A STUDY ON STORAGE STABILITY OF VALUE ADDED PRODUCTS OF JAK FRUIT



178

KOMATHY CHELLAPILLAI



57603

FACULTY OF AGRICULTURE
EASTERN UNIVERSITY
SRI LANKA
2004



My dox off

Abstract

Value added horticultural products hold promises in holstering the national economy by salvaging the staggering post harvest losses at one end of the spectrum and on the other end by providing quality nourishment to consumer at affordable costs. During this study two value added products were developed, minimally processed fruitless and jak fruit bar and their storage stability were studied by analyzing changes in chemical, sensory and microbial characteristics. Minimally processed fresh cut fruit was prepared and packed in low density poly ethylene bags (LDPE) and cellophane bags and kept under refrigerator at 11°c. The fresh cuts in LDPE were spoiled after two days but fresh cuts in cellophane bags were remained as fresh up to five days. The storage stability of fresh cut jak fruit was evaluated at 3rd and 5th day storage periods and the results were compared with raw fruit. Significant changes in chemical parameters such as moisture content, acidity, ascorbic acid, pH, reducing sugar and total sugar were observed but no significant difference in sensory parameters of over all eating quality and significant difference for taste was observed. The fungal growth was found greater than bacterial growth in microbial analysis.

Jak fruit bar were prepared from varieties, varriccan and chempavarriccan, packed in polyethylene bags. The fruit bars were stored at room temperature $(34 \pm 2^{\circ}\text{c})$ for two months. Significant changes in chemical parameters such as moisture content, acidity, ascorbic acid, pH, reducing sugar and total sugar were observed in both bar samples. No difference in sensory parameters such as flavour, taste, colour, and over all acceptability was observed in fruit bar prepared from varriccan but significant change in sensory parameters was observed in fruit prepared from chempavarriccan. Comparatively less microbial colony was observed in fruit bar of varriccan in microbial analysis.

LIST OF CONTENTS

		Pa	age
ABSTRACT			1
ACKNOWLEDGEMENTS			II
CONTENTS			III
LIST OF FIGURES			VI
LIST OF TABLE			VII
CONTENTS			
			6
CHAPTER 1: INTRODUCTION			1
1.1. Rationale			1
1.2. Objectives of the study			3
2.83 a Modification of water activity			
CHAPTER 2: LITERATURE REVIEW			4
2.1. Jak fruit			4
2.1.1 Classification of jak fruit	1 .		4
2.1.2. Origin and distribution			5
2.1.3. Description			6
2.1.4 Varieties			7
2.2. Uses of jak fruit		> i	7
2.3. The nutritional value			9
2.4. Value addition		1	10
2.4.1. Fruit bar		•	10
2.4.1.1 Storage stability of jak fruit bar			10
2.4.2. Preservation of immature jak fruit			11
2.4.2.1. Preparing a fresh cut			11
2.4.2.2. Bottling polos in brine			12
2.4.2.3 Drying			12

2.4.3. Preservation of mature jak fruits		13
2.4.4. Jak fruit receipes		13
2.5. Minimal processing		16
2.5.1. Definition		16
2.5.2. Theory behind minimal processing		17
2.5.2.1. Physiological responses		17
2.5.2.2. Microbiological concerns		17
2.5.2.3. Product preparation		19
2.5.2.4. Packaging, modified atmospheres, and handling		20
2.5.2.5. Quality of minimally processed product		21
2.5.3. Preservation of minimally processed fruits and vegetables		. 21
2.5.3.1. Low temperature storage		23
2.5.3.2: Chemical additives		24
2.5.3.3. Mild heat treatment		24
2.5.3.4. Modification of PH		24
2.5.3.5. Modification of water activity		25
2.5.3.6. Ionizing radiation		25
2.5.3.7. Suitable packaging		25
2.5.3.8. Edible films and coatings		26
2.6. Sensory evaluation		29
2.6.1. Definition		29
2.6.2. Uses of sensory analysis		29
2.6.3. Preparing for test	9	29
2.6.3.1. Testing area		29
2.6.3.2. Testing setup	1	30
2.6.3.3. Lighting		30
2.6.3.4. Testing schedule		30
2.6.4. Rules of sensory analysis		30
2.6.5. Hedonic scale		31
The Control of the Indian State of Little		
CHAPTER 3: MATERIALS AND METHODS		32

3.1. Product development			32
3.1.1.Preparation of minimally processed fruit lets			32
3.1.2. Preparation of jak fruit bar			33
3.2. Chemical analysis			34
3.2.1. Moisture content			34
3.2.2. Titratable acidity			34
3.2.3. Determination of PH			35
3.2.4. Determination of vitamin C in material			35
3.2.5. Determination of reducing sugar			36
3.2.6. Determination of total sugar			37
3.3. Organoleptic evaluation			38
3.3.1. Instruction for taste panel			38
3.4. Microbial analysis			39
3.4.1. Sterilization of glass wares			39
3.4.2. Media preparation			39
3.4.2.1. Potato dextrose agar for fungus counts			39
3.4.2.2. Nutrient agar for bacterial counts			39
3.4.3. Dilution of sample			40
3.4.4.1. Incubation in PDA medium	1.		40
3.4.4.2. Incubation in nutrient agar medium			41
3.4.5. Counting the colonies in plate			41
3.4.5.1. Total fungal counts			41
3.4.5.2. Total bacterial counts			41
CHAPTER 4: RESULT AND DISCUSSION		1	42
4.1 Minimally processed jak fruit		1	42
4.1.1. Chemical characteristics			42
4.1.1.1. Moisture content			42
4.1.1.2. PH			43
4.1.1.3. Titratable acidity			. 44
4.1.1.4. Ascorbic acid			45

4.1.1.5. Reducing sugar			46
4.1.1.6. Total sugar			47
4.1.2. Organoleptic characteristics			47
4.2.2.1. Taste			47
4.2.2.2. Over all eating quality			48
4.1.3. Microbial analysis			48
4.2. Fruit bar			49
4.2.1. Chemical characteristics			49
4.2.1.1 Moisture content			50
4.2.1.2. Ascorbic acid			51
4.2.1.3 PH		= 58 10 10	52
4.2.1.4 Titratable acidity			52
4.2.1.5 Reducing sugar			53
4.2.1.6 Total sugar			53
4.2.2. Organoleptic characteristics			54
4.2.2.1 Taste			54
4.2.2.2 Colour	mally processed fruit		55
4.2.2.3 Flavour			55
4.2.2.4 Over all acceptability	. A.		56
4.2.3. Microbial analysis			56
early of Leones in to outile solid during stor			
HAPTER 5	il bill.	S 4	
5.1. Conclusion			58
5.2. Suggestion for further development		1	59
References		1	60
APPENDIX			