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UTILISATION OF SAPOTA POMACE OBTAINED AFTER JUICE EXTRACTION

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ABSTRACT

The investigation on processing of sapota fruits was conducted during the year 2005-06 in the Department of Post-harvest Technology, Kittur Rani Channamma College of Horticulture, Arabhavi, district Belgaum, Karnataka. The burfi prepared from fresh pomace with 1 : 1 proportion of pomace to sugar and 0.2 per cent citric acid was found superior with respect to organoleptic quality. The burfi with 1 : 1.5 proportion of pomace to sugar with 0.2 per cent citric acid was comparable to that of earlier. The sapota burfi prepared with recipe of 1 : 1.5 pomace powder to sugar with 0.2 per cent citric acid scored highest with respect to colour and appearance, texture, taste, flavour and overall acceptability (4.25, 4.25, 4.25, 4.00 and 4.25, respectively) closely followed by the burfi with 1 : 1.25 proportion of pomace powder and sugar containing 0.2 per cent citric acid.

INTRODUCTION

Sapota, *Manilkara achras* (Mill.) Fosberg (Syn: *Achras zapota* L.), is one of the most important tropical fruits belonging to the family sapotaceae. It is popularly known as chikku. Sapota is mainly valued for its sweet and delicious fruits. It is primarily used as dessert fruit. Sapota fruit is a good source of digestible sugar, which ranges from 12 to 20 per cent and it is virtually a treasure of minerals such as iron and calcium. The fruits have an appreciable amount of protein, fat, fibre, calcium, phosphorus, iron, carotene and vitamin C (Shanmugavelu and Srinivasan, 1973). It is also rich in bio-iron required for the formation of haemoglobin (Gursharan Singh, 2001).

The pomace *i.e.*, pulp obtained after extraction of juice can be utilised as a by-product. The pomace can be dried and used for preparation of burfi, milk shake, *etc*

However, there are no popular commercial products of sapota in the market. Hence, there is a need to develop a low cost technology for processing sapota fruits into value added products, such as juice based beverages, candy and utilization of by-product which have ready acceptability in the market. Therefore, the present investigation was undertaken with the objective of utilisation of pomace and development of new product from sapota.

MATERIALS AND METHODS

The investigation on processing of sapota fruits was carried out in the Department of Post-harvest Technology, Kittur Rani Channamma College of Horticulture, Arabhavi, district Belgaum, Karnataka during the year 2005-2006.

Kalipatti, a commercially important cultivar of this region was used for the study.

Pomace is a by-product obtained from sapota pulp after juice extraction, which can be utilised for preparation of burfi, halwa, jam, *etc*. The pomace can also be dried to get a powder of good quality. Therefore, an experiment was conducted to utilise the fresh pomace as well as dried powder for burfi making.

The design adopted for these experiments was completely randomised design with eight treatments and three replications. Burfi was prepared with the pomace or pomace powder of 100g with 75, 100, 125, 150g sugars and citric acid of 0.2 and 0.4%.

The required quantity of sugar as mentioned in treatment details was added to 150 ml of water and boiled to prepare syrup. The boiling was stopped when a drop of syrup formed a single thread when tested in

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between fingers. The required quantity of acid as per treatments was added to the syrup and the pomace or powder was added to the syrup and mixed well.

This mixture was spread on a stainless steel plate smeared with ghee and pressed to make a uniform thickness. The pieces of 3.0 x 3.0 cm size and rectangular shape were cut with knife and then packed in pet containers for storage.

RESULTS

The data on organoleptic evaluation of sapota burfi prepared from fresh pomace as influenced by treatments are presented in Table 1. The results revealed highly significant differences between treatments with respect to organoleptic quality parameters like colour and appearance, texture, taste, flavour and overall acceptability.

Table 1. Organoleptic quality of sapota burfi prepared from fresh pomace (scores out of 5.0)

Treatments	Colour and appearance	Texture	Taste	Flavour	Overall acceptability
100 g fresh pomace + 75 g sugar + 0.2% citric acid + 150 ml water	4.50	3.50	3.25	3.00	3.25
100 g fresh pomace + 100 g sugar + 0.2% citric acid + 150 ml water	4.50	4.00	4.25	4.00	4.25
100 g fresh pomace + 125 g sugar + 0.2% citric acid + 150 ml water	4.00	2.50	3.50	3.00	3.00
100 g fresh pomace + 150 g sugar + 0.2% citric acid acid + 150 ml water	4.50	3.00	4.50	4.25	4.00
100 g fresh pomace + 75 g sugar + 0.4% citric acid acid + 150 ml water	4.50	3.50	3.00	3.00	3.00
100 g fresh pomace + 100 g sugar + 0.4% citric acid + 150 ml water	4.00	3.00	2.00	2.00	2.00
100 g fresh pomace + 125 g sugar + 0.4% citric acid + 150 ml water	4.00	2.50	2.50	2.50	2.50
100 g fresh pomace + 150 g sugar + 0.4% citric acid + 150 ml water	4.50	3.00	3.00	3.00	3.00
Mean	4.31	3.13	3.25	3.09	3.13
S.Em±	0.006	0.010	0.011	0.042	0.005
C.D. at 1%	0.024	0.040	0.044	0.150	0.019

Significantly higher score for colour and appearance was recorded in T₁, T₂, T₄, T₅ and T₈ (4.50), whereas lowest score was recorded in T₃, T₆ and T₇ (4.00). Maximum score for texture of burfi was observed in T₂ (4.00) followed by T₁ and T₅ (3.50), whereas the lowest score was observed in T₃ (2.50).

The taste of sapota burfi was highly influenced by treatments. Maximum score for taste was observed in T₄ (4.50) followed by T₂ (4.25), whereas minimum score was observed in T₆ (2.00). The flavour of sapota burfi varied with treatments. Maximum score for flavour was seen in T₄ (4.25) followed by T₂ (4.00), while lowest score was recorded in T₆ (2.00). Maximum overall acceptability score was recorded in T₂ (4.25) followed by T₄ (4.00), whereas lowest score was recorded in T₆ (2.00).

The data pertaining to the organoleptic evaluation of sapota burfi prepared from pomace powder are presented in Table 2. The data on sensory evaluation indicated that there were highly significant differences between the treatments.

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Table 2. Organoleptic quality of sapota burfi prepared from pomace powder (scores out of 5.0)

Treatments	Colour and appearance	Texture	Taste	Flavour	Overall acceptability
100 g pomace powder + 75 g sugar + 0.2% citric acid + 150 ml water	2.00	2.00	2.00	2.50	2.00
100 g pomace powder + 100 g sugar + 0.2% citric acid + 150 ml water	4.25	4.10	3.50	3.00	3.75
100 g pomace powder + 125 g sugar + 0.2% citric acid + 150 ml water	4.15	4.15	3.75	3.25	4.00
100 g pomace powder + 150 g sugar + 0.2% citric acid + 150 ml water	4.25	4.25	4.25	4.00	4.25
100 g pomace powder + 75 g sugar + 0.4% citric acid + 150 ml water	2.00	2.00	2.00	2.50	2.00
100 g pomace powder + 100 g sugar + 0.4% citric acid + 150 ml water	3.50	4.00	3.00	2.75	3.00
100 g pomace powder + 125 g sugar + 0.4% citric acid + 150 ml water	4.00	2.50	2.50	2.75	3.50
100 g pomace powder + 150 g sugar + 0.4% citric acid + 150 ml water	4.10	4.10	3.50	3.50	3.75
Mean	3.53	3.39	3.06	3.03	3.28
S.Em±	0.016	0.008	0.005	0.012	0.005
C.D. at 1%	0.064	0.032	0.019	0.048	0.019

Maximum score for colour and appearance was observed in T₂ and T₄ (4.25) followed by T₃ (4.15), whereas minimum score was recorded in T₁ and T₅ (2.00).

The texture of burfi varied significantly with treatments. The highest score was obtained by T₄ (4.25) followed by T₃ (4.15), while the lowest score was seen in T₁ and T₅ (2.00).

The taste of burfi was highly influenced by the treatments. The highest score for taste was recorded in T₄ (4.25) followed by T₃ (3.75), whereas lowest score was recorded in T₁ and T₅ (2.00).

Flavour of sapota burfi also showed significant differences due to treatments. Maximum score was recorded in T₄ (4.00), which was followed by T₈ (3.50), while the lowest score was recorded in T₁ (2.50).

Overall acceptability of sapota burfi varied significantly with treatments. Maximum overall acceptability score was seen in T₄ (4.25) followed by T₃ (4.00), whereas lowest score was recorded in T₁ and T₅ (2.00).

DISCUSSION

The pomace obtained after extraction of juice from the pulp is generally considered as a waste. It accounts for about 20 to 25 per cent of fruit weight. This pomace is also rich in minerals, nutrients, traces of juice, etc. This can be successfully utilised for preparation of burfi with fresh pomace or after drying and powdering. The fresh pomace has short shelf life. So, it can be dried, powdered, stored for many days in airtight containers and used as and when required. Therefore, the present experiment was initiated to utilise the fresh as well as dried pomace for preparation of value added products like burfi.

The burfi was prepared with fresh pomace with different levels of pulp to sugar ratio, i.e., from 1 : 0.75 to 1 : 1.5 with two levels of citric acid, 0.2 to 0.4 g per kg of mixture.

The data on organoleptic evaluation of burfi from fresh pomace revealed that the burfi prepared with a recipe 1 : 1 or 1 : 1.5 pulp to sugar ratio with 0.2 per cent citric acid was found to be significantly superior to other treatments and highly acceptable with a score of 4.00 to 4.25. This indicates that lower level of acid content (0.2%) with higher levels of sugar was best.

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Organoleptic evaluation of sapota burfi prepared from pomace powder indicates that pomace could be dried and used for burfi preparation whenever required. The scores for sensory qualities indicate that the burfi was quite acceptable when prepared with 1: 1 and 1: 1.5 proportion of pomace powder : sugar ratio with 0.2 per cent citric acid were found superior with respect to sensory qualities. The burfi prepared with 1: 0.75 proportion of pomace powder: sugar with both the citric acid levels of 0.2 and 0.4 g were poor in quality because the burfi failed to set due to insufficient quantity of syrup.

Thus, from the above discussion, it can be concluded that both fresh as well as powdered pomace can be used for preparation of a good quality burfi having sugar in the ratio of 1: 1 to 1: 1.5 and 0.2 per cent citric acid.

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