

THE PROSPECT OF *Avicennia marina* IN SEDIMENT REMEDIATION FROM TOXIC ELEMENTS: A CASE STUDY IN EASTERN SRI LANKA

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Varieties of mangrove plants are investigated in phytoextraction potentiality of probable toxic elements considering the different regions of the world which are controlled by the prevailing environmental and climatic conditions. Yet, the eastern coastal environments of Sri Lanka are rich in natural vegetation, a very few studies have been carried out to investigate the phytoextraction potentiality of Sri Lankan mangrove species. The present study aimed to estimate the phytoextraction potentiality of selected six heavy metals in readily available mangrove species (*Avicennia marina*) in Batticaloa Lagoon and Uppar Lagoon of the eastern coast of Sri Lanka. A batch experiment was conducted considering the concentrations of As, Cd, Cr, Cu, Ni and Pb in three similar extent plants in each lagoon. The root sediments and plant parts including roots, stem below water, stem above water and leaves were considered in order to identify the above trace metal concentrations using Inductively Coupled Plasma Mass Spectrometry. The average toxic element concentrations in sediments are in the order of Cr (58.97 ppm) > Ni (39.20 ppm) > Cu (25.57 ppm) > Pb (10.56 ppm) > As (0.95 ppm) > Cd (0.14 ppm). The content of Ni is above the Effect Range -Low (ERL) in marine sediments indicating its rare adverse effects on biodiversity whereas other elements are below the ERL values. The concentration of considered toxic metals in different parts of *Avicennia marina* shows higher values in stem parts for Cd and Pb while all other elements show that in roots. The Bio Concentration Factor (BCF) of below water plant parts (roots and stem) were in order of Cr > As > Ni > Cu > Pb > Cd indicating significant phytoextraction potentiality for the study area compared to the previous studies in different regions of the world. The root to leaf translocation factors (TF) are in order of Pb (0.97) > Cu (0.91) > Ni (0.74) > As (0.69) > Cd (0.68) > Cr (0.54) indicating the high capacity of *Avicennia marina* to store the metals. Hence, the present study recommends the applications of *Avicennia marina* in soil remediation from non-essential toxic elements such as Pb, Cd and As for Sri Lankan coastal environments.

Keywords: *Phytoextraction, Avicennia marina, probable toxic elements, eastern Sri Lanka*

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