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DEVELOPMENT OF CARBONATED BEVERAGE FROM POMEGRANATE (*Punicagranatum L*) SYRUP

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Abstract:

Commercial fruit is cultivated in those parts where the summer is warm to hot and where rainfall is minimal during late summer/autumn. Clinical research approve the drinking pomegranate juice/pomegranate peel extract for alleviating the stress-induced myocardial ischemia in patients of coronary heart disease, total cholesterol and low-density lipoprotein (LDL) cholesterol in hyperlipidemia, systolic blood pressure in hypertension, prostate cancer progression in prostate cancer and gum infection in stomatitis.

INTRODUCTION

Pomegranate juice is good source of carbohydrate, potassium, vitamin C and fiber as well as small amounts of several other vitamins and minerals. The juice is widely used in making jellies, puddings, desserts, wine and fruit drinks. Earlier various studies of pomegranate juice were carried out that include preparation of RTS, enzymatic clarification of juice, pasteurization and safe storage (A.B. Suryawanshi, K.S. Kirad, G.N. Phad, & S.B. Patil Nov.2008), and pomegranate juice extraction (Graca Miguel, Susana Dandien, Dulce Antunes, Alcinda Neves, and Denis). In present study an attempt was made to prepare pomegranate carbonated soft drink using its syrup with carbonated water.

OBJECTIVE

To prepare pomegranate syrup and develop acceptable quality carbonated beverage from the prepared syrup by appropriate dilution and carbonation.

MATERIALS AND METHOD

Extraction of Juice

Premium quality of Ganesha pomegranates were collected from local market of Jalgaon. The fruits were pale yellow in color and of the size of apple. Fruits were peeled to separate arils from peels. The juice was obtained by expressing the arils without water in mixer and filtered through muslin cloth. Extracted juice is clarified by the process of natural sedimentation in a pot carried for 2-4 hours and clarified juice was decanted in a separate vessel.

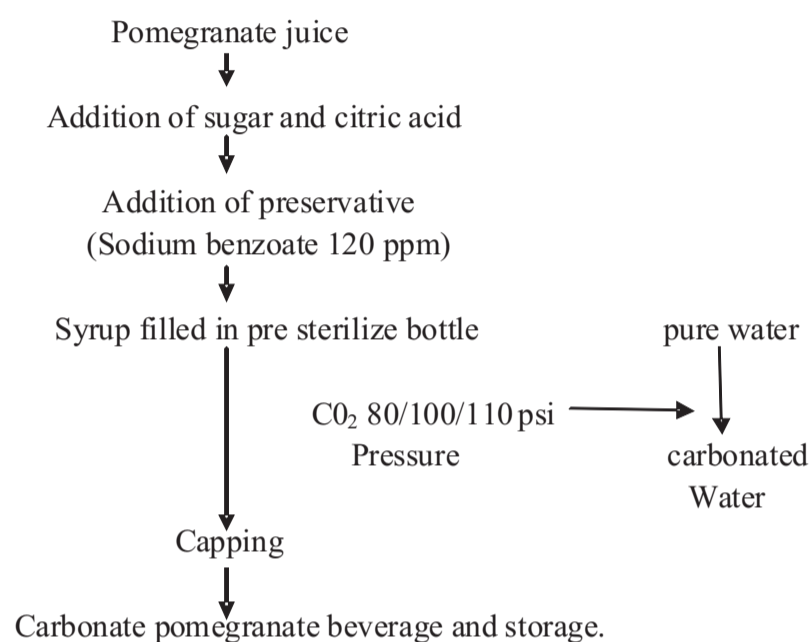
Preparation of syrup

Pomegranate syrup was prepared as per FPO specification of 65Bo and 2.5% acidity by mixing juice with required amount of sugar and acid. In the prepared syrup sodium benzoate 120 ppm is added for preservation.

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Preparation of carbonated softdrink

Pomegranate ready-to-serve carbonated beverages RT1 and RT2 were prepared by mixing syrup and soda water in the ratio 1:3 and 1:4. at pressure 80psi, 100psi and 110 psi which were abbreviated in case of RT1 as RT1P1, RT1P2, RT1P3 while for RT2 as RT2P1, RT2P2, RT2P3 respectively.



Analysis of Various Raw Materials and product

Raw Materials and products were tested for various physicochemical parameters viz total soluble solids, pH(systronic digital pH meter), Acidity(citric acid), sugars(lane and Eyonon method), vitamin C (2,6 dichlorophenol-indophenol) and gas volume (Jam Nigel instrument) and specific gravity(specific gravity bottle) by following the standard procedure.

INVERTED BRIX:

Procedure

1. Take 30 ml sample in conical flask & add 0.4ml of 2.5N HCl.
2. Then place the stopper on conical flask.
3. Then place that conical flask in water bath for more than 45min.
4. Finally calculate its brix by brix meter.

Gas Volume:

Procedure

- a. Take a chilled bottle of beverage.
- b. Pierce a Jam Nigel instrument in bottle which having pressure gauge for pressure measurement and temperature scale for temperature measurement.
- c. After piercing shake the bottle and take the temperature and pressure of product which is seal in bottle and subtract 1.5 from pressure
- d. Adjust the temperature and pressure on GV scale.
- e. Measure the value which gives idea of CO₂ dissolved in that beverage.

Pectin as Ca-pectate:

The two set of carbonated soft drinks thus prepared at three different pressures were offered to trained and semi trained panel of judges for sensory evaluation on 9 point hedonic scale.

Table 1: Physical characteristic Pomegranate fruit

Physical characteristics	Ganesh pomegranate
Color of fruit	Pale yellow
Average weight	77.8g
density	0.96 g/ml
Average polar diameter	4.72 cms
Average equator diameter	5.54 cms
% waste	62.01%

Average weight of fruit :77.8gm Density of fruit:0.96g/ml, Average polar diameter: 4.72 ,Average equator diameter: 5.54cm

Table 2: Chemical composition of Pomegranate juice

Characteristics	Fresh juice (Cultivar Ganesh)
% Yield(weight basis)	37.99
TSS	13 B ⁰
Reducing sugar g/100ml	12.78
Non reducing sugar g/100ml	3.315
Total sugar g/100ml	16.27
% total acidity	0.23 %
Specific gravity g/ml	1.04
Ascorbic acid mg/100ml	22.4
Pectin content	0.2 %

Table 3: Chemical composition of syrup

Parameter	Calculated value
% Juice	50.38
% acidity	2.45
TSS	65 B ⁰
Ascorbic acid mg/100ml	11.8
Reducing sugar g/100ml	20.21
Non reducing sugar g/100ml	43.63
Total sugar g/100ml	63.84

Table 4: Chemical composition of product

Parameter	RT ₂ P ₂	RT ₁ P ₂
% Juice	10.07	12.59
pH	2.79	2.75
TSS	13.2 B ⁰	16 B ⁰
Inverted Brix	15.2 B ⁰	16.8 B ⁰
% Acidity	0.56	0.62
Brix : Acid ratio	23.57	22.77
Gas vol. at 80 psi	2.1	2
Gas vol. at 100 psi	2.6	2.4
Gas vol. at 110 psi	2.8	2.6

RT₁P₁

Sr no	appearance	color	texture	Flavor	Overall acceptability
1	8	8	9	8	8
2	8	8	8	7	8
3	8	8	7	7	8
4	9	7	9	7	8
5	8	8	7	7	7
6	8	8	7	7	8
7	8	7	7	7	7
8	7	7	7	6	6
9	8	7	7	7	7

Sensory table RT₁P₂

Sr no	appearance	color	texture	flavor	Overall acceptability
1	7	8	8	7	8
2	8	8	8	8	8
3	7	8	8	7	8
4	8	8	8	8	8
5	8	9	8	9	9
6	8	9	8	9	9
7	8	8	8	9	9
8	7	8	8	8	8
9	7	8	7	8	8

RT₁P₃

Sr no	appearance	color	texture	flavor	Overall acceptability
1	7	8	8	6	7
2	8	7	7	8	8
3	7	7	8	8	8
4	7	7	8	8	8
5	7	7	6	7	7
6	6	6	6	5	6
7	7	8	7	7	7
8	6	5	5	7	5
9	7	8	7	7	7

RT₂P₁

Sr no	appearance	color	texture	flavor	Overall acceptability
1	7	8	8	6	7
2	7	7	7	8	7
3	7	7	6	7	7
4	7	7	6	7	7
5	8	8	7	7	7
6	7	6	7	5	7
7	7	8	6	6	7
8	6	5	6	6	6
9	8	7	7	8	8

RT₂P₂

Sr no	appearance	color	texture	flavor	Overall acceptability
1	5	5	6	5	5
2	8	7	8	8	8
3	7	6	7	6	6
4	6	6	7	6	6
5	6	6	6	6	5
6	5	7	5	5	5
7	6	6	6	5	5
8	6	7	6	6	6
9	7	6	6	6	7

RT₂P₃

Sr no	appearance	color	texture	flavor	Overall acceptability
1	4	5	4	4	4
2	8	7	8	7	7
3	7	7	6	7	7
4	7	6	6	7	6
5	6	6	5	5	5
6	5	8	6	5	7
7	8	7	7	7	7
8	6	6	7	7	7
9	7	7	7	6	7

RESULTS AND CONCLUSION

The clarified pomegranate juice was evaluated for %yield (fruit basis), TSS, acidity, reducing sugars, non reducing sugars, ascorbic acid pH and specific gravity(g/ml) and were found to be 38%, 13%, 0.23%, 12.78 %, 3.315 g%, 22.4 mg/100ml, 4.0 and 1.04 respectively. The prepared syrup had T.S.S 65 0B,

acidity 2.45 % as citric acid, ascorbic acid 11.8 mg/100ml, reducing sugar 20.21 % and non-reducing sugar 43.63%. RT1P2 received maximum sensory score by the panelist. The analysis result of RT1P2 was showing T.S.S 16 0B, acidity 0.62 % and CO2 volume 2.4. It is concluded from the present study that the acceptable quality of carbonated beverage can be prepared from the pomegranate syrup by diluting it with carbonated water of 100 psi CO2 pressure in the ratio of 1:3.

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