

Poison in the Kingdom

A poisonous fungus is one that, when ingested, causes toxic effects. In terms of its effects on the eater, the toxicity can vary according to the species and to the amount ingested. At times poisoning is not caused by eating fungi but by eating foods, such as cereal products, that have been contaminated by a fungus. Rye, and to a lesser extent oats, barley, and wheat, can host toxic fungi that produce dangerous mycotoxins. These mycotoxins can cause hallucinations, convulsions, and very severe damage in the tissues of human organs. •

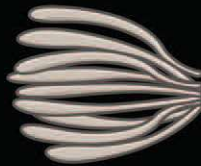
Attack on Rye

➤ Ergot (*Claviceps purpurea*) is a parasite of rye and produces alkaloid mycotoxins—ergocristine, ergometrine, ergotamine, and ergocryptine. When barley with ergot is processed for use in food, the mycotoxins can be absorbed when eaten. All these toxic substances can act directly on nerve receptors and cause the constriction of blood vessels.

1.

Release

Within the enclosing structures a stroma, or compact somatic body, is formed. Inside it, reproductive growths develop, which contain a large number of perithecia.



3.

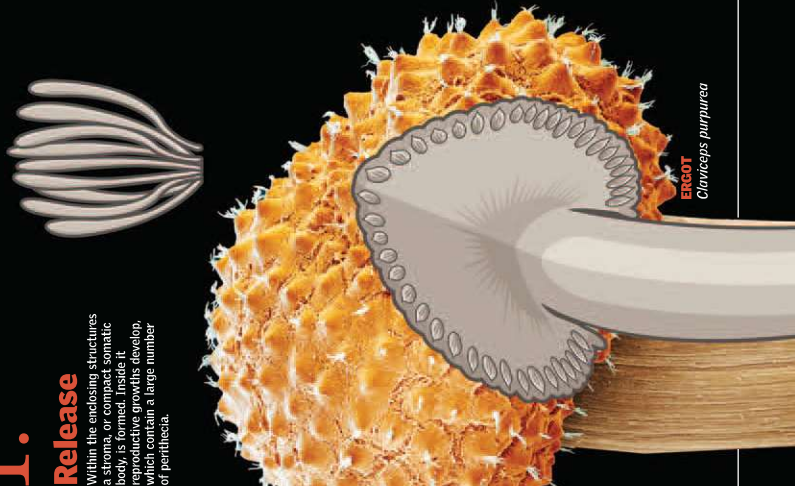
Spores

The asci are sac-shaped cells that contain spores called ascospores. In general, they grow in groups of eight and are light enough to be scattered into the air.



Fruit

The perithecium is a type of fruiting, or reproductive, body in ascomycetes. It is a type of closed ascocarp with a pore at the top. The asci are inside the perithecium.



ERGOT
Claviceps purpurea

Ergotism

➤ Ergotism, or St. Anthony's Fire, is a condition caused by eating products such as rye bread that have been contaminated with alkaloids produced by *Claviceps purpurea* fungi, or ergot. The alkaloids typically affect the nervous system and reduce blood circulation in the extremities, which produces the burning sensation in the limbs that is one of the condition's notable symptoms.

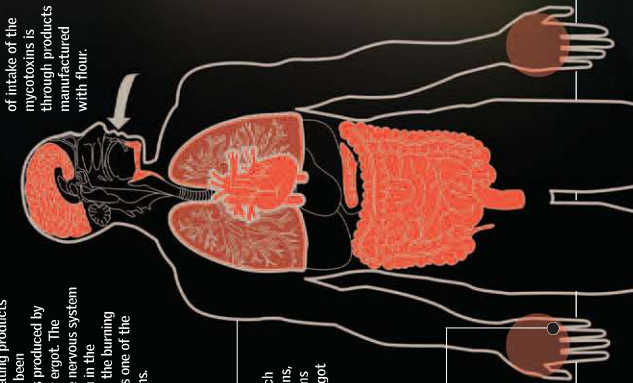
NERVOUS SYSTEM

Lethargy, drowsiness, and more severe conditions, such as convulsions, hallucinations, and blindness, are symptoms caused by the effects of ergot on the nervous system.

EXTREMITIES

Ergotamine alkaloids cause the constriction of blood vessels, leading to gangrene.

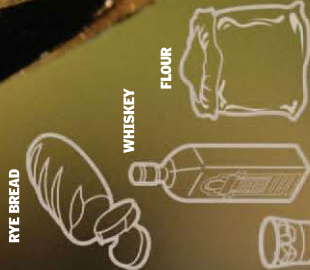
INGESTION
The main means of intake of the mycotoxins is through products manufactured with flour.



4.

Parasites

Ascospores of sexual origin or asexual conidia develop as parasites in the ovary of the rye flower. They cause the formation of masses and form sclerotia. In some languages ergot's name is related to the word for "horn" because of sclerotia's horntlike shape.



RYE BREAD

WHISKEY

FLOUR

Derived from Rye

➤ In Europe during the Middle Ages wheat bread was a costly food, not part of the common diet. Most people ate bread and drank beer prepared from rye. This made them susceptible to ingesting mycotoxins from *Claviceps purpurea*. Thus, the largest number of cases of ergotism occurred during this time. Today preventative controls in the production of bread and related products from rye and other cereals have greatly reduced instances of ergotism.

Poisonous Mushrooms

➤ Eating the fruiting bodies of some species can be very dangerous if it is not clearly known which are edible and which are poisonous. There is no sure method for determining the difference. However, it is known for certain that some species—such as certain species of the genera *Amanita*, *Macrolepota*, and *Bolëtus*—are poisonous.



DESTROYING ANGEL
Amanita virosa

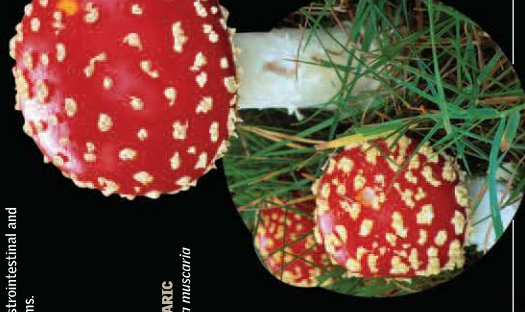
Pretty But Deadly

This mushroom is toxic to the liver. It grows from spring to fall, often in sandy, acidic soil in woodlands and mountainous regions. Its cap is white and 2 to 5 inches (5-12 cm) in diameter. Its stem and gills are also white, and the gills may appear detached from the stem. The base of the stem has a cuplike volva, but it may be buried or otherwise not visible.



Insecticide

The fly agaric's name is thought to come from its natural fly-killing properties. Its cap is typically red and 6 to 8 inches (15-20 cm) in diameter. It may be covered with white or yellow warts, but they are absent in some varieties. The stem is thicker at the base, which looks cottony. It also has a large white ring that looks like a skirt. It grows in summer and fall in coniferous and deciduous forests. If eaten, it causes gastrointestinal and psychotropic symptoms.



FLY AGARIC
Amanita muscaria