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A Review on Ganoderma Lucidum Medicinal Mushroom

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Abstract: *One such mushroom is Ganoderma lucidum, often known as Lingzhi, which is renowned for its therapeutic properties in the treatment of many illnesses and the extension of life. Both in vitro and in vivo investigations on the various metabolic processes of medicinal mushrooms have been carried out.Polysaccharides, dietary fibres, oligosaccharides, triterpenoids, peptides and proteins, alcohols and phenols, mineral elements (such as zinc, copper, iodine, selenium, and iron), vitamins, and amino acids are among the active ingredients present in mushrooms. Recently, it has been discovered that some naturally occurring substances derived from the fungi of the genus Ganoderma exhibit anti-tumor, liver protection, anti-inflammatory, immunological modulation, anti-oxidation, anti-viral, anti-hyperglycemic, and anti-hyperlipidemic properties.The wood dregading basidiomycete ganoderma lucidum has a wide range of therapeutic effects. Due to the mushroom's extreme rarity in nature, it has been known to grow fruiting bodies artificially on wood logs and on sawdust in plastic bags or bottles.*

Keywords: Ganoderma luidum ,mushrooms, immunological modulation, therapeutic effects

I. INTRODUCTION

The Ganodermataceae family's Ganoderma Lucidum is a member of the Basidiomycetes class. According to popular belief, herbal medications are crucial for both rebuilding our biological systems and preventing the onset of disease.[1] Modern synthetic medications often come from plant extracts and other botanical sources. Since ancient times, medicinal mushrooms have been utilised to treat a range of chronic and acute diseases.[2]One of the most crucial medicinal mushrooms is Ganoderma lucidum, often known as Reishi and Ling Zhi. In traditional medicine, ganoderma lucidum is a material that is said to support the body's normal systems, particularly the neurological system[3].The plant ganoderma lucidum is referred to as "the king of herbs". Specifically on dead and deciduous trees like willow, oak, sweet gum, maple, and elm, the fungus Ganoderma lucidum develops.[4] Found in the Far Eastern nations of China, Japan, Korea, and the higher Himalayas. The Latin word lucidum, which meaning shiny, can be used to identify the macrofungi's fruiting body, which has a shiny look on the site of growth. [5]

Fig. 1. Reishi Mushroom

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Common names

- United States: Reishi mushroom, Ganoderma.
- China: Lingzhi, Lingzhi Cao, Ling Chih, Hong Ling Zhi, Chi Zhi.
- Japan: Reishi, Mannentake, Rokkaku Reishi.
- Korea: Young ji.
- Vietnam: Ling chi.
- Russian: Chaga.
- American: Lingchich.
- Korean: Youngzhi

CLASSIFICATION

- Kingdom: Fungi
- Phylum: Basidomycota
- Class: Agaricomycetes
- Order: Aphyllophorales
- Family: Ganodermataceae
- Genus: Ganoderma
- Species: Ganoderma lucidum

II. BIOCHEMICAL CONSTITUENT

Numerous studies on Ganoderma lucidum have revealed that water makes up about 90% of its total weight; the remaining 10% is rich in a variety of other nutrients, including protein, which makes up about 10% to 40% of its weight, fat, which makes up 2% of its weight, carbohydrate, which makes up 3-28% of its weight, fibre, which makes up 33% of its weight, and ash, which makes up 8% to 10%.[6] The remaining 10% of the mushroom's weight is made up of elements including calcium, minerals, phosphorus, potassium, magnesium, copper, iron, and selenium. Various compounds, such as steroids, terpenoids, phenols, polysaccharides, nucleotides, and glycoproteins are also present in Ganoderma lucidum in addition to the aforementioned ingredients.[7]The mushroom includes each and every essential amino acid. Leucine and lysine make up a large portion of proteins. The most important bioactive components of Ganoderma lucidum are triterpenes, polysaccharides, and peptidoglycans[8].

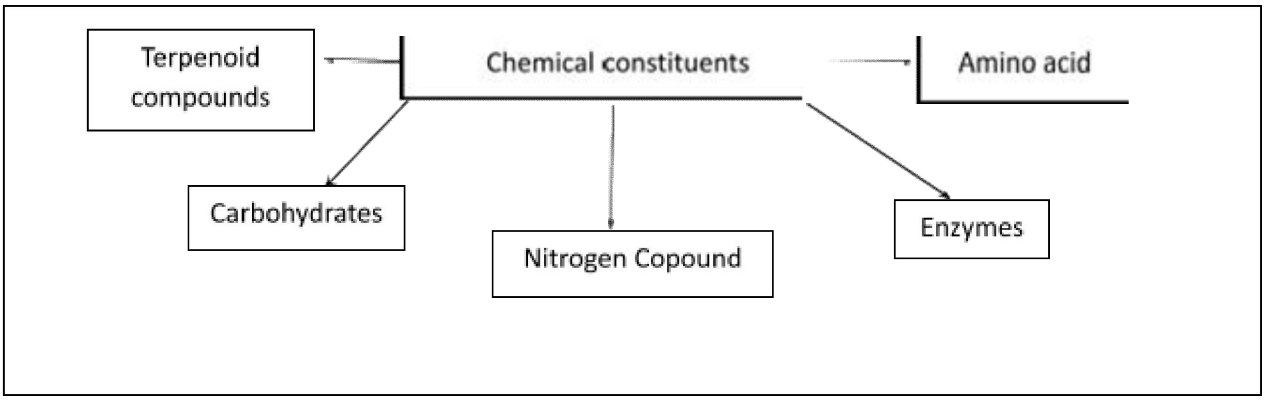

Fig. 2 Biological Constituents

III. BIOLOGICAL FUNCTIONS OF GANODERMA

Anti-androgenic properties

Benign prostatic hyperplasia (BPH), which affects roughly 40% of males in the age range of 50 to 60 years, is one of the major androgen-mediated diseases. Testosterone is converted to DHT by the 5 alpha reductase enzymes, which can play a significant role in the development of BPH. BPH can be prevented in part by naturally occurring 5 Alpha

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reductase inhibitors. Among the 19 edible and medicinal mushrooms tested for their anti-androgenic action in an in vitro animal model study, Ganoderma lucidum extract had the strongest 5-alpha reductase inhibitory effect. [9]

Hypertension-lowering activities

In a clinical research conducted on 53 hypertension subjects in Japan, the active group received 6 pills daily containing 240 mg of ganoderma extract.[10] After six months of treatment, it was seen that the Ganoderma lucidum-administered active group had demonstrated a reduction of blood pressure, thereby ameliorating hypertension. Additionally, the outcomes revealed that ganoderma had no negative side effects. (Kanmatsuse K et al. 1985). [11]

Potential for antioxidants

By defending cells from H2O2 induced cytotoxicity and preventing the production of reactive oxygen species in myoblasts, Ganoderma lucidum exhibits antioxidant potential.[12]The proteins found in the mushroom's mycelia are what give it its anti-radical activity. [13]

Activity against cancer

The examination of Ganoderma lucidum's anticancer properties has been the subject of numerous investigations. Breast cancer, lung cancer, colorectal cancer, and anti-metastatic action have all been demonstrated for ganoderma lucidum. [14]

Antiviral Potential

A hot water extract of G. lucidum was administered to infected mice by intranasal and oral routes, and Zhu et al. studies the anti-influenza effects. [15]However, there have been few scientific studies that have examined the antiviral effect of G. lucidum. According to the study's authors, ingesting Lingzhi hot water extract over a short period of time had just a minor impact on the ability to ward off influenza. The long term anti-influenza effects, which could enhance the practical usage of this mushroom against influenza, were therefore the subject of the authors recommendation for additional research.[16]

IV. GANDOERMA HEALTH BENEFITS

Ganoderma assists people with a healthy immune system by bolstering and enhancing it in both patient's immune system and in healthy people .[17] In general, Ganoderma has a positive impact on lymphocytes performance, infection resistance, and cancer treatment in cancer patients. [18]

The ability of Rishi mushroom to maintain long term health may be related to their impact on white blood cells, which travel through the bloodstream and fight off infetions like viruses and bacteria to keep the body healthy. Rishi mushrooms, according to studies, may improve the function and amount of white blood cells in your body.[19]

V. PROSPECTS FOR THE FUTURE AND THE CURRENT SITUATION :

The scientific community is now paying close attention to studies on G. lucidum and its products because it has made significant recent advances in the field. [20]Numerous studies from various angles have clarified the pharmacological effects and associated mechanisms, clinical applications based on G. lucidum, as well as its biological characteristics, chemical composition, and active components. G. lucidum has also advanced somewhat in the industrial sphere.[21]

Future research on G. lucidum will focus on new chemical formulations and active ingredients (as a potentially useful functional food), cellular and molecular mechanisms of biological activities (such as prebiotic effects), quick and conclusive methods to identify effective ingredients, fermentation and cultivation methods, double-blind large-scale clinical trials, and quality control monitoring of the final product.[22]

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