

# Characterization and Bioremediation Efficacy of Arsenic Resistant Bacteria Isolated from Contaminated Soil

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## ABSTRACT

Arsenic (As) is a naturally occurring metalloid widely distributed in environment. Since it is a carcinogen, there is a high level of interest in developing inexpensive methods aimed at cleaning up or detoxifying As contaminated soil with minimal environmental side effects. This study was done to isolate As-resistant bacteria from As contaminated soils of Ramnagar (22°20.050' N, 88°28.589' E), S-24 Parganas, West Bengal, to be used for possible bioremediation processes. Fourteen morphologically different As resistant bacteria were isolated and their As (III) and As (V) resistance were evaluated by maximum tolerable concentration (MTC) tests. Among the isolates SR1, SR2 and SR12 showed higher MTC of 10 mM to 20 mM in As(III) whereas, SR1, SR4, SR10 and SR12, showed values equal or greater than 250 mM in As (V). Scanning electron microscopy was carried out in order to investigate the effects of As on cellular morphology. The Energy dispersive X-ray spectroscopy study proved that there was intracellular accumulation of As within the bacterial cell. The detailed biochemical characterization showed that these bacteria can be potent source of various biotechnologically important enzymes. Furthermore, the presence of possible interaction between bio remediating bacteria and indigenous microbial consortia of the contaminated soil indicated the need for further refined studies.

**Keywords:** Arsenic, Bioremediation, Maximum tolerable concentration, Bacteria