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Biological control of barley covered smut by bacterial antagonists

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ABSTRACT

Six strains of *Bacillus* which were isolated from wheat field of Markazi, Golestan and Mazandaran provinces and also 11 strains of *Pseudomonas fluorescens* isolated from wheat fields of Karaj and Markazi province were evaluated as potential biological agents for control of barley covered smut caused by *Ustilago hordei* in field. The randomized complete design with three replications was used for experiments. Results indicated that *Bacillus lichniformis* (B1) and *B. cereus* (B2) completely controlled barley covered smut. The percentage of infection in treatments with *Bacillus* sp (B2), *B. cereus* (B4), *B. subtilis* (53) and *B. subtilis* (71) ranged from 0.119 to 0.617 and were significantly less than infected control ($p < 0.01$).

The best results were achived with *Pseudomonas fluorescens* bioV (C15), *P. fluorescens* bioV (E2), *P. fluoresecns* (D11) and *P. fluoresecns* bioI (32). The percentage of infection in these treatments were 0.207, 0.177, 0.133 and 0.18 respectively. Other strains of *Pseudomonas* were capable of reducing the incidence of covered smut and the percentage of infection significantly less than infected control.

Key words: Barley covered smut, *Bacillus lichniformis*, *Bacillus cereus*, *Bacillus subtilis*, *Pseudomonas fluorescens*, Biological control, *Ustilago hordei*

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