

GRAIN SIZE DISTRIBUTION, MINERALOGY AND GEOCHEMISTRY OF SURFICIAL SEDIMENTS OF SAUDI RED SEA COAST; AN OVERVIEW TO INTERPRET PALEOENVIRONMENT AND PALEOCLIMATE IN RESPONSE TO NATURAL AND ANTHROPOGENIC ACTIVITIES

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Abstract

Red Sea is a semi-enclosed water body, connected to Gulf of Aden by small strait at Bab-al-Mandeb. Sediment yield in northern and southern part is controlled mainly by amount of episodic discharge from temporarily active wadis and the bioproductivity, whereas, in central part, anthropogenic activity prevails the sediment input. Texturally, surficial sediments in the eastern Red Sea coast can be classified as gravel, sand and mud. Sand dominates in nearshore areas and fine fraction increases with increase in depth. The major mineralogical constituents of the surficial sediments are carbonate minerals (calcite and aragonite) and detrital siliciclastic minerals (quartz and feldspar). Some evaporites are also noted in the sediments depicting extreme arid environment. This grain size variability in conjunction with mineralogical assemblage present in the surficial sediments controls the distribution and abundance of major and trace elements, CaCO₃ and organic content. Sand fraction is composed of carbonate material eroded from coralline terraces and terrigenous detrital material transported by seasonal wadis during flood event and contains high concentration of Ca, Mg and Sr, whereas, trace element concentrations are positively correlated with mud, Fe, Al, Ti, Mn, Cu, Ni, Co, Cr, V and B contents.