

REPRODUCTION OF SIX POPULATIONS OF *PRATYLENCHUS* SPP. FROM THE MEDITERRANEAN REGION ON SELECTED PLANT SPECIES

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Summary. Investigations were undertaken in 1999-2001 to assess the reproduction of six populations of root lesion nematodes, three of *Pratylenchus thornei* from Italy, Morocco and Tunisia, one of *P. neglectus* from Italy, one of *P. pinguicaudatus* from Tunisia and one of *P. penetrans* from Algeria, on 15 plant species in a glasshouse at 22 ± 2 °C. The numbers of nematodes of three populations of *P. thornei* in the roots of chickpea, pea, faba bean and durum wheat were larger than those from the remaining plant species. Few nematodes were found in the roots of sugarbeet, pepper, eggplant and sunflower. Durum wheat, burley, tomato, French bean and faba bean were very good hosts for *P. neglectus*. Alfalfa, eggplant, lentil, melon, pea, sunflower and sugarbeet were also good hosts and chickpea, pepper and peanut were poor hosts for *P. neglectus*. Pea, French bean, faba bean, chickpea, alfalfa, peanut and lentil were good hosts for *P. penetrans*. *P. pinguicaudatus* reproduced better on faba bean, lentil and pea than on the other plants.

Various root lesion nematodes, *Pratylenchus* spp., were reported on several annual plant species in the Mediterranean basin. *Pratylenchus thornei*, *P. penetrans*, *P. neglectus* and *P. mediterraneus* are very common and cause severe damage to Mediterranean crop such as legumes and cereals (Di Vito *et al.*, 1992; Di Vito *et al.* 2000; Greco and Di Vito, 1994; Thompson *et al.*, 2000).

Crop rotation could provide an easy and economical way for reducing yield losses caused by these *Pratylenchus* spp., but unfortunately information on the host range of these nematodes, needed for suggesting the most useful crop sequence, is scanty (Greco *et al.*, 1988). Therefore an investigation, in the frame of the EU Project FRYMED, was undertaken to assess the host status for *P. thornei*, *P. penetrans*, *P. neglectus* and *P. pinguicaudatus* from Algeria, Italy, Morocco and Tunisia of several plant species of economic importance in the Mediterranean region.

MATERIALS AND METHODS

Fifteen groups of clay pots, containing three litres of steam sterilized sandy soil, were prepared and three pregerminated seeds or seedlings/pot of each plant species (Table I) were planted and maintained on benches in a glasshouse at 22 ± 2 °C. Three populations of *P. thornei* Sher et Allen originated from durum wheat at Cerignola (Italy), faba bean at Rommani (Morocco) and faba bean at Beja (Tunisia), one each of *P. neglectus* (Rensch) Filipijev et Schuurmans Stekhoven from faba bean at San Ferdinando (Italy), *P. pinguicaudatus* Corbett from faba bean at Beja (Tunisia) and *P. penetrans* (Cobb) Filipijev et Schuurmans Stekhoven from faba bean at Béni Hmidane (Algeria) (Troccoli and Di Vito,

2002) were reared, separately, for three months on carrot disks in a growth chamber at 22 ± 2 °C. The nematodes were extracted from the carrot disks by incubation for 24 hours (Young, 1954). Two pots of each plant species and nematode population were inoculated with 15,000 nematodes/pot.

Fifty days after inoculation the plants were uprooted, the roots were gently washed free of adhering soil and the nematodes in the roots extracted by the centrifugation method (Coolen, 1979) and counted. The data were then statistically analyzed by ANOVA and LSD's calculated.

RESULTS AND DISCUSSION

The number of nematodes of the three populations of *P. thornei* in the roots of chickpea, pea, faba bean and durum wheat were larger than those extracted from the other plant species (Table I). Few nematodes were found in the roots of sugarbeet, pepper, eggplant and sunflower. Durum wheat, burley, tomato, French bean and faba bean were heavily infested by *P. neglectus*, indicating that they are very good hosts for this nematode. Sunflower, eggplant, melon, lentil, sugarbeet, alfalfa and pea were also good hosts, whereas chickpea, pepper and peanut were poor hosts for *P. neglectus*. Pea, French bean, faba bean, chickpea, alfalfa, peanut and lentil were good host for the Algerian population of *P. penetrans* (Table II). The Tunisian population of *P. pinguicaudatus* reproduced better on faba bean, lentil and pea than in the remaining plants which should be considered as non-hosts or poor hosts (Table I).

The host status of several crops for *P. neglectus*, *P. penetrans* and *P. thornei* is confirmed. Plant species,

Table I. Population densities of *Pratylenchus* species in the roots of selected plants.

Plant, species (cultivar)	N° of nematodes/roots					
	<i>P. thornei</i> (Italy)	<i>P. thornei</i> (Morocco)	<i>P. thornei</i> (Tunisia)	<i>P. neglectus</i> (Italy)	<i>P. penetrans</i> (Algeria)	<i>P. pinguicaudatus</i> (Tunisia)
Faba bean, <i>Vicia faba</i> L. (Aguadulce)	3285	3328	2900	5253	2565	3056
Chickpea, <i>Cicer arietinum</i> L. (Ghab 1)	15804	2132	5200	854	2325	345
Lentil, <i>Lens culinaris</i> Medic. (Ill 5582)	604	1100	890	1902	1120	1272
Pea, <i>Pisum sativum</i> L. (Progress 9)	8815	3889	4800	1155	11435	1216
French bean, <i>Phaseolus vulgaris</i> L. (Lingua di fuoco)	534	1798	2340	5091	3250	692
Alfalfa, <i>Medicago sativa</i> L. (Equipe)	521	50	20	1177	1600	120
Peanut, <i>Arachis hypogaea</i> L. (Florunner)	587	62	46	644	1200	140
Durum wheat, <i>Triticum durum</i> Desf. (Simeto)	1465	3227	3520	16687	440	364
Burley, <i>Hordeum vulgare</i> L. (Das 10)	800	1162	980	11375	120	244
Tomato, <i>Lycopersicon esculentum</i> Desf. (Rutgers)	300	234	54	6377	23	156
Pepper, <i>Capsicum annuum</i> L. (Yolo wonder)	125	103	102	736	98	98
Eggplant, <i>Solanum melongena</i> L. (Violetta di Firenze)	129	89	30	2804	120	184
Melon, <i>Cucumis melo</i> L. (Napoletano giallo)	240	313	231	2104	215	274
Sugarbeet, <i>Beta vulgaris</i> var. <i>saccharifera</i> Alefeld (Suprema)	91	80	71	1316	234	95
Sunflower, <i>Helianthus annuus</i> L. (Isoleic)	140	48	32	2921	34	183
LSD: P = 0.01	328.3	148.7	160.9	2508.0	1085.5	128.2
P = 0.05	247.5	112.0	121.3	1890.4	817.1	96.6

hosts, good hosts or very good hosts of root lesion nematodes could increase the soil population densities of the nematode at high level and consequently, severe losses of the following crops might be expected, mostly with legumes and cereals which are cultivated on a large scale in the area.

All non-host and poor host plants could profitably be included in a crop sequence aimed at limiting yield losses caused by these species of root lesion nematodes. Some non-host or poor host plants such as sunflower, sugarbeet, melon, eggplant, pepper, tomato, peanut and alfalfa (Table II) are commonly cultivated in many countries of the Mediterranean region.

No substantial difference in host status was observed between the three populations of *P. thornei* from Italy, Morocco and Tunisia (Table II).

These results were obtained under controlled condition and all tested plant species grew equally well. However, in the field they are cultivated as winter or summer crops and this might differently affect the reproduction of the nematodes. Therefore, before including such plants in a crop rotation scheme, it is suggested that they are tested under field conditions.

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Table II. Host status of *Pratylenchus* species on selected plants.

Plant species	Population of <i>Pratylenchus</i> spp. (origin)					
	<i>P. thornei</i> (Italy)	<i>P. thornei</i> (Morocco)	<i>P. thornei</i> (Tunisia)	<i>P. neglectus</i> (Italy)	<i>P. penetrans</i> (Algeria)	<i>P. pinguicaudatus</i> (Tunisia)
Faba bean	+++ ¹	+++	+++	+++	+++	+++
Chickpea	++++	+++	++++	++	+++	+
Lentil	++	++	++	+++	++	++
Pea	++++	+++	+++	++	++++	++
French bean	+	++	+++	++++	+++	+
Alfalfa	+	-	-	++	++	-
Peanut	+	-	-	+	++	-
Durum wheat	++	+++	+++	++++	+	+
Burley	+	++	++	++++	-	+
Tomato	+	+	-	++++	-	-
Pepper	-	-	-	+	-	-
Eggplant	+	-	-	+++	-	-
Melon	+	+	+	+++	+	+
Sugarbeet	-	-	-	++	+	-
Sunflower	+	-	-	+++	-	-

++++ = very good host, +++ = good host, ++ = host, + = poor host and - = non-host.

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