



CENTRAL MARINE FISHERIES RESEARCH INSTITUTE

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R & D SERIES FOR MARINE FISHERY RESOURCES MANAGEMENT

12. THE BLOOD CLAM CULTURE

The blood clam *Anadara granosa* (Linnaeus) is widely distributed in the Indo-Pacific. Besides being an important resource for the capture fishery in several countries, it is extensively cultivated in Japan, Malaysia, Republic of China, Thailand and Taiwan. This species occurs in stray numbers along the Indian Coast and is unique in that it forms a fishery of some magnitude (2000 t/year) only in the Kakinada Bay. Based on the experiments conducted in 4 seasons during 1979 - 82, simple techniques for augmenting the production of *A. granosa* by transplantation, were developed by the Central Marine Fisheries Research Institute at Kakinada.

Clam culture techniques

Culture site: The clams are grown in sheltered areas close to the shore in estuaries, bays and backwaters. About 1-2 hr exposure of the site at each low tide renders management easy. Too long an exposure results in poor growth due to reduced feeding. Also the site should not be selected in deeper waters as it is disadvantageous when predators are to be eradicated. Clams are rarely grown in ponds. The substratum preference and salinity tolerance range differ between species. Areas prone to frequent changes of contour and liable to pollution should be avoided. The site is cleared of dead shells, debris, etc. and casuarina or bamboo poles are planted to mark the boundary of the culture site. Split bamboo screens, interlaced with hemp twine, are used in constructing the

pen enclosure. Each screen measures 5 m long, 30 cm high and interspaced with 6 numbers of 1 m long bamboo sticks; these bamboo sticks are driven upto 75 cm into the substratum to hold the screen vertically.

The experiments were conducted in an area in the Kakinada Bay within the clam bed, but sparsely populated by clams. The bottom is muddy (majority particles in the sediment below 0.125 mm in diameter) and the monthly average water temperature varied from 27.8 to 33.5° C, salinity from 13.69 to 34.4‰ and dissolved oxygen from 4.45 to 7.00 ml/l.

Seed availability and stocking: In the Kakinada Bay, *A. granosa* spawns throughout the year with major spawning generally occurring in January–April. The ideal period for the collection of seed is February–May. Seed occurs at low densities not exceeding 30 no/m² in Kakinada Bay. The seed is collected from the natural bed at low tides by scooping the muddy substratum with a small bag shaped hand net called *Nathudu vala* or by hand-picking and sieved. The average weight of the seed clams stocked during different seasons varied from 5.53 to 7.08 g (average length 21.8 - 25.1 mm). The stocking is done at high tide from a plankbuilt boat by sowing the seed on the substratum, ensuing an even dispersal as far as possible. They were stocked at densities varying from 140 - 200 no/m².

Growth, retrieval and production: During the grow-out period the clams feed on plankton and detritus which are available in the water. Except for watch and ward work and eradication of clam predators if they occur, no other maintenance job is necessary during the grow-out phase. Birds, skates, rays, starfishes, crabs and gastropods are known to prey upon the clams. However, during these studies conducted at Kakinada, none of these predators posed any problem. The clams are harvested after 5 or 6 months either by hand-picking or with the help of *Nathudu vala* and washed in bamboo baskets to rid them of mud. At harvest, they attained average weights of 25.53 - 32.97 g (average length 39.2 - 42.7 mm). The retrieval was 83.4 to 88.6% when pen enclosure was used and 41.5% when there was no pen; production rates of 38.5 - 41.6 t/ha/5-5½ months were obtained when pen culture was practised and 21.0 t/ha/6 months when pen was not used. Thus both retrieval and production rates were reduced by about 50% when the blood clam culture was undertaken without pen. This is because, although the clams have restricted movement, their mobility is good enough to enable them to move out of the culture site and thereby affect both retrieval and production.

By another study conducted by growing clams in boxes, it is concluded that in the Kakinada Bay, under the prevailing conditions, a stocking density of 400 clam seed/m² is the optimum for getting the maximum production of marketable size (25g) *A. granosa*.

Economics

The four year study conducted in an area extending upto 0.5 ha gave consistent results with regard to retrieval and production. Based on the experience gained in the management of the experimental farm, the economics, projected for a 1 ha blood clam farm are given below. The duration of the culture is taken as 6 months. The expenditure consisting the cost of 20 bamboo poles and 400 m bamboo pen enclosures, hire charges for plank-built boat, watch and ward charges, labour charges for seed collection and harvesting and unforeseen expenses works out to Rs. 7,450/- against an income of Rs. 10,000/- by sale of 40 t shell-on weight of clams. The profit is Rs. 2550/- which gives a return of 34.2% on investment. Without pen enclosure the expenditure, income and profit are estimated at Rs. 4,900/-, Rs. 5,250/- and Rs. 350/-. The percentage of profit over investment in this case works out to 7.1%.

Prospects of clam culture: (1) Clam culture is low intensive both for capital and labour. (2) Farming and management techniques are simple. (3) The growth rate is fast and high production is obtained within a short period of 5-6 months. (4) Clams are efficient converters of primary production as food, fit for human consumption. (5) The blood clam has export potential and the trial consignments of frozen *A. granosa* meat sent by an entrepreneur to Japan from Kakinada in 1983 were received well.

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The conclusions/recommendations made in this series are subject to revision with addition of further information on the resource.

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