

# Edible and Poisonous Mushrooms

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EACH SPRING AND FALL, when the weather is warm and rainy and the biggest mushroom flushes of the year occur, my desk at the conservation department overflows with wild mushrooms to be identified.

Most of the people who bring in these mushrooms want to make sure that the tasty-looking morsels they have collected are in fact edible and won't send them racing to the emergency room a few hours after supper. Often they are interested in collecting other wild mushrooms for the table but are aware of the dangers and don't know quite where to start.

I certainly appreciate their caution. Because a few wild mushrooms are deadly and many more are mildly poisonous, mushroom hunting is not a hobby for the careless or uninformed. On the other hand, neither is it necessarily the death-defying feat that many people imagine. There are a number of good edible mushrooms that are easy to recognize and hard to confuse with anything dangerously poisonous. (Poisonous mushrooms are often referred to as "toadstools," but this is a folk name that has no precise meaning. In this article, they will be called simply poisonous mushrooms.)

The purpose of this article is twofold: to help you identify a number of safe, edible wild mushrooms while avoiding mushroom poisoning, and to introduce you to the gentle sport of mushroom hunting, which among other things is a fine excuse to walk in the woods. It is divided into three sections: Edible Mushrooms, Poisonous Mushrooms and More About Mushrooms. Please read all three sections before you start collecting.

## **EDIBLE MUSHROOMS**

All of the edible mushrooms shown here are distinctive in some obvious way. Once you learn their distinguishing features, you won't confuse them with any dangerously poisonous species.

Along with each illustration is a brief description of the mushroom, including *where* and *when* it can be found. Remember that where and when a mushroom grows can be very important in identification. If there are reasons for caution, they are noted. Also included are some cooking hints for each type of mushroom.

## PUFFBALLS (*LYCOPERDON* spp. and *CALVATIA* spp.)

**Description:** Depending on their size, puffballs have been mistaken at a distance for everything from golf balls to sheep.

These round or pear-shaped mushrooms are almost always whitish, tan or gray and have no stalks. The interior of a puffball is solid white at first, gradually turning yellow, then brown as the mushroom ages. Finally, the interior changes to a mass of dark, powdery spores. Size: 1" to 12" in diameter, sometimes larger.



**When and Where:** Late summer and fall; in lawns, open woods, pastures, barren areas. On soil or decaying wood.

**Cautions:** Each puffball should be sliced from top to bottom and the interior examined. It should be completely white and featureless inside, like a slice of white bread. There should be no trace of yellow or brown (which will spoil the flavor) and especially *no sign of a developing mushroom with a stalk, gills and cap* (see page 9). Amanitas, when young, can resemble small puffballs, but cutting them open will quickly resolve the question.

**Cooking Hints:** Remove outer skin if it is tough, then slice, dip in batter and fry.

## SHAGGY MANE (*Coprinus comatus*)

**Description:** The shaggy mane or lawyer's wig is so large and distinctive that with a little practice you can identify it from a moving car.

The cap of a fresh specimen is a long, white cylinder with shaggy, upturned, brownish scales. The gills are whitish, and the entire mushroom is fragile and crumbles easily. Most important, as the shaggy mane matures, the cap and gills gradually dissolve into a black, inky fluid, leaving only the standing stalk. Size 4" to 6" tall, sometimes larger.



**When and Where:** Spring, summer and fall, growing in grass, soil or wood chips. Often seen scattered in lawns and pastures.

**Cautions:** Shaggy manes are best when picked before the caps begin to turn black. However, until you become familiar with these mushrooms, check for the developing ink to be sure of your identification. (note: The shaggy mane is the largest of a group of edible mushrooms called inky caps. The field guides listed at the end of this article can help you identify other members of this group.)



**Cooking Hints:** Saute butter and season with nutmeg or garlic. Good in scrambled eggs or chicken dishes. Shaggy manes are delicate and should be picked young and eaten the same day.

## CORAL FUNGI (*Clavariaceae*)

**Description:** These fungi appear as clumps of branching stems which point upward. They do look much like coral. Most are tan, whitish or yellowish; a few are pinkish or purple.

Also called club fungi, antler mushrooms or doghair mushrooms. Size: clusters may be up to 8" high.

**When and Where:** Summer and fall; in wooded areas, growing on the ground or on decaying logs.

**Cautions:** A few coral fungi have a laxative effect, and some people seem to be particularly sensitive. Avoid coral fungi that taste bitter, bruise brown when handled or have gelatinous bases. These are most likely to cause trouble. No serious poisonings from coral fungi have been reported.

**Cooking Hints:** Tips and upper branches are most tender. Saute and add to vegetables or white sauce.



## MORELS

(*Morchella* spp.) **Description:** Sponge, pinecone and honeycomb mushroom-the nicknames of the morel-are all appropriate. Morels are easy to recognize and delicious to eat, making them the most popular wild mushroom in Missouri.

The surface of a morel is covered with definite pits and ridges, and the bottom edge of the cap is attached directly to the stem. Size: 2" to 12" tall.

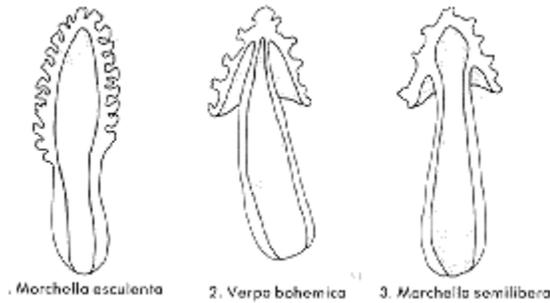
**There are three common species of morels:**



(left) Common Morel (center) Half-Free Morel (right) Black Morel

1. The common morel (*Morchella esculenta*): When young, this species has white ridges and dark brown pits and is known as the "white morel." As it ages, both the ridges and the pits turn yellowish brown, and it becomes a "yellow morel." If conditions are right the "yellow morel" can grow into a "giant morel," which may be up to a foot tall.
2. The black morel or smoky morel (*Morchella elata*): The ridges are gray or tan when young, but darken with age until nearly black. The pits are brown and elongated. These morels are best when picked young; discard any that are shrunken or have completely black heads.

3. The half-free morel (*Morchella semilibera*): This is the exception to the rule that morels have the bottom of the cap attached directly to the stem. The cap of the half-free morel is attached at about the middle (see illustration). These morels have small caps and long bulbous stems.



**When and Where:** From spring to early summer. Morels are found on the ground in a variety of habitats, including moist woodlands and in river bottoms.

**Cautions:** Morels are quite distinctive, but there is a small chance they could be confused with false morels. See page 10 for ways to distinguish true morels from false morels.

Half-free morels may be confused with a mushroom called the wrinkled thimble cap (*Verpa bohemica*). Fortunately, this mushroom is also edible in moderation. The cap of the wrinkled thimble cap is free from the stem except at the top (see illustration).

**Cooking Hints:** Cut morels in half to check for insects. Wash carefully. Morels can be breaded and fried, stewed, baked, creamed or stuffed with dressing. Their delicate flavor is brought out best by sauteing them in butter for about five minutes on each side.

## Bearded Tooth - (*Hericiium erinaceus*)

**Description:** With its clumps of hanging white "fur," this tooth fungus looks much like a polar bear's paw. It is pure white when fresh and young, but yellows with age.

The bearded tooth may grow quite large, as much as a foot across. Its size and whiteness make it easy to spot against the dark logs on which it grows.



Other names include bear's head, satyr's beard and hedgehog mushroom. Size 4" to 12" across.

**When and Where:** Summer and fall; always on trees, logs or stumps.

**Cautions:** The bearded tooth is distinctive and has no poisonous look-alikes. There are several closely related species which are more open and branched, but all are good edibles.

Only young, white specimens should be eaten; older, yellowed ones are sour.

**Cooking Hints:** Slice, parboil until tender (taste a piece to test), drain and serve with cheese sauce.

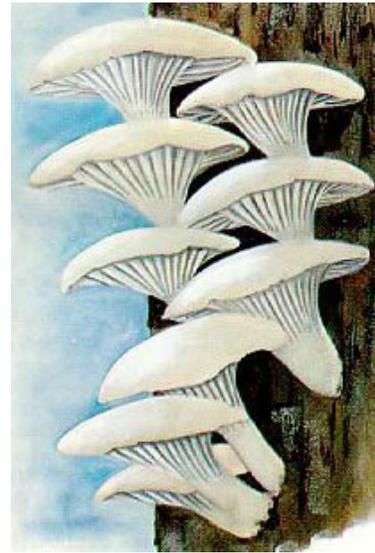
## Oyster Mushroom (*Pleurotus ostreatus*)

**Description:** Those hardy souls who take long winter walks are sometimes treated to the sight of a snow-capped mass of fresh oyster mushrooms growing on a tree or log.

This large white, tan or ivory-colored mushroom is named for its oyster shell-like shape. It has white gills running down a very short, off-center stem. Spores are white to lilac, and the flesh is very soft. Oyster mushrooms usually are found in large clusters of overlapping caps and always on wood. Size: 2" to 8" wide.

**When and Where:** Spring, summer, fall and during warm spells in winter. On trees and fallen logs.

**Cautions:** This mushroom has a number of look-alikes, (including *Crepidotus* and *Lentinus* spp.), but none are dangerous. They may, however, be woody or unpleasant-tasting. Check by tasting a small piece and by making a spore print (see page 12). Watch out for the small black beetles which sometimes infest this mushroom.



**Cooking Hints:** Soak in salted water to remove bugs. Dip in beaten egg, roll in cracker crumbs and fry.

## Chanterelles (*Cantharellaceae*)

**Description:** Chanterelles are a great favorite of European mushroom hunters and are becoming more popular in the United States.

These mushrooms are funnel- or trumpet-shaped and have wavy cap edges. Most are bright orange or yellow, although one, the black trumpet, is brownish-black. Fresh chanterelles have a pleasant, fruity fragrance.



To make sure you have a chanterelle, check the underside of the cap. Some species of chanterelle are nearly smooth underneath, while others have a network of wrinkles or gill-like ridges running down the stem. The ridges have many forks and crossveins and are *always blunt-edged*. (True gills are sharp-edged and knifelike). Size 1/2" to 6" wide, 1" to 6" tall.

**When and Where:** Summer and fall; on the ground in hardwood forests. Usually found in scattered groups.



(top) Chanterelles (bottom) Black Trumpet

**Cautions:** When you can recognize those blunt-edged, crisscrossing ridges, you won't confuse chanterelles with anything else. However, take extra care at first that you do not have the poisonous jack-o'-lantern (see page 11). Jack-o'-lanterns have knifelike gills and grow in the tight clusters on wood or buried wood, rather than on the ground.

**Cooking Hints:** Chanterelles are tough and need long, slow cooking, but when properly prepared their flavor is excellent. Saute slowly in butter until tender, season with salt, pepper and parsley, and serve on crackers.

## Boletes (Boletaceae)

**Description:** If you can picture a hamburger bun on a thick stalk, you will have a good idea of what most boletes look like. These sturdy, fleshy mushrooms can be mistaken at first glance for gilled mushrooms, but if you turn over a cap you will find a spongy layer of pores on the underside rather than blade-like gills. The pore layer can easily be pulled away from the cap.

Bolete caps are usually brownish or reddish-brown, while the pores may be whitish, yellow, orange, red, olive or brownish. Size: Up to 10" tall; caps 1" to 10" wide.

There are more than 200 species of boletes in North America. The King Bolete (*Boletus edulis*) is probably the best edible.

**When and Where:** Summer and fall; on the ground near or under trees. Frequently found under pines.

**Cautions:** Boletes are considered a good, safe edible group for beginning mushroom collectors. However, you should observe these cautions:

1. A few boletes are poisonous. To avoid these, *don't eat any boletes that have orange or red pores.*
2. Some boletes, while not poisonous, are very distasteful. Check this by tasting a pinch of the raw mushroom cap. If it is bitter or otherwise unpleasant, throw it out.
3. To make them more digestible, boletes should be cooked before eating. If the cap is slimy, peel off the slime layer; it sometimes causes diarrhea.
4. Bugs seem to like boletes as much as people do, so check your specimens carefully. Boletes also tend to decay quickly. Be sure to collect and eat only fresh specimens.

**Cooking Hints:** Remove tough stems, and peel off the pore layer in all but the youngest specimens.

Saute in butter and add to any cheese dish. Dried boletes also are good in soups.



(left) Boletes (right) King Bolete

## Sulfur Shelf (*Laetiporus sulphureus*)

**Description:** These mushrooms light up the forest with their brilliant orange-red caps and pale sulfur-yellow pore surfaces. Some specimens fade to a peach or salmon color.

The sulfur shelf always grows on wood, usually in large masses of overlapping caps. It has no stem; the cap is attached directly to the wood. The pores are tiny.

Other names include chicken mushroom and chicken of the woods. Size 2" to 12" wide.



**When and Where:** Summer and fall; in clusters on living trees or dead wood.

**Cautions:** This is a distinctive mushroom with no poisonous look-alikes. It does cause a mild allergic reaction (swollen lips) in some people.

**Cooking Hints:** Cook only the tender outer edges of the caps; the rest is tough and woody. Slice and simmer in stock for 45 minutes, then serve creamed on toast.

When cooked, this mushroom has the texture and often the taste of chicken.

## Hen-of-the-Woods (*Grifola frondosa*)

**Description:** This mushroom really does look something like a large, ruffled chicken. It grows as a bouquet of grayish-brown, fan-shaped, overlapping caps, with offcenter white stalks branching from a single thick base. On the underside, the pore surface is white.

A single clump of hen-of-the-woods can grow to enormous size and weigh up to 100 pounds. It often grows in the same spot year after year.



**When and Where:** Summer and fall; on the ground at the base of trees, or on stumps.

**Cautions:** Many gilled mushrooms grow in large clumps-remember that hen-of-the-woods is a pore fungus.

This mushroom has no poisonous look-alikes, but there are some similar species of pore fungi that are tough and inedible. If what you have tastes leathery or otherwise unpleasant, you probably didn't pick a hen-of-the-woods.

**Cooking Hints:** Use only fresh, tender portions. Simmer in salted water until tender (requires long, slow cooking), and serve as a vegetable with cream sauce; or chill after cooking and use on salads.

There are many other good edible wild mushrooms available to Missouri mushroom hunters, including the popular meadow mushrooms. If you'd like to try collecting some of these, the references listed at the end of this article will help you do so safely.

## POISONOUS MUSHROOMS

Every mushroom hunter should be familiar with the three most dangerous groups of fungi. These are the amanitas, the false morels and a catch-all category known as little brown mushrooms (LBMS). Mushrooms in these groups cause virtually all the fatal mushroom poisonings in the United States, with amanitas alone accounting for 90 percent of mushroom-related deaths. The pictures and descriptions on the following pages will help you avoid them.

There also are hundreds of other mushrooms that will cause anything from a mild stomachache to severe physical distress-including vomiting, diarrhea, cramps and loss of coordination. Two common poisonous mushrooms of this type, the jack-o'lantern and the green-spored *Lepiota*, are described here. Although the symptoms of poisoning from these mushrooms may be alarming, they usually pass in 24 hours or less with no lasting effects. You should, however, notify your doctor immediately if you suspect mushroom poisoning of any kind.

*There is no quick and easy test that will separate edible from poisonous mushrooms-including peeling the cap, testing with a silver spoon, checking for insect damage or any other folk method. To avoid mushroom poisoning, you should follow these five rules:*

1. Identify each and every mushroom you collect, and only eat those whose identification you are sure of. When in doubt, throw it out.
2. Strictly avoid: any mushroom that looks like an amanita (parasol-shaped mushrooms with white gills); all little brown mushrooms; all false morels.
3. Some people are allergic to even the safest mushrooms. The first time you try a new wild mushroom, it is important that you eat only a small amount and wait 24 hours before eating more.
4. 4As with other foods, rotting mushrooms can make you ill. Eat only firm, fresh, undecayed mushrooms.
5. Most wild mushrooms should not be eaten raw or in large quantities, since they are difficult to digest.



## Amanitas (*Amanita* spp.)

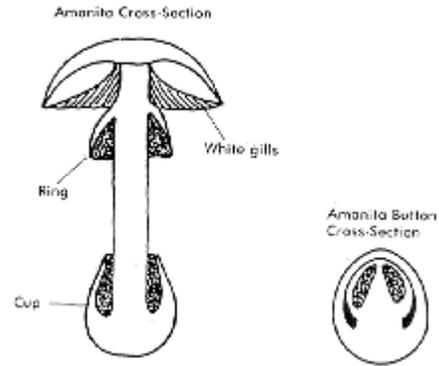
Amanitas are the reason why there are no old, bold mushroom hunters. Several members of this group contain *amanitin*, one of the deadliest poisons found in nature. One cap of a Destroying Angel (*Amanita virosa*) can kill a man

An amanita starts as an egg-shaped button which can resemble a small puffball. This breaks open as the mushroom grows. Fully developed amanitas are gilled mushrooms with parasol-shaped caps that may be white, yellow, red or brown. They also have the following characteristics:

1. A saclike cup surrounding the base of the stem. This often is buried just beneath the soil surface and may not be obvious.
2. A ring on the stem.
3. White gills.
4. A white spore print (see page 12).

Both the ring and the bulb may be destroyed by rain or other disturbance. For this reason, beginning mushroom hunters should avoid all parasol-shaped mushrooms with white gills.

Amanitas are usually found on the ground in woodlands in summer and fall, but be on the lookout for them whenever you hunt for mushrooms.



## False Morels (*Helvella* and *Gyromitra* spp.)

False morels are difficult to treat in an article on edible and poisonous mushrooms, because they so clearly fit both categories.

On one hand, many people have enjoyed eating false morels for years and may even consider them a favorite wild mushroom. On the other, false morels have definitely caused serious illnesses and deaths in the United States.

The problem seems to involve the amount of a toxic chemical, called monomethyl hydrazine (MMH), present in these mushrooms. MMH causes diarrhea, vomiting and severe headaches, and occasionally it can be fatal. However, because of different cooking techniques and different individual sensitivities to MMH, false morels poison some people but leave others unaffected. In addition, false morels in some areas of the country contain more MMH than in other areas. All this makes these mushrooms a very doubtful group as far as edibility is concerned.



*Helvella* sp. *Gyromitra caroliniana*

False morels have wrinkled, irregular caps that are brainlike or saddle-shaped. They may be black, gray, white, brown or reddish. (The "big red morel," *Gyromitra caroliniana*, common in

Missouri, is a large false morel with a reddish cap.) Other names include elephant ears, Arkansas morels and brian mushrooms. Size 2" to 8" tall.

False morels differ from true morels in two obvious ways:

1. The cap surface has lobes, folds, flaps or wrinkles, but it does not have pits and ridges like a true morel. You might say their caps bulge outward instead of being pitted inward.
2. The bottom edge of the cap of a false morel hangs free around the stem, like a skirt. On true morels, the bottom edge of the cap is attached to the stem (see page 4).

False morels are found in spring, summer and fall, on the ground in woodlands.

**Note:** Because these mushrooms have definitely caused deaths, we cannot recommend that you eat them. If you nevertheless choose to do so, they should be thoroughly cooked in a well-ventilated room, since MMH is driven off by heat.

## Little Brown Mushrooms (LBMs)



Like the LGBs (little gray birds) of the birdwatchers, this is a catchall category. It includes all small to medium-sized, hard-to-identify brownish mushroom with spores of all colors-of which there are many hundreds.

Many LBMs are harmless, some are mildly poisonous or hallucinogenic, and a few are deadly. The innocent-looking little mushrooms of the genus *Galerina* are probably the most dangerous of the LBMs. They contain the same toxin as amanitas and have caused a number of deaths. Galerinas grow in clusters on wood and have brownish spores.



Because they are so difficult to identify, all LBMs should be avoided.

Little brown mushrooms are found in spring, summer and fall, in all habitats. Poisonous LBMS may grow on soil or wood and may appear in lawns, pastures or forests.

## Jack-O'-Lantern (*Omphalotus olearius*)

The bright-orange is well named. Not only is it pumpkin-colored and found in the fall- it also glows in the dark. Fresh specimens sometimes give off a faint greenish glow at night or in a darkened room.



These common mushrooms have caused many poisonings because they look, smell and even taste good. They cause mild to severe stomach upset but are not life-threatening to healthy adults.

Jack-O'-lanterns have a pleasant, fruity fragrance. They are sometimes mistaken for the edible chanterelle (see page 6), which is the same color and also has pleasant smell. Chanterelles, however, have flat-edged, interconnecting ridges or wrinkles instead of knifelike gills, and grow on the ground. Size 3" to 10" tall, cap 3" to 8" diameter.

These mushrooms are found in summer and fall, in large clusters at the base of trees, on stumps or on buried wood.

The jack-o'-lantern and green-spored lepiota are only two of a large number of mushrooms that can cause mild to severe (though not life-threatening) illness if eaten. To avoid poisoning from these mushrooms, be sure to follow the rules on page 8.

### **Green-spored Lepiota (*Chlorophyllum molybdites*)**

These large, common mushrooms often appear in fairy rings on suburban lawns, and are frequently eaten by the lawn's owner-to his or her regret. They cause violent gastrointestinal upset.

The green-spored lepiota is parasol-shaped and has a cream or tan, scaly cap, a large ring on the stem and cream-colored gills which turn dingy green with age. As its name suggests, it is the only mushroom with a greenish spore print. Size 4" to 12" tall, 2" to 12" in diameter.



This mushroom is found in summer and fall, on the ground in lawns, pastures and meadows.

## **MORE ABOUT MUSHROOMS**

*What is a mushroom?* Mushrooms are actually the fruits of fungus. The fungus itself is simply a net of threadlike fibers, called a *mycelium*, growing in soil, wood or decaying matter. Mushrooms on a mycelium are like apples on an apple tree.

The function of a mushroom is to produce spores, which are the "seeds" of the fungus. Some kinds of mushrooms produce their spores on gills (the gilled fungi); some in pores (the pore fungi); some on teeth (the tooth fungi); some inside a leathery pouch (the puffballs); some on the inside of shallow cups (the cup fungi, including the morels); and some simply on the surface of the mushroom (coral fungi and others). The spores form on these various structures, then fall off to blow away on the wind or be carried by animals, water or insects. If a spore lands in a suitable spot, it germinates and grows into a new mycelium.

The mushrooms most people recognize are the gilled fungi. These typical parasol-shaped mushrooms have caps with bladelike gills on the underside and stems with or without rings. The pore fungi are similar in appearance but have a spongy layer of tubes of pores on the underside of the cap instead of gills.

## ***Collecting mushrooms***

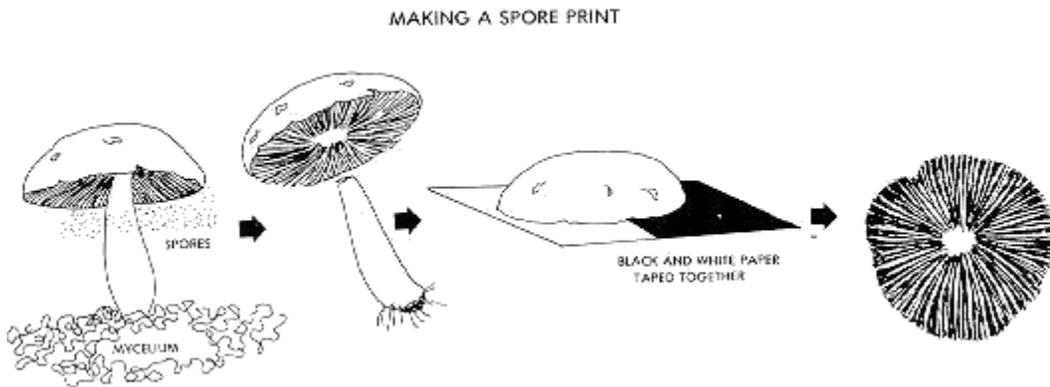
Mushroom collecting requires only the simplest of equipment: a flat-bottomed basket or box, a roll of waxed paper, a digging tool and a pencil and paper for notes.

Be sure to collect the entire mushroom, including the base. Take only fresh, young specimens that are free of insect damage. Each type of mushroom should be wrapped separately in waxed paper (not plastic wrap, which hastens decay), along with any notes you might want to make about the habitat and appearance of the mushroom. It's a good idea to note where the mushroom is growing (on wood, soil, moss); whether it is single or in clusters' the colors of the caps, gills and stem; and any other distinctive features. The more you can observe about the mushroom in the field, the easier it will be to identify at home.

## ***Making a spore print***

Individual spores are too small to be seen with the naked eye, but you can make a spore print that will show the color of the spores in mass. This color is an important identifying characteristic for many mushrooms, especially the gilled fungi.

To make a spore print, cut the stem off the mushroom and place the cap gill-side or pore-side down on a piece of white paper. To best see the spore color, use one sheet of black paper and one of white, taped together side-by-side. Cover with a bowl or jar. If the mushroom is at the right stage-not too young, too old or deteriorated-the spores will slowly collect on the paper. A spore print will be visible in one to 12 hours.



## ***Other Books About Mushrooms\****

- *The Audubon Society Field Guide to North American Mushrooms* by Gary H Lincoff. Alfred A Knopf, 1981.
- *Mushrooms of North America* by Orson K Miller, Jr. E. P. Dutton, 1977 (paperback edition).
- *The Mushroom Trail Guide* by Phyllis G Glik. Holt, Rinehart and Winston, 1979.
- *The Mushroom Hunters Field Guide* by Alexander H Smith and Nancy Smith Weber. University of Michigan Press, 1980.

\*Available by order at bookstores.

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