



Winter 2022

# Fungi Kingdom News

The newsletter of the Pioneer Valley Mycological Association

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There are plenty of interesting fungi to find even in the middle of winter, but you might have to look a little harder to find them. Turning over logs and sticks can reveal unexpected treasures, like these *Scytinotus ringens* (reddish brown) and *Tectella patellaris* (pale brown) found growing together by Jess Benson Evans.

## It's Time to Renew!

Please renew your membership now. The exception is if you are a new member who signed up on or after October 1, 2021; your membership is good through 2022.

Benefits include weekly guided fungi identification walks, access to our most recent newsletter, eligibility to participate in Fungi Kingdom University seminars, programs with leading experts in various mycology topics, access to free PVMA late summer 5-day Foray in White Mts. of NH, information on multi-day regional forays, scholarship opportunities to attend multi-day forays, and educational programs via Zoom.

Membership dues remain just \$15 for an individual and \$25 for a family. There are two ways to renew. You may renew online at our new website by [clicking here](#). You may also print out the form on the last page of this issue and mail it in along with your payment. We hope you'll consider joining us for another year of friends, fun, and fungi!

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## Pioneer Valley Mycological Association

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### OUR MISSION STATEMENT

The Pioneer Valley Mycological Association is dedicated to enhancing the public's knowledge and appreciation of the fungal kingdom by providing ongoing educational programming in the form of guided mushroom walks, lectures, newsletters, information on multi-day regional and national forays, and citizen science projects. Because fungi are integral components of complex ecosystems, we are committed to advocating for responsible and sustainable study and collection methods. We focus on, but are not limited to, the three counties of the Pioneer Valley in western Massachusetts (Franklin, Hampshire and Hampden).

PVMA is a member of the Northeast Mycological Federation ([www.nemf.org](http://www.nemf.org)) and the North American Mycological Association ([www.namyc.org](http://www.namyc.org)).

[www.PVMAmyco.org](http://www.PVMAmyco.org)

Also visit Dianna Smith's educational site [fungikingdom.net](http://fungikingdom.net) for articles, fungi photos, and more.

### We Welcome Your Submissions!

This is your newsletter; we'd love to have you contribute to it!

Prose, verse, photos, drawings, recipes, scientific observations – send them all to:

[jessicabensonevans@gmail.com](mailto:jessicabensonevans@gmail.com)

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### From the President...

Happy New Year, everyone! I hope that the new year finds all of you healthy and staying warm during these deep, cold months. It's been an interesting winter weather-wise so far, with warmer temperatures and little snow making it possible for many of us to continue discovering treasures "out-of-season" into December.

Personally, I was thrilled to find a few *Craterellus ignicolor* just before Christmas out in my back woods.



Many of us spend the winter studying, looking through photographs we've taken, and working to identify mysteries from the mushroom season. This winter, my goal is to become more familiar with the iNaturalist app so that I can utilize its features to help with my identification and documentation. Namely, I've been thrilled to discover the mapping features, so I can see just how deep into my back woods I'm going. (Spoiler: it's not as far as it seems on foot!)

Now is also the time to consider renewing your membership in PVMA. We are hard at work on our walk schedule for the upcoming season and would love to have you join us. Please see membership renewal information on the front page. Looking forward to seeing you when the weather warms!

- Jessica



## Please Vote!!!

In the "before" time, we held our elections as part of our annual membership meeting; a joyful potluck event in the spring where members could get to know each other before the walk season began. Unfortunately, Covid-19 has made it inadvisable for us to gather in large groups indoors these past two years. We are very hopeful that we'll get back to this tradition in the coming years. This spring, however, we find it prudent to hold our elections virtually again. You will receive an email in the next few weeks that invites you to vote for the sole position up for re-election for our Board of Directors: Vice President. There will be an option to vote for Mary or write-in a candidate of your choosing.

Mary Obrzut, our current Vice President, would love to continue serving for a second two-year term in this position. Please take part in our election process by voting. You can learn about Mary (and our other board members) from her short bio on our website [here](#).

When you receive the online voting poll via email, please be sure to take part. It is a very simple, anonymous process. We need a quorum of members, or a specific number of votes, to make our elections valid for the coming terms. Your participation is vital to the everyday workings of our club!

If you have any questions about our elections, terms of office, or our club by-laws, please reach out via email to [JessicaBensonEvans@gmail.com](mailto:JessicaBensonEvans@gmail.com).



# FunDis Northeast Rare Fungi Challenge: Citizen Science at Work

**By Jessica Benson Evans**

Several years ago, our club took part in the North American Mycoflora project, which was designed to encourage citizen scientists (amateurs, us!) to document our mushroom finds and select some to send for DNA sequencing. The end goal of the project was to create a comprehensive mycoflora, or database, of fungi across North America. Our club participated by sending out 28 specimens for sequencing, adding to a broader understanding of which fungi exist in our area and a more specific understanding of how DNA sequencing can help identify and categorize fungi.

More recently, the North American Mycoflora project went through a “reboot” in late 2020, rebranding as FunDis (the Fungal Diversity Survey.) This reboot was undertaken primarily to ensure that the mission of the project would be clear to all; the term “mycoflora” led to public confusion about the key role of fungi in our ecosystems<sup>1</sup>. Namely, fungi deserve recognition as a separate entity from both flora and fauna, and the use of “flora” in the project’s name muddied the waters. They kept the same goals, namely “to increase scientific knowledge and public awareness of the critical role of fungi in the health of our ecosystems and to better utilize and protect them in a world of rapid climate change and habitat loss.”<sup>2</sup> Through community science, or the work of amateurs collecting and documenting fungi, the project aims to ensure public awareness of the importance of fungi in our world. We are all community or citizen scientists, so each of us has the opportunity to participate in this valuable project.

There are several key steps to this project, the first of which many of us participate in each time we attend a club mushroom walk. Step 1 is to Document mushroom finds. This can be accomplished by signing up for an account on either [Mushroom Observer](#) or [iNaturalist](#). With an account, citizen scientists can upload photographs of their finds and get help identifying any unknown species. From my perspective, this is a very achievable step for all of us! While the next steps in the FunDis project may seem daunting, documenting mushroom finds is made very easy by both of the websites I mentioned. Even better, iNaturalist even has an app for your smartphone. (If you know me well, you know I was very slow to jump on the smartphone bandwagon. I happily use the iNaturalist app now.)

As noted by the FunDis folks, the documentation phase is also referred to as “Level 1.” They hope many more citizen scientists (again, that’s you!) take part in Level 1 by adding your finds to either Mushroom Observer or iNaturalist. Bill Sheehan and D. Jean Lodge from FunDis state that “We have learned that there are many competent naturalists who are eager to learn about fungi (a number likely in the hundreds of thousands) but are intimidated by the notion that they must learn DNA sequencing and voucher all specimens to participate in NAMP (North American Mycoflora Project). So, we aim to become a welcoming home for people eager to learn, as a first step, about proper documentation of fungi and posting observations on public, databased platforms.”<sup>1</sup> This documentation step, Level 1, is key. The reason for this is simple; the more documentation we have about which species occur in what areas, the better we can understand how fungi interact with and within their ecosystems.

Of course, some fungi are harder to find than others. There are many rare and under-documented fungi across the Northeast, and FunDis needs your help to find them! They have developed a list of twenty rare or threatened species in the Northeast, listed here and illustrated in the pages at the end of this article:

*Amanita ristichii*  
*Boletus purpureorubellus*  
*Butyriboletus billieae*  
*Caloboletus peckii*  
*Clavulinopsis appalachiensis*  
*Dendrocollybia racemosa*  
*Echinodontium ballouii*  
*Entoloma flavoviride*  
*Entoloma indigoferum*  
*Helvella palustris*  
*Hodophilus Peckianus (=Camarophylloopsis peckiana)*  
*Hypocreopsis rhododendri*  
*Psathyrella epimyces*  
*Pseudofistulina radicata*  
*Squamanita umbonata*  
*Tricholoma apium*  
*Tricholoma grave*  
*Underwoodia columnaris*  
*Volvariella surrectat*  
*Wynnea sparassoides*

You may recognize one of these species, *Wynnea sparassoides*, from our last club newsletter. Member

Brenda Clark found and brought to the tables a beautiful specimen of *W. sparassoides* at the COMA foray in Hebron, CT last fall. Citizen science in action! On the following pages, I've included photographs of most of the species for your reference. You can also see the list here: <https://fundis.org/protect/northeast>.

Participation in this aspect of FunDis can help scientists track these rare or threatened species, to better understand trends among these species and beyond. How are these species interacting with their environments? How is climate change affecting rare or threatened fungi? Citizen scientists can help answer these questions. You can see the progress in finding these rare/threatened species already by visiting the [Mushroom Observer species list](#) or the [iNaturalist species list](#) for the FunDis Northeast challenge.

Should you find any of these species, Level 2 in the FunDis project is to send the specimen out for DNA sequencing. Sequencing gives mycologists additional information about each species, either confirming that it matches the identification given in the field or sometimes leading researchers in a different direction. The work of the citizen scientist in this regard is invaluable; because we're out in the field more often, we have more opportunities for discovery. In past years, FunDis has had grant funds available for sequencing fungi from the rare/threatened list. They are hopeful that funds will become available again for this purpose.

Beyond Levels 1 and 2 are additional facets of the project that may seem unreachable for citizen scientists, but are possible with club support. Level 3 tasks focus on vouchering a specimen, which means drying a collected mushroom specimen and sending it to an herbarium for storage. In the past, our club has dried and sent specimens to the New York Botanical Garden for long-term storage and accession by mycologists. For club members interested in completing the project through this step, I have done so in the past and can offer information about the process. Each herbarium has specific guidelines to be followed, from how the specimen is dried to how it is labeled and mailed.

The final level of FunDis is called the "Super User" level, which details citizen scientists who "learn DNA technology, teach others how to analyze DNA results, and perhaps even describe new species."<sup>2</sup> Although most typical participants do not eventually become super users, the potential is there through this project for any of us to reach this level of understanding.

As we begin planning events and workshops for the coming years, I'd be open to offering educational opportunities focusing on this project and its many

facets. Want to learn how to use Mushroom Observer or iNaturalist? Want to hear more about creating voucher specimens? Our club can create workshops with this in mind. I know I'll be out there this summer, looking for these rare specimens!

## References

1. <https://msafungi.org/evolution-of-the-north-american-mycoflora-project/>
2. <https://fundis.org/about-fundis>



*Amanita ristichii*. © Renée Lebeuf. Used with permission.



*Boletus purpureorubellus*. Image ©Igor Safonov. Used under CC BY-SA 3.0. Accessed at Mushroom Observer.



*Butyriboletus billieae*. Image ©Sigrid Jakob. Used under CC BY-SA 3.0. Accessed at Mushroom Observer.



*Caloboletus peckii*. ©Robert Gergulics. Used under CC BY-SA 3.0. Accessed at Mushroom Observer.



*Clavulinopsis appalachiensis*. Courtesy of Garrett Taylor. Accessed at iNaturalist.



*Dendrocollybia racemosa*. ©Christian Schwarz. Used under CC BY-NC 4.0. Accessed at iNaturalist.



*Echinodontium ballouii*. ©Tom Murray. Used under CC BY-NC 4.0. Accessed at iNaturalist.



*Entoloma flavoviride*. Courtesy of Garrett Taylor. Accessed at iNaturalist.



*Entoloma indigoferum*. ©John Plischke. Used under CC BY-NC-SA 3.0. Access at Mushroom Observer.



*Helvella palustris*. ©user zaca at Mushroom Observer. Used under CC BY-SA 3.0.



*Hodophilus peckianus* (= *Camarophylloopsis peckiana*). ©Django Grootmyers. Used under CC BY-SA 3.0. Accessed at Mushroom Observer.



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*Squamanita umbonata*. ©Rick Van de Poll. Used under CC BY-NC 4.0. Accessed at iNaturalist.



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*Tricholoma grave* ©Christian Schwarz. Used under CC BY-NC 4.0. Accessed at iNaturalist.



*Underwoodia columnaris*. ©Eva Skific. Used under CC BY-SA 3.0. Accessed at Mushroom Observer.



*Volvariella surrecta* © Matt Pulk. Used under CC-BY-NC 4.0. Accessed at iNaturalist.

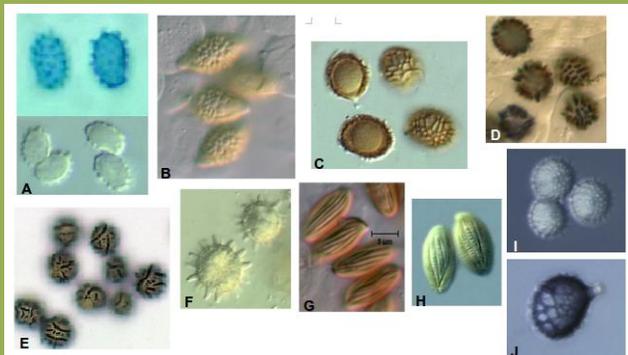


*Wynnea sparassoides*. Note that this is from PVMA member Brenda Clark's collection at the 2021 COMA foray in Hebron CT. ©Zaac Chaves. Used under CC BY-NC-SA 3.0. Accessed at Mushroom Observer.

## Free Microscopes for PVMA Members!



We have a few extra microscopes that we are giving away to the first PVMA members who ask! These are older microscopes that were great in their heyday but are still very useful now, especially if you are new to microscopy and want to give it a try. Please contact [Dianna Smith](#) if you are interested.



Images from the microscopy articles in *Fungi Kingdom News*, Spring and Summer 2018. The articles are available [here](#).

# Mycoparasitic Boletes

By Sue Lancelle

We all know and love the boletes for their relatively large size, colorful diversity, and delicious possibilities. However, some of them are hiding lifestyle secrets that remain to be fully elucidated. An example of this is mycoparasitism, where one species of fungus (in our case, a bolete) parasitizes another fungus.

The vast majority of members of the family Boletaceae are ectomycorrhizal, meaning that they have a symbiotic association with plant roots, whereby the plant supplies carbon to the fungus, while the fungus supplies nutrients to the plant. These boletes can't survive any other way. But some have evidently adopted other nutritional modes, including mycoparasitism and perhaps saprotrophy (feeding on dead plant material). It is even possible that some of these boletes can switch among multiple nutritional modes or use multiple modes at once. There are three members of the Boletaceae that you might find in our geographic area that reportedly exhibit mycoparasitism.

## 1. *Pseudoboletus parasiticus*

This is one you probably have seen or will likely run across if you spend much time in the woods around here, as it is fairly common, at least in some years. It parasitizes *Scleroderma citrinum*, the “pigskin puffball” (a better name is “earthball” to distinguish it from true puffballs). Interestingly, *Scleroderma* is also in the order Boletales, along with the members of the family Boletaceae.

In this case, the host-parasite relationship is easy to see, as the bolete fruiting body grows directly out of the *Scleroderma* fruiting body (Figs. 1,2) Ernst Both (2006) summarized his observations of the effect of *Pseudoboletus parasiticus* on development in *S. citrinum*. He stated that the effect on the host depends on its developmental stage when it initially becomes parasitized. Younger, less mature fruiting bodies end up with cavities in the spore forming tissue (the gleba), which then does not mature. The outer coat (peridium) partly collapses and becomes deformed. If the infection occurs after the host reaches a certain size (40-90 mm) the gleba remains solid and gray in color, and becomes diffused with the parasite's hyphae. The host's outward appearance is fairly normal. In all cases, the parasite does not kill the host while obtaining nutrition from the living tissue, but does prevent spore maturation and release by the *Scleroderma* host. It is common to see a group of



Figure 1. *Pseudoboletus parasiticus* parasitizing *Scleroderma citrinum*.



Figure 2. Multiple fruiting bodies of *Pseudoboletus parasiticus* emerging from the base of a single *Scleroderma citrinum*.

*Scleroderma* growing in close proximity, with only some of them parasitized. The others develop and release spores normally.

Although the mycoparasitic nature of *P. parasiticus* is well documented, Ernst Both (2006) mentioned that there are a couple of reports indicating that the species may be capable of other nutritional modes. One report states that *P. parasiticus* was found growing independently about 25 cm away from the nearest *Scleroderma*. Another study showed synthesis of mycorrhiza between *P. parasiticus* and *Pinus resinosa* (red pine) in the laboratory, indicating that *P. parasiticus* may also be mycorrhizal, at least some of the time.

To find *P. parasiticus*, simply look for *S. citrinum*, which is very common in our area and is present from midsummer into fall in a variety of habitats. *S. citrinum* is mycorrhizal with a wide variety of conifers and hardwoods and can be found growing on the ground,

in moss, or sometimes on rotting wood. Examine the fruiting bodies carefully to see if you can find the bolete, which seems to be very common some years but hardly present in others. There may be one or more bolete fruiting bodies coming from a single *S. citrinum* (Fig. 2).

## 2. *Buchwaldoboletus*

There are three species of *Buchwaldoboletus* found in the Eastern U.S. (Bessette *et al.* 2006). They are all uncommon to rare, but the one you are most likely to find in our area is *B. lignicola* (Fig. 3). This mushroom grows most often on dead pine wood, often in close



**Figure 3.** *Buchwaldoboletus lignicola*. ©Ivan Matershev. Used under CC BY-NC 4.0. Accessed at iNaturalist.

association with *Phaeolus schweinitzii* (Figs. 4,5), a polypore that causes brown rot in conifers. The history of observations of this association are documented in Ortiz-Santana and Both (2011) but it has been assumed that *B. lignicola* is mycorrhizal and perhaps even saprotrophic, since it grows on dead wood. However, Nuhn *et al.* (2013) presented evidence from laboratory experiments that *B. lignicola* hyphae can surround and lyse the hyphae of *P. schweinitzii*, leading to the suggestion that *B. lignicola* is actually parasitic upon the polypore, explaining why the two are so often found closely together. In this case, the host-parasite interaction is thought to occur between hyphae in the substrate, so it isn't as evident to the naked eye as with *Pseudoboletus parasiticus*.

A recent study by Caiafa and Smith (2022) examined the three species of *Buchwaldoboletus* that are found in the Eastern U.S. (*B. lignicola*, *B. hemichrysus*, and *B. sphaerocephalus*), utilizing laboratory experiments to determine if these boletes could parasitize various species of fungi, and whether they could also colonize and decay dead wood in the presence or absence of other wood rotting fungi. They found that all three can parasitize a wide variety of fungi, both white and brown wood rotters. Interestingly, hyphae of *Ganoderma*



**Figure 4.** *Buchwaldoboletus lignicola* (foreground) growing in close association with the polypore *Phaeolus schweinitzii*. ©Ivan Matershev. Used under CC BY-NC 4.0. Accessed at iNaturalist.

*curtisii*, a white rot polypore that grows on hardwoods, and *G. curtisii* var. *meredithiae*, which grows on conifer wood, were both parasitized by hyphae of all three species of *Buchwaldoboletus*. Also significantly, *B. hemichrysus* and *B. lignicola* showed some ability to colonize and decay wood on their own, indicating that



**Figure 5.** Young fruiting bodies of *Buchwaldoboletus lignicola* (foreground) emerging in close association with the polypore *Phaeolus schweinitzii*. ©Ivan Matershev. Used under CC BY-NC 4.0. Accessed at iNaturalist.

they may be able to survive by saprotrophy when they need to. It is important to stress that these are laboratory experiments and the results may not directly translate to the field because of the complexity of natural environmental and physical interactions. However, it does provide interesting evidence to suggest that at least some fungi have a variety of nutritional mechanisms.

When you are out in the woods, watch carefully for

boletes that are closely associated with the wood rotting polypores *Phaeolus schweinitzii* and *Ganoderma curtisii*, and you may just find a specimen of *Buchwaldoboletus*!

### 3. *Chalciporus piperatus*

This species is relatively common in our area and grows under both hardwoods and conifers (Bessette *et al.* 2016) (Fig. 6).



**Figure 6.** *Chalciporus piperatus*. Image courtesy of user mangoblatt at iNaturalist.

As summarized in Nuhn *et al.* (2013) and Caiafa and Smith (2022), the evidence for *Chalciporus piperatus* being a mycoparasite is perhaps on shakiest ground, being entirely circumstantial. The fungus was long thought to be mycorrhizal like most other boletes, but laboratory experiments trying to establish mycorrhizal associations *in vitro* have been inconclusive. There is also some evidence that it has some saprotrophic ability. Observations in the southern hemisphere have led to the suggestion that *C. piperatus* is mycoparasitic.



**Figure 7.** *Chalciporus piperatus* (small mushroom at right) growing in close association with *Amanita muscaria* in Tasmania. Image ©Roy Halling, used with permission.

*Pinus radiata*, a species of pine native to California and Mexico, was introduced to Australia and New Zealand. Along with it came *Amanita muscaria*, one of the pine's mycorrhizal partners and a species new to the continent. Soon *A. muscaria* made a host jump to the native *Nothofagus* trees, and now *C. piperatus* is found fruiting in close association with *A. muscaria* under these *Nothofagus* trees (Fig. 7). This indicates that *C. piperatus* may have been introduced along with *A. muscaria*, since *C. piperatus* is also non-native to the region. The close association between the two fungal species prompted the speculation that *C. piperatus* is a mycoparasite of *A. muscaria*, but more rigorous study should be employed to help confirm whether this is the case. Interestingly, though, based on DNA analysis, *Buchwaldoboletus* is a very close relative of *Chalciporus* (Nuhn *et al.* 2013, Caiafa and Smith 2022), so it is possible that mycoparasitism is a character that has evolved in common in this line of boletes.



**Figure 8.** *Chalciporus piperatus* growing in close association with *Amanita muscaria* var. *guessowii* in Michigan. Image courtesy of Jud Van Wyk, Michigan State University.

The association of *C. piperatus* with *A. muscaria* in the U.S. doesn't seem to be well documented (although Fig. 8 is from Michigan), so this is another bolete that we should watch for. If you do find it, carefully document its habitat and any associated species, both plant and fungal. For any of these mushrooms, take photographs and post on Mushroom Observer or iNaturalist. Our observations and photos will add to the knowledge base of these interesting fungi.

*Thank you to Dr. Roy Halling for his help and constructive feedback during preparation of this article.*

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# Musings on Mushroom Poisonings: An Epidemic of Cases During the Pandemic

Reprinted, with permission of the author, from *Mainely Mushrooms*, the newsletter of the Maine Mycological Association, Winter 2022

By Greg Marley

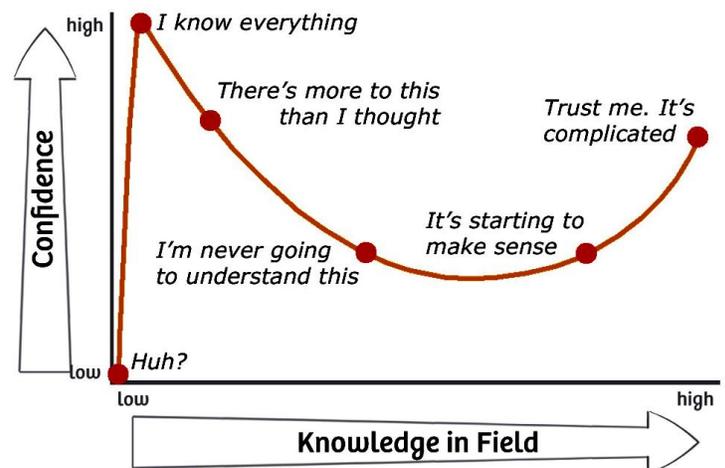
2021 is coming to a close with alternating waves of rain and snow across Maine; a fitting end to one of the wettest and most abundant mushroom years I have experienced. We all found our fungal friends in, at times, overwhelming abundance, and diversity of species this year. This cornucopia of mushrooms coincided with an explosion of interest in all things mushroom sweeping the American consciousness. It is fueled by an interest in foraged food, natural health supports, and an appreciation of the range of edible and medicinal fungi that has been growing for decades. Three other factors came together recently: access to nature as pandemic stress-relief, the movie *Fantastic Fungi*, and the increasing popularity of social media sites devoted to mushrooms. It seems like everyone is mad about mushrooms!

New England is a treasure house of edible mushrooms with around 40-50 different species commonly collected and eaten. Mushrooming, “the quiet hunt” as the Russians say, calls on us all to bring our knowledge and skills to bear as we develop an understanding of the species sought, the habitat they are likely to inhabit and the awareness of terrain and microclimate variations as we search out our quarry. It also engenders the same rush of emotions when success results in a full basket and the same tendency toward gluttony as we collect and sometimes eat more than we need. Yes, mushroom hunting is wild fun.

The dark side of wild mushrooms is, of course the risk of poisoning. The danger is real; New England is home to about as many toxic mushrooms as edibles and 5-10 species that can cause serious and even life-threatening poisonings. The same excitement and interest that has perhaps tripled the number of new members to the Maine Mycological Association is also seen in an increasing number of people sickened after eating the wrong mushroom, or too many mushrooms, or undercooked mushrooms that require full cooking. Thirty-five years ago I was one of the people who ate

the wrong mushroom (*Sutorius eximius*, the lilac brown bolete) and ended up in the hospital emergency room, much to my chagrin. Though I had learned about toxic mushrooms before, the experience of 12 hours of gastronomic pyrotechnics fueled my study of toxic mushrooms and mushroom toxins. For the past twenty years I have served as a volunteer mushroom identifier for the Northern New England Poison Center (NNEPC) and occasionally also for Massachusetts and Rhode Island. Over recent years, the number of cases I cover that involve clear symptomatic mushroom poisoning has increased incrementally as mushroom foraging has increased. This year the NNEPC saw a significant increase in poisonings of foragers and their families and friends resulting from eating the wrong mushroom or in the wrong way.

I was recently reacquainted with a phenomenon that may, in part, explain some of the mistakes people make, especially when a new or less experienced forager. The Dunning-Kruger Effect is where someone with a little knowledge assumes they know a great amount about the subject and make decisions based on assumptions of knowledge that just isn't there. This assumption of knowledge is akin to “they don't know what they don't know, and they don't know that they don't know it.” As Charles Darwin wrote in his book *The Descent of Man*, “Ignorance more frequently begets confidence than does knowledge.”



The Dunning-Kruger Effect

Let's be honest and admit that we have all fallen prey to this cognitive bias and have assumed more competence than we had, especially those of us of the male persuasion. In content areas where I have spent years learning, practicing, and refining my knowledge base (subjects that others see me as expert in) the more I learn, the more I can see and am willing to acknowledge just how much I still have to learn. And without a doubt, mushrooming is a constant learning curve. We are exposed to perhaps two thousand species in Maine, with a constantly shifting taxonomy and a growing base of knowledge about the fungi! Keeps it fun though ...

Let's look at some examples of toxic mushroom mistakes made this year, the basis of the mistaken thinking and some of the mushrooms consumed in these cases:

**Magical thinking** is perhaps the scariest basis upon which to eat a wild mushroom. This happens when someone comes upon a mushroom or a group and believes they are beautiful and natural and must be edible based on a belief of their goodness, or another non-rational perspective. We had an adult couple in New England cook and eat *Amanita virosa*, the destroying angel, based on this thinking [ed. note: *In New England, there are a number of very similar white Amanita species that go by the common name "destroying angel." Here, the author groups them all under the European name A. virosa because of the taxonomic uncertainties. The important thing to know is that they are ALL deadly toxic*]. They ended up hospitalized with severe liver damage. I have seen people poisoned by a number of different mushrooms based on magical thinking. In this situation there is often NO knowledge-base of mushroom identification, just an assumption of goodness.

Magical thinking is again increasing because of all of the great research supporting the therapeutic use of certain psychoactive mushrooms and the rampant media coverage of the hope and promises of psychoactive mushrooms in cognitive health and mental health. As a mental health clinician (and child of the 1960s) I too am excited by the clinical findings supporting appropriate use of psilocybin and psilocin containing mushrooms in management of depression, anxiety, and trauma. If accurately identified and used in appropriate settings these mushrooms rarely cause problems other than for those with heightened anxiety or in very young children. However, mushrooms with psilocybin are not abundant or well known in Maine but a different psychoactive mushroom, *Amanita muscaria*, is quite common and, this year, quite abundant. These mushrooms, along with several common related *Amanitas*, contain ibotenic acid and muscimol along with small concentrations of muscarine. When eaten, they trigger a complex of effects including nausea,



*Amanita muscaria* var. *guessowii*

vomiting, shakes, agitation, deep somnolence and sleep as well as intoxication and visions. It can be a hard ride, especially for someone eating the mushroom believing they are edible! This year the NNEPC received several cases where these mushrooms were eaten, either as food or for their psychoactive effects and the resulting strong negative symptoms described above brought people into the emergency department for care. We strongly recommend avoiding the *Amanitas* for those seeking visioning or a recreational experience!

**Assumptions of edibility of a whole group of mushrooms:** This is a mistake often made with the boletes, that large and diverse group of fleshy pored mushrooms. It happens pretty frequently in people



The destroying angel

(often summer visitors to this region) who learned their mushroom foraging skills in Europe, especially Eastern Europe. They believe that all boletes are edible except for some of the red-pored blue-staining species. This has resulted in people cooking and eating *Boletus huronensis* or *Sutorius eximius* in New England and experiencing severe gastrointestinal distress for many hours! Every year over recent history we have seen sickening with both species and 2021 was no exception.

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*Omphalotus illudens*

hours of severe nausea and vomiting. Chanterelles are golden yellow and never grow in clusters of more than 2 or 3 together. Never eat a mushroom unless you are 100% sure of the identity and the edibility; when in doubt, throw them out!

**Assuming an edible mushroom is edible raw or under-cooked:** There are several great edible mushrooms commonly eaten and enjoyed that are toxic if eaten raw or undercooked. In New England, sickening by raw or undercooked mushrooms is chiefly seen in honey mushrooms (*Armillaria mellea* and related), chicken of the woods (*Laetiporus sulphureus* and related) and blewits (*Lepista nuda*). Each of these species caused sickenings this year when they were eaten undercooked or raw. We have also seen this in morels. Almost all mushrooms must be cooked to aid in digestion and though not many are actually toxic, they will sicken some people when eaten raw.

**Multiple meals of the same mushroom:** As mushroom madness sweeps the nation, I am witnessing a developing level of competitiveness among certain foragers, especially some who have been sipping the Facebook Kool-Aid. People strive to collect and eat as many species as possible and work to exceed others in both diversity and volume of mushrooms eaten. This can lead to problems associated with **gluttony**. It has also shown that eating the same mushrooms several times a day over successive days can sometimes lead to an overwhelmed digestive system. In an uber-abundant mushroom year like 2021, many people experienced the resulting “challenges.” I am aware of several cases of uncontrollable diarrhea following overconsumption of benign mushrooms like black trumpets or maitake/hen of the woods. I experienced this in mild form this year from a bountiful abundance of shaggy

© Greg Marley



*Sutorius eximius*

**Mistaken identity:** The look-alike challenge can happen in many groups of mushrooms and is a mistake most common among new mushroom foragers who assume they know more than they do. People mistaking *Boletus huronensis* for one of the variants in the *B. edulis* group has occurred many times in recent years. The most common case of mistaken identity seen this year and every year is the person who finds the glorious caespitose cluster of orange mushrooms and believes it is the mother lode of golden chanterelles when in reality they are a typical cluster of the toxic Jack O'Lantern mushroom (*Omphalotus illudens*). The result is almost always 5-7

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*Boletus huronensis*

manes in soup eaten over several days. The most common symptom is diarrhea and a sense of bloat, but others report being bound-up. It may last for days.

**Pushing the boundaries:** a recently seen and growing phenomenon. As mushroom madness morphs into a competitive sport (BAD idea guys!) a certain small part of the community strives to outdo others and post their feats of bravery (or madness) on social media. They may not post the mushrooms that tasted bad or left them nauseous but may brag about the new

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*Scleroderma citrinum*

species they tried for the first time and how they are pushing the limits on edibility. This is leading to people taking more chances and more people getting sick. If you are someone who can eat and digest *Scleroderma* puffballs with impunity, please do not push others to eat them. MOST people who eat this group rapidly develop intense GI difficulties! There is a

Northeast mycophile who hosts events called “Eating Rare Mushrooms” or something similar. It is a scary trend.

About 37 years ago a small group of mushroomers were on a workshop with a well known and respected mycologist. They found an abundant collection of what was initially identified as *Ramariopsis kunzei*, a beautiful pure white coral mushroom. It was cooked and eaten and at least five people were severely sickened and three were placed inpatient in hospital for several days as the result. There is a closely related mushroom named *R. lentofragilis* that can only be

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*Ramariopsis* sp., likely *R. kunzei*. The toxic *R. lentofragilis* looks identical.

distinguished from *R. kunzei* by use of a ferrous sulfate color change. It triggers very severe symptoms, possibly including liver damage. We had a case of people hospitalized after eating a mixed group of mushrooms this summer where one was later identified as *R. lentofragilis* by our friend Willow Cullen Torrey. Let's all go slow, be deliberate and a bit conservative, especially with new and rare mushrooms. I often eat 35-45 different mushrooms in a year but am very conservative with what I choose to eat or to share. 1986 was my only significant sickening!

### General Guidance for a New Mushroom Forager

If you have read this far, you are either interested in mushroom foraging and want to make sure you avoid an unfortunate mistake, or you might be reading this primarily interested in protected a well-loved mushroom forager in your life. Either way, there are some simple but key recommendations to guide safe foraging:

- Actively learn the mushrooms in your area. **Learn the edible ones and learn the toxic ones with the same fervor!**
- Get copies of good field guides for your area.
- Take a mushrooming class or workshop.
- Join your local mycological association and attend forays and lectures and ask questions.
- Join Facebook sites and mostly watch and learn.
- Find and befriend a mentor whose knowledge and judgment you respect.

### When collecting for food or for identification:

- Don't be driven by wanting the longest life list of eaten species. Mushrooming is not an extreme sport!
- Take note of the habitat and associated trees where the mushroom grows.
- Collect all parts and all stages for best ID characteristics.
- Collect only firm prime specimens for food.
- Avoid ground with any risk of contamination (busy roadways, golf courses, manicured lawns).
- NEVER eat a mushroom unless 100% certain of ID and edibility.

### When eating wild mushrooms for the first time:

- Always cook your mushrooms well; few mushrooms are edible raw.
- Try one new mushroom at a time. Do not cook mixed species together.
- Keep a few whole or take good photos in case of problems.
- Eat a small amount the first time to ensure tolerance.
- Be very cautious sharing new mushrooms with a group!
- When in doubt, throw them out!

# Fungi as Wedding Décor

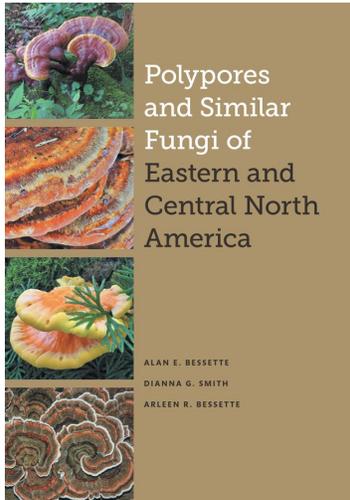
This past summer, we had the pleasure of hosting our son's wedding in our yard. The couple chose to have a rustic, woody theme, and we all pitched in to create the decorations. This involved a lot of sticks, moss, bark and leaves! But as luck would have it, a huge crop of *Ganoderma curtisii* cropped up in our yard, colonizing an old maple stump. I immediately seized upon the idea of using some of them as "artist conks" like is traditionally done with *Ganoderma applanatum*. While they didn't allow detail as fine as can be achieved with *G. applanatum*, they served passably well as little additions to the cake table decorations. They also sparked many interesting conversations! For our son and his wife, these dried fungal decorations are now lasting reminders of the big day.

– Sue Lancelle



# Polypores and Similar Fungi of Eastern and Central North America

**Polypores and Similar Fungi of Eastern and Central North America**  
**Alan E. Bessette, Dianna Smith and Arleen Bessette**  
University of Texas Press 2021  
430 pages  
Available for order (\$65) from the following sources: Amazon, Univ. of Texas Press ([www.utexaspress.com](http://www.utexaspress.com)) or by email: [custserv@press.uchicago.edu](mailto:custserv@press.uchicago.edu)



## Reviewed by Mike Ostrowski

When it comes to polypores, many of us passionately seek the delicious edible chicken mushrooms (*Laetiporus sulphureus* and *L. cincinnatus*) and hen of the woods (*Grifola frondosa*), but there is a whole world of other interesting polypores to learn about. The new book *Polypores and Similar Fungi of Eastern and Central North America* by Alan E. Bessette, our own Dianna Smith, and Arleen Bessette, opens the door to over 250 other polypore species in this beautifully illustrated and comprehensive field guide.

The introduction begins with the origin of the word polypore, from the Greek word *poly*, meaning “many” and *poros*, meaning “pores,” and outlines the life cycle of a dispersed spore. If lucky enough to find a suitable substrate, a spore can germinate and form a germ tube, and with water, the tube swells and forms multicellular hyphae that branch out radially. These hyphae can connect with other hyphae, forming a mycelium of feeding hyphae. Expanding in all directions in search of food, the hyphal tips penetrate a favored food source, and their enzymes then convert organic material to useable nutrients. Some polypore species can form a miles-long network of hyphae in a single tree. Under the right conditions, and over a period of time, the mycelium will produce a primordium that develops into a fruiting body that will produce and release mature spores, completing the cycle.

A lengthy discussion presents the current understanding of the relationships between fungi and their hosts from an ecological and evolutionary perspective. Originally, fungi were unicellular and mobile, moving through water with a whiplike appendage called a flagellum. These likely existed at least 900 million years ago. Eventually, they colonized land and became multicellular. From these humble beginnings arose the huge variety of forms that we see in fungi today. The oldest documented fungal fossils associated with plants date back to about 450 million years ago, and the history of the co-evolution of fungi with their plant hosts is summarized in this section of the book.

The discussion of ecosystems includes a description of the

major forest types in the central and eastern U.S. and Canada, and the ecological influences on fungal populations. Importantly, the importance of old growth forest to the diversity of all organisms is emphasized.

The book describes the major types of wood decay caused by polypores: white rot and brown rot. White rot can break down all three components of wood – cellulose, hemicellulose, and lignin – while brown rot breaks down cellulose, but cannot decompose lignin, which leaves a brown stain and eventually disintegrates into fine dust. Most wood decay fungi are white rot fungi, while less than 6% are brown rot fungi.

Another section of the book covers current uses of polypores. Some species, like *Fomes excavatus* (the tinder fungus) is used to start fires in the wilderness, while a spongy material called amadou, derived from the same species, is made into a suede like fabric used to make hats and other items. Manufacturers of blue jeans use *Trametes versicolor* (turkey tail) to lighten and soften new blue jeans. Weavers and knitters use *Phaeolus schweinitzii* (dyer’s polypore) to create colorful dyes. And of course, there are the edibles. Most polypores are very tough and lack taste but there are several choice edibles, including those mentioned at the beginning of this review.

The book provides guidelines for collecting and preserving polypores so that you can go back and identify them later, along with a useful equipment list. There is also a section with comprehensive keys, along with instructions on how to use them. The keys should lead you to a suggested identification, but the authors emphasize that you shouldn’t rely on the keys alone. You should always carefully study the detailed descriptions and photos when determining what species you have. The descriptions include detailed macroscopic and microscopic features, as well as occurrence and edibility of the polypore.

At the end of the book, there are five appendices and a glossary that further enhance the study of polypores:

- Appendix A. Microscopic examination of polypores.
- Appendix B. Chemical reagents for polypore identification
- Appendix C. How to make a spore deposit
- Appendix D. The medicinal uses of polypores: A brief history and summaries of current research (a must read for anyone interested in this topic!)
- Appendix E. Polypores organized by order, family, genus, and species

*Polypores and Similar Fungi of Eastern and Central North America* is a welcome addition to my field guide shelf. When I’m in the forest, I always see many different polypores, and now with this very useful guide I will be able to put a name to a face. Imagine recognizing a polypore like you would an old friend!

# PVMA Membership Application (Mail-in Form)

(January 1 to December 31)

Please enter your name and email address as you wish it to appear on correspondence for the upcoming year (please print clearly).

Name(s) \_\_\_\_\_

Address \_\_\_\_\_

City/State/Zip \_\_\_\_\_

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The Annual Membership fee for individuals is just \$15. For families or couples of two or more individuals living in the same household, it is only \$25 per year (Jan.-Dec.) Fees collected are used to pay invited mycologists to lead our spring series of "Fungi Kingdom" workshops and occasionally to lead us on scheduled guided walks. Fees also pay for our membership in the North American Mycological Association (NAMA), club equipment, such as microscopes, as well as partial scholarships enabling deserving members to attend an annual regional foray. **Please make your check for \$15 (single membership) or \$25 (family of two or more living in same household) payable to the PVMA. Mail this form with your check to PVMA membership secretary Michael Ostrowski, 27 East Street, South Hadley, MA 01075.**

**First time membership applicants joining from Oct. 1 of the current year will be granted membership for the next year as well as the remaining months of the current year.** We recommend you also consider joining **NAMA (North American Mycological Association)**. As a PVMA member you are eligible to join them at a reduced rate. See <http://www.namyco.org/>.

**All members are required to sign a release of liability form below.**

I (We) \_\_\_\_\_  
hereby release the PVMA, any officer or member thereof from any and all liability arising out of or relating to any injury, accident or illness of any nature during or as a result of any field trip, foray, excursion or educational event.