

Effective Natural Products BioChaga and BioDihydroquercetin to Safe Assistance to the Body at all Stages of COVID-19 Viral Infection

O Usolceva*

Irkutsk State Medical University, Russia

***Corresponding Author:** O Usolceva, Irkutsk State Medical University, Russia.

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The rapid outbreak of coronavirus infection is a global public health problem worldwide. In a pandemic, the issue of creating effective antiviral drugs for the treatment of a new coronavirus infection is most acute. The issue of prevention is also acute. Each of us would like to know what he can do to protect his body from the threat of coronavirus infection. So far, effective treatments have not yet been developed. The scarcity of clinically proven drugs has contributed to the fact that natural products have received increasing attention due to their low toxicity and lack of side effects.

Medicinal plants synthesize a large number of various biologically active substances (BAS), on the basis of which medicines and biologically active supplements are produced. These biologically active substances have multiple effects on various organs and systems of the human body [9,10]. BAS isolated from plants are used mainly in the form of extracts, which are presented as drugs or biologically active additives (BAA). The quality of medicines and dietary supplements from plant materials is influenced by 2 factors: the quality of the original plant material and the technology of its processing. Today, it is said much about the need to use zinc, calcium, vitamin D, vitamin C, for prevention and during covid infection. However, it is worth paying attention to two more natural products that have a fairly extensive evidence base for use in coronavirus infection. These natural remedies are dihydroquercetin, which is extracted from Siberian larch wood, and chaga birch fungus. Dihydroquercetin is a natural product that belongs to flavonoids. In its structure and functions, it is close to

quercetin, but it has a more powerful effect, due to the presence of only two additional hydrogen atoms in it. Dihydroquercetin is the most powerful antioxidant of the new generation.

There are many dietary supplements based on dihydroquercetin on the market today. One of them is BioDihydroquercetin, which is produced by the Irkutsk company SibPribor llc under the trademark "Baikal Legend". This dihydroquercetin is distinguished by a special production technology. BioDihydroquercetin consists of 100% active substance with a purity of 99.2% and is presented in the form of a super-light powder, which is well absorbed by the body and has high efficiency and safety. The use of BioDihydroquercetin is effective at all stages of the spread of a viral infection: prevention, the height of the disease, as an aid, and the recovery period. Dihydroquercetin is a well-known plant flavonoid whose antiviral properties have long been confirmed by numerous studies. The mechanism of the antiviral action of dihydroquercetin is not yet fully understood. It is assumed that its effectiveness is associated with an increase in the activity of interleukins and interferons, which act through the activation of the lymphocyte link [1].

In addition, there is evidence that dihydroquercetin inhibits the production of prostaglandin PGE2, which reduces the body's defenses and allows the virus to spread freely in the body [4]. Dihydroquercetin also has a membrane-stabilizing effect, which makes it difficult for the virus to penetrate into the cell. Since the virus is an intracellular parasite and can only develop inside the cell, this fact is a deterrent to the development of a viral infection

[3]. A study conducted at the Infectious Diseases Department of Wuhan University Tongren Hospital on 57 patients hospitalized with COVID-19 (January 20, 2020 to March 26, 2020) showed that dihydroquercetin was used to treat pneumonia caused by a new type of coronavirus, it is possible to reduce the time for determining a positive reaction to a viral nucleic acid (positive PCR test), accelerate the resolution of inflammation in the lungs and reduce the time of hospitalization.

The membrane-stabilizing effect of dihydroquercetin and its redox properties also contribute to the effective functioning of tissue respiration enzymes. Dihydroquercetin helps to increase the oxygen and energy supply of cells, blocks the removal of charge from erythrocytes, thereby preventing their adhesion and the formation of blood clots. The antiplatelet properties of dihydroquercetin are widely known [6,7]. It was shown in [8] that dihydroquercetin can dose-dependently suppress the aggregation of platelets activated by various inducers. The second effective natural product is chaga birch mushroom. Chaga also makes it difficult for the virus to enter the cell, due to three main mechanisms: the difficulty of adsorption (adhesion) of viral particles to the cell surface, suppression of the formation of viral enzymes that are necessary for the introduction of viral particles into the cell, and slowing down the replication (multiplication) of the virus. In addition, chaga also has a positive effect on the nonspecific immune response against many infectious agents, including the COVID-19 pathogen.

In the laboratory of mycology of the State Scientific Center for Virology and Biotechnology "Vector" of Rospotrebnadzor (Koltcovo, NSO), since March 2020, a study was conducted on the effectiveness of chaga in combating SARS-CoV-2, the causative agent of COVID-19. In the department "Collection of Microorganisms" SSC VB "Vector" virologists under the guidance of Ph.D. O. V. Pyankova studied the antiviral activity of aqueous extracts of pharmacy chaga against the SARS-CoV-2 coronavirus, where it was shown that an aqueous infusion of chaga inhibits the replication of the virus and makes it difficult for it to penetrate into healthy cells [5]. Specialists of the Vector Center for Virology are already recommending that patients with COVID-19 take concentrated water extracts of chaga in parallel with the therapy prescribed by doctor. One of these extracts is BioChaga, which, like BioDihydroquercetin, is produced by the Irkutsk company SibPriboir LLC under the "Baikal Legend"

trademark. To obtain an extract, the manufacturer uses his own method, which allows you to preserve all the biologically active substances (BAS) of the fungus as much as possible and present them in a form that is easily accessible to the body.

BioChaga is produced from environmentally friendly raw material of Baikal region rich in biologically active substances. The origin of chaga provides BioChaga with ecological cleanliness and high efficiency, which is greatly enhanced thanks to the author's technology for its production. The uniqueness of the production technology lies in the use of low temperatures, which makes it possible to preserve the main active ingredients of the mushroom and concentrate them. Thus, a highly concentrated chaga extract is obtained, which is 100% composed of the active components of the birch mushroom and is well absorbed by the body. BioChaga and BioDihydroquercetin can be effectively used at the recovery stage after a coronavirus infection. According to the WHO international classification, post-covid syndrome is classified as a "disease of the nervous system".

Post-covid syndrome is a new symptom complex that arose with the advent of a new coronavirus infection and is put forward as a diagnosis if the clinical symptoms last more than 12 weeks. It does not develop for everyone. According to statistics, 10-20% of people who have recovered from COVID-19 experience signs of post-COVID syndrome. It is known that COVID-19 primarily affects the vessels and causes the development of chronic thrombovascular disease. Covid thrombovasculitis mainly affects the nervous system (central, peripheral, vegetative), less often lungs, kidneys, skin.

The main manifestations of post-covid syndrome are still neurological symptoms:

- asthenia
- decreased tone
- Decreased concentration of attention
- Dizziness
- Sleep disorders (drowsiness, insomnia)
- Loss of smell
- Alternating fever and chills
- Increased blood pressure.

BioDihydroquercetin restores blood vessels throughout the body due to its anti-inflammatory and antiplatelet action, preventing thrombosis and restoring blood viscosity. BioChaga, due to its pronounced antioxidant and antiradical action, detoxifies the body, which has undergone massive toxic effects during the illness. The manufacturer of BioChaga and BioDihydroquercetin SibPribor llc conducted an experimental study of the combined use of BioChaga and BioDihydroquercetin on the basis of the Siberian Branch of the Russian Academy of Sciences, Institute of General and Experimental Biology, where the mutually potentiating effect of these products was shown at a concentration of 50 to 50.

Based on the above, the following conclusions can be drawn:

- The use of dietary supplements BioChaga and BioDihydroquercetin for coronavirus infection is scientifically justified.
- The combined use of BioChaga and BioDihydroquercetin is preferable, since the effectiveness of both products is mutually enhanced. The study shows the mutual potentiating effect of these products.
- The use of BioChaga and BioDihydroquercetin is an effective and safe way at all stages of coronavirus infection: prevention, auxiliary treatment, recovery.

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