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MESOZOOPLANKTON OF THE POMERANIAN BAY IN 1977 - 1979

by

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ABSTRACT

The Pomeranian Bay mesozooplankton sampled in 1977-1979 was found to contain 27 species, the maximum densities being observed in summer /Table 1/. The mesozooplankton studied consisted of marine and brackish-water forms typical of the Baltic and also freshwater species indicating the magnitude and extent of seasonal influxes of fresh water, mainly from the River Odra, into the Bay.

Résumé

Dans les années 1977 - 1979, on a trouvé dans les eaux de la baie de Poméranie 27 espèces des représentants de mésozooplancton. Leur nombre maximum était toujours observé au cours de l'été /Tab. 1/. Les formes qui constituaient le mésozooplancton étaient les formes marines et d'eaux saumâtres caractéristiques pour la Baltique, de même que les formes d'eaux douces. Ces dernières étaient en même temps les indices du nombre et du rayon d'influence saisonnière des eaux fluviales /principalement de l'Odra/ sur les eaux de la baie de Poméranie.

The Pomeranian Bay zooplankton samples collected /Fig. 1/ seasonally over a 3 - year period of 1977 - 1979 by means of a 0.250 mm Bongo net allowed to follow the dynamics of zooplankton abundance and composition in the specific ecosystem of the Bay. Świna and Dziwna, the two rivers discharging their waters into the Bay enrich the latter with nitrogen and phosphorus, thereby bringing about a strong eutrophication. It is particularly in the Bay's coastal zone periodically supplied with allochthonous organic matter that the autochthonous organic matter displays strong periodic fluctuations. Typical of the estuarine - type waters of the Pomeranian Bay are considerable variations in salinity of the surface and bottom layers, both in the coastal and off-shore zones. The salinity along with temperature /frequent homothermy and insignificant thermal differences between the surface and bottom layers / are the factors modelling the planktonic fauna composition in the Bay.

Within 1977 - 1979, the presence of 27 mesozooplankton species was recorded, most of them being holoplankters, and copepods prevailing in each season. The following species and higher taxa were identified: Keratella quadrata, Keratella cochlearis, Nematoda, Evadne nordmanni, Daphnia pulex, Leptodora kindti, Bosmina coregoni maritima, Podon leuckarti, Podon intermedius, Acartia bifilosa, Acartia tonsa, Acartia clausi, Acartia discaudata, Acartia longiremis, Pseudocalanus minutus elongatus, Temora longicornis, Centropages hamatus, Eurytemora hirundo, Oithona similis, Cyclops viridis, Cyclops leuckarti

Halacaridae, Balanus improvisus nauplii, Macoma spp. and Mytilus edulis veligers, Fritillaria borealis and Sagitta setosa.

The zooplankton abundances in spring and autumn were rather uniform, while those in winter and summer differed markedly /Table 1, Fig.2/. The temperature data provided by Dr.Tadajewski and his collaborators assist in detecting a positive relationship between the zooplankton abundance and composition on one hand and temperature on the other. A seasonal variability in dominants was also seen, their order and percentage contribution to the fauna in the samples varying from season to season and from station to station; however, the basic seasonal dominants were as follows:

- winter: Pseudocalanus minutus elongatus, Acartia longiremis,
- spring: Eurytemora spp., Acartia bifilosa, Acartia tonsa, Evadne nordmanni;
- summer: Acartia tonsa, Acartia bifilosa, Podon spp., Eurytemora spp.;
- autumn: Acartia tonsa, Acartia bifilosa, Pseudocalanus minutus elongatus, Acartia longiremis.

The maximum abundances were constantly recorded in summer, when the biological production was at its highest, preceded by marked influxes of organic matter from the Szczecin and Kamień Firths. The highest abundance was at that season observed at Station h /9 nautical miles off River Świna mouth/, while the lowest abundances were recorded at those stations closest to the rivers Świna and Dziwna mouths /Stations 1 and 5 /, which resulted from a rapid change in osmotic pressure, fatal for the fresh-water and marine stenohalines carried into this zone of the Bay /Table 1/. The rivers mentioned influenced the Pommeranian Bay mesozooplankton composition by introducing such fresh-water elements as Leptodora kindti, Daphnia pulex, Keratella spp., Cyclops viridis, Cyclops spp., Eurytemora hirundo. At the same time, high densities of permanent and seasonal holoplankters were found to be accompanied by abundant marine meroplankton /larvae of Rhithropanopeus harrisi, Balanus improvisus, Macoma spp. and Mytilus edulis/.

As a rule, very low zooplankton abundances near the river mouths were giving way to increasing densities farther off-shore to be replaced beyond the boundary of the mixing zone by a decreasing found there. The mixing zone in autumn, winter and spring was found to extend to about 3 nautical miles north and east off river mouths, while in summer the boundary tended to shift to 9,and even 12, nautical miles north.

/The source of information on water chemistry of the Pomeranian Bay in 1977 - 1979 are unpublished manuscripts by Dr.Tadajewski and his collaborators/.

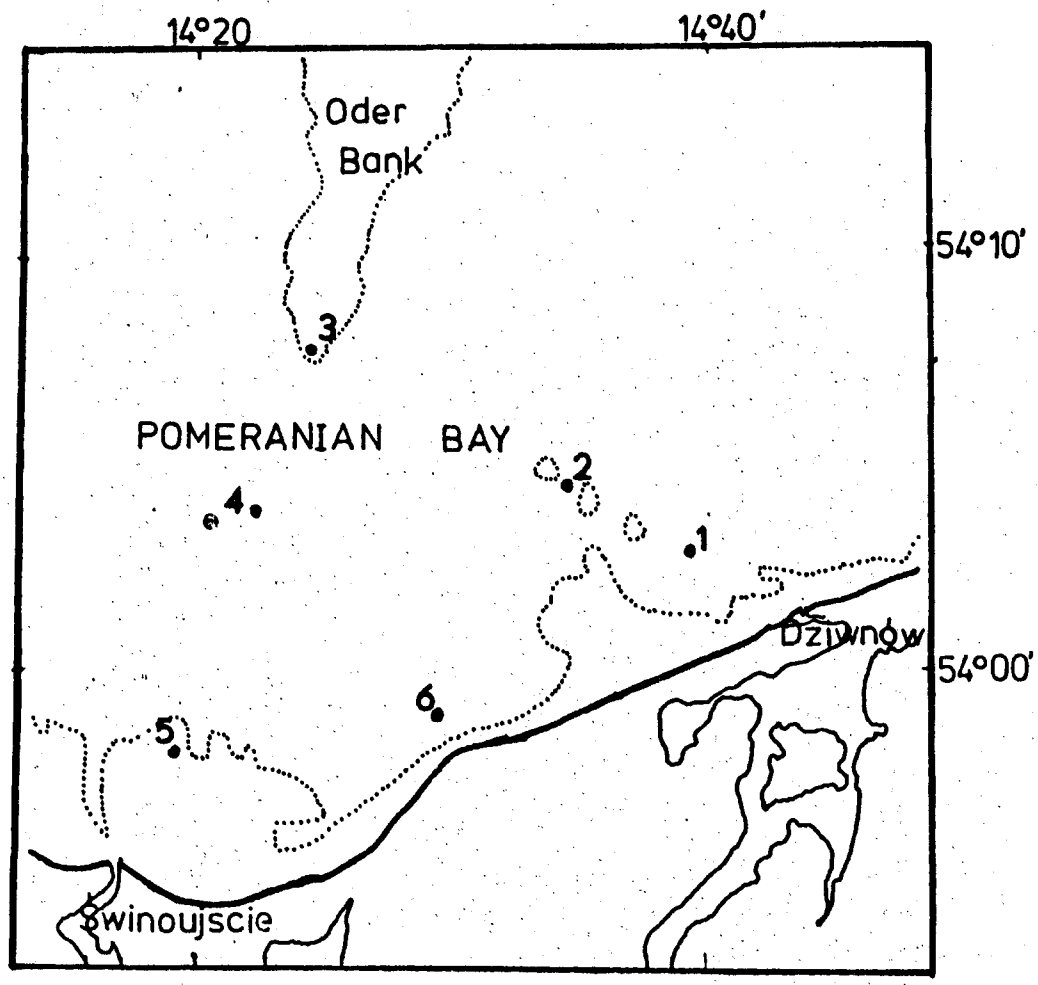

Fig.1. Location of sampling sites in the Pomeranian Bay.

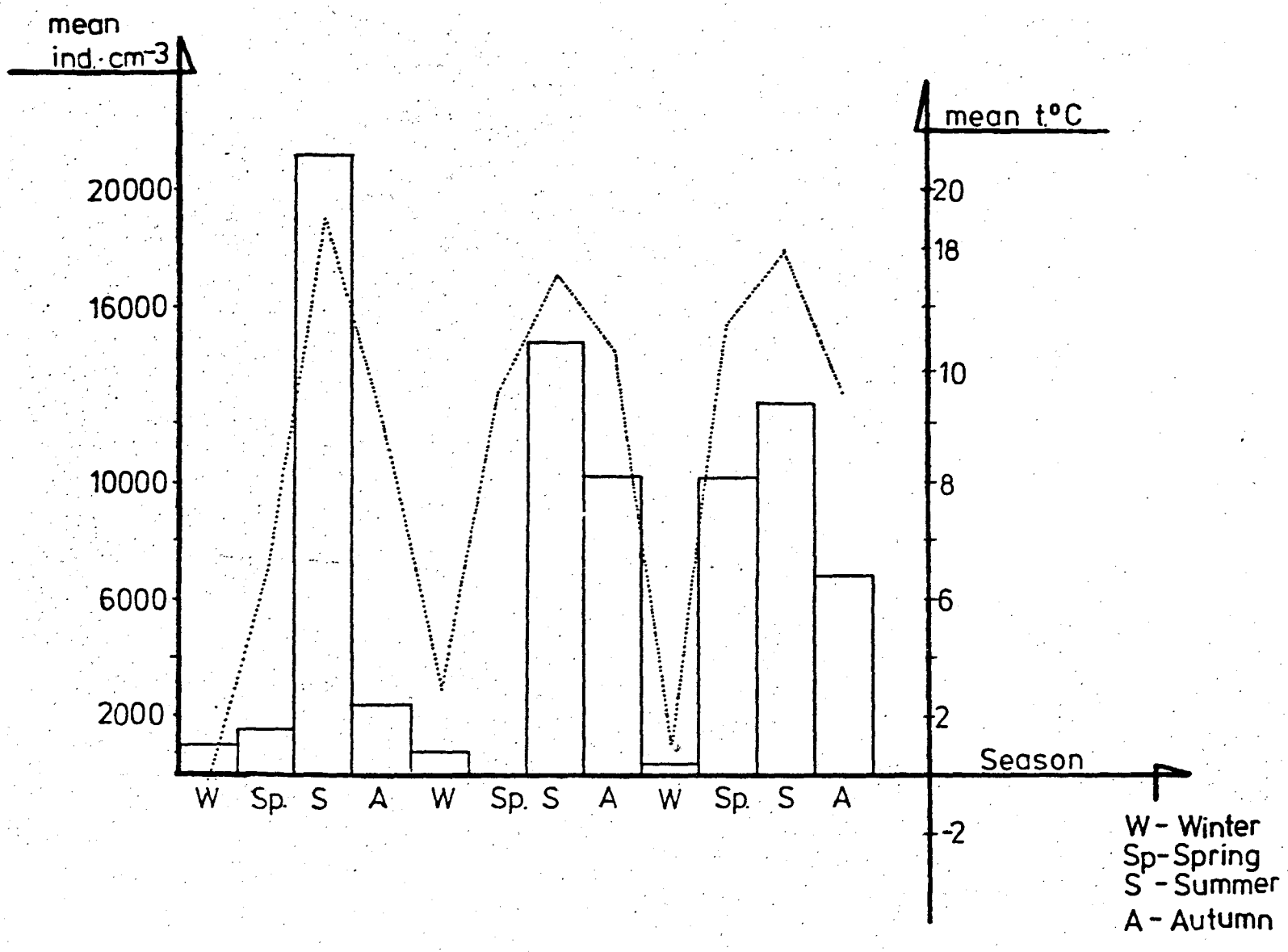

Fig.2. Mean abundance of mesozooplankton versus mean water temperature in each season.

Table 1

Zooplankton abundances in the Pomeranian Bay in 1977 - 1979/ ind.x m^{-3}/

Station N°	1977				1978				1979			
	Winter	Spring	Summer	Autumn	Winter	Spring	Summer	Autumn	Winter	Spring	Summer	Autumn
1	1170	920	11480	242	148	3048	4035	507	91	14223	13977	2240
2	1190	700	19650	3484	1035	947	5484	33452	14	16960	11395	2482
3	340	1860	27450	1662	151	a/	8880	18188	95	9372	1824	5850
4	240	3240	29420	1093	543	a/	60200	688	30	12986	1349	26939
5	310	1970	18450	6289	2406	a/	5265	2321	54	5944	119	1801
6	3030	a/	a/	743	212	a/	4862	3798	2064	3141	47247	2059

a/ no samples taken