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Biomass of the Southern Baltic holoplanktonic crustaceans in 1973

by

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Our investigations on the Southern Baltic crustacean plankton, carried out during four seasons /spring, summer and autumn 1973, winter 1974/, revealed considerable seasonal and regional variations in the zooplankton biomass. The biomass values presented were obtained using standard weights of each species. An average Baltic crustacean biomass amounted to 42.307 g/m^2 for the whole period investigated. The biomasses of both the permanent zooplankton components, i.e., copepods /*Pseudocalanus elongatus*, *Temora longicornis*, *Centropages hamatus*, *Acartia* spp., *Oithona similis*/ and the seasonal ones, namely the copepod nauplii and cladocerans /*Bosmina coregoni maritima*, *Evadne nordmanni*, *Podon* spp./ were taken into account. The copepod biomass appeared to be relatively constant throughout the year /Table 1/. Notwithstanding the season, dominations of particular species followed each other or overlapped so no significant fluctuations of the copepod biomass were observed during the whole period studied. On the other hand, the cladocerans exhibited conspicuous annual biomass fluctuations depending on the season.

In spring, the copepod nauplii made up 45.9% of the whole crustacean biomass, while in summer a seasonal component, cladoceran *Bosmina coregoni maritima* amounted to 64.3%. In autumn, *Pseudocalanus elongatus* and *Temora longicornis* furnished almost 60% of the total biomass, the fraction of the other crustaceans, particularly that of the cladocerans, being decreased. The smallest crustacean biomass was observed in winter,

31.5% of its value being ascribed to *Pseudocalanus elongatus* /Figs.1 and 2/.

Bosmina coregoni maritima showed the greatest biomass variability throughout the year, its biomass increasing from spring till summer from 0.153 to 52.231 g/m², respectively. Despite the seasonal occurrence of this species, it exhibited the greatest annual average biomass of 15.721 g/m². Owing to that, *B.c.maritima* can be placed, during the period of its predominance in the zooplankton, among the most important protein-producers for planktonophagous fishes. The biomass of the remaining cladocerans, despite its considerable annual fluctuations, showed a low annual average value, what allows to regard those organisms as a supplementary fish food, in no case a basic one.

Pseudocalanus elongatus showed the most stable biomass throughout the whole period, its biomass in the Southern Baltic varied within a narrow range of 7.207 - 8.141 g/m². The data obtained prove the significant role played by this copepod species in the planktonophagous fish food, particularly during the winter and winter - spring seasons before the seasonal components appear.

Temora longicornis, *Centropages hamatus*, and *Oithona similis* demonstrated strong fluctuations of their biomasses from season to season. *Temora longicornis* showed maximum values both in number of individuals and in biomass in summer and autumn, the biomass values during those seasons amounting to 8.423 and 7.333 g/m², respectively. Together with *P. elongatus*,

it formed an important food component for sprat and herring.

The biomasses of *Centropages hamatus* and *Oithona similis* reached their maximum values, 2.849 and 0.335 g/m², respectively, in summer.

Significant differences in the crustacean biomasses occurred regionally, the greatest values being found at certain stations of the Bornholm and Gdańsk Deeps, 62.27 and 84.94 g/m², respectively, while the smallest ones at the Arkona Deep /24.006 g/m²/. A clear eastward tendency to increase the crustacean biomass could be followed, this trend being ascribed to the hydrographic and topographic conditions of the Southern Baltic /Fig. 3/.

It can be concluded that the biomasses of *Bosmina coregoni maritima*, *Pseudocalanus elongatus*, *Temora longicornis*, and *Acartia* spp. supply the essential fraction of the whole crustacean biomass recorded for the Southern Baltic. The biomass of *Pseudocalanus elongatus* seems to be the most important one, showing the most uniform values and being most frequently found within the food of Baltic herring throughout the year.

Table 1.

Changes in average biomass of the Southern Baltic holoplanktonic crustaceans during the seasons investigated /g/m²/.

Crustacea	1973		1974	
	spring	summer	autumn	winter
Copepoda	27.344	25.722	25.040	21.633
Cladocera	3.955	54.015	0.668	2.220
Total	31.299	79.737	25.708	23.853

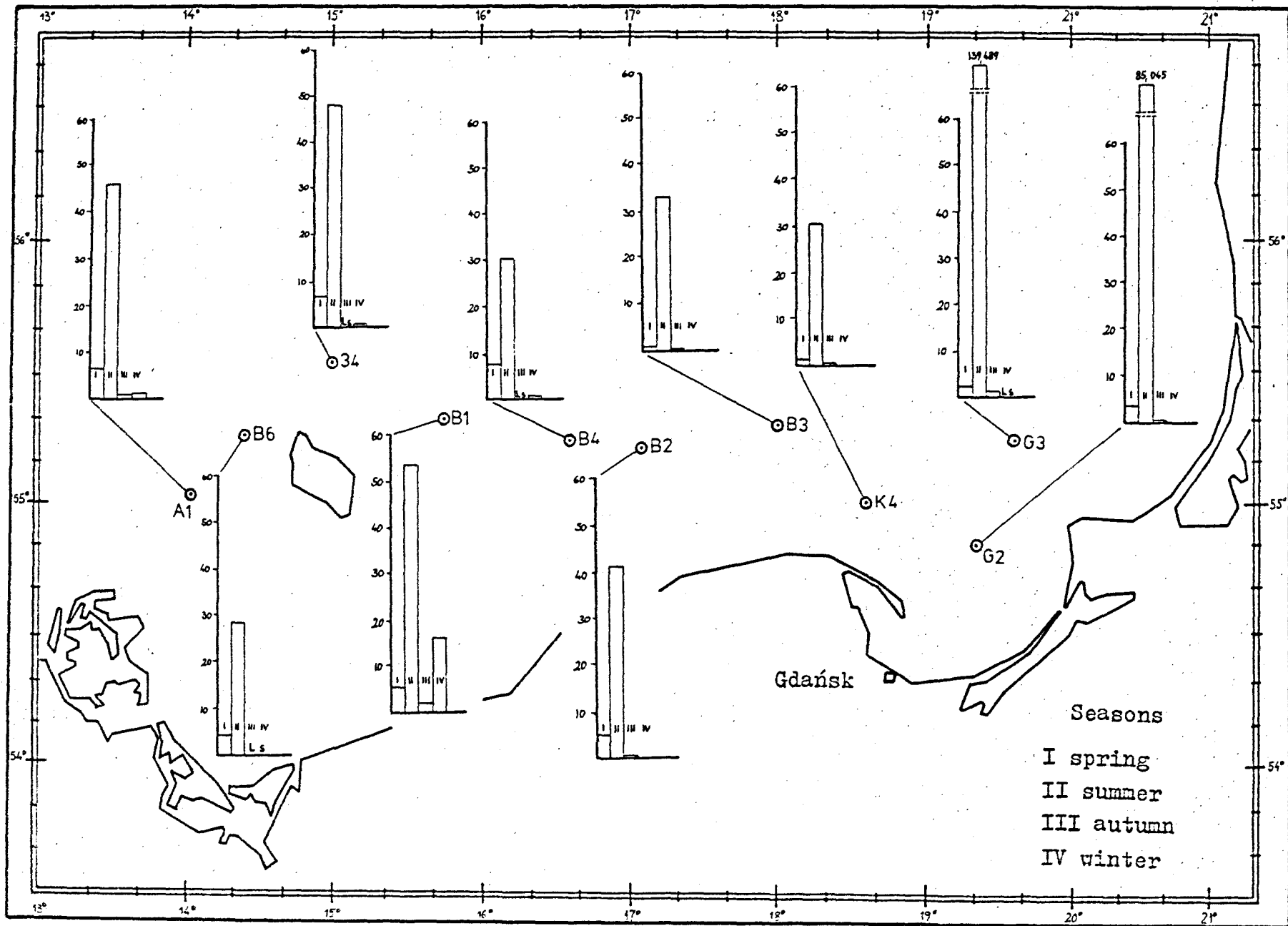


Fig. 1 Total biomass g/m^2 of eladocerans in 1973

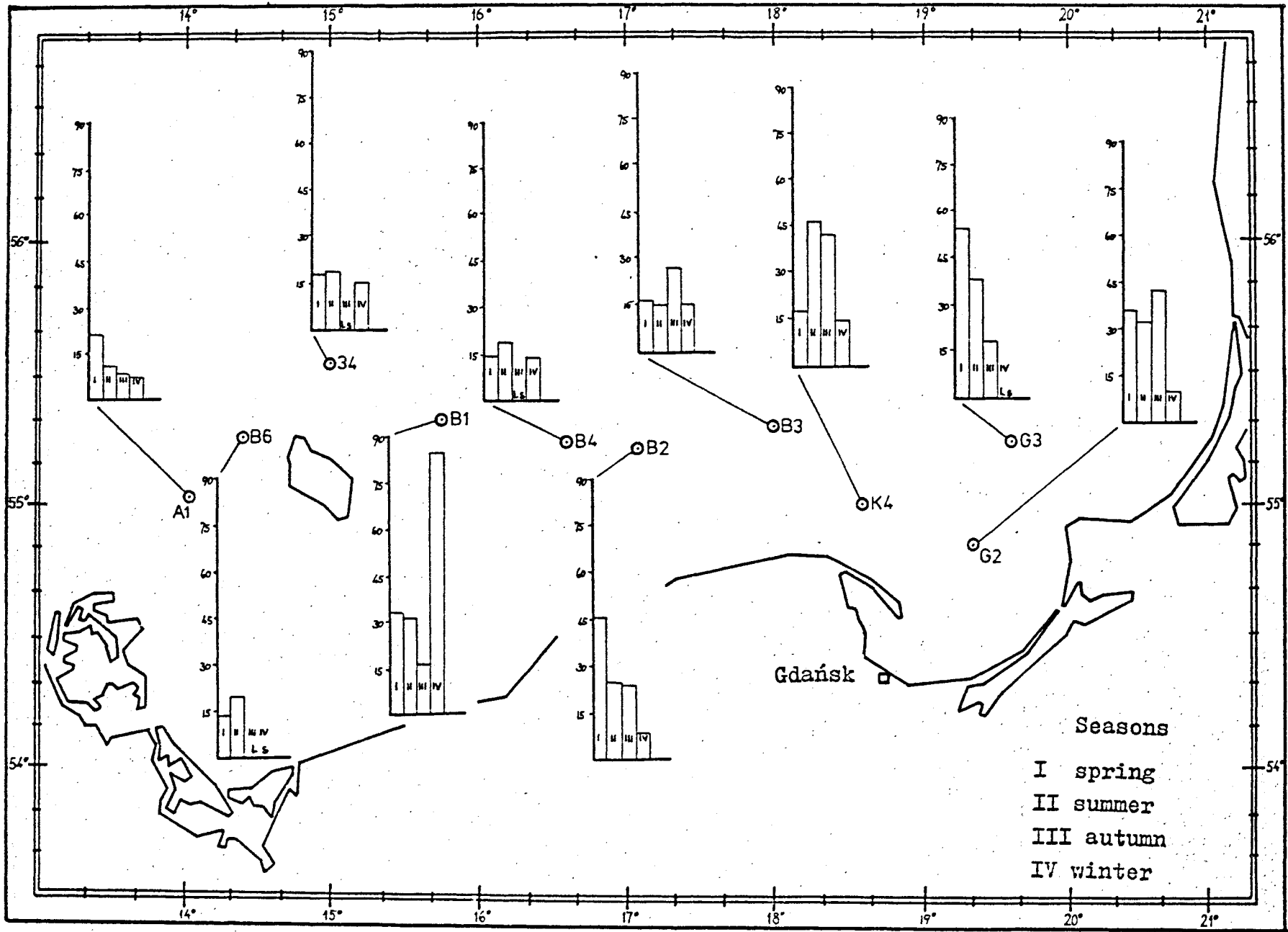


Fig. 2 Total biomass g/m^2 of copepods in 1973

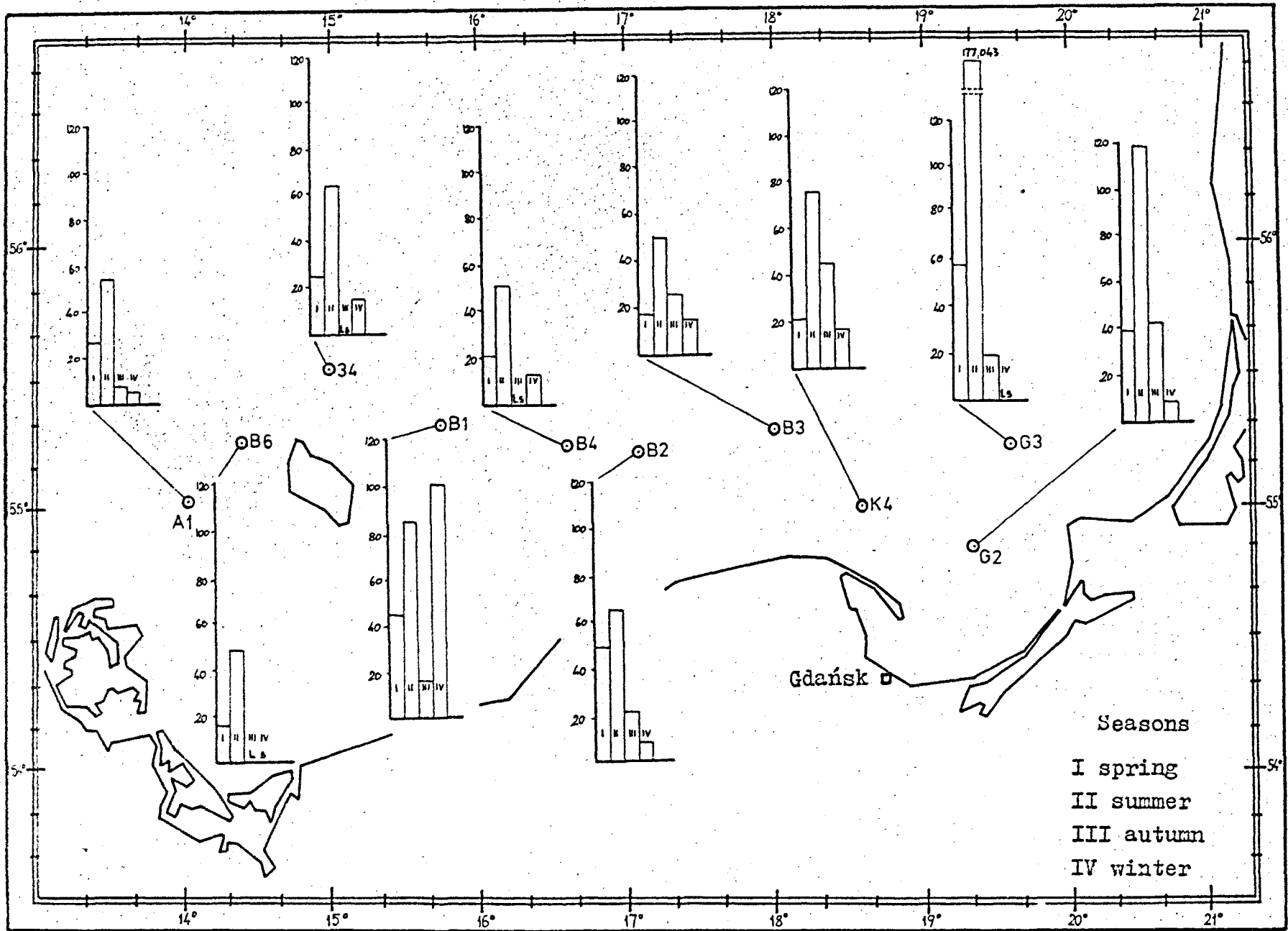


Fig. 3 Total biomass g/m^2 of crustaceans in 1973