

## **Organoleptic Acceptability and Popularity of Nutritious Fruit Candies**

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*Email: mamtatewari63@gmail.com* **Abstract**

*Fruit candies are highly nutritious and rich source of calorie, vitamin C, vitamin A and antibiotic elements. Although candies are very popular among individual of all age groups but it is prepared mainly from sugar, fructose, glucose, fruit essence, corn or maltose sugar. These ingredients added candies are energy dense but poor source of nutrients as well as functional or therapeutic properties. Now a days fruit candies are becoming more popular due to high acceptability, higher nutrient content and longer shelf life. Therefore in present study fruit candies were prepared from Ginger, Papaya, Amla and Beal. The prepared candies were subjected to two groups (each group had 30 subjects) and their organoleptic attributes were assessed. Nine (9) point Hedonic rating scale was used for organoleptic analysis of these fruit candies. After acceptability the popularity of these candies were also assessed. Results revealed that various organoleptic attributes, i.e. appearance, colour, taste, flavour, mouthfeel and overall acceptability of all four fruit candies got e" 7 hedonic scores by both groups indicating that the candies were liked moderately to very much by them. Attributes, i.e., appearance, taste, flavour and overall acceptability of papaya candy were liked very much to extremely by the both group panel members. Hedonic scores of beal candy, amla candy and ginger candy were similar and these products were liked very much. Amla (98%), papaya (98%) and ginger (93%) candies were more popular among trainees. It can be concluded that fruit candies are tasty and palatable and can be incorporated in daily intake of individual due to health potential of different fruits.*

**Key words:** Candies, organoleptic attributes, fresh, fruits, hedonic rating scale

### **Introduction**

The Indian food manufacturing industry is the largest processing unit for chocolates and confectionery products. The Indian confectionery market contains numerous confectionery items namely sugar boiled, hard boiled candies, toffees and other sugar based candies. Manjula and Suneetha (2014) indicated that sugar boiled confectioneries have a large potential for growth as they are penetrated in estimated 15% of households only. The range of candies available in today's market include such treats as soft and tender golden caramels, elegant truffles and fudges, chewy licorice, chocolates, mouth watering toffee and hard

candy, as well as rolls, jelly beans and gum drops. The list is almost endless. Each of these candy delights has their own special quality about them, which makes them unique in their own way. Consumers of all age groups prefer chocolate and confectionery products because of their attractive appearance and colour. Confectionery has a major future role to play in the fast food market, as the benefits of its portability, long shelf life without refrigeration and its ability to provide control of calorie intake and balance nutrition, together with beneficial additives are promoted. Confectionery products with specific additives etc. with health benefits, added to conventional confections – often called nutraceuticals or functional foods.

India is the largest country after China that produces abundant amount of fruits and vegetables. Fruits have various vitamins and minerals and have

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numerous therapeutic potentials. Due to delicacy of different fruits, they can be used in confectionery industries. Fruit candies are becoming more and more popular because of high acceptability, minimum volume, higher nutritional value and longer shelf life. These have additional advantage of being least thirst provoking and ready to eat snacks (Shekawat et al, 2014).

Ginger (*Zingiber officianale* Rosc.) contains volatiles (Sesquiterpene and monoterpernoid hydrocarbons) that provide distinct aroma and taste of ginger. It has antiinflammatory, anti oxidative and antimicrobial potential (Mashhadi et al, 2013). Papaya (*Carica papaya*) is known as power house of nutrients. It is rich source of antioxidants (Vitamin A, C & E) minerals, B-vitamins and fibre (Aravind et al, 2013). Amla has been used in Ayurveda for treatment of several disorders, i.e. common cold, scurvy, cancer and heart disease (Jain et al, 2016). Beal (*Aegle marmelos*) is rich source of various micronutrients and contains antiinflammatory, anti oxidative, antidiarrhoeal and antimicrobial potential (Rahman and Parvin, 2014). Due to therapeutic properties of these four fruits, they were used to prepare sugar boiled candies in present endeavour.

#### Objectives

1. To prepare 4 nutritious fruit candies
2. To assess the organoleptic quality of formulated 4 nutritious fruit candies by group A
3. To assess the organoleptic attributes of formulated 4 nutritious fruit candies by group B

#### Methodology

It was a laboratory based trial conducted within a month of preparation of particular candies during that particular season in the year 2016-2017. Different fresh candies, i.e., ginger, papaya, amla and beal were prepared from these 4 fruits.

##### *Formulation of nutritious fruit candies*

Fruits (ginger, papaya and beal) were washed and peeled. After peeling they were cut in cube form and were boiled for 10-15 minutes for amla candy. For amla candy amlas were washed and boiled (10-15 minutes) then were cut in cube forms then sugar was taken according to the amount of fruits. Sugar was divided into 3 parts. Then sugar syrup was prepared from one part by boiling the appropriate sugar in water then cubes of fruits were added in this syrup and boiled for 3-4 times. Then they were placed for cooling. Similar process was done to next 2 days. After

that the candies were dried.

##### *Organoleptic analysis*

According to (Reddy, 2012; Jellink, 1985) organoleptic analysis or sensory evaluation is a scientific discipline that analyses and measure human response to the composition of food or product made by the sense of taste, smell and touch when food is eaten. Two groups, i.e., group A and group B were selected for organoleptic analysis. Each group had 30 panel members thus the total sample size was 60. Subjects were selected using triangle test. Group A was consisted with Home scientists, Horticulturists, Agronomists and Entomologists of Agriculture University, Kota. Group B was made with the common people who did not have the appropriate knowledge of different candies. Nine point Hedonic test was used to judge the different organoleptic attributes, i.e., appearance, colour, taste, flavour, consistency and overall acceptability of the four prepared nutritious fruit candies namely ginger, papaya, amla and beal. In this test panel members of both groups A and B were asked to measure the degree of pleasurable and unpleasurable experience of candies on a nine point Hedonic rating scale i.e., like extremely to dislike extremely. The former carried a score of 9 while latter was scored as 1. In this scale scores were categorized as 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-Extremely Dislike. Mean and standard deviation were calculated for each attribute of organoleptic analysis.

##### *Popularity of Fruit candies*

Food processing unit of Krishi Vigyan Kendra, Agriculture University, Kota continuously organizes training programmes related to food processing and preservation. In year 2016-2017 ten training programmes were conducted. 25 trainees were enrolled in each training programme thus total sample was 250. Skills related to formulation method of these fruit candies were imparted in these trainees. They learned to make fruit candies and expertise themselves. After training they prepared fruit candies at centre and started selling of these fruit candies at home level. In present study, popularity of fruit candies (market analysis) among consumers was also assessed.

#### Results and Discussion

Table 1 reveals that mean hedonic scores of ginger candy were ranged between 8.0 to 8.3 Hedonic

Table 1: Mean hedonic scores of organoleptic attributes of candies by group A (n=30)

Attributes	Ginger candy	Papaya candy	Amla candy	Beal candy
	Mean±SD			
Appearance	8.2±0.91	8.5±0.51	8.2±1.07	7.9±0.96
Colour	8.1±1.12	8.2±0.96	8.1±0.96	8.1±0.71
Taste	8.2±0.79	8.6±1.04	8.2±0.76	7.9±1.23
Flavour	8.0±0.91	8.7±0.92	7.9±1.28	7.8±1.31
Mouthfeel	8.0±1.28	8.7±0.72	7.9±1.00	7.9±1.05
Overall acceptability	8.3±0.85	8.9±0.64	8.2±1.02	8.1±0.96

Table 2: Mean hedonic scores of organoleptic attributes of candies by group B (n=30)

Attributes	Ginger candy	Papaya candy	Amla candy	Beal candy
	Mean±SD			
Appearance	8.2±0.68	8.5±0.51	8.0±0.45	7.9±0.71
Colour	8.3±0.51	8.8±0.41	8.1±0.55	8.1±0.50
Taste	8.0±0.79	8.6±0.51	8.0±0.51	7.8±1.04
Flavour	8.3±0.80	8.6±0.50	8.1±0.76	7.9±0.89
Mouthfeel	8.5±0.51	8.6±0.50	8.2±0.61	7.8±0.76
Overall acceptability	8.1±0.55	8.7±0.50	8.2±0.61	8.2±0.68

scores of all attributes were more than 8 indicating that these attributes were liked very much by the group A. Standard deviation (SD) indicates the dispersion from mean value. For example, higher SD value means the dispersion was high from mean. Panel members of group A gave more than 8 scores to all attributes of papaya candy (common name cheery) ranging from 8.2 to 8.9. Hedonic scores of flavour, mouthfeel and overall acceptability were near to 9 indicating that these attributes of papaya candy were liked extremely by the panel of group A. Flavour and mouthfeel scores of amla candy were near to 8 on 9 point scale (7.9) whereas appearance, colour, taste and overall acceptability scores were more than 8 (ranged from 8.1 to 8.2) illustrating that this product was liked very

much by the panel members of group A. Beal candy received higher than 7 scores by panel members (mean hedonic scores ranged from 7.8 to 8.1 for all attributes). The scores were near to eight on nine point scale, thus the product was liked very much by group A members. Thus table 1 revealed that likeability of all the candies was very high.

Table 2 indicates the mean hedonic scores of organoleptic attributes of prepared fruit candies rated by group B. All attributes of ginger candy got hedonic scores more than 8 indicating that this candy was liked very much by all the panel members of group B. Hedonic scores of organoleptic attributes of papaya candy and amla candy were higher than 8 illustrating that both candies were liked very much by group B.

Table 3: Market analysis (popularity) of different fruit candies prepared at centre (n=250)

S. No.	Types of fruit candies	Frequency of trainees those prepare fruit candies after training	Percentage of trainees those prepare fruit candies after training
1	Amla candy	245	98%
2	Papaya candy	245	98%
3	Ginger candy	235	94%
4	Beal candy	115	46%

Beal candy was liked very much by the panel members of group B. Among all the candies, papaya candy got highest hedonic score for all attributes followed by amla candy then ginger candy and beal candy by group B.

Overall results indicated that candies like ginger, papaya, amla and beal were liked equally by the panel members of both group A and group B. These fruit candies were tasty, palatable and mouth watering. Panellists said that the products were appealing, delicious and had higher palatability and acceptability. These fruit candies contained various therapeutic benefits also as well as they are time, money and energy saving.

Table 3 indicates that among consumers, amla candy and papaya candy were most popular followed by ginger candy. More than 90% trainees regularly prepared these three candies at centre (amla & papaya candy= 98%; ginger candy= 93%) on consumer demands. Although beal candy was also acceptable as indicated in organoleptic analysis but the popularity of the product was not as good as others, because the availability of beal fruit was poor as it was not available round the year. Apart from it the plant was out of the reach to most of the trainees.

### Conclusions

Delicious and mouth watering ginger candy, papaya candy, amla candy and beal candy were formulated in present study. It was observed that both group A and group B liked all the candies. On the basis

of overall acceptability, it can be asserted that all candies were liked very much by the panel members. These can be used in our daily life due to their taste, palatability and therapeutic value along with its time, money and energy saving value. Popularity analysis indicates that three candies namely amla, papaya and ginger were equally popular among all age groups and 94% to 98% trainees regularly preparing these candies and earning their livelihood..

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