12/1/2018

100% NATURAL BIRCH TREE CHAGA MUSHROOMS

HEALTH BENEFITS FOR PET DOGS

Tina Sampalis M.D., Ph.D.

100% NATURAL BIRCH TREE CHAGA MUSHROOMS
NATURAL HEALTH BENEFITS FOR DOGS

Chaga is a highly nutritious mushroom that grows on birch trees in below freezing temperatures. Semintha Chaga grows at -40°C in a primeval organic environment clear of any nuclear waste, contaminants or other toxins making Semintha chaga mushrooms safe for chronic consumption and highly effective.

Chaga is the dense black mass (25-40 cm large) that can be seen on the outside of birch trees. It is a dense sterile mass of mycelia, with decayed bits of birch tissue incorporated. They are quite rare and difficult to harvest. When chopped from the tree the interior has a rusty yellow-brown color, somewhat granular in appearance, and is often mottled with whitish or cream-colored veins. The hard, deeply cracked black outside of the Chaga is called the sclerotium. Mature Chaga sclerotia are found on trees over 40 years of age. The estimated time period between the times of infection of the tree by the fungus to the maturity of the chaga mushroom is around 20 years. The chaga can be harvested five years post maturity. After harvesting, chaga can regrow to harvestable size again in three to ten years, and this can be repeated until the tree dies.

SUPPLEMENT FACTS
Serving size 3gr
Total Fat 0.03g
Total Carb 2.25g
Cholesterol 0mg
Protein 12g
Sodium 0.42mg
Calcium 1.44mg
Magnesium 1.4mg
Manganese 0.21mg
Potassium 51mg
Sodium 0.011mg
Phosphorus 9,96mg
Iron 0,07mg
Beta Glucan 0,75g
Zinc 0,12mg

NUTRITIONAL COMPOSITION OF CHAGA MUSHROOMS:

- Potent antioxidants
- Good sources of superoxide dismutase (SOD)
- More than 215 phytonutrients, glyconutrients including: Betulin, Betulinic Acid, Polysaccharides, Beta Glucans, Tripeptides, Triterpenes including Lanosterol-type Triterpenes, Sterols, Saponins, Inotodiols, Trametenolic Acid and Melanin.
- Significant source of riboflavin and niacin
- Vitamins B and D, flavonoids, phenols, copper, calcium, potassium, manganese, zinc iron and enzymes
- One of nature's riches sources of the minerals rubidium, potassium, cesium and germanium; (maintains body alkalinity).
- High in Amino Acids, Dietary Fiber, Ionized Trace Minerals (Copper, Selenium, Zinc, Manganese, Iron), Ionized Essential minerals (Magnesium, Potassium, Calcium, Chloride, Sodium, Phosphorus), Vitamin B1 (Thiamine), B2 (Riboflavin), B3 (Niacin), Vitamin D2 (Ergosterol), which is not found in vegetables.

GENERAL HEALTH PROPERTIES OF CHAGA MUSHROOMS

Chaga improves and stimulates the immune response, regulates glucose metabolism, reduces inflammation, is a potent antioxidant and inhibits mutagenic cell growth

Chaga is rich in Phytonutrients

- Phytonutrients may serve as antioxidants, enhance immune response, enhance cell-to-cell communication, alter estrogen metabolism, convert to vitamin A (beta-carotene is metabolized to vitamin A), repair DNA damage caused by smoking and other toxic exposures and detoxify.
- Chaga Mushrooms contain Glyconutrients; plant saccharides that provide support for the immune system. Glyconutrients play a key role in supporting your immune system and promoting effective cell-to-cell communication. Recent scientific research has shown that eight simple sugars (monosaccharides) combine with proteins and fats to create glycoforms that coat the surface of nearly every cell in the body and function as cellular recognition molecules that communicate the messages a body needs to function in health. These messages directly affect proper organ and system function including the immune and endocrine systems

Chaga Mushroom Polysaccharides

Mushroom polysaccharides act as carriers of other nutrients, delivering them to where they are needed most in the body to increase bio-availability to maintain optimum health.

Chaga contains Beta-glucans

Chaga mushroom is considered a natural Biological Response Modifier (BRM) mainly due to its high content of a class of polysaccharides known as Beta-D-Glucans and other key nutrients that help activate an array of immune cells, including lymphocytes, macrophages, and natural killer cells. These cells allow the body to suppress the formation of chronic health conditions like autoimmune disease, allergies, and cancer.

Chaga is a powerful potentiating and immune-enhancing "superfood" with vast potential for the maintenance of a healthy immune system with a vast array of potential benefits in the management of food and asthma allergies, atopic dermatitis, inflammation (including autoimmune inflammatory conditions such as rheumatoid arthritis), atherosclerosis, thrombosis and human immunodeficiency virus (HIV) and cancer. (detailed bibliography enclosed)

Superoxide Dismutase in Chaga

Chaga mushrooms have the highest levels of Superoxide Dismutase (SOD) found in any natural food and is extremely high in antioxidants. Other foods like wheatgrass, broccoli and some cabbages also contain SOD but in much smaller amounts.

Triterpenoids and Sterols

Triterpenes immune and cardiovascular system strengthening properties increase the body's ability to resist disease, lower cholesterol levels and promote the destruction of foreign abnormal cells. The immune-modulating properties of Lanosterol-linked triterpenes have been validated by Dr. Kirsti Kahlos, School of Pharmacology, University of Helsinki, Finland. Dr. Kahlos' team conducted studies validating the immuno-modulating impact of Lanosterol-linked triterpenes effective as a flu-vaccination and for anti- tumor applications.

Betulinic Acid (phytosterol)

Chaga is rich in Betulinic Acid a phytosterol which is naturally present in the bark of the Birch tree. Betulin from the Birch tree is converted into Betulinic Acid by the Chaga Mushroom making it soluble for us to ingest into the bloodstream.

Ergosterol (Vitamin-D2).

One of three vitamins able to be absorbed by the skin and the only one that the body is able to manufacture (when exposed to ultraviolet light). This vitamin is necessary for the building of new skin cells, as well as bones, teeth, and hair.

Saponins

Saponins have been shown to have anti-inflammatory and antioxidant activity.

Melanin

The Melanin produced by the Chaga mushroom demonstrates high antioxidant and geno-protective effects. Melanin enhances the appearance of hair, skin and eyes, and restores a more youthful appearance.

CHAGA HEALTH BENEFITS FOR PET DOGS

Dogs are considered man's best friend for thousands of years and it's easy to see why. Through out these years they have protected us, saved lives, assisted the disabled, helped us raise our kids, became our best companions for us and our family. Most of all, they have established themselves as loyal and faithful companions. Anyone who has ever experienced the companionship and true loyalty of dogs would understand why we consider them as part of our family. We cater to all their needs and once we have their trust, they offer unconditional love. Unfortunately, dogs, like humans, are sensitive to certain ailments which affect their quality and expectancy of life. It is our obligation to offer them the best care possible as we would for ourselves.

Following are the most frequent and/or debilitating conditions affecting dogs for which the pathology and treatments are often very similar to humans. This justifies our ability to rely on human as well as animal research to enrich our knowledge.

ALLERGIC DISORDERS

An allergic reaction for dogs can be quite distressing having a strong impact on their health and quality of life. Dogs are predisposed to food-, airborne- and other environmental allergies, manifested mainly by dermatological reactions. Most common dog allergies result from immune overreaction to airborne agents including dust, chemicals, fleas, mites, seasonal pollens, fungi, and numerous others. The immune system becomes less effective at detecting and fighting viral and bacterial invaders and abnormal cells as dogs age. Most frequently, dogs will exhibit mild to quite severe skin eruptions of varying durations while less often they will develop eye and ear discharges, or nasal and bronchial inflammation. Unfortunately, allergic reactions tend to increase in severity with time if not properly managed.

AUTOIMMUNE DISEASES

Normally, human and animal immune system alike does not react to its own body tissues which it is meant to protect. However, in some cases, the immune system fails to maintain this equilibrium and actually attacks its own as normal cells are regarded as foreign invaders. While the precise cause of disease in an individual dog cannot yet be decisively established, it is known that genetics play an important role. Some of the common canine auto-immune diseases are described below:

- Arthritis. There are a number of auto-immune arthritic conditions that beset dogs. In general, arthritis is caused when antigens and antibodies, failing to react in the normal way, join in a cellular structure which migrates into various joints. These immune complexes, in turn, chemically summon other immune cells, which together cause long-term and often debilitating inflammation.

- Autoimmune Hemolytic Anemia. In this common (and sometimes fatal) canine disease, auto-antibodies cause the destruction of red blood cells, resulting in anemia. If left untreated, this leads to lethargy, labored breathing and ultimately signs of dementia such as loss of balance, personality changes, etc.

- Systemic Lupus Erythematosus. Contrary to humans where lupus attacks practically every body system in most dogs, especially with early intervention, the results are less serious. Clinical signs often include skin lesions and ulcers on the face and legs, and swollen lymph nodes.

CANCER

Cancer is the most frequent cause of death in dogs. Learning your dog has cancer is an extremely frightening experience and unfortunately, according to the National Canine Cancer Foundation (NCCF), it is a diagnosis one out of every three dogs will receive during their lifetime. The good news is, about half of all canine cancers are treatable if they are caught early.

Cancer comes in many forms, including carcinoma, sarcoma, melanoma, lymphoma, and leukemia, and can occur at any age in both mixed breeds and purebreds. Early signs of cancer that we need to look out for are:

- Abnormal swelling
- A sore that does not heal
- Weight loss
- Loss of appetite
- Bleeding or discharge from any opening on the body
- Unpleasant or unusual odor
- Difficulty eating or swallowing
- Loss of energy
- Ongoing lameness or stiffness
- Difficulty breathing, urinating, or defecating

The most common types of cancer affecting dogs are listed below:

- Mast cell tumors: Mast cell tumors are an extremely common form of cancer in older dogs and mixed breeds, as well as boxers, Boston terriers, Labrador retrievers, beagles, and schnauzers. Mast cells are found in the skin and other tissues, like the intestines or respiratory tract. They contain large amounts of histamines and enzymes that protect the body, but when tumors develop, that protection turns against the immune system. The first sign of a mast cell tumor is usually a lesion on the skin. Some mast cell tumors can also be uncomfortable and cause agitation.
- Lymphoma: Lymphoma occurs in cells in the lymph nodes or bone marrow and is most commonly diagnosed in dogs between the ages of 6 and 9 years old. Lymphoma affects the dog's immune system and can spread rapidly if left untreated. It is classified in five progressive stages and treatment options vary depending on the stage. The first sign of lymphoma is typically a painless, swollen lymph node in the neck or behind the knees.
- Hemangiosarcoma: Hemangiosarcoma is a malignant cancer of the blood vessels. It is more common in dogs than any other species. Hemangiosarcoma is commonly diagnosed in the spleen, liver, and

heart, but can travel to any organ or occur just under the skin. Because there are no distinct early warning signs for hemangiosarcoma, many dogs are not diagnosed until the disease has reached its advanced stages. It is often seen in German shepherd dogs, golden retrievers, and other large breeds.

- Melanoma: Melanoma is a type of skin cancer that can be found in the nail beds, footpads, and eyes, but the vast majority of melanoma tumors start in the mouth or around the lips. Melanoma tumors are highly aggressive, growing deep into the skin to invade vital organs. The first sign of melanoma might appear as a swollen paw, an eye that drains, or a sore in or near the mouth.
- Osteosarcoma: Osteosarcoma is cancer of the bone. Approximately 85 percent of osteosarcoma tumors are malignant, and grow very quickly. Osteosarcoma commonly affects large breeds between the ages of 4 and 7 years old, including Great Danes, Irish setters, Doberman pinschers, Rottweilers, German shepherd dogs, and golden retrievers. While osteosarcoma can occur in any bone, it most commonly affects the limbs. Initial signs of osteosarcoma may include swelling and lameness.
- Mammary cancer: According to the American College of Veterinary Surgeons (ACVS), mammary tumors are more common in female dogs that are either not spayed or were spayed after 2 years of age. About 50 percent of all mammary tumors are malignant and have metastasized, or spread to other areas of the body, by the time they are surgically removed. Signs of mammary cancer are often overlooked because the tumors appear as a small nodule on or around the dog's nipple; however, this type of cancer can also present itself as a painful tumor around the nipple.

TREATMENT OPTIONS FOR DOGS WITH CANCER

Several factors influence cancer treatment decisions for dogs with cancer, including:

- Age of the dog
- General health of the dog
- Tumor type
- Biological behavior of the tumor
- The Stage of the Cancer

The dog's overall health status plays a major role in therapy choices. Treatments for dogs with cancer are similar to human therapies, which can include:

- Chemotherapy
- Surgery
- Radiation therapy
- Natural regimens / Nutraceuticals

There is a general consensus that combination treatments may be more effective. In most cases combining conventional with nutraceutical regimens may result not only in a more effective treatment but also, and in our mind more importantly, a longer and better quality of life.

Mushrooms were once thought to be dangerous for dogs; now evidence has proven them to be beneficial if selected carefully and correctly. Through extensive research and studies, scientists have found mushrooms to be high sources of antioxidants and cancer fighting benefits that are not only safe for dogs but life-saving as well. Chaga is considered a leader among mushrooms used more and more by veterinarians around the world as dog immunity supplements.

The chaga mushroom is characterized as a **treasure trove of science-backed healing potential that's been a prominent feature in folk medicine for thousands of years.**

Hundreds of scientific studies suggest that Chaga exhibits strong apoptotic, anti-proliferative, and chemo-protective benefits. Its full spectrum of phytosterols, including lanosterol, inotodiol, ergosterol, and fecosterol, are among the many Chaga constituents that have been shown to directly inhibit the growth and spread of cancer cells in humans and animals[121].

A study evaluating the effects of chaga on tumor-bearing mice, extracts of Chaga achieved significant tumor-suppressive effects, reaching a mean of 60% reduction in tumor size. Chaga increased tumor agglomeration and inhibited tumor vascularization, further inhibiting the growth and spread of cancer in these mice[122].Related research demonstrated Chaga's anti-cancer potential as it pertains to the down-regulation of certain cell pathways associated with cancer, including in colitis-induced human colorectal cancer[123].Furthermore, the therapeutic benefits of Chaga's bioactive triterpene compounds became apparent through the inhibition of the growth of a number of cancer cell lines, as demonstrated both in vitro and in vivo[124].

Chaga also possesses hepatoprotective properties that are particularly relevant not only to liver injuries but also to liver cancer. Studies have found that even when taken at relatively low doses, Chaga actively scavenges the free radicals that cause oxidative liver injury, effectively blocking the formation of liver disease and liver cancer[125].

All of this and more is why one study dubbed Chaga as a premier "natural anti-cancer ingredient in food," suggesting that it may, in fact, be a safe and effective treatment and preventative protocol for cancer[126]. This sentiment is further reflected by David Winston, RH, AHG, Dean of the Center for Herbal Studies in Broadway, New Jersey, and an herbal practitioner with more than 40 years of experience under his belt, who's convinced that Chaga is the most powerfully anti-cancer medicinal mushroom in existence[127].

It all makes sense when you consider the incredible nutrient profile of Chaga, which is virtually unmatched in the natural world. Even with all that we know it can do, there's still so much more to learn about the wonders of the Chaga mushroom, which is why this powerful superfood will continue to be the focus of scientific research involving functional foods for many years to come.

IMMUNOMODULATIG PROPERTIES OF CHAGA MUSHROOMS

Chaga is a powerful potentiating and immune-enhancing "superfood" with vast healing potential[128].3 A natural Biological Response Modifier (BRM), Chaga mushroom is rich in a class of polysaccharides known as Beta-D-Glucans that help to balance the body's immune system response, boosting or slowing it as needed for optimal function. Chaga also possesses key nutrient compounds that give it the ability to activate an array of immune cells, including lymphocytes, macrophages, and natural killer cells. These cells allow the body to suppress the formation of chronic health conditions like autoimmune disease, allergies, and cancer.

The immuno-modulatory effects of Chaga appear to extend even further than this, demonstrating benefits in the management of both food and asthma allergies, atopic dermatitis, inflammation (including autoimmune inflammatory conditions such as rheumatoid arthritis), atherosclerosis, thrombosis, human immunodeficiency virus (HIV), listeriosis, septic shock, and perhaps most prominently, cancer.

CHAGA MUSHROOM ANIINFLAMMATORY PROPERTIES

In addition to Beta-D-Glucans, Chaga mushrooms contain a variety of other polysaccharides that have been scientifically shown to help boost energy levels and promote mental clarity, while protecting the various organs of the body against damaging inflammation. Particularly in the area of cardiovascular health, Chaga exhibits a type of soothing effect that's been shown to help relax blood vessels and improve blood flow. This in turn delivers more oxygen throughout the body.

Dogs suffering from chronic pain, neuropathy, and even diabetes are strong candidates for Chaga's use in this regard, as the mushroom's constituents have further been shown to help modulate platelet aggregation[129].

Chaga's diverse antioxidant profile is even more impressive, as it bears the highest ORAC score of any known superfood. According to research compiled by Tufts University, Chaga has three times the antioxidant power of wolfberries (aka goji berries), which is the next strongest known food. One could argue that this makes Chaga the world's number one source of inflammation-fighting antioxidants[130]

Chaga mushroom contains high amounts of Super Oxide Dismutase (SOD), a powerful class of enzymes that contributes to its robust antioxidant defense against oxidation and free radical damage. Chaga's natural black pigmentation is indicative of its high content of melanin, a polyphenol-rich "super" antioxidant that protects against DNA damage[131]. Melanin is the same antioxidant naturally found in human skin that protects against sun damage.

WHY INCLUDE THIS KING OF THE MUSHROOMS, CHAGA, IN YOUR PET'S LIFE?

- Anti-inflammatory, anti-viral, and antibacterial properties
- Huge immune booster and modulator (but it will also lower an overactive immune system as well)
- Anti-cancer
- Improves skin repair and DNA protection
- High in superoxide dismutase (SOD), an important enzyme that functions as a powerful antioxidant. All together it gives your body seven different antioxidants.
- A free radical scavenger in your body!

YOUR TIME TOGETHER IS PRECIOUS

SAVOR EVERY MOMENT

Enjoy every moment and do all you can to extend your dog's life far beyond the natural lifespan of his/her breed. We do not make miracles happen but with conscientious care, enrichment, regular veterinary attention and proper nutrition, you may be able to give your buddy a few extra years.

SELECTION OF RESEARCH ON CHAGA MUSHROOMS

1. Chaga and Other Fungal Resources; Assessment of Sustainable Commercial Harvesting in Khabarovsk and Primorsky Krais, Russia by David Pilz, 2004
2. Separation of an aqueous extract Inonotus obliquus (Chaga). A novel look at the efficiency of its influence on proliferation of A549 human lung carcinoma cells.
   Mazurkiewicz W, Rydel K, Pogocki D, Lemieszek MK, Langner E, Rzeski W. Acta Pol Pharm. 2010 Jul-Aug;67(4):397-406.PMID: 20635536 [PubMed – indexed for MEDLINE
3. Optimization of hydroxyl radical scavenging activity of exo-polysaccharides from Inonotus obliquus in submerged fermentation using response surfacemethodology.
   Chen H, Xu X, Zhu Y. J Microbiol Biotechnol. 2010 Apr;20(4):835-43.PMID: 20467262 [PubMed – indexed for MEDLINE]
4. Phytochemical characteristics and hypoglycaemic activity of fraction from mushroom Inonotus obliquus.
   Lu X, Chen H, Dong P, Fu L, Zhang X. J Sci Food Agric. 2010 Jan 30;90(2):276-80.PMID: 20355042 [PubMed – indexed for MEDLINE]
5. Anti-inflammatory effects of Inonotus obliquus in colitis induced by dextran sodium sulfate.
   Choi SY, Hur SJ, An CS, Jeon YH, Jeoung YJ, Bak JP, Lim BO. J Biomed Biotechnol. 2010;2010:943516. Epub 2010 Mar 10. Review.PMID: 20300439 [PubMed – indexed for MEDLINE]
6. Cancer cell cytotoxicity of extracts and small phenolic compounds from Chaga [Inonotus obliquus (persoon) Pilat].
   Nakajima Y, Nishida H, Matsugo S, Konishi T. J Med Food. 2009 Jun;12(3):501-7.PMID: 19627197 [PubMed – indexed for MEDLINE]
7. Antioxidant activities of extracts and subfractions from Inonotus Obliquus.
   Liang L, Zhang Z, Wang H. Int J Food Sci Nutr. 2009;60 Suppl 2:175-84. Epub 2009 Jul 1.PMID: 19585318 [PubMed – in process]
8. Anti-inflammatory effect of Inonotus obliquus, Polygala senega L., and Viburnum trilobum in a cell screening assay.
   Van Q, Nayak BN, Reimer M, Jones PJ, Fulcher RG, Rempel CB. J Ethnopharmacol. 2009 Sep 25;125(3):487-93. Epub 2009 Jul 3.PMID: 19577624 [PubMed – indexed for MEDLINE]
9. Progress of research on Inonotus obliquus. Zhong XH, Ren K, Lu SJ, Yang SY, Sun DZ. Chin J Integr

Med. 2009 Apr;15(2):156-60. Epub 2009 Apr 29. Review.PMID: 19407959 [PubMed – indexed forMEDLINE]

10. Antitumor activity of water extract of a mushroom, Inonotus obliquus, against HT-29 human colon cancer cells. Lee SH, Hwang HS, Yun JW. Phytother Res. 2009 Dec;23(12):1784-9.PMID: 19367670 [PubMed – indexed for MEDLINE]

11. Oxidative stress response of Inonotus obliquus induced by hydrogen peroxide.
Zheng W, Zhao Y, Zhang M, Wei Z, Miao K, Sun W. Med Mycol. 2009 Dec;47(8):814-23.PMID: 19184774 [PubMed – in process]

12. Chaga mushroom extract inhibits oxidative DNA damage in human lymphocytes as assessed by comet assay
Yoo Kyoung Parka,**, Hyang Burm Leeb,c,**, Eun-Jae Jeona, Hack Sung Jungb and Myung-Hee Kanga,* aDepartment of Medical Nutrition, Kyunghee University, 1 Hoekidong, Dongdaemoonku, Seoul 130-701, South Korea

13. Comparative study of antioxidant activity and antiproliferative effect of hot water and ethanol extracts from the mushroom Inonotus obliquus.
Hu H, Zhang Z, Lei Z, Yang Y, Sugiura N. J Biosci Bioeng. 2009 Jan;107(1):42-8.PMID: 19147108 [PubMed – indexed for MEDLINE]

14. Evaluation of antitumor activity of peptide extracts from medicinal plants on the model of transplanted breast cancer in CBRB-Rb(8.17)1Iem mice.
Tepkeeva II, Moiseeva EV, Chaadaeva AV, Zhavoronkova EV, Kessler YV, Semushina SG, Demushkin VP. Bull Exp Biol Med. 2008 Apr;145(4):464-6.PMID: 19110595 [PubMed – indexed for MEDLINE]

15. Potential anticancer properties of the water extract of Inonotus [corrected] obliquus by induction of apoptosis in melanoma B16-F10 cells.
Youn MJ, Kim JK, Park SY, Kim Y, Park C, Kim ES, Park KI, So HS, Park R. J Ethnopharmacol. 2009 Jan 21;121(2):221-8. Epub 2008 Oct 25.PMID: 19041933 [PubMed – indexed for MEDLINE

16. Inotodiol, a lanostane triterpenoid, from Inonotus obliquus inhibits cell proliferation through caspase-3-dependent apoptosis.
Nomura M, Takahashi T, Uesugi A, Tanaka R, Kobayashi S. Anticancer Res. 2008 Sep-Oct;28(5A):2691-6.PMID: 19035296 [PubMed – indexed for MEDLINE]

17. Antimutagenic effects of subfractions of Chaga mushroom (Inonotus obliquus) extract.
Ham SS, Kim SH, Moon SY, Chung MJ, Cui CB, Han EK, Chung CK, Choe M. Mutat Res. 2009 Jan 10;672(1):55-9. Epub 2008 Oct 17.PMID: 18992843 [PubMed – in process]

18. Identification of Inonotus obliquus and analysis of antioxidation and antitumor activities of polysaccharides.
Song Y, Hui J, Kou W, Xin R, Jia F, Wang N, Hu F, Zhang H, Liu H. Curr Microbiol. 2008 Nov;57(5):454-62. Epub 2008 Sep 16.PMID: 18795365 [PubMed – indexed for MEDLINE]
19. Lanostane-type triterpenoids from the sclerotia of Inonotus obliquus possessing anti-tumor promoting activity.
Taji S, Yamada T, Wada S, Tokuda H, Sakuma K, Tanaka R. Eur J Med Chem. 2008 Nov;43(11):2373-9. Epub 2008 Feb 8.PMID: 18387711 [PubMed – indexed for MEDLINE]
20. Chaga mushroom (Inonotus obliquus) induces G0/G1 arrest and apoptosis in human hepatoma HepG2 cells.
Youn MJ, Kim JK, Park SY, Kim Y, Kim SJ, Lee JS, Chai KY, Kim HJ, Cui MX, So HS, Kim KY, Park R. World J Gastroenterol. 2008 Jan 28;14(4):511-7.PMID: 18203281 [PubMed – indexed for MEDLINE]Free PMC Article
21. Identification of a novel blocker of IkappaBalpha kinase activation that enhances apoptosis and inhibits proliferation and invasion by suppressing nuclear factor-kappaB.
Sung B, Pandey MK, Nakajima Y, Nishida H, Konishi T, Chaturvedi MM, Aggarwal BB. Mol Cancer Ther. 2008 Jan;7(1):191-201.PMID: 18202022 [PubMed – indexed for MEDLINE]
22. New antioxidant polyphenols from the medicinal mushroom Inonotus obliquus.
Lee IK, Kim YS, Jang YW, Jung JY, Yun BS. Bioorg Med Chem Lett. 2007 Dec 15;17(24):6678-81. Epub 2007 Oct 25.PMID: 17980585 [PubMed – indexed for MEDLINE]
23. Antioxidant small phenolic ingredients in Inonotus obliquus (persoon) Pilat (Chaga).
Nakajima Y, Sato Y, Konishi T. Chem Pharm Bull (Tokyo). 2007 Aug;55(8):1222-6.PMID: 17666849 [PubMed – indexed for MEDLINE
24. Analysis of aqueous extract of Inonotus obliquus.
Mazurkiewicz W. Acta Pol Pharm. 2006 Nov-Dec;63(6):497-501.PMID: 17438866 [PubMed – indexed for MEDLINE]
25. Isolation and characterization of a novel platelet aggregation inhibitory peptide from the medicinal mushroom, Inonotus obliquus.
Hyun KW, Jeong SC, Lee DH, Park JS, Lee JS. Peptides. 2006 Jun;27(6):1173-8. Epub 2005 Nov 11.PMID: 16289471 [PubMed – indexed for MEDLINE]
26. Chaga mushroom extract inhibits oxidative DNA damage in human lymphocytes as assessed by comet assay.

Park YK, Lee HB, Jeon EJ, Jung HS, Kang MH. Biofactors. 2004;21(1-4):109-12.PMID: 15630179 [PubMed – indexed for MEDLINE]

27. Antioxidant effect of Inonotus obliquus.
Cui Y, Kim DS, Park KC. J Ethnopharmacol. 2005 Jan 4;96(1-2):79-85.PMID: 15588653 [PubMed – indexed for MEDLINE]
28. The effect of aqueous extracts from Inonotus obliquus on the mitotic index and enzyme activities.
Rzymowska J. Boll Chim Farm. 1998 Jan;137(1):13-5.PMID: 9595828 [PubMed – indexed for MEDLINE]
29. Antimitotic activity of aqueous extracts of Inonotus obliquus.
Burczyk J, Gawron A, Slotwinska M, Smietana B, Terminska K. Boll Chim Farm. 1996 May;135(5):306-9.PMID: 8942059 [PubMed – indexed for MEDLINE]
30. Fungi in Khanty folk medicine.
Saar M. J Ethnopharmacol. 1991 Feb;31(2):175-9.PMID: 2023426 [PubMed – indexed for MEDLINE]
31. Effect of the extracts from fungus Inonotus obliquus on catalase level in HeLa and nocardia cells.
Jarosz A, Skórska M, Rzymowska J, Kochmańska-Rdest J, Malarczyk E. Acta Biochim Pol. 1990;37(1):149-51.PMID: 2087905 [PubMed – indexed for MEDLINE]
32. Antitumor Activity of Triterpenes in Inonotus obliquus.
Kahlos K, Kangas L, Hiltunen R. Planta Med. 1986 Dec;52(6):554. No abstract available. PMID: 17345522 [PubMed – in process]
33. Anonymous. 2004. Cytotoxic effect of *Inonotus obliquus* composition in HCT-15 human colon and AGS gastric cancer cells. *Journal of the Korean Society of Food Science and Nutrition*. 33:633-640.
34. Alves, R. E., et al. 2002. Camu camu (*Myrciaria dubia* Mc Vaugh): a rich natural source of vitamin C. *Proc. Interamer. Soc. Trop. Hort.* 46:11-13.
35. Ajith, T. A. and K. K. Janardhanan. 2007. Indian medicinal mushrooms as a source of antioxidant and antitumor agents. *J. Clin. Biochem. Nutr*.40:157.
36. Babitskaya, V. G,, Scherba, V. V., Ikonnikova, N.V., Bisko, N.A., and N.Y. Mitropoiskaya. 2002. Melanin complex from medicinal mushroom *Inonotus obliquus* (Pers:Fr.) Pilat (Chaga) (Aphyllophoromycetidae). *Int. J. Med. Mushrooms*.4:139-45.
37. Babitskaya, V. G,, Scherba, V. V., Ikonnikova, N.V., Bisko, N.A., and N.Y. Mitropoiskaya. 2002. Melanin complex from medicinal mushroom Inonotus obliquus (Pers:Fr.) Pilat (Chaga) (Aphyllophoromycetidae). Int. J. Med. Mushrooms.4:139-45.

38. Bobek, P., Ozdin, L., and I. Kajaba. 1997. Dose-dependent hypocholesterolemic effect of oyster mushroom (Pleurotus ostreatus) in rats. Physiol Res. 47:327-329.
39. Bobek, P. and S. Galbavy. 1999. Hypocholesteremic and antiatherogenic effect of oyster mushroom (Pleurotus osteratus) in rabbits. Nahrung. 43:339-342.
40. Burczyk, J., Gawron, A. Slotwinska, M., Smietana, B., and K. Terminiska. 1996. Antimitotic activity of aqueous extracts of Inonotus obliquus. Boll. Chim. Farm. 135:306.
41. Chang, S. T. 1999. Global impact edible and medicinal mushrooms on human welfare in the 21st century: non-green evolution. Int. J. Med. Mushr. 1:1-7.
42. Chen, C., Zheng, W., Gao, X., Xiang, X., Sun, D., Wei, J., and C. Chu. 2007. Aqueous extract of Inonotus obliquus (Fr.) pilat (Hymenochaetaceae) significantly inhibits the growth of sarcoma 180 by inducing apoptosis. American Journal of Pharmacology and Toxicology. 2:10-17.
43. Chihara, G., Maeda, Y., Sasaki, T. and F. Fukuoaka. 1969. Inhibition of mouse sarcoma 180 by polysaccharides from Letin us eodes (Berk.) Nature. 222:687.
44. Chorvathova, V., et al. 1993. Effect of oyster fungus on glycemia and cholesterolaemia in rats with insluin-dependent diabetes. Physiol. Res. 42:175-179.
45. Cui, Yo, Kim, D. S., and K. C. Park. 2005. Antioxidant effects of Inonotus Oblique. J. Ethnopharmacol. 96:79-85.
46. de Sa, M. S., et al. 2009. Antimalarial activity of betulinic acid and derivatives in vitro against Plasmodium falciprum and in vivo in P. Berghel-infected mice. Parisitol. Res. Jul;105:275-279.
47. Fulda, S, et al. 1997. Betulinic acid triggers CD95 (APO-1/Fas)- and p53-independent apoptosis via activation of capases in neuroectodermal tumors. Cancer Research. 57:4956.
48. Fulda, S. 2008. Betulinic acid for cancer treatment and prevention. Int. J. Mol. Sci. 9:1096-1107.
49. Fulda, S., Jeremias, I., Pietsch, T. and K. M. Debatin. Betulinic acid: a new chemotherapeutic agent in the treatment of neuroectodermal tumors. Klin Padiatr. 211:319-322.
50. Gu, Y. and S. Gowsala. 2006. Cytotoxic effect of oyster mushroom Pleurotus ostreatus on human androgen-independent prostate cancer PC-3 cells. J. Med. Food. 9:196-204.
51. Ham, S. S., et al. 2003. Antimutagenic and cytotoxic effects of ethanol extract from the Inonotus obliquus. J. Korean Soc. Food Sci. Nutr. 32:1088-94.
52. Hawksworth, D. L. 2001. Mushrooms: the extent of the unexplored potential. Int. J. Med. Mushr. 2:1-9.
53. Hossain, S., et al. 2003. Dietary mushroom (Pleurotus ostreatus) ameliorates atherogenic lipid in hypercholesterolaemic rats. Clin. Exp. Pharmacol. Physiol. 30:470-475.

54. Hyun, K. W., Jeong, S. C., Lee, D. H., Park, J. S., and J. S. Lee. 1996. Isolation and characterization of a novel platelet aggregation inhibitory peptide from the medicinal mushroom, Inonotus obliquus. Boll. Chim. Farm. 135:306-309.
55. In-Kyoung, L., Young-Sook, K., Yoon-Woo, J., Jin-Young, J., and Y. Bong-Suk. 2007. New antioxidant polyphenols from the medicinal mushroom Inonotus obliquus. Bioorganic & Medicinal Chemistry Letters. 17:6678-6681.
56. Jeremias, I., et al. 2004. Cell death induction by betulinic acid, ceramide, and TRAIL in primary glioblastoma multiforme cells. Acta Neurochirurgica. 146:721-729.
57. Kahlos, K., Kangas, L., and R. Hiltunen. 1987. Antitumor activity of some compounds and fractions from an n-hexane extract of Inonotus obliquus in vitro. Acta Pharm. Fennica. 96:33-40.
58. Kharazmi, A. 2008. Laboratory and preclinical studies on the anti-inflammatory and anti-oxidant properties of rosehip powder—identification and characterization of the active component GOPO. Osteoarhritis and Cartilage. 16:55-57.
59. Kim, B. K., Shin, G.G., Jeong, B.S., and J.Y. Cha. 2001. Cholesterol lowering effect of mushrooms powder in hyperlipidemic rats. J. Korean Soc. Food Sci. Nutr. 30:510-515.
60. Kim, Y. O., et al. 2005. Immuno-stimulatory effect of the endopolysaccharide produced by submerged culture of Inonotus obliquus. Life Sci. 77:2438-56.
61. Kim,Y. O., et al. 2006.Anti-cancer effect and structural characterisation of endo-polysaccharide from cultivated mycelia of Inonotus obliquus. Life Sci. 79:72-80.
62. Koyama, T., Yeunhwa, G., and T. Akira. 2008. Fungal medicine, Fuscoporia obliqua, as a traditional herbal medicine, in vivo testing and medicinal effects. Asian Biomedicine. 2:459-469.
63. Kraus-Zaki, J. 1957. (In Polish) ACTH jako czynnik hydrolizujacy kwasy dezoksyrybonukleinowe w zastosowaniu do bada cytoenzymatycznych. Haematologica. 1:48-50.
64. Krauss-Zaki, J. 1962. Correspondence: Digestion of Cell Nucleus by Enzymes. Blood Journal. 19:527.
65. Lindequist, U., Niedermeyer, T. H. J., and W-D Julich. 2005. The pharmacological potential of mushrooms. Institute of Pharmacy, Greifswald, Germany.
66. Lull, C., Wichers, H. J., and H. F. J. Savelkoul. 2005. Antiinflammatory and immunomodulating properties of fungal metabolites (In) Mediators of Inflammation. Hindawi Publishing Corp.
67. McCord, J. M. and I. Fridovich. 1988. Superoxide dismutase: the first twenty years (1968-1988). Free Radic. Biol. Med. 5(5-6):363-369.

68. Mizuno, T., et al. 1999. Antitumor and hypoglycemic activities of polysaccharides from Sclerotia and mycelia of Inonotus obliquus. Int. J. Med. Mushrooms. 1:306.
69. Mizuno, T. 1999. The extraction and development of antitumor-active polysaccharides from medicinal mushrooms in Japan (review). Int. J. Med. Mushr. 1:9-30.
70. Mothana, R. A. A., Awadh, N. A. A., Jansen, R.,Wegner, U., Mentel, R., and U. Lindequist. 2003. Antiviral lanostanoid triterpenes from the fungus Ganoderma pfeifferi BRES Fitoteraia. 74:483-485.
71. Mullauer, F. B., Kessler, J. H., and J. P.Medema. Betulin is a potent antitumor agent that is enhanced by cholesterol. 2009. (by) Laboratory for Experimental Oncology and Radiology, PLoS One; 4(4)
72. Muller, F. L., et al. 2006. Absence of CuZn superoxide dismutase leads to elevated oxidative stress and acceleration of age-dependent skeletal muscle atrophy. Free Radic. Biol. Med. 40:1993-2004.
73. Najafzadeh, M., et al. 2007. Chaga mushroom extract inhibits oxidative DNA damage in lymphocytes of patients. Biofactors. 31:191-200.
74. Nakagawa-Goto, K., Taniguchi, M., Tokuda, H., and K. H. Lee. 2008. Cancer preventive agents 9. Betulinic acid derivatives as potent cancer chemopreventive agents. Bioorg. Med. Chem. Lett. 1;19:3378-3381.
75. Nasar-Abbas, S. M. and A. Kadir Haikman. 2004. Antimicrobial effect of water extract of sumac (Rhus coriaria L.) on the growth of some food borne bacteria, including pathogens. J. Food Micro. 10:1016.
76. Nicolson, G. L., et al. 2000. Diagnosis and integrative treatment of intercelluar bacterial infections in chronic fatigue and fibromyalgia syndromes, GulfWar Illness, and rheumatoid arthritis and other chronic illnesses. Clin. Prac. Alt. Med. 1:92.
77. Nicolson, G. L. 2002. Co-infections in fibromyalgia syndrome, chronic fatigue syndrome, and other chronic illnesses. National Fibromyalgia Partnership—Fibromyalgia Frontiers. 10:5-9; 27-28.
78. Papas, A. M. (ed). 1999. Anitoxidant Status, Diet, Nutrition, and Health. Boca Raton: CRC Press. Park,Y. M., et al. 2005. In vivo and in vitro anti-inflammatory and antinociceptive effects of the methanol extract of Inonotus obliquus. J. Ethnopharmacol. 101:120-128.
79. Park,Y. M., et al. 2007. In vivo and in vitro anti-inflammatory and antinociceptive effects of the methanol extract of Inonotus obliquus. J. Med. Food. 10:80-90.
80. Rein, E., Kharazmi, A., and K. Winther. 2004. A herbal remedy, Hyben Vital (stand. Powder of Rosa canina fruits) reduces pain and improves general welbeing in patients with osteoarthritis- a double-blind, placebo controlled randomized trial. Phytomedicine. 11:383.
81. Rzymowska, J. 1996. The effect of aqueous extracts from Inonotus obliquus on the mitotic index

and enzyme activities. Boll Chim. Farm. 135:306-309.

82. Sarkar, F. H. andY. Li. 2006. Using chemoprevention agents to enhance the efficacy of cancer therapy. Cancer Res. 66:3347.
83. Sawada, N., et al. 2004. Betulinic acid augments the inhibitory effects of vincristine on growth and lung metastasis of B16F10 melanoma cells in mice. British Cancer Journal. 90:1672.
84. Scott, Cyril. 1944. Health, Diet, and Common Sense. London: the Homeopathic Publishing Co.
85. Shin, Y., Tamai, Y., and M. Terazawa. 2000. Chemical constituents of Inonotus obliquus sclerotium. Eurasian Journal of Forest Research. 1:43-50.
86. Shivrina, A.N. 1967. Chemical characteristics of compounds extracted from Inonotus obliquus. Chem. Abstr. 66:17271-17279.
87. Sudhakar, C., Sabitha, P., Shashi, K. R. and S. Safe. 2007. Betulinic acid inhibits prostate cancer growth through inhibition of specificity protein transcription factors. Cancer Research. 67:2816.
88. Sung, B., et al. 2008. Identification of a novel blocker of IkappaBalpha kinase activation that enhances apoptosis and inhibits proliferation and invasion by suppressing nuclear factor-kappaB. Mol. Cancer Ther. 7:19-201.
89. Takada, Y. and B. B. Aggarawal. 2003. Betulinic acid suppresses carcinogen-induced NF-kB activation through inhibition of IkappaB alpha kinase and p65 phosphorylation: abrogation of cyclooxygenase-2 and matrix metalloprotease-9. Journal of Immunology. 171:3278.
90. Wang, H., Gao, J., and T. B. Ng. 2000. A new lectin with highly potent antihepatoma and antisarcoma activities from the oyster mushroom Pleurotus ostreatus. Biochem. Biophys. Res. Commun. 275:810-816.
91. Wick, W., Grimmel, C., Wagenknecht, B., Dichgans, J. and M. Weller. 1999. Betulinic acid-induced apoptosis in glioma cells: A sequential requirement for new protein synthesis, formation of reaction oxygen species, and caspase processing. J. Pharmacol. Exp. Ther. 289:1306-1312.
92. Willmann, M. et al. 2009. Characterization of NVX-207, a novel betulinic acid-derived anti-cancer compound. Eur. J. Clin. Invest. 39:384.
93. Winther, K., Apel, K. and G. Thamsborg. 2005. A powder made from seeds and shells of a rose-hip subspecies (Rosa canina) reduces symptoms of knew and hip osteoarhritis: A randomized, double-blind placebo controlled trial. Scand J. Rheumatol. 34:302.
94. Yesilada, E., et al. 1997. Inhibitory effects of Turkish folk remedies on inflammatory cytokin: interleukin-1 alpha, interleukin-1 beta, and tumor necrosis factor alpha. J. Ethnopharmacol. 58:59-73.

95. Ying-Mee, T., Yu, Rong, and J. M. Pezzuto. 2003. Betulinic acid induced programmed cell death in human melanoma cells involves mitogen-activated protein kinase activation. Clinical Cancer Research. 9:2866.
96. Joo, J.I., Kim, D.H., Yun, J.W. 2010. "Extract of Chaga mushroom (Inonotus obliquus) stimulates 3T3-L1 adipocyte differentiation." Phytother Res. 24 (11):1592-9. doi: 10.1002/ptr.3180.
97. Ko, S.K., Jin, M., Pyo, M.Y. 2011. "Inonotus obliquus extracts suppress antigen-specific IgE production through the modulation of Th1/Th2 cytokines in ovalbumin-sensitized mice." J Ethnopharmacol. 137 (3):1077-82. E-pub July 28, 2011.
98. Najafzadeh, M., Reynolds, P.D., Baumgartner, A., Jerwood, D., Anderson, D. 2007 "Chaga mushroom extract inhibits oxidative DNA damage in lymphocytes of patients with inflammatory bowel disease." Mol Cells. 31 (2):165-73. E-pub Dec. 22, 2010.
99. Park, Y.K., Lee, H.B., Jeona, E-J., Jungb, H.S., Kang, M.H. 2004. "Chaga mushroom extract inhibits oxidative DNA damage in human lymphocytes as assessed by comet assay" BioFactors 21:109-112.
100. Stamets, P., 2008. U.S. Patent Application # 12/284,646. "Antiviral and Antibacterial Activity from Medicinal Mushrooms." Filed September 24, 2008.
101. Won, D.P., Lee, J.S., Kwon, D.S., Lee, K.E., Shin, W.C., Hong, E.K. 2011. "Immunostimulating activity by polysaccharides isolated from fruiting body of Inonotus obliquus." Mol Cells 31(2):165-73. E-pub 22 Dec. 2010.
102. А. В. Кавкин Лечение деревьями, Советский Спорт, Москва (2002) с. 175-180.
103. А. Артемова, Береза исцеляющая и омолаживающая, Диля, Москва – Санкт-Петербург, 2001, с. 29-32.
104. К. П. Балицкий, А.Л. Воронцова, Лекарственные растения и рак, Наукова думка, Киев, 1982, с. 143-151.
105. В. М. Кулемзин, Человек и природа в верованиях хантов. Томск, 1984, 196 с. Монография.
106. В. М. Кулемзин, Н.В. Лукина, Васюганско-ваховские ханты в конце XIX – начале XX вв. Этнографические очерки, Томск, 1977. 225 с.
107. Н.В. Лукина, Народные средства по сохранению здоровья и жизни у восточных хантов / Тезисы Всесоюзной конференции 10-12 марта 1972 года// Этнографические аспекты изучения народной медицины. – Ленинград, 1975. – с. 26-27.
108. Лукина Н.В. Заметки о системе питания хантов // Западная Сибирь в эпоху средневековья, Изд-во Томского ун-та, Томск, 1984, с. 168-179.
109. Sekiba F. An account of Ainu medicine. In: A collection of materials on the Ainu history. Private

publication (in Japanese), 1895.

110. Hutchens, Alma R., (1973) Indian Herbology (sic) of North America. Merco, Windsor, Ont., Canada
111. П.А. Якимов, М.Ф. Ступак, Чага и ее лечебное применение при раке IV стадии, Медгиз, Ленинград, 1959. с. 50-54.
112. Watanabe O, Abe T, Kawakami M, Kakimoto M (2005) Antioxidation by water-soluble lignin-like substance from a northern terrain basidiomycetes, Fuscoporia obliqua. Bull Hokkaido Food Processing Res Center. 6 : 13-6.
113. Kahlos, K. and Hiltunen, R. 1983. 'Identification of some lanostane type triterpenes from Inonotus Obliquus'. Acta. Pharm. Fenn., 92, 220
114. Kahlos, K. and Hiltunen, R. 1985. 'Sterols and triterpenes in Inonotus Obliquus'. Acta. Agron., 34, 82
115. Kahlos, K. and Hiltunen, R. 1986. 'Anti-tumor tests of Inotodiol from the fungus Inonotus Obliquus'. Acta. Pharm. Fenn., 95, 173-7
116. Yong Cui, et.al;(2005) Antioxidant effect of Inonotus obliquus. Journal of Ethnopharmacology 96, p.79–85
117. ZHENG Wei-Fa, et.al.; (2008) Phenolic compounds from Inonotus obliquus and their immune-stimulating effects. Mycosystema 27(4): 574-581
118. ZHENG Wei-Fa, et.al.; (2007) Sterol composition in field-grown and cultured mycelia of Inonotus obliquus. Acta Pharmaceutica Sinica 42(7); 750-756
119. Sharikova, L.A. et.al.; (2010) Standardisation of Chaga tincture and Befungin. Pharmaceutical Chemistry Journal, Vol. 44(3) p. 35-37
120. David Pilz (2004) Chaga and Other Fungal Resources – Assessment of Sustainable Commercial Harvesting in Khabarovsk and Primorsky Krais, Russia. PilzWald Forestry Applications of Mycology *(assessment report)*
121. Antitumor Activity of Water Extract of a Mushroom, Inonotus Obliquus, Against Ht-29 Human Colon Cancer Cells.
122. Continuous Intake of the Chaga Mushroom (Inonotus Obliquus) Aqueous Extract Suppresses Cancer Progression and Maintains Body Temperature in Mice.
123. Ergosterol Peroxide from Chaga Mushroom (Inonotus obliquus) Exhibits Anti-cancer Activity by Down-regulation of the β-catenin Pathway in Colorectal Cancer.
124. Composition and Biological Activity of Triterpenes and Steroids from Inonotus Obliquus (Chaga)].

125. Hepatoprotective Activity of Water Extracts from Chaga Medicinal Mushroom, Inonotus obliquus (Higher Basidiomycetes) Against Tert-Butyl Hydroperoxide-Induced Oxidative Liver Injury in Primary Cultured Rat Hepatocytes.
126. Ethanol Extract of Innotus Obliquus (Chaga Mushroom) Induces G1 Cell Cycle Arrest in HT-29 Human Colon Cancer Cells.
127. David Winston's Center for Herbal Studies
128. Isolation and Characterization of a Novel Platelet Aggregation Inhibitory Peptide from the Medicinal Mushroom, Inonotus Obliquus.
129. Antihyperglycemic and Antilipidperoxidative Effects of Dry Matter of Culture Broth of Inonotus Obliquus in Submerged Culture on Normal and Alloxan-Diabetes Mice.
130. Chaga Benefits That Are Not Found in Any Other Herb
131. Chaga Mushroom: The Immune-Boosting Superfood
132. Isolation and Characterization of a Novel Platelet Aggregation Inhibitory Peptide from the Medicinal Mushroom, Inonotus Obliquus.
133. Antihyperglycemic and Antilipidperoxidative Effects of Dry Matter of Culture Broth of Inonotus Obliquus in Submerged Culture on Normal and Alloxan-Diabetes Mice.
134. Chaga Benefits That Are Not Found in Any Other Herb
135. Chaga Mushroom: The Immune-Boosting Superfood

Semintha Nutraceuticals Ltd.

Introducing a premier source of Birch Sap located on the North American continent…

Extracting Value from Nature Birch Trees - Non-Timber Resource

Birch Sap is set to be the consumer's health and beauty essential for years to come.

Coconut water has become the go-to health drink that delivers energy-boosting effects without the extra calories or sugar. But the days of the coconut water craze may be limited by a nature-given energy drink: birch tree sap. Medical Daily June 8, 2015

- Birch Sap originates from countries where temperatures reach minus 20-30 degrees Celsius.
- Birch Sap is collected by taking the tree trunk in early spring whenthe birch tree awakes from a deep dormant winter period.
- The sap is super concentrated, vitamin and mineral rich, and contains all the ingredients for the birch tree to burst back into life for the short northern summer.
- Birch sap has a slightly sweet and refreshing taste. Birch sap contains several groups of soluble constituents, including sugars, minerals,organic acid and free amino acids, some of which are bioactive medicinal ingredients, electrolytes.

- It is rich in nutrients including, manganese, iron, calcium, potassium, magnesium, zinc and phosphorous.
- Birch sap has amino acids present, including glutamine, citrulline, glutamic acid, isoleucine, valine and asparagine are present in birch sap. The dominant amino acid, glutamine comprises about 40% of the entirepool.
- Like coconut water, it is believed to be adept at rehydration. What separates it from coconut water is that it also contains saponin which has been shown to control blood cholesterol levels, and to be good for the immunesystem.
- Birch sap is known to help cleanse and remove toxins from the body; it helps nourish the body's cells with organicacids.
- It has been enjoyed for centuries for its purifying, diuretic, and strengthening properties.
- It provides the skin with vitamins and other biologically active substances, such as free amino acids, and valuable sugars to rejuvenate, protect and reduce the signs of aging.

HARMONY

Opportunity

Semintha Nutraceuticals LTD presents nature's "elixir of life." Birch

Sap presents the opportunity for uses in the following product types:

- Cosmetics / Cosmeceuticals
- Functional Beverages
- Functional Food
- Dietary

Supplements

Supporting

Documentation

Attached

product specs.

SEMINTHA BIRCH SAP

CERTIFICATE OF ANALYSIS

Production Date:	2017.05.13	Expiry Date:	2018.05.20
Analysis Date:	2017.05.20	Analysis No.:	B693949
Report Creation Date:	2017.05.20	Last Revision:	2017.07.01

SEMINTHA BIRCH SAP (REVERSE OSMOSIS 90%)		
NUTRITIONAL PARAMETERS		
VITAMIN C	mg/100g	1,970.0
CALCIUM	mg/L	1,110.0
MAGNESIUM	mg/L	320.0
SODIUM	mg/L	251.0
CHLORIDE	mg/L	490.0
IRON	mg/L	2.2
ZINC	mg/L	30.6
PHOSPHORUS	mg/L	60.8
POTASSIUM	mg/L	1,128.0
MANGANESE	mg/L	100.0

Approved by

Tina Sampalis M.D., Ph.D.

9400 Henri Bourassa Blvd. West
St.-Laurent, QC, Canada, H4S 1N8

IMMUNOMODULATING EFFECTS OF CHAGA MUSHROOMS

BIBLIOGRAPHY

Chaga mushroom is considered a natural Biological Response Modifier (BRM) mainly due to its high content of a class of polysaccharides known as Beta-D-Glucans and other key nutrients that help activate an array of immune cells, including lymphocytes, macrophages, and natural killer cells. These cells allow the body to suppress the formation of chronic health conditions like autoimmune disease, allergies, and cancer.

Chaga is a powerful potentiating and immune-enhancing "superfood" with vast potential for the maintenance of a healthy immune system with a vast array of potential benefits in the management of food and asthma allergies, atopic dermatitis, inflammation (including autoimmune inflammatory conditions such as rheumatoid arthritis), atherosclerosis, thrombosis and human immunodeficiency virus (HIV).

1. Int Immunopharmacol. 2018 Jan;54:286-295. doi: 10.1016/j.intimp.2017.11.025.

The mast cell stabilizing activity of Chaga mushroom critical for its therapeutic effect on food allergy is derived from inotodiol.

Nguyet TMN(1), Lomunova M(1), Le BV(2), Lee JS(2), Park SK(3), Kang JS(3), Kim YH(2), Hwang I(4).

While an anti-allergic effect of Chaga mushroom (Inonotus obliquus) has been indicated, its therapeutic effect on allergy and immunoregulatory mechanisms and chemical constituents directly responsible for that are hardly known. We examined the effect of 70% ethanol extract of Chaga mushroom (EE) and its dichloromethane (DF) and aqueous (AF) fractions using a mouse model of chicken ovalbumin (cOVA)-induced food allergy, and found that only EE and DF ameliorated allergy symptoms to a significant extent. The in vivo mast cell-stabilizing activity was also found only in EE and DF whereas the activities to suppress Th2 and Th17 immune responses and cOVA-specific IgE production in the small intestine were observed in all three treatment regimens, implying that inhibition of the mast cell function by lipophilic compounds was vital for the therapeutic effect. Results also indicated that inotodiol, a triterpenoid predominantly present in DF, played an active role as a mast cell stabilizer.

DOI: 10.1016/j.intimp.2017.11.025
PMID: 29175507 [Indexed for MEDLINE]

2. Int J Biol Macromol. 2016 May;86:587-93. doi: 10.1016/j.ijbiomac.2016.01.111.

Investigation of three lignin complexes with antioxidant and immunological capacities from Inonotus obliquus.

Niu H(1), Song D(1), Mu H(1), Zhang W(1), Sun F(1), Duan J(2).

Mushroom Inonotus obliquus (I. obliquus), a folk medicine, has been widely used to treat several human malicious tumors since 16th century. In this study, three homogenous biomolecules (designated IOA1, IOA2 and IOA3) were prepared from the alkali extract of I. obliquus. Their molecular weights were measured to be 6.1 × 10(4), 2.9 × 10(4) and 3.5 × 10(4) g/mol respectively and all of them were characterized as lignin-carbohydrate complexes mainly comprised lignin as well as ~25% carbohydrates. Antioxidant assays indicated that all of them exhibited pronounced reductive power and strong scavenging activities on DPPH and hydroxyl radicals in vitro. Immunological tests showed that they

could also significantly stimulate nitric oxide production and phagocytic activity in RAW 264.7 macrophages. These results implied that the lignin-carbohydrate complexes extracted from I. obliquus might be used as novel natural antioxidants or immunostimulants in functional foods or pharmaceutical candidates.

DOI: 10.1016/j.ijbiomac.2016.01.111
PMID: 26845476 [Indexed for MEDLINE]

3. Food Chem Toxicol. 2017 Oct;108(Pt B):498-509. doi: 10.1016/j.fct.2017.01.007.

Anti-diabetic effects of Inonotus obliquus polysaccharides-chromium (III) complex in type 2 diabetic mice and its sub-acute toxicity evaluation in normal mice.

Wang C(1), Chen Z(1), Pan Y(1), Gao X(1), Chen H(2).

Polysaccharides are important bioactive ingredients from Inonotus obliquus. This study aimed to synthesize and characterize a novel I. obliquus polysaccharides-chromium (III) complex (UIOPC) and investigate the anti-diabetic effects in streptozotocin (STZ) induced type 2 diabetes mellitus (T2DM) mice and sub-acute toxicity in normal mice. The molecular weight of UIOPC was about 11.5 × 10 4 Da with the chromium content was 13.01% and the chromium was linked with polysaccharides through coordination bond. After treatment of UIOPC for four weeks, the body weight, fasting blood glucose (FBG) levels, plasma insulin levels of the diabetic mice were significantly reduced when compared with those of the diabetic mice ($p < 0.05$). The results on serum profiles and antioxidant enzymes activities revealed that UIOPC had a positive effect on hypoglycemic and antioxidant ability. Histopathology results showed that UIOPC could effectively alleviate the STZ-lesioned tissues in diabetic mice. Furthermore, high dose administration of UIOPC had no obviously influence on serum profiles levels and antioxidant ability of the normal mice and the organ tissues maintained organized and integrity in the sub-acute toxicity study. These results suggested that UIOPC might be a good candidate for the functional food or pharmaceuticals in the treatment of T2DM.

DOI: 10.1016/j.fct.2017.01.007
PMID: 28087233 [Indexed for MEDLINE]

4. Int Immunopharmacol. 2014 Aug;21(2):269-78. doi: 10.1016/j.intimp.2014.05.015.

Polysaccharides from Inonotus obliquus sclerotia and cultured mycelia stimulate cytokine production of human peripheral blood mononuclear cells in vitro and their chemical characterization.

Xu X(1), Li J(2), Hu Y(2).

Inonotus obliquus is an edible and medicinal mushroom to treat many diseases. In the present study, polysaccharides and fractions were isolated and purified by DEAE-52 and Sephadex G-200 chromatography from I. obliquus wild sclerotia, culture broth and cultured mycelia under submerged fermentation. The extracts and fractions could significantly induce the secretion of TNF-α, IFN-γ, IL-1β, and IL-2 in human peripheral blood mononuclear cells (PBMCs) and showed no toxicity to PBMCs. The stimulation effect of the six extracts and eight fractions on the four-cytokine production was dose-dependent. Sclerotial polysaccharides were more effective in the four-cytokine production at 150 μg/ml while exopolysaccharides and endopolysacchrides showed a much better effect on IL-1β production at 30 μg/ml. Purified fractions from exopolysaccharides and endopolysaccharides were more effective than the fraction from sclerotia in most cytokine production. These

heteropolysaccharide-protein conjugates mainly contained glucose, galactose, and mannose. Protein content, molecular weight, monosaccharide molar ratio, and anomeric carbon configuration differed from each other and had effects on the cytokine induction activity of the polysaccharides to some extent.

DOI: 10.1016/j.intimp.2014.05.015
PMID: 24867795 [Indexed for MEDLINE]

5. Food Chem. 2013 Aug 15;139(1-4):503-8. doi: 10.1016/j.foodchem.2013.01.030.

Anti-inflammatory and anticancer activities of extracts and compounds from the mushroom Inonotus obliquus.

Ma L(1), Chen H, Dong P, Lu X.

Mushroom Inonotus obliquus (I. obliquus) has been used as functional food and traditional Chinese herbs for long time. An efficient method for bioassay-guided preparative isolation was used for identifying the anti-inflammatory and anticancer constituents in I. obliquus. The petroleum ether and ethyl acetate fractions were found to have significant inhibition effects on NO production and NF-κB luciferase activity in macrophage RAW 264.7 cells and cytotoxicity against human prostatic carcinoma cell PC3 and breast carcinoma cell MDA-MB-231. Six main constituents were isolated from these two fractions and they were identified as lanosterol (1), 3β-hydroxy-8,24-dien-21-al (2), ergosterol (3), inotodiol (4), ergosterol peroxide (5) and trametenolic acid (6). Compound ergosterol, ergosterol peroxide and trametenolic acid showed anti-inflammatory activities and ergosterol peroxide and trametenolic acid showed obviously cytotoxicity on human prostatic carcinoma cell PC3 and breast carcinoma MDA-MB-231 cell. The results obtained in this work might contribute to understanding the biological activity of mushroom I. obliquus for food and drug application.

DOI: 10.1016/j.foodchem.2013.01.030
PMID: 23561137 [Indexed for MEDLINE]

6. Int Immunopharmacol. 2013 Apr;15(4):666-70. doi: 10.1016/j.intimp.2013.03.015.

Inhibitory effect of chaga mushroom extract on compound 48/80-induced anaphylactic shock and IgE production in mice.

Yoon TJ(1), Lee SJ, Kim EY, Cho EH, Kang TB, Yu KW, Suh HJ.

Chaga mushrooms (Inonotus obliquus) are hypothesized to exhibit general immune-potentiating, anti-inflammatory, and antitumor properties, but their anti-allergic activities are not fully understood. Therefore, this study investigated whether a chaga mushroom extract (C-HE) might have anti-allergic activity. This activity was assessed through the levels of the IgE Ab produced in response to an allergen (OVA). The administration of C-HE prophylactically inhibited the systemic anaphylactic shock induced by compound 48/80 in mice. The oral administration of C-HE significantly reduced the total IgE levels in mice and slightly affected the production of IgG1. Furthermore, spleen cell cultures harvested from OVA-sensitised mice that had received C-HE orally showed a significant increase in Th1-derived responses (IFN-γ production). Therefore, our results suggest that the chaga mushroom extract may be used as an anti-allergic functional food.

DOI: 10.1016/j.intimp.2013.03.015
PMID: 23535020 [Indexed for MEDLINE]

7. Fish Shellfish Immunol. 2012 Jun;32(6):1148-54. doi: 10.1016/j.fsi.2012.03.021.

Inonotus obliquus containing diet enhances the innate immune mechanism and disease resistance in olive flounder Paralichythys olivaceus against Uronema marinum.

Harikrishnan R(1), Balasundaram C, Heo MS.

The present study describes the effect of diet supplementation with Chaga mushroom, Inonotus obliquus extract at 0%, 0.01%, 0.1%, and 1.0% levels on the innate humoral (lysozyme, antiprotease, and complement), cellular responses (production of reactive oxygen and nitrogen species and myeloperoxidase), and disease resistance in olive flounder, Paralichythys olivaceus against Uronema marinum. The lysozyme activity and complement activity significantly increased in each diet on weeks 2 and 4 against pathogen. The serum antiprotease activity and reactive nitrogen intermediates production significantly increased in fish fed with 0.1% and 1.0% diets from weeks 1-4. However, reactive oxygen species production and myeloperoxidase activity significantly increased in 1.0% and 2.0% diets on weeks 2 and 4. In fish fed with 0.1% and 1.0% diets and challenged with U. marinum the cumulative mortality was 50% and 40% while in 0% and 0.01% diets the mortality was 85% and 55%. The results clearly indicate that supplementation diet with I. obliquus at 0.1% and 1.0% level positively enhance the immune system and confer disease resistance which may be potentially used as an immunoprophylactic in finfish culture.

DOI: 10.1016/j.fsi.2012.03.021
PMID: 22484608 [Indexed for MEDLINE]

8. J Ethnopharmacol. 2011 Oct 11;137(3):1077-82. doi: 10.1016/j.jep.2011.07.024.

Inonotus obliquus extracts suppress antigen-specific IgE production through the modulation of Th1/Th2 cytokines in ovalbumin-sensitized mice.

Ko SK(1), Jin M, Pyo MY.

ETHNOPHARMACOLOGICAL RELEVANCE: Chaga mushroom (Inonotus obliquus, IO) has been used as a folk remedy for cancer, digestive system diseases, and other illnesses in Russia and Eastern Europe.
AIM OF THE STUDY: In the present study, we investigated the immunomodulating effects of IO through in vivo and ex vivo studies.
MATERIALS AND METHODS: Serum immunoglobulins (IgE, IgG(1), and IgG(2a)) and cytokines (interleukin (IL)-4, interferon (IFN)-γ, and IL-2) were measured in concanavalin A (ConA)-stimulated splenocytes and CD4(+) T cells. The nitric oxide (NO) secretion of lipopolysaccharide (LPS)-stimulated peritoneal macrophages was also measured after oral administration of 50, 100, or 200 mg kg(-1) d(-1) IO hot water extract (IOE) to ovalbumin (OVA)-sensitized BALB/c mice.
RESULTS: We found that the OVA-induced increase in serum IgE and IgG(2a) was significantly suppressed when IOE was orally administered after the second immunization with OVA. ConA stimulation in spleen cells isolated from OVA-sensitized mice treated with 100 mg kg(-1) IOE resulted in a 25.2% decrease in IL-4 production and a 102.4% increase in IFN-γ, compared to the controls. Moreover, IL-4, IFN-γ, and IL-2 were significantly reduced after ConA stimulation in isolated CD4(+)T cells. We also determined that IOE inhibits the secretion of NO from LPS-stimulated peritoneal macrophages ex vivo.
CONCLUSIONS: We suggest that IO modulates immune responses through secretion of Th1/Th2 cytokines in immune cells and regulates antigen-specific antibody production.

DOI: 10.1016/j.jep.2011.07.024 PMID: 21820502 [Indexed for MEDLINE]

9. Mol Cells. 2011 Feb;31(2):165-73. doi: 10.1007/s10059-011-0022-x.

Immunostimulating activity by polysaccharides isolated from fruiting body of Inonotus obliquus.

Won DP(1), Lee JS, Kwon DS, Lee KE, Shin WC, Hong EK.

In this study, we investigated the immunostimulating activity of polysaccharides isolated from fruiting body of Inonotus obliquus (PFIO). Additionally, the signaling pathway of PFIO-mediated macrophage activation was investigated in RAW264.7 macrophage cells. We found that PFIO was capable of promoting NO/ROS production, TNF-α secretion and phagocytic uptake in macrophages, as well as cell proliferation, comitogenic effect and IFN-γ/IL-4 secretion in mouse splenocytes. PFIO was able to induce the phosphorylation of three MAPKs as well as the nuclear translocation of NF-κB, resulting in activation of RAW264.7 macrophages. PFIO also induced the inhibition of TNF-α secretion by anti-TLR2 mAb, consequently, PFIO might be involved in TNF-α secretion via the TLR2 receptor. In addition, our results showed that oral administration of PFIO suppressed in vivo growth of melanoma tumor in tumorbearing mice. In conclusion, our experiments presented that PFIO effectively promotes macrophage activation through the MAPK and NF-Kb signaling pathways, suggesting that PFIO may potentially regulate the immune response.

DOI: 10.1007/s10059-011-0022-x
PMCID: PMC3932689
PMID: 21191814 [Indexed for MEDLINE]

10. J Ethnopharmacol. 2009 Sep 25;125(3):487-93. doi: 10.1016/j.jep.2009.06.026.

Anti-inflammatory effect of Inonotus obliquus, Polygala senega L., and Viburnum trilobum in a cell screening assay.

Van Q(1), Nayak BN, Reimer M, Jones PJ, Fulcher RG, Rempel CB.

AIM OF THE STUDY: The purpose of the study was to assess the anti-inflammatory effects of the mushroom Inonotus obliquus (Chaga), Polygala senega (Senega) and Viburnum trilobum (Cranberry) bark extract fractions from locally produced materials in lipopolysaccharide (LPS) induced murine macrophage RAW 164.7 cells.
MATERIALS AND METHODS: Four fractions from each of the three extracts were obtained: (80% ethanol extracted; Fa), (water-soluble polysaccharide fraction; Fb), (Polyphenolic fraction; Fc) and (ETOAc/H(2)O extracted fraction; Fd). These extract fractions were tested in the cell screening system at 50,100 and 500 microg/ml for their ability to inhibit LPS induced inflammatory cytokines IL-1beta, TNFalpha and IL-6. Supernatants from LPS alone treated cells were used as control. The cytokines in the cell culture supernatants following treatments with extract fractions were quantified by ELISA method, using 96 well ELISA plates.
RESULTS: All fractions of the extracts significantly inhibited ($p<0.05$) the levels of IL-1beta, IL-6 and TNFalpha except the polyphenolic Fc fraction of Senega which showed an increased production of IL-6. Furthermore, each fraction showed a dose-dependant anti-inflammatory effect. Nitric oxide production was not affected by cranberry and senega, while Chaga significantly reduced NO production in murine macrophage cell assay.
CONCLUSIONS: These results demonstrate that the extracts obtained from the root of Polygala senega L., bark of Viburnum trilobum, and the mushroom Inonotus obliquus possess anti-inflammatory properties when tested in a RAW 264.7 macrophage cell system.

DOI: 10.1016/j.jep.2009.06.026
PMID: 19577624 [Indexed for MEDLINE]

11. Life Sci. 2005 Sep 23;77(19):2438-56.

Immuno-stimulating effect of the endo-polysaccharide produced by submerged culture of Inonotus obliquus.

Kim YO(1), Han SB, Lee HW, Ahn HJ, Yoon YD, Jung JK, Kim HM, Shin CS.

Inonotus obliquus BELYU1102 was selected from 12 different strains of Inonotus as a producer of immuno-stimulating polysaccharide. After a batch fermentation of I. obliquus BELYU1102 was carried out in a 300 l pilot vessel, endo-polysaccharide and exo-polysaccharide were both obtained. The proliferation activity of endo-polysaccharide for splenic cells was much higher than the activity of exo-polysaccharide. The active endo-polysaccharide was produced primarily during the late stationary phase. Enhanced proliferation and polyclonal IgM antibody production were observed in B cells by purified water-soluble endo-polysaccharide. Nitrite production and expression of IL-1beta, IL-6, TNF-alpha, and iNOS in macrophages were also enhanced. However, the endo-polysaccharide did not affect the proliferation of T cells, the IL-2 expression of Th1 cells, or the IL-4 expression of Th2 cells. The endo-polysaccharide showed activities similar to lipopolysaccharide (LPS) for B cells and macrophages, but there was a large difference between the two polysaccharides because cellular activations induced by endo-polysaccharide were not affected by polymyxin B, a specific inhibitor of LPS. The endo-polysaccharide appeared to have other cellular binding sites with TLR-4 and did not show a direct toxicity against tumor cells. However, indirect anti-cancer effects via immuno-stimulation were observed. The mycelial endo-polysaccharide of I. obliquus is a candidate for use as an immune response modifier. Submerged mycelial cultures are advantageous for industrial production of polysaccharides.

DOI: 10.1016/j.lfs.2005.02.023
PMID: 15970296 [Indexed for MEDLINE]

12. Biofactors. 2004;21(1-4):109-12.

Chaga mushroom extract inhibits oxidative DNA damage in human lymphocytes as assessed by comet assay.

Park YK(1), Lee HB, Jeon EJ, Jung HS, Kang MH.

The Chaga mushroom (Inonotus obliquus) is claimed to have beneficial properties for human health, such as anti-bacterial, anti-allergic, anti-inflammatory and antioxidant activities. The antioxidant effects of the mushroom may be partly explained by protection of cell components against free radicals. We evaluated the effect of aqueous Chaga mushroom extracts for their potential for protecting against oxidative damage to DNA in human lymphocytes. Cells were pretreated with various concentrations (10, 50, 100 and 500 microg/mL) of the extract for 1 h at 37 degrees C. Cells were then treated with 100 microM of H2O2 for 5 min as an oxidative stress. Evaluation of oxidative damage was performed using single-cell gel electrophoresis for DNA fragmentation (Comet assay). Using image analysis, the degree of DNA damage was evaluated as the DNA tail moment. Cells pretreated with Chaga extract showed over 40% reduction in DNA fragmentation compared with the positive control (100 micromol H2O2 treatment). Thus, Chaga mushroom treatment affords cellular protection against endogenous DNA damage produced by H2O2.

PMID: 15630179 [Indexed for MEDLINE]