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BIOREMOVAL OF TRIVALENT CHROMIUM USING INDIGENOUS *Bacillus* species – A BIOFILM BASED APPROACH

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Abstract

Heavy metal pollution is a major source of aquatic contamination and has deleterious effect on the environment, therefore treatment of the polluted sites and wastewater becomes very essential. Biofilm based bioremoval of heavy metals have been a new area of research. Bacterial strains belonging to the genus *Bacillus*, isolated from chromium polluted soil (Palar river basin, India) have been employed as consortium for Cr(III) removal from chrome tanning effluent. The bacterial isolates were found to be *Bacillus subtilis* VITSCCr01 and *Bacillus cereus* VITSCCr02 by 16s rRNA gene sequencing. Kaolin clay was used as a supporting material for bacterial biofilm formation. Incorporation of 0.25 % MgSO₄ to the growth medium resulted in effective biofilm formation. Scanning electron microscopy and Confocal laser scanning microscopy results reveal thicker and denser biofilm formation with kaolin as support. The mechanism of sorption was confirmed by FT-IR and SEM-EDS. Bacterial biofilm prepared using low cost adsorbents like kaolin and bacteria proves to be effective for Cr(III) removal, especially when the metal ion concentration is ≤ 100 mg/L. This work promotes a feasible sorption method for Cr(III), which leaches out during leather processing.

Key words: Cr(III), *Bacillus subtilis* VITSCCr01, *Bacillus cereus* VITSCCr02, biofilm

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