

C  
581  
KAR

A COMPARATIVE SURVEY OF BIOACCUMULATION OF  
SOME METALLIC IONS SUCH AS  $\text{Cu(II)}$ ,  $\text{Cr(VI)O}_4^{2-}$  BY  
THE AQUATIC FERN – *Azolla pinnata*

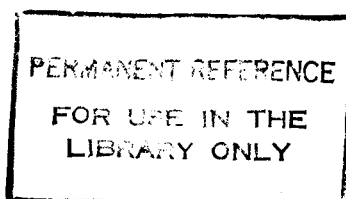
A PROJECT REPORT PRESENTED

BY

H.W.C.C. KARUNARATNE

✓

to the



POSTGRADUATE INSTITUTE OF SCIENCE

*in partial fulfillment of the requirement*

*for the award of the degree of*

MASTER OF SCIENCE

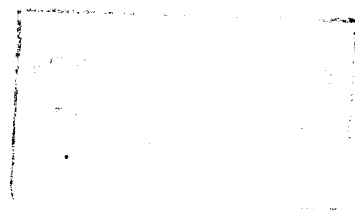
of the

UNIVERSITY OF PERADENIYA

SRI LANKA

JUNE 2000

539761



### ABSTRACT

Plants of *Azolla pinnata* were treated with six different concentrations of Cu(II) and Cr(VI)O<sub>4</sub><sup>2-</sup> (0.5, 1.0, 2.0, 3.0, 4.0, and 5.0 mg dm<sup>-3</sup>) for 48, 72, 168 hours under laboratory conditions. Accumulation of Cu(II) and Cr(VI)O<sub>4</sub><sup>2-</sup> by *Azolla pinnata* was studied. Cu(II) accumulation was greater than that of Cr for *Azolla* plants. The plants showed ability to reduce 5.0 mg dm<sup>-3</sup> Cu background concentration to below 0.03 mg dm<sup>-3</sup> within 168 hours. The Cr(VI)O<sub>4</sub><sup>2-</sup> concentration of 5.0 mg dm<sup>-3</sup> was reduced to below 0.14 mg dm<sup>-3</sup> in 168 hours. Cysteine synthesis was greater under Cu than Cr stress condition. The Chlorophyll content in plants decreased non-significantly with an increase in Cu(II) and Cr(VI)O<sub>4</sub><sup>2-</sup> concentrations and duration of exposure. The results suggest that an increase in cysteine by Cu(II) and Cr(VI)O<sub>4</sub><sup>2-</sup> treatment at the initial exposure period are part of the overall expression of Cu(II) and Cr(VI)O<sub>4</sub><sup>2-</sup> tolerance in the plant, and the decrease in Chlorophyll content is a consequence of Cu(II) and Cr(VI)O<sub>4</sub><sup>2-</sup> toxicity at higher metal concentrations and increased period of exposure.