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# Potential application of selected phosphate solubilizing bacteria isolated from Chenopodium quinoa rhizosphere in early plant growth promotion

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***Abstract***

To meet the worldwide demand for food, smart management of arable lands is needed. This could be achieved through sustainable approaches such as the use of plant growth-promoting microorganisms including bacteria. Phosphate (P) solubilization is one of the major mechanisms of plant growth promotion by associated bacteria. In the present study, we screened 14 strains isolated from the rhizosphere of *Chenopodium quinoa* plant grown in the experimental farm of UM6P for plant growth promoting properties including their ability to solubilize phosphate, to produce indole acetic acid (IAA), and to tolerate salt stress. Next, they were identified using 16S rRNA and Cpn60 genes sequencing as Bacillus, Pseudomonas and Enterobacter. These strains showed dispersed capacities to solubilize phosphate (up to 346 mg L−1) following 5 days of incubation in NBRIP broth. We also assessed their abilities for indole acetic acid (IAA) production (up to 795,3 µg ml−1) and salt tolerance. Three Bacillus strains QA1, QA2, and S8 tolerated high salt stress induced by NaCl with a maximum tolerable concentration of 8%. Four performant isolates, S6, QA1, QA2 and QF11, were further selected for seed germination assay because of their pronounced abilities in terms of P solubilization, IAA production and salt tolerance. The early plant growth potential of tested strains showed that inoculated Quinoa seeds displayed greater germination rate and higher growth under bacterial treatments. The positive effect on seed germination traits strongly suggest that tested strains are growth promoting, halotolerant and P solubilizing bacteria which could be exploited as biofertilizers.

***Biography:***

MAHDI Ismail a third year PhD candidate in soil microbiology at the laboratory of Microbiology and Molecular Biology, Medical Application Interface Center of Mohammed VI Polytechnic University in collaboration with the Laboratory of Microbial Biotechnologies, Agrosciences and Environment (BioMAgE), Faculty of Sciences Semlalia, Marrakesh. He holds a master's degree in Biology and Health at the faculty of Sciences of Fez and a bachelor's degree in Molecular and cellular Biology at the faculty of Sciences of Agadir, Morocco. His thesis research investigation centers around plant growth promoting microbes especially halotolerant phosphate solubilizing bacteria.

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