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6. FISHERY AND RESOURCE OF GREEN MUSSEL, *PERNAVIRIDIS.* ALONG THE WEST COAST OF INDIA

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ABSTRACT

The green mussel, *Pema viridis,* constitutes a sustenance fishery in India, particularly along the Malabar Coast. The paper deals with the distribution, extent of mussel beds, exploited resources, total stock and the man power employed in the fishery along the Kerala coast from Calicut to Cannanors and Karnataka coast from Bhatkal to Majali. In the Callcut-Cannanore area fishery Is from August to June and the catch is estimated at 3043 t, 3074 t and 2596 t during 1981-82, 1S82-83 and 1983'84, respectively. The mussels tanged in length from 20-129 mm. The total man power employed Is assessed as 685 in the Callcut-Cannanore area, of which 325 are traditional full time mussel divers and the rest are part time mussel divers, The seed resources varied from 4.57 to 6.52 kg/m- In December 1983 and the size of the seeds ranged from 10-40 mm. There is no regular commercial fishery in the Bhatkal-Majall area. The paper also deals with the constraints and prospects for development of the mussel fishery.

INTRODUCTION

Hornell (1917. 1922) and Jones (1950, 1968) provided an account of the sea mussel resources of India. Later Jones and Alagarswami (1973) gave a more detailed account of the resources and magnitude of the mussel fishery. The settlement and colonisation by the juveniles of the green mussel and their resources on the stone embankments and groynes along the central coast of Kerala was delt by Nair et al (1975). The paper deals with the results of the investigations carried out on the fishery resources of green mussel along the Karnataka coast from Majali to Bhatkal and Kerala coast from Cannanore to Calicut during 1981-82 to 1983-84.

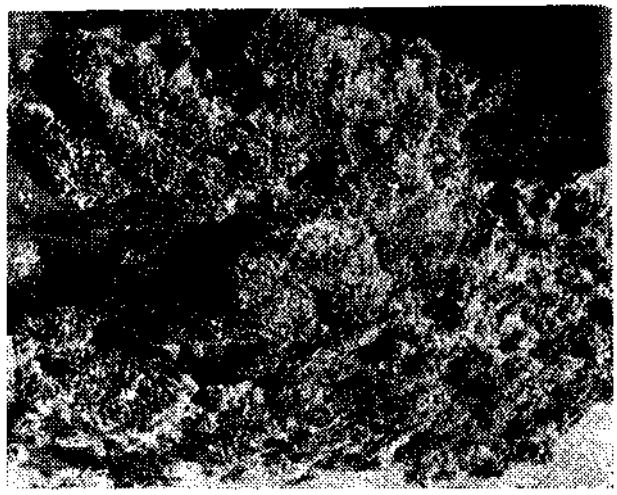

Fig. 1 : Natural mussel beds.

DISTRIBUTION AND EXTENT OF MUSSEL BEDS

The green mussel, *Perna viridis* is found attached to the intertidal and submerged rocks along the West Coast of India in varying densities (Fig. 1). Its distribution along the Karnataka Coast from Majali to Bhatkal is much dispersed and patchy. Mussel beds are found in Majali, Karwar, Kuramgat Islands in the Karwar bay, Binage, Chendia, Harwada, Gabithwada, Manjuguni, Tadri and Bhatkal. Mussel fishery, on a very low sustenance scale was noticed only at 3 centres namely Karwar, Harwada and Tadri. The total extent of mussel beds along this coast is estimated as 5 ha.

The Coast of Kerala from Cannanore to Calicut is the virtual mussel zone of India, where the abundance and exploitation are quite high. In this zone dense and extensive mussel beds are found in Azhikkal, Cannanore, Mythanappally, Koduvally, Tellicherry, Thalai, Mahe, Chombala, Mutungal, Badagarar

TABLE 1 *Extent of musssl beds and estimated annual production at different centres in the Cannanore Calicut area.*

Centres	Extent of mussel beds (ha)	Average weight of mussels per Sq.m (kg) (kg)	Total estimated stock (t)
Challlum-Calicut	80	3.0	2,400
Elathur-Kappad (poyilkavu)	75	2.25	1,687
Kollam-Thikkokdi	240	2.5	6,000
Badagara-Chombala	40	4.5	1,800
Mahe-Thalai	40	4.0	1,600
Theliicherry-Koduvally	80	3.0	2,400
Total	555	—	15,887

Thikkodi, Moodadi, Kollam, Kappad, Elathur' South Beach and Challium. Mussels occur on coastal rocks from intertidal zone to 4 km into the sea where the depth is about 12 m. Exploitation is normally restricted to the upper 5 m in view of the abundance of mussels upto this depth and limitation of physical endurance of the divers. The extent of the mussel beds from Cannanore to Calicut and the production from the natural beds are presented in Table 1 The estimates were made in September 1983. Total extent of the beds was estimated at 555 hectares, excluding the intertidal area due to the non-availability of mussels there at the time of observations.

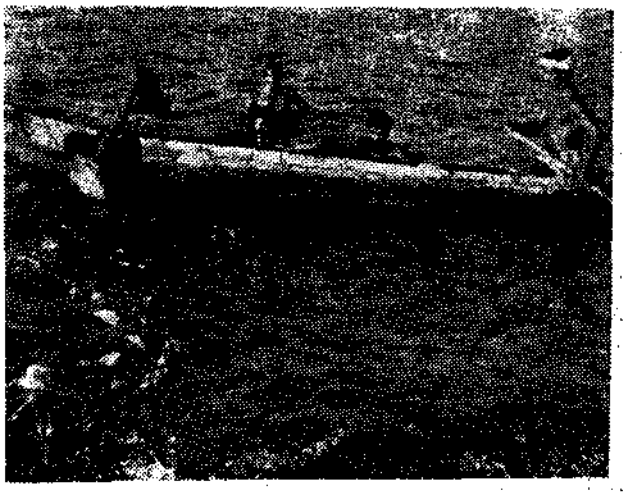

Fig. 2 : Mussel divers picking the mussels from the submerged mussel beds

MUSSEL FISHERY AND PRODUCTION

The mussel fishery along the Malabar and Karnataka coast is of a sustenance nature. The fishery has gained importance and an organised trade exists with a concentrated market in Ca cut. The musse divers reach the mussel beds either by swimming or by canoes (Fig 2) depending on the distance of the beds from the shore and collect the mussels either by hand picking or with sharp tool like chisel. Each diver has a net bag tied around his waist in which he keeps the collected mussels. Women and children collect mussels from the intertidal rocks (Fig. 3)

MANPOWER OR UNIT OF EFFORT EMPLOYED IN THE MUSSEL FISHERY

The average catch by a man per day's considered as one unit of effort, Karnataka coast from Majali to Bhatkal engaged in the mussel fishery on Paft time basis. In the Cannanore-Calicut persons are engaged full time and another 360 on part time (Table 2) . These persons hail from 16 centres and a maximum of 155 parsons from Elathur followdd by 153 from Calicut.

Fig. 3 : Women and children picking the mussels from exposed rocks.

TABLE 2 *The manpower employed in the mussel fishery in Cannanore-Calicut zone.*

Centres	Full time mussel divers	Part time mussel divers
Calicut (Challium & South Beach)	93	60
Elathur	110	45
Poyilkavu (Kappad)	—	12
Kollam	—	10
Moodadi	21	16
Thikkodi	30	15
Badagara	—	15
Muttungal	—	10
Chombala	29	35
Mahe	22	16
Thalai	—	20
Thellicherry	—	18
Koduvally	20	28
Mythanappally	—	20
Cannanore	—	25
Azhikkal	—	15
Total	325	360

PRODUCTION

The commercial exploitation of mussels along the Malabar and Karnataka coasts of India is carried out by means of canoes. Twenty six canoes are engaged in the Majali-Bhatkal area. In the Cannanore-Calicut zone 340 Canoes are employed. The logs were used in Thikkodi in 1981–82; but the number decreased to 3 in 1983-84.

The major mussel landing centres in the Cannanore-Calicut area are Koduvally, Mahe, Chombala, Moodadi & Thikkodi, Elathur, Challium & South Beach (Fig. 4). Fig 5 shows the monthly average production from 1981-82 to 1983-84 from the above landing centres. The season for the mussel fishery in this zone starts from August and last till June. There will be no mussel exploitation in July due to the south west monsoon. At Moodadi & Thikkodi, which is the most important mussel landing centre the season for mussel fishery is from November to May with peaks in January and March (122.16 t and 138 9 t). Challium & South beach rank second in importance with the maximum catches in December (169.7 t) followed by a minor peak in March (74.2 t). At Mahe the maximum mussel picking is in October (70.6 t) with a secondary peak in March (48.6 t) and at Koduvally it is in January (64.6 t). In Chombala the peak catches are in March (59.6 t). At Elathur the maximum exploitation is in November (45.3 t) with a secondery peak in May.

Fig. 4 : Mussel landing Centre, South Beach (Calicut)

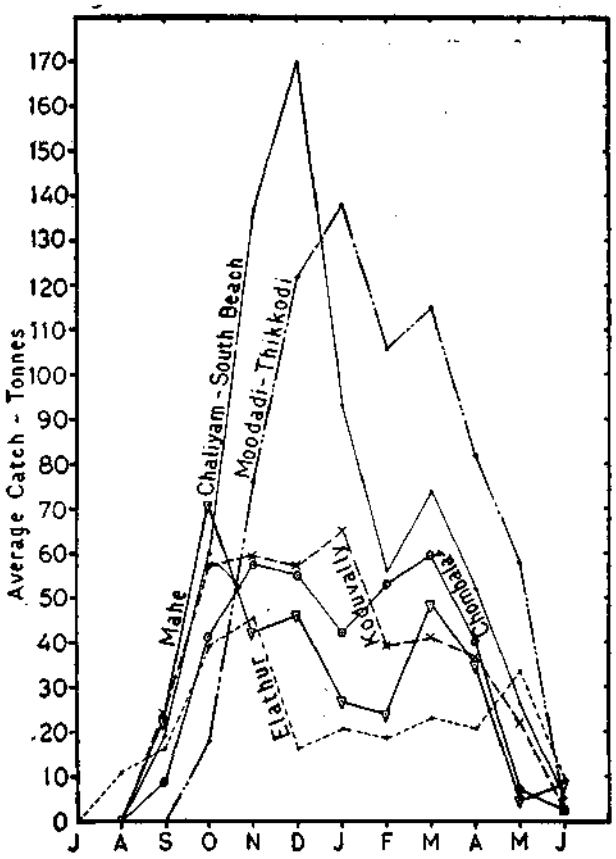

Fig. 6 : Monthly avaraga catch of green mussel during the fishery season from 1981-82 to 1983- 84 from different centres In tha Cannanore-Callcut area

In general the traditfonal full time mussel divers along the Malabar Coast are fromElathur. They move with their canoes to different centres for mussel picking depending upon the availability of mussels in the natural beds. In October their concentration is in Mahe. In December the mussel divers move to Challium & South Beach and Thikkodi, In January the exploitation is more in Thikoodi and Koduvally

The estimates of production, total effort and the catch per unit of effort in the Cannanore-Calicut zone for the years 1981-82 to 1983-84 are presented in Table 3. The production was estimated at 3043.0 t, 3074.2 t and 2596.8 t for the years 1981-82, 1982-83 and 1983-84 respectively. The corresponding effort expended to obtain the catch was 50377, 61005 and 58557 units. The catch per unit of effort for the above years worked out to 60,4,50.4 and 44.3 kg. The length of the green mussel expio-

TABLE 3 *Estimates of green mussel production (annual landing in tonnes), total annual effort and average catch per effort (in kg) during the years 1981-82 to 1983-84 in Calicut-Cannanore zone.*

Year	Catch in t	Effort	Catch per unit effort (kg)
1981-82	3043.9	50397	60 4
1982-83	3074.2	61005	50.4
1983-84	2596.8	58557	44.3

ited from different centres ranged from 20-129 mm (Fig 6) and the size of the bull< of the catches ranged from 50-90 mm. In March, smaller length groups ranging from 45-65 mm are also abundant along with the larger groups around 90 mm.

In the Majaii-Bhatkal area the fishing season is from April to June. The production from this zone is estimated as 36.5 t in 1982-83.

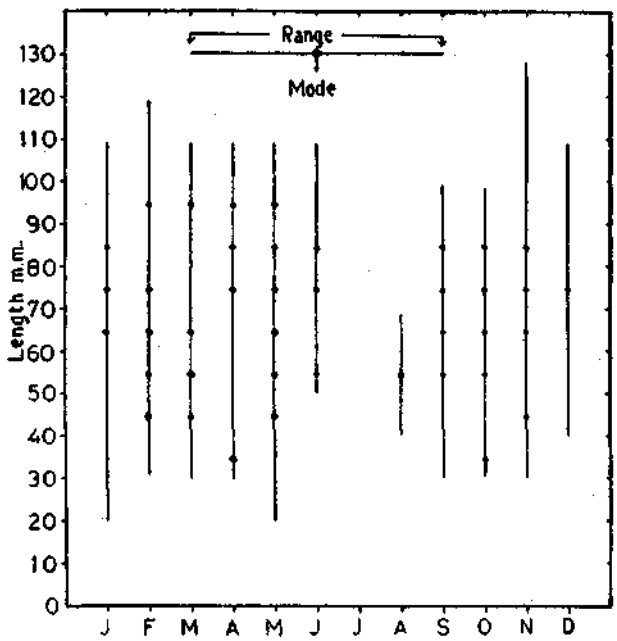

Fig. 6 : size range and model values of mussel Bxploltod during different months of the fishery season from 1981-82 to 1983-84.

j^e length of the exploited mussels ranged from 40-100 mm. The total stock trom a 5 ha area of mussel beds in this zone fs estimated at 2061.

TABLE 4 *The graenmusse/ seed resources from 7 centres along the Malabar Coast in December 1983.*

	Total number/m^	kg/m^	Length range (mm)	Mode (mm)
Challium	2055	4.90	14-40	25—29
South Beach	1547	4,57	20-40	25-29
Elathur	6225	6.25	10-35	20-24
Moodadi & Thikkodi	3750	5.72	12—36	20-24
Chombala	1715	4.90	12—40	25-29
Mahe	3595	6.52	12—38	25—29
Koduvally	2825	5.17	12—35	20-24

The total stock for the Cannanore-Calicut area of mussel beds in this zone is estimated at 15,887 t from an area of 555 ha of mussel beds (Table 1). The density per square meter ranged from 2 25-4.5 kg of mussels,

The mussel seed resources estimated from 7 centres in the Cannanore-Calicut zone in 1983 i? presented in Table 4. The density of seeds in the natural beds varied from 1547 to 6225 numbers per m^ weighing 4.57 to 6.52 kg and their length ranged from 10-40 mm. The maximum density in numbers was noticed at Elathur. In the Majali-Bhatkal area the mussel $eed was noticed at 3 centres namely Karwar, Harwada and Tadri in 1983. The total area of the seed bed was 150m2 at Harwada, BOm^ at Tadri and 20m^ at Karwar. The density of seeds varied from 6,000-10,000/m* in December 1983 and their length ranged from 8-16 mm.

DISCUSSION

It is seen from the earlier reports of Jones (1950, 1968), Jones and Alagarswami (1973) and Rao et al (1975) that the green mussel resources and their fishery along the west coast of India is restricted to a few rocky patches except in the Cannanore-Calicut zone along the Kerala Coast. The production of mussels from Ratnagiri to South Kanara was estimated as 15 5 t and from Calicut to Cannanore as 290 t (Jones and Alagarswami 1973). The present study showed an increase in production of two and a ^^'^ ^'"'"^^ ^^ ^^^ ^°''^^' ^"d ^®" ^'"'"^^ ^^ the latter area. Jones and Alagarswami (1973) estimated that 170 canoes and 10 logs are deployed m the Cannanore-Calicut zone for mussel picking. The present study showed considerable increase in the craft also. The *i'9h density of seed observed in the Cannanore-Calicut zone is encouraging for taking up l^rge scale mussel farming along this coast.

At present mussels are marketed fresh without depuration. Simple and effective depuratlon techniques should be developed to maintain the quality of mussels before marketing. There is also need for enlarging the consumer sector through vigorous extension drive of the proposed products so that the fishermen get better remuneration for the catch.

As the mussel resources are small the developmental effort in future should be towards increasing the production of mussels through farming, particularly in view of the fact that the yield by culture is very high (Kuriakosa 1980).

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