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Standardisation and sensory quality analysis of nutritious product from an indigenous fruit (*Annona muricata*)

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Abstract

The study entitled “Standardisation and sensory quality analysis of nutritious product from an indigenous fruit (*Annona muricata*)” was aimed to standardize nutritious products from *Annona muricata* and analyse its sensory quality. *Annona muricata* is a member of the Annonaceae family and is a fruit tree with a long history of traditional use. The fruit is used as natural medicine for arthritic pain, neuralgia arthritis, diarrhoea, dysentery, fever, malaria, parities, rheumatism, skin rashes and worms. The objectives of the study were to develop baked product (cake and cookie) from Sour sop (*Annona muricata*), to standardize the two products developed from Sour sop and to analyse the organoleptic quality of the developed product. In the study we selected fully matured firm soursop fruit and ripened at room temperature. Through pre-processing of sour sop fruit, we separated the fruit pulp. Using the fruit pulp, we made three different variations of cookies and cakes V₁(30 gm Soursop), V₂(40 gm soursop), V₃(50 gm soursop). Sensory quality evaluation was done using hedonic rating scale by a panel of 9 judges. The cake and cookies were prepared according to the variations and the standardization procedure was done by considering the overall score of Hedonic rating scale of the three variations. It was found that, from the three variations of cookie V₁, V₂, V₃, the second variation recorded the highest hedonic value of 7.2. Similarly, from three variations of cake V₁, V₂, V₃, the third variation recorded the highest hedonic value of 6.4. While considering the results of hedonic rating of variations of cookie the second variation showed high preference and in cake the third variation showed high preference. The sour sop (*Annona muricata*) is abundantly grown in Kerala. This fruit has not been tapped by the processing industry. Soursop is a type of fruit that is used in medicine and cooking. It is low in calories but high in fiber and vitamin C. It has impressive benefits on our health.

Keywords: *Annona muricata*, soursop, hedonic rating scale, sensory analysis

1. Introduction

Annona muricata is a member of the Annonaceae family and is a fruit tree with a long history of traditional use. *A. muricata*, commonly known as soursop, graviola, guanabana, paw-paw and sirsak, is a member of the Annonaceae family comprising approximately 130 genera and 2300 species. *A. muricata* is native to the warmest tropical areas in south and North America and is now widely distributed throughout tropical and sub-tropical parts of the world, including India, Malaysia and Nigeria. *A. muricata* is an evergreen, terrestrial erect tree reaching 5-8 meter in height and features an open, roundish canopy with large, glossy, dark green leaves. The edible fruit of the tree are large, glossy, dark green leaves. The edible fruit of the tree are large, glossy, heart-shaped and green in colour, and the diameter varies between 15 and 20 cm. (Camejo, 1994) [2]

All portions of the *A. muricata* tree similar to other *Annona* species, including *A. squamosal* and *A. reticulate* are extensively used as traditional medicines against an array of human ailments and diseases, especially cancer and parasitic infections. The fruit is used as natural medicine for arthritic pain, neuralgia arthritis, diarrhoea, dysentery, fever, malaria, pasities, rheumatism, skin rashes and worms and it is also eaten to elevate a mother’s milk after childbirth (Morton, 1987) [5]. The leaves are employed to treat cystitis, diabetes, headaches and insomnia. In addition to ethnomedicinal uses, the fruits are widely employed for the preparation of beverages, candy, ice creams, shakes and syrups (Barbeau, 1998) [1].

A 1994 survey conducted on fruit processing enterprises in the Caribbean revealed that the

large processing enterprises use imported juices, pulps and concentrates primarily from extra-regional sources to produce a range of carbonated and non-carbonated beverages in cans, bottles or aseptic packaging (Francis, 1995)^[3].

Soursop fruit are highly perishable, being very susceptible to bruising and decay. Thus, they must be handled with extreme care. The soursop juice can be exported in its fresh form because it retains its flavour even after deep freezing (Satney, 1994)^[7].

1.2 Nutritional Importance of Sour SOP (A. Muricata)

Research has shown that one hundred grams of raw soursop fruit yields 66 kcal and normally consist of 67.5 % edible pulp, 8.5 % seeds, 20 % contains about 80 % water, 18 % carbohydrate, 1 % protein, 24.5 % non-reducing sugar and an abundant source of vitamin C, B₁ and B₂, and some minerals such as potassium, calcium, phosphorous and chloride. In addition, the fruit is low in sodium, saturated fat and contain no cholesterol. The oil consist of 28.07 % saturated and 71.93 % unsaturated fatty acids. The unsaturated oil includes linoleic acid, oleic and saturated oils palmitic and stearic acid. Sugar of soursop pulp contains about 67.2 % - 69.9 % of total solids. Traces of 1.8 % fructose, 2.27 % D-glucose, and 6.57 % sucrose is also found in the pulp.

Furthermore, research shows that 33 gram dietary fibre is found in one hundred grams of the fruit and pectin is the one mainly found (Watson and Preedy, 2010)^[9]. The soursop seeds are also rich in oil and proteins and low in toxicants such as tannins, phytates and cyanide. Therefore seeds could be harnessed in human or animal nutrition. A high content of magnesium and zinc is found in the seed (Watson R & Preedy, 2010)^[9].

2. Review of Literature

Some under-exploited tropical fruits such as soursop (Annonu muricutu) can be utilized in the development of exotic processed products, thus adding value to tropical fruits, reducing import substitution and increasing foreign exchange (Barbeau, 1998)^[1].

The major fruiting season is from January to April, but the trees bear fruits throughout the year (McComie 1987).

3. Methodology

The present study entitled “STANDARDISATION AND SENSORY EVALUATION OF NUTRITIOUS PRODUCT FROM AN INDIGENOUS FRUIT (ANNONA MURICATA)” was aimed to standardise and evaluate their sensory quality. The methodology employed for the study is presented under the following headings:

3.1 Selection of base material

3.2 Processing and Standardisation

3.3 Sensory Evaluation

3.1 Selection of Base Material

Fully mature firm soursop fruit were purchased from market. The fruits were ripened at room temperature for 2 days to allow full flavour and aroma development (Rajack, 1990)^[6].

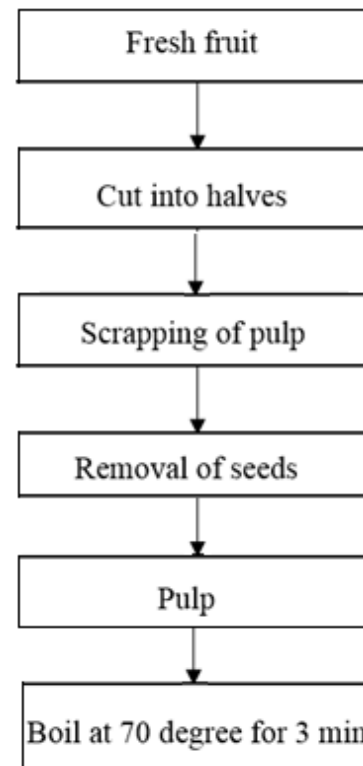
The fruit were washed, air dried and allowed to ripen. The fruit pulp is sweet, white to light yellow, and resembles and taste like custard. The edible portion coats the seeds generously a bit like the gooey portion of a tomato seeds. Soursop pulp has a very distinct sweet smelling fragrance it is slightly grainy a bit slippery, very sweet and very soft (Barbeau, 1998)^[1].

3.2 Processing and Standardisation

Food processing industry is of enormous significance for India’s development because of the vital linkage and synergies that it promotes between the two pillars of the economy, namely Industry and Agriculture (Maheshkumar, 2009)^[4]. Standardized recipes is one that has been tried, adapted and retried several times for use by a given food service which has been and yield every time when the exact procedures are used with the same type of equipment and the same quantity and quality of ingredients (USDA, 2001).

3.2.1 Processing

A. Pre-Processing of Soursop Fruit



3.2.2 Standardisation

Standardization of recipes is an essential strive for high quality products.

According to Tolute (2000) the procedure for recipe standardization begins with the process of recipe modification or adjustment. In the standardisation procedure, from the variation we choose standard recipe.

A) Different Variations

Table 1: Cookies

Variations	Ingredients	Proportions in grams
V1	Soursop pulp, Maida, Sugar, Butter, Egg, Baking powder, Salt, Baking soda	30 + 100 + 100 + 100 + 50 + 2.5 + 1 + 1.2
V2	Soursop pulp, Maida, Sugar, Butter, Egg, Baking powder, Salt, Baking soda	40 + 100 + 100 + 100 + 50 + 2.5 + 1 + 1.2
V3	Soursop pulp, Maida, Sugar, Butter, Egg, Baking powder, Salt, Baking soda	50 + 100 + 100 + 100 + 50 + 2.5 + 1 + 1.2

Table 2: Cake

Variations	Ingredients	Proportions in grams
V1	Soursop pulp, Maida, Sugar, Butter, Egg, Baking powder, Salt, Baking soda	30 + 100 + 100 + 100 + 50 + 2.5 + 1 + 1.2
V2	Soursop pulp, Maida, Sugar, Butter, Egg, Baking powder, Salt, Baking soda	40 + 100 + 100 + 100 + 50 + 2.5 + 1 + 1.2
V3	Soursop pulp, Maida, Sugar, Butter, Egg, Baking powder, Salt, Baking soda	50 + 100 + 100 + 100 + 50 + 2.5 + 1 + 1.2

3.3 Sensory Evaluation

Sensory quality evaluation plays an important role in acceptability study of a new product. A hedonic rating scale was used to find out the best combinations.

3.3.1 Selection of Judges

A panel of 15 judges was selected using simple triangle test at laboratory level. The judges selected were in the age group of 18-35 years as suggested by Jellinek (1985).

3.3.2 Product Development

From the extracted pulp, we developed 3 variations of cookies and 3 variation of cakes. From the three variations of each we choose a standard recipe.

3.3.4 Recipe of Soursop Cookies

3.3.4.1 Ingredients

1. Soursop
2. Refined flour
3. Butter
4. Sugar
5. Salt
6. Baking powder
7. Egg

3.3.5 Method

1. Preheat the oven to 375 degree Fahrenheit. Lightly grease the butter to the baking bowl
2. Mix refined flour, baking powder, powdered sugar and salt
3. Add egg to the butter, mix well and make it smooth
4. Gradually add mixed flour and mix well
5. Add pulp of soursop and mix gently.
6. Drop the cookies by the traditional tablespoon full on to the prepared baking sheets spacing them about 2 apart.
7. Bake at 150 degree Celsius for 10-15minutes.

3.3.6 Recipe of Soursop Cake

3.3.6.1 Ingredients

1. Soursop
2. Refined flour
3. Butter
4. Sugar
5. Salt
6. Baking powder
7. Egg
8. Milk

3.3.7 Method

1. Preheat the oven to 375 degree Fahrenheit. Lightly grease the butter to the baking bowl
2. Mix refined flour, baking powder, powdered sugar and salt
3. Add egg to the butter , mix well and make it smooth and

foamy

4. Gradually add mixed flour and mix well in one direction
5. Add pulp of soursop and mix gently.
6. Pour in to greased bowl
7. Bake at 150 degree Celsius for 30 minutes

4. Results and Discussion

Result of the present investigation entitled “Standardization and sensory evaluation of nutritious product from an indigenous fruit (*Annona muricata*) are detailed in this chapter under the following headings;

1. Processing and standardization of cakes and cookies
2. sensory evaluation of cakes and Cookies

4.1 Processing and Standardization of Cakes and Cookies

The selected soursop fruit was pulped and processed for the preparation of baked products. The base material (soursop pulp) was added with different proportions (30, 40, and 50). The standardization procedure was done by considering the overall score of hedonic rating scale of three variations of cakes and cookies. Overall acceptability is an important parameter to evaluate the acceptability of the product.

4.2 Sensory Evaluation of Cakes and Cookies

Table 3: Average score of cakes and cookies

Variations	Cakes	Cookies
Variation 1 (V1)	5.4	5.5
Variation 2 (V2)	6.2	7.2
Variation 3 (V3)	6.4	6

V1= Variation with 30gram soursop

V2= Variation with 40gram soursop

V3= Variation with 50gram soursop

It was found that the three variation of cakes and cookies were not significantly different from each other, in other words all the variations of cakes and cookies are equally good.

Hedonic rating was adapted for screening the best variations from cakes and cookies. In cakes, the highest value was obtained in the third variation (6.4) and the least for the variation1 (5.4). Similarly in cookies, the second variation recorded the highest value off 7.2 and the least for the variation1 (5.5) respectively.

5. Conclusion

In the study investigation entitled “Standardization and sensory evaluation of nutritious product from an indigenous fruit (*Annona muricata*), we selected fully matured firm soursop fruit and ripened at room temperature. Through pre-processing of soursop fruit, we separated the fruit pulp. Using the fruit pulp, we made three different variations of cookies and cakes V₁ (30 gm soursop), V₂ (40 gm soursop), V₃ (50 gm soursop). Sensory quality evaluation was done using hedonic rating scale by a panel of 9 judges. The cake and cookies were prepared according to the variations and the standardization procedure was done by considering the overall score of Hedonic rating scale of the three variations. It was found that, from the three variations of cookie V₁, V₂, V₃, the second variation recorded the highest hedonic value of 7.2. Similarly, from three variations of cake V₁, V₂, V₃, the third variation recorded the highest hedonic value of 6.4. While considering the results of hedonic rating of variations of cookie the second variation showed high preference and in cake the third variation showed high preference.

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