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EFFECT OF TEMPERATURE ON THE REPRODUCTION OF A POPULATION OF *XIPHINEMA DIVERSICAUDATUM*

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Xiphinema diversicaudatum (Micoletzky) Thorne is widespread in peach groves of Borgo d'Ale in the province of Vercelli, northern Italy, where it is the natural vector of Strawberry Latent Ringspot Virus (SLRV) (Roca *et al.*, 1986). Studies on the transmission of this virus have shown that not all populations of *X. diversicaudatum* are equally efficient in transmitting SLRV to indicator plants (Brown and Taylor, 1981; Brown and Trudgill, 1983). Moreover, individuals collected in different seasons from the rhizosphere of infected peach trees at Borgo d'Ale showed a variability in their vector efficiency depending on the time at which they were collected from the field (Lamberti *et al.*, 1986). Transmission of the virus in nature certainly occurs at different rates during the course of the year and one of the factors involved is undoubtedly due to the size and biological integrity of the vector population.

A study under controlled conditions of the effect of temperature on the reproduction of this population of *X. diversicaudatum* is one aspect of the examination of factors influencing transmission of SLRV.

Materials and Methods

Runners of strawberry (*Fragaria* x *ananassa* Duch.) cv. Douglas were rooted in clay pots 14 cm diam containing 1 l of steam sterilized sandy loam and kept in a glasshouse at 22-24° C. One month after planting, 30 pots were each inoculated with 20 non gravid females of the population of *X.*

diversicaudatum from Borgo D'Ale collected directly from the field; it was assumed that most of them had already been fertilized by males in the natural environment in September 1981. Series of 10 pots each were transferred to growth chambers at 15, 20 and 25 ± 2°C, 65% R.H. and 3000 lux for twelve hours daily.

Six months after nematode inoculation the soil was depotted and mixed carefully. From one aliquot of 50 ml per pot eggs were extracted by centrifugation (Zacheo and Lamberti, 1974). The mobile stages of the nematode were extracted from the rest of the soil by means of Cobb's sieving technique and counted under a stereomicroscope, separating the different stages and the newly formed females.

Results and Discussion

Populations of *X. diversicaudatum* reproduced actively at 25°C, and much slower at 20°C whereas almost no reproduction occurred at 15°C (Table I). In fact only a few juveniles and eggs, one male and some of the

Table I - Effect of temperature on the reproduction of a population of *Xiphinema diversicaudatum*.

STAGE	Mean numbers of nematodes/pot (standard deviation)		
	Temperatures °C		
	15	20	25°C
Juvenile 1st	0 ± 0	7.3 ± 4.33	14.2 ± 17.33
Juvenile 2nd	0 ± 0	7.4 ± 5.62	9.5 ± 12.19
Juvenile 3rd	0.2 ± 0.4	8.1 ± 7.6	11.7 ± 12.79
Juvenile 4th	0.3 ± 0.45	6.4 ± 6.48	10.2 ± 12.11
Female	0.8 ± 1.77	2.4[1] ± 2.37	13.7[2] ± 11.94
Male	0.1 ± 0.3	0.5 ± 0.67	1.4 ± 1.74
Total	1.4	32.9	60.7
Egg/50 ml soil	0.6 ± 1.8	6.3 ± 4.64	8.9 ± 8.84

[1] 20 out of 24 were new females; [2] 74 out of 137 were new females.

old inoculated females were recovered from the pots kept at 15°C, indicating that most of the inoculated females had died and those that had survived had involuntarily layed eggs whose differentiation had already started at the time of inoculation. Reproduction occurred regularly although at a different rythm in the pots kept at 20 and 25°C. However, two patterns were observed in both of these series, e.g. in some pots where no males were found the populations of *X. diversicaudatum* were declining and no newly formed females were detected. Conversely in the pots where males were present the populations of the nematode were increasing and numerous newly formed females were observed.

These results confirm the amphimictic character of this population of *X. diversicaudatum* and in agreement with Flegg (1969) no active reproduction occurred at 25°C. The data indicate that reproduction of *X. diversicaudatum* at Borgo d'Ale occurs mostly between May and October reaching its peak in August-September. The transmission of SLRV is most efficient in the autumn (Lamberti *et al.*, 1986).

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