

# FUNGUS Among Us

Mushrooms are all around. Learn to spot and identify these amazing organisms.

BY MARY HOFF

Popping up on the side of a hiking trail, nestled into a cubby at the base of a tree, sprinkled across a lawn after a rainy day—Minnesota mushrooms are everywhere! Whether you're hiking in a wilderness forest or playing in your own neighborhood, there's likely a mushroom not far away.

Some mushrooms have the familiar “toadstool” shape with a stem and a cap. Others can look like a blob of bright jelly, a sponge, a big white ball, or a shelf sticking out from a tree. Mushrooms come in an amazing variety of sizes, shapes, and colors.

Mushrooms are not plants. They're not animals. So what are they? Let's find out!

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*A clump of honey mushrooms (Armillaria mellea) grows on a tree.*



COURTESY OF KEITH COETZMAN, DNR

The common puffball (*Lycoperdon perlatum*) is a mushroom that can puff out spores to make new mushrooms.

## Hidden wonders

Mushrooms are members of the group of living things known as fungi. This kingdom also includes the yeast we use to make bread and the microbes that cause athlete's foot.

There's much more to a mushroom than what you see. A mushroom is just part of a much bigger living thing. Most of its body is made up of tiny threads that weave through the soil, through wood, or through parts of plants.

The threads, called *hyphae*, are cylinder-shaped cells stuck together end to end. A single mushroom may have thousands of feet of hyphae. When hyphae clump together to form structures like the visible part of a mushroom, they are called *mycelium*. Hyphae use enzymes to extract the energy they need to live from the material in which they live. As they do, they break the material down into molecules such as organic carbon and nitrogen-containing



RON SPINOSA

Honey mushrooms (*Armillaria mellea*) are named for their honey-colored cap.

compounds that other living things need. Fungi are among the few kinds of organisms that can break down *lignin*, one of the main components of wood.

When the moisture, temperature, and other conditions are just right, the thread-like parts of the mushroom sense that it's time to make more of its kind. The mycelium forms a larger structure that pushes out of the surface into the air. This is what we usually think of as a mushroom. Inside the

mushroom, special cells called *spores* form. Just as plant seeds can make more plants, spores can make new mushrooms. When they are ripe, they blow away in the wind, or an animal might carry them to another place. If the conditions are just right, tiny threads of hyphae can emerge from the spores, mate, and form a new mushroom.

Some mushrooms emerge and fade away within a few days. Others, such as shelf fungi, may last for many years.





## Part of the web

Mushrooms are an important part of the eat-and-be-eaten network of living things known as the *food web*. They break down dead things into the building blocks that other living things need to grow. They also provide food for many kinds of animals, which in turn are food for other animals. Fungi are indispensable! They help make soil, and without soil, life as we know it would not exist.

Some mushrooms help trees stay alive and thrive. They form a relationship, called *symbiosis*, with the tree. The hyphae interact with a plant's roots

to form structures called *mycorrhizae*. The plant provides the mushroom with sugar. Through the mycorrhizae, the mushroom can provide the plant with nutrients and water it otherwise wouldn't have access to. Different species of mushrooms form symbiotic relationships with different kinds of plants. That's why some kinds of mushrooms tend to grow around certain kinds of trees.

A forest ecologist named Suzanne Simard has discovered that trees can use these underground networks that mushrooms create to connect with each other.

STAN TEKELA

Oyster mushrooms (*Plurotus ostreatus*) are a type of shelf fungus, sticking out from trees like small shelves.

The mycelia form tiny routes between the roots of different trees. Nutrients and other chemicals move from one tree to another through these passages. A tree can even use the “Wood Wide Web,” as this

underground network has been called, to let neighboring trees know that it is being attacked by insects. The other trees can then ramp up production of insect-detering chemicals to protect themselves.

## Look But Don't Taste!



Wild mushrooms are *not* the same as the mushrooms you find in a grocery store. Some wild mushrooms contain chemicals that can make

you violently sick. Others can paralyze or even kill you. It takes a lot of knowledge and experience to tell the difference between safe mushrooms

and deadly ones. Mushrooms can be great fun to look at, but unless a trusted expert has given you permission, *do not eat them—not even a nibble.*

## Spot That Shroom

Are you ready to go find some mushrooms? Your best bet is to look in damp, shady places, especially after a rain. Bring a magnifying glass if you can so you can look closely at the different parts of the mushroom. Bring a camera, too, and take a picture to share with friends. You can also use a photo to help identify what you saw by comparing it with pictures in a field guide or on the internet.

To identify a mushroom, start by looking carefully at it. If it has a cap, is the cap shaped like an egg, cone, cylinder, plate,

funnel, or cup? Is it smooth, rough, shaggy, or bumpy? Does the underside have paper-edge-like gills or tiny holes called *pores*? If it has a stem, is the stem smooth or shaggy? Note the kind of habitat in which it was growing. Was it growing singly or in a cluster? If you found it under a tree, what kind of tree is it? What other plants are growing around it? What is the soil like? All of these things are clues that you can compare with photos and descriptions to identify what mushroom you've found.

## Minnesota Mushrooms to Look For



BILL JOHNSON

### Yellow morel (*Morchella americana*)

The yellow morel is Minnesota's state mushroom. It's shaped like a hollow, cone-shaped sponge. A morel's spores are hidden in the hollows that pit the surface of its cap. Look for these mushrooms in springtime growing from soil near hardwood trees. People often look for yellow morels near dead elm trees.



SPARKY STEINSAAS

### Honey mushroom (*Armillaria mellea*)

These mushrooms tend to have a honey-colored cap. You might find them in the fall growing on trees and logs. A honey mushroom growing in Oregon has earned the title of "humongous fungus" because it is so big. Its mycelium covers an area larger than 2,000 football fields, and scientists estimate that it's more than 2,000 years old.

### Chicken of the woods (*Laetiporus sulphureus*)

Also known as the sulfur shelf, chicken of the woods grows on hardwood trees, especially oak. It is orange on top and yellowish on the bottom, which has tiny holes or *pores*. The pores are actually tubes that contain the spores. This mushroom is soft when it first appears and hardens as it gets older. Look for chicken of the woods in the summer and fall.



MIKE DVORAK

### Turkey tail (*Trametes versicolor*)

If you've ever seen a turkey's tail, you will be able to identify this shelf fungus right away. Its leathery surface is made up of wavy stripes of earth-tone colors. If you look at the underside with a magnifying glass, you will see tiny pores. You can find turkey tail growing like a shelf out of a log, stump, or dead tree. It helps break down the dead wood into nutrients for new life.



BILL JOHNSON

### Hen of the woods (*Grifola frondosa*)

Continuing the poultry theme is hen of the woods, a mushroom that grows on the ground near oaks, maples, or other hardwood trees or stumps. Most common in late summer or fall, hen of the woods can grow to 2 feet or more in diameter. It looks a little bit like a fluffed-up chicken or a pile of beige or gray potato peels.



STAN TEKIELA

### Common puffball (*Lycoperdon perlatum*)

Puffballs look like small cream-colored balls up to 3 inches in diameter. Look more closely and you'll find they are pear-shaped. As the puffball dries, a hole opens up on top. Gently squeeze one and you'll see the spores can puff out like smoke.



COURTESY OF KEITH GOETZMAN, DNR





### Fly agaric (*Amanita muscaria* var. *guessowi*)

The fly agaric likely was the model for spotted toadstools you have seen in cartoons and coloring books. It has a golden cap that can grow up to 10 inches across and is dotted with light-colored bumps. It forms mycorrhizal relationships with both conifers and deciduous trees.



### Golden chanterelle (*Cantharellus flavus*)

The funnel-shaped golden chanterelle, also called the yellow chanterelle, grows in summer and fall in the soil under hardwood trees such as oak and sometimes around pine trees. Like the fly agaric, it forms a mycorrhizal association with the trees around it. It might reach 2 inches tall and up to 5 inches in diameter.



### Jack-o-lantern (*Omphalotus illudens*)

Talk about a perfect name! The jack-o-lantern mushroom is orange like a pumpkin and glows in the dark. Found in a few counties in north-central and southeastern Minnesota, it grows on oaks and other hardwood trees. Chemicals called *luciferase* and *luciferin* make this mushroom glow green in the dark. These are the same chemicals that fireflies use to make their flashing lights.

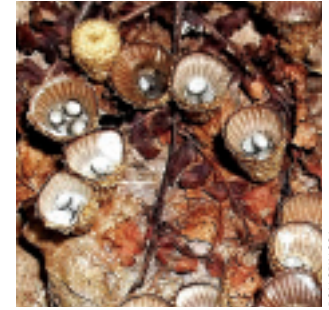


### Loebster mushroom (*Hypomyces lactifluorum*)

Minnesota is far from the ocean, but it's home to a mushroom that's colored like a lobster and smells like a fish! And that's just the beginning of the strange story of the lobster mushroom. What you see is actually not just one fungus but two. *Hypomyces lactifluorum* is the red-orange outer layer. The inner layer is another kind of mushroom that the parasitic lobster mushroom grows around and takes nutrients from.

### Bird's nest fungus (*Cyathus striatus*)

This fungus has a fascinating way of getting animals to help it spread its spores. Each cap of the bird's nest fungus looks like a tiny nest with eggs. The "eggs" hold the spores. When rain falls, the raindrops knock the eggs out of the nest. They stick to nearby plants. When an animal eats the plant, it also eats the eggs and eventually poops them somewhere else. The poop-nourished spores grow into new mushrooms in a new place.

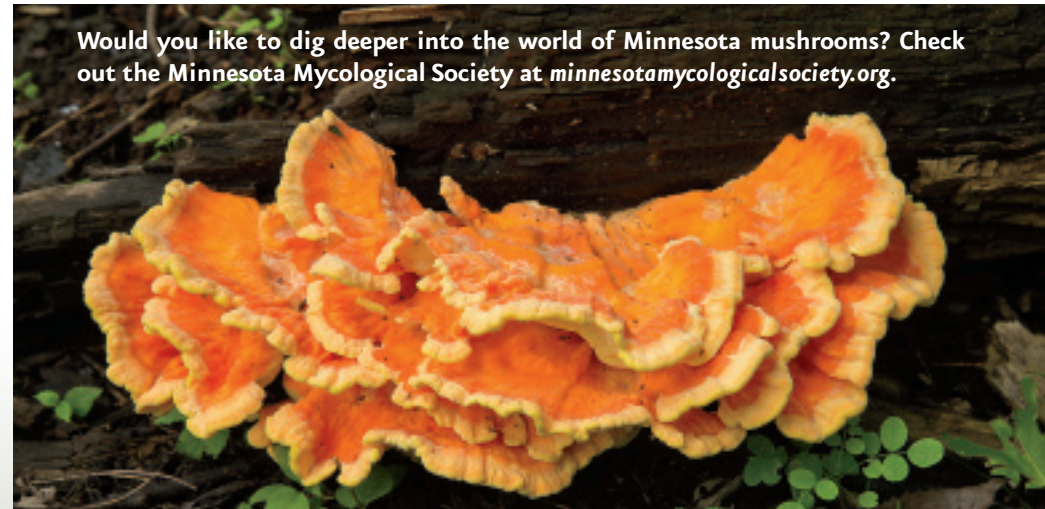


### Oyster mushroom (*Pleurotus ostreatus*)

The oyster mushroom has a flat, cream-colored to light brown cap, making it look a bit like an oyster shell. A type of shelf fungus, it grows mainly on dead deciduous trees. You can find oyster mushrooms all summer long, from spring into early winter. In addition to breaking down wood to obtain nutrients, oyster mushrooms also sting and paralyze tiny worms called nematodes with their hyphae and then eat them. 🍄



Would you like to dig deeper into the world of Minnesota mushrooms? Check out the Minnesota Mycological Society at [minnesotamycologicalsociety.org](http://minnesotamycologicalsociety.org).



**TEACHERS RESOURCES.** Find a Teachers Guide and other resources for this and other Young Naturalists stories at [mndnr.gov/young\\_naturalists](http://mndnr.gov/young_naturalists).