

Identification of fungal agent causing damping-off and root rot beans in Lorestan province and biological control with fungal and bacterial antagonists

Abstract

Cereals are the most important sources of human food are cultivated worldwide, Beans is heat-loving plant, which are the highest performance in light soils (sand clay) and is rich of organic materials. Lorestan province with the 24000 hectar culture area is one of the most important production zone in Iran. Several infectious and non-infectious factors are causal of damage on this product which between them pathogenic fungi are cause maximum damage. fungus *R. solani*, *M. phaseolina* and *F. solani* f.sp. *phaseoli* species are the most pathogenic fungi on bean. Use of chemical pesticides to control disease, caused the loss of beneficial microorganisms and ecological imbalance. The use of integrated pest management, agricultural and biological control is very important. In this study, in order to investigation, possibility of control of crown and root rot agents, sampling was performed from different aerea of bean cultivation in the province, then samples were transferred to the laboratory. After culture of infected tissues on different culture medium and purifie using hyphal typing, single spore and single sclerote methods, a total of 247 isolates were isolated then were purified and identified. Based on morphological citria *R. solani*, *M. phaseolina*, *F. solani*, *F. oxysporum*, *F. acuminatum*, *F. culmorum*, *F. diversisporum*, *F. equiseti*, *F. javanicum*, *F. proliferatum*, *F. scirpi*, *F. semitectum*, *F. virguliforme*, *Fusarium* sp, *A. alternata*, *C. globosum*, *C. destructans* and *A. parasiticus* species were detected The antagonist effect of bacterial and fungal on the pathogenic agent was evaluated in vitro conditions using of cross-culture test (Dual culture) . The results showed that the *R. solani* species was more virulence than other pathogenic agents. The evaluation of biocontrol activity of antagonist fungi was done simultaneously using inoculums preparation and for bacterial antagonist using bean seed priming method in suspension of bacterial spores at the time of culture of plants in greenhouse. A completely randomized design with four replications at each antagonist was done. Analysis of variance was performed by using SPSS 22 software. Mean comparison of traits in the laboratory and greenhouse experimental were done using Duncan test at the 1% and 5% probability level respectively. Percentage and severity inhibition assay showed that *R. solani* species has high antagonistic activity to control of agent disease. Greenhouse experiments showed that *P. fluorescens* and *B. subtilis* bacterial antagonists controlled disease at 51.57 and 40.98 percent respectively. *T. harzianum* and *T. virens* antagonist fungi cotroled disease at 48.99 and 42.58 percent respectively

Keywords: biological control, decay, antagonist, bean



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