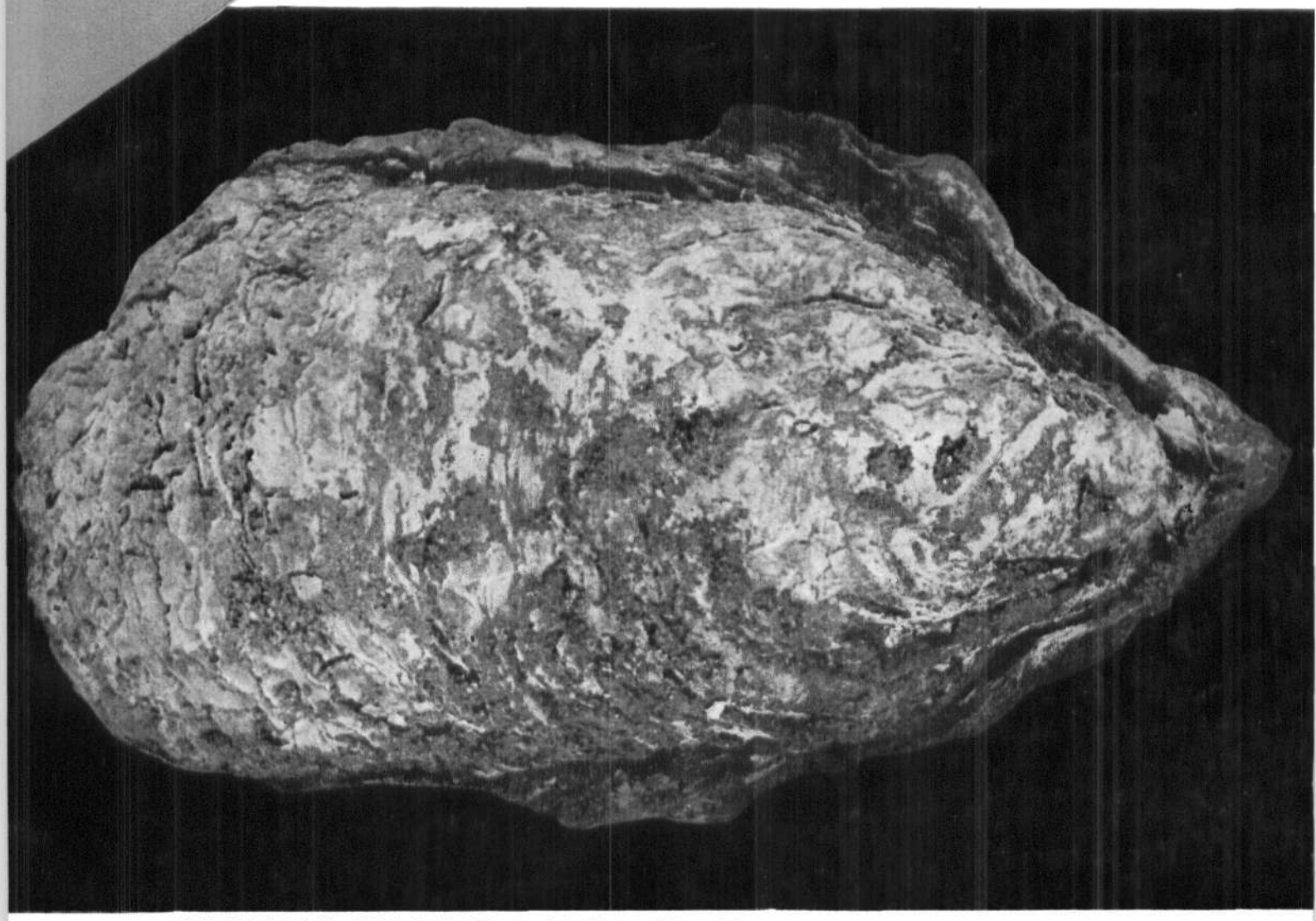
CMFRI
bulletin 38

JANUARY 1987

OYSTER CULTURE—STATUS AND PROSPECTS

Edited by : K. NAGAPPAN NAYAR AND S. MAHADEVAN



CENTRAL MARINE FISHERIES RESEARCH INSTITUTE
(Indian Council of Agricultural Research)
P.B. No. 2704, Cochin 682 031, India

3

OYSTER RESOURCES OF INDIA

S. MAHADEVAN[1]

Of the 8 species of *Crassostrea* listed by Awati and Rai (1931) only *C. madrasensis* (Preston), *C. gryphoides* (Newton & Smith), *C. discoidea* (Gould) and *C. cucullata* are known to be economically and commercially important so far as India is concerned. Following Stenzel (1971) who recognised *Saccostrea* as one of the eight genera of living oysters the tuberculated species, *Crassostrea cucullata* is now designated as *Saccostrea cucullata* (Born). It has now been reported by Rao (personal communication) that it is *C. rivularis* (Gould) that occurs all along the Gujarat Coast and in some regions of Maharashtra coast. Judging from the commonness and distributional abundance of these 4 species under the two genera found in India it can be reasonably stated that *C. madrasensis* is the native oyster of India and *C. gryphoides* and *C. rivularis* may be designated as west coast oysters for the purpose of convenience.

Saccostrea cucullata is purely a marine form. Although it occurs all along the coast of India nowhere is it found to form prolific oyster beds unlike the other three species. *Crassostrea* spp. occurring in India are euryhaline and are found in estuaries, backwaters and open sea coastal shallows. These are found either as large aggregations where the substratum for their settlement, survival and growth is ideal or as patchy aggregations on submerged objects suitable for attachment. Dense occurrence is seen in the proximity of bar mouth of estuaries possessing gritty bottom or otherwise conducive for their settlement. Both the west and east coasts of India possess many productive areas and a few moderately productive areas of these species. It is of particular interest to mention that *C. gryphoides* and *C. rivularis* are restricted to the northwest coast regions and not reported so far anywhere in the east coast.

From the resources point of view, Tamil Nadu and Kerala are rich in *C. madrasensis*, Maharashtra and Goa in *C. gryphoides* and Gujarat in *C. rivularis*.

Unlike other molluscs like clam and mussel most of the edible oyster beds are clumsy formations and mostly dispartate, The horizontal and vertical aggregations of individuals build up one over the other cemented together, thus giving rise to mounds. The 'oyster reef' so formed usually consists of different size and year groups of oysters with a considerable percentage of dead shells. This makes population estimation difficult. The locations of many beds are also not so easy of approach. It is therefore not surprising that our understanding of the actual extent of the oyster beds in each state, population density, magnitude of annual recruitment etc. is still imperfect. Creation of a special task force of scientists to assess the oyster resources potentiality of each state is therefore very necessary on the model of what has been done for the oyster beds in York river, James river, Plankatank, Rappahanrock and Wicomico rivers in Virginia State of the United states of America. The information so gathered by us will be of great help in the future exploitation of oysters which otherwise is at present spasmodic and underexploited.

The present chapter gives an account of what little information that is available on the oyster resources on an all India basis.

Crassostrea madrasensis (Preston)

West Bengal

Very little is known about the resources along West Bengal coast.

[1] *Present address :* CMFRI, Research Centre, Tuticorin-628 001.

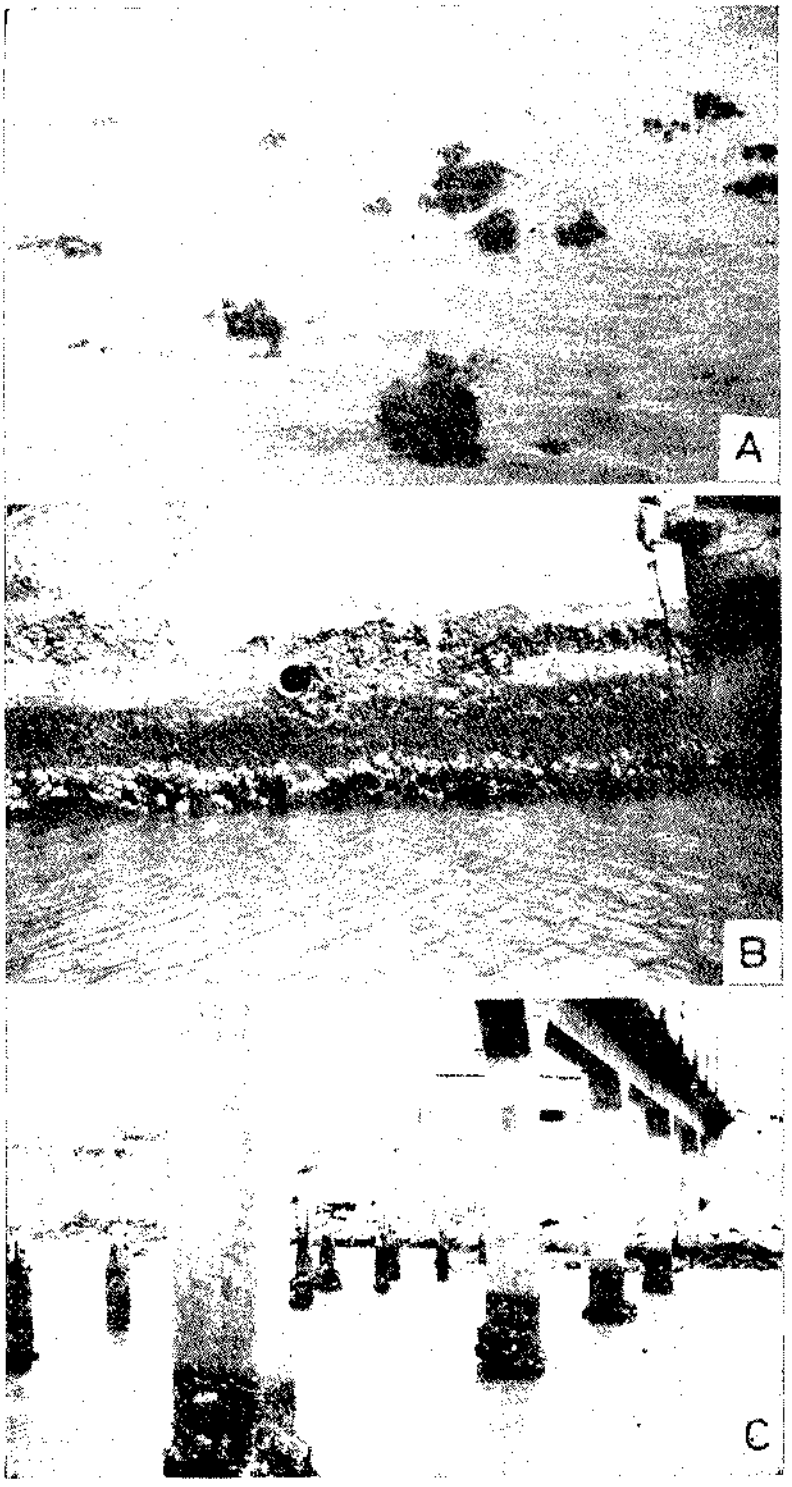


PLATE I A. A bed of *Crassostrea madrasensis* in Pulicat Lake partially exposed at low tide. B. *C. madrasensis* settled and growing on the embankment of a bridge at Tuticorin. C. The oysters growing attached to the pillars of an abandoned bridge at Karapad, Tuticorin.

Orissa

The state has a coastline of 480 km. and brackish waterspread of 0.4128 million ha. The only area where oyster beds are known to exist is the Bahuda river estuary near Sonapur. An approximate area of 5 ha. of the river bed close to the bar mouth contains 3 distinct beds. The oyster population was estimated in this area as 2,500,000.

Andhra

The state has a coastline of 982 km. with 0.566 million ha. of brackish water. Oyster beds are reported in Sarada estuary and near Waltair. In Bhimunipatnam, the oyster beds are subjected to annual depredation due to fresh water influx in the area, making it difficult to assess the actual density of the population. In Upputeru canal banks 2.25 hectare is reported to contain millions of oysters. Although they are reported from Godavari and Krishna estuaries, the population density is very thin. Another bed of considerable extent is known from Gokulapalli. Here oysters are regularly exploited.

Tamil Nadu

The state has 1,000 km. long coastline and 0.17 million ha. of brackish water. Oyster resources are rich compared to other states. Naturally the oyster beds in this state have been better studied than in other states. Pulicat backwaters (Lake) is famous for the extensive oyster beds. Areas like Chinnaparaval bed, Karimanal bed, Dhonirevu, Moosamani, Kottakuppam, Sathankuppam, Kondurpatnam and Dugarajapatnam are well known for the oyster beds. The extent of each bed varies from 4 hectares to 10 hectares. The oysters in these beds are characteristically elongate, long, narrow or subspatulate in form. They tend to segregate into clusters varying 3 to 4 individuals in each. They are sparsely scattered over the bottom, shallower region showing greater density. Although the entire lake is subject to the influx of flood water during the rainy season large scale mortality of oysters does not take place. It is estimated that the total oyster population in the lake is about 11 million. Regular fishing is reported from one or two beds like Karimanal. The Courtallayar estuary at Ennore and Adyar estuary at Madras possess oyster beds to an extent of 50 hectares. The population here is often affected by flood water admixture. Regular exploitation by fisherfolk goes on.

In Killai backwaters (near Cuddalore) at Mudasodai and Chinnavaykal there are 3 beds containing oysters. Exploitation is limited. At Muthupet swamp, patchy settlement is noticed. The Vaigai estuary at Athankarai possesses two hectare area of oyster beds having about 3.5 million oysters. Exploitation is not done. These oysters suffer periodically due to abnormal salinity of the water in the estuary on account of solar evaporation of the impounded water when the bar mouth remains closed during summer. At Tuticorin there are 3 tidal inlet beds with a total area of 20 hectares having a population of 1.5 million oysters. In Tamparaparni estuary at Pinnakayal there is a bed of 2.5 hectares in the upriver region. The oysters here are sparsely distributed. Exploitation in this area is not reported (Pl. I a-c).

Kerala

Kerala has a coastline of 560 km. and a backwater area of 0.33 million ha. Oysters are found in 5 hectare area in Ashtamudi Lake. Dalavapuram, Kavanadu, Kuripuzha, Karichal, Panathura, Thirumullavaram to Quilon are all areas where oysters are found sparsely distributed and exploited. Anchengo backwaters also contains good population of oysters. In Vembanad Lake there are distinct oyster beds but the density of population is thin. Apart from this Neendakarai, Kannamali, Maruvekkadu, Punnappara, Thottapally, Chaliyar estuary, Beypore, Azhikode, Elathur, Calicut, Tellicherry and Cannanore also possess oyster beds of limited extent. These are exploited by the local fisherfolk. The extent of oyster beds in these areas mentioned above has not been determined so far.

Karnataka

The coastline is limited but the state abounds in many estuaries. Of these, Nethravathi, Sharavathi and Kali river estuary possess oyster beds of limited extent ranging from 1 ha. to 5 ha. In addition, Mulky river estuary, estuaries at Uppunda, Bhatkal, Venkatpur and Coondapoor show oyster beds of some extent. These beds are being exploited regularly.

Apart from the utilization of live oyster meat as food the dead shells are collected for industrial purposes. Mining of subfossil deposits by lessees carried out in many estuaries like Kali river, Athankarai and Bahuda river yield nearly 15,000 t of oyster shells annually.

Crassostrea gryphoides (Newton and Smith)

Maharashtra

The state has a coastline of 720 km and brackish waterspread of 0.1214 million ha. The oyster beds are not very extensive as in the case of *C. madrasensis*

but unlike the latter wherever beds of *C. gryphoides* are located exploitation is regularly done.

Dahanu Creek, Boiser, Satpuri, Palghar, Kelwa, Malad, Navapur, Utsali, Dahisar, Mahim Creek, Alibag, Purnagad, Ratnagiri, Jaytapur, Malwan, Worli, Versova, Marve, Gobbunder, Cuff Parade, Bandra, Madh, Bhate Bunder, are all areas where beds are found and population harvested periodically.

In many places like Utsali, Navapur and Kelwa bottom culture is done traditionally by fisherfolk. (Alagarswami and Narasimham 1973, Silas et al. 1982) Unfortunately details of annual production from natural beds and by culture are lacking.

Goa

The territory has a coastline of 153 km. Oyster settlement is reported from Ribander, Siolim and Curca. Extent of grounds and magnitude of annual production is not available.

Crassostrea rivularis (Gould)

Gujarat

The state has a coastline of 1,663 km and brackish waterspread of 0.4189 million ha. The oyster species occuring here has been reported to be *C. discoidea* by Awati and Rai (1931). As already mentioned Rao considers that it is *C. rivularis* which is distributed in Maharashtra and Gujarat coasts.

The oysters are found in intertidal hard grounds and in muddy creeks. Aramra, Poshetra, Port Okha, Porbander, Sikka, Gagwa creek, Singach creek, Beet Kada, Khanara creek, Laku Point, Gomati creek (Dwarka), Harsad, Navibander (Medha creek), Balapur, Azad island are all places where there are settlements. Exploitation is done regularly. But data on extent of beds, population density and annual production are wanting.

Maharashtra

In Mahim, Ratnagiri and Jaytapur areas also this species is found along with *C. gryphoides.*

Saccostrea cucullata (Born)

This species is found all along the Indian coast in shallow areas wherever the substratum is rocky or very hard. But nowhere does it form beds large enough for exploitation. Nevertheless, those found along Maharastra and Gujarat coast are numerically large, collected and utilized as food. The quantity exploited is insignificant when compared to other three species.

REFERENCES

ALAGARSWAMI, K. AND K. A. NARASIMHAM. 1973. Clam, cockle and oyster resources of the Indian coasts. *Proc. Symposium Living Resources of the seas around India.* C.M.F.R.I., Spl. publication : 648-656.

AWATI, P. R. AND H. S. RAI. 1931. *Ostrea cucullata* (The Bombay Oyster). *Indian Zool. Mem.*, 3 : 1-107.

ANONYMOUS 1977. *Indian Fisheries.* E. G. Silas Ed. Published by Central Marine Fisheries Res. Inst. on the occasion of the Fifth Session of the Indian ocean Fishery Commission, Cochin. 1977 : 96 pp.

SILAS, E. G., K. ALAGARSWAMI, K. A. NARASIMHAM, K. K. APPUKUTTAN AND P. MUTHIAH. 1982. Country status paper. In : Bivalve culture in Asia and the Pacific. *Proc. of a workshop held in Singapore :* 16-19. Feb. 1982. (Ed. F. Brian Davy and Michael Graham) I.D.R.C. publication.