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Importance of medicinal mushrooms

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ABSTRACT

For many years, mushrooms have been utilized for their medicinal and culinary qualities. The evidence shows that a well-rounded diet plan is highly effective in efficiently managing various bodily functions, ultimately promoting good health and reducing the risk of various diseases. In the past few years, there have been significant advancements in pharmacological research that provide strong evidence on the therapeutic benefits of mushrooms as natural remedies. These unique fungi have exceptional characteristics such as remarkable abilities to combat fungi, bacteria, oxidative damage and viruses.

Introduction:

The mushroom belongs as member of the enormous and remarkably complex phylum basidiomycetes, which together with the ascomycetes constitute the kingdom Dikarya, also known as the "higher fungi." The lower cretaceous fossil record provides evidence that mushrooms were present on earth before human beings. Although mushrooms have long been valued as a food and medicine, scientists have only just started to comprehend the molecular mechanisms and advantages of their bioactive components. Mushrooms have a characteristic body that can be epigeous or hypogeous, large enough to be seen with the unaided eye. The majority of edible mushroom species are members of the class Agaricomycetes, which produces basidiocarps such as coral, jelly gilled mushroom, bracket puffballs and crust fungi.They are mostly collected by hand.

Importance of medicinal mushrooms

Various types of mushroom metabolites, namely proteins, polysaccharides, and glycoproteins lipopolysaccharides, have been established as effective agents for enhancing the immune system. Mushrooms also synthesize various efficacious low-molecular-weight secondary metabolites, including phenols, polyketides, and terpenes, which possess potent phytotherapeutic properties. Extensive research has revealed that the phenolic compounds present in mushrooms exhibit remarkable antioxidant properties and possess potential anti-carcinogenic effects. Several significant medicinal mushrooms have been proposed for various therapeutic interventions, namely Agaricus subrufescens, Ganoderma sichuanense, Grifola frondosa, Lentinula edodes, Phellinus linteus, Pleurotus ostreatus, and Polyporus umbellatus. Recent research has unveiled that polysaccharides derived from mushrooms possess notable anti-cancer properties, while exhibiting minimal adverse effects in comparison to the prevailing chemotherapeutic drugs employed in anticancer treatment. The utilization of edible mushrooms in the development of alternative medical remedies, specifically for enhancing the efficacy of anti-cancer drugs, has been duly acknowledged. In the pursuit of identifying a solution to combat antibiotic medication resistance exhibited by human pathogenic microbes, researchers have also undertaken investigations into the antimicrobial properties of mushrooms. Mushrooms are employed as therapeutic foods in view of their chemical composition, which bestows upon them the capacity to mitigate the onset of ailments, including hypertension, hypercholesterolemia, atherosclerosis, and cancer. The fruiting bodies of certain fungal species, exemplified by mushrooms, possess significant functions within forest ecosystems due to their unique ability to facilitate the decomposition of wood, leaves, and other organic matter, consequently facilitating nutrient recycling. Mushrooms possess considerable nutritional value and have been acknowledged by medical professionals worldwide for their medicinal properties. Mushrooms surpass fish or beef in terms of nutritional value due to their composition comprising eight indispensable amino acids, polyunsaturated fatty acids, and only minimal quantities of saturated fatty acids. Mushrooms possess substantial nutritional value owing to their valuable chemical composition, characterized by notable levels of dietary fiber, minimal fat content, and provision of essential proteins, vitamins, and minerals, all of which are critical components for a balanced diet [1].

Application of mushroom as food and medicine

Mushrooms possess unique characteristics that differentiate them from other food crops, including an unmistakable texture, flavor, and aroma. Numerous examples of edible mushroom species are prevalent in indigenous forests, including Macrolepiota, Auricularia, Armillaria, Pholiota, and Coprinus. Several species of Macrolepiota and Agaricus are commonly recognized in upland pasture regions. Mycological specimens found within exotic plantations, including pinus and cupressus, persist in obscurity to the indigenous population and are therefore not procured for utilization. Chlorophyllum molybidites stands as the preeminent poisonous mushroom, exhibiting a resemblance to edible mushrooms within the Agaricacea family. However, due to significant similarities, local populations face challenges in discerning this toxic species from its consumable counterparts. Mushrooms possess a high nutritional value and provide a low-calorie dietary option characterized by the presence of high-quality proteins, vitamins, and minerals. Mushrooms hold significant relevance as a valuable reservoir of both sustenance and therapeutic substances derived from natural origin. Edible mushrooms have long been recognized as a suitable dietary choice for individuals struggling with obesity or diabetes due to their inherent composition of elevated fiber content, reduced fat content, and low levels of starch. This nutrient profile renders them highly beneficial in averting hyperglycemic episodes. They are recognized for their potential in exhibiting anti-oxidative, cardiovascular, hypercholesterolemic, antimicrobial, hepato-protective, and anticancer properties. According to Barros' report, a considerable number of over 3000 mushroom species are primarily identified as edible. However, commercial cultivation is limited to merely 100 species, with only ten species being employed on an industrial level. The global and economic worth of these mushrooms is progressively rising owing to their rising significance as a food source, as well as their medicinal and nutritional values [2].

Nutritional composition of mushroom

The carbohydrate component of mushrooms comprises the majority of their fruiting bodies, constituting approximately 50 to 65% on a dry weight basis. The proportion of free sugars equates to approximately 11%. According to the findings, Coprinus atramentarius was found to possess a carbohydrate content of 24% in terms of its dry weight. Mannitol, widely recognized as mushroom sugar, comprises approximately 80% of the collective free sugars, thus establishing its dominant presence. Singh NB and Singh P. According to the report, the composition of a fresh mushroom consists of 0. 9% mannitol, 028% reducing sugar, 0. 59% glycogen, and 0. 91% hemicelluloseThe predominant carbohydrate constituents within Agaricus bisporus encompass Raffinose, sucrose, glucose, fructose, and xylose. The mushroom is considered a significant source of protein, as it serves as a crucial component within the dry matter composition of mushrooms. The protein content of mushrooms is contingent upon a multitude of factors, including the composition of the substratum, size of the pileus, harvest time, and specific species of mushrooms. The protein composition of mushrooms has been observed to display fluctuations across different growth cycles. Protein found within organism A is a topic of interest for scientific investigation. The dry weight analysis of bisporus mycelium reported a range of 32% to 42%. Generally, mushrooms exhibit a greater protein content in comparison to the majority of other vegetables as well as a large proportion of wild plants. Specifically, the fruiting bodies of Lactarious deliciosus and Lactarious

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sanguiffus contain protein levels ranging from 14. 71% to 1737% and 1520% to 1887% respectivelyMushrooms possess the complete repertoire of essential amino acids necessary for fulfilling the dietary requirements of an adult individual [3].

Application of mushroom as medicine

Mushrooms serve as not merely nutrient-rich substances, but also as therapeutic culinary options with potential benefits in disease prevention, specifically in cases of hypertension, diabetes, hypercholesterolemia, and cancer. The functional attributes exhibited by mushrooms are predominantly attributed to the presence of dietary fiber, namely chitin and beta glucans. Certain species of mushrooms exhibit antitumor, antiviral, antithrombotic, and immunomodulating properties, indicating their potential therapeutic benefits. Furthermore, these mushrooms have been associated with the ability to potentially regulate elevated blood glucose levels. In accordance with the findings presented in the report, it has been established that Pleurotus species possess a substantial degree of therapeutic significance. Compounds derived from these mushrooms demonstrate efficacy against several chronic ailments such as hypertension and hypercholesterolemia, while also exhibiting vital antioxidant, anti-inflammatory, and antitumor properties. Agaricus blazei is commonly employed in general medicine for the treatment of various ailments, such as cancer, chronic hepatitis, diabetes, arteriosclerosis, and hyperlipidemia. There has been a noticeable surge in interest concerning the utilization of this particular mushroom and/or its derivatives as nutritional supplements. This increased fascination can be attributed, at least in part, to its documented properties that include anti-tumor, anticarcinogenic, antiviral, anti-inflammatory, hypoglycemic, hypocholesterolemic, and antihypertensive effects. Mushrooms have been acknowledged as valuable agents for managing chronic catarrh diseases of the breast and hinges. Additionally, they are known to effectively reduce cholesterol levels in the bloodstream, enhance circulation, alleviate night sweating in tuberclusis, rheumatism, gout, jaundice, and dropsy conditions. Furthermore, mushrooms demonstrate considerable potency as remedies for intestinal worms, while also exhibiting noteworthy anti-tumor, anti-viral, and anti-cancer properties. According to various reports, mushrooms have shown notable efficacy in the treatment of hypertension, renal effects, and diabetes in patients. Additionally, the immunomodulatory and antitumor activities of the Polysaccharide-Protein Complex (PSPC) derived from mycelial cultures, as well as the immunomodulatory and antitumor activities exhibited by lectins present in edible mushrooms, have contributed to their recognized medicinal value. The Ganoderma lucidum mushroom, commonly referred to as bracket mushroom, has been employed on multiple occasions for the therapeutic management of individuals afflicted with HIV and AIDS. This utilization can be substantiated by the observed enhancements in bodily mass [4].

Mushroom as antimicrobial action

The mushroom species Osmoporus odoratus is renowned for its ability to generate several extracts, namely petroleum ether, chloroform, acetone, and water extracts. These extracts have proven to be beneficial due to their antibacterial properties, particularly against strains of Staphylococcus aureus, Streptococcus pyogenes, Bacillus subtilis, Escherichia coli, and Pseudomonas aeruginosa. The aqueous extract of Osmoporus odoratus possesses antibacterial properties against various organisms and demonstrates comparable efficacy.

Mushroom as antitumor

The antitumoral activity of four mushrooms, namely Lentinus (Lentinula) edodes, Schizophyllum commune, Grifola frondosa, and Sclerotinia sclerotiorum, along with their respective β-glucans, lentinan, schizophyllan (also referred to as SPG, sonifilan, or sizofiran), grifolan, and SSG, has been well-documented. The majority of β-(1-6) branched β-(1-3)-linked glucans have demonstrated the capability to exhibit antitumor properties. Pleurotus rimosus has been found to generate ethyl acetate, methanol, and aqueous components, which display inhibitory actions towards the Dalton's Lymphoma Ascites (DLA) cell line-induced solid tumor and EAC cell line-induced ascites tumor in mice. Notably, the ethyl acetate extract exhibits a superior antitumor effect when compared to the other extracts. The antitumor activity exhibited by G (abbreviation for a specific compound) is a subject of investigation and analysis in scientific research. The substance known as lucidum is once again commonly employed. The present study employed the EAC cell line to induce solid tumors in mice, and assessed the therapeutic potential of methanol and aqueous extracts in suppressing tumor growth. It was observed that these extracts exhibited remarkable antitumor properties by impeding the progression of tumor development. Additionally, polysachrides extract derived from mycelium demonstrated notable efficacy in inhibiting the proliferation of solid tumors in mice [5].

Mushroom as a anti-inflammatory

The present study investigates the anti-inflammatory properties of ethanol derived from cultured mycelium of M. Succulents are renowned for their notable anti-inflammatory properties and their capacity to effectively impede acute and chronic inflammation in a mouse model. These effects are found to be comparable to those observed with the commonly employed pharmaceutical, Diclofenac. The present study explores the acute and chronic anti-inflammatory properties of ethyl acetate and methanolic extracts derived from G. The present study examines the expression levels of lucidum in response to carrageenan-induced acute inflammation and formalin-induced chronic inflammation. Mushrooms possess a commendable nutritional value owing to their valuable chemical composition, characterized by elevated fiber content, reduced fat content, and the presence of essential proteins, vitamins, and minerals crucial for maintaining a balanced diet [6].

Conclusion

Historically, mushrooms are valued for their culinary and medicinal traits. New studies show mushrooms' therapeutic potential. Features like immune boosters, antioxidants, and disease-fighting polysaccharides highlight their significance in medicine and nutrition. Mushrooms boost immunity, prevent diseases, and heal cancer, hypertension, diabetes, and high cholesterol. Their disease-fighting ability is valuable because of their antimicrobial properties. Their diet is nutritious because of the amino acids they have. As global interest in mushrooms grows, their significance in cooking, healthcare, and nutrition is being acknowledged. Their versatility in cooking and medicine makes them a valuable resource for the future. Scientists and medical professionals must keep studying mushroom benefits. Promoting mindful eating can raise awareness of healthy eating benefits. Mushrooms have a rich history and bright future, essential for improving well-being.

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