

Lion's Mane (*Hericium erinaceus*) : It's Health Benefits

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ARTICLE ID: 027

Mushrooms have been examined by the food and pharmaceutical industry as a source of medicinal compounds including phenolics, terpenes, tocopherols and polysaccharides. Edible mushrooms and fungi are a valuable source of nutrients and bioactive compounds. Recently, edible mushrooms have become increasingly attractive as functional food due to their potential beneficial effects on human health including anti-oxidant, anti-cancer, prebiotic, immunomodulating, anti-inflammatory, cardiovascular, anti-microbial and antihypercholesterolemia effects. Having such a repertoire of bioactive compounds, mushroom fungi has great potential to provide lead compounds for the pharmaceutical industry.

Lion's mane mushroom, also called Monkey head, is an edible and medicinal mushroom belonging to the class Basidiomycetes, subclass Holobasidiomycetidae, order Hericiales, family Hericiaceae. Lion's mane mushroom is native to North America, Europe and Asia. *Hericium erinaceus* are considered as source of beneficial medicines properties having nutritional functional foods. It is usually containing health-promoting compounds and a good source of nutrients (Feeney, 2014, Dwyer, 2014). It occupies central dead wood of large trees, branches of dead or living tree and fallen broad leaves trees such as walnut, oak and beech. Naturally these are old pollards or developed trees with spread crowns, but it also fruits rarely on injured or damaged younger trees. The fruit body of Lion's mane (*Hericium erinaceus*) is enormous, unevenly bulbous, compact snowy to creamy mass and width ranges from 5 to 40 cm. It includes few determined basal branches and is continuously govern by rubbery, hanging, spore-producing spines having size of 10 to 40mm. The fruit body becomes yellow to brown through maturity. The hyphae are thin to thick walled around 3-15µm wide.

Nutritional Uses:

Lion's mane (*Hericium erinaceus*) is composed of valuable constituents such as protein (42.5%), carbohydrates (60.95%), crude fiber (7.81%), low fats (7.9%), ash (8.9%) and amino acids. There are 17 different amino acids are presents in the mycelium and fruiting body of (*Hericium erinaceus*) (Egwim *et al.*, 2011). The vital amino acids available are threonine, methionine, valine, histidine, isoleucine, arginine, leucine, phenylalanine and lysine whereas; non-essential amino acid includes cysteic acid, tyrosine, alanine, glutamic acid, aspartic acid, serine, proline, and glycine. It also contains variable amount of minerals i.e. sodium (157mg), potassium (29163mg), phosphorus (6121mg), zinc (59mg), magnesium (1166mg), copper (13mg), manganese (11mg) and calcium (395mg) (Nachshol *et al.*, 2014).

Medicinal Uses:

Hericium erinaceus also have a vital role in curing tumor, wounds, interventions, Inflammation, gastric ailments, immunology, colon, skin diseases, respiratory failure, alzheimer disease and boosting of immune system (Ulziijargal *et al.*, 2011). Likely maximum medicinal mushrooms Lion's mane seems to have bioactive compounds such as polysaccharides, phenolic acids (Gallic, p-coumaric acids and p-hydroxybenzoic), Tocopherols (a-tocopherol, b-tocopherol, dtocopherol, g-tocopherol, oxalic acid, malic acid and fumeric acid) and organic acids which regulate several metabolic (Wang *et al.*, 2005). There are several polysaccharides extracted from fruit body such as galactoxyloglucans, heteroxyloglucans, xylans and glucoxylans. Whereas, β -1, 3-glucan and β -1, 3- branched glucan with a molecular mass of 13kDa are responsible for activation of macrophages in immune system.



Fig 1: *Hericium erinaceus* in wild form

Health Benefits:

1) **Protect against dementia**

The brain's ability to grow and form new connections typically declines with age, lion's mane mushrooms contain two special compounds (hericenones and erinacines) that can stimulate the growth of brain cells and its extracts have been shown to reduce symptoms of memory loss in mice, as well as prevent neuronal damage caused by amyloid-beta plaques, which accumulate in the brain during Alzheimer's disease.



Fig 2: *Hericium erinaceus* in polybags (Cultivated form)

2) **Helps relieve mild symptoms of depression and anxiety**

Lion's mane mushroom extract has anti-inflammatory effects that can reduce symptoms of anxiety and depression. Up to one-third of people living in developed countries experience symptoms of anxiety and depression.

3) **May speed recovery from nervous system injuries**

The nervous system consists of the brain, spinal cord and other nerves that travel throughout the body. These components work together to send and transmit signals that control almost every bodily function. Injuries to the brain or spinal cord can be devastating. They often cause paralysis or loss of mental functions and can take a long time to heal. However, research has found that lion's mane mushroom extract may help speed recovery from these types of injuries by stimulating the growth and repair of nerve cells

4) **Protect development of ulcers in the digestive tract**

Ulcers are capable of forming anywhere along the digestive tract, including the stomach, small intestine and large intestine. Stomach ulcers are often caused by two major factors:

overgrowth of a bacteria called *H. pylori* and damage to the mucous layer of the stomach that's often due to long-term use of non-steroidal anti-inflammatory drugs (NSAIDs). Lion's mane extract may protect against the development of stomach ulcers by inhibiting the growth of *H. pylori* and protecting the stomach lining from damage and extract of this mushroom can also reduce inflammation and prevent tissue damage in other areas of the intestines. In fact, they may help treat inflammatory bowel diseases like ulcerative colitis and Crohn's diseases

5) Reduces Heart Disease Risk

Major risk factors for heart disease include obesity, high triglycerides, large amounts of oxidized cholesterol and an increased tendency to get blood clots and Lion's mane mushrooms appear to benefit the heart and blood vessels in multiple ways.

6) Helps manage diabetes symptoms

Diabetes is a disease that occurs when the body loses the ability to control blood sugar levels. Chronically high blood sugar levels eventually cause complications like kidney disease, nerve damage in the hands and feet and vision loss. This mushroom may be beneficial for diabetes management by improving blood sugar control and reducing some of these side effects. In addition to lowering blood sugars, lion's mane extract may reduce diabetic nerve pain in the hands and feet.

7) May help fight cancer

Cancer occurs when DNA becomes damaged and causes cells to divide and replicate out of control. In addition to killing cancer cells, lion's mane extract has also been shown to slow the spread of cancer.

8) Reduces inflammation and oxidative stress

Chronic inflammation and oxidative stress are believed to be at the root of many modern illnesses, including heart disease, cancer and autoimmune disorders. This mushrooms contain powerful anti-inflammatory and antioxidant compounds that may help reduce the impact of these illnesses and may also help reduce some of the health risks associated with obesity, as they have been shown to decrease the amount of inflammation released by fat tissue.

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