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Phosphate solubilizing *Bacillus* species as potential biofertilizers

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The intensive usage of agro-chemicals is a serious concern on the security of natural resources. Agro-chemicals reduce the soil quality, increase the pathogen durability and create risks on human health and environmental safety. Consequently, in recent years the sustainable agricultural production systems are targeting the use of microbial fertilizers and organic products as biocontrol agents. Rhizobacteria (plant growth promoting rhizobacteria, PGPR) are promote plant growth by supplementing the nutrients required for plants. *Bacillus* species, due to their significant soil amendment properties, are important members of PGPR. In this study, with the aim to discover potential biofertilizers, 440 *Bacillus* isolates from soil and compost sources were screened qualitatively for phosphate solubilizing and positive isolates were processed for quantitative estimation of solubilized phosphate and organic acid production. Confirmation of organic acid production and quantitative estimation ($\text{ng } \mu\text{l}^{-1}$) was done by gas chromatography (GC). Results indicate that phosphate solubilization ranges from 6.9 ± 1.00 to $95.5 \pm 1.83 \mu\text{g ml}^{-1}$ for *Bacillus* isolates and most of the isolates are able to produced more than one organic acid. Six best phosphate solubilizing isolates were further tested for IAA production, molecular identification by 16S rDNA sequencing, in vitro seed germination and pot trails. All six strains were observed to produce IAA, significantly enhanced radicle and hypocotyl germination, considerably increase plant growth by improving development of roots and stems. On the basis of results these *Bacillus* strains can be considered as potential biofertilizers.

Biography

Fakhra Liaqat is currently doing PhD in Biotechnology at Ege University, Izmir, Turkey. She did her MPhil in Microbiology from University of Veterinary and Animal Sciences, Lahore, Pakistan. She has published 6 research articles in the microbiology field in reputed journals.

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