

TRICHODERMA HARZIANUM AS A BIOCONTROL AGENT FOR PYTHIUM APHANIDERMATUM, A CAUSAL ORGANISM OF DAMPING-OFF OF TOMATO

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Soil-borne fungal diseases in plants cause a severe reduction in the quality and quantity of plant products in agricultural lands. Damping-off disease, which occurs mainly due to the attack of *Pythium* sp., is one such disease affecting most species of crop plants, specially the Solanaceae crops including tomato. Methods of prevention and disease control include the use of fungicides, reduction in seedling density and biological control. *Trichoderma*, a soil-borne fungus, has been found to be a successful biocontrol agent against a number of soil-borne pathogenic fungi over a period of years.

Trichoderma sp. was isolated from garden soil mixed with decomposing plant material, by the dilution plate method on Potato Dextrose Agar medium (PDA). Based on colony, morphological characteristics and growth rate measurements on 2% Malt Extract Agar (MEA), the species was identified as *Trichoderma harzianum*. The causal organism was isolated on water agar from root tips of diseased seedlings, collected from a seedling bed of tomato (cultivar:Thilina, V/2/3/K.U.N/003). Based on colony and morphological characteristics, the fungus was identified as *Pythium aphanidermatum*.

The biocontrol ability of *Trichoderma harzianum* against *Pythium aphanidermatum* was tested in comparison to 0.02% Captan [1,2,3,6-Tetrahydro-N-(trichloromethylthio) phthalimide 3a,4,7,7a-Tetrahydro-2-[(trichloromethyl)thio]-1H-isoindole-1,3(2H)-dione], a recommended contact fungicide to control the disease. Linear growth measurements of *P. aphanidermatum* on PDA plates were taken in the presence of treatments (*T. harzianum* or fungicide). The inhibition in growth of *P. aphanidermatum* was significant ($P = 0.05$ level) in *T. harzianum* treated plates compared to the fungicide treatment and the control.

In vivo effect of *T. harzianum* against damping off development was tested using tomato plants in a moisture chamber at room temperature (27 ± 1 °C). The treatments were addition of a spore suspension (10^6) of *T. harzianum*, fungicide (0.02%) and reducing the number of seeds planted. The number of diseased seedlings was counted 10 days and 14 days after planting and percentage disease incidence was calculated. There was a 88.8% reduction in disease incidence by *T. harzianum*, which was significant at $P = 0.05$ level. Treatment with *T. harzianum* was 30.6% more effective than the fungicide used (Captan) and 18.4% more effective than reduced seedling density.

Results obtained from the current study showed that damping-off disease of tomato caused by *Pythium aphanidermatum* can be significantly reduced by the biocontrol agent *Trichoderma harzianum*.