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Plant Protection Institute, National Agricultural Research Foundation, 71110 Heraklion, Crete, Greece
and
Istituto di Nematologia Agraria, CNR - 70126 Bari, Italy

OCCURRENCE OF VIRUS VECTOR NEMATODES AND THEIR ASSOCIATED NEPOVIRUS IN VINEYARDS OF THE GREEK ISLAND OF RHODES

by
A. AVGELIS, L. CATALANO and N. VOVLAS

Summary. A survey of virus-vector nematodes and their associated virus was carried out in vineyards in the island of Rhodes. *Xiphinema pachtaicum* (Tulaganov) Kirjanova was found in 37% of the samples and *X. index* Thorne *et* Allen, the natural vector of the Grapevine fanleaf nepovirus (GFLV), in 10% of the samples. GFLV was detected in only five vineyards of the 40 inspected and in plants showing evident symptoms of virus infection. In two of these vineyards the virus was found associated with its vector.

The Greek island of Rhodes has a long history of viticulture. The absence of Phylloxera (*Viteus vitifoliae* Fitch) has permitted continued traditional cultivation, mainly of wine cultivars, of *Vitis vinifera* L. Cv. Athiri, which is the most important in the local enological industry, is grown on over 800 ha., with the cv. Amorgiano occupying 500 ha. The local wine cvs Moschat of Rhodes and Assirtico and the introduced table grape cvs as Sultanina, Razaki and Cardinal occupy a further 200 ha.

Because viticulture on the island has not made use of Phylloxera resistant American rootstocks, information on the distribution of grapevine fanleaf nepovirus (GFLV) and its nematode vector, *Xiphinema index* Thorne *et* Allen are important in relation to the development of phytosanitary regulations in replanting programmes. During the spring of 1992 an investigation was undertaken in the main viticultural area (Northwestern part of the island) and the results are reported here.

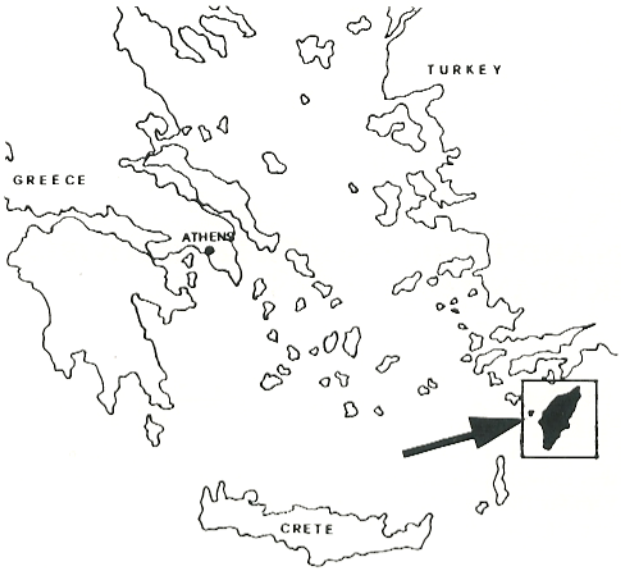
Material and methods

Plant and soil samples were collected in 40 localities, either from vines showing clear chromogenic or distorting symptoms of GFLV infection or from plants suspected of being infected. Plant samples consisted of leaves, shoot tips and woody canes; a 5 kg soil sample was taken from the rhizosphere of the plant at 30-40 cm depth. Both leaves and cambial tissues were assayed in two replicates for each plant. The presence of GFLV in plant tissues and nematodes was detected by double sandwich ELISA (Clark and Adams, 1977) using an antiserum to an Italian GFLV isolate raised locally. IgG concentration was 1 µg/ml and the conjugate dilution 1:1000. ELISA reactions were read with a Titertek Multiskan MKII absorptionmeter at 405 nm.

Nematodes were extracted from soil samples by centrifugation. Aliquots of 30 hand-picked *X. index* were assayed by ELISA, in three replicates for each population using the test described by Catalano *et al.*, (1991). Nematodes for morphometric observations were processed to glycerol while five to 10 g of roots were removed from each sample to establish the extent of damage to the root system caused by *X. index*.

Results and conclusions

Specimens of *Xiphinema* were recovered from 47% of the inspected vineyards (Fig. 1). Two species were found: *X. pachtaicum* (Tulaganov) Kirjanova, and *X. index* Thorne *et.* Allen. *Xiphinema pachtaicum* occurred in 37% of the samples with 89-1185 specimens/500 ml of soil. This species, is the most common and widely distributed species of the genus in the mediterranean region (Lamberti, 1981) but it has not been implicated as a vector of GFLV (Catalano *et al.*, 1992). Morphometric characteristics of the specimens from Rhodes are within the range recorded for the species (Martelli and Lamberti, 1967; Lamberti and Siddiqi, 1977).



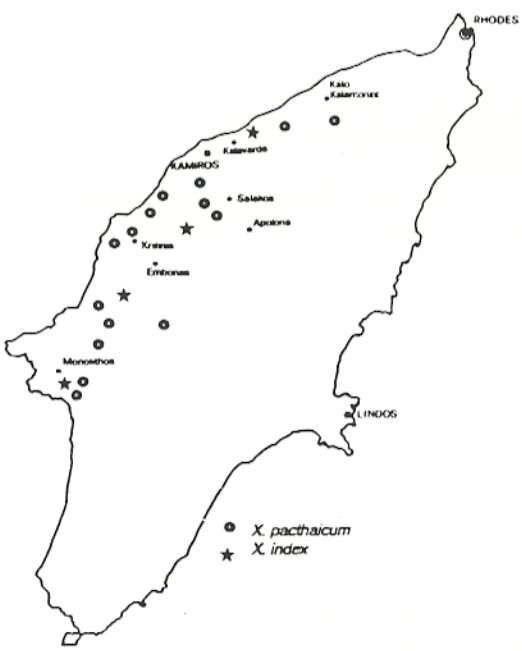


Fig. 1 - Surveyed area and distribution of *Xiphinema* species in the island of Rhodes.

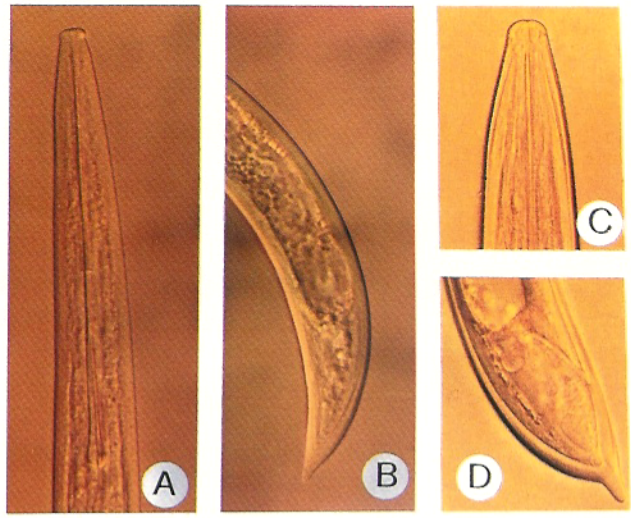


Fig. 2 - Head and tail ends of *Xiphinema pacthaicum* A and B, *Xiphinema index* in C and D.

Fig. 3 - *Vitis vinifera* cv. "Razaki" plant infected by a chromogenic strain (yellow mosaic of GFLV) in a vineyard infested by *X. index*.

Xiphinema index, was found in 10% (Fig. 1, 2) of the samples only, but because of its association with GFLV, it is regarded as a pathogen for the grapevine growing areas of the island. In four cases *X. index* occurred in association with grapevine plants infected by the chromogenic strain (yellow mosaic) of GFLV (Fig. 3). Where nematode population densities were large (300-560 specimens / 500 ml of soil) the roots were damaged also by *X. index* feeding, with both mechanical and physiological injury. The infected roots showed necrosis and terminal swellings.

GFLV was detected in only five of the sampled vineyards and only in plants showing evident symptoms of infection (Fig. 3). Twenty vineyards of cv. Athiri, situated on hilly ground, were free of obvious GFLV-infection symptoms. Also the GFLV was not detected in any of the plant samples from vineyards where the *X. index* populations were also shown to be free of GFLV. Several of the surveyed lowland vineyards of cvs Amorgiano, Sultanina and Razaki were characterized by patches or randomly distributed plants with typical chromogenic and distorting GFLV - symptoms. The virus was detected by ELISA in all plants with symptoms and in two populations of *X. index* collected from the rhizosphere of virus infected plants.

The present study shows that *Xiphinema* species and GFLV are present in Rhodes and it should be taken into account in any proposed phytosanitary regulations for replanting vineyards in the island.

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