

ABSTRACT

Benthic and planktic foraminifera, pteropods and geochemical signatures (stable isotopes) were analyzed from 451 core samples from Ocean Drilling Program (ODP) Hole 716A to understand paleoceanographic and paleoclimatic changes in the equatorial Indian Ocean during the late Quaternary (~450 – 150 Kyr). Factor and cluster analyses of the 53 highest-ranked benthic foraminiferal species identified five biofacies, characterizing major changes in deep-sea environments during this interval, with a shift across the middle Brunhes epoch (Marine Isotope Stage 9 and 8 transitions). Biofacies *Rn-Tr*, *Upo-Rs* and *Cs-Bsp* document high organic flux with low oxygen paleoenvironment dominating before the mid-Brunhes event, similar to *Globigerina bulloides* population, while *He-Ms* and *Upe-Qs* record high seasonality in food supply with well-oxygenated bottom water and dominated after ~300 Kyr. These changes are also visible in planktic foraminifera and pteropods. The shallow, intermediate and deep-water conditions at Hole 716A were coupled during the late Quaternary. Benthic species diversity reveals increasing trends during interglacial phases, indicating less competition among species due to sufficient food supply to the deep-sea. At present, the equatorial Indian Ocean is swept by the Indian Ocean equatorial westerlies (IEW) which are strongest during April-May and October-November (monsoon transitions) and drive Eastward Equatorial current (EEC) in the upper ocean. Hole 716A was recovered beneath the narrow equatorial track (7°N to 7°S) along which the IEW prevail. The strength of the IEW is closely related to the Indian Ocean Dipole (IOD). The IEW weakened across MIS 9/8 during which time the IOD strengthened, causing heavy rains and floods over the equatorial East Africa and deficient rainfall over Australasia. The faunal changes at Hole 716A were linked to weakening of IEW across ~300 Kyr. The proxy response changed from low to high frequency cycles across the mid-Brunhes event with a shift towards stronger precessional signal. The weakening of the IEW was coupled with the strengthening of the IOD and was related to changes in the West Pacific Warm Pool-Southern Oscillation. [321 words]

Key Words [13]: Hole 716A, late Quaternary, equatorial Indian Ocean, Paleoceanographic and paleoclimatic changes, benthic and planktic foraminifera, *Globigerina bulloides*, Stable oxygen isotope, Indian Ocean equatorial westerlies, Indian Ocean Dipole, Mid-Brunhes climatic event, East Africa, Australasia, Indian monsoon.