Paphia malabarica (Dillwyn, 1817)*

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IDENTIFICATION

Order	:	**Venerida**
Family	:	**Veneridae**
Common/FAO Name (English)	:	**Short neck clam**

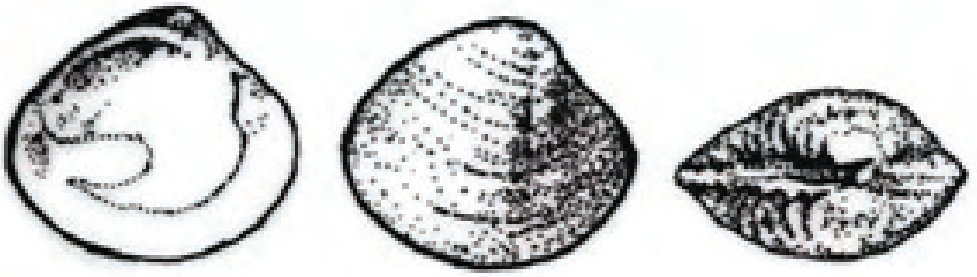
Local names: Tisre (**Konkani**); Chippi kallu, Kesha maruvai (**Kannada**); Poovan kakka (**Malayalam**)

MORPHOLOGICAL DESCRIPTION

The short neck clam has a shell which is triangular to oval in shape with rounded anterior and posterior margins. Shell is more or less long and smooth but the outer surface of shell has concentric ridges. Hinge area is short and has narrow diverging teeth. The pallial sinus is not too deep and is 'U' shaped.

* *Protapes gallus* (Gmelin, 1791) as per Huber,M. (2010)

Source of image : Molluscan Fisheries Division , CMFRI , Kochi



PROFILE

GEOGRAPHICAL DISTRIBUTION

It is distributed from the Gulf of Oman to Japan; covering India, China, Sumatra and the Philippines. It is distributed along both the east and west coast of India in many estuaries and coastal waters. Along the west coast, it forms a major fishery in Mulky, Gurupur, Udyavara and Coondapoor estuaries of Karnataka and Azhikkal, Chittari and Ashtamudi estuaries of Kerala.

HABITAT AND BIOLOGY

The short neck clam inhabits marine and estuarine habitats. It is distributed in the sandy mud flats upto a depth of 4 m. In Mulky estuary, sexes are almost equally distributed, except in August when males outnumber females. However, in estuaries in Kerala, females outnumber males in most of the months. Size at first maturity is 20 mm for females and 22 mm for males. It spawns once in a year. Spawning season is from September to February. Average lengths are 6 cm, with a maximum of 8.6 cm. They are filter feeders which feed on microalgae species like *Nannochloropsis salina*, *Isochrysis galbana*, *Dicrateria inornata*, *Chaetoceros calcitrans*, *Tetraselmis gracilis* and *Dunaliella salina*.

BREEDING IN CAPTIVE CONDITIONS

The breeding and larval rearing of *Paphia malabarica* was successfully carried out on an experimental basis at Tuticorin R. C. of CMFRI. Broodstock collected from the wild were transported and conditioned at 24-25 °C for about 20 days for gonadal development. It was fed a mixture of *Isochrysis galbana* and *Chaetoceros calcitrans* for one week prior to thermal stimulation. The clams were dried in the dark for 4-6 h and are then shifted to filtered seawater maintained at high temperature (0.45 µm, 28-30 °C) for induction of spawning. It spawned 4-6 h after induction. Both sperms and eggs were allowed to fertilize for few minutes. About 24 h after fertilization, eggs developed into D-shaped larvae.

LARVAL REARING

D-shaped larvae transferred to larval rearing tanks were fed with *Nannochloropsis salina* at density of 5 x 10^3 cells/ml. Water was completely exchanged daily and continuous aeration was provided. Spat settlement occurred on 9th day and was completed by 12th day. Size of spat was 286 µm. Maximum survival varied from 73.4 % to 84.5 % at pH between 8.0 and 8.1 during the umbo stage on day 6.

NURSERY REARING

Hatchery produced spat of size 2-3 mm in shell length were stocked at density of 1,000 nos./bag in nylon bags of 1-2 mm mesh. A nylon meshed fish net was stitched over it for additional protection against damage by crabs and fishes. Bags were suspended from racks in shallow calm waters. Bags were periodically cleaned to remove silt, predators and foulers. After 6 weeks of stocking, spats attained a shell length of 10-15 mm and were ready for grow-out.

GROW-OUT

Clam seed of 10.7-12.4 mm shell length grew to 30.4-34.6 mm (7.8-9.5 g) in 3.5 to 5.5 months. Production was 14.3 to 59.3 t/ha with a retrieval of 7 to 17.6 %.

FOOD AND FEEDING

It is a filter feeder, feeding on phytoplankton viz., *Nannochloropsis salina*, *Isochrysis galbana*, *Dicrateria inornata*, *Chaetoceros calcitrans*, *Tetraselmis gracilis* and *Dunaliella salina*.

GROWTH RATE

In 3 months, the hatchery produced seed grew to a mean length of 2.9 mm with a maximum of 4.2 mm. Higher growth rate (30.5 %) was observed at 28 g/l salinity. By ranching in natural beds the hatchery produced seeds of 12.4 mm grew up to 32.4 to 36.6 mm in 4-5 months.

DISEASES AND CONTROL MEASURES

Information not available

PRODUCTION, MARKET AND TRADE

PRODUCTION

The short neck clam fishery of the Ashtamudi Lake of Kerala was the first Marine Stewardship Council (MSC) certified fishery of India. The production (green weight catch) of this clam from Ashtamudi Estuary was 11,052 t in 2011 and 11,174 t in 2012.

MARKET AND TRADE

In India, this clam is used for human consumption especially in Kerala. In other states like Tamil Nadu, Pondicherry and Andhra Pradesh, this clam is used as part of shrimp feeds. The shells are used for manufacture of cement, calcium carbide, sand-lime and bricks. The short neck clam, together with *Meretrix meretrix*, contributes 80-90 % of the total clams exported from India. The meat of the short neck clam caught in the Ashtamudi Lake MSC certified fishery is exported to Vietnam, Thailand, Indonesia and Malaysia after processing and is valued to fetch nearly ₹ 10 crore/annum.

CHALLENGES TO MARICULTURE

Though technologies for broodstock development, larval rearing, nursery rearing and grow out have been standardized, these need to be scaled for higher adoption rates in the fish farming community.

FUTURE PROSPECTS

The short neck clam forms a major part of the clams exported from India. The meat is consumed domestically and the shell is used in a variety of industries. Hence mariculture of this species can lead to increased exports from India, thereby earning much needed foreign exchange, as well as contribute to industries which use clam shell resources.

SUGGESTED READING

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