Geochemistry of trace metals in mangrove ecosystem of India and Bangladesh: An overview of differential process governing its accumulation in varied mangrove ecosystem.

AL RAMANATHAN*[1], PRABHAT RANJAN[1]

[1]School of Environmental Sciences, JNU, New Delhi;
(*Correspondence: alrjnu@gmail.com)

The study of trace metals in mangrove ecosystem is important as they act as a potential sink for anthropogenic metal contaminants (1,2). The present study highlights the status of different estuarine mangrove complexes across the Indian and Bangladesh coast with reference to occurrence of trace metals in the sediments as well as biota of mangrove forest based on published literature. Distribution and accumulation of trace metals can be due to many factors like soil texture and organic matter as fine particle with great surface area and higher ionic attraction makes complex of inorganic and organic compound like precipitation of metals as hydroxide coating (mainly Fe and Mn) which have tendency to further accumulate other trace metals like Cd, Cu, Pb and Zn as they pass through the water en route to sediment (3,4). In the vertical profile of trace metals, most of the trace metals show peak value in the subsurface layer which can be attributed to leaching, uptake by vegetation and post-depositional remineralization. In speciation, most of the trace metals show dominance in residual fraction and are not bioavailable under a prevalent condition which reduces the potential risk. Mn show potential risk with the higher value in an exchangeable fraction. Biota Sediment Accumulation Factor (BSAF) in fishes follows the order as Cd>As>Ni>Cu>Pb> Cr which indicates that the rate of accumulation of Cd is higher in fish species (5). Trace metals concentration in different fish species of mangrove and BSAF value shows that the pelagic fishes exhibit lower values of heavy metals than the bottom dwelling fishes. In the study on macrobenthos of Sundarban (Bangladesh), it was found there is the accumulation of Fe, Cu, Pb due to its contamination from water and sediment (6).

1. Silva C a R, Lacerda LD, Rezende CE. Metals Reservoir in a Red Mangrove Forest. Biotropica. 1990 Dec [cited 2016 Oct 11];22(4):339–45.