

Sedimentation patterns and Clay mineral RECORDS on southwestern continental margin of India: clues to PALEOMONSOONAL AND Paleoenvironmental changes

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Paleo-topography of the late Pleistocene, sea-level fluctuations, monsoon intensity and sediment input from rivers are the important factors that control sedimentation patterns on the continental shelf and slope regions. The sedimentary records from continental margins, therefore, present an ideal archive to study various sedimentary processes and for deciphering the past fluctuations in the climate and environmental systems.

The temporal variations in sedimentation rates reflect the changes in weathering conditions as a result of fluctuations in the intensity of monsoons in the region. The sedimentation records clearly show a decrease in the sedimentation rate from 19 ka BP to 10 ka BP and increase from 10 ka BP to 3 ka BP. This clearly reflects the weaker monsoon conditions during the pre-Holocene and gradual strengthening of monsoon from 10 ka BP onwards at the adjacent hinterland of the west coast of India. The trend of low sedimentation rate from 3 ka BP to the Present indicates the starting of very weak monsoon (arid) conditions from 3 ka BP. The temporal changes of sedimentation rates can be comparable with the paleomonsoonal records. Smectite, kaolinite, illite and chlorite are recorded in the decreasing order of abundance. Down-core variations in clay minerals, except in smectite, are significant. Generally, illite and chlorite form under dry/arid conditions and kaolinite under humid conditions. The increase in kaolinite content reflects the increase in warm humid conditions, whereas an increase of illite and chlorite suggests the change from cold to dry conditions. The gradual decrease of illite and increase of kaolinite from 17 ka BP onwards suggests the gradual change of climate from colder to warm humid conditions in the region since that period.