



Conference Abstract

Environmental monitoring of the highly polluted Gulf of Bagnoli (Italy) using foraminiferal metabarcoding and morphology-based assessment

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Abstract

The former-industrial site of Bagnoli (Naples, Southern Italy), the second Italian largest steelwork, has been negatively affected by the discharges of heavy metals and hydrocarbons that have markedly altered the water and sediment quality as well as the biota living therein. On the basis of benthic foraminiferal traditional morphology-based approach and eDNA metabarcoding, we evaluate the response of benthic foraminifera to pollution and define the Ecological Quality Status (EcoQS) in Gulf of Bagnoli. Higher concentrations of Pb (up to 322 ppm) and Zn (up to 795 ppm) than Effect Range Median are identified in the area in front of the former industrial site, specifically between the two piers. Indeed, significant differences in terms of alpha and beta diversity have been found between the most polluted area (i.e., in front of the former industrial plant) and the sites in the northern area that can be considered relatively low polluted. The analysis of selected biotic indices (i.e., $\exp(H'_{bc})$, Foram-AMBI, gAMBI) computed for the morphological and metabarcoding datasets strikingly and congruently identify poor to bad EcoQS in the

polluted area in front of the former industrial plant, whereas the EcoQS results good to high North to the site. The congruence and complementarity between metabarcoding and morphological data support the application of foraminiferal metabarcoding in routine biomonitoring as a reliable, time- and cost-effective methodology to assess the environmental impacts of heavily polluted marine areas.

Keywords

Foraminifera; eDNA; environmental monitoring; Bagnoli

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