



# **Development and Organoleptic Evaluation of Vegan Honey Tender Bamboo Shoots Murabba**

**Koushki Devi <sup>a++\*</sup> and Neetu Singh <sup>a#</sup>**

<sup>a</sup> *Department of Food and Nutrition, School of Home Science, Babasaheb Bhimrao Ambedkar University, Lucknow-226025, Uttar Pradesh, India.*

## **Authors' contributions**

*This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.*

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## **ABSTRACT**

The aim of this study was to make a Bamboo Shoots (*Phyllostachys edulis*) are regarded as one of the beneficial health foods due to their high protein, carbohydrate, vitamin, fiber, and mineral composition and very low fat content. In the current study, "Value of tender bamboo shoots murabba with cinnamon, cardamom, lemon, vegan honey, jaggery," vegan honey bamboo murabba was made in the food science and technology laboratory of the department of food and nutrition at Babasaheb Bhimrao Ambedkar University in Lucknow. Five different preparation methods for the vegan honey bamboo murabba. This research sought to determine whether vegan honey bamboo murabba was acceptable based on a sensory evaluation test completed at BBA University in India. Tender bamboo shoots, jaggery, vegan honey, cinnamon, cardamom, ginger, juice, lemon juice, and water made up the basic ingredients for bamboo murabba. These ingredients were combined, dissolved, condensed, and made to an 80°C (about 50°C) jaggery content. In a glass container, bamboo that had been heated to 50°C was placed. This sample was

<sup>++</sup> PG Scholar;

<sup>#</sup> Associate Professor;

\*Corresponding author: Email: [kaushikidevi432@gmail.com](mailto:kaushikidevi432@gmail.com);

referred to as a cold-packed bamboo murabba. In order to sterilize it, the hot-pack murabba was heated on low temperature for 20 minutes. The bamboo was sterilized after 20 minutes and allowed to settle at room temperature. The sample that underwent sterilization was referred to as a heated murabba. Each sample was assessed using a Murabba sample, which was graded on a 9-point hedonic scale for flavor, smell, texture, appearance, and general acceptances in the sensory test. The color, sweetness, acidity, taste, and flavor of each sample were also assessed.

**Keywords:** *Tender bamboo shoots; vegan honey; tender bamboo shoots murabba; organoleptic evaluation; vegan honey tender bamboo shoots murabba.*

## 1. INTRODUCTION

The bamboo, a member of the Poaceae family of forest tree grasses, is thought to be one of the most beneficial and versatile species. There are more than 1250 different species of bamboo, however most of them are found in Southeast Asia. Because of their high levels of protein, carbohydrates, vitamins, fiber, and minerals, as well as their comparatively low levels of fat, bamboo shoots are recognized as one of the healthiest foods. Despite the fact that bamboo shoots have a number of nutritional benefits, most countries in Southeast Asia and East Asia only occasionally eat them. Bamboo is most frequently consumed as food in the Northeastern area of India, where it is a crucial ingredient in many local cuisines. Fresh bamboo shoots are among the most often consumed traditional dishes among the many ethnic groups shoot [1]. In some species, the leaves that shield the shoots are colored black, brown, yellow, or purple and have little hairs on them. Tender bamboo has a sharp flavor and an acerbic appearance similar to coil springs. They typically wear specialized clothing called Culm sheaths, which are frequently multicolored when young and serve as protection. If prepared on the day of harvest, the white meat, which is visible once the Culm sheath is removed, becomes yellow when cooked and is incredibly delicious (Jatindra K Sahu 2010). Bamboo shoots are low in fat and high in proteins, dietary fibers, minerals, and vitamins (Choudhury et al. 2012). Veganism is a style of life devoid of any kind of animal exploitation or suffering, according to Donald Watson's 1944 definition. Plants, fruits, and roots are used to make vegan honey. With this technique, bees are not utilised. We harvested pollen and nectar from the plants. Bees are not harmed during the development of this method. We only use raw sugar/jaggery or other sweeteners, organic plants, fruits, and pure water. No colorants, flavors, or preservatives are added. You get everything straight from the plants. In order to improve vegan honey and

provide health benefits comparable to those of genuine honey, spices are also used as flavoring agents. A development in the manufacture of animal-free goods is vegan honey [2-5]. Use of jaggery is highly valued in Indian culture. Eating jaggery provides a variety of health benefits. It is recognized as a natural sweetener. In our present age of modernism, sugar has largely taken the role of jaggery, especially in cities, although this is still consumed in almost every household in our villages. Sugar has no good impacts and is harmful to your health. While sugar is unhealthy for us, it is good for us. Ayurveda claims that a person can avoid numerous diseases by taking a small amount of jaggery each day. Jaggery use increases as soon as winter arrives. But in actuality, we should eat it all year long. You eliminate numerous illnesses by consuming it. The antioxidant flavonoids and vitamin C found in lemons are excellent sources. Free radicals can damage cells, therefore antioxidants help the body get rid of them. In addition to enhancing health and wellbeing, these vitamins and minerals can also offer illness prevention. The eating of lemons may have some of these benefits. Lemons are an extremely bright yellow citrus fruit. Both culinary and therapeutic uses are possible for lemon juice. Lemons are a common ingredient in drinks, sauces, dips, and sweets all around the world. Cinnamon is one of the most important spices that people use on a daily basis. At the Cinnamon primary ingredients are its essential oils and a number of compounds, including cinnamaldehyde, cinnamic acid, and cinnamate. In addition to being an antioxidant and an anti-inflammatory, cinnamon has been demonstrated to lower cholesterol and the risk of cardiovascular disease. It is also thought to have preventive benefits against neurological illnesses such as Parkinson's and Alzheimer's. Cardamom is known as the "queen of spices" because of its alluring aroma, versatility in flavoring food and beverages, and significant use in traditional regional remedies. Cardamom is a spice that is

used in the food industry to flavor meats, baked foods, soups, fruit products, jellies, and pickles. Depending on the recipe, it can be used as seeds, pods, or powdered seeds in quantities that are frequently weighed out by the teaspoon to flavor both sweet and savory dishes. Half a teaspoon (Keith Singletary, PhD 2004).

## 2. MATERIALS AND METHODS

### 2.1 Collection of Material

The samples used for the research work were Apple fruits, Jaggery, Spices i.e. Ginger, Cinnamon and lemon market of purchased from local market of BBAU Gate no -1, Lucknow, UP, India. The *Dendrocalamus strictus* sample's edible shoots were procured from local sources in the Indian village of Muda Neemgaon, in the district of lakhimpur kheri, in the state of Uttar Pradesh. 2 week after collection, the samples were brought to the lab. The shoots underwent defoliation and washing in the lab. After the undesirable components were eliminated, the soft, palatable sections were used for further processing.

### 2.2 Preparation of Vegan Honey

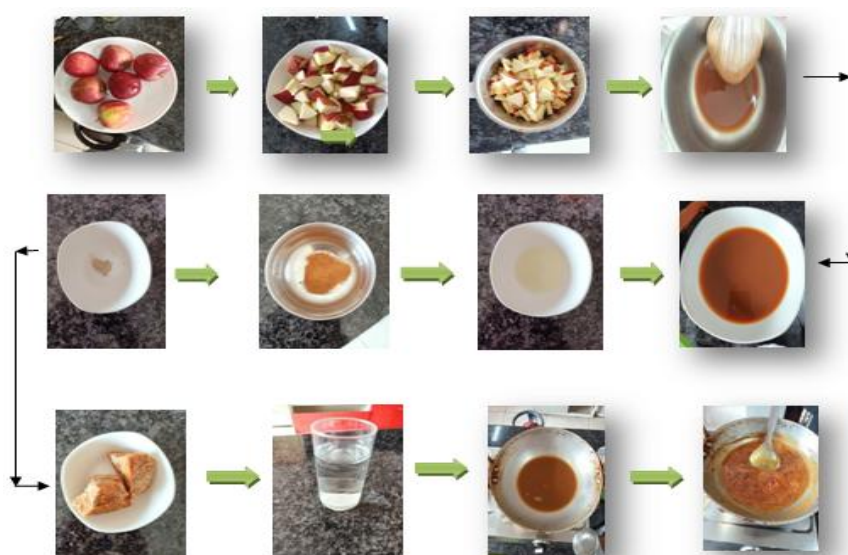
Fruit of the apple that was used to conduct this study. The market was visited to choose some fresh apple fruit. Fruits that were rotten, infected, or damaged were rejected after sorting. To

remove dirt, the apple fruits were properly washed in clean water. Damaged and discolored fruit portions were removed and turned into juice and other items [6-8]. The apple was peeled, chopped, and ground. A muslin cloth was used to filter it, and the juice was then taken from it. At the School of Home Science at Babasaheb Bhimrao Ambedkar University in Lucknow Department of Food and Nutrition's Food Science & Technology Laboratory created apple-cinnamon vegan honey. 100 g of the controlling amount are ready First, raw materials are prepared other words, apple juice, lemon juice, and cinnamon powder. Following the heating of 250g of apple juice over a medium flame, the remaining components were added. Including 20 ml of lemon juice, 250 g of jaggery, and 2.5 g of cinnamon powder. All ingredients are properly combined in apple juice during cooking with the use of a ladle. The substance is boiled until it has been reduced by half, and a single-stage thread test can reveal the final product. Poured into a sterilized glass container after cooling for 2 to 5 minutes [9-12].

### 2.3 Location of the Study

The preparation of bamboo murabba was carried out in the Food Science & Technology laboratory, Department of Food and Nutrition, School of Home Science, Babasaheb Bhimrao Ambedkar University, Lucknow, in addition to completing all the study's [13].

### 2.4 Preparation of Vegan Honey



**Fig. 1. Flowchart for making of vegan honey**



**Fig. 2. Flowchart for making of vegan honey**

## **2.5 Preparation of Bamboo Murabba**

Took fresh bamboo shoots and then cut them after being sliced into circular pieces, the shoots were rinsed under running water to remove any debris or extra portions. The bamboo shoot pieces were blanched for 30 minutes with water changes every 10 minutes. Blanched pieces were boiled into metal sheets to let the excess water evaporate [14,15].

## **2.6 Tender Bamboo Shoots Vegan Honey Murabba**

### **2.6.1 Murabba production**

Murabba was cooked using the bamboo shoots was boiled then started cooking with jaggery then they includes vegan honey, jaggery,

Cinnamon powder, Cardamom powder, Ginger juice, Lemon juice, Water. The mix was cooked at medium temperature on 15 minutes, then chilled and depend an additional minutes.

## **2.7 Sensory Evaluation**

When the vegan honey bamboo shoot murabba sample was prepared, the sensory evaluation took place five hours later. 40 untrained students from Babasaheb Bhimrao Ambedker University lucknow composed the sensory panel [16-18]. Murabba sample was evaluated on a 9-point hedonic scale for flavor, scent, texture, appearance, and over all acceptances. Since the 9-point hedonic scale demonstrates and explained the level of consumer acceptability and pleasure. The hedonic rating card that is displayed in the table was handed to them.





**Fig. 3. Tree of tender bamboo shoots**



**Fig. 4. Tender bamboo shoots**



**Fig. 5. Fresh bamboo shoots after defoliation of outer covering and rinsing with running water**



**Fig. 6. Fresh bamboo shoot pieces after cutting**

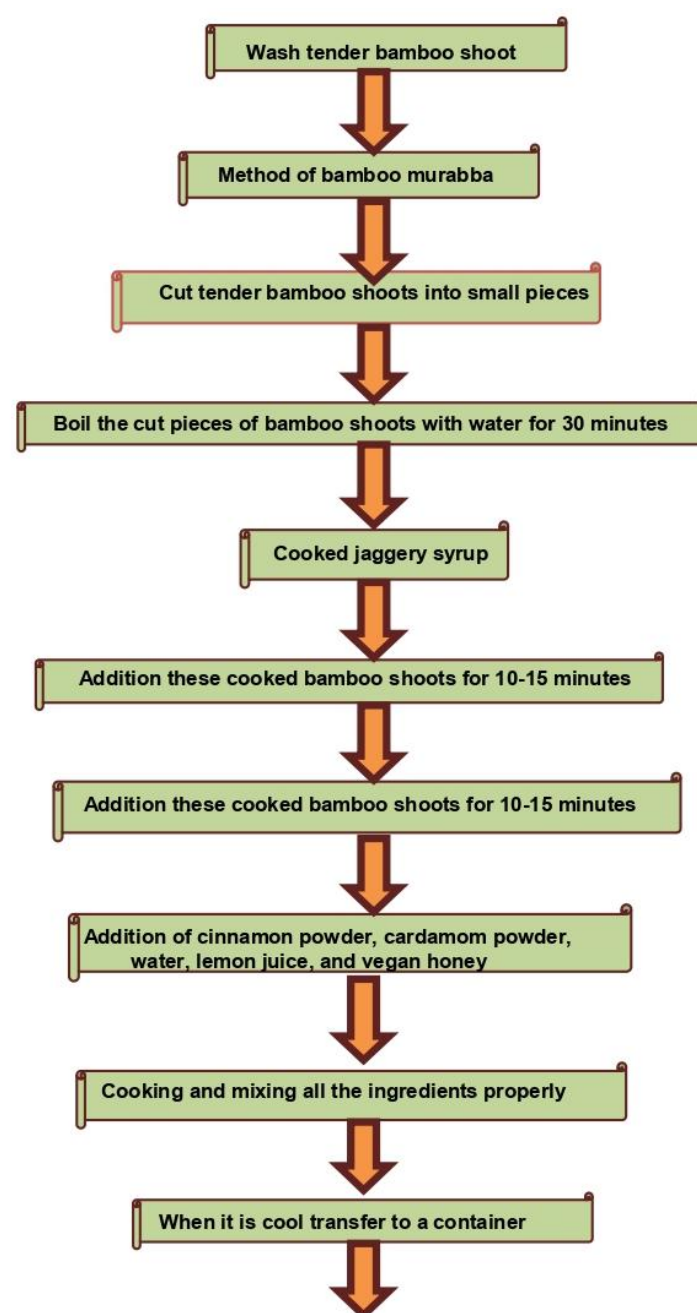


**Fig. 7. Vegan honey bamboo murabba**

### **3. RESULTS AND DISCUSSION**

The Development of Vegan Honey Tender Bamboo Shoots Mursbba. This includes ingredients vegan honey, jaggery, Cinnamon powder, Cardamom powder, Ginger juice, Lemon juice, Water. The prepared of bamboo murabba. These ingredients were combined, dissolved, condensed, and made to 80°C (about 50°C) jaggery content. In a glass container, bamboo that had been heated to 50°C was placed five different preparation methods for the vegan honey bamboo murabba. This research sought to determine whether vegan honey

bamboo murabba was acceptable based on a sensory evaluation test completed at BBA University in India. Displays the percentage of scores for the sensory evaluation of the control ingredients, T5, T4, T3, T2, and T1 samples. The sample T5 that contained Tender bamboo shoots 54%, Jaggery 22%, Vegan honey (gm) 22%, Cinnamon powder(gm) 2.05%, Cardamom powder (gm) 2.80%, Ginger juice(ml) 14.05%, Lemon juice (ml) 8.0%, and Water (ml) 1.9% received the highest ratings for appearance, smell, taste, texture, and overall acceptance in general [19-22].



**Fig. 8. Flowchart for making of vegan honey bamboo murabba**

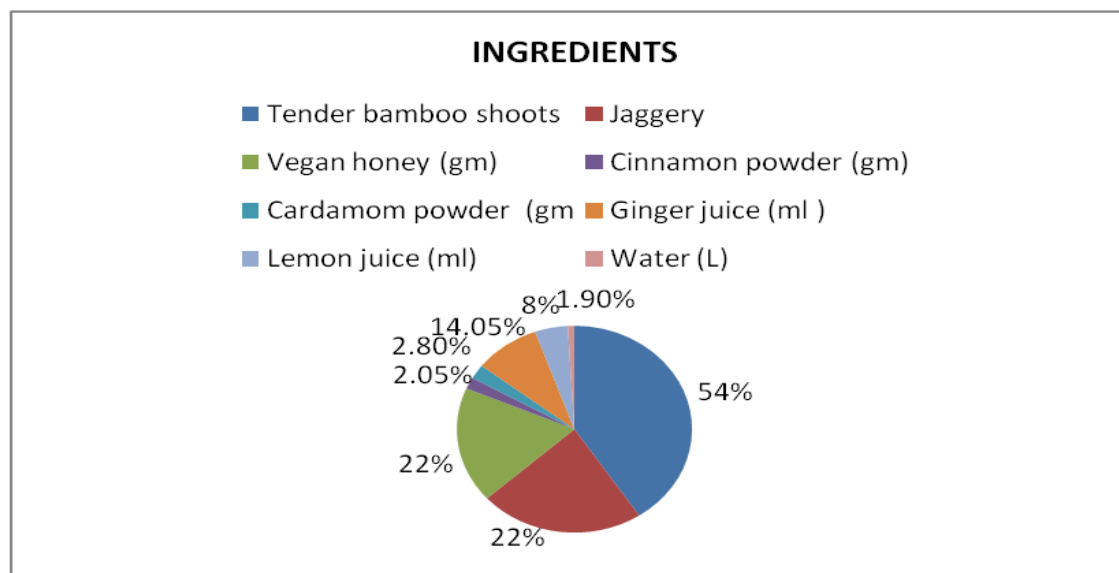
**Table 1. Approximate of ingredients composition of tender bamboo murabba**

Bamboo murabba	Ingredient							
	Tender bamboo shoots (gm)	Jaggery (gm)	Vegan honey (gm)	Cinnamon powder (gm)	Cardamom powder (gm)	Ginger juice (ml )	Lemon juice (ml)	Water (ml)
<b>Control 100</b>	—	—	—					
<b>T1</b>	45	25	20	2	2.5	10	5	1
<b>T2</b>	50	25	25	2	2.5	15	5	1
<b>T3</b>	55	25	20	2	3	15	10	2.5
<b>T4</b>	60	20	20	2	3	15	10	2.5
<b>T5</b>	60	15	25	2	3	15	10	2.5
<b>Total</b>	270	110	110	10	14	70	40	9.5
<b>Percentage</b>	54.0 %	22.0%	22.0%	2.05	2.80%	14.05	8.0%	1.9%

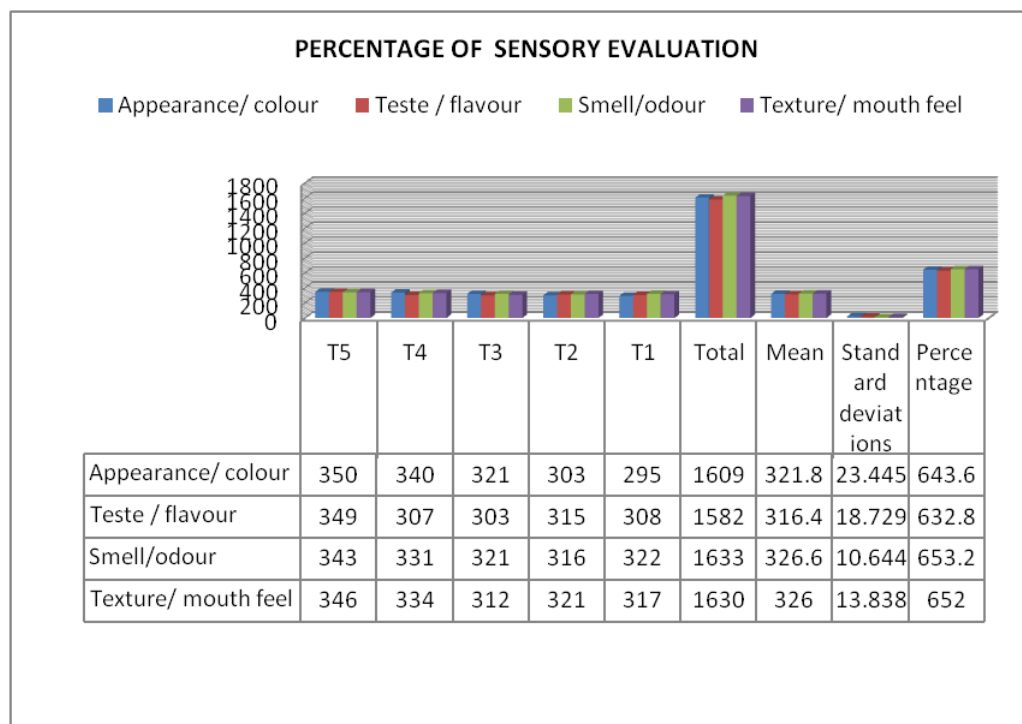
**Table 2. Sensory evaluation of total 40 penal list**

Sample	Appearance/ colour	Teste / flavour	Smell/odour	Texture/ mouth feel
T5	350	349	343	346
T4	340	307	331	334
T3	321	303	321	312
T2	303	315	316	321
T1	295	308	322	317
<b>Total</b>	1609	1582	1633	1630
<b>Mean±SD</b>	321.8±23.44	316.4±18.72	326.6±10.64	326±13.83
<b>Percentage</b>	643.6%	632.8%	653.2%	652%





**Fig. 9. Pie representation of ingredients composition of tender bamboo murabba**



**Fig. 10. Graphical representation of sensory evaluation**

Displays the percentage of scores for the sensory evaluation of the control ingredients, T5, T4, T3, T2, and T1 samples. The sample T5 that contained Tender bamboo shoots 54%, Jaggery 22%, Vegan honey (gm) 22%, Cinnamon powder (gm) 2.05%, Cardamom powder (gm) 2.80%, Ginger juice(ml ) 14.05%, Lemon juice (ml) 8.0%, and Water (ml) 1.9% received the highest ratings for appearance, smell, taste, texture, and overall acceptance in general.

Displays the percentage of scores for the sensory evaluation of the appearance/colour, test/flavour, smell/ odour, texture/mouth feel. Control ingredients, T5, T4, T3, T2, and T1 samples. The sample T5 that contained appearance/colour 643.6%, test/flavour 632.8%, smell/ odour 653.2%, texture/mouth feel 652% received the highest ratings for appearance, smell, taste, texture, and overall acceptance in general.

#### 4. CONCLUSION

Bamboo shoots with vegan honey as a value-added product Childhood height may be increased by murraba, and old people can aid to normalise bone-aging pain. The unique quality of this bamboo murabba is that it aids in the relief of bodily joint issues. The fact that we made this murabba at our home is also quite advantageous. Eating bamboo with the food you eat has several health benefits, including improving immunity, protecting against bacteria and viruses, reducing weight, increasing height, improving heart health, building up the body's strength and preventing fatigue and laziness, among countless other advantages. By incorporating vegan honey into our product, we are attempting to boost the nutritional benefits of bamboo murabba. By adding value to vegan honey easy bambo shoots murraba, farm women can make money. The use of the murabba bamboo stalk can expanded among bigger can populations and utilised to fortify food products. It is necessary for researching further nutritional properties of bamboo shoot murabba.

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#### COMPETING INTERESTS

Authors have declared that no competing interests exist.

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