

UTILISATION OF CLAM MEAT AS FEED IN THE SHRIMP FARMS OF KERALA

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INTRODUCTION

Of late there has been an upsurge in shrimp culture practices in many parts of the country. Kerala with an estimated brackish water area of 65000 ha suitable for shrimp culture has witnessed a slow but steady change from the traditional system of farming to the more profitable scientific type of farming with different fast growing species like *Penaeus indicus* and *P. monodon*. The estimated area under culture was 13400 ha in 1992-93 while in 1994-95, 14100 ha was utilized for shrimp farming. The shrimp production from culture also rose from 9750 t in 1992-93 to 12000 t in 1994-95. Associated with the farming system, the requirement for shrimp seed and supplementary feed has increased considerably. Supplementary feeding promotes better growth and gives higher production per unit area. Shrimp farmers are resorting to various types of natural as well as formulated feeds. Even through various formulated feeds are available in the market, most shrimp farmers of Kerala prefer clam meat as the major supplementary feed for shrimps. Ready availability, low cost and its acceptability to prawns are the main reasons attributed to the growing popularity of clam meat as shrimp feed.

As early as in 1933, finely chopped clam meat was given as

feed for shrimp post-larvae in Japan. Clams are used as shrimp feed in the semi-intensive farms in India as well as abroad. According to Muthu *et al.* (1982) clams are used as feed in the farms of Japan, Taiwan and Korea, where shrimps like *Penaeus japonicus*, *P. monodon* and *P. chinensis* are cultured. In India, the blood clam or cockle *Anadara granosa* is used as feed for *Penaeus monodon* in Andhra Pradesh (Muthu *et al.*, 1988). Apart from being used as feed in the farm, it is also used in the hatchery as feed for the brood stock as well as for the post-larvae (Beard *et al.*, 1977; Caubere *et al.*, Muthu and Laxminarayana, 1979, 1982; Primavera, 1978).

In addition to the direct utilization as feed the clam meat is also used as an important ingredient of formulated feed. Ahamed Ali (1982) has observed that feeds compounded using clam as one of the ingredients produced the highest growth increment of 313% with an average growth of 13.2 mg/day.

CLAM RESOURCES OF KERALA

Clams form an important resource of the estuaries of Kerala. The dominant species are *Villorita cyprinoides*, *Paphia malabarica*, *Meretrix casta* and *Katelysi opima*.

a. *Villorita cyprinoids*: Popularly

known as the black clam, *V. cyprinoides* (Fig. 1) is the major clam resources of Vembanad Lake. Being highly euryhaline it is widely distributed and the main landing centres are at Kumbalangi, Chellanam-Kannamaly, Nettur-Panangad, Kuthiathode, Chembu, Vaikom, Vechoor, Muhamma, Aryad and Thaikattussery. A hand scoop net or a scoopnet attached to a long wooden pole is used for fishing the clam. Clams are fished throughout the year with peak season from February to May. Clam of length 11 to 48 mm contribute to the fishery. Nearly 2000 families are involved in the fishing activities of Vembanad Lake.

b. *Paphia malabarica*: Known as the yellow clam or "poovan kakka" *P. malabarica* is an important resource of the Astamudi Lake and north Kerala. This species has restricted distribution, occurring in areas where the salinity does not drop below 10‰. In some areas the entire clam bed is known to be destroyed during the south-west monsoon. The clam is fished during low tide by a hand operated net.

c. *Meretrix casta*: Extensive beds of this clam are located in the estuaries and coastal waters in the area between Chettuva and Munambam. This clam is fished mainly for its meat.

CLAM UTILIZATION

The harvested clam is

Present Address :

1. Central Marine Fisheries Research Institute, P.B. No. 1603, Cochin - 14
2. The Marine Products Export Development Authority, Cochin - 15.

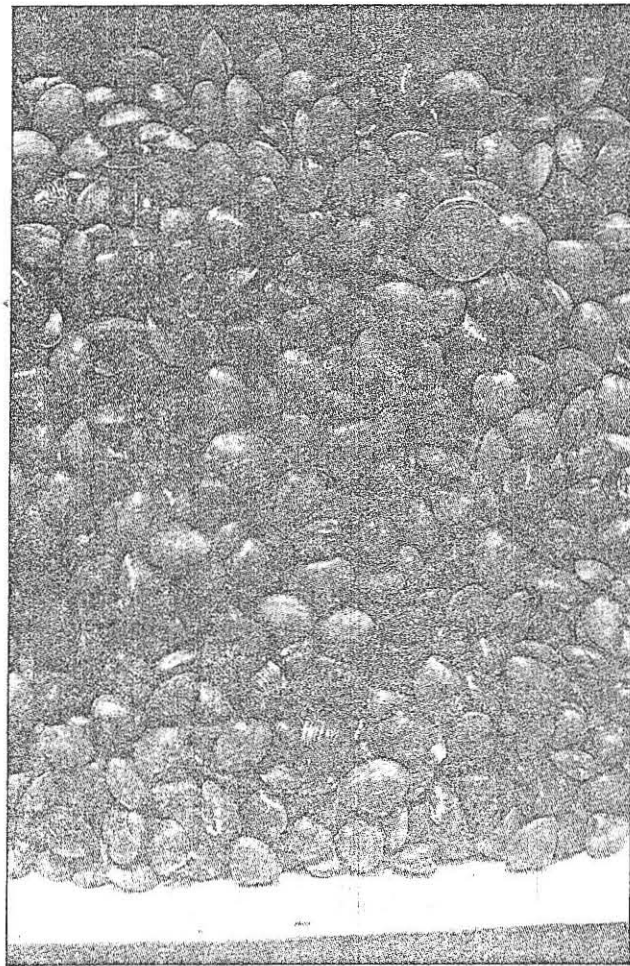


Fig. 1. Fishery sample of *Villorita cyprinoides* and *Meretrix casta*

seasonal crop. In the traditional system, both perennial and seasonal, the natural shrimp seed composed of various shrimp species like the *Penaeus indicus*, *P. monodon*, *Metapenaeus dobsoni* and *M. monoceros* along with a variety of fish species are trapped and cultured.

Recently, *Penaeus indicus* and *P. monodon* are cultured scientifically in the brackish water shrimp farms of Kerala. The shrimp seeds are procured from different hatcheries established in Kerala and other states. Shrimp larvae of the size 20-25 mm are stocked and reared in separate nurseries (Fig. 3) for 2 to 4 weeks. After the nursery phase they are let out into the main farm and reared till harvestable size. During the culture period the shrimps are provided with supplementary feed. Most of the farmers use clam meat as shrimp feed during the entire culture period including the nursery phase.

boiled and the meat is sold for gastronomic purposes in the local market. The shrimp farmers buy the boiled meat to be used as shrimp feed in fresh condition. The meat is dried after salting and this can be stored for longer periods. The boiled meat is also mixed with tapioca powder or ground nut oil cake and wheat flour and dried and used as shrimp feed. Dried and powdered clam meat is used as an ingredient in the formulated (artificial) shrimp feed.

SHRIMP CULTURE IN KERALA

From time immemorial, shrimps were grown in the traditional 'Pokkali' (rice) fields as a



Fig. 2. Fisherwomen engaged in sorting the clams fished

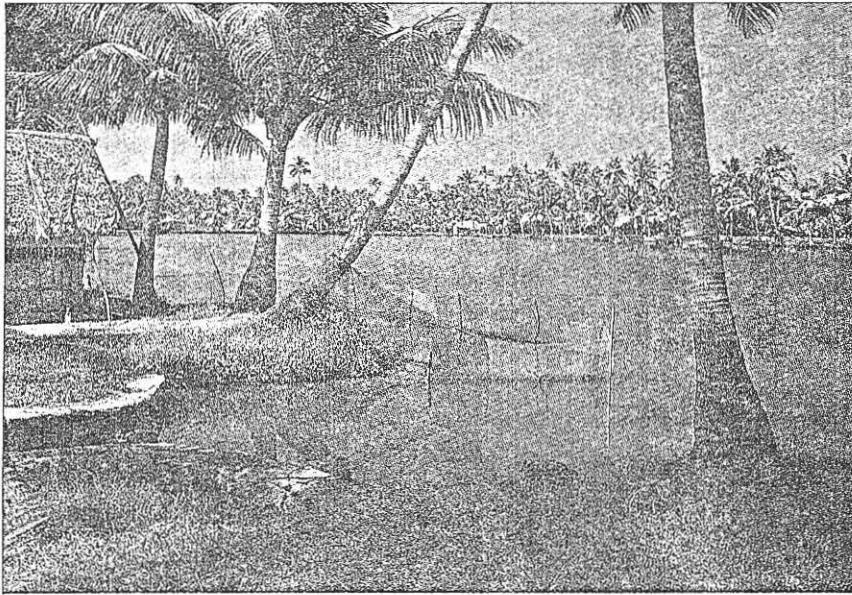


Fig. 3. A view of the nursery of a shrimp farm where post larvae are stocked initially

a. *Clam Meat as Feed for Post Larvae*

About 70% of the shrimp farmers in Cochin area feed the postlarvae during the nursery phase. Others are of the opinion that the natural feed available in the water is sufficient for the postlarvae. Initially for one or two days after stocking, the shrimp larvae are not given any feed. Afterwards the larvae are provided with supplementary feed in one of the following forms:

1. Minced clam meat.
2. Finely powdered clam meat.
3. Boiled clam meat along with boiled egg.

The larvae after the nursery phase are reared to harvestable size in the main farm. Of late with the estab-

lishment of modern feed mills and with the availability of imported feed, some

b. *Clam as Feed for Adult Shrimp*

The shrimp in the grow out ponds in Vypin - Alleppey area are given the boiled meat of *Villorita cyrinoides* in various rates depending on the management measure (Table 1). The small scale shrimp farmers in Quilon area utilize the meat of *M. casta*, *Katylisia opima* *V. cyprinoides* and *P. malabarica* as shrimp feed. Usually in 0.4 ha shrimp farm where 20,000 prawn seed are stocked, about 10-

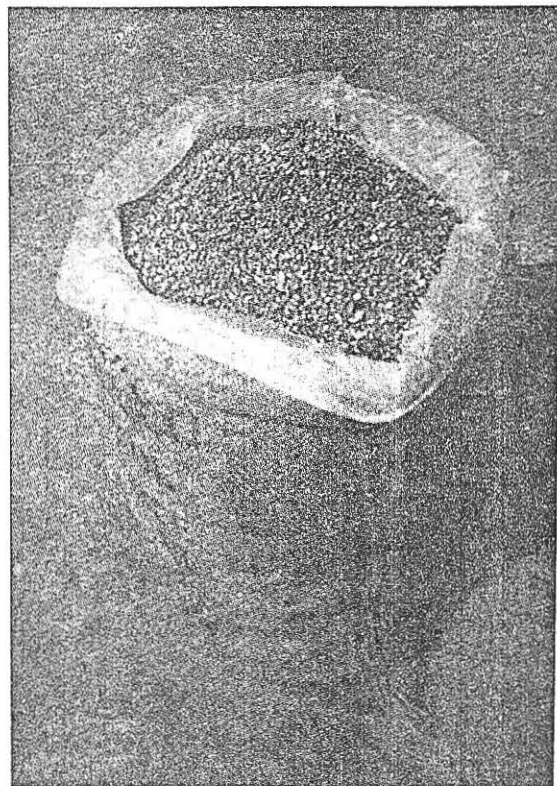


Fig. 4. Dried meat of *Villorita cyrinoides* which is used as feed for shrimps

15 Kg. of clam meat is used per day. The various forms in which the clam meat is utilized are given below:

1. Fresh boiled clam meat alone once or twice a day.
2. Dried clam meat either as it is or after soaking in water prior to feeding.
3. Feed prepared by mixing clam meat and with slaughter house waste and tapioca powder.
4. Feed prepared by mixing clam meat with squid/cuttlefish waste and tapioca powder.

The feed is given to the shrimp every say in separate trays kept in different parts of the farm. The left over

feed is removed in the evening. In some cases the feed is broadcast in the farm.

In some semi-intensive farms farmers use imported formulated feed during the culture period. In the last phase, for about 20 days to one month, before the expected date of harvest farmers feed clam meat as the major feed item.

c. *Clam as Feed for Broodstock in Hatcheries*

Usually the broodstock maintained in the shrimp hatcheries are fed with fresh clam *ad libidum*. Apart from the black clam, the marine clam *Sunetta scripta* which is available in the area off Cochin is also used

in fresh condition as feed for the broodstock. The clams are purchased from local fishermen and stored in deep freezer. The shell-on clam is given to the broodstock in the rearing tank. The empty shells left behind after the prawns feed on the meat, are removed from the tank periodically.

ECONOMICS

The price of clam meat is highly flexible: During the monsoon season the meat is sold @ Rs. 2.50 to 3.0/kg. In the summer months the price rises upto Rs. 5 to 8/Kg. The dried clam meat is sold @ Rs. 20-22/Kg. With an average requirement of 13 Kg/day in one acre farm, the farmer has to spend about Rs.8,190 (@ Rs. 7/Kg of

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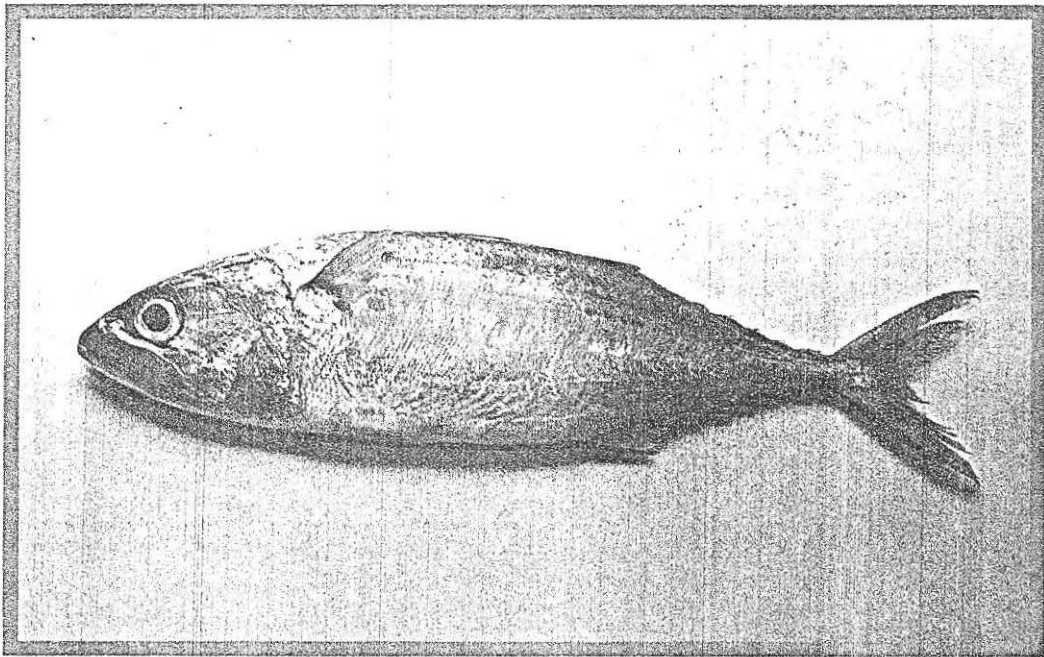
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