

# Gall Formation on *Pistacia vera* by *Rotylenchulus macrodoratus*

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*Rotylenchulus macrodoratus*, the Mediterranean reniform nematode, is a common parasite of various fruit trees. The nematode usually induces the formation of an uninucleate giant cell without hyperplasia in root tissues (1,2). However in *R. macrodoratus* infected large-flowered sweet william (*Dianthus barbatus* L.), an unusual hyperplastic root reaction was observed (2). A similar host reaction is reported here on pistachio (*Pistacia vera* L.). The macro- and micro- structural details of this reaction are described and illustrated.

Pistachio seedlings were transplanted

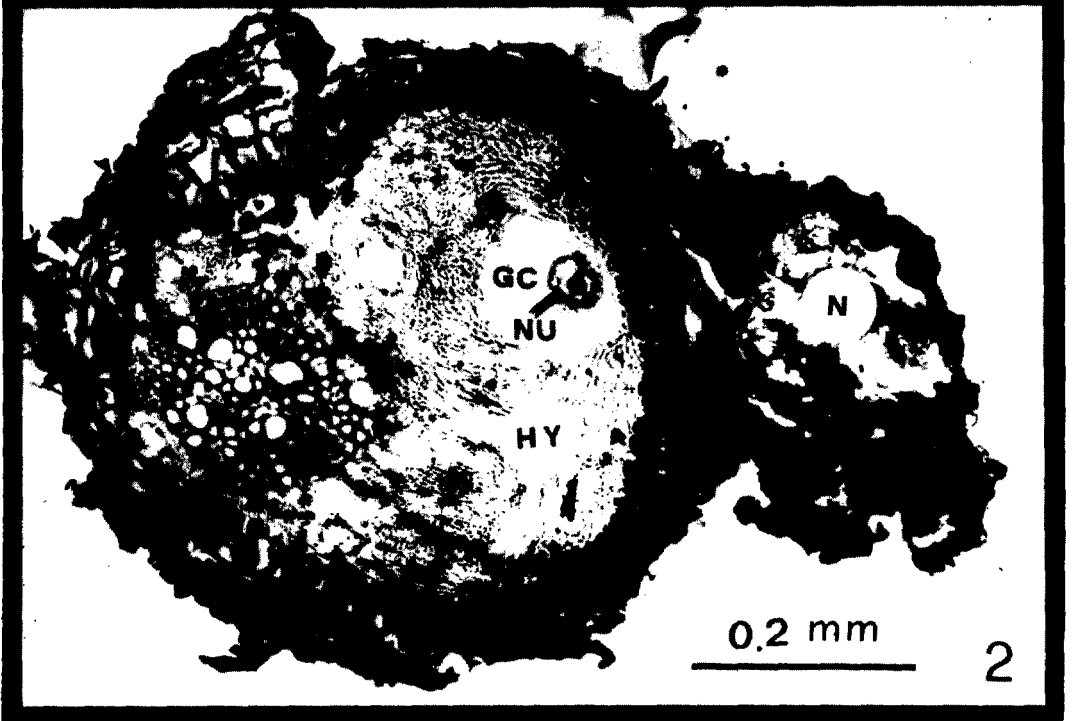
into a glass-house bin containing soil infested with *R. macrodoratus* and infected roots were collected eight weeks after transplanting. The roots were fixed in formalin-acetic acid-alcohol, dehydrated in a tertiary butyl alcohol series embedded in paraffin, sectioned at 10–15  $\mu\text{m}$ , stained with safranin and fast-green, mounted in Dammar Xilene, and examined microscopically.

Galls usually occurred along the root axis and were from 0.3 to 1.8 mm long and 0.2 to 0.8 mm wide (Fig. 1). Occasionally two or three females were found attached in a swollen portion of the root. The swellings were three to four times the normal root size (Fig. 1). Histological sections through swellings showed a hyperplastic reaction of

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Figs. 1–2. Histological changes induced by *Rotylenchulus macrodoratus* on *Pistacia vera* roots. 1) Roots with swelling in correspondence with female nematode penetration. 2) Secondary root cross-section showing asymmetry of root structure and hyperplasia (HY) of secondary vascular parenchyma cells surrounding the uninucleate (NU) hypertrophic giant cell (GC). N = nematode.



the secondary vascular parenchyma cells surrounding the uninucleate giant cell (Fig. 2). Due to the hyperplasia of this tissue and to the enlargement of the giant cell, the root structure becomes asymmetric with the central cylinder completely shifted to one side of the root (Fig. 2). Hyperplasia is not common in roots infected with *Rotylenchulus* spp., but it appears as a characteristic symptom in *R. macrodoratus* infected large-flowered sweet william and pistachio.

#### LITERATURE CITED

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