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AN ITALIAN BIOTYPE OF THE CITRUS NEMATODE

by

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Five biotypes of the citrus nematode, *Tylenchulus semipenetrans* Cobb, are reported in the literature. Four of them occur in California (Baines *et al.*, 1974) one being capable of active reproduction on olive trees (Lamberti and Baines, 1970). A fifth, in Florida, is said by Stokes (1969), to parasitize the grass *Andropogon rhizomatus* Swallen but not citrus rootstoks.

The results of two experiments, to characterize as biotypes three Italian populations of *T. semipenetrans*, are discussed in this paper. One experiment was done in a glass-house at Bari and the other in a lath-house at Catania, in 1972-1973, to test the infectivity and the pathogenecity of the nematode on citrus, olive and grape plants (Lamberti *et al.*, 1974 and 1976).

Material and methods

The three populations were collected in citrus groves, one in Sardinia, at Zerfaliu (Oristano), one in Sicily (Catania), and the third in Lucania, at Policoro (Matera), and inoculated to the plants listed in Table I, following the procedures given in Lamberti *et al.* (1976).

At the end of the experiment, a year after the inoculation, the number of mature females of the nematode present on 1 g of roots of each plant was determined and the capability of each population of reproducing itself on the different hosts compared with that of the known biotypes of *T. semipenetrans*. The infectivity of the three populations tested on the various hosts was also compared statistically by mean of Duncan's multiple range test.

Table I - *Differential hosts of biotypes of* Tylenchulus semipentrans.

Hosts	Biotypes							
	California (Baines *et al.*, 1974)				Florida (Stokes, 1966)	Italy		
	1	2	3	4		Lucania	Sicily	Sardinia
Citrus aurantifolia (Christm.) Swing. (Palesine lime)	nt	nt	nt	nt	nt	+	—	+
C. aurantium L. (Sour orange)	nt	nt	nt	nt	—	+	+	+
C. lemon (L.) Burm. (rough lemon)	nt	nt	nt	nt	—	+	+	+
C. medica L. var. Ethrog (citron Ethrog)	nt	nt	nt	nt	nt	+	+	+
C. pennivesiculata (Lush.) Tan.	nt	nt	nt	nt	nt	+	+	+
C. reticulata Blanco (« Cleopatra » mandarin)	nt	nt	nt	nt	nt	+	+	+
C. sinensis (L.) Osbeck. (sweet orange)	+	+	+	+	—	nt	nt	nt
C. volkameriana Pasq.	nt	nt	nt	nt	nt	+	+	+
Poncirus trifoliata (L.) Raf.	nt	nt	nt	nt	—	nt	nt	nt
P. trifoliata « Bennecke »	nt	nt	nt	nt	nt	—	—	—
P. trifoliata « Pomeroy »	—	+	+	—	nt	—	—	—
P. trifoliata « Rubidoux »	—	—	+	+	nt	—	—	—
C. paradisi Macf. x *C. reticulata* (tangelo « Orlando »)	nt	nt	nt	nt	nt	+	+	+
C. sinensis x *P. trifoliata* (« Troyer » citrange)	+	+	+	+	nt	+	+	+
P. trifoliata x *C. paradisi* (citrumelo)	nt	nt	nt	nt	nt	—	—	—
Severinia buxifolia (Poir.) Tenore	nt	nt	nt	nt	nt	—	—	—
Olea europaea L. (« Frangivento »)	nt	nt	nt	nt	nt	—	—	—
O. europaea (« Manzanillo »)	+	+	—	+	nt	nt	nt	nt
Vitis vinifera L. (« Thompson seedless »)	+	+	+	nt	nt	nt	nt	nt
V. berlandieri Planchon x *V. riparia* Michaux (« Kober 5BB »)	nt	nt	nt	nt	nt	+	+	+

N. B.: nt = not tested; + = infection took place; — = infection did non occur.

Discussion

The Italian populations of *T. semipenetrans* differ from the Floridian biotype because this is not infective on sour orange and rough lemon, and from the Californian biotype 1, because it does not infect olive. They differ from biotype 2 because they do not infect olive and « Pomeroy » trifoliate orange, from biotype 3 because they do not infect the trifoliate oranges « Pomeroy » and « Rubidoux », and from biotype 4 because they do not infect either trifoliate orange or olive (Tab. I).

From an examination of the data concerning the infectivity of the three populations tested on the different hosts, in the two experiments (Tab. II), one might conclude that more than one biotype of the citrus nematode is present in Italy.

We advise that further studies should be undertaken to confirm this hypothesis which is, however, supported by the fact that in the

Table II - *Infectivity of three Italian populations of* T. semipenetrans.

Hosts	Number of mature female/g of roots		
	Populations		
	Lucania	Sicily	Sardinia
EXPERIMENT AT BARI			
Sour orange	78.6 A	157.5 B	121.2 AB
Rough lemon	475.7 A	611.3 A	532.8 A
« Cleopatra » mandarin	40.6 A	73.2 A	43.6 A
C. volkameriana	773.8 A	488.8 A	602.3 A
« Troyer » citrange	136.7 A	407.0 B	299.8 AB
Citrumelo and *P. trifoliata* (« Bennecke », « Pomeroy » and « Roubidoux »)	0.0	0.0	0.0
EXPERIMENT AT CATANIA			
Sour orange	20.5 A	5.2 A	7.0 A
Citron « Ethrog »	184.9 A	29.2 B	26.8 B
C. pennivesiculata	19.5 A	78.8 A	45.0 A
Palestine lime	74.4 A	0.0 B	18.9 AB
Tangelo « Orlando »	27.2 A	3.6 A	4.3 A
« Troyer » citrange	0.0 A	15.3 A	1.7 A
Grapevine « Kober 5BB »	38.7 A	0.3 B	6.8 B
Olive « Frangivento » and *S. buxifolia*	0.0	0.0	0.0

N. B.: Numbers with similar letters are not significantly different on the rows ($P = 0.01$).

second experiment, carried out in a lath-house in Catania, « Troyer » citrange was not infested by the population of *T. semipentrans* from Lucania and Palestine lime was not infested by the Sicilian population. Moreover, it is also of interest that in a plantation at Lentini (Siracusa) roots of sour orange were heavily infested with mature females (Fig. 1), but those of « Troyer » citrange were completely uninfested.

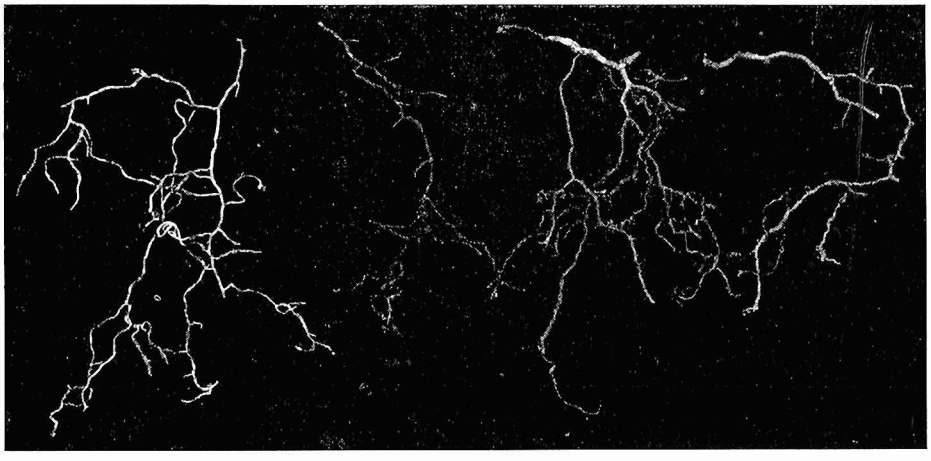

Fig. 1 - Roots of sour orange heavily infested by *Tylenchulus semipenetrans* (right); at left roots of « Troyer » citrange immune to the nematode.

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