

BIOREMEDIATION BY FREE AND IMMOBILIZED BACTERIA ISOLATED FROM TANNERY EFFLUENT

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ABSTRACT

The effect of free and immobilized cells of effluent tolerant bacteria isolated from the tannery effluents of Vaniyambadi to treat effluent water was studied. Two bacterial strains were isolated from tannery waste water and identified as *Pseudomonas putida* and *Bacillus cereus*. The level of turbidity and other Physico-chemical parameters found to decrease from high to moderate or optimum level in the effluent treated with free and immobilized cells of both isolated strains whereas, the pH was increased from 6.5 to 7.0. The percentage reduction of free CO₂, total alkalinity, hardness, dissolved oxygen, Nitrate and Nitrite was ranged from 45 to 75% when treated with *P. putida*, whereas they were ranged from 60 to 79% in the 15th day of the treatment. The level of BOD was reduced drastically after 15th day of exposure by the free cells of both bacteria. The maximum percentage of reduction (83%) was shown by immobilized *B. cereus*. The percent reduction of COD ranged from 16% to 65% in both the bacterial strains. The percentage of removal of Cr (VI) was 86 and 91% for free and immobilized cells respectively. In *B. cereus* treated sample, it reached 84% and 89% at the 15th day respectively. It is concluded that both *P. putida* and *B. cereus* investigated in this study are highly recommended for beneficial bioremediation applications for in-situ and off-site removal of pollutants.

KEYWORDS: Tannery Effluent, Immobilization, Vaniyambadi, Bioremediation