Tegillarca granosa (Linnaeus, 1758)

Jasmin F.

IDENTIFICATION

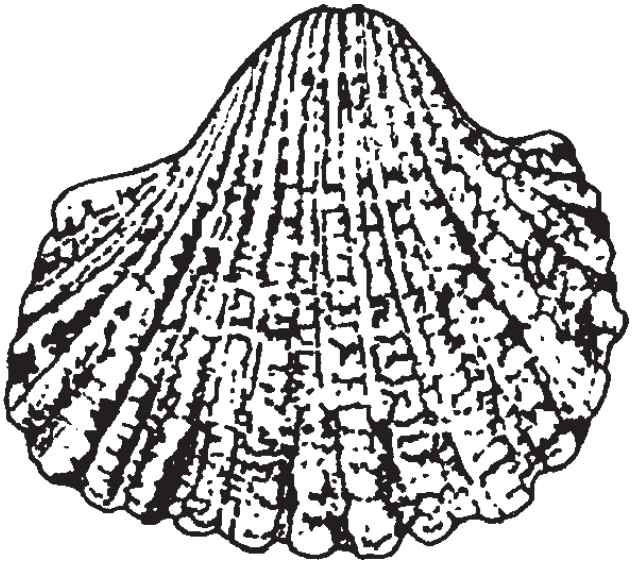
Order	:	**Arcida**
Family	:	**Arcidae**
Common/FAO Name (English)	:	**Blood clam**

Local names: Arippan kakka, Kallan kakka (**Malayalam**); Buditha gulla (**Telugu**)

MORPHOLOGICAL DESCRIPTION

Shells are equivalved, thick and solid, ovate in shape and strongly inflated. It is feebly equilateral in shape. The umbones are of strongly protruding type and the cardinal area is large. There are about 18 radial ribs (15 to 20) on each valve. The radial ribs are broad and have clear knobs. Periostracum is thin and smooth. The margins have distinct crenulations corresponding with the outer radial ribs. The byssal gape is not present. Outer surface is white in colour with a yellowish brown periostracum covering. Inner surface is white with light yellow tinge towards the umbonal cavity.

Source of image : RC of CMFRI, Visakhapatnam



PROFILE

GEOGRAPHICAL DISTRIBUTION

It is distributed in the Indo-west Pacific region, from east Africa to Polynesia, north to Japan, China, Malaysia, Taiwan, Thailand and south to northern and eastern Australia. In India, it forms a fishery of good quantity at Kakinada Bay and a small fishery in Tuticorin and Chennai.

HABITAT AND BIOLOGY

It is a benthic brackish water species which can live up to 20 m water depths but is mostly found in the littoral zone. It inhabits muddy bottoms, mainly in protected bays and estuaries, or in mangroves. It is sessile or burrower, and is a filter feeder, feeding low in the food chain. Feeding habit is related to the bottom feed where it lives. Important diet components are organic detritus (98%), phytoplankton and unicellular algae.

It begins to mature at an age of 1+ to 2+ years and reproduces throughout the year. It can have 2-4 reproductive cycles in a year and their duration can vary considerably between years according to a study at Kakinada Bay, India. Males attain maturity at 20 mm and females at 24 mm length. One female can produce 5,18,400-23,13,200 eggs. Embryos develop into free-swimming trochophore larvae, succeeded by the bivalve veliger, resembling a miniature clam.

BREEDING IN CAPTIVE CONDITIONS

Breeding, larval rearing and nursery rearing of blood clam have been reported from Tuticorin R. C. of CMFRI. Twenty-five *T. granosa* specimens were collected from Tuticorin of length ranging from 39 to 74 mm and transferred to 100 l FRP tank containing seawater. They were kept in the conditioning room at 24-26 °C water temperature and fed intensively with *Isochrysis galbana*. They were induced to spawn with thermal shock of 4-7 °C. The fertilized eggs were cleaned using 40 µm and 100 µm sieves to remove excess sperm, debris, etc. and collected in 1 t FRP rearing tank. The water was changed completely on even days and half the volume of water replaced on the odd days. Gentle aeration was given in the rearing tank. *I. galbana* was given as food once a day. The eggs were spherical, light pink red in colour. Fertilization occured within minutes and soon after, the eggs became opaque. Cell division was observed within 10 min. After passing through the blastula and gastrula stages, the morula larvae developed in 3-4 h, trochophore larvae in 5 h and veliger larvae in 20-26 h after fertilization.

LARVAL REARING

On first day, *Isochrysis galbana* was fed at 5,000 cells/larva/day. Early umbo stage was observed on 7th day and the feed was increased to 7,000 cells/larva/day. Advanced umbo stage was reached on 12th day. On day 14, some of the larvae developed foot and on day 16, majority developed foot, marking the advent of pediveliger stage. Hinge of 12-16 days old larvae showed 14-16 teeth, arranged in a linear series, leaving a gap in the middle. Feeding rate was increased to 10,000 cells/larva/day from day 14 onwards. Settlement of the larvae was first observed on day 16 and the majority had settled by day 18.

NURSERY REARING

On day 20, for the post set clam, the algal cell ration was increased to 12,000 cells/larva/day. On day 22, the shell of the spat showed 18 ribs, a characteristic feature of the adult. On 31st day, the spiny periostracum was observed on spat shells. Feed was increased to 15,000 cells/spat/day on day 25 and further to 20,000 cells/spat/day on day 40. From day 48 to day 59, it was increased to 25,000 cells/spat/day. Hatchery produced seed had an average length of 2.42 µm.

GROW-OUT

It is cultured in China, Japan, Philippines, Thailand, Indonesia and Malaysia. In Thailand, cockles are usually cultivated on mud in the intertidal zone with a water salinity of around 10-32 g/l. Experimental pen, box and off-bottom culture in Kakinada Bay has been carried out by Kakinada R. C. of CMFRI. Clams were cultured in pens, boxes and off-bottom, in nylon mesh cages suspended from rafts at Kakinada Bay. It did not thrive when suspended in the water column in metal ring cages without muddy substratum. Growth rate in the pen was faster. Hatchery produced seeds were

reared from day 60 onwards in 40 x 40 x 10 cm cages made of 6 mm iron rod and covered with an inner 0.6 mm and outer 20 mm mesh synthetic webbing. Cages were hung from racks at 1 m depth with each cage containing 100 clam seeds.

FOOD AND FEEDING

It feeds on plankton and detritus.

GROWTH RATE

Growth rate is 3.3 mm/month.

DISEASES AND CONTROL MEASURES

Information not available

PRODUCTION, MARKET AND TRADE

PRODUCTION

Culture production has increased from 2,52,233 t in 1995 to 3,15,811 t in 1999. Capture production during the same period ranges from 1,415 t to 6,503 t. Thailand imports from Malaysia, every year, few thousand tonnes of seeds and adults. Production in Thailand was around 20,000 t to 21,000 t per year during 1996-1997.

MARKET AND TRADE

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

CHALLENGES TO MARICULTURE

Seed availability from wild for culture is a major constraint. Culture in India has been on an experimental scale, and hence mass scale development of production systems, including breeding, larval and nursery rearing in confined environment has to be developed.

FUTURE PROSPECTS

The culture of this clam can be a good source of employment to women's self help groups and fisherwomen cooperatives. Since the species is edible and the shell has multiple uses its culture will be a good means of livelihood for the farmers.

SUGGESTED READING

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