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Isolation and Identification of Heavy Metals Tolerant Bacteria from Industrial and Agricultural Areas in Kerala



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Abstract :

Heavy metals have a crucial role in the metabolic processes of the biota. Although some of them act as essential micronutrients for living beings, at higher concentrations they can lead to severe poisoning and will be introduced into food web through different mechanisms. Heavy metal contamination thus poses a serious threat to both the ecosystem and human and requires expensive clean up costs. Bacteria have evolved uptake and efflux mechanisms to adapt in heavy metal contaminated environment and thus represent a potential source for bioremediation of polluted environment. The major goal of the study was to isolate and characterize bacteria that are able to accumulate heavy metals like copper, zinc, lead, silver, mercury from industrial and agricultural areas. Among the isolates, two efficient strains of bacteria that showed profuse growth pattern on heavy metals incorporated media were selected for further studies. The Minimum Inhibitory Concentration (MIC) of bacterial strains against various heavy metals was studied. The antibiotic sensitivity assay was done to evaluate the antibiotic resistance of bacterial strains. By biochemical analysis and bacterial identification software, the strains were found to be *Bacillus megaterium* and *E.coli* respectively. Further, molecular characterisation of the samples was done. For this, Genomic DNA was isolated and amplified with eubacterial primers for 16S rDNA gene. The sequences of amplicons were then compared using BLAST software which established the above observation.

Keywords:

Heavy metals, Heavy metal tolerant bacteria, 16S rDNA, BLAST, Bioaccumulation, MIC.

