

## ABSTRACT

Soil salinity is the major cause limiting plant productivity and growth worldwide. Beside plant growth, salinity also has an impact on microbial activity and diversity. Saline habitats have a unique microbial population, adapted to such environment. Plant growth-promoting rhizobacteria (PGPR) are beneficial bacteria that colonize plant roots and enhance plant growth by a wide variety of mechanisms. The use of PGPR is steadily increasing in agriculture and offers an attractive way to replace chemical fertilizers and supplements. In our investigation, we have isolated, screened and characterized rhizospheric and endophytic PGPR from plants in saline soil of Akrotiri Salt Lake in Limassol District, Cyprus. Bacterial isolates were screened preliminarily for their ability to grow in conditions of high salinity and also, tested for their attachment ability both in the presence and in the absence of salt. Furthermore, bacterial isolates that showed the highest growth in the presence of 5% NaCl were identified through 16S rDNA sequencing. Twenty six (26) isolates were tested for their PGPR traits such as, nitrogen (N) fixation, phosphorus (P) solubilization and indole-3-acetic acid (IAA) production. Also, the bacterial isolates were tested for protease, chitinase, cellulose, pectinase activity and for their antifungal activity against *Fusarium oxysporum* and *Verticillium dahliae*. The present study, suggests that the use of PGPR isolates as inoculants/biofertilizers is potentially beneficial for plant growth, in the presence of salt due to the production of indole-3-acetic acid (IAA), nitrogen (N) fixation, phosphorus (P) solubilization and also having antifungal activity against phytopathogenic fungi. These specific microorganisms should be further studied to test their capability to promote plant growth (*in planta*) under salinity or drought stress conditions.