Short Paper

Complete Larval Rearing of the Japanese Spiny Lobster *Panulirus japonicus*.

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(Received September 28, 1988)

Researches on the larval rearing of the Japanese spiny lobster *Panulirus japonicus* have been carried out by many workers.¹⁻⁸⁾ Inoue^{7,8)} reported larval rearing of this species for 253 days, up to the last stage of phyllosoma, but metamorphosis into puerulus was not achieved. Until now, no one has ever succeeded in rearing the whole larval stages in the species belonging to the genus *Panulirus*, though several workers successfully reared phyllosoma larvae to the puerulus stage in other members of the family Palinuridae⁹⁻¹¹⁾ or to the nisto stage in some scyllarid lobsters.^{12,13)}

The present authors have succeeded in rearing the phyllosoma larvae of *Panulirus japonicus* to the puerulus stage and then to the juvenile stage. The summary is reported here.

Newly hatched phyllosoma larvae were obtained on July 11, 1987 from berried females caught with gill nets off Haida, Owase, Mie Prefecture. About 1000 individuals among them were kept in glass finger bowls (1.4 or 2.0 l in volume) at the density of 20-30 individuals in each initially. *Artemia* *napulii* were fed to larvae of the 1st and the 2nd instar, and larger-sized *Artemia* grown with *Phaeodactylum* sp. were given after the 3rd instar. Finely chopped gonads of mussel *Mytilus edulis* were also used as their food after the 10th instar and were exclusively fed to them after the 14th instar. Seawater in the rearing bowl was exchanged once or twice a day and water temperature kept at 26°C until 206 days after hatching and at 24°C thereafter. Occasionally, individuals which showed poor growth were removed from the rearing bowl, and only one individual was kept in each glass bowl in the later stages.

One individual among them metamorphosed into the puerulus stage after the 28th molt on May 12, 1988 (307 days after hatching). Body length of the last stage of phyllosoma was 30.3 mm and that of the puerulus stage was 17.3 mm respectively.

Abdomen and the environs of median line of thorax

looked thick and whitish in the phyllosoma several days before metamorphosis. On the day before molting, it ceased taking food. The 2nd antenna also turned whitish on the day of molting, and the larva stopped moving supinely just before molting. The phyllosoma metamorphosed at around 5:30 p.m.. The sign of the onset was recognized by a contraction of the eye-stalks. Ten minutes after that, a newly metamorphosed puerulus emerged by an abrupt molting.

The puerulus, just after metamorphosis, frequently swam actively in the rearing tank (30 l in volume), but lurked in a PVC pipe (13 mm in diameter) which was put in the tank two days after metamorphosis as a shelter. Chopped mussels were scattered in the tank as food for puerulus but it couldn't be confirmed whether they were eaten or not.

The puerulus molted into a juvenile lobster (17.9 mm in body length) on May 25, which is 13 days after the metamorphosis into a puerulus. The water temperature of this period had been kept at 24°C. The juvenile lobster molted several times thereafter and has now grown to 76.0 mm in body length (on September 18).

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Fig. 1. Larval and juvenile stages of *Panulirus japonicus* reared in the laboratory.
A; Last stage (XI) of phyllosoma (300 days after hatching, 30.3 mm in body length).
B; Puerulus stage (315 days after hatching, 17.3 mm in body length).
C; Juvenile stage (VII) (405 days after hatching, 54.0 mm in body length).

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