

Quality evaluation and efficacy of products by incorporating betel leaves as a functional food

Kiran Agrahari and Anamika Pandey

The objective of present investigation “Quality evaluation and efficacy of products by incorporating betel leaves as a functional food” was to standardize and develop the products using betel leaves and their sensory evaluation. Piper betel is blessed as evergreen and perennial plant, that has God created and have given the shape of his own heart. In Ayurveda (Indian medicinal system) betel leaf is known by its Vedic name Saptasira and used as adjuvant with different medicines for voice, purifying blood, laxative and appetizer. Ascorbic acid is an excellent source of antioxidant, which helps decrease the free radicals in the body, accordingly preventing cancer. Apart from being served as a mouth freshener, betel leaf has many health benefits which also make it good for pregnant women. Developed products of betel leaves were Paan shake, mouth freshner balls. The organoleptic evaluation of products was done by using (9-point hedonic scale). The result of betel leaves based products for (Paan shake and mouth freshner balls) (T_1) were best in all treatment in case of all sensory attributes. The overall acceptability of experimental (T_1) betel leaves Paan shake, mouth freshner balls were 8.8 and 8.4, respectively. Developed products were accepted by panel members.

Key Words : Betel leaves, Functional food, Product enrichment, Product development, Antioxidant

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INTRODUCTION

The scientific name of betel vine is *Piper betel* L. belongs to the family Piperaceae, i.e. the Black Pepper family. It is originated from Malaysia and cultivated in tropical and subtropical parts of India. Due to ethno-medicinal properties, the plant is widely used in south-east Asian countries.

“In the 1980s, it was said that the betel juice caused oral cancer. The Cancer Institute’s in India attempt to show to be false this allegation, citing that it is not the betel but rather the betel quid with tobacco causing the

cancer.”

Piper betel or Betel vine deep green heart shaped vary famous leaves rich in nutrients, minerals, vitamins, antioxidants, phytochemicals (Dwivedi and Tripathi, 2014 and Sengupta and Banik, 2013). Leaves are rich in many nutrients like water, energy, protein, fats, fibre, calcium and iron etc. and the antioxidants present are flavonoids, tannins, saponins alkaloids, terpenoids etc. Piper betel helps in curing various diseases like diabetes, hypertension, brain toxin, halitosis, boils and abscesses, obesity, wound healing, voice problems, conjunctivitis, constipation, headache, hysteria, itches, mastitis, mastoiditis, leucorrhoea, ringworm, swelling of gum, rheumatism, abrasion, cuts and injuries etc. So, we have to highlight these nutrients rich betel leaves and its benefits. This paper put a light on nutraceuticals properties of betel leaves and says that cultivation and use of betel leaves should be increased to cure the diseases.

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Objective :

- To develop the products by incorporating betel leaves.
- Organoleptic evaluation of the developed products.

METHODOLOGY

The present investigation entitled “Quality evaluation and efficacy of products by incorporating betel leaves as a functional food” was carried out to standardized betel leaves based products. The study was conducted in department of food and nutrition, Faculty of Home science, Kamla Nehru Institute of Physical and Social Science, Sultanpur.

Justified, judicious and scientific methodological consideration is indispensable for any investigation to deduce meaningful interferences concerning the objectives of the study. The study design reflects to the logical manner in which units of the study of the study are assessed and analyzed for the purpose of drawing generalization. Thus, with the view of available resources, the best procedures for taking correct observation should be first sorted out in a logical manner so that unbiased interference can be drawn. This chapter delineates information pertaining to the research design and methodological steps used for investigation. The research procedures has been distinctly described as under in the following heads:

Procurement of materials:

For the present investigation material *i.e.* betel leaves was produced from the local market of Sultanpur city. The procuring was done in single a lot to avoid variation compositional differences so that the quality differences should be ruled out.

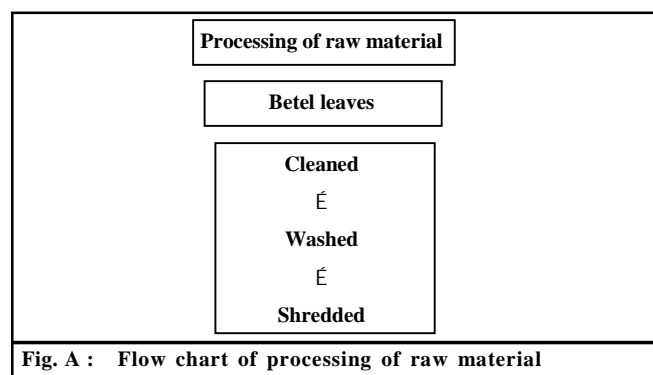


Fig. A : Flow chart of processing of raw material

Processing of raw material:

Processing of the raw material is shown by flow chart (Fig. A).

Development of betel leaves based products :**Paan Shake:**

A milkshake is a sweet, cold beverage which is usually made from milk, ice cream, or iced milk, and flavorings or sweeteners such as butterscotch, caramel sauce, chocolate syrup, or fruit syrup (Table A).

Ingredients	Amount	
	Controlled	Experimental
Betel leaves	-	3
Milk	250ml	250ml
Chocolate powder	1tbsp	1tbsp
Gulkand	-	1tbsp
Sugar	1tbsp	1tbsp

Method for preparing Paan shake:

Betel leaves were washed and chopped off from the stalk. Chopped Paan leaves, milk, gulkand paste and sugar are mixed together and blended in blender till smooth mixture. The mixture is poured into glasses and are served chilled.

Betel leaves mouth freshener balls:

Mouth freshner is a colorful Indian after-meal snack or digestive aid widely used as a mouth freshener, especially after meals. It can be made of various seeds and nuts, but often found with fennel seeds, anise seeds, coconut, and sesame seeds (Table B).

Ingredients	Amount	
	Controlled	Experimental
Betel leaves	-	4leavs
Gulkand	-	3tbsp
Desiccated coconut	¼	¼ cup
Finely chopped pitted dates	2tbsp	2tbsp
Colorful fennel seeds	2tbsp	2tbsp
Fennel seeds	1tbsp	1tbsp
Chopped almonds	2tbsp	2tbsp
Chopped cashews	2tbsp	2tbsp
Tutti frutti	2tbsp	2tbsp

Method for preparing mouth freshner balls with betel leaves :

Betel leaves were grounded and all the ingredients

i.e. gulkand desiccated coconut, finally chopped pitted dates, colourful fennel seeds, fennel seeds, chopped almonds and cashew, futti frutti were mixed with well. Balls were made using proper amount of the mixture.

OBSERVATIONS AND ASSESSMENT

The data were collected on different aspects per plan were tabulated and analyzed statistically. The result from the analysis presented and discussed chapter in the following sequence.

Calculation of nutritive value of betel leaves :

The nutritive value of betel leaves was calculated

Table 1 : Nutritive value of betel leaves (100 g)

Nutrients	Total
Energy	44kcal
Moisture	85g
Protein	3g
Fat	1g
Mineral	2g
Fibre	2g
Carbohydrates	6g
Calcium	230mg
Phosphorus	40mg
Iron	11mg

with the help of “Nutritive Value of Indian Foods” given by ICMR (2004). Table shows that the total energy, moisture, protein, fat, mineral, fibre, carbohydrates, calcium, phosphorus and iron. Value of most acceptable betel leaves was 44kcal, 85g, 3g, 1g, 2g, 2g, 6g, 230mg, 40mg, and 11mg, respectability (Table 1).

Organoleptic evaluation of betel leaves based products :

- Flavor and taste.
- Body and texture.
- Color and appearance.
- Overall acceptability.

Table 2 shows that the experimental (T₁) obtained maximum 8.7, 8.7, 8.7, and 8.8 for flavour and taste, body and texture, color and appearance and overall acceptability; while control (T₀) 8, 8, 7.8, and 8 for flavour and taste, body and texture, colour and appearance and overall acceptability, respectively. This indicated that the experimental (T₁) shake was found to be fallen under category of Liked Very Much to Liked Extremely (Fig. 1).

Suresh *et al.* (2015) conducted that with the present study, it is confirmed that commercially available yeast yields better phytochemicals than wild yeast in betel leaf

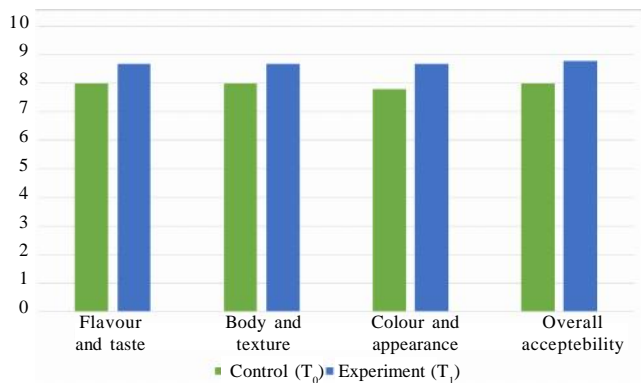


Fig. 1 : Organoleptic evaluation of betel leaves shake

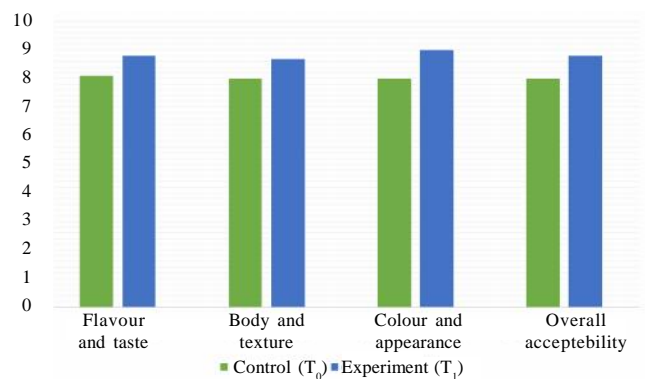


Fig. 2 : Organoleptic evaluation of betel leaf mouth freshner balls

Table 2 : Organoleptic evaluation of betel leaves shake

Product	Flavor and taste	Body and texture	Color and appearance	Overall acceptability
T ₀ – Controlled	8.0	8.0	7.8	8.0
T ₁ -Experimental	8.7	8.7	8.7	8.8

Table 3 : Organoleptic evaluation of betel leaves mouth freshner balls

Product	Flavor and taste	Body and texture	Color and appearance	Overall acceptability
T ₀ -Controlled	8.1	8.0	8.0	8.0
T ₁ - Experimental	8.8	8.7	9.0	8.4

wine production and so, betel leaf wine is suitable for consumption. Further analysis can be carried out in betel leaf wine for some more phytochemicals

Table 3 shows that the experimental (T_1) obtained maximum 8.8, 8.7, 9, and 8.4 for flavor and taste, body and texture, color and appearance and overall acceptability; while control (T_0) 8.1, 8, 8, and 8 for flavor and taste, body and texture, colour and appearance and overall acceptability, respectively. This indicated that the experimental (T_1) mouth freshener balls was found to be fallen under category of “Liked Very Much to Liked Extremely (Fig. 2)”.

Sengupta and Banik (2013) Conducted that the leaves are nutritive and contain anti carcinogens showing promise for manufacturing of a blood cancer drug. The present review aims to compile medicinal values of Piper betel generated through the research activity using modern scientific approaches and innovative scientific tools

(Hoque *et al.*, 2011).

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