

# Trophodynamics of mesopelagic micronekton in the southern ocean

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During the austral summer of 1982, a program was initiated to investigate the trophodynamics and ecology of micronekton in the major ecosystems of the southern ocean. Initial sampling with opening/closing midwater trawls was conducted from the R/V *Hero* (9–17 February 1982) in two of the deep basins (less than 1,000 meters) of the Gerlache and Bransfield Straits. Most of the collecting was focused in Croker Passage (64°06'S 61°53'W) adjacent to Brabant Island. Predictably, trawl samples revealed communities with relatively few species, yet high abundance, of micronekton. The dominant fish species were the nototheniid *Pleuragramma antarcticum* and the myctophid *Electrona antarctica*; other important fish species included *Gymnoscopelus nicholsi*, *Protomyctophum bolini*, *Electrona carlsbergi* and *Lampanyctus achirus*. Less common fishes included *Cyclothone* sp., *Bathylagus antarcticus*, and an as yet unidentified paralepidid.

Discrete-depth hauls revealed that the upper 50 meters of the water column were overwhelmingly dominated by dense patch-

es of krill, *Euphausia superba*. The deepest layers of the basins were characterized by large gammarid amphipods (e.g., *Eurythenes*, *Cyphocaris*, *Eusirus*) and a large population of the mysid *Antarctomysis*. Diel vertical migrations do not appear to be a prominent feature of the feeding patterns of the mesopelagic fish fauna, no doubt because of the disproportionately long periods of daylight during the austral summer. Fish feeding patterns clearly are linked to the populations of *E. superba*, which is a major dietary item for most of the fish species examined. Preliminary stomach content analyses, however, indicate that these fishes prey on a number of the region's zooplankton, including amphipods, chaetognaths, copepods, and ostracods. Detailed stomach content surveys for identification of prey items and chemical analyses of daily rations are in progress in our respective laboratories.

Preliminary data on the age patterns of the mesopelagic fish fauna suggest that the antarctic forms are much longer-lived than their taxonomic and ecological counterparts from subtropical and tropical waters. Correlative growth data from otoliths and chemical composition analyses are accumulating but as yet are too few for interpretation.

The final results of our first year's efforts will be a preliminary characterization of the basin's micronektonic fauna in terms of their relative abundance, nutrient uptake patterns, and age and growth. These data will be compared with additional data collected in 1982–83 from the basins and from offshore.

In the coming year, additional sampling of these basins is planned to better define patterns of vertical distribution. Comparative sampling in more open waters of the Ross Sea will be initiated from the icebreaker *Glacier*.

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