

# Lions Mane The Multi Helpful Mushroom



## Name

Common name: Lions Mane

Scientific name: *Hericium erinaceus*



## What Does This Fungus Look Like?

The lions mane is a medical mushroom and an edible mushroom that can be cooked and eaten in many dishes, but they don't look like your typical mushroom, as they don't have a cap or stem. They are usually white or cream and can sometimes be pink, but when they turn old or dry out they can become brown or yellowish coloured. When they turn brown they become bitter to eat. The mushroom has thousands of spikes, known as teeth, that hang down in one large clump and they can grow from 1-6cm long.



## Why Is This Fungus Helpful?

This fungus is not only pretty, as its thousands of spikes hang downwards, but it also tastes very good once cooked. It is said to have a seafood like taste, similar to lobster or shrimp, and the texture is wonderful and chewy. This mushroom is a culinary delicacy and people enjoy it cooked and cut up into salad, with pasta or even on crackers. The mushroom can also be seen in Chinese vegetarian cuisine, to replace the pork or lamb.



The lions mane has its own medical properties, as it has the ability to stimulate nerve and myelin regeneration, which makes it helpful in many neurological diseases, such as multiple sclerosis, muscular dystrophy, Alzheimer's disease and dementia. The name of the medical compounds that are found in *Hericium erinaceus* that have neurological health benefits are called Erinacines. The compounds are small enough to pass through the blood brain barrier, and then on to help heal the myelin sheaths or neurons. Some compounds in *Hericium erinaceus*, such as threitol, D-arabinitol and palmitic acid have antioxidant effects, regulates blood lipid levels and reduce blood glucose levels. So this mushroom is very useful in medicines, as it is known to help with a range of illnesses and problems.



## Ecology

The lions mane mushroom is very rarely found and may even be endangered in some countries in Europe, but is common in nature in the countries of Japan, China and North America. The fungus grows from the wounds, on trunks and large branches, of living hardwood trees, especially beech and oak. These mushrooms are commonly found around late summer and autumn in the wild and they feed on the flesh of the wood and the nutrients within the trunk. They also use the water that the trees store in their large trunks.

[http://www.mushroomexpert.com/hericium\\_erinaceus.html](http://www.mushroomexpert.com/hericium_erinaceus.html)

[http://en.wikipedia.org/wiki/Hericium\\_erinaceus](http://en.wikipedia.org/wiki/Hericium_erinaceus)

[http://www.worldlingo.com/ma/enwiki/en/Hericium\\_erinaceus](http://www.worldlingo.com/ma/enwiki/en/Hericium_erinaceus)



# RICE-BLAST FUNGUS

Common name: Rice-blast fungus  
Scientific name: *Magnaporthe grisea*



## What is it?

Rice-blast fungus is a harmful disease that destroys rice crops that could feed an average of 60 million people each year, making it the most devastating agricultural disease in the world.

## What happens to the infected plant?

Once the fungus has reached the inside of the plant, it grows between the plant cells and steals the plant's nutrients. The fungus continues to grow until the rice plant dies because it does not have enough nutrients to survive.

## What is being done?

Although this disease may not affect you directly, it does affect people living in poorer countries. For some people, rice is what they live on. To help these people scientists are trying to find ways to combat the disease.

## What happens to the rice crops?

Rice-blast fungus destroys rice crops by puncturing holes in the leaves of the plant and slowly injecting proteins that break down the plants tissues.

A fungal spore lands on the leaf of a rice plant and it produces a tube which swells at the tip. The tip swells due to stored glucose and lipids that are converted into sugars. The sugars produce a concentration gradient (uneven distribution) that makes the water move from the rice plant to the tip of the tube. This makes the tip swell and it is now called an appressorium.

BY DEVINA PATHAK





For the time being the Gliocladium roseum grows wild exclusively in the forests of Patagonia; this is because it has only recently been discovered. However due to its' unique and useful qualities there is a potential for mass cultivation that will in all probability be exploited.



# FUNGUS

## Gliocladium roseum

Bionectria ochroleuca (Gliocladium roseum)

No common name has yet been devised

Gliocladium roseum is a unique fungus that has recently been discovered by Professor Gary Strobell of Montana State University. It was apparently found living in the Ulmo trees in the Patagonian forests, Argentina. The G. roseum can also be found growing on wine grapes.

The worlds' fuel consumption is estimated to exceed 100 million barrels per day by 2020, with each barrel containing 159 litres. Petrol and diesel, being fossil fuels, take many millions of years to form and its' supplies are therefore limited. G. roseum presents the possibility of cultivating en masse a sustainable and environmentally friendly form of fuel.

<http://www.greenoptimistic.com/2008/11/06/diesel-fungus-gliocladium-roseum/>

[http://www.naturalnews.com/025747\\_fuel\\_biofuel\\_antibiotic.html](http://www.naturalnews.com/025747_fuel_biofuel_antibiotic.html)

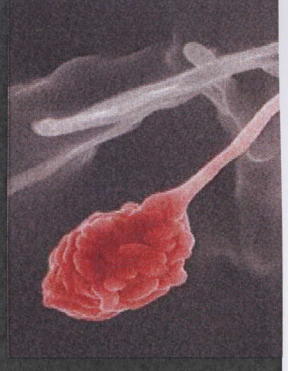
<http://www.physorg.com/news144958975.html>

<http://www.ens-newswire.com/ens/nov2008/2008-11-04-02.asp>



It produces fuel compounds in the form of gas directly from cellulose. The fuel is strikingly similar to diesel. Cellulose is an organic carbohydrate that is a chief constituent of all plant tissues and fibres.

It feeds on cellulose and the bio-fuel appears to be a waste product.





# Beauveria Bassiana

THIS FUNGUS HELPS HUMANS TO CONTROL INSECT PESTS



EFFECTIVE,  
EFFICIENT  
AND EASY

## Pests cause illness and damage crops

### Humanity's Friend

We use it to control pest population and eradicate them if necessary. It is harmful to insect pests, beetles, termites and fire ants. When it infects insects it is called a white muscardine disease. It rarely affects humans. There is current research to see if the mosquitos which spread malaria can be killed by it.

### Who found this fungi?

In the 19th century an Italian scientist, Agostino Bassi, discovered this when he studying this disease on silk worms for over 30 years. In honour of finding out the disease, it was named after him.

### Ecology of Beauveria Bassiana

#### Where does it grow?

Normally it is found in the soil throughout the world but when it meets an appropriate insect it germinates inside the host.

#### What does it feed on?

The Beauveria Bassiana fungus feeds upon the host's internal organs and body fluids. But how does it enter the host in the first place? If you are wondering, read on as this is explained in the next point.

### How it gets in and kills the host

It infects the insects through its skin and then starts to produce spores. This is different from other pathogens which need to be eaten in order to cause an infection.

It also produces Beauvericin, which weakens the host's immune system. Now it can start feeding.

The host dies within 3-7 days. But that's not all. The fungus starts to grow off the host, creating a 'white bloom' effect. The white layer gives off the spores and then the whole process repeats again.

#### **SOURCES**

[http://web.mst.edu/~microbio/bio221\\_2006/B\\_bassiana.htm](http://web.mst.edu/~microbio/bio221_2006/B_bassiana.htm)

#### **USED IN THIS**

<http://www.uoguelph.ca/~gbarron/MISCELLANEOUS/>

#### **POSTER:**

[nov01.htm](http://nov01.htm)

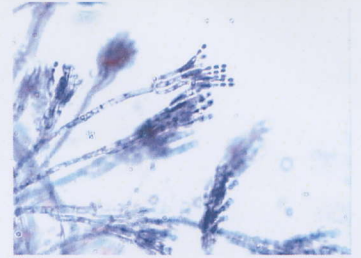




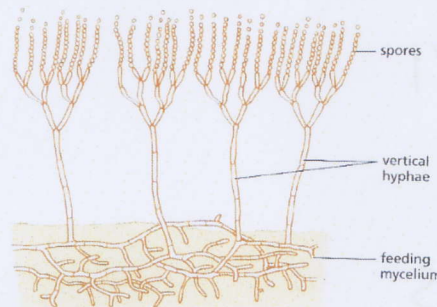
## *PENICILLIUM (Helpful Fungi)*

### What is Penicillium?

Penicillium is a genus of mould fungi that grow on decaying vegetable matter, damp leather and citrus fruits; used in making cheese and as a source of penicillin. The mycelium grows over the food, digesting it and absorbing nutrients. Penicillium (from Latin penicillus: paintbrush) is a major importance in the natural environment as well as food and drug production. It produces penicillin, a molecule that is used as an antibiotic, which kills or stops the growth of certain kinds of bacteria inside the body. For all those reasons Penicillium affects our every day life.



**Above: Fungi Penicillium as seen under a electron microscope**



**Above: penicillin tablets**

### What is Penicillin?

One of the things Penicillium is most famous for is the drug penicillin. It was used to create the first antibiotic. Penicillin is one of the most well-known and widely used antibiotic around the world. Doctors prescribe penicillin for hundreds of infectious diseases. Penicillin is produced by the mould, fungus Penicillium and was discovered by Sir Alexander Fleming in 1920.

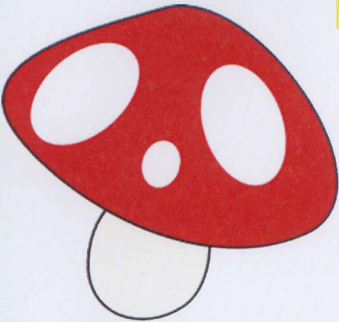
The penicillins are bactericidal and act by interfering with the bacterial cell wall synthesis. Penicillin is still an important antibiotic but it is produced by mutant forms of different species of Penicillin from that studied by Fleming. The different mutant forms of the fungus produce different types of penicillin.

### Is Penicillium, always harmless?

Although most penicillin are safe for the majority of people, some people may experience side effects.

So many people are allergic to Penicillium since it was overused back in the day. Penicillium is a common indoor mould; allergy to which is not associated with antibiotic allergy.

There are thousands of types of mould, however, only a few of these are currently available for allergy testing. Penicillium is one of the most likely causes of allergic disease based on the types of mould spores collected in the air.



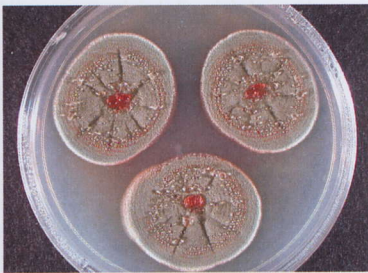
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**Three colonies of a Penicillium mould growing on an agar medium. The green fuzzy appearance is the asexual spores of the fungus.**

#### Sources for further information:

- [en.wikipedia.org/wiki/Penicillium](http://en.wikipedia.org/wiki/Penicillium)
- <http://www.emlab.com/app/fungi/Fungi.po>
- [microbewiki.kenyon.edu/index.php/Penicillium](http://microbewiki.kenyon.edu/index.php/Penicillium)

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