

Isolation, Screening and Characterization of Plant Growth Promoting Traits of Rhizobacteria from Rhizosphere of Agricultural Crops in Eastern Himachal Pradesh

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ABSTRACT

In the recent years, the application of PGPR for reducing costs of chemical fertilizer and pesticides is widely increasing in agricultural practices and considered as safe alternative to replacing synthetic fertilizers with microbial inoculants. Hence, the present study was aimed to assess the bacterial population and PGP activity of rhizobacteria from the soils of agricultural crops in Eastern Himachal Pradesh. In the present study, bacterial count and R:S ratio were found to be higher in rhizospheric soil of agricultural crops as comparison to non rhizospheric soil. In this context, a total of twelve bacteria were isolated with the occurrence percentage of 2.16% to 89.4% and characterized for various PGP attributes in vitro. Six isolates were found to be positive for phosphate solubilization in pikovskaya agar with PSI of 5 to 17. Ten isolates produced indole-3-acetic acid in the range of 1.14 to 207 $\mu\text{g ml}^{-1}$, in the presence of tryptophan. Only two isolates were found to be positive for siderophore and HCN production and production of ammonia shown by none of the bacterial isolates. Catalase production shown by most of the soil isolates. The results suggest that presence of effective rhizobacteria with multiple PGP traits may be exploited as biofertilizers and microbial inoculants in the soils of agricultural crops as they enhanced plant growth via diverse mechanisms and also appropriate for sustainable crop management in eco-friendly manner.

Keywords: Microbial inoculants, PGPR, PSI, rhizobacteria and R:S ratio