

Chromium Reduction Using Bacteria: Bioremediation Technologies

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Abstract : Bioremediation is the demand of the day. Tannery and textile effluents/waste waters have lots of pollution due to presence of hexavalent Chromium. Methodologies used in the present investigations include isolation, cultivation and purification of bacterial strain. Further characterization techniques and 16S rRNA sequencing were performed. Efficient bacterial strain capable of reducing hexavalent chromium was obtained. The strain can be used for bioremediation of industrial effluents containing hexavalent Cr. A gram negative, rod shaped and yellowish pigment producing bacterial strain from tannery effluent was isolated using nutrient agar. The 16S rRNA gene sequence similarity indicated that isolate SA13A is associated with genus *Luteimonas* (99%). This isolate has been found to reduce 100% of hexavalent chromium Cr (VI) (100 mg L⁻¹) 100% in 16 h. Growth conditions were optimized for Cr (VI) reduction. Maximum reduction was observed at a temperature of 37 °C and pH 8.0. Additionally, *Luteimonas aestuarii* SA13A showed resistance against various heavy metals like Cr+6, Cr+3, Cu+2, Zn+2, Co+2, Ni+2 and Cd+2 . Hence, *Luteimonas aestuarii* SA13A could be used as potent Cr (VI) reducing strain as well as significant bioremediator in heavy metal contaminated sites.

Keywords : bioremediation, chromium, eco-friendly, heavy metals

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