

Mesoscale spatio-temporal dynamics of demersal assemblages of the Eastern Ionic Sea in relationship with natural and fisheries factors



Data from the MEDITS bottom trawl surveys in the Eastern Ionic Sea, covering a depth range of 28 to 845 m were analysed for the period 1998–2008. For each trawling location, environmental and geographical parameters were recorded, while biomass, abundance, biodiversity and size-based metrics were estimated for the total megafaunal community, as well as for four taxonomic sub-communities (Osteichthyes, Chondrichthyes, Crustacea and Cephalopoda) which were expected to respond differently to environmental changes and fishing. In addition, biomass and abundance of ten species selected based on commercial interest, depth range and life history traits were explored, with particular emphasis on deep-sea species. Fishing effort data collected during the study period were analysed and showed a decreasing trend, mainly due to a decrease in the activity of static nets. The relation between the estimated parameters and environmental and spatial factors, as well as temporal (interannual) effects and the effect of fishing effort were explored using generalized additive models (GAMs). Results of GAMs showed that depth and location

explained much of the variation in community metrics, probably reflecting mesoscale spatial features and species/communities requirements. Even though the different communities and species exhibited variant patterns in bathymetric and spatial distribution, some common aggregation patterns in productive areas were identified. Despite the relatively short time series, GAMs were effective in detecting increasing trends for several metrics; taking into account spatial factors further contributed to attributing the remaining deviance to temporal effects. These trends were partly explained by the observed decline of fishing effort, which is further supported by the fact that negative relations between several metrics and fishing effort were identified, for some of the selected communities and populations. Abundance, species richness and maximum length proved the most informative metrics concerning the effect of fishing. The current decline in fishing effort in the area seems to be a move in the right direction and should be complemented by additional measures aiming to prevent allocation of effort towards the deep sea.

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