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Resistance of actinobacteria and rhizobia from wild Saharan plants to environmental stresses and their phosphate solubilization capacity

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Plant growth promoting bacteria (PGPB) enhance plant development through various mechanisms such as the fixation of atmospheric nitrogen, production of siderophores and phosphate solubilization [1]. This could be beneficial for the implementation of more sustainable agricultural practices. The objective of this study was to evaluate the effect of temperature and salinity variation as well as to evaluate the phosphate solubilization capacity of a collection of bacteria, originating from various sites in the Algerian Sahara Desert [2,3]. These sites are affected by abiotic stresses such as wide variations in temperature range and high salinity levels, so PGPB for inoculation in these soils need to be adaptable and withstand extreme conditions. To carry out this study, the bacteria were subjected to different temperatures and concentrations of NaCl [4]. The phosphate solubilization capacity was evaluated, in the National Botanical Research Institute's Phosphate Growth (NBRIP) medium. Overall, the tested bacteria did not solubilize phosphate, since no halos were observed around the bacterial colonies. The bacteria most tolerant to a wider range of temperatures and salinities and, therefore, most promising for inoculation in semi-arid and arid soils were *Afipia sp.* 61 and *Afipia massiliensis* 21, which showed significant growth in all studied conditions. In general, it was observed that most bacteria grow at temperatures and salinities, different from their common growth range.

Keywords: Abiotic stress; actinobacteria; N₂ fixation; rhizobia-legume symbioses

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