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EFFECT OF TEMPERATURES AND FIG ROOT LEACHATE ON HATCH OF *HETERODERA FICI*

by
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The fig cyst nematode, *Heterodera fici* Kirjanova, is worldwide in distribution (Mulvey, 1972). In infested soils the nematode damage to commercial (*Ficus carica* L.) and to ornamental fig (*Ficus elastica* Roxb.) is more severe on seedlings than on trees (Braasch, 1975; Di Vito and Inserra, 1982).

The emergence of juveniles from cysts of *Heterodera* spp. is affected by root diffusates, temperature, aeration and soil moisture (Shepherd, 1962; Clarke and Perry, 1977; Greco, 1981), but there was no information on egg hatch of *H. fici*. Therefore, an experiment was undertaken to investigate the influence of different temperatures and fig root leachate on the egg hatch of an Italian population of *H. fici*.

Materials and Methods

A population of *H. fici* collected from the roots of commercial fig at Barile (Potenza) was reared on the same host in a glasshouse at 20-23° C. Newly formed cysts were then collected from the roots and batches of 100 each (about 10,000 eggs and juveniles) were placed in 5 cm diam Petri dishes (Greco *et al.*, 1982) containing 3 ml of distilled water, soil extract or fig root leachate. Cysts were kept in growth chambers at 10, 15, 20, 25 or 30°C. The fig root leachate was obtained by drenching the soil of 35 pots planted with three month old fig plants, with three litres of distilled water and collecting the leachate during a 48 hour period. The

same procedure was used to obtain an extract from soil without plants. The leachates were then centrifuged at $1500\times g$ for 30 minutes and stored at $2-3^{\circ}\text{C}$.

Replication was fourfold. Emerged juveniles were counted and media renewed weekly. At the end of the experiment, unhatched eggs and juveniles were counted (Seinhorst and Den Ouden, 1966) to ascertain the total numbers occurring within cysts at the beginning of the test. Cumulative numbers of juveniles emerging weekly were expressed as percentage of the total egg content of the cysts and statistically analysed by calculating LSD's.

Results and Discussion

No juveniles emerged from cysts incubated in distilled water, in leachate from soil without plants, and at 10°C in fig root leachate (Fig. 1).

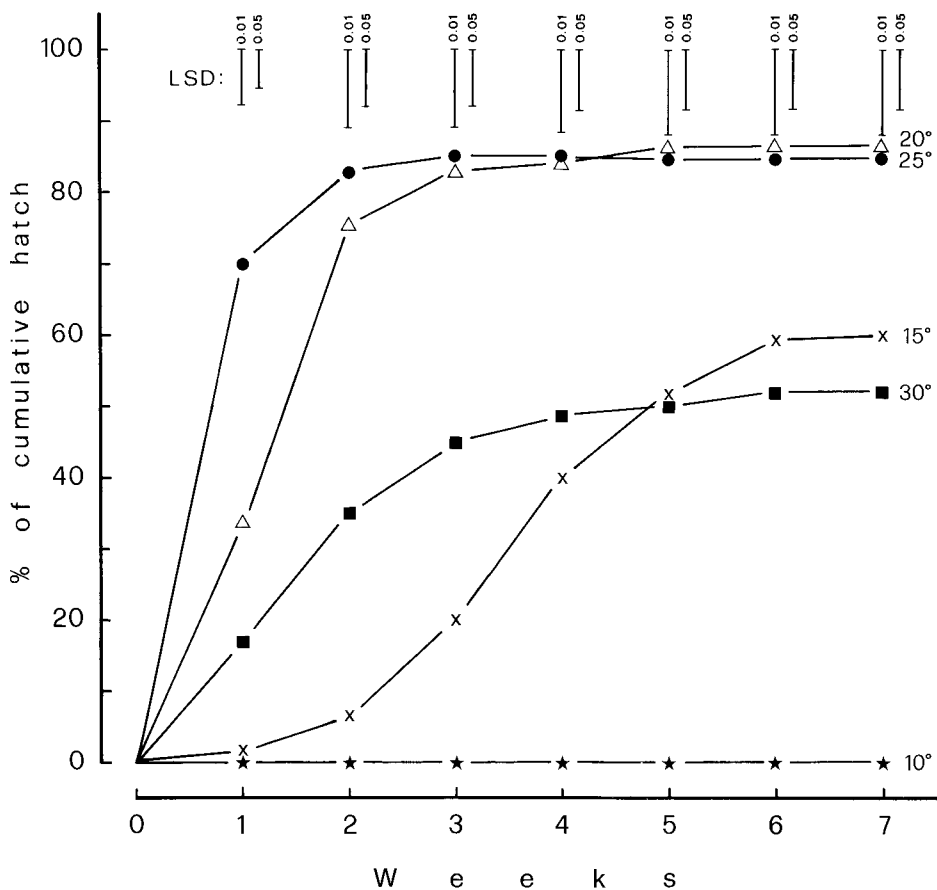


Fig. 1 - Influence of temperatures on the emergence of juveniles from cysts of *Heterodera fici*. In fig root leachate: x—x 15°C ; Δ — Δ 20°C ; \bullet — \bullet 25°C ; \blacksquare — \blacksquare 30°C ; \star — \star at all temperatures in distilled water or in soil extract, and at 10°C in fig root leachate.

But, after one week in fig root leachate, juveniles emergence was 2, 17, 33 and 70% at 15, 30, 20, and 25°C, respectively (Fig. 1). Hatching of cysts incubated in fig root leachate at 20 and 25°C was 75 and 83%, respectively, after two weeks, about 85% at both temperatures after three weeks, and negligible thereafter. At 30°C juveniles emergence was about 50% after four weeks and remained at the same level until the end of the experiment.

Egg hatch of the fig cyst nematode occurred only in fig root leachate and was greatly affected by temperatures. In fact all cysts incubated in fig root leachate at $\geq 15^{\circ}\text{C}$ hatched promptly, but at 10°C in fig root leachate, and soil extract and in distilled water at all temperatures tested (10-30°C) no juveniles emerged.

It appears that the Italian population of *H. fici* does not require any special temperature pretreatment to initiate hatching of eggs in newly formed cysts. Therefore more than one generation per year could be completed by this nematode under field conditions.

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S U M M A R Y

The hatch of *Heterodera fici* in fig root leachate, soil extract, and distilled water was investigated by incubating newly formed cysts of the nematode at 10, 15, 20, 25 or 30°C. The fig root leachate and temperatures greatly influenced the emergence of second stage juveniles. More than 85% of the eggs hatched after three weeks at 20 and 25°C. At 30°C about 50% of the eggs hatched after 4 weeks, but no juveniles emerged thereafter. The hatching was slow at 15°C and reached 60% after 6 weeks. No hatch occurred at 10°C in fig root leachate, and at all temperatures in soil extract and in distilled water.

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