HISTOPATHOLOGY OF ARTICHOKE ROOTS INFESTED BY *PRATYLENCHUS PENETRANS* IN GREECE

by

N. VOVLAS and F. ROCA

The lesion nematode *Pratylenchus penetrans* (Cobb, 1917) Filipjev et Schuermans Stekhoven, 1941 is a common pathogen of several crops in the Mediterranean area (Scognamiglio, 1963; Lamberti, 1973; Corbett, 1973; Koliopanos and Vovlas, 1977; Inserra et al., 1978). It is recorded from more than 350 plant hosts in temperate and subtropical areas but there is no information of its pathogenic association with artichoke (*Cynara cardunculus* v. *scolymus* L.). This note describes the anatomical changes induced by *P. penetrans* on naturally infested artichoke roots collected in heavily infested fields near Kornithos.

Lateral roots were selected from nematode-infested plants, washed free of soil and fixed in chrome-acetic-formalin solution dehydrated in tertiary butyl alcohol, and embedded in paraffin. Roots were sectioned at 15 μm transversely and longitudinally with a rotary microtome. Sections were mounted on glass slides and stained with safranin and fast-green for microscopic examination (Johansen, 1940).

The nematode densities ranged from 150 to 560 specimens per gram of roots. Necrotic lesions and discoloured areas on the feeder roots contained from a single to numerous specimens and eggs (Fig. 1). The histopathological observations showed that the nematode invaded the epidermis and several cell layers of the cortical parenchyma (Fig. 3). Occasionally specimens were folded within a single cell (Fig. 4). Cells with ruptured, necrotic (darkly stained) walls and collapsed tissues were common around the nematode body (Figs. 4, 5). Large necrotic areas/lesions and cavities formed in the cortex as a result
Figs. 1-5 - Histology of artichoke (*Cynara cardunculus* v. *scolymus* L.) roots infested by *Pratylenchus penetrans*. 1) Necrotic lesions on the surface of lateral roots. 2) Longitudinal section with epidermis (EP) disrupted by the nematode (N) penetration near a lateral root (LR). 3) Longitudinal section showing cavities (CA) in the cortical parenchyma near the nematode body (N). (T) = thickened cell wall; (V) = vascular cylinder. 4) Cross section showing necrotic tissues surrounding sectioned nematodes (N), one of them folded in a single cell. 5) Single layer of destroyed cells in the cortex (N) = nematode.
of the complete breakdown of several layers of cells, which absorbed
the safranin stain (Fig. 4).

Nematodes were frequently detected in tissues near the lateral
roots, generally longitudinally orientated (Fig. 2). The pathway of the
nematode was revealed by a single cell layer row of collapsed cells.
This confirms that the nematode migrates longitudinally and intra-
cellularly in the root tissues (Fig. 5). The pathogenicity of *P. penetrans*
on artichoke appears similar to that of other lesion nematodes such
as *P. coffeae* (Radewald *et al.*, 1971), *P. vulnus* (Inserra and Vovlas,
1977), *P. loosi* (Inserra *et al.*, 1980), *P. scribneri*, *P. alleni* (Acosta and
Malek, 1981). As with these species the feeding of *P. penetrans* seems
to be confined only to the epidermal and cortical tissues. The number
of specimens of *P. penetrans* which can cause stunting of plant varies
with the host species, soil type and climate, but is in the range 50 to
2,000 specimens/l of soil (Corbett, 1973). In artichoke fields, in southern
Greece, *P. penetrans* was found in large numbers (2,500 to 3,000
specimens/l soil), indicating that artichoke is a good host for the
nematode in the Mediterranean area.

**LITERATURE CITED**

ACOSTA N. and MALEK R. B., 1981. Syntomatology and histopathology of soybean
roots infested by *Pratylenchus scribneri* and *P. alleni*. *J. Nematol.* 13: 6-12.

Set 2 No. 25, pp. 4.

INSERRA R. N. and VOVLAS N., 1977. Effects of *Pratylenchus vulnus* on the growth

INSERRA R. N., VOVLAS N. and BRANDONISIO A., 1978. Nematodi endoparassiti as-
sociati a colture di cereali in deperimento nell'Italia meridionale. *Nematol.

INSERRA R. N., VOVLAS N., SIVAPALAN P. and LAMBERTI F., 1980. Histopathology of
75-76.


KOLIOPANOS C. N. and VOVLAS N., 1977. Records of some plant parasitic nema-
todes in Greece with morphometrical descriptions. *Nematol. medit.*, 5:
207-215.
