

Tolerance and biosorption capacity of Zn²⁺, Pb²⁺, Ni³⁺ and Cu²⁺ by filamentous fungi (*Trichoderma harzianum*, *T. aureoviride* and *T. virens*)

ABSTRACT

Heavy metal pollution has become a serious environmental issue in the last few decades. There is a need to develop potential technology that can remove toxic heavy metals ions found in polluted environments. This study was undertaken to determine the resistance levels of different concentrations of heavy metals using filamentous fungi of *Trichoderma aureoviride*, *T. harzianum*, and *T. virens*. Based on the results, the *T. virens* strain T128 gave the highest tolerance ability for Ni³⁺ and Pb²⁺ in a 1200 mg/L concentration. The accumulation and uptake capacity was determined by the maximum removal of Pb²⁺, Cu²⁺, and Ni³⁺ by a *T. harzianum* in liquid medium when compared to other fungi. The metal removal occurred at a concentration of 500 mg/L and was 13.48 g/g for Pb²⁺, 3.1254 g/g for Cu²⁺ and 0.8351 g/g for Ni³⁺. For Zn²⁺, the highest tolerance and uptake capacity of metal was recorded at 3.1789 g/g by *T. virens*.