

TITLE: Detection of phosphate solubilization, 3-IAA production, amylase and phosphatase activity in *Azospirillum* sp. isolated from *Jacaratia corumbensis* O. KUNTZE

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Azospirillum is a genus of plant growth promoting rhizobacteria widely studied and used as an agricultural inoculant. The interaction of plant growth promoting bacteria of the genus *Azospirillum* sp. with plants have shown important results due to beneficial effects such as biological nitrogen fixation, phytohormone production, phytopathogenic antagonism, phosphate solubilization and enzyme production. The objective of this study was to detect in bacteria of the genus *Azospirillum* sp. isolated from *Jacaratia corumbensis*, the solubilization of calcium and aluminum phosphates; indolacetic acid production (3-IAA); amylolytic activities, acid and alkaline phosphatases. The assays were performed with 50 isolates, for the phosphate solubilization assays were conducted in GL medium. To evaluate the production of 3-IAA the isolates were inoculated in culture medium with DL-tryptophan and without DL-tryptophan. To verify the amylolytic activity, the isolates were inoculated in YMA solid medium, with addition of starch. The enzymatic index was measured using the formula IE: halo diameter / colony diameter. To evaluate the production of acid phosphatase the isolates were inoculated in saline medium, correcting the pH to 7.4. The plates were incubated for 2 to 3 days at 28° C. The positive result was verified by the formation of a translucent area around the colony. The diameter of the colonies was measured and then the plates were flooded with p-nitrophenylphosphate solution to acid phosphatase and incubated at 37° C for 90 minutes. After this period, the diameter of the yellow halo formed by the transformation of the p-nitrophenylphosphate, resulting from the acid phosphatase activity, was also measured. The ratio between the two diameters was the index adopted to evaluate the ability of the microorganism to produce the enzyme phosphatase. Among the isolates evaluated, eight isolates presented solubility of phosphorus solubilization index between 1.37 ± 0.09 and 1.87 ± 0.18 cm; 18 were able to produce indoleacetic acid in culture medium plus DL-tryptophan, ranging from 3.82 ± 0.21 to 21.28 ± 0.9 µg / mL. As for enzyme production, 32 isolates showed amylolytic activity with enzymatic index between 1.83 ± 0.36 and 4.5 ± 0.33 cm. Twelve isolates showed acid phosphatase activity between 1.32 ± 0.11 and 3.99 ± 0.61 µg / mL. None of the isolates was able to solubilize calcium phosphate and to produce indoleacetic acid in culture medium without DL-tryptophan. Our results are promising and reveal the potential of the isolates for phosphate solubilization and enzyme production, which stimulates the continuity of this study aiming the characterization and application of the isolates in future stages.

Keywords: Biochemical characterization, diazotrophic bacteria, plant growth promotion.

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