

HEAVY METAL CONCENTRATIONS IN THE ESTUARY AND TIDAL ZONE SEDIMENTS ALONG THE EAST COAST, TAMIL NADU, INDIA

Abbas Hameed, Hema Achyuthan* and S. Srinivasalu
Department of Geology, Anna University, Chennai-600 025, India
E-mail: hachyuthan@yahoo.com

Abstract

Most natural and anthropogenic materials and sediments delivered by rivers to the ocean are trapped in estuaries and tidal zones and these are heterogeneous. Heavy metal analyses of sediments from five cores collected from the estuary and tidal zones between Cuddalore to Odinur along the East Coast Tamil Nadu, India, reveal high concentration of Mn, Zn, Pb, Cu, Co, Cr and Ni in the near surface sediments. The surface sediments are largely coarse grained. Depth profile of Cr, Zn, Ni, Mn, and Pb reveal discrete surface enrichment in each core, probably due to early diagenetic processes and contributions by anthropogenic activity. Geochemical data of five cores were processed using correlation matrix and R-mode factor analysis. This was carried out to infer the source of the heavy metals. The provenance of ferromagnesian elements is from detritus heavy minerals represented by garnet, amphiboles and pyroxenes. Concentration of Fe, Mg, is due to early diagenetic events. The high concentration of Pb, Zn, Cu, Co, Cr and Ni are largely due to atmospheric fallout (Pb), industrialization (Cu, Co, Cr and Ni) and anthropogenic (Zn, Pb) contribution. Aluminosilicate concentration is due to the occurrence of kyanite, staurolite and silimanite minerals that are present in the source rock and sediments.

Keywords: Sediment cores, Estuary and tidal zones, Trace metals, Near surface enrichment, East Coast Tamil Nadu.