



Medicinal Mushrooms

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Literature Education Series On Dietary Supplements

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Edible mushroom extracts, especially those used in Chinese and Japanese natural medicines (*Cordyceps sinensis*, *Agaricus blazei*, *Grifola frondosa*, *Trametes versicolor* and *Ganoderma lucidum*), are a rich source of naturally occurring polysaccharides; especially beta glucans. These polysaccharides in the aforementioned mushrooms can directly stimulate immune reactions by primarily modulating immune responsive cytokines such as IL-1, IL-2, IL-6 and INF-gamma.^{1 2 3 4 5 6 7 8} This article will discuss the various health properties of these medicinal mushrooms.

Cordyceps sinensis

Endurance properties

In April of 1993, eight Chinese women runners broke 2:27 in the Tianjin (China) Marathon, by far the greatest on-nation showing ever for 26.2 miles. In August, Chinese women won every track distance event in the Stuttgart World Championships. They easily took first in the 1500, 1-2-3 in the 3000 and 1-2 in the 10,000. In September, Chinese women ran their most astonishing race yet, demolishing the world records for 1500, 3000 and 10,000 meters in their National Games in Beijing. Almost overnight, they became by far the greatest female distance runners the world has every seen.⁹

How did these Chinese runners achieve these incredible records—new and improved training techniques, dedication, etc? Certainly these were important factors, but there was one other vital factor: *Cordyceps sinensis*. The winning Chinese distance runners trained on a diet that included Cordyceps.¹⁰

Cordyceps history

Cordyceps is a mushroom found on the high plateaus of western China. Cordyceps' Mandarin name, *dong chong zia cao*, literally means "winter bug, summer herb. This accurately describes the fact that the worm dies in the summer, and a mushroom grows on it. It was discovered 1,500 years ago when Tibetan herdsman found that their yaks were much livelier after eating this worm-mushroom from mountain pastures.¹¹ Eventually, Cordyceps found its way into the hands of the Emperor's physicians who considered it to have ginseng-like properties.¹²

Clinical trials

There are some clinical trials supporting the efficacy of cordyceps, particularly for liver, kidney, and immune problems. A number of studies indicate that cordyceps may have anti-cancer, anti-metastatic, immuno-enhancing, and antioxidant effects.^{13 14 15 16 17}

Agaricus blazei

Background

Agaricus blazei ("Kawariharatake" in Japan, "Cogmelo de Deus" in Brazil) was first discovered in Florida, USA, in 1944. Its main natural habitat is the mountainous district of Piedade in Sao Paulo, Brazil. It was found that the rate of occurrence of adult diseases in the Piedade region is extremely low since people

took *A. blazei* as a part of their regular diet. The mushroom was brought to Japan in 1965. An artificial cultivation process was established in 1978, and since then this mushroom has been well evaluated in terms of biochemical and medicinal properties.¹⁸

Many animal studies and clinical experience have demonstrated that *A. blazei* shows antitumor activity, immunological enhancement, and also the fungus is effective for treatment of AIDS, diabetes, hypotension, and hepatitis.¹⁹

Grifola frondosa

Background

Grifola frondosa, commonly known as maitake, is a mushroom which is famous for its taste and health benefits. It is also known as the “dancing mushroom”; since legend holds that those who found it began dancing with joy.²⁰

In any case maitake has been used historically as a tonic and adaptogen; that is a substance that invigorates/strengthens the system and helps it adapt to stress. Along with other “medicinal” mushrooms, such as shiitake and reishi, maitake is used as a food to help promote wellness and vitality.

An immunomodulator

Maitake contains complex polysaccharides which act as immunomodulators, helping to support immune system function. The polysaccharides present in maitake have a unique structure and are among the most powerful studied in test tubes to date.²¹ The primary polysaccharide, beta-D-glucan, is well absorbed when taken orally and is being studied as a potential tool for prevention and treatment of cancer and as an adjunctive treatment for HIV infection.^{22 23}

Serum lipids

Animal studies suggest maitake may also lower serum cholesterol and triglyceride levels.^{24 25}

Obesity

Japanese scientists undertook an *in vitro* experiment to see what effect maitake had on the $C_3H_{10}T_{1/2}B_2C_1$ cell. This cell is normal in most aspects, but it has the potential to balloon and turn into an adipocyte, a fat cell. The results of the experiment showed that maitake inhibits the

conversion of normal $C_3H_{10}T_{1/2}B_2C_1$ cells into adipocytes.²⁶ The question, of course, is will this inhibition process actually translate into beneficial results in overweight individuals. In at least one human study, this does seem to have been the case.

Thirty-two overweight subjects were given 10 grams of maitake powder for two months. Without changing their diets, all subjects lost an average of 12 pounds.²⁷

Trametes versicolor

The mushroom *Trametes versicolor* (also known as *Coriolus versicolor*), and its components, have been shown to affect the immune system of the host (i.e., an immunomodulator) and therefore some researchers have suggested it could be used to treat a variety of disease states.²⁸

For example, in one cell line study a *Trametes* extract was considered to have promise as an adjuvant therapy in the treatment of hormone responsive prostate cancer; and to have chemopreventive potential to restrict prostate tumorigenic progression from the hormone-dependent to the hormone-refractory state.²⁹

These results make sense when considering the fact that *Trametes versicolor* has the distinction of being the mushroom from which one of the world’s leading anticancer drugs is derived. The drug is called Krestin. Although Krestin has not been approved for use by the United States’ F.D.A, it was the best-selling anticancer drug in Japan for much of the 1980s, with sales toping \$500 million annually. Krestin was the first mushroom-derived anticancer drug to be approved by the Japanese government’s Healthy and Welfare Ministry, the equivalent of the F.D.A. All healthcare plans in Japan cover members’ purchases of Krestin.³⁰

In addition, *Trametes versicolor* has demonstrated activity against the pathogenic microorganism *Plasmodium falciparum*.³¹

Ganoderma lucidum

Background

Ganoderma lucidum, commonly known as reishi mushrooms, grow wild on decaying logs and tree stumps in the coastal provinces of China.³²

Reishi has been used in Traditional Chinese Medicine for at least 2,000 years.³³ The Chinese name *ling zhi* translates as the “herb of spiritual potency” and was highly prized as an elixir of immortality.³⁴ Its Traditional Chinese Medicine indications include treatment of general fatigue and weakness, asthma, insomnia, and cough.³⁵

Cardiovascular benefits

Reishi contains several major constituents which may lower blood pressure as well as decrease LDL cholesterol. These constituents also help reduce blood platelets from sticking together—an important factor in lowering the risk for coronary artery disease. Two controlled clinical trials have investigated the effects of reishi on high blood pressure in humans and both found it could lower blood pressure significantly compared to a placebo or controls.^{36 37} The people with hypertension in the second study had previously not responded to medications, though these were continued during the study.

Other benefits

Some human research has been reported that demonstrates some efficacy for the herb in treating altitude sickness and chronic hepatitis B. Nonetheless, these uses still need to be confirmed in well-designed human trials.³⁸

Animal studies and some very preliminary trials in humans suggest reishi may have some beneficial action in people with diabetes mellitus and cancer.³⁹

Another study found that the body weight of rats fed with soybean paste containing reishi were significantly lower than the control group whereas, there was no significant difference in body weight in groups of rats fed soybean paste with the mushrooms *Phellinus linteus* or *Cordyceps militaris*.⁴⁰

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