

## Lifestyle & Culture

# 'Ganoderma lucidum' – The mushroom of immortality



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Herbal medicine is by far one of the most ancient forms of therapy known to mankind, as the use of plants as medicine predates human history and contributes to the birth of modern medicine. Presently, herbal medicine is mostly practised in Eastern countries like Asia, Japan and China. In fact, the *Ganoderma lucidum* mushroom, which has been exploited by men for over 2,000 years, is known for its nutritional content but most importantly its superior pharmaceutical and health benefits.

*G. lucidum*, which belongs to the ganodermataceae family, is commonly known as lingzhi in China and as reishi or manne-take in Japan. Back in the day, it was considered a rare plant and due to its incredible healing properties, only the nobility could afford it and was thus believed that this sacred fungus only grew in the homes of the immortals on the "three aisles of the blest" off the coast of China. However, nowadays, this fungus is cultivated in several countries preferably under hot and humid conditions in sub-tropical regions. Having many medicinal attributes such as preventing cancer and infections, in Chinese medicine this mushroom has attained its well-earned names the "King of Herbs" or the "Miracle Chinese Herb".

Over 90 brands of *G. lucidum* products have been registered and marketed globally where global consumption either in the form of powder, tea or dietary supplements, has been estimated at several thousand tonnes in which the total estimated annual market value in 1995 was US\$1,628m.

The mushroom of immortality has a large dark glossy exterior and a woody texture. However, the shape and colour of the fruit body can vary from red, yellow, blue/green to white or black. It is composed of about 90% water by weight with the remaining 10% consisting of mostly protein and carbohydrates as well as some fibre, fat, minerals and vitamins. Fortunately, this mushroom consists of all the essential amino acids being particularly rich in lysine and leucine, making it a wonderful dietary supplement. One must however note that its phytochemical composition is



largely responsible for *G. lucidum*'s medicinal applications.

The three main bioactive chemicals are polysaccharides, peptidoglycans and triterpenes as well as some proteins. Polysaccharides have proven to enhance the immune system and prevent cancer through the activation of immune effector cells including macrophages, natural killer cells and T-lymphocytes. Similarly, triterpenoids suppress tumour invasion by inhibiting eukaryotic DNA polymerase and thus consequently reducing the multiplication of tumour cells. Ganoderic acid T, ganoderic acid D and ganoderiol F which are all triterpenes, contribute to preventing cancer and metastasis. Ganoderma is also composed of phenolic compounds which exhibit great antioxidant properties, scavenging free radicals which are highly detrimental to the body. Flavonoids such as quercetin, rutin, myricetin, morin and naringenin aid in *G. lucidum*'s therapeutic application too.

Several studies have depicted this species' property in managing diabetes mellitus since it naturally acts as a hypoglycaemic

(that is, lowers blood glucose levels) as well as maintaining cholesterol and other lipid levels within healthy parameters to prevent cardiovascular diseases like atherosclerosis. In addition, it can also act as an anti-inflammatory agent, an anti-oxidant, a neuroprotective agent and also protect against gastric mucosal congestion.

However, this mushroom is especially known for its anti-cancer property and has been known to protect/manage prostate, lung, glioma and breast cancers among others. *G. lucidum* combats cancer by suppressing the cell cycle of the cancerous cells, inducing apoptosis of these cells and preventing angiogenesis of the invading tumour (that is, preventing blood vessel growth surrounding the tumour). This will also prevent metastasis of the cancer and thus its progression.

Unsurprisingly, Reishi has anti-microbial characteristics in which it can fend off influenza, HIV, *E. coli* and other microbial infections. With respect to HIV, *G. lucidum* has been known to suppress the protease activity of this virus, as was similarly seen with its replicative in-

hibitory properties on the hepatitis B virus. In addition, a dried hot water extract of this mushroom taken orally has also been proven to decrease the pain and improve lesion healing in postherpetic (varicella-zoster virus) patients. Furthermore, as most are aware Covid-19 was declared a global pandemic on 11 March 2019 and has presently taken the lives of over six million individuals. Sadly, it is still proving challenging to treat it and its side effects. Fortunately, a few studies have depicted *G. lucidum*'s potential in combating this virus. In saying this, having the monkeypox virus declared as a Public Health Emergency of International Concern on 23 July 2022, one can only wonder what antiviral potential the Reishi mushroom may have against this virus.

Apart from Ganoderma's great potential in producing plant-based drugs to treat countless diseases like chronic bronchitis, bronchial asthma, leukopenia, coronary heart diseases and cancer, it is also used to decolourise wastewater as well as in cosmetics. Its application in cosmetics prevents wrinkles,

UV damage to the skin and has anti-ageing properties.

In conclusion, it is no surprise that this simple yet complex species has gained interest over the years, especially in the scientific community. Presently, people are starting to deviate to more natural forms of therapy due to their belief that nature is the best remedy, that the treatment may be less expensive and more attainable as well as reduce the risk of adverse drug reactions that one might experience with modern drugs. However, although, herbal medicine is gaining more interest and is greatly practised in Eastern countries, more awareness on a global level has to be raised, especially with respect to the scientific community practising Western medicine.

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