

Biological control of *Fusarium oxysporum* f.sp. *lycopersici* using antagonistic agents of tomato rhizosphere

Abstract

Tomato is a cosmopolitan vegetable. The quantitative and qualitative characteristics of tomato are influenced by a variety of diseases. Where the plant is severely affected. *Fusarium* wilt is among the fungal diseases of tomato. As it can become epidemic. The disease is caused by *Fusarium oxysporum* (Schlechtendi: fr.) f.sp. *lycopersici* (saac.) Snyder and Hassen. In the research the contaminated and healthy tomato plants were collected from different regions of Lorestan province. The samples along the adhesive soils were transferred to the laboratory where, 15 bacterial isolates and 27 fungal isolates were separated from crop's rhizosphere. In the next step, antagonistic effects of the isolated bacteria and fungi on *F. oxysporum* f.sp. *lycopersici* were studied through using dual culture method. Antagonistic effects of the bacterial isolates, *Bacillus subtilis* and *Pseudomonas fluorescens*, and fungal isolates, *Trichoderma harzianum* and *Trichoderma virens*, and also biological toxin, Trichomix-H, were studied in the greenhouse. Inoculum of *F. oxysporum* f.sp. *lycopersici* in a weight proportion of 10 percent and was mixed with the pot sterilized soil to fill the upper 1/3 of the pots. The bottom 2/3 of the pots had been filled with the sterilized soil. The pots were kept for 25 days in the greenhouse and evaluation of biocontrol capacity of the antagonists in disease control was conducted simultaneously through cultivating the crop by using saturating soil method. The trial was conducted based on a completely randomized design for each antagonist with three replicates. The data were analysed using SPSS software and the average comparison of the traits was conducted using Duncan test. The results of the greenhouse experiments revealed that the antagonistic bacteria *B. subtilis* and *P. fluorescens*, controlled 100 and 62.5 percent the disease, respectively. The antagonistic fungi *T. harzianum* and *T. virens*, Trichomix-H50 and Trichomix-H30 controlled 100, 66.67, 62.96 and 55.56 percent the disease respectively.

Keywords: Biological control, *Fusarium* wilt, Competition, Nutrient, Tomato



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