RESEARCH PAPER | Science | Volume : 5 | Issue : 10 | October 2015 | ISSN - 2249-555X

An another side of mulberry - Mulberry for human consumption

KEYWORDS: Sericulture, Mulberry, Sensory evaluation, Anti oxidation

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ABSTRACT *Mulberry leaf is commonly used for Sericulture in almost every part of the world but its potential to be utilized for human consumption is not well recognized. Recently increased concern about health has driven people to pick up foods that have functional value. Among many useful plants and herbs, "mulberry" in particular its leaf attracts people and researchers because it is known to exert medicinal effects such as depression of blood sugar level, blood pressure and cholesterol level and antioxidation action. Because of its health benefits, mulberry farming can generate income for its farmers not only through sericulture, even it can be utilized for human consumption and can generate income for the mulberry farmers. Hence the present study was undertaken to study the nutritive values of mulberry and development of commonly used Indian recipe by mixing mulberry leaf powder.*

Introduction:
Mulberry is a herb that has been exclusively used in Chinese medicine since A.D. 659. The Chinese pharmacopoeia (1985) lists the leaves, root bark, branches, and fruit as ingredients in medicinal preparations but other parts, including the sap and wood ash, are also widely used. It has been reported that mulberry leaf has very low content of lipids while it contains water Carbohydrates, Proteins and 25 different kinds of aminoacids among them Alanine, Asparaginic acid, Glutamic acid, Serine and Tyrosine which helps in blood circulation in brain. Mulberry's medicinal properties are reducing the blood serum glucose, lowering blood cholesterol and lipid levels, fighting arterial plaque, diuretic and expectorant effects. Various compounds present in mulberry has created a new dimension that it has been cultivated even for human consumption. Human beings & animals also appreciate mulberry for its fruits & leaves. Hence the present study was undertaken with the following objectives.

Objectives of the study:
- To process the mulberry leaf for consumption.
- To analyze the mulberry leaf power for its nutrient compositon.
- Formulation and Standardization of mulberry leaf powder incorporated recipes.
- Quality analysis of the mulberry based product.

Materials and Methods:
The whole study was conducted in two phases. Phase - I includes the estimation of nutrients in mulberry leaf powder per 100 gm and in the phase – II mulberry based food products were developed and are subjected to sensory evaluation and the significant different between the reference and mulberry based recipe were analyzed.

Results and Discussion:
As per the objectives of the study in phase – I 500 kg of mulberry leaves are taken and cleaned thoroughly in plain water and then water is drained completely. Mulberry leaves are dried under hot sun for a period of 10 days and the dried leaves are weighed using common balance. After drying the dried leaf are reduced to one fourth weight and weight about 125 Kg. These dried leaves are powdered in a pulverizing machine. Then the nutrient composition of mulberry leaf powder was done using various standard procedures.

Table 1: Nutrient composition of Mulberry leaf powder per 100 gm

Carbohydrates	**9.80 g**
Protein	**1.44g**
Fat	**0.39 g**
Energy	**43 Kcal**
Vitamin A	**25 IU**
Vitamin C	**36.4 mg**
Iron	**1.85 mg**
Calcium	**39 mg**
Dietary Fibre	**1.7 g**

In phase – II, mulberry leaf powder was mixed with various ingredients and is developed into s commonly used recipe like Paratha. Parathas are made using four variations of mulberry leaf powder are subjected to sensory evaluation.

Basic Paratha	Paratha Variation-1 (10 g)	Paratha Variation – 2 (20 g)	Paratha Variation – 3 (30 g)	Mulberry based Paratha
Maida – 100 g	Maida – 90 g Mulberry powder - 10g	Maida – 80 g Mulberry powder - 20g	Maida – 70 g Mulberry powder - 30g	

Sensory evaluation of Products:
Various characteristics like taste, flavour, texture, appearance and general acceptability tests were assessed using nine point hedonic scale to select one best variation from the three variations prepared. A total number of individuals who are working as teachers in a corporate school were selected and trained to judge the products as panel members.

Great food products delight many senses all at once. Sensory evaluation helps in understanding the aroma, taste,

Volume : 5 | Issue : 10 | October 2015 | ISSN - 2249-555X

color and texture of food. The sensory quality of a food product is the single most important factor influencing its success in the marketplace. One can increase the chances of a product's success in today's food and pharmaceutical markets if we understand and can measure the sensory quality of foods.

Table No 2. Sensory Evaluation of Mulberry based food product

Mulberry based food product	Type	N	Mean	Standard deviation (±)	t-value	p-value
Mulberry based Paratha	Reference	25	8.44	0.50	0.86	0.39
	Experimental	25	8.32	0.47		

In the mulberry based food product Paratha, there is no significant difference between the reference and experimental, as the $P > 0.05$.

Conclusion:

Now a days there is great demand for neutraceuticals, at this present scenario drugs made with naturally available herbs will have much positive effects. Looking at the nutrient composition and its sensory acceptance along with health benefits mulberry can be used not only in cookery but also can be used in formulating neutraceuticals wich helps in various health issues. Hence mulberry can be suggested for human consumption apart from sericulture.