



Nearshore Pollution Bio-monitoring Using Benthic Ostracods (Crustacean) Along the Red Sea Coast of Egypt

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In the latest decades in Egypt, industrial and other human activities have increased intensely along the Red Sea coast. This resulted major environmental disturbances including siltation and pollution especially by heavy metals. Benthic ostracods are regarded as one of the most useful micro-invertebrates for bio-monitoring in shallow marine environments. They are extremely sensitive to environmental changes that can be reflected by their diversity and abundances. In this respect, eighteen sediment samples were collected from Ras Gharib and Quseir sites, along the Red Sea coast, to assess the ostracods response toward these disturbances. *Jugosocythereis borchersi*, *Alocopocythere reticulata*, and *Loxocorniculum ghardaqensis* were the most abundant ostracods in the study localities. To evaluate the linkage between ostracods and polluted sediments, heavy metal concentrations in the sediments (e.g., Cd, Mn, Ni, P, Fe, Cr, Co, Zn, Cu, Pb, As, and B) were measured using Inductively Coupled Plasma Emission Spectrometer (ICP-OES). We observed a significant spatial difference in metal concentrations in Quseir and Ras Gharib sediment samples. Polluted environments (Quseir site) favour the presence of pollution-tolerant species (*Jugosocythereis borchersi*, *Ghardagliaia triebeli*, *Cyprideis torosa*, *Alocopocythere reticulata*, *Moosella striata* and *Loxocorniculum ghardaqensis*). Ras Gharib is less polluted than Quseir and is characterized by pollution-sensitive taxa (*X. rhomboidea*, and *Cytheroma dimorpha*). The quantitative analyses of the benthic ostracods associations are processed with geochemical data and clustered the study area according to environmental characters and degrees of pollution. Accordingly, pollution intensity of the Red Sea coast was measured using the enrichment factor (CF), geo-accumulation index (I_{geo}), and the pollution load index (PLI). Severe and moderately severe enrichment of Cd, As, Pb, B, P and Zn in the Quseir harbor with minor enrichment of Cu and Co were observed, which reflects the intensity of the anthropogenic inputs discharged into this system. The results of both pollution load and geo-accumulation indices reveal that Quseir is the most polluted area, followed by Ras Gharib site. A comparison with sediment quality guideline measure was also made here, indicating that there may be some ecotoxicological risk to benthic organisms (Ostracods) in these sediments.