



## Abnormal test growth in benthic foraminifera from hypersaline coastal ponds of the United Arab Emirates

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The living (Rose-Bengal stained) benthic foraminifera assemblage from shallow coastal ponds located in the intertidal area of the United Arab Emirate Western Region was investigated. The studied coastal ponds are located between a lagoonal area, characterized by carbonate sedimentation, and the supratidal, evaporite-dominated, sabkha.

Sampling was undertaken when the maximum water depth in the ponds was 50 cm with a water temperature ranging from 27 to 35°C, a pH of 8 and a maximum salinity of 60 ppt. The sides and floor of the pond were characterized by a microbial mat. Detached blades of sea grass were present in the ponds and are inferred to have been transported into the pond either during high-tides or storm surges. Collected samples were stained with Rose-Bengal at the moment of sample collection and the living assemblage was studied.

The benthic foraminifera that were present show a low-diversity assemblage. Epiphytic larger benthic foraminifera dominate the living assemblage with *Peneroplis pertusus* and *P. planatus* characterizing 90% of the living assemblage and the species *Spirolina areatina*, *S. aciculata*, *Sorites marginalis* and *Quinqueloculina* spp. comprising the rest of the foraminifera community. High percentages (up to 50% of the stained assemblage) of anomalous tests of benthic foraminifera belonging to the genera *Peneroplis*, *Spirolina* and *Sorites* were observed. The anomalies included dissolution, microboring and abnormality in growth. Three different forms of abnormal shell architecture were recorded; the presence of multiple apertures with reduced size, deformation in the general shape of the test and abnormal coiling.

The high percentage of abnormal tests reflects natural environmental stress caused by instability of physical parameters (particularly high and variable salinity and temperature) in this kind of transitional marine environment. The unique presence of epiphytic species, suggests that epiphytic foraminifera may be transported into the pond together with seagrass and continued to live in the pond. The presence of dissolution or microboring on the tests of living benthic foraminifera may be related to the presence of microbial communities.