

ABSTRACT

During the Neogene, Earth witnessed significant climatic changes across low and high latitude regions. These changes have been captured by various proxies. Benthic and planktic foraminifera, stable isotope values were examined at Ocean Drilling Program (ODP) Hole 807A, western Pacific to understand the paleoceanographic and paleoclimatological changes in the study area during the Neogene. Eleven biofacies are recognized at Hole 807A using coherent results of both factor and cluster analyses of benthic faunal census data. The environmental preferences of these biofacies are used to assess the deep-sea paleoceanographic changes. Factor and Cluster analysis of highest ranked benthic foraminiferal species identified eleven biofacies at Hole 807A, characterizing distinct deep-sea environments. A major change occurred in benthic assemblages during the middle Miocene from 16.5 to 14 Ma indicating the high carbon input to the sea floor, this event corresponds to the Early Miocene Climatic Optimum (EMCO). All biodiversity parameters show a gradual increase from ~10 to 6.9 Ma. This high productivity event occurred ~10-6.9 Ma at the end of the building phase of the East Antarctic ice sheet and possibly the beginning of the formation of the West Antarctic ice sheet. During this interval (~10-6.9 Ma) an increase in relative abundance of benthic foraminifer *Uvigerina proboscidea* and planktic foraminifer *Globigerinita glutinata* occurred. This time interval also shows an increase in $\delta^{13}\text{C}$ values. From ~5.2 to ~4.8 Ma all species diversity parameters and the relative abundance of *U. proboscidea* increased, corresponding to the “Indo-Pacific Biogenic Bloom”. All parameters show a decreasing trend between ~3.5 and 2.0 Ma with increasing $\delta^{18}\text{O}$ values and decreasing values of $\delta^{13}\text{C}$, corresponding to initiation of the Northern Hemisphere Glaciation. Mixed Layer Species relative abundances indicate the thickening of the West Pacific Warm Pool at ~3.5 Ma.

Key words: West Pacific Warm Pool; paleoceanographic and paleoclimatic changes; planktic foraminifera; benthic foraminifera; Mid Miocene Climatic Optimum; Northern Hemisphere Glaciation; Indo-Pacific biogenic bloom; Pacific Ocean.