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Potential of a sea grass *Thalassia hemperichii* as a biofilter for selected heavy metals (Cu, Pb) in coastal environment

T.G.I.P Amaranayaka[1], H. B. Asanthi[2] and R.G.A. Iroshini[1]

[1]*Department of Oceanography and Marine Geology, University of Ruhuna, Matara, Sri Lanka.*
[2]*Department of Limnology, University of Ruhuna, Matara, Sri Lanka.*

Sea grasses are submerged flowering plants in shallow coastal waters and play a significant role in the near shore dynamics including nutrient cycling, remineralization and act as a sink for pollutants in coastal environment. The occurrence of *Thalassia hemperichii* in South East Asia has been reported to be associated with the presence of other dominant seagrass species. Heavy metals in the coastal areas have been resulted from significant discharge of effluents from boat construction and painting sites and various metal using industries. Sea grasses are capable of uptaking metals from both water through leaf surfaces, sediment and interstitial water through their roots. Therefore, the filtering ability of selected heavy metals is studied by *Thalassia hemperichii* at selected coastal sites. Water, sea grass and sediments were collected from Dondra and Weligama reef lagoons. Concentration of metals (Cu, Pb) in water, sea grass and sediment were analyzed using Atomic Absorption Spectrometer. The highest concentrations of copper in water at Weligama and Dondra sites were 0.284 and 0.123ppm respectively. The highest lead concentrations in water of Weligama and Dondra sites were 0.41ppm and 0.34ppm respectively. According to independent t test, there was no significant difference of copper concentrations in sediment between Dondra and Weligama areas. But, significant difference of copper concentrations in sediment between Dondra and Weligama areas was observed ($P<0.05$). The highest copper concentrations in sediment of Weligama and Dondra sites were 5μgg^{-1} and 174 μgg^{-1} dw, respectively. The highest lead concentrations in sediment of Weligama and Dondra area were 202 μgg^{-1} and 424 μgg^{-1} respectively. The highest copper and lead concentrations in the sea grass at Dondra reef lagoon were 149 and 467 μgg^{-1}dw respectively. The highest copper and lead concentrations in sea grass at Weligama site were 204 and 1750 μgg^{-1}dw, respectively. A significant difference in metal concentrations was found in water between the sea grass present sites and the sea grass absent sites in Dondra ($p<0.05$). Also, the variation depends on the abundance of sea grass and metal concentrations at sampling sites. The results of the laboratory experiment showed a significant positive correlation between metal uptake rate by the seagrass and metal concentrations in the water. Therefore, this study shows clearly the ability of the sea grass for accumulating metals from the ambient and the potential of use as a natural, low cost biofilter for reducing metals in the coastal environment.

Keywords: Coastal environment, Sea grasses, *Thalassis hemperichii,* Heavy metals, biofilter