Medicinal Mushrooms

A brief guide written by Martin Powell.
About Martin

Martin is a biochemist and a Chinese herbalist who has worked with mushroom nutrition for over 20 years. He lectures at the University of Westminster and is the author of Medicinal Mushrooms - a Clinical Guide.

As well as running a clinical practice he continues to research mushrooms health benefits and runs seminars on their clinical uses for doctors and health care professionals in the UK and world wide.

D. Atkinson Mushroom Extracts

All of our mushroom extracts are produced for us by Martin Powell. Our products are practitioner strength and are produced to the highest standards.

Disclaimer

The information below is intended for educational use and is not meant to be used to diagnose or treat any medical condition. Anyone who is experiencing any symptoms, has been diagnosed with or suspects they may have a medical condition should contact a medical doctor or appropriately qualified health professional.
REISHI

Main active components

Reishi's wide-ranging health benefits are due to its combination of highly active immune-modulating polysaccharides and over 130 triterpenoid compounds (primarily ganoderic and lucidenic acids), with actions including: anti-inflammatory, antihistamine, sedative, anti-hypertensive and anti-cancer.\(^1\)

Traditional use

Reishi has traditionally been associated with the Taoist quest for immortality, as well as being used to treat a range of health conditions, including: cancer, heart disease and bronchitis.

Main Health Benefits

Cancer

Reishi has a long history of use in cancer treatment with many reports of spontaneous remission.\(^2\) Although both polysaccharides and triterpenes contribute to Reishi's anti-cancer action, clinical trials have focussed exclusively the more easily characterised polysaccharide extracts, with a recent review of 5 randomised controlled trials indicating that patients given Reishi polysaccharide extracts were 1.27 times more likely to respond positively to chemo/radiotherapy than those without.\(^3\) At the same time, Reishi's triterpenes also show extensive anticancer activity, inhibiting cancer cell growth, inducing apoptosis (cell death) and, in the case of prostate cancer cells, blocking androgen receptors.\(^4\)

Allergies

Reishi’s combination of high immuno-modulatory activity with strong anti-inflammatory and anti-histamine activity make it a uniquely suitable supplement for those suffering from allergies such as hayfever (allergic rhinitis).\(^5\) By addressing both the underlying immune imbalance that predisposes the body to overreacting to pollen or other allergens, as well as the histamine-mediated inflammatory responses that result, it can be used to both help alleviate the symptoms and prevent their development.

Auto-immune disease

Reishi's combination of immunomodulatory and anti-inflammatory action also makes it a useful supplement for a range of inflammatory auto-immune conditions, such as rheumatoid arthritis, psoriasis or ulcerative colitis.
**Insomnia/anxiety**

The traditional name ‘spirit mushroom’ points to the sedative action of Reishi’s triterpenoid components.

Improvements in sleep patterns are one of the most commonly reported effects of Reishi supplementation and it is frequently prescribed for this purpose⁶.

**Liver disease**

Reishi has long been a popular traditional treatment for liver diseases and demonstrates wide hepatoprotective properties, including:

- Protection from chemical toxicity
- Inhibition of liver fibrosis
- Normalisation of liver enzymes
- Reduction in inflammation

**Cardiovascular health**

Traditionally used in the treatment of heart disease, Reishi has been shown to support cardiovascular health through cholesterol-lowering, blood-pressure lowering and anticoagulant effects, with improvements in ECG, chest pain, palpitations and shortness of breath reported in one randomized, double-blind, multi-centred study using a polysaccharide extract at 5.4g/day⁷.

**Respiratory health**

As well as its benefits for cardiovascular health, Reishi has traditionally been used to treat bronchitis, with older patients showing particular benefit. Its anti-allergic properties mean that it is helpful for allergic asthma, while Chinese studies also report alleviation of altitude sickness⁸.

**Notes**

Classically differentiated according to six different colours, today virtually all cultivated Reishi is Red Reishi, with the term Duanwood Red Reishi sometimes being used to refer to cultivation on whole logs, as opposed to cultivation on ‘logs’ made of compressed sawdust.

Reishi’s uniquely broad health benefits are due to its combination of immune-modulating, water-soluble polysaccharides and antiinflammatory triterpenes, which are poorly water-soluble. In order to deliver high levels of both polysaccharides and triterpenes, supplements may combine both
polysaccharide-rich hotwater and triterpene-rich ethanolic (alcohol-based) extracts. Alternatively, some supplements use Reishi spores, which also contain high levels of triterpenes, with oil-based spore extracts containing up to 30%.

Supplementation levels of Reishi products can vary considerably owing to the range of product types available. Most trials using polysaccharide extract have been at 5.4g/day, while daily consumption of pure Reishi powder can be considerably higher. Products combining Reishi polysaccharides and triterpenes typically have dosage ranges of 1-3g/day, Reishi sporoderm-broken spore products 3-5g/day and Reishi spore oil extracts 500-1,500mg/day. Reishi’s triterpenes have been reported to have anti-coagulant properties and supplements containing high levels should be used with caution by those on blood-thinning medication.

References:

CHAGA

Main active components

Unusually among medicinal mushrooms, Chaga’s most important components are derived from the bark of the host birch trees on which it grows. Chief among these are a large number of betulinic acid derivatives and melano-glucan complexes.

Traditional use

Revered as a folk medicine, especially among the peoples of eastern Russia, Chaga has traditionally been boiled to make a tea, which is drunk to treat a range of conditions, including: cancers, viral and bacterial infections and gastro-intestinal disorders\(^1\)\(^2\).

Main Health Benefits

Cancer

Betulinic acid shows wide-ranging anti-cancer activity, including against: leukaemia, malignant brain and peripheral nervous system cancers for which mushroom polysaccharide-based supplements show limited benefit\(^3\). As with other mushrooms, Chaga’s polysaccharide components also show strong immune-modulating activity and this combination of mushroom polysaccharides with host-derived betulinic acid contributes to Chaga’s traditional use in cancer treatment, including FOR: inoperable breast, lip, gastric, parotid, lung, skin, colorectal cancer and Hodgkin lymphoma\(^1\).

Digestive disorders

Melano-glucan complexes have wide antimicrobial activity and Chaga has traditionally been used as an internal cleanser with Befungin, an alcohol extract of Chaga, licensed in Russia for the treatment of stomach and intestinal disorders\(^1\).

Psoriasis

Several anecdotal reports indicate benefit of Chaga for psoriasis and this is supported by a Russian study on 50 psoriasis patients, which reported a 76% cure rate, with improvement in a further 16% of cases. The same study reported that it typically took 9-12 weeks for improvement to become apparent\(^4\).
Notes

Chaga supplements need to be made from wild-harvested Chaga if they are to contain the main active components derived from the bark of the host birch trees. Although most traditional use is based on hot-water extracts (teas), the triterpenoid betulinic acid derivatives (although not the polysaccharides) are more soluble in alcohol and for this reason tinctures or other alcohol-based extracts are sometimes used, either on their own or in combination with polysaccharide-rich hot-water extracts. Traditionally around 5g of Chaga would be ground and boiled to make a tea, while the recommended daily dose of Befungin is 1tsp, three times a day and for extracts 1-3g/day.

References:


MAITAKE

Main active components

Polysaccharides are the principal active components in Maitake, with several fractions, including: D-fraction and MD-fraction, showing strong immunological activity\(^1,2\).

Traditional use

Most traditional sources do not mention Maitake and it appears that it was often not differentiated from Umbrella Polypore (also known as Grifola umbellata), of which it is said that ‘long term use makes one feel happy and vigorous and look younger’.

Main Health Benefits

Cancer

Impressive results have been reported from the use of Maitake polysaccharide extracts, or combinations of polysaccharide extracts and fruiting body, with one study using 40-100mg MD-fraction and 4-6g powdered fruiting body reporting cancer regression or significant symptom improvement in 58% of liver cancer patients, 68% of breast cancer patients and 62% of lung cancer patients. Similar results have been reported using combinations of D-fraction and powdered fruiting body and improvements in immune competent cell activities have also been reported when taken in conjunction with chemotherapy\(^3,4\). Polysaccharide extracts of Umbrella Polypore are also licensed as anti-cancer agents in China, with improved treatment outcomes and quality of life indicators in a number of cancers, including: lung, liver, leukaemia, bladder, nose and throat\(^5\).

Diabetes

Several studies report significant improvement in blood sugar levels in type II diabetes patients from using purified Maitake polysaccharides. Positive results have also been reported from inclusion of crude Maitake powder in the diet of diabetic animal models (20% of food, or 1g/day in a mouse model)\(^6,7\).
Polycystic Ovary Syndrome (PCOS)

In the majority of cases, PCOS is associated with some level of insulin resistance and Maitake polysaccharide extracts also show promise as agents for helping address this condition. In one Japanese study, ovulation was observed in 20 of the 26 women given a Maitake polysaccharide extract and 6 of 8 women who failed to ovulate after being treated with clomiphene citrate did so after being given the polysaccharide extract. In addition, all 3 women who expressed an interest in becoming pregnant were able to do so.

Notes

Polysaccharide extracts or combinations of extract and fruiting body have been favoured clinically at doses of 3-6g/day.

References:

CORIOLUS

Main active components
Like most mushroom polysaccharide extracts, both PSK and PSP are proteoglycans (polysaccharides with attached protein groups).

Traditional use
Coriolus is used in traditional Chinese medicine to strengthen the immune system, treat lung and urinary tract infections, tumours and liver disorders.

Main Health Benefits

Cancer
The Coriolus extracts PSP and PSK are routinely used alongside conventional treatment in the Far East, typically at 3g/day, with over 40 randomized controlled trials confirming benefit for a range of cancers, including: stomach cancer, colorectal cancer, lung cancer (NSCLC), oesophageal cancer, nasopharyngeal cancer, breast cancer and cervical/uterine cancer.

Reported benefits include increases in 2, 5 and 15 year survival, as well as reduced side-effects from conventional treatment\(^1\,^3\).

Anti-viral
Coriolus' ability to support healthy immune function means that it is also an excellent supplement for chronic viral conditions\(^4\), including:

Herpes
Coriolus has been shown to inactivate Herpes Simplex Virus (HSV) in a dose-dependent manner and clinically is seen to reduce the frequency of HSV outbreaks.

HIV
In-vitro studies show anti-HIV activity of Coriolus extracts and clinical reports indicate improvement in HIV patients' immune status from Coriolus mycelial biomass supplementation.
Chronic Fatigue Syndrome (CFS/ME)

Many cases of CFS are associated with high viral levels and Coriolus mycelial biomass (1.5-3g/day) has been shown to provide effective support, helping improve quality of life scores, lower viral levels and improve immune parameters, including increased NK cell activity5.

Anti-fungal

Coriolus extracts have a pronounced protective effect against lethal infection with Candida albicans in mice6.

Notes

Clinical trials using high concentration extracts, such as PSK and PSP, are mostly at a dose of 3g/day. Research with mycelial biomass products shows benefit at the same supplementation level.

References


2. Coriolus versicolor - Detailed Scientific Review. MD Anderson Cancer Center.


CORDYCEPS

Main active components

The ability of Cordyceps to increase metabolic efficiency and promote adaptation to harsh environments is largely due to the nucleoside derivatives (cordycepin, etc.) that it produces, which are also responsible for many of its unique health promoting properties. In addition, polysaccharide fractions have shown significant immunomodulatory activity.

Traditional use

Because of its rarity, Cordyceps was traditionally restricted to the few who could afford it. Its main uses were in the treatment of asthma and erectile dysfunction, and as a tonic for the elderly and those recovering from long illness.

Main Health Benefits:

Energy

In the same way that Cordyceps species help their hosts survive in oxygen-poor environments, Cordyceps-based products are used to enhance athletic performance and endurance by increasing the efficiency of energy metabolism. Studies in healthy elderly subjects using Cs-4 (see below - 3g/day) showed significant increases in aerobic capacity and resistance to fatigue, while other research has shown increases in energy output and oxygen capacity in sedentary humans taking C.sinensis and increased endurance in animals given C. militaris\textsuperscript{1,2}.

Asthma/COPD

As well as increasing efficiency of energy metabolism, Cordyceps provides valuable support for those, including children, with impaired lung function from conditions such as asthma and COPD, based on an adult dose of 3g/day\textsuperscript{3}.

Anti-viral

The nucleoside analogues found in C. militaris and hybridized cordyceps species function as reverse transcriptase inhibitors, inhibiting viral replication. At the same time, cordyceps’ polysaccharides have been shown to enhance the immune response to viral infections\textsuperscript{3}.
Cancer

Because of its combination of immune-modulating polysaccharides and nucleoside derivatives, many practitioners consider Cordyceps to be one of the most useful mushrooms for helping improve treatment outcomes in cancer, with cordycepin reported to induce apoptosis (cancer cell death) in multiple cancer cell lines, including: oral, colorectal, bladder, leukaemia, melanoma, multiple myeloma, breast and prostate.

Diabetes

Cordyceps provides useful support for cases of diabetes, with actions including:

- Triggering release of insulin
- Increasing hepatic glucokinase
- Increasing sensitivity of cells to insulin

Again, cordycepin and related nucleoside derivatives appear to play a key role in cordyceps’ anti-diabetic action and cordycepin has also been shown to suppress the chronic low-grade inflammation associated with diabetes⁴,⁵.

Infertility

In addition to its traditional use for improving libido and treating erectile dysfunction, Cordyceps can be beneficial for both male and female infertility, with increases in steroid hormone production and improvements in testes morphology, sperm quantity and quality at a dose of 3-4.5g/day⁶,⁸.

Kidney protective

The traditional use of Cordyceps to support the kidneys is backed up by reports of improved kidney function in patients with chronic renal failure and speedier recovery in patients with antibiotic-induced kidney damage³.

Hepatoprotective

Cordyceps can be a beneficial supplement for those suffering from impaired liver function, with inhibition of fibrosis and reductions in liver enzymes reported for liver conditions, including hepatitis and liver steatosis (fatty liver)⁹.
Nowadays the Cordyceps available in supplement form is almost exclusively sourced from commercially cultivated material, dramatically increasing its availability, lowering its cost and making it suitable for vegetarians and vegans. The move to cultivated material has led to a number of different Cordyceps products being available:

- **Cordyceps sinensis** - Strains of wild-harvested Cordyceps that have then been cultivated on grain-based substrates (solid fermentation / mycelial biomass technology).

- **Cordyceps militaris** - *C. militaris* has long been a common substitute for *C. sinensis* and, as *C. militaris* contains higher levels of cordycepin than *C. sinensis*, it may even be that it is at least partially responsible for the reverence in which *C. sinensis* has traditionally been held. Now artificially cultivated and harvested as fruiting bodies, as well as by solid fermentation / mycelial biomass technology. Sometimes called Cordyceps Flowers and known in Chinese as Yong Chong Cao.

- **Cs-4** - Not strictly Cordyceps, Cs-4 has been identified as Paecilomyces hepiali, an organism isolated from wild *C. sinensis* specimens by China’s Academy of Sciences and selected for ease of cultivation by large-scale liquid fermentation technology.

Although most studies have used 3.0 or 4.5g/day, supplementation of 1.5g/day can provide useful support for long term use. Because Cordyceps has been shown to increase levels of male and female sex hormones, it may not be appropriate for those suffering from hormone dependent cancers (prostate and breast) and its hypoglycemic properties mean that it should be used with caution by those taking insulin.

**References:**


