

Evaluation of Potassium Solubilizing Rhizosphere Bacteria: For Use as Biofertilizer in Wheat (*Triticum aestivum* L.)

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Abstract—Potassium (K) is the third major essential macronutrient for plant growth. With the rapid development of intensive agriculture, available K levels in the soils have dropped due to crop removal, leaching, runoff and erosion. Moreover, the concentration of soluble potassium in the soil is usually very low and more than 90% of potassium in the soil exists in the form of insoluble rocks and silicate minerals. Rhizosphere bacteria have been found to dissolve potassium from K-bearing minerals. In this study, total 110 bacterial isolates were obtained from rhizosphere of wheat, maize and cotton on modified Aleksandrov medium containing mica powder as potassium source. Fifty isolates showed efficient potassium solubilization on mica supplemented plates. These potassium solubilizing strains were tested for different plant growth promoting activities like phosphorus solubilization, IAA production, ACC utilization, antifungal activity and siderophore production. These selected strains showed IAA production in a range of 3.25 to 12.48 µg/ml. Thirty strains were efficient phosphorus solubilizer and 12 strains showed good antifungal activity. ACC utilization was observed in 30 rhizobacterial strains and 11 strains showed siderophore production. On the basis of these beneficial activities, two best strains SMP27 and SMP54 were selected for strain improvement by using nitrosoguanidine mutagen. Mutants having increased/low potassium solubilization ability will be tested for growth improvement of wheat under pot house conditions.