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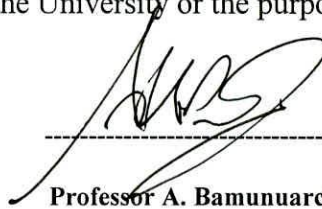
“ The work described in this thesis was carried out by me under the supervision of Professor A. Bamunuarachchi (Department of Chemistry, University of Sri Jayawardanepura, Nugegoda, Sri Lanka) and Professor T.S.G. Fonseka (former Head/Institute of Post Harvest Technology, National Aquatic Resources Research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

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**STUDIES ON THE CHEMICAL-MICROBIOLOGICAL ASPECTS OF  
FISH CURING**

by

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(B.Sc. Agriculture {University of Ruhuna, Sri Lanka})

Thesis submitted to the University of Sri Jayawardanapura, Sri Lanka for the award  
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## CONTENTS

	Page No
I CONTENTS	I
11 LIST OF FIGURES	x
111 LIST OF TABLES	xv
IV LIST OF APPENDICES	xvi
VI ANNEX	xvi
VII ACKNOWLEDGMENTS	xvii
VIII ABSTRACT	xviii
 <b>Chapter 1</b>	
1 INTRODUCTION	1
1.1 Fish Consumption	3
 Chapter 11	
2 LITERATURE REVIEW	5
2.1 Chemical composition of fish	5
2.2 Fresh fish spoilage	6
2.3 Principles in fish preservation and processing	7
2.4 Fish processing methods.	9
2.4.1 Sun drying	9
2.4.2 Fermenting of fish	10
2.4.2.1 Salt drying or dry curing	11
2.4.2.2 Pit curing	13
2.4.2.3 Colombo curing or preparation of jaadi	15
2.4.2.4 Marinating	18
2.4.2.5 Fish sauce	19
2.4.2.6 Fish smoking	20

2.5. Factors affect the quality of fish products	22
2.5.1 Salt quality	23
2.5.1.1. Sources of salt	22
2.5.1.2 Chemical composition	23
2.5.1.3. Microbiological purities	24
2.5.1.4. Physical properties	24
2.5.1.5. Quantity of salt used	25
2.5.1.6. Effects of salt on fish microorganisms	26
2.5.2 Organic acid	28
2.5.3 Other natural preservatives	30
2.7 Nutritional aspects of fermented fish	31
 <b>Chapter 3</b>	
3 Materials and Methods	36
3.1. Selection of sampling sites and samples of fermented fish jaadi	36
3.2 Proximate composition of selected samples	37
3.2.1 Sodium chloride	37
3.2.1.1 Materials	37
3.2.1.2 Method	38
3.2.2 Dry matter content	39
3.2.2.1 Materials	39
3.2.2.2 Method	39
3.2.3 Ash content	40
3.2.3.1 Materials	40
3.2.3.2. Method	40
3.2.4 Crude protein content	40
3.2.4.1 Materials	40

3.2.4.2. Method	41
3.2.5.Oil content	42
3.2.5.1 Materials	42
3.2.5.2. Method	43
3.3. Evaluation of quality of jaadi samples	43
3.3.1 Total Volatile nitrogen	43
3.3.1.1 Materials	44
3.3.1.2 Method	44
3.3.2 Trimethylamine	45
3.3.2.1 Materials	45
3.3.2.2 Method	45
3.3.3 Free fatty acid value	45
3.3.3.1 Materials	45
3.3.3.2 Method	45
3.3.4 Peroxide value	46
3.3.4.1 Materials	46
3.3.4.2 Method	47
3.3.5 Amino nitrogen content	47
3.3.5.1 Materials	47
3.3.5.2. Method	48
3.3.6 pH value	48
3.3.6.1 Materials	48
3.3.6.2. Method	49
3.4 Sensory observations	49
3.4.1. Materials	49
3.4.2. Method	49

3.5	Structural analysis	49
3.5.1.	Materials	49
3.5.2.	Method	50
3.6	Total Bacterial Count	50
3.6.1	Materials	50
3.6.2	Method	51
3.7	Preliminary identification of all dominant micro flora	52
3.7.1	Characterization of isolates from fish	52
3.7.1.1	Materials	52
3.7.1.2	Method	52
3.7.2	Mortality test	52
3.7.2.1	Materials	52
3.7.2.2	Method	53
3.7.3	Catalase test	53
3.7.3.1	Materials	53
3.7.3.2	Method	53
3.7.4	Oxidation or fermentation of glucose	54
3.7.4.1	Materials	54
3.7.4.2	Method	54
3.7.5	Oxidase activity	54
3.7.5.1	Materials	54
3.7.5.2	Method	55
3.7.6	Methyl red test	55
3.7.6.1	Materials	55
3.7.6.2	Method	55
3.7.7	Acetyl methyl carbinol production –vp	55
3.7.7.1	Materials	55

3.7.7.2	Method	56
3.8.	Studies on the quality of jaadi prepared under controlled Condition	56
3.8.1	Effect of different salt concentration	56
3.8.1.1	Materials	56
3.8.1.2	Method	56
3.8.2	Effect of goraka concentration	57
3.8.2.1.	Materials	57
3.8.2.2.	Method	58
3.8.3	Effect of packing methods	58
3.8.3.1	Materials	58
3.8.3.2	Method	59
3.8.4.	Comparison on jaadi prepared by traditional and improved method	60
3.8.3.1	Materials	60
3.8.3.2	Method	60
3.9	Effect of natural preservatives and salt in fish curing	61
3.9.1	Selection of highest acceptable natural preservative	61
3.9.1.1	Materials	61
3.9.1.2	Method	61
3.9.2.	Selection of Optimum Tamarind Concentration	62
3.9.2.1.	Materials	62
3.9.2.2	Method	62
3.10.1	Effect of salt at constant concentration and vinegar at different concentration.	63
3.10.1.1	Materials	63
3.10.1.2	Method	63



3.10.2	Effect of vinegar at constant concentration and salt at different concentrations	64
3.10.2.1.	Materials	64
3.10.2.3	Method	64
3.11.	Statistical analysis of the results	64
<b>Chapter 4</b>		
4	RESULTS AND DISCUSSION	65
4.1	Evaluation of Proximate Composition	65
4.2	Evaluation of Quality Parameters	68
4.3	Studies on the Quality of Jaadi Prepared Under Controlled Conditions	74
4.3.1	Effect of different salt concentrations	74
4.3.1.1.	Effect of different salt concentrations on TBC(Total Bacterial Counts)	74
4.3.1.2.	Effect of different salt concentrations on pH	75
4.3.1.2.	Effect of different salt concentrations on salt concentration (flesh) of jaadi	77
4.3.1.4.	Effect of different salt concentrations on dry matter content of jaadi	78
4.3.1.5.	Effect of different salt concentrations on oil content of jaadi	80
4.3.1.6.	Effect of different salt concentrations on Total Volatile Nitrogen (TVN) content of jaadi	82
4.3.1.7.	Effect of different salt concentrations on amino nitrogen content of jaadi	83
4.3.1.8	Effect of different salt concentrations on the overall acceptability of jaadi	85
4.3.1.9	Comparison of the sensory evaluation and the bio-chemical properties of jaadi in trials where different fish-salt ratio were used	87
4.3.1.10	Structural analysis of different salt concentrations	88
4.3.2	Effect of Different Goraka Concentration	96
4.3.2.1	Effect of different goraka concentration on TBC	96
4.3.2.2	Effect of different goraka concentration on pH value of jaadi	97

4.3.2.3	Effect of different goraka concentration on oil content of jaadi	99
4.3.2.4	Effect of different goraka concentration on peroxide value of jaadi	100
4.3.2.5	Effect of different goraka concentration on dry matter content of jaadi	102
4.3.2.6	Effect of different goraka concentration on Total Volatile Nitrogen (TVN) content of jaadi	104
4.3.2.7	Overall acceptability of jaadi at different concentrations of goraka	105
4.3.2.8	Sensory evaluation, bio-chemical changes and nutritional properties of jaadi developed under different goraka concentrations	107
4.3.3	Effect of Different Packing Methods on Quality of Jaadi	108
4.3.3.1	Effect of different packing methods on Total Volatile Nitrogen(TVN)	108
4.3.3.2	Effect of different packing methods on Total Bacterial Counts (TBC)	109
4.3.3.3	Types of bacterial colonies in jaadi	112
4.3.3.3.1	Major bacteria in jaadi packed in vaccum packs	113
4.3.3.3.2	Major bacteria in jaadi packed in sterile glass bottles	125
4.3.3.3.3	Major bacteria in jaadi packed in plastic containers	114
4.3.3.4	Overall acceptability of jaadi in different packing condition	116
4.3.3.5	Sensory observations of jaadi in different packing condition	117
4.3.4	Effect of Jaadi Preperation by Improved and Traditional Processing Method	120
4.3.4.1	Effect of processing methods on Total Volatile Nitrogen (TVN) content of jaadi	120
4.3.4.2	Effect of processing methods on dry matter content of jaddi	120
4.3.4.3	Effect of processing methods on oil content of jaadi.	121
4.3.4.4	Effect of processing methods on peroxide value of jaadi	122
4.3.4.5	Effect of processing methods on pH value of jaadi	123
4.3.4.6	Effect of processing methods on salt content of jaadi	123
4.3.4.7	Effect of processing methods on Total Bacterial Count (TBC) of jaadi	124

.4.3.4.8	Effect of processing methods on overall acceptability of jaadi	124
4.4	Effect of other Natural preservatives	126
4.4.1	Effect of Three Natural Preservatives and Salt in Fish	126
4.4.1.1.	Effect of three natural preservatives on the Total Bacterial Count (TBC) of fish	126
4.4.1.2.	Effect of three natural preservatives on the Total Volatile Nitrogen (TVN) of fish	128
4.4.1.3.	Effect of three natural preservatives on the pH of fish.	129
4.4.1.4.	Effect of three natural preservatives on the salt concentration of fish.	131
4.4.1.5.	Effect of three natural preservatives on the dry matter content of fish.	133
4.4.1.6.	Effect of three natural preservatives on the crude protein of fish	134
4.4.1.7.	Effect of three natural preservatives on the overall acceptability of fish	136
4.4.1.8.	Sensory evaluation and bio-chemical and nutritional properties of fish cured with three natural preservatives	138
4.4.2	Effect of Different Tamarind Content on the Quality of Cured Fish	140
4.4.2.1	Effect of different tamarind content on Total Bacterial Count of cured fish	140
4.4.2.2	Effect of different tamarind content on Total Volatile Nitrogen content of cured fish.	141
4.4.2.3.	Effect of different concentration of tamarind content on crude protein content of cured fish	142
4.4.2.4.	Effect of different concentrations of tamarind content on oil content of cured fish.	144
4.4.2.5.	Effect of different concentration of tamarind content on peroxide value of cured fish	145
4.4.2.6	Overall acceptability of tamarind treated cured fish during storage	146
4.4.2.7	Sensory evaluation and bio-chemical and nutritional properties of tamarind cured pickle developed using different tamarind content.	148
4.5.1	Effect of Acetic Acid on the Quality of Marinated Fish.	149
4.5.1.1.	Effect of acetic acid concentrations on pH of cured fish during storage.	152

4.5.1.2	Effect of acetic acid concentrations on TVN(Total Volatile Nitrogen) of cured fish during storage.	154
4.5.1.3	Effect of acetic acid concentrations on oil content of cured fish during storage.	157
4.5.1.4	Effect of acetic acid concentrations on salt content of cured fish during storage.	159
4.5.1.5	Effect of acetic acid concentrations on Total Bacterial Count (TBC) of cured fish during storage.	159
4.5.1.6	Overall acceptability of cured fish with acetic acid under cooked and uncooked condition	161
4.5.1.7	Sensory evaluation and the bio-chemical and nutritional properties of pickle developed using different acetic acid ratio	165
4.5.2	Effect of Different Salt Concentrations on Cured Fish with Acetic Acid	166
4.5.2.1	Effect of different salt concentrations on Total Bacterial Count(TBC)	166
4.5.2.2	Effect of different salt concentrations on dry matter content	167
4.5.2.3	Effect of different salt concentrations on oil content	170
4.5.2.4	Effect of different salt concentrations on peroxide value	172
4.5.2.5	Effect of different salt concentrations on salt content	175
4.5.2.6	Effect of different salt concentrations on Total Volatile Nitrogen (TVN)	177
4.5.2.7	Effect of different salt concentrations on crude protein content	179
4.5.2.8	Effect of different salt concentrations on pH value	181
4.5.2.9	Overall acceptability of cooked and uncooked marinades made with constant concentration of acetic acid and varied concentration of salt.	183
4.5.2.10	Sensory evaluation and the bio-chemical and nutritional properties of marinades developed using different salt concentrations at constant acetic acid concentrations	185
<b>Chapter 5</b>		<b>186</b>
<b>5.1 CONCLUSIONS</b>		<b>186</b>
LITRATURE CITED		199
APPENDIX		214

## LIST OF RESEARCH PUBLICATIONS AND COMMUNICATIONS

FROM THE STUDY 222

ANNEX 223

## LIST OF FIGURES

	Page No
Fig. 2.1 Flow chart for Sun drying of fish.	10
Fig. 2.2 Flow chart for dry curing of fish	12
Fig.2.3 Flow chart for Pit curing of fish	13
Fig. 2.4 Fish species used for preparation of jaadi.	15
Fig- 2.5 Flow chart for Colombo curing of fish.	17
Fig-2.6 Flow chart for marinating of fish	18
Fig-2.7 Flow chart for fish sauce preparation	20
Fig.2.8 Flow chart for smoking of fish	21
Fig-3.1 Major jaadi producing areas of Sri Lanka	35
Fig-3.2 A view of Jaadi available for marketing at coastal areas of Sri Lanka	34
Fig-4.1. Effect of four different salt levels on the Total Bacterial Count of jaadi during fermentation	74
Fig-4.2. Effect of four different levels of salt concentration on pH value during fermentation of jaadi	76
Fig-4.3 Effect of four different levels of salt concentration used in jaadi Preparation on the salt concentration of jaadi (flesh) during Fermentation	77
Fig-4.4 Effect of four different levels of salt concentration used in jaadi preparation on the dry matter of jaadi (flesh) during fermentation	79
Fig-4.5 Effect of four different levels of salt on the oil content of jaadi (flesh)during fermentation	81
Fig-4.6 Effect of four different levels of salt concentration on the Total Volatile Nitrogen of jaadi (flesh) during fermentation	82
Fig-4.7 Effect of four different levels of salt concentration on the	

amino nitrogen content of jaadi during fermentation	84
Fig-4.8 Effect of four different levels of salt concentration on overall acceptability of jaadi	90
Fig-4.9 Vertical cross section of raw fish muscles structure	91
Fig.4.10 Horizontal cross section of raw fish muscles structure	91
Fig-4.11 Vertical cross section of structure of jaadi stored in 2:1 fish:salt ratio	92
Fig-4.12 Horizontal cross section of structure of jaadi stored in 2:1 fish:salt ratio	92
Fig-4.13 Vertical cross section of structure of jaadi stored in 3:1 fish:salt ratio	93
Fig-4.14 Horizontal cross section of structure of jaadi stored in 3:1 fish:salt ratio	93
Fig-4.15 Vertical cross section of structure of jaadi stored in 4:1 fish:salt ratio	94
Fig-4.16 Horizontal cross section of structure of jaadi stored in 4:1 fish:salt ratio	94
Fig-4.17 Vertical cross section of structure of jaadi stored at 5:1 fish:salt ratio	95
Fig-4.18 Horizontal cross section of structure of jaadi stored at 5:1 fish:salt ratio	95
Fig-4.19. Changes in Total Bacterial Counts (TBC) jaadi at different fish:goraka concentrations	96
Fig-4.20 Changes in pH value of jaadi at different fish:goraka concentrations	98
Fig-4.21 Changes in oil content of jaadi at different fish:goraka concentrations	99
Fig-4.22 Changes in peroxide value of jaadi at different fish:goraka concentrations	100
Fig-4.23 Changes in dry matter jaadi at different fish:goraka concentrations	101
Fig 4.24. Changes of in Total Volatile Nitrogen (TVN) content at different fish:goraka concentration	103
Fig-4.25 Changes in overall acceptability of jaadi at different fish:goraka concentration	104
Fig-4.26 Changes of in Total Volatile Nitrogen (TVN) jaadi under three packing conditions	108
Fig-4.27 Changes of in Total Bacterial Counts (TBC) jaadi under three packing conditions	110
Fig 4.28 Different types of packing methods	111

Fig-4.29 Changes of in overall acceptability of jaadi with time under different packing condition	117
Fig- 4.30 Effect of three natural preservatives on the Total Bacterial Count(TBC) of fish	126
Fig- 4.31 Effect of three natural preservatives on the Total Volatile Nitrogen(TVN) of fish	128
Fig- 4.32 Effect of three natural preservatives on the pH value of fish.	131
Fig-4.33 Effect of three natural preservatives on the salt concentration of fish.	132
Fig-4.34 Effect of three natural preservatives on the dry matter content of fish.	133
Fig-4.35 Effect of three natural preservatives on the crude protein content of fish	135
Fig-4.36 Effect of three natural preservatives on Overall acceptability of fish	137
Fig-4.37 Pulp of tamarind fruit	138
Fig-4.38. Goraka fruit (dried-black), (red- fresh) ( <i>Garcinia cambogia</i> )	139
Fig-4.39. Turmeric rhizome ( <i>Curcuma domestica</i> )	139
Fig-4.40. Changes of Total Bacterial Count during storage of fish cured us different tamarind concentrations	140
Fig-4.41 Changes of Total Volatile Nitrogen during the storage of fish cured using different tamarind concentrations	142
Fig-4.42 Changes of on crude protein content during storage of fish cured using different tamarind concentrations	143
Fig 4.43 Changes of on oil content during storage in fish cured using different tamarind concentrations	144
Fig 4.44 Change of on peroxide value during storage of fish cured using different tamarind concentrations	145
Fig 4.45 Change of on overall acceptability during storage of fish cured using different tamarind concentrations	147
Fig-4.46 Effect of different acetic acid concentrations on pH value in uncooked marinades	149
Fig-4.47 Effect of different acetic acid concentrations on pH value of in cooked marinades	150
Fig- 4.48. Effect of different acetic acid concentrations on Total Volatile	

Nitrogen content in cooked marinades	153
Fig-4.49. Effect of acetic acid concentrations on Total Volatile Nitrogen Content in uncooked marinades	154
Fig-4.50 Effect of different acetic acid concentrations on oil content in uncooked marinades	155
Fig-4.51 Effect of different acetic acid concentrations on oil content in cooked marinades	156
Fig-4.52.. Effect of different acetic acid concentrations on salt content in uncooked marinades	157
Fig-4.53.. Effect of different acetic acid concentrations on salt content in cooked marinades	158
Fig-4.54 Effect of different acetic acid concentrations on Total Bacterial Counts of in uncooked marinades	160
Fig-4.55.. Effect of different acetic acid concentrations on Total Bacterial Counts in cooked marinades	161
Fig-4.56 Overall acceptability of uncooked fish pickled in different acetic acid concentrations	163
Fig-4.57 Overall acceptability of cooked fish pickled in different acetic acid concentrations	164
Fig-4.58 Effect of different concentration of salt on Total Bacterial Counts of cooked marinades with acetic acid	166
Fig-4.59 Effect of different concentration of salt on Total Bacterial Count of uncooked marinades with acetic acid	167
Fig-4.60. Effect of different concentration of salt on dry matter of cooked marinades with acetic acid	169
Fig-4.61. Effect of different concentration of salt on dry matter of uncooked marinades with acetic acid	170
Fig-4.62 Effect of different concentration of salt on oil content of cooked marinades with acetic acid	171
Fig-4.63 Effect of different concentration of salt on oil content of uncooked marinades with acetic acid	171
Fig-4.64 Effect of different concentration of salt on peroxide value of cooked marinades with acetic acid	173
Fig-4.65 Effect of different concentration of salt on peroxide value of uncooked marinades with acetic acid	174
Fig-4.66 Effect of different concentration of salt on salt concentration of	



cooked marinades with acetic acid	175
Fig-4.67 Effect of different concentration of salt on salt (flesh) of uncooked marinades with acetic acid	176
Fig-4.68 Effect of different concentration of salt on Total Volatile Nitrogen (TVN)of cooked marinades with acetic acid	177
Fig-4.69 Effect of different concentration of salt on Total Volatile Nitrogen of uncooked marinades with acetic acid	177
Fig-4.70 Effect of different concentration of salt on crude protein content of cooked marinades with acetic acid	179
Fig-4.71 Effect of different concentration of salt on crude protein content of uncooked marinades with acetic acid	180
Fig-4.72. Effect of different concentration of salt on pH value of cooked marinades with acetic acid	181
Fig-4.73. Effect of different concentration of salt on pH of uncooked marinades with acetic acid	182
Fig.-4.74 Variation of overall acceptability of cooked marinades with constant concentration of acetic acid and varied concentrations of salt	184.
Fig. 4.75. Variation of overall acceptability of uncooked marinades with constant concentration of acetic acid and varied concentrations of salt	184.

## LIST OF TABLES

		Page No
Table 3.1	Different fish:salt ratio in the curing mixture	57
Table 3.2	Fish: goraka ratio in curing mixture	58
Table- 3.3	Fish: salt: goraka ratio in curing mixture of two processing methods	60
Table-3.4	Fish:natural preservatives ratios in curing mixture	61.
Table- 3.5	Fish : tamarind ratio in curing mixture	62
Table -4.1	Average percentage proximate composition of different varieties of jaadi and the raw fish.	69
Table-4.2	Comparision of TVN, TMA,, TBC and FFA value of jaadi prepared from different fish species	71
Table-4.3	TVN value of jaadi samples of different producing areas of Sri Lanka.	71
Table-4.4	TMA value of jaadi samples of different producing areas of Sri Lanka.	71
Table- 4.5	TBC at (30°0) jaadi samples obtain from southern and western coastal areas.	72
Table -4.6.	Percentage composition of bacterial colonies in jaadi under three packing conditions	112
Table- -4.7.	Percentage composition of bacteria in jaadi in vaccum packed condition	113
Table - 4.8	Percentage composition of bacteria in jaadi in sterile glass bottles condition	114
Table-4. 9	Percentage composition of bacteria in jaadi in packed in plastic containers	115
Table- 4.10	Sensory observations of jaadi fermented in steriled glass bottles	118
Table-4.11	Sensory observations of jaadi fermentation in plastic	

	Packes	119
Table-4.13	Nutritional, bio-chemical and sensory properties of jaadi during storage with improved processing method	121
Table 4.14	Nutritional, bio-chemical and sensory properties of jaadi during storage with traditional processing method	122

#### LIST OF APPENDICES

		Page No
Appendix-Table1	Organoleptic score card for evaluation of jaadi	214
Appendix-Table2	Organoleptic score card used for evaluation of cured fish using natural preservatives	215
Appendix-Table-3	Organoleptic score card for evaluation of fish Marinades	216
Appendix-Table-5	Method of fish Micro-Technique	217
Appendix-Table-5	Scheme prepared according to Shewan, Hobbs & Hodgkiss(1960), Cowan & Steel (1977), Lee & Pfeifer (1975) for the preliminary identification of microflora.	221

#### LIST OF ANNEX

		Page No
Annex-1	Statistical analysis of sensory evaluation of jaadi at effect of different levels of salt concentrations	223
Annex-2	Statistical analysis of sensory evaluation of jaadi at effect of different levels of goraka concentrations	225
Annex-3	Statistical analysis of sensory evaluation of jaadi At effect of different packing systems	228
Annex-4	Statistical analysis of sensory evaluation at effect of three natural preservatives of fish	217
Annex-5	Statistical analysis of sensory evaluation at effect of different tamarind concentration	233
Annex-6	Statistical analysis of sensory evaluation at effect of different acetic acid concentration	235

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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 jaadi but is not effective in controlling mould 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.