ISOLATION, IDENTIFICATION AND SCREENING OF CHROMIUM RESISTANT BACTERIA

J.H.G. Abewickrama, I.V.N. Rathnayake, D.L. Jayarathne and M.M. Gunawardane

Department of Microbiology, Faculty of Science, University of Kelaniya Sri Lanka
Corresponding author: hasitha.abewickrama@gmail.com

This study was carried out in order to select Cr (VI) resistant bacteria. Morphologically different bacteria were isolated from tannery effluent water from Mattakkuliya, Sri Lanka. Pour plate technique was used to isolate different bacterial species. Pure cultures were obtained by repeated streaking on nutrient agar plates. Initial identification was carried out using morphological, cultural, Gram's staining, Endospore staining and biochemical characteristics. Three cultures were identified as morphologically different *Bacillus* isolates and other one showed biochemical characteristics (Gram negative, motile, Citrate positive, Methyl red negative, Voges Proskauer negative, Catalase positive, Oxidase positive, blue color pigment production) of genus *Pseudomonas*. One *Bacillus* isolate contained endospores while other two did not contain endospores. All the isolates were tested for Cr (VI) tolerance using Tris minimal medium. The Cr (VI) concentration range was selected as 0.25, 0.5, 1.0, 2.0 and 5.0 mg/L that were around the tolerance limits (0.5 mg/L) for effluents being discharged from tanning industry specified by the Central Environmental Authority, Sri Lanka. Single colonies obtained from each culture were grown in Luria Bertani medium overnight. The cell pellets taken from centrifugation were re-suspended in Tris minimal broth containing tube to have the equal number of cells to each inoculum. After inoculation to each broth medium, growth of bacteria was measured as Absorbance at 600 nm after 24, 48, 72, 96 hour time intervals for each different concentration. The growth curves were plotted and survival percentages were calculated per bacterial culture. According to the results two *Bacillus* isolates were selected as Cr (VI) resistant bacteria as a 50 % population could tolerate 5.0 mg/L within a period of 96 hours. The other *Bacillus* culture was a Cr (VI) sensitive bacterium since it reduces its survival percentage less than 25 % towards the latter part of the growth curve. Accordingly, two *Bacillus* cultures and one *Pseudomonas* sp. were identified as the bacterial isolates which could tolerate Cr (VI) and one *Bacillus* isolate was sensitive to Cr (VI).

Keywords: *Bacillus* sp., Cr (VI) resistant bacteria, *Pseudomonas,* Tannery effluent