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Late Quaternary Glacial / Interglacial Cyclicity Models of the Red Sea

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Four distinct glacial / interglacial cycle during the last 380 Kyr have been recognized in the Red Sea. The identified four cycles reveal deviation in deep-sea ecosystem between the northern and southern Red Sea. In the northern Red Sea salinity fluctuations, productivity and deep-water ventilation and formation had the major impact on benthic foraminiferal pattern corresponding to glacial/interglacial cycles and glacio-eustatic sea level changes coupled with the impact of Mediterranean climate regime. While in the southern Red Sea region the oscillation trend of benthic foraminiferal pattern within the glacials and interglacials stages, indicating a high frequency environmental alternation. This alternation is consistent with the extent of NE monsoonal wind that controls the intensity and extension of the productivity, which in turn determine organic matter fluxes and oxygen level at the sea floor.
The benthic foraminiferal faunas from samples of two piston cores retrieved along a North–South transect in the Red Sea were studied. The northern core was collected during Meteor cruise M 31/2, while the southern one was collected during the Sonne cruise 121. Benthic foraminiferal faunas from both sites exhibit large variability with respect to density, diversity, species composition and assemblages combined with stable oxygen and carbon isotope records of planktic and benthic foraminifera. One hundered thirty benthic foraminiferal species were identified in the investigated cores. The faunal data set of the northern core was reduced to five assemblages (factors) while the southern one was reduced to four assemblages. All assemblages were ranked according to their ecological significance. Besides, Relative abundance of major benthic foraminiferal suborders (Textulariina (agglutinating foraminifera), Miliolina, and Rotaliina), in addition to infaunal/epifaunal relative abundance were used as paleoenvironmental proxies allowing the reconstruction of past changes in deep-water salinity, ventilation, and organic carbon fluxes at the sea-floor.