

ORIGIN OF THE ANOMALIES OF RARE EARTH ELEMENTS IN SEDIMENT CORES FROM A TROPICAL MANGROVE ENVIRONMENT – SE, BRAZIL

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Rare earth elements (REE) have shown coherent and predictable behavior in the sedimentary environment, so they allow us to investigate the nature of sedimentary biogeochemical processes. In this paper, we characterized the distribution and fractionation patterns of REE and identified the origin of their anomalies in sediments of Sepetiba bay, Rio de Janeiro State, Brazil. Sepetiba bay is a tropical coastal environment largely affected by tourism, industrial and urban activities which have strongly impacted the environment, mainly in regard to zinc and cadmium input. Four sediment cores were collected in Sepetiba bay. Cores 1 and 2 were collected respectively in the tidal flat just in the edge of the mangrove and another within the mangrove trees in the Garças Cove, a depositional environment strongly affected

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by freshwater and anthropogenic inputs. The cores 3 and 4 were also collected respectively in the tidal flat and within the mangrove trees, but in the Coroa Grande Cove, situated in the more preserved seaward region of Sepetiba bay. The sediment cores were sliced into 3 cm intervals and REE were determined through Neutron Activation Analysis. The sum of REE in core 1 and 2 are higher than those observed in cores 3 and 4, providing that the relief close to cores 3 and 4 is considerably more abrupt with forest mountains diving directly to the sea, the lower concentration of REE in these cores indicates the lower evolution of weathering products from local rocks. The dominance of tonalitic gneiss plagioclase-rich rocks explains both the lower fractionating of REE elements and positive Eu anomalies observed in cores 3 and 4. On the other hand, in core 1, below the 28 cm depth, we observed negative Eu anomalies, no relationship between REE and Th, and a sudden decrease of <0.062 mm sedimentary fraction. These are evidences that exists more than one source of REE in the studied area. Further than local rocks, the weathering products from the Paraíba do Sul river catchment also enters in Sepetiba bay. In 1948, the waters from Paraíba do Sul river were transposed to the Sepetiba bay catchment in order to provide power and potable water to the metropolitan region of Rio de Janeiro city. Therefore, we suspect that this also contributes to the differences between geochemistry of the two places studied.