

Gucchi Mushroom: Treasure on Himalayas

*Saroj Kumari¹, R S Rana², Rishita Kapoor³ and Tarun Sharma⁴

¹Ph. D. Scholar (Agronomy), Department of Agronomy, College of Agriculture, CSK Himachal Pradesh Krishi Vishvavidyalaya, Palampur, India

²Principal Scientist, Department of Agronomy, CSK Himachal Pradesh Krishi Vishvavidyalaya, Palampur, India

³Ph. D. Scholar (Genetics and Plant Breeding), Department of Genetics and Plant Breeding, College of Agriculture, CSK Himachal Pradesh Krishi Vishvavidyalaya, Palampur, India

⁴Project Associate-1, Centre for Geo-informatics Research and Training Centre, CSK HPKV, Palampur, Himachal Pradesh, India

*Corresponding Author's email: sarojchauhan293@gmail.com

North- Western Himalayan region is well known for its rich agro-diversity throughout the world. A wide range of species having medicinal properties are found in Himalayas. *Gucchi* mushroom is one of them predominantly found in Himalayas. *Gucchi* mushroom (*Morchella esculenta*) which is commonly known as morel mushroom is a wild edible fungus native to the temperate Himalayan regions of India, particularly confined in Jammu & Kashmir, Himachal Pradesh and Uttarakhand. The *Gucchi* mushroom found in the Doda district of Jammu and Kashmir, was indeed granted a GI tag by the Geographical Indication Registry. This GI tag recognizes the unique qualities and reputation of the mushroom, which is primarily found in the temperate forests of Doda. *Gucchi* mushrooms have a distinctive structure consisting of a honeycombed, spongy cap (pileus) and a hollow, white to pale yellow stem (stalk). The cap is characterized by deep pits and ridges, giving it a wrinkled appearance. The stem is typically swollen at the base and can be hollow or filled with a cottony substance. It is a highly valuable wild species hence recognized as the “growing gold of mountains”¹.



Figure 1: Shows the Physical Appearance of *Gucchi* Mushroom

Gucchi mushrooms are found in several districts in Himachal Pradesh. It is particularly found in higher altitude regions including Kullu, Shimla, Kinnaur, Chamba and Sirmour. They thrive in cold climates and on steep slopes and can be found in dense coniferous forests at elevations ranging from 2500 to 3500 meters above mean sea level. *Gucchi* mushrooms are well adapted to mountainous regions, specifically in well-drained, humus-rich, loamy soil. These mushrooms are often found near dead wood or disturbed areas. In Himachal Pradesh, the *Gucchi* mushroom is locally called *Gucchi*, *Rangmuch*, or *Cheu*. Other local names for *Gucchi* mushroom in Himachal Pradesh include *Dhunglloo*, *Chaeu*, *Jamchu*, *Chunchroo*, *Chuahar khukh*, *Rangmuts*, *Jangmuts*, and *Bhuntu*. These mushrooms appear during spring season, from March to July, especially in areas that have experienced forest fires, which promote their growth².

Cultural and culinary importance of gucchi mushrooms

Gucchi mushrooms have been used for centuries by Himalayan communities as an important part of traditional recipes. They are valued in Kashmiri, Himachali and other North Indian cuisines for their rich taste. These mushrooms are traditionally consumed in various regional delicacies such as gucchi pulao, gucchi curry and gucchi masala especially in the cuisines of Himalayan communities including Kashmir and Himachal Pradesh. Indian make Gucchi with rice and vegetables and believe it to be as nutritious as meat or fish. Tribal peoples use Gucchi by boiling the fruiting bodies in water, while the local communities in Kullu District of Himachal Pradesh cook gucchi in milk. Morels must be properly cooked before consumption as they contain hydrazine toxins in raw form and these toxins are destroyed by heat.

Nutritive value

The edible fruiting body of *M. esculenta* also contains organic acids, carotenoids, tocopherols and phenols. δ -, α -, and γ -tocopherol are found in this mushroom. This mushroom contains certain organic acids including citric, quinic, fumaric, oxalic and malic acid. The carotenoids include lycopene and β -carotene. Protocatechuic acid, p-coumaric acid and p-hydroxybenzoic acid are the phenolic compounds found in this mushroom. This mushroom is rich in nutrients, as it is high in protein, carbohydrates and vitamins, particularly those in the B complex, with lower levels of vitamins A, C and D. It also provides essential minerals such as calcium, iron, copper, zinc, magnesium, manganese, sodium, phosphorus, potassium and selenium. It is low in calories and fat, containing about 38 percent carbohydrates, 32.7 percent protein, 17.6 percent fibre, 9.7 percent ash and 2.0 percent fat^{3,4}.

Medicinal properties of gucchi mushrooms

The fruiting body of *M. esculenta* contains a variety of active constituents like vitamins, steroids, minerals, proteins, polysaccharides and polynucleotides. *M. esculenta* and its active compounds possess significant cardiovascular protective, antibacterial, antitumor, immunomodulatory, antiparasitic, hepatoprotective, antiviral and antidiabetic properties.

1. Rich in antioxidants: Gucchi mushrooms contain natural antioxidants like phenols, flavonoids and ascorbic acid. These helps neutralize free radicals, which reduce cell damage and prevent premature aging, cancer and chronic diseases.

2. Boosts immunity: Gucchi is rich in polysaccharides and beta-glucans, which are known to stimulate the immune system. It enhances macrophage and natural killer (NK) cell activity, improving the defense mechanism of body.

3. Anti-inflammatory properties: Compounds in gucchi have anti-inflammatory effects, which help reduce swelling, pain and inflammation in conditions like arthritis, asthma and other inflammatory diseases.

4. Antimicrobial activity: Gucchi mushrooms show antibacterial and antifungal properties. Extracts from the mushroom inhibit the growth of pathogenic bacteria like *E. coli*, *Staphylococcus aureus* and *Candida* fungi.

5. Supports heart health: Gucchi is cholesterol-free, low in fat and contains heart-protective potassium and magnesium. It helps in regulating blood pressure, improving blood circulation and reducing the risk of heart disease.

6. Good for brain function: Rich in B-complex vitamins, especially vitamin B₁₂ and niacin, gucchi supports nerve health and brain function.

7. Liver protective (Hepatoprotective): Gucchi extracts can protect the liver from toxins and oxidative stress, improving liver health and detoxification.

8. Anticancer potential: Bioactive compounds like lectins, triterpenes and polysaccharides found in gucchi have anti-tumor effects.

9. Supports digestive health: Gucchi mushrooms are rich in dietary fibre, which improves digestion, relieves constipation and supports healthy gut bacteria.

10. Helps in managing diabetes: The low glycemic index and fibre content help regulate blood sugar levels. Some compound may also improve insulin sensitivity.

Economic importance

Gucchi mushroom is one of the most expensive vegetable in the world, with their dry form fetching high market prices ranging from ₹20,000 to ₹30,000 per kilogram in local markets and even higher in international gourmet markets. In remote mountain areas, collection and sale of gucchi mushrooms serve as an important source of income for many rural families. These mushrooms are expensive due to many reasons. One of the reasons for their high cost is the fact that they grow naturally and are not yet commercially cultivated on a significant scale due to their specific and complex ecological requirements as they are mycorrhizal fungi forming symbiotic relationships with certain tree roots. Other factors leading to high cost of these mushrooms includes their rarity and the high demand in gourmet and export markets for their unique flavour and culinary properties. Another reason behind its high cost is due to difficulty and risk involved in harvesting, as it requires significant effort, expertise and familiarity with forest ecology. The harvesting process is physically demanding and sometimes dangerous involving long treks in hilly terrains and dense forests. The mushrooms are often well-camouflaged among forest litter, grow in remote and rugged terrains, and are available only for a brief seasonal window, making their collection both labor-intensive and uncertain.

Research and conservation

Despite its high nutritional value, there is limited scientific understanding of Guccchi mushroom's life cycle and ecology, which hampers cultivation efforts. Researchers and agricultural institutions are working on strategies to enable controlled cultivation through spawn development and substrate trials but success remains limited so far. Every year in October/November months locals set fire to the ground, believing that this will increase Guccchi yield. There is a need for scientific assessment of the ecological and economic consequences of such traditional practices. There is also an urgent need to introduce conservation practices and community-based forest management to ensure the sustainable availability of this forest treasure.

Conclusion

Mushrooms are essential and beneficial organisms that grow naturally in the environment and possess a wide range of characteristics. Guccchi mushroom is more than just a delicacy, it represents nature's abundance hidden within the Himalayan forests. Its high nutritional value, economic importance and cultural legacy make it a subject worth greater attention in the fields of sustainable agriculture, forest conservation and rural development. The distinctive flavor of mushrooms, along with their essential bioactive compounds, makes them highly significant in pharmacology. Mushroom extracts may be used to cure a number of ailments. With proper research, awareness and policy support Guccchi could become both a gourmet ingredient for the world and a sustainable livelihood for mountain communities. In the coming years the Guccchi mushroom will change the Indian mushroom business, assisting farmers in their economic development.

References

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