



The Response of Living Benthic Foraminifera at an Organically Polluted Locality in Eastern Bahrain

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This study examines the response of living benthic foraminifera at a polluted site in eastern Bahrain, with the aim to determine the effects of anthropogenic pollution on their distribution patterns and the occurrence of morphological deformities. The boat harbor in Askar (Bahrain) is subjected to pollution by nutrients, organic matter, and hydrocarbons. Foraminiferal density is found to be higher at the polluted site compared with a nearby unpolluted site, suggesting a higher amount of available food for the benthic foraminifera. Seven taxonomical groups were recognized in the organically polluted transect including *Ammonia*, *Glabratellina*, *Murrayinella*, *Elphidium*, *Brizalina*, miliolids, and peneroplids. By comparing the foraminiferal assemblages with a nearby unpolluted transect, the genus *Murrayinella* appeared to be a dominant and pervasive taxon that was able to proliferate in an organically polluted environment. Strong correlations of *Murrayinella* with nitrates, sulfates, TOC, and THC put forward the opportunistic behavior of this taxon. Our results contrast with previously published findings on modern foraminiferal assemblage in the Arabian Gulf, as *Murrayinella* is rarely reported. The population of miliolids was drastically reduced at the polluted site, which suggests that the group was adversely affected by organic pollution when compared with the unpolluted transect. This reaffirms the sensitive nature of the miliolid group of foraminifera, supporting the findings of previous studies of the effect of historical coastal eutrophication on foraminiferal assemblages in the Gulf of Mexico and Japan. Therefore, the miliolids might be considered as a pollution proxy for future biomonitoring studies in the Gulf region.