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AN ELABORATIVE REVIEW ON BAMBUSA VULGARIS

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ABSTRACT

In addition to being high in nutraceuticals like phenols and phytosterols, Bambusa vulgaris s are also high in protein, fibre, vitamins, and minerals. Historically utilised in pharmaceuticals, Bambusa vulgaris s have been linked to a number of health advantages, including hypolipidemia, prebiotics, and anti-diabetic effects.

Packed into 121 genera, these plants make up a sizable subfamily of the grasses (Poaceae: Bambusoideae), with approximately 1662 species. Bamboos come in a wide variety of functional forms that are found in many different biogeographic locations. These forms include huge tropical woody species that may grow up to 20 meters in height and miniature herbaceous species found in temperate settings. These species, which naturally occur on all continents with the exception of Europe can adapt to and multiply in hostile settings, such as the humid, chilly summits of mountains as well as the dry, warm ones. A significant contributor to the diversity of South American forests is bamboo. In the New World, Brazil is the nation with the highest diversity of native bamboo species . This indicates that 65% of known bamboo species and 89% of genera

Bambusa Vulgaris are considered to be among the most precious, readily obtainable, and significant renewable forest resources. These plants are members of the Bambusoideae subfamily of the grass family Poaceae, which includes roughly 25% of all plants on Earth. With their distribution throughout 116 taxa, bamboos are thought to have a diversity of about 1400 species worldwide. In Southeast Asia, bamboo species have long been utilised as building blocks for the production of paper, furniture, boats, bicycles, textiles, musical instruments and food. Their leaves are also used as a wrapping material to keep food fresh for a longer period of time. The physiologically active substances that these species acquire, such as polyphenols and other secondary plant metabolites, may help to explain why bamboo leaves are used in traditional Asian medicine to treat conditions like hypertension, arteriosclerosis, cardiovascular disease, and some types of cancer. Bamboo extracts may also contain physiologically active peptides and polysaccharides in addition to the typical secondary metabolites; these compounds' activity and potential synergy with other metabolites require additional research. The majority of research published in the literature focusses on Asian bamboo species; little is known about the potential of Southern American bamboo species.

KEYWORDS:- *Bambusa vulgaris, Carbohydrates, Protines,Polyphenols,*

INTRODUCTION

Bambusa Vulgaris can become extremely dominant species after opening in a natural or anthropogenic origin, and they have a huge ecological amplitude in response to canopy changes. Furthermore, they grow extremely quickly from the base of the stem to the top of the plant . As of right now, bamboo species are thought to be among the most accessible forest resources. Bamboos are considered one of the most significant renewable resources since they account for 20–25% of the total biomass in tropical and subtropical regions . Bamboo is regarded as a quick absorber of atmospheric carbon dioxide and possesses mechanical and physical qualities that allow it to be utilised in the production of goods typically made from replanted or native wood, such as building materials, furniture, and agricultural cables.

B. vulgaris is an erect, evergreen, clump-forming bamboo that reaches heights of 15 to 20 meters (Figure 1). It grows in loose, thorn-free clumps with dark green leaves and lemon-yellow stems that are mostly green striped. The stems are tough, not straight or easily split, stiff in nature, and have thick walls with narrow lanceolate leaves. The densely tufted stems are 4 to 10 cm thick and reach heights of 10 to 20 meters. The trunk can be flexible (alternately bent in various directions) or straight, drooping at the ends. The walls of the trunk are quite thick, and nodes grew marginally. The internodal segment is 20 to 45 cm. There may be sprouting of a few branches between the middle trunk nodes to the top.

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Image: Bambusa Vulgaris

Bionomial Classification

Kingdom: Plantae
Clade: Tracheophytes
Order: Poales
Family: Poaceae
Genus: Bambusa
Species: *B. vulgaris*
Binomial name: *Bambusa vulgaris.*
Synonym: *Bambusa auriculata, Gigantochloa auriculata, B. striata*

Phytoconstituents present in B. vulgaris

The most plentiful source of pharmacological intermediates, modern pharmaceuticals, nutraceuticals, food supplements, folk cures, and chemical entities for synthesised drugs is plants. Plants are able to carry out essential biological processes and defend themselves against herbivorous animals, fungus, and insects by synthesising a vast array of chemical compounds. A variety of medicines with high activity profiles were produced by extracting and characterising several active phytocompounds from plants . Many plant components and extracts have the ability to scavenge free radicals or serve as antioxidants . The primary and secondary metabolites of these phytochemicals are distinguished. To ascertain whether B. vulgaris leaf samples were safe to eat, a phytochemical analysis was performed on both the wet and dry ethanol-extracted leaf samples.

It was shown that all of the leaf extract included cyanogenic glycoside, general glycoside, coumarin, polyphenol, and flavonoids. There were no traces of anthraquinone, carotenoid, triterpenoid, steroid, or anthracene glycoside in any of the species . Certain bamboo species are prized for their health advantages not just from their leaves and stems but also from their shoots, which have a high protein, carbohydrate, vitamin, fibre, and mineral content together with a very low fat level.

1. Carbohydrates

   In terms of total carbohydrates, bambusa vulgaris comprised polysaccharides, oligosaccharides, and monosaccharides. The primary polysaccharides found in bambusa vulgaris are starch, cellulose, and hemicellulose, with a small amount of more complicated minor polysaccharides such as glycoproteins. It was discovered that the three main oligosaccharides in bambusa vulgaris were sucrose, arabinoxylan trisaccharide, tetrasaccharide, and xyloglucan disaccharide. Bambusa vulgaris are rich in dietary fibre that contains antioxidants. Fructose and glucose are the monosaccharides that are typically present in bambusa vulgaris. Common species of just emerging juvenile bamboo shoots typically have a carbohydrate content ranging from 2.0 g/100 g to 9.94 g/100 g .

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2. Minerals
   Currently available studies indicate that bambusa vulgaris are an excellent source of macro and microelements. The primary microelements are cobalt (Co), copper (Cu), nickel (Ni), manganese (Mn), selenium (Se), iron (Fe), and zinc (Zn), whereas the primary macroelements are potassium (K), phosphorus (P), sodium (Na), calcium (Ca), and magnesium (Mg). Potassium was the most common macroelement in bambusa vulgaris, according to the majority of research, followed by phosphorus and magnesium.

3. Vitamin A
   Most vitamin studies have focused on two specific vitamins: ascorbic acid (vitamin C) and tocopherol (vitamin E). Both vitamins are closely related to the body's capacity to produce antioxidants in vivo, but vitamin E strengthens the immune system when combined with vitamin C. As is also the case with other common vegetables, fresh bambusa vulgaris contain far more vitamin C than vitamin E. Furthermore, in some areas, fresh bambusa vulgaris are a respectable source of Î²-carotene and B-group vitamins. The amounts of both vitamins decreased significantly with the age of the shoots. Additionally, the amounts of vitamin C varied to a variable extent depending on the growth of bamboo shoots' altitude and distinct parts.

4. Flavonids
   Flavonoids such as orientin, isoorientin, isovitexin, vitexin, and tricin are found in bamboo shoots and leaves . The majority of flavonoids found in bamboo tissues, including shoots, sheaths, and leaves, were insoluble forms of free aglycones or flavonoid ligands.

5. Phenolic Compound
   Bambusa vulgaris contained phenols that were primarily made up of flavonoids and phenolic acids. Bambusa vulgaris have been found to contain the following phenolic acids: protocatechuic acid, p-hydroxybenzoic acid, catechin, caffeic acid, chlorogenic acid, syringic acid, p-coumaric acid, ferulic acid, gallic acid, and vanillic acid . Protocatechuic acid, p-hydroxybenzoic acid, and syringic acid were the three most prevalent substances among them . There have been reports of fifteen phenolic acids, including 3-O-caffeolyshikimic acid, chlorogenic acid, p-coumaric acid, 3-p-coumaroylquinic acid, 5-p-coumaroylquinic acid, cryptochlorogenic acid, 1,3- dicaffeoyl quinic acid, 3,5-dicaffeoyl quinic acid, ferulic acid, 3-O-feruloylquinic acid, 5-O-ferul.

6. Glycocides
   The majority of edible species of bambusa vulgaris have a significant quantity of cyanogen glycoside, with the shoot tip having the highest concentration. Cyanogenic glycosides have been reported in B. vulgaris. The cyanogen glycoside taxiphyllin is found in bambusa vulgaris at different levels (23-26). The Î²-glycosidase, which is produced in damaged bamboo shoot tissues, reacts with taxiphyllin to form dangerous hydrogen cyanide, whose concentration shouldn't be higher than what is toxic to humans.

Traditional Uses

In many Asian nations, bamboo is closely associated with people's cultural, social, and economic circumstances. It is the multipurpose, fastest-growing woody plant with a wide range of commercial and domestic use. Its application is not limited to substituting wood in construction, furnishings, flooring, and scaffolding; in China and Southeast Asia, it has long been used as a food and medicinal source. Medicine is made from the bamboo plant's rhizome, culm, bark shavings, shoots, leaves, roots, and seeds. Bamboo is essential to the food, pharmaceutical, and cosmeceutical industries and is currently garnering interest on a global basis for its nutritional and therapeutic possibilities. Bamboo leaves and shoots have great therapeutic potential and can be used to organically heal ailments.

Bamboo has been an essential ingredient of traditional Asian medicines for a long time, especially Chinese and Indian (Ayurvedic) medicines. Bamboo was first used medicinally in India about 10,000 years ago. It was used to make a health tonic called Chyawanprash, which included bamboo manna among other plants, and was meant to encourage youth, beauty, and longevity. Due to its potent anti-stress and anti-aging properties, Chyawanprash has become well-known globally. Ayurveda, the traditional Indian medical system, recommends using bamboo and its products, such as Tabasheer, Banslochan, and Sitopaladi Churna, to treat a range of ailments. It has reportedly been used traditionally as an astringent, emmanogogue, and abortifacient in Tanzania, Brazil, India, and Pakistan.

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Therapeutic Uses

Rheumatism is treated with the stems.
The shoots are used to cure malaria and abscesses.
The bark is emmenagogue and astringent.
The leaves are used to cure malaria and cardiac issues.
To treat fevers, they are cooked and added to a bath. Women use a decoction of cooked leaves as a "clean-out" during dilatation and curettage, as well as to help facilitate the expulsion of the afterbirth.When used to cure fevers, the cooked leaves are made into a hot tea that causes copious sweating.Fever and haematuria can be treated with the sap.

Taxonomy

Due to the presence of bracts, indeterminate inflorescences, pseudospikelets (units of inflorescence or flower clusters and glumes or leaf-like structures in woody bamboos that are similar to spikelets or clumps of grass), three lodicules (a tiny scale-like structure found at the bottom of a floret or clump of grass flowers, found between lemma, the lowest part of spikelets, and sexual organs of the flower), six stamens, and three stigmas, the bambusoid taxa have long been considered the most "primitive" grasses.Some of the world's fastest-growing plants are bamboos.

The clumping bamboo tribe Bambuseae, of which B. vulgaris is a species, is primarily found in tropical and subtropical regions of Asia, particularly in the wet tropics. Bambusa is a vast genus. In clumping bamboos, the pachymorph (sympodial or superposed in a form that mimics a single axis) rhizome system extends just a small distance horizontally every year.Depending on the species, the emerging shoots form either an open or tight habit (group); common bamboo produces open groups. All clumping species are not regarded as invasive, regardless of how open their clumping behaviour .Only at the very tip of the rhizome may new culms develop.The Bambuseae subfamily of perennial evergreens, which includes the Bambusoideae subfamily, is distinguished by having three stigmata and three like bheviour.

CONCLUSION

Bambusa Vulgaris is still a plant group whose therapeutic qualities are being researched, despite the fact that Traditional Chinese Medicine has employed it for generations. The most common species in Asian nations—China, Korea, Japan, and others—have previously had studies done on their biological characteristics and chemical makeup. On the other hand, not much has been done to access the therapeutic benefits of bamboo in the countries of Southern America, where there is a great diversity of bamboo. Many species have demonstrated significant antioxidant activity, indicating that they may be used to treat a variety of illnesses, including anti-inflammatory, anticancer, and other conditions involving oxidative processes. Furthermore, bambusa Vulgaris extracts may include physiologically active peptides and polysaccharides in addition to the typical secondary metabolites. These macromolecules have the potential to have a variety of biological benefits when mixed with polyphenols and other metabolites. These effects could include anti-aging, anti-fatigue, anti-free radical, antibacterial, and antiviral properties. They could also be used as a useful dietary supplement, cosmetic ingredient, or food additive.

For millennia, people have utilised bamboo as a food source and a remedy for a range of ailments. It has a major impact on people's socioeconomic welfare. Several studies have assessed the plant's potential medicinal value. Beyond its use in food and crafts, however, more thorough research on bamboo is still required. Before bamboo is widely employed in a variety of therapeutic treatments, its ethnopharmacological uses need to be supported by significant academic study. They also have a large potential for use as important health foods because of their high level of healthy proteins, amino acids, carbohydrates, and other critical minerals and vitamins, together with their incredibly low fat content.

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