

Istituto di Nematologia Agraria, C.N.R. — 70126 Bari, Italy

REPRODUCTION OF TWO POPULATIONS OF *XIPHINEMA INDEX* IN RELATION TO HOST AND TEMPERATURE

by
M.I. COIRO, C.E. TAYLOR and F. LAMBERTI

Summary. In a small pot experiment *Xiphinema index* populations from Italy and U.S.A. reproduced on fig but not on *Petunia hybrida*, and only the U.S.A. population reproduced on tomato. Reproduction occurred at 22° and 29°C, but virtually none at 15° or 36°C, and the U.S.A. population had a greater reproductive capacity than the Italian. The life cycle of the U.S.A. population was 55 days at 22° or 29°C whereas that of the Italian was estimated as 62 days.

The length of the life cycle of *Xiphinema index* Thorne et Allen and the suitability of various host plants for reproduction have been referred to in many publications. There is general agreement that fig (*Ficus carica* L.) and grapevine (*Vitis* spp.) are excellent hosts for the nematode but the life cycle in the field has been variously given as ranging from two to nine months, and possibly longer (Radewald and Raski, 1962; Cohn and Mordechai, 1969; Prota and Garau, 1973; Prota *et al.*, 1977; Harris, 1979).

The total reproductive capacity of *X. index* has been investigated in the laboratory and has been shown to vary with the origin of the population and with the host plant (Coiro and Brown, 1984; Brown and Coiro, 1985). Differences in reproductive performance between populations may also vary in relation to temperature and the results of an experiment investigating this are reported here.

Materials and methods

Populations of *X. index* from Italy (Brindisi) and USA (California) were cultured for several months on fig in a glasshouse (22° ± 1°C). Single 4th stage juveniles from each population were then added to 25ml clay pots containing sterilized sand into which were planted seedlings of tomato (*Lycopersicon esculentum* Mill. cv. Haubners Volendung), *Petunia hybrida* Vilm. or fig. Ten pots with each different host were then exposed to 15, 22, 29 or 36°C for 8 weeks in growth chambers. Nematodes were extracted from each pot by wet sieving and counted. The roots of

each plant were examined for galling as evidence of nematode feeding.

Results and discussion

Neither of the populations reproduced on petunia and the Italian population also failed to reproduce on tomato. There was also little reproduction at 15° or 36°C and at the higher temperature none of the Italian nematodes that were added to the pots survived for the period of the experiment (Table I). The Californian population had a greater reproductive capacity than the Italian, and the rate of multiplication was greater on fig than on tomato. Assuming a basal temperature of 14°C, below which repro-

TABLE I - Multiplication of two populations of *Xiphinema index* on fig and tomato at four temperatures.

Host	Population	Temperature (°C)			
		15	22	29	36
Fig		Nematodes per pot			
	California	1.4	68.0	66.8	8.3
	Italy	0.5	32.4	19.8	0.0
Tomato	California	0.0	9.8	10.0	7.0
	Italy	0.0	0.0	0.0	0.0

duction does not occur, it can be estimated that the day degrees required for egg production in the Californian population are lower (6.6 and 12.6 per egg at 22° and 29°C, respectively) than the Italian population (45.7 and 84 per egg at 22° and 29°C respectively). Based on the numbers of new females and 4th instar juveniles at the end of the experiment, it can be estimated that the life cycle of the Californian population is approximately 55 days at 22° or 29°C. No new females had appeared in the Italian population at the end of the experiment, but based on the numbers of 4th instars and comparison with the Californian population it is estimated that the life cycle would be about 62 days (cf. Prota *et al.*, 1977).

The most obvious difference between the Californian and Italian populations of *X. index* is the failure of the latter to reproduce on tomato, and our results support previous observations (Coiro and Brown, 1984). The results of the experiment also indicate that the Italian population has a lower reproductive capacity than the Californian population.

Literature cited

- BROWN D.J.F. and COIRO M.I., 1985 — The reproductive capacity and longevity of *Xiphinema index* (Nematoda: Dorylaimida) from three populations on selected host plants. *Revue Nématol.*, 8: 171-173.
- COHN E. and MORDECHAI M., 1969 — Investigations on the life cycles and host preference of some species of *Xiphinema* and *Longidorus* under controlled conditions. *Nematologica*, 15: 295-302.
- COIRO M.I. and BROWN D.J.F., 1984 — The status of some plants as hosts for four populations of *Xiphinema index* (Nematoda: Dorylaimida). *Revue Nématol.*, 7: 283-286.
- HARRIS A.R., 1979 — Seasonal populations of *Xiphinema index* in vineyard soils of north-eastern Victoria, Australia. *Nematologica*, 25: 336-347.
- PROTA U. and GARAU R., 1973 — Indagini sulla biologia di *Xiphinema index* Thorne *et* Allen in vigneti sardi. *Nematol. medit.*, 1: 36-54.
- PROTA U., BLEVE-ZACHEO T., GARAU R. and LAMBERTI F., 1977. Studies on the life-cycle of *Xiphinema index*. *Nematol. medit.*, 5: 299-303.
- RADEWALD J.D. and RASKI D.J., 1962 — A study of the life cycle of *Xiphinema index*. *Phytopathology*, 52: 748.