

Tolerance and biosorption of copper (Cu) and lead (Pb) by filamentous fungi isolated from a freshwater ecosystem.

ABSTRACT

Filamentous fungi are able to accumulate significant amount of metals from their environment. The potential of fungal biomass as agents for biosorption of heavy metals from contaminated sediments is currently receiving attention. In the present study, a total of 41 isolates of filamentous fungi obtained from the sediment of the Langat River, Selangor, Malaysia were screened for their tolerance and uptake capability of copper (Cu) and lead (Pb). The isolates were identified as *Aspergillus niger*, *A. fumigatus*, *Trichoderma asperellum*, *Penicillium simplicissimum* and *P. janthinellum*. *A. niger* and *P. simplicissimum*, were able to survive at 1000 mg/L of Cu(II) concentration on Potato Dextrose Agar (PDA) while for Pb, only *A. niger* survived at 5000 mg/L concentration. The results showed that *A. niger*, *P. simplicissimum* and *T. asperellum* have a better uptake capacity for Pb compared to Cu and the findings indicated promising biosorption of Cu and Pb by these filamentous fungi from aqueous solution. The present study was also determined the maximum removal of Cu(II) and Pb(II) that was performed by *A. niger*. The metal removal which occurred at Cu(II) 200 mg/L was (20.910 +/- 0.581) mg/g and at 250 mg/L of Pb(II) was (54.046 +/- 0.328) mg/g.

Keyword: Biosorption; Copper; Lead; *Aspergillus niger*; *Penicillium simplicissimum*; *Trichoderma asperellum*.