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# 76. UTILISATION OF THE EDIBLE OYSTER, *CRASSOSTREA MADRASENSIS* — PREPARATION OF CERTAIN VALUE ADDED PRODUCTS

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## ABSTRACT

A variety of new products have been developed with the edible oyster, *Crassostrea madrasensis* and comparative study of their storage characteristics is reported. Of the different types of products developed oyster soup, oyster nectar, oyster curry and oyster pickle will have export potential, as these items are popular in western countries. In addition to the above mentioned products, oysters canned in brine, oil etc. have been prepared and it is hoped that there will be a good market for these products among people especially in urban areas. The products can either be canned or frozen and preserved for reasonable storage period.

## INTRODUCTION

Attempts have been made at the beginning of this century to develop methods for the culture of the edible oyster, *Crassostrea madrasensis* in Pulicat Lake due to the food value of the oyster. Only recently, after intensive research in this subject at the Central Marine Fisheries Research Institute, methods have been evolved for the culture of *C. madrasensis*. It is now possible to produce large quantities of oysters through farming. Except for a few places there is no demand for oyster meat in our country. Therefore there is need for popularizing oysters as an item of food.

Unless suitable methods are evolved for the preservation and processing of oysters and for the preparation of various products it will not be possible to cater to the needs of a large segment of the population. Preparation of diversified and value added products from oysters will provide a steady outlet for the edible oysters and bring remunerative prices to the fishermen who are engaged in oyster culture. No attempts have so far been made for the preparation of such products using edible oysters even though various fish and shellfish have been used for such preparations (clam pickles, Vijayan et al 1982), (green mussel pickles, Muraleedharan et al 1982) (Blood clam pickle, Gupta and Basu 1985) (pickle from low cost freshwater fish, Chatto-

padhyay et al 1986), (canned fish curry, Vijayan and Balachandran 1986). An attempt has also been made on the canning edible oyster meat by Balachandran et al 1984. The method of preparation and shelf life study about different oyster products are given in the present study.

## MATERIAL AND METHODS

Shucked oysters were obtained from the oyster farm of the Tuticorin Research Centre of the Central Marine Fisheries Research Institute. The oysters were collected and deperated in settling tanks in the CMFRI laboratory Complex in Karapad. The shucked oysters were brought to the shore laboratory of the Fisheries College in the Fishing Harbour premises and were immediately processed for the preparation of different diversified products such as oyster pickles (hot), oyster pickles (sweet and sour), oyster soup powder and canned preparations which included oyster curry, oyster nectar, oyster in brine, oyster in oil, oyster in masala, oyster in tomato sauce and smoked oyster in oil. The method of preparation of different products and shelf life studies on them is detailed below.

### *Oyster pickles (hot)*

The shucked oysters were washed well in running water and blanched in 5% boiling salt solution for 8 minutes. The blanched meat

was drained and fried in refined oil to a brown colour and the fried meat kept aside. Then the different ingredients for preparation of masala (spices) as given (Table 1) were fried in minimum quantity of refined oil. Half of the remaining quantity of hot oil was then added and the masala made into a paste. The fried oyster was added to the past, and gently stirred. Vinegar and the remaining oil were then added and set aside. The next day the pickles were packed in bottles and closed air tight

TABLE 1 *Standard recipe for oyster pickle (Hot)*

Ingredients	Amount
Gyster (shucked meat)	1 kg
Salt	130 g
Chilly powder	100 g
Turmeric powder	2.5 g
Mustard	19.0 g
Garlic	88.0 g
Ginger	25.0 g
Green chillies	40.0 g
Curry leaves	5.0 g
Dill	5.0 g
Asafoetida	1.0 g
Masala powder	5.0 g
Citric acid	5.0 g
Refined vegetable oil	500 ml
Vinegar	240 ml
Sodium benzoate	2.0 g

TABLE 2. *Standard recipe for oyster pickle (sweet and sour)*

Ingredients	Amount
Oyster (shucked meat)	1 kg
Salt	110 g
Chilly powder	35 g
Turmeric powder	1.0 g
Mustard	10 g
Asafoetida	1.0 g
Dill	5.0 g
Garlic	80.0 g
Ginger	100 g
Green chillies	20 g
Curry leaves	5.0 g
Sugar	250 g
Refined vegetable oil	500 ml
Vinegar	100 ml
Sodium benzoate	2.0 g

### *Oyster Pickles (Sweet and Sour)*

This variety of pickles was prepared in a manner similar to the hot variety except that the ingredient composition of the masala was slightly changed as given in Table 2. In addition to refined oil and vinegar, sugar syrup and ginger extract were added.

### *Oyster curry*

The shucked oysters were washed well in running water and steam cooked for 5 minutes and kept aside. Chopped onion was fried to a brownish tint in vanaspathi and then it was boiled in prawn broth. Maida suspended in water was also added to the mixture of fried onion and prawn broth, which was boiled again. Then the different ingredients for the preparation of curry as given in Table 4 were added to the above mixture followed by the cooked oyster meat. The entire contents were again mixed thoroughly for a few seconds and finally packed in 301 x 203 SR lacquered cans with a pack weight of 175 g and all the cans were retorted at 121°C for 45 min.

TABLE 3. *Sensory evaluation oyster pickle*

Characteristic	Hot pickle	Sweet & sour pickle
Appearance	Good	Good
Colour	Excellent	Good
Texture	Fair	Good
Flavour	Good	Good
Tests	Good	Good
Overall quality	Good	Good
Remarks	Hard and fibrous	—

TABLE 4 *Standard recipe for oyster curry*

Ingredients	Amount
Oyster (Shucked meat)	1 g
Chopped Onion	500 g
Vanaspathi	35 g
Maida	5 g
Chopped tomato	200 g
Minced fresh prawn	50 g
Prawn broth	150 ml
Salt	10 g
Pepper Powder	5 g
Chilly Powder	5 g
Masala powder	10 g

### *Oyster nectar*

The shucked oyster meat was ground well to extract the liquor, which was collected by filtration. The liquid was boiled in 1% salt solution. Finally it was packed in 301 x 203 SR lacquered cans with a pack weight of 175 g and the cans were heat processed at 15 lb pressure for 20 min.

### *Smoked oyster*

The shucked oyster meat was washed well in running water and blanched in 5% brine for 5 min. Then the meat was smoked in AFOS smoking kiln at 45°C for 30 min initially and then at 60°C for 30 min. Finally the smoked oyster meat was packed in 301 x 203 SR lacquered cans with the hot refined groundnut oil as a filling medium and the cans were heat processed at 121°C for 20 min. The pack weight was 140 g.

### *Canned oyster in brine, oil, masala and Tomato sauce*

The shucked oyster meat was washed thoroughly in running potable water and blanched in 3% boiling brine containing 0.2% citric acid for 8 min. The blanched meat was drained well and then packed in 301 x 203 SR lacquered cans with the pack weight of 140 g for the brine and oil packs, 125 g for tomato sauce and 175 for masala pack. For the preparation of masala pack, the blanched oyster meat was fried in hot refined oil till it turned brown and then the different ingredients for the preparation of masala as given in Table 5 were mixed and fried for a short time with the meat and finally this mixture was packed in cans.

TABLE 5 *Standard recipe for the preparation of masala (spices) used in canning oyster*

Ingredients (for 1 kg of meat)	Quantity
Masala powder	20 g
Chilly powder	35 g
Salt	20 g
Refined oil	175 ml
Chopped Onion	300 g

2% table salt solution and hot refined groundnut oil were used as filling media for brine and oil pack respectively, whereas for the

tomato sauce pack, commercially available tomato sauce was diluted with potable water in 1:1 ratio and then used as filling medium.

After filling with the media, the cans were exhausted and seamed and finally the cans were heat processed at 115°C for 45 min for brine and oil packs and for 60 min for masala and tomato sauce packs respectively.

### *Oyster soup*

The shucked oyster meat was washed well and steam cooked for 20 min. Then the different ingredients as given in Table 6 were mixed well and ground thoroughly to give a homogenous dough. It was then dried at 50°C in vacuum oven. The dough was placed in a mould and the soup was obtained in the form of cubes. The cubes were over-wrapped in aluminium foil and kept in bottles air tight. The cubes can be dissolved in boiling water and soup prepared whenever required. Sensory evaluation was conducted by a taste panel and the product acceptability tested. Can opening test was conducted for the canned products and presented in Table 8.

TABLE 6 *Standard recipe for the preparation of oyster soup*

Ingredients	Quantity
Oyster (shucked meat)	1 kg
Chopped Onion	600 g
Vanaspathi	100 g
Refined salt	60 g
Maida	300 g
Pepper powder	15 g
Garlic	50 g
Cumin seeds	50 g
Curry masala powder	5 g
Turmeric powder	2 g
MSG	2.5 g

### DISCUSSION

The results of the sensory evaluation of oyster pickles and canned oyster products have been given in Tables 3 and 7 respectively. The overall quality of the pickles (hot as well as sweet and sour) was found to be good, but the texture was hard and fibrous in the case of hot pickles. The overall quality of the soup powder

TABLE 7. *Sensory Evaluation of Canned Oysters*

Characteristics	Oyster nectar	Oyster in Brine	Oyster in Oil	Oyster in masala	Oyster in Tomato sauce	Smoked oyster in oil	Oyster curry
Appearance	Good	Good	Good	Good	Fair	Good	Fair
Colour	Good	Fair	Good	Good	Fair	Good	Fair
Texture	—	Fair	Good	Good	Fair	Good	Good
Flavour	Poor	Fair	Good	Good	Fair	Good	Good
Taste	Poor	Fair	Good	Good	Fair	Excellent	Good
Overall quality	Fair	Fair	Good	Good	Fair	Good	Good
Remarks	—	Greenish-tinge doserved in the meat Slightly bitter in taste	Greenish tinge observed in the meat	Slightly bitter in taste	Bitter taste	—	Slightly bitter in taste

TABLE 8. *Can Opening Test for Canned Oyster*

Particulars	Oyster in Brine	Oyster in oil	Oyster in masala	Oyster in Tomato sauce	Smoked oyster in oil	Oyster Curry
Can Exterior & Interior	Good	Good	Good	Good	Good	Good
Vacuum (cms of Hg)	22	22	22	9	17	13
Head space (mm)	9	8	8	7	6	9
Gross weight (g)	250	245	240	255	245	245
Net weight (g)	200	195	190	205	195	195
Drained weight (g)	135	150	167	135	120	185
	(67.5%)	(77 %)	(88 %)	(66 %)	(61.5%)	(95 %)
Volume of Liquid Drained (ml)	60	55	26	74	85	10
Exudate per centage of total liquid drained	—	25	—	—	35	—

prepared from the oyster meat was good and flavour was found to be excellent. These products kept well for more than 3 months during the study period and are expected to have a shelf life of 6 months.

The can opening test showed sufficient vacuum and head space in all the cans. The drained weight was above 65%. The exudate percentage of the drained liquid of smoked oyster in oil pack was 35 which was a little more than in the ordinary oilpack, wherein the exudate percentage was 25. Based on sensory evaluation of the canned products, oil pack was rated high than all the other packs. The canned products also kept well during the study period and are expected to have a shelf life of 2 years and more. It is hoped that the recipes and processing methods will be useful in making oyster a favoured food and also lead to the development of exports to western countries.

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