The effects of the sludge dumping and disposal on the benthic fauna in Izmir Bay

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Izmir Bay is an area which has been subject to efforts to deepen the harbour since 1930. This bay is divided into an inner bay, a middle bay and an outer bay, from the standpoint of topographical and hydrographical characteristics (Fig. 1). The polluted inner bay, where the Izmir harbour is located and where mud-dredging efforts have been carried out, is narrow (57 km2) and shallow (maximum depth 21 m); the unpolluted outer bay, where the mud has been dumped, is much wider (539 km^2 and deeper (45-70 m).

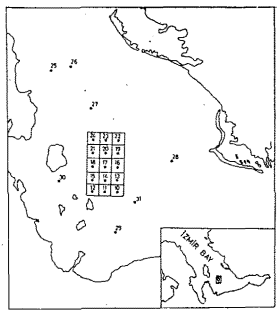

Figure 1. Sampling stations.

Dredging efforts were carried out in the harbour in two periods : 1930-1976 and 1976-1988. In the first period 2.8 million m^3 of mud was dumped back into the inner bay; in the second period 9 million m^3 of mud dredged out was dumped in the outer bay near Hekim Island. In order to determine the effect of the mud dumped in the outer bay upon benthic communities, samples were taken by grab (10 dm^3) from 22 stations which had been decided on in the area in question during June 1990. The results of these samples showed 98 species belonging to 8 groups. Speaking qualitatively, Polychaeta were first with 41 species, followed by Crustacea, with 25 species (Fig. 2).

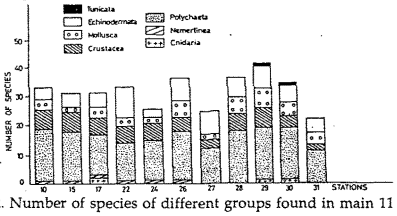

Figure 2. Number of species of different groups found in main 11 stations.

In order to determine the degree of similarity among the 22 stations, when the dendogram made using the BRAY-CURTIS similarity coefficient is examined, the maximal similarity is seen to be 67% (Fig. 3). Of these, the first group, with a similarity of about 56%, was at stations 28 and 29, the second was at station 31, the third group at stations 25 and 26, the fourth group at station 30, and the fifth group, with similarity changed from 45 to 67%, was at the other stations (Fig.4).

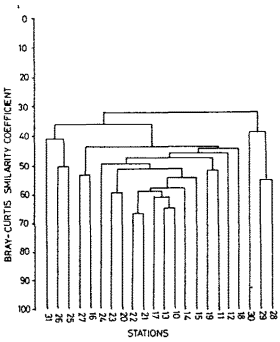

Figure 3. Bray-Curtis similarity dendogram among stations.

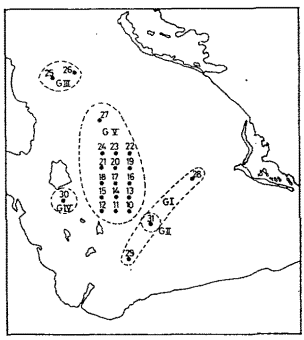

Figure 4. The result of MDS analyses.

In the studies carried out in the dumping area, only *Audouinia tentaculata* of the species characteristic of polluted zones was observed, and a few examples of *Corbula gibba*, characteristic of semi-polluted zones, were observed. In addition, examples of such species as *Brissopsis lyrifera, Labidoplax digitata, Sternaspis scutata* and *Turritella communis* which are characteristic of clean zones, were encountered at all stations. In conclusion, when studies done earlier (GOKCEN and CIRIK, 1988; KOCATAS *et al.*, 1988) are compared with those carried out at stations outside the dumping area, it may be seen that benthic species in this area have not been much affected.

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