

LITHO- AND BIOFACIES OF THE LAMINATED HEMIPELAGIC SEDIMENTS FROM UPPER MAKRAN SLOPE, NORTH ARABIAN SEA

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The north Arabian Sea is characterized by oxygen minimum zone (OMZ) and has strong influence on sedimentation at the upper continental slope off the coast of Pakistan. The upper slope sediments off the coast of Pakistan between 200 and 1000 m water depth are characterized by well preserved lamination. In this study sediment cores from upper Makran slope off Ormara have been analyzed for sedimentological and geochemical investigations. The laminated sediments contain varves which are characterized by specific colour variations and fauna. These varves provide Holocene record of oceanic productivity and paleoclimate of Makran Hinterland.

Sediments of the cores in this study are hemipelagic deposits. Sediments are layered with alternate dark and light colored laminae of about 0.5-5 mm thick. The laminae are of both litho and biogenic origin and form distinct litho and bio facies of hemipelagic laminated sediments of upper Makran slope region. Litho facies also include turbidites and event deposits that constitute 40% of the total thickness. The lamination is caused by rhythmic sedimentation with an annual cycle. The light gray laminae (litho facies) are well sorted, terrigenous, unfossiliferous silty clay (mica-Illite, chlorite, quartz). These hemipelagic sediment layers have been interpreted as suspensate event deposits.

Event deposits having thickness >5mm are consists of medium to dark-gray, homogeneous silt turbidites. These thick layers are commonly graded and internally laminated. These silt turbidites have been derived from the continent, mainly by resuspensions of material deposited by episodic and perennial rivers on coastal plains. Silty clay suspensions are being transported across narrow shelf and upper slope by low-density turbid layer flow or plumes of mid-water nepheloid suspensions. Thin light gray suspensate deposits and silt turbidites have been developed as a result of suspension settling.

The dark olive gray laminae (bio facies) are poorly sorted silty clay. These are rich in planktonic foraminefera, coccoliths, diatoms and faecal pellets and contain marine organic carbon ~ 1%. Down core variations in sedimentary record shows (1) the variability of dark and light-colored laminations which is due to the variations of sediment supply and productivity during the annual monsoon cycle; (2) decadal-centennial (millennial) climatic changes which are shown by variable terrigenous silt and clay supply to the slope, explained by variations in precipitation and river runoff in the Makran hinterland.