

DEVELOPMENT OF POMEGRANATE JELLY FORTIFIED WITH POMEGRANATE PEEL POWDER

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ABSTRACT

In food industry pomegranate peel forms the major waste. They are full of bioactive compounds but are basically discarded and underutilized. These peels are rich in flavanoids, reservertol, anthocyanin, which are richest sources of antioxidants. Jelly is the product consumed by consumers of all age. The main aim of this study is to develop a jelly from pomegranate ,fortified with pomegranate peel powder and to study the properties of developed jelly. The development of jelly as a functional food product enriched with active compounds from pomegranate juice and peel powder could give health benefits to the consumer. Here nutritional parameters ,colour and textural properties of developed jelly were analysed along with sensory quality.

KEYWORDS: Colour, jelly, nutritional parameters, sensory quality, textural properties,

I. INTRODUCTION

Researchers are discovering the reality encompassing the pomegranate's powers , proving why this exotic fruit has climb such a legendary place in cultures throughout the ages. Nowadays, consumers in the food and beverage market are interested in a trend of healthy lifestyles which has created demand for health oriented products. They have become health conscious. Pomegranate (*Punica granatum L*) is considered as a 'Superfruit' and a food medicine. The principal antioxidant polyphenols in pomegranate juice include the ellagitannins and anthocyanins. Some of these active compounds can be also presented in pomegranate peel. Jelly is the product consumed by consumers of all age groups. The development of jelly as a functional product enriched with active compounds from pomegranate juice and pomegranate could give health benefits to the consumers. The optimum formulation of the jelly product with pomegranate juice fortified with pomegranate peel powder was developed.

II. MATERIALS AND METHODS

This chapter describes the experimental set-up, method and materials used for development of pomegranate jelly fortified with pomegranate peel powder. The experiment was also conducted to assess the quality of the developed jelly. Fresh and properly matured pomegranate were procured from the local market. Sucrose (common sugar) required for the experiment was also procured from the local market. Pectin, citric acid, refractometer, refrigerator, weighing balance, hot air oven, cutting knife, muslin cloth, plates etc. were used at various stages during the preparation of jelly.

A. POMEGRANATE PEEL POWDER

Healthy and mature pomegranate (*punica granatum*) fruits were washed, cut manually with the help of knife and seed/arils were separated from the peel. The peels were dried with the help of a tray drier for 5 hours at a temperature of 60° Celsius. Pomegranate peel was weighed, at each 30 minute interval. Then the dried peels were taken out from the tray drier, and were transferred into the jar of a mixer grinder. The peel was grinded till fine powder was obtained. After grinding the powder was transferred into a zip-lock cover and stored airtight.



Table 1: List of parameters analyzed

Nutritional tests done	Parameters Tested
☐ Fat	☐ Color
☐ Carbohydrate	
☐ Sodium	
☐ Potassium	
☐ Protein	
☐ Vitamin A	
☐ Vitamin C	
☐ Calcium	
☐ Magnesium	

B.POMEGRANATE JELLYFORTIFIED WITH POMEGRANATE PEEL POWDER

Uniformly ripe pomegranate fruits were selected for extraction of juice for the purpose of making of jelly. Three pomegranate fruits were cut into 2-4 pieces and crushed in grinder. The crushed mass was then filtrated through muslin cloth and the juice was collected and weighed as per the Flow chart shown in Fig 1 (Chopra *et al*, 2003).

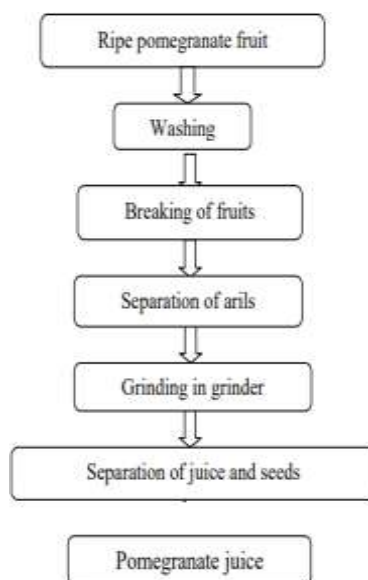


Fig.1 Flow chart for extraction of juice

Jelly was prepared by heating juice extract of 200 ml of the clear juice of pomegranate, few strips of pectin, 60-65 % sugar and 0.5% citric acid were added to the extract while heating. Heating was continued with constant stirring up till the TSS reached to 65⁰Brix and desired consistency was reached.



Fig.2 Pomegranate jelly fortified with pomegranate peel powder

III. RESULT AND DISCUSSION

A.POMEGRANATE PEEL POWDER

➤ Table 2. Nutritional values

S.NO	TYPICAL VALUES	UNITS	PEEL POWDER VALUE
1	Energy	Kcal	38.8
2	Total fat	Gm	0.97
3	Sodium	Mg	2.07
4	Potassium	Mg	163
5	Total carbohydrate	Gm	6.37
6	Protein	Gm	1.15
7	Vitamin A	%	0
8	Vitamin C	%	8.69
9	Calcium	%	0.38
10	Magnesium	%	1.47

➤ Table 3. Textural analysis

S.NO	PARAMETER	PEEL POWDER
1	Colour	Reddish Brown

B.POMEGRANATE JELLY FORTIFIED WITH POMEGRANATE PEEL POWDER

➤ Texture analysis

Test ID	Batch	Force 1	Force 2	Force 3	Area F-T 1:2	Time Difference 1:2	Area F-T 1:3	Area F-T 2:3	Adhesiveness	Time Difference 4:5	Area F-T 4:6
		g	g	g	g.sec	sec	g.sec	g.sec	g.sec	sec	g.sec
		Force 1	Force 2	Force 3	Area F-T 1:2	Time Difference 1:2	Area F-T 1:3	Area F-T 2:3	Adhesiveness	Time Difference 4:5	Area F-T 4:6
Start	jelly										

batch jelly											
Jelly 1	jelly	78.191	87.750	6.618	52.954	2.020	82.20 9	29.25 5	-14.582	1.240	65.42 3
Jelly 2	jelly	65.322	70.102	5.883	35.262	2.020	57.34 1	22.07 9	-10.975	1.170	51.67 3
End batch jelly	Jelly										
Avera ge	jelly (F)	71.757	78.926	6.250	44.108	2.020	69.77 5	25.66 7	-12.779	1.205	58.54 8
S.D	jelly (F)	9.099	12.479	0.520	12.510	0.000	17.58 5	5.074	2.551	0.049	9.722
Coef. of variati on	jelly (F)	12.681	15.811	8.319	28.363	0.000	25.20 2	19.77 0	-19.962	4.108	16.60 6
End of Test Data											

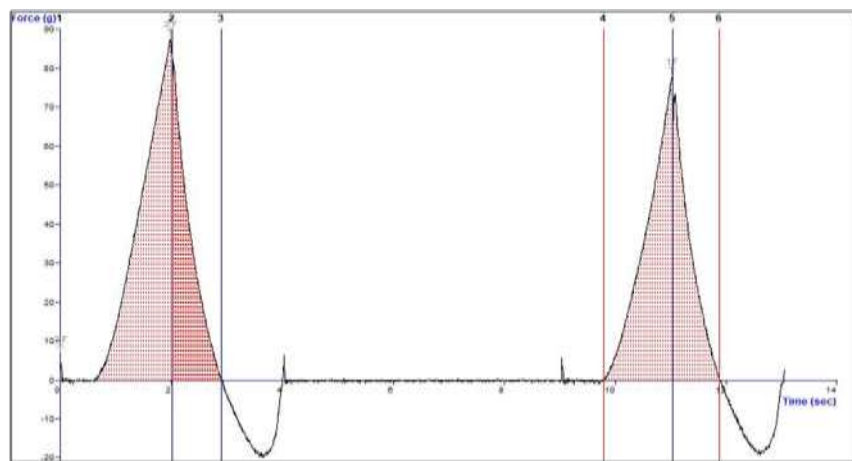


Fig.3 Jelly - 1

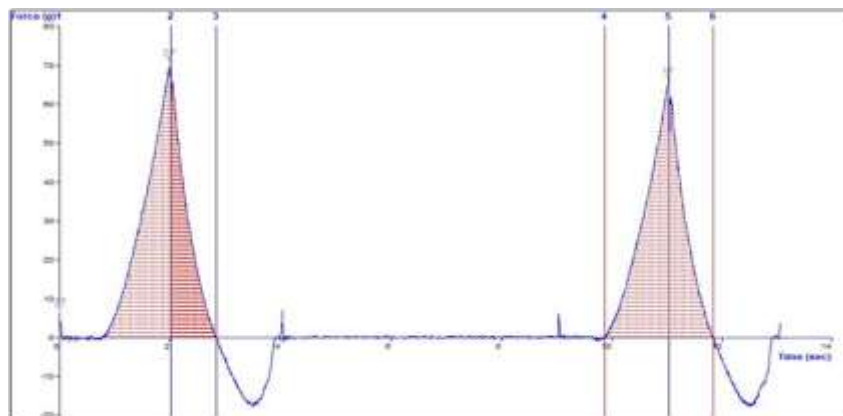


Fig.4 Jelly – 2

➤ **Colour value**

Sl.No	L*	a*	b*
1	43.19	17.23	0.54

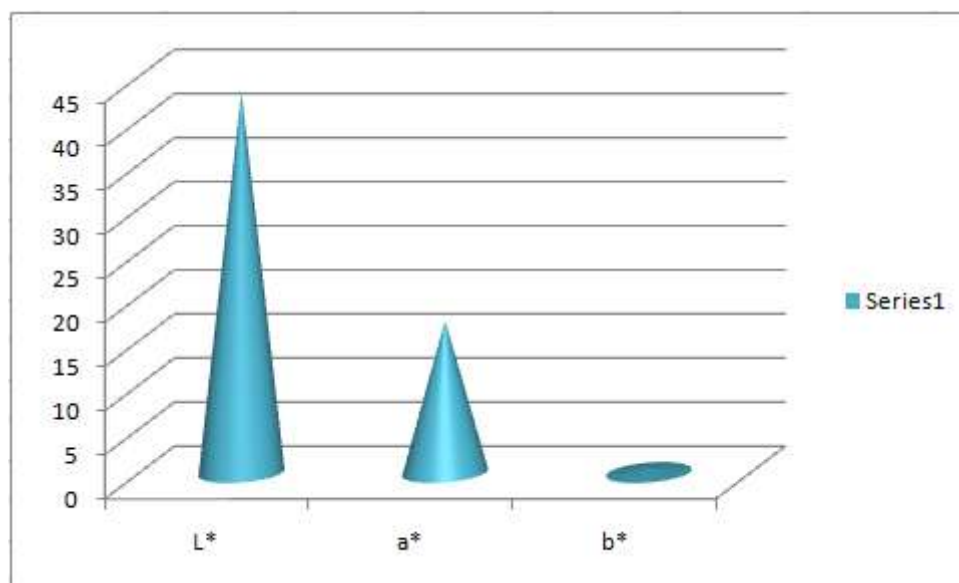


Fig.5 Colour value

➤ **Sensory evaluation**

The samples were refrigerated and taken out, before serving, colour, taste, odour, texture and overall acceptability of samples were evaluated using 9 point hedonic scale (9= like extremely, 8=like very much, 7=like moderately, 6= like slightly, 5=neither like nor dislike, 4=dislike slightly, 3=dislike moderately, 2=dislike very much, 1=dislike extremely) (Lawless and Heymann, 1998).

Parameters	Person 1	Person 2	Person 3	Person 4	Person 5
Taste	8	9	9	8	8
Colour	8	9	9	9	9
Odour	8	8	8	8	9
Texture	8	8	9	8	8
Overall acceptability	8	8.5	8.75	8.25	8.5

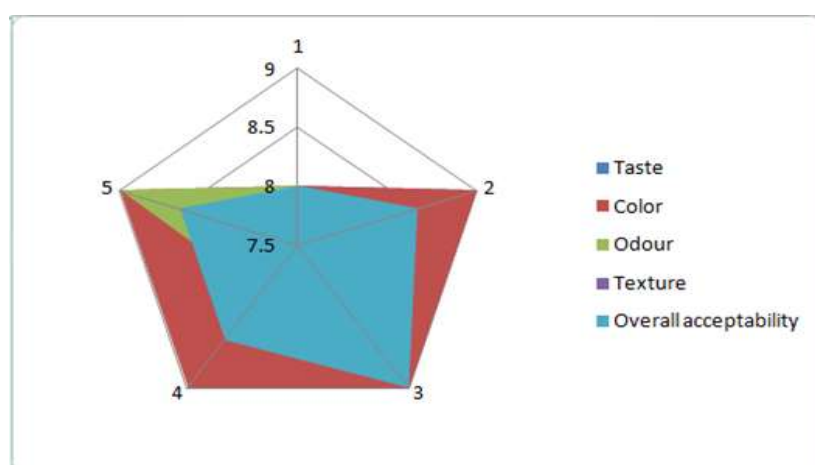


Fig.6 Sensory evaluation

V. CONCLUSION

The pomegranate fruit is taken into account as it is the suitable fruit for the process and utilization because of its glorious flavor ,colour, physic-chemical constitution and therapeutic properties. It is referred as the super fruit due to its high biological process worth, high antioxidant capability and shopper charm. However in spite of high nutritional worth ,the consumption of pomegranate is not wide unfold because of tedious and time consuming peeling and irritations and marking of hands during handling of fruits. Here we have analyzed the nutritional values of pomegranate peel powder and have developed pomegranate jelly fortified with pomegranate peel powder. The benefit of the pomegranate jelly in terms of antioxidant property could be increased by adding pomegranate peel powder in the formulation.

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