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DECLARATION

" The work described in this thesis was carried out by me under the supervision of Professor A. Bamunuarachchi (Department of Chemistry, University of Sri Jayawardanepura, Nugegoda, Sri Lanka) and Professor T.S.G. Fonseka (former Head/Institute of Post Harvest Technology, National Aquatic Resources Research and Development Agency, Colombo 15, Sri Lanka) and the report on this has not been submitted to any university for another degree"

Date 11.09.2000

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DECLARATION OF THE SUPERVISION

"We certify that the above statement made by the candidate is true and that this thesis is suitable for submission to the University or the purpose of evaluation"

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STUDIES ON THE CHEMICAL-MICROBIOLOGICAL ASPECTS OF FISH CURING

by

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Thesis submitted to the University of Sri Jayawardanapura, Sri Lanka for the award of the Degree of Master of Philosophy in Chemistry on 11th September 2000

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STUDIES ON THE CHEMICAL MICROBIOLOGICAL ASPECTS OF FISH CURING

by

Pradeepa Shayamali Jayasinghe

ABSTRACT

The keeping quality and proximate composition of Sri Lankan traditional fermented fish, jaadi were evaluated using commercial samples collected from the Southern and North western coasts of Sri Lanka. A series of experiments using jaadi samples was carried out by changing the relative properties of ingredients, its salt, goraka content and packing systems. Further, the acceptability during storage of jaddi, prepared with different natural preservatives and the use of different proportions of vinegar and salt for fish curing were also studied.

Commercially prepared jaadi made out of different fish species, spotted sardinella ,Spanish mackerel, Indian mackerel, oil sardinella and white sardinella indicated elevated levels of protein content 27.92%, oil content 11.5%, ash content 24.64%, dry matter content 54.13% and salt content 20.23% respectively when compared to the fresh fish. The samples from South-west coastal areas are better in quality than the samples from North-west areas.

Jaadi made with 3:1 fish: salt ratio was found to be the 'best' acceptable quality after more than six months of storage in ambient temperature. High salt content , 2:1 and least salt content 5:1 lead the product to be of 'poor' acceptability and delay in development of characteristic jaadi flavour and least salt content resulted in excessive hydrolysis.

Goraka (*Garcinia cambogia*) concentration also affects the quality of jaddi but is not effective in controlling molud growth. The ratio of 10:1 fish: goraka was found to be of 'best' acceptable quality and was also the most cost effective fish:salt ratio in jaadi preparation. Following are the quality parameters of the 10:1 fish:goraka ratio at the end of the six month storage period, results of the TBC of log 1.7/g, TVN of 90.3 mg/100g , peroxide value of 85.2meq./kg and oil content of 2.92%, pH value of 3.53 and dry matter content of 54.9%.

The sterilized glass bottles were found to be the most stable and safe packing method effective in preventing growth of moulds in jaadi for a period of more than six months. *Lactobacillus* was the dominant microflora that had contributed towards the characteristic flavour and aroma of jaadi.

Tamarind (*Tamarindus indica*) fruit and seed were found to be the best natural preservatives and had more properties of acceptability indicating TVN of 58.79mg/100g, protein of 15.7%, TBC of log 3.63. It is more effective in preventing the growth of microbes and moulds than goraka (*Garcinia cambogia*) or turmeric (*Curcuma domestica*). The product of ratio 7.5:1 fish: tamarind showed the 'best' acceptable keeping quality suitable for packing even in plastic containers for more than six months.

The quality of fish preserved using vinegar (acetic acid) and salt in cooked and uncooked conditions have suggested that the cooked fish in 2% acetic acid level and 17% salt concentration is the most effective combination for fish marinated for a long period but uncooked marinades have been poorly accepted within the first week of storage and have been rejected for consumption.