PART III

NOTES, ABSTRACTS AND NEWS

NOTE: 1

PICKLE CURING OF FISH USING TARTARIC ACID AND GARLIC AS PRESERVATIVES

Pickling has been one of the most popular methods of fish preservation in our country from olden times. The conventional Colombo curing using gorukha puli *(Garcina cambogiea)* as preservative has been extensively practised for preservation of oil sardine, mackerel etc. especially along the west coast. Several attempts have been made for evolving better preservatives for pickled products (Vasavan and Varma 1959; Rao, Valsan and Nair 1962; Rao and Valsan 1962) and vinegar, Malabar tamarind, propionic acid etc. were suggested as good preservatives. But since propionic acid is not manufactured indigenously this otherwise good method has not become very popular in commercial practice.

Colombo curing has got certain defects. The gorukha puli imparts an unattractive dark appearance to the product. Its texture is tough and fibrous and salt content is generally high. Because of these, the use of gorukha puli is nowadys avoided and fish curers mostly preserve their bulk catches in saturated brine in big cement tanks. The brine, wnich is changed frequently, is kept saturated by the addition of solid salt at intervals. This method does not bring down the pH of the pickle medium to sufficiently low level, thereby causing increased bacterial action and spoilage. Such products are more susceptible to the attack of red halophiles though the dark unattractive appearance of the colombo cured products is avoided.

In view of these facts, tartaric acid was tried as preservative for pickle cured fishes. The preservative action of gorukha puli is due to its action of lowering the pH (Sreenivasan and Venkataraman 1957). But if tartaric acid itself is used instead of gorukha puli the pH is lowered without impairing the appearance of the pickled fish. But from trial experiments it was observed that though tartaric acid has good bactericidal activity its bacteriostatic effect was not satisfactory. So the method was slightly modified by incorporating a little garlic in the pickled medium. Garlic also was not very effective when used alone as a preservative for pickled fishery products. But when used in combination with tartaric acid, garlic gave highly satisfactory products of good appearance, texture, taste and shelf life. This note reports results of the studies conducted with these preservatives on the pickle curing of some common cheap food fishes like silver belly,

cat fish, sole, ribbon fish etc. which are not properly utilized at present.

Fresh silver belly, cat fish, sole, ribbon fish etc. were procured from the landing centres. They were cleaned, washed and pickled in glass Jars in two lots (1) as is done commercially at present without any special preservative other than salt, and (2) using tartaric acid and garlic as preservative, for comparison. The composition of the pickle mediums are given below:

Sample	Salt : Fish	Preservative
1	1 : 4	—
2	1 : 4	2% tartaric acid and 2% garlic (on the wt. of refined salt).

Sufficient saturated brine was added after 48 hours in both cases to keep the samples immersed. The spoilage in these samples was assessed by the change in the total volatile nitrogen. (Table II).

From the table it can be seen that in all the cases the tartaric acid-garlic sample remained in good condition for more than 16 weeks whereas the control sample spoiled within 8 weeks itself. The faint garlic smell and taste of the product was also relished by the laboratory taste panel.

The method has several advantages: (1) it overcomes the dark appearance of colombo cured products, and gives an attractive product of good taste, texture and shelf life (2) the preservatives used are cheap, locally available and harmless.

We are thankful to Shri. M. R. Nair, Officer-In-Charge, C. I. F. T. (Processing Division) for his interest in the work. We are also thankful to Shri. G. K. Kuriyan, Director of the Institute for his permission to publish this note. The technical assistance of Shri. P. Sadanandan of this laboratory is also gratefully acknowledged.

TABLE I

Initial analysis of Pickled samples:
1. Control. 2. Tartaric acid (2%) and garlic (2%) treated.

	Cat fish		Ribbon fish		Silver belly		Sole	
	1	2	1	2	1	2	1	2
Moisture	48.42	54.54	52.75	54.91	55.89	52.67	52.14	52.10
Chloride (%DWB)	28.14	25.96	35.34	34.35	28.38	27.47	38.58	38.12

TABLE II

Total Volatile Nitrogen in Pickled products.
1. Control 2. 2% Tartaric acid 2% garlic treated.

Storage in Weeks	Total Volatile Nitrogen								Physical observation
	Cat fish		Ribbon fish		Silver belly		Sole		
	1	2	1	2	1	2	1	2	
Initial	30.97	29.75	38.45	37.96	31.5	28.78	28.4	26.75	— —
4	34.10	32.52	68.21	52.21	55.72	33.12	66.65	42.4	Thin layers of fungus on the surface of brine in control samples. Tartaric acid and garlic samples in good condition.
8	51.48	36.17	88.64	58.54	76.12	39.23	116.2	50.52	Heavy fungus and foul smell in control samples. 'Red' also in control sample of pickled sole. All tartaric acid - garlic samples in good condition.
12	75.41	42.50	107.09	68.21	102.24	48.91	168.2	59.14	Heavy fungus and maggots and also 'red' in control samples - completely spoiled. Tartaric acid garlic samples in good condition.
16	92.40	48.85	146.75	78.02	128.32	54.92	192.56	65.12	Control samples completely spoiled in all cases-discarded-Tartaric acid garlic samples in good condition.

REFERENCES

A. O. A. C. *Official methods of analysis*; Association of Official Agricultural Chemists, 1960. 9th Edn.

Rao, S. V. S., A. P. Valsan and M. R. Nair. 1958. *Indian, J. Fish.*, **5**, 2 : 326.

Rao. S V S, A. P. Valsan and M. R. Nair. 1962. *Proc. Indo. Pac. Fish. Counc.* **10**, II, Technical Paper.

Sreenivasan A and R. Venkataraman, 1957. *Proc. 2nd. Int. Symp. Food microbiol.*, 117.

Vasavan, A. G. and K. G. Varma. 1959. *Curr. Sci.* **28**: 153.

C. I. F. T. Unit,
West Hill,
Calicut-5.

K. Devadasan,
V. Muraleedharan,
K. George Joseph.