

Review

PROSPECTS FOR CULTURE OF BIVALVES IN INDIA

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ABSTRACT

Culture of molluscs has a potential of meeting the ever increasing demand for fishery products. India has about 8.5 million hectares of coastal area suitable for mariculture. The Central Marine Fisheries Research Institute (CMFRI) has developed technology for seed production and culture of most molluscs, but the technology has not yet been employed for large-scale mollusc culture in India. This paper summarises the production potential of Indian bivalve molluscs. However, consumption of molluscs is localised to only a small segment of the population.

INTRODUCTION

The marine clams, cockles, edible oysters, pearl oysters, and mussels inhabiting vast areas of east and west coasts of India have been exploited by coastal populations for decades (Prasad 1996). The pearl (and chank) fisheries are under the monopolistic rights of the Government and the same is regulated by law.

The Central Marine Fisheries Research Institute (CMFRI) has developed techniques for the culture of most marine bivalves with an economic interest. This knowledge can be applied because India is blessed with suitable localities for commercial scale production of molluscs. However, adequate publicity on the nutritive value of mollusc food is necessary to create an awareness on the value of molluscs. The purpose of this paper is to update information on the present exploitation of bivalves in India (Ayyakkannu 1994), and to put further emphasis on the great potential for development of bivalve culture in India (Devaraj 1996).

OYSTERS

In India, four species of oysters are considered commercially important: *Crassostrea madrasensis*, *C. gryphoides*, *C. rivularis* and *Saccostrea cucullata*. They are widely distributed in estuaries, creeks and backwaters

(Satyanarayana *et al.* 1996). *C. madrasensis* is the dominant species distributed along the coasts of the Bay of Bengal, in Kerala and Karnataka. Oyster beds also occur in the Bahuda Estuary of Orissa and in the Sarada Estuary, Bheemunipatnam Backwater, Upputeru Canal and Gokulapalli Backwater of Andhra Pradesh. In the Andaman and Nicobar Islands, oyster beds are located at Havelock Island, Mayabunder, Dighipur and Port Blair. In Tamil Nadu, oyster beds cover about 10 ha in Pulicat Backwater, 45 ha in Ennore backwater of Chennai (formerly Madras), 1.6 ha in Athankarai, and 3.25 ha in Tuticorin. Killai Backwater, Muthupet Swamps and Thambaraparani Estuary are other important Indian habitats of oyster. *Crassostrea madrasensis* has been studied in detail at the Central Marine Fisheries Research Institute (CMFRI), Tuticorin. It is a highly suitable species for aquaculture and the techniques have been evolved for collection of spat from natural bed and also for hatchery production of seed. Apart from Tuticorin, experimental oyster culture has been conducted in Mandapam, Madras, Bheemunipatnam, Kakinada, Mulki and Ashtamudi. Oyster culture was initiated in 1993 in Ashtamudi. By rearing 600 strings in a 0.04 ha farm, adopting the rack and

string methods, 2.5 t of oysters were harvested. The encouraging results have motivated many fishermen and entrepreneurs to take up the oyster culture at Ashtamudi and Dharmadam along Kerala coast. However, lack of local demand for oyster meat and lack of awareness among the entrepreneurs are the main hurdles for the commercialisation of oyster culture.

CLAMS/COCKLES

Clam species exploited along the Indian Coast belong to the families of Arcidae, Veneridae, Corbiculidae, Tridacnidae, Solenidae, Mesodesmatidae, Tellinidae and Donacidae (Narasimham *et al.* 1996). *Anadara granosa*, the Arcid clam or blood clam, occurs all along the Indian coast and forms fishery of some magnitude in Kakinada Bay. The following major distribution of clams has been recorded: *Meretrix casta* in Goa, Karnataka, Vellar Estuary, Pulicat Lake, and Bheemunipatinam Backwaters. - *Meretrix meretrix* in Kalinadi and Coondapur estuaries of Kakinada Bay, Karnataka. - *Paphia malabarica* in Mulky, Gurpur, Udyavara and Coondapur estuaries. Koduvally, Azhikkal, Karyamgod, and Chittari estuaries, Ashtamudi Lake of Kerala, and Kakinada Bay. - *Katelysia opima* in Coondapur, Uppunda and Sita estuaries, Kakinada Bay. - *Meretrix* sp. in Chilka lake and Sonapur backwaters of Orissa. - *Villorita cyprinoides* in Vembanad lake, Goa and in Nethravathi, Gurpur, Udyavara, Swarna and Coondapur Estuaries in Karnataka. - *Tridacna maxima*, *T. crocea*, *T. squamosa* in the Andaman and Nicobar Islands, and Laccadive Islands.

In clam culture, the seed is collected from natural grounds and replanted in culture areas, but CMFRI has developed the technology for seed production and culture of *Anadara granosa*, *Paphia malabarica*, *M. meretrix*, and *M. casta*. There is already a good export of clam meat to Japan, Western Europe and USA (Anonymous 1994), and prospects of developing clam culture in

India on commercial lines are very bright. The Kakinada Bay offers wide scope for *P. malabarica* culture. Likewise, Andhra Pradesh and Tamil Nadu has many biotopes suitable for clam culture.

PEARL OYSTER

Twenty eight species of pearl oysters have been identified in tropical and subtropical regions, but only 3 Indo-Pacific species produce quality pearls of commercial value, *viz.*, *Pinctada maxima*, *P. margaritifera*, and *P. fucata*. In India, *P. fucata* is the dominant species. Four other species of pearl oysters have been recorded from Indian waters, *viz.*, *P. margaritifera*, *P. chemnitzii*, *P. sugillata*, and *P. anomioides*.

Pearl oysters are cultured in the Gulf of Kutch where 42 known pearl oyster beds cover 24,000 ha scattered along the southern part, bordering the coastline of Jamnagar district. About 70 beds are known in the Gulf of Mannar over a distance of 160 km from Pamban to Manapad. The central zone from Vaipat to Trichendur (about 100 km²) provides the best beds, exploited for centuries. However, the potential for pearl oyster culture has not yet been fully utilised (Victor *et al.* 1996)

MUSSELS

In Indian coastal waters two species of mussels, *Perna viridis* and *P. indica* are found. On an average about 3,100 tonnes of mussel is harvested annually especially from the west coast of India. However, the consumption of mussels is localised and restricted to some selected regions of the coastal belt. Attempts have been made to popularise the mussel meat, but with limited success. Mussel meat is often used for feeding prawns in prawn farms.

The distribution of mussels along the Indian coast is patchy. The green mussel, *Perna viridis*, is common between Calicut and Cannanore and scanty along Karwar, Goa, Ratnagiri, Visakhapatnam, Kakinada, Madras, Pondicherry and Cuddalore. The brown

mussel, *Perna indica*, is distributed between Quilon to Cape Comorin in the South west coast of India. The total extent of the bed is estimated at 261,700 m². The coasts of India offer great scope for the development of mussel culture.

SCALLOPS

Though significant research work has been carried out on the biology of a number of scallops in many countries, commercial scale

culture is limited to only a few countries, especially China and Japan.

In India, detailed studies on scallops are lacking (Kripa 1996). The available species in Indian waters include *Pecten plica*, *Pecten tranquebaricus*, *Pecten splendidulus*, *Pecten crassicosatus* and *Amusium pleuronectes*.

For successful culture and management, a sound knowledge of the biology of the species is necessary.

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