

FEEDING BEHAVIOR OF THE ANTARCTIC KRILL, *EUPHAUSIA SUPERBA* DANA

I. REACTION TO SIZE AND CONCENTRATION OF FOOD PARTICLES

Haruto ISHII, Makoto OMORI and Masaaki MURANO

The ingestion rate of the Antarctic krill, *Euphausia superba*, Dana, was estimated using concentrations of natural particles between 0.13×10^9 and $29.53 \times 10^9 \mu\text{m}^3/l$. Rates were significantly lower at concentrations less than $2 \times 10^9 \mu\text{m}^3/l$. In large krill (>81.6 mg dry wt.), no saturation of ingestion rate was seen; the rate increased linearly with increasing particle concentration over the range of food concentration used. At the average particle concentration of natural seawater (0.40×10^9 to $1.74 \times 10^9 \mu\text{m}^3/l$), small and medium krill ingested slightly more than their daily minimum carbon requirements, but large krill did not. There is possibility that, at high food concentrations, krill can ingest a large amount of food in a short period. Krill feed on a wide variety of organisms, but larger particles are always preferentially ingested. Cannibalism was frequently observed. Individuals lived for as long as 40 days without food. This adaptive feeding behavior is believed to be important to the success of krill in the Antarctic Ocean. (p. 117-124).

ORGANIC CHEMICAL COMPOSITION OF FECAL PELLET OF THE KRILL *EUPHAUSIA SUPERBA* DANA

I. LIPID COMPOSITION

Eiichiro TANOUE

The fecal pellets produced by the large and small krill under seminatural conditions were analyzed for lipid class compositions and fatty acid compositions. Lipid compositions of the fecal pellet were compared with those of the plankton and the particulate matter.

The fatty acid compositions of the fecal pellet produced by the large and small krill were quite different from each other. By comparing the lipid compositions of the large and small krill fecal pellets with those of the plankton and the particulate matter, it was suggested that the main source of the lipid materials of the fecal pellet produced by the small krill was the diatom, whereas that of the lipid materials of the large krill fecal pellet was a mixture of the lipid materials of the phytoplankton, diatoms, and the nanozooplankton, choanoflagellates.

The significance of the lipid compositions of the fecal pellets and of the nanozooplankton fed by the krill was discussed in relation to the energy transfer processes of the food web in the Antarctic ecosystem. (p. 125-134).

ORGANIC CHEMICAL COMPOSITION OF FECAL PELLET OF THE KRILL *EUPHAUSIA SUPERBA* DANA

II. AMINO ACID COMPOSITION

Eiichiro TANOUE

Amino acid compositions of the fecal pellet produced by the large and small krill were compared. Some differences were observed between the two samples, although the distribution patterns of amino acids in the two samples were approximately the same. The Essential Amino Acid Index (EAA Index) was applied to estimate the protein quality of the fecal pellet samples. The EAA Index supported the previous conclusion obtained through

lipid composition analysis of the same samples that the large krill more preferably fed on the nanozooplankton, choanoflagellates, than the small krill. (p. 135-138).

STOCK AND QUANTITATIVE DISTRIBUTION OF THE
ANTARCTIC KRILL (*EUPHAUSIA SUPERBA* DANA) IN
THE ANTARCTIC OCEAN SOUTH OF AUSTRALIA
IN JANUARY AND FEBRUARY 1984

Denzo INAGAKE, Noboru MATSUURA and Yoshihiro KURITA

The quantitative distribution of the Antarctic krill (*Euphausia superba* Dana) was examined using a scientific echo sounder (SIMRAD EK-S120) on board the T/V UMITAKA MARU in the Antarctic Ocean south of Australia in January and February 1984, and the stock of the krill was estimated. The krill was abundantly found in a layer between 25 m and 85 m deep in the Antarctic Divergence Zone and its southern area. The mean density of the krill is 0.0287 g/m³ and 0.0712 g/m³ in each survey area in the first leg and the second leg, respectively. The density varies from place to place very much, for example from none to 0.2151 g/m³. The estimated stock in the cruise is about four times that in the FIBEX cruise by the UMITAKA MARU carried out in almost the same area. (p. 139-147).

NOTES ON CETACEAN SIGHTINGS DURING SIBEX
CRUISE OF THE UMITAKA MARU III, 1983/84

Ryohei ONO and Fujio KASAMATSU

Cetacean sightings were carried out in January and February 1984 in the Southern Ocean south of Australia during the SIBEX cruise of the T/V UMITAKA MARU III. A total of 89 schools of 293 whales were sighted during the cruise which covered approximately 5,000 nautical miles. Of these whales, 71 of five baleen whale species and 159 of five toothed whale species were identified. Of the total baleen whales observed, minke whale (*Balaenoptera acutorostrata*) schools were found most frequently. Among toothed whales, sperm whale (*Physeter catodon*) schools were the largest in number. Approximately two-thirds of all the whales sighted were found in a definite area south of 60°S. Minke whales yielded the highest discovery rate in the area. Relative abundance of baleen whales and toothed whales in the Antarctic Ocean was discussed based on the present data. Differences in sighting efficiency between experts and non-experts were also criticized. (p. 149-154).

SEABIRDS IN THE AUSTRALIAN SECTOR OF THE
SOUTHERN OCEAN, JANUARY AND
FEBRUARY 1984

Hideo MOCHIZUKI and Isao KASUGA

Sightings of seabirds were carried out during the period from November 1983 to March 1984 as a part of BIOMASS program. In this observation, 3 species of Spheniscidae, 8 species of Diomedidae, 20 species of Procellariidae, 4 species of Hydrobatidae, 2 species of Stercorariidae, 2 species of Laridae, a single species of Sulidae and unidentifiable species of genera *Pachyptila* and *Pelecanoides* were recorded. Distribution patterns of most species were similar to the previous information. However, King Penguin was recorded from 64°S and Royal Albatross from 61°S. White-chinned Petrel was very few and Short-tailed Shearwater was very common near the Antarctic Convergence. (p. 155-165).