

MIDWATER FISHES OF THE SOUTHERN OCEAN SOUTH
OF AUSTRALIA (EXTENDED ABSTRACT)

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Midwater fishes play important roles in oceanic ecosystems. Knowledge of their biology, however, is scarce and fragmentary, particularly that of the Southern Ocean. Over 2000 fishes were collected during the BIOMASS SIBEX I cruise of the R. V. HAKUHO MARU (KH-83-4) of the Ocean Research Institute, University of Tokyo, from the Southern Ocean south of Australia. The patterns of horizontal distributions and some aspects of the biology were described on the basis of these collections.

Samples were taken using a 10-foot Isaacs-Kidd Midwater Trawl towed obliquely from the surface to a maximum depth of 670-1050 m at nine stations (Fig. 1). Stns. 1 and 8, Stns. 2 and 7, and Stns. 3, 4, PI-2, 5 and 6 are located in the Subtropical, the Subantarctic, and the Antarctic Waters, respectively.

A total of 2039 fishes belonging to 19 families was caught. Of these, fishes of the family Gonostomatidae, Myctophidae and Bathylagidae comprised 95% of the total catch. Gonostomatids were by far the most numerous (72%), followed by myctophids (17%) and bathylagids (6%).

Gonostomatids and myctophids were identified to species. Fishes of the genus *Cyclothone* occupy more than 99% of the total number of the gonostomatids. Four species, *C. braueri*, *C. sp.*, *C. pallida* and *C. microdon*, were found in the catches. Occurrence of *C. braueri* was restricted to the Subtropical and Subantarctic Waters, whereas the other three species were also collected in the Antarctic Water. However, the numbers of *Cyclothone* collected showed a southward decline, suggesting that they were expatriates especially in the Antarctic Water.

Twenty-one species of the myctophids were identified. Patterns of horizontal distributions of the myctophids may be largely divided into four types: those occur mainly in (i) the Antarctic Water; (ii) the Antarctic and Subantarctic Waters; (iii) the Subantarctic Water; and (iv) the Subantarctic and Subtropical Waters. Each type was represented by the following dominant species: (i) *Electrona antarctica*; (ii) *Protomyctophum (P.) bolini*; (iii) *E. paucistrata*; and (iv) *E. carlsbergi*, *Hygophum hanseni* and *Lampanyctus australis*. Type (i) was the most easily recognizable pattern probably due to the fact that endemism in the Antarctic Water is distinct compared with that in the other areas.

Electrona antarctica was the most numerically dominant myctophid in our catches. A length-frequency distribution of *E. antarctica* shows a trimodality (Fig. 2) and the smallest length class was composed mainly of juveniles and youngs, while mature males and females were found only in the largest length class. On the assumption that the

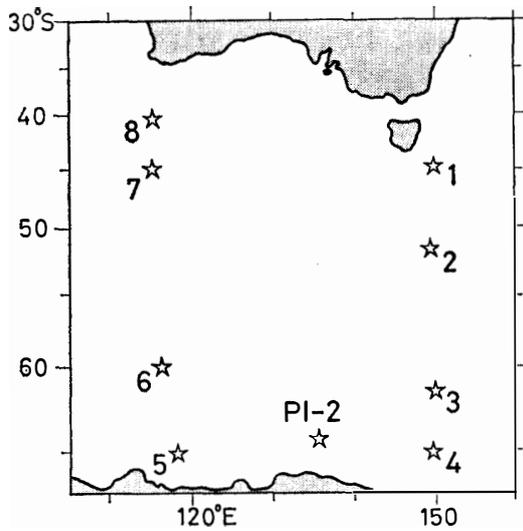


Fig. 1. Locations of sampling stations.

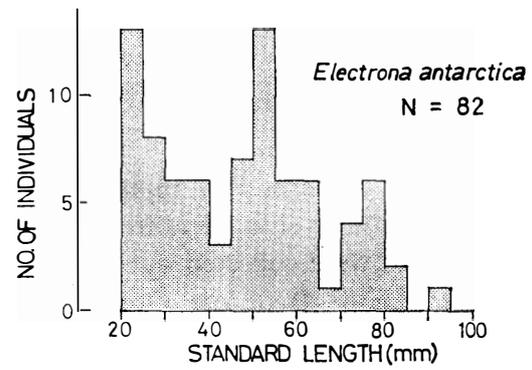


Fig. 2. Length-frequency distribution of *Electrona antarctica*. Samples from all stations are combined. *N* indicates the total number caught.

spawning occurs once a year and each mode represents an year-class, *E. antarctica* matures in 2 years at 70–85 mm in standard length.

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