



## MYCOFORCE™

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### Medicinal Mushrooms

Mushroom fruiting bodies have been used as both food and medicine by various human cultures for thousands of years.<sup>1</sup> Yet not all culinary mushrooms are considered medicinal, and not all medicinal mushrooms are considered culinary food. Some medicinal mushrooms are also culinary mushrooms (e.g., lion's mane, shiitake, oyster, enoki, chanterelle, and maitake) in that they are edible when cooked. Mushrooms that are categorized to be "medicinal mushrooms" produce bioactive metabolites that have beneficial effects on humans.<sup>2</sup> Most, but not all, medicinal mushrooms grow on trees, and many are somewhat woody and fibrous in nature, which makes them inedible in raw form.

### Mushroom Life Cycle

Mushrooms are actually just one stage in the life cycle of fungal organisms that contains three distinct states – spores, mycelium, and fruiting body (mushrooms). The mushroom, or "fruiting body," produces spores, which, once dispersed, will serve as "seed" to propagate the species. When the environment is suitable, typically in the spring, with ample moisture and warming temperatures, the mushroom spores will germinate in suitable substrate into threadlike tubes called hyphae, which will, in turn, grow together in a mass of filaments to form the mycelium. In Nature, the mycelium and spores are rarely seen, as the spores are very small, and the white, web-like mycelium is typically embedded in its food source (e.g., wood, woody debris, fallen leaves, and all kinds of annual plants). When environmental conditions are conducive, typically in the fall, a fertile mycelium will "sprout" a mushroom (fruiting body), and the life cycle begins again.

### Immune System Support

Interestingly, humans are susceptible to many of the same diseases that afflict fungal organisms,<sup>1</sup> but usually do not suffer from those that infect other plants. Some scientists believe that this is because humans are more closely related to fungi than any other kingdom as animals and fungi share a more recent evolutionary ancestor than plants, protozoans, or bacteria. It is therefore no surprise that medicinal mushrooms have been found to contain compounds that activate the most ancient cells in the human immune system – macrophages.<sup>3\*</sup> Macrophages are the key white blood cells of innate immunity and can be thought of as the "conductor" of the human immune response.

One of the key bioactive compounds in medicinal mushrooms is beta-D-glucans (specifically, 1,3-1,6 beta-glucans), which have potent immunomodulatory benefits:<sup>4</sup> stimulating the immune system when deficient and also moderating an overactive immune system.\* Beta-glucans are effectively soluble fiber and, as such, are not digestible by humans in raw form. Since they are not degraded by digestive enzymes, they are absorbed unmodified into the blood and bind to receptors on macrophages (and other white blood cells) to exert their immunomodulatory effects. Beta glucans and chitin are the dominant component of the fungal cell walls and are found in all life stages of mushrooms. Chitin is the tough, fibrous, polysaccharide material of the cell wall and mycologists hold the view that it is largely indigestible to humans. Fortunately, hot water breaks down these chitinous cell walls and the beta-glucans and other compounds are released for absorption by humans. A hot water extraction process (or other heat treatment) is therefore an essential feature of any quality mushroom supplement.

### Comprehend and Mimic Nature

Viktor Schauberger, one of the greatest pioneers of the quantum physical study of Nature's subtle energies, was a master at comprehending and mimicking Nature in all areas of life. To create a top-notch medicinal mushroom product, we looked deeply into Nature to find answers. With a couple exceptions, all medicinal mushrooms can be found growing on live (injured or dying) or fallen trees in their natural habitat. Wood is the preferred growth medium for these medicinal mushrooms which act as primary decomposers in one of Nature's many important biological cycles, the nutrient cycle.

For centuries, with the exception of chaga and a few other lesser-known mushrooms, the forest has given the fruit of the mushroom as the source for medicine and food. Nature concentrates the essence, the codes, and the frequencies of the fungus into the ephemeral fruiting body which generally has a very short life span. If there were ever a time on this planet where we would need to evacuate into the forests, the fruiting body is what we would find growing on the outside of the tree to help us sustain life. A person would not be able to open up and get into a tree to extract the embedded mycelium. Instead, a person would consciously harvest the fruiting body, giving gratitude for the gift, cut it into small pieces, add the pieces to a pot of freshly harvested spring water, and decoct it into a tea over a campfire. This has always been Nature's way of consuming medicinal mushrooms. MycoForce is formulated with all fruiting bodies with the exception of wildcrafted chaga which is technically a sclerotium.

### Best of Both Worlds: Fruiting Body and Mycelium

Research has validated the medicinal value of the many active ingredients found in mycelium other than beta-glucans.<sup>6,7</sup> The intuitive intelligence of Nature gives us birch-grown chaga which is technically a type of hardened, dense, compact mass of mycelium, not a fruiting body, called a

sclerotium (sclerotia, plural) that intriguingly grows on the outside of the tree where humans can access it. This sclerotium is able to survive extreme environments and is what makes wildcrafted chaga such a powerful functional, therapeutic agent. The black color denotes wildcrafted chaga's high melanin content which it can only derive from growing on one of its natural substrates, the birch tree.

## Medicinal Mushroom Cultivation

Mushroom cultivation originated thousands of years ago in China with the cultivation of shiitake mushrooms. Asia, specifically China, is the largest mushroom producer in the world. Mushroom cultivation techniques have evolved over time, but wood-grown, and sawdust-log-grown mushrooms continue to be the gold standard for medicinal mushroom fruiting body production with the exception of *Cordyceps militaris*, which is fairly new to large scale, commercial mushroom cultivation.

The maitake, shiitake, and lion's mane fruiting bodies used in MycoForce are grown on wood-type logs. They are essentially sawdust logs that are inoculated with fungal spores to eventually produce fruiting bodies that can be harvested. The sawdust is a byproduct of the lumber mill industry and originates solely from hardwoods since hardwoods are what maitake, shiitake, and lion's mane grow on in the forest. The trees that are milled into lumber originate from managed tree plantations, not old-growth forests.

The red reishi used in MycoForce is grown on actual, authentic beech wood logs, not sawdust, that are obtained from locally-managed beech wood forests in China. This is because reishi needs actual beech wood logs (a hardwood), one of its natural growing substrates, in order to produce the really important bioactive compound triterpenes, which is where red reishi get its signature, therapeutic bitter flavor from. Red reishi grown on authentic hardwood logs is the hallmark of what a true cultivated fruit body reishi mushroom supplement is as it is of the highest quality.

It is to be noted that the scientific community has affirmed a species clarification on the *Ganoderma* medicinal mushroom. *Ganoderma*, known as "Lingzhi" in East Asia, has long been taxonomically assigned to *Ganoderma lucidum*, a species originally described from Europe. Based on molecular research conducted in recent years, morphological studies using rDNA sequencing analysis confirms that Lingzhi is actually a different species than its European cousin.<sup>8,9</sup> A new species for Lingzhi, *Ganoderma lingzhi*, which has an East Asia distribution, has been adopted. This is the species that has been used in traditional Chinese medicine for thousands of years and is the species we use.

Chaga, due to its naturally high melanin content, is sustainably<sup>10</sup> wildcrafted from the taiga, a boreal forest of the cold, subarctic region of Siberia, just south of the Arctic Circle. The quality and energetics of Siberian Chaga is quite remarkable. Among the many types of trees that make their home there, the taiga is host to the mystical ringed cedars which no doubt has an influence on Siberian Chaga's energetics. A unique attribute of wild chaga is that its makeup is not solely comprised of hardened mycelium. Wild chaga uptakes some of the birch tree into its mass and is what makes chaga special as a person consuming a chaga preparation is also consuming some of the benefits of the birch tree (betulin, a naturally-occurring triterpene).<sup>11</sup>

What is unique about wild chaga sclerotium is that it is not a fruiting body. Unlike the way mycelium is found *inside* the host tree of a medicinal mushroom, Nature gives us the sclerotium of chaga visible to the naked eye just like a fruiting body that grows on the outside of the tree. Put simply, Nature truly gives us the fungal part of a medicinal mushroom that it wants humans to focus on and consume.

*Cordyceps militaris* is the only one of our mushrooms that is not wood grown; it is actually grown on organic rice. *C. militaris* has been used in traditional Chinese medicine<sup>12</sup> for many years and is the first cordyceps species that has been able to be grown for its fruiting body commercially at scale at an affordable price. Except for wild cordyceps (*Ophiocordyceps sinensis*), the caterpillar fungus, which is astronomically expensive, what the world has known to be a cordyceps supplement has been in the form of 100% pure mycelium grown via liquid fermentation (in Asia, *Cordyceps Cs-4*) or mycelium on grains (in the USA, *C. sinensis* and/or *C. militaris*). Cultivation of authentic *O. sinensis* fruit bodies has always been impossible, but recently China's persistence and ingenuity paid off and they were able to solve the puzzle and cultivate an authentic fruit body. However, despite of this advancement in mushroom cultivation techniques, *O. sinensis* fruit bodies remain far too pricey for the commercial mushroom supplement market. By growing *C. militaris* authentic fruit bodies, we are able to provide a fruiting body with all of its compounds (e.g., cordycepin) and all its benefits<sup>13</sup> which is how Nature has always provided cordyceps to us. Our cordyceps is not grown on insects nor does it contain insects.

While the U.S. is always our first preference for herbs and mushrooms, we were not able to find wood grown, fruiting body mushrooms cultivated in the USA that are grown commercially at scale. U.S.-grown mushrooms generally offer a new school of thought and focus on the mycelium stage of the mushroom life cycle. These mushroom products are grown on grain and either provide a finished product of all mycelium or mycelium with some fruiting bodies. Sometimes the spores are claimed to be part of the product, but they are not listed in the supplement panel. The end result is that the grain is still part of the finished product that is sold to consumers. Extracellular compounds are claimed to be part of the grain substrate, but no active ingredients are listed on the supplement panel or label. It is also unclear the ratio of mycelium to fruiting body.

While this is a valid form of manufacturing a mushroom supplement, we prefer to not have to eat grains to get the benefit of medicinal mushrooms. Grains are an important part of many people's diet, but our choice is to consume something that most resembles and mimics what we would get in Nature if out mushroom foraging. MycoForce is formulated to also honor the way traditional Chinese medicine has prepared and used medicinal mushrooms for thousands of years. All of the mushrooms in MycoForce and Integrity Extracts™ Reishi/Chaga/Lion's Mane/Cordyceps are proudly and organically grown in remote mountain regions of China. Mushroom growing techniques developed in China and China continues to be the major producer, consumer, and exporter of mushrooms in the world, followed by the U.S. and the Netherlands.<sup>14</sup>

There are a myriad of beneficial components in medicinal mushrooms, and while beta-glucans aren't the be-all and end-all of therapeutic compounds, it is well established in the scientific literature that beta-glucans are the main bioactive component in terms of supporting the immune system\* and that the highest amounts are found in the fruiting body.<sup>15-17</sup>

MycoForce provides a minimum of 20% beta-glucans, Integrity Extracts Reishi provides a minimum of 35% beta-glucans, Integrity Extracts Chaga provides a minimum of 7% beta-glucans, Integrity Extracts Lion's Mane provides a minimum of 25% beta-glucans, and Integrity Extracts Cordyceps provides a minimum of 25% beta-glucans. Every lot of each HealthForce SuperFoods mushroom finished product is third-party lab tested for beta-glucans to ensure potency and strength.

## MycoForce Ingredient Breakdown

For thousands of years, hot water extracted medicinal mushrooms have been the centerpiece of tonic immune support in the traditional Chinese medicine herbal system. MycoForce contains certified organic hot water extracts of four different wood-grown medicinal mushroom fruiting bodies: shiitake, maitake, red reishi, and lion's mane; one certified organic, hot water extract of wildcrafted mushroom sclerotium, chaga; and one certified organic hot water extract of grain grown fruiting body, cordyceps, known for their potent immunomodulatory properties.<sup>18-23\*</sup>

Our certified organic hot water extracts are spray dried back onto the original, finely milled mushroom powder used to make the extract in order to avoid the use of non-beneficial carriers. This ultimately produces a fully functional final product as the insoluble fiber is still intact. This allows both the insoluble and soluble fiber elements to harmonize and create a beautiful balance in the GI tract. Each type of mushroom has a slightly different beta-glucan branching profile, so by combining these different beta-glucan fractions, we produce a more complex and ultimately effective immune response for daily immune support.\* MycoForce's flavor and aroma is that of quality grown and extracted mushrooms, an experience a person can sense and appreciate.

**Shiitake Mushroom** (*Lentinula edodes*): This best known culinary and medicinal mushroom is commonly known in the English language by its Japanese name, shiitake. Shiitake was the first mushroom to ever be cultivated, giving credit to the Chinese for accomplishing this, and continues to be one of the most cultivated mushrooms in the entire world. This tasty culinary mushroom has a long history of medicinal use in traditional Chinese and Asian medicine and can usually be found in most health food stores year-round. The folklore around shiitake mentions that in Chinese culture shiitake was revered for its aphrodisiacal qualities regarded as a substance that promotes youthfulness, virility, and longevity.<sup>24</sup>

Being the most studied medicinal mushroom, hundreds of laboratory studies have verified potent levels of immunomodulatory benefits from consuming shiitake extracts.<sup>18\*</sup> Shiitake has also been shown to provide other benefits as well some of which include supporting the cardiovascular system, providing antioxidant activity, protecting the liver, lowering blood cholesterol, and supporting gut health in those in already healthy ranges consuming a balanced diet.<sup>25-30</sup>

**Maitake Mushroom** (*Grifola frondosa*): Also called "hen of the woods," but more commonly known in the West by its Japanese name, maitake, this tasty culinary and medicinal mushroom can normally be found growing at the base of oak trees. Ancient texts affirm maitake can boost qi (fundamental life force/vital energy) and fortify the spleen,<sup>31</sup> moisten the lungs, and protect the liver.<sup>32,33\*</sup>

Research has demonstrated that maitake stimulates the production of a variety of immune cells.<sup>4</sup> In addition, maitake possesses the ability to lower blood sugar levels,<sup>35</sup> provide antioxidant activity,<sup>36</sup> lower cholesterol levels,<sup>37</sup> and reduce blood pressure<sup>38</sup> in those in already healthy ranges consuming a balanced diet.\*

**Reishi Mushroom** (*Ganoderma lingzhi*): Reishi, the Japanese name for this auspicious, woody mushroom, has been used in traditional medicine for thousands of years for calming of the nerves and encouraging inner awareness. Reishi was a highly-prized folk tonic by Chinese royalty and Taoists alike as they knew that reishi's essence could nourish a person's spiritual radiance and heart thus promoting health and longevity.<sup>39</sup> Lingzhi, the Chinese name for this mushroom, translates to herb of spiritual potency. Better known as the "Mushroom of Immortality," reishi has shown much promise as an overall health and immune system tonic.<sup>20</sup> In traditional Chinese medicine, reishi, an adaptogen, is considered to be in the highest class of tonics, if not the highest tonic.

**Wildcrafted Chaga Sclerotium** (*Inonotus obliquus*): For centuries, chaga has been part of traditional folk medicine in countries such as China, Korea, Poland, Russia, and Scandinavian countries. It is primarily found growing on hardwood trees like the birch tree in the cold circumpolar forests of the Northern Hemisphere.

Chaga was highly prized and considered a mainstay for thousands of years by indigenous Siberian shamans who used it as a nutritive tonic intuitively knowing that chaga's fungal spirit could nourish the energy that animates the body. As the folklore goes, the Tsar Vladimir Monomakh used a preparation of chaga to address a lip issue during his reign of what was twelfth-century Russia.

The famed Russian author Aleksandr Solzhenitsyn wrote the novel "The Cancer Ward" in the late 1960s depicting life in the Soviet Union during the 1950s painting the picture that a militarized police state is itself a type of cancer. It was Solzhenitsyn's intrigue of chaga that guided him to write about its magical, virtuous powers in his book which eventually went on to win a Nobel Prize and is how chaga became popular in the West.

Chaga is also known by names such as "King of Herbs" and "Diamond of the Forest." In addition to its immune-supporting\* beta-glucans, chaga

is a known source for many other bioactive constituents including betulin,<sup>11</sup> melanin,<sup>40</sup> triterpenes<sup>41</sup>, and antioxidants.<sup>42</sup> Chaga is considered an adaptogen as by definition an adaptogen helps to aid the body's innate resilience to non-specific states of stress thereby supporting overall human homeostasis.<sup>43</sup>

**Cordyceps Mushroom** (*Cordyceps militaris*): Considered both a yin and a yang tonic<sup>44,45</sup> *Cordyceps militaris* is said to nourish Jing (a person's essence) and tonify qi (fundamental life force/vital energy). Cordyceps has also long been used as a kidney<sup>46,47</sup> and lung<sup>47,48</sup> tonic in traditional Chinese medicine. Considered a suitable and praiseful alternative to wild cordyceps, science has shown that *C. militaris* is similar in nutrition and therapeutic efficacy.<sup>13,49</sup> Besides being known for its immune potentiating properties, cordyceps gained its popularity in the sports nutrition world for its ability to support energy levels.<sup>49,50</sup> In China, cordyceps, due to its adaptogenic properties, is given to support recovery after a health challenge.<sup>50</sup> Cordyceps is acclaimed for its fame as an aid in supporting sexual function.

**Lion's Mane Mushroom** (*Hericium erinaceus*): Also known as yamabushitake (Japan) and houtou (China), Asian cultures have long used lion's mane for fortifying the spleen, nourishing the stomach, and tranquilizing the mind.<sup>51</sup> Both a culinary and medicinal mushroom, lion's mane got its moniker due to its long, shaggy, white haired appearance. In Asia, it is said that lion's mane gives you "nerves of steel and the memory of a lion." Long revered by Buddhist monks of East Asia, legend has it that lion's mane was prepared as a tea to facilitate enhanced concentration, creativity, and support mental well-being, thus acting as an aid to their spiritual practices.

Aside from its immune-supporting benefits, this mushroom's super powers are due to its ability to encourage nerve growth factor (NGF) synthesis.<sup>52,53\*</sup> NGF is involved in the regulation of the growth, maintenance, and development of new neurons.

### Beta-Glucan Content Verified

MycoForce delivers by far the highest levels of beta-glucans in a supplement containing a blend of mushrooms on the market. Our tests consistently show 20%+ 1,3-1,6 beta-glucans with less than 5% starch. And, since our mushrooms have been hot water extracted, we know that these beta-glucans are actually bioavailable. HealthForce SuperFoods MycoForce sets a new industry standard for medicinal mushroom supplements by providing actual beneficial levels of immune support at an economical price. MycoForce's, along with Integrity Extracts Reishi/Chaga/Lion's Mane/Cordyceps' product label will always state the beta-glucan content. Like all HealthForce SuperFoods products, MycoForce and Integrity Extracts Reishi/Chaga/Lion's Mane/Cordyceps is lab tested for botanical identity, microbials, heavy metals, pesticides, GMOs, and gluten. Certificate of Analysis available upon request.

**\* These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.**

#### Powder

Supplement Facts		
Serving Size: 1.5 grams (1 teaspoon)		
	Amount Per Serving	%DV*
<b>Mushroom Blend</b>	<b>1,500 mg</b>	
Shiitake Extract <sup>∅∞</sup> (fruiting body)		†
Maitake Extract <sup>∅∞</sup> (fruiting body)		†
Reishi Extract <sup>∅∞</sup> (fruiting body)		†
Chaga Extract <sup>∅∞</sup> (sclerotium)		†
Cordyceps Extract <sup>∅∞</sup> ( <i>C. militaris</i> , fruiting body)		†
Lion's Mane Extract <sup>∅∞</sup> (fruiting body)		†
Beta-D-glucans	>20%	

\*Percent Daily Values are based on a 2,000 calorie diet.  
† Daily Value not established.

∅Organic ∞Wildcrafted ∞TruGanic™

#### VeganCaps™

Supplement Facts		
Serving Size: 2 VeganCaps™ (850 mg)		
	Amount Per Serving	%DV*
<b>Mushroom Blend</b>	<b>850 mg</b>	
Shiitake Extract <sup>∅∞</sup> (fruiting body)		†
Maitake Extract <sup>∅∞</sup> (fruiting body)		†
Reishi Extract <sup>∅∞</sup> (fruiting body)		†
Chaga Extract <sup>∅∞</sup> (sclerotium)		†
Cordyceps Extract <sup>∅∞</sup> ( <i>C. militaris</i> , fruiting body)		†
Lion's Mane Extract <sup>∅∞</sup> (fruiting body)		†
Beta-D-glucans	>20%	

\*Percent Daily Values are based on a 2,000 calorie diet.  
† Daily Value not established.

Other ingredient: VeganCaps<sup>∞</sup>  
(fermented tapioca) – no flow agents

∅Organic ∞Wildcrafted ∞TruGanic™

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## Additional Resources

Has The Holy Grail of Radioprotective Foods Been Found?

<https://www.greenmedinfo.com/blog/could-melanin-convert-radiation-harmless-even-useful-energy>

Lion's Mane Mushroom – Unparalleled Benefits for Your Brain and Nervous System

<https://www.greenmedinfo.com/blog/lion-s-mane-mushroom-unparalleled-benefits-your-brain-and-nervous-system>

Decomposing the Myth That Mushrooms Can't Produce Vitamin D3

<https://www.greenmedinfo.com/blog/decomposing-myth-mushrooms-cant-produce-vitamin-d3>

A Review of Mushrooms as a Potential Source of Dietary Vitamin D

<https://doi.org/10.3390/nu10101498>

How Lingzhi Mushrooms Combats Aging, Disease and Cancer

<https://drsircus.com/general/lingzhi-mushrooms-combats-aging-disease-cancer/>

Ganoderma lucidum (Lingzhi or Reishi): A Medicinal Mushroom

<https://www.ncbi.nlm.nih.gov/books/NBK92757/>