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Quality Should Never Compromise to Price



Introduction of

**Duanwood Reishi Mushroom/ Lingzhi /
Ganoderma Lucidum Extract**

TCM Adaptogen Warehouse



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TCM Adaptogen Warehouse-a high-tech enterprise for researching and manufacturing natural ingredients **for around 10 years with 46,000.00 sqms areas, Agilent 1260 Infinity HPLC&SHIMADZU UV Visible Photometer dectectors,100,000 level purification workshop**, this is how we keep superior quality and competitive cooperation for global valued customers.

At TCM Adaptogen Warehouse, we are focused on providing Traditioanl Chinese Medicine extracts powders and other natural ingredients with the highest levels of customer satisfaction – we will do everything we can to meet clients' expectations. Our featured products include **horny goat weed (epimedium) extract(icariin), duanwood reishi mushroom extract, ginseng extract, chaga mushroom extract, tongkat ali root extract,nettle root extract, pine pollen** and other natural ingredients.

We bear advanced extraction, isolation, purification, synthesis, fermentation equipment and technology with rich production experience and strict quality control system, and we have built a sophiscated sale service system, products are exported to Europe, North and South America, Asia and other Oceanian countries with good reputation.

We believe that quality is the life of TCM Adaptogen Warehouse. All our products are manufactured strictly complied with ISO9001: 2000 quality management system during the whole entire production process. **"Quality Never Compromises to Price"** is core value of our enterprise to offer our customers the reliable products and services that they expect and deserve.





【English name】 : Reishi Mushroom Extract/Ganoderma lucidum extract

【Latin name】 : Ganoderma lucidum (Leysser.Fr)Karst

【Plant part used】 : mycelium& fruiting body

【Testing methods】 : UV&HPLC

【CAS No.】 : Polysaccharide, 9012-72-0; Triterpenoid, 81907-62-2.

【Appearance】 : Brownish fine powder

【Particle size】 : 100% pass 80 mesh

【Main Function】 : Stimulate Immune System and Anti-Cancer

Specification

Ratio Extract:

10:1, 20:1, 50:1TLC

Standard Aqueous Extract:

Polysaccharide 10%, 20%, 30%, 40%, 50% UV, Triterpenoid 2% HPLC
BETA D Glucan 30-50% UV; Triterpenoid 1-2% HPLC

Standard Aqueous & Ethanol Extract:

Polysaccharide 10% UV, Triterpenoid 4%, 6%, 8% HPLC

Shell-broken Ganoderma lucidum (Reishi) spore powder:

polysaccharide>2%, triterpenoid 4%, shell-broken ratio>98%, 250mesh.



The mushroom Ganoderma Lucidum holds a place in a variety of Asian traditional medicine; it is most well known as Reishi, the name given to the mushroom by practitioners of Japanese medicine. In Traditional Chinese Medicine it is known as Lingzhi, and Korean medicine refers to it as Yeongji; in Taiwan it is sometimes referred to as Ling-Chih. Other complimenting names given to Ganderma Lucidum include The 10,000 year Mushroom (Japanese), and the Mushroom of Immortality (Chinese). The praise it receives is in part due to its bioactive effects, but may also be affected by the modes of distribution in the past (where, due to its rarity, only nobility or the privileged could afford it). According to the year 2000 edition of the State Pharmacopoeia of the People's Republic of China (an official compendium of drugs), Ganoderma Lucidum "acts to replenish Qi, ease the mind, and relieve cough and asthma, and it is recommended for dizziness, insomnia, palpitation, and shortness of breath".

Traditional usage of Ganoderma Lucidum extends to as anti-cancer and anti-tumor, anti-microbial, anti-fungal, and anti-viral (specifically against herpes and HIV), as well as anti-inflammatory or immunomodulatory. Pro-longevity claims have also been made. Traditionally known as the God of Fungi, although associations with nobility may have raised it to undeserved god-like status. Used for almost everything and said to work for everything; tends to be more focused on immunity, sickness, and cancer.

Comparison of (Ganoderma)Lingzhi sources

In the Chinese Pharmacopoeia (v.2000) both *Ganoderma Lucidum* (Red Lingzhi) and *Ganoderma Sinensis* (Purple Lingzhi) are listed as Lingzhi. Despite both being referred to as Lingzhi in Chinese medicine, these two species have some shared and differing properties. The term Ling Zhi can extend to more mushrooms, and ancient Chinese texts (ShenNong Ben Cao Jing and from the Han Dynasty and Ben Cao Gang Mu from the Ming Dynasty, the latter of which is considered the first pharmacopoeia) indicated up to 6 types of Ling Zhi. The possible other *Ganoderma* mushrooms implicated here are *atrum*, *luteum*, *tsugae*, *tropicum*, *tenue*, *applanatum*, *asutrale*, and *capense*; all other 250+ strains of *Ganoderma* known worldwide currently were not known during the era in China Ling Zhi was used as medicine. *Ganoderma Lucidum* is seen as the 'most medicinal' Ling Zhi, and is the strain that permeates into Korean and Japanese (Kampo) medicine.



They (in reference to the two main strains, Purple and Red Lingzhi) differ in levels of the bioactive ergosterol and some triterpenoids and the genetic influence of triterpenoids on monocytes (immune cells) shares about 26% similarity between species at best; polysaccharide content does not differ as significantly. Beyond species, different locations that grow *Ganoderma Lucidum* can markedly differ in quantities of bioactives. At least one study investigating over-the-counter Reishi products noted that out of 11 randomly selected products, the triterpenoids ranged from indeterminate to 7.8% and polysaccharides from 1.1-5.8%, the differences were attributed to differences in production method (with water soluble extracts possessing less triterpenoids) and growth conditions. One study growing Reishi noted somewhat similar levels of triterpenoids overall, but the specific triterpenoids fluctuated wildly between samples.

Why Duanwood *Ganoderma Lucidum* (Red reishi/Lingzhi) gains highest potent?

Twenty years ago, Japanese Dr. Yoshi discovered that reishi mushroom possessed cancer-healing properties. The Japanese government wasted no time in sending him to China in search of the finest, highest quality and most potent reishi mushroom. Through much research and lab tests it was discovered that Duanwood reishi prevailed as meeting the requirements Dr. Yoshi had set. Duanwood reishi specifies that it has been grown on specific types of hardwood indigenous to specific areas of China. It is the fruiting bodies of the red reishi mushroom. Duanwood reishi has the highest concentration of powerful, plant-kingdom medicinal agents, called phytonutrients.

It is also common in the field of medicinal mushrooms to use the immature bodies of the mycelium, which is the stage of the mushroom between the spore and the mature adult body. In most cases, these mushrooms are cultivated in grain slurry, in a box, with a small growing period. It costs considerably less money to produce mycelium, and when you get the final product, it is half minimally potent mushroom and half the grain slurry the mushroom was not able to digest. When dealing with Duanwood reishi, you are ensured the highest quality of mushroom, grown on hardwood in nutrient-rich soil, where the mushroom is able to obtain the essential phytonutrients it needs for its powerful health benefits. The government actually regulates Duanwood reishi, as it is forbidden to use chemicals or pesticides in the growing process, so you can be assured that you are also getting a one hundred percent organic product.

We mainly adopt **Ganoderma Lucidum (red reishi/Lingzhi)** as the raw materials for our extract products. And all raw Ganoderma Lucidum (red reishi/Lingzhi) are from our **GAP cultivation base.**



GAP Duanwood Ganoderma Lucidum Cultivation Base



Ganoderma Compositions

Mushrooms in general tend to be 90% water or so, which makes a basic mushroom 'extract' dehydrated mushroom powder (and thus 1g extract, if unspecified, may be about as potent as 10g of the mushroom). Beyond that, they tend to be a good source of protein (10-40% of the non-water weight) carbohydrates (3-28%), fiber (3-32%) and then trace Essential Vitamins or Minerals. Ganoderma is on the high end for fiber, low end for carbohydrate, moderate to high end for protein and has a relatively low ash (mineral) content. Beyond the basics, Ganoderma Lucidum possesses unique bioactive molecules including:

- A variety of Bioactive polysaccharides that tend to be the components that interact with the immune system and are subdivided into β -1,3-glucans and polysaccharide peptides like peptidoglycan.
- Water-soluble Polysaccharide Peptides, or carbs with amino acids in the structure. They include GLPS peptide (GLPP), GLPG, GLIS, PGY, and F3
- β -1,3-Glucans (subset of polysaccharides) sometimes called 'Curdlan' and some other Glucan molecules
- Over 120 triterpenoid compounds which can be separated into those with a carboxylic side chain (Ganoderma Acids) and those without (Ganoderma alcohols). Some are referred to as lucidenic acids
- Nucleotide bases (thymine, uridine, inosine, guanosine, adenosine) the sum of all ranging from 303-1217mcg/g (in the mushroom cap) and 22-334mcg/g in the stem.
- Some bioactive proteins, such as LZ-8 (Lingzhi-8) and Ganodermin
- A 114kDa hexameric lectin, a glycoprotein with 9.3% sugar
- A reversible and highly specific competitive alpha-glucosidase inhibitor known as SKG-3 with an IC50 value of 4.6mcg/mL
- Ergostane sterols and ergosterol, known as pro-vitamin D2
- C19 fatty acids (nonadecenoic acid and cis-9-nonadecenoic acid)
- Riboflavin
- Vitamin C
- Copper and Zinc
- Selenium at up to 72mcg/g dry weight (best estimate of wet weight is 7.2ug/g) and can biotransform selenium into selenium-containing proteins
- Germanium (the ion, not to be confused with Geranium) at up to 489mcg/g

There is also a large Chitin content in the Ganoderma Lucidum mushroom, which is indigestible (and for the most part, not bioactive) and makes the mushroom tough to chew. The mushroom is hazel/red in color, which is due to the polysaccharide content.



Structure and Properties

The main bioactives of Ganoderma Lucidum tend to be seen as the triterpenoid component (broken down into Ganodermic acids, Ganodermic Alcohols, and Lucidenic Acids) and the polysaccharide content.

In regards to the differentiation between Ganoderma Acids and Alcohols (the triterpenoid compounds), acidic fractions appear to favor acid accrual and neutral fractions the alcohol fragment. Triterpenoids appear to be hydrophobic, and are present in ethanolic or chlorophyll extractions; the polysaccharides are water-soluble and are the main bioactive in any Ganoderma water-soluble extract.

Different forms of Ganoderma Lucidum

Water-soluble Extract

The water-soluble extract tends to be catered towards the polysaccharide content. Water-soluble extract mainly adopts reishi mycelium which mainly carries polysaccharide, and the solvent used during extraction process is water only.

Ethanolic Extract

The ethanolic extract of tends to be catered towards the triterpenoid content, contributing little to no polysaccharides. For ethanolic extract, whole mushroom(mycelium&fruiting body) or fruiting body is used as the raw material and 70% concentration ethanol is used during extract process.

Benefits of Reishi Polysaccharides and Its Dosage:

Reishi is officially listed as a substance for **treating cancer** by the Japanese government.

In comparison to its other properties, Reishi has received the most attention as a source of **antitumor activity**. This action is due to immunostimulating polysaccharides, particularly those known as Beta-D-Glucans.

Dr. Fukumi Morishige, M.D., Dr. Med. Sci., Ph.D., a former heart surgeon and cancer surgeon, did extensive research on the action of Reishi on the **immune system**. He gave two groups of patients Reishi extracts. In those patients who had shown high readings of immunoglobulins (IgA, IgG, IgE, IgM), their counts had lowered, while those who previously had low counts now showed the same antibodies in higher counts.

In 1979, researchers in Poland found that an RNA from Reishi **disrupts viral diseases** by inducing the production of interferon. This RNA was found in the fruit body of Reishi and in higher levels in the mycelium.

Reishi Polysaccharides **increase RNA and DNA in the bone marrow** where immune cells such as lymphocytes are made. One of the active polysaccharides is called D6. Researchers in Beijing injected it into mice for a week and then monitored the changes in DNA and RNA in the bone marrow. Increases were roughly 50%. Protein in bone marrow also increased by as much as 28.5%. It is in the bone marrow that the body manufactures B-cells which in turn produce antibodies. It is also where macrophages have some of their earliest beginnings.

Investigators in China found that the polysaccharide part of Reishi causes a marked **increase in the action of macrophages** to gobble up foreign cells in the abdomen of mice. Dr. Morishige discovered that vitamin C renders the high molecular weight polysaccharides into oligoglucans of molecular weight about 30,000. He explains that once the oligoglucans are dissolved in the bloodstream, the macrophage, which normally rests until late in the war on abnormal and foreign cells, is called into action at an earlier stage of the battle.

Reishi polysaccharides also augments the **responsiveness of antibodies**, particularly IgG, by expanding the "memory" of T-cells. IgG constitutes a major class of antibodies in human serum that act to enhance phagocytosis (the cell-gobbling action of certain immune cells) and neutralize toxins.

AIDS treatment news, a newsletter out of San Francisco, talks about research conducted on Fu Zheng treatment of AIDS by Dr. Subhuti Dharmananda and his group. Reishi is one of the herbs that appears to be used successfully.

Reishi polysaccharides have high molecular weights of up to 1,050,000, which makes absorption by the intestines difficult. Dr. Fukumi Morishige, M.D. found that patients given large doses of Reishi (2-9g/day) had diarrhea, but when a large dose of vitamin C was combined, no diarrhea occurred. **Vitamin C renders the high molecular weight polysaccharides to a molecular weight of 30,000 when they are much more readily absorbed by the intestines and bloodstream.** For **general health** maintenance and prevention, take **2g Reishi Polysaccharide twice per day** on an empty stomach.

Also take 500 mg of Vitamin C per day after breakfast.

When a **serious illness occurs**, increase the dosage to **9g Reishi Polysaccharide twice per day** on an empty stomach. Also take 2,000-3,000 mg of Vitamin C per day after meals.

Some people may experience Vertigo Reaction when they first take Reishi. During the first week, they may experience slight swelling of the head or dizziness. Arthritis patient may experienced a temporary increase in the pain level. This is a cleansing reaction, often called a "healing crisis". Continue to take Reishi and the symptoms will be alleviated within a week.

Benefits of Reishi Beta glucan

Beta glucan is found in medicinal mushrooms like shiitake, maitake, and reishi and is found to be an anticancer agent. According to the Merriam Webster dictionary, beta glucans are "any of several polysaccharides consisting of glucose units and including one found in endosperm cell walls of cereal grains (as barley and oats)." Beta glucans are also found in other popular products like yeast and medicinal mushrooms. As far as anticancer agents are concerned, medicinal mushrooms can beat out other sources of beta glucans since mushrooms also naturally have anticancer properties.

Natural anticancer agent

How beta glucans work as a natural anticancer agent is discussed by E Jurczynska, J Saczko, et al., at the Wroclaw University of Environmental and Life Sciences in Poland. They show that "Beta-glucans participate in the processes of repair, metabolism and detoxification, and affect the overall health of the body counteract the pathological conditions of reactive oxygen and nitrogen and the processes in which they participate."

Interesting it is nitrogen and reactive oxygen species that have a critical role in the pathogenesis of a number of human diseases, including cancer, so the bottom line is that beta glucan—acting as an anticancer agent—can help ward off both oxidative and nitrosative stress. "Reactive oxygen and nitrogen react with proteins to cause impairment of their function [and] nitric oxide enhances the effect ... and becomes a mediator of inflammation." Inflammation, as most medical scientists have known for a long time, is associated with the development of cancer.

Immune system enhancer

Beta-Glucans are known as "biological response modifiers" because of their ability to activate the immune system. Immunologists have discovered that receptors on the surface of innate immune cells called dectin-1 and complement receptor 3(CR3 or CD11b/CD18) are responsible for binding to Beta-glucans, allowing the immune cells to recognize them as "non-self".

Lowering blood cholesterol

Several health claims requests were submitted to the EFSA NDA Panel (Dietetic Products, Nutrition and Allergies), related to the role of β -glucans in maintenance of normal blood cholesterol concentrations and maintenance or achievement of a normal body weight. In July 2009, the Scientific Committee issued the following statements:

- On the basis of the data available, the Panel concludes that a cause-and-effect relationship has been established between the consumption of beta-glucans and the "reduction of blood cholesterol concentrations."
- The following wording reflects the scientific evidence: "Regular consumption of beta-glucans contributes to maintenance of normal blood cholesterol concentrations." In order to bear the claim, foods should provide at least 3 g/d of beta-glucans from oats, oat bran, barley, barley bran, or mixtures of non-processed or minimally processed beta-glucans in one or more servings. The target population is adults with normal or mildly elevated blood cholesterol concentrations.
- On the basis of the data available the Panel concludes that a cause-and-effect relationship has not been established between the consumption of beta-glucans and the maintenance or achievement of a normal body weight.



Reishi Triterpene Introduction

Triterpenoids/ triterpene, also called Ganoderic acids which is another major active constituent found in red reishi. Preliminary studies indicated that ganoderic acids help alleviate common allergies by inhibiting histamine release, improve oxygen utilization and improve liver functions. Triterpenoids are bitter in taste and the level of the triterpenoid content contained in a product can be determined by the bitterness. Users of Ginkgo Biloba, Horse Chestnut and Valerian will recognize the potential benefits of terpenes.

The potency of Reishi mushrooms is usually based on its level of triterpenoids. One can determine the level of this by tasting it. The more bitter it is, the higher the level of triterpenoids. Because Reishi is a polypore, (a group of hard, woody, bracket-like mushrooms) it is not eaten, but cut into pieces and made into a tea. In China, the average dose is 3 to 5 grams a day. Other popular forms of delivery are the water/alcohol extracts and powders.

For these people it should come as little surprise that the triterpene-rich reishi mushroom is reputed to reduce hypertension. What may be news, however, is that the same compounds may also be adaptogenic and anti-allergic. The Ganoderic acids, C, A and D--in that order--appear to have the greatest anti-allergic activity, inhibiting histamine release. Ganoderic acids B and D may reduce hypertension. Studies done on a combination formula of reishi and other ganoderma species have shown these anti-allergic effects to be perhaps this medicinal's most promising property. The combination formula has been observed to have a modulating and stabilizing effect on immunoglobulin levels. Patients with bronchitis, bronchial asthma, and allergies have all done well on reishi extract. Triterpene content may explain reishi's ability to alleviate altitude sickness, as reported by Chinese mountain climbers ascending as high as 17,000 ft.

Anti-cancer Activity of Reishi Triterpene

Triterpenes are one of the possible pharmaceutically active compounds contributing to the medicinal activities of *G. lucidum*. Triterpenes are a subtype of Terpene, a class of Naturally occurring compounds, composed of one or more isoprene units. Terpenes are widely distributed throughout the plant world. Many subtypes of Terpenes have been found to have anti-inflammatory, anti-tumourigenic, and hypolipidemic activity. Triterpenes contain six isoprene units. The isoprenes may form linear chains or fold-up and form a ring-like structure.

Ganoderic acid is a sub-type of triterpenes with four cyclic and two linear isoprenes. There are over 140 species of triterpenes and triterpenoids identified in *G. lucidum*. Triterpenes are primarily isolated from the spores of *G. lucidum* and have shown remarkable pharmacological and therapeutic activities on multiple human diseases including cancer. Extraction of triterpenes is usually by means of methanol, ethanol, acetone, chloroform, ether, or a mixture of these solvents.

Studies have shown that many subtypes of triterpene extracts from *G. lucidum* can directly induce apoptosis of multiple human cancer cell lines. The cytotoxic effect varied greatly between different subtypes of triterpenes. Some subspecies of triterpenes have shown strong cytotoxic effects at low concentrations in various human cancer cell lines, these include: Ganoderic acid T is the most abundant triterpenic acid found in *G. lucidum* and shows significant anti-cancer effects in both in vitro and in vivo studies. In a study by Chen et al. (2010), Ganoderic acid T was shown to inhibit tumour invasion by inhibiting Matrix Metalloproteinase (MMP)-9 expression. Ganoderic acid D has been shown to directly bind to 14-3-3ζ protein in a study by Yue et al. (2008), and this binding may contribute to the apoptosis observed in HeLa cell. Ganoderiol F (GA-F) is a tetracyclic triterpene found in *Ganoderma* species. GA-F has shown cytotoxicity in vitro against Lewis lung carcinoma (LLC), Meth-A, Sarcoma-180, and T-47D cell lines. In addition, the anti-tumour effect of GA-F has been demonstrated in vivo in rats implanted with LLC tumour cells. Additional forms of triterpenes isolated from *G. lucidum* have shown cytotoxicity in the following human cancer cell lines: p388, HeLa, BEL-7402, and SGC-7901.

Reishi Extract Certificate of Analysis

Product Name: Ganoderma(Reishi) Extract	Botanical Name: <i>ganoderma lucidum</i>
Part Used: Fruitingbody	Batch Number: TCM20170825GL
Date of Manufacture: 2017/08/25	Quantity: 500kg
Date of Analysis: 2017/08/26	Expiry date: 2019/08/24

Item	Specification	Result	Testing Method
Assay(Triterpenoid) 三萜	2% Min.	2.06%	NY/SJ 339-2001
Polysaccharide 多糖	30% Min	30.3%	NY/SJ 339-2001
Physical & Chemical Control			
Appearance 外观	Brownish yellow fine powder	Complies	Visual
Odor	Characteristic	Complies	Organoleptic
Tasted	Characteristic	Complies	Organoleptic
Loss on Drying 水份	5% Max.	1.2%	//2.5hrs
Ash 灰份	2% Max.	1.75%	//3hrs
Heavy Metal 重金属	10ppm Max	Complies	AAS
As 砷	1ppm Max	Complies	AAS
Pb 铅	2ppm Max	Complies	AAS
Hg 汞	0.2ppm Max.	Not Detected	AAS
Pesticides Residues 杀虫剂	1.0ppm Max.	Not Detected	GC
Microbiological			
Total Plate Count 细菌	10000/g Max.	Complies	CP2010
Yeast & Mould 酵母, 霉菌	25/g Max	Complies	CP2010
Salmonella 沙门氏菌	Negative	Complies	CP2010
E.Coli 大肠杆菌	Negative	Complies	CP2010
Staphylococcus 致病菌	Negative	Complies	CP2010
Conclusion	Complies with specification		
Storage	In cool & dry place. Keep away from strong light and heat.		
Shelf life	24 Month when properly stored.		
Packing	25/drum, Pack in paper-drums and two plastic-bags inside.		



TCM Adaptogen Warehouse

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