

Macroposthonia sicula n. sp. (Nematoda: Criconematidae), a Parasite of Olive Trees in Sicily

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Abstract: *Macroposthonia sicula* n.sp. collected from rhizosphere and roots of olive (*Olea europaea* L.) at Kamarina, Sicily, Italy, is described and illustrated. It is distinguished from the related species (*M. sphaerocephala* and *M. maskaka*) by the longer stylet and the characteristic narrowing postvulval portion of the body. *Key words:* taxonomy, scanning electron micrographs.

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Several ring nematodes are reported in association with olive (*Olea europaea* L.) trees in Italy (7), but only *Ogma rhombosquamatum* (Mehta & Raski) Andrassy has been proven pathogenic to this crop (10). Recently a new nematode species, belonging to the genus *Macroposthonia*, has been observed feeding ectoparasitically on roots of olive trees in Sicily and is here described. No other host has been found, and the known distribution is confined to the type locality.

MATERIALS AND METHODS

The specimens utilized for this study were extracted from olive roots by the Young incubation method (11) and from soil samples by Cobb's (2) sieving and decanting method. Adult specimens were

killed and fixed in hot aqueous solution of 4% formaldehyde and 1% propionic acid. Some specimens were mounted in dehydrated glycerine (8), others transferred into 1% osmium tetroxide solution for 12 h, infiltrated with Spurr's low-viscosity resins (1,5), mounted on scanning electron microscope (SEM) specimen stubs, coated with gold, and examined and photographed with SEM at 5 KV of accelerating voltage.

DESCRIPTION

Macroposthonia sicula n. sp.

FEMALE (Fig. 1 A-C, E, F; Fig. 2 A-G).

Paratypes (20 specimens): L = 366 μ m (324-400); a = 9 (8-10); b = 2.9 (2.6-3.0); c = 55 (50-66); V = 96% (95-97); VT (vulva-terminus distance) = 14 μ m (13-17); stylet = 76 μ m (73-78); R = 74 (70-83); RSt = 15 (14-17); ROes = 23 (22-26); Rex = 24 (22-26); RV = 4-5; Ran =

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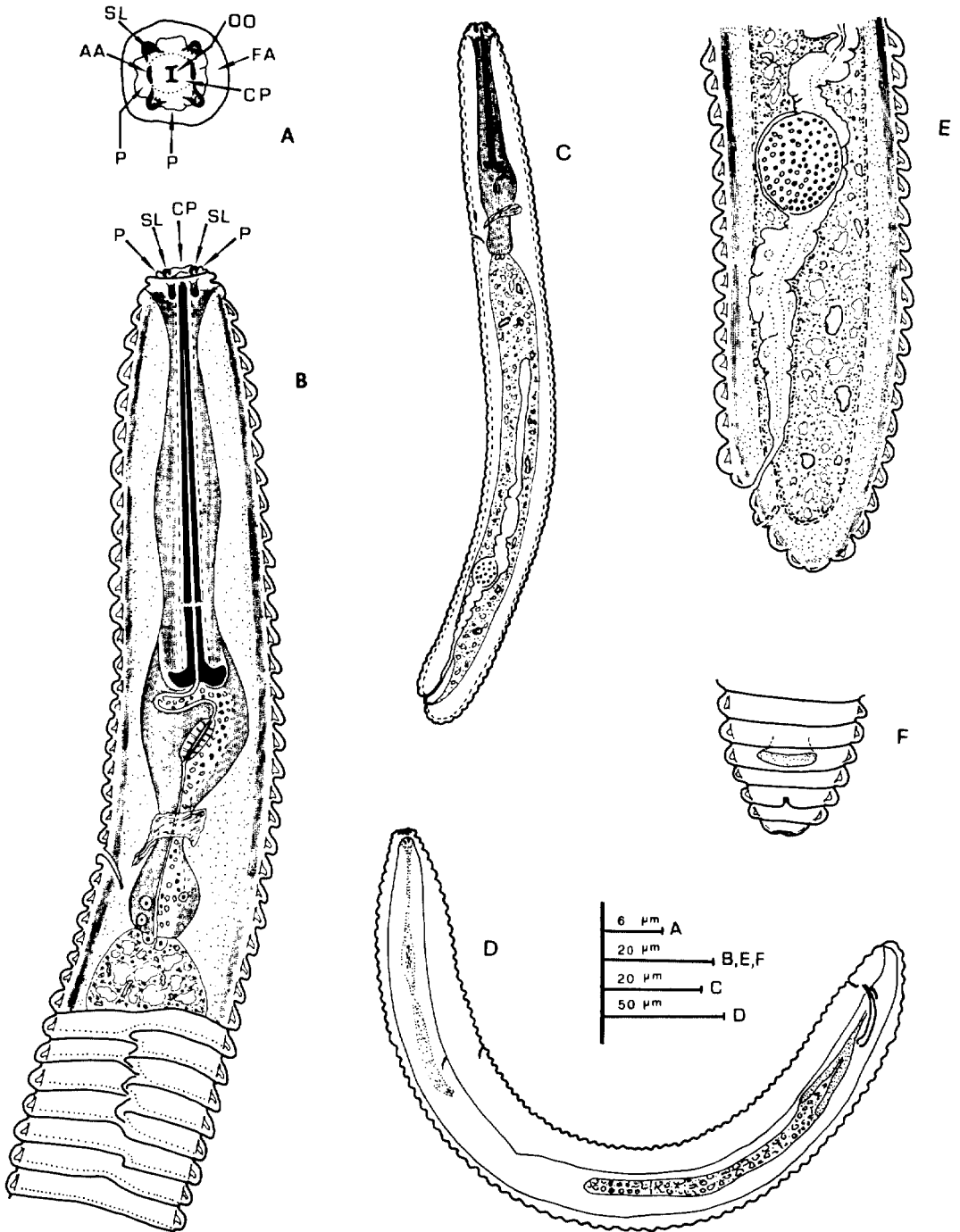


Fig. 1. A-F) *Macroposthonia sicula* n.sp. A) Face view of female showing oral opening (OO), submedian lobe (SL), first annule (FA), cephalic plate (CP), pseudolips (P), amphidial aperture (AA), and submedian lobe (SL). B) Oesophagus region of female. C) Lateral view of entire female body. D) General view of male enclosed in the juvenile cuticle. E) Lateral view of the posterior part of female body. F) Ventral view of vulval and anal area.

2-3; RVan = 1; VL/VB = 0.96 (0.8-1.2).

Holotype (female): L = 384 μm ; a = 10; b = 2.9; c = 54; V = 96%; VT = 17 μm ; stylet = 77 μm ; R = 76; RSt = 15; ROes = 24; Rex = 23; RV = 4; Ran = 2; RVan = 1; VL/VB = 0.9. For the meaning of the symbols R, RSt, ROes, Rex, RV, Ran, RVan, and VL/VB see De Grisse (3).

Description. Female body cylindrical, rounded at both ends, slightly curved, ventrally and abruptly narrowing (30% reduction of body diam.) at the vulval level (Figs. 1C; 2F). Body annules (4.5-5.0 μm wide at mid-body), slightly retrorse with smooth or slightly irregular posterior edges. The first body annule, 13-16 μm wide, is smaller than the following annules and not retrorse (Figs. 2A; 2B; 2E). Anastomosis of two to eight annules forms a characteristic zig-zag lateral line (Figs. 1B; 2C; 2D) which has been also observed in juveniles.

The lateral line is often interrupted by continuous annules which show a sinuous edge (flexion) at the lateral line level (Figs. 1B; 2C; 2D). The head protrudes slightly beyond the first annule. In face view the rounded and slightly raising cephalic plate is visible surrounded by the four submedian lobes (Figs. 1A; 2B). The centrally located I-like oral opening is oriented dorso-ventrally and becomes almost circular when the robust stylet is protruded (Fig. 2D). The irregular shaped dorsal, ventral, and lateral pseudolips are located between the submedian lobes and the first body annule (Figs. 1A; 2B; 2E). The small slit-like amphidial apertures are located between the lateral borders of labial disc and the slightly lower lateral pseudolips (Figs. 2B; 2E).

The stylet, with strong knobs 9-10 μm wide, is 19% (18-20) of body length and 60% (58-63) of oesophagus length. Oesophagus typical of the genus with a large median bulb, partially filled with distinct glandular granules. The isthmus is short, surrounded by the nerve ring, and the posterior rounded bulb is well developed, but considerably smaller than the median bulb. Two large gland nuclei and several small nuclei are present but with variable positions. The excretory pore is situated always at level or anterior to the oesophagus-intestinal junction. The small hemizonid

is located two annules anterior to excretory pore. A conspicuous longitudinal muscle band (3 μm wide at mid-body) begins anteriorly to the second annule and ends near the tail terminus. The vulva is of the open type with smooth anterior lip. The body annule, immediately anterior to the vulva opening is usually with a prominent ventral protrusion (Figs. 1C; 1E; 2F). In ventral view small lobes are visible on the anterior lip of the vulva (Fig. 2G). The anus opening is located at the level of second annule, posterior to the vulva, and appears as a small pore about half an annule or less in width (Fig. 2G). Tail terminus rounded with one or sometimes two lobes. Ovary sometimes reflexed and in some cases very long, overlapping the basal bulb of the oesophagus. Spermatheca spheroidal 16 μm (15-18) wide, filled with rounded sperms and located 13-17 annules anterior to the vulval opening.

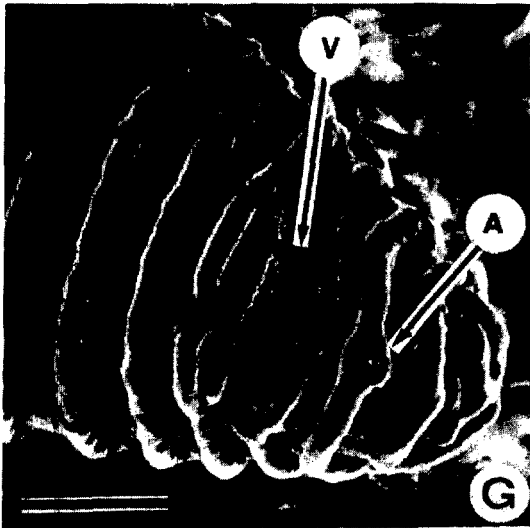
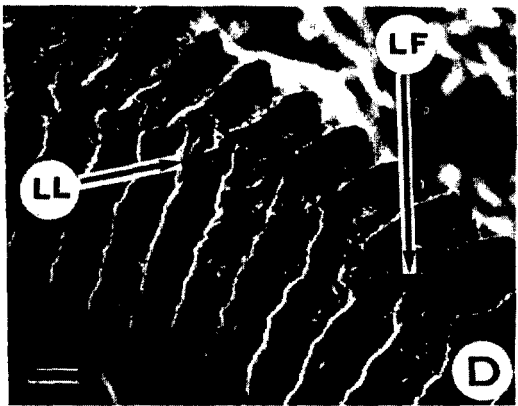
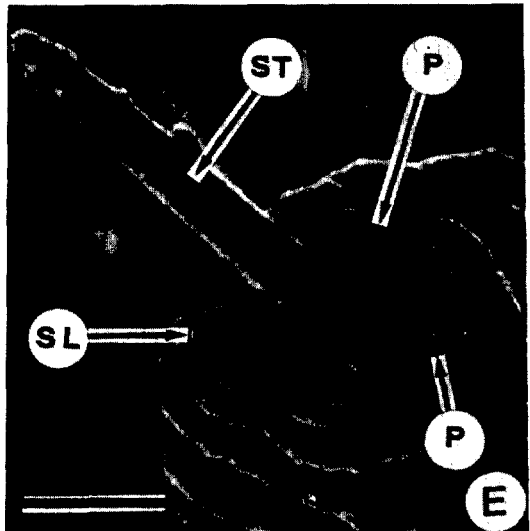
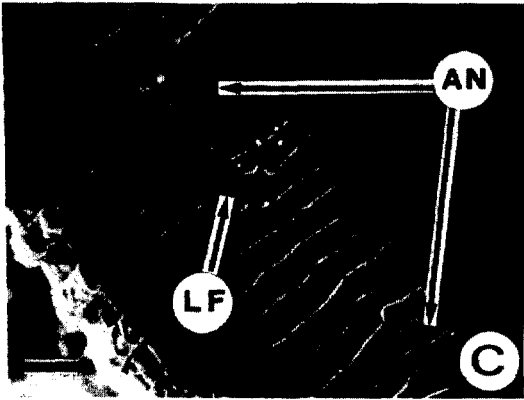
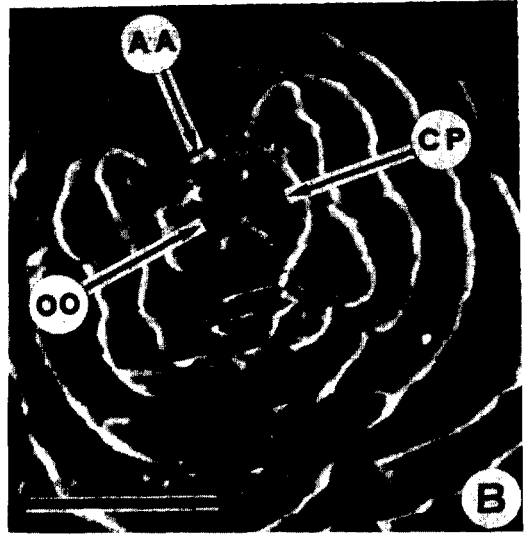
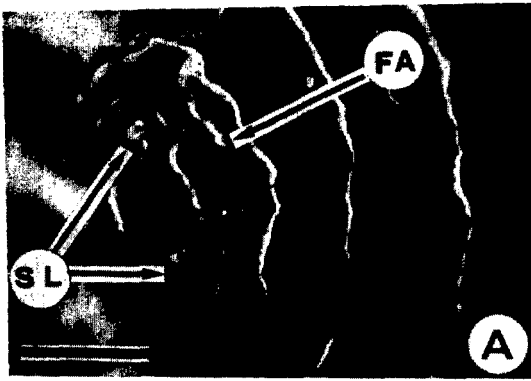
MALE (Fig. 1D).

Only a single male, which was enclosed in the juvenile cuticle, was found. Male body cylindrical, 375 μm long, more slender than female, with stylet and oesophagus degenerate. Spicules 37 μm long, arcuated and cephalate. Gubernaculum 6 μm long and slightly curved. Testis single, 169 μm , occupying about 45% of the body length. Tail, 24 μm long, curved slightly ventrally. Anterior end to excretory pore distance, 95 μm .

Type specimens: Holotype female slide V.46/1/1 and male slide V.46/1/2 at Istituto di Nematologia Agraria, C.N.R., Bari, Italy.

Paratypes: Slides V.46/1/3-9 with 26 females at Istituto di Nematologia Agraria, C.N.R., Bari, Italy, and two females each at 1) Rothamsted Experimental Station, Nematology Department, Harpenden, Herts, England; 2) Commonwealth Institute of Helminthology, St. Albans, Herts, England; 3) Plantenziektenkundige Dienst, Wageningen, The Netherlands; 4) University of California, Nematode Collection, Davis, California, USA; 5) USDA Nematode Collection, Beltsville, Maryland, USA; 6) Museum National d'Histoire Naturelle, Laboratoire des Vers, Paris, France.

Type habitat and locality: Sandy loam soil and roots of olive (*Olea europaea* L.)



trees in Kamarina (Ragusa), Sicily, Italy.

Diagnosis and relationships: *Macroposthonia sicula* n. sp. is closely related to *M. sphaerocephala* (Taylor) De Grisse & Loof 1965 (4) and *M. maskaka* Heyns 1970 (6). It is distinguished from the former by its longer stylet (73–78 μm vs. 43–68 μm), the abruptly narrowing postvulval portion of the body that is more uniform and regularly shaped in *M. sphaerocephala*, and by the smaller number of anastomosed annules. In *M. sphaerocephala* almost all the annules are anastomosed (3,9). *M. sicula* differs from *M. maskaka* in having a longer stylet (73–78 μm vs. 63–65 μm); a larger value of RSt (14–17 vs. 11–13), a more anterior position of anal aperture (Ra = 2–3 vs. 1; RVan = 1 vs. 3), and a greater number of anastomosed annules.

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Fig. 2. A–G) *Macroposthonia sicula* n. sp. Female (SEM micrographs). A) Head in profile, showing the first annule (FA) and submedian lobe (SL). B) Head in face view, showing the amphidial aperture (AA), cephalic plate (CP), and oral opening (OO). C–D) Lateral view of mid-body showing anastomosed annules (AN), lateral flexion of annule (LF), and lateral line (LL). E) Head region showing protruded stylet (ST), pseudolips (P), and submedian lobe (SL). F) Lateral view of posterior part of body. G) Ventral view of posterior part of body showing the vulva (V) and anus (A). (Scale bar = 5 μm).