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Review Article

EDIBLE MUSHROOM - A NUTRITIOUS FOOD IMPROVING HUMAN HEALTH

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ABSTRACT

Mushrooms have been consumed since earliest history. The word Mushroom is derived from the french word for Fungi and Mold. Now-a-days, Mushroom are popular valuable food because they are low in calories, carbohydrate, Fat, sodium and also cholesterol free. Besides this, Mushroom provides important nutrients, including salenium, potassium, riboflavin, niacin, Vitamin D, proteins and fiber. All together with a long history as food source. Mushroom are important for their healing capacity and properties in traditional medicine. It has reported beneficial effects for health and treatment of some disease. Many nutraceutical properties are described in Mushroom like cancer and antitumor attributes. Mushroom act as antibacterial, immune system enhancer and cholesterol lowering Agent. Additionally, they are important source of bio-active compounds.

KEYWORDS

Edible Mushroom, Nutraceutical properties, Cardiovascular & Antitumor.

INTRODUCTION

Around 2,000 species are exist in Nature but around 25 are widely accepted as food. Mushroom are consider as a high nutritional and functional value and they are also accepted as nutracutical food. They have their own medical properties and economical significance.[1, 2] There are several mushroom that are used for Medical purpose and edible both. Edible Mushroom spieces have therapeutic properties.[3] The most cultivated mushroom is *Agaricus bisporus* (Figure 1), followed by *lentinus edodes, pleurotus* etc. China is the bigest producer of Mushroom.[4,5]

lentinus edodes (Figure 2) is the most studied spieces and also have an antimicrobial action against gram positive and gram negative bacteria. Mushroom are source of antimicrobial compound such as benzoic acid deivatives, terpens, steroids etc.[6] They are rich in protein, Amino Acid and fiber. That's why it use in human diet and promote health for all the synergistic effect of all the bioactive compound present.[7-11] Mushroom have more than 100 medical functions like Anti-oxidant, Anticancer, Anti allergic, Antiviral, Antibacterial, Antifungal, detoxification, antidiabetic, and hepatoprotective effects. They also protect against tumur development and inflammatory process.[12-16]

A balance diet is the supporting treatment for the prevention of illness and especially against oxidative stress. Mushroom have long history of its use in the medicine to prevent and fight numerous diseases.[17-22] Numerous molecules synthesized by micro Fungi are known to bio-active and these bioactive compounds found in fruit bodies, cultured mycelium and cultured broth that are polysccharides, proteins, fats, Minerals, glycosides, alkaloids, volatile oils, tocopherols, phenolics, lectins, enzymes, ascorbic and organic acid.[5,16,17,20] Mushroom have potential to design future strategies for human health. In this review article we are going to discuss the health benefits of mushroom.

Antioxidative and nutraceutical properties of Mushroom:

Mushroom is excellent source of folic acid, the blood building vitamin that prevent anaemia. Mushroom protein is comparable to muscle protein in terms of nutritive value. The active consistent constituents and wild edible mushroom that have been analysed for both their nutritional and nutraceuticals components.[23, 24] The active constituents found in mushroom are polysaccharides, dietary fibers, oligo saccharides, triterpenoids, proteins and peptides, alcohol and phenols and mineral aliments such as zinc, copper, iodine, selenium, iron, vitamin, amino acids etc. These have been found to boost the immune system and also have anti-cancerous property act as anti-hypercholesterolemia and hepato protective agents, show anti HIV activity and anti viral activity. Many of the species are known to be aphrodisiacs. Oxidation is essential for all living organism for the production of energy to fuel biological processes. However, Oxygen centered free radicals and other reactive oxygen species that are continuously produced in vivo, result in cell death and tissue damage.[25, 26] Oxidative damage caused by these free radicals may be related to ageing and diseases, such as atherosclerosis, diabetes , cancer and cirrhosis. The

antioxidant potential has been studied from water and methanol extracts of fruiting bodies of 23 species of mushroom naturally grown in different geographic locations of India.[27, 28]

Figure 1. ***Agaricus bisporus***

Cardiovascular and Hypercholesterolemia Effect of mushroom:

Diabetes is a major endocrine disorder affecting nearly 10% of population all over the world. The major risk factor in development of coronary artery disease (CAD) have been identified as DM, increased blood level of total cholesterol, low density lipoprotein (LDL) cholesterol as well as lowered level of high density lipoprotein cholesterol.[29] Mushroom have high fiber, proteins, micro-elements and low caloric value are almost ideal for diets design to prevent cardiovascular diseases as first suggested by traditional Chinese Medicine. The therapeutic potential of *Agaricus bisporus* and its antioxidant effect in Hypercholesterolemia induced albino rats has been studied. [30] The consumption of *P. florida*s upplemented diet renders antihyperglycaemic as well as anti-hypercholesterolemia effect to alloxan induced diabetic rats.

Figure 2. ***lentinus edodes***

Lentinus edodes can lower both blood pressure and free cholesterol in plasma, as well as accelerate accumulation of lipids in liver by removing from circulation. In most developed countries, The common cause of death is coronary artery disease.[31] The main risk factors are Hypercholesterolemia and dislipoproteinemia, diabetes, disturbance in blood platelet binding and high blood pressure. The initial step in the prevention and treatment of CAD and hypercholesteromia is the modification of nutritional regime with a diet low in fat and fatty acids and rich in crude fibers. Mevinolin is the first specific inhibitor of microbial enzyme that occurs early in the biosynthetic pathway to cholesterol formation. The addition of 4% dried pleurotus to a high cholesterol diet reduced cholesterol accumulation in the serum effectively and liver of experimental rats. In western countries coronary artery disease is the major cause of death, while Hypercholesterolemia is a risk factor, which causes the hardening of the arteries. In humans, 50% or more of total cholesterol is derived of the arteries. Shiitake mushroom is used to lower blood serum cholesterol via factor known as eritadenine.[32 - 34]

Antimicrobial property:

In recent years Basidimycetes and other higher fungi including some recognized medicinal mushroom have been recognized medicinal mushroom have been re-investigated as sources of novel bioactive compounds from the Actinomycetes and Streptomycetes. The researches possess an idea about the antibiotic activity of some of the important wild mushroom of Central India. Growth of medically challenged bacteria like *S.aureus* and *B. cereus* was inhibited by five mushroom out of six selected.[35, 36] Moreover the synthetic antimicrobial discs have been showed a marked increase in their activity when combined with mushroom extract. The petroleum ether, chloroform, acetone and water extracts of mushroom osmoporus odoratus has been observed that the antimicrobial activity against *staphylococcus aureus, streptococcus pyogenes, bacillus subtilis, E. coli;* the water extrct alone showed antibacterial activity against the tested organisms and the results were comparable with that of amphicillin rather than choramphenicol. Determination of antimicrobial activity profile of *Lycoperdon perlatum, Cantharellus cibarius, Ramaria formosa* and *p. pulmunarius* tested against a panel standard pathogenic bacteria and fungi indicated that the concentration of bioactive components directly influence the antimicrobial capability of the isolates. The antimicrobial effect of ethanol against four species of gram positive bacteria, five species of Gram negative bacteria and one species of yeast.[37 - 39]

Hepatoprotective and Antitumor Effect:

Bilirubin concentration has been used to evaluate chemically induced hepatic injury. Besides various normal functions, liver excretes the breakdown product of hemoglobin namely bilirubin into bile. It is well known to cause large increase in bilirubin content. *Lentinus edodes* extract prevented severity of liver damage caused by paracetamol as evidenced by the low level of bilirubin in the serum.[40,41] They use oyster mushroom extract on induced liver damage. The liver tissue of mice which received 1 mL/Kg of saline and free access to pellets. Control group showed a normal liver architecture of hepatocytes where they were well arranged without any alteration at central and portal veins.[42]

Polysaccharides pharmaceutically active mushroom compounds, continue to be the subject of most researches including isolation, chemical structure and experiments. Ten

year ago, the researcher were concentrated on the four mushrooms, *Lentinus edodes, Schizophyllum commune, Grifola frondosa and Sclerotinia sclerotiorum,* particularly their respective b-glucans, lentinan, schizophyllan, grifolan and SSG. Most of them, b-(1-6) branched b-(1-3) linked glucans, were found to exhibit significant antitumor activity. In recent years, little additional research has been conducted with these four mushrooms but a host species has been investigated and a variety of species has been explored. At least 651 species representing 182 genera of hetero and homobasidiomycetes mushroom contain antitumor or immunostimulating polysaccharides. These are also several reports of mushroom containing more than one polysaccharides with antitumor activity.[43-46]

CONCLUSION

Mushroom is a nutrient rich product. It is rich in Vitamin B Niacin, biotin, riboflavin, copper, chromium and selenium and also a good source of Vitamin D. Mushroom provide that type of minerals that are difficult to obtain in the diet. It contain highest amount of Antioxidant. It stimulate the Immune system. Now a days, Mushroom used in cooking due to its Umani flavor. It have its own salty flavor that replace salt in food. Use of edible mushroom in cooking is increase due the properties which are showing in this review article. Compounds such as Lectins and other unique proteins, glucans and other special carbohydrates inhibit cancer formation and growth. Mushroom have so many other compound which are helpful to prevent the diseases and nutrients that provide health to the human.

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