

An in vitro study on the adsorption, absorption and uptake capacity of Zn by the bioremediator *Trichoderma atroviride*.

Abstract

The concentrations of Zn in the sediment of a polluted river at the Serdang Industrial Area were determined. These polluted sediment samples revealed high level of Zn (219.27 µg/g). Isolation of fungi from this polluted sediment was also carried out using Rose Bengal Agar (RBA). The isolated fungi were exposed to different concentrations of Zn (0-6000 mg/L) on Potato Dextrose Agar (PDA) to find the most tolerant isolate. *Trichoderma atroviride* was found to have the highest tolerance and it was studied for growth rate, Zn uptake capacity, its tolerance to Zn and also localization of Zn by using Potato Dextrose Broth (PDB) as the liquid culture medium. In the present study the results found out that the uptake capacity of *T. atroviride* ranged from 18.1-26.7 mg/g in liquid media at Zn concentrations from 500 to 1000 mg/L. The isolate showed 47.6-64% adsorption and 30.4-45.1% absorption for Zn. Based on the present study, 5.7-7.4% of Zn removal was observed due to biomass washing. The high adsorption, relatively low absorption and high uptake capacity of Zn suggest that *T. atroviride* is a potential bioremediator of Zn. However, further studies are needed to confirm its practical use as a bioremediating agent for Zn under field conditions.

Keyword: *Trichoderma atroviride*; Bioremediation; Adsorption; Absorption; Zn.