Panulirus ornatus (Fabricius, 1798)

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IDENTIFICATION

Order	:	**Decapoda**
Family	:	**Palinuridae**
Common/FAO Name (English)	:	**Ornate spiny lobster**

Local names: Titan (**Gujarati**); Shevand (**Marathi**); Konju (**Kannada**); Parra konchu, Kadal konchu, Chitta konchu (**Malayalam**); Rani singi eral (**Tamil**); Rati royya (**Telugu**); Bama royya **(Oriya);** Jhata chingri (**Bengali**)

MORPHOLOGICAL DESCRIPTION

As the name suggests, the ornate spiny lobster is colourful with a bluish-green carapace and yellow-red spines. It is characterized with intricate streaks and spots of varying colours; frontal horns, walking legs and abdomen are brownish or greenish grey having contrasting dark and light colouration resulting in banded or marbled appearance, with minute indistinct speckles. The abdominal somites are smooth and naked, without transverse groove and whitish bands. Antennular plate has four spines with no small spines in between. Antennal flagella are distinctly banded and brightly coloured. Third maxilliped is without exopod. A large anterior eyespot is present near base of pleura accompanied by an oblique pale streak. Pleura are with white tips.

Source of image : RC of CMFRI, Chennai

PROFILE

GEOGRAPHICAL DISTRIBUTION

Panulirus ornatus is distributed in the Indo-West pacific region, from the Red Sea and east Africa (South to Natal) to southern Japan, the Solomon Islands, Papua New Guinea, Australia, New Caledonia and Fiji. In India, it is mainly distributed along south-east coast.

HABITAT AND BIOLOGY

It is a reef dwelling species, found at depths of 1 to 50 m; most abundant on coral and coastal fringing rocky reefs and surroundings and shallow areas. It is found in sediment beds (50-60 m depth) during breeding migrations, indicating their broad environmental tolerances that make them suitable for aquaculture. It is solitary or lives in pairs; also found in larger concentrations during the juvenile phase. The juveniles and adults are omnivorous, grazing primarily on small crustaceans, molluscs, worms and algae. It matures in its second year post puerulus, when the size is > 90 mm carapace length (CL). Each female produces 5,18,181 to 19,79,522 eggs per spawning, and spawns 2-3 times in a year.

It undergoes spawning migrations to the edge of the continental shelf for releasing the larvae. Egg incubation takes 24-27 days. Hatching occurs at night, and the first stage phyllosoma larvae (< 2 mm carapace length) are released normally at 49.7 % efficiency from the total fecund eggs in a brood .The planktonic phyllosoma larvae develops through 11 distinct stages involving upto 20 successive moults (instars), until it reaches the final stage which has a carapace length of > 25 mm. The final stage phyllosoma metamorphoses into the puerulus, which is free-swimming and transparent (initially), looking like a lobster and lasts for 2-3 weeks, seeking a suitable habitat on or near coral reefs. The puerulus is a non-feeding stage living off accumulated energy reserves. Once suitable habitat is located, the puerulus, which is pigmented, settles to the bottom, moults to the first juvenile stage and takes on a benthic habit. It is one of the largest of the *Panulirus* species attaining a maximum body length (TL) of about 50 cm, but usual length ranges encountered in the fishery is much smaller (30-35 cm).

PRODUCTION SYSTEMS

BREEDING IN CAPTIVE CONDITIONS

Generally more than 1 kg size lobsters are used as broodstock. The ornate spiny lobster can be bred throughout the year through manipulation of captive environmental conditions. Brooders can produce 2,00,000-8,00,000 larvae with each female lobster capable of producing up to 4 broods per season. At the School of Tropical Biology, James Cook University, Australia, brooders were stocked in 2 t round polyethylene tanks supplied with semi-recirculated sea water, within an environmentally controlled room. The sex ratio used was 1:1.5 or greater (male:female). Exposure to photo-thermal regulation resulted in captive breeding. They were fed on mixed diet of live and frozen pipis *Plebidonax deltoids*, frozen green mussels *Perna canaliculus* and squid *Loligo opalescens* once per day after 15:00 hrs. Lobsters were fed at the rate of 3 % body weight per day.

LARVAL REARING

The larval rearing has been carried out on experimental basis in many places, however the complete larval cycle information is not available.

NURSERY REARING

The stocking density during the nursery phase is 50-100 pueruli/m^2 in submerged cages. This phase usually lasts for 3-6 months, during which the lobsters grow to 10-30 g.

GROW-OUT

Aquaculture practices till date are based on only naturally settled pueruli, which are very abundant in some areas of Vietnam. By the mid 1990s, Vietnamese fishers had developed techniques and identified locations to capture lobsters at the swimming (puerulus) stage; since 1996 the bulk of lobsters marketed from Vietnam have been farmed from an initial capture size of less than 5 g. More than 1,500 t of *P. ornatus* are farmed each year in sea cages in Vietnam. It grows well in sea cages. Grow-out cages are typically square in shape, 3 to 4 m along each side and 3 to 5 m deep.

FOOD AND FEEDING

It is cannibalistic in nature. It feeds well on mussel, clams, gastropods, fish meat and artificial diets.

GROWTH RATE

It grows well in aggregation during its juvenile phase, growing from puerulus to more than 1.0 kg in 18-20 months in Vietnam and from 100 g to 1.5 kg in 8 months in India.

DISEASES AND CONTROL MEASURES

The common problem in cage farming at Vietnam is the Milky Disease/Milky Haemolymph Disease (Rickketsia) which is treated by oxytetracyclin incorporation in diets. Red body (Gaffkemia like symptom), black gill and tail rot are possibly rectified by better management practices and formalin treatments. Loose shell and soft shell syndromes are addressed by nutritional supplements and upkeep of salinity requirements.

PRODUCTION, MARKET AND TRADE

PRODUCTION

Information not available

MARKET AND TRADE

The demand for *Panulirus ornatus* from the Chinese market is very high and the rates are very lucrative. Chinese consumers are specifically interested in *P. ornatus* as a sashimi product due to its flesh characteristics (pearly lustre, sweet taste and firm texture).

CHALLENGES TO MARICULTURE

The primary constraint to industry expansion is the non-availability of seed. Though certain countries like Vietnam have established the industry on wild caught seed this will not be sustainable. In the long term, the demand for future can only be secured with hatchery supplied seed. Another major constraint in spiny lobster farming is diseases. It is probably related to the feeding of trash fish, which brings in large volumes of organic materials and pollution. Substitution of trash fish with pelleted diet would control disease outbreak and increase profitability.

FUTURE PROSPECTS

Development of seed production technology will go a long way in improving farming activities. Research efforts from several countries in captive breeding and larval rearing are nearing commercialisation. With consistent seed supply, lobster farming will have an economic edge and the aquaculture will be very promising.

SUGGESTED READING

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