



Recent benthic foraminifera and sedimentary facies distribution of the Abu Dhabi (United Arab Emirates) coastline

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The distribution of benthic foraminifera and sedimentary facies from Recent coastline environments adjacent to the coastline of Abu Dhabi (UAE) was studied in detail with the aim to: 1) provide reliable analogs for understanding and interpreting the depositional environment of ancient shallow-marine sediments from the UAE; 2) assess any modifications in the distribution of benthic environments and sedimentary facies in an area affected by significant anthropogenic activities – particular construction and land reclamation.

A total of 100 sea-floor sediment samples were collected in different shallow-marine sedimentary environments (nearshore shelf, beach-front, channels, ooid shoals, lagoon and mangals) close to the coastline of Abu Dhabi Island. Where possible, we revisited the sampling sites used in several studies conducted in the middle of last century (prior to any significant anthropogenic activities) to assess temporal changes in Recent benthic foraminifera and sedimentary facies distribution during the last 50 years.

Five foraminiferal assemblages were recognized in the studied area. Species with a porcellaneous test mainly belonging to the genera *Quinqueloculina*, *Triloculina*, *Spiroloculina*, *Sigmoilinita* are common in all studied areas. Larger benthic foraminifera *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. The species belonging to the genera *Ammobaculites* and *Reophax* are present only in the finest grain samples particularly in lagoons and mangal environments and have not been reported previously in the studied area. The majority of the ooid 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 nearby environments.

While the shallow-water settings of the Abu Dhabi coastline continue to be areas of active carbonate sedimentation, there have been significant changes in facies distributions over the last 50 years. In particular:

- The opportunistic genera *Ammonia* and *Elphidium* have become more abundant. *Reophax* and *Ammobaculites* are reported in the area for the first time.
- With anthropogenic activities some environments, such as inner lagoons, are lost whilst other areas show resilience to anthropogenic activities with little change in sedimentary facies distribution and foraminiferal assemblage.
- No living foraminifera are found in dredged channels.

The detailed analysis of these changes in foraminifera distribution and sedimentary facies allows us to further our understanding of the effects of anthropogenic activities on shallow-marine environments. By so doing, we are better able to distinguish between those changes that result from anthropogenic activities and those that are a result of naturally-occurring environmental perturbations.