MEGAFAUNAL COMPOSITION OF THE FINE SURFACE SANDS BIOCENOSIS IN NORTH AEGEAN SEA (COAST OF XANTHI)

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Abstract

Sampling of the megafaunal coexistance of the fine surface sands (FSS) was carried out at two stations along the Xanthi coast (NE Aegean Sea). Overall 16 species were identified. The analysis of 72 samples collected during summer and autumn 2000 showed that species composition at the two stations differed.

Keywords : Megabenthos, Donax, Echinocardium, Aegean Sea, Soft substratum

Introduction

Although the coexistance of the fine surface sands of the subtidal zone is considered to be one of the poorest in terms of species (1,2), some species, like *Donax trunculus*, have recently turned out to be worthy commercially (3). Thus biomonitoring of faunal communities are very important for understanding the consequences of overfishing (3). In this study,contacted within an E.U research programme, information is provided for the first time concerning the faunal composition of fine surface sand in place and time and especially during a period when fishing of *Donax trunculus* is not allowed (1st November-31st March).

Materials and Methods

The research was conducted at two stations, STA where fishing pressure is high and STB where fishing pressure is low, along the coast of Xanthi (NE Aegean Sea). Sampling took place across perpendicular sections (ST1 T1, ST2 T2) at three different depths (0.5, 1.5 and 2.5 m). A 50 x 50 x 15 cm metal frame was the minimum sampling surface used to estimate the spacial dispersion and density of the megafaunal populations (4). Overall, 72 samples were taken (6 samples per site and per two seasons, summer and autumn). The contribution of the various species was quantifing using presence (P), mean abundance (Am) and partial mean dominance (Dmp) (5).Two additional samples of microfauna were collected from each layer with a corer (4.5 cm diameter) penetrating 10 cm into the substrate (6). All samples were collected by SCUBA diving. Sediment samples (1 lt) were also collected from each place and their grain composition was analyzed. In addition, the total amount of organic matter in the sediment was estimated using the H_2O_2 compustion method.

The matrix comprised by the number of individuals per species, per replicates and depth of sampling, was analysed using multidimensional scaling (MDC) and the Bray-Curtis similarity index (4,7) (Figure1).

Results and Discussion

The granulometry showed that there are not important differences between STA and STB, since the 90% of the size of the grains taken from the two stations, was 500-250 _ and 250-125 _. At both stations the percentage of organic matter was <0.2% during summer in both stations whereas during autumn it was <1.43% at STA and <1.04 % at STB, the latter attributed to increased amount of incoming substances from a side river of the Nestos river which is located in the wider area of STA. In addition, the microfaunal species composition indicated that there are important differences not only among seasons but also among stations (Table 2).Thus juvenile bivalves (probably of D.T) mainly predominate in the summer samples. Nematode abundance was higher at STA whereas at STB there was a remarkably high number of Granulareticulosea during autumn. Copepods perdominated in high percentage only during summer in STA. Overall 16 species were found, which were already recorded as members of the FSS coexistance, from other similar areas of the Western Mediterenean (Table 1). *Donax trunculus* and *Echinocardium cordatum* exhibited remarkable presence (P) and abundance (Am, Dmp) that should probably be regarded as characteristic of the two stations. The number of species at both stations was lower during autumn and higher at STA compared to STB.The results of MDS indicated that samples ware separeted into groups reflecting the station effect with few exceptions (cases 5 and 8 for which 5 and 2 species were found, respectively, in very low abundances) (Table 1).

To sum up the two stations differ with respect to the megafaunal species composition. These differences are probably related to organic matter deposition that diffuses from STA towards STB rather than to the substrate composition. Group formation was not affected by depth and season of sampling . This can be attributed to similarities in the substrate and the distribution of organic matter as well as to the similar fishing presure expended at these areas in recent years.

Table 1 : Distribution of species in STA and STB during summer and autumn 2000. *P=presence, Am=mean abundance, Dmp=partial mean dominance.*

Fauna / species	STATION A						STATION B					
	Summer			Autumn			Summer			Autumn		
	P	Am	Dmp	P	Am	Dmp	P	Am	Dmp	P	Am	Dmp
Donax trunculus	14	1.7	36.6	11	0.7	22	13	1.05	51.4	12	1.39	62.5
Donax semistriatus	4	0.2	4.87	3	0.2	5.08	2	0.17	8.11	3	0.17	7.5
Solen marginatus	3	0.2	3.65	1	0.1	1.7	0	0	0	0	0	0
Mactra sp.	1	0.1	1.22	0	0	0	0	0	0	0	0	0
Mactra corallina	1	0.1	1.22	0	0	0	3	0.33	16.2	2	0.11	5
Mactra corallina lignaria	1	0.1	1.22	2	0.1	3.38	1	0.06	2.1	3	0.17	7.5
Cyclope neritea	6	0.6	13.4	9	0.9	27.1	0	0	0	2	0.11	5
cyclope donovani	0	0	0	7	0.4	11.9	0	0	0	0	0	0
Diogenes pugilato	0	0	0	0	0	0	1	0.06	2.7	0	0	0
Circulus striatus	0	0	0	0	0	0	1	0.06	2.7	0	0	0
Astarte sulcata	0	0	0	0	0	0	0	0	0	2	0.11	5
Spisula su btruncata	1	0.1	1.22	0	0	0	0	0	0	0	0	0
Amyclina corniculum	0	0	0	1	0.1	1,69	1	0.05	2.7	0	0	0
Astropecten jestoni	0	0	0	0	0	0	1	0.06	2.7	0	0	0
Liocarcinus depurator	1	0.1	1.22	0	0	0	0	0	0	0	0	0
Echinocardium cordatum	16	1.5	34.1	10	0.9	27.1	4	0.22	10.8	2	0.16	7.5
Glycera tesselata	1	0.1	1.22	0	0	0	0	0	0	0	0	0
Number of species	11			8			9			7		
Number of individuals	82			59			37			40		

Table 2 : Distribution of microfaunal individuals in STA and STB during summer and autumn 2000.

Classes	Station A						Station B					
	Summer			Autumn			Summer			Autumn		
	P	Am	Dmp	P	Am	Dmp	P	Am	Dmp	P	Am	Dmp
Bivalvia	4	8.75	22.87	4	3	18.2	6	7.5	35.15	6	5.16	8.01
Copepoda	2	9.25	24.18	2	1	6.06	1	0.16	0.78	2	0.33	0.52
Granulareticulosea	2	1	2.61	4	2	12.1	6	5	23.44	6	44.8	69.5
Nematoda	3	28	18.3	4	5.5	33.3	5	3.33	15.625	6	11.2	17.3
Polychaeta	4	12	31.37	4	5	30.3	6	5.33	25	6	3	4.65
Number of individuals	152			66			128			387		

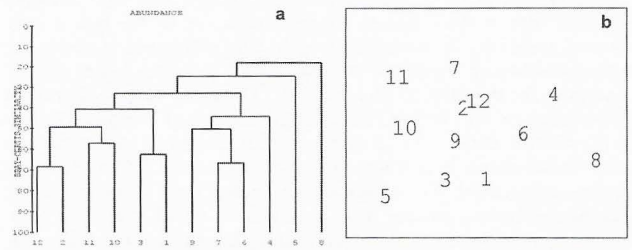

Figure 1. Results of (a) cluster and (b) multidimensional scaling (stress value = 0.129) basedon Bray-Curtis similarity index. 1-6 : samples during summer, 7-12 samples during autumn.

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