

Black Clam is all set to go places

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Clams, oysters and mussels are shelled molluscs, which are sedentary beings found in inshore waters. They move very little during their lifetime, but they can change fortunes of many lives. Many fishing communities sustain their livelihood on these organisms.

Clam contribute to nearly 72.9% of the total bivalve production in the country. The total clam production reported from the country in 2016 was 64,105 metric tons (CMFRI, 2016). About 73.8% of clam landings in India is consisted of Black clam, whose scientific names is *Villorita cyprinoides*. And in this, Vembanad Lake in Kerala contributed 81.7% to the fishery during 2016 (CMFRI, 2016). The other important clam species exploited from lakes and estuaries of Kerala included short neck clam (*Paphia malabarica*) and yellow clam (*Meretrix casta*).

Clam marketing today

Yellow clam led the international export, touching 721.88 tons valued at Rs.10.67 lakhs during 2016-'17 (MPEDA, personal communication, 2018). Most of the yellow clam, targeting international markets at Japan and Thailand, came from a few processing plants in Kollam, Thiruvananthapuram and Kozhikode. Despite

having an equally good potential in the export scene and arrival in large quantities, black clam did not make a similar impact (Fig. 1). The export of black clam to Thailand at a quantity of 1.3 mt from a processing plant in Kollam was reported in 2016. A few processing plants in Kollam and Ernakulam were processing and exporting black clam meat in block frozen form.



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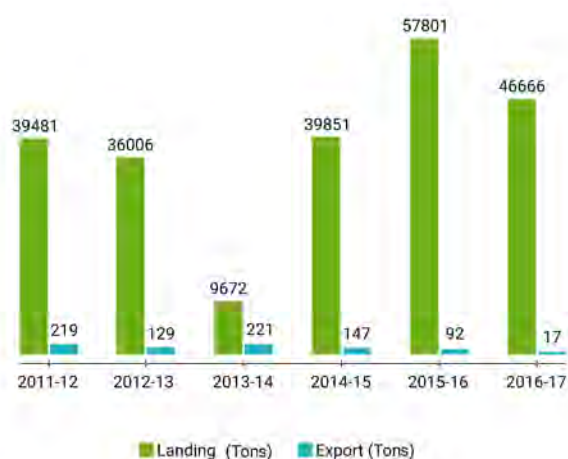


Fig. 1. Comparison of landing and export data during 2011-2017

Date source: Publications of MPEDA, ICAR-CMFRI

The international markets for clam are countries like China, Korea, Europe and USA, of which China also has bivalve culture to meet the demand of the domestic catering industry (WHO, 2010). Many countries have regulatory standards for maintaining food quality of bivalves and the processing units of these countries adhere to these standards. India has so far not been able capture the market of bivalves, primarily because the focus has been on shrimp and cephalopods as well the no compliance issues with regard to food safety. Most developing countries also do not have established bivalve culture, though it is practised in localised pockets through Institutional support (Mohamed et. al. 2016).

The bivalves are generally harvested from natural waters and consumed locally. The coliform counts in clam meat should not be above the acceptable limits of 230 *E. coli* per 100 g flesh for consumption in live condition (<https://www.eicindia.gov.in/>...accessed 8 May 2018). If the *E. coli* count in the clam meat exceeds this limit it should be subjected to depuration and heat treatment as per the EU standards (WHO, 2010). Since the clams are harvested from lakes and estuaries, the efficiency of checking the contamination of clam harvested waters at the sources of pollution is limited. The periodic closure of clam harvested waters during possible periods of build-up of toxins, proper depuration before processing, awareness on the need to adhere to the quality standards from harvesting to final consignment etc. are the suggested ways to counter this (WHO, 2010).

In Kerala, black clam (*Villorita cyprinoides*) meat is

mainly marketed domestically. Majority of the clam processed in the State comes from villages, mostly along the Ashtamudi and Vembanad lakes. These are sold in the nearby wholesale or retail markets by fisherwomen. The clam is crudely processed by boiling and manual shucking by fishermen, which is usually a homestead based activity (Gopal *et. al.*, 2014). Currently the harvested clams are boiled in aluminium containers and the meat is separated using iron meshed sieves. The meat is stored in aluminium containers till it is marketed and the fisherwoman spend up to 8 hours for the clam processing activities.

Those involved in the process are susceptible to respiratory problems due to exposure to smoke and other ailments due to drudgery involved. The knowledge level in productive manufacturing practices and value addition is much less. The fishery supports the lime industry through supply of shell which is a by-product after the meat is separated.

Even though most of the meat is marketed locally, the clam from the State has started to get markets in Karnataka and other neighbouring States since 2015. Clam meat is fetching better prices in these new markets compared to what they fetch in Kerala (CMFRI, 2016). In Kerala the clam cooperative societies have also come up to promote the trade of clam shell (Suja and Mohammed, 2011).

Interventions by ICAR-CIFT

The prospects of clam in the domestic and export market is directly connecting to the awareness among fishermen on quality standards to be maintained. Once the processing of clam in areas where it is richly bred and the quality of the meat processed are ensured to be of accepted standards, the prospects of the industry will improve significantly. The fishermen should be made aware about hygiene in processing and packaging at the source itself.

In Vembanad lake fishermen of eight fishing villages are actively involved in clam fishing, processing and marketing of clam resources. Perumbalam is one such village, an island located in Vembanad Lake. About 250 families are engaged in clam fishery in Perumbalam Island (Gopal *et. al.*, 2014) and hence this was identified as an ideal location for the implementation of a project by the ICAR-CIFT, Cochin, to cluster the clam fishers and create a facility for processing of the harvested clam hygienically. This was carried out under a project funded by the Department of Science & Technology's (Science for Equity Empowerment and Development

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(SEED) Programme), Government of India. Suitable protocols and technology inputs were developed by the Institute, which included depuration of clam meat and the standardisation of post harvesting technology including processing and packaging.

Fisher Clusters

The clam fishers (women and men) of the Perumbalam village were grouped into clusters and training was imparted to equip the cluster members in hygienic handling practices, scientific methods of processing and preparation of value added products from clam meat. Hands-on training on Good Manufacturing Practices (GMP) were given to about 90 clam fishers. The centralised clam processing facility with the depuration unit and industrial cooking and boiling unit will be established at Perumbalam. This processing facility can serve as the model for other clam processing villages of the Vembanad Lake.

Standardization of processes

The processing plant will have a well-equipped depuration system comprising customised to meet the requirements for processing about 1 metric ton of raw material in a day. The cooking time was standardized at 10 minutes per batch (each batch can handle 100 kgs of raw, depurated clam). Industrial cooking and boiling unit fabricated for the purpose will be used for cooking the whole clams using steam generated in the boiling unit. The boiling chamber can produce continuous steam with an initial burning biomass of around 7 kgs for 40 minutes. The cooking unit is comprised of two chambers, each of which can accommodate 50 kg of clam in 5 trays at a time. The unit is also provided with a chill room for short term storage of the clam meat that can then be marketed locally or for export or alternatively used for preparation of value added products. The clam meat is amenable to value addition and through the project seven products have been tried which include popular read-to-eat products like cutlets, rolls, balls, samosa etc. as well as clam pickle, which can be popularised for small scale entrepreneurs. Standardisation under various storage conditions like chilled and frozen storage in appropriate market friendly packaging is under progress.

The manual separation of meat from the shell expends time and effort which is reduced by shucking in an improved design of manually operated rotary meat and shell separator. This also reduces the chances of microbial contamination of meat as it minimises the manual handling of clams. The rotary motion of the unit separates the meat from shell and the meat is

collected in the shallow steel tray fixed at the bottom of the drum and the shell collected separately at one end of the machine.

New Marketing Strategies

The processed meat is often marketed without suitable processing and packaging by the market commission agents, which reduces the marketing margin accrued to the producer in the existing conditions in India. If the product is marketed after proper branding and with suitable quality specification to the consumer directly, the market acceptability of the product will be improved. The consumers will be ready to buy clam meat if guaranteed of improved quality and palatability by depuration and processing in hygienic conditions. Simultaneously, promotion of clam culture is also essential as this improve the availability of clam resources from harvesting areas free of pollution as care may be taken in site selection of aquaculture farms.

Conclusion

The future prospects of clam trade from countries like India requires assistance in improving practices of harvesting and post harvesting to produce product of good quality which is safe for the consumer. There should be strong liaison between the stakeholders, processing industry and the competent regulatory authority for adherence to quality standards. The improved quality will enhance the remuneration of clam meat in domestic market with a subsequent increase in export market.

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