

Plant Protection Research Center, Abu-Ghraib, Baghdad, Iraq

OCCURRENCE OF PLANT PARASITIC NEMATODES IN VINEYARD SOILS IN IRAQ

by

Z. A. STEPHAN, A. H. ALWAN and B. G. ANTONE

In Iraq there are about 30 million grapevine (*Vitis vinifera* L.) yielding 424,000 tonnes of fruit annually (Anon, 1978). Decreasing yields and vigour of the vines prompted investigations on the occurrence of nematodes; *Tylenchulus semipenetrans* Cobb and *Xiphinema index* Thorne *et* Allen (Katcho and Allow, 1968, 1969) and *Meloidogyne* sp. (Katcho *et al.*, 1976) were associated with diseased vines. Further investigations reported here extend the information on the occurrence and distribution of plant parasitic nematodes in grapevine soils in Iraq.

Between 1976 and 1978, 268 soil and root samples were collected from 180 vineyards in the North, Centre and South regions of Iraq. The North region is at an altitude of 223 to 1006 m, with an annual rainfall of 38 mm and temperatures ranging from 11 to 28°C; the Centre region is at 20-201 m altitude, with an annual rainfall of 14 mm and temperature 15-30°C; the South region is at 2-9 m altitude, with an annual rainfall of 19 mm and temperature 18-30°C. Nematodes were extracted from 250 g soil using a Seinhorst elutriator and roots were examined for damage and the presence of endoparasitic nematodes.

The nematode species and their relative occurrence in the different regions are listed on Table I.

Xiphinema index occurred in 30% of the total samples and in 94% of the samples from the North region. Symptoms of grapevine

Table I - Relative occurrence of plant parasitic nematodes in vineyard soils of Iraq.

Nematode species	Sampling occurrence within surveyed regions			General frequency of occurrence %
	North	Centre	South	
	58	159	51	
<i>Amplimerlinius macrurus</i> (Goodey) Siddiqi	5	3	0	3
<i>Criconemella antipolitana</i> de Guiran	27	8	0	13
<i>C. sphaerocephala</i> Taylor	0	5	0	2
<i>C. xenoplax</i> (Raski) Luc et Raski	0	18	0	6
<i>Criconemoides amorphus</i> de Grisse	10	17	2	11
<i>Ditylenchus destructor</i> Thorne	0	1	4	2
<i>Helicotylenchus digonicus</i> Perry	28	6	5	13
<i>H. exallus</i> Sher	3	0	0	1
<i>H. indicus</i> Siddiqi	0	0	3	1
<i>H. minzi</i> Sher	3	0	0	1
<i>H. platyrus</i> Perry	0	3	0	1
<i>H. pseudorobustus</i> (Steiner) Golden	8	111	16	50
<i>H. tunisiensis</i> Siddiqi	27	0	0	9
<i>H. vulgaris</i> Yuen	9	2	0	4
<i>Hemicriconemoides chitwoodi</i> Esser	0	0	9	3
<i>H. cocophilus</i> (Loos) Chitw. et Birchfield	0	4	5	3
<i>H. mangiferae</i> Siddiqi	0	9	0	3
<i>Hemicycliophora</i> sp.	0	2	1	1
<i>Heterodera</i> sp.	0	3	0	1
<i>Hoplolaimus seinhorsti</i> Luc	2	32	14	16
<i>Longidorus africanus</i> Merny	0	18	0	6
<i>L. belondiroides</i> Heyns	0	0	20	7
<i>L. siddiqii</i> Aboul-Eid	0	29	0	11
<i>Meloidogyne incognita</i> (Kofoid et White) Chitw.	0	25	14	15
<i>M. javanica</i> (Treub) Chitw.	0	105	45	54
<i>Merlinius brevidens</i> (Allen) Siddiqi	13	5	0	6
<i>M. leptus</i> (Allen) Siddiqi	6	0	0	2
<i>M. rugosus</i> Siddiqi	5	3	3	4
<i>Nothocriconema mutabile</i> (Taylor) de Grisse et Loof	0	9	0	3
<i>Paratylenchus nainianus</i> Edward et Misra	0	3	0	1
<i>P. obtusicaudatus</i>	0	6	0	2
<i>P. projectus</i> Jenkins	0	8	0	3
<i>P. variabilis</i>	0	0	3	1
<i>Paratylenchoides</i> sp.	3	0	0	1
<i>Pratylenchus delattrei</i> Luc	0	4	0	1
<i>P. neglectus</i> (Rensch) Filipjev et Sch. Stek.	2	2	0	1
<i>P. scribneri</i> Steiner	0	3	0	1
<i>P. thornei</i> Sher et Allen	6	13	7	10
<i>Rotylenchus</i> sp.	3	9	4	6
<i>Rotylenchulus reniformis</i> Linford et Oliveira	6	0	0	2
<i>Telotylenchus</i> sp.	6	0	0	2
<i>Tylenchorhynchus brassicae</i> Siddiqi	0	16	14	10
<i>T. mashhoodi</i> Siddiqi et Basir	0	3	0	1
<i>Tylenchorhynchus</i> sp.	11	2	5	14
<i>Tylenchulus semipenetrans</i> Cobb	2	86	27	43
<i>Xiphinema diversicaudatum</i> (Micoletzky) Thorne	0	3	0	1
<i>X. index</i> Thorne et Allen	49	11	20	30
<i>X. pachticum</i> (Tulaganov) Kirjanova	38	11	0	4
<i>X. vuittenezi</i> Luc, Lima, Weischer et Flegg	9	0	0	3

fanleaf virus were observed in many of the vineyards and the presence of the nematodes was associated with root malformation and necrosis of the cortex.

Xiphinema vuittenezi Luc *et al.* was found only in the North region and is a new record for Iraq. *X. diversicaudatum* (Micoletzky) Thorne, was found only in the Centre region. *X. pachtaichum* (Tulaganov) Kirjanova, was found in the North and Centre regions.

The presence of root-knot nematodes, *Meloidogyne javanica* (Treub) Chitw. and *M. incognita* (Kofoid *et* White) Chitw., were invariably associated with damage to the vines. Both species were absent from the North region where the vines are not irrigated and no vegetables are grown. In the South and Centre regions vineyards are irrigated and vegetables, in many instances infected with root-knot, are interplanted.

The citrus nematode, *T. semipenetrans*, mostly occurred in the Centre and South regions and in some vineyards where populations were 10,000-15,000 juveniles/250 g soil there was extensive bark necrosis, root proliferation, and the trees showed symptoms of decline.

Helicotylenchus pseudorobustus (Steiner) Golden occurred mostly in the Centre region where it was present in 70% of the samples. The other seven *Helicotylenchus* species generally had a more northerly distribution. *H. pseudorobustus*, *Hoplolaimus seinhorsti* Luc and *Criconemella antipolitana* de Guiran were usually found in declining vineyards and it would be useful to identify their role as plant pathogens. *C. xenoplax* (Raski) Luc *et* Raski was found in 18 samples in the Centre region but no obvious root injury was associated with its presence.

Eight species of *Helicotylenchus*, five of *Pratylenchus*, four of *Paratylenchus*, three each of *Criconemella*, *Hemicriconemoides*, *Longidorus*, *Merlinius*, and *Tylenchorhynchus* and one each the remaining species listed in Table I are recorded for the first time from Iraq.

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