



## REVIEW ARTICLE

## Medicinal Importance of mushrooms – A review

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### Manuscript Info

#### Manuscript History:

Received: 22 October 2014  
Final Accepted: 26 November 2014  
Published Online: December 2014

#### Key words:

Mushrooms, medicinal importance, disease fighting agents, nutritive value.

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### Abstract

There are 1600 mushroom species out of which 100 species have been accepted as food. More than 33 species of mushroom are under commercial cultivation throughout the world and 3 species are popularly grown in India viz, White Button mushroom, Oyster mushroom, and Paddy Straw mushroom. These mushrooms are rich in protein, vitamins, minerals and excellent source of thiamine, riboflavin, niacin and folic acid etc. The digestibility of mushroom protein is 71-90%. Major contribution to Indian mushroom production comes from white button mushroom (*Agaricus bisporus*) i.e 90-92%, while rest comes from oyster mushroom (*Pleurotus Spp.*) and paddy straw mushroom (*Volvariella spp.*). For centuries, people across the world have been using wild mushrooms for food, medicine and cosmetics as well as for other economic and cultural purposes. Mushrooms are devoid of starch and low in calories and other carbohydrates. Apart from their nutritional value, mushrooms have potential medicinal benefits; they are an ideal food for diabetics and over-weight people.

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### Introduction

A mushroom is the fleshy, spore-bearing fruiting body of a fungus, typically produced above ground on soil or on its food source. Mushrooms were included in diet by Greeks and Romans since ancient times. Romans regarded them as food of God while Chinese termed them as elixir of life (Boa,2004;Moerman,2008). Mushrooms have long been appreciated for their flavour, texture, and some for medicinal and tonic attributes, recognition that they are nutritionally a very good food and physiologically an important potential source of biologically active compounds of medicinal value is much more recent. It is now known that mushrooms are rich in high quality protein, contain a high proportion of unsaturated fatty acids, and have a nucleic acid content low enough to allow daily use as a form of vegetable. (Chang,1994)

### Review of Literature

Oso (1975) reported that traditional doctors employ *T. Microcarpus* found in mushroom as a medicinal preparation for the treatment of gonorrhoea.

Chan (1982) observed that edible mushroom is considered as healthy food because their mineral content is higher than that of meat, fish and most vegetables. Furthermore, it is known that protein content of fresh mushrooms is about twice than that of vegetables and four times than that of oranges.

Li and Chang (1982) found that edible mushrooms contain all nine amino-acids essential for human being and are rich in lysine and leucine, which are lacking in most staple cereal foods.

Mintz (1986) reports that mushrooms are very nutritious, rich in calories and vitamins; heavy foods; and are the total equivalent of meat. Fried mushrooms prepared in liberal amounts of oil or butter regarded as the meat component of the meal, and is usually consumed with a serving of carbohydrates. In addition to their perceived caloric contribution, mushrooms are valued for their strong distinctive flavor that tends to saturate the taste of the entire dish.

Ross (1987) has reported that mushrooms are perceived as nutritiously valuable. They are regarded as heavy foods and a caloric equivalent of meat.

Fukushima (1989) observed that a protein bound polysaccharide extracted from the mushrooms displays various unique biological activities including the stimulation of functional maturation of macrophages and have an ability to scavenge active oxygen species which is widely prescribed for cancers of digestive organs like stomach, oesophagus colon etc.

Rammeloo and Walley (1993) reports that, whereas mushrooms cannot compete with beans, they must be considered as important dietary supplements. For local populations, mushrooms are usually considered as substitutes for animal protein and are known as meat for the poor.

Mizuno et al (1995) observed that mushroom possesses anti-cancer, anti-viral, immunopotentiating, hypocholesterolaemic and hepatoprotective properties.

Chang and Buswell (1995) revealed that mushroom nutraceuticals is refined/ partially defined mushroom extractive which is consumed in the form of capsules or tablets as a dietary supplement and which has potential therapeutic applications. A regular intake may enhance the immune response of the human body thereby increasing resistance to diseases and in some cases cause regression of a disease state.

The finding by Manzi (1999) revealed that mushrooms are healthy foods, poor in calories and fats, rich in vegetable proteins, vitamins and minerals.

Ikekawa (2001) reported that the intake of mushrooms proved to be effective in cancer prevention, growth inhibition and also has high anti tumor activity and a preventive effect in tumor metastasis.

Janardhanan (2001) on his study found that the substance extracted from the mushrooms can reduce blood pressure, blood cholesterol and blood sugar level as well as inhibition of platelet aggregation.

Feng et al., (2002) found that mushroom rich in antioxidant activity have been shown to play an important role in prevention of cancer.

Mattila (2002) reports that mushrooms have functional properties such as vitamin B-complex, vitamin D and antitumor, anticancer and antiviral activities due to letinin.

Hadar (2002) reported that mushrooms have important nutritional, medical and biotechnological properties and environmental application, they are low in calories, sodium, fat and cholesterol, while, rich in protein, carbohydrate, fibre and minerals, mushrooms are good sources of vitamins like riboflavin, biotin, thiamine. These nutritional properties make them health promoting foods.

Apetorgbor (2002) has reported that mushrooms are also used as blood tonic, decreases blood pressure and is used for the treatment of diseases like kwashiorkor, obesity and diarrhoea.

National Cancer Institute (2005) reported that a number of medicinal mushrooms possessed promising antioxidant and anticancer properties. Several mushroom derived compounds are now increasingly used as adjuvant to standard radio and chemotherapy. The most encouraging effect is the ability of these mushroom derived compounds when administered prior to or during radio or chemotherapy significantly reduced the side effects from these treatments.

Sencer (2006) reported that mushroom is a good source of niacin and helps in preventing the pellagra because of having pellagra preventive factor.

Celik and Peker (2006) found that conjugated linoleic acid is found in mushrooms, which can stop cancer cell growth through blocking cancer cell reproduction.

Garcha (2007) has revealed that increasing consumption of mushroom is good for preventing malnutrition, although mushrooms can be an alternative protein source instead of meat.

Ajith (2007) reported that mushrooms are known to have effective substances for anti fungal, anti inflammatory, anti tumour, anti viral, anti bacterial, anti diabetic, and hypotensive activities.

Oyetayo (2011) reported that mushrooms such as *Pleurotus tuber-regium* used for headache, stomach pain fever, cold, constipation; *Lentinus squarulosus* for mumps, heart diseases; *Termitomyces microcarpus* for gonorrhoea; *Calvatia cyathiformis* for leucorrhoea, barrenness; *Ganoderma lucidum* for treating arthritis, neoplasia; *G. resinaceum* used for hyperglycemia, liver diseases (hepatoprotector); *G. applanatum* used as antioxidant and for diabetes.

Jin et al (2012) reported that the use of *G. lucidum* mushrooms as a first-line treatment for cancer. It remains uncertain whether *G. lucidum* helps prolong long-term cancer survival. However, *G. lucidum* could be administered as an alternative adjunct to conventional treatment in consideration of its potential of enhancing tumor response and stimulating host immunity.

Duyff R. (2012) reports that mushrooms are the leading source of the essential antioxidant selenium in the produce aisle. Antioxidants, like selenium, protect body cells from damage that might lead to chronic diseases. They help to strengthen the immune system, as well. In addition, mushrooms provide ergothioneine, a naturally occurring antioxidant that may help protect the body's cells.

Chang R. (2012) reports that mushrooms provide many of the nutritional attributes of produce, as well as attributes more commonly found in meat, beans or grains. Mushrooms are low in calories, fat-free, cholesterol-free and very low in sodium. Patel and Goyal (2013) reported that mushrooms act as anti-cancer compounds play crucial role as reactive oxygen species inducer, mitotic kinase inhibitor, anti-mitotic, angiogenesis inhibitor, topoisomerase inhibitor, leading to apoptosis, and eventually checking cancer proliferation.

## Conclusion

As the population of the world continues to increase, so the amount of food and the level of medical care available to each individual, especially those living in less developed countries, decreases. Mushrooms, with their great variety of species, constitute a cost-effective means both of: (a) supplementing the nutrition of the majority of human kind through mushroom production, and (b) of alleviating the suffering caused by certain kinds of illness using mushroom products. It is believed that advances in the scientific study of mushroom biology and in the technological development of the mushroom based industries would be served best if research into both these aspects could be jointly coordinated and were to be supported on a reciprocal basis.

## Acknowledgement

Authors acknowledge the great help received from the scholars whose articles cited and included in references of the manuscript

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