FEEDING GUILDS OF POLYCHAETES ASSOCIATED WITH *MYTILUS GALLOPROVINCIALIS* (LAM.) ASSEMBLAGE IN THE NORTH AEGEAN SEA

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Abstract

The present study has demonstrated 8 polychaete feeding guilds in the assemblage of *Mytilus galloprovincialis*. Among these feeding guilds, the most abundant are the microphagous, sedentary polychaetes. Regarding the macrophagous feeding guilds, the carnivorous are the most numerous. The distribution of the microphagous/sedentary polychaetes shows a significant fluctuation in time, which is related to the surface available to the polychaetes to settle on, which in turn depends directly on the abundance and the structure of the population of the bivalve (*M. galloprovincialis*). In contrast, the fluctuation in the distribution of the discretely motile polychaetes in time is the result of the process of reproduction of the species *Prionospio* sp., which is known for its multiannual reproductive efforts . The variety of the feeding guilds of the polychaetes in the assemblage agrees with its particular physiognomic aspect, as determined by the *M. galloprovincialis*.

Keywords : Infralittoral, Polychaeta, Trophic Relations, Aegean Sea

Introduction

As it is known, the assemblages of *Mytilus galloprovincialis* can develop in heavily polluted areas as well as in clean or semi-polluted areas (1, 2). This is a fact of great importance, since the frequent observation of the composition of these assemblages can provide us with very useful information about the impact of pollution on the assemblages of hard substrates. According to Wenner (3) the structure of the mussel community is regarded as a good biological indicator for monitoring marine pollution. On the other hand, the study of the benthic assemblages requires the knowledge of both their structure and their composition (4, 5). Information about the structure of the assemblages of *Mytilus galloprovincialis* in the Aegean Sea is available in the studies of Kocatas (6) and Topaloglou (7), while the studies of Bellan-Santini (2), Tursi (8), Desrosiers (5) and Matarrese (9) refer to the assemblages in the western Mediterranean and the Adriatic.

The study of the assemblages of *Mytilus galloprovincialis* which develop on the eastern shore of the Bay of Thessaloniki has been included in a research programme concerning the assemblages of the artificial hard substrates in Thermaikos Gulf. This paper presents preliminary results regarding the structure of the polychaete fauna of this assemblage and the organization of their populations in time.

Materials and methods

The sampling area is located on the eastern coast of Thessaloniki bay (Agia Triada), in the North Aegean Sea. Sampling was carried out by scuba diving. Samples were taken by means of the sampling methods described by Chintiroglou and Koukouras (10). The area covered by this sampler is 400 cm^2 (20 x 20 cm) which is the minimum necessary quadrat area for the investigation of the hard substrate (2, 11). During each sampling period 3-4 replicates were taken. The samples, 14 in total, were collected during winter and summer of 1994 and 1995. After sampling, the specimens were preserved in a 10% formalin solution and were transferred to the laboratory for further treatment. In the sampling area, the depth was 1.5 - 2 m; water temperature was 11°C ± 0.9 in winter and 24.5°C ± 3.8 in summer; salinity 38 ± 0.3‰ (winter) and 36.9 ± 0.3‰ (summer), dissolved O2 6.3-7.1ppm and pH 8-8.7. The annual fluctuation of the salinity agrees with the facts that were recently presented by Anagnostou (12).

Classification of Polychaetes' feeding guilds

The families of polychaetes, that have been identified in our samples, have been classified in eight feeding guilds, based on the models of Fauchald and Jumars (13), and then divided into three categories. The first one divides the polychaetes into macrophagous and microphagous, according to the size of the portions of the food they get. The second category divides them into carnivores and herbivores, according to the kind of food they consume and then the third category in motiles, discretely motiles and sessiles, according to the activity they show during the consuming of their food.

Hypotheses and analyses

The null hypotheses tested in this study were : 1. the various feeding guilds of the polychaetes in time were equally abundant, 2. the number of individuals (NI= abundance) in the different feeding guilds were equally distributed among the samples in time. Non-parametric methods, such as Kruskal-Wallis, Friedman two-way analysis of variance and Mann-Whitney Test were used (14).

Results and discussion

In order to quantify the contribution of the various feeding guilds mean abundance and partial mean dominance (Table 1) were calculated (15). The following eight feeding guilds were indentified among the 1743 individuals of polychaetes living in *M. galloprovincialis* assemblages. BMX: burrowers, motile, unarmed pharynx; CDJ: carnivores, discretely motile, jawed pharynx; CMJ: carnivores, motile, jawed pharynx; CMX: carnivores, motile, unarmed pharynx HMJ: herbivores, motile, jawed pharynx; FST: filter-feeders, sessile, tentaculated; SDT: surface deposit-feeders, discretely motile, tentaculated and SST: surface deposit-feeders, sessile, tentaculated (for definitions, see 13). The number of individuals (NI) of the polychaetes differed significantly between feeding guilds. From Figure 1, it can be seen that the abundance of feeding guilds SST, CMJ, CMX, HMJ and BMX was very low. FST was the most abundant type, followed by SDT. The results from the Kruskal-Wallis Test for the comparison of abun-

Table 1. Polychaetes with type of feeding guilds associated with *Mytilus galloprovincialis* . (Am) mean abundance, (Dmp) partial dominance, Number of Taxa and Number of individuals.

	Feeding	Winter 94		Summer 94		Winter 95		Summer 95	
Polychaetes species	Guilds	Am	Dmp	Am	Dmp	Am	Dmp	Am	Dmp
Amphitrite sp1	SST	-	-	1	0.4	-	-	-	-
Amphitrite sp2	SST	-	-	0.3	0.1	-	-	-	-
Capitella capitata	BMX	-	-	-	-	-	-	0.3	0.3
Capitellidae	BMX	-	-	2.5	1.1	-	-	2	2.2
Ceratonereis sp.	HMJ	-	-	-	-	-	-	0.3	0.3
Cirratulidae	SST	2.3	1.8	6	2.6	0.3	3.9	3.3	3.6
Dodecaceria concharum	SST	0.3	0.2	-	-	-	-	-	-
Eunice sp.	CDJ	-	-	0.3	0.1	-	-	-	-
Eunicidae	CDJ	-	-	-	-	-	-	-	-
Harmothoe impar	CMJ	2	1.6	-	-	-	-	-	-
Harmothoe sp.	CMJ	2	1.6	3.5	1.5	-	-	0.3	0.3
Heteromastus sp.	BMX	-	-	0.3	0.1	-	-	-	-
Hydroides pseudouncinata	FST	3.5	2.7	9	3.9	2.3	29.9	30	32.4
Kefersteinia cirrata	CMJ	1.8	1.4	4.3	1.9	-	-	13	14
Kefersteinia sp.	CMJ	-	-	0.3	0.1	-	-	-	-
Lepidasthenia sp.	CMJ	-	-	0.3	0.1	-	-	-	-
Lepidonotus clava	CMJ	-	-	-	-	-	-	1.3	1.4
Lysidice ninetta	CDJ	-	-	0.3	0.1	-	-	-	-
Lubrineris funchalensis	CDJ	-	-	2.3	1	0.3	3.9	0.3	0.3
Lubrineris sp.	CDJ	-	-	0.8	0.4	-	-	-	-
Magalia sp.	CMJ	3	2.3	-	-	0.3	3.9	-	-
Marphysa fallax	CDJ	-	-	0.3	0.1	-	-	-	-
Marphysa sanguinea	CDJ	-	-	0.3	0.1	-	-	-	-
Nereis caudata	HMJ	-	-	-	-	-	-	1	1.1
Nereis zonata	HMJ	-	-	0.5	0.2	-	-	1.7	1.8
Nereis irrorata	HMJ	-	-	-	-	-	-	0.3	0.3
Paleanotus sp.	CMX	0.3	0.2	0.8	0.4	-	-	-	-
Phyllodocidae	CMX	2	1.6	2.8	1.2	0.7	9.1	2	2.2
Platynereis dumerilii	HMJ	2.5	2	-	-	0.3	3.9	8.3	9
Polydora caeca	SDT	1.3	1	2	0.9	-	-	2	2.2
Polydora ciliata	SDT	-	-	0.5	0.2	-	-	-	-
Polydora sp.	SDT	0.5	0.4	0.5	0.2	-	-	1.7	1.8
Polymnia sp.	SST	0.3	0.2	-	-	-	-	-	-
Potamila reniformis	FST	-	-	-	-	-	-	0.7	0.8
Prionospio sp.	SDT	-	-	72.3	31.3	0.3	3.9	3	3.3
Pygospio sp.	SDT	-	-	18.8	8.1	-	-	-	-
Sabelaria spinulosa	FST	5	3.9	2	0.9	-	-	-	-
Sabellidae	FST	-	-	0.8	0.4	0.3	3.9	-	-
Serpula concharum	FST	-	-	13	5.6	-	-	-	-
Serpula vermicularis	FST	4	3.2	67.3	29.1	1.3	16.9	8	8.7
Serpula vermiliopsis	FST	1	0.8	-	-	-	-	-	-
Serpulidae	FST	28.5	22.5	-	-	-	-	-	-
Sphaerosyllis sp.	CMJ	-	-	-	-	0.3	3.9	-	-
Spio filicornis	SDT	-	-	-	-	-	-	0.3	0.3
Spionidae	SDT	1.5	1.2	1	0.5	-	-	-	-
Spirobranchus polytrema	FST	54.8	43.3	0.8	0.4	1	13	-	-
Spirocephalus polytrema	FST	6.3	5	-	-	-	-	-	-
Staurocephalus rudolphii	CDJ	-	-	2.3	1	-	-	-	-
Staurocephalus sp.	CDJ	-	-	7.8	3.4	0.3	3.9	5.7	6.2
Syllidae	CMJ	2.5	2	3	1.3	-	-	3.7	4
Terebella lapidaria	SST	1	0.8	2.3	1	-	-	3.3	3.6
Terebellidae	SST	-	-	1	0.5	-	-	-	-
Vermiliopsis sp.	FST	0.3	0.2	-	-	-	-	-	-
Number of Taxa	23	35	12	23					
Number of individuals	526	921	24	272					