

Distribution of sedimentary constituents and mineralogy in the northern part of the Persian Gulf (marine area and incoming rivers)

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Abstract

Sedimentological aspects of the Iranian side of the Persian Gulf were investigated in present study. The research objective was to identify the sediment components and compositions of the Persian Gulf continental shelf and incoming rivers. In total, 200 surface samples were collected from bed materials of the study area ranging 10 to 100 m water depths and incoming rivers (between 1 to 4 m water depths) using Van Veen Grab. Sample preparation was implemented to granulometric test to identify biota and detrital content and to determine mineralogy (x-ray diffraction analysis) of sediments. Results showed low contribution of detrital components (i.e. quartz, feldspar, mica and rock-fragment) and high contribution organic-biogenic components (i.e. gastropoda, ostracoda, echinoderm, bryozoan and benthonic-planktonic foraminifera) in sediment composition. Accordingly, more than 50% of seabed components composed of mud (silt and clay)-size particles. Four types of sediment textures, slightly gravelly mud, sandy mud, gravelly mud and slightly gravelly sandy mud have formed more than 75% of these sediments. Detrital components of the Persian Gulf foreland basin are derived almost the Anatolia-Zagros mountain belt. The similarity of fluvial and shallow-deep marine sediments (with the exception of shell-fragments in marine deposits) indicates similarity in their origins. In addition, effects of various sediment transport mechanisms such as fluvial, tidal and wave-induced currents on distribution of sediments in the shallow zone have been proved again in present study. Incoming rivers to the northern part of the Persian Gulf are the most important factors in supplying and transporting detrital components. Detrital and organic-biogenic components are scattered by tidal and marine currents across the Persian Gulf. The most clay minerals (kaolinite, illite, smectite and chlorite) with the exception of palygorskite (autogenic origin) are detrital in the northern part of the Persian Gulf.

Keywords: *Sediment components, Persian Gulf, Mineralogy, Detrital particles, Clay mineral*