

*Full Length Research Paper*

## **Biosorption characteristics of *Aspergillus fumigatus* in removal of cadmium from an aqueous solution**

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Nineteen fungal species were isolated from soil contaminated with industrial wastes of which *Aspergillus* species were the most dominant. The growth of the isolates was notice by Cd concentration in growth medium, thus about 20% of the isolates can grow up to 50 mg Cd/100 ml medium and only *Aspergillus fumigatus* and *Penicillium chrysogenum* can grow at 100 mg Cd with growth decrease of 88.2 and 99.4%, respectively. The results revealed that the living biomass of the isolates were more efficient to biosorb Cd than their dried powdered biomass by 15 - 44%. The formulation of yeast peptone glucose (YPG) medium fortified the isolates by ingredients favored the best growth yields that have the highest Cd biosorption, compared to yeast malt extract (YM) and sabourad (Sb) media. The dried *A. fumigatus* biomass was the most efficient than other tested fungi. The influence of different treatments of dried *A. fumigatus* biomass on its Cd biosorption activity, indicated that 0.5 N NaOH and autoclaving was the most efficient treatment (3 fold increase as compared to untreated). The biosorption of Cd by treated *A. fumigatus* biomass was considerably influenced by the pH value of the biosorption medium, contact time, biomass levels and Cd concentration. Thus, 98% of Cd was absorbed in biosorption medium containing 10 mg Cd and 100 mg dried treated biomass/100ml bidistilled water at pH 5 after 90 min of contact, nitric acid (0.05 N) was the best Cd eluent (99.8%) as compared to the other eluents. The desorbed *A. fumigatus* biomass was successfully reused for 5 consecutive times for Cd biosorption with decrease reached to 28% at the 5<sup>th</sup> reuse.

**Key words:** Biosorption, cadmium, *Aspergillus fumigatus*, industrial wastes, biomass.