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THE BIODIVERSITY OF MEIOBENTHIC POLYCHAETES FROM THE COASTAL SEAWATER OF CRIMEA (BLACK SEA)

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INTRODUCTION

In the Black Sea, the largest taxon of benthic organisms, which includes as many as 193 species, is the Class Polychaeta (Kiseleva, 2004). All the polychaetes may be divided into three size groups known as micro-, meio-, and macrobenthos. Meiobenthos are worms with a body not longer than 2 mm, and this size group comprises two component parts: constant and temporary, or eumeiobenthos and pseudomeiobenthos, respectively. The pseudomeiobenthos are juvenile macroforms. Species composition and quantitative development of meiobenthic polychaetes have been repeatedly described and discussed (Kiseleva, 1965, 1985, 2004; Kiseleva, Slavina, 1965; Revkov *et al.*, 2002; Grintsov, Murina, 2002; Murina, Grintsov, 2004).

MATERIAL AND METHOD

Samples of meiobenthic polychaetes were collected during 2004-2006 from four coastal seawater locations: in the southwest of Crimea (Omega Bay in Sevastopol), in the south (Laspi Bay), near Cape Placa, and in the southeast of Crimea (Karadag Nature Reserve) (Figure 1).

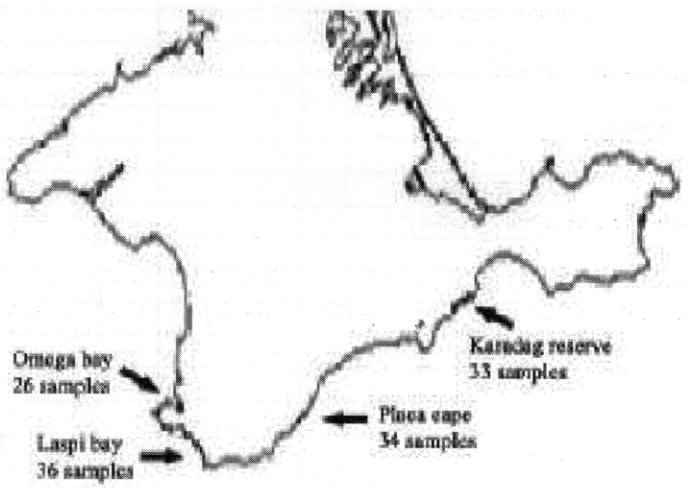

Figure 1. Sampling locations (Crimea, Black Sea).

In the sampling locations, the biotopes occupied natural rocky substrate (Karadag, Cape Placa), artificial substrate, i.e., concrete blocks of a breakwater (Laspi Bay), and soft silty-sandy substrate (Omega Bay). The 129 samples collected were handled to determine the species composition and maximum number of meiobenthic polychaetes in them. The sampling techniques for fouling communities of hard substrates (Murina, Grintsov, 2004) and soft silty-sandy substrates (Sergeeva *et al.*, 2006) were recently described.

RESULTS

In Karadag, the registered species diversity of meiobenthic polychaetes is remarkably high: 31 species in 12 families. In Omega Bay, it was 28 species in 15 families; in Laspi Bay and the sea close to Cape Placa, it was 26 species in 13 families and 17 species in 11 families, respectively. In total, the meiobenthic polychaetes are represented by 42 species in 17 families (Table 1).

Assessed using the Bray-Curtis index (McAleece, N., 1997), biotopes on the rocks of the Karadag Nature Reserve and on the breakwater in Laspi Bay are very similar, while those of the soft substrates in Omega Bay and the sediment at Cape Placa differ considerably (80 and 53, respectively). For polychaetes compared between the epibiotas of the Karadag cliffs and the sea bottom substrates of Cape Placa, the index is evaluated at 63. Comparison between the polychaete complexes on the breakwater in Laspi Bay and in Omega Bay and those of Laspi Bay and Cape Placa yields estimates of 58 and 68, respectively. The percentage of eumeiobenthos, the constant component of meiobenthos, is uniformly high: approximately one-third for the faunas of Omega Bay and Cape Placa, one-fourth for Laspi Bay, and one-fifth for Karadag. Certainly, soft sediments give shelter to eumeiobenthis polychaetes of a remarkable taxonomic diversity. The seawater areas studied differ in the mass species of polychaetes that prevail in the local meiobenthos.

Table 1. The taxonomic composition of meiobenthic polychaetes from different coastal seawater locations and biotopes of Crimea.

Family, species	Rocky substrate, Karadag	Artificial substrate, Laspi Bay	Silty sand, Omega Bay	Cape Placa
Family Phyllodocidae				
Paranaitis lineata (Claparede, 1870)**	+	-	-	-
Genetyllis tuberculata (Bobretzky, 1868)**	+	+	-	-
Eumida sanguinea (Oersted, 1843)**	+	-	-	-
Eulalis viridis (Linneus, 1767)**	+	+	-	+
Eteone picta Quaterfages, 1865**	+	+	+	-
Phyllodoce maculata (Linne, 1767)**	+	-	-	-
Family Glyceridae				
Glycera capitata Oersted, 1843**	-	-	+	-
Family Nephtidae				
Micronephthys stammeri (Augener, 1932)*	-	-	+	+
Family Polynoidae				
Harmothoe reticulata (Claparede, 1870)**	+	+	-	+
Harmothoe imbricata (Linneaus, 1767)**	+	+	-	+
Family Sigalionidae				
Pholoe synophthalmica (Aud. et M. Edw., 1834)**	+	+	+	+
Family Nereidae				
Nereis zonata Malmgren, 1867**	+	+	+	+
Family Syllidae				
Typosyllis variegata (Grube, 1860)**	+	+	+	+
Typosyllis prolifera Krohn, 1852**	+	+	+	+
Typosyllis hyalina (Grube , 1863)**	+	+	+	-
Syllis gracilis Grube, 1840**	+	+	+	+
Trypanosyllis zebra (Grube, 1860)**	+	-	-	-
Sphaerosyllis bulbosa Southern, 1914*	+	-	+	-
Haplosyllis spongicola (Grube, 1855)**	+	-	-	-
*Syllides longic*irrata Oersted , 1843**	-	+	-	-
Brania clavata (Claparede, 1863)*	+	+	-	+
Brania limbata (Claparede, 1868)*	+	-	+	+
Exogone gemmifera Pagenstecher, 1862*	+	+	+	+
Brania tenuicirrata (Claparede, 1864)*	-	-	+	-
Family Eunicidae				
Lysidice ninetta (Audoin et Miln Edw., 1833**	+	+	+	+
Family Dorvilleidae				
Dorvillea rubrovittata (Grube, 1855)**	+	+	+	-
Protodorvillea kefersteini (McIntosh, 1869)**			+	-
Schistomerginos rudolphi (Delle Chiaje, 1828)**	-	-	+	+
Family Spionidae				
Prionospio cirrifera Wiren, 1883**	+	-	+	-

Polydora ciliata (Johnston, 1838)*	+	+	+	-
Spio filicornis (Mueller, 1776)*	-	-	+	-
Scolelepis ciliatus (Keferstein, 1862)*	-	-	+	-
Family Cirratulidae				
Tharyx marioni (Saint-Joseph, 1894)**	-	-	+	-
Family Capitellidae				
Capitomastus minimus Langerhans, 1881*	+	+	-	+
Heteromastus filiformis (Claparede, 1864)**		-	+	-
Notomastus profundus Eisig, 1887**	-	+	-	-
Capitella cf. *capitata* (Fabricius, 1780) **	+	+	+	-
Family Maldanidae				
Euclymene collaris (Claparede, 1868)**	+	+	+	+
Family Terebellidae				
Amphitritides gracilis (Grube, 1860)**	+	+	+	-
Family Sabellidae				
Fabricia sabella (Ehrenberg, 1837)*	+	-	+	-
Family Spirorbidae				
Pileolaria militaris (Claparede, 1868)*	+	+	+	+
Janua pagenstecheri (Quatrefages, 1865)*	+	+	-	-
Total	31 (12)	26 (13)	28 (15)	17 (11)

* eumeiobenthos , ** pseudomeiobenthos

Exogone gemmifera (Syllidae) prevailed in the epibiota of the rocks in Karadag, *Brania clavata* (Syllidae) in Laspi Bay, *Capitella c. capitata* (Capitellidae) in Omega Bay, and *Micronephthys stammeri* (Nephtyidae) in the sea near Cape Placa (Table 2).

Table 2. Maximum numbers and frequency (ind/m^2 and %, respectively) of polychaetes prevailing in meiobenthos of the coastal seawater biotopes of Crimea.

Species	Karadag	Laspi Bay	Omega Bay
*Brania clavata**	1250 (57,6)	7200 (64.3)	-
*Brania limbata**	-	-	880 (46.2)
*Exogone gemmifera**	2175 (57.6)	400 (57.1)	-
*Capitomastus minimus**	1900 (63.6)	440 (64.3)	-
*Prionospio cirrifera***	2650 (63.6)	-	520 (65.4)
*Pholoe synophthalmica***	-	1330 (64.3)	-
*Micronephthys stammeri***	-	-	800 (34.6)
*Capitella capitata***	-	-	15,800 (65.4)
*Euclymene collaris***	-	3120 (92.8)	-

*eumeiobenthos, **pseudomeiobenthos.

CONCLUSION

For the first time, the taxonomic composition of meiobenthic polychaetes was studied in the bays of Laspi and Omega, and Cape Placa. Comparison between the examined biotopes (Figure 1) demonstrates that the richest diversity of polychaetes (31 species) was registered on the rocky substrate of Karadag Nature Reserve. The greatest abundance of a dominant species (Table 2) (*Capitella capitata*, 15,800 ind/m^2) was in the silty sand of Omega Bay. The biotopes of the rocky substrate in Karadag and the artificial substrate in Laspi Bay were the most similar in number of identical meiobenthic polychaete species, while the most different biotopes are in Laspi and Omega Bays. On the breakwater in Laspi, the maximum number of eumeiobenthic polychaetes is greater than that of pseudomeiobenthic worms, while in the biotopes of Karadag and Omega Bay, pseudomeiobenthic polychaetes are more numerous than eumeiobenthic. Organisms of the meiobenthic polychaetes, the majority of which are in juvenile stages, are known to be more susceptible to anthropogenic impacts than adult macrozoobenthos. Therefore the rich species diversity of the meiobenthos reliably indicates that the Crimean coastal sea favours the development of recreation.

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