

DISTRIBUTION OF PELAGIC SHRIMPS IN THE AUSTRALIAN SOUTHERN OCEAN (ABSTRACT)

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Pelagic shrimps are widely distributed in the oceanic waters and are the main components of the macroplankton and micronekton. Previous studies on pelagic shrimps in the Antarctic Ocean have been restricted to taxonomy. The present study deals with geographical distributions of biomass and species of pelagic shrimps in the Australian Southern Ocean.

Samplings were carried out on the R. V. HAKUHO MARU during the KH-83-4 cruise (BIOMASS SIBEX phase-1) conducted by the Ocean Research Institute, University of Tokyo from December 1983 to January 1984. Nine stations were occupied; two of them to the north of the Subtropical Convergence (Subtropical Zone), one between the Subtropical Convergence and the Subantarctic Front (Subantarctic Zone), one between the Subantarctic Front and the Polar Front (Antarctic Polar Frontal Zone) and five in the south of the Polar Front (Antarctic Zone). The samples were collected by oblique hauls in the layer between the surface and the depth of 570-1050m with a 3.16m Isaacs-Kidd midwater trawl with a mesh opening of 5mm.

Pelagic shrimps were comparatively stable in terms of their proportion to the total macroplankton and micronekton biomass at 60°S in the Antarctic Zone and northward; the values ranged from 6.1 to 11.6% with an average of 8.2%. At three stations along 65°S in the Antarctic Zone, pelagic shrimps constituted 0.001-1.8% of the total biomass. These values in the Australian Southern Ocean were much smaller than in the western Pacific Ocean where the values were about 20% (IWASAKI, unpublished).

The biomass (wet weight) of pelagic shrimps in the Subtropical, Subantarctic and Antarctic Polar Frontal Zones was 0.98-4.08 g/1000m³ with an average of 2.7 g/1000m³. In the Antarctic Zone, it was 0.003-0.92 g/1000m³ with an average of 0.49 g/1000m³. The average biomass in the Antarctic Zone was about one-tenth of the average biomass in Sagami Bay, Japan, which was the largest biomass in the western Pacific Ocean and the Bering Sea. It was the smallest biomass next to the tropical oligotrophic water.

The largest abundance, 9.53 individ./1000m³, was observed in the Subtropical Zone, whereas the smallest abundance was 0.03 individ./1000m³ at one of the stations in the Antarctic Zone.

A total of 355 specimens representing 10 genera 17 species was identified, and of these seven species, *Gennadas kempfi*, *Sergestes arcticus*, *Petalidium foliaceum*, *Acantheephyra pelagica*, *Hymenodora gracilis*, *Pasiphaea acutifrons* and *P. longispina*, were collected from the Antarctic Zone. The occurrence of *G. kempfi* is the first record in the Antarctic Zone. *P. longispina* is an endemic species in the Antarctic Ocean.

Pelagic shrimps in the Australian Southern Ocean are classified into the following four groups by their geographical distribution. The first group includes four species

(*e.g.*, *Sergestes disjunctus* and *S. pectinatus*) and is restricted to the Subtropical Zone. The second group includes six species (*e.g.*, *A. quadrispinosa* and *Systellaspis debilis*) and occurs in the Subtropical and Subantarctic Zones. The third group includes six species (*e.g.*, *A. pelagica* and *P. foliaceum*) and is distributed from the Subtropical Zone to the Antarctic Zone. The fourth group including one species (*P. longispina*) occurs in the Antarctic Polar Frontal and Antarctic Zones.

The present study has revealed the following features of distribution of pelagic shrimps in the Australian Southern Ocean. In general, the biomass, abundance and species richness tend to decrease southward. Meso- and bathypelagic species are widely distributed in the Australian Southern Ocean. Furthermore, the distribution patterns are discussed in relation to the water masses in the Australian Southern Ocean.

(Received May 2, 1985; Revised manuscript received July 18, 1985)