

## POTENTIAL OF *Bacillus toyonensis* FOR COMMON BEAN GROWTH PROMOTION

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### ABSTRACT

Brazil is the largest producer of the common bean (*Phaseolus vulgaris* L.), reaching 3 million hectares of planted area. In addition to the economic scenario, beans are an important grain for human consumption worldwide, due to the high content of protein, fibers, complex carbohydrates, complex C vitamins, minerals, low in lipids and sodium. Several studies have demonstrated the use of endophytic microorganisms to increase growth, seed emergence, crop yield and disease control. Some endophytic microorganisms have the ability to stimulate plant growth through direct and indirect mechanisms. Thus, the objective of this study was to analyze the potential of *B. toyonensis* endophyte of common bean for common bean promotion. The capacity of *B. toyonensis* to promote plant growth by direct mechanisms was performed *in vitro* for the activities of nitrogen fixation, phosphate solubilization, siderophores production, indole acetic acid and volatile organic compounds and by indirect mechanisms such as protease, chitinase, cellulase, amylase and hydrogen cyanide production. For *in vivo* analyzes, bean seeds were soaked in a suspension of *B. toyonensis* and sterile distilled water (control) before being planted in pots with substrate. After 45 days in greenhouse conditions, the number of leaves, root length, fresh mass and dry mass of shoot and root were analyzed. The data were submitted to ANOVA and the means were compared by the Tukey test, at a significance level of 5%. *B. toyonensis* presented positive results for nitrogen fixation, production of volatile organic compounds, proteases, chitinase and amylase, in addition to a significant increase of 31.5 % in length and 33.6 % in dry mass of common bean roots. In conclusion, *B. toyonensis* showed potential to be used as a growth promoter in common bean.

**Keywords:** Common bean, *B. toyonensis*, endophytic, promotion growth plant.

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