

ABSTRACT

Benthic and planktic foraminifera, and geochemical signatures (total organic carbon and stable isotopes) were examined at ODP Hole 728B Oman margin and Hole 731A Owen Ridge to understand paleoceanographic and paleoclimatic changes in the northwestern Arabian Sea during the Neogene. Factor and cluster analysis of highest ranked benthic foraminiferal species enabled to identify five assemblages (Ba-Bs, Be-Vi, Eb-Pb, Ab-Hb, Up-Uh) from Hole 728B and eight from Hole 731A (Ps-Gs, Uh-Ba, Ss-Eb, Cb-Ec, Cc-Gs, Pl-Pu, Gp-Ps, Sa-Nu) characterizing distinct deep sea environments during the studied interval. A major change occurred in benthic assemblages during ~13 Ma. This change is also observed in planktic foraminifera suggesting that the Indian monsoon shaped the benthic foraminiferal regimes during the studied interval. The appearance of upwelling species, increasing rate of Total Organic Carbon around ~13 Ma and subsequent increase in relative abundances of *Uvigerina proboscidea* between 10 and 8 Ma indicate increasing food supply to the ocean from high surface productivity at Hole 731A, Owen Ridge. Abundances of *U. proboscidea* during the Neogene in the Indian Ocean have been correlated with high surface productivity due to intense upwelling driven by southeast trade winds. The high productivity 10-8 Ma event occurred at the end of the building phase of the East Antarctic ice sheets and possibly the beginning of the formation of the West Antarctic ice sheets. Fluctuations in species diversity values, increasing rates of Total Organic Carbon and changes in benthic foraminiferal assemblages all indicate pronounced changes in the Indian monsoon system during the Neogene. The study further implies that the onset or intensification of the modern day Indian monsoon wind regimes can be dated at ~13 Ma. The decreasing values of all species diversity parameters from 3.6 to 2.5 Ma corresponding with increasing $\delta^{18}\text{O}_{\text{Cibicides spp.}}$ values, decrease in upwelling species, absence of high surface productivity species *Uvigerina proboscidea* and reduced Total Organic Carbon values show weakening of the SW monsoon corresponding with increased Northern Hemisphere Glaciations.

Key words: Indian Monsoon System; paleoceanographic and paleoclimatic changes; Neogene; planktic foraminifera; benthic foraminifera; Upwelling; productivity.