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Phosphate Solubilization by *Klebsiella Oxytoca* under Heavy Metal Stress

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Abstract

Isolation and identification of microorganisms which can display plant growth promoting properties under metal stress is important in making use of metal contaminated lands for agricultural purposes. A heavy metal resistance bacteria was isolated from abandoned mines in Daejeon, South Korea and identified as *Klebsiella oxytoca* using 16S rRNA sequence analysis. Phosphate solubilization of the bacterial isolate was assessed with five different heavy metals (Cu, Zn, Co, Cd and Pb) at the 200 µg/ml concentration. Phosphate solubilization measured as the amount of phosphorous released into the medium was recorded as 861 µgml⁻¹ and 804 µgml⁻¹ in control medium and Zn treated medium respectively. Results further indicated that there were no significant differences in phosphate solubilization between control and Zn treated medium (6.7% reduction). However, phosphate solubilization was found to be severely affected by Cu, Co, Cd and Pb resulting in 57.7%, 63.7%, 60.8% and 91% reductions respectively compared with the control. It could be concluded that the isolated strain showed higher resistance to Zn, moderate resistance to Cu, Co, Cd and susceptible to Pb.

Keywords: Isolation, *Klebsiella oxytoca*, Heavy metal, Phosphate solubilization