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SCLERACTINIAN DISTRIBUTION IN A SILICICLASTIC INFLUENCED CARBONATE SETTING: EXAMPLES FROM THE PALEOCENE/EOCENE OF OMAN

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The most complete succession of Paleogene depositional sequences in the Middle East is exposed along the southeastern Arabian platform margin in Oman. The distribution of the coral faunas and their paleoecological environment depends on the development of the Arabian shelf. Tertiary transgression started during the late Paleocene. Later, due to a fairly generized regression of the Eastern Arabian Peninsula, the Oligocene sea was much more limited in extent.

Late Paleocene - Early Eocene (Thanetian-Ipresian): This period involved widespread subsidence and extensive transgression over the Arabian platform, aggradation of the first Paleogene carbonate platform. Slope and basin area were dominated by carbonate hemipelagic sedimentation. Some gravity flow deposits are observed in lowstand and early transgressive system tracts of 3rd order depositional sequences. The upper part of the Jafnayn Formation, representing a shallow shelf environment, consists of carbonate horizons with alveolinid foraminifera, coralline algal nodules and scleractinian corals (*Astrocoenia, Siderastrea, Pachygyra, Dendrophyllia, Polytremacis*) forming isolated colonies and coral banks. The coral development is influenced by siliciclastic influx. Extentional tectonic activity and a correlative major sea level drop were responsible for a wide emergence of the Arabian carbonate platform (RAZIN et al. 2001) at the end of the Ipresian.

Middle - Late Eocene (Lutetian-Priabonian): Regional subsidence of the Arabian plate was accompanied by extensive transgression and aggradation of the second Paleogene mixed carbonate siliciclastic carbonate platform. Thick deltaic deposits accumulated along the subsiding eastern border of the passive platform margin. The calcarenitic shallow shelf deposits in the west are characterized by a rich macrofauna (molluscs, echinids and corals). The corals are abundant in the basal part (e.g. *Astrocoenia, Dendracis, Montastraea, Porites, Stylophora*) and form coral banks, which contain a rich benthic foraminifera microfauna.
The main extentional tectonic phase in the Oligocene is related to the opening of the Gulf of Aden, progressive uplift and emergence of the Arabian platform, further block faulting at the margin. Forced regression and shelf margin platform progradation/aggradation developed at the edge of the Arabian plate. Carbonate platform collapse and resedimentation along the margin occurred at the beginning of this stage. Than chaotic gravity flow sedimentation eroded along the bypass slope.
The Paleogene major transgressive-regressive cycles show a depositional partitioning between platform and basin that can be directly related to tectonic activity. The periods of tectonic relaxation reflected by regional subsidence are characterised by aggradation of the carbonate platforms onlapping the Arabian craton. During the Paleogene control mechanisms like tectonic movements and eustatic sea-level changes controlled dimension and facies distribution on the platform. This triggering mechanisms influenced the coral growth during the different time-slices.

Reference

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