



ThorneVet Mushroom Medley

A potent blend of five organic medicinal mushrooms for supporting optimal immune function

ThorneVet's Mushroom Medley combines five organic, hot water-extracted medicinal mushrooms — Reishi, Turkey Tail, Cordyceps, Maitake, and Chaga. This synergistic blend of medicinal mushrooms provides robust support for balanced immune system function. The Mushroom Medley blend is ideal for supporting patients with weakened immune function, including providing support for patients undergoing treatment for cancer.

Key Nutritional Support Features:

- | Made from certified organic mushrooms
- | A blend of organic extracts of Reishi, Turkey tail, Cordyceps, Maitake and Chaga
- | Hot water-extracted only from mature fruiting bodies – no mycelium – no fillers or grains
- | Tested to ensure high levels of beta-glucans – guaranteed to provide greater than 20-percent beta-glucans content
- | Third-party tested for quality, potency, and purity

Mushroom Medley – Special Nutrients

Overview

Medicinal mushrooms have been used for thousands of years to promote health and wellness. **Reishi mushroom**, or **Ganoderma lucidum**, for example, was considered in Traditional Chinese Medicine to be the “mushroom of immortality.” **Reishi’s** medicinal properties were so revered in ancient Chinese culture that its use was reserved only for the emperor.

Medicinal mushrooms have long been considered to be superior adaptogens because they help the body deal with stress. They are also considered to be “longevity tonics” because of their system-wide support in helping to maintain a balanced immune response throughout the body. Medicinal mushrooms have been found to have beneficial effects on digestion, circulation, respiration, immune function, and cognition.¹

It has been suggested that medicinal mushrooms exhibit this broad spectrum of pharmacological activity due to the mechanisms of action of their various bioactive constituents, including immunomodulating, digestive, hepatoprotective, neuroprotective, nephroprotective, osteoprotective, and hypotensive activity.¹ It is believed to be the presence of various natural constituents of medicinal mushrooms — **phenolic compounds**, **polysaccharides**, **terpenoids**, and other **bioactive compounds** — that contributes to their potent biological activity.²

Bioactive Compounds

Polysaccharides represent the major bioactive compounds existing in medicinal mushrooms. **Polysaccharides** are believed to exhibit potent immunomodulatory activity – they bring balance to the immune system.¹ The best known and most abundant of the mushroom **polysaccharides** are the **alpha-glucans** and the **beta-glucans**.³

Terpenoids are organic compounds present in mushrooms that have been reported to be extremely versatile in their health-promoting benefits, with effectiveness against multiple adverse health conditions.⁴

Proteins are found in mushrooms in abundant quantities. It has been hypothesized that many mushroom **proteins** have significant health-promoting benefits. In particular, **proteins** called **lectins** are involved in many biological activities, such as promoting innate immunity and up-regulating cell-to-cell interaction. **Lectins** are also believed to have significant beneficial immunomodulatory properties.⁵

Ergothioneine is a sulfur-based amino acid found in its highest levels in mushrooms, as well as in various fermented foods. **Ergothioneine** has potent antioxidant capabilities and is considered to be a longevity nutrient.

Other mushroom metabolites that have beneficial biological activity include **phenolic compounds**, **antioxidants**, **sterols**, and **fatty acids**.²

Reishi – *Ganoderma lucidum*

Reishi – known in Traditional Chinese Medicine as “the mushroom of immortality” – has been used in traditional systems of folk medicine for thousands of years. As a result, **Ganoderma lucidum** is truly time-tested for both its safety and its efficacy. **Reishi** is an effective adaptogenic that helps the body deal with the negative effects of stress. Stress can cause an imbalanced inflammatory response, hormonal imbalances, adrenal fatigue, and weakened immune function. In addition to its adaptogenic properties, **Reishi** has been shown to support balanced immune function by helping to maintain a normal inflammatory response throughout the body.⁶ It is this characteristic – support for a companion animal’s balanced immune function – that dictated the inclusion of **Reishi** in **Mushroom Medley**.

Because many immune health disorders are rooted in inflammatory dysregulation, **Reishi** mushroom’s recognized immunomodulatory effects can help alleviate these imbalances.⁷ The natural constituents in **Reishi** have been described in the scientific literature as exhibiting this beneficial immunomodulatory effect.⁸

In **Ganoderma lucidum**, many of its natural constituents are extracted from the fruiting body. Many polysaccharides and triterpenes, the two major groups of bioactive components in the mushroom, exhibit beneficial effects on immune function, as shown in numerous results from *in vitro* experiments and animal and human *in vivo* studies.⁹ **Reishi** mushroom provides a broad array of beneficial effects to help a companion animal suffering from an immune system’s inflammatory response that is out of balance.

Turkey Tail – *Coriolus Versicolor*

Turkey Tail mushroom has gained substantial popularity in veterinary medicine since a study by the University of Pennsylvania showed that supportive therapy with a polysaccharopeptide from **Turkey Tail** prolonged survival in dogs being treated for a particularly common but virulent type of cancer (hemangiosarcoma).¹⁰ This study created much excitement in veterinary circles because historical veterinary treatment of hemangiosarcoma has a poor prognosis and is often unrewarding.

Similar to **Reishi**, **Turkey Tail** mushroom has been used for many years in Japanese and Chinese medical systems. **Turkey Tail** mushroom has strong properties that promote a healthy immune response through its diverse array of antioxidant components.¹¹ Research suggests this strong antioxidant capability helps prevent DNA damage.¹²

The two primary compounds that provide the above benefit are **polysaccharide P (PSP)** and **polysaccharide K (PSK)**. **PSK** has been in common clinical use in Japan since 1970.¹³ There is a tremendous amount of research analyzing these compounds in the treatment of a wide variety of companion animal disorders. **Turkey Tail** mushroom also holds promise in supporting the veterinary patient who is undergoing conventional chemotherapy and radiation by supporting the animal’s innate immune system, as well as providing needed energy and vitality.

Turkey Tail mushroom also has the added benefit of supporting a healthy microbiome because the **beta-glucan** constituent acts as a prebiotic. It has also been found that the **PSP** in **Turkey Tail** mushroom supports the presence of healthy probiotic bacteria, while also reducing the harmful overgrowth of undesirable bacterial species.¹⁴

Cordyceps – *Cordyceps sinensis*, *Cordyceps militaris*

Cordyceps species of mushrooms have a fascinating lifecycle. They are a parasitic fungus that actually grows inside of an infected insect. Each species of **cordyceps** infects a specific kind of insect. The **cordyceps** spores land on the head of an insect, where they then produce filaments that move internally into the insect's head that then begins to produce mycelium. The mycelium consumes the insect from the inside, and when the environmental conditions are ripe, a fruiting body will erupt from the head of the insect, release spores, and the cycle begins all over again.¹⁵

The wild species of **cordyceps** is **Cordyceps sinensis**, which infects the caterpillar of the Hepilau moth. **C. sinensis** mainly grows at high elevations in Tibet and the Chinese provinces of Sichuan, Yunnan, Qinghai, and Gansu – it can also be found in India, Nepal, and Bhutan, although it is less abundant there. However, the price for **Cordyceps sinensis** extracts is very high because until only recently there was no way to commercially produce this strain of mushroom. For this reason, **C. sinensis** is rarely found outside of Asia, and it is very expensive when it can be found. Most of the **Cordyceps** extracts found in North America come from **Cordyceps militaris** because this mushroom strain can be cultivated commercially. However, **C. militaris** is certainly a viable alternative to **C. sinensis** because the qualitative and quantitative composition of the bioactive substances from in vitro-cultivated **C. militaris** do not differ from the same substances in **C. sinensis** fruiting bodies.¹⁶

In the traditional medicine systems of Asia, the **Cordyceps** species of mushrooms have a revered place as a special tonic. For example, this mushroom has been used for thousands of years to boost “kidney essence” or “Jing,” to nourish “Yin,” to tonify “Yang,” and to generally improve vitality.

Current research shows the diverse potential of **Cordyceps** mushroom in helping to maintain a healthy inflammatory response throughout the immune system, boosting energy production and vitality, and providing potent antioxidant effects.¹⁵ The main compounds that exert these beneficial effects are **cordycepin** and **cordycepic acid**, **polysaccharides**, **sterols**, and **fatty acids**, as well as other compounds found in smaller quantities, such as crude protein, amino acids, and metal elements, which still manifest a wide range of beneficial pharmacological functions.¹⁷

Maitake – *Grifola frondosa*

Maitake mushroom – **Grifola frondosa** — is a basidiomycete fungus (also called Hen of the Woods) that has been used widely in Japan, Korea, and China as a traditional food additive. **Maitake** literally means “dancing mushroom” because, reportedly, individuals who found the mushroom in deep mountain valleys would dance with joy because they knew of the mushroom's delicious taste and health benefits.¹⁸

Maitake has been extensively studied in Japan, where many of its compounds have been found to exhibit a wide array of positive health-promoting effects. The fruiting body of this mushroom has been reported to contain multiple beneficial **polysaccharides**. These **polysaccharides** have been identified as many types of **beta-glucans**.¹⁹ Research also shows that **Grifola frondosa** has potent antioxidant and free radical-scavenging effects.²⁰

Maitake's most important **beta-glucan** that has been extensively studied is the MD Fraction. The MD Fraction, discovered and named by Professor Emeritus Susumu Namba of Kobe Pharmaceutical University, is an effective **polysaccharide beta-glucan** found only in the **maitake mushroom**. Research has shown significant benefits of the MD Fraction in beneficially activating cell-mediated immune response.²¹

Chaga – *Inonotus obliquus*

Chaga is another unique fungus because **Chaga** will only grow on the birch tree. **Chaga** is the common name for what is actually a sterile conk, or canker, that forms after a birch tree has been infected by the parasitic fungus **Inonotus obliquus** (or **I. obliquus**). **Chaga** must be collected while it is actually still on the birch tree because it is the symbiotic relationship between the birch and the parasitic **I. obliquus** that forms the medicinal compounds found in **Chaga**, like the **triterpenes betulin** and **betulinic acid**. In addition to these **triterpenes**, **Chaga** also has abundant **polysaccharide beta-glucans** and **melanin**.²² Fungal **melanin** has been shown in both *in vitro* and *in vivo* animal studies to have powerful antioxidant and DNA-protective properties.²³

Chaga has powerful natural antioxidant activity, in addition to exerting activity as an immune system adaptogen. **Chaga** can help balance the immune system of a veterinary patient who is having an exaggerated or over-active immune response (such as one being seen for an allergy). **Chaga's** wide range of antioxidant activity supports a healthy inflammatory response. **Chaga** apparently does this by beneficially modulating the release of certain otherwise harmful cytokines that are associated with up-regulating inflammation.²⁴



Mushroom Medley

Potent blend of five organic medicinal mushrooms to support optimal immune function

.....



1 scoop per 25 pounds body weight daily, one to two times daily

V950-P / 120 Scoops

PRODUCT FACTS

120 Scoops per Container

Active Ingredients per 1.5-cc Scoop:

Chaga Mushroom Extract (<i>Inonotus obliquus</i>)	100 mg
Cordyceps Mushroom Extract (<i>Cordyceps sinensis</i>)	100 mg
Maitake Mushroom Extract (<i>Grifola frondosa</i>)	100 mg
Reishi Mushroom Extract (<i>Ganoderma lucidum</i>)	100 mg
Turkey Tail (<i>Coriolus</i>) Mushroom Extract (<i>Trametes versicolor</i>)	100 mg

THORNEVET

Mushroom_Medley_V01_07.26.23| Copyright 2019, ThorneVet Companion Animal Health Products, LLC, Inc. All rights reserved

References

1. Venturella G, Ferraro V, et al. Medicinal mushrooms: bioactive compounds, use, and clinical trials. *Int J Mol Sci* 2021 Jan 10;22(2):634. doi: 10.3390/ijms22020634. PMID: 33435246; PMCID: PMC7826851.
2. Elkhateeb WA. What medicinal mushroom can do? *Chem Res J* 2020;5:106-118.
3. Kozarski M, Klaus A, et al. Antioxidative and immunomodulating activities of polysaccharide extracts of them medicinal mushrooms *Agaricus bisporus*, *Agaricus brasiliensis*, *Ganoderma lucidum*, and *Phellinus linteus*. *Food Chem* 2011;129:1667-1675.
4. Dasgupta A, Acharya K. Mushrooms: an emerging resource for therapeutic terpenoids. 3 *Biotech*. 2019 Oct;9(10):369. doi: 10.1007/s13205-019-1906-2. Epub 2019 Sep 24. PMID: 31588393; PMCID: PMC6760460.
5. Zhao S, Gao Q, et al. Immunomodulatory effects of edible and medicinal mushrooms and their bioactive immunoregulatory products. *J Fungi* 2020;6:269. doi: 10.3390/jof6040269.
6. Dudhgaonkar S, Thyagarajan A, Sliva D. Suppression of the inflammatory response by triterpenes isolated from the mushroom *Ganoderma lucidum*. *Int Immunopharmacol* 2009;9:1272-1280. doi:10.1016/j.intimp.2009.07.011
7. Lull C, Wichers HJ, Savelkoul HF. Antiinflammatory and immunomodulating properties of fungal metabolites. *Mediators Inflamm* 2005 Jun 9;2005(2):63-80. doi: 10.1155/MI.2005.63. PMID: 16030389; PMCID: PMC1160565.
8. Wachtel-Galor S, Yuen J, Buswell JA, et al. *Ganoderma lucidum* (Lingzhi or Reishi): A Medicinal Mushroom. In: Benzie IFF, Wachtel-Galor S, editors. *Herbal Medicine: Biomolecular and Clinical Aspects*. 2nd edition. Boca Raton (FL): CRC Press/Taylor & Francis; 2011. Chapter 9. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK92757/>
9. Zaidman BZ, Yassin M, et al. Medicinal mushroom modulators of molecular targets as cancer therapeutics. *Appl Microbiol Biotechnol* 2005;67:453-468.
10. Brown DC, Reetz J. Single agent polysaccharopeptide delays metastases and improves survival in naturally occurring hemangiosarcoma. *Evid Based Complement Alternat Med* 2012;2012:384301. doi: 10.1155/2012/384301. Epub 2012 Sep 5. PMID: 22988473; PMCID: PMC3440946.
11. Cui J, Chisti Y. 2003. Polysaccharopeptides of *Coriolus versicolor*: physiological activity, uses, and production. *Biotechnology Advances* 2003;21(2):109-122. <https://www.sciencedirect.com/science/article/abs/pii/S0734975003000028/>
12. Knežević A, Živković C, et al. Antigenotoxic Effect of *Trametes* spp. extracts against DNA damage on human peripheral white blood cells. *The Scientific World Journal* <<https://www.hindawi.com/journals/tswj/2015/146378/>>
13. Dou H, Chang Y, Zhang L. *Coriolus versicolor* polysaccharopeptide as an immunotherapeutic in China. *ScienceDirect Academic Press*. 2019 <<https://www.sciencedirect.com/science/article/pii/S1877117319300353?via%3Dihub#bb0050>>
14. Pallav K, Dowd SE, Villafuerte J, et al. Effects of polysaccharopeptide from *Trametes versicolor* and amoxicillin on the gut microbiome of healthy volunteers. *Gut Microbes* 2014;5(4):458-467 <<https://www.tandfonline.com/doi/full/10.4161/gmic.29558>>
15. Yue K, Ye M, et al. The genus *Cordyceps*: A chemical and pharmacological review. *The Journal of Pharmacy and Pharmacology* 2013;65(4):474-493. doi:10.1111/j.2042-7158.2012.01601.x
16. Jędrzejko KJ, Lazur J, Muszyńska B. *Cordyceps militaris*: An overview of its chemical constituents in relation to biological activity. *Foods* 2021 Oct 30;10(11):2634. doi: 10.3390/foods10112634. PMID: 34828915; PMCID: PMC8622900.
17. Zhou XW, et al. *Cordyceps* fungi: natural products, pharmacological functions, and developmental products. *J Pharm Pharmacol* 2009;61:279-291.
18. Mayell M. Maitake extracts and their therapeutic potential. *Altern Med Rev* 2001;6:48-60.
19. Masuda Y, Matsumoto A, Toida T, et al. Characterization and antitumor effect of a novel polysaccharide from *Grifola frondosa*. *J Agric Food Chem* 2009;57:10143-10149.
20. Yeh JY, Hsieh LH, et al. Antioxidant properties and antioxidant compounds of various extracts from the edible basidiomycete *Grifola frondosa* (Maitake). *Molecules* 2011 Apr 15;16(4):3197-3211. doi: 10.3390/molecules16043197. PMID: 21499220; PMCID: PMC6260640.
21. Kodama N, Komuta K, Nanba H. Can maitake MD-fraction aid cancer patients? *Altern Med Rev* 2002 Jun;7(3):236-239. PMID: 12126464.
22. Khan AA, Gani A, et al. Biological and pharmaceutical activities of mushroom β -glucan discussed as a potential functional food ingredient. *Bioactive Carbohydrates and Dietary Fibre* 2018;16:1-13. <<https://doi.org/10.1016/j.bcdf.2017.12.002>>
23. Revskaya E, Chu P, Howell RC, et al. Compton scattering by internal shields based on melanin-containing mushrooms provides protection of gastrointestinal tract from ionizing radiation. *Cancer Biotherapy & Radiopharmaceuticals* 2012;27(9):570-576. <<https://doi.org/10.1089/cbr.2012.1318>>
24. Van Q, Nayak BN, Reimer M, et al. Anti-inflammatory effect of *Inonotus obliquus*, *Polygala senega* L., and *Viburnum trilobum* in a cell screening assay. *Journal of Ethnopharmacology* 2009;125(3):487-493. <<https://doi.org/10.1016/j.jep.2009.06>>