

# *Thenus unimaculatus* Burton & Davie, 2007

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## IDENTIFICATION

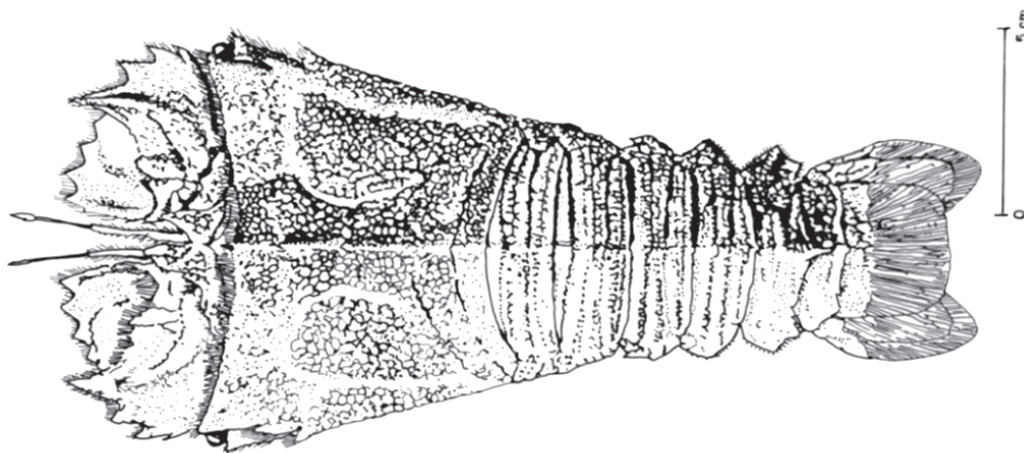
Order	: <b>Decapoda</b>
Family	: <b>Scyllaridae</b>
Common/FAO Name (English)	: <b>Flathead lobster</b>



**Local names:** Kaka (**Gujarati**); Phatphati (**Marathi**); Konju (**Kannada**); Poozhi konchu, Manal konchu, Adippan konchu (**Malayalam**); Madakku eral (**Tamil**); Tapatapalu (**Telugu**); Toptepa (**Oriya**); Patal chingri (**Bengali**)

## MORPHOLOGICAL DESCRIPTION

The body of the flathead lobster is dorsoventrally flattened, brown dorsally with purplish brown granules; ventral surface yellowish white. It possesses typical purple spotting on the carapace and a purple blotch on the inner face of the merus of 1 or more pereopods. Carapace is trapezoid and depressed. The anterior part of lateral margin is with only two teeth. Rostrum is absent. Eyes are in distinct orbits. Frontal horns are absent. Antennae are plate-like. Antennules are yellowish white with red-brown bands. Fifth abdominal segment is armed with a strong postero-median spine. Pleura are directed downwards. Tail fan and pleopods are orange-red and internal sides of the pereopods are purplish.



## PROFILE

### GEOGRAPHICAL DISTRIBUTION

It is widely distributed in Asia and Australia. Its range extends in the Indo-West Pacific from the east coast of Africa (Southern Red Sea to Natal) to China, southern Japan, the Philippines and tropical Australia (western Australia to Queensland). In India, it is distributed along the coasts of Gujarat, Maharashtra, Kerala and Tamil Nadu.

### HABITAT AND BIOLOGY

Flathead lobsters are bottom dwellers and prefer sand and mud habitats at depths ranging from 10 to 50 m. It is found associated with soft substrate, sand or mud, or a mixture of the two, sometimes with shells or gravel. It buries into the substrate with only eyes and antennules visible during the daytime. It is a nocturnal feeder, feeding mainly on benthic bivalves and gastropods. Life span is 3-4 years. Spawning season is from November-April along the Indian coast. Fecundity ranges from 19,600 (60 mm carapace length female)- 59,500 (102 mm carapace length female). The maximum recorded size is 25 cm total length and 10 cm carapace length for females and 25 cm total length and 9 cm carapace length for males, with maximum weight varying from 450-500 g.

## BREEDING IN CAPTIVE CONDITIONS

Captive breeding, larval rearing and indoor grow-out system has been developed by the CMFRI at its Kovalam Field Laboratory in Tamil Nadu, India. Technology for continuous mass scale seed production is presently being standardized. Captive maturation and breeding was successfully carried out in indoor FRP tanks using recirculatory system, with minimum light exposure and feeding. Ideal natural feeds are marine and coastal bivalves, specifically the marine wedge clam, *Donax* sp.

## LARVAL REARING

Ideal larval rearing system uses high density with substrates or intensive raceways with false substrates and with higher rates of water exchange. It has four larval stages. At Kovalam Field Lab of CMFRI, larval rearing was completed in 26-30 days. The phyllosoma were stocked in larval rearing tanks at 10 nos./l. It was mostly phototactic and preferred specific zooplankters as live feed. It usually preferred ctenophores as live feed, but also accepted formulated diet. There was no dependency on mass phytoplankton culture or *Artemia*. The phyllosoma larvae underwent progressive moults and attained the post larval stage of puerulus and settled at the bottom. The duration of larval stages was shortened at higher temperature. Juveniles were sturdy and were easily maintained in captivity. The optimal pH for culture was 7.2-8.5 and optimal salinity was 30-39 g/l. When reared at higher salinity (36-37 g/l) and water pH (8-8.2) with minimum light exposure, the incubation period was found to decrease from 39-41 days at 25-27 °C to 32-35 days at 28-30 °C.

## NURSERY REARING

The nursery phase lasted for 2-3 months, when the seed attained a size of 20-30 g.

## GROW-OUT

Grow-out and fattening was successfully carried out in indoor and outdoor cement tanks at Kovalam. Natural diets (freshly chopped bivalve meat) were given along with artificial diets. Nursery and grow-out was for 9-12 months. Growth in laboratory-raised juveniles was on par with growth in wild-collected juveniles. Seed of 20 g attained 150 g in about 180 days. No cannibalism or growth retardation was recorded at higher densities. Transportation in moist packing is possible for 12 hours and in wet conditions for 20 hours for individuals weighing 50-150 g.

## FOOD AND FEEDING

The preferred feed is fresh clam and mussel meat. Trash fish and commercial (shrimp) pellet feed has low acceptance. FCR is 1:4.

## DISEASES AND CONTROL MEASURES

*M*oult Death Syndrome (MDS), tail rot and stress related milky muscle syndrome are problems in captive rearing. These can be controlled by following proper handling and domestication protocols. It is susceptible to fungal moulds when the organic loads in the substrate increases, which can be regulated by regular screening and management. Luminescent bacteria, fouling protozoa and filamental bacteria are some issues in larval rearing which needs to be addressed. To an extent, problems caused by filamentous and fouling forms are remedied through water quality screening and treatment but luminescent bacteria still remains a bottleneck.

## PRODUCTION, MARKET AND TRADE

### PRODUCTION

*Thenus unimaculatus* contributes 5-24 % of the lobster landings along the Indian coast, with maximum landings from the north-west coast, followed by the south-east coast. Catch trends indicate decline in stock. The overall Indian marine lobster landing, from 2,400-2,500 t in the year 2000, declined by more than 75 % by 2006. There was some improvement in the years 2008 and 2009 averaging 1,800 t till 2010.

### MARKET AND TRADE

*I*t is marketed locally as live and fresh or frozen. The major markets are Japan, Australia, USA, Italy, Greece and France. In Taiwan, it is found in the markets year-around with maximum abundance during March to August. In the Philippines, it is priced lower than the spiny lobsters. The minimum legal export size in India is 150 g (65-66 mm CL; 160-164 mm TL). It is valued at US \$13-20/kg. Meat yield ranges from 28-33 %. It is exported as frozen meat to European countries.

## CHALLENGES TO MARICULTURE

*S*eed production, at present, is achieved only on a small scale, and cost-effectiveness has to be worked out. Technology on nursery rearing has to be standardized in outdoor cement tanks and ponds. Supplementary feeds for larval and grow-out phases needs to be developed. Health issues in the larval phase are being presently investigated by researchers of CMFRI.

## FUTURE PROSPECTS

*I*t is one of the most promising candidate species for lobster aquaculture in India. Broodstock can be raised and bred in captivity by environmental management. The relatively shorter duration of the larval phase is an advantage in captive rearing of the sand lobster. Its low consumption of feed

makes it a more efficient converter and is comparatively cheaper to grow when compared to spiny lobsters. Increasing demand for live lobsters in the export market could be an impetus for farmers to take up lobster farming provided all the associated bottlenecks in culture are addressed.

## SUGGESTED READING

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