

## RESEARCH NOTES

### Parasitic Habits of *Ogma rhombosquamatum* and Description of the Male

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The original description of *Ogma rhombosquamatum* (Mehta and Raski, 1971) Andrassy, 1979 was based on females only (1,4) collected from *Pinus* sp. and *Smilax* sp. in northern Italy. Males were collected recently from the rhizosphere of olive (*Olea europaea* L.) at Erice (TP) Sicily and are described here for the first time. Information is also given on morphological characters of females as observed with the scanning electron microscope (SEM) and light microscope and on the histopathology induced by this species on olive.

Nematodes were extracted from olive roots by incubation in a jar (6) and from soil by Cobb's decanting and sieving method (2). They were prepared for light microscopic observations by fixing in hot 4% formalin and 1% propionic acid and processing to dehydrated glycerin. Additional specimens were prepared for SEM observations by fixing in TAF (triethanolamine-formalin), transferring to 1% OsO<sub>4</sub> aqueous solution, infiltrating with Spurr's resin, and coating with gold (5). Olive feeder roots with nematodes attached were prepared for histopathological studies as follows: root segments were fixed in chrome-acetic-formalin solution, dehydrated in tertiary butyl alcohol, and embedded in paraffin. Transverse sections, 10–15  $\mu\text{m}$  thick, were stained in safranin-fast-green, mounted in permount, and observed with a compound microscope.

*Ogma rhombosquamatum*  
(Mehta and Raski, 1971)  
Andrassy, 1979.

**Male** (n = 20; Fig. 1 C-E): L = 0.35 mm (0.32–0.40); a = 16 (15–17), b = 3.2 (3.1–3.5); c = 10 (9–11); c' = 2.5 (2.4–2.8); spicules = 38  $\mu\text{m}$  (34–42); gubernaculum

= 8  $\mu\text{m}$  (7–9); anterior-end to excretory pore distance = 106  $\mu\text{m}$  (102–110); greatest body width = 20  $\mu\text{m}$ ; annules width = 1.8  $\mu\text{m}$ ; lateral field width = 3  $\mu\text{m}$ .

**Description:** Body curved ventrally. Annules coarse; lateral field with two longitudinal striae. Lip region rounded. Oesophagus and intestine degenerate. Hemizonid distinct, 2–3 annules long and 5–6 annules anterior to excretory pore. Testis single, outstretched, and occupying about 40% of body length. Spicules arcuate, cephalated, and finely pointed. Gubernaculum linear and slightly curved. Caudal alae (observed in only 60% of specimens) rudimentary with distinct annulate margin, extending from just behind the cloacal opening to 2–3 annules before terminus. Body narrowing posterior to cloaca; tail conical with regular distinct annules and pointed terminus. The last annule small and digitiform.

**Deposition of specimens:** This collection is deposited as follows: 12 at Laboratorio Nematologia agraria, C.N.R., Bari, Italy, and 2 each at U.S. Department of Agriculture, Nematode Collection, Beltsville, Maryland, U.S.A.; Nematology Department, Rothamsted Experimental Station, Harpenden, England; Plantenziektenkundige Dienst, Wageningen, The Netherlands; Canadian National Collection of Nematodes, Ottawa, Canada; and National Nematode Collection, Indian Agricultural Research Institute, New Delhi, India.

**Female** (n = 50; Fig. 1 A-B, F-G): L = 0.42 mm (0.39–0.45); a = 11 (10–13); b = 3.3 (3.1–3.6); c = 15 (14–17); c' = 1.4 (1.0–1.6); V = 86% (84–87); stylet = 94  $\mu\text{m}$  (88–102); R = 85 (82–88); RSt = 20 (19–23); ROes = 26 (24–29); Rex = 29 (28–30); RV = 15 (13–16); RVan = 6 (5–7); Ran = 9 (8–10); VL/VB = 1.8 (1.6–1.9); anterior-end excretory pore distance = 139  $\mu\text{m}$  (137–153). For explanation of symbols see De Grisse (3).

**SEM observations of females:** The two

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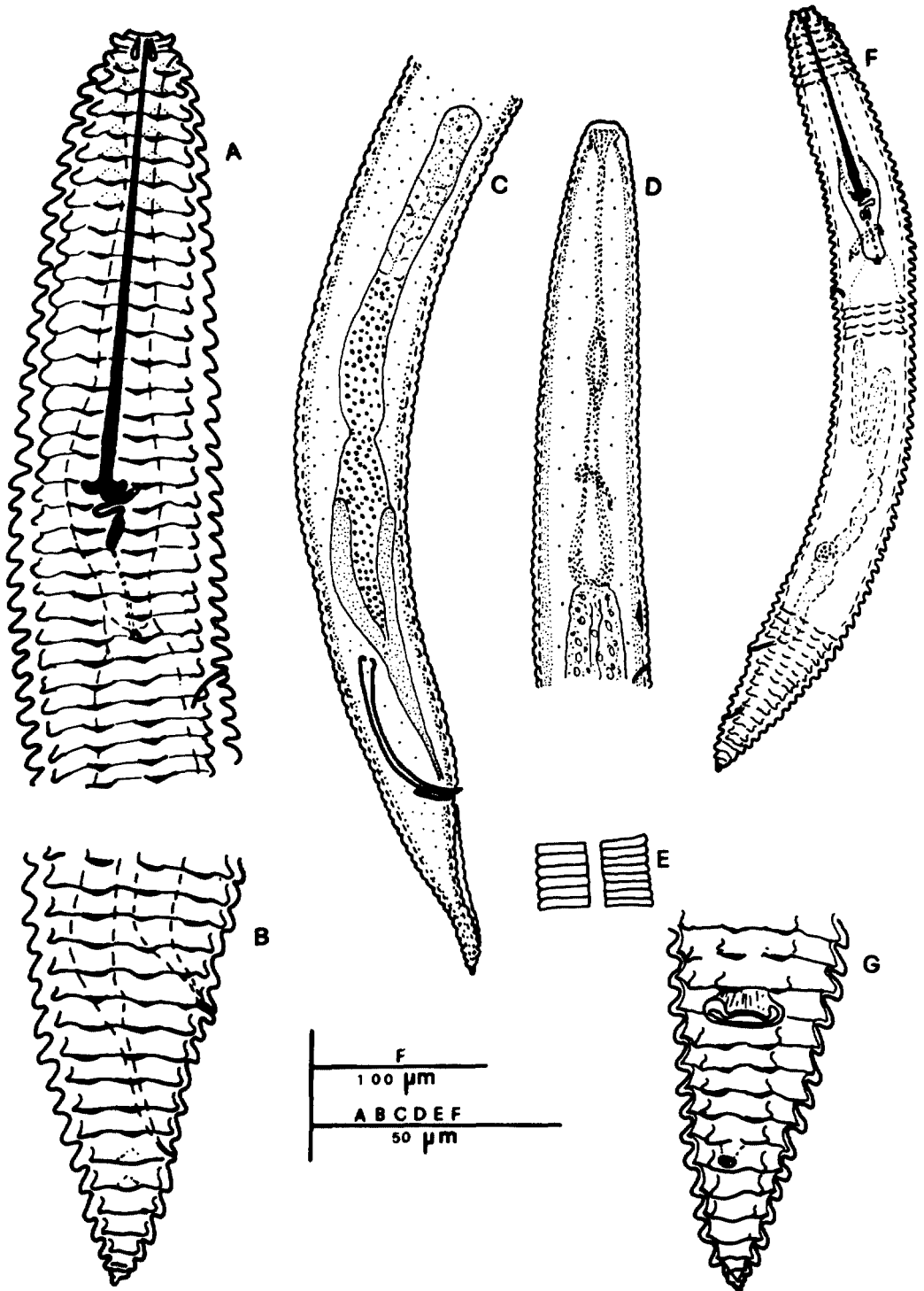


Fig. 1. *Ogma rhombosquamatum*. A-B) Lateral view of anterior and posterior portion of female body. C-D) Lateral view of anterior and posterior portion of male body. E) Male lateral field. F) Lateral view of female. G) Ventral view of vulvar region and tail of female.

head annules of females have irregular crenate edges and fine incisures along the annule walls (Fig. 2 A-B). These annules are equal in diameter; the first is anteriorly directed. In face view, a cuticular ring is noted in the first annule between submedian lobes and oral aperture (Fig. 2 A). The amphidial apertures appear rectangular, leaving a faint lateral connection between the two subdorsal lobes (Fig. 2 A). The scales marking the body annules are semidome shaped as viewed by SEM (Fig. 2 C), whereas they ap-

pear diamond shaped when observed with light microscope. Transverse ridges traverse the longitudinal groves between the scales. The vulvar lips protrude slightly from the body surface, and the anterior lip is marked by three protuberances along the edge. The posterior lip is regular, with smooth edge (Fig. 2 D). The anal aperture is located between two ventral scales on the 9th (8-10) annule. The terminal annule is small, conoid, and spiralled (Fig. 2 D).

*Parasitic habits:* On olive feeder roots

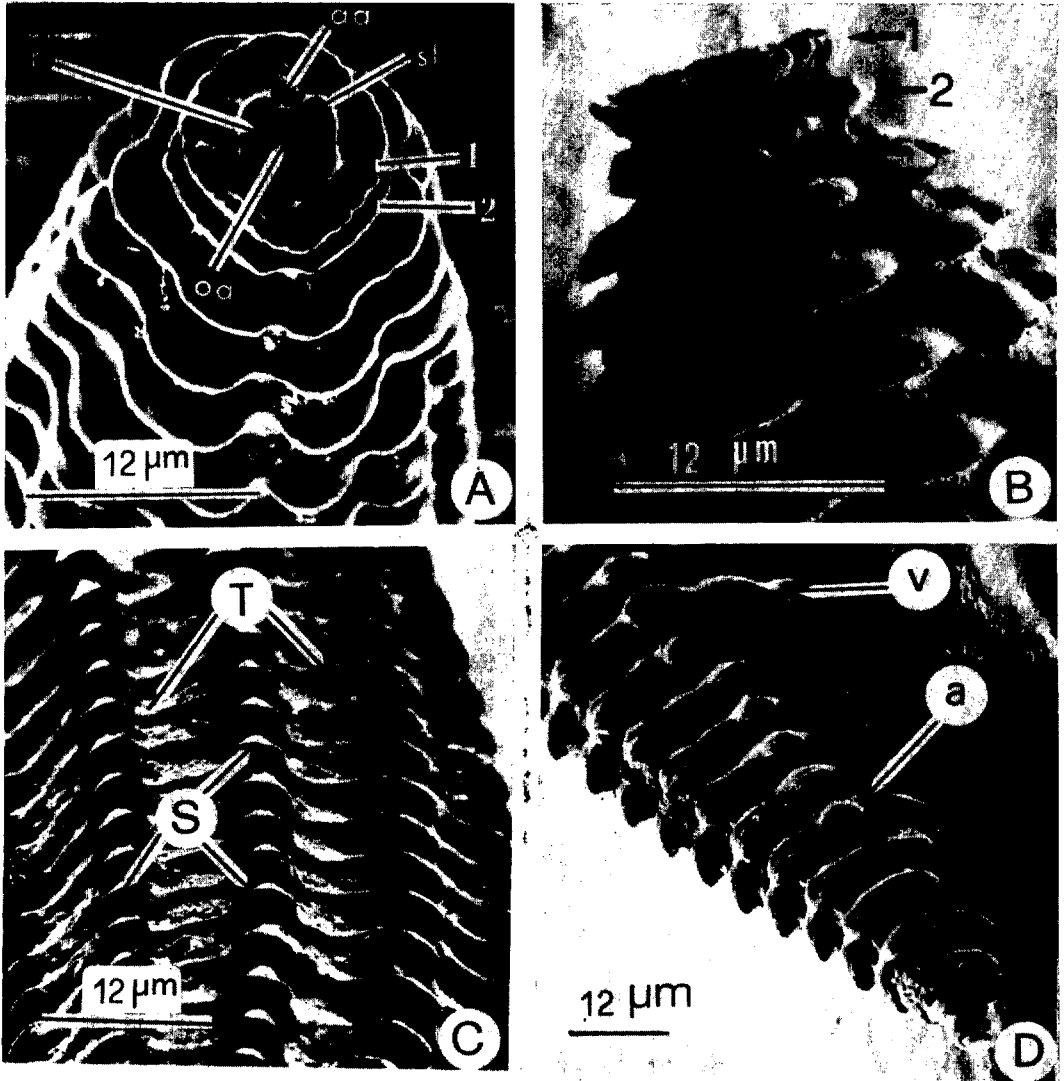


Fig. 2. *Ogma rhombosquamatum* female. A) Face view showing head annules (1, 2) with crenations and incisures, submedian lobes (sl), amphidial aperture (aa), cuticular ring (r) and oral aperture (oa). B) Lateral view showing crenations and incisures of the head annules (1, 2). C) Lateral view of a portion of the body showing the semidome-shaped scales (S) and transverse annular ridges (T). D) Posterior portion of the body showing vulva (V) with the anterior lip marked by three protuberances, anal aperture (a), and spiralled last annule. (SEM photomicrographs by S. Cham, Nematology Dept., Rothamsted Exp. Stn, England.)

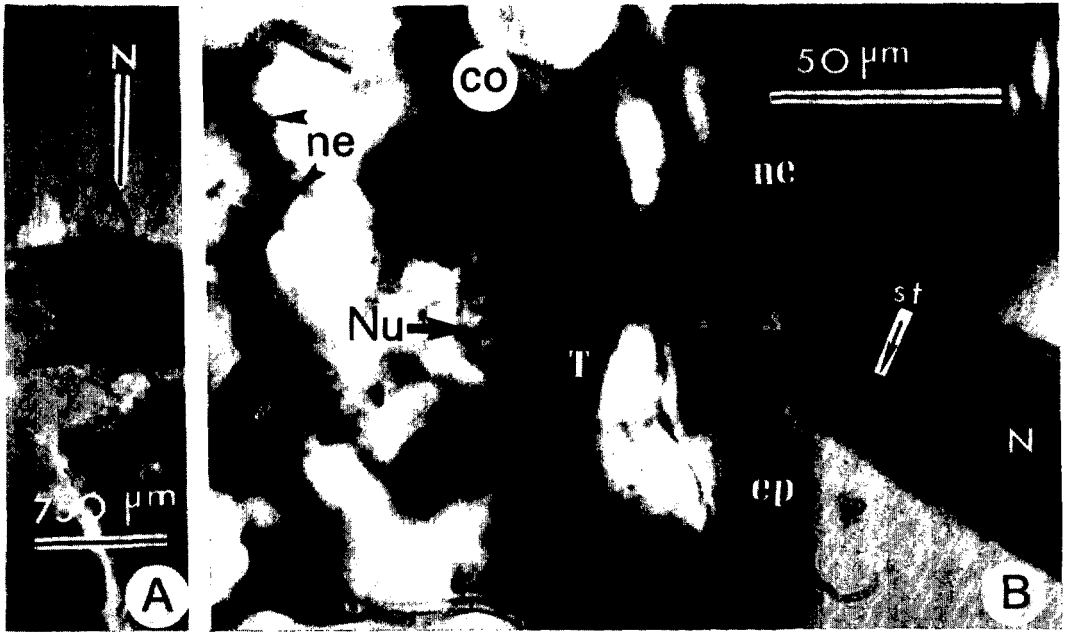


Fig. 3. *Ogmia rhombosquamatum* on olive feeder roots. A) Olive root segment with a female nematode (N) attached on the root surface. B) Cross section of olive root showing a female nematode (N) attached by stylet (st) to the root surface causing thickening (T) of cell wall and hypertrophy of nucleus and nucleolus (Nu) of a cortical (CO) cell along with necrosis (ne) of epidermal (ep) and cortical cells.

*O. rhombosquamatum* was observed in ectoparasitic feeding position (Fig. 3 A). Colonies of females were noted together with several eggs adhering to the root surface and among the root hairs. No gelatinous matrix was observed. Females remained attached to the root surface by the stylet which penetrated the epidermis and 2-3 layers of cortical cells. Nematode feeding activity induced thickening of cortical cell walls and hypertrophy of the nucleus and nucleolus (Fig. 3 B) which appeared 4-5 times larger than those of normal cortical cells. Necrosis was observed in epidermal and cortical tissue. Males which lack stylets were not observed on roots. In Sicily we detected both males and females in high population densities (280-360 nematodes/g of fresh root) in the volcanic sands and sandy loam of several olive growing areas.

This indicates that olive is one of the preferred hosts of this polyphagous nematode.

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