The Cladocera of the Inner Bay of Izmir

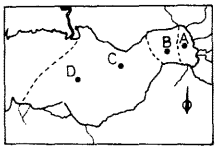
Ismet OZEL and Süleyman MAVILI

Department of Hydrobiology, Ege University, Science Faculty, 35100 Bornova, Izmir (Turkey)

The Gulf of İzmir can be divided into two parts topographically and hydrographically: an inner bay and an outer bay. The inner bay is situated in the eastern part of the Gulf of İzmir around the city and is connected with the outer bay through a channel (580 m wide and 18.6 m deep). This lagoon-like bay is shallow and the depth reaches 5 m to about 20 m.; the area is 65.5 km². Large quantities of organic matter and industrial wastes of this densely populated settlement are transported by several outfalls and small rivers. So, inner bay waters are less transparent and the quantities of seston and nutrients are very high.

A WP-2 nylon net with a mesh size of 200 µm was used. Zooplankton samples were collected by means of surface hauls for 5 min, at an approximate speed of 1.5-2 knots/h. 4 stations were investigated (Fig. 1).

The eutrophicated and very polluted inner bay may be divided into three parts: very polluted area (A), polluted area (B) and semipolluted area (C, D) (Kocataş, 1980). All six mediterranean Cladoceran species: **Penilia avirostris** Dana, **Evadne spinifera** P.E. Müller, **Evadne tergestina** Claus, **E. nordmanni** Lovén, **Podon intermedius** Lilljeborg and **P. polyphemoides** Leuckart have been found. Distribution and abundance of these species show conformity to the dividing mentioned above and vary significantly in the investigated stations, and also depend on the various environmental factors (Tab. 1).



Stations	Temp. (°C)		Sal.(0/00)		Sec.disc.(m)	
	Min.	Max.	Min.	Max.	Min.	Max.
A	11.5 -	26.0	34.9-	37.6	0.80 -	1.75
B	10.0 -	25.5	35.2-	37.9	1.00 -	3.20
C	9.8 -	26.5	35.2-	38.0	1.30 -	4.00
D	9.5 -	27.0	35.1-	38.6	1.50 -	4.70

Penilia avirostris is an euryhaline and neritic species. It is found most abundantly in July and November. Its quantity increases from the inner part to the channel. The presence of this species in the inner bay may be explained by the existence of detritus.

Evadne spinifera is a thermophilic species. It is found during the warm period, maximum in July and disappears in winter. It prefers clear waters, so it is absent in the inner parts (A, B), in relation with the decreasing of water transparency.

Evadne tergestina is also a thermophilic species and is found in all stations in the warm period, from June to December, maximum in July.

Evadne nordmanni is found occasionally in all stations, only in March and April (only in May in the outer bay).

Podon intermedius is a typically psychrophilic species and is encountered in the whole inner bay (except in its innermost part) during the cold period, maximum in January.

Podon polyphemoides is the indicator of both diluted waters and pollution. It is the most common and abundant Cladoceran species of the inner bay. Although a thermophilic species (Patriti, 1973), it is found in great numbers in the whole inner bay in all months, maximum in May (Fig. 2).

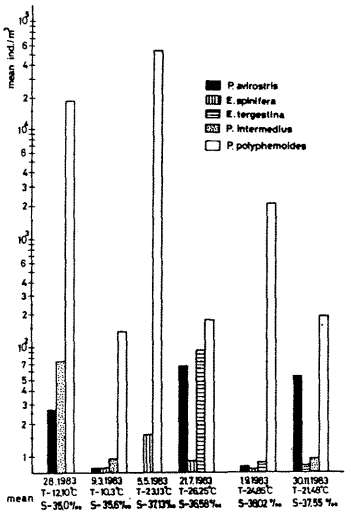


Fig.2.- Quantitative variations of Cladocera in the Inner Bay of İzmir.

REFERENCES

KOCATAŞ- A., 1980. Effects of domestic pollution in İzmir Bay (Turkey). Helgol. Meeresunters., 33: 393-400.

PATRITI, G., 1973. Les cladocères des milieux portuaires de Marseille. Mar. Biol. 20: 50-57.

Surface dynamics of *Cypridina multipilosa* (Ostracoda; Crustacea) in the Gulf of Aqaba (Eilat), Red Sea

T. ECHELMAN* and L. FISHELSON**

*Marine Science Research Center, State University of New York-Stony Brook, Stony Brook, NY 11794-5000 (U.S.A.)

**Department of Zoology, Tel Aviv University, Ramat Aviv 69978 (Israel)

Numerous taxonomic studies of zooplankton have been conducted in the Gulf of Aqaba, but few ostracod species have been reported (Echelman, 1989) and less is known of ostracod seasonal population dynamics.

Ostracods were usually more abundant 2 km offshore than near the reef. They were quite rare in mid-day surface zooplankton collections (Echelman, 1989), and in seasonal night collections most abundant during February and March. The Ostracod collections included six species: Asterope sp., Conchoecia sp., Cypridina multipilosa, Cypridinodes sp., Philomedes sp., and Synasterope sp., of which only C. multipilosa was numerous. Maximum C. multipilosa abundances (419 m^{-3}) were observed during a relatively full moon (March 1, 1988), at this time comprising 47.2 % of the total zooplankton ind. and a significant portion of the total biomass (86.1 g wet weight m^{-3}). Horizontally this high concentration was quite patchy, where at a distance of less than 600 m concentrations as low as 61 ind. or a total biomass of 8.3 g wet weight m^{-3} were observed. With the exception of these March abundances, maxima never exceeded 27 m^{-3} and were generally much lower.

Ostracod maxima have been observed in the same season (February to April), in the Atlantic Ocean (Deevey, 1982) and Andaman Sea (Boonruang, 1985), but reported maxima were much lower (24-46 ind. m^{-3}). To our knowledge only one other seasonal ostracod maximum has been reported, of similar magnitude to our findings during March 1988, and according to Paulinose and Aravindakshan (1977), this phenomena had previously been unreported from any region of the world oceans. There in the northern Arabian Sea Cypridina dentata was observed at concentrations of ca 179 ind. m^{-3}, which set record zooplankton displacement volumes for the upper 200 m of the Indian Ocean, and appeared associated with swarming for planktonic mating and bioluminescence (Daniel and Jothinayagam, 1977; Paulinose and Aravindakshan, 1977). Like Cypridina multipilosa, C. dentata was observed in dense vertically migrating patches (Daniel and Jothinayagam, 1977; Paulinose and Aravindakshan, 1977).

The assemblage of ostracod species from the Gulf of Aqaba appears similar to that of the Gulf of Suez, where seven species are known (Halim, 1969). However, four of the six species from the Gulf of Aqaba, including: Conchoecia sp., Cypridina multipilosa, Cypridinodes sp., and Synasterope sp. have not been reported from the Gulf of Suez or the Red Sea proper. For most planktonic taxa, more species are known from the Red Sea proper than either of the two northern Gulfs; however, ostracods appear to be an exception to this trend (Halim, 1969; Echelman, 1989).

Acknowledgments: The authors wish to express their sincerest thanks to Dr. R. Lerner-Seggev for her help in identifications, A. Cushnier and others for their help in collections, and the H. Steinitz Marine Biological Laboratory for providing facilities and equipment.

Literature

Boonruang, P. (1985). The community structure and distribution of zooplankton at the East Coast of Phuket Island, Southern Thailand, Andaman Sea. Phuket Mar. Biol. Center, No. 39.

Daniel, A. and J. Jothinayagam. (1977). Neuston biomass and variations in abundance of its major zooconstituents in the northern Arabian Sea during the oceanographic expedition on Ins Darshak. pp. 264-273. in: Proceedings of The Symposium on Warm Water Zooplankton. National Institute of Oceanography, India.

Deevey, G. (1982). Planktonic ostracods of the north Atlantic off Barbados. Bull. of Mar. Sci., 32(2): 467-488.

Echelman, T. and L. Fishelson. (1988). The seasonal surface zooplankton dynamics near Eilat, Gulf of Aqaba, Red Sea. Rapp. Rapp. P.-v. Reun Comm. int. Mer. Mediterr., 31: 304

Echelman, T. (1989). The seasonal surface near-reef and offshore zooplankton dynamics near Eilat, Gulf of Aqaba, Red Sea. Tel-Aviv University (M.Sc. thesis).

Halim, Y. (1969). Plankton of The Red Sea. Oceanogr. Mar. Biol. Ann. Rev., Vol. 7: 231-275.

Paulinose, V. and P. Aravindakshan. (1977). zooplankton biomass and abundance in the northeastern Arabian Sea. pp. 132-145. in: Proceedings of The Symposium on Warm Water Zooplankton. National Institute of Oceanography, India.