn. *M. ornatus*) door de staartvorm, de afwezigheid van mannetjes en enkele maten (L, oes, MB, stekel). *M. siddiqii* verschilt van *M. quadrifer* door de staartvorm, de sclerotisatie van de kop, het aantal longitudinale lijnen, enkele maten (L, oes, MB).

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