

RESEARCH ARTICLE :

Role of acidity on processing of different Karonda products (Jam, Jelly, Squash, Candy) during storage periods

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ARTICLE CHRONICLE :

Received :
20.07.2017;

Accepted :
16.08.2017

SUMMARY : The Karonda products (jelly, jam, candy and squash) are consumed and liked by everyone whether a child, an old, a poor or a rich man. The commercial candy, jelly and squash in our country is quite expensive. This gave an idea to standardize the unconventional jelly, jam, candy and squash making by using karonda fruits and to assess their physico-chemical and organoleptic qualities during storage. An experiment was carried out at Post-harvest Technology Laboratory of Department of Horticulture, Allahabad Agricultural Institute-Deemed University, Allahabad. In this experiment Analysis of Acidity were studied in processed karonda products. Results showed that the maximum Acidity was recorded in jelly and jam and minimum in candy and squash. It was clear from the experiment that the trend of Acidity was increasing in storage period.

How to cite this article : Bajpai, Rashmi and Vasure, Narendra (2017). Role of acidity on processing of different Karonda products (Jam, Jelly, Squash, Candy) during storage periods. *Agric. Update*, 12 (TECHSEAR-8) : 2277-2281.

KEY WORDS :

Acidity, Products Jam, Jelly, Squash, Candy

BACKGROUND AND OBJECTIVES

Karonda is an indigenous fruit of India and belongs to the family Apocynaceae. Karonda is a very hardy evergreen bush growing well even on marginal and inferior land when most other fruits either fail to grow or give poor performance. It is found in Africa, Australia and Tropical Asia, particularly in Western Peninsula and dry tracts of India, Sri Lanka and Malaysia mainly in wild form. In India, it was cultivated by the Europeans in kitchen garden to get fruit for jelly preparation. Karonda is evergreen thorny

Bushes, which thrive well throughout tropical and sub-tropical climate (Singh and Singh, 1992). Almost every part of plant is used for one purpose or other. Karonda fruit is rich source of minerals especially iron and calcium. It is also rich in pectin. Its vitamin C content is higher than apple and banana. The fruit has a potential for processing. Fruit is used for preparation of jelly, pickle and preserve (Singh 1984). The ripe fruit having anti-scorbutic properties is reported to be cooling, acidic and useful in bilious (Watt, 1972). Fruit is slightly sour and astringent in taste, therefore, its cultivation is only confined as a fencing bush

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and it is not popular as desert fruit.

RESOURCES AND METHODS

The present investigation was carried out at Post-harvest Technology Laboratory, Department of Horticulture, Allahabad Agricultural Institute-Deemed University, Allahabad (U.P.) to evaluate the consumers acceptability of Karonda fruit (*Carissa carandas* L.) products prepared by various recipes. The fruits used for the experiments were taken from Mundera mandi (Farm). Analysis of Acidity of the products were done in Laboratory of Department of Horticulture, A.A.I.-D.U., Allahabad, Glass bottles were used as packaging material

for storage of jelly, jam, candy and squash for different storage periods. The data of the experiment was statistically analysed by using C.R.D. (Completely Randomized Design) with three replications. In this experiments different recipes of karonda were standardized.

Standardization of technique for processing :

Jelly :

Data on formulation of recipes and organoleptic quality of karonda jelly are furnished in Table A. Juice extract and sugar ratio of 1:1.6 with 0.32 per cent acidity was recorded as an ideal recipe for making jelly from

Recipe no.	Juice and sugar ratio	TSS (o brix)	Acidity(%)	Organoleptic quality	
				Score	Rating
1	1:1	68.00	0.30	7.43	Like moderately
2	1:1.2	68.50	0.30	7.28	Like moderately
3	1:1.5	69.00	0.32	7.30	Like moderately
4	1:1.6	72.00	0.32	8.26	Like very much
5	1:1.7	71.00	0.33	8.19	Like very much
6	1:1.8	70.00	0.33	7.44	Like moderately
S.E. ±		1.00	0.03	0.16	-
C.D. (P=0.05).		2.17	0.06	0.34	

Recipe no.	Pulp and sugar ratio	TSS (o brix)	Acidity (%)	Organoleptic quality	
				Score	Rating
1.	Pulp mixed with 700 g of sugar	73.00	0.20	7.22	Like moderately
2.	Pulp mixed with 750 g of sugar	73.00	0.21	7.33	Like moderately
3.	Pulp mixed with 800 g of sugar	74.00	0.21	7.58	Like moderately
4.	Pulp mixed with 850 g of sugar	74.00	0.20	7.75	Like very much
5.	Pulp mixed with 950 g of sugar	76.00	0.20	7.40	Like very much
6.	Pulp of apple and karonda mixed with equal proportion of sugar	80.00	0.22	7.65	Like moderately
S.E. ±		1.00	0.03	0.16	-
C.D. (P=0.05)		2.17	0.06	0.34	

Recipe no.	Recipe	TSS (o brix)	Acidity (%)	Organoleptic quality	
				Score	Rating
1.	Whole fruit without pectin coating	74.21	0.40	7.46	Like moderately
2.	Segmented fruit without pectin coating	75.73	0.40	7.35	Like moderately
3.	Whole fruit with pectin coating	78.88	0.41	7.56	Like moderately
4.	Segmented fruit with pectin coating	77.64	0.41	7.22	Like very much
5.	Fruits without coating <i>i.e.</i> , control	78.90	0.40	7.25	Like very much
S.E. ±		1.15	0.03	0.04	-
C.D. (P=0.05)		2.55	0.06	0.03	

Recipe no.	Juice and sugar ratio	TSS (o brix)	Acidity (%)	Organoleptic quality	
				Score	Rating
1.	1:1	44.33	0.21	7.30	Like moderately
2.	1:1.2	49.66	0.21	7.35	Like moderately
3.	1:1.5	50.33	0.20	7.55	Like moderately
4.	1:1.6	52.33	0.21	7.26	Like very much
5.	1:1.7	54.66	0.21	7.25	Like very much
S.E. \pm		0.78	0.02	0.08	-
C.D. (P=0.05)		1.73	0.04	0.17	

karonda fruits. The score of this recipe differed significantly from all other recipes used for making jelly.

Jam :

Data on formulation of recipes and organoleptic quality of karonda jam are furnished in Table B. Karonda pulp 500 g and sugar 850 g with 0.20 per cent acidity was recorded as an ideal recipe for making jam from karonda fruits. The score of this recipe differed significantly from all other recipes used for making jelly. recipe detail is given in table.

Candy :

Data furnished in table- 3 show the organoleptic quality of karonda candy, prepared using the recipe of 78.88 per cent or ° brix total soluble solids and 0.41 per cent acidity was best among all the recipes. The score of this recipe differed significantly from all other recipes used for making candy.

Squash :

Data on formulation of recipes and organoleptic

quality of karonda squash are furnished in table. Results indicate that the recipe containing juice and sugar ratio 1:1.5 with the 0.20 per cent acidity was found to be the best followed by recipe containing juice and sugar ratio 1:1.2 with 0.21 per cent acidity.

OBSERVATIONS AND ANALYSIS

Mean score of the Karonda products prepared by ideal recipes is given in the table with S.E. and C.D. values at the bottom. In jelly recipe contained juice and sugar ratio (1:1.6) with 72° brix TSS and 0.32% acidity was best rather than other recipes. In jam, recipe contained 500g pulp mixed with 850g of sugar with 74° brix (TSS) and 0.20% acidity was best rather than other recipes. Similarly in candy recipe (Whole fruit with pectin coating and fruit and sugar ratio (1:1.5) was best while in squash, recipe contained juice and sugar ratio (1:1.5) was ideal in comparison to all other recipes. The lowest mean score of Acidity was recorded in candy *i.e.*, (0.64%), followed by jelly (0.53%) in 0 days of storage period and it was maximum in jelly(3.92%) and candy

Table 1: Changes in Acidity (%) during storage of Karonda products.

Products (A)	Storage period (B)					Mean
	0 Days	30 Days	60 Days	90 Days	120 Days	
Jelly	0.53	2.32	3.61	3.78	3.92	2.83
Jam	0.22	0.61	1.59	1.63	1.68	1.15
Candy	0.64	0.69	0.73	1.60	1.72	1.08
Squash	0.20	0.48	1.20	1.23	1.30	0.88
Mean	0.52	1.08	1.73	1.96	2.12	-

Acidity in Karonda Fruit = 3to 4%

Comparison	S.E. \pm	C.D. (P=0.05)	F-test
Difference between two A product means	0.08	0.15	S
Difference between two B storage period means	0.09	0.15	S
Difference between two AB product mean and two storage period means	0.18	0.34	S

(1.72%) during 120 days of storage period. Statistical analysis revealed that the differences of Acidity of various karonda products during storage periods and interaction of products and storage periods were significant. It is obvious from the table that the maximum Acidity was recorded in jelly *i.e.*, (2.12%) for 120 days of storage, while minimum was in squash (0.20%) for 0 days of storage.

Acidity of the karonda :

Products prepared by best recipe varied from 0.88 to 2.83% as compared to fresh fruit *i.e.*, 3-4%. The increase of acidity was found in all products as jelly, jam, candy and squash *i.e.*, 3.92, 1.68, 1.72, and 1.30 % after 120 days of storage. Degradation of pectic substances have been reported to increase the acidity in fruit products. This is supported by the findings of Conn and Stumpf (1976), and Kertesz, (1951) in jelly. These findings were similar to those of Ambadan and Adsule (1979) in mango pulp, (Rao and Singh, 1979), and (Dubey, 1984) in bael squash, aonla beverages. Dhawan and Gupta (1996) in Guava jelly and Singh and Kumar (1997) in fresh aonla fruit. Increase in acidity during storage was also recorded in aonla preserve (Sethi et.al., 1980), aonla beverages, (Ram 1984), guava squash (Singh, 1985), jamun jelly and squash (Ashraf, 1987), guava jelly (Gupta and Dhawan 1996), aonla jam and candy (Pathak, 1988 and Deen, 1992), papaya jam, squash and candy (Kumar, 1990), and litchi squash (Singh and Singh 1994). Maciel et al. (1999) in acerola jelly

Acknowledgement :

We are thankful to Dr. D. B. Singh, Prof. and Head, Department of Pomology and Fruit Preservation Laboratory, Allahabad Agricultural Institute-Deemed University, Allahabad for providing all the required facilities during this research.

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