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CLADOCERA OF THE SOUTHERN BALTIC SEA

by

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From among Phyllopoda only one group, the Cladocera is present in the Baltic.

Cladocera are summer forms and therefore this species is of some importance among the planktonic animals of the Baltic exclusively during the warmest period of the year.

The most frequent species in the southern Baltic is Bosmina coregoni maritima. It makes up 50-65% of all Cladocera and is controlled by the hydrographical features of the environment being more numerous in coastal zone than elsewhere. On the second place the species Evadne nordmanni is to be listed /25-35 %/. This species from the genus Podon, however, is less frequent, and Podon leuckartii occurs sporadically only.

Scarce in a rather the same degree in respect to their occurrence are the fresh water species such as Bosmina longirostris, Alona affinis, A.nana, A.rectangula, Diaphanosoma brachyurum, Daphnia cucullata, D.cristata, Chydorus sphaericus and Leptodora Kindti. Their occurrence is restricted to firths and estuaries of the southern Baltic.



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Bosmina corregoni maritima P.E.Müller

This species, as it has been stated, occurs during the period from March /sometimes from February/ to November inclusive. Its maximum occurrence has been noted from the end of July until mid September. In the open sea there were found at that time 100 individuals per 1 m³ of water; in the coastal zone, however, and in the bays, the highest numbers of individuals were such as 1600-2500 per 1 m³.

During the whole period of occurrence of this species the presence of females with parthenogenetic eggs in their brood chambers was observed with the maximum of frequency in June and July; about the end of August and the beginning of September, however, the number of females bearing parthenogenetic eggs was much scarcer.

In June and July larger numbers of females /with embryos/ were noted, but in August and September the males prevailed.

It was stated that the number of males grew toward Autumn. From what is said above a certain relationship could be seen between the decrease in number of females with parthenogenetic eggs in last days of August and first days of September, on the one hand, and the increase in number of males during that period as well, as the appearance of females bearing some sporocyston the other.

Both the maximum occurrence of Corregoni maritima during summer and its complete absence in winter lead to the conclusion that this species is to be considered a thermofile one.

The results obtained from vertical hauls have demonstrated that the species under consideration occurs in masses during the period mentioned above, within the water layer from 0 m to 22 m depth /85-97 %/, thus, in the

top waterlayer with highest temperatures /16-20°C/.

As concerns the salinity, this species was found to abound in waters of about 7‰ salinity.

Reasumming, it can be said that this species is thermophile and euryhaline, and is a summer form that lives in the top water layer with a preference for the coastal zone where it occurs in masses.

Evadne nordmanni Leoven

E. nordmanni was found from March to November. Its maximum occurrence was observed in June but it was also found in samples taken about the end of May and in early July /1200-1400 individuals per 1 m³ in bays and in the coastal zone/.

As the reproduction is concerned, the presence of young individuals both, in brood chambers and in free state, as well as the presence of females bearing parthenogenetic eggs was observed since May. The reproduction ended in September. In late autumn, the eggs were found to be present in brood chambers.

In the period last mentioned the adult males were found too. In the summer period this species was found to be numerously dwelling both, in the upper and bottom water layers, because of the relatively highest temperature in those two water layers, amounting in June to 14° - 18° C.

In autumn when the temperature gets homogenous, this species was found to occur rather evenly distributed within the whole water column showing, though, an apparent tendency to maintain in the top water layer.

The waters this species used to be found within were most frequently characterized by a salinity of about 7 ‰.

It follows from the study on this species that the areas of its occurrence are: the firths of the Baltic, the Baltic, the Danish Straits, the North Sea, and the Atlantic Ocean, thus it can be considered an euryhaline and eurythermic one.

Podon polyphemoides Leuckart

This species was found in samples taken from April to November. Its frequency is highest in August when it occurs in masses.

P. polyphemoides in the coastal zone is the commonst from among the other species of the genus Podon.

As a most frequent from it occurs in the north-western part of the Bay of Gdańsk /the Puck Lagoon/. Toward the open sea the number of its individuals diminishes more and more until they get sporadic only.

The presence of females and males was observed from May. During the summer period, when the number of individuals was increasing considerably, the females were found with parthenogenetic eggs or embryos in their brood chambers.

P. polyphemoides were almost exclusively caught within the 0-20 m water layer, and, as it was just mentioned above, were most frequent in shallow coastal waters /especially in bays/ where the salinity oscillated between 4 and 8 ‰.

Podon intermedius Lilljeborg

This podon was caught from May /in very warm years even from April/ to November inclusive. The highest frequency of this species was noted in last days of August, then during September and the first half of October /sometimes even until November/.

The males and females could be distinguished as early as since May. During summer the females were bearing eggs or embryos in their brood chambers. The period of a full development for this species in the area investigated is considered to be the end of summer and the beginning of autumn.

The horizontal distribution shows that podon dwells more frequently in the open waters of the Baltic than in those of its coastal zone and bays.

In spite of the fact that the extension of the vertical distribution of P. intermedius is rather large /down to 100 m depth/ a characteristic feature of this species is that it exhibits an apparent tendency to dwell in the top water layer, thus a marked thermophilia is conspicuous.

Podon leuckartii G.O. Sars

This species showed a sporadically occurrence, therefore it was impossible to give here its more precise characteristics excepting that single specimens were caught on the turn of spring.

References

1. Ackefors, H., 1971: *Podon polyphemoides* Leuckart and *Bosmina coregoni maritima* /P.E. Müller/ in relation to temperature and salinity in field studies and laboratory experiments. - J. exp. mar. Biol. Ecol. 7, 51-70.
2. Ackefors, H., C.-G. Rosen, 1970: Temperature preference experiments with *Podon polyphemoides* Leuckart in a new type of alternative chamber. - J. exp. mar. Biol. Ecol. 4, 221 - 228.
3. Gireskes, W.W.O., 1971: Removal of *Podon polyphemoides* from the Genus *Podon*. - Hydrobiologica 38, 61-66.
4. Ciszewski P., - 1966: Zooplankton wód otwartych Południowego Bałtyku. Zakład Oceanografii Morski Instytut Rybacki, Gdynia.
5. Drzycimski J., Chojnacki J., Radzinn M - 1972 - Ekologia zooplanktonu Południowego Bałtyku. Zakład Oceanografii, Morski Instytut Rybacki - Ekosystemy Morskie, Biologia.
6. Siudziński K. - 1966 - Zooplankton Strefy przybrzeżnej Zatoki Gdańskiej Zakład Oceanografii - Morski Instytut Rybacki Gdynia.
7. Siudziński K. - 1966 - Zooplankton of the Baltic Sea, the Vistula Firth and the Szczecin Firth as Viewed on the Background of Variable Conditions of Salinity.
8. Siudziński K. 1967 - Zooplankton of the Gdańsk Bay. MRBM. International Council for the Exploration of the Sea. C.M. 1967/L:12 Plankton Committee.
9. Siudziński K. - 1968 - Investigation on zooplankton in western part of the Gdańsk Bay. Annales Biologiques VOL. XXIII /1966/ Part II Plankton and Benthos.
10. Siudziński - 1968 - Influence of the Environmental Conditions on Distribution of Zooplankton in the Bay of Gdańsk. International Council for the Exploration of the Sea.

CM 1968/L:12 Plankton Committee.

11. Siudziński - 1968 - Planktonic Crustacea from the Estuaries in the Firth of Puck. International Council for the Exploration of the Sea. CM 1968/L:13 Plankton Committee.

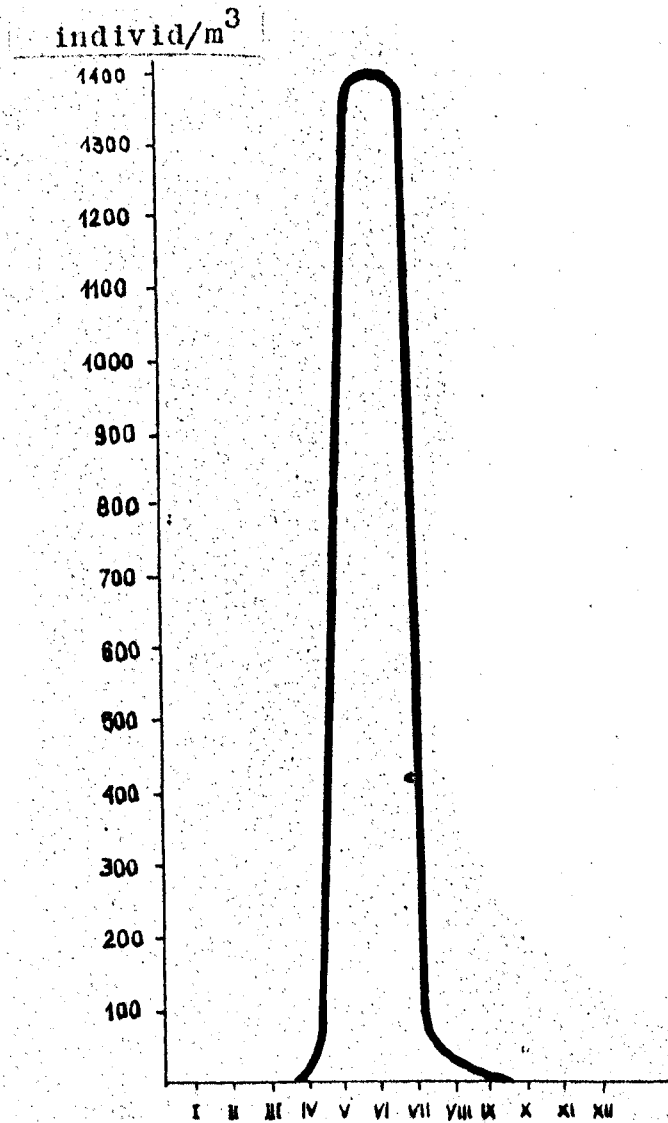


Fig. 1. The quantitative occurrence of *Evadne nordmanni* in particular seasons in the Bay of Gdańsk /after K. Siudziński/

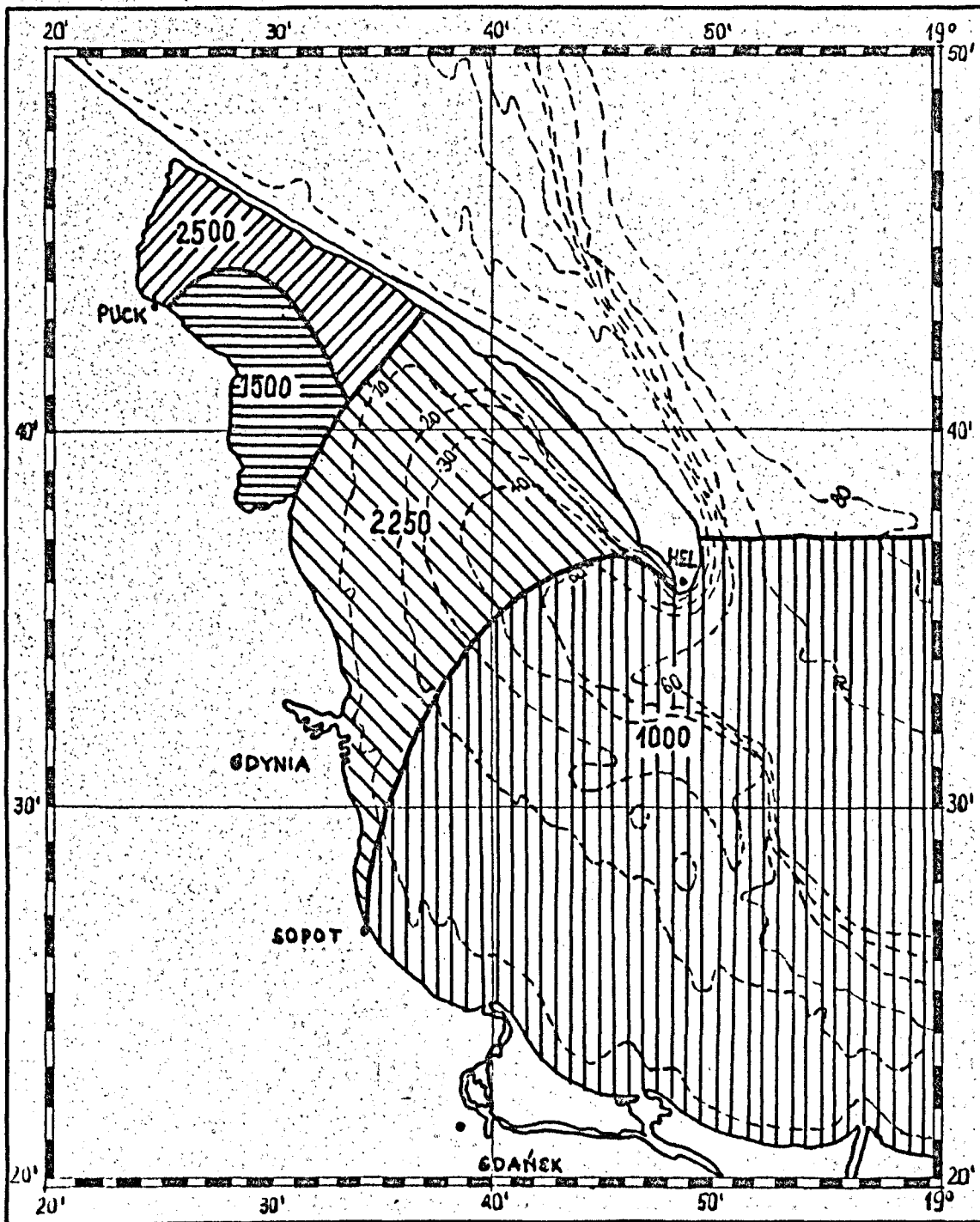


Fig. 2. The horizontal quantitative distribution of *Bosmina coregoni maritima* in summer /individ/m³/

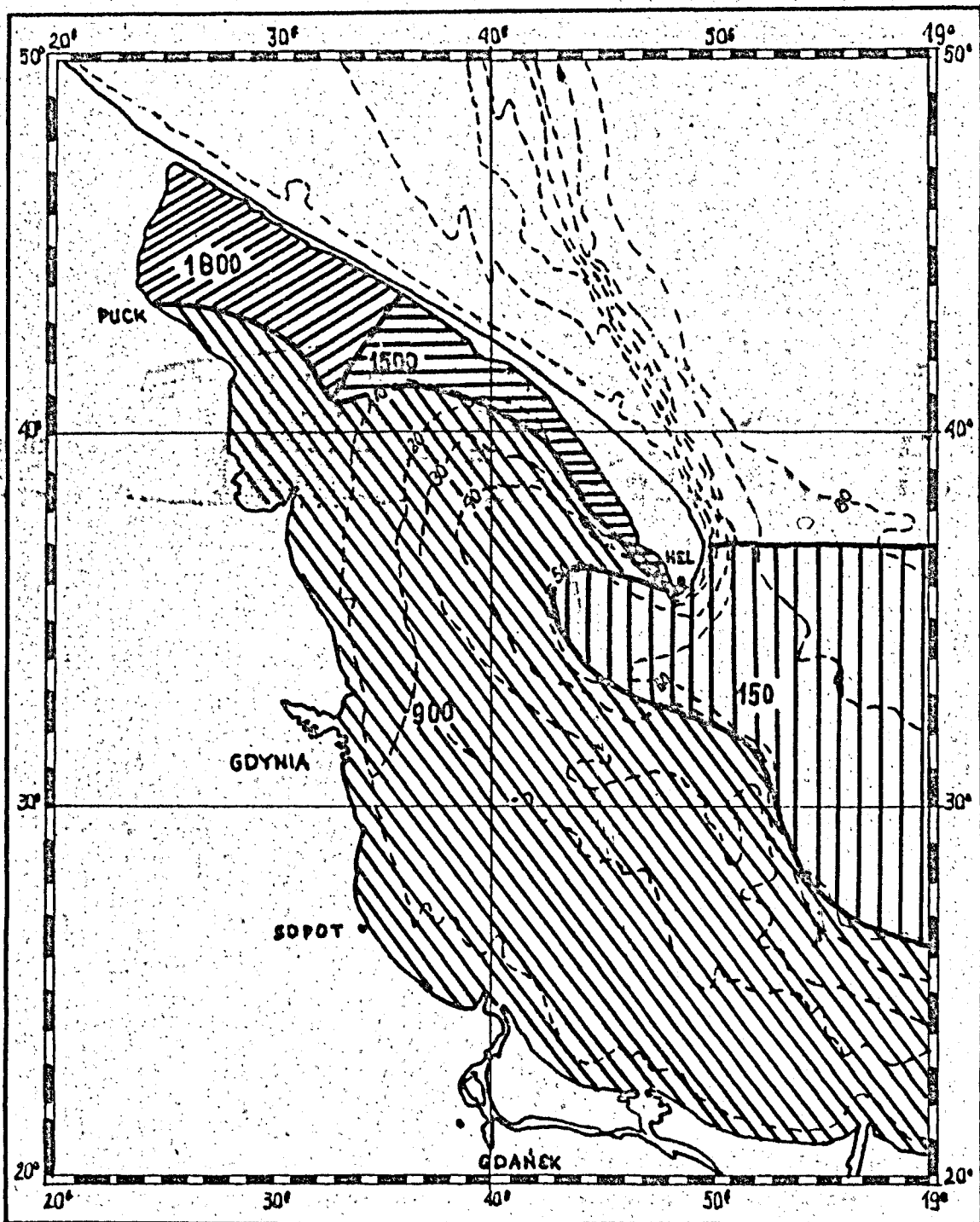
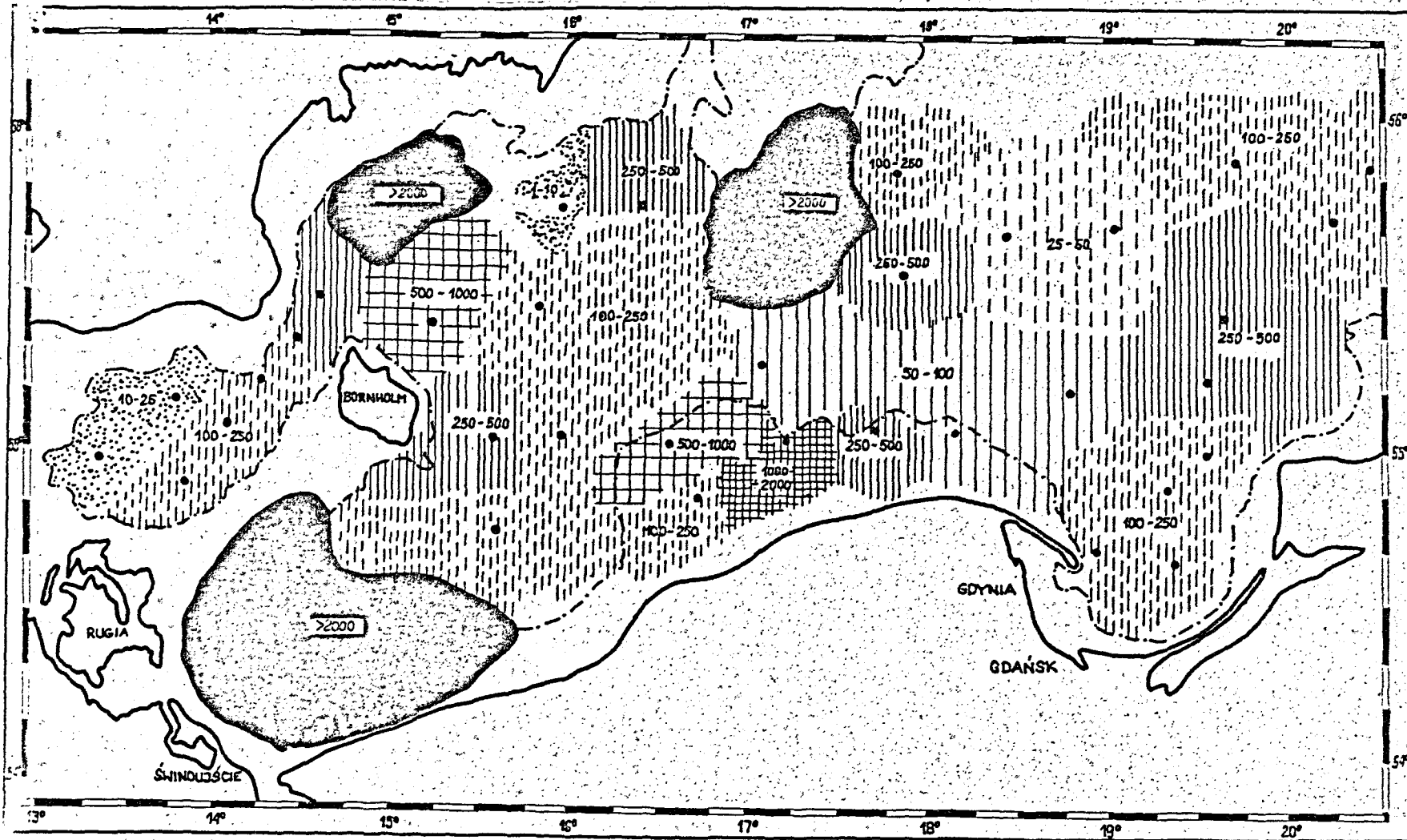


Fig. 3. The horizontal quantitative distribution of *Evadne nordmanni* in summer /individ/m³/

Fig. 4. The horizontal quantitative distribution of *Bosmina coregoni* maritima
in summer in the southern Baltic /individ/m³/
/according to P. Ciszewski/



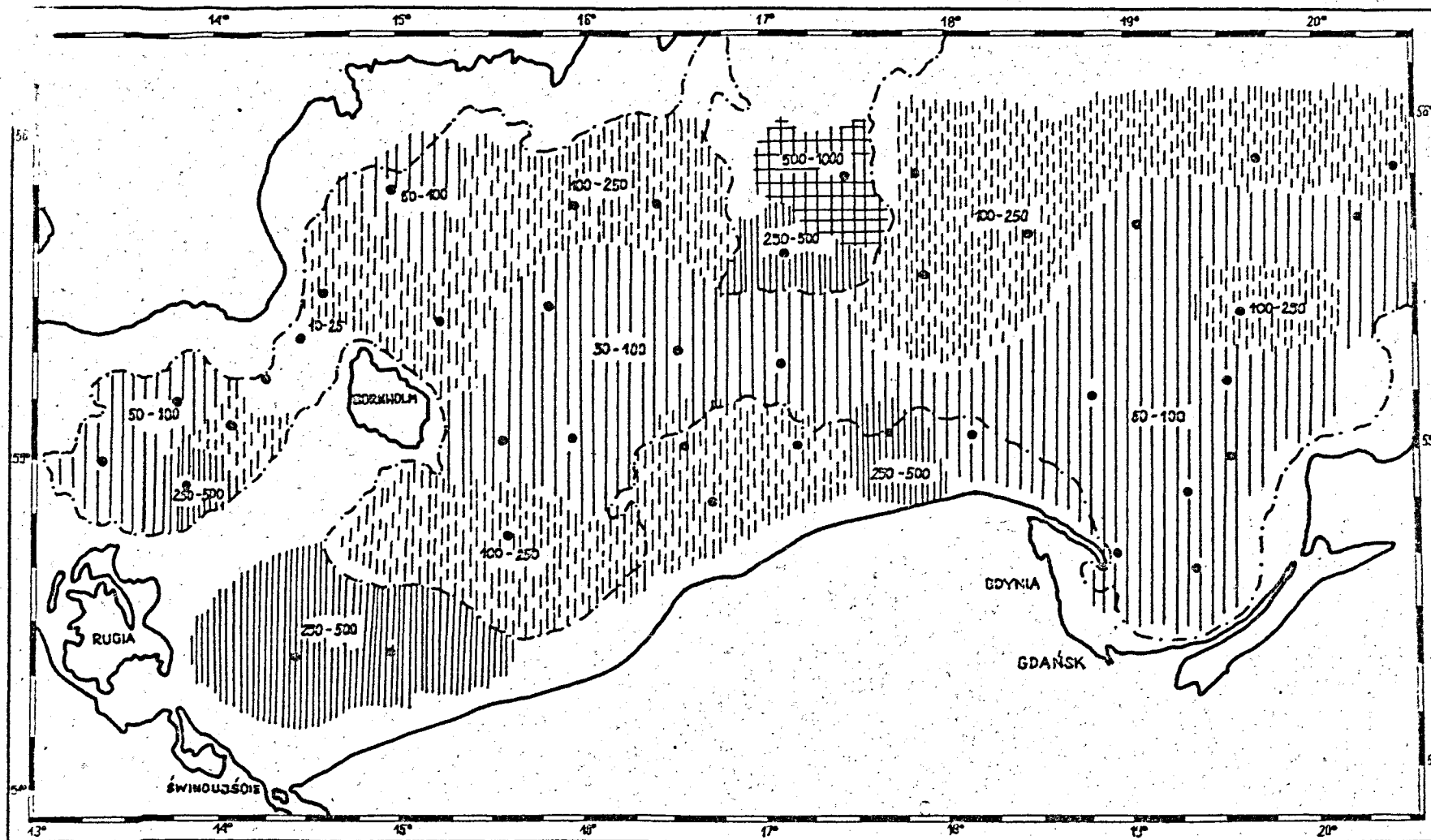


Fig. 5. The horizontal quantitative distribution of *Evadne nordmanni*
 in summer in the southern Baltic /indiv/m³/
 /according to P. Ciszewski/