

THE UPTAKE OF CADMIUM AND LEAD FROM SOLUTION AND INFLUENCE ON PLANTS TRANSPIRATION IN RHIZOFILTRATION PROCESS

VLIV KADMIA A OLOVA NA TRANSPIRACI ROSTLIN V PROCESU RHIZOFILTRACE A JEJICH ODBĚR Z ROZTOKU

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Abstract:

The effectiveness of heavy metal removal from contaminated solution by aquatic macrophytes *Pistia stratiotes* L. was estimated in this study. The influence of cadmium (3.5 mg L^{-1} and 10.5 mg L^{-1}) and lead (25 mg L^{-1} and 125 mg L^{-1}) on plant stress symptoms was observed through the transpiration rate determination over 14 days of the experiment. Chemical interactions were predicted by Visual MINTEQ. The accumulation of Pb affected by ZIP protein activity in plant tissues was the highest during the first 4 days and was more than 10 times higher in the roots ($42,862 \text{ mg kg}^{-1}$) than in the leaves ($3,867 \text{ mg kg}^{-1}$). The accumulation of Cd under micronutrient deficiency increased gradually over the experiment. Concentrations in roots ($3,923 \text{ mg kg}^{-1}$) were roughly 6 times higher than in the leaves (624 mg kg^{-1}). Results showed a short term negative influence on the transpiration rate under Pb treatments and short term positive effect under Cd treatments.

Keywords:

Heavy metal; accumulation; *Pistia stratiotes*; transpiration