ISSN 0254-380 X

MARINE FISHERIES INFORMATION SERVICE

No. 179

January, February, March, 2004

TECHNICAL AND EXTENSION SERIES

CENTRAL MARINE FISHERIES RESEARCH INSTITUTE

COCHIN, INDIA

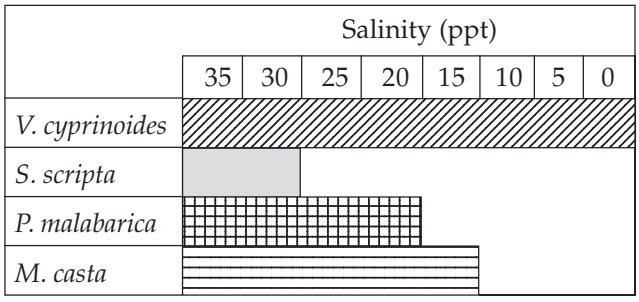
(INDIAN COUNCIL OF AGRICULTURAL RESEARCH)

1052 Clam fishereis of Vembanad Lake, Kerala with observations on the socio economic conditions of the clam fishers

Kerala state along the south western part of India harbours one of the richest clam resources in the country. One of the features of this state is that majority of the 41 rivers in the state drain into the esturaries before they empty into the sea through perennial of temporary opening. There are about 30 estuaries in the state and Vembanad Lake ($9^0$28′ and $10^0$10′N 76^0 13′ and $76^0$31′E) is the major estuarine system which harbours a rich resource of clams forming the livelihood of 5,000 fisher families. The black clam (*Villorita cyprinoides*) is the main resource followed by *Meretrix casta, Paphia malabarica* and *Sunetta scripta.* Annualy about 31,650 tonnes of clams are fished from this lake of which 31,430 tonnes is contributed by the black clam.

Vembanad Lake, extending from Azikode in the north to Thaneermukkam in the south is about 80 km long and forms the habitat of a diverse fauna and flora ranging from oligohaline to stenohaline species. Periyar and Muvattupuzha are the major rivers which open to this lake. A bund constructed at Thannermukkam near Vaikom prevents the incursion of sea water into the agricultural fields in Kuttanad. This also controls the flow of four rivers, Pamba, Achankovil, Manimala and Meenachil into the lake. The lake opens to the Arabian Sea through two permanent openings, one at Cochin and the other at Azikode. The distribution of the clams in the Lake is mostly based on the salinity (Fig. 1) of the region. *V. cyprinoides* is distributed even in regions where freshwater conditions prevail during monsoon, while scripta is seen only near the bar mouth.

Fig. 1. Distribution of clams in relation to salinity



Black Clam Fishery

V. cyprinoides (Grey) is widely distributed in the main system as well as in the canals, creeks and shrimp ponds connected to the lake. Large quantities of rain water drain into this lake lowering the salinity to nearly freshwater conditions during monsoon. The average protein and fat content of the clam has been found to be 14.4 and 7.8% respectively. The shell is thick and rich (93.3 to 95.8%) in calcium carbonate. Different estimates have been made regarding the density of the clams in this lake. During 1969 - 70 very high densities ranging from 4620 and 18,660 numbers per sq.m have been reported. Random surveys conducted in 1993 have indicated the densities to be lower than this with maximum of 858 nos per sq. m.

This resource has been traditionally exploited by the local fishers for more than a century and the shells have supported the lime shell industries within the state and also in the neighbouring states. During the last decade huge quantities of dried clam meat have been utilized as raw material by the shrimp feed industries within the state and also as a direct shrimp feed by private farmers.

Apart from live clam beds the lake also has extensive sub fossil deposits which are popularly known a the white shell deposits in contrast to the black shell, i.e live clam. The sub soil or sub fossil deposits were formed by the accumulation of clam shells which were originally coloured but later lost the periostracum. Though there is separate fishery for this, in the present paper the description is limited to the live clam fishery. The second major clam resource in this lake is *M. casta*. *P. malabarica* and *S. scripta* also occur in regions of high salinity in patches The main points regarding the fishing period, fishing method, length range of the clams fished etc are given in Table.1.

Table .1. Fishery details of clams in Vembanad Lake

Fishery / Biological aspect	*Villorita cyprinoides*	*Meretrix casta*	*Paphia malabarica*
Average annual landings (tonnes)	31,430	120	100
Method of fishing	Hand scoop net Drag net	Hand scoop net, Drag net	Hand scoop net
Marketing	Mainly through cooperative societies	Individually	Individually
Fishing season	Throughout the year	September to May	September to May
Length range in catch (mm)	8-42	14-38	16-44
Approxiamte number of fishermen involved	3658	150	150

Women play an active role in the clam fishing and marketing. They pick the clams from shallow areas of the lake by scoop net or by a special method of collection without diving. They accrue the clams by swift movements of the legs in a particular area and collect these in a vessel. Male members go for fishing the clams in deeper areas. Fishing is done throughout the year for 14 to 20 days in a month. The average catch per canoe ranges from 75 to 500 kg per day. Clams of length 10 to 42 mm contribute to the fishery. Seed size clams have been noted in the fishery mainly during January, May, August and November when they form 36, 13, 12 and 9% respectively of the total catch. However, the seed clams are separated by the fishers and stocked in the waterfront of their homesteads for further growth which is commonly termed as relaying or semiculture. Only in certain areas, the seed clams are utilized for lime shell industry or as poultry feed. The average percentage of meat in the clams ranges from 9 to 14%.

The production of black clams has increased from 20,542 tonnes (valued at Rs. 3.7 lakhs) in 1965 to 31,430 tonnes (valued at Rs. 220 lakhs) in 2000. The fishing effort has decreased slightly. In 1965, the number of fishers actively engaged in fishery was estimated as 5788. Now there are seven clam cooperative societies in which fishers from 17 fishing villages are registered members. Though there are 4533 members only 2158 are active fishers. Apart from these, there are nearly 1500 clam fishers who fish and sell the clams independently in different villages around the lake. In some regions the societies also help the fishers by providing them facilities for tugging their canoe to the fishing site by arranging a mechanized boat.

After the clams are fished, the women of the family clean the clams and heat shuck the meat and sell it in the nearby markets. In the marketing of shells Clam Fishermen Societies play an important role. The shells are sold by the fishers to these societies @ Rs. 600 to Rs. 700 per tonne who later sell it to the lime shell industry with a profit of 30 to 40%. The societies play a significant role in the welfare and development of these fishers by providing them financial assistance for various activities.

Fishery of *M. casta, P. malabarica* and *S. scripta*

These clams have a restricted distribution in the high saline areas near the barmouth in the northern parts of Vembanad Lake. *Meretrix casta* is found in the deeper areas (2 to 5m) of the lake and only men are engaged in clam fishing. They use a hand drag net and the clams are sold either in the shell on condition or as heat shucked meat. However, there are no co-operative societies and the fishers sell the shell directly. Annually about 120 tonnes of *M.casta* are fished by about 25 fishers in the Maliankara - Munambam area.

P. malabarica supports a seasonal fishery. Permananet beds of these clams have not been observed. Spatfall occurs in certain years and during this period the clams are fished and utilized. Munambam - Maliankara region in north Vembanad and Manakoodum near Cochin are the sites where *P. malabarica* beds have been observed. The average annual landings have been estimated to be 100 tonnes. The meat of this clam is highly relished. The fishery is restricted from October to May.

S. scripta is a stenohaline species having limited distribution. This occurs along with *M. casta* in north Vembanad region. During monsoon, most of the clams

suffer mortality and the empty shells are collected and sold as rw material for lime shell industry. The total landings have been estimated as 250 toones. The main clam population is located in the seaward side, i.e. off Cochin at a depth 5 to 10 m and this is regularly fished and sold through a clam cooperative society.

Socio economic conditions of the black clam fishers

A survey was conducted in three clam fishing villages, Kutthiathode, Muhamma and Chembu during 2002 and details regarding their livelihood and problems faced were inferred from the interactions with 100 families. 60% of the families were small with 2 to 4 members, 32% had 5 to 6 members, 7% with 7 to 8 members and only 1% had more than 9 members. Regarding the literacy level, it was observed that most of the fishers were literate and 28% of the women did not have any formal schooling. The level of education was higher among men than women. While 74% of the men continued their education from primary level, only 47% of the women pursued their academics. None of the fishers were graduates, but 3% and 6% of the male and female members had attended pre graduation courses.

The results indicated that 8% of the clam fishers had an average monthly income ranging between Rs. 4000 and Rs. 4500. However, 39% had earnings ranging between Rs. 2000 and 3000 per month. Since the clam fishery was limited to 5 to 6 hours a day, most of the fishers earned additional income through other activities like fishing (72%), animal husbandry (10%), coir matting (7%), carpentry (7%) and fish marketing (4%). Apart from this, there are several families which depended on clam marketing alone. They purchase the meat from the main clam fishers and sell it in the local markets. All the clam fishers had their own residence, 68% of them lived in tiled houses, 17% in concrete roofed and 14% were in thatched houses. 65% of the house were electified. However, only 60% of the fishers had their own canoes, the rest used hired canoes for their fishing activities.

An important observation was that only 7% of the both male and female fishers were below 25 years. Majority of the male fishers were in the age group 45 to 50 and most of the women in clam fishery related activities were in the age group 40 to 45. While 13% of the women were between 55 to 60 years only 7% of the males belonged to this age group.

The problems raised by the clam fishers are low recruitment levels in the clam beds and low price of clam meat. All the fishers opined that the price of the clam should be increased. The fishers in southern part of Vembanad Lake were of the opinion that the population of clam has reduced over the years and the catch per unit effort has decreased by 50 to 60%.

Remarks

The clam resources of Vembanad Lake are the source of income of several villagers in central Kerala. It has been reported that the water spread area in the lake has reduced considerably in the recent years. The Cochin backwaters, in the northern tip of the lake in 1912 was 315 sq. km and this was reduced to 180 km^2 (43% of the original) in 1983. Later, in a survey in about 130 km^2, it was observed that 14% reduction had occurred due to natural and artificial processes. Such shrinkage has resulted in the reduction in area for spat settlement. However judicious management of this resource would help to support a sustained fishery. During spatfall the concentration of both black clam and *P.malabarica* seed in certain areas has been found to be high, while in certain other regions, the settlement is low to nil. Transplantation of seed clams for better growth is also suggested.

The price of the clam meat and the product from the fishery has been remaining stagnant for past several years. The lack of interest among the younger generation as evidenced by the low percentage of <25 year age group involved in the fishery is mainly due to the low returns. Improved profit from the fishery which can be achieved by diversification of the product into canned and other ready to prepare products prepared under hygienic conditions which would help to increase the per capita consumption of clam meat and also extend the market.

Reported by : **V. Kripa, T. S. Velayudhan, Shoji Joseph, P. S. Alloycious, M. Joseph, P. Radhakrishnan and J. Sharma, CMFRI, Cochin - 682 018**