

## Variation in Clay Mineral Records During the Last 20 Kyr: Clues to Paleomonsoonal and Paleoenvironmental Changes

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The sedimentary records of the continental margins present an ideal archive to study various sedimentary processes and the past fluctuations in climate and environmental systems. The temporal variations in sedimentation rates and clay mineralogy reflect the changes in weathering conditions and fluctuations in the intensity of monsoons.

We present here the data on the sedimentation rates and clay minerals variations in two sediment cores raised from the southwest coast of India. Both the cores were recovered in the present day oxygen minimum zone. Low sand and high silt contents during 19–12 ka, increase in sand and decrease in silt during 12–10 ka, and gradual decrease of sand and increase of silt during 10–3.5 ka bp were recorded. High sedimentation rates were recorded during 19–15 ka and 10–3 ka bp, and low sedimentation rates during 15–10 ka and since 3 ka b. p. Variations in sediment texture and sedimentation rates suggest varied hydrolysis and monsoon conditions. The sedimentation rates reflect the weaker monsoon during the pre-holocene and gradual strengthening of the monsoon since 10 ka bp onwards. Low sedimentation rate since 3 ka bp indicates the onset of weaker monsoon conditions. The study reveals that the sedimentation rate is controlled by variations in monsoonal conditions and sea level changes. The temporal changes of sedimentation rates can be comparable with the paleomonsoonal records. Among the clay minerals, smectite is the dominant one, followed by kaolinite, which is particularly dominant since 7 ka BP. Illite is higher than kaolinite prior to 7 ka BP, whereas chlorite is dominant since 6 ka BP. The increase in kaolinite content reflects the increase in warm humid conditions, whereas increase of illite and chlorite suggests the change from cold to dry conditions. The gradual decrease in illite and increase in kaolinite from 17 ka BP suggest that the climate has gradually turned to warm humid conditions since then in this region. High ratios of kaolinite/chlorite from 19.5–6.3 ka and chlorite/illite from 6.3 ka to the Present suggest humid and arid climates respectively.