ISSN:2319-2607 IISUniv.J.Sc.Tech. Vol.4(1),19-22 (2015)
RESEARCH ARTICLE

Proximate Composition Analysis of Gooseberry Fruit *(Emblica officinalis Gaertn)* and Basil Leaves (*Occium basilium*) and Development of Value Added Products by Adding Basil in Gooseberry Products

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Abstract

Gooseberry and basil are commonly available and possess a lot of cosmetic, therapeutic and culinary properties in them. Gooseberry is an excellent antioxidant; it improves digestive health, skin and hair health, good for lowering blood sugar and act as natural coolant and anti-inflammatory agents. The Basil variety *Tulsi* is a sacred herb is the Hindu religion. The objective of the study was to assess the proximate composition of Gooseberry and Basil and to develop the value added products by incorporating basil in gooseberry products. The products developed were *Murabba*, Candy, Jam and Squash. The products were evaluated for sensory quality and shelf life. The proximate composition of both gooseberry and basil was compared by standards. The cost of all the products was also calculated according to latest market price. The proximate composition of 100 gram of gooseberry was moisture (71.65%), protein (0.5%), fat (0.1%), fiber (3%), carbohydrate (13.2%) and vitamin C (605 mg). The energy content of Gooseberry was reported to be 50 Kcal. The nutritional composition of basil was moisture (80.48%), protein (4.71%), fat (0.7%), fiber (2.62%), carbohydrate (2.37%) and ash (96.51%). The results of sensory evaluation revealed that the recipes formulated by incorporating 10 g of basil in gooseberry products were highly acceptable for Jam, *Murabba* and Candy where as in case of Squash the basil was acceptable at 15 g also. The cost of all the variations of each product was Rs 40.63/kg of raw material for Jam, Rs 41.2/kg of raw material for Squash, Rs 40.81/kg of raw material for *Murabba* and Rs 35.93/kg of raw material for Candy.

Key words : *Emblica officinalis Gaertn,* Gooseberry*, Murabba, Occium basilium, Tulsi*

Introduction

Gooseberry *(Emblica officinalis Gaertn)* is one of the most important plants of Ayurved, the traditional Indian medicine (Scatezzini *et al,* 2006). The marble like emblic (*Phyllanthus emblica*), hard and sour, is valued in Asia as a thirst quencher and for its ascorbic acid content. Gooseberry is a plant that can provide complete nutrition, taken in any form, it is sour in taste but with other ingredients it becomes edible as the plant has both therapeutic and nutritional qualities. Health benefits of gooseberry include its application in absorption of minerals, detoxification, weight loss, lowering cholesterol level and blood sugar level, improves digestive health, acts as natural coolant and anti-inflammatory agent (Reddy *et al,* 2008). Researches have revealed the presence of many active nutrients including carbohydrates, protein, minerals, fiber, calcium, phosphorus, iron, vitamin C and many others. Basil is one of the herbs that have been considered as most sacred among all the herbs in India. Basil derived from Greek word 'ozo' which means 'to smell', in reference to the strong odors of the species within the genes. It is important for both culinary and therapeutic uses like in cardiovascular health, digestion, jaundice, infections, pain relief, blood circulation, eye treatment, skin care, cosmetics, anti-aging and many more. It is considered as important ingredients of the cuisines like Thai, Italian, Vietnamese and Laotian.

Materials and Method

In the present study, Gooseberry products were developed by incorporating Basil leaves in it. The products were Jam, Squash, Candy and *Murabba*. Standard recipes were followed and 3 variations were developed by incorporating basil (5-15 g) in all the products. Various proportions of basil added to developed products were 5, 10 and 15 g. The total raw material taken for preparation of Jam was 300 g, for Squash was 400 g, for *Murabba* was 260 g and Candy was 430 g to which basil leaves were added by substituting gooseberries in 3 proportions, i.e. 5, 10 and 15 g.

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Products were evaluated for sensory quality on 5 attributes (colour, flavour, taste, after taste and over all acceptability) on a 5 point rating scale (Srilakshmi, 2002) by a semi-trained panel of 10 members, selected by sensitivity threshold test. The proximate composition (moisture, total protein, fat, crude fiber, ash and carbohydrate) of Gooseberry and Basil were analyzed by standard procedures (AOAC, 2005; Raghuramulu *et al,* 2003) and vitamin C content of gooseberry was also estimated (Raghuramulu *et al,* 2003). The cost of all the developed products was also calculated based on the cost of raw materials, according to the latest market price. The shelf life of all the products was evaluated by sensory quality over a period of one-and-a-half month at an interval of 15 days.

Results and Discussion

Gooseberry was collected from the local grocery shop and basil was collected from the kitchen garden and the campus of The IIS University, Jaipur. The gooseberry and basil were washed and cleaned to remove the impurities present on them and they were cooked by various cooking processes like boiling, grinding, grating to yield a cost effective recipe. Standardization is aimed at obtaining consistently good quality outcome which means that every repetition of the procedure will result in a standard quality product. The modifications were made in the basic recipe by adding basil in variations ie 5-15 g. For Jam, weight of raw material taken was 300 g and proportion of basil was 1.6-5%. For Squash, raw weight taken was 400 g and proportion of basil was 1.25-3.75%. For *Murabba*, weight of raw material taken was 260 g and proportion of basil was 1.9-5.8%. For Candy, weight of raw material taken was 430 g and proportion of basil was 1.15-35%

Nutritional Composition

The proximate composition of gooseberry as analyzed was moisture (71.65%), protein (0.5 g), fat (0.1 g), carbohydrate (13.2 g) and fiber (3 g). The vitamin C content was estimated was 605 mg per 100 g of gooseberry and the energy content was 50 Kcal. The nutritional composition of basil was moisture (80.48%), protein (4.71 g), fat (0.7 g), fiber (2.62 g), ash (9.12%) and carbohydrate (2.37 g). The energy content of 100 g of basil was 34.62 Kcal (Table 1).

Sensory Evaluation

The results of sensory evaluation revealed that the recipes formulated by incorporation of basil in gooseberry products in different proportions (5-15 g) were equally or more liked than the standard recipes. The products developed using Gooseberry and Basil was Jam, Squash, Candy and *Murabba*. Sensory evaluation of Jam containing 10 g of Basil scored highest mean score of 4.3 and the one containing 15 g of basil had the mean score of 3.7 as compared to the standard recipe (having a mean score of 4.1). It was observed that Jam containing 5 g of basil scored slightly a higher value than the standard recipe (Fig.1). The values of mean obtained on a five point rating scale for different attributes like appearance, color, taste, after taste, over all acceptability for Squash with varied amount of Basil were S4 (having 15 g of Basil) - 4.3, S3 (having 10 g of Basil) - 4.1, S2 (having 5 g of Basil) and S1(standard) - 3.9 (Fig.2). The overall acceptability of *Murabba* varied from 3.9-4.1. The product having 10 gm of Basil had the highest overall mean score of 4.2, next acceptable product according to the panelist was M 2 (containing 5 g of basil) with 4 as an overall mean score. Least acceptable was the product in which 15 g of Basil was added whose mean score was 3.8 (Fig.3). The product C3 (having 10 g of Basil) was found to have the highest overall mean score of 4.1, indicating that the product was highly acceptable. The product C4 containing 15 g of Basil was the next acceptable product with 4 as overall mean score. Least acceptable by panel members was the products C2 with 3.9 over all mean score which had 5 g of Basil (Fig.4).

Shelf Life

Shelf life study was done over a period of $1^1/2$ month at an interval of 15 days. No change was observed in the sensory quality of the developed products. Basil is supposed to increase the shelf life of products (Anbarasu and Vijaylashmi, 2007).

Cost Analysis

The cost of all the variations of each product based on the raw material was Rs 40.63/kg for Jam, Rs. 41.2/kg for Squash, Rs. 40.81/kg for *Murabba* and Rs. 35.93/kg for Candy. The addition of basil did not increase the cost of the product as it was available in the college campus and kitchen garden (Table 2).

Results are supported by the concept that some medicinal plants and derived natural products are of great interest for developing therapeutic strategies against bone disorders, including rheumatoid arthritis and osteoporosis (Penolazzi *et al,* 2008). Gooseberry juice was blended with other fruit juices for the preparation of ready-to-serve (RTS) beverages; as it boosts the nutritional quality in terms of vitamin C content (Jain and Khurdiya, 2004). Gooseberry extracts works effectively in mitigative, therapeutic and cosmetic application through control of collagen metabolism (Fujii *et al,* 2008). During summers consumption of gooseberry and basil based Squash can provide relief to body in hot summers and act as thirst quenchers.

The bark of *P. emblica* is rich in polyphenols and its extractions have strong antioxidative and radical scavenging activity (Yang *et al*, 2009). The topical application of *P. emblica* represents a feasible and productive approach to support dermal wound healing (Sumitra *et al*, 2009). According to Penolazzi *et al*, (2008) the application of *Emblica officinalis* extracts acts as an alternative tool for therapy applied to bone diseases. The holy basil oil in suitable formulations is useful for acne skin care (Pisutthanan *et al*, 2006). The extracts of naturally available, easily cultivable *Tulsi*, increases the shelf life of products (Anbarasu and Vijaylashmi, 2007). Jyoti *et al*, (2007) suggested that the potential anti-stressor activity of *O. sanctum* is partly attributable to its antioxidant properties.

Table 1. The estimated proximate composition of Gooseberry and Basil

S. No.	Nutrients	Amount/100g	
		Gooseberry	Basil
1	Moisture	71.65%	80.48%
2	Fat	0.1 g	4.71 g
3	Protein	0.5 g	0.7 g
4	Carbohydrate	13.2 g	2.37 g
5	Fiber	3.0 g	2.62 g
6	Vitamin C	605 mg	9.12 g
7	Energy	50 Kcal	34.62 Kcal

Table 2. Cost of the Developed Value Added Products

Products	Cost (Rs./kg)
Jam	40.63
Squash	41.20
Murabba	40.81
Candy	35.93

Note: The cost of all the variations was same because basil leaves were procured from kitchen garden.

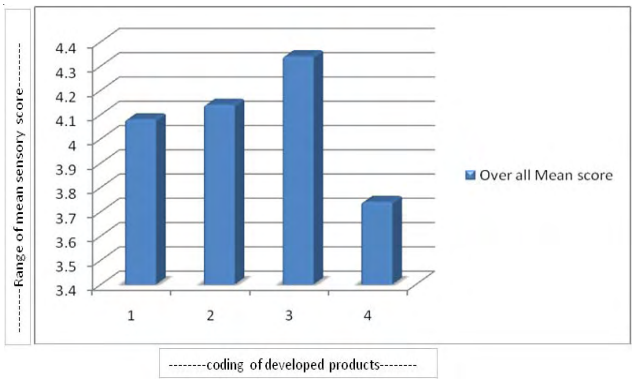

Fig1. The mean over all acceptability of value added Jam

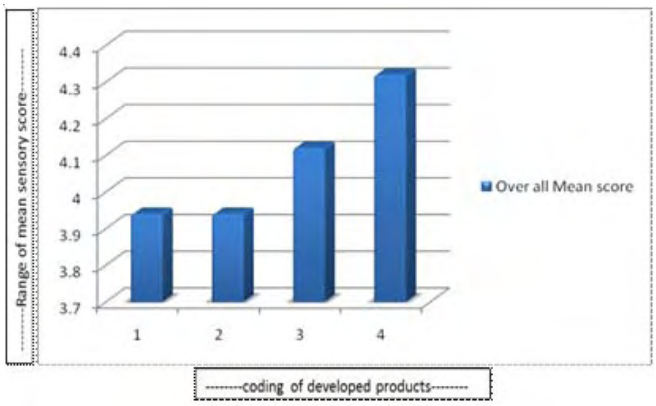

Fig.2. The mean over all acceptability score of value added Squash

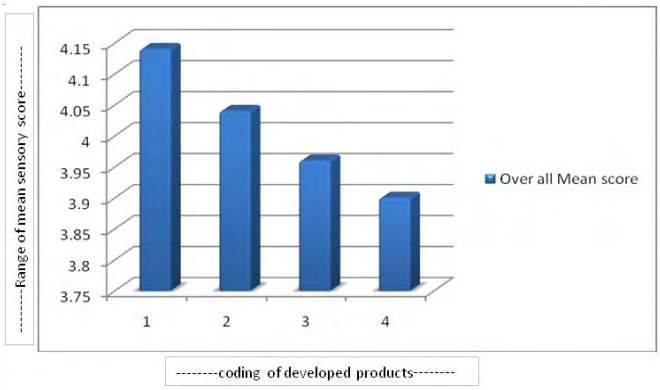

Fig.3. The mean over all acceptability of value added *Murrabba*

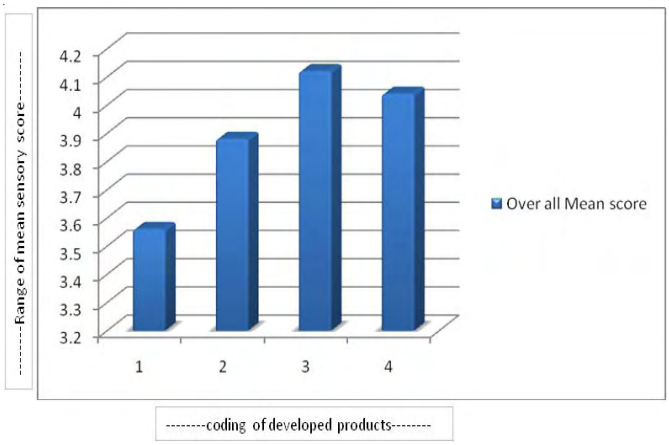

Fig.4. The mean over all acceptability of value added Candy

Conclusion

The products like gooseberry and basil Jam, *Murabba*, Squash and Candy can be relished by people of all age groups especially by children. Jam can also be consumed by spreading on bread, toast, *chapatti* and *parantha*. Consumption of nutrient dense products can help in

building the nutritional gap among children, preventing the risk of developing nutritional deficiencies. Therefore, the results of the present study clearly indicate that there is great scope of developing various value added products with gooseberry by incorporating basil as it is enhancing both the flavour and the nutritive value of the developed products. Both gooseberry and basil are nutrient rich and possess a number of therapeutic, culinary and cosmetic properties, so, an attempt was made to incorporate them and develop value added products.

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