

Identification of fungal causal agents of damping off in cucurbits in Sistan and their control by rhizosphere antagonist

Abstract

The melon (*Cucumis melo*) is cultivated in different regions of Iran. Vine decline disease is a destructive soilborne disease of melon. Vine decline is a generic term applied to a group of diseases with similar symptoms but different causal agents. Different methods were used to decrease the disease. In addition to plant management, researches were performed on biocontrol agent to control vine decline diseases in cucurbitaceae and other plants. To identify fungi associated with root and vine decline of melon and isolation of antagonistic agents to control these fungi in commercial fields in different regions of Sistan sampled were collected during growing season of 2011-2012. Suspected samples were collected and transported to the laboratory. To isolate the fungi, discolored segments of roots and crowns were surface sterilized in 1% sodium hypochlorite for 1-3 min and cultured on Potato Dextrose Agar. The plates were incubated for 3 to 5 days, hyphal tips or spores of the fungi were transferred to new PDA plates and were identified based on morphological characteristics. The pathogenicity test was performed using inoculum of fungal isolates. The test was done in the greenhouse. In the study, *Rhizoctonia solani*, *Macrophomina phaseolina*, *Monosporascus cannonballus*, *Fusarium proliferatum* and *Fusarium solani* were identified as fungal causal agents of damping off in melon in Sistan. In the second step, the soil samples from the rhizosphere of infected and non-infected melon were plated on Nutrient Agar and McFadden & Sutton's RB-S-F. *Bacillus* sp and *Trichoderma* sp were separated. In the third step, Dual culture was used to study the antagonist effects of the *T. harzianum*, isolates of *Bacillus subtilis* and *Bacillus tequilensis* on mycelial growth of *R. solani*, *M. phaseolina*, *M. cannonballus*, *F. proliferatum* and *F. solani* *in vitro*. The ability of the isolate of *B. subtilis* and *T. harzianum* in reduction of the incidence of melon crown and root rot in a glasshouse was proven. Analysis of variance was performed and the means were compared using Duncan's multiple Range Test at $p < 0.05$. The greenhouse results revealed that *T. harzianum* decreased incidence of melon crown and root rot that were infected with *R. solani*, *F. proliferatum*, *F. solani*, *M. phaseolina* and *M. cannonballus* to 18/3, 42, 30/3, 18/3 and 20 percent while *B. subtilis* B₁ and *B. subtilis* B₈ infected with *R. solani*, *F. proliferatum*, *F. solani*, *M. phaseolina* and *M. cannonballus* the disease was decreased to 0 and 1/6, 29 and 34/7, 17 and 26/3, 20 and 18/3 and 13/3 and 16/6 percent respectively.

Keywords: Antagonists, damping off, melon, vine crops.



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