Geophysical Research Abstracts, Vol. 8, 04902, 2006
SRef-ID: 1607-7962/gra/EGU06-A-04902
© European Geosciences Union 2006

Oligo/Miocene biota of S-Oman as witness for biogeographic differentiation and biotic gradients in the western Indo-Pacific

W. E. Piller (1), M. Harzhauser (2), A. Kroh (2), M. Reuter (1)

(1) Institute of Earth Sciences - Geology and Paleontology, Graz University, Austria, (2) Natural History Museum Vienna, Austria

(werner.piller@uni-graz.at)

In the Palaeogene the (Neo)Tethys connected the two major oceanic realms, the Atlantic and the Pacific. Throughout the latest Cretaceous to the Early Eocene marine benthic invertebrate faunas in this area are characterised by a large number of taxa showing a wide geographic distribution (e.g., HARZHAUSER et al. 2002; ROMAN et al. 1989). Affinities between east and west were even larger than between the northern and southern coast (POPOV 1993). The "Terminal Tethyan Event" (ADAMS et al. 1983), which caused the disconnection of these two oceanic realms and brought about the "birth" of the Indian Ocean and the Mediterranean, changed this situation. From the Late Eocene to Early Oligocene onwards affinities between European/North African and West Indian/East African faunas began to decline (e.g., ROMAN et al. 1989). Although the precise dating of the disconnection and when it started to affect faunal migration is still under discussion (e.g., JONES 1999; HARZHAUSER et al. 2002) most authors agree that with the beginning of the Middle Miocene each region had developed its own distinct biota.

While the evolution and palaeobiogeography of the marine biota of the Mediterranean are well known that of the Western Indian Ocean are poorly understood. Attempts to precisely date the "Terminal Tethyan Event" have been severely hampered by the lack of well dated marine invertebrate faunas of this region (ADAMS et al. 1983; JONES 1999; HARZHAUSER et al. 2002). The goal of an ongoing project (FWF - P18189-N10) is to document the faunal differentiation taking place during and immediately after the disconnection of the Tethyan seaway, which ultimately led to the establish-

ment of a marine fauna distinct from that of the Mediterranean. The persistence of Mediterranean biotic elements along the East African coast during the Early and Middle Miocene (ALI 1983; ALI & CHERIF 1987) and the relation of faunas of East Africa to that of Western India/Pakistan is an important topic in this context. Therefore, key areas in SE-Iran, Pakistan, Tanzania and Zanzibar as well as in Oman were identified from where biota have to be studied including gastropods, bivalves, echinoids, foraminifers, corals, and coralline algae. From these data a more accurate picture of the initiation patterns for the largest modern biogeographic realm - the Indopacific – is expected to be derived.

The Arab Peninsula is one of the interesting areas for the depicted problem, however, only few Oligocene sediments exist in its south-eastern part. The Central Oman is one of the few areas where fossiliferous shallow-water sediments of Oligocene/Miocene age were recorded. A crucial area is located between Duqm and Shuwaymiyah, where fore-reef limestones of the Shuwayr Formation (Dhofar Group) of Early Oligocene – Early Miocene age rim the coast of Sawqirah Bay (BÉCHENNEC et al. 1993). These bioclastic sediments, which yielded corals and benthic foraminifers, are overlain by the Lower Fars Group of Burdigalian to Langhian age. In the Duqm area the Lower Fars Group is represented by the Warak and Dam Formations. The Warak Formation is outcropping east of the Haushi-Huqf palaeohigh and comprises fore-reef limestones yielding abundant corals and benthic foraminifers (BÉCHENNEC et al. 1993; BERNECKER 2004). In the Interior Oman, west of the Haushi-Huqf palaeohigh sediments of the Dam Formation are also preserved. These are composed mainly of marls and bioclastic carbonates which yielded a typical inner shelf fauna including bivalves, gastropods, echinoids and larger foraminifers. The Dam Formation is also known from other parts of the Arab Peninsula (i.e., Saudi Arabia; KIER 1972) and preserves a moderately diverse, well preserved echinoid fauna with affinities to the Lower Fars Group in Iran and the Gaj Formation in Pakistan. These data serve as basic information on the southern shore of the Indian ocean close to its northwestern margin.