

Original Research Article

Preparation of Value Added Food Products from Dehydrated Underutilized Hogweed (*Boerhaavia Diffusa*) Root Powder

Kumari Rosy¹, Gupta Alka²

¹Student, Foods and Nutrition, Ethelind School of Home Science, Allahabad-211007

²Assistant Professor, Foods and Nutrition, Department of Ethelind School of Home Science, SHIATS, Allahabad - 211007.

Corresponding Author: Kumari Rosy

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ABSTRACT

Boerhaavia diffusa is an important medicinal plant. It is a herbaceous member of the family Nyctaginaceae. It is widely distributed in the tropics and subtropics. It has a long history of uses by indigenous and tribal people and in Ayurvedic or natural herbal medicines. The objective of the present study is to incorporate *Boerhaavia diffusa* root powder for the development of traditional recipes as well as to evaluate organoleptic quality, and determine the nutritive value and cost of the developed products. Two different recipes "Fruit custard, and Lassi" were made by incorporating *Boerhaavia diffusa* root powder at 5 percent, 10 percent and 15 percent levels refers as T₁, T₂ and T₃ respectively and the control T₀ for all the prepared products was made without the incorporation of the *Boerhaavia diffusa* root powder. The products prepared were organoleptically evaluated for the color, texture, flavor and taste and overall acceptability using 9 Point Hedonic Scale. Lassi was the best product as compared to the Fruit custard. The data obtained during study were analyzed statistically using analysis of variance and critical difference techniques. Among the four products, the Lassi was found best nutritionally, Lassi had good nutrients such as energy, protein, and carbohydrate and vitamin were also enhanced after adding *Boerhaavia diffusa* root powder. The total cost of the prepared products ranged between Rs. 1.47 to 5.37.

Key words: *Boerhaavia diffusa*, Root powder, Product development, Sensory evaluation, Nutritive value, Cost.

INTRODUCTION

The herb is distributed throughout India. Herbs play an important role in our day to day life. Herb is a medicinal plant containing active component to inhibit the growth of microorganism where by controlling the health complaints. Ayurvedic stresses the use of plant-based medicines and treatments. Addition, fats are used both for consumption and for external use. Ayurvedic medicines are made up of a combination of herbs. ^[1] Underutilized crops are those marginalized by farmers and consumers due to agronomic, genetic,

economic, environmental and cultural reason, which were once important and major crop in the community. Highly nutritious or have medicinal properties or other multiple uses. ^[2] *Boerhaavia diffusa* is an herbaceous member of the family Nyctaginaceae. It is widely distributed in the tropics and subtropics. ^[3] The swollen tap-roots when softened by boiling are applied externally as a poultice to draw abscesses and encourage the extraction of guinea worms. Apart from this, the root of *B. diffusa* is considered to have an expectorant action and thus used in the

treatment of asthma, cough, stomach and intestinal colic, haemorrhage, oedema, anemia, jaundice, piles, rheumatism, eye disease, liver ailments, gonorrhoea, small pox, yaws, and cancer. [4,5] It has also been used as a laxative, diuretic, emetic in large doses, antivenom, and in the treatment of heart disease. [6] The root powder, when mixed with mamira (Thalictrum foliolosum), is used to treat eye diseases. It cures corneal ulcers and night blindness and helps restore virility in men. [7] The major active principle present in the roots is alkaloidal and is known as punarnavine.

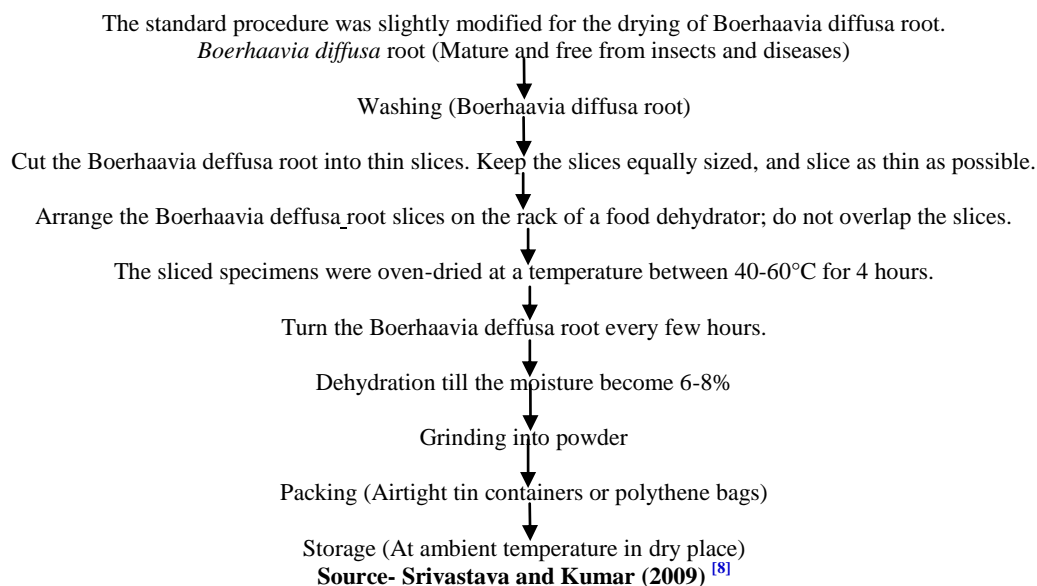
MATERIALS AND METHODS

Boerhaavia diffusa roots were obtained from the field of Sam Higginbottom Institute of Agriculture, Technology and Sciences, (SHIATS) Allahabad district, India. They were mainly found to be growing near buildings and or in hard places with cement work. The roots were subjected to a very good washing with water as much as was necessary to remove all the attached soil and dirt. After this, they were sliced to expose a greater surface area and to facilitate drying. Other ingredients for the development of the value added products like milk, fruits, suji etc. procured from the local market of the Allahabad, district (India). The standard procedure was

slightly modified for the drying of Boerhaavia diffusa root. The Boerhaavia diffusa root (Mature and free from insects and diseases) were subjected to a very good washing with water as much as necessary to remove all the attached soil and dirt. Cut the Boerhaavia diffusa root into thin slices. Keep the slices equally sized, and slice as thin as possible. Arrange the Boerhaavia diffusa root slices on the rack of a food dehydrator; do not overlap the slices for 2-6 hours. After this they were oven-dried at a temperature between 40-60°C for 4 hours. Turn the Boerhaavia diffusa root every few polythene bag and stored at ambient temperature in dry place.

Two products were prepared, namely Fruit custard and Lassi with four treatments for each of the products i.e. T₀, T₁, T₂ and T₃ and the Boerhaavia diffusa root powder were incorporated at different levels. Sensory attributes like colour, flavour, taste, texture, crispness and overall acceptability were evaluated by trained judges using 9-Point Hedonic Score Card. The panelist gives score 9-1 for the product, ranging from 'like extremely' to 'disliked extremely' to find out the most suitable composition of the prepared food products. The prevailing prices of the ingredients used in the preparation of the products were used to calculate their actual cost.

Drying process of Boerhaavia diffusa root:



Analysis of variance technique (ANOVA), CD, and other appropriate statistical test was used to analyze the data. The data obtained from sensory evaluation were statistically analysis of variance technique (one way classification). Significant difference the treatments was determined by using CD (critical difference) test.

RESULTS AND DISCUSSION

Fig 1.2 shows the sensory evaluation of *Fruit custard* with the incorporation of *Boerhaavia diffusa* root powder showed that the overall acceptability was highest in T₁ (Milk with Fruits + *Boerhaavia diffusa* root powder, 80:15:5) scored (8.44) followed by T₂ (75:15:10) scored (7.5), T₃ (70:15:15) scored (7.37) respectively and there was a significant difference, between the three treatments. Similar results were also reported by Srivastava *et al* (2013) [7] the data shows that the highest score of in kheer prepared from the blend of standard Miik

and Soya milk was obtained 7.56 for Treatment T₂ in Kheer were followed by the T₁ (7.52), T₄ (7.16). The lowest average score of 7.04 was recorded for T₃.

Boerhaavia diffusa root powder incorporated in the Lassi showed that T₁ (Curd with Sugar+ *Boerhaavia diffusa* root powder, 70:25:5) (9:00) had the highest score followed by T₂ (65:25:10) scored (7.98) and T₃ (60:25:15) scored (7.97) respectively (Fig 1.3). The treatments were liked moderately by the panel of judges. There was a significant difference between the three treatments Similar result was also reported by Prakash *et al* (2013) [9] the data shows that in the case of "Banana Milk Shake" and "Mango Lassi" incorporated with *Ashwagandha* roots powder treatment T₁ scored the best in colour and appearance, consistency, taste and flavour and overall acceptability. But in case of "Pineapple Drink" T₀ scored the best in consistency and overall acceptability.



Fig. 1.1 Root of *Boerhaavia diffusa*
Source :- trade.indiamart.com [10]

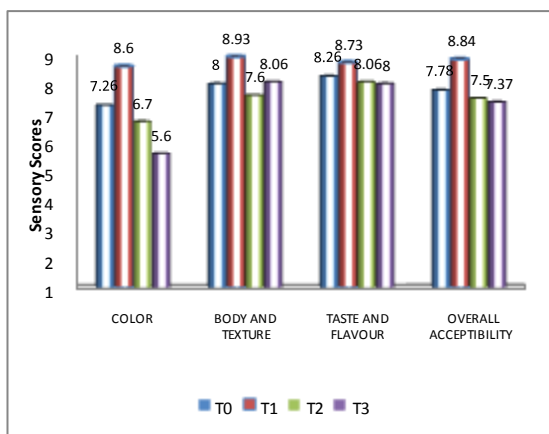


Fig. 1.2 The effect of incorporation of *Boerhaavia diffusa* root powder at different levels on Fruit custard

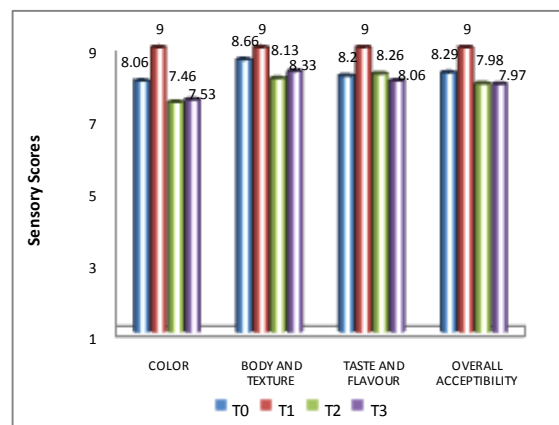


Fig. 1.3 The effect of incorporation of *Boerhaavia diffusa* root powder at different levels on Lassi

Table 1 Shows the With regard to nutrient content of the best treatment of the products on the basis of sensory evaluation T₁ (Milk with Fruits + Boerhaavia diffusa

root powder, 80:15:5) scored (8.44) for Fruit custard and T₁ (Curd with Sugar+ Boerhaavia diffusa root powder, 70:25:5) scored (9:00) for Lassi.

Table 1: Percentage of nutrients in control and treated sample Boerhaavia diffusa root powder (per 100g).

Product and Treatments	Nutrients contents in prepare food products					
	Energy (Kcal)	Protein (g)	Fat (g)	Fibre (g)	Calcium (mg)	Phosphorus (mg)
Fruit Custard						
T ₀	47.57	7.3	15.09	0.03	108.67	79.85
T ₁	47.69	7.37	15.1	0.05	133.77	80.65
T ₂	47.91	7.45	15.12	0.07	158.87	81.45
T ₃	48.08	7.52	15.13	0.09	183.97	82.25
Lassi						
T ₀	67.6	2.5	3.2	0.02	121.16	39.50
T ₁	68.12	2.39	2.82	0.04	134.1	67.15
T ₂	66.74	2.44	2.64	0.065	162.05	68.10
T ₃	65.36	2.48	6.15	0.085	185.7	74.6

Table 2: Cost of the Prepared Products on the basis of raw materials Cost of the products in Rupees of the Fruit custard and Lassi

Developed product	T ₀	T ₁	T ₂	T ₃
	Rs	Rs	Rs	Rs
Fruit custard (100g)	5.37	5.18	4.99	4.80
Lassi (100g)	1.92	1.84	2.92	3.62

Table 2 Shows the Cost of the products based on the raw materials; Average cost of the fruit custard per 100gm was T₀ control Rs. 5.37, T₁ Rs. 5.18, T₂ Rs.4.99 and T₃ Rs. 4.80. Average cost of the Lassi per 100gm was T₀ control Rs.1.92, T₁ Rs. 1.84, T₂ Rs.2.92 and T₃ Rs. 3.62.

CONCLUSION

From the results, it can be concluded that Incorporation of Boerhaavia diffusa root powder in products like Fruit and Lassi is well acceptable. The product prepared by the incorporation with Boerhaavia diffusa root powder, Fruit Custard was rich in Fat. Lassi was found rich in Calcium content. Fat and Calcium was found highest in Fruit custard. The total cost of the prepared products ranged between Rs. 1.47 to 5.37.

REFERENCES

1. Kukreja,V, Shahani S., Fernandez, A, Maroli S, and Datye S. "Efficacy of Lactwell-A herbal formulation, as a galactogogue, Medicinal and Aromatic plant abstract, vol. 23 No.4. 441.
2. IPGRI. *Neglected and underutilized plant species: Strategic Action Plan*

of the International Plant Genetic Resources Institute. International Plant Genetic Resources Institute. ISBN 92-9043-529-1. 2002; Retrieved 21 August 2013.

3. CSIR. *The Wealth of India: Raw Materials Vol. VII B.* CSIR, New Delhi, India.1988; p. 174.
4. Bakhru HK. *Herbs that heal: natural remedies for good health.* Orient Paperbacks, New Delhi. 1992;
5. Leyon PV, Lini CC, Kuttan G. Inhibitory effect of *Boerhaavia diffusa* on experimental metastasis by B16F10 melanoma in C57BL/6 mice. *Life Sciences* 76(12): 2004; 1339-1349.
6. Chikere, Nwakanma NM, Okoli BE. Cytological effects of the root extracts of Boerhaavia diffusa on root tips of *Crinum jagus*, *EurAsia J BioSci* 4, 2010; 105-111.
7. Srivastava A G, Verma A and Neerubala. Studies on organoleptic quality of kheer prepared from the blend of standard milk and soymilk. *The Allahabad Farmer Vol. LXIX, July – 2013; No. 1.*
8. Srivastava R.P. and Kumar S. *Fruit and vegetable preservation*, 3rd edition, International Book Distributing Co. 2006; Pg. 144.
9. Prakash DR, Ranu P, Bhavna G and Shruti. Preparation of Healthy beverages by incorporating

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