

## Transport of live Antarctic fishes from Syowa Station to Port of Nagoya Public Aquarium

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Four individuals of two species of Notothenioidei fishes (one ploughfish *Gymnodraco acuticeps* and three emerald rockcod *Trematomus bernacchii*) were collected near Syowa Station in January 2019 and transported alive to Port of Nagoya Public Aquarium (Nagoya, Japan). Here we provide some detailed records on how the transport was successfully conducted.

The fishes were collected by fishing in Kita-no-ura cove (Lützow-Holm Bay, East Antarctica) (Nishizawa et al. 2019). One ploughfish was collected on 18 Jan., and five emerald rockcod were collected between 10 and 17 Jan. After the collection, the fishes were divided into two sealed buckets (Toslon SN-20) filled with seawater and aerated by dry cell air pump and held under the Environmental Science Building of Syowa Station. The fishes were transported by helicopter to the icebreaker "SHIRASE" on 19 Jan. On board "SHIRASE", the fishes were housed in the sealed buckets with 20 litres of seawater, one or two individuals in one bucket, and aerated with a dry-cell air pump. The sealed buckets were housed in C-packs (CES-4) and kept cool with freshwater ice around them. The C-packs were placed in the refrigerator (room temperature 2-5°C) in Observation Room 2 of "SHIRASE". During the transport in "SHIRASE", water was changed every 3-10 days at a rate of 7-8 litres per bucket. Ice for cold storage and air pump batteries were replaced every three days. After "SHIRASE" arrived at the Port of Sydney, Australia, on 18 March, the fishes were unloaded from "SHIRASE" and packed for air transport after quarantine. Each fish was sealed in a plastic bag with seawater and oxygen and placed in a sealed bucket. Sealed buckets were placed in C-packs and kept cold around them with freshwater ice and refrigerants. The fishes left Sydney Airport on 19 March and arrived at Chubu Centrair international Airport the same night. Then they were transported to Port of Nagoya Public Aquarium and housed in aquaria. After the collection, the fishes were not fed for approximately two months, including during transport, until they were housed in aquaria at Port of Nagoya Public Aquarium. The water temperature during transport temporarily rose to 4.0°C during loading onto "SHIRASE" and temporarily rose to 2.7°C during transshipment in Sydney, but otherwise remained between -1.0°C and 1.3°C. During transport, one emerald rockcod died on 2 Feb and another emerald rockcod on 16 Feb.

The transport from Sydney to Nagoya could not be treated as an export because none of our staff at the scene resided in Australia. This case, we adopted the procedure of a transshipment of fishes in Sydney. However, a problem was what an appropriate treatment could be to enter them into Japan. After discussions with Nagoya Customs, we came to the conclusion that it would be treated as domestic cargo from Syowa Station to Nagoya. The fishes brought into Port of Nagoya Public Aquarium are still kept in good health after three and a half years.

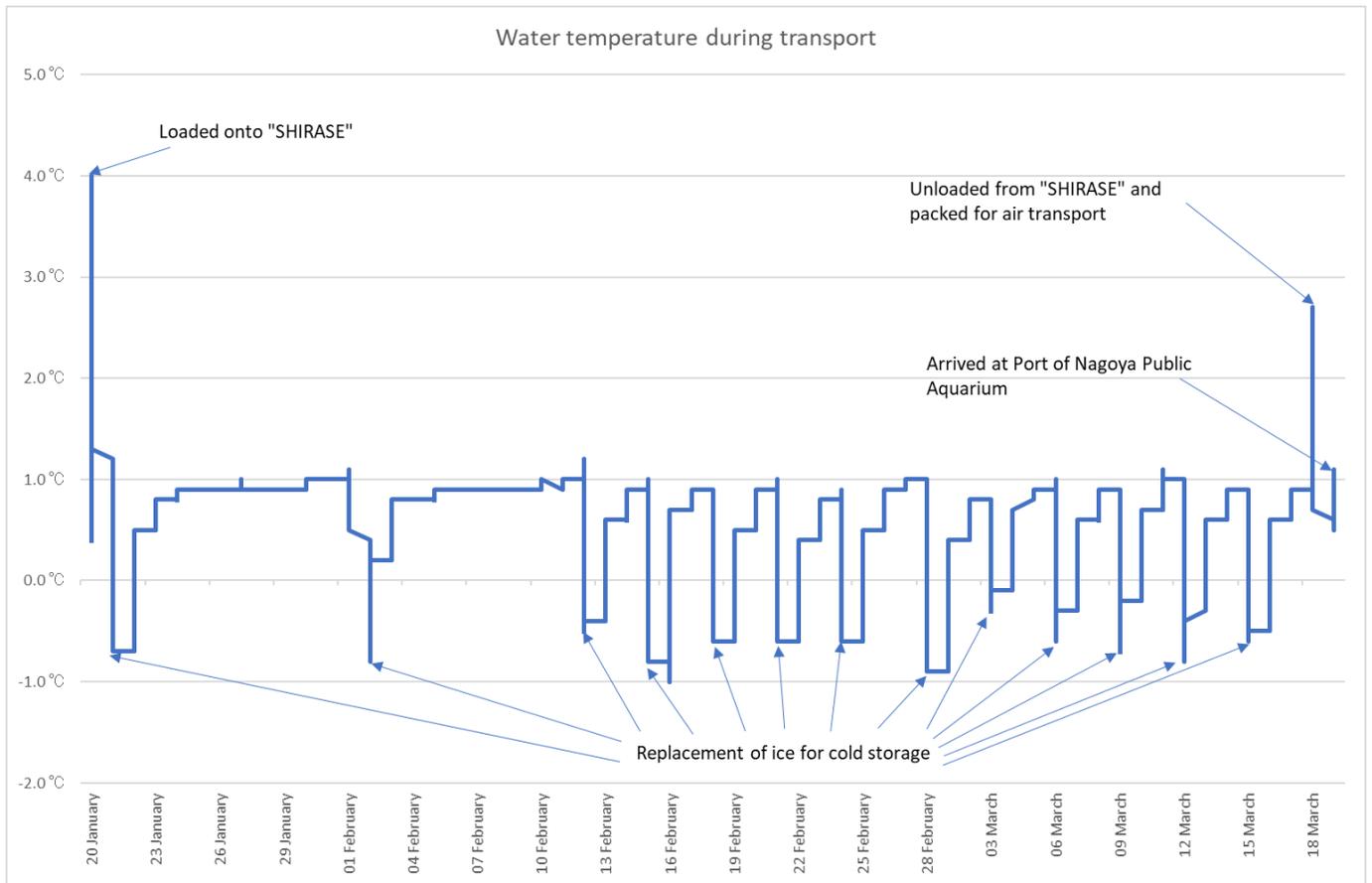


Figure 1. Water temperature during transport

**References**

Nishizawa, H., K. Ichikawa, S. Asai, N. Arai, H. Mitamura, Y. Miyamoto and T. Iwami, Record of fishes sampled in Kita-no-ura cove (Lützw-Holm Bay, East Antarctica) in January 2019, *Antarctic Record*,63,27-55, 2019.