



MEDICINAL MUSHROOMS

Reishi, Maitake and Shiitake

All medicinal mushrooms help to nourish, strengthen and balance the immune system.

COMMON NAME: reishi, maitake and shiitake | LATIN NAME: Ganoderma lucidum, Grifola frondosa, Lentinula edodes
PART OF PLANT USED: Fruiting body & mycelium | PLANT FAMILY: Fungi

Key points

1. Contain beta-glucans, powerful polysaccharides renowned for their profound effect on the immune system and on inflammation
2. Full spectrum extract which contains both the fruiting body and the mycelium to deliver the best concentration of beta-glucans
3. Provide both short- and long-term adaptogenic support for the immune system and chronic conditions

What conditions would you recommend it for?

- Daily, long-term immune-building support: reduced immune function, allergies, autoimmune conditions, frequent colds and infections
- Follow-on support from immune suppressant treatments such as chemotherapy and radiotherapy.
- Use short-term to deal with acute allergies and to aid recovery from illness

Identifying the mushrooms



Reishi



Maitake



Shiitake

Sourcing organic practitioner-grade mushrooms

There is often controversy regarding how mushrooms should be grown. Pukka mushrooms are grown in custom-made growing chambers with strictly defined growth substrates and carefully controlled growth parameters such as temperature, light and air quality. Some mushrooms are grown on grain and without the ability to develop their fruiting body; this can lead to a lower bioavailability of the mushroom's active constituents, beta

glucans. Pukka's shiitake, maitake and reishi are all sourced from the USA.

Mushrooms are made up of the fruiting body (the part seen sitting on top of the soil) and the mycelium (the part sitting under the soil, like roots). A mushroom extract that is described as a 'full spectrum' extract contains both the fruiting body and the mycelium. Beta glucans, the primary active constituents in mushrooms, are found in both the fruiting body and mycelium of the mushroom; with around 75% from the fruiting body and 25% from the mycelium. Full spectrum extracts are preferable because there are valuable constituents, aside from beta glucans, found in both parts of the mushroom.¹ The mycelium is often favoured, but it's important to remember that the mycelium alone is not a mushroom, just like the roots of a tree alone are not a tree. The beneficial compounds in these mushroom species are all studied with relation to their function as a whole unit.

How medicinal mushrooms work

All medicinal mushrooms are rich in beta-glucans, powerful polysaccharides renowned for their profound effect on the immune system and on inflammation.² Beta-glucans can stimulate the production of cells that support immune function, such as natural killer cells, T-lymphocytes and T-helper cells.² They are best used long-term to gradually improve the overall health and balance of the immune system, but can be used short-term during allergic responses or in recovery from acute infections such as colds and 'flu.'²

The three medicinal mushrooms

Reishi: Although its activity is centred within the immune system, reishi has different specialist areas of activity. It displays anti-histaminic and anti-inflammatory actions and therefore is strongly indicated for support of chronic allergic conditions.³ This interesting combination of actions (including immunomodulatory activity) has made reishi

a choice supplement in the treatment of chronic long-term allergic conditions such as asthma and bronchitis, but also shorter-term afflictions such as hay-fever.⁴ It has also been clinically proven to provide essential protection in breast health.

Shiitake: A common culinary mushroom, valued for its nutritious qualities. However, it has been used medicinally for many years to address diseases where the immune system is chronically depressed and underactive.⁵ This means shiitake can have application in both long-term conditions and recurrent short-term conditions such as frequent coughs and colds.⁶ It also has a use in treating inflammation within the respiratory and urinary tract, in addition to reducing high cholesterol.^{7,8} Shiitake contains a constituent known as lentinan found in the cell walls of the mushroom. Lentinan may be responsible for the immunomodulatory effects of this mushroom.⁹

Maitake: This mushroom supports recovery from long-term chronic conditions affecting immunity or where individuals have undergone extreme treatments such as radiotherapy or chemotherapy.⁴ Specifically, it has demonstrated actions in supporting liver, lung and breast tissue.¹⁰ Maitake has also been shown to balance blood sugar levels and support conditions such as PCOS that are associated with a blood sugar imbalance.^{11,12}

Constituents of medicinal mushrooms

Polysaccharides – including the 1,3-1,6-β-glucans, triterpenoids, essential amino acids, ergosterol (pro-Vitamin D), B Vitamins: B1 (thiamine), B2 (riboflavin), B3 (niacin), B5 (pantothenic acid), iron, fibre, polyunsaturated fats.

Research highlights

Reishi, shiitake and maitake have all





demonstrated anti-tumour activity. The β -glucans found in all three mushrooms have immune-modulating effects via induction of cytokines, enhancement of T- and B-cell proliferation, activation of IL1 β , IL-2, IL-6, IL-10, and tumour necrosis factor (TNF)- α gene expression.^{13,14,15}

The β -glucans in medicinal mushrooms have been found to boost the activity of immune cells and shift immune system balance towards Th1 to decrease inflammation. Cell and animal studies have found antioxidant and liver protective effects.¹⁶

Clinical trials of all three mushrooms have found hypoglycaemic effects, improved survival time in cancer patients and reductions in serum cholesterol.⁵

One study looking at the effects of these three mushrooms on human macrophages has confirmed that combined therapy is best. It showed the immuno-stimulating effect of all three mushrooms was greater than for individual mushrooms suggesting a potential synergistic effect of the combined mushroom formula.¹⁷

The specific effects vary depending on the β -glucans present in the mushroom, so by

including all three mushrooms in Mushroom Gold (with a total of 300mg of β -glucans), benefits can be maximised.

Ayurvedic energetics

- Taste:** Sweet and bitter
- Temperature:** Neutral
- Constitutional effect:** Equalises all three doshas
- Energetic actions:** Rejuvenating, balancing, protective

Safety & contraindications

- Reishi, maitake and shiitake are popular mushrooms in oriental cooking and come under the category of functional foods, indicating their safety.
- Multiple small-sized clinical trials in healthy individuals have determined no adverse effects of reishi. Those taking anticoagulants should avoid very high doses of reishi (3g and higher), due to observed antiplatelet effects at high doses.¹ Pukka Mushroom Gold provides levels of reishi well below this.
- Shiitake dermatitis can occur in some individuals consuming raw shiitake, but this does not occur with cooked or dried mushrooms.

- There is no data on the safety of medicinal mushrooms in pregnancy, however, due to their long-established use as food, no issues are expected.
- Medicinal mushrooms tend to have hypoglycaemic effects, so diabetics should monitor blood sugar levels.

Dosage

Dried concentrated extracts: 1g daily
Pukka Mushroom Gold: Two capsules twice daily

Where to find medicinal mushrooms at Pukka

Supplements family

- Mushroom Gold
- Womankind premenstrual
- Vitalise



Medicinal mushrooms at home

Make your own immune boosting soup

Ingredients

Handful of shiitake mushrooms
 250g organic pearl barley (or

quinoa)
 2 chopped beetroot
 4 chopped carrots
 4 chopped potatoes
 2 chopped leeks
 3 chopped onions
 4 cloves chopped garlic
 2 heads chopped kale
 mound of chopped spinach
 1 large stick ginger
 Additional fresh herbs such as

rosemary, thyme and turmeric

Method

Simmer the Shiitake mushrooms in 3 pints of water for half an hour. Then to the mushroom water, add the rest of the ingredients and simmer for 45 minutes.



¹ Sharma C, et al. 2019. Bioactive metabolites of Ganoderma lucidum: Factors, mechanism and broad spectrum therapeutic potential. J Her Med [In Press]. Doi <https://doi.org/10.1016/j.hermed.2019.100268>

² Jesenak M, et al. 2017. Respiratory tract infections and the role of biologically active polysaccharides in their management and prevention. Nutrients. 9: 779.

³ Bhardwaj N, et al. 2014. Suppression of inflammatory and allergic responses by pharmacologically potent fungus Ganoderma lucidum. Recent Pat Inflamm Allergy Drug Discov. 8: 104-117.

⁴ Chen, H.S., Tsai, Y.F., Lin, S., editors. et al. 2004. Studies on the immuno-modulating and anti-tumor activities of Ganoderma lucidum (Reishi) polysaccharides. Bioorg Med Chem. 12:5595-601.

⁵ Vetrivicka, V., Vetrivickova, J. 2014. Immune-enhancing effects of maitake (Grifola frondosa) and shiitake (Lentinula edodes) extracts. Ann Transl Med. 2(2): 14.

⁶ Dai X, et al. 2015. Consuming Lentinula edodes (shiitake) mushrooms daily improves human immunity: A randomized dietary intervention in healthy young adults. J Am Coll Nutr 34: 478-487.

⁷ Rop O, et al. 2009. Beta-glucans in higher fungi and their health effects. Nutr Rev. 67: 624-631.

⁸ Hobbs, C. Medicinal value of Lentinus edodes (Berk.) Sing. A literature review. Int. J. Med. Mushr., 2000, 2, 287-02.

⁹ Hamuro J.; Chihara, G. In Immune Modulation Agents and Their Mechanisms; Lentinan, a cell-oriented immunopotentiator: its experimental and clinical applications and possible mechanism of immune modulation; Fehiche, R.L. Ed.; Marcel Dekker, New York, 1985; pp. 409-435.

¹⁰ He X, et al. 2017. Polysaccharides in Grifola frondosa mushroom and their health promoting properties: A review. Int J Biol Macromol. 101: 910-921.

¹¹ Konno S, et al. 2001. A possible hypoglycaemic effect of maitake mushroom on type 2 diabetic patients. Diabet Med. 18: 1010.

¹² Chen JT, et al. 2010. Maitake mushroom (Grifola frondosa) extract induces ovulation in patients with polycystic ovary syndrome: A possible monotherapy and a combination therapy after failure with first-line clomiphene citrate. J Altern Complement Med 16: 1295-1299.

¹³ Deng G, et al. 2009. A phase I/II trial of a polysaccharide extract from Grifola frondosa (maitake mushroom) in breast cancer patients: Immunological effects. J Cancer Res Clin Oncol 135: 1215-1221.

¹⁴ Gao Y, et al. 2003. Effects of ganopoly (a Ganoderma lucidum polysaccharide extract) on the immune functions in advanced-stage cancer patients. Immunol Invest. 32: 201-215.

¹⁵ Yamaguchi Y, et al. 2011. Efficacy and safety of orally administered Lentinula edodes mycelia extract for patients undergoing cancer chemotherapy: A pilot study. Am J Chin Med 39: 451-459.

¹⁶ Hamuro, J., Chihara, G. In Immune Modulation Agents and Their Mechanisms; Lentinan, a cell-oriented immunopotentiator: its experimental and clinical applications and possible mechanism of immune modulation; Fehiche, R.L. Ed.; Marcel Dekker, New York, 1985; pp. 409-435.

¹⁷ Mallard, B., Leach, D.N., Wohlmut, H. and Tiralongo, J., 2019. Synergistic immuno-modulatory activity in human macrophages of a medicinal mushroom formulation consisting of Reishi, Shiitake and Maitake. PloS one, 14(11), pp.e0224740-e0224740.

