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Foraminifera and sedimentary facies distribution changes along the Abu Dhabi (UAE) coastline over the last 50 years

Flavia Fiorini and Stephen Lokier
The Petroleum Institute, Petroleum Geosciences, Abu Dhabi, United Arab Emirates (slokier@pi.ac.ae)

Changes in Recent benthic foraminifera and sedimentary facies distribution along the coastline of Abu Dhabi, United Arab Emirates (UAE) were assessed. Anthropogenic activities are modifying the morphology of the coastline causing changes to coastal sedimentary systems. During the early 1960's, prior to any major construction activities, a number of studies examined the distribution of shallow-marine foraminifera and sedimentary facies in the shallow off-shore coastal zone of Abu Dhabi providing a good overall assessment of the distribution of sedimentary facies and foraminifera prior to the anthropogenic activities. The present study revisited, the sampling sites used in the studies conducted in the 1960's. One hundred sea-floor sediment samples were collected, proximal to the coastline of Abu Dhabi Island in nearshore shelf, beach front, channels, ooid shoals and lagoonal settings. Samples were collected at a water depth of 1 to 15m in water with a temperature of 22-29˚C and a salinity of 40-46‰.

The identified foraminifera consist mainly of species with a porcellaneous test belonging to the genera Quinqueloculina, Triloculina, Spiroloculina, Sigmoilinita. Larger benthic foraminifera mainly belonging to the genera Peneroplis and Spirolina are particularly abundant in samples collected on seaweed. Hyaline foraminifera mostly belonging to the genera Elphidium, Ammonia, Bolivina and Rosalina are also common together with Miliolidae in the nearshore shelf and beach front. Agglutinated foraminifera (Clavulina, Textularia, Ammobaculites and Reophax) are present in low percentages. Among the agglutinated foraminifera the species belonging to the genera Ammobaculites and Reophax are present only in the finest grain samples and have not reported previously in the studied area.

The majority of the oolith shoal sediments, the coarser sediments of the beach front and samples collected in dredged channels do not contain living foraminifera and the dead assemblage is mostly composed of a few specimens of coarse sized Miliolidae with fragmented or abraded tests, probably transported from the nearby environments.

Over the last 50 years there have been changes in facies distributions along the Abu Dhabi coastline. Some settings have been lost, with sites formerly in lagoons now being in land, whilst other areas show little or no change in sedimentary facies distributions.

The major changes in the benthic foraminiferal assemblages over the last 50 years were the following:

• Increase in abundance of opportunistic genera as Ammonia and Elphidium.
• The opportunistic agglutinated genera Reophax and Ammobaculites are reported in the area for the first time.
• No living foraminifera are found in dredged channels.