

## PROCESSING MEAT OF *CHICOREUS RAMOSUS* INTO PICKLE

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### ABSTRACT

Pickle was prepared of *Chicoreus ramosus* meat, common South Indian spices and other ingredients. A suitable standardized recipe was developed. The meat was softened by cooking under pressure ( $1 \text{ kg/cm}^2$ ) before making pickle. The pickle was packed in air tight glass bottles and stored at room temperature. The quality and shelf life was assessed by chemical, microbial and organoleptic characters.

### INTRODUCTION

Eating habits change very fast due to the vast improvement in socio-economic conditions. There is a marked swing and sophistication in the preparation of seafood. Consumers abroad and at home demand new types of value added, hygienically prepared, nutritious and attractively packed products (Gopakumar 1993). Marine products have been prepared mainly of shrimp, lobster, cuttlefish, squid, bivalves and some fish species. The use of new resources will bring additional income to the fishing population, and provide a suitable source of protein. *C. ramosus* is mainly consumed by the fishing population, after being processed into dried chips. (Patterson *et al.* 1992). Patterson *et al.* (1994) described 12 recipes with *C. ramosus* meat. Attempts have been made to develop standard methods for processing pickles from seafood. However, a limited number of species are used for that purpose: prawns (Chandrasekhar 1979); clams (Vijayan *et al.* 1982); green mussel (Muraleedharan *et al.* 1982) and blood clam (Gupta & Basu 1985).

### MATERIALS AND METHODS

*Chicoreus ramosus* were collected at Cuddalore in lobster gill nets. Unbored animals, 17-19 cm long, were transported to the laboratory. The shells were washed, operculum removed, boiled in water for 20 minutes, and the meat was shucked off. The edible portions, viz., foot, mantle and columella muscle were separated manually and washed in potable water. The meat was cut in 1 cm pieces and softened by cooking in a pressure cooker ( $1 \text{ kg/cm}^2$ ) for about 2 1/2 hours.

The following spices and ingredients were used: 500 g softened meat; 400 ml vinegar; 250 g peeled

garlic; 15 g coriander powder; 20 g chilli powder; 100 g finely chopped ginger; 500 mg turmeric powder; 500 mg mustard; 250 mg fenugreek; 5 mg asafoetida powder; salt to taste and gingili oil for frying.

#### Procedure

The meat was marinated for half an hour in a mixture of the turmeric powder, salt and half the amount of the chili powder, then fried in refined gingili oil over medium heat until golden brown and kept aside. Mustard and fenugreek were fried till bursting. Coriander powder, ginger, garlic, asafoetida powder and the remaining chili powder were added and stirred well for about 5 min. The fried meat was added and stirred thoroughly for about 10 min. Then, 400 ml of vinegar was added to the meat mixture, mixed well by stirring, and cooled.

#### Quality evaluation

The pickle was packed in clean glass bottles, sealed air tight and stored at room temperature. The quality of the pickle was assessed monthly by examining the pH, liquid titrable acidity, microbiological and organoleptic characteristics. A pH meter was used to analyze the acidity: 10 g of the sample was thoroughly homogenized in a mortar with 100 ml distilled water. The liquid titrable acidity was estimated following the Gerasimov and Antonova (1979) method.

#### Microbiological examination

The total bacterial number (TBC) was calculated by the pour plate technique. A 1 g sample was collected aseptically and transferred to 99 ml of sterile 50 % sea water and disintegrated with a sterile glass rod. Appropriate dilutions were made with 9 ml of 50 %

sea water blank. One ml aliquots of  $10^{-1}$  to  $10^{-6}$  dilutions were pipetted out into sterile petri dishes, and 15-20 ml sterile ZoBell 2216e Marine agar (Himedia) was poured into the petri dishes. The plates in triplicates were incubated at room temperature ( $28 \pm 2^\circ\text{C}$ ) for 1 to 2 days.

#### Organoleptic evaluation

Organoleptic characters like colour, flavour, texture and taste were analyzed by five members of the TMMP group.

### RESULTS

The shelf-life of the pickle was more than 5 months. The pH decreased and the liquid titrable acidity increased during the storage period (Table 1). Only the total bacterial number was counted (Table 1). The initial colour of the pickle was pale red and the texture was tough (Table 2). The flavour was similar to that of traditionally prepared pickle from citrus fruits. No remarkable changes were observed in colour, flavour, texture or taste after storage.

**Table 1.** Changes in chemical and microbiological characteristics of *C. ramosus* meat pickle during storage

Storage (days)	Liquid acidity (as % of acetic acid)	pH	TBC No/g
0	0.28	4.21	2600
30	0.44	3.84	1100
60	0.54	3.72	1300
90	0.59	3.56	540
120	0.64	3.47	540
150	0.76	3.44	30

### DISCUSSION

The pH value decreased considerably from 4.21 to 3.44 during the storage period due to the increase of the

**Table 2.** Organoleptic characteristics of *C. ramosus* meat pickle during the storage period (Hedonic scale 1-5). A: Days of storage; B: Colour; C: Flavour; D: Texture; E: Taste; F: Overall acceptability

A	B	C	D	E	F
0	4.9	5.0	5.0	4.8	4.9
30	4.9	4.9	5.0	4.8	4.9
60	4.8	4.8	5.0	4.8	4.8
90	4.7	4.8	5.0	4.8	4.8
120	4.7	4.6	5.0	4.8	4.8
150	4.6	4.6	5.0	4.6	4.8

liquid titrable acidity, probably because of acid producing bacteria. Litchfield (1976) stated that some acid forming microaerophilic bacteria tolerate low pH values, even down to pH 3.5. Gupta and Basu (1985) made similar observations in pickle prepared of the blood clam *Anadara granosa*.

Jarvis (1950) reported that the spices used in pickling may be slightly preserving and Stansby (1963) suggested that spices slightly retard bacterial spoilage. Subba Rao *et al.* (1963) described that an emulsion containing acetic acid, mustard and turmeric powders is preservative and has controlling effects on growth of yeast and moulds. Nkanga and Urali (1981) reported an inhibiting effect of condiments - cloves, onion, ginger, black pepper and red pepper on *Staphylococcus aureus* growth. According to Kumar and Gupta (1984) also garlic reduces *S. aureus* growth. Muraleedharan *et al.* (1982) and Vijayan *et al.* (1982) stated that the mould growth in pickled products could be arrested by the use of skinned mustard and gingli oil. In addition to the spices, the cooking of the meat under pressure ( $1\text{ kg cm}^{-2}$ ) for about 2<sup>1</sup>/<sub>2</sub> hours also destroys the microbes and hence the pickle prepared of *C. ramosus* meat is free from pathogens.

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