

Laboratorio di Nematologia agraria del C.N.R.
70126 Bari, Italy

PARASITIC HABITS OF *GRACILACUS PERATICA* ON OLIVE FEEDER ROOTS

by

R. N. INSERRA and N. VOVLAS

Gracilacus peratica Raski was originally described from material collected on grape (*Vitis vinifera* L.) soil in Germany (Raski, 1962). This species, though also reported in Italy in association with olive (*Olea europaea* L.), grape, and laurel (*Laurus nobilis* L.) (Scognamiglio *et al.*, 1968; Inserra *et al.*, 1976; Raski, 1976), is not well known and no information is available on its parasitic and biological behavior. In this note we discuss histological changes caused by the feeding of this nematode on olive feeder roots.

MATERIALS AND METHODS

The observations were made on feeder roots collected from an olive orchard in Italy naturally infected with *G. peratica*. The olive feeder roots were carefully removed from the soil and gently washed free of any clinging soil particles. Root segments with nematode specimens attached to the surface were selected with the aid of a stereoscopic microscope, removed, and fixed in FAA (formalin-acetic acid-alcohol). Cross sections were cut 15 µm thick, dehydrated through the tertiary butyl alcohol series, stained with safranin and fast-green (Johansen, 1940) and observed with a compound microscope. Infested root segments fixed and stained in lactophenol with acid fuchsin were also used to examine localized nematode colonies.

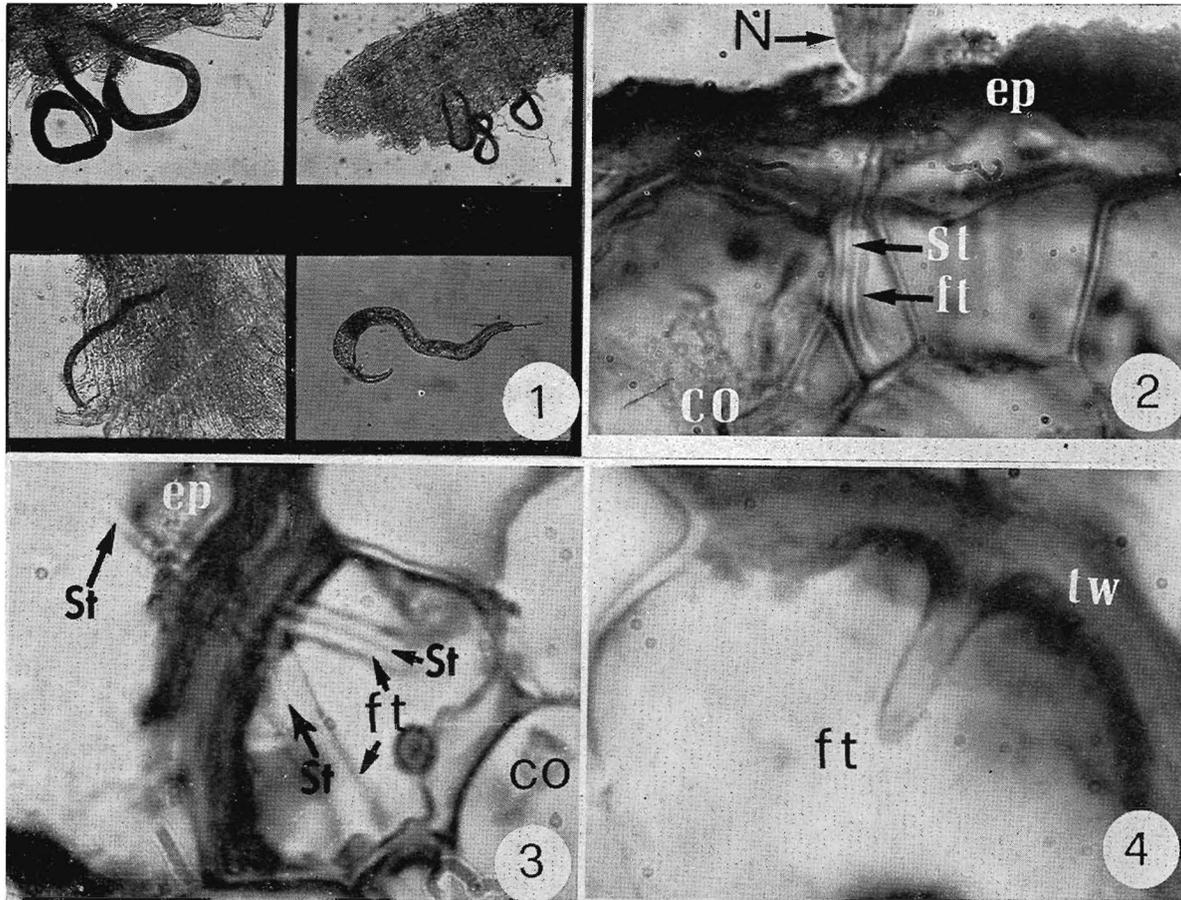


Fig. 14 - *Gracilacus peratica* on olive feeder roots. 1) Colonies of mature females attached to olive rootlets. 2) Cross sections of olive root showing a female nematode (N) with the stylet (St) inserted through the epidermis (ep) and into adjacent cortical cells (CO). The feeding tube (ft) is visible surrounding the stylet. 3) Two stylets (St) inserted in a cortical cell surrounded by feeding tubes (ft). 4) A finger shaped feeding tube (ft) extending into a cortical cell. Note thickened cell wall (tw) in proximity of the nematode stylet insertion point.

RESULTS AND DISCUSSION

During our observations, the active vermiform juveniles, immature females, and males were detected only in the soil, whereas mature females were found attached to the roots. Usually, clusters or colonies of sedentary females with the swollen posterior portion of their bodies protruding from the root were observed on or behind the tip of the feeder root (Fig. 1). No gelatinous matrix containing eggs or surrounding the female body, as in sedentary semi-endoparasitic nematodes was observed, indicating that eggs are deposited outside and are not protected by the female body.

Cross sections of infested olive feeder roots showed that female stylets penetrated through the epidermis into the cortex, 1-4 cells deep (Fig. 2). The nematode was attached to the root only by the stylet that was inserted into the cortical tissue. Some times two or more nematodes inserted their stylets in the same cell (Fig. 3). The stylet appeared to be enveloped by a feeding tube in the cell (Figs. 2-3), which remained visible after the spear was withdrawn and assumed a finger like appearance (Fig. 4). Similar feeding tubes formed by hardened saliva have been reported in root cells of tobacco (*Nicotiana tabacum* L.) parasitized by *Trichodorus similis* Seinhorst (Wyss, 1975). We were not able to ascertain if the feeding tubes induced by *G. peratica* were formed by hardened saliva or by coagulated cytoplasm. A cellular reaction to the feeding activity of the nematode was observed as a thickened cell wall, which stained a dark red with safranin indicating lignification in proximity to the point of the stylet penetration (Fig. 4).

Unlike species of the genus *Paratylenchus* Micoletzky that commonly feed on epidermal cells (Lindford *et al.*, 1949; Rhoades and Linford, 1961; Brzeski *et al.*, 1975), *G. peratica* feeds primarily in cortical tissue. The long (92 μ m) and robust stylet enables this species to penetrate several cells and become permanently attached to the root surface in a sedentary manner without bodily penetration in the root tissues. According to Raski's supposition (Raski, 1976) the feeding and sedentary habits of mature females indicate that *Gracilacus* is more closely related to *Cacopaurus* Thorne than to the genus *Paratylenchus*.

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