

Tabasheer: A comprehensive study of traditional uses, Phytochemical, Biochemical and Medicinal properties of Tabasheer in different varieties of Bamboo

Rekha Sharma¹, Sarita Chourasia²

¹Scholar, Sage University Indore Madhya Pradesh

²Professor, Sage University Indore

ABSTRACT:

Tabasheer also known as "Bamboo Manna" is a unique substance that has been used in traditional medicine and various industries for centuries. This review paper provides a comprehensive review of Tabasheer including its sources, chemical composition and potential applications. The paper aims to consolidate the existing knowledge on Tabasheer and shed light on its significance in various fields including Pharmaceutical, cosmetic and Material Science. Additionally, this review discusses the challenges and further properties associated with Tabasheer.

INTRODUCTION

Tabasheer is siliceous secretion present in clumps of various species of bamboo. Tabasheer is a hard siliceous crystalline whitish grey translucent substance consisting chiefly of pure silica. This opal-like herbaceous gem is highly valued for medicinal purposes, especially for Ayurvedic medicine. Tabasheer is in the shape of irregular polygonal blocks, surface is white, gray and blue tint. It is light, crisp and easily broken. Tabasheer chemically is 90% silica. It contains 90-97% of organic silica, potash, iron and many other ingredients. Tabasheer is recommended as a bioavailability enhancer synergistic effect. Tabasheer is an abundant source of natural bamboo silica that comprises more silicon dioxide than other plant sources. Bamboo is a member of the Gramineae family. The genus has 1200 species of bamboo worldwide, of which 33 species are found in India. It is extracellular silica found in the hollow stems. Tabasheer is considered as a medicine in treating various afflictions (disease). Initial developments of such ingredients are primarily silicon. It is a compound with a track down amount of defined elements. Tabasheer is obtained from various species of bamboo. It is also known as "poor man's timber" or "green gold of forest". The hardness and stiffness is due to the presence of intracellular silica in the fiber structure.

SUMMARY

Silicon is extensively present in its inorganic form SiO_2 in the soil which can be absorbed by plants and transform inorganic silica into organic form i.e. orthosilicic or monosilicic acid $\text{Si}(\text{OH})_4$, which is taken up by the plant roots through transpiration stream and making it bioavailable for humans to absorb. In plants, silica gets bonded with water molecules and is usually deposited in microscopic bodies named as

phytoliths or opal phytolith which is present in the cell wall, lumen and intercellular space during plant growth. These phytoliths are present in several plants, particularly abundant in members of family poaceae, e.g., bamboo, rice. Silicon improves plant cell wall strength and structural integrity, plant vigor, biomass, yield and plants resistance to biotic and abiotic stresses. The plant-based products have more silicon than animal based products, common plant based foods with high silicon content are cereals (rice, barley, oats) and some vegetables (beans, spinach and root vegetables). Though biological attention in this element has increased, data of silicon content in majority of the food plants still need to be determined. Bamboo, a distinctive phytolith-accumulator belongs to family Poaceae, is predominantly distributed in tropical and subtropical regions of the world. Bamboo is the richest known source of natural silica, containing over 70% organic silica, which is more than ten times the level found in the widely used horsetail plant (*Equisetum*) (5% to 7% silica). Different parts of bamboos are used in ancient Chinese, Indian Ayurveda, Tibetan and various traditional system of medicine for a number of ailments. Tabasheer or banslochan or bamboo-manna, mainly consist of pure silica, obtained from bamboo internodes is a part of the pharmacology of the traditional Ayurvedic and Unani medicine in the Indian subcontinent.(Rawat et al., 2018)

Quras Tabasheer is one of these medicines the ingredients of this medicine have been formulated in such a way to cover maximum aspects of the treatment of gastritis. Although the result of control group and the test group are almost same with no significant difference, the test drug bears many advantages like cost effectiveness ready availability of ingredients and no known side effects. Further the test drug covers maximum aspect of the treatment of gastritis. It contains medicines which correct inflammation, reduce gastric secretion, remove toxic material, produce soothing effect and provide material for healing. Health of stomach (meda) has been given a prime importance in Unani Medicine. Almost all Unani Physicians have contributed towards the health and disease of stomach. Unani Physicians have mentioned a wide spectrum of treatment for gastritis (warm-e-meda) according to the cause, clinical presentations, regions, climate, age, acuteness or chronicity and dietary habits with prime concern on the correction of Mizaj (temperaments) and Akhlat (humours) of the patients. Number of medicine and corrective approaches covering all these aspects have been described in unani medicine resource book. It is era of evidence based medicine and in this study we have tried to demonstrate that Qurs-e-Tabasheer not only declines the symptoms of gastritis and duodenitis but it also corrects them which was proved by repeated endoscopy after treatment and the results of the test group and control group were similar with no significant difference.(Hussain & Ali, 2015)

The bamboo-manna is not a sugar, but a white, gritty body and salt like brittle between the teeth. According to Watts's (Dictionary of Chemistry) Bambusa is defined as "Hydrated silica, occurring in stony concretions from the joints of bamboo, it resembles hydrophane, and when thrown upon water does not sink till completely saturated. For collecting the natural banslochan listening to the rattling sound of the bamboo is one of the acceptance criteria for presence and absence of tabasheer. Small quantity of tabasheer is generally available in the bottom and sides of the cavity of bamboo of the certain species like (*Bambusa arundinacea* and *Melocana bambusoides* etc.) Bambusha has greater abundance than others. Production of the tabasheer is greatly influenced by the soil, situation and season. The principal component of tabasheer i.e silica (amorphous, crystalline and colloidal form) is deliberately adulterated. On the contrary, requirement of dietary silicon and its mechanism of action is yet not clearly elucidated. Biogenic silica attributed with metal ions is an important part of biology. However there is still no evidence to support the idea of mechanism, silicon manifestation. The toxicity profile data is not

available in approval of bamboo-manna. The ingredient (Tabasheer) containing various formulations hypothetically act as synergistically, antagonistically and supra additively, bioavailability enhancer, nano carrier. (Maji et al., 2018)

Earlier investigations of chemical constituents and their pharmacology revealed that flavonoids and glycosides possess hypoglycemic activity. The phytochemicals have also been reported to be present in some of the ingredients of QT, having hypoglycemic effect. In a study, oral administration of *P. oleraceae* reduced the blood sugar level in chemically induced diabetic animals. *R. damascena* contains a bitter principal, tanning matter consisting of cyanine, a yellow glycoside of quercetin, and a yellow crystalline dyestuff. Rosebuds are astringent moreover, tannin occurs in all part of the *P. granatum*. Oral administration of its flower extract lowered glucose in normal, glucose-fed hyperglycemic and alloxan-induced diabetes. The oral administration of *P. granatum* peel extract in normal and STZ-induced diabetic rats showed a significant decrease in the post prandial hyperglycemias. Tabasheer consisting of 70% of silica and 30% of potash and lime, Silicate of alumina or magnesia and oxide of Armenian bole may have acted as a barrier for glucose absorption. Hence, the hypoglycemic effect of test drug may be attributed to the presence of these phytochemicals. Anti-hyperglycemic drugs act mostly by insulin-like properties. In this study, the effects cannot be claimed due to increased insulin secretion as no such activity is reported in any of the ingredients of QT. Most herbal hypoglycemic drugs are said to exert their action by decreasing the absorption of glucose by intestine. [28] Astringent and glutinous properties of some of the ingredients may have decreased glucose absorption; however, insulin-mimetic activity cannot be ruled out at all. (Ahmed et al., 2012)

Silicon (silica) is thought to improve the cardiovascular system, as it is essential to the structural integrity, elasticity and permeability of the arteries. Silica may be useful in reducing blood fats & cholesterol. Atherosclerosis can occur as a result of silicon deficiency whereas silicon is abundant (up to 14 times more) in the arteries of people who are free of heart disease. Silicon improves the condition of the hair, nails, teeth, gums and skin and has been used to alleviate eczema and psoriasis. Silica plays an essential role in mineral absorption and may help in recalcifying decalcified bones & decalcify soft tissue deposits of calcium. Silicon enhances the function of iron, calcium, magnesium, potassium and boron, and is essential for normal bone development which may help prevent osteoporosis. Silicon helps maintain the correct calcium magnesium balance. Silicon may be useful in strengthening the musculoskeletal system, preventing injuries and helping bones to heal in athletes & others. Silica converts aluminum from both water and other dietary sources into insoluble hydroxyaluminosilicates that cannot enter the bloodstream or brain. This has important consequences for preventing the development of Alzheimer's dementia by assisting the body in eliminating aluminum. Aluminum is thought to a causative factor in the development of Alzheimer's disease. Silica stimulates chondroblasts to deposit chondroitin sulfate and hyaluronic acid into the cartilage matrix. This has important implications in managing arthritis pain as silicon will improve the function and effectiveness of glucosamine sulfate which is the precursor of both chondroitin sulfate and hyaluronic acid.

Tabasheer contains silica 70 or silicum as a hydrate of silicic acid, peroxide of iron, potash, lime and alumina. The seeds had been reported to contain proteins, phosphorus, iron, vitamin B, nicotinic acid, riboflavin, and carotene. The seeds, tender shoots and fruits were reported to contain calcium phosphorus, thiamine, riboflavin, niacin; the tender shoot also contains oxalic acid. The leaves reported to be highly nutritious as compared to other commonly used green fodders, containing proteins amino acids methionine and lysine, fiber, calcium, and phosphorus. Six microsattellites, three polymorphic and

three monomorphic, were characterized in a bamboo species, *B. arundinacea* (. et al., 2021)

CONCLUSION

This research paper aims to provide a comprehensive understanding of tabasheer, covering its sources, chemical composition, traditional use, and potential application of various industries. By consolidating the existing knowledge on tabasheer, this review will serve as a valuable resource for researchers, industry professionals, and stakeholders interested in exploring this substance's application and commercial potential. Further research and interdisciplinary collaboration are crucial to fully unlock the benefits and address the challenges associated with tabasheer's sustainable utilization. The present literature review of *Bambusa arundinacea* supports its potential as a miraculous medicinal plant. Numerous phytochemical and pharmacological studies that have been conducted on different parts of *Bambusa* International Journal of Unani and Integrative Medicine *arundinacea* support its use in traditional systems of medicine. In view of the beneficial nature of the plant, more research can be done to investigate the unexplored potential of this plant, as well as the mechanism of action behind the known potentials.

RESEARCH GAP

As of my last knowledge update in September 2021, "tabasheer" is a term used to refer to a substance that is sometimes found in bamboo and has been used in traditional medicine in some cultures, particularly in traditional Chinese medicine (TCM). It is also known as "tian zhu huang" in TCM. Tabasheer has been attributed with various medicinal properties, including being a cooling agent, a remedy for fever and anxiety, and having potential benefits for the respiratory and urinary systems. However, research on tabasheer has been relatively limited compared to other natural substances, and there are several potential research gaps and areas for further investigation:

1. **Chemical Composition and Characterization:** One significant research gap is a comprehensive analysis of the chemical composition of tabasheer. While it is believed to contain silica, calcium, and other minerals, a more detailed chemical analysis is needed to understand its constituents fully.
2. **Pharmacological Properties:** There is a need for more rigorous scientific studies to evaluate the pharmacological properties of tabasheer. This includes research into its potential anti-inflammatory, antipyretic, anxiolytic, and other claimed therapeutic effects.
3. **Toxicology and Safety:** Research on the safety and potential toxic effects of tabasheer is limited. More studies are needed to determine its safety profile, especially when used in higher doses or for extended periods.
4. **Mechanism of Action:** Understanding the underlying mechanisms through which tabasheer exerts its therapeutic effects is essential. This can help validate its traditional uses and potentially identify new applications.
5. **Dosage and Formulations:** Research is needed to establish appropriate dosages and formulations for tabasheer, especially if it is to be used as a standardized herbal medicine or dietary supplement.
6. **Clinical Trials:** Conducting well-designed clinical trials to assess the efficacy of tabasheer for specific health conditions can help provide more concrete evidence of its benefits.
7. **Quality Control:** Ensuring the quality and authenticity of tabasheer-containing products in the market is crucial. Research into methods for quality control and authentication is necessary.
8. **Cultural and Ethnobotanical Research:** Exploring the cultural and ethnobotanical aspects of tabas-

her, including its traditional uses and cultural significance, can provide valuable context for its study and utilization.

9. **Sustainability and Environmental Impact:** Investigating the sustainability of tabasheer harvesting from bamboo and its potential impact on bamboo ecosystems is important, especially given concerns about overharvesting.

It's important to note that research on traditional remedies like tabasheer often faces challenges in terms of standardization, placebo controls, and funding. Therefore, interdisciplinary collaboration between botanists, chemists, pharmacologists, and traditional medicine practitioners may be necessary to address these research gaps effectively. Additionally, new research developments may have occurred since my last knowledge update in September 2021, so it's advisable to consult more recent sources for the latest findings on tabasheer.

REFERENCE

1. A., Zakir, S., & Anwar, M. (2021). Eth. A., Zakir, S., & Anwar, M. (2021). Ethno medicinal, phyto chemical and therapeutic importance of *Bambusa arundinaceous*: A review. *International Journal of Unani and Integrative Medicine*, 5(2), 161–164. <https://doi.org/10.33545/2616454x.2021.v5.i2c.18>.
International Journal of Unani and Integrative Medicine, 5(2), 161–164. <https://doi.org/10.33545/2616454x.2021.v5.i2c.185>
2. Ahmed, D., Sharma, M., Mukerjee, A., Kant, R. K., & Kumar, V. (2012). Antidiabetic, Anti-hyperlipidemic & Hepatoprotective effect of a Polyherbal Unani formulation “Qurs Tabasheer” in STZ-diabetic wistar rats. *Nature Precedings*. <https://doi.org/10.1038/npre.2012.7056.1>
3. Hussain, R., & Ali, T. (2015). *Role of Qurs-E-Tabasheer in Endoscopically Proved Gastritis and Duodinitis*. 6, 138–143.
4. Maji, J. K., Patel, M., & Mehta, P. J. (2018). *Bambusha : Realm of Indian*. 5(February 2019), 65–72.
5. Rawat, K., Nirmala, C., & Bisht, M. S. (2018). Quantitative assessment of silicon in fresh and processed bamboo shoots and its potential as functional element in food, nutraceuticals and cosmeceuticals. *Proceedings of 11 Th World Bamboo Congress, Theme: Food and Pharmaceuticals, Martin*, 14–18. <https://worldbamboo.net/wbcxi/papers/Rawat, Kanchan, Nirmala Chongtham, M.S. Bisht.pdf>