

Acceptability of betel and mint leaves recipes among the population by sensory evaluation

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ABSTRACT

Betel and mint leaves are very nutritive and helpful in coping malnutrition which increases morbidity and affects adversely the physical growth and development of human beings. Green leafy vegetables are the rich source of the micro-nutrients and so the betel and mint leaves are also functional in these deficiencies because they are nutritive and easily available throughout the year at reasonable cost. Mint leaves (*Pudina*) are already popularly used in recipes but betel leaves (*Pan*) are still not a part of that. Some of recipes as Laddu, Namkeen and cutlet were prepared by using these leaves and then evaluated their acceptability among the population by sensory evaluation. In present research t-test was applied to see the significance of difference between means of two independent products *i.e.* experimental product (betel leaves) and control product (mint leaves). Results revealed that cutlets were equally accepted while betel leaves Ladoo and Namkeen were more accepted than mint leaves Ladoo and Namkeen by the population. Moreover, none of the product was rated poor or very poor on a five point scale.

KEY WORDS: Betel leaves, Mint leaves, Acceptability, Micronutrient deficiencies, Sensory evaluation

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Betel leaves and mint leaves are very nutritive and helpful in coping malnutrition which increase morbidity and affect adversely the physical growth and development of human beings. Malnutrition resulted from micronutrient deficiencies which are widespread in developing countries. Most common deficiencies are due to lack of iron (anaemia), vitamin A (xerophthalmia), iodine (goiter and cretinism) and calcium (osteoporosis). Green leafy vegetables are the rich source of these micro-nutrients and so the betel and mint leaves are also functional in these deficiencies.

Betel leaves are known to Indian culture from ages. The *Coloquial name* for betel leaves is *Paan* and its *botanical name* is *Piper betel*. Paan was invented by scholars of Ayurveda thousands of years ago with the help of Dhanvantri. Betel was found to be good for digestion. There are several kinds of betel leaves, each differing slightly in shape and efficacy according to the soil in which they are grown (Guha, 2006).

Betel leaves are highly nutritive and contain substantial amount of vitamins and minerals, especially calcium, iron, magnesium and carotene. Six leaves with a little bit of slaked lime is said to be comparable about 300 ml of cow milk particularly for the vitamin and mineral

nutrition. The leaves also contain the enzyme like diastase and catalase besides a significant amount of all the essential amino acids except lysine, histidin and arginine, which are found only in traces. A recent research carried out at the Pharmacognosy Research Laboratory, at the University of Calcutta, revealed that the betel leaf prevents degeneration of cells.

On the other hand, mint is the erect plant with dark green leaves with pleasant flavour. Mint has an important place in Indian cuisine. Researches indicate that mint oil used externally in a cold, reduce pain in cases of arthritis and chronic joint pain.

In this present study, recipes are prepared by betel and mint leaves to check the acceptability among the population by sensory evaluation because they are nutritive and easily available throughout the year.

Curative properties of betel leaves:

- Used as an aromatic stimulant and anti- flatulent.
- Beneficial in the treatment of nervous pain, nervous exhaustion and debility. Betel juice serve with a teaspoon honey is a good tonic.
- Betel leaf juice is credited with diuretic properties.
- Betel leaf has analgesic and cooling properties.

Table a: Nutritional composition of betel leaves and mint leaves			
Sr. No.	Parameters	Values	
		Betel leaves	Mint leaves
1.	Moisture	80 g	48.9g
2.	Protein	3.1g	4.8g
3.	Fat	0.89 g	0.6 g
4.	Fibre	2.3 g	2 g
5.	Carbohydrates	5.2 g	5.8 g
6.	Energy	44 kcal	48 kcal
7.	Calcium	230 g	200 g
8.	Phosphorus	40 g	62 g
9.	Iron	10.6 mg	15.6 mg
10.	Vitamin A		
	Riboflavin	0.03 mg	0.26 mg
	β- carotene	5,760 µg	1.620 µg

Shows positive result in headache.

- It is useful in pulmonary affection in childhood and old age when it soaked in mustard oil and warmed and applied to the chest to relieve cough.
- It also gives relieve in constipation.
- Beneficial in the treatment of inflammation such as arthritis.
- Betel leaves can be used to heal wounds.
- Promotes secretion of milk during lactation.
- It provides freshness to breath, and cleanses the mouth with its mild anti-infective content. Its constituents enter the blood directly from the buccal mucosa. It also helps in cutting down plaque formation on teeth.

Objectives:

- To formulate and standardise the recipes prepared from betel and mint leaves such as cutlets, namkeen and ladoos.
- To analyze the prepared recipes chemically for their nutritive value.
- To make sensory evaluation of all the recipes.

Hypotheses:

- There is no significant difference between the acceptability of betel and mint leaves cutlets.
- There is no significant difference between the acceptability of betel leaves namkeen and mint leaves namkeen.
- There is no significant difference between the acceptability of ladoos prepared from betel leaves and mint leaves.

RESEARCH METHODS

The study was conducted under the residential colony namely, Dayanand Nagar, district Ghaziabad and V.M.L.G. (P.G.) College, Ghaziabad. In present study, recipes prepared from mint leaves served as controlling purpose and recipes prepared from betel leaves served as experimental purpose. Information about nutritive value of betel leaves and mint leaves was obtained from "Nutritive Value of Indian Foods", (Gopalan, 2004). The recipes were standardised thrice and presented for final organoleptic evaluation.

The base line analysis was done for the physio-chemical characterization of the recipes. All the recipes were analyzed by the Indian Standard Method (Is 4706-part II- 1978). Chemical analysis of all the recipes was done in Food and Nutrition Laboratory of V.M.L.G. (P.G.) College, Ghaziabad. Estimation of nutrients were done by following methods- Protein estimation by Micro Kjeldal method, Fat estimation by Soxhlet method, determination of crude fibre, calories estimation by bomb calorimeter, estimation of calcium content by EDTA titrimetric method.

Organoleptic evaluation was done to assess the acceptance of recipes prepared from betel leaves as compared to the mint leaves in which consumers were asked to evaluate the products for acceptance, optimal quality or desired quantity variation. The products were evaluated for colour, texture, odour, doneness, taste, after taste and overall acceptability on a 5 point scale with the help of performa. A panel of 50 members of the teachers and students of V.M.L.G. (P.G.) College, Ghaziabad were selected for the evaluation of the food products. Sensory evaluation of prepared recipes was done by the panel of 10 teachers of M.Sc. Food and Nutrition Department. Mean, Standard deviation, t-test and percentage were used as statistical techniques to draw inferences and conclusion and to make generalizations.

RESEARCH FINDINGS AND DISCUSSION

Food products were evaluated for colour, texture, odour, doneness, taste, aftertaste and overall acceptability (Table 2). To rank the various quality attribute of the food stuffs, an ascending scale from 1 to 5 was used *i.e.* (1) very poor, (2) poor, (3) satisfactory, (4) good and (5) excellent. Table revealed that none of the products got a mean below 3.0 thus, no product was rated poor or very poor.

In present research, t-test was applied to see the significance of difference between means of two independent products *i.e.* experimental product (betel leaves) and control product (mint leaves). Table 3 shows that the calculated t-value for cutlet was 0.564 and

Table 1: Table showing nutritive value of recipes (per 100g)

Sr. No.	Nutrients	Recipes					
		Cutlets		Namkeen		Ladoos	
		Betel leaves	Mint leaves	Betel leaves	Mint leaves	Betel leaves	Mint leaves
1.	Energy (Kcal)	170.8	172.2	253	254	326.05	327.45
2.	CHOs (g)	24.08	23.97	36.46	36.35	27.165	27.06
3.	Protein (g)	6.435	7.03	14.285	14.88	7.085	7.68
4.	Fat (g)	5.45	5.38	5.51	5.58	18.53	18.46
5.	Carotene(μ g)	2038.6	589.6	2058.6	609.6	2046.55	597.55
6.	Calcium(mg)	141.95	131.45	252.7	242.2	290.9	280.4
7.	Iron (g)	5.28	7.03	7.77	9.52	5.46	7.21
8.	Fiber (g)	2.01	1.91	3.98	3.88	1.22	1.11

Table 2: Table showing the mean palatability scores for recipes

Sr. No.	Nutrients	Recipes					
		Cutlets		Namkeen		Ladoos	
		Betel leaves	Mint leaves	Betel leaves	Mint leaves	Betel leaves	Mint leaves
1.	Colour	4.5	4.4	4.84	4.64	4.48	4.36
2.	Texture	4.2	4.2	4.6	4.38	4.52	4.38
3.	Odour	4.14	4.14	4.36	4.3	4.28	4.76
4.	Doneness	4.28	4.12	4.54	4.42	4.34	4.12
5.	Taste	4.1	4.18	4.8	4.48	4.4	3.8
6.	After taste	4.12	4.22	4.54	4.08	4.3	3.76
7.	Overall acceptability	4.28	4.22	4.62	4.5	4.62	4

Table 3: Table showing the statistical values

Sr. No.	Estimated values	Cutlets	Namkeen	Ladoos
1.	Mean difference	0.02	0.214	0.394
2.	Estimated variance	0.0088	0.0188	0.0499
3.	Standard deviation	0.938	1.371	0.223
4.	Standard error	0.0383	0.518	0.08
5.	't' value	0.564	4.1	4.9

tabulated value of 't' at 0.05 level was 1.94 which was greater than calculated value. So, the Null hypothesis 1 is accepted. Thus, betel leaves cutlets are accepted like mint leaves cutlet by population. In the case of namkeen, the calculated t-value (4.1) was greater than the table value of t (1.94 at 0.05 level of significance). So, the Null hypothesis 2 was rejected. It means betel leaves namkeen was more accepted than mint leaves namkeen. It was found that the calculated 't' value of ladoos was 4.9, which was greater than the table value of t *i.e.* 1.94 at 0.05 level. The Null hypotheses 3 is rejected. Therefore, betel leaves ladoos are more accepted than mint leaves ladoos by the population.

Conclusion:

The present study was undertaken to assess the organoleptic acceptability of the food products prepared from betel and mint leaves. These green leaves are available easily throughout the year at reasonable cost. The present study

showed that the utilization of betel leaves in day-to-day life through various recipes can help to overcome deficiencies of micronutrients such as iron and calcium. As mentioned above, research carried out at the Pharmacognosy Research Laboratory, at the University of Calcutta, revealed that the betel leaf prevents degeneration of cells. It is only when chewed with tobacco they are harmful. Betel leaves are also beneficial in various diseases such as headache, arthritis, indigestion, toothache etc. Therefore, it can be state that the utilization of betel leaves is economical in reference to good health and cost also.

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