

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.

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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.

<p>Not shaped like mushrooms or shelves on wood</p>	<p>Not parasol- or shelf-shape. Odd mix of puff-balls, stink horns, false morels, and other strange shapes.</p>
<p>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.</p> <p>Earthstars—<i>Geastrum sp.</i></p>	 <p>© Br. Alfred Brousseau, Saint Mary's College</p>
<p>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.</p> <p>Devil’s Urn—<i>Urnula craterium</i></p>	 <p>George Barron, University of Guelph, Canada</p>
<p>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.</p> <p>Streaked Bird’s Nest Fungus—<i>Cyathus striatus</i></p>	 <p>George Barron, University of Guelph, Canada</p>

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.

Yellow Stalked Puffball—*Calostoma lutescens*

picture not available

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.

Dye-maker's False Puffball, —

Pisolithus tinctorius



George Barron, University of Guelph, Canada

**Mushroom/Toadstool-shaped:
No Gills**

dry scaly cap and teeth = *Sarcodon*
dry cap and pores =
Boletus/Boletellus/Stobilomyces
slimy cap and pores = *Suillus*

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



George Barron, University of Guelph, Canada

Scaly Tooth—*Sarcodon imbricatus*

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.



Brian Shelton, University of Guelph, Canada

Old Man of the Woods—*Strobilomyces sp.*

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*







pores
bruise
blue,
brown,
or
gray

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**.



John Walker, University of Vermont

**Red-and-Yellow Bolete—
*Boletus bicolor***

<p>pores bruise same color as flesh</p>	<p>Cap 1-2 inches across, surface dry, brownish yellow, with erect fiber-clusters; Flesh yellow, unchanged when cut; Pores cream-colored, turning to greenish-yellow, does not bruise; Stalk 3-4 inches long, tapering towards cap and curving at base, netted by flesh-colored or red ridges Russell's Bolete—<i>Boletellus russellii</i></p>	 <p>George Barron, U. of Guelph, Canada</p>
	<p>Cap 1-2.5 inches across, surface dry, 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—<i>Boletus parasiticus</i></p>	 <p>George Barron, University of Guelph, Canada</p>
	<p>Cap 1-4.5 inches across, slightly slimy or dry, red with pattern of yellowish 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—<i>Suillus pictus</i></p>	 <p>P. Super, NPS</p>
	<p>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 <i>Suillus americanus</i></p>	 <p>George Barron, University of Guelph, Canada</p>
	<p>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—<i>Suillus brevipes</i></p>	 <p>George Barron, University of Guelph, Canada</p>
	<p>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, speckled with reddish dots Hairy Bolete—<i>Suillus hirtellus</i></p>	 <p>R. Vilgalys, Duke University</p>

**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*



T. Rhese, Duke University

Cap buff to light brown with **radiating ridges along the margin;**
Stalk 3-6" tall with **no ring.**

Tawny Amanita—*Amanita fulva*



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



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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*



George Barron, University of Guelph, Canada

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*



George Barron, University of Guelph, Canada

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*



Dr. Robert Thomas and Margaret Orr © California Academy of Sciences

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*



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*



Asheville Mushroom Club

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



George Barron, University of Guelph, Canada

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*



Dr. Robert Thomas and Margaret Orr © California Academy of Sciences

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*



R. Vilgalys, Duke University

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



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*



Dr. Robert Thomas and Margaret Orr © California Academy of Sciences

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



R. Vilgalys, Duke University

Bleeds milky substance when gills or cap are broken like all *Lactarius*, at least when young;
Cap white, often cup-shaped, 2-6” across;
Gills white, crowded, forking;
Stalk white, 0.75 - 3” tall.

Peppery Milky Mushroom—*Lactarius piperatus*



George Barron, University of Guelph, Canada

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*



©Bessette et al.

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*



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 attachment, split down the middle.**

Common Split-gill—

Schizophyllum commune



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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*



George Barron, University of Guelph, Canada

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*



George Barron, University of Guelph, Canada

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***



Asheville Mushroom Club

Observer name:

Date:

Genus species

Trail name:

Habitat:

___ on hardwood (species? _____)

___ on conifer wood (species? _____)

___ leaf litter ___ sandy soil

___ moss ___ humus

___ in grass* ___ on ground in woods*

___ manure ___ other

*nearby tree species, if any _____

UTM or Lat/Long coordinates:

[or detailed description of location, including landmarks and distance to nearest intersection or stream—use back.]

Observer name:

Date:

Genus species

Trail name:

Habitat:

___ on hardwood (species? _____)

___ on conifer wood (species? _____)

___ leaf litter ___ sandy soil

___ moss ___ humus

___ in grass* ___ on ground in woods*

___ manure ___ other

*nearby tree species, if any _____

UTM or Lat/Long coordinates:

[or detailed description of location, including landmarks and distance to nearest intersection or stream—use back.]

Observer name:

Date:

Genus species

Trail name:

Habitat:

___ on hardwood (species? _____)

___ on conifer wood (species? _____)

___ leaf litter ___ sandy soil

___ moss ___ humus

___ in grass* ___ on ground in woods*

___ manure ___ other

*nearby tree species, if any _____

UTM or Lat/Long coordinates:

[or detailed description of location, including landmarks and distance to nearest intersection or stream—use back.]

Observer name:

Date:

Genus species

Trail name:

Habitat:

___ on hardwood (species? _____)

___ on conifer wood (species? _____)

___ leaf litter ___ sandy soil

___ moss ___ humus

___ in grass* ___ on ground in woods*

___ manure ___ other

*nearby tree species, if any _____

UTM or Lat/Long coordinates:

[or detailed description of location, including landmarks and distance to nearest intersection or stream—use back.]

