



Characterisation of organic matter source and sediment distribution in Ashtamudi Estuary, southern India

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In the present study we have focussed on the surface sediments of Ashtamudi Estuary (southern India) to understand (i) the fate and sources of organic matter by investigating lipid biomarker (n-alkanes) distribution in modern sediments and vegetation samples and (ii) the processes controlling the sediment distribution into the lake basin using end-member modelling approach.

The sediment n-alkanes from the Ashtamudi Estuary exhibit a pronounced odd over even predominance with maxima at C29 and C31 chain length indicative of a dominant terrestrial contribution. A number of n-alkane indices have been calculated to illustrate the variability in space by considering separately the river dominated northern reaches and tidal influenced southern part of Ashtamudi Estuary. The highest terrigenous organic contents were found in sediments from the river and upper bay sites, with smaller contributions to the lower parts of the estuary. The Paq and TAR (terrigenous/aquatic ratio) indices demonstrate maximum aquatic productivity (plankton growth and submerged macrophytes) in the tidal dominated region of the Ashtamudi Estuary. The carbon preference index (CPI) and average chain length (ACL) provide evidence for high petrogenic organic inputs in the tidal zone, whereas dominant biogenic contribution have been observed in the riverine zone.

In addition, the end member modeling of the grain size distribution of the surface sediment samples enabled us to decipher significant sedimentological processes affecting the sediment distribution in the estuarine settings. The end-member distribution showing highest loading with the coarser fraction is maximum where estuary debouches into the sea. However, the samples near the mouth of the river shows finer fraction of the end-member.