Indian Phytopath. 57 (2) : 235-236 (2004)

Management of root-knot nematode infecting tomato by *Trichoderma viride* and *Paecilomyces lilacinus*

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Key words: biocontrol, plant-parasitic nematodes, tomato

In recent years, attempts have been to modify the soil environment in a manner in which population of harmful micro-organisms would be reduced causing no environmental hazards. This mission could be achieved by some fungal and or/bacterial pesticides(3). In the present days some biopesticides i e., *Aspergillus niger*, *Trichoderma viride*, *Pseudomonas fluorescence*, etc. are attaining a commercial status with an aim of replacing chemicals in combating serious fungal and nematode diseases (1-2,4-6). In this direction, attempts have been made to test *Paecilomyces lilacinus* and *Trichoderma viride* on egg-parasitisation of root-knot nematode, *Meloidogyne incognita* infecting tomato.

For *in vitro* tests each of the above two fungal species were isolated on Potato dextrose broth and allowed to incubate at 25±2°C for 15 days. The culture filtrate from each was taken as standard extract while two dilutions namely S/10 and S/100 were also prepared. For the larvicidal test about hundred freshly hatched juveniles of *M. incognita* were exposed to each of the above dilutions of fungus separately and observations were taken after 24, 48 and 72h exposure keeping PD broth and water check. Further, for the ovicidal test, three eggmasses after surface sterilization with $HgCl_2$ (0.1%) for 30 seconds were allowed to soak for 48h in each of the dilutions following which they were transferred to sterilized water. The observations were recorded daily till it ceased to hatch. In *in vitro* study both the culture filtrates from the above bioagents showed larvicidal effect. *T.viride* showing more toxicity (60%) than *P.lilacinus* (25%). However, inhibition of hatching of *M. incognita* eggs was also observed to be more by *T. viride* (65%) than by *P.lilacinus* (40%).

The egg parasitization capacity of *M. incognita* by the above two fungi was tested on PDA (Potato Dextrose Agar) where the egg masses after surface sterilization with 0.1% $HgCl_2$ for 30 seconds were transferred in BOD for one week at 25±2°C. Then, these egg masses were stained with cottonblue lactophenol, crushed and observations were taken under stereobinocular for egg parasitization. It was found that 70% eggs were parasitised in case of *P.lilacinus* as against 5% in *T. viride*.

Glasshouse experiments were conducted in 4'' diameter pots with soil infested with *M. incognita* @ 2 larvae/g of soil. Both the bioagents @ 2x 10^6 spore load/g helped in reducing nematode population in roots and soil in either of the treatments i.e., singly or concomitantly. However, both the fungi when applied in combination at half the dose ie., 1g/fungal mat/500g soil reduced 80 larvae/500g soil as compared to *P.lilacinus* (190 larvae/500 g soil) or *T. viride* (230 larvae/500 g soil). The plant growth increased significantly (Table 1) only in treatment *T.viride* alone and in combination of *T.viride* + *P.lilacinus* (24.5cm and 25.1cm) respectively as

Table 1. Influence of *T. viride* and *P.lilacinus* on nematode development and plant growth

Treatment	Plant height (cm)	No. of eggs/ egg masses	Soil pop.
T. viride	24.5	45	230
P. lilacinus	21.5	32	190
T. viridae + *P. lilacinus*	25.1	25	80
Neem alone	16.8	205	850
Check	22.8	0.0	0.0
CD @ 0.05%	3.8	7.2	9.1

compared to *P.lilacinus* alone (21.5cm), untreated uninfested check (22.8cm) and untreated infested check (16.8cm) (Table 1). It is proposed that the plant growth promoting hormonal property of *Trichoderma* would have helped to attain plant vigour thus making it tolerant to nematodes attack.

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Received for publication March 3, 2001