

Biotransformation of hexavalent chromium by indigenous microbes

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The Chromium, in the trivalent form (Cr (III)), is an important component of a balanced human and animal diet and its deficiency causes disturbance to the glucose and lipids metabolism in humans and animals. In contrast, hexavalent Cr (Cr (VI)) is highly toxic carcinogen and may cause death to animals and humans if ingested in large doses. Recently, concern about Cr as an environmental pollutant has been escalating due to its build up to toxic levels in the environment as a result of various industrial and agricultural activities. Majority of the tannery industries are located in Ambur, Vaniyambadi, Walajapet and Thirupattur areas of Vellore district, Tamil Nadu. The industries are disposed the tannery waste into soil and near the Palar river basin. Palar river basin is the primary source of drinking water for the residents of Vellore district, Tamil Nadu. Large amounts of Cr found in groundwater and as well as soil ecosystem. The water quality parameters in the area are found to be above the WHO permissible limits (0.05 mg L^{-1}). Based on the basic survey on tanneries and its pollution in the Vellore district, our studies focused on bio-remediation of tannery contaminated soil. Cr resistant microbes were isolated from contaminated soil and characterization was done by biochemical method. The cultures were evaluated with hexavalent chromium reduction in soil. The three microbial cultures were identified from contaminated soil (*Pseudomonas fluorescens*, *Aspergillus niger* and *Trichoderma viride*). The percent reduction ranged from 39 to 79 by *Pseudomonas fluorescens*, 30.8 to 58.4 by *Trichoderma viride* and 50.3 to 83.4 by *Aspergillus niger*. Among the three native isolates, the *Aspergillus niger* was found relatively superior to *Pseudomonas fluorescens* and *Trichoderma viride* in reducing the Cr VI in soil.

Biography

I completed my PhD programme during June 2012 at Tamil Nadu Agricultural University. Presently I am working as Senior Research Fellow in the Department of Environmental Science, Tamil Nadu Agricultural University, Coimbatore. My area of research for my PhD was on Bioremediation of chromium contaminated soils due to tannery wastes disposals. I have worked extensively on the chemistry of chromium transformation in soil. I have passed National Eligibility Test conducted by ASRB-UGC (Agricultural Scientist Recruitment Board). I have published two research papers and one book chapter. I also have to my credit four and half years of research experience.

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