



I CONGRESS ON SCIENCE, BIODIVERSITY AND SUSTAINABILITY

21-22 October 2019. UFMG, Belo Horizonte, Brazil.

EVALUATION OF TWO *Bacillus* STRAINS FOR PLANT GROWTH PROMOTION *IN VITRO*

Camila Cristina Vieira Velloso¹, Bárbara Temponi Vilarino Godinho²,
Chainheny Gomes Carvalho³, Christiane Abreu de Oliveira^{3,4}, Eliane Aparecida
Gomes⁴, Ubiraci Gomes de Paula Lana^{3,4}, Sylvia Morais de Sousa^{1,3,4*}

¹ Universidade Federal de São João Del Rei (UFSJ), São João del-Rei, MG, ² Universidade Federal de Lavras, Lavras, MG, ³ Centro Universitário de Sete Lagoas, Sete Lagoas, MG, ⁴ Embrapa Milho e Sorgo, Embrapa Milho e Sorgo, Sete Lagoas, MG

*sylvia.sousa@embrapa.br

Several abiotic factors, such as phosphorus (P) deficiency, contribute to reduce agricultural productivity in the world. Despite being available in the soil in organic and inorganic forms, P is found predominantly in immobilized and precipitated forms, while plants absorb only the soluble forms H_2PO_4^- and HPO_4^{2-} . Given the negative environmental impact of excess use of phosphate synthetic fertilizers and their rising costs, the use of beneficial soil microorganisms such as plant growth promoting bacteria appears as an efficient alternative for a more sustainable agriculture. The objective of this work was to evaluate *in vitro* the potential to solubilize P and to promote plant growth of two *Bacillus* strains isolated from the rhizosphere of P-efficient maize genotypes. The two *Bacillus* strains, B116 and B119, from the Collection of Multifunctional Microorganisms of Embrapa Milho e Sorgo were able to produce exopolysaccharides (EPS), fix nitrogen and survive in medium with water activity of 0.919. However, B119 produced higher amounts of IAA and siderophores, whereas B116 was characterized as the best biofilm producer and produced more phosphatases. Strain B116 solubilized 931.22 mg L^{-1} and B119 925.53 mg L^{-1} of phosphate. Strain B116 reached maximum phosphatase production in 48 h, while B119 required 96 h to reach the same point. The P-solubilization and growth promotion capacity of these two *Bacillus* strains suggested that association with these bacteria might benefit plants, as they have potential to enhance nutrient acquisition and increase stress resistance. Interest in plant growth promoting bacteria has increased considerably due to its potential to minimize the effect of abiotic stresses on crops of agricultural interest using a more sustainable approach.

Financial support: Embrapa, Capes and CNPq.