



Review Paper

Multipurpose Uses of Bamboo Plants: A Review

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Abstract

This review paper discusses the versatile uses of bamboo grass plant. Bamboo plants have some useful properties and having lot of beneficiary uses; these are using as pillar, fencing, housing, house hold products, raw materials of crafts, pulp, paper, boards, fabrics industry, fuel, fodder etc. The shoot of young bamboo grass can be processed into various delicious healthy foods and sometimes uses as medicines. Young bamboo shoot is usually consumed as vegetable in curry and also as pickle. The nutritional value of bamboo shoots varies by species to species, harvesting procedure and growing environment. Bamboos also utilized in different areas as herbal or traditional treatments.

Keywords: Bamboo, importance, medicinal value, food value, Bangladesh.

Introduction

Bamboos is a large woody grasses that belonging to the family *Poaceae*. This ancient woody grass widely found in tropical, subtropical and mild temperate zones of the world. It is a tremendously diverse plant, which have the capacity to adapt any extreme climatic and soil conditions. There are about 90 genera and about 1200 species of bamboo found in the world. Most of the bamboos are found in forestry and it also widely spread outside forests usually farmlands, riverbanks, roadsides and rural areas. Bamboo is a long stick like non-wood forest product and sometimes used as wood substitute. Moreover, as it is found any regions of the world and plays an important economic role. Even though it is used for housing, crafts, pulp, paper, panels, boards, veneer, flooring, roofing, fabrics and vegetable (the bamboo shoot). Products of bamboos are using everywhere and bamboo industries are now thriving in Asia and are quickly expanding across the continents to Africa and America¹.

In Bangladesh, there are 26 species of bamboo under seven genera including natural and cultivated exotics². Bamboo has lot of beneficial impact for alleviating many of the social and environmental problems in many countries³. It has been act as natural protection of environment restoration and in the production of household handicrafts, arte facts and furniture. Bamboo product like bamboo-ply, laminated boards, flooring, roofing sheets, props and many others, have been key wood substitutes of bamboo in the construction and fencing industry world-wide. Moreover, it also used as medicines, food, charcoal, vinegar, beverages, natural pesticides, and toiletries⁴. It is utilized as wood in construction work, furniture, utensils, fibre and paper. Bamboo charcoal produces three times as

porous as wood and releases more energy and gives us huge fuel backup. Bamboo shoots are also delicious to eat and the young leaves provide feedstuff for animals⁵. It is a likely demanding species and mostly occurs in pure stands, also mixed with other vegetation⁶. The shoots from stem develop during the pre-monsoon and grow during the rainy season. Elongation of the bamboo plant takes place during the rainy season and it continues still the post rainy season⁷. Lack of reliable, comprehensive data on bamboo resources and utilization hampers their sustainable development and limits their potential to contribute to poverty reduction¹. However, the using potentiality of bamboo remains unexploited. Literature on the nutritional and medicinal potential of bamboo shoots is scarce.

Uses as food

A bamboo shoot is the new gentle growth of the stem apex into a young culm consisting of compressed internodes sheltered by a number of leathery sheaths. The shoots are usually harvested when they attain the height of 15-16 cm. After eliminating the fibrous sheaths the inner tender portion or meat has been thoroughly washed in water and then cut into pieces. The pieces are usually eaten as vegetable components in curry or soup by mixing with fish or meat and also as pickle. Shoots of both running (monopodial) and clump forming (sympodial) bamboos are utilized as food. In Northern China and Japan, the monopodial bamboo species such as *phyllostachys edulis*, *p. mitis*, *p. pubescens* are most common and prepared delicious bamboo shoot⁸. However, plantation of bamboo should be encouraged and promoted due to their high value, productivity, uniformity of crop, choice of species linked to peoples' and industrial need. It is estimated that bamboo plants constitutes about 13% of the total forest area of the India. About 50% of

bamboo produced in North Eastern region and West Bengal of India. It is also estimated that India has the second largest bamboo reserves in the world after China⁹. Various palatable species and interesting food products (fermented shoots, pickle, etc.) and guidelines of bamboo shoots (bamboo beer, bamboo cookies) are consumed all over the world. Different species of bamboo shoots have varieties of nutritional composition. Bamboo shoot used as food in traditional ways by the tribal community the in deferent countries. Bamboo shoots are used as a good source of dietary fiber, low in fat and calories for human being¹⁰. Bamboo shoots contain high protein but less fat, moderate dietary fiber, having essential amino acids, selenium, potassium, a potent antioxidant and minerals for healthy heart. Besides all the versatile uses of bamboo, people has been using shoots of this plant as one of his food items since prehistoric days when they were ignorant about vegetable growing. Young shoots of several species of bamboo are used as important vegetable in the daily meals in China, Japan, Taiwan and Thailand. These young bamboo shoots have been considered as gourmet items in the western world where these are available only as imported canned products⁸. They can be stir-fried alone or mixed with other vegetables with or without meat and with very little oil. Bamboo juice is also used in recipes. To get some delicious effect, it needs to extract moisture from the roots, particularly those that are a little sweet¹¹. Soft drink, bamboo wine also prepared from bamboo shoot¹². Moreover, nutritional value of bamboo shoots is different between species and within the same species based on local conditions. Generally the nutritional values are more or less similar. Nutritional value for bamboo shoots, cooked, boiled, with salt bamboo shoots is rich and they contains about 18 amino acids¹³ and it also contains 96% moisture¹⁴.

Uses as medicine

From the ancient and using the traditional knowledge, pharmaceutical preparations of bamboo shoots like bamboo salt, bamboo vinegar, bamboo extracts are using to control diabetes and keep the cholesterol level within normal limit¹⁵. Bamboos and bamboos extract has been utilized in Korea for traditional treatment to relieve hypertension, sweating and paralysis. It has been established that bamboo extract have antioxidant activities and anti-inflammatory effects^{16, 17}. *Bambusa arundinacea* is highly reputed ayurvedic medicinal plant. Various parts of this plant such as leaf, root, shoot and seed possess anti-inflammatory, antiulcer, anti-diabetic, anti-oxidant, anthelmintic and astringent activity. Various phyto-pharmacological evaluations have been reported for the important potential of the *Bambusa arundinacea*¹⁸. The root (burnt root) is applied to ringworm, bleeding gums and arthritis. Bark is used for skin eruptions. Leaf has a property of antileprotic and anticoagulation activities that can be used in haemoptysis¹⁹. Seeds are acrid, laxative, said to be beneficial in strangury and urinary discharges²⁰. The combination of herbal product (methanol extract of *Bambusa arundinacea*) with modern medicine (NSAIDs) will produce the best anti-inflammatory

drug and will be useful for long-term treatment of chronic inflammatory conditions like rheumatoid arthritis with peptic ulcer²¹. *Bambusa arundinacea* seed has shown statistically significant anti-diabetic activity as like the standard glibenclamide²². Furthermore, bamboo-derived pyrolyzates have been proposed to have antimicrobial and antifungal activities²³ and to protect neurons from oxidative stress²⁴. Bamboo extract pyrolyzates may have anti-apoptotic effects and can be useful as a supplement for ischemic injury treatment²⁵. The tender shoots of *Bambusa bambos* are reported to enhance appetite and help in digestion. Buds of *Bambusa bambos* are reported to have estrogenic activity. Extract of the bud has shown antifertility activity in rats²⁶ and very soft shoots of this species are used for birth control²⁷ in north Lakhimpur, Assam, India. It is also reported that bamboo shoots have cancer prevention properties and effective in decreasing blood pressure, cholesterol and increasing appetite²⁸. *Bambusa bambosa* L. leaves extract possess broad spectrum antibacterial properties and can be used for the most common bacterial diseases. These promissory extracts open the possibility of new clinically effective antibacterial compounds²⁹. Modern research has revealed that bamboo shoots have a number of health benefits such as: improving appetite and digestion, weight loss, curing cardiovascular diseases, antioxidant activities and anti-inflammatory effects³⁰.

Chemical compositions

The different parts of this plant contain silica, cholin, betain, cynogenetic glycosides, albuminoids, oxalic acid, reducing sugar, resins, waxes, benzoic acid, arginine, cysteine, histidine, niacin, riboflavin, thiamine, protein, gluteline, lysine, methionine, proteolytic enzyme, nuclease, urease¹⁸. The silicious substance found inside the bud joint and it is white camphor like crystalline in appearance, slightly sticky to the tongue and sweet in taste^{31,32}. Moreover, shoot has active constituents those are oxalic acid, reducing sugar, resins, waxes, HCN, benzoic acid³³. Seed contain arginine, cysteine, histidine, isoleucine, leucine, lysine, methionine, phenylamine, threonine, valine, tyrosine, niacin, riboflavin and thiamine. Similarly, leaves mainly contain protein, gluteline, lysine, methionine, betain, cholin, proteolytic enzyme, nuclease, urease³⁴. It has been noted that the bamboo plant has unusually high levels of acetylcholine (which acts as a neurotransmitter in animals and humans; its role in plants is as yet unknown), especially in some portions of the plant (e.g., upper part of the bamboo shoot)³⁵. Occurrence of taxiphyllin, a cyanogenic glycoside in raw shoots, and it have harmful effect on human health calls for the demand to innovate processing ways using scientific input to eliminate the toxic compound without disturbing the nutrient reserve¹⁵.

Conclusion

Bamboo plant usually uses for making houses in sub-urban and rural areas. It is also, used as raw materials of different house

hold products, production of paper and useful handicrafts. Bamboo shoot has been suing one of the delicious vegetable in different countries. Research has revealed that bamboo shoots have a number of health benefits. So, it is necessary to promote bamboo cultivation through appropriate methods. As well as verify the impacts of the plants extract in human body as traditional medicine by using modern technology for further recommendation.

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