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Proximate and sensory analysis of beetroot (*Beta vulgaris*) and Jamun (*Syzygium cumini*) juice blended drink

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Abstract

The objective of the study is to investigate proximate analysis and sensory evaluation of effect of beetroot when blended with jamun juice at different level of combinations. The investigation comprises of three treatments, T₁ = 75% beetroot juice + 25% jamun juice, T₂ = 50% beetroot juice + 50% jamun juice, T₃ = 25% beetroot juice + 75% jamun juice and T₀ = 100% beetroot juice (i.e. control). The data collected on different aspects were tabulated and analysed statistically using method of variance and critical difference. Proximate analysis was carried out to ascertain the extend of variation in (moisture, crude protein, crude fat, crude fibre, ash and carbohydrate). Sensory evaluation (flavour and aroma, colour and appearance, mouth feel and taste and overall acceptability) were done by using 9 point hedonic scale. According to the analysis of treatments, T₁ was found to be best among the treatments and can be rated as T₁>T₀>T₂>T₃. The juice can be used as valuable ingredients for the production of health beverage with all the important properties and medicinal characteristics.

Keywords: Beetroot (*Beta Vulgaris*), Jamun (*Syzygium Cumini*), proximate analysis, sensory evaluation

Introduction

Juice is a beverage made from the extraction or pressing out of the natural liquid contained in fruit and vegetables. Juice is commonly consumed as a beverage or used as an ingredient or flavouring in foods or other beverages, such as smoothies.

Beetroot (*Beta Vulgaris*) is the taproot portion of the beet plant, also known by many names as red or golden beet, the table beet, garden beet, or simply we called as the beet. In recent years noticed increased has been concentrate on utilization of healthy foods. Beetroot is known to be a powerful antioxidant (Winkler *et al.*, 2005) [2]. The juice of beetroot is also consumed as a natural remedy for sexual weakness and to expel kidney and bladder stones (Sharma *et al.*, 2011) [9]. The claimed therapeutic use of beetroot includes its antitumor, carminative, emmenagogue and hemostatic and renal protective properties and is a potential herb used in cardiovascular conditions (Vali *et al.*, 2007) [8].

Jamun (*Syzygium Cumini*), is also known as Indian blackberry. The jamun tree is native to India and its bordering countries like Nepal, Pakistan, Bangladesh Sri Lanka and even Indonesia and widely distributed in tropical and sub tropical region of the world. It is a rich source of natural antioxidant, vitamins and minerals having good nutraceutical and medicinal value. Its juice is used to cure the diabetes disease effectively as well as also useful against bleeding piles, correcting liver disorders, jaundice, kidney stone, asthma and blood pressure.

Materials and methods

Procurement of Raw Materials

The vegetables and fruit used for this study: beetroot was purchased from a local market and locally available jamun fruits were collected from a single tree. All the primary operations like washing, peeling, cutting, slicing were carried out.

Preparation of Beetroot Juice

Beetroot was washed, peeled out, sliced, crushed in a grinder with addition of subsequent water, then pulped by using hydraulic press and the extracted juice was again filtered by using a four layer muslin cloth to remove remaining curd.

Preparation of jamun juice

Unblemished, riped and good quality jamun fruits were washed thoroughly with clean tap water, hand crushed, for easy partition of the seed from pulp it was heated up to 70°C for two

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minutes. The juice was extracted by squeezing pulp and then straining through muslin cloth.

Treatment details

T₀ = 100% beetroot juice (control)

T₁ = 75% beetroot juice + 25% jamun juice

T₂ = 50% beetroot juice + 50% jamun juice

T₃ = 25% beetroot juice + 75% jamun juice

The juices of beetroot and jamun were blended as per the

different treatments. Then the mixture was filtered through muslin cloth. The product was then filled in glass bottles which was earlier washed with 1% Cl and presterilized at 121° C for 15 minutes and then sealed. After that, bottle was pasteurized at 85°C for 30 sec, cooled and stored at refrigerated temperature for more than 30 days and studied for shelf life. The flow chart of blend is shown in figure 1.

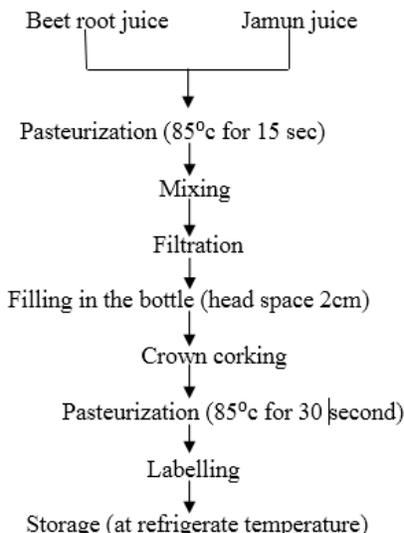


Fig 1: Process Details and Flow Chart

Sensory Analysis

Sensory evaluation of RTS samples was performed by 5 semi trained panellists. The 9-point hedonic scale and composite scoring tests were used to carry out sensory evaluation. They assessed RTS in terms of Flavour and aroma, Colour and appearance, Mouth feel and taste and Overall acceptability.

Physico-Chemical Analysis

Moisture, Ash, Fat and Protein content were determined according to A.O.A.C methods. Protein content was obtained

by using conversion factor of 6.25. Total carbohydrate content was determined by using total carbohydrate estimation using anthrone method Ranganna.

Results and discussion

Proximate composition of raw materials:

Beetroot juice

Results show that Beetroot juice is rich source of carbohydrates, vitamins, minerals and poor in fats. The results are shown in table no 1.

Table 1: (Proximate analysis of beetroot)

Components	Values (%)
Moisture	96.5
Crude protein	0.10
Crude fat	0.27
Crude fiber	0.81
Ash	0.54
Carbohydrate	1.78

Jamun juice

It is found that jamun juice is rich source of carbohydrate,

poor in fats. The results are shown in table no.2

Table 2: (Proximate analysis of jamun juice)

Components	Values (%)
Moisture	83.7
Crude protein	0.7
Crude fat	0.3
Crude fiber	0.9
Ash	0.4
Carbohydrate	14

Sensory Analysis

Sensory evaluation (Flavour and taste, Colour and

appearance, Mouth feel and taste and overall acceptability) of beetroot and jamun juice blended drink were analysed by 9

point hedonic scale and composite scoring test by panel of judges. Results obtained by composite scoring test were

shown in Table no. 3. While, average sensory analysis data analysed by 9 point hedonic scale were shown in figure no.2.

Table 3: (Sensory analysis and Overall acceptability of control and beetroot and Jamun juice blended drink)

Parameters	T ₀	T ₁	T ₂	T ₃	S.Ed ±	C.D. at 5%	Result
Flavour and aroma	8.50	8.56	7.94	7.25	0.19	0.41	Significant
Colour and appearance	8.60	8.74	8.14	7.98	0.14	0.32	Significant
Mouth feel and taste	8.42	8.58	8.14	7.88	0.16	0.34	Significant
Overall acceptability	8.61	8.66	8.40	8.00	0.18	0.39	Significant

Significant at 5 % level

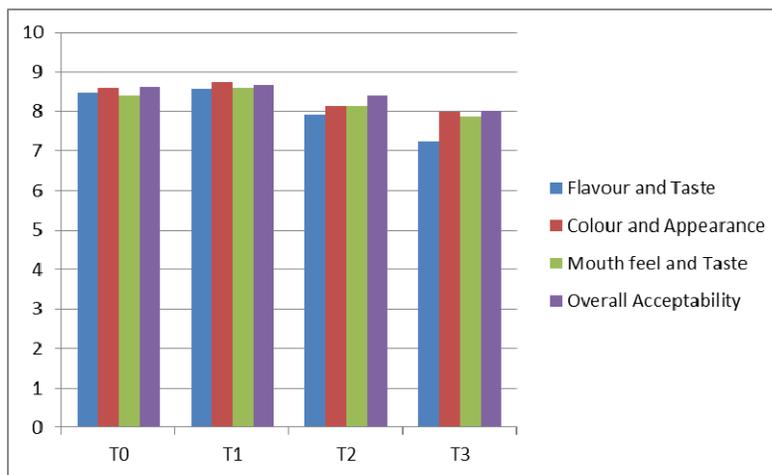


Fig 2: Average sensory analysis data

Proximate composition of RTS samples

In this present investigation of research, it was found that protein content was in the range of 0.10 to 0.57 per cent. The highest protein content was recorded in sample T₃ i.e. (0.57 per cent) while, minimum protein content was found in sample T₀ i.e. (0.10 per cent). Carbohydrates content was in the range of 1.78 to 10.94 per cent. The highest Carbohydrate content was recorded in sample T₃ i.e. (10.94 per cent). While, minimum carbohydrate content was found in sample T₀ i.e. (1.78 per cent). Fat content was in the range of 0.22 to 0.28 per cent. The highest fat was recorded in sample T₂ i.e. (0.28 per cent.). While, minimum fat content was recorded in sample T₃ i.e. (0.22 per cent). fibre content was in the range of

0.78 to 0.85 per cent. The highest fibre was recorded in sample T₂ i.e. (0.85 per cent). While, minimum fibre content was recorded in sample T₃ i.e (0.78 per cent). Ash content was in the range of 0.29 to 0.54 per cent. The highest ash content recorded is in sample T₀ i.e. (0.54 per cent). While, minimum ash was recorded in sample T₂ i.e. (0.29 per cent). Moisture content was in the range of 86.89 to 96.5 per cent. The highest moisture content wae recorded in sample T₀ i.e. (96.5 per cent). While, minimum moisture was recorded in sample T₃ i.e. (86.89 per cent).

Result of proximate analysis of beetroot and jamun juice blended drink are shown in Table no. 4

Table 4: (Proximate analysis of beetroot and jamun juice blended drink).

Parameters	T ₀	T ₁	T ₂	T ₃	S.Ed ±	C.D. at 5%	Result
Moisture	96.5	93.30	90.10	86.89	0.29	0.63	Significant
Crude protein	0.10	0.25	0.40	0.57	0.02	0.04	Significant
Crude fat	0.27	0.27	0.28	0.22	0.05	0.11	Significant
Crude fibre	0.81	0.82	0.85	0.78	0.08	0.18	Significant
Ash	0.54	0.50	0.29	0.43	0.03	0.04	Significant
Carbohydrate	1.78	4.83	7.89	10.94	0.29	0.63	Significant

Significant at 5 % level

Conclusion

The results obtained from the statistical analysis revealed that the beetroot and jamun can be satisfactorily used for juice making. As per experimental T₁ with 75% beetroot juice and 25% jamun juice was found to be best among the three treatments T₁>T₀>T₂>T₃. Thus, blend can be recommended for production at commercial level to make nutritious and healthy Juice.

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