

BIOLOGICAL CONTROL OF COMMON BEAN PATHOGENS USING *Bacillus toyonensis*

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ABSTRACT

Common bean (*Phaseolus vulgaris* L.) crop in Brazil is affected by fungal diseases such as anthracnose (*Colletotrichum lindemuthianum*) Fusarium wilt (*Fusarium oxysporum* f. sp. *phaseoli*) and the white mold (*Sclerotinia sclerotiorum*). Biological control is an alternative for the sustainable and environmentally management of diseases. Some endophytic microorganisms may offer benefits to plants, such as disease control and growth promotion. The objective of this study was to analyze the potential of *Bacillus toyonensis* endophytic isolated from common bean in the control of different phytopathogens (*Colletotrichum lindemuthianum*, *Fusarium oxysporum* f. sp. *phaseoli* and *Sclerotinia sclerotiorum*). To achieve this goal, *in vitro* and *in vivo* analyzes were performed. The antagonistic potential were analyzed *in vitro* by inoculating *B. toyonensis* cell suspension on cellophane paper in BDA-agar medium. After 48 h, the cellophane was removed and a disc (5 mm) of fungal mycelium was deposited on the plate. As a control, the disc of mycelium was placed in medium without prior inoculation of bacteria. The percent inhibition of mycelial growth of phytopathogens (CI) was calculated. The values were submitted to ANOVA and the means were compared by Tukey test, at the 5 % level of significance. For *in vivo* analyzes, the bean seeds were soaked in a suspension of *B. toyonensis* and sterile distilled water (control) before being planted. Plants with 10 days of age were inoculated with *C. lindemuthianum*, *F. oxysporum* f. sp. *phaseoli* and *S. sclerotiorum* and the severity of the disease was evaluated. *B. toyonensis* exhibited activity against *S. sclerotiorum* with a reduction of mycelial growth of 95.2 % *in vitro* and 87.5 % of disease severity *in vivo*. *C. lindemuthianum* and *F. oxysporum* f. sp. *phaseoli* had reduced mycelial growth in 24.2 % and 8.2 % *in vitro* and the severity in 39.3 % and 0 % *in vivo*, respectively. In conclusion, *B. toyonensis* has potential as a biocontrol agent of common bean diseases.

Keywords: Common bean, *B. toyonensis*, endophytic, biocontrol agent.

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