Biosorption of Copper Ions by Schizophyllum Commune

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Heavy metal (HM) pollution has become a great issue over the last decades, because it endangers human's health. Drinking water is one of the major routes, by which HM get into human's body. HM biosorption by wastes of agriculture, algae and bacteria biomass, has been studied as a promising alternative to physical and chemical methods of waste water treatment. Biosorption by fungi is a less examined process. The aim of this study was to investigate copper ions biosorption by submerged mycelium of the wood rotting fungus Schizophyllum commune, which is the waste of polysaccharide Schizophyllan production in Contipro Biotech company. S.commune mycelium was derived from submerged cultivation in laboratory bioreactor in amount 23 g/L. The mycelium absorbed 0.07 ± 0.02 mMol/g Cu2+ from aqueous solution. The sorption capacity increased more than 4 times (0.30 ± 0.06 mMol/g) after mycelium hot alkaline extraction (25% NaOH, 90 °C, 3 h). Hereby acquired biosorbent CGC I absorbed Cu2+ in the range of pH 2.0-5.0, while the sorption capacity increased with raising pH. CGC I was saturated with copper ions within the first 2.5 minutes of sorption; then, the amount of absorbed Cu2+ remained in dynamic equilibrium. CGC I was able to absorb Cu2+ at low concentrations of copper ions (32 mg/L) but the sorption capacity decreased with decreasing concentration of the ions. The waste of Schizophyllan biotechnological production, S. commune submerged mycelium, can be used to prepare biosorbent CGC I, which effectively removes copper ions from drinking water.

Awards Won:

Third Award of $1,000