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INFECTION OF GERMINATING PADDY SEED BY *APHELENCHOIDES BESSEYI*

by
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Summary. *Aphelenchoides besseyi* was mainly located near the embryonic region of rice seeds. Majority of nematode recovered were 4th stage juveniles which constituted the main invasive stage.

Aphelenchoides besseyi Christie, is known to survive anhydrobiotically under the husk of infected paddy seed. Under favourable conditions, the nematodes are activated and emerge to invade the germinating seed. However, precise information on the exact location of nematodes under the seed husk and subsequent infection by the anhydrobiotically surviving developmental stages is lacking. An attempt was, therefore, made to study these aspects of nematode biology and the results are presented here.

Infected paddy (*Oryza sativa* L.) seeds (with an average of 6 nematodes per seed) were used in these studies. To identify the location of nematodes under the seed husk, one hundred infected seeds, in three replications, were plunged into hot water at 60°C for 30 minutes. After cooling (about 15 min.) each seed was cut transversely into three equal parts, which were then kept separately in water. Subsequently, the husk from each part was removed mechanically and the nematodes thus extracted were counted.

To investigate the infectivity of different developmental stages to the germinating seed, nematodes were recovered by soaking infected paddy seeds overnight in water followed by manual removal of the seed husk. The different stages, thus extracted, were kept separately in small watch glasses containing water. As some of the extracted nematodes did not show any movement initially, all of them were, therefore, kept in water at 30°C for 24 hours for activation. Three day old paddy seedlings (grown in petriplates containing 1% water agar) were inoculated separately with 10 individuals of each of the developmental stages. There were 3 replications. These petriplates were kept at $28 \pm 2^\circ\text{C}$. The number of nematodes penetrating and subsequently moulting were recorded after every 24 hours for five days to ascertain the infectivity of different nematode stages.

The results indicate that maximum concentration of nematodes was near the embryonic region, averaging 480

nematodes per 100 seeds. In the mid and distal-end parts of the seed, there were only 15 and 2 nematodes respectively per 100 seeds.

This is similar to the results of Huang and Huang (1972) who found that the embryonic tissues were the preferred sites for nematodes feeding. Maximum concentration of nematodes in the embryonic region probably facilitates rapid invasion of the growing point of the germinating seedlings.

The majority of individuals recovered from the infected seeds were in the 4th stage, although all of the developmental stages, except the second stage, were present in the infected seeds. Tikhonova (1966) has also reported that with the fall in humidity (to 15-18%) of paddy seeds approaching maturity, all stages except second stage juveniles coil up and go into a state of anabiosis. This probably explains the absence of second stage juveniles in the infected seeds. Maximum penetration of germinating seeds was by fourth stage juveniles, followed by adults. There was no difference in penetration by female or male nematodes. The least penetration was noticed with third stage juveniles. Per cent nematodes moulting further was also recorded to be more with preadults. This may be due to the better anhydrobiotic survival capability of preadults. Higher percentage of occurrence of preadults may also perhaps ensure better perpetuation of the species.

Literature cited

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