

PRELIMINARY STUDY ON THE BIVALVIA ASSEMBLAGES OF THE NORTHERN ADRIATIC SOFT BOTTOMS

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Abstract

Present study is a part of comprehensive investigation on the soft bottom benthic communities in the northern Adriatic circalittoral zone. It aimed to compare and characterize the assemblages structure and seasonal dynamics of Bivalvia associated with three different benthic communities, i.e. biocoenoses of coastal detritic (DC), muddy detritic (DE) and shelf-edge detritic bottom (DL). The structure of bivalves fauna was determined by distinctive dominance of families Nuculidae, Tellinidae and Veneridae; species *Tellina donacina* and *Nucula nitidosa*, outstanding position of 5-6 species (>5%) per site, and diversity ranged 23-27 species or 3,18-3,68 bits./ind.

Keywords : Adriatic Sea, Bivalves.

Introduction

Benthic communities represent powerful tools for detection of natural and anthropogenic disturbance, but also for assessment of marine ecosystems stability. This study dealt with communities experienced heavy disturbance due to oxygen crisis in 1989 [1]. On that occasion Bivalvia were proved to be an excellent indicators of disturbance and ecosystem instability. The results of biennial post anoxic monitoring indicated partial recovery of benthic communities as well as Bivalvia assemblages [1, 2]. In the meantime the anoxic conditions were not repeated. Thus, we expect that recovery of benthos within investigated area is achieved. To test hypothesis on the resilience of benthic communities, assemblages structure and dynamics of Bivalvia were investigated.

Materials and Methods

Sampling was performed seasonally from March to December 2005 on three permanent sites SJ005 ($45^{\circ}18,4'N$; $13^{\circ}08,0'E$), SJ007 ($45^{\circ}17,0'N$; $13^{\circ}16,0'E$) and SJ107 ($45^{\circ}02,8'N$; $13^{\circ}19,0'E$). All sites characterized by similar environmental features (depths of 30-36 m, silty-sand type of sediment) and close macrobenthic composition [1]. Benthic biocoenoses are classified according Pérès and Picard [3] as: biocoenosis of muddy detritic bottom (SJ005), biocoenosis of shelf-edge detritic bottom (SJ007) and biocoenosis of coastal detritic bottom (SJ107) [1]. At all sites sediment was classified as poorly sorted silty sand ($\phi=2,38-3,05$), and it was distinguished by high participation of sand (57-69%) dominated by fine and very fine fractions [4]. Samples were collected with $0,1m^2$ Van Veen grab. The material was treated according to standard field and laboratory procedure: sieving (2 mm and 1 mm mesh), fixation (neutralized 4% formalin and 70% ethanol), counting and classification of macrofauna [5], as well as taxonomic determination of Bivalvia retained on 2 mm sieve [6]. The data were subjected to multivariate and distributional statistical analyses [7].

Results and Discussion

A total of 43 species, belonging to 33 genera and 24 families were identified. Faunistic composition were characterized by dominance of *Tellina donacina* and *Nucula nitidosa*, relatively high abundance (>5%) of 5-6 species and lower single participation of all others (Fig. 1a, 1b, 1c). Bray-Curtis similarity coefficients pointed out moderately high faunistic affinity between sampling sites ($Q_{SJ005:SJ107}=38\%$, $Q_{SJ005:SJ007}=57\%$, $Q_{SJ007:SJ107}=53\%$.). The results of ANOSIM (global $R=0,762$; $T=999$, $p<0,1$) suggested differences in Bivalvia assemblages structure between SJ107 and two other sites ($R_{SJ005:SJ107}=0,969$, $R_{SJ007:SJ107}=0,938$), but no difference between SJ005 and SJ007 were found.

Mutual intersection of k-dominance curves belonging to particular seasons suggested the same trend of distribution of individuals per species suggested no differences in diversity pattern within sites (Fig. 1d, 1e, 1f). A general shape, position and elevation of k-dominance curves indicated higher diversity and evenness at SJ107, related SJ005 and SJ007 (Fig. 1g). Compared with results of the previous investigations our results point out relatively high stability of Bivalvia assemblages and indicate resilience of benthic communities.

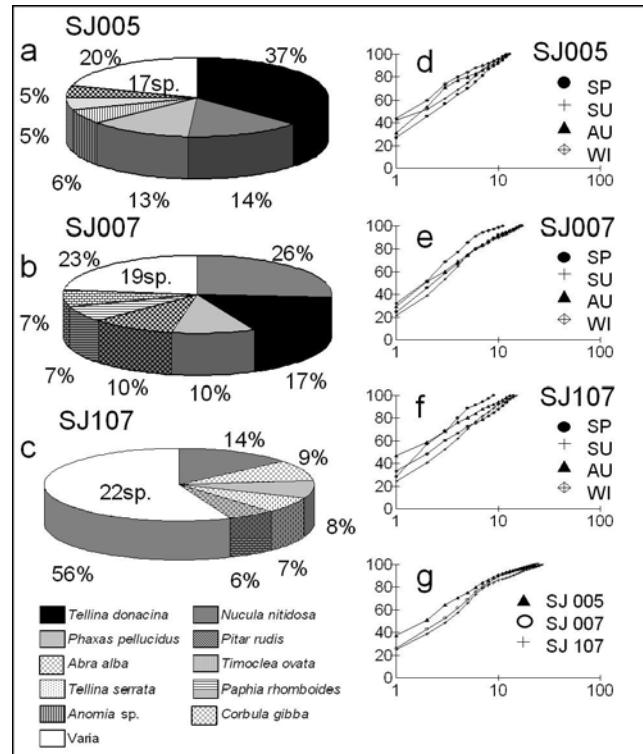


Fig. 1. Species composition and relative abundance of dominant ($d>5\%$) Bivalvia species (a-c); k-dominance curves for Bivalvia assemblages (d-g).

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