Heavy metal accumulation in trees on an abandoned mine tailing in southwestern Japan

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Abstract

Phytoremediation is a general term for technologies cleaning heavy metal pollution of water and soil using plant's metabolism. Hyperaccumulator plants heavily absorb heavy metals compared to other normal plants and can be used efficient and sustainable cleaning environmental pollution without civil engineering works. The purpose is to study on the absorption of heavy metals of collected trees and soils at an abandoned mine tailing site polluted by heavy metals in Japan. The tree samples are analysed by PIXE, and the soil samples are analyzed by PIXE and ED-XRF. The average concentrations of heavy metals of the soils are 673 mg Cu/ kg-DW, 2,090 mg As/kg, and 1,820 mg Pb /kg-DW. The maximum concentration of roots of Pinus densiflora had 1,560 mg Cu/kg-DW and 688 mg Pb/kg-DW. Root of Rhododendron reticulatum had 690 mg Cu/kg-DW in maximum. The Pinus densiflora have the possibility use for phytoremediation.