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Short Report

Transport of Live Green Snails, *Turbo marmoratus*, from Japan to Tonga

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The green snail, *Turbo marmoratus*, was first introduced to Tonga from Vanuatu in 1993, to create a new fishery of this commercially valuable species. Fifty live green snails were transported by air on August 8, 1993. The flight from Vanuatu to Tonga took seventeen hours and twenty minutes and the survival rate of the snails was 100 % one week later (Fa'anunu and Sone, 1994).

To find another source of the green snail for transplantation, two transportation trials of live green snails were conducted from Japan. The first transportation of 28 snails was conducted on March 24, 1994. The journey took 48 hours from Narita airport, Japan, to the Ministry of Fisheries at Sopu, Tonga, via Nadi, Fiji. The survival rate of the green snails was 39 % one week after the transportation. It is thought that the low survival rate must have been due to the long transportation time. The second transportation was conducted using the much shorter air route via Auckland, New Zealand, and this report deals with the details of that second transportation.

A total of 292 green snails were placed in ten plastic cages with lids (52 cm x 35 cm x 27.2 cm) and hung in the sea at a depth of about 2.5 m at Boma Port, Tokunoshima Island (about 1,400 km south west from Tokyo). They were left

there for ten days before being flown to Tokyo. Of the 292 snails, 278 were hatchery produced with 76 g being the average body weight (including the weight of the shell) and 14 were wild with 1 kg being the average body weight. The total weight of all the snails was 35 kg. During the ten day period, the green snails were fed every two days with seaweeds, *Gracilaria edulis*, *Coelothrix irregularis* and *Amansia glomerata*, and none of them died.

Five styrofoam boxes with lids (48 cm x 40 cm x 23 cm) were used for packing the snails. Newspapers soaked in seawater were spread over the bottom of each box. About 60 green snails, including two to three large ones, were placed in each box in the apex-up position. The spaces between snails were crammed with dry newspapers crumpled into balls. Snails were then covered with more seawater soaked newspapers and two packs of cooling agents also wrapped in newspaper were placed on top of the cover. Each box was covered with a lid and sealed with adhesive plastic tape.

The green snails were flown to Tokyo on July 28, 1994. They were then land transported from the airport to the Tokyo University of Fisheries. Upon arrival at the university at 10:00 pm they were placed in a 500 litre plastic tank filled with 100 litres of aerated seawater. The journey from Tokunoshima to the university took about 10 hours. The next morning, July 29, 1994, the green snails were packed in the styrofoam boxes in the same way and sent to Narita airport at 10:30 am. Water temperature in the plastic tank was 26.3-28.2 °C during the night. No mortality was observed at this stage.

The green snails were then flown from Narita airport to Fua'amotu airport, Tonga, via Auckland, New Zealand. Then they were land transported to the Ministry of Fisheries at Sopu. Upon arrival at the ministry, the snails were put into the 4.5 m^3 raceway tank supplied with running seawater. Two snails were found dead at this stage. Most of

the snails found to be weak at the time of arrival died within five days. A total of 52 snails died during the first month, one large sized wild one and 51 small hatchery produced ones.

The survival rate was 92.9 % for the wild snails and 81.6% for the hatchery produced snails. Therefore, the survival rate was much improved by shortening the air-transportation time. The lower survival rate recorded for the hatchery produced snails may be explained by the fact that those reared under hatchery conditions have a lower resistance to a sudden change in the temperature and dried conditions. It may be given as a conclusion that the green snails can be transported live if transportation time does not exceed 24 hours and provided that the temperature inside the packing box is controlled by using some cooling agents.

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References

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