

Elemental Geochemistry of Superficial Sediments of Batticaloa Lagoon in Sri Lanka: Implications for Provenance and Sedimentary Processes

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The Batticaloa lagoon is the largest lagoon estuarine system in the eastern Sri Lanka, which margins to the Bay of Bengal. In this study, the sedimentary processes and sediment provenance of Batticaloa lagoon were assessed by geochemical means. A total of 34 superficial sediment samples were collected and analyzed for five major oxides, 13 trace elements, total sulfur and selected halogens. The sediments were strongly enriched for Zr, Mn and Y compared to the Post-Archaean Austrarian Shale (PAAS) and Zr, As, V, Mn, Ti, Cr and Y compared to the average Upper Continental Crust (UCC). This is probably due to the strong weathering under tropical climate and sorting effect by well circulations of water currents in the lagoon. The low concentrations of total sulfur and halogens also suggest well water current circulations to deplete marine organic matters. The cross plots of Zr, Ti and Fe further indicated mineral sorting effect for sediments. The sediments of Batticaloa lagoon are closer to the sediment recycling and upper crust input, and away from compositional origin in the Th/Sc-Zr/Sc diagram due to zircon addition. Sediments have a source composition similar to granite on the mixing curve between granite and ultramafic end members on the Cr/V-Y/Ni diagram. Therefore, the results suggest a metamorphic granitic origin for Batticaloa lagoon sediments, and well circulation of water currents in the lagoon, which affect the well-sorting of sediments.

Key words: Sediment provenance, geochemistry, Batticaloa lagoon, Sri Lanka