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## Functional activities of *Bacillus* isolated from bromeliads and growth promoting activity of maize exposed to drought stress

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The search for drought-tolerance in plants has increased and numerous strategies has been evaluated, and one of them is the use of plant growth promoting rhizobacteria (PGPR). Among the beneficial mechanisms, the hydrolysis of 1-aminocyclopropane-1-carboxylate (ACC) it's an example. ACC is the precursor of ethylene in plants that in high concentrations slow root growth and cause senescence. The objective of this work was to characterize *Bacillus* spp. isolates regarding their enzymatic properties and the effect of inoculation of these isolates on germination of maize under drought stress. The isolates were evaluated for catalase, cellulase, protease and amylase activity, indole-3-acetic acid (IAA) production, solubilization of phosphorus (P) and zinc (Zn), detection of ACC deaminase by PCR of the *acdS* gene and measurement of the enzymatic activity. The ACC deaminase-producing were evaluated for growth under dry and production of exopolysaccharides (EPS). The best isolates were inoculated in maize to analyze the effect on germination under stress by polyethylene glycol (PEG). Selected isolates were assessed in a pot experiment in which the effects on mass accumulation in maize were observed in single inoculation and co-inoculation experiments with *Azospirillum brasilense* (Ab-V5/Ab -V6) under conditions of water stress (dry). According to the results, 52%, 84%, 60% and 52% produced catalase, cellulase, protease and amylase, respectively; while 32% produced IAA, 76% and 64% solubilized P and Zn. 22 isolates showed amplicons for the *acdS* gene. However, only 10 isolates were able to use ACC as only N-source. All bacteria grow under dry and produce EPS. In the germination assay, inoculation of the VBE23 isolate had a higher percentage of germination than the treatments without inoculation. In the pot experiment, in drought conditions the single inoculation of VBE23 and its coinoculation provided the highest values of fresh and dry mass of shoot and root, showing the potential of this isolate for growth promotion under drought stress.

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