



## **Benthic Foraminifera along a depth transect in western Bahrain: seasonal variations and environmental assessment**

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We surveyed living benthic foraminifera in a depth transect off western Bahrain (Arabian Gulf) with the aim of understanding the seasonal population dynamics and environmental parameters. In winter, the population was found to be highest due to the large number of rotaliids, followed by miliolids. In each season, the population was found to increase along the depth transect due to the higher number of juveniles. A strong correlation is observed between foraminiferal population and sediment grain size - the juveniles are most abundant on coarser-sandy substrate. The population decreases in the spring and is lowest in the summer. Finally, the living population recovered again in the autumn with increasing juveniles/adult ratios along the depth transect. Results of species consistency and relative abundance showed that *Ammonia* was consistent from the shallowest to the deepest station, whereas miliolids started appearing in the deeper stations. The average numbers of *Elphidium* and *Peneroplis* also increased along the depth transect. Another seasonal effect is that juveniles of *Ammonia tepida* are found during each season reflecting its reproduction throughout the year, whereas *Brizalina pacifica* was only found during spring and autumn. The study of environmental parameters reveals that the site is subjected to eutrophication i.e. nitrates and sulfates, however, pollution by heavy metals and hydrocarbons is not significant. An assessment of 63 heavy metals in sediment samples showed that none of the metals had concentrations higher than the internationally accepted norms, which is further confirmed by values of the Foraminiferal Deformities Index of less than 2%. Likewise, no hydrocarbons were detected in the water or sediment samples. Therefore, it is concluded that the site in Bahrain is not yet adversely affected by human development, and therefore can provide baseline information for future comparison and assessment of foraminiferal assemblages in contaminated zones of the Arabian Gulf.