



Preparation of pankand by using betal leaves (Piper betle) and damask rose (Rosa damascene) petals

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Abstract

The current research was carried to prepare pankand by incorporating betal leaves and rose petals. The main aim is to standardized the product using betel leaves so that it can be preserved for long term. The product was develop using sugar, water, rose petals betal leaves, lemon juice and cardamom. Paan is used for generations as anti healing agent, anti diabetic agent, lowers high cholesterol, anti cancer agent etc. During preparation of Paankand , sugar syrup and betal leaves were used as a primary ingredient while cardamom was used as a secondary ingredient. After the paankand was prepared its physicochemical properties such as ash, moisture, TSS, ph, ascorbic acid content was determined. Four different formulation was used. Apart from physicochemical properties its sensory and microbiological evaluation was carried out. Sensory properties were compared to hedonic table. Pankand showed 26.54% moisture, 0.69% ash content, 57.32% sugar and 2.6 gm per 100gm iron from the above result it was concluded that.

Keywords- Betal Leaves, Rose petals.

Introduction

Piper betel deep green heart shaped vary famous leaves belongs to the family of Piperaceae and has over indigenous to India. A well-prepared betel quid is still regarded as a good mouth freshener and mild vitalizer, and is routinely provided on social, cultural, and religious occasions such as weddings, religious festivals, and sraddha ceremonies. (religious function performed after cremation) etc. The most likely place of origin of Piper betel is Malaysia but it is also cultivated in India, Srilanka, Bangladesh, Burma and Nepal. Piper betel leaves are

popularly known as paan leaves in India, which are consumed by about 15-20 million people in the country. (Ekta Singh Chauhan et al., 2016)

The scientific name of betel vine is *Piper betel* L. belongs to the family Piperaceae, i.e. the Black Pepper family. In spite of its alienness, the plant is much more popular in India than in any other country of the world since antiquity. This would be evident from the numerous citations laid down in the ancient literature; particularly the Indian scriptures. In these citations, significance of the leaves has been explained in relation to every domain of human life including social, cultural, religious and even day-to-day living, which is very much relevant even these days. It is also used as a special item offered to the guests in order to show respects and for such traditional use of betel leaf in the Indian society. Even now, the leaf is unique and without counterpart. The essential oil isolated from the leaves is supposed to be useful in treating respiratory catarrhs and as an anti-septic. *Piper betel* is claimed to be useful to improve learning and memory, in Indian traditional system of medicine yet not documented scientifically in this regard. Betel leaves help to heal the illnesses such as, Betel leaf is popular home remedy for headache. The betel leaf has analgesic and cooling properties. It can be applied with beneficial results over the painful area to relieve intense headache. Betel leaves are used to cure nervous aches, nervous weariness, and debility.. Betel leaf is an excellent household remedy in the treatment of cough and sore throat. To treat an unpleasant cough, combine mashed fruit or berries with honey. Betel leaves are useful in pulmonary affection in childhood and old age. The leaves soaked in mustard oil and warmed, may be applied to the chest to relieve cough and difficulty in breathing. The application of leaves smeared with oil is said to promote secretion of milk when applied on the breast during lactation. Betel leaves can be used to heal wounds. The juice of a few leaves should be extracted and applied on the wound. A perennial dioecious creeper. Semi-woody stems climb via short adventitious roots.. Leaves 10-20 cm long, broadly ovate, slightly cordate and often unequal at the base, shortly acuminate, glabrous, glaucous on sides, bright green or yellowish, petiole stout 2.0-2.5 cm long. Male spikes cylindrical dense. Female spikes 2.5-5.0 cm long, pendulous. Fruits rarely produced, often sunk in the fleshy spike, forming nodule-like structures. The most beneficial home cure for common illnesses is betel leaf. The betel (*Piper betel*) is a spice with therapeutic effects. The plant's branches are enlarged at the nodes. The leaves are alternating, heart-shaped, smooth, shiny, and long-stalked, with a pointy tip. It has five to seven ribs that grow from the base and tiny flowers. Betel is indigenous to Malaysia's centre and eastern regions.. (Rupa Sengupta et al., 2013)

A plant of the Rosaceae family, the rose is linked to many fruits, including the apple, plum, pear, cherry, strawberry, and blackberry. Since the beginning of time, roses have been prized for their flowers, fruits, habits, fragrance, and beauty. They evolved into a representation of love, triumph, aristocracy, and profundity. Roses are full of virtues and therapeutic benefits, like being a good source of vitamin C, an antidepressant, an antibacterial, an antiviral, an aphrodisiac, a sedative for the nervous system, etc. Betel leaves are used in the food sector to make jam, sherbet, syrup, ceramics for cakes, vinegar, marmalade, wine, and other products.

Modern medicines are widely known to be primarily derived from plants. Traditional medicine first emerged as a result of the use of herbs for disease treatment and prevention by people in antiquity. Many plant species create a variety of chemical compounds known as secondary metabolites that are not involved in primary metabolism. (Rhodes, 1994).

Rose is a flowering plant in the genus *Rosa*. The majority of species have petals that are 5-15 cm long and two opposite (pinnae). Each leaf stack has at least 3 to 5 to 9 or 13 children leaf-like leaves, and the leaf (stipule) is elliptical, pinnate, edge-bearing, tapered at the tip of the petals, and has thorns on the stem near the ground. The rose had always been admired for its beauty and had a long history of symbolism. Roses are ancient emblems of love and beauty (Encyclopedia > Rose (2)). Rose has numerous health effects, including antidepressant, antiviral, antibacterial, anti-inflammatory, and vitamin C source.

Gulkand, which translates to rose petal jam, is a delectable Ayurvedic dish that has been used for ages to promote excellent health. *Rosa centifolia* (centi: 100 &folia:petals) is the most widely used plant for Gulkand preparation. This plant is a member of the Rosaceae family. The National Institute of Ayurvedic Medicine presents a list of the benefits of regularly drinking gulkand. It has traditionally been used to treat weariness, lethargy, hyperacidity, dysmenorrhea, fluid retention, and heat-related illnesses. It is also beneficial to memory and acts as a blood purifier.

Material and Method

Materials

The present study entitled “Preparation of pankand by using betel leaves (*Piper betle*) and damask rose (*Rosa damascene*) petals” was carried out in the Department of Food Technology, Parul Institute of Applied Sciences, Parul University, Vadodara. This section enlists the material used and elaborates the processing techniques, organoleptic evaluation and analytical procedure following during the research . Betel leaves, rose petals, sugar, cardamom, citric acid were bought from the local shops in the Vadodara. Equipments used while the processing are hot air oven, wighing balance, utensils and other equipments.

Methods

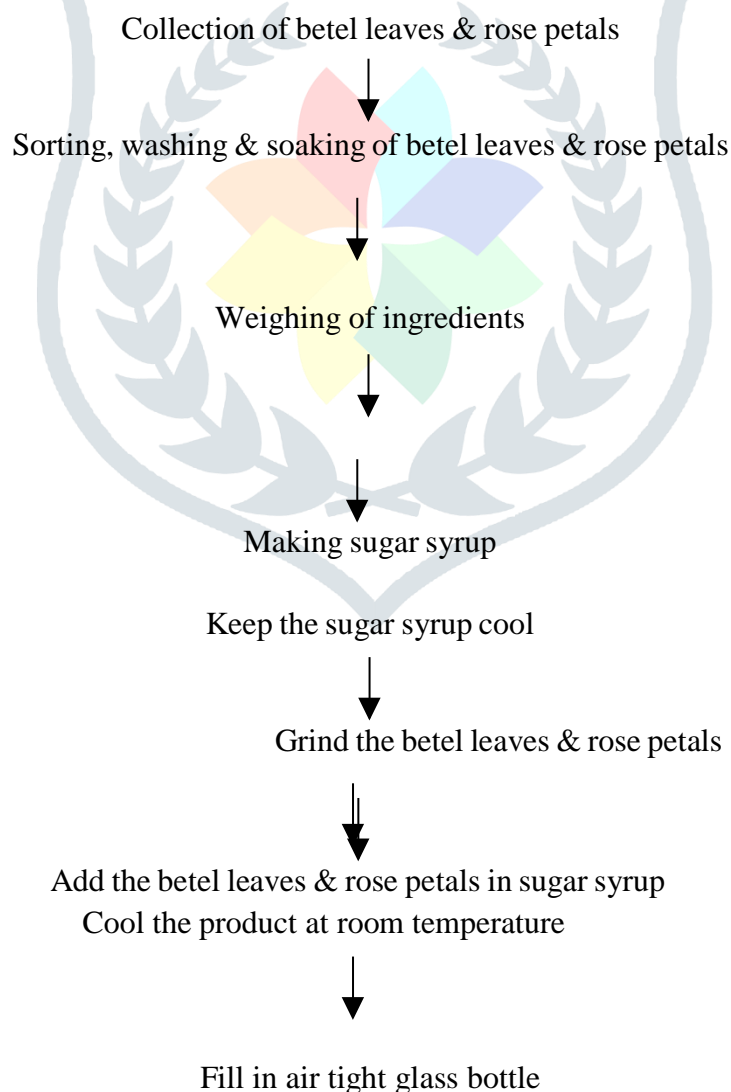


Fig 1: Flow chart for making Paankand

Table 1: Formulation of paankand (S₁, S₂, S₃)

Sr no.	ingredients	sample 1	sample 2	sample 3
1	betel leaves (crushed)	50gm	60gm	70gm
2	rose petals (crushed)	50gm	40gm	30gm
3	sugar	130 gm	130 gm	130 gm
4	water	125 ml	125 ml	125 ml
5	cardamom	2pinch / 0.18gm	2pinch / 0.18gm	2pinch / 0.18gm
6	lemon juice	5-6 drps	5-6 drps	5-6 drps

Proximate analysis-

All samples were analyzed for moisture, protein, fat, total ash and total carbohydrate contents. Sugar and iron content according to their respective standard methods.

Moisture Content

Moisture content was estimated adopting AOAC (1990) method. The following equation was used to measure moisture content.

$$\text{Moisture content (\%)} = \frac{w_2 - w_3}{w_2 - w_1} \times 100$$

Where, W₁=Weight of the container with lid, g

W₂=Weight of the sample before drying +weight of the container with lid, g

W₃=Weight of the sample after drying+ weight of the container with lid, g

Ash Content

AOAC (1990) method using muffle furnace was used to determined ash content of the samples. The per cent ash was calculated using following formula

$$\text{Ash content} = \frac{w_2 - w_1}{w_2} \times 100$$

Where, W₁= Weight of the sample, g

W₂= Weight of the crucible before combustion, g

W3=Weight of the crucible after combustion, g

Protein content:

Determination of Protein content: Protein content was determined by Micro-Kjeldhal method.

- Digestion: 200mg of defatted ground sample was accurately weighed and a pinch of catalyst mixture $K_2SO_4:CuSO_4:HgO$ red (91:8.2:0.8g) was added and then it was transferred to the digestion flask, digestion was carried out with 5ml of concentrated H_2SO_4 for 2-3hrs at 450 C till the content becomes colorless.
- Neutralization and Distillation: Digested sample was diluted to the 50ml in volumetric flask and made final volume to 50ml with distilled water. Then the 5ml of aliquot was neutralized with 30% HCL and 40% of NaOH containing 5g of sodium thiosulphate. Distillation was carried and liberated ammonia was absorbed in 2% boric acid solution containing methyl red as indicator.
- Titration: The collected ammonia was titrated against 0.01N H_2SO_4 . Titer reading was noted, Nitrogen was calculated by using following formula and % protein was calculated by multiplying 6.25. Simultaneously a blank sample was also run. Crude Protein % = (Sample titre – Blank titre) \times 0.0014 \times 6.25 / Sample weight \times 100

Fat content

To establish the samples' crude fat content, the Soxhlet apparatus was employed in accordance with the AOAC (1990) technique. The fat percentage was expressed as follows.

$$\text{Fat content (\%)} = \frac{\text{Final weight of flask}}{\text{Initial weight of flask}} \times 100$$

Total Carbohydrate

The total carbohydrate content of the samples was calculated by subtracting the protein, fat, ash, and moisture from 100 (Pearson, 1976)

$$\% \text{ Carbohydrate} = 100 - (\% \text{ Moisture} + \% \text{ Ash} + \% \text{ Fat} + \% \text{ Protein})$$

Sugar

$$\text{Free reducing sugar, percent by mass (X)} = \frac{m_1 + f}{a} \times 4$$

f = Correction factor (see C-Z.1.3.3) mL; and

mt =mg of invert sugar from Table 3 corresponding to the reading fat 00;

'a' =titre reading obtained before inversion

Iron

Pipette 10mL aliquot of ash solution into 25mL volumetric flask, and add 1mL hydroxylamine hydrochloride solution. After 5 min, add 5mL buffer solution and 1 mL O - phenanthroline solution or 2mL of dipyridyl

solution and dilute to volume. Determine absorbance of solution at 510 nm. From absorbance reading, determine Fe content present in aliquot of ash solution taken by referring to standard curve.

Iron content of the sample (Mg Fe/100gm sample)=

$$\frac{\text{Quantity of Fe in aliquot of ash solution (From calibration curve)}}{\text{Aliquot of ash solution taken for determination}} \times \frac{\text{Total volume of Ash solution}}{\text{Wt. of sample taking for ash}} \times 100$$

Sensory Evaluation

Sensory evaluation was done by 10 panellists. The samples were evaluated for appearance, colour, melt in mouth, texture, flavour, taste and overall acceptability, using 9-hedonic scale test as described by Larmond (1991)

Scores to Be Given As Follows

1. Liked extremely – 9
2. Liked very much – 8
3. Liked moderately – 7
4. Liked slightly – 6
5. Neither liked nor disliked – 5
6. Disliked slightly – 4
7. Disliked moderately – 3
8. Disliked very much – 2
9. Disliked extremely – 1



Result and Discussion

The parameters like moisture content, protein content, ash content, fat content, carbohydrates were evaluated for paankand and presented in the table

Table 2: Proximate composition of Paankand

sr no	parameter	per 100gm
1	moisture	26.54%
2	total ash	0.69%
3	fat	0.24
4	protien	0.91
5	carbohydrates	71.62
6	sugar	57.32
7	iron (fe)	2.6

The parameters like moisture content, protein content, ash content, fat content, carbohydrates, sugar and iron were evaluated for Paankand and presented in the table.

Moisture Content

The moisture content of paankand was evaluated using a 5gm capacity infrared moisture meter. The sample was placed on a plate and attached to the meter. After inserting the sample into the meter, the needle was reset to zero because moisture will cause the needle's reading to alter.

Ash Content

The ash content of meals shows the total mineral content. The ash content of C was determined using a muffle furnace, in which a 10 g sample was taken and weighed, and then a dried crucible was weighed. It then burns away the chemical compound in air at temperatures above 500 degrees Celsius for 8 to 10 hours, and then it is cooled in a desiccator and the burning sample is weighed again.

Fat Content

The fat content of this product is affected by the addition of paankand. Paankand contains a low fat compared to other constituent ingredients. Fat in the body acts as an energy source, especially in sports with moderate intensity in a long time, for example, endurance (Rismayanthi, 2015). It was observed that the fat content of paankand was lower (0.69%). The significant decrease in the fat content of paankand was as a result of the contribution of ingredients added in the production of paankand such asleaves and rose petal , particularly unsaturated fats, are easily oxidized and reduce the shelf-life of food products. (Borchers et al., 2000; Afoakwa et al., 2007)The fat analysis of paankand was done using Soxhlet. 5g of sample was weighed and took in thimble. The extraction cups were dried in oven at 1300 C for 15 min and took the weight of empty cups. The

extraction cups were cooled and 70ml of petroleum ether was added. The instrument was pre-heated and when the temperature was attained, the extraction cups were attached to the instrument and left for boiling for 30min, followed by rising for 20min and last of all recovery of solvent was done for 10 min. The recovered ether was collected and fat contained in extraction cups were estimated.

$$\text{Fat} = (W2 - W1) / W \times 100$$

Protein content:

Protein was determined using the AOAC (1995) Kjeldahl technique, which consists of three steps: digestion, distillation, and titration.

Carbohydrate

Based on the analysis of nutrient found the highest carbohydrate content is 71.62 g. because of the concentration of sugar more than other ingredients

Sugar

Sugar content of paankand was evaluated by using reducing sugar formula where the sugar content was about 57.32gm per 100gm of sample.

Iron

Determination of iron was done by using colorimeter method. The sample contains 2.6gm per 100gm of sample

Organoleptic evaluation of Paankand

Sensory evaluation acceptance tests was performed for paankand which was formulated by addition of sugar, betal leaves, rose petals in the different proportions to know the acceptability of the product. Acceptance scores were assigning for various sensory paramameters like colour, flavour, taste and texture.

Sample 2 observed better in oveall acceptability as well as colour, flavour, texture and appearance. Hence based on sensory evaluation sample 2 is finalized.

Table 3 : Organoleptic evaluation of Paanaknd

sr no	parameter	sample 1	sample 2	sample 3
1	colour	7	8	6
2	flavour	7	9	8
3	texture	7	7	7

4	appearance	7	8	7
5	overall acceptability	7	9	6

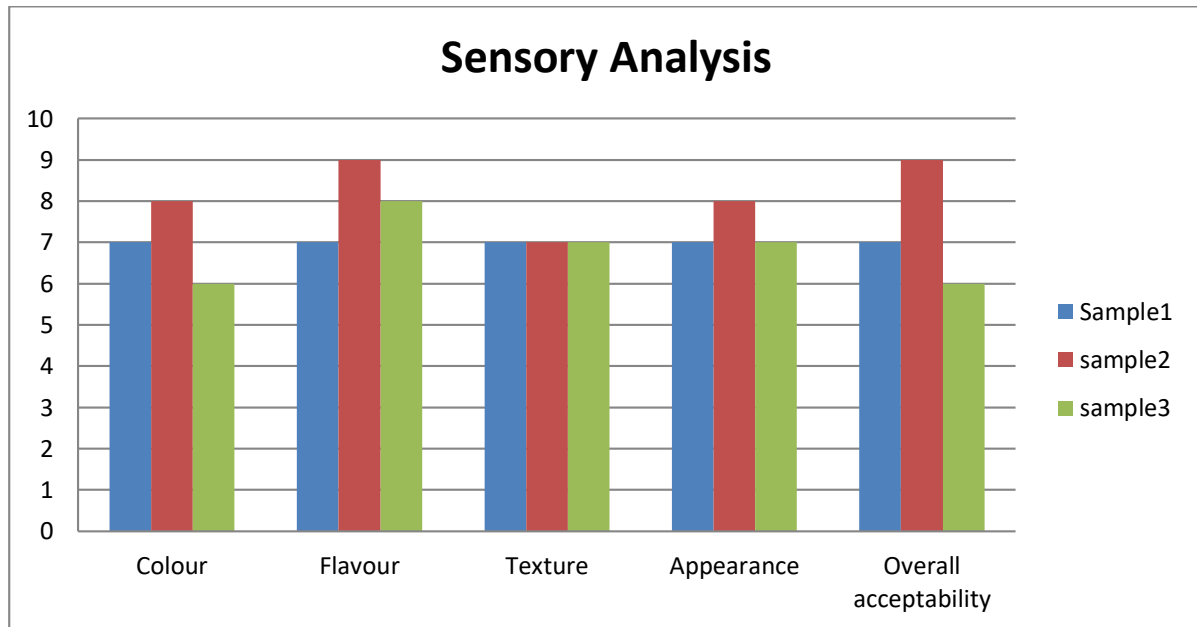


Fig 2 : Sensory Analysis

Conclusion

The formulation of paankand was done. For making of paankand we used 60 % of betel leaves (Paan) and 40 % rose petal. Sugar was used as primary component and cardamom, lemon juice were used as secondary components. We firstly did the study of physico-chemical properties of betel leaf. We studied about the moisture content, proteins, carbohydrates etc. We also studied about the microbial analysis and sensory analysis of the product. We also studied the shelf life of the paankand. Sugar syrup is used as primary ingredient including betel leaves and rose petals. Lemon juice, Cardamom is secondary ingredients. From physicochemical analysis of betel leaves we conclude the properties such as TSS, Ash content, Moisture, Protein content,. These physicochemical properties help us to standardize the process of paankand. Sensory analysis showed us the attributes about the product. It gave the idea about our product. The shelf life of betel leaves can be increased by using sugar syrup. They can be prevented upto 1 month by convert it into by product. Sensory analysis of product helps us to understand on which basis we have to do sensory analysis of product. Sensory analysis given us idea what actually panellist or customers need from our product.

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