

Interaction of salinity, *Bacillus subtilis* and *Glomus mosseae* on cucumber damping off caused by *Pythium aphanidermatum*

Abstract

Cucumber is one of the most important products in Iran that classified as semi-sensitive to salinity plants. In recent years due to changing weather conditions and limitations appearing in the quality of water resources and reduce, For the off- season and increased produce of cucumbers, more attention has been focused on the greenhouse cultures. Pests and pathogens are the most important factor limiting the cultivation of this product and lead to reduced yields in greenhouses. The biological control advantages compared to other methods to control the disease, the best way to control the disease in the greenhouse. In this study, the suspected infected plants to *Pythium* from commercial greenhouses growing cucumbers were collected, after isolation and morphological identification of fungal species *Pythium*, molecular identification was performed with specific primers for the dominant species. Then Antagonistic effects of *Trichoderma virens* and isolates of *Bacillus subtilis* strains on the fungus *Pythium aphanidermatum* in laboratory with cross-culture method was examined. Inhibitory effects of these isolates in the greenhouse with mycorrhizae fungus *Glomus mosseae*, and then the interaction of salinity with *Glomus mosseae*, isolates of the *Bacillus subtilis* BSP2 and B3E on damping off caused by *pythium* was evaluated. This study was done in a completely randomized design with four replications, Variance analysis of data was performed using SAS software and mean comparison were using LSD test at 5% level.

Finally was found that disease severity in treatments with *Trichoderma virens* 31 percent, seed treatment with BSP2 and B3E isolates, respectively, 45 and 41%, the use of soil isolates and BSP2 and B3E respectively 46 and 42%. Also with colonization of seedling roots with mycorrhizae disease severity was 28 percent while the control plants infected with *Pythium* disease severity was 56%. By examining The interaction of salinity with *Glomus mosseae*, BSP2 and B3E, isolates of the species of *Bacillus subtilis*, were found that Bacterial isolates have little effect in reducing disease severity in salinity conditions, However, root colonization with the fungus *Glomus mosseae* in salinity levels 2, 4 and 8 dSm⁻¹ were reduced disease severity significantly.

Key words: *Pythium*, *Glomus mosseae*, *Bacillus subtilis*, *Trichoderma virens*, Salinity



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The Thesis Submitted for M.Sc. Degree in Plant Pathology

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and *Glomus mosseae* on cucumber
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January
2012