Abstract

In this pilot study, we monitored for the first time the biodiversity of hardbottom communities grown on artificial substrata in two shallow water habitats of the Saronikos Gulf, Greece. Here we report preliminary results from the analysis of assemblages that established at a disturbed and an undisturbed study site as well as a list of macrofouler species. This research was performed within the framework of the German-Greek collaboration for the advancement of knowledge exchange among young scientists (IKYDA, 2006).

Keywords: Aegean Sea, Monitoring, Biodiversity, Artificial Reefs, Fouling.

Methods

At each study site 6 PVC carrier rings (each with 10 PVC settlement panels, 15 x 15 cm in size) were deployed in March 2006. All macrofouler species larger than 1 mm were identified and their abundances were estimated as percent cover. Settlement panels were exposed to natural fouling at two study sites in the Saronikos Gulf: Agios Kosmas (AGK) and Mavro Lithari (ML) (Figure 1). The Inner Saronikos Gulf is one of the most heavily polluted regions of the Greek coast, mainly due to domestic and industrial effluents [2]. Mavro Lithari lies in the Outer Saronikos Gulf far from these effluents, while Agios Kosmas is located only a few kilometres SE of Piraeus Port and has lately been heavily disturbed by the construction of the Sailing Center for the Olympic Games 2004 [3].

Study sites

Settlement panels were exposed to natural fouling at two study sites in the Saronikos Gulf: Agios Kosmas (AGK) and Mavro Lithari (ML) (Figure 1). The Inner Saronikos Gulf is one of the most heavily polluted regions of the Greek coast, mainly due to domestic and industrial effluents [2]. Mavro Lithari lies in the Outer Saronikos Gulf far from these effluents, while Agios Kosmas is located only a few kilometres SE of Piraeus Port and has lately been heavily disturbed by the construction of the Sailing Center for the Olympic Games 2004 [3].

In this pilot study, we described and analysed the structure of assemblages grown on artificial substrata that were deployed at a disturbed and an undisturbed site in the Saronikos Gulf.

Results and Discussion

Intertidal and shallow water subtidal coastal ecosystems are more impacted by human activities than any other marine habitat. Therefore, they can be a useful tool to measure human-induced changes in the marine environment [1]. One promising approach to detect and quantify these changes is to compare the composition and stability of hardbottom communities from impacted and non-impacted areas. The aim of this pilot study was to describe and analyse the structure of assemblages grown on artificial substrata that were deployed at a disturbed and an undisturbed site in the Saronikos Gulf.

Between sampling sites we found a significant difference (p ≤ 0.05) in species number (N) and Shannon index (H', loge) for each sampling event, while the communities differed in their evenness (J', p < 0.001) from the 6th month on. Significant differences in the composition of hardbottom communities from the two study sites were also observed for all sampling events (R ≥ 0.77, p ≤ 0.001).

Since communities from the impacted site were always less diverse than the assemblages from the non-impacted habitat, we assume that the composition and structure of the hardbottom communities reflect the ecological conditions at the two study sites. Differences between assemblages from Agios Kosmas and Mavro Lithari should therefore not only be due to different colonizer pools. This assumption will be tested in the future course of this study in order to establish hardbottom communities grown on artificial substrata as a tool in the ecological monitoring of Mediterranean coastal waters.

References