

ABSTRACT

Benthic and planktic foraminifera from Holocene sediments recovered from three ODP Holes 724B, 725C and 727B, off Oman margin situated at different water depths were analyzed to deduce climate induced variations in surface water productivity resulting from upwelling driven by the southwest monsoon. The benthic foraminiferal population was divided into two assemblages: the low oxygen, high organic species like *Uvigerina peregrina*, *Bolivina globulosa*, *Bulimina* sp., *Globobulimina notovata* indicating intense summer monsoon, and species preferring well-oxygenated, oligotrophic conditions with pulsed food supply like *Oridorsalis umbonatus*, miliolids signifying weak summer monsoon. The diversity parameters of benthic foraminifera like Information function [H(S)], Equitability (E), Number of species and Sanders' rarefied values were calculated to examine changes in species diversity of benthic foraminifera driven by the summer monsoon. On comparison of the high organic flux/low oxygen and pulsed organic flux/high oxygen benthic assemblages from the three holes over the past 16,000 cal yrs BP, it was observed that water depth, terrigenous flux and deep water ventilation played a major role in the formation of Oxygen Minimum Zone apart from strong monsoonal activities and upwelling in the western Arabian Sea. The population flux of planktic foraminifer *Globigerina bulloides* suggests phases of strong summer monsoons during the early to mid Holocene and a weak summer monsoon during the late Holocene. However, there seems to be a spatial variation in the strength of the summer monsoon in the western Arabian Sea during the studied interval. The spectral analysis performed on *G. bulloides* data shows cyclicity which can be linked to solar variability. The Total Organic Carbon content at Hole 724B shows little accumulation in the sediments in the early Holocene although this hole underlies the Oxygen Minimum Zone (OMZ). This is attributed to the lack of ballasts in the organic material and presence of labile organic matter which remineralizes before reaching the sea floor.

Keywords: monsoon, benthic foraminifera, planktic foraminifera, Oxygen Minimum Zone, Holocene, Total Organic Carbon, cyclicity, insolation.