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CHROMIUM BIOREMOVAL FROM TANNERY INDUSTRIES EFFLUENT BY ASPERGILLUS ORYZAE

M. Nouri Sepehr, S. Nasserri, M. Mazaheri Assadi K. Yaghmaian

Abstract:

Recently laboratory studies had recognized the capability of alge, fungi, and bacteria in the removal of heavy metals from industrial effluent. In this research, growth of *Aspergillus oryzae* in the tanning house effluent, and its capability in chromium bioremoval were assessed. *Aspergillus oryzae* can grow in different concentration of Cr+, 120-1080 mg/l. Maximum biomass growth and chromium removal rate at pH, 3.3, Cr+3 concentration equal to 240 mg/l and inoculum size equal to 0.12% (dry weight) were 0.25% (dry weight) and 94.2%, respectively. Effects of various factors such as pH, temperature, shaking velocity and nutrients were also investigated. At optimum conditions (ie: pH=5; temperature=30°C, shaking velocity = 150 rpm, and nitrogen source of dihydrogen ammonium phosphate concentration=0.3%), biomass growth and chromium removal rate were found as 0.45% of dry weight and 99.8%, respectively. Effect of detention time showed that after 30h, biomass growth and chromium removal rate were 0.28% and 97.6%, respectively. Statistical studies on factors such as pH, temperature, shaking velocity, type and concentration of nutrients on the "biomass growth" and "residual chromium", showed that all of the factors had significant effects ($\alpha = 0.05$, $P < 0.001$). Therefore *A.niger* capable grow in the tannery industries effluent with 240 mg/l chromium and 97.6% chromium removal rate .

Keywords:

Tannery industries effluent . bioremoval . *aspergillus oryzae*

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