Meretrix meretrix (Linnaeus, 1758)

Jasmin F.

IDENTIFICATION

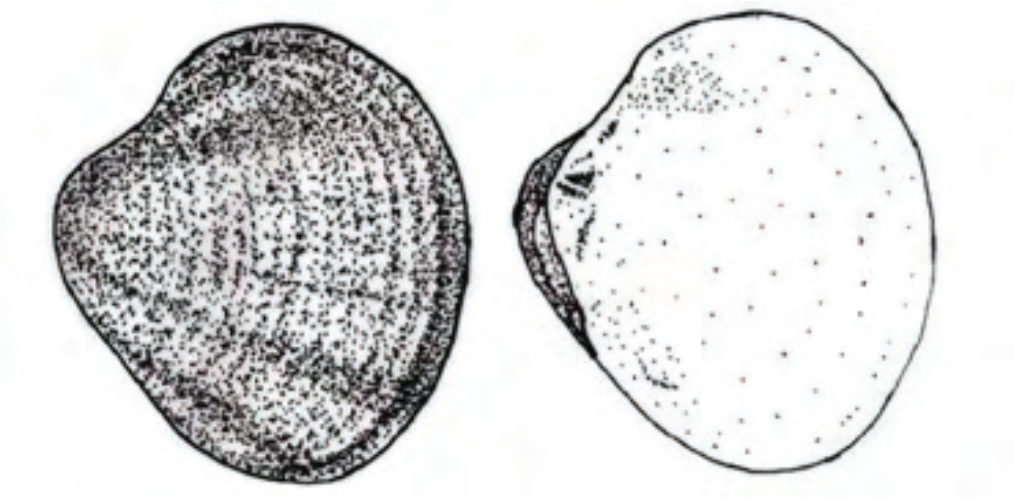
Order	:	**Venerida**
Family	:	**Veneridae**
Common/FAO Name (English)	:	**Asiatic hard clam**

Local names: Manja kakka (**Malayalam**); Maruvai, Meretrix dada, Khude, Ane maruvai (**Kannada**); Matti (**Tamil**)

MORPHOLOGICAL DESCRIPTION

It has a hard shell covered with a delicate, brownish-greyish periostracum, and its postero-dorsal margin has a greyish-blue- bluish-brown band. The shell is triangular to oval in shape. The posterior margin is slightly more pointed. It is equivalved, having no gape when closed. The lunule is not clear and the ligament is short. It has an umbo on anterior side. The shell exterior is white in colour. There is light purple or pink colouration along the radial lines. Hinge plate is hard. There are three cardinal teeth on the left and right valves.

Source of image : RC of CMFRI, Visakhapatnam



PROFILE

GEOGRAPHICAL DISTRIBUTION

Meretrix meretrix is a large bivalve which is distributed in Philippines, Australia, Singapore, Indonesia, Thailand, South Africa, Malaysia, Indonesia, Vietnam, China, Japan, Korea and Papua New Guinea. It is also widely spread along the west and east coasts of India. It occurs along the west coast in Kalbadevi and Bhatea creeks of Maharashtra; Chaporal, Sal, Mandovi and Zuari estuaries of Goa; Kalinadi, Tadri and Coondapur of Karnataka and Thellicherry and Ashtamudi lake of Kerala. Along the east coast, it occurs in major estuaries of Tamil Nadu, Andhra Pradesh and in the Chilika Lake.

HABITAT AND BIOLOGY

It inhabits marine and estuarine habitats. It is distributed in the sandy mud flats upto a depth of 4 m. Life span is 7-8 years with size ranging from 14.6-91 mm. They are dioecious. It followed a clear pattern of annual reproductive cycle with a long breeding period, extending from September to January in west coast and during September and May along the east coast of India . Gonads of female have light brown colour and male gonads have milky white colour when mature. In Vietnam a study found that the size at first maturity of the hard clam is 40 mm. Absolute fecundity ranged from 3,18,400 to 38,25,000 eggs/individual and the average was 11,81,151 eggs/individual. They are filter feeders which feed on microalgae.

BREEDING IN CAPTIVE CONDITIONS

Hatchery technology for seed production was developed by Tuticorin R. C. of CMFRI. The clams of length ranging 34.3-88 mm were collected from the Korampallam creek, Tuticorin and 20 of them were conditioned in 50 t FRP tanks containing sea water at temperature 24-26 °C. They were fed with *Isochrysis galbana* once a day. After 10-15 days a thermal shock (rise of 4-5 °C) was given to induce spawning. The males usually spawned first followed by females. After spawning the parents were removed from the tank. The fertilized eggs settled at the bottom and the supernatant was removed with fresh sea water. The morula larvae developed after 2-4 h.

In China, broodstock, collected from shallow water were conditioned in seawater from 18 to 24 °C for 10 days. They were fed an algal diet of *Phaeodactlyum tricormtum* and *Isochrysis galbana*. Mature clams were induced to spawn by air-drying without light for 4-6 h followed by thermal shock at 27-28 °C in filtered seawater. After 24 h the veliger larvae were collected and reared at different stocking densities.

LARVAL REARING

The larvae or spat were reared in hatchery for three months using algal diet at Tuticorin. Spat settlement at size of 184 µm occured between day 8th to 12th post fertilization. On day 75, average size of 2.9 mm was attained with survival ranging from 2.8 to 18.8 %. The trochophore larvae developed 9 h after fertilization, and then changed to D shaped larvae in 20 h. It was fed with *Isochrysis galbana* at 5,000 cells/larva/day. On the 4th day, on reaching umbo stage, feeding was increased to 8,000 cells/larva/day. Metamorphosis to pediveliger larvae occurred on the 6th day with subsequent foot development and was completed by the 10th day. At this stage, feeding was increased to10,000 cells/larva/day. Settlement occurred between 6th and 10th day, depending on the habitat.

NURSERY REARING

Hatchery produced young clams of 7.8 mm grew to 14.5 mm in 5 months. Exposure of 2 mm seed to fluctuating salinities revealed high growth rate (189.65 %) at 20 g/l.

GROW-OUT

In the estuarine regions along Ratnagiri, the clams were traditionally kept in pits at stocking density of 1,000 to 1,500 nos./m^2 for a short period of 8 to 10 days. Clams were transplanted at 10 m and 30 m away from the shore, in the intertidal zones of the estuary, at stocking density of 100 individuals/m^2. Clams, after one year, attained average length of 39.91±3.79 mm, average weight of 19.2±4.06 g and average meat weight of 3.4±0.26 g when transplanted 10 m away,

and when transplanted 30 m away attain average length of 37.76±3.75 mm, average weight of 18.45±3.06 g and average meat weight of 2.45±0.39 g.

FOOD AND FEEDING

It is a filter feeder, which feeds on phytoplankton and in captive conditions it prefers microalgae like *Isochrysis galbana*.

GROWTH RATE

Monthly growth rate for hatchery reared seeds varied from 0.15 mm to 2.20 mm.

DISEASES AND CONTROL MEASURES

Information not available

PRODUCTION, MARKET AND TRADE

PRODUCTION

During 1984, the production was about 17,115 t from Taiwan province of China. China is still a major producer with 30,711 t in 2002.

MARKET AND TRADE

It is commonly collected from shallow waters for human consumption. Tamil Nadu, Pondicherry and Andhra Pradesh possess rich clam resource which is used mostly as shrimp feed. Domestic consumption is negligible in these states. Clam shells are used in the manufacture of cement, calcium carbide, sand-lime bricks and lime.

CHALLENGES TO MARICULTURE

Culture in India is on an experimental scale, and hence mass scale development of production systems, including breeding and larval and nursery rearing in confined environment has to be developed.

FUTURE PROSPECTS

In order to protect the existing resources and to increase the possibilities of long-term exploitation, research should focus on large scale culture in captivity.

SUGGESTED READING

Branch, G. M., Griffiths, C. L., Branch, M. L. and Beckley, L. E. 2002. Two Oceans: A guide to the marine life of southern Africa. 5th impression. David Philip publishers, Cape Town & Johannesburg, 360 pp.

http://eol.org/pages/3054975/details

http://www.marinespecies.org/aphia.php?p=taxdetails&id=224891

Huber, M. 2010. Compendium of bivalves. A full-color guide to 3300 of the world's marine bivalves. A status on Bivalvia after 250 years of research. ConchBooks Publishers, Hackenheim, 901 pp.

Kripa, V. and Appukuttan, K. K. 2003. Marine Bivalves. In: Modayil, M. J. and Jayaprakash, A. A. (Eds), Status of exploited marine fishery resources of India. CMFRI, Cochin, p. 211-220.

Liu, B., Bo Dong, Tang, B., Zhang, T. and Xiang, J., 2006. Effect of stocking density on growth, settlement and survival of clam larvae, *Meretrix meretrix*. Aquaculture, 258(1-4): 344-349.

Muthiah, P. 2004. Molluscan Culture: Clam. Ocean-Life, Food and Medicine Expo 2004, p. 1-9.

Nair, R. V. and Rao, K. S. 1974. The Commercial Molluscs of India. Central Marine Fisheries Research Institute, Bulletin No. 25, p. 170.

Narasimham, K. A. and Laxmilatha, P. 1996. Clam culture. CMFRI Bulletin - Artificial reefs and Seafarming technologies, 48, p. 76-87.

Narasimham, K. A., Muthiah, P., Gopinathan, C. P. and Gandhi, A. D. 1988. Larval rearing and spat production of the great clam, *Meretrix meretrix* (Linnaeus). Indian J. Fish., 35 (2): 107-112.

Narasimham, K. A., Muthiah, P., Sundararajan, D. and Vaithinathan, N. 1988. Biology of the Great Clam, *Meretrix meretrix* in the Korampallam Creek, Tuticorin. Indian J. Fish., 35 (4): 288-293.