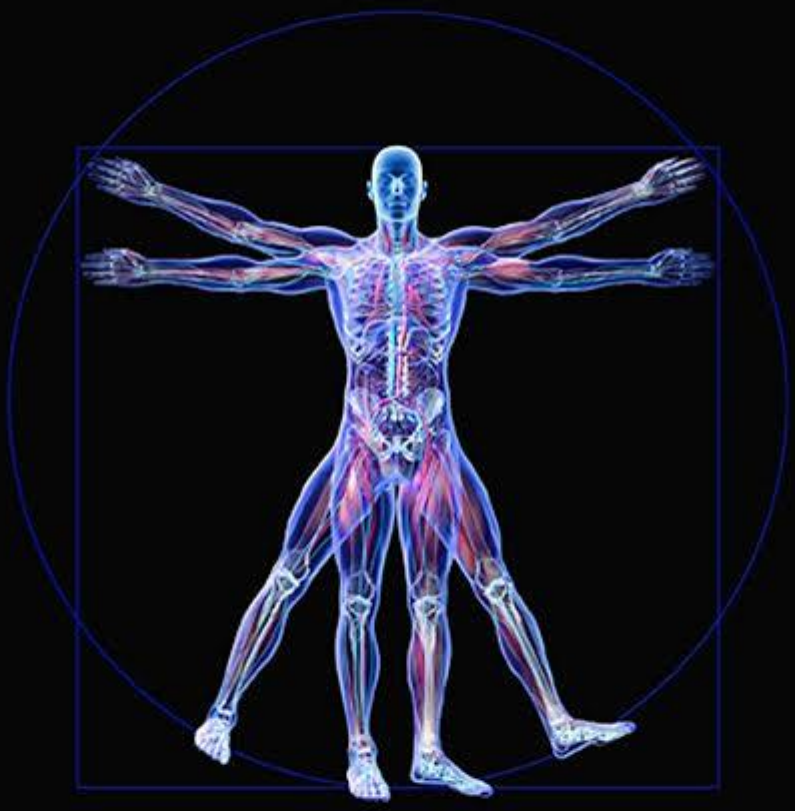
Wild Chaga

The Miraculous Medicinal Mushroom



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Disclaimer: Although the contents of this monograph rely on the findings of scientific research, it is not intended to be an exhaustive review. Rather, it is the author's personal synthesis and interpretation of that research base, which is of course subject to other interpretation. Before beginning to take wild Chaga, individuals should consult their physician.

Copies of this monograph may be ordered or downloaded from www.myrealchaga.com

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About the Author

Dr. Ron McDow is a board certified medical doctor of Family Medicine. He attended Medical School at the University Tennessee Center for Health Sciences. He did his post graduate training at the both Tennessee Center for Health Sciences and Vanderbilt University Medical Center, where he also studied and received an MBA at the Vanderbilt Owen School of Management. He practiced family medicine for 20 plus years before devoting full time to development of a low cost Cryosurgical Delivery System which was approved by the FDA and patented. The results of these clinical studies were published in both The Journal of Family Practice and The Journal of Dermatologic Surgery and Oncology. Dr. McDow maintains his medical licensure and continues to work in ongoing improvements in the Cryosurgical Delivery System and has developed an interest in uncovering scientifically validated natural nutraceutical products that are not widely recognized or available in Western Medicine.

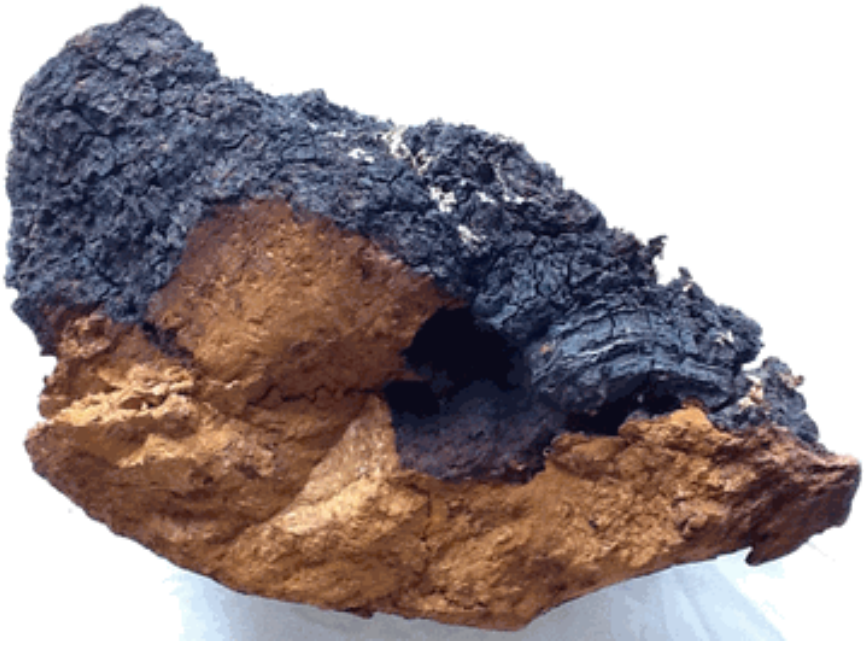
WILD CHAGA: THE MIRACULOUS MEDICINAL MUSHROOM

Introduction

Wild Chaga is an extremely nutrient rich medicinal mushroom that when ingested provides remarkable health benefits. When properly emulsified, its nutrients are easily absorbed and increase power, energy, and stamina, as well as stimulate healing processes within the body. Widely used and highly respected in the medical communities of Eastern Europe and Asia, its health benefits have only recently garnered the attention of the west.

In the wild, the Chaga mushroom grows on trees, primarily birch trees, in very cold arctic climates. Known scientifically as *Inonotus Obliquus*, it is not easily recognized as a mushroom. Rather, it looks more like a dark brown canker sore growing from trees. It is dense, very hard, and deeply cracked on the surface. Inside, it is a yellowish brown with bits of white mixed in and has a moderately hard, cork-like texture. The Chaga mushroom has a symbiotic relationship with the tree on which it lives, both feeding and taking in nutrients from the tree, while simultaneously giving the tree nutrients that heal and support the health of the tree.

Wild Chaga mushroom growing on a Siberian birch tree



A recently harvested Chaga mushroom

While not particularly attractive to look at, its looks are deceiving. Wild Chaga is perhaps the most nutritionally dense food on the planet and provides numerous health benefits when consumed by humans. Wild Chaga has been shown through considerable scientific research conducted across the globe to have powerful immunity enhancing, anti-inflammatory, antioxidant, and anti-aging properties, as well as remarkable positive impact on a number of degenerative diseases. It has even been called a "disease fighting power house." Many consider it the super food of super foods. The real beauty of wild Chaga is in what it does for the human body.

The Research Base

Globally, a plethora of scientific studies has demonstrated the power of Chaga and its constituent nutrients on health. In total, there are over 400 peer reviewed articles. A quick electronic search using *Academic Search Complete*, focusing on scholarly journals readily available in the USA published in the last decade, produced 90 peer reviewed studies using just the search terms, Inonotus Obliquus and/or Chaga mushroom. This research base includes: (a) studies to determine its constituent parts, (b) investigation of the impact of these constituent parts on health, and (c) examination of the overall impact of Chaga consumption on health. Most of this research has been conducted outside the USA, primarily in Russia, South Korea, China, and Japan, with several important studies coming from Finland and Germany. As with all biological agents, examinations of its health effects have largely been conducted in laboratory settings with cells and tissue or with animals. While far fewer randomized control trials in humans exist, a few very important studies on the overall impact of wild Chaga on the human body have been conducted. While this document is not intended to be an exhaustive review of this large and burgeoning research base, the statements it contains are rooted in this research. The actual research studies consulted in its creation are listed in the references list.

A Word about Epigenetics

There is increasing understanding that our genes do not entirely determine our fate. Instead, it is the interaction of genes with the environment that determines the phenotype that is actually expressed. Current estimates are that modulation of the genome is 25% genetics and 75% environment. In other words, our genetics create predispositions for certain conditions within the body. Whether or not these conditions become expressed is dependent on the environment. A primary environmental component that interacts with the expressions of our genes is the nutritional quality of the foods we eat. Wild Chaga, as one of the world's most nutritionally

dense foods, works at the cellular level to protect and repair the body from a number of environmental assaults that can interact with a person's DNA, thus allowing the body to express a healthier phenotype.

Why Wild Chaga

In this monograph, we describe the benefits of wild Chaga, not Chaga mushrooms that are cultured in vats. Specifically, we refer to wild Chaga harvested from birch trees in Siberia and other arctic regions above the 45^{th} parallel. The incredible health benefits associated with the Chaga mushroom are true only for mushrooms grown and harvested in the wild. Chaga mushrooms cultured in vats have dramatically lower nutrients values.

Wild Chaga, in order to have full medicinal potency, requires complete maturity of about 20 years growth before harvesting. The aging process matters, because aging allows the mushroom to synthesize vast amounts of nutrients. The Chaga mushroom gains much of its nutritional density by ingesting the rich nutrients of the birch tree on which it grows, incorporating many nutrients into its own cells. As the Chaga mushroom feeds on the birch tree, it concentrates the therapeutic compounds found in birch, making them more readily available for human absorption.

Further, Chaga generates stress fighting nutrients produced by years of surviving in arctic conditions, which can reach -70^{O} centigrade in Siberia. Harsh climate forces both the birch tree and the Chaga mushroom to produce powerful stress neutralizing nutrients for their own survival. Cultured Chaga do not face harsh, climatic conditions and, thus, produce less potent nutrients. In short, cultured Chaga, while less expensive to produce, is biochemically different from wild Chaga and basically impotent. Only wild Chaga provides the rich source of life enhancing nutrients described in this monograph.

Background

Wild Chaga has been used for medicinal purpose throughout Eastern Europe and China for at least 5,000 years. It can be considered one of the first nutraceuticals. Within Chinese medicine, it has been highly regarded for millennia and even referred to as a "gift from God" and the "King of herbs." The Japanese refer to it as the "diamond of the forest."

Its health benefits have long been recognized by the peoples who populate Siberia. Known for their hardiness, vitality, and long life spans, Siberian peasants consume, daily, Chaga tea made from pulverized wild Chaga in much the same way as westerners drink coffee. Siberians consider it the secret to long life and stamina. They also inhale Chaga smoke to assist with respiratory infections and make skin creams from Chaga to aide in the healing of rashes, cuts, and burns. Siberians recognize that daily consumption of Chaga helps to maintain their strength and vitality, as well protect them from infection and disease.

Interestingly, Siberian peasants, with little access to modern western style medicine, typically live into their late 90s and early 100s and suffer significantly less from degenerative diseases, such as cancer and heart disease than other peoples. Similarly, Canadian aborigines also regularly consume wild Chaga tea and historically are a long lived people, despite living in harsh conditions with little access to modern medical care. However, Inuit peoples living in similarly harsh arctic conditions, but who do not regularly consume Chaga, typically live only into their mid-50s. While there are likely multiple factors in the disparity in lifespan among these groups of arctic dwelling peoples, the fact that the long lived groups consume Chaga daily, while the short lived group does not, is certainly intriguing and merits further study.

It is not just Siberian peasants who regularly consume Chaga. Historically, Chaga was the preferred natural medicine of the Russian Tsars. Today, Chaga is widely consumed throughout Russia, the Baltic regions, China, Korea, and Japan as a nutritional supplement to support strength and guard against infection and disease. Within these countries, significant amounts of scientific research have been conducted to determine the chemistry and nutritional density of the wild Chaga mushroom and to scientifically examine its impact on cell and bodily functions, as well as its role in preventing and curing disease. The Russian Research Council, a body similar

to the National Institute for Health in the USA, recognizes Chaga as effective for the maintenance of good health, enhancement of immunity, and regulation of metabolism, as well as for the treatment of high blood pressure and cancer.

The research done in these and other countries suggests that wild Chaga is:

1. a robust immunity potentiatior;
2. a vigorous anti-inflammatory agent;
3. a powerful antioxidant;
4. a strong antiviral, antiparasitic, antifungal, antibacterial agent;
5. effective against toxin induced mutations;
6. potent for cancer prevention;
7. useful in cancer treatment; and
8. helpful for diabetes prevention.

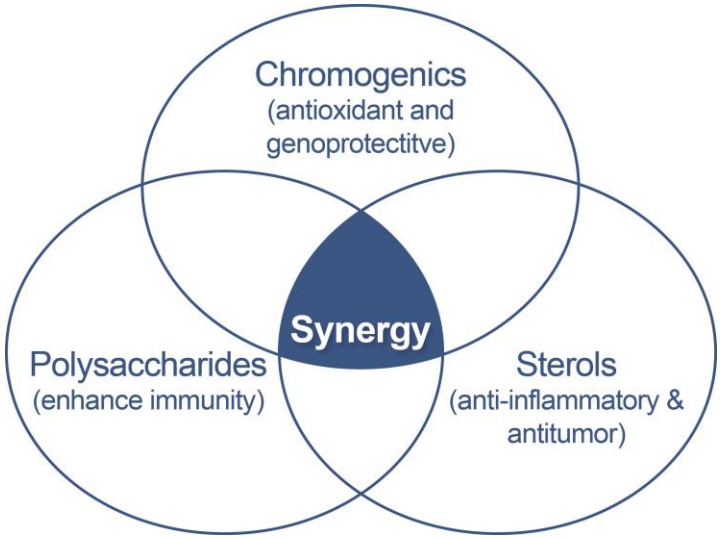
The Nutritional Breakdown

What makes wild Chaga a superfood is its chemistry and nutritional density. To understand why Chaga is so potent, it is important to understand the constituent nutrients that comprise wild Chaga. While we discuss some of these constituent nutrients one at a time, it is important to keep in mind that these various nutrients work together in a synergistic manner to facilitate good health.

To date, 215 nutrients and/or photochemicals have been identified in wild Chaga. It has even been called a complex living pharmacy. It is a good source of B vitamins, vitamin D, and minerals; as well as a top source of antioxidant enzymes, digestive enzymes, sterols, flavonoids, and polysaccharides. Importantly, it is very safe for human consumption, even for those taking numerous medications. Chaga is actually good for these individuals because it helps stabilize the body against noxious effects of chemical toxins found in many pharmaceutical drugs. The only known side effect of wild Chaga is excellent health.

While there are numerous constituent nutrients that comprise Chaga, for the sake of time and space, we focus on only a few of its most potent nutrients in three categories:

1. Chromogenic agents, including Superoxide Dismutase and Melanin.
2. Sterols, including the Triterpenes of Lanosterol, Betulin, Inotodiol, Betulinic acid.
3. Polysaccharides, in particular Beta Glucans.



Chromogenic Substances

A chromogenic substance has high energy activity resulting from its interaction with light. In Chaga, both superoxide dismutase and melanin interact with light to cause its dark, yellow-brown pigment. Its color is the result of trapped energy. When consumed, it appears that the energy stored in these chromogenic substances is transferred to cells through the body, providing energy directly to the mitochondria. This transfer of energy may explain the increased energy and vitality many individuals report as a result of ingesting Chaga on a daily basis.

Superoxide Dismutase (SOD). Superoxide Dismutase is an electrically charged enzyme with potent antioxidant properties. SOD has been shown to be 3,500 times more potent than vitamin C at reducing superoxide or free radicals. While SOD is rarely found in food, wild Chaga contains massive amounts. In fact, birch tree Chaga is the world's top source of edible SOD, with as much as 40% of the weight of the Chaga mushroom composed of SOD.

While Oxygen (O_2) is harmless and necessary for life, a harmful by-product of normal metabolic processes associated with oxygen utilization, as well as exposure to any radiation and sunlight, is the superoxide radical (O_2-) ion. This explosive form of oxygen (i.e., free radical) causes direct damage to body tissue. Because tissue damage is the cause of aging within the body, blocking tissue damage slows aging and extends life. Cell membranes contain cholesterol and phospholipids (fats) that are easily damaged by free radicals, causing contortions in the cell membranes that leave cells unable to function properly, as well as depolymerization, which is

the destruction of the normal structural bonds between human cells. In this weakened state, cells are unable to fend off attack and susceptible to various diseases, including: heart disease, diabetes, atherosclerosis, arthritis, skin disorders, lupus, and cancer.

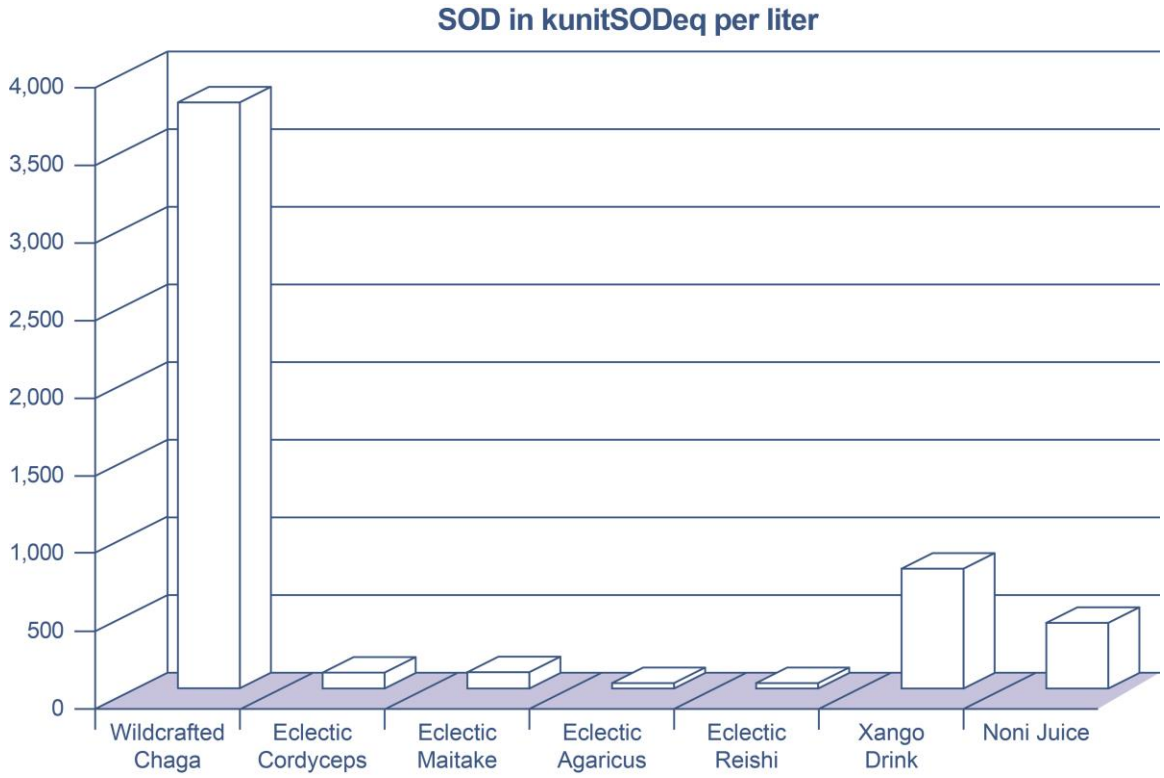
SOD is produced in the body naturally and is the main enzyme responsible for the destruction of superoxide radical (O_2-) ion, protecting cells from free radical induced damage. SOD neutralizes these destructive oxygen compounds by converting dangerous forms of oxygen (O_2-) to oxygen gas (O_2) which can be breathed. SOD is genetically programmed to seek O_2- and neutralize it as it forms, before it can damage cells of the body. However, if the body does not have adequate amounts of the SOD enzyme present, the superoxide radical (O_2-) molecule remains present and goes on to damage tissue and cause degeneration.

SOD has long been established scientifically as a substance that increases longevity. For example, mice with lower SOD and associated enzymes develop rare cancers, cataracts, develop muscle loss earlier and are more sensitive to toxic chemicals. They die younger. While human beings naturally produce SOD, production declines after about age 30. At the same time, levels of inflammatory gene expression increase. This decline in SOD is associated with the signs of aging that become increasingly apparent after age 30.

Individuals vary genetically in how much SOD they produce. Levels of SOD can vary as much as 50% from individual to individual; thus, perhaps explaining why certain families and individuals are more prone to degenerative diseases than others. Individuals who genetically produce less SOD will age more rapidly and are more likely to develop degenerative diseases earlier.

While critical for maintaining health, SOD is not readily available from edible sources. Other types of mushrooms, green peas, cabbage, dark green leafy vegetables such a broccoli, nutritional yeast, wheat grass, wheat germ, beef heart, and raw livers all supply some SOD. However, wild Chaga has higher levels of SOD content than any other food source. For example, maitake and reishi mushrooms are also considered good sources for SOD, as are cordyceps, agaricus, xango drink and Noni juice (see figure below). However, none of these sources come close to providing the levels of SOD delivered in wild Chaga*.

Comparison of Superoxide Dismutase (SOD) Contents of Foods Considered Good Sources



(*note: These results are for *Wildcrafted Siberian Chaga*^{TM}. Results for other brands may vary.)

Importantly, SOD cannot be isolated and taken as a supplement. SOD is an electrically charged substance. The electrically charged photons cannot be duplicated synthetically. Multiple studies illustrate that SOD cannot be taken as a supplement or in chemical form. It has no influence on tissue levels in this form. In whole food or whole food extract, the charge is retained. Thus, the only reliable source of highly absorbable SOD is in natural concentrates, such as properly emulsified wild Chaga drops.

Because wild Chaga has SOD in large quantities, wild Chaga assists the body in maintaining and increasing SOD, thus reducing oxidation (i.e., destruction of tissue) resulting in slowing the aging process, maintaining the body's natural cancer fighting defenses, and elongating the lifespan. Estimates are that Chaga elongates life by 10% or more when taken regularly.

Melanin. The reason Chaga is colored orange-yellow to dark brown is largely due to its melanin content. Melanins constitute the group of high-molecular-weight black and brown pigments formed as a result of the oxidative polymerization of phenols, in response to ecological stress, such as pathogen and insect attack, UV radiation, and wounding. Known as an

adaptogen, Chaga creates melanin as it adapts and responds to the harsh arctic climate in which it lives. The chemical compound of melanin that creates this pigment also protects the Chaga mushroom from the noxious action of toxic forms of oxygen which protects the genes (i.e., DNA) from toxin induced degeneration. Further, melanin has been shown to not just protect DNA, but to also repair fractured DNA within cells. Thus, melanin provides both antioxidant and genoprotective effects.

Melanins are widespread in both the animal and plant worlds and are produced naturally. They are found in skin, hair follicles, pigment epithelium of eye retina and iris, brain and spinal marrow, adrenal medulla, and internal ear. Eye, skin, and hair color are determined by the amount of melanin that is present in the body. Individuals with less melanin in the body are more fair skinned and have lighter hair and eyes. Beyond providing pigment, melanin plays a substantial role in eye, skin, and hair health, as well as cell health throughout the body.

The production of melanin within the body decreases with increasing age. The lack of melanin or pigment can also lead to blurred vision, as well as other eyesight problems, such as nystagmus, astigmatism, and photophobia. Other effects of a low melanin count can be dangerous sensitivity to the sun's UV rays, as well as being highly prone to skin cancer and other skin diseases.

While edible sources of melanin that can be absorbed by the body are somewhat rare, wild Chaga is one of those sources. Wild Chaga possesses a rich amount of absorbable melanin which stimulates the growth and production of melanin in the body. Melanin helps to nourish and protect the skin, hair, and eyes, as well as assists with the treatment of skin cancers and other skin conditions.

Sterols

Sterols, a type of lipid (LDL), are the plant version of steroids. Humans are able to utilize plant sterols to support the production of steroids, which are responsible for a multitude of functions within the body. Sterols and steroids are essential for the digestion of fat in our diet, the maintenance of integrity of cell membranes, the creation of new cells, and for making and regulating hormones. Like steroids, sterols have significant anti-inflammatory effects. Importantly, sterols and SOD work together within the body to dramatically slow aging by halting cell damage and inducing cell repair.

Abundant in Chaga are **triterpenes**, a specific type of sterol made of carbon rings with considerable oxygen. They form large molecules which are typically difficult for the body to absorb when ingested. However, when wild Chaga is appropriately emulsified into liquid form, such as wild Chaga drops, these molecules become readily absorbed.

Triterpenes strengthen cell membranes and keep them flexible; healthy cell walls are flexible, while diseased ones are stiff. Triterpenes also repair cell damage, thus reducing inflammation and providing protection from many degenerative diseases. Importantly, triterpenoids have been extensively studied for the potential use as anticancer agents. Several triterpenes have been shown to cause programmed cell death (apoptosis) of cancer cells including: betulin, betulinic acid, inotodiol, lanosterol, and saponins. These agents promote cell death only among damaged, cancerous cells, leaving healthy cells unaffected.

Betulin. Betulin is potent for balancing the immune system and reducing inflammation. It has been shown to speed the healing of tissues. This electrically charged lipid acts as a conductor of electricity. Electrons create internal energy, which gives the organs the strength to combat disease. Long believed to be just a precursor to betulinic acid, betulin has recently been proven to be an anti-tumor agent in its own right, causing apoptosis through induction of changes in the mitochondrial membrane, which leads to the production of potent oxygen radicals that break apart the cancer's DNA. However, for its cytotoxic effects to be expressed, it requires the presence of cholesterol. Because betulin is not an isolated substance within wild Chaga, the needed cholesterol is also present in every dose of wild Chaga.

Betulinic acid. Betulinic acid has received considerable attention for its ability to cause apoptosis via the mitochondrial pathway. The American Cancer Society (ACS) reports that betulinic acid, isolated from birch trees, holds promise for patients with melanoma, certain nervous system tumors, and other forms of cancer. While trials with humans have yet to be conducted, the ACS does acknowledge three German studies that concluded that betulinic acid showed anti-tumor activity against cells from certain types of nervous system cancers in children. Because wild Chaga ingests birch bark, the betulinic acid of birch bark is also found in wild Chaga.

Inotodiol. Inotodiol is a sterol that has demonstrated remarkable anti-tumor capabilities. First isolated in 1962 in Poland, inotodiol molecules actually dissolve the cell membranes of cancerous cells, causing apoptosis. However, this molecule does not impact healthy cells.

Lanosterol. Lanosterol is a cholesterol-like lipid that has been shown to reduce HDL (bad cholesterol), as well as have strong anti-viral and antifungal properties. It has also been show to facilitate apoptosis on cancer cells. It plays a primary role in assisting with the production of steroids throughout the body.

Saponins. Saponins, also known as glycosides, are a type of triterpenes made from a complex glucose molecule. This molecule assists cells throughout the body, including nerve cells, to be more flexible and enhance signal transmission. This cholesterol-like sterol assists the production of vitamin D, the repair of arterial walls, the regeneration of cell walls (due to its wax-like sealant properties), and the building and strengthening of muscle tissue. It also facilitates the synthesis of various processes throughout the body including the production of key hormones, such as adrenal steroids, testosterone, DHEA, estrogenic compounds, and progesterone. In the brain, saponins assist the body in regenerating the myelin sheath. It is believed that saponins may play a role in protecting the brain from degenerative diseases, including Alzheimer's and ALS.

Of great importance is how saponins operate in healthy cells and cancer cells. Within healthy cells, saponins facilitate electrical impulses that allow communication among cells. However, in cancer cells, saponins attract and block the transmission of electrical impulses causing apoptosis in cancer cells.

Polysaccharides

Polysaccharides are essentially long strings of sugar molecules. There are three types: (a) storage (starch and glycogen), (b) structural (cellulose/fiber), and (c) immune. It is the immune variety that is abundant in wild Chaga. It appears that the polysaccharides in Chaga activate immune B-cells and macrophages (humoral immunity), but not T-cells (cellular immunity). Importantly, rather than boosting or increasing immunity, Chaga modulates the body's immunity, bringing it into balance. Thus, Chaga is safe and helpful for individuals with autoimmune disorders.

Beta Glucans. Wild Chaga contains a large quantity of beta glucans, a type of immune enhancing polysaccharide. Beta glucans have been shown to significantly increase the ability of white blood cells to consume bacteria and viruses. Beta glucans strengthen the various immune surveillance cells, including macrophages, Kupffer cells (in the liver), neutrophils, and natural killer cells. Recent scientific research in animals demonstrates that beta glucans assist the body

to correct immune deficiencies, ward off tumors, balance hormones, enhance cardiovascular function, and fight bacterial, viral, fungal, and parasitic diseases. They have even been shown to regenerate bone marrow following radiation therapy. In short, beta glucans serve to prepare the immune system against any external or internal threat.

Multiple, randomized control trial studies in humans demonstrate the power of beta glucans by dramatically reducing post-surgical infection and death. In one study, beta glucans were shown to reduce post-surgical infection by 40%. In another study, trauma patients given beta glucans prior to surgery had a 0% death rate, compared to a 30% death rate among patients who had experienced similar traumas but were not given beta glucans prior to surgery. In another study, 50% of patients experienced post-surgical sepsis without beta glucans, compared to only a 10% sepsis rate for patients who were given beta glucans after surgery. Thus, one of the ways Chaga may extend life is by greatly reducing this risk of life threatening infection, as well as prevent infections altogether.

Body Wide Impact

While it is informative to understand the individual benefits of the various nutrients contained in wild Chaga, it is really the combination of the nutrients, working in concert, that makes wild Chaga the superfood that it is.

Cell Health

The human body is made up of literally trillions of individual cells. Thus, healthy cells equal a healthy body. A primary benefit of wild Chaga is keeping cells healthy. The sterols within Chaga provide protection to cell health ensuring cell membranes are strong, flexible, and able to communicate with one another. These sterols assist with the regeneration of cell walls throughout the body, including nerve and arterial cells, as well as help the building and strengthening of muscle tissue. The powerful antioxidants contained within wild Chaga play a significant role in protecting cells from the ravages of superoxide radical damage, protecting them from contortions in the cell membranes, and depolymerization. Thus, cells are better able to fend off attack and less susceptible to various diseases, including: heart disease, diabetes, atherosclerosis, arthritis, skin disorders, and perhaps even cancer.

By keeping cell membranes strong and protecting the cell against these free radicals, damage to tissue is halted, degeneration stopped, and aging dramatically slowed. Chaga also helps to repair

damage to DNA, thus healing damaged cells. Further, substances within wild Chaga have been shown to promote apoptosis in malignant cells. Thus, its greatest benefit may be assisting the body to purge unhealthy malignancy before overtaking the body. Given its antitumor capabilities, it should not be surprising that numerous case studies suggest that wild Chaga is beneficial in the treatment of cancer, although more scientific research is needed to confirm its effectiveness in the treatment of cancer in humans.

Immune System

Beyond helping to keep cells healthy, wild Chaga assists the immune system to be optimally effective. By reducing the risk of life threatening infection, wild Chaga ultimately helps to extend life.

Wild Chaga has developed mechanisms to protect itself from foreign invaders while living in the damaged, rotting parts of the birch tree. These rotting parts of the tree, by their very nature, are havens for all sorts of germs, viruses, and other fungi that ultimately can kill the tree. To survive, the wild Chaga mushroom does two important things. First, it destroys invaders causing infection to the tree. Second, it heals the cells of the tree, allowing the tree to provide a sustained food source without killing the tree. Wild Chaga appears to perform similar immunity and healing functions in the human body.

Wild Chaga has been shown to have powerful germicidal agents that have been demonstrated in scientific studies to destroy bacteria, viruses, parasites, and fungi. For example, wild Chaga has been shown to have active anti-viral agents that are particularly potent against the influenza viruses. The agents responsible have been isolated as the phenolic components, hispidin and hisolon, agents found ONLY in wild Chaga and birch bark.

While Chaga has powerful germicidal action, the prevention of bacterial, viral, and fungal infection is achieved primarily through its immune system activation properties. In particular, its beta glucans prepare and activate the various immune cells to secrete powerful substances, like interferon, interleukins and natural killer cells, which seek and destroy invaders with no residual toxic impact on the body.

Wild Chaga appears to be particularly helpful in warding off fungal infections. This is not surprising given that in the wild, it must destroy competing fungi that also grow in rotting matter. As a result, wild Chaga has highly potent antifungal properties, but unlike many

prescribed anti-fungal medication, it has no known toxic effects. Further, the body does not appear to build resistance to Chaga, as it does most other fungal treatments.

An important aspect of the immune support that Chaga provides is that it normalizes or balances immunity. This means that for those with impaired, underactive immunity, Chaga supports the body to increase immunity. Conversely, in individuals with overactive immunity, as in the case of autoimmune conditions, Chaga actually acts to dial back the actions of the immune system.

Inflammation and Pain

Of course, by enhancing immunity, the body is better able to purge itself of noxious toxins and pathogens, which also reduces inflammation since toxins and pathogens cause inflammation. Beyond immunity enhancement, wild Chaga has other superior anti-inflammatory properties. When inflammation is reduced, the pain associated with that inflammation is also reduced. Not unlike the bark from white willow trees from which aspirin is derived, the birch tree also contains powerful substances that reduce inflammation, including proanthocyanidins, simple phenols, flavonoids, and sterols. These birch tree substances become part of the Chaga mushroom across its lifespan.

The various sterols contained within wild Chaga also prevent, as well as correct, inflammation throughout the body. Sterols are waxy lipids that provide lubrication and strengthen cell walls, thus preventing or correcting inflammation. Healthy cells have strong walls, and healthy cells are not inflamed. Further, the SOD and melanin contained in wild Chaga eradicate free radicals which, as they damage tissue, cause inflammation. Researchers have also discovered that wild Chaga blocks the mediators of inflammation, including prostaglandins, nitric oxide synthase, and cyclooxygenase (COX-2).

Impact on Specific Body Systems

Cardiovascular

Mushrooms, in general, are well established for supporting cardiovascular health, given their rich mineral content - in particular selenium and manganese. However, the cardiovascular benefits of wild Chaga go beyond the benefits reaped from its minerals. Chaga actually supports the pumping action of the heart. Bioglycans isolated from wild Chaga have been demonstrated to improve communication among the nerve cells located in the venous sinus, reducing the time

required for firing impulses and thus increasing pumping action. These bioglycans act in a manner similar to calcium channel blockers, but without the potential toxic side effects.

Wild Chaga also has a direct effect on platelet function, reducing blood coagulation. Of course thick blood is more difficult for the heart to pump, while clots can prevent pumping altogether. In one study, wild Chaga evidenced an 80% inhibitory activity on hyperactive platelets. Wild Chaga has also been shown to prevent blood clots in mice. Further, the sterols it contains block excessive accumulation of animal cholesterol in the blood, preventing cholesterol from building up plaque on arterial surfaces.

The tissues of the cardiovascular system need to be strong and pliable in order to function well. Just as sterols do throughout the rest of the body, sterols help the cells of the arteries and heart to be strong and flexible; which in turn, assists the heart muscle in performing its pumping action, protecting it from injury. Flexible arteries are healthy arteries, while brittle arteries disintegrate easily, leading to degeneration. The same is true of the heart itself. The sterols contained in wild Chaga help build and maintain the integrity of the muscle tissue of the heart itself and the tissue of the arteries.

Dermatological

Wild Chaga has been well studied in Asia and Eastern Europe for its effects on skin conditions, including aging. It is well understood that the SOD and melanin contained in large quantities in wild Chaga have potent anti-aging properties. As previously discussed, the substances block free radical damage from occurring to the cells of the dermis, thus preventing damage. Likewise, melanin provides protection from harmful UV radiation, serving to slow aging and protect the skin from skin cancer.

The role that Chaga plays in enhancing the immune system also assists in the treatment of several chronic skin conditions, including eczema, psoriasis, and acne. It is now understood that many skin conditions result from a breakdown in tissue integrity that allows infection caused by common skin bacteria, including *Staphylococcus epidermidis* and *Propionibacterium acnes*, as well as fungus including *pityrosporum ovale*. One study determined that Chaga inhibits the growth of all three of these skin invaders. Other skin disorders, such as Rosecea, has been associated with inflammation. Thus, the anti-inflammatory properties of wild Chaga also help in combating various skin conditions.

Gastrointestinal

Wild Chaga assists gastrointestinal function in multiple ways. First, it assists the body to digest fats. The sterols in wild Chaga stimulate the production of bile, which is largely made from steroids and is essential for fat digestion. Bile also acts as a cleaning agent, removing food residue from the colon wall. This cleansing activity paired with the germicide agent present in Chaga act to purge the digestive tract of various pathogens that can be harbored in the cells lining the intestines and colon. The sterols contained in wild Chaga also strengthen the cell walls of the intestines and colon. Because these cells regenerate more rapidly than other cells of the body (every 7 days), they require larger amounts of sterols than cells in other locations in the body. Likewise, wild Chaga's immunity enhancing capabilities are particularly helpful in eradicating H-pylori bacteria, thus preventing or healing stomach ulcers.

Musculoskeletal

Inflammation is a primary culprit in problems of the musculoskeletal system. Wild Chaga contains powerful anti-inflammatory and anti-pain sterols. These sterols bolster adrenal function, which also helps to modulate inflammation and pain. These sterols help keep muscle tissue strong and flexible, able to regenerate, and inflammation free. The chromogenic substances in wild Chaga also provide direct energy to the mitochondria of muscle tissue, resulting in increased energy and ability to perform physical tasks. The oxygen rich substances provide proper oxygenation, while fending off free radical damage, allowing muscle tissue to respond favorably and recover quickly from physical activity, without developing inflammation.

Respiratory

The relationship between respiratory infections and immunity are well known. The immune boosting capabilities of wild Chaga have clear utility for the prevention and treatment of such infections. Wild Chaga has been shown to increase the immune system's ability to clear the lungs of pathogens. In particular, the beta glucans activate the white blood cells to ward off bacterial infections and increase the capacity of lymphocytes to clear the respiratory of viruses and fungal attack.

Metabolic/Endocrine

Chaga contains a number of substances which act on metabolism and support the glands of the endocrine system. In terms of metabolism, Wild Chaga helps the body to increase usable oxygen. Wild Chaga thrives in oxygen rich environments, and its polyphenols and sterols trap oxygen. This molecular oxygen is then released to the cells of the body. Wild Chaga is well documented to have potent action on the metabolism of oxygen, while simultaneously neutralizing the natural production of superoxide radical (O2-) ion, effectively halting free radical damage. Thus, it assists to provide energy to the body, without harming cells. An adaptogen, wild Chaga helps cells to adapt to low oxygen conditions, helping the body to use available oxygen more efficiently. It has been shown to reverse poor oxygen metabolism, and may even be useful for individuals with hypoxic conditions. Of particular note is the probable value of wild Chaga in the treatment of hypothyroidism, which results in low oxygen.

Rich in endocrine boosting agents, wild Chaga helps to regenerate function of the glands of the endocrine system. The sterols, in particular the triterpenes, are essentially a pre-hormone. Triterpenes serve to facilitate the synthesis of various processes throughout the body, including the adrenal glands, testes, and ovaries. They assist the body to synthesize and produce key hormones, such as adrenal steroids, testosterone, DHEA, estrogenic compounds, and progesterone. Of great importance, given the high stress world where most individuals reside, wild Chaga has also been shown to support adrenal function. The adrenal gland basically wears out when faced with ongoing, unrelenting stress. Thus, it is not surprising that adrenal functions of this gland commonly become impaired in many individuals, with exhaustion ensuing. Wild Chaga assists the adrenal gland to function in the face of ongoing stress, as well as to heal when overworked. Wild Chaga has also been shown to be useful in supporting endocrine functions in prediabetic and diabetic individuals.

Importance of Methods of Manufacturing

It is not possible to just go into the woods, find some Chaga mushrooms growing on a tree, cut them down and eat them. Raw wild Chaga is not in a form that delivers its nutrients in an easily absorbable form. Thus, wild Chaga must be emusified for human consumption. Emulsification causes the extraction of the various enzymes, sterols, and polyphenols. While these compounds can be difficult to absorb, if extracted correctly, they become easily utilized by the human body.

It is necessary to do one's homework on how a Chaga product was harvested and manufactured before purchasing. Only the highest grade Chaga harvested from birch trees growing in artic regions should be purchased. The inexpensive Chaga drops available on the market are vat grown, cultured Chaga which have little value. Thus, even though their cost is low, they are a waste of hard earned income.

It is also possible to purchase Chaga powder, which is really just ground-up Chaga. Because this powder has not been emulsified, its nutrients are not readily absorbable. Thus, one cannot just put Chaga powder on foods or mix it with water, if absorption of the full array of nutrients is the goal. It appears that the most beneficial way to consume wild Chaga is for it to be emulsified in purified water or other natural liquid substance and consumed as drops, which can be taken as sublingual drops or incorporated into other drinks.

The traditional way of preparing Chaga, historically, has been to pulverize the mushroom and emulsify it in boiling water. Boiling breaks apart the hard to digest, waxy coating of the mushroom, freeing its medicinal compounds. Once brought to a boil, the heat is reduced and the mushroom is left to steep for some time, before being reheated for consumption as a tea. Siberian peasants allow the mushroom to steep for days.

This process, while fairly effective, is very time consuming and likely not feasible for busy people living in western societies. So today, it is necessary, or at least more reasonable, to purchase wild Chaga that has already been prepared for human consumption. The issue is that many Chaga products are either NOT <u>wild</u> Chaga to begin with or NOT prepared in the manner which maintains wild Chaga's natural nutrition density. In other words, how the nutrients are extracted is very important.

Some manufacturers use synthetic solvents in order to extract the nutrients from Chaga, including: ethyl alcohol, hexane (a type of gasoline), methanol (wood alcohol); all substances which are poisonous. While the manufactures claim that no residue of these poisons remain, it is very difficult to completely remove this residue. Therefore, consumption of these products may include consumption of poisons. Further, synthetic solvents disrupt chemistry of the natural molecules that comprise the various sterols, enzymes, phenols, and other nutrients. A change in the molecular structure of a substance changes that substance, at best, reducing the nutritional value of the substance, and at worst, rendering it toxic. Thus, speaking as a medical doctor, it is my professional opinion that Chaga extract using these chemicals should NOT be ingested.

Only products using natural extracting substances, such as water, vinegar, olive oil, or emulsified spice oil, should be considered.

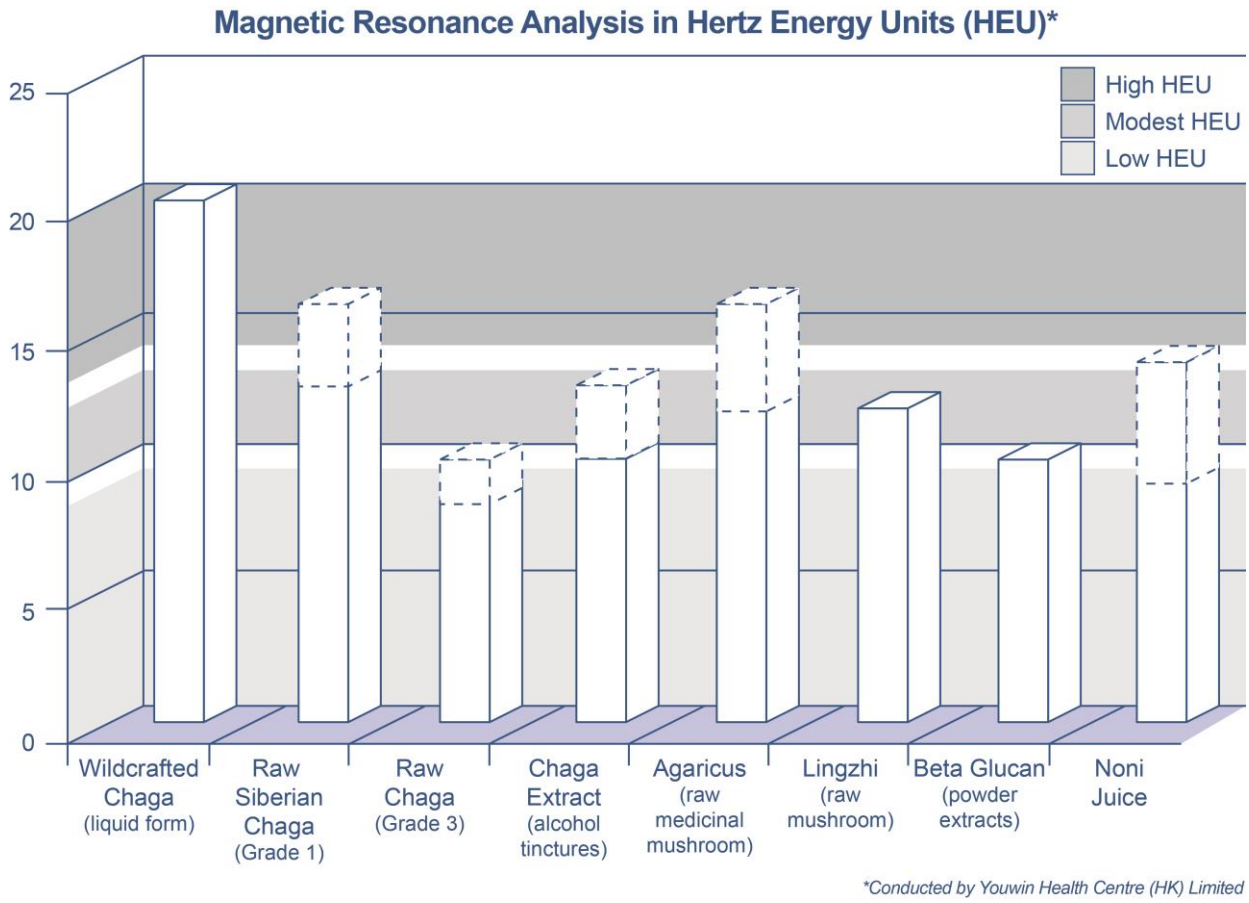
It is also important to know how heat was used in the process of emulsification. Low heat actually helps to concentrate the nutrients. Heat through boiling point is fine, as long as boiling does not occur for an extended time. For example, a popular Chaga brand out of South Korea boils the Chaga for four hours. This extended boiling time destroys all enzymes and leaves the sterols distorted. Needless to say, not all products labeled Chaga are equal. Buyer beware!

Wildcrafted Siberian Chaga™

After extensively conducting research into the various Chaga products that are available, I now personally endorse only one, *Wildcrafted Siberian Chaga*™ (www.myrealchaga.com). In fact, because this particular product is so pristine and nutrient dense, I am now on a personal crusade to ensure the health benefits of this exceptional formulation of wild Chaga realized right here at home.

The process of determining the best formulation of wild Chaga drops took over four years of rigorous scientific research conducted in alliance with the Women and Cancer Fund at an expenditure of about $3,000,000. In total, this research included over 2,000 participants and resulted in the *Wildcrafted Siberian Chaga*.

Wildcrafted Siberian Chaga is superior to other available Chaga products for several reasons. First, it is extracted from only the highest level of graded Chaga sourced from the forests of Siberia. This wild Chaga has been allowed to grow for 20 years in a symbiotic relationship on birch trees in the Siberian Mountains of Russia. As previously discussed, the 20 years growth cycle is necessary to harvest the most nutrient dense raw Chaga. Even when harvested from the wild, Chaga has various grades according to its nutritional density. *Wildcrafted Siberian Chaga* is formulated from only the highest grade of Chaga. Chaga not meeting the highest standards are rejected. Importantly, the standards for Chaga quality are measureable by equipment, such as Far infrared spectrometers and magnetic resonance analysis. Thus, the nutritional density of chemical composition of *Wildcrafted Siberian Chaga* compared to other versions of Chaga is known. The figure below shows the energy encapsulate in *Wildcrafted Siberian Chaga* in comparison to other chaga and nutraceuticals products. Some products are shown as a range based on various samples.



Second, *Wildcrafted Siberian Chaga* is formulated to be the perfect concentration of Chaga for human consumption. Extensive research was conducted to determine the correct percentage of Chaga for this very special liquid-based formulation. Higher concentrations of Chaga do not provide any increased clinical benefits, but lower concentrations reduce the clinical benefits of Chaga.

Third, the process used in the manufacturing of *Wild Siberian Chaga* ensures that none of the nutrients are lost, no toxins are introduced, and the nutritional contents are easily absorbed. Use of short-cut extraction techniques, such as using alcohol, which destroys a large portion of the antioxidants and energy level, and the inclusion of preservatives, are NOT part of the manufacturing process of *Wildcrafted Siberian Chaga*.

To determine the best way to manufacture *Wildcrafted Siberian Chaga*, extensive testing was done to determine the correct temperatures, pressures, extraction time, and water quality to use in the formulation process to keep all natural powerful melanins, beta glucans, and super antioxidants from being inactivated, damaged, or denatured in any way. The process using advanced low pressure, low temperature vacuum separation techniques takes more time and is more expensive than typical, but the outcome is well worth the expense. This manufacturing

process insures that all of the precious properties, melanins, and super antioxidants from the high grade wild Chaga remain intact. Because *Wildcrafted Siberian Chaga* is preservative free, refrigeration after opening a bottle is recommended. Likewise, unopened bottles should be stored in temperatures under 80°F and 45% humidity.

Last, *Wildcrafted Siberian Chaga* is formulated using purified, activated (i.e., energized) water. Energized water is found deep, over 1,000 meters under the earth. This water vibrates faster and aids in faster absorption of the product as well as rapid expulsion of toxins that are in our bodies.

Conclusion

The synergistic effect of this naturally perfect formulation of nutrients makes wild Chaga responsible for the potent positive impact on improving and maintaining the health of systems throughout the body. There are few, if any other, nutritional sources which offer as many diverse benefits as wild Chaga. Indeed, a food source that can both protect and regenerate the body is extremely rare. Wild Chaga is just such a super food. It not only protects the body from oxidation, infection, and toxins; ensures cells and tissues are strong; and modulates immunity and metabolism; but, also repairs DNA, heals degeneration, causes apoptosis, and slows aging. All of these things, of course, lead to increased quality of life and longevity.

Wild Chaga has been used in Russia, Poland, and several other eastern European countries for literally hundreds of years and has remained virtually unknown in the Western hemisphere, except to a few highly interested people and practitioners of holistic medicine, naturopathic physicians, and those with an interest in Chinese and Russian medicine. There are over 400 peer reviewed scientific articles that have been published about the multiple benefits of Chaga or its constituent parts. Since 2006, the carefully formulated *Wildcrafted Siberian Chaga* has been available in the East, including China, South Korea, Indonesia, and Japan, with amazing benefits for those who use it. Now, this formulation is being made available in the USA.

There are currently various Chaga teas, powders, and other Chaga products available in the USA. Most have preservatives, and many have had toxins introduced during the extraction process. While these products probably provide some benefit, they are not the same as what was used by the Siberian natives that often lived into their 100s in very harsh cold climates. Unlike these lesser Chaga products, *Wildcrafted Siberian Chaga* meets the highest quality standards, providing the results that people need and expect. By sourcing the highest quality Chaga from

the sub-freezing Siberian climate and using a proprietary manufacturing process based on four years of costly research to ensure the ideal formulation, *Wildcrafted Siberian Chaga* is the best Chaga available in the world.

I first became aware of *Wildcrafted Siberian Chaga* during a time when I had a serious and ongoing upper respiratory infection. After five months, multiple tests, and several consultations with my medical colleagues, it was finally determined that I had a "super virus." This was an infection that my body's own immune system simply could not overcome and western medicine could not defeat. It was not until I began to take *Wildcrafted Siberian Chaga* that my symptoms began to improve and were completely resolved within two to three weeks. That was about two years ago from this writing. At that time, I became a true believer. In the ensuing two years, my energy, stamina, vitality, and sense of well-being have only increased. Today, I won't travel without my *Wildcrafted Siberian Chaga*. Now, I want to share this precious gift with the rest of the world.

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