



# REVIEW STUDIES ON EDIBLE MUSHROOMS WITH SPECIAL REFERENCE TO U.P

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## Abstract

Since the dawn of civilization, man has enjoyed mushrooms, and their usage as sustenance is likely even older. Because man did not consider it important for his food and almost did not fully understand the art of mushroom growth, the effective approach towards their conservation and taming was not created until a few years back. This review of many studies on mushrooms focused on ritual, dietary, medical, and pharmaceutical aspects that will be useful to researchers studying mushroom production.

**Keywords-**Mushroom, Cultivation, Ritual And Medicinal Studies.

## Introduction

India has several environmentally diverse regions spread out across its territory, from the north to the south and from the east to the west. An important element that has prompted scientists in related fields to consider it is the exploitation of its biodiversity in the production of potential human food. Since the dawn of civilization, man has enjoyed mushrooms, and their usage as sustenance is likely even older. Because man did not consider it important for his food and almost did not fully understand the art of mushroom growth, the effective approach towards their conservation and taming was not created until a few years back. Despite the abundance of substrates available, this was the reason they were unable to cultivate mushrooms at a traditional and commercial level. The orchards, pastures, and deep woods of practically all the districts of eastern Uttar Pradesh are home to a wide variety of edible wild mushrooms. There is a chance that many new edible fungal species and strains will appear in this area. Some of these species and strains may be cultivable, while others may be edible wild species that we have never heard of. The present endeavour will meet a long-needed need in the Eastern U.P. because the area has not been adequately studied for the existence of edible mushrooms.

## Ritual Studies

Mushroom use stretches back to the Palaeolithic period, yet few people, including anthropologists, are aware of how mushrooms have influenced human evolution. In Mesoamerica, India, and ancient Greece, mushrooms were extremely important. Fungi have always evoked strong emotional reactions, ranging from admiration from those who comprehend them to outright dread from those who do not. This is in keeping with their enigmatic nature. According to the past, mushrooms have been utilised for less-than-beneficial purposes. Claudius II and Pope Clement VII were both poisoned with lethal Amanitas by rivals, who then killed them both.

According to a myth, Buddha perished as a result of a subterranean fungus. A peasant who thought mushrooms were a delicacy gave Buddha one. Although 'truffles' grow underground and pigs are used to find them, the fungus that was associated with the expression 'pig's foot' in ancient verse has never been discovered.

The Tassili image from a cave, which dates back 3500 years before the birth of Christ, is most likely the oldest archaeological evidence of mushroom use that has been discovered to date. The artist's intention is obvious because a dancing shaman is outlined by mushrooms with electric auras. The image's spiritual meaning is evident and transcends time. No wonder the phrase "be mushroomed" has emerged to describe the mindset of a devoted mushroom lover. Hikers in the Italian Alps discovered the well-preserved remains of a guy who passed away more than 5300 years ago in the winter of 1991, almost 200 years after the Tassili cave artist. The news media dubbed him the "iceman," and he had a knapsack, a flint axe, a string of dried birch polypores (*Piptoporus betulim*), and an additional, as-yet-unidentified fungus. The polypores can be used as both tinder and medicine to cure wounds. By boiling these mushrooms, a rich tea with immune-boosting qualities can also be made. 'soma' has one of the Wasson's most intriguing findings: The Florentine codex of the Franciscan monk Bernardino de Sahagrin contains stories of the use of mushrooms in rituals. He said that the mushroom was either fed with honey or chocolate at rituals, coronation rites, or even during business festivities and sacrifices. More than a dozen species and subspecies of the genus *Psilocybe* are currently used by Indians in Mesoamerica, according to Guzman (1983). Some *Panaeolus* species and one *Conocybe* species may still be employed for ritual purposes, according to recent research (Schutlitz and Hofmann, 1980).

## Taxonomic Studies

In 1981, Pacioni published a wonderful article on mushrooms and toadstools in the Encyclopaedia. He provided complete colour descriptions of 420 distinct mushrooms, including information on their appearance, habitats, seasons, and edible qualities. 390 of these were from the British Isles, according to reports. Additionally, he provided the introduction with illustrations and the spore structure for each species. The Colour Dictionary of Mushrooms was edited by Dickinson and Leucas in 1982. This beautifully illustrated book is a useful work of reference that makes it simple for amateurs to recognise and categorise specific species. Beautiful 516 coloured plates with brief descriptions, eco- and edibility-related information were provided. Dr. M. Svrcek created a monumental work on mushrooms in 1983. It was a thorough work that would be very helpful to a beginner in mushroomology. This is a priceless manual for correctly identifying enigmatic and much criticised creatures. According to scientific categorization, he classified around 250 different species of mushrooms, each of which was lucidly described and exquisitely depicted.

The climatic conditions in the northern part of India provide a favourable environment for the development and function of edible mushrooms. This is the cause of the abundance of these fungi in forests, grasslands, and orchards, which has drawn the attention of mycologists to consider their many facets. The diversity of mushrooms in the Madhya Pradesh region's Gulberga area was recorded by Rajak and his team in 2005. Of the 35 species of mushrooms they discovered, 31 were named. There were four species of *Agaricus*, six

of *Lepiota*, two of each of *Tricholoma*, *Psilocybe*, *Termitomyces*, *Coprinus*, and *Marasmius*, and 11 of the 31 species of mushrooms were represented by just one type. Rahi (2001) also investigated the edible mushrooms found in Madhya Pradesh's tribal regions.

### Cultivation

Around 1630, the cultivation of mushrooms began in France under Louis XIV, where they were grown in caves carved out of limestone rocks. The first description of mushroom cultivation dates back to Bonnefons in 1630, and a French gardener named Chambry began cultivating them underground in order to ensure year-round production in 1810. In the USA, Duggar (1905) invented a method for preparing pure spawn by cultivating pileus tissue on nutritional medium. The first mushrooms were grown in the nineteenth century. In 1910, conventional mushroom houses were constructed, and tray cultivation followed. The cultivation of mushrooms then began in a number of other nations in Asia and Europe. Due to the first world war, which began in 1914, the world was unable to give mushroom agriculture the attention it deserved. Special attention was devoted to and attempts were made to cultivate mushrooms on a wide scale due to the lack of grain.

### Amendment Studies

As mushroom farming gained popularity, numerous scientists throughout the world experimented with various substrates and additives to boost productivity. Inaba *et al.* in 1982 amended sulphate waste compounds obtained during soft and hard wood cooking and observed the fruiting body formation of *Pleurotus sajor-caju* and *Flammulina volutipes* grown on saw dust medium.

The substrate used to grow oyster mushrooms is home to a variety of microorganisms. Many workers have experimented with bio-control of the substrate to improve mushroom growth (Deena Nath, 2006).

### Medicinals

A relatively recent field of study, beginning from the late 1970s, is the cultivation of mushrooms exclusively for the manufacture of medicinal substances. Since then, several bio-active substances have been found in the mushroom fruit body, mycelium, and leftover culture broth that are of interest. The chemical present at various periods of life is usually always the same. However, there are some exceptions, when a disproportionately higher amount of a target molecule can be recovered from one growth stage than the other (Wassersoloma, 1999). They claimed that compounds such as penicillin, lentinan, eritadenine, and others may be isolated from fungi. She *et al.* (1998) and Wang *et al.* (1998) extracted lectin from *Volvariella volvacea* fruiting bodies that demonstrated immunomodulatory activity.

### Nutritional Aspects

In order to determine the chemical makeup of eleven species of edible mushrooms that were taken from the forests of Pakistan-occupied Kashmir, Sabir *et al.* (2003) conducted studies. The results obtained were used to compare to those of some commonly known edible mushroom species. They also collected some lesser known species like *Amanita ceciliae*, *Volvariella bombycina*, *Collybia dryophila*, *C. ellepsoidia*, *Flammulina volutipes*, *Laccaria globosa*, *Marasmiellus njamii*, *Marasmius oreades*, *Oudemansiella radicata*, *Russula aeruginea* and *R.*



*chamaeleontina* and analysed for their chemical composition including total dietary fibre, crude protein, fat, ash, moisture and carbohydrates. When these values were compared with the values of the common mushrooms *Lentinus edodes*, results were promising.

Sidhant (Personal communication) has tried more than 10 different types of substrates for the cultivation of oyster mushrooms and many of them gave good results. Poppe (2004) recently compiled nearly 200 different kinds of agricultural wastes and found that there was a great variation in B.E. of various mushrooms in amended sets as compared to control. Upadhyay and Verma (2000) studied the use of nonconventional substrates for growing Oyster mushroom and observed tea leaves alone were proved to be poor substrate for mycelial growth of *Pleurotus sapidus* and *P. flabellatus*. If tea leaves mixed with wheat straw in the ratio of 3 :1 and 1:1, it gave better results than wheat straw alone. Malt Industry waste rich in nitrogen could substitute wheat straw upto 20% for growing *Pleurotus florida*. They further observed that dried populus leaves alone or in combination with wheat straw gave 70 percent biological efficiency. The adoption of such less expensive substrates could reduce the cost of producing mushrooms and may assist boost the economy of the society's most vulnerable members.

Mushrooms become tougher and softer after harvest. In 1987, Bealman investigated how the surface texture of mushrooms changed during post-harvest preservation. After two days of storage, 50% less energy was needed to compress the side of the mushroom than the top, compared to 26%. Initial bacterial population was a key consideration during storage, according to Bealman (1987). He reported the presence of *Pseudomonas talasii*, *Clostridium botulinum* and *Staphylococcus aureus* in the mushrooms. He concluded that *P. talasii* was responsible for mushroom browning.

### Breeding in Mushrooms Species.

Self fertility is a highly widespread phenomena among all fungus, yet only 10% of the species in basidiomycetes are self fertile. In today's world, breeding has become a crucial tool in every industry, and mushrooms are no exception. Several cultured edible mushroom improved lines have been created either through selection or hybridization. Selection is done using tissue, multispore, or monospore cultures. Prior to mycelium crossover or hybridization, selection is attempted in genetics. With homothallic and heterothallic species, respectively, monosporic and multisporic selection is carried out. In the 18th century, studies on Indian agarics were conducted in Europe, and Montagnae (1842) was the first to document an Indian agaricales member. Since then, we've climbed a lot of stairs. A single basidium's basidiospores might vary, according to Song et al. (1972). Chang (1978 ) observed that single spore isolate was better potentiality for breeding purposes in *Volvariella volvacea*. Kaul and Kachroo (1975) have elevated a number of strains in *Agaricus bisporus*, Chang (1978 ) Summed up the breeding works done in *Volvariella volvacea*'' .

### Test for Basidiocarp

The ways that mushrooms respond to various compounds have also come to play a significant role in classification. For example, the genus *Lyophyllum* was created to include different white-spored agarics, which have dark-colored granules in their basidia. in aceto-carimine when heated (Arora, 1986). He goes on to

say that a mushroom hunter or researcher should at least try to obtain two useful chemicals. The first chemical is a mixture of Melzer's reagent, an iodine solution, and 5–10% aqueous potassium hydroxide. Amyloid spores stained with this reagent exhibit either a bluish-grey or bluish-black tint, while dextrinoid spores exhibit a brown or reddish-brown stain.

### Mushroom's on Stamps

In addition to botanists, mycologists, and naturalists, mushrooms have also piqued the curiosity of common people, politicians, and nationalists throughout the world, depending on whether they are edible, inedible, medicinal, or poisonous. This is evident by issue of 'Stamps' of one or the other mushrooms by many countries like Cambodia, Cuba, Australia, Afghanistan, Bulgaria, Burkina, Japan, Germany, Czechoslovakia, Djibouti, Guinea, Guyana, Jugostavia, Korea, Mali, Rumania, Mangolia, Laos, Nicaragua, Nigeria, Poland, Rumania, Rwanda, Somalia, Sweden, Togolese, Tome, Tristan de Kuna, Vietnam, Yemen, Battue, Benin and Zaire etc. (mushworld.com).

Mushrooms like *Agaricus campestris*, *A. augustus*, *Amanita muscaria*, *A. fulva*, *A. solitaria*, *Lepiotaprocera*, *A. pantherina*, *Russula spp.*, *Flammulina volutipes*, *Cantharellus sp.*, *Pleurotus ostreatus*, *Phallus impudicus*, *Ganoderma applanatum*, *Bovista lycoperdon*, *Coprinus comatus*, *More he I la esculenta*, *Polyporus*, *Lactarius* and several others have attracted the attention of Heads of the respective states and have got place on stamps. This demonstrates how crucial these are for people. In order for future generations to understand the importance of biodiversity protection, they not only use them but also exhibit an inclination towards their preservation.

### Conclusion

This study came to the conclusion that mushrooms are employed both as nutritional and therapeutic resources. Due to the highest potential for structural polymorphism in comparison to other biologically active compounds, polysaccharides from mushrooms have been shown to display immunomodulation characteristics, antitumor, antioxidant, antibacterial, and prebiotic action. Because mushrooms may be cultivated on a variety of cheap agricultural or forestry wastes, including rice straw, maize cobs and sawdust, the advantages of mushrooms are quite affordable. The usage of mushrooms is a very good strategy and solution in the search for affordable and environmentally responsible techniques for environmental restoration. Increasing mushroom production in India appears to be a feasible and alluring solution for more sustainable farming on a worldwide scale. Enhancing the commercial worth of products, whether they are in their raw or processed forms, could result in an increase.

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