

REARING OF ANTARCTIC MARINE ORGANISMS IN JAPAN
(EXTENDED ABSTRACT)

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Rearing of Antarctic marine organisms was made at the aquarium, Kamogawa Sea World, Chiba Prefecture, Japan under the cooperative contract between the National Institute of Polar Research and the aquarium. This trial aimed at keeping the Antarctic marine organisms alive as long as possible in Japan and to getting basic information on the rearing technique from the prospect that Antarctic marine organisms may be required as materials for experimental researches of the Antarctic organisms in the future. At the end of July 1983, eighteen months after the collection of organisms, most of the species reared were still in a good condition.

Three kinds of nototheniid fish, an echinoid, an asteroid, a gastropod, a nemertine, two unidentified kinds of ascidian, an unidentified amphipod and a red alga were provided for the rearing. Specimens were collected from the coastal waters near Syowa Station (69°00'S, 39°35'E) in late January and at a point of 68°47'S 38°51'E, where the icebreaker FUJI moored, in early February 1982. Fish were caught mainly by hook and line. Invertebrates were gathered by a fish meat bait trap. The red algal specimens borne on the back of urchin were sampled.

Specimens collected in the Syowa Station area were transported by a helicopter to the icebreaker FUJI. Mortality of specimens was high after the transportation possibly due to mechanical injury of specimen, rise in water temperature and lack of dissolved oxygen. During about 70 days of the cruise from the Antarctic ice edge to Tokyo, specimens were kept in small containers set in a refrigerator installed in the biology laboratory on board the FUJI. Temperature of sea water was maintained between 0° and +1°C. Two-thirds of sea water in a container was changed with the filtered and cooled sea water of 0° to +1°C twice a day. Continuous aeration through a charcoal filter was made. Fish, asteroids, gastropods and amphipods were fed with defrosted shrimp meat, and echinoids with a green alga. Mortality of specimens was low throughout the cruise.

Rearing at Kamogawa Sea World started on April 20, 1982. Twelve 63 l and eight 20 l containers were prepared for rearing in a refrigerator. An adequate number of individuals of single species was allocated to each container. Water temperature fluctuated between -2.1° and +3.6°C until August 1982 but thereafter within the range

of -0.5° to $+2.0^{\circ}\text{C}$. The specific gravity of sea water changed in the range of 1.025 to 1.030. To purify the water a sand filter through which sea water passes was set at the bottom of the container. However, marked variations in the concentration of nitrate N and nitrite N were observed. The nitrate N concentration changed between 0.6 and 9.4 ppm and the nitrite N concentration varied from 0.001 to 0.235 ppm. The pH value fluctuated between 7.95 and 8.25. Fish, ascidians, asteroids, gastropods, amphipods and nemertines were fed with meat of shrimp, bivalve, and fish and echinoids were fed with a green alga, *Ulva lacutuca*. Diet was given at 5 day intervals.

The number of specimens in each species at the start of rearing and that at the end of July 1983 are given below:

	Species	Individ. No. (April 20, 1982)	Individ. No. (July 31, 1983)
Fish:	<i>Trematomus bernacchii</i>	3	2
	<i>Trematomus newnesi</i>	2	0
	<i>Pagothenia borchgrevinki</i>	4	4
Ascidian:	Ascidia sp. 1	2	2
	Ascidia sp. 2	1	1
Echinoid:	<i>Sterechinus neumayeri</i>	7	6
Asteroid:	<i>Odontaster validus</i>	15	1
Gastropod:	<i>Neobuccinum eatoni</i>	14	10
Amphipod:	Amphipoda sp.	50	2
Nemertine:	<i>Lineus corrugatus</i>	6	5
Red alga:	<i>Phyllophora antarctica</i>	1	1

The mortality in species except for *O. validus* and Amphipoda sp. was low until July 1983. High mortality in Amphipoda sp. was observed in July and in the period from October to November 1982, when molting occurred and molted individuals died soon after. A remarkable decrease in the number of *O. validus* occurred in November and December 1982. The cause of death in *O. validus* was not clarified. In conclusion, however, it seems that the long-term rearing of Antarctic marine organisms in Japan is feasible.

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