ZOOBENTHOS OF THE PROBABLE DUMPING AREA IN IZMIR BAY (AEGEAN SEA)

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Abstract

The samples were collected at 18 stations in June 1992. A total of 74 species were recorded, of which *Pseudopolydora antennata* and *Aricidea mutabilis* were new to the Turkish fauna. The most dominant and frequent species in the area were *Sternaspis scutata*, *Turritella communis*, *Corbula gibba* and *Labidoplax digitata*. As a results it can be conclude that the study area possess typical muddy bottom fauna of the Mediterranean Sea.

Key-words: zoobenthos, monitoring, pollution, Aegean Sea, Eastern Mediterranean.

Introduction

Intense sedimentations occurred in Izmir harbour lessened water depth and resulted in hindering the ships to approach to the harbour. Because of the huge economical losses it occasionally become a requisite to deeper the approaching route of the ship by dredging.

The mud-dredging efforts were carried out near the harbour in the two periods; 1930-1976 (ca. 2.8 million m^3 of sediment off Göztepe-inner bay) and 1976-1988 (9 million m^3 of sediment off Hekim Ada-outer bay). Considering the unpredictable bad effects of the dumping efforts on the ecosystems it was planned to alter the dumping area. Finally the area in the northeast of Uzun Ada (outer bay) had been suggested for this purpose.

In the present paper it is intended to elucidate the status of the zoobenthic fauna in the probable dumping area to constitute a database for the monitoring program.

Material and methods

Benthic samples were taken by a Van Veen Grap in 18 stations in June 1992 (Fig 1). The samples were washed through sieve with 1 mm mesh size. The community indices were applied on the presence-absence and abundance data.

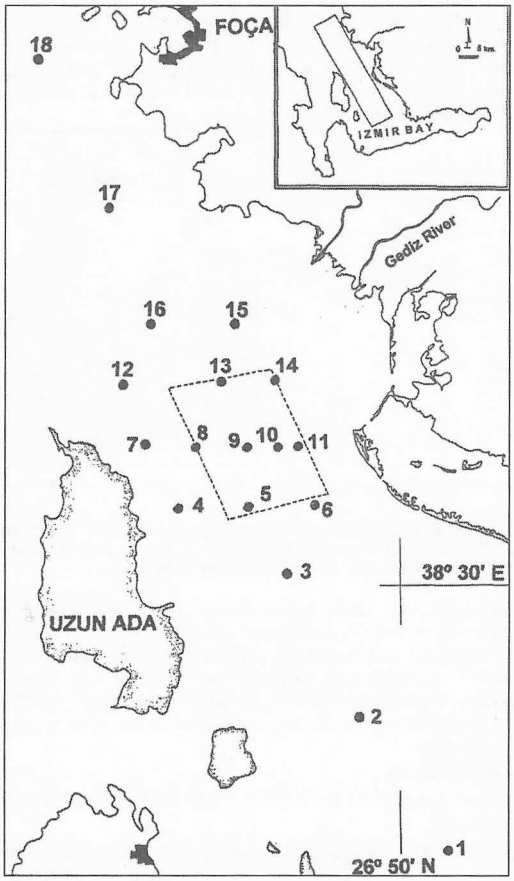

Fig 1. Map of the investigated area with location of sampling sites.

Results and discussion

A total of 74 species and 714 individuals belonging Nemertea, Sipuncula, Polychaeta, Crustacea, Phoronida, Mollusca and Echinodermata were determined, of which *Pseudopolydora antennata* and *Aricidea mutabilis* were new records for the Turkish fauna.

The most diversified group was Polychaeta with 43 species and 339 ind. (47.4%) followed by Crustacea with 13 species and 126 ind (17.7%) and Echinodermata with 8 species and 108 ind. (15.3%).

The most dominant species of the important groups and their relative dominance values are as follows; Polychaeta (*Sternaspis scutata*, 5.6%; *Terebellides stroemi*, 4%; *Prionospio fallax*, 2.9% and *Lumbrineris latreillii*, 2.7%); Crustacea (*Ampelisca sp.*, 2.9%; *Apseudes latreillei*, 2.5%; *Microdeutopus sp.*, 2.5% and *Athanas nitescens*, 1.6%); Mollusca (*Turritella communis*, 5.4%; *Corbula gibba*, 3.7% and *Clausinella fasciata*) and Echinodermata (*Labidoplax digitata*, 5.6%; *Amphiura filiformis*, 3.8%; *Trachythyone tergestina*, 1.9% and *Brissopsis lyrifera*, 1.6%).

The community diversity (H') and evenness (J') indices in each site were very high (Table 1). The lowest H' value (3.66) was calculated in the station 2 where *S. scutata* was represented by high number of specimens. The species with *C. gibba* and Ia were preferential species of the sandy-mud substratum of Izmir Bay.

Table 1. Depths, community indices and dominant species of each sampling site.

Station	Depth	S	N	H'	J'	Dominant Species
1	48 m	27	38	4.62	0.97	*Terebellides stroemi* (5.3%)
2	52 m	16	27	3.66	0.91	*Sternaspis scutata* (25.9%)
3	48 m	21	30	4.25	0.97	*Turritella communis* (13.3%)
4	51 m	28	41	4.69	0.98	*Magelona papillicornis* (7.3%)
5	51 m	28	44	4.69	0.98	*S. scutata* (6.8%)
6	32 m	24	47	4.23	0.92	*Lumbrineris latreillii* (19.1%)
7	58 m	20	34	4.19	0.97	*Labidoplax digitata* (11.8%)
8	55 m	17	40	3.77	0.92	*Microdeutopus sp.* (17.5%)
9	45 m	24	44	4.32	0.94	*L. digitata* (%9.1)
10	35 m	26	39	4.61	0.98	*Phascolosoma sp.* (7.7%)
11	20 m	28	60	4.60	0.96	*L. latreillii* (8.3%)
12	59 m	29	47	4.64	0.95	*Clausinella fasciata* (8.5%)
13	45 m	17	31	3.95	0.97	*Microdeutopus sp.* (12.9%)
14	19 m	23	38	4.39	0.97	*Nephthys hombergi* (10.5%)
15	36 m	25	38	4.43	0.95	*Chaetozone sp.* (10.5%)
16	56 m	26	40	4.44	0.97	*Microdeutopus sp.* (12.5%)
17	52 m	22	42	4.21	0.94	*S. scutata* (11.9%)
18	50 m	24	34	4.50	0.98	*Aponuphis bilineata* (8.8%)

In the area 13 species were categorized as constant, 24 as common and 37 as rare. *S. scutata*, *T. communis*, *C. gibba* and *L. digitata* comprised the highest values with 100%. The finding of the constant species, *P. malmgreni* was noteworthy since it has widely been utilised as an indicator species of the organically polluted bottom. However in the sampling period it formed a scarce population as compared to that in the polluted waters.

The Cluster analysis depicted that the faunal affinities in the area were relatively high. The highest similarity was calculated between the stations 17 and 18 (67%) which were far from the probable dumping area. The stations such as 9, 10, 11, 14 and 15 which were under the influence of the Gediz River constituted a group of 45% similarity.

The former sludge dumping area was investigated by Kocatas *et al.* (1) who emphasized that the dumping activities caused less effects on the benthic biota with only one opportunistic species (*Audouinia tentaculata*). They also emphasized the dominance of *C. gibba* in the area. In this study solely *P. malmgreni* as being opportunistic species was found with low dominance but high frequency index values. The other species collected in the area are widely distributed in the undisturbed soft substratum of the Mediterranean Sea (2). In conclusion it could be pointed out that the probable dumping area was typical of sandy- mud biocenosis with a few opportunistic components.

References

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