

BENTHIC VAGILE FAUNA ASSOCIATED TO COLONIZATION PROCESSES IN THE NORTHERN ADRIATIC CORALLIGENOUS HABITATS

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Abstract

Benthic vagile fauna associated to colonization processes in the northern Adriatic coralligenous habitats was investigated by means of tiles field experiments carried out from August 2005 to August 2008 in three different rocky outcrops offshore of Chioggia characterised by different epibenthic assemblages. Although most of the single taxa didn't show a clear distribution pattern, as well as the species diversity indices, assemblage structures significantly differed among plots and between sites. The interaction between sessile and vagile fauna could play a relevant role in structuring the epibenthic assemblages.

Keywords: Adriatic Sea, Zoobenthos, Continental Shelf, Marine Parks

Introduction

Numerous coralligenous rocky outcrops occur in soft silty-sandy sediments of the Northern Adriatic Sea bottom between 10 and 40 metres in depth, ranging in size from only a few to several thousands square metres, and raising between 1 and 4 metres from surrounding bottoms ([1]; [2]). The largest and better known outcrops are widespread offshore of Chioggia and Venice, between 18 and 30 m in depth and from 6 to 24 km from the coast and their ecological importance were recognised by the institution of a No Take Zone in 2002 ([3]). According to previous studies, epibenthic assemblages on subtidal hard bottoms offshore of Chioggia show high heterogeneity at a range of spatial scales, from 10s to 1000s of meters ([4]). The assemblages occurring on these outcrops could be clustered in three main typologies consistent with time and characterised by different abundance of algal turf, encrusting calcareous algae, encrusting and boring sponges and colonial ascidians ([4]). In order to assess the role of the recruitment processes in determining such variability, colonization patterns have been investigated in a long-term field experiment based on travertine tiles ([5]). The aim of the present study is to analyse the vagile fauna associated to the colonized tiles three years after their deployment.

Material and methods

Three study sites offshore of Chioggia, representing the three main hard bottom benthic assemblages identified in the previous study, were randomly chosen. Site P204 (6.6 km far from the coast, depth 20 m, 45° 12.665' N 12° 23.038' E) was dominated by algal turf and encrusting sponges, MR08 (14.6 km far from the coast, depth 22 m, 45° 13.825' N 12° 29.365' E) was characterised by red calcareous algae and colonial ascidians, while P213 (15.0 km far from the coast, depth 25 m, 45° 10.264' N 12° 30.999' E) presented intermediate abundances of algal turf and encrusting algae. In August 2005, three plots were randomly selected in each site, and for each plot sixteen travertine tiles (15.0 x 11.5 x 1.0 cm) were horizontally deployed in contact with the natural hard bottom. Three years after the deployment, tiles appeared indistinguishable from the surrounding bottom. In August 2008, four tiles for each plot were collected with the associated vagile fauna and preserved by 4% formaldehyde in separate plastic bags. Species were identified to the lowest possible taxonomic level and their abundance was estimated as number of individuals per sample. Differences between plots and sites were assessed by uni- and multivariate permutational analysis of variance (PERMANOVA, [6]).

Results

Overall 98 taxa were identified. Tanaidacea, Copepoda, *Bittium reticulatum*, *Leptochelia savignyi* and *Sillys* sp. were the most abundant taxa. Although most of the single taxa didn't show a clear distribution pattern, as well as the species diversity indices, assemblage structures significantly differed among plots and between sites. Vagile assemblages were correlated with those sessile colonizing the tiles. In particular, the gastropod *Bittium reticulatum* and the caprellid amphipod *Phthisica marina*, generally associated with algal turf and hydroids were more abundant in the site P204 dominated by a large amount of algae, while the isopod *Jaeropsis* sp., commonly found in the Mediterranean coralligenous habitats ([7]), was more abundant in the site MR08, characterised by red calcareous algae. Vagile assemblages appeared also correlated with depth, distance from the coast and spatial extent of the outcrops.

Discussion

The formation and maintenance of benthic assemblages on subtidal rocky bottoms largely depends by settlement and recruitment processes determined

by the interaction of biotic and abiotic factors which operate at different spatial and temporal scales ([8]). Also post-recruitment processes including post-larval dispersion and intra- and interspecific interaction could play a relevant role ([9]). The analysis of the recruitment sequence of sessile species highlighted the importance of both early colonisation processes and following competitive interaction between species in structuring the epibenthic assemblages in the northern Adriatic subtidal rocky bottoms ([5]). The interaction between sessile and vagile fauna could also play a relevant, though often largely neglected, role in structuring the epibenthic assemblages ([10]).

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