Studies on the Isolation and Charaterization of Potential Growth Promoting Rhizobacteria from Non-Rhizhospheric Soil.

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ABSTRACT

Extensive use of fertilizers has undoubtedly brought about a steep increase in the food production, without much concern for sustainability. Only 50% of the applied fertilizer is taken up by the crop plants the rest is lost as volatilization, leaching and denitrification causing huge economic losses as well polluting the environment. Plant growth promoting rhizobacteria (PGPR) can be defined as an indispensable part of soil biota, which when grown in association with the host plants can stimulate the growth of the host. A potential bacterial strain with multiple plant growth promoting attributes was isolated and characterized. Plant growth promoting traits were evaluated by determining the P-solubilisation efficiency, Indole acetic acid production, HCN and siderophore production. The strain was found to be gram negative, exhibiting growth at 10-40°C (optimum 37°C) with a pH range of 6-12. 16S rRNA gene sequencing of the strain provided confirmation of the isolate as Pseudomonas stutzeri PIMS6. Under in-vitro conditions the isolate was found to produce indole acetic acid, P-solubilization and hydrogen cyanide, phosphate solubilization was accompanied by a decrease in pH from 7.0<3.0. Hence the Pseudomonas stutzeri strain emerged as a promising plant growth promoting bacteria showing multiple PGPR attributes. Studies on this isolate further will provide the basis for formulation and field applications.

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