



Is the nearshore Arabian Gulf becoming too hot to sustain marine benthic life?

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In recent years the popular press has asked the question whether the sea surface temperatures in the Arabian Gulf are becoming too hot to sustain animal life. In order address this question, we are gathering baseline annual temperature data at several nearshore locations in Bahrain and in Saudi Arabia. We measured seawater temperatures and substrate temperatures in the intertidal zone during the hottest day of the year at a lagoon in Askar, Bahrain. We additionally observed the distribution and behavior of marine benthic organisms in the intertidal zone, and surveyed benthic foraminiferal assemblages along several transects from the proximal to distal near the outflow of a desalination plant in Bahrain.

We have now gathered an annual record of sea-surface temperature data within a lagoon and in the proximity of the desalinization plant. Within the lagoon, temperate varies from a low of 10 degrees to a high of 42 degrees. Sea water temperatures in excess of 42 degrees were observed on the incoming flood tide during the hottest day of the year. Surficial mud temperatures in the intertidal zone reached 50 degrees at the high-tide mark during mid-afternoon. There is a clear demarcation line on the mudflat created by the distribution of periwinkle gastropods. Live gastropods are only found on the lower part of the intertidal zone where substrate temperature is below 40 degrees. The higher part of the tidal flat where temperatures are in excess of 40 degrees is barren of gastropods. Only mad dogs and Englishmen can be seen on the high mudflat in the summer noonday sun. Moreover, the gastropods on the lower mudflat display a climbing behaviour, forming small pyramids. The lucky gastropod at the apex of the pyramid experiences temperatures that are about three degrees lower than the surficial mud temperature.

This study will help establish baseline temperature data and identify key bioindicator species that can be further explored for understanding adaptive strategies of microbenthos in the current scenario of rising sea temperatures and salinity in the Arabian Gulf.