

## SHORT COMMUNICATION

OCCURRENCE OF *XIPHINEMA INDEX* IN LEBANESE VINEYARDSJ. Jawhar<sup>1</sup>, N. Vovlas<sup>2</sup> and M. Digiario<sup>3</sup><sup>1</sup> LARI, Lebanese Agricultural Research Institute, P.O. Box 90-1965, Fanar, Lebanon<sup>2</sup> CNR-IPP, Istituto per la Protezione delle Piante, Via Amendola 165/a, 70126 Bari, Italy<sup>3</sup> MAI, Mediterranean Agronomic Institute, Via Ceglie 9, Valenzano (BA), Italy

## SUMMARY

Soil samples were collected in late spring 2005 from vineyards in 25 different locations of the Bekaa valley, the main grapevine-growing area of Lebanon, to investigate the presence of the longidorid nematode *Xiphinema index* Thorne & Allen, the vector of *Grapevine fanleaf virus* (GFLV). Approximately 14% of the samples contained the nematode, which was found in all developmental stages except for males, which are very rare in this species. The density of the nematode population ranged from 8 to 45 specimens/500 ml of soil. The main morphological characteristics of taxonomic relevance in the Lebanese population of *X. index* are described, while selected morphometric parameters from a population of 18 specimens were compared with those reported in the literature. This is the first survey for the presence and distribution of *X. index* in Lebanon.

*Key words:* *Xiphinema index*, nematode virus vector, *Grapevine fanleaf virus*.

As reported in a number of reviews (Siddiqi, 1974; Brown and Taylor, 1987; Brown *et al.*, 1990; Martelli and Taylor, 1990; Robbins and Brown, 1991) the distribution of *Xiphinema index* Thorne & Allen follows pretty much that of the grapevine in many viticultural areas of the world.

However, no information is apparently available on the occurrence and distribution of this nematode in Lebanon, where vineyards have greatly expanded in the last ten years, with more than 15,000 ha given over to grapes for table consumption and "arak" production. The importance of *X. index* as vector of *Grapevine fanleaf virus* (GFLV), one of the economically relevant grapevine viruses, suggested the present survey in which samples were collected from 10- to 15-year-old vineyards and analyzed.

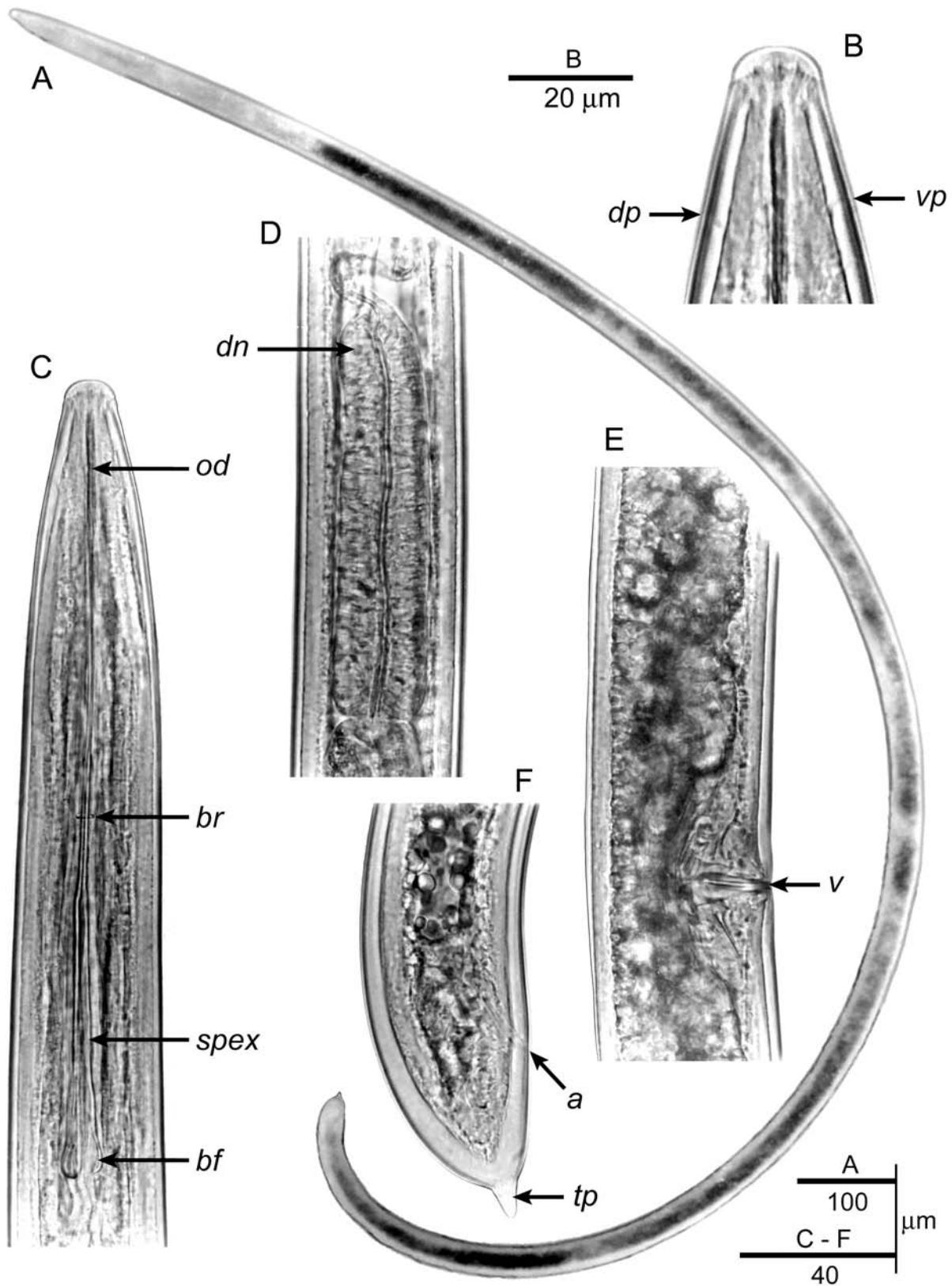
Ninety-five soil and root samples were collected in late spring 2005 from 25 different locations representing the main grapevine-growing areas of the Bekaa valley. Each sample consisted of 2 kg of soil from the rhizosphere of 2-3 vines selected at random within each vineyard. One kg of soil from each sample was washed by sieving and decanting and the extracted nematodes were separated after 24 h from the residue collected on a 75 µm screen. Populations were estimated and species identified by microscopy. Selected glycerine-infiltrated specimens from samples containing *X. index* populations were used for morphometric trait determination and photography. All measurements are in micrometers unless otherwise stated. Morphometric data were compared with those of the original (Thorne and Allen, 1950) and other descriptions reported in the literature.

All nematode developmental stages, except for males, which are very rare in this species, were seen in samples containing *X. index*, with populations ranging from 8 to 45-specimens/500 ml of soil. Of the 95 samples, 13 (ca. 14%) contained the nematode.

The main morphological characteristics of taxonomic value in the Lebanese population of *X. index* are illustrated in Fig. 1 and described as follows:

Female body elongated, cylindrical, 3.39 mm long, forming an open C, the anterior end with a hemispherical lip and the rear end with a mammiform tail and digitate ventral terminal peg (Fig. 1F). Stylet (= odontostyle) 131 µm in length, furcate at its base, providing strong attachment to the spear extension (= odontophore), which was 74 µm in length with 3 large basal flanges. Basal ring of spear guiding sheath at 113 µm from the anterior end of the stylet and 121 µm from the anterior end of the body. Posterior oesophageal part cylindroid (Fig. 1D). Oesophago-intestinal valve small, conoid-rounded. Vulva (Fig. 1E) a depressed transverse slit located at 39 % of body length from the rear. Tail 0.80 to 1.0 times as long as the anal body width, convex-conoid, with greater curvature dorsally.

Selected morphometric measurements of the Lebanese population of *X. index*, (n=18 specimens) were: L = 3.39±13 (3.19-3.65) mm; a = 39±5.3 (36-43); b = 6.9±4.2 (6.3-7.8); c = 94±5.2 (86-99); c' = 0.83±0.1 (0.75-1.0); V% = 39±2.2 (36-43); odontostyle = 131±4.3 (125-139)



**Fig. 1.** Light micrographs of *Xiphinema index* from a Lebanese population. **A)** Entire female; **B)** head end; **C)** and **D)** anterior and posterior regions of oesophagus; **E)** vulval region; **F)** tail end. Abbreviations used: a = anus; br = basal ring of spear guiding sheath; bf = basal flanges; dn = nucleus of dorsal oesophageal gland; dp = dorsal body pore; v = vulva; vp = ventral body pore; tp = tail terminal peg.

$\mu\text{m}$ ; odontophore =  $74 \pm 3.5$  (68-78)  $\mu\text{m}$ , total stylet length =  $205 \pm 6.1$  (193-217)  $\mu\text{m}$ ; guide ring of stylet guiding sheath =  $121 \pm 8.8$  (105-129)  $\mu\text{m}$  from anterior end; tail length (excluding terminal peg) =  $36 \pm 2.3$  (32-38)  $\mu\text{m}$ .

These morphometric data tally pretty much with those of the original description (Thorne and Allen, 1950) and of a population from South African vineyards (Siddiqi, 1974), except for small differences consisting in a greater length of odontostyle and body. Finally, only females were detected in Lebanese populations, confirming the extremely rare presence of males in this species.

In a survey for virus and virus-like grapevine diseases conducted in Lebanon by Haidar *et al.* (1995), GFLV was the only nepovirus recovered from symptomatic wine grapes in the Bekaa valley, with an estimated infection rate of 6.3%. The virtual absence of GFLV in native table-grape cultivars, contrasting with its wider presence in imported wine grapes, had suggested that this virus could have entered the country with grafted plants imported from abroad. Its limited spread was attributed to the apparent absence of the nematode vector *X. index*, which had not been previously recorded in the country. Whether new GFLV outbreaks are to be expected in newly established vineyards remains to be established with additional surveys now underway.

#### ACKNOWLEDGEMENTS

This work was carried out in the framework of the Bilateral Italy-Lebanon Cooperation Project for the "Production and Delivery of Certified Plant Material in Lebanon", supported by the Italian Ministry of Foreign

Affairs. The authors are very grateful to Dr. E. Nerilli, for logistic and technical support during the sampling and to Prof. G.P. Martelli for critical reading of the text.

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