

IN VITRO ASSESSMENT OF PLANT GROWTH PROMOTING POTENTIAL OF *KLEBSIELLA PNEUMONIAE*, *BACILLUS AMYLOLIQUEFACIENS* AND *BACILLUS SP.*

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ABSTRACT

Biosynthesis of Indole-3-acetic acid (IAA), phosphate solubilization and siderophore production plays most important role in the plant growth promotion. The present study aimed to investigate the effect of various concentrations (5µg/ml, 10µg/ml, 25 µg/ml and 40µg/ml) of zinc compounds like ZnCl₂, ZnSO₄·7H₂O, ZnO and CH₃COOZn on the IAA production by six rhizobacterial strains namely MR-M1, MR-AI, MR-SP, RR-R2, WR-W2 and MR-Z1 under *in vitro* conditions. To study siderophore biosynthetic potentials on the basis of orange/yellow halo zone formation, isolates were grown onto JNFb and basal medium containing 1µM of FeCl₃. JNFb medium was observed as the most suitable medium for siderophore production. More than two fold stimulation of IAA production was observed in presence of zinc compounds. The highest level of IAA was recorded in presence of ZnSO₄ as compared to other zinc compounds. Strain *Bacillus subtilis* WR-W2 followed by strain *Klebsiella pneumoniae* MR-M1 was observed as the most efficient strain in terms of their capability to produce siderophore. However, strain *Klebsiella pneumoniae* MR-M1 was observed as the best IAA producer and phosphate solubilizer as compared to other *Bacillus sp.* MR-AI, MR-SP, RR-R2, WR-W2 and MR-Z1. Altogether, *Klebsiella sp.* and *Bacillus sp.* reveal multiple beneficial properties for plant growth promotion that could be further applied as bioinoculums in different formulation in crop fields for sustainable agriculture.

KEYWORDS: Plant Growth Promoting Rhizobacteria, Siderophore Production, Zinc