ABSTRACT

Contamination of environment is increasing day by day due to unsustainable resource utilization and releasing tons of untreated effluents from industries. Different strategies to cope environmental pollution are being applied and bioremediation has shown promising results in this respect. Current study is aimed to isolate Chromium (Cr) resistant bacteria, their characterization on molecular basis and finding their role in bioremediation of chromium from the effluent water of leather processing units in Sialkot, Pakistan. Two bacterial strains Cr-S1 and Cr-S2 were isolated on Cr^{+6} enriched nutrient agar plates at the concentration of 100µg/ml. Minimum inhibitory concentration of chromium for Cr-S1 was 500µg/ml while for Cr-S2 was 400 µg/ml. Maximum growth of Cr-S1 and Cr-S2 was noticed at 37°C and at 8.0 and 7.0 pH, respectively. After careful phenotypic and biochemical characterization, confirmation was done by 16S rRNA gene amplification and sequencing. Partial sequencing results of 16S rDNA of Cr-S1 showed 97% homology with *Bacillus thuringiensis* while Cr-S2 showed 99% homology with *Bacillus pumilus*. Both the bacterial strains *B. thuringiensis* (Cr-S1) and *B. pumilus* (Cr-S2) were assessed for their bioremediation potential in culture medium containing 100µg/ml of chromium showed 87.04% and 90.1% Cr uptake at 37°C within 24 hours. Our research suggests use of *B. thuringiensis* and *B. pumilus* to remove elevated levels of, not only, Cr but also other heavy metals from polluted waters from industry.