

## RESEARCH PAPER

# Scaling of hedonic score of herbal instant beverages based on sapota fruits

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Research chronicle : Received : 04.02.2014; Revised : 15.05.2014; Accepted : 23.05.2014

## SUMMARY :

The present investigation was carried to assess the effect of different herbal blends on herbal instant beverages based on sapota fruits. The product was prepared by using different sapota based blends (10, 15 and 20%) consist of different fruits, herbs and spices with maintaining TSS (12 and 15 °Brix) and acidity (0.30, 0.40 and 0.50 %). Then product was stored under ambient condition (22 - 35°C) for 6 months and evaluated for sensory properties at an interval of 2 months. The storage study revealed a pattern of gradual decrease in taste, flavour, texture (body), overall acceptability whereas, increasing trend was recorded in colour and appearance during entire periods of storage. Amongst various treatments, the most acceptable and stable herbal beverages based on sapota fruit can be prepared by using blend (15%), TSS (15%) with acidity (0.30%) gave excellent score for taste, flavour, colour, appearance and overall acceptability and found most stable during storage of 6 months. This herbal instant beverage is considered as protective food as it is rich in antioxidant, nutrients and has therapeutic values for health remedy. Therefore, this herbal sapota based beverage technology could be promoted as health food and exploited for agro food processing industry at cottage as well as at industrial scale with advantage.

**KEY WORDS :** Sapota beverage, Herbal instant beverage

**How to cite this paper :** Sangani, S.L., Vaghani, S.N., Patel, N.B. and Desai, C.R. (2014). Scaling of hedonic score of herbal instant beverages based on sapota fruits. *Internat. J. Proc. & Post Harvest Technol.*, 5 (1) : 62-66.

Sapota [*Manilkara achras* (Mill.) Fosberg] is a tropical fruit crop grown for its delicious and sweet fruits. India is considered to be the largest producer of the sapota in the world. It prefers coastal climate therefore, it is commercially, extensively and intensively cultivated in states like Maharashtra, Gujarat, Karnataka and Tamil Nadu. It has emerged as one of the major fruit of South Gujarat. At present the area and production under this crop is increase resulting glut in the market in main season. Whereas, sapota is highly perishable in nature and cannot be stored at ambient temperature for longer period. Therefore, fruit need to be disposed off as early as possible after harvest. Thus, the Inadequate post harvest management practices and poor shelf- life leads to enormous loss from 25-30 per cent. It is, therefore, necessary to convert the sapota fruit into processed products to avoid post harvest loss and get value added product. However, in recent years

the increasing consumer awareness has emphasized the need for functional beverages which provide a health benefit beyond energy and essential nutrients. Therefore, the present investigation was under taken to develops data base information and evaluated sensory properties of herbal instant beverages based on sapota under ambient condition (22 - 35°C).

## EXPERIMENTAL METHODS

The fresh, uniformly matured sapota, ripened aonla, pineapple and dried kokum and tamarind with uniform size, different herbs and spices like mint, *Tulsi*, orange peel, ginger, funnel, curry neem, clove, cardamom, black papper formed the experimental material. Then fruits were thoroughly washed with clean tap water to remove any surface dust and dirt. Care was taken to see that the fruits should be well ripened with firm

texture but not mushy in texture. Fruits were peeled with stainless steel knife, cut in to small pieces and fibrous material was removed from central core and seeds from respective fruits. The pulp was prepared by homogenizing the fruit pieces in blender. The prepared pulp of different fruits was mixed together and known quantity of water was added and to homogenize stirred. Pulp was divided into lots according to treatment and measured quantity of sugar, spices, citric acid were added and mixed well as per treatments.

The known quantity of beverage base was filled into aluminium foil pouches and heat sealed. They were labeled appropriately with details of treatment, date, repetition, serial number and stored for the periodical observations.

The pouches of herbal instant beverages were stored at an ambient temperature (22 to 35<sup>o</sup> C). These were then subsequently used for periodical evaluation at two month interval for a period of six months. The product was organoleptically evaluated at the time of preparation and after every two months interval during ten months of storage. A panel of five judges did the sensory evaluation of the product

in term of colour, appearance, texture, taste, flavour, and overall acceptability. Allotting maximum of ten marks for each character did scoring and for any score less than 5 the product was not acceptable.

## EXPERIMENTAL FINDINGS AND ANALYSIS

It is apparent from the data that the colour acceptance score of herbal instant beverages increase with the advancement of storage. However, its pattern of acceptability varied according to treatments. The most acceptable colour was observed in the treatment T<sub>8</sub> (8.58 to 9.10) containing higher level of acidity (0.50%), higher level of blend (20%) and optimum level of TSS (15%). It is well known that sapota is rich in polyphenols and tannin which induced browning during processing and storage can be used to impart desirable and attractive colour in food product. The medicinal herbs and spices are rich in tannin which also helps in development of redish colour. Moreover, this was also associated with non enzymic reaction among the nitrogenous compound and acids

**Table 1: Effect of various treatments on colour rating of herbal instant beverages based on sapota during storage (10 points)**

Treatments	Initial	2 Month	4 Month	6 Month
T <sub>1</sub>	7.29	7.49	7.67	7.90
T <sub>2</sub>	7.92	8.09	8.24	8.36
T <sub>3</sub>	8.35	8.46	8.66	8.80
T <sub>4</sub>	7.96	8.15	8.29	8.42
T <sub>5</sub>	8.17	8.28	8.53	8.71
T <sub>6</sub>	7.61	7.72	7.86	8.11
T <sub>7</sub>	8.03	8.27	8.48	8.64
T <sub>8</sub>	8.58	8.76	8.92	9.10
	0.132	0.089	0.098	0.094
	0.40	0.27	0.29	0.28
	2.86	2.90	3.12	2.92

**Table 2 : Effect of various treatments on appearance rating of herbal instant beverages based on sapota during storage (10 points)**

Treatments	Initial	2 Month	4 Month	6 Month
T <sub>1</sub>	7.20	7.43	7.61	7.78
T <sub>2</sub>	7.82	7.98	8.21	8.36
T <sub>3</sub>	8.27	8.39	8.41	8.59
T <sub>4</sub>	7.9	8.12	8.22	8.40
T <sub>5</sub>	8.13	8.25	8.49	8.67
T <sub>6</sub>	7.58	7.69	7.82	8.09
T <sub>7</sub>	7.97	8.19	8.42	8.58
T <sub>8</sub>	8.54	8.72	8.86	9.01
S.E. ±	0.129	0.094	0.093	0.097
C.D. at 5 %	0.39	0.28	0.28	0.29
C.V. %	2.81	3.06	2.97	3.04

resulting in caramelization and millard reaction which rendered the lustrous desirable colouration in the product. In the present investigation our values for colour score support by the result of Patel (2009) in low-calories beverage based on sapota, Patel (2008) in mixed fruit medicinal jam based on

sapota, Dayal *et al.* (2007) in cape gooseberry squash, Venilla (2004) in guava; papaya fruit bar.

There has been a significant increase in the appearance of herbal instant beverages based on sapota during storage. But, its pattern of improvement varied according to treatments.

**Table 3: Effect of various treatments on taste rating of herbal instant beverages based on sapota during storage (10 points)**

Treatments	Initial	2 Month	4 Month	6 Month
T <sub>1</sub>	8.70	8.39	8.21	8.03
T <sub>2</sub>	9.50	9.21	9.02	8.82
T <sub>3</sub>	9.05	8.78	8.61	8.36
T <sub>4</sub>	7.83	7.54	7.42	7.17
T <sub>5</sub>	5.78	5.59	5.26	5.01
T <sub>6</sub>	8.26	8.01	7.80	7.52
T <sub>7</sub>	5.35	5.13	4.76	4.51
T <sub>8</sub>	4.53	4.26	4.06	3.78
S.E. +	0.108	0.073	0.070	0.075
C.D. at 5 %	0.32	0.22	0.21	0.22
C.V. %	2.54	2.73	2.69	2.97

**Table 4: Effect of various treatments on flavour rating of herbal instant beverages based on sapota during storage (10 points)**

Treatments	Initial	2 Month	4 Month	6 Month
T <sub>1</sub>	8.64	8.27	7.98	7.56
T <sub>2</sub>	9.42	9.26	8.98	8.78
T <sub>3</sub>	8.92	8.69	8.52	8.29
T <sub>4</sub>	7.74	7.45	7.22	7.01
T <sub>5</sub>	5.69	5.47	5.18	4.92
T <sub>6</sub>	8.17	7.91	7.76	7.39
T <sub>7</sub>	5.27	4.87	4.58	4.4
T <sub>8</sub>	4.42	4.18	3.93	3.67
S.E. +	0.114	0.077	0.071	0.074
C.D. at 5 %	0.34	0.23	0.21	0.22
C.V. %	2.72	2.89	2.78	3.01

**Table 5: Effect of various treatments on overall acceptability rating of herbal instant beverages based on sapota during storage (10 points)**

Treatments	Initial	2 Month	4 Month	6 Month
T <sub>1</sub>	7.96	7.90	7.87	7.82
T <sub>2</sub>	8.69	8.64	8.61	8.58
T <sub>3</sub>	8.65	8.58	8.55	8.51
T <sub>4</sub>	7.86	7.82	7.79	7.75
T <sub>5</sub>	6.94	6.90	6.87	6.83
T <sub>6</sub>	7.91	7.83	7.81	7.78
T <sub>7</sub>	6.66	6.62	6.56	6.53
T <sub>8</sub>	6.52	6.48	6.44	6.39
S.E. +	0.138	0.086	0.081	0.088
C.D. at 5 %	0.41	0.26	0.24	0.27
C.V. %	3.13	2.99	2.83	3.11

Treatment having higher level of acidity (0.50%), higher level of blend (20%) with optimum level of TSS (15%) gave highest appearance rating of herbal beverage ( $T_8$ ) at the end of storage period. The medicinal herbs and spices are rich in tannins which helped to develop attractive appearance. These observations are in agreement with the findings of Patel (2009) in low-calories beverage based on sapota, Mulla (2007) in mixed fruit jam based on sapota, Ahmed (1996) in watermelon squash and RTS, Chadha (1992) in sapota products, Uddin and Hoque (1991) in papaya products.

In general, the taste score of the beverage declined significantly as the storage period increased. This may obviously be assigned to development of acidity and odd taste through more solubilization of tannin from spices and herb and enzymes and microbes in the product. The most acceptable taste was recorded in the product which combined with optimum levels of acidity (0.30%), TSS (15%) and blend (15%). We know that most consumers prefer mild acidulent taste with spicy sip beverage compared to other products. However, spicy flavour cannot be enhanced without acid blend. Similarly, comparatively less sweet beverage also does not enhance the taste. Again too spicy product causes irritation in mouth and stomach which is need to control the optimum level of spices. Therefore, to develop good taste in beverage it is essential to blend with optimum level of fruit pulp, spices, herbs, sweetness and acid taste. The results are in good agreement with the finding of Patel (2009) in low-calories beverage based on sapota, Chaudhari (2008) in mixed fruit beverage based on sapota, Mulla (2007) in mixed fruit jam based on sapota, Dayal *et al.* (2007) in cape gooseberry squash, Sharma *et al.* (2001) in galgal juice concentrate, Sawant *et al.* (1999) in ber juice, Chadha (1992) in sapota products.

This decrease in flavour score might be due to highly volatile nature of flavour under high ambient storage temperature. The lowest flavour score was recorded in treatment containing higher levels of blend (20%) and acidity (0.50%) with optimum level of TSS (15%) as in  $T_8$ . This might be due to spices have its own flavour and aroma which at higher level during initial stage of storage more or less adversely affect the flavour of the products. Further, high acidity also reacts with various constituents especially with polyphenols which develops formation of some unpleasant off-flavouring compounds. Whereas, during later stage of storage acid deteriorate the volatile compounds by liberating more aromas from product and finally flavour is emitted from the product within short time. The most acceptable flavour was in  $T_2$  having optimum levels of acidity (0.30%), blend (15%) and TSS (15%). Spices are rich in essential oil a good source of pleasant flavour. But consumer prefers mild flavour with spicy beverage. Further, these flavour and aroma are more enhanced

with sufficient level of sugar and acid. Similar type of variable results are also in accordance with the findings of Patel (2009) in low-calories beverage based on sapota, Chaudhari (2008) in mixed fruit beverage based on sapota, Meena (2008) in mixed fruit chutney based on sapota. Mulla (2007) in mixed fruit jam based on sapota, Dayal *et al.* (2007) in cape gooseberry squash, Sharma *et al.* (2001) in galgal juice concentrates, Chadha (1992) in sapota products, Uddin and Hoque (1991) in papaya products and Sawant *et al.* (1999) in ber juice.

In general, overall acceptability score of herbal instant beverages based on sapota declined significantly throughout the storage period. This pattern of decline varied according to treatments. The decline in overall acceptability of the product might be due to gradual decrease in scoring colour, appearance, taste and flavour. Highest score for overall acceptability of herbal beverages was recorded combined with optimum levels of acidity (0.30%), blend (15%) and with optimum level of TSS (15%). This result may probably be due to the highest rating in all organoleptic parameters which imparts the synergetic effect. The lowest score for overall acceptability of beverages was observed in the product having higher level of acidity (0.50%), higher level of blend (15%) with optimum level of TSS (15%) as in  $T_8$  which might be due to highest citric acid and blend added to the product adversely affect all the organoleptic parameters. These results are in accordance with Patel (2009) in low-calories beverage based on sapota, Chaudhari (2008) in mixed fruit beverage based on sapota, Patel (2008) in medicinal jam based on sapota, Desai (2007) in mixed fruit jelly based on sapota, Deka *et al.* (2005) in mango-pineapple spiced beverage, Sharma *et al.* (2001) in galgal juice concentrates, Prasad and Mali (2000) in pomegranate squash, Ahmed (1996) in watermelon squash and RTS, Kalra *et al.* (1991) in mango: papaya beverage.

### Conclusion:

From the above discussion it can be concluded that the organoleptic properties of herbal instant beverages based on sapota fruits was continuously and gradually increased in colour and appearance rating but decreasing pattern was observed in colour, taste, flavour and over all acceptability during 6 months of storage under ambient temperature (22-35°C). It can be revealed that herbal instant beverages based on sapota combined with 15 per cent blend, 15 °brix and 0.30 per cent acidity, which were packed in aluminium foil pouches and stored under ambient temperature (20-35°C) was found to be most stable and acceptable product in the terms of flavour, taste, colour, appearance and overall acceptability for the storage of 6 months.

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