#### Information about the FungiMap Project in Great Smoky Mountains National Park

FungiMap is a project the Appalachian Highlands Science Learning Center launched in 2002 with the Asheville Mushroom Club and Dr. Dennis Drehmel of Duke University to provide the park resource managers with better information about the distribution of fungi in the park. Mushrooms are generally difficult to identify where they grow, especially for the amateur. Some species, however, can be reliably identified by an interested volunteer with just a little training and a good field guide. The idea of using volunteers to develop range maps for mushrooms comes from Australia where their own FungiMap project has been under way for a number of years. Our goal is to generate a database of observations from any interested park visitor with a basic ability to identify distinctive mushrooms. This database will help us to know where in the park and when during the year the fungi on the list fruit (produce mushrooms) and will allow us to identify tree species associated with these different fungi.

If you would like to participate, make copies of the data forms and the list of species we are targeting. Some of the species, such as the stinkhorn, anyone can identify with confidence. Some of the others require some basic knowledge of mushrooms and a field guide, but they are distinctive and do not require advanced skills. If you can, provide us with UTM or Latitude/Longitude coordinates for each observation. If you do not have the ability to do that, record the trail or road name and as detailed a description as possible for where the observation was made. We are happy to receive observations for other species which you are confident in your ability to identify, but are focusing on those species in the list below. At any time of year, at least some of the species on the list could be spotted. We are especially interested in people who travel the same trails at different times of year and over several years so we can get better information of the timing of fruiting.

Completed forms can be sent to Paul Super at the address below and can be accepted electronically by e-mail to paul\_super@nps.gov.

Paul Super PO Box 357 Lake Junaluska, NC 28745 (828) 926-6251

# **Great Smoky Mountains National Park** FungiMap Species Guide

Produced in cooperation with the Asheville Mushroom Club, Duke University, Discover Life in America, and Great Smoky Mountains National Park.

# Not shaped like mushrooms or shelves on wood

Fruiting body a spore-bearing sac ringed by triangular rays which are leathery or woody; mouth may form a beak, ejects puff of spores if touched;

Some species have a second, less-developed ring inside the outer rays.

# Earthstars—Geastrum sp.

Fruiting body black or dark brown cups ½" to 2.5" across, often turning out along the rim, tough, leathery, sometimes hairy;

Stalks up to 2.5" long, often hidden in ground, moss, or leaf litter.

#### Devil's Urn—Urnula craterium

Fruiting body small cup, less than 1" tall or wide, containing egg-like spore cases, Told from other Bird's Nest Fungi by the **sides** being ridged or streaked.

# Streaked Bird's Nest Fungus-Cyathus striatus

Not parasol- or shelf-shape. Odd mix of puff-balls, stink horns, false morels, and other strange shapes.





George Barron, University of Guelph, Canada



George Barron, University of Guelph, Canada

#### References:

Barron, George. 1999. Mushrooms of Northeast North America. Lone Pine Publishing.

Bessette, Alan E., Arleen R. Bessette, and David Fischer. 1997. Mushrooms of Northeastern North America. Syracuse University Press.

Hesler, L.R. 1960. Mushrooms of the Great Smokies. University of Tennessee Press.

We wish to thank George Barron, John Walker, and the other photographers credited for allowing the use of their photos for this guide.

Fruiting body is **hard and black**, finely pitted, inside is white, up to 6" tall, in a **variety of finger-like shapes**;

Grows on dead wood.

# Deadman's Fingers—Xylaria polymorpha



David Dennis, NA Mycological Association, www.namyco.org

Fruiting body **black, flattened club, sometimes shiny,** up to 5" tall, slight widening near end; Several species of different genera, can only be told apart by microscopic examination of spores.

# Black Viscid Earth Tongue— Gloeglossum difforme and similar species



George Barron, University of Guelph, Canada

Fruiting body **yellow to orange-yellow club** up to 2.5" tall including stalk, **head round, flattened** and wider than stalk;

Stalk slightly scaly.

# **Orange Earth Tongue—***Microglossum rufum*



George Barron, University of Guelph, Canada

Fruiting body **bright orange or yellow**, **club-shaped**, 1-2" tall;

Stalk whitish;

Grows out of buried moth or caterpillar pupae.

Orange-colored Cordyceps—

Cordyceps militaris



David Dennis, NA Mycological Association, www.namyco.org

Surface is roughened like sandpaper; Cap reddish-brown to blackish; Stalk olive-colored to yellowish, 2-3.5" tall; Growing out of buried relative of the truffle.

# Round-headed Cordyceps—

Cordyceps capitata



George Barron, University of Guelph, Canada

Fruiting body with **saddle-shaped** cap, whitish to yellow or tan, and 0.3 to 1.5" tall;
Stalk is ridged, of the same color as the cap and 0.5 to 2.5" tall;

Usually fruits in fall or late summer.

## Saddle-backed False Morel—Helvella crispa



George Barron, University of Guelph, Canada

Fruiting body reddish brown to dark brown **brain-like but without ridges and pits** as in a true morel, 2-5" tall;

Stalk whitish, broad at base, 3.5-6" tall; Usually fruits in spring.

# Carolina False Morel—Gyromitra caroliniana



Fruiting body erect and **phallus-like** with **head usually covered in olive-gray, foul-smelling slime**;

Stalk 2-4 inches long, pale-yellowish to white and spongy;

Grows on ground or wood chips.

Ravenel's Stinkhorn—Phallus ravenelii



P. Super, NPS

Fruiting body a **yellowish round ball with a mouth outlined in red**, no collar at the base; Stalk up to 2" long, spongy but **not cased in jelly**.

#### Ravenel's Stalked Puffball—

Calostoma ravenelii



P. Super, NPS

Similar to Ravenel's Stalked Puffball, but with **broken collar around base of head** and jelly around the stalk or cap.

picture not available

## Yellow Stalked Puffball—Calostoma lutescens

Fruiting body a red, round ball with a mouth outlined in deeper red;

**Grows in a dense jelly**, like tomatoes in aspic; Stalk 1-3" long, spongy and covered in jelly.

### Tomato and Aspic—Calostoma cinnabarina



David Dennis NA Mycological Association www.namyco.org

Fruiting body round, tapering to a wide stalk, off-white with the **top covered in short, spiny bumps** ("jewels");

When mature, becomes brownish; top opens into a mouth which puffs out spores when touched.

# Devil's Snuff-box—Lycoperdon perlatum

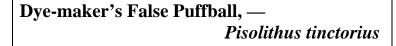


Dr. Robert Thomas & Margaret Orr © Calif. Acad. of Sciences

Fruiting body 2-5" across, partially buried, olive to black, disintegrating into brown spores, shows network of spore chambers when cut if fresh, no mouth;

Tapers to a stalk-like base;

Can stain paper or clothing if touched.





George Barron, University of Guelph, Canada

# Mushroom/Toadstool-shaped: No Gills

Underside of cap with downward-oriented spines or "teeth";

Leathery cap 2 to 6 inches across, light to dark brown, depressed in center and scaly; Grows on ground

Scaly Tooth—Sarcodon imbricatus

dry scaly cap and teeth = Sarcodon dry cap and pores =

Boletus/Boletellus/Stobilomyces slimy cap and pores = Suillus



George Barron, University of Guelph, Canada

Cap dry and with large, dense, dark, soft warts, 2.5 to 5 inches across;

Flesh white, changing to red and then blackish when cut; Pores start white, becoming blackish;

Stalk 2.5-4 inches long, covered to some extent with same warts as cap.

Old Man of the Woods—Strobilomyces sp.



Brian Shelton, University of Guelph, Canada

Cap 3-6 inches across, surface dry, gray, rather thick;

Flesh gray-white or dull yellow, becoming pinkish when cut after a while;

Pores white to gray, **bruise brown**; Stalk 2-4.5 inches long, **whitish to yellowish**, **with darker netting**, base often crooked



George Barron, University of Guelph, Canada

Gray Bolete—Boletus griseus

Cap 2-6 inches across, surface dry, **purplish to dark red** at first, becoming yellowish-mottled;

Flesh yellow, often becoming more golden when cut:

Pores yellow to brownish, **bruise blue**; Stalk 2.5-4 inches long, also **bruises blue**.

Red-and-Yellow Bolete—

**Boletus** bicolor



John Walker, University of Vermont

pores bruise blue, brown, or gray

Cap 1-2 inches across, surface dry, brownish yellow, with erect fiber-clusters; Flesh yellow, unchanged when cut; Pores cream-colored, turning to greenishyellow, does not bruise; Stalk 3-4 inches long, tapering towards cap and curving at base, netted by fleshpores colored or red ridges bruise Russell's Bolete—Boletellus russellii same color eorge Barron, U. of Guelph, Canada Cap 1-2.5 inches across, surface dry, as flesh leathery, becoming cracked yellowish to olive; Flesh white, becoming yellow when cut; Pore surface does not bruise; Stalk 1-2 inches, same color as cap, with dark flecks; Parasitic on puffballs Parasitic Bolete—*Boletus parasiticus* George Barron, University of Guelph, Canada Cap 1-4.5 inches across, slightly slimy or dry, red with pattern of vellowish cracks: Flesh creamy-yellow, slowly becoming reddish when cut: Pores yellow, aging to brown, does not bruise; Stalk 1.5-3 inches long, colored like the cap. Painted Bolete—Suillus pictus P. Super, NPS Cap 1.5-4 inches across, slimy, surface chrome yellow, tinged or spotted reddish; Flesh yellowish, turning pinkish-brown then yellow when cut; Smells slightly sour; Stalk 1-2 inches long, yellow with reddish-brown glandular dots. Slippery Jack or Chicken Fat Mushroom Suillus americanus George Barron, University of Guelph, Canada Cap 1.5-4 inches across, slimy, brownish to reddish-chestnut with dark stains; Flesh white, does not change color when cut; does not bruise; Stalk short, 0.5-1.5 inches, whitish or yellow and tapering downward. **Short-stalked Bolete—**Suillus brevipes George Barron, University of Guelph, Canada Cap 1-3 inches across, slimy, orange to yellow, with dense tufts of fibers; Flesh pale yellow, unchanged if cut, but can stain paper greenish-yellow; Pores pale yellow to brownish, does not bruise; Stalk 1.5 to 2.5 inches long, yellowish,

R. Vilgalys, Duke University

speckled with reddish dots

Hairy Bolete—Suillus hirtellus

# Mushroom/Toadstool-shaped: Gills Present

Stalk usually with ring, and cup-like or sack-like structure around base (vulva) or fragments of it.

Amanitas

Cap 1-2.5 inches across, **bright yellow with pale- yellow scales**;

Gills white or pale yellow;

Stalk 1.5-5" tall, with prominent ring.

## Yellow Patches—Amanita flavoconia



David Dennis, NA Mycological Association, www.namyco.org

#### Deathly White;

### Prominent ring around stalk;

Cap 2.5-5 inches across;

Stalk 4-7" or more tall, with prominent ring when young, losing ring as it ages.

# Destroying Angel—Amanita verna/virosa/bisporigera

Cap buff to light brown with **radiating ridges along the margin**;

Stalk 3-6" tall with **no ring**.

# Tawny Amanita—Amanita fulva



T. Rhese, Duke University



George Barron, University of Guelph, Canada

Cap 2-6 inches across, dingy reddish-brown or orange-cinnamon, with numerous whitish or pale-red scales;

#### **Bruises reddish**;

Gills white:

Stalk 2-6" tall, tinged reddish, with large ring.

#### The Blusher—Amanita rubescens



John Walker, University of Vermont

Cap 3-8" across, buff or white with **numerous pale brown scales**;

Gills whitish, **becoming dull green w/age**; Stalk 3-8" tall with **ring and bulbous base**.

# Green-spored Parasol— Chlorophyllum molybdites

Cap more or less cylindrical, 2-4" long, whitish when young, dissolving into black fluid as ages, covered in shaggy scales;

Stalk 2-4" tall.

# **Shaggy Mane—***Coprinus comatus*

Cap 0.75-2" across, brown, covered in white granular scales, **glistening with mica-like** particles;

Stalk 1-3" tall;

Gills white, becoming black and inky.

# Mica Cap—Coprinus micaceus

Cap 1.5" to 5" across, brown to smoky gray—
"deer-colored";

Gills white to pinkish, **not attached to the stalk**, unlike Amanitas, no ring & no cup at base; Stalk 3" to 6" tall, whitish; bases often fused together.

#### Deer Mushroom—Pluteus cervinus

Cap 1/3" to 2" across, yellow;

Gills yellow to green;

Stalk up to 2.5" tall, the same color as the cap;

Multiple mushrooms grow out of the same log or stump.

# Sulfur Tuft—Naematoloma fasciculare



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George Barron, University of Guelph, Canada



George Barron, University of Guelph, Canada



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David Dennis, NA Mycological Association, www.namyco.org

Orange to golden-yellow and growing in clumps with bases of stalks fused, often growing out of stumps or other dead wood;

Cap 2-8" across;

Stalk 4-6" tall;

Gills are luminescent in the dark.

### Jack-o-Lantern—Omphalotus olearius

Cap up to 2" wide, cone-shaped with a nipple-shaped knob at apex, orange to pink colored, occasionally tinged greenish;

Gills the color of cap;

Stalk 2-4.5" tall, the color of cap, sometimes tinged greenish.

#### Salmon-colored Nolanea—

### Nolanea quadrata

Cap is **cone-shaped** or shaped like a peaked sun hat, **red to orange**, 1-2.5" wide;

Gills start white, becoming yellowish or olive, waxy;

Stalk 2-4" tall, whitish at base, becoming same color as cap

Bruises black.

# Witch's Hat—Hygrophorus conicus

Cap 2-4" across, clay-color or cinnamon, smells strongly;

Gills white, staining brown if bruised, **very brittle**; Stalk 0.75 – 2.5" tall, white, **staining brown if bruised**.

# Firm Russula—Russula compacta

Cap 2-5" across, honey-colored or clay-colored, radial ridges along margin, smells strongly, often unpleasantly;

Gills white, staining brown if bruised, **very brittle**, may exude drops of water but not milky;

Stalk 2-3.5" tall, white, **staining brown if bruised**.

# Almond-scented Russula— Russula foetens/laurocerasi



Asheville Mushroom Club



George Barron, University of Guelph, Canada



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R. Vilgalys, Duke University

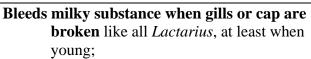


George Barron, University of Guelph, Canada

Cap brown, cinnamon, or pinkish brown, ¾ to 2" wide;

Gills widely spaced, **waxy**, pinkish white; Stalk the same color as cap, 1-3.5" tall; Grows on the ground.

#### Common Laccaria—Laccaria laccata

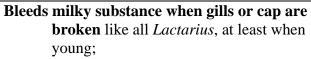


Cap brown with **conspicuous rings**, 1.5-5" across; Gills pinkish to brown;

Stalk same color as cap, 1-3" tall.

### Peck's Milky Mushroom—

Lactarius peckii



Cap white, often cup-shaped, 2-6" across; Gills white, crowded, forking; Stalk white, 0.75 - 3" tall.

# Peppery Milky Mushroom—

Lactarius piperatus

Bleeds milky substance when gills or cap are broken like all *Lactarius*, at least when young, white but staining gills green;

Cap **Green**, usually dark green, 2-5" across; Gills white to buff;

Stalk green, 1-3" tall.

# Dark Green Milky Mushroom—

Lactarius atroviridis

Bleeds milky substance when gills or cap are broken like all *Lactarius*, at least when young;

All parts of mushroom BLUE, including milk; Cap 2-6" across;

Stalk 1-3" tall.

# Blue Milky Mushroom—Lactarius indigo



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R. Vilgalys, Duke Univeristy



George Barron, University of Guelph, Canada



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John Walker, University of Vermont

# **Shaped Like Shelves on Wood**

Cap shelf-like with no stalk, 1-4" across, leathery or slightly woody, zoned gray and brown;
Pores whitish to brown, may stain pink if bruised, pores circular to irregular in shape.

Thin-maze Flat Polypore—

Daedaleopsis confragosa



George Barron, University of Guelph, Canada

Cap shelf-like with no stalk, 1-4" across, leathery or corky, zoned gray and brown, **hairy**; **Gills present, not pores**.

Often, though not exclusively, grows on birch.

**Multicolor Gill Polypore**—

Lenzites betulina



George Barron, University of Guelph, Canada

Cap rounded or lobed, fan-shaped, attached without a stalk to dead wood, **whitish and densely hairy**, up to 1" across;

Gills radiate from point of attachement, split down the middle.

Common Split-gill—

Schizophyllum commune



© Br. Alfred Brousseau, Saint Mary's College

Cap ½ to 2" across, shelf-like with zones of many colors: white, yellow, brown, red, bluish, but not purple, **leathery and velvety**;

Pore surface white or yellowish.

# Turkey Tail—Trametes versicolor



Cap 4-6" across, shelf-like, blackish to brown or gray, **often with a reddish band near the edge**, hard and woody;

Pore surface whitish;
Perennial (exist for multiple years);
Grow on hardwoods, but primarily on conifers.

# Red-belted Polypore—Fomitopsis pinicola



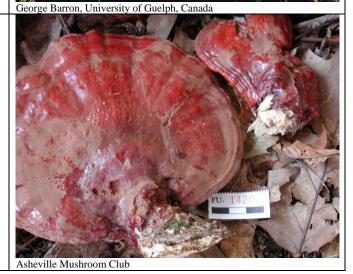
Cap 2-8" across, shelf-like and corky, **reddish brown to blackish**, **shiny**;

Pore surface white to brownish, discolored if bruised:

Usually found on dead hemlocks, but may be found on other conifers—note what tree it is growing out of, if you can determine!

Hemlock Conk—

Ganoderma tsugae/curtisii



Observer name:		Date:	Observer name:		Date:
Genus	species	Trail name:	Genus	species	Trail name:
Habitat:on hardwood (species?)on conifer wood (species?)leaf litter			Habitat: on hardwood (species?) on conifer wood (species?) leaf litter		
UTM or Lat/Long coordinates: [or detailed description of location, including landmarks and distance to nearest intersection or stream—use back.]			UTM or Lat/Long coordinates: [or detailed description of location, including landmarks and distance to nearest intersection or stream—use back.]		
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