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## The nutritional and therapeutic role of bamboo shoots in Assamese food culture

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### Abstract

Bamboo shoots the young edible sprouts of various bamboo species which are commonly called as *Bahgaj* or *Khorisa* in Assam represent a vital component of the region's food culture. Bamboo shoots hold a significant place in Assamese food culture, both nutritionally and therapeutically. In Assamese food culture, bamboo shoots are not only valued for their nutritional content but also for their unique flavor profile that enhances various dishes while providing health benefits. Rich in essential nutrients such as vitamins, minerals, and dietary fiber, bamboo shoots contribute to a balanced diet and promote overall health. The consumption of bamboo shoots is linked to various health benefits such as improved digestion, anti-inflammatory effects, and potential cancer-fighting properties due to their antioxidant content. Furthermore, the medicinal properties of bamboo shoots contribute to better digestion and a stronger immune system. In traditional medicine, bamboo shoots are recognized for their anti-inflammatory properties and potential to lower cholesterol levels. They are also believed to have antimicrobial effects, which may help in preventing infections. The presence of phytochemicals like flavonoids enhances their therapeutic profile, making them valuable not only as food but also as a natural remedy for various ailments. Their integration into daily meals not only reflects the cultural heritage of Assam but also underscores the significance of local ingredients in promoting overall health and wellness. This article intends to offer an in-depth analysis of bamboo shoots, illustrating their importance as a food source and their integral role in fostering the health and vitality of Assamese cultural heritage.

**Keywords:** Bamboo shoot, *bahgaj*, *khorisa*, traditional medicine, natural remedy

### Introduction

Bamboo shoots, the tender young sprouts of bamboo plants hold a significant place in the culinary landscape of Assam, a northeastern state in India. Known for their unique flavor and crunchy texture, bamboo shoots are not only a staple ingredient in Assamese cuisine but also embody a rich cultural heritage that intertwines with the region's agricultural practices and traditional knowledge systems. The nutritional profile of bamboo shoots is impressive; they are low in calories yet rich in essential nutrients such as dietary fiber, vitamins (notably B vitamins), and minerals like potassium and magnesium <sup>[1]</sup>. This nutritional density makes them an excellent addition to a balanced diet. In Assamese food culture, bamboo shoots are often incorporated into various dishes, ranging from curries to pickles, showcasing their versatility. They are typically harvested during the monsoon season when they are at their peak freshness and flavor. Beyond their culinary applications, bamboo shoots have been recognized for their therapeutic properties within traditional medicine practices. They are believed to possess anti-inflammatory, antioxidant, and antimicrobial properties contributing to overall health and well-being <sup>[2]</sup>. The integration of bamboo shoots into Assamese cuisine is not merely about sustenance; it reflects the community's deep-rooted connection to nature and sustainable living. The harvesting of bamboo shoots is often done sustainably, ensuring that this valuable resource continues to thrive for future generations. Furthermore, the preparation methods employed by local communities highlight an intricate understanding of food preservation techniques that enhance both flavor and nutritional value. The therapeutic applications of bamboo shoots are not a recent discovery; they have been part of traditional Assamese medicine for generations. Local communities have long relied on bamboo shoots for their medicinal properties to manage various ailments, including digestive issues, inflammation, and infections. As global interest in natural and traditional medicine grows, the therapeutic role of bamboo shoots, as seen in Assamese culture, offers valuable insights into how these age-old

practices can contribute to modern health paradigms. The purpose of this article is to investigate the various dimensions of bamboo shoots in Assamese gastronomy, emphasizing their nutritional value, medicinal qualities, culinary functions and cultural importance.

### 1. Plant Profile

Bamboo plants belonging to the family Poaceae which is classified as a grass rather than a tree is a significant component of the flora in Assam, India. The region's diverse climatic conditions and rich biodiversity create an ideal environment for various species of bamboo to thrive. It is characterized by its rapid growth and the ability to thrive in a wide range of climatic conditions. The plant is distinguished by its jointed stems, known as culms, which are hollow, woody, and cylindrical. These culms can vary greatly in size and color, depending on the species. Bamboo is not only ecologically important but also holds cultural and economic significance for the local communities. Bamboo plays a crucial role in maintaining ecological balance. It acts as a soil stabilizer, preventing erosion due to its extensive root system. The dense growth of bamboo can also help in conserving moisture and improving soil fertility through leaf litter decomposition. Additionally, bamboo forests provide habitat for numerous wildlife species, contributing to biodiversity conservation.

#### • Growth Pattern

Unlike various bamboo species that tend to spread via underground rhizomes, Assam bamboo primarily develops in clusters which simplifies sustainable harvesting practices. This growth pattern is beneficial for multiple reasons such as it promotes efficient resource sharing among closely grouped plants and offers structural resilience against wind and heavy rainfall, conditions frequently encountered in the region. The growth pattern is also influenced by seasonal changes in Assam<sup>[3]</sup>. During the monsoon season the plants experience vigorous growth due to increased rainfall and humidity while during the dry months their growth slows significantly as they enter a period of dormancy.

#### • Leaf and Root System

The leaves of the Assam bamboo are lanceolate, measuring approximately 15-30 cm in length and 2-4 cm in width. The leaf blades are thin and elongated, allowing for efficient light capture while minimizing water loss through transpiration. The leaf structure is well adapted to the humid climate of Assam, where this species thrives. The root system of the Assam bamboo is characterized by its fibrous nature, which allows for extensive anchorage and stability in the soil. The roots spread horizontally and can penetrate deeply into the ground, facilitating nutrient uptake and water absorption. This extensive root network also plays a crucial role in preventing soil erosion, particularly in hilly terrains where bamboo is commonly found.

#### • Flowering Cycle

The flowering cycles of the Assam bamboo plant have a unique flowering cycle that varies from species to species. Typically, bamboo species have a flowering cycle that can range from several years to several decades, depending on the species. In the case of Assam bamboo, it is known to flower gregariously every 40 to 50 years. Species such as *Bambusa balcooa* and *Dendrocalamus hamiltonii* are characterized by a unique phenomenon known as gregarious flowering. This

occurs when large populations of bamboo flower simultaneously after a long period, which can range from several decades to over a century. The flowering cycle is typically followed by the death of the parent plants, leading to a regeneration phase where new shoots emerge from the ground. This unpredictable flowering cycle adds an element of ecological interest and challenges for bamboo management.

#### • Shoot Growth

Bamboo plants of Assam exhibit a rapid shoot growth due to their unique rhizome-dependent system. The shoots emerge from the ground at their full diameter and can grow significantly within a short period, often reaching heights of up to 91 centimeters (36 inches) in just 24 hours under optimal conditions. This growth typically occurs during the wet season when environmental conditions are favorable<sup>[4]</sup>. During the initial stages of growth bamboo shoots can grow several centimeters per day, reaching heights of up to 30 meters in mature plants. This rapid growth is attributed to the unique structure of bamboo, which allows it to expand quickly without the need for extensive root systems. The shoots are typically harvested when they are young and tender, as this is when they possess the best flavor and nutritional value.



Fig 1: *Bambusa tulda* (Jati Baah) species with shoot

### 2. Diversity Of Bamboo Species in Assam

The diversity of bamboo species in Assam is notable and approximately 30 different species have been documented within the region. These include both indigenous and exotic varieties. Some prominent native bamboo species include:

#### • *Bambusa balcooa* (Bhaluka Baah)

*Bambusa balcooa* which is commonly known as “Bhaluka Baah” is distinguished by its robust and thick-walled culms. This plant can reach heights of up to 20 meters with culm diameters ranging from 10 to 15 cm. Furthermore, it is cultivated for its edible shoots. This species is predominantly utilized in scaffolding, construction materials, and the production of paper pulp. Additionally, it serves as a resource for furniture making.

#### • *Dendrocalamus hamiltonii* (Kako Baah)

*Dendrocalamus hamiltonii* is locally called as “Kako Baah” and is well-known for its thick and sturdy culms which are widely used in construction, basket making and fencing. This towering bamboo species can grow as tall as 30 meters and

has a diameter of about 15 cm. Its impressive dimensions and strength make it an excellent choice for heavy-duty construction, scaffolding, and various structural applications. The tender shoots of this bamboo species are also a delicacy in Assamese dishes.

- ***Bambusa tulda (Jati Baah)***

*Bambusa tulda* commonly referred to as “*Jati Baah*” is among the most extensively cultivated bamboo species in Assam. This species is renowned for its straight and robust culms and it thrives in moist environments, achieving heights of approximately 15 to 20 meters. The culms of this species are versatile and are employed in the production of housing materials and agricultural tools. Additionally, it finds frequent application in construction, furniture making, and handicraft production.

- ***Melocanna baccifera (Muli Baah)***

The bamboo species of *Melocanna baccifera* referred to as “*Muli bamboo*” in Assam and is highly regarded for its long, pliable, and lightweight culms, making it suitable for the production of fishing rods, walking sticks, and crafts. This species is particularly notable for its gregarious flowering every few decades which leads to the mass mortality of the plants. Nevertheless, it serves an essential function in local ecosystems during its growth phase and produces edible shoots.

- ***Bambusa nutans (Mokla Baah)***

*Bambusa nutans* which is commonly referred to as *Mokla Baah* in Assam is recognized for its robust and sturdy culms, making it suitable for heavy construction and the crafting of musical instruments. Locally it is known as “*Bidhuli*” or “*Mukial*” This species exhibits a rapid growth rate and can be employed in a variety of applications such as construction, handicrafts, and paper manufacturing. However, its shoots are not as frequently consumed as those of other bamboo species.

**Table 1:** Botanical classification of bamboo

Kingdom	Plantae
Phylum	Magnoliophyta
Class	Liliopsida
Subclass	Commelinidae
Order	Cyperales
Family	Gramineae (Poaceae)
Subfamily	Bambusoideae
Genus	<i>Bambusa</i> , <i>Dendrocalamus</i> , <i>Oxytenanthera</i> and others
Species	<i>Balcooa</i> , <i>Hamiltonii</i> , <i>Vulgaris</i> and others

### 3. Significance of Bamboo in Assamese Culture and Rituals

In Assam bamboo is often referred to as “Green Gold” due to its versatility and economic potential <sup>[5]</sup>. Bamboo is an integral part of Assamese culture and is deeply rooted in the daily lives of the people of Assam. It is not only a symbol of cultural heritage but also plays a significant role in various rituals and ceremonies. Assam is renowned for its highly developed bamboo craftsmanship. Artisans skillfully design a range of detailed products such as baskets, mats, furniture and ornamental pieces. These items serve both utilitarian functions and showcase the artistic abilities that have been transmitted across generations. The local economy heavily relies on bamboo cultivation and processing, providing livelihoods for many families. Bamboo is used in various rituals and ceremonies in Assamese culture, including weddings, festivals and religious ceremonies. In the Bihu festival bamboo is used to create traditional music instruments such as the “*Gogona*”, *Baanhi*, *Toka* etc. which are played during this festival <sup>[6]</sup>. The festival is celebrated to mark the beginning of the new year and the arrival of spring. Bamboo is also used to create traditional crafts such as “*Jaapi*” which are worn during the festival. The bamboo structure is decorated with flowers, leaves, and other ornaments, and is considered a symbol of good luck and prosperity. Assamese bamboo has gained attention in sustainable development initiatives due to its rapid growth rate and renewability.



**Fig 2:** Jaapi made from bamboo worn by Assamese people during the Bihu festival

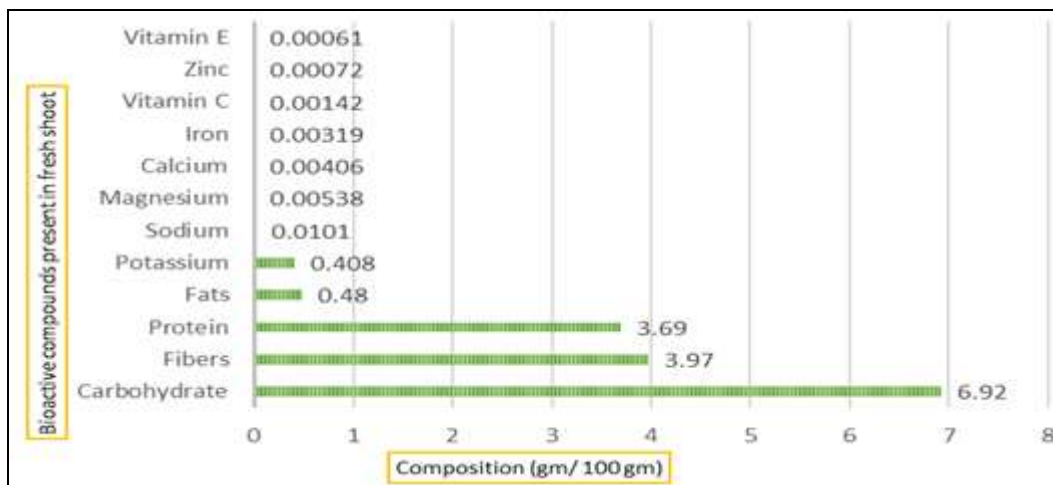


**Fig 3:** Traditional music instruments of Assam made from bamboo A. *Gogona* B. *Baanhi* C. *Toka*

#### 4. Bioactive Compounds Present in Assamese Bamboo Shoot

**Table 2:** Role of different bioactive compounds found in shoot of *Bambusa tulda* species

Serial No.	Components	Content (g/100 g)	Contributions in health-related benefits	References
1.	Carbohydrate	6.92	High cellulosic content of bamboo shoots stimulates appetite	[2,7,8]
2.	Fibers	3.97	Helps in lowering the blood cholesterol	
3.	Protein	3.69	Promotes growth and development of cells and tissue	
4.	Fats	0.48	Reduces reproductive health related issues in female like infertility problems	
5.	Potassium	0.408	Maintains normal BP and stable heartbeat of individuals	
6.	Sodium	0.0101	Regulates equilibrium of fluids in the body's physiological systems	
7.	Magnesium	0.00538	Optimize the various metabolic and biochemical reactions in the body	
8.	Calcium	0.00406	Helps building strong and dense bones and teeth	
9.	Iron	0.00319	Plays a vital role in the formation of hemoglobin for oxygen transport in tissues	
10.	Vitamin C	0.00142	Enhances the body's immune system to fight with infections effectively	
11.	Zinc	0.00072	Supports the activity of cells involved in the innate immune system	
12.	Vitamin E	0.00061	Acts as an antioxidant to protect cells from the damage caused by free radicals	



**Fig 4:** Composition of various bioactive compound found in fresh shoot of *Bambusa tulda* species

#### 6. Use Of Bamboo Shoot as A Food in Assamese Culture

Bamboo shoots hold a prominent place in Assamese food culture, reflecting the region's rich biodiversity and cultural heritage. In Assam bamboo shoots are not merely a food ingredient but they are a vital component of traditional dishes that showcase the unique flavors and cooking techniques of the local people. The use of bamboo shoots is deeply rooted in the culinary practices of various ethnic communities within Assam such as Boro, Ahom, Sonowal, Deori, Moran etc. which are highly regarded bamboo shoot for their distinctive

flavor and texture. In Assamese culture both fresh and fermented bamboo shoots are utilized as a food ingredient. Fresh bamboo shoots referred to locally as "Baah Gaj" which are collected during the monsoon season when they exhibit optimal tenderness and flavor. The fermented variant known as "*Khorisa*" which is produced from young edible bamboo shoots that undergo fermentation process which intensifies their distinctive pungent taste [9]. This fermented product can be stored for extended periods, making it a staple ingredient in many households. Bamboo shoots are featured in various

traditional Assamese dishes. One popular preparation is “*Khorisa Dia Murgir Mankho*” which translates to chicken cooked with bamboo shoots is a traditional dish of Bodos, Mishings and other ethnic communities of Assam [10]. This dish combines tender chicken pieces with finely sliced bamboo shoots, mustard oil, and basic spices like turmeric and coriander powder. The fermentation process adds a unique sourness that complements the richness of the chicken. Another notable dish is “*Khorisa Gahori*” which is a traditional dish of Ahom community where fresh or fermented bamboo shoots are cooked with tender pieces of pork combined with ginger, garlic, green chilies and spices [11]. The tangy flavor of *Khorisa* enhances the richness of the pork making it a favorite among meat lovers of Assam.



**Fig 5:** Assamese traditional dish of “*Khorisa Dia Murgir Mankho*” and “*Khorisa Gahori*”

## 7. Traditional Practices for The Preparation of *Khorisa* in Assam

In Assamese tradition *Khorisa* is made from tender bamboo shoots by using fermentation method. The process typically involves harvesting young bamboo shoots, which are rich in nutrients and have a unique flavor profile. These shoots are then cleaned and boiled to remove any bitterness before being fermented. The fermentation process involves submerging the boiled bamboo shoots in water or brine which may include salt and spices for flavor enhancement. This mixture is then stored in airtight containers or jars to allow anaerobic bacteria to grow. Over several days to weeks these bacteria convert sugars present in the bamboo shoots into lactic acid resulting in a tangy flavor and preserving the shoots for extended periods. Now these fermented bamboo shoots can be used as a condiment or ingredient in various dishes for enhancing flavors [9, 12].



**Fig 6:** Fermented Assamese bamboo shoots (*Khorisa*)

## 8. Medicinal Value of Assames Bamboo Shoots

### • Anti-Inflammatory Properties

The anti-inflammatory properties of bamboo shoots are well-documented. Their bioactive compounds which encompass flavonoids, phenolic acids, and polysaccharides play a crucial role in diminishing inflammation in the body. Within Assamese traditional medicine, bamboo shoots are utilized to

ease symptoms related to inflammatory ailments including arthritis, bronchitis and asthma. Regular inclusion of bamboo shoots in the diet is believed to aid in controlling inflammation and reducing pain thus fostering overall health and well-being [13].

### • Digestive Health and Probiotics

The consumption of fermented bamboo shoots provides a significant source of probiotics, which are beneficial microorganisms that enhance gut health. Through the fermentation process, the probiotic concentration in bamboo shoots is elevated, aiding in the preservation of a healthy gut flora balance. This is particularly useful for those who suffer from digestive ailments such as indigestion, constipation, and irritable bowel syndrome [14]. Furthermore, the high fiber content found in bamboo shoots contributes to digestive health by increasing stool bulk and promoting consistent bowel movements.

### • Antimicrobial and Antifungal Activity

The bioactive compounds found in bamboo shoots possess notable antimicrobial and antifungal effects. Research has established that extracts from these shoots are capable of targeting a diverse array of pathogens, including various bacteria and fungi. This efficacy renders bamboo shoots a viable natural solution for infection management and the prevention of microbial growth [15]. In the region of Assam, bamboo shoots are sometimes incorporated into home remedies aimed at treating minor wounds, cuts, and skin infections owing to their antiseptic properties.

### • Cardiovascular Health

Bamboo shoots are characterized by their low-fat content and high levels of dietary fiber, which play a significant role in lowering cholesterol levels within the body. The fiber interacts with cholesterol molecules in the digestive tract, facilitating their excretion and consequently decreasing overall cholesterol levels. This process contributes to a reduced risk of cardiovascular diseases, including atherosclerosis, hypertension, and myocardial infarctions [16]. Additionally, the presence of phytosterols and lignans in bamboo shoots further aids in lowering blood pressure and enhancing blood circulation, thus promoting cardiovascular well-being.

### • Weight Management and Diabetes Control

The nutritional profile of bamboo shoots includes a low-calorie count coupled with a high fiber content, making them particularly suitable for those focused on weight management. The fiber in bamboo shoots contributes to a sense of fullness, thereby helping to mitigate overeating and support weight control efforts. Additionally, their low glycemic index ensures that they do not induce rapid increases in blood sugar levels, a feature that is particularly beneficial for diabetic individuals in maintaining stable glucose levels [17].

### • Cancer Prevention

Bamboo shoots are a source of phenolic acids, flavonoids, and other antioxidants that contribute to the scavenging of free radicals in the body. These free radicals are unstable molecules that can cause cellular damage and are implicated in chronic diseases, including cancer. The antioxidants present in bamboo shoots are beneficial in reducing oxidative stress and preventing the proliferation of cancer cells, particularly in the digestive tract. Several studies suggest that

habitual consumption of bamboo shoots may decrease the risk of certain cancers, particularly colon cancer <sup>[13]</sup>.

#### • **Detoxification and Liver Health**

Bamboo shoots are thought to possess detoxifying qualities that facilitate the elimination of toxins from the body and enhance liver function. In the context of traditional Assamese medicine, bamboo shoots are frequently incorporated into dietary practices to assist in the detoxification process. Their significant fiber content encourages regular bowel movements, thereby aiding in the expulsion of waste materials and preventing the buildup of harmful substances.

#### • **Immune System Support**

The presence of vitamins and minerals in bamboo shoots, particularly Vitamin C, Vitamin E, and B vitamins is associated with the enhancement of the immune system. These nutrients are instrumental in the formation of white blood cells which play a critical role in combating infections and diseases <sup>[18]</sup>. Furthermore, the antioxidants found in bamboo shoots serve to protect immune cells from oxidative damage thus bolstering the body's defense mechanisms.

#### • **Respiratory Health**

Bamboo shoots are utilized in traditional Assamese healing practices for the treatment of respiratory disorders such as asthma and bronchitis. Their anti-inflammatory effects play a significant role in diminishing airway inflammation, which can help alleviate breathing difficulties. In some Assamese communities, herbal teas or infusions are crafted using bamboo shoots in combination with other therapeutic herbs to support respiratory health.

#### • **Bone Health**

Bamboo shoots serve as a valuable source of essential minerals, including calcium, phosphorus, and magnesium, which play a vital role in the maintenance of robust and healthy bones. The regular inclusion of bamboo shoots in the diet may aid in the prevention of bone-related conditions, such as osteoporosis, while also enhancing overall bone density.

### 9. Usage of Bamboo Shoot in Assamese Traditional Medicine

#### • **Banshor Tenga**

The preparation involves boiling fresh bamboo shoots in water, with the optional addition of ginger and salt, until they are tender and their distinctive flavors infuse the liquid. This broth is reputed to assist in alleviating respiratory ailments and strengthening the immune system. Furthermore, it is known for its mild laxative effects, which encourage regular bowel movements and detoxify the digestive tract. It is commonly consumed to relieve indigestion and promote better gut health.

#### • **Khorisa Juice**

*Khorisa* Juice is derived from the fermentation of bamboo shoots, where the shoots release a liquid that is gathered for consumption. This fermentation enhances the juice's flavor, resulting in a tangy and pungent profile, while also infusing it with beneficial microorganisms and bioactive compounds. Consumed in moderation, this juice aids in digestion, promotes gut health, and helps in the expulsion of intestinal worms. Its medicinal properties, which range from supporting digestion and detoxifying the body to enhancing immunity

and regulating blood pressure, render it an important natural remedy within Assamese culture.

#### • **Bamboo Shoot Paste**

The preparation of a paste from young bamboo shoots involves cooking and grinding the shoots into a fine mixture. This paste can be utilized as a condiment, incorporated into recipes, or employed for medicinal purposes. It is sometimes applied topically to help reduce inflammation or to cleanse the skin. Furthermore, the consumption of bamboo shoot paste can improve digestive health by encouraging the proliferation of beneficial gut bacteria, which can help mitigate indigestion, bloating, and constipation. The fiber present in the paste also promotes regular bowel movements and acts as a mild laxative.

#### • **Khorisa Bhorta**

*Khorisa Bhorta* is a traditional chutney derived from fermented bamboo shoots, resulting in a spicy and tangy paste. It often includes a variety of spices, herbs, and sometimes other vegetables or ingredients, making it a flavorful and versatile addition to Assamese cuisine. Typically served as a side dish, it enhances digestion and provides antioxidant properties. The fiber content in this chutney promotes regular bowel movements and contributes to overall digestive wellness.

#### • **Baah Gajor Jool**

This dish is a light and nutritious soup made from fresh bamboo shoots, traditionally prepared in Assam for its health benefits, particularly in easing digestive problems and enhancing immunity. It is commonly offered to those recuperating from illness or during colder months to provide warmth and nourishment. Rich in minerals, including vitamin C and high in dietary fiber this soup supports digestion and encourages regular bowel movements, contributing to a healthy digestive system.

### 10. Conclusion

The nutritional and health benefits of bamboo shoots are vital to Assamese food culture representing the rich biodiversity and food tradition of the region. These edible shoots provide essential nutrients, including vitamins, minerals, and dietary fiber, while also offering numerous health benefits that enhance overall well-being. With their reduced calorie levels, these foods represent a fantastic choice for those who wish to follow a balanced diet. Bamboo shoots have been recognized for their potential medicinal properties including anti-inflammatory and antioxidant effects which align with traditional practices in Assamese medicine. As awareness of sustainable and health-promoting foods expands, bamboo shoots serve as a prominent case of how local traditions and natural resources can foster global health and well-being. Further exploration of the health benefits associated with bamboo shoots coupled with the innovation of new products can enhance their nutritional and therapeutic attributes. Merging traditional knowledge with current scientific research may yield new health solutions and increase the importance of bamboo shoots beyond regional culinary applications.

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## 12. References

1. Chongtham N, Bisht MS, Haorongbam S. Nutritional properties of bamboo shoots: Potential and prospects for utilization as a health food. *Compr Rev Food Sci Food Saf*. 2011 May;10(3):153-68.
2. Nongdam P, Tikendra L. The nutritional facts of bamboo shoots and their usage as important traditional foods of northeast India. *Int Scholarly Res Notices*. 2014;2014(1):679073.
3. Das MC, Singnar P, Nath AJ, Das AK. The flowering pattern and seed production of a monocarpic tropical climbing bamboo *Melocalamus compactiflorus* in North East India. 2017;16(2):65-76.
4. Wikipedia Contributors. Bamboo [Internet]. Wikipedia. Wikimedia Foundation; 2019 [cited 2019 Jan 17]. Available from: <https://en.wikipedia.org/wiki/Bamboo>
5. Hussain I. Socio-economic importance of bamboo in Assam: A brief analysis. *Int J Eng Manag Humanit*. 2022;3(1):97-103.
6. Neog DP. Bihu festivals: all-inclusive elucidations. Notion Press; 2021 Jan 30.
7. Singh P, Rathore M, Prakash HG. The nutritional facts of bamboo shoots have a potential and prospects for utilization as a health food: a review. *Asian J Dairy Food Res*. 2021;40(4):388-97.
8. Awol A. Nutrient, mineral and bioactive constituent evaluation of bamboo shoots grown in Masha area, South-West of Ethiopia. *Am Sci Res J Eng Technol Sci (ASRJETS)*. 2015;7(1):15-25.
9. Sharma N, Barooah M. Microbiology of khorisa, its proximate composition and probiotic potential of lactic acid bacteria present in khorisa, a traditional fermented bamboo shoot product of Assam. *Indian J Nat Prod Resour (IJNPR)*. 2017 Sep 5;8(1):78-88.
10. Bhaswati B. Recipes for the regular homecook [Internet]. Recipes for the regular homecook. 2021 [cited 2024 Sep 13]. Available from: <https://slurrrp.club/assamese-recipes/chicken-bamboo-shootdry-khorisa-dia-murgir-mangso>
11. Khorisar lagot gahori mangxo/Assamese style pork with bamboo shoots for Burra baba [Internet]. Of Spices and Pisces. 2012 [cited 2024 Sep 13]. Available from: <https://spicesandpisces.wordpress.com/2012/12/18/khorisar-lagot-gahori-mangxoassamese-style-pork-with-bamboo-shoots-for-burra-baba>
12. Narzary Y, Brahma J, Brahma C, Das S. A study on indigenous fermented foods and beverages of Kokrajhar, Assam, India. *J Ethnic Foods*. 2016 Dec 1;3(4):284-91.
13. Sangeetha R, Diea YK, Chaitra C, Malvi PG, Shinomol GK. The amazing bamboo: a review on its medicinal and pharmacological potential. *Indian J Nutr*. 2015;2(1):1-7.
14. Thakur K, Rajani CS, Tomar SK, Panmei A. Fermented bamboo shoots: a rich niche for beneficial microbes. *J Bacteriol Mycol Open Access*. 2016;2(4):00030.
15. Sarma S, Dey BK, Dutta PP, Pathak MP. Phytochemical, antioxidant, and antimicrobial properties of fermented shoot extracts of *Bambusa tulda* found in northeastern India. *J Adv Zool*. 2024 Sep 2;45.
16. Devi OJ, Pamba P. Anti-hypertensive activity of bamboo shoot: A review. *Asian J Pharm Clin Res*. 2015;8(1):46-7.
17. Nandi A, Bhuyan B, Gogoi M, Kapil MJ, Sharma N. *In vitro* anti-diabetic activity evaluation of standardized extracts of *Bambusa tulda* Roxb. *J Pharmacogn Phytochem*. 2024;13(4):250-8.
18. Joshi B, Indira A, Oinam S, Koul A, Chongtham N. Fermented bamboo shoots: a potential source of nutritional and health supplements. In: *Bamboo Science and Technology*. Singapore: Springer Nature Singapore; 2023 Mar 15. p. 201-36.