INTRAANUAL VARIABILITY OF BIVALVIA ASSEMBLAGES IN THE TRANSITIONAL COMMUNITY OF DETRITC BOTTOMS OF THE NORTHERN ADRIATIC SEA

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Abstract

Present study is a part of comprehensive investigation of the soft bottom benthic communities in the northern Adriatic circalittoral zone. The goal of this study was to estimate intraanual dynamics of Bivalvia assemblages in the transitional community of detritc bottoms. Bivalvia assemblages structure was determined by the presence of 58 species, dominance of *Nucula nitidosa, Phaxas pellucidus, Tellina distorta, Thyasira flexuosa, Kurtiella bidentata*, and diversity ranged 19-31 species or 3,37-4,13 bits./ind. The results indicated abundant, diverse and stable community.

Keywords: Adriatic Sea, Bivalves

Introduction

The major part of the Adriatic Sea bottom belongs to the circalittoral zone and nearly all of the area of the mobile bottom is of the costal detritc type [1]. In this zone, variability of abiotic parameters is less pronounced than in the shallow infralittoral. Such environment support sustainable and stable benthic communities if strong environmental gradients and/or disturbance are not present. However, the northern Adriatic Sea is characterized by the full range of features associated with sensitive marine ecosystems, including temporary oxygen depletions [2, 3]. The community considered in this paper experienced heavy disturbance due to anoxia in 1989 [3, 4], but from that time severe oxygen crisis was not repeted [5]. Macrobenthic fauna and Bivalvia assemblages, in particular, are considered as very good indicators of ecocystem instability. In order to assess stability of transitional community of detritic bottoms, intraanual dynamics of Bivalvia assemblages was studied.

Materials and Methods

Bottom samples were collected with a 0,1 m^2 van Veen grab (five replicates) at sampling station SJ 007 (45° 17,0'N; 13° 16,0'E) in the northern Adriatic Sea from February 2003 to January 2004. This site is caracterized by depth 31 m and silty-sand type of sediment dominated by fine and very fine fractions [3]. Benthic biocoenosis is classified according Pérès and Picard [6] as transitional community of detritic bottoms [7]. The material was treated according to standard field and laboratory procedure: sieving (1 mm mesh), fixation (neutralized 4% formalin and 70 % ethanol), sorting and counting of macrofauna [8]. Collected bivalves were counted and identified to the species level [9]. The bivalve assemblage structure was analyzed with the PRIMER v. 5 software package [10].

Results and Discussion

A total of 58 species belonging to 25 families were recorded. Classification analysis based on Bray-Curtis similarity matrices separated three group of samples with moderate to high affinity (Q=53-75%), associated with higher (>15 °C), intermediate (10-15 °C), and lower near-bottom water temperatures (<10 °C), Fig. 1.

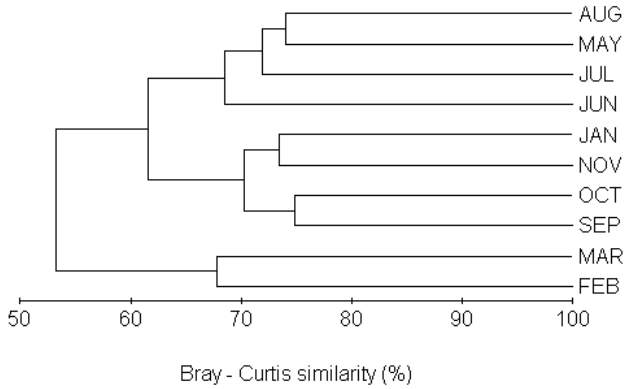

Fig. 1. Hierarchical classification of samples. The affinity level based on Bivalvia assemblages structure was expressed as % of faunistic similarity among months

The global ANOSIM test showed significant differences (R=0,186, p=0,1%) in assemblages structure between months but without a clear seasonal pattern (Tab. 1). In order to examine intraanual diversity changes, several univariate indices were calculated (S, d, J', H'). Statistically significant differences were found only for abundance values between March and May and for Shannon-Wiener diversity index between March and July, at p<0,05 level. Compared with results of previous study, provided at the same site in disturbed and unstable environmental conditions [3], this study revealed rather high values of univariate indices as well as its low intraanual variability. This investigation figured out rather abundant, diverse and stable Bivalvia assemblages with no clear seasonal distribution and thus, suport the hypothesis of sustainable and stable benthic community.

Tab. 1. Results of ANOSIM test (R=0,186, p=0,1%). Statistically significant differences between pair of months where indicated with asterisk (*).

	FEB	MAR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	JAN
FEB	-									
MAR	67,8	-								
MAY	66,8	63,2*	-							
JUN	66,4	62,9	69,9	-						
JUL	70,9*	64,2*	72,4	68,4	-					
AUG	60,0*	53,3*	74,0	70,9*	71,9	-				
SEP	57,9*	57,1*	61,6*	71,7	63,2*	71,1*	-			
OCT	57,0	56,4*	70,4	67,5	67,2	73,3	74,9	-		
NOV	61,1	57,0*	70,6	69,0	66,8*	65,3*	71,0	72,2	-	
JAN	63,9	60,4*	66,4*	72,8	68,1	69,4	70,3	73,8	73,4	-

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