

Assessment of Manganese biosorption efficacy of *Bacillus subtilis* and *Pseudomonas aeruginosa* isolated from waste dump site

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Abstract

This study was carried out to assess Manganese removal efficiency of Bacillus subtilis and pseudomonas aeruginosa isolated from Waste Dump site. Parameters affecting the biosorption of heavy metals such as pH, Biomass Concentration, Contact time, Incubation Temperature and Initial Metal concentration were investigated. The percentage biosorption was highest on the 28 day with percentage biosorption of 78.4% for Bacillus subtilis and 80.2% for Pseudomonas aeruginosa. The optimum biosorption pH was found to be pH 5 with sorption percentage of 76.3% and 80.2% for Bacillus subtilis and Pseudomonas aeruginosa respectively. 2ml biomass concentration shows the highest sorption rate with sorption percentage of 72.4% and 65.3% for Bacillus subtilis and Pseudomonas aeruginosa respectively. When effect of temperature was taken as a parameter the sorption optimum temperature was found to be 37°C with sorption percentage of 78.4% for Bacillus subtilis and 89.5% for pseudomonas aeruginosa. The sorption rate was highest at 5ppm initial metal concentration with biosorption percentage of 79.9% and 69.2% for Pseudomonas aeruginosa and Bacillus subtilis respectively. Pseudomonas aeruginosa was found to be more effective in manganese removal than Bacillus subtilis. The results obtained suggests that Pseudomonas aeruginosa possess better biosorption ability and could be used in the removal of Manganese from the environment.

Keywords: Biosorption, Manganese, pH, Incubation temperature, Contact time.

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