TOXIC MUSHROOMS AND CONFUSING EDIBLES IN NEW ENGLAND

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Photos: Greg Marley

SOME EDIBLE MUSHROOMS AND THEIR TOXIC LOOK-ALIKES

- **The edible Golden Chanterelle and the toxic Jack O'Lantern**
- **The edible King Bolete and the toxic Lilac Brown Bolete**
- **The edible King Bolete and the toxic *Boletus huronensis***
- **The edible Bicolor Bolete and the toxic Sensitive Bolete**
- **The esteemed Yellow Morels and the toxic False Morel**
- **Edible Puffballs; Calvatia and Lycoperdon and the toxic Pigskin Puffballs (Scleroderma)**
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Americans have increasing interest in learning the mushrooms growing in our forests and fields; most have an interest in discovering mushrooms to eat. This passion for wild edibles coincides with an increase in mushroom poisonings across New England the the rest of the US.

The forest floor in summer and fall comes alive after a rainy period as many species of fungi respond to the drenching to bring forth a diverse array of different mushrooms. As the crop of mushrooms appear, there is a surge in fungi-related calls to the **Northern New England Poison Center.** Most calls involve infants, toddlers and children who sample the world by tasting everything of interest; most never get sick. A few calls involve adult foragers who sicken themselves (and others) after eating mushrooms; mostly toxic mushrooms mistaken as edible. Often the mistake is the result of not knowing enough about the mushrooms and not taking the time to be sure of their identity; assuming rather than being sure.

Below are some of the New England mushrooms most responsible for sickness in recent years, along with the common edible mushrooms they may resemble. Many other seriously toxic mushrooms have not been included in this short guide.

This guide contains some general guidelines for mushroom foraging but is not meant to be an identification guide. Never eat a mushroom unless you are 100% certain of its identity and that it is a good edible.

"WHEN IN DOUBT, THROW IT OUT!"

- **The edible Golden Chanterelle and the toxic Jack O'Lantern mushroom.**

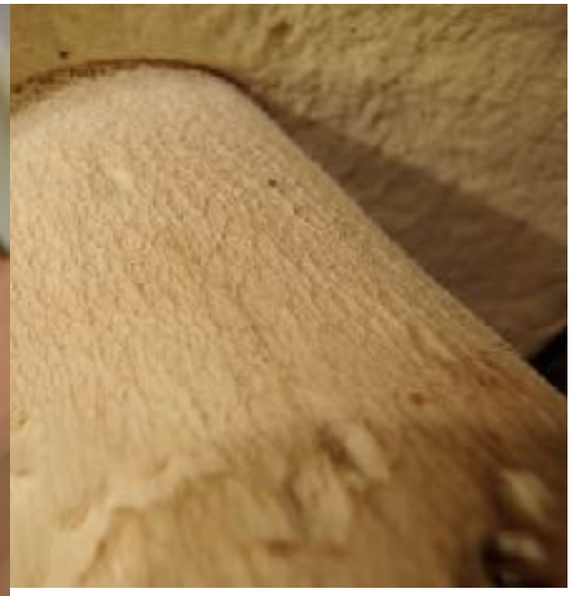
Golden Chanterelle(*Cantharellus cibarius* complex) is the most commonly collected and eaten wild mushroom in the Northeastern US, and a prized edible across the US and in countries on 4 continents. This is a forest mushroom found from mid-summer through the fall, growing in association with the roots of trees singly or in scattered troops with several different conifers and hardwood trees. A basketful may give off a distinct fruity apricot odor. Chanterelles have a mild and pleasant flavor that is brought out by butter or cream. Preserve them by a gentle sauté and then freezing. There are several smaller chanterelle species that are also common, edible and very good. It is distinctive for its golden yellow color, vase shape and the blunted gills that occasionally fork as they run down the stem (see top left).

The toxic Jack O'Lantern Mushroom: (*Omphalotus illudens) is a* bright orange, medium-large, mushroom that rots the heartwood of hardwood trees and typically fruits in dense clusters on the ground at the base of the tree(see below left)or from buried wood. (Chanterelles are smaller, more yellow than orange and never grow in large clusters.) Each Jack O'Lantern mushroom has a 2-4 inch bright orange cap that flattens with age(may become funnel-like) and knife-edge gills that run down the orange or whitish orange stalk. The fresh orange gills glow in the dark with bioluminescence in total darkness. Unwary foragers mistake them for chanterelles and suffer hours of nausea, vomiting and severe gastrointestinal distress from sesquiterpene toxins.

- **The edible King Bolete (*Boletus edulis* complex*)* and the toxic *Boletus huronensis***

The King Bolete is a complex of related edible species which are not easily separated, including *B. variipes***,** *B. clavipes*, and *B. chippewaensis* in the northeast and additional species across North America. All are widely collected and prized as edibles. Look for a medium to large fleshy mushroom with pores (Bolete) with a dry or slightly tacky cap of variable brown hues and with pores maturing from white to yellow to yellow-green and staining only faintly yellow-green, never blue The stem is white to light brown with white surface netting at least near the top and often with a bulbous base (when young). The flesh does not bruise blue. They are found in association with broadleaf and conifer trees in forests world wide. The King Bolete is one of the most highly regarded edibles. Members of the *Boletus edulis* complex may be found from June through October.

Boletus huronensis is a large handsome meaty bolete found growing in Hemlock forests that some inexperienced foragers mistake as belonging to the edible King Bolete group. This mushroom has a warm light brown cap, pale yellow flesh that stains slightly blue and a smooth pale yellow to cream stem with faint traces of reddish blush (see below left). The stem also lacks the net-veining on the stalk that distinguish its edible cousin. The pore surface of *B. huronensis* remains pale yellow throughout its lifespan, unlike the *B. edulis* group that matures from white through yellow to green. The pores also turn slowly blue when bruised. *B. huronensis i*s not commonly found but has been the cause of a number of severe gastrointestinal poisonings over recent years, leaving its victims miserable for hours. It presents significant risk for anyone older or with fragile health. It has mistakenly been listed as edible in some field guides.



- **The edible King Bolete (*Boletus edulis complex)* and the toxic Lilac Brown Bolete *(Sutorius eximius)***

See the description of the King Bolete (top) above.

The Lilac Brown Bolete, (*Sutorius eximius),* is particularly striking. This medium to large bolete has purple-lilac colors when young (below right) but the pores, stem and cap mature to milk chocolate brown (bottom, left). The firm marbled brown flesh is rarely attacked by the insects that often render edible boletes unfit. It is found in mixed hardwood and conifer forest from mid-summer into the fall. Putting lie to the myth that all non-bluing boletes are edible, for most people, eating this mushroom triggers a number of hours of vigorous gastrointestinal distress. Older field guides have labeled this mushroom as edible.

- **The edible Bicolor Bolete (*Boletus bicolor)* and the toxic Sensitive Bolete (*Boletus sensibilis)***

New England is home to several boletes with reddish caps, red and yellow stalks, and yellow pores. The best edible is *B. bicolor*. Several look-a-likes are toxic; caution is urged!

The Bicolor Bolete, *Boletus bicolor* (top) is found almost exclusively with oaks and in certain years, can occur in abundance in mid to late summer. The name comes from the contrast of bright red cap and stem base and bright yellow upper stalk and pore surface. The pore surface stains blue, but usually slowly, and the flesh of the cap and stalk turns blue even more slowly or not at all. It has a relatively thin pore layer.

***Boletus sensibilis*, the Sensitive Bolete** (bottom) is known to sicken those who eat it. Its brick red-rose cap, pale reddish and yellow stalk and yellow pores all stain instantly blue and the mushroom has a distinct odor of chicken bouillon. It is distinguished from edible *B. specious* by the absence of net veining (reticulations) on the stalk. The mushroom is widespread and occasional in hardwood forests with oak and beech. Eating the Sensitive Bolete will cause severe nausea and vomiting. **Avoid all red and yellow boletes with yellow pores unless you are quite experienced at identification; accurate ID is difficult & essential!**

- **The esteemed Yellow Morel (*Morchella esculenta group*) and the problematic False Morel (*Gyromitra esculenta*)**

Morels (*Morchella esculenta group* and *M. elata* group*)* are distinctive mushrooms that come out in the mid spring. The yellow Morel, *M. esculenta* appears about the time the apple trees and lilacs are in bloom, and the black morel a couple of weeks earlier. Morels are uncommon in the acidic soil of much of Maine and New Hampshire forests, but are common in parts of Quebec, Vermont and Massachusetts. The pitted gray-tan cap and pale cream stem are distinctive, as is the completely hollow interior.(photo left) Find yellow morels in old apple orchards, with dying or dead elms and in rich forest with ash. They like disturbance and can sometimes fruit abundantly following a forest fire or cutting. Morels are highly regarded as an edible, however, raw or under-cooked they cause severe GI distress.

The False Morel: (*Gyromitra esculenta)* False morels fruit in the early to mid-spring, at times appearing at the edge of receding snow drifts. Their deep reddish-brown caps are rounded & irregularly folded on wide gray-white stems (see below left). In most regions of Northern New England, false morels are more common than the edible true morel. They are found with conifers. They contain gyromitrin which can cause delayed vomiting and diarrhea sometimes followed by seizures and other neurologic difficulties, and is quite carcinogenic. They are traditionally eaten in some regions, but only after special preparation. ***People have been killed by eating False Morels; avoid eating them.***

Edible Puffballs; *Calvatia* spp. and *Lycoperdon* spp. and the toxic Pigskin Puffballs (*Scleroderma* spp.)

New England is home to a number of puffballs; mushrooms that are rounded globes maturing to release millions of spores from their centers. Many species are edible when collected young with insides that are pure white and firm. They range in size from the Giant Puffball reaching 2-3 feet across to the small *Lycoperdon* species, usually under 2 inches in diameter. In general, the puffballs with a uniform firm white interior are considered safe to eat. The edible purple spored puffball at various stages is pictured above; young and white, later soft and yellow, and then purple.

The Pigskin Puffballs (*Scleroderma spp.)* have a thicker outer skin and while they have white interiors when very young, quickly become dark purple/gray to black on the inside, There are several common species widespread across our region that occur in forests and disturbed areas. Also sometimes called earth balls, all *Scleroderma* puffballs cause moderate to severe nausea, vomiting and cramps when eaten. The very common and toxic *Scleroderma citrinum* is shown bottom left and right.

The Problematic Scaber Stalks: Genus Leccinum

The Scaber Stalks are a group of medium to large Bolete mushrooms that have obvious and prominent brown to black bundles of rough scabrous hair on their stalks. Several species have orange to orange-brown caps and are often collectively called Birch Boletes. Most mushroomers have historically looked at the Scaber Stalks as a safe group to eat. Many people have a long history of consumption without problems. Yet, each year we see people sickened by eating these mushrooms either raw or cooked, especially the Scaber Stalks with orange caps. They were responsible for 3.5% of mushroom poisonings reported to the North American Mycological Assoc. over a 30 year period. One problem is the relatively large number of closely related species and the very challenging task of accurately identifying them to the species level. Common field guides feature only a few types.

People sickened by eating Leccinum mushrooms experience mild to severe gastrointestinal distress and a few have experiences significant weakness and malaise. There is some thought that the problem may be related to raw or undercooked mushrooms, but caution should be taken before foraging and eating Scaber Stalks.

Honey Mushrooms: *Armillaria mellea* complex: Toxic when raw or undercooked

Honey Mushrooms have long been a popular edible in New England. They are found from early to late autumn associated with trees, emerging from the bark of dead trunks or roots, or from buried wood. This complex is a group of closely related species differentiated by appearance and by preferred host. They live as saprobes, rotting dead wood and as vigorous parasites attacking, weakening or killing their tree host. Foresters know it as the bootstrap fungus, a deadly pathogen of trees. You can tell a forest is under attack by the masses of Honey mushrooms appearing in the fall and by dead trees that have a network of the black “shoelace” hyphae under the bark.

Honey mushrooms are a popular edible group., commonly foraged and eaten as food. Experienced mushroomers may collect and dry a supply for winter use. Eastern Europeans prize these mushrooms and may use them in a Yuletide soup. But if Honey mushrooms are eaten raw or are undercooked they trigger an acute gastrointestinal reaction including nausea, vomiting and diarrhea. A bad reaction might also be caused by overindulgence; since they often fruit in profusion, some may be tempted to gluttony. Cook them well and eat all mushrooms in moderation.

The Fly Agaric: ***Amanita muscaria var. guessowii***

The Fly Mushroom is likely the most illustrated mushroom in the world, especially in its typical bright red cap and array of white “warts” across the cap. It has long been seen as a symbol of good fortune associated with the yule season and Christmas.

The Fly Agaric in New England is a variety with a bright yellow-orange cap with an array of ivory “warts” that are the remnants of the universal veil that enclosed the button before it expanded. Look for a swollen stem base with ridges or almost a collar and a fleshy skirted ring on the upper stem. The gills are off white to ivory and free from the stalk. It is most common late summer and the fall.

The Fly Mushroom(pictured top and bottom left) contains two psychoactive compounds; Ibotenic Acid and Muscimol that can result in agitation, a deep coma-like sleep and hallucinations or visions. Symptoms often begin with a period of nausea and vomiting. The closely related Panther Mushroom (*Amanita velatipes)* has higher concentrations of the toxic compounds and eating these mushrooms has resulted in several serious poisonings and one attributed death in Quebec. Avoid ALL species of Amanita.

Guidelines for the New Mushroom Forager Greg A Marley

A set of guidelines for anyone who is considering collecting and eating wild mushrooms. While the guidelines may seem extensive and cautionary, it's important to consider them all; it helps ensure that your early mushrooming experiences are positive.

Before Collecting Any Mushrooms for Food: Learn about mushrooms and focus on the common, easily identified mushrooms to start. Spend as much time and effort learning the poisonous mushrooms as you do learning the edible ones. Here are some suggestions to help you learn.

1. Buy and use one or more mushroom field guides
2. Become familiar with the best **online** mushroom identification sites .
3. Take part in mushroom classes or public walks.
4. Join the Maine Mycological Association or a local club in another state.
5. Befriend an *experienced* local mushroom guide.

When Collecting Mushrooms for Food:

1. Start slow and stay safe. Be conservative about the groups of mushrooms you collect for eating. Begin with the common well-known edibles; puffballs, shaggy manes, chanterelles or oyster mushrooms.

2. Avoid collecting mushrooms from potentially contaminated sites, e.g. heavily used roadsides and golf courses. Some mushrooms can concentrate heavy metals and other contaminants.

3. Collect only young or prime specimens for food, leaving old ones to drop their spores. Old mushrooms are perfect breeding ground for bacteria and molds that may sicken.

4. Collect a number of specimens in various stages of growth in order to gain a good understanding of what changes occur to the mushroom as it ages.

5. Collect all parts of the mushroom, above and below the ground to aid identification.

6. Do make a spore print to confirm spore color as a preliminary aid to identification.

After Collecting Mushrooms:

1. **Do not eat a new mushroom prior to having collected it several times**. Each time, confirm identification.
2. **Never eat a mushroom unless you are 100% certain of the identification and its edibility. When in doubt, toss it out!** This is vitally important!
3. **Avoid eating mushrooms that closely resemble or are related to toxic species.**

When you are certain that you have correctly identified and weighed the risks of the mushrooms you intend to eat:

1. **Keep some uncooked specimens for comparison** the first time you eat a new species in case of mistaken identification or a bad reaction.
2. For a new mushroom, **cook up a small amount and try a few bites.** This first meal of a new species is never shared with family or friends.
3. **Don't be a pig.** Mushrooms can be hard to digest, so eat them in moderation**.**
4. **Always cook your mushrooms well.** A few mushrooms (eg. Morels and Honeys) are toxic when raw, and all species are more easily digested when cooked.

RESOURCES

Recommended by mushroom experts:

- **Mushroom Expert: An online mushroom identification site. Lacks information on edibility or toxicity. www.mushroomexpert.com.**
- **The Bolete Filter: An online resource for identification and use of Bolete mushrooms. Does address edibility and toxicity. https://boletes.wpamushroomclub.org/**
- **Mushrooms of the Northeastern United States and Eastern Canada. Timothy Baroni. 2017. Timber Press. A good field guide with information on edibility.**
- **Boletes of Eastern North America. Alan Bessette, Arleen Bessette, & William Roody. 2016 . Syracuse Press. An excellent guide to Bolete mushrooms.**
- **The Maine *Mycological* Association, Inc.: A great, statewide group that organizes regular "forays" and educational winter meetings. Become a member. www.mainelymushrooms.org**

- **Northern New England Poison Center: 1-800-222-1222. https://www.nnepc.org**

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Northern New England Poison Center

The Maine Mycological Association, Inc.

When Exposure to a Potentially Toxic Mushroom has Occurred:

After seeking care for any physical symptoms, accurate identification of any mushroom eaten is a vital first step in addressing the potential risks involved with eating a bad mushroom. The Northern New England Poison Center (NNEPC) has mushroom identification consultants available to assist in this process. The information they need for identification of the mushroom(s) includes:

- Clear and accurate photographs of the top and underside of the mushroom(s).
- Information about where it was found (lawn, forest, roadside…) and any nearby trees.

If symptoms are suspected to be caused by a mushroom eaten, call the **NNEPC (1-800-222-1222)** and/or your healthcare provider/ Emergency Department and seek help. Let the provider know:

- What mushroom(s) were eaten (photos are really helpful),
- Description of symptoms, if any,
- Time elapsed between eating mushrooms & onset of symptoms,
- How much of the mushroom was eaten and how it was prepared (raw or cooked).
- If anyone else ate the mushrooms and their symptoms, if any.