Canning of smoked brown mussel *Perna indica*

Jamila Patterson

Patterson, J. 2001. Canning of smoked brown mussel *Perna indica*. - Phuket Marine Biological Center Special Publication 25(1): 219-220.

The brown mussel, *Perna indica* meat was smoked and canned in SR lacquered cans and their consumer preference and quality were checked during storage period. The microbial load is drastically decreased when small mussels are smoked for 30 min and larger ones for 45 minutes. The final product is sterile and has the best consumer preference qualities.

Jamila Patterson. Suganthi Devadason Marine Research Institute, 44, Beach Road, Tuticorin - 628 001, India.
E-mail - jamilapat@hotmail.com

INTRODUCTION

The brown mussel *Perna indica* is abundant on the rocky beaches of southwest coast of India (Jones & Algarswami 1973). The main fishing season falls from September to March with a peak in November to January. The people of the coastal villages and nearby towns consume the mussel meat. The price was very low during 1987; it was only Rs. 3-5/100 mussels (Appukuttan *et al.* 1987). Now the people are aware about the delicacy and nutritive value of mussels and the price is up to Rs. 50-80/100 mussels. The utilization of fresh mussel is restricted the area where it is available. In a processed form this delicious meat can be enjoyed all over India.

Smoking is an ancient method of preserving seafood. The smoked products obtain an attractive colour and characteristic flavour besides being preserved. Smoky flavour is popular among consumers in many markets. In India smoked tuna meat is the only smoked product popular in the local market. Smoking of green mussel has been reported earlier by Muraleedharan *et al.* (1979), but no work has been done on canning of smoked mussel even though it is having great potential in the export market. In the present study, smoked mussels were canned and the quality assessed.

MATERIALS AND METHODS

Live mussels from the landing center at Colachal were brought to laboratory in wet gunny bags. The shells were cleaned and the mussels kept in filtered sea water with continuous aeration for 24 hrs followed by immersion in 5 ppm chlorinated water for 2 hrs, to minimize the sand content in the meat. After this depuration mussels were washed, boiled for 10 -15 min, and the fully opened mussels shucked. The meat was washed thoroughly and blanched in 5 % boiling brine for 5 min. After blanching, the drained meat was spread on trays and dried for 15 to 30 min in order to facilitate uniform and better absorption of smoke. Smoking was done in a conventional smoking kiln where sawdust generated the smoke. During smoking, samples were drawn at 15 min interval for microbial analysis and to check the effect of smoking time on the quality of the product. Two size groups of mussel meat were smoked for 30 and 45 min and packed separately in sulphur resistant lacquered cans (size 301 x 303) and filled with heated refined sunflower, ground nut and cotton seed oil. The filled cans were exhausted in steam, seamed in a double seamer and heat processed in steam at 121 °C. for 15 min. The heat-processed cans were rapidly cooled in chlorinated water, the cans were washed, surface dried, and stored at room temperature.

Microbial analysis. - The Total Heterotrophic Bacteria (THB) and *Salmonella* were enumerated by standard pour plate technique using ZoBel's 2216E marine agar and Xylose Lysine Deoxycholate Agar medium respectively. THB was enumerated in the raw material, after depuration, shucking and smoking. The sterility of the cans were analyzed using thioglycollate test after the cans were incubated for 14 days at 37 and 55 °C. The shelf life was assessed.

Organoleptic analysis. - Cut out analysis of the processed cans was done periodically and the can

interior and the samples were checked. The canned meat was given to the taste panel and the feed back information collected.

RESULTS AND DISCUSSION

The effect of smoking time on the quality of the meat is presented in Table 1. Meat with an average wet weight of 1.8 g impart adequate smoke flavour after 30 min. while the bigger sized mussel (average wet weight of 7.12 g) became best after 45 min of smoking. The meat of larger mussels smoked for 15 minutes failed to give adequate flavour and the colour of the meat did not change. After 30 min of smoking, the colour changed to pale brown, whereas meat smoked for 45 min obtained adequate smoky flavour and golden brown colour. Long-term smoking resulted an intense smoky flavour and the colour of the meat changed into black, which made the product less acceptable. Muraleedharan *et al.* (1979) reported 30 min of smoking adequate for green mussel *Perna viridis*.

Table 1. Effect of smoking time on the quality of meat of *Perna indica*.

smoking time (min)	smokey flavour	texture	colour
15	slight	soft	white
30	slight	soft	slight brown
45	moderate	firm	golden brown
60	intense	firm	black

Table 2. Total Heterotrophic Bacteria and *Salmonella* sp. count at different stages of processing

Sample	THB ($\times 10^{-5}$ CFUg^{-1})	*Salmonella* sp. ($\times 10^{-1}$ CFU g^{-1})
Raw meat	40	1
Depurated meat	17	Nil
Blanched meat	8	Nil
Smoked meat	7	Nil

Table 2 shows the bacterial load. The Total Heterotrophic Bacteria (THB) colonies were high in the raw materiel (40 CFU/g) but gradually decreased with processing steps until 7 CFU/g in the smoked product. Very few colonies of *Salmonella* were observed in the raw material and not found in the smoked meat. The decrease in bacterial load may be due to the lower water content, as well as the bactericidal properties of smoke.

Table 3. Cost of smoked mussel per can, size 301 x 303.

	cost in Rs.
cost of raw mussel	Rs. 25.00
cost of can	Rs. 8.00
transportation, oil, fuel	Rs. 15.00
total cost	Rs. 48.00 = US$1.14

The cut out analysis revealed normal can interior throughout the storage period of nine months. The organoleptic analysis showed that the texture of the meat was soft and flavour was good during the storage period. The taste panel accepted meat packed in all the three types oils tested. The cost of cottonseed oil is very low so this oil will reduce the production cost in commercial production of canned smoked mussel.

The study clearly revealed that brown mussel canned after smoking had better organoleptic characters and shelf life. The cost of production was calculated (Table 3). The cost per can of smoked mussel was Rs. 48 (US $ 1.2) which will be lower in large scale commercial production. The product can be used in the local as well as export markets.

REFERENCES

Appukuttan,K.K., T.P.Nair, M.Joseph & K.T.Thomas, 1988. Brown mussel *(Perna indica)* resources on the southwest coast of India and the results of farming experiments at Vizhinjam. - CMFRI Bulletin, 42: 257-263.

Jones,S. & K.Algarswami, 1973. Mussel fishery resources of India. Proceedings of the Symposium on Living resources of seas around India. - CMFRI, Special Publication, 641-647.

Muraleedharan,V., T.S.U.Nair & K.G.Joseph, 1979. Smoke curing of mussels. - Fishery Technology: 16: 29-31.