

Do nematode and macrofauna assemblages provide similar ecological assessment information?

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ABSTRACT

In a time where there is a demand for assessing ecosystem's health and ecological quality status, a plethora of indices has been designed. In the scope of the European Union Directives (Water Framework Directive and Marine Strategy Directive), the assessment of the benthic compartment only includes macrobenthic communities, leaving those of meiobenthos out. Macrofauna's organisms are biological quality elements analysed to determine the ecological quality status of coastal and transitional waters, while estuarine meiofauna communities have been only recently considered to be good indicators of ecological quality status, exhibiting intrinsic advantages over macrofauna, such as their small size, high abundance, rapid generation times and absence of a planktonic phase.

In order to determine if both benthic communities (macrofauna and meiobenthic nematodes) provided similar ecological assessment information, subtidal soft-bottom assemblages and the environmental parameters were sampled, covering the entire salinity gradient of the Mondego estuary (Portugal). The ecological status of each community was determined by applying the Benthic Assessment Tool to the macrofaunal data and the Maturity Index and the Index of Trophic Diversity to the nematode data. Overall, the results indicated that answering to the initial question "Do nematode and macrofauna assemblages provide similar ecological assessment information?" is not straightforward. Nematode and macrofauna have provided different responses regarding environmental status probably due to local differentiation in microhabitat conditions, given by distinct sampling locations within each estuarine stretch and by different response-to-stress times of each benthic community. Furthermore, the analysis of a temporal series of nematodes showed a consistency in the results using both taxonomic and functional attributes. This suggests a complementarity between the information given by these two assemblages and, taking advantage of the additional information given by the meiobenthic compartment, both assemblages should be taken into consideration when assessing the ecological status of estuaries.