

Heavy metals in mangrove surface sediment of Mengkabong Lagoon, Sabah : Multivariate and geo-accumulation index approaches

Abstract

The inter-tidal mangrove environment of Mengkabong lagoon is important as it supports the local fishing activities, nursery grounds for many fish and shellfish species, and as well as being central for ecotourism activities. The study showed that in general, the physicochemical parameters (pH, salinity and electrical conductivity), granulometric fractions, organic matter, base cations (Na, K, Ca and Mg) and heavy metals (Fe, Cu, Pb, Zn and Al) showed increasing loadings at high tide compared to low tide. Multivariate statistical techniques, principal components analysis (PCA) and cluster analysis (CA), were employed to better interpret information about the sediment and its controlling factors. The PCA results revealed six controlling factors at high tide while seven at low tide. In CA there are two distinct clusters were identified at high and low tides. The calculation of geoaccumulation index (I_{geo}) suggests the Mengkabong mangrove sediments are having background concentrations for Al, Cu, Fe, and Zn and unpolluted for Pb.