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Boston Mycological Club
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The Bulletin



MAGIC MUSHROOMS FROM MEXICO TO CAMBRIDGE
LENIN • CHYTRIDIOMYCOTA • IDENTIFICATION BASICS
HEBELOMA • THAXTEROGASTER • EVENTS CALENDAR

*A publication of the
Boston Mycological
Club prepared
diligently, at times
relentlessly, by your
faithful Editorial
Board*

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We proudly present to you an overflowing issue of *The Bulletin*, covering the a what has been a prodigious season. As you ready yourselves for the winter we hope you will keep exploring and writing about these fungal marvels.

This following issue contains many tidbits and tales to keep you and your friends amused. Remember to always keep *The Bulletin* out in the open for others to peruse. It ought not be stored away somewhere. If you must part with one, tuck it into a magazine stack at a nearby business. This will help us get many new members (and possibly some colorful letters to the editor.)

And you have continued to keep us impressed and, candidly, a little perplexed with the unique contributions in this issue. We have endeavored to fit this varied content in this *Bulletin* to the best of our abilities and hope you will enjoy the range of pictures, poetry, art pieces, and articles. Keep up your enthusiastic pursuit of fungi in all of their myriad forms. Every issue will be housed permanently in the Harvard Herbaria archives.

We encourage submission from any and all mycophiles and we make a concerted effort to publish from first time contributors.

The cover image is *Ophiocordyceps sp.* photographed by Joe Warfel. The specimen was captured in Groton MA and incubated so that it could grow. Periodically it was photographed in Joe's home. You can read more about this on page four.



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The Bulletin

OCTOBER 2018

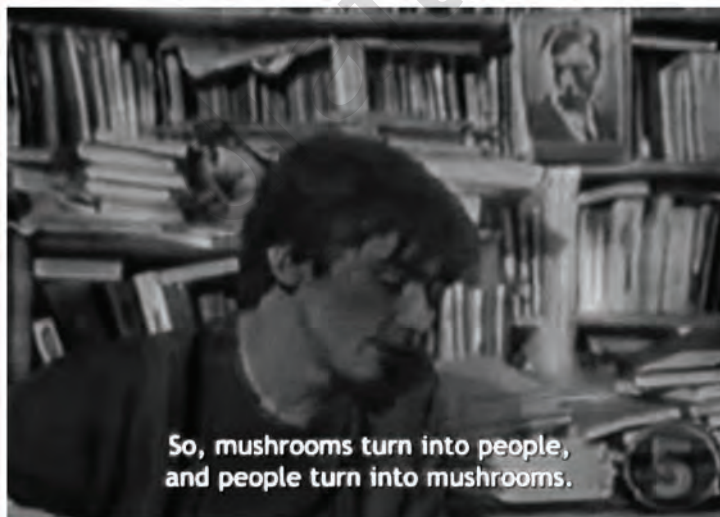
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Was Lenin a Mushroom? by Lawrence Millman

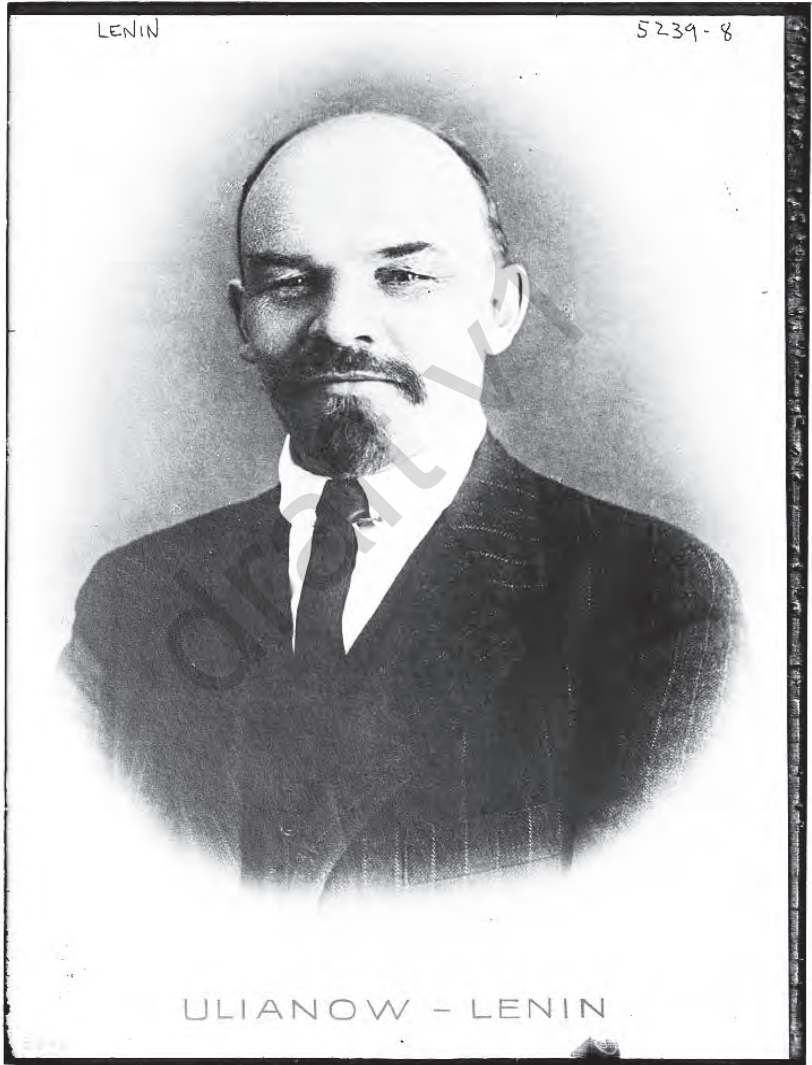
In the waning days of the Soviet Union, a musician-performance artist named Sergei Kuryokhin gave an interview on a Russian television show *The Fifth Wheel* and made an altogether remarkable claim – that Soviet icon Vladimir Ilyich Lenin had been a mushroom. Specifically, Lenin had eaten so many *mukhumors* (*Amanita muscarias*) that their fungal “consciousness” consumed him, and he became an *Amanita muscaria* himself. One of the sources for this claim, Kuryokhin said, had been material he’d found at the Massachusetts Institute of Technology.

Kuryokhin’s scholarly manner doubtless disguised the fact that the story was an early example of fake news. After all, Lenin had no more been a mushroom than a pomegranate. But a number of viewers believed the story even though Kuryokhin also talked about mushrooms being composed of radio waves. Indeed, a group of diehard Bolsheviks approached a Soviet party official and demanded to know if Lenin had been a mushroom. The official must have wondered whether the group was on mushrooms themselves. I take that back. He must have assumed that they had simply drunk too much vodka.



Sergei Kuryokhin: Lenin was a mushroom / С.Курехин: Ленин был грибом, part 2

If you want to watch the television show in question, visit YouTube and type in “Lenin Was a Mushroom.” The show is in two parts, with the second part containing more revelatory material about one of the chief promulgators of the Russian Revolution being a fleshy basidiomycete.



Lenin

The Library of Congress. Bain News Service,, publisher. [between ca. 1915 and ca. 1920]s, via Flickr Commons.

Letters To the Editor

Thanks Zaac,

Just a note of interest. Last weekend Larry, Tom Murray and I went wandering around in the woods of Groton near Tom's place. While ripping into an overturned log I found an ant (dead) which looked in close inspection, possibly infected with *Ophiocordyceps* sp. though it wasn't exactly clear. It had the classic entopathogenic pose with legs/antennae stuck to the substrate by hyphae and an obvious black growth emerging from out the back of the head.

Could have been *post mortem* fungus but I thought not. Larry seemed unconvinced as I remember it. I collected the specimen with a chunk of the wood and since last weekend it has rested on my computer desk in a vial. Last night before going to bed I checked the specimen and lo and behold the ant was more heavily covered with fungal growth (synnemata?) and out of the black growth from back of the head was a fresh pinkish colored synnemata emerging from out of the original bit of synnemata from back of the ant head.

I have included photos.

Cheers,

Joe Warfel

Dear Editor,

Larry Millman asked me to give readers of the Bulletin the sad news that the White Mountain Fungal Foray has kicked the bucket. Registration for last year's foray was not good, with most of the people coming from Dianna Smith's Pioneer Valley Mycological Society, so the folks at World Fellowship decided that it wouldn't be in their best interest to host the Foray anymore. Maybe this is not surprising, since the focus of the Foray was fungal ecology, a subject much less interesting than pot hunting to most mycophiles.

Myself, I started out as a pothunter (how could it be otherwise, since I am from Russia?), but thanks to the White Mountain Foray I developed a passion for what mushrooms were doing in their respective habitats. I also learned not to pick everything in sight and then throw the specimens on a table for an expert to identify. So, as they say in Russian, *Pokoyasya s' mirom belly gornyy nabeg!* [Editor's note: Rest in peace, White Mountain Foray].

Boris Arapov



How Magic Mushrooms Got from Mexico to Cambridge

By Oakes Plimpton

Gordon Wasson, a Wall Street banker, retired to pursue the Sacred Mushroom of southern Mexico, alerted by an article in the 1938 Harvard Botanical Leaflets by Prof. Richard Schultes. His wife, Valentina, a Russian, introduced him to the wonder of mushrooms. Together they wrote a book *Russia, Mushrooms and History*. It may be found online. His later book, *The Wondrous Mushroom*, was donated to the Society by the speaker Oakes Plimpton, who had served as his assistant and participant in a trip to Huautla, Mexico (Teotitlan district) in August of 1957.

He brought with him the slides of the expedition. The slides were shown through an old-fashioned projector, still vivid! Attached to this review are photographs of Gordon Watson receiving the mushroom from the Curandera, Maria Sabina. Too bad one cannot picture the colorful visions from the mushroom; also the blissful feelings! One purpose in journeying to Huautla was to collect the mushroom, dry them, and send them to a Swiss scientist to find the psychoactive agent, Psilocybin.

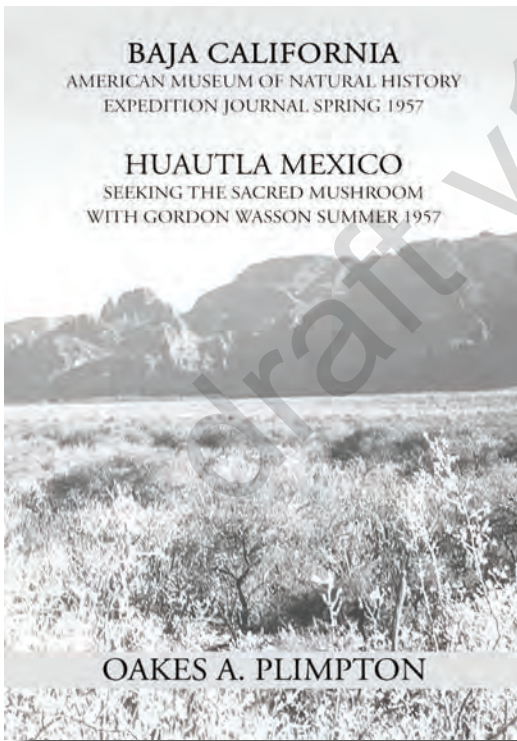
Unfortunately the mushroom can also bring terrifying visions and make one sick. Gordon Watson persuaded our hostess, Herlinda, an acculturated school teacher, to take the mushroom like us, scientifically, but she truly suffered a bad trip. The ceremony is led by the Curandera and her daughter, the Curandera sitting straight and dignified, her daughter looser and suckling a baby. They chanted back and forth, sometimes staccato. *Padre Nuestro!* Their language is musical, tonal like Chinese. They sat for hours afterwards counseling Herlinda.

Besides the Wassons (who did not partake) nor their daughter Masha, Joan Ferrante and I took the mushroom. Joan had a bad trip, unable to feel her feet or see the ceiling or know who she is. When the Curandera heard, she came up to us and spit a great mouthful of aguardiente into our faces! Woke me up and changed her experience from fearful to blissful!

Diana Munn, program director of the Museum of Natural History, came to the meeting, bringing with her her mother, a native of Huautla! Her father was an anthropologist. She loved seeing the thatched roofs of her Town in the 1957 photos! She knew Erlinda well, also Maria Sabina. Then Huautla was a town of 5,000 peo-

ple, no road. We got there by Piper Cub and by foot (mules). Now there is a road, 35,000 people. Watson let the world know about the mushroom through a 1957 *Life* article with color photographs. Before the Mushroom was secret, considered wrong. Now it became more accepted.

But then so many people came seeking a thrill that the sagem culture was partly lost. Gordon Watson regretted writing the article. Maria Sabina was pleased that now her art was appreciated, but also felt the influx of people damaged the mushroom rite. But Diana's mother said she liked the new arrivals – curious, handsome, friendly, and they brought amenities such as coffeehouses, inns, music, restaurants, etc.



Cover Image 1957 *Expeditions Journal: Baja California American Museum of Natural History Expedition Journal Spring 1957 Huautla Mexico Seeking The Sacred Mushroom With Gordon Wasson Summer 1957*
by Oakes A. Plimpton

The speaker brought with him his self-published journals of the trip to Huautla, and in the same year, his experiences being the Assistant on a Museum of Natural History expedition to the islands of Baja California collecting marine life, mammals, reptiles, fossils. He brought with him the book 1957 *Expeditions Journal* iUniverse, 2013. \$5 at the meeting. If anyone else is interested, let the Society know – send along a check for \$10 for the book which will be mailed to your address.



My Non-Fatal Mycophilia, a case

by Mark Pawlak

study

First Appeared in Mount Hope issue #11, Spring 2017

I suffer from mycophilia, a love for and obsession with mushrooms. In a nation made up largely of mycophobes, who considered all but the white button and crimini mushrooms packaged and sold in supermarkets to be poisonous toadstools., I'm an unrepentant mycophile. I forage for mushrooms in season and bring them home to cook and eat. I also collect 'suspect', inedible, and toxic species to practice identification and to add to my general knowledge of fungi. The rest of the year I seek out edible varieties to buy in grocery stores, gourmet specialty shops, or farmers' markets: chanterelles, shiitakes, hen-of-the-woods, oyster mushrooms etc.

There is a shelf in my kitchen pantry filled with mushroom cookbooks. A living-room bookshelf contains my extensive collection of mushroom field guides and books on how to grow your own (I have a crop of oyster mushrooms growing on shredded newspaper in my basement). I also own specialized guides to favorite geni: *North American Boletes: A Color Guide To the Fleshy Pored Mushrooms*, *Waxcap Mushrooms of Eastern North America*, and *Morels*, plus a rare copy of *Soma: Divine Mushroom of Immortality*. And, when I go out to a restaurant for dinner, I scour the menu for dishes that contain mushrooms. After I order an appetizer or entrée that includes wild-foraged mushrooms, I become giddy with anticipation.

I belong to a club of mushroom enthusiasts called the Boston Mycological Club (BMC). It's the country's oldest. I've been a member for almost forty years. Summers, the club hosts Sunday morning forays to woodlands, parks, and town conservation lands within roughly an hour's drive of Boston, such places as the Middlesex Fells, Concord Woods, Hapgood Woods, Mount Misery Reservation, Scow Town Forest.

A club member leads each of these "walks," someone who typically lives near by the site and regularly picks mushrooms there. We arrive, are handed a trail map if one exists; if not, we're given verbal directions by the leader; then we disperse, baskets in hand to forage. We come back together

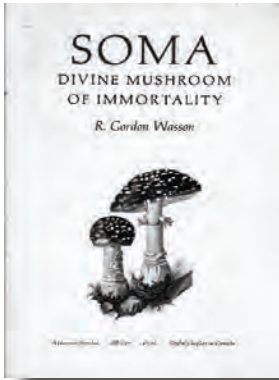
WAXCAP MUSHROOMS of Eastern North America

Alan E. Bessette William C. Roody Walter E. Sturgeon Arleen H. Bessette

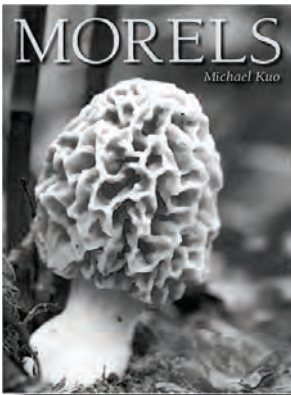


Waxcap Mushrooms of Eastern North America

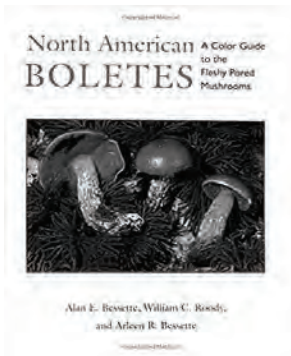
Alan Bessette, William Roody, Walter Sturgeon,
Arleen Bessette



Soma
R. Gordon Wasson



Morels
Michael Kuo



North American Boletes: A Color Guide To the Fleshy Pored Mushrooms
Alan Bessette, William Roody, Arleen Bessette

er after a few hours to display and identify our finds. There is usually a member of the club's Identification Committee on hand to verify the IDs, and one club member is responsible for recording all the varieties (species) we have found. Like birders, the BMC website keeps a running list of all fungi identified during club sponsored forays.

Maria Maravigna, who lived to be 106, even into her nineties led an annual foray to the Town of Winchester's conservation lands near her home. She walked the Fells at a brisk pace, pointing out spots where she used to find favorite edibles. "Used to be ... " she'd say in her chick Italian accent, "Now no more." At the walks conclusion, she invited everyone back to her house. There, with her sister's help, she cooked up and served freshly picked mushrooms to us fellow foragers seated at picnic tables in her back yard. After the repast, she conducted tours of her pottery studio, where samples of her anatomically correct, glazed porcelain mushroom models were on display. Her porcelains are in private collections and museums around die world. Maria Maravigna: "used to be, now no more."

It was only after tagging along on one of Maria's annual forays that my wife, Mary, relaxed her skepticism about my mycophilia. She was charmed by Maria's Old World manners and New World accomplishments. This led her to conclude that, although we club members were an odd lot for our obsession, we were nevertheless characters worthy of her interest as well as enjoyable company. Nor that my wife doesn't sometimes still wake me in the middle of the night after I have served her a dinner featuring my wild-foraged mushrooms to ask, "Are you sure about those mushrooms?"

Club-sponsored events are generally congenial affairs, but not always. I have witnessed arguments such as when an “Old World” immigrant forager vehemently disagreed with an ID Committee member about the edibility of a particular species: “I don’t care if the field guide calls this red russula suspect. Back in Russia we considered it a delicacy.”

In Russia, whole families head to the woods during picking season with baskets and buckets in hand. I’ve been told by mycophile friends who hail from that region that camaraderie among fellow foragers is as shallow as the forest soil. Under their breaths they grumble about one another: “That so-and-so had better not pick in my favorite spots.” A milder version of the same attitude holds here, too.

One weekend strolling merrily down a woodland path in Concord, heading toward my secret spot to picking black trumpets, I was startled by a man who suddenly emerged from dense undergrowth and stammered a “Hello,” trying to look nonchalant. I recognized him as a club member who I knew was also a commercial forager, supplying Boston’s gourmet food stores and restaurants. He asked to see what I had collected, inspected my basket that contained boletes and milky-caps, offered a comment or two on their quality, then continued up the path, looking back over his shoulder a bit nervously. I didn’t move from the spot until he was out of sight, then I pushed through the undergrowth near where he’d emerged. Hidden behind a tree trunk I found an abandoned paper shopping bag filled with black trumpets. The so-and-so had picked “my spot” clean!

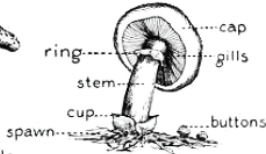
The National Forest Service closed public lands in the Pacific Northwest to foraging at a time when matsutake mushrooms, harvested for the Japanese market, were fetching fifty dollars per ounce. Claim jumping among commercial pickers and migrant laborers had led to violent confrontations, including knivings and shootings. It was like a page taken from the Klondike Gold Rush.

The BMC holds its meetings at Harvard’s Farlow Herbarium on Monday evenings during the picking season so that if you should happen to forage on your own over the weekend, and if you are not confident about your identifications, you can bring the fungi you collected to the Monday-night gathering and someone will assist you. During the off-seasons, there are monthly talks by visiting scientists and workshops on such topics as mushroom photography and organic wool dyeing using fungi. A series of fall classes in mushroom identification is also offered to members at a very modest price. And there is an annual culinary meeting when we gather to share prepared mushroom dishes and recipes.

MUSHROOMS



Parasol mushroom. Edible.



Parts of mushroom.



Common variety, cultivated in caves or cellars.



Death cup. Poisonous.



Oyster mushroom. Edible.



Amanitopsis. Edible.



Delicious morel. Edible.



Fly mushroom. Poisonous.



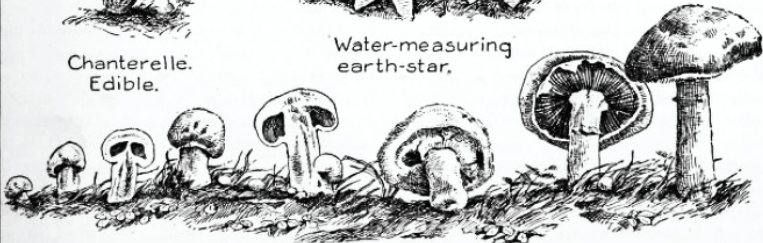
Inky cap. Edible.



Chanterelle. Edible.



Water-measuring earth-star.



Different stages in the life of the table mushroom.

O'Shea, M. V. (Michael Vincent), 1866-1932, ed Foster, Ellsworth D., ed Locke, George Herbert, 1870-1937, ed. *The world book*; [electronic resource] *organized knowledge in story and picture*, Chicago, New York [etc.] Hanson-Roach-Fowler Co. Published 1917, Page 4015. Digitizing Sponsor: Internet Archive, via Flickr Commons.

A few BMC members are professional mycologists, i.e., scientists who study mushrooms; the rest of us are amateur enthusiasts, interested, to one degree or another, in learning more about fungi. Some are immigrants or the children of immigrants from Europe or Asia where foraging mushrooms for the table is a tradition. Some members are ambitious to learn to identify all 10,000 North American species, using spore prints, dichotomous keys, and even microscopes, but many just care to learn the edible varieties and how to distinguish them from the toxic ones. If you plan to eat what you pick, you have to be careful. There is an Eastern European saying: "All mushrooms are edible, but some only once."

My grown son, Andrai, called me to complain one day. He'd purchased oyster mushrooms from his local supermarket and so assumed they were safe to eat. The next thing he knew, he was covered in hives, which lasted for days. "Did you eat them raw?" I asked. "Didn't I teach you to cook chem first?" This is good advice regardless of the variety. Another piece of advice: taste just a small sample of any "edible" fungi, especially the first time you ingest it to see whether you might be allergic. There are mushrooms that will give you indigestion, while others will make you violently ill. One common, "edible," inky-cap mushroom is guaranteed to make you nauseated, but only if you've been drinking alcohol. It's the most frequent reason for frantic calls to the poison hotline-but it's not lethal.

There are, however, mushrooms that will kill you. Every student of Ancient Rome knows the story of how Nero came to occupy the throne after his mother, Agrippina, slipped a deadly *Amanita* into the Emperor Claudius' favorite mushroom dish. And each summer I come across a news story about - a southeast Asian immigrant family that thought they had picked straw mushrooms (*Volvariella volvacea*) native to their homeland but instead had mistakenly gathered death caps (*Amanita phalloides*) in the button stage. I won't get gory and describe death from *Amanita* poisoning but trust me that if you wish to do yourself in, I recommend sitting in your car with the engine running and the garage door closed.

In New England, where I live, you can find flushes of yummy morels in early spring in abandoned orchards whose locations, even among club members, are closely kept secrets; but for the most part, the foraging season here runs from July through October. About February, depending upon how severe the winter, we mycophiles get cabin fever. To cure it, someone had the bright idea to organize a winter foray to Boston's Chinatown, followed by a lunch at one of the restaurants there that features mushroom dishes. It has become an annual outing.

Encompassing just a three-square block area, Boston's Chinatown is small. Within these boundaries are several C-Marts, a Chinese grocery chain specializing in fresh produce. There are other, smaller, Mom & Pop stores that also carry fresh produce, and one that specializes in a wide range of dried fungi, some quite exotic. There is also an herb shop, on whose shelves you can find mushroom-derived infusions alongside such exotic products as "Clear Eye Tea" and "Forever Young Rose Flower Tea," plus medicinal reishi and lingzhi, whole, sliced, and powdered. A gauze curtain cordons off the back room where the resident herbalist conducts individual consultations, then he writes out prescriptions to be filled by the staff at the front counter .. My first visit to this shop, I mistook him for a bookie.

On a typical Saturday winter foray about thirty BMC club members, some with curious friends in tow, meet up at the China Trade Center downtown, break up into four or five small groups so as not to interfere with the business being transacted in the smaller stores, and, with maps in hand take off in different directions. I've served as a group leader on two occasions. Our collective fresh mushroom finds are extensive: shiitakes, some with thin broad caps and slender stems, others with thick caps incurved at the edges and stubby stems; birch mushrooms (shimeji), both brown and white varieties; long, thin-stemmed, white enoki; and two or three varieties of "oyster" mushrooms: the blue-capped "winter" oyster, the large king oysters (eryngii), all thick stipe and almost no cap, and abalones.

Canned Chinese straw mushrooms are stocked in every shop, as are traditional dried "black" Chinese mushrooms (shiitake actually). One shop specializing in dried produce had five or six grades of these including the prized and pricey "flower" variety with their cream-colored flesh showing through the crack-patterned gray cap. It also offered two kinds of wood ear fungi, black (Judas ear) and the lighter-hued cloud ear; a brittle Luffa-sponge looking fungi called snow fungus; and an exotic phallic-shaped stinkhorn called bamboo fungi. I recall one foray when my group puzzled over a shelf filled with packages of ball-shaped, brittle, white fungi until someone was finally able to translate the label as Monkey's Head, only then did we realize it was a dried version of our native lion's mane fungus that grows in clumps of long white "teeth" on hardwoods. Back at home after my first winter foray, I immediately went on the Internet, curious to learn how these more exotic fungi were used in Chinese cuisine.

I first foraged for mushrooms as a child, tagging along with my grandfather, a Polish immigrant. We collected mostly giant puffballs, which Grandpa battered and fried; and honey mushrooms, which he pickled. In those days, the late 1950s, white button mushrooms, grown in abandoned mineshafts in Pennsylvania, were the only kind to be found in supermarkets. Shiitakes, although domesticated in Japan over 600 years ago, hadn't yet reached the American market. A few decades later, portobello and shiitake mushrooms started to appear in American markets, quickly followed by oyster mushrooms. Today, there are so many commercially grown or foraged varieties stocked by upscale supermarkets that I needn't head co the woods to keep my larder stocked with such delicious edibles as hen-of-the-woods, black trumpets, lobster mushrooms, hedgehogs, chanterelles, or porcini. There is even a gourmet food store, *Formaggio Kitchen*, in my West Cambridge neighborhood that is supplied by a local forager; a BMC member, who also supplies to local restaurants. My wide-eyed son Gianni, taking note of the prices per ounce for these said, "Dad, we could make a living picking wild mushrooms."

I needn't venture to Chinatown in order to purchase oriental favorites anymore either. In the years since my first winter foray, Asian restaurants and Asian markets have proliferated in the greater Boston area and surrounding suburbs. Limited residential housing and high rents in downtown Chinatown are one reason for the dispersion. But to a greater extent this is the result of an influx of new immigrants and Asian college students enrolled in Boston's many colleges and universities. Within a five mile driving radius, I now have access to Korean, Japanese, Szechuan Chinese, Taiwanese, Vietnamese, Thai, and Cambodian grocery stores. H-Mart, an Asian supermarket chain, has opened a franchise in Central Square, Cambridge, where I can restock my supply of fresh shiitakes, enoki, simaji, maitake, and *eryngii* any day on my commute home from work via the Red Line.

And yet, in the depths of winter, my thoughts still turn to the narrow streets and crowded shops of Chinatown, where live carp and eels swim languidly in the C-Marc's large fish tanks, where bartering is conducted in Cantonese, and where every second person you pass on the sidewalk is carrying a signature red plastic shopping bag illustrated with Chinese characters. Arid in late summer, after a day or two of drenching rain, I'm up at the crack of dawn, pulling on my hiking boots; collecting basket, walking stick, and field guide at the ready in the trunk of my car. Driving west out of the city, anticipating a good harvest, I think of the Roman poet Martial's epigram:



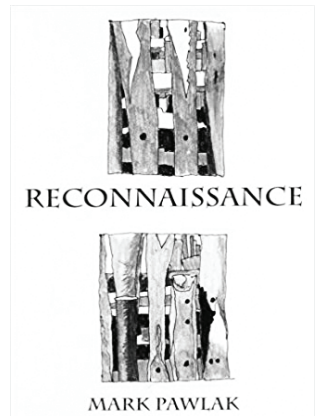
Marcus Valerius Martialis as Martial
Martialis.jpg CC-PD-Mark via Wikimedia Commons

One can live without gold and silver
And even resist the temptations of seductive women,
But to abstain from eating mushrooms is difficult.



Mark Pawlak is the author of nine poetry collections and the editor of six anthologies.

His latest books are *Reconnaissance: New and Selected Poems and Poetic Journals 2005-2015* (Hanging Loose, 2016) and *Natural Histories* (poems, Cervena Barva Press, 2015). His work has been translated into German, Polish, Spanish and Turkish. He teaches mathematics at the University of Massachusetts, Boston.



Reconnaissance
Mark Pawlak

The Genus *Thaxterogaster*

Who's in a Name

By John Dawson

T*haxterogaster* is a genus of gastroid agarics—fungi whose fruiting bodies resemble mushrooms that have never opened, and whose spores are enclosed and not released into the air. They are believed to have evolved from more familiar agarics as an adaptation to extreme environments. *Thaxterogaster*, in particular, is thought to have evolved from the genus *Cortinarius*. Its most common U.S. species, illustrated in color in Trappe, Evans and Trappe's *Field Guide to North American Truffles*, is *Thaxterogaster pinguis* (literally, “Thaxter’s greasy stomach fungus”), which grows in the western North American mountains.¹ The genus is named after Roland Thaxter (1858–1932), whose publications in mycology are considered “classics in their field,” due both to their “meticulous accuracy” and to the “exquisite” quality of the illustrations that Thaxter prepared for them.²

Thaxter was born in Newtonville, Massachusetts, and spent his entire career in New England. The youngest child of literary parents, he was educated at Boston Latin School and went on to earn degrees from Harvard, as his father, grandfather, and great-grandfather had before him. He received his A.B. *magna cum laude* in 1882, and following a year of ill health, entered Harvard Medical School in the fall of 1883. After two years of medical study he was awarded a fellowship to the Harvard Graduate School, where he became an assistant to William Gilson Farlow, profiled earlier in this series. In 1887, the year of his marriage to Mabel Freeman, he published an important paper on the rust genus *Gymnosporangium*, and the next year he was awarded both the M.A. and Ph.D. degrees simultaneously, the latter for a dissertation on the *Entomophthoraceae* (a family of Zygomycetes parasitic on insects).

After receiving his doctorate Thaxter was appointed botanist at the Connecticut Agricultural Experiment Station, a post he held for three years. Although more interested in pure than applied research, during his short tenure there he made several important contributions to plant pathology—most notably, determining the cause of potato scab, studying diseases of onions (especially onion smut), discovering and describing a species of *Phytophthora* parasitic on lima beans, and pioneering the spray-

1 A second species illustrated there is *Thaxterogaster pavelekii*, whose name, like that of *Bondarzewia berkleyii*, is a double eponym: Its specific epithet honors Henry Pavelek, a founder and past president of the North American Truffling Society, who discovered the fungus in Oregon in 1984.

2 Quotations are from the article on Thaxter by I.M. Lamb in the *Dictionary of Scientific Biography*, vol. 13, p. 299.

ing of fungicides as a means of controlling plant diseases.³

In 1891 Thaxter returned to Harvard, at Farlow's invitation. Initially appointed as assistant professor of cryptogamic botany, he became a full professor there ten years later, at which time he assumed sole responsibility for instruction and research in that field. He retired in 1919, and from then until his death held the title of professor emeritus and honorary curator of Harvard's cryptogamic herbarium.

Although plagued by ill health that limited his participation in scientific meetings, Thaxter was a member of many learned societies, including the National Academy of Sciences,⁴ the American Association for the Advancement of Science, The American Philosophical Society, and a host of botanical societies here and abroad. He also traveled widely, including sabbaticals spent in Europe, the West Indies, and Chile, and collecting trips to various areas of the U.S., Canada, and the Caribbean.

Thaxter's greatest work was a five-volume study of the Laboulbeniaceae, "a unique and isolated family" of ascomycetes that are "minute parasites on the integuments of various insects."⁵ Published over a span of thirty-five years, from 1896 to 1931, those volumes contain descriptions of "hundreds of species" illustrated by 166 plates, the last volume alone containing more than a thousand drawings.⁶ In addition he published important studies of the group of organisms known as *Myxobacteriaceae*.

A man of "retiring nature," Thaxter appears to have had few interests outside his teaching and research. He maintained exacting standards both for himself and his students, "hated to waste any time on trivial or needless matters," and was "early to his work and usually late in quitting."⁷

Overall, Thaxter's work is deemed to have "had a profound and lasting influence on the development of mycology and of cryptogamic botany generally."⁸ Besides the genus *Thaxterogaster*, Thaxter is commemorated in the names of several other species of fungi (such as the dung fungus *Saccobolus thaxteri*) and at least two species of lichens.

3 For more on Thaxter's contributions to that field, see W.H. Weston, Jr., "Roland Thaxter (1858–1932): His influence on plant pathology," *Phytopathology* 23 (1933), 564–571.

4 The obituary memoir of Thaxter by G.P. Clinton in the *Biographical Memoirs of the N.A.S.* (vol. 17, 1937, pp. 55–64) was one of the principal sources for the information in this article.

5 Lamb, *loc.cit.*

6 Clinton, *op.cit.*, p. 60.

7 *Ibid.*

8 Lamb, *loc.cit.*





Larry and Ella
by Jessica Evans



Scutellinia sp.
by Jessica Evans

Musings on a Late May Foray: A Somewhat Off-Beat Account

By Jessica Evans

It hadn't been done before, but I resolved this spring to host a club walk in May, in hopes that I'd be able to introduce members to some of the lesser-known spring (and year-round) species often overlooked by the time the large fleshy fungi are in abundance. My friend Larry Millman proposed to join me in this quest, and after some dizzying back-and-forth emails between various parties on dates and transportation options, a plan was made. Larry would travel to our area via a friend, and I'd host him overnight and get him back to the train station the day after the scheduled walk. Simple, right?

Oh, but the best-laid plans often go astray in some form or another. In our case, we all ended up exactly where we were meant to be, while accoutrements of travel managed instead to go astray. Thus, I give you my account of our mycological wanderings as well as the fascinating true story of Larry's lost baggage.

We met at the trailhead to Jabish Brook Conservation Area, Larry having arrived some time before and forayed down the trail ahead of the walk's start time. *Hellooo!* I called, as I spotted him walking back up towards the parking area. Larry greeted me enthusiastically and filled me in; he'd lost a sandal from his backpack somewhere between Cambridge and our current position. A quick search was no help, and members began to arrive for the scheduled event. We'd revisit this again, later.

A cheerful foray was held; members and guests with Larry's guidance were able to enjoy a wide variety of fungi, including a species new to the Pioneer Valley Mycological Association's collection list- *Vibrissea truncorum*. Other interesting finds included *Cudoniella clavus*, *Kuehneromyces marginellus*, and *Peziza varia*. Despite the unseasonably hot day, we were marvelously entertained by Larry's knowledge; members in particular enjoyed the lighting of a *Fomes fomentarius* in order to ward off mosquitoes! We ended the foray pleased with our finds and delighted with the company.

Fortified further by a visit to a local record shop and a lovely dinner in my tiny apartment with guests, Larry and I (along with Ella, age 7) resolved to foray again the next morning despite the rainy forecast.

The next morning, after the essential cups of coffee were had (but not by Ella), I led Larry out to my backyard. There, a short trail leads

to an old logging site which contains acres of woody debris- the saprotrophs delight! We could have been several hours out there, but we had other items on the agenda. We headed over to make a search of the Jambish Brook site one more time for Larry's missing sandal (and a small pouch which also absented itself from Larry's bag at some point!) then brunchted sufficiently at a local vegan place and headed out for the trails. We visited portions of the Robert Frost Trail in Amherst as it rained intermittently. We delighted in finding various fungi as well as several Harvestmen (Larry) and a few lovely groupings of *Cypripedium acaule* (Ella).

Despite our clear understanding that we'd need an hour to get Larry back to the train station in Fitchburg for his return home and had left plenty of time to get there, somehow, the GPS disagreed. This, as you might imagine, caused a small amount of panic among my car's occupants. We then, against all better judgment, entered into an argument with an electronic device incapable of understanding even our simplest commands (I'm so ashamed!). I wrote the next paragraph in the days directly following our weekend foray in an email to Larry:

"The intrepid travelers, weary from two days' pursuit of minuscule mycological wonders amidst the often-incessant chatter of a seven-year-old chief identifier, found themselves arguing most passionately with an electronic nincompoop. "Take me to Wachusett," I exclaimed. "Le Creuset?" it asked. "You're an idiot!" the mycophiles rejoined. "Did you mean, Hong Kong Kitchen?" the GPS replied. Clearly, if we were going to get Larry back to the train station, we'd need to rely on our own wits.

Eastward progress was thankfully made, and our threesome arrived at our port of call with minutes to spare. As the vehicle came to a stop, one member of the party spotted something rising up from the ground in the distance. The sun shone through drizzly clouds, highlighting the glow of something special arising from the concrete. "Manna!" Larry exclaimed. Could it be? But, no. This was no *Tirmania nivea*.¹ It was.... Larry's missing sandal! Reunited at last, Larry and the sandal boarded the train; each chattering excitedly about all they'd seen."

Some poetic license was taken, of course, in my description of the events of that fantastic weekend in May. Our fungal finds, our argument with the GPS, and our overall enjoyment, however, are depicted accurately. After all that excitement, there's only one thing left to do: schedule another foray!



1 Many thanks to Elinor Shavit; without her enlightening presentation on desert truffles, this comparison might never have been made.

Microbia: A Journey into the Unseen World

Eugenia Bone
2018, Rodale Books
\$29.99

Around You

Book Review by Lawrence Millman

In her previous book, *Mycophilia*, Eugenia Bone refers to my mustache as being akin to “a baby hedgehog that refuses to lie down.” An apt description, but what does such a personal remark have to do with her latest book *Microbia*? Well, that latest book is no less personal. Despite its title, it is as much a memoir as it is an introduction to the hidden world of microbes.

At the age of 55, Ms. Bone decides to return to college in order to study micro-organisms and their lifestyles. She is at least twice the age of the other students in her classes, a fact that makes her feel not only old, but a bit clumsy at managing the most up-to-date technologies. Yet it also gives her a much broader context — she sees the proverbial forest for the trees — than if she were simply one of the other students in the class. Thus we experience the slow advance of her learning, *a pas de deux* of advance and retreat, just as if we were taking the class ourselves. The book is so good that we often do indeed seem to be taking the class ourselves...

We learn that microcubes inspire our feeding habits, our flight or flight strategies, some of our prejudices, and even our preference for our own farts to other peoples’ (we have an intimate relationship with the molecular composition of our own farts). We learn that bacteria are like ants not because they enjoy biting us, but because they behave collectively, like ants in a hive. We also learn that most of the bacteria in our immediate environments are absolutely harmless. Another thing: we learn that too much washing is not good for our health.

But don’t think the book ignores mycology. There are several pages about the role of fungi in our guts as well as quite a bit of information about the symbiosis of fungi with bacteria. One reference I particularly like, by the late, great Gary Lincoff, concerns the currently promiscuous fungal name changes

created by genetics. “It’s like early onset Alzheimer’s,” Gary remarks. “I know fewer mushrooms each year...” Ms. Bone describes the Boston Mycological Club’s very own President, the inimitable Susan Goldhor, as the kind of person at “whose end of the dinner table you want to sit at.”

Microbia is an instant classic — by all means, go out and buy a copy!

The *Hebeloma* Project Progresses:

Citizen Science at Work

By Henry Beker

For the last two decades Ursula Eberhardt, Jan Vesterholt and I have been studying the genus *Hebeloma*. Our European monograph is complete (published earlier this year as *Fungi Europaei Volume 14: Hebeloma*).¹ We have already begun to extend this work to the rest of the world. The next major area we wish to address is North America. As well as understanding the North American taxonomy we also hope to address the species overlap between North America and Europe. In order to make this study meaningful we need collections from throughout North America, where we anticipate discovering some new species. Ideally we need good collections, carefully dried and with good pictures; also good macroscopic descriptions particularly of any characters that may disappear with drying such as odor. We can attend to the microscopic descriptions. We have developed a recording sheet for the macroscopic description (See image). We are thankful to all who have already submitted collections but need help to assemble a more representative sample, across the whole continent. This will be Citizen Science at its best. Our goal is a future monograph on the *Hebeloma of North America*, although this is probably several years away. However, we will of course send information regarding our determinations to contributors of material, and all such contributions will be fully acknowledged. In due course we will establish a website so that all contributors will be able to see their collections on a map of North America.

This genus has long been regarded as difficult and consequently *Hebeloma* are rarely recorded. Within Europe there are some 300 published names and in North America there are over 200 additional published names. In Europe the list of published names boiled down to 54 species, and, during the course of our studies, 30 species new to science were discovered. In order to unravel the taxonomy and phylogeny of this difficult group, we developed a methodology combining molecular analysis with the functionality provided by a powerful database, allowing the comparison of hundreds of morphological characters (macroscopic and microscopic) and molecular characters from several loci.

¹ See book review of *Hebeloma* by Andrus Voitk in *Omphalina*, Vol VII, No. 6, August 26, 2016, pp. 16-17.

Species	Section	Subsection	Collector	Record ID
Place Name	County/Region	Location Ref	Altitude	Date
Ecosystem Descriptor	Ecosystem Qualifier	Special Habitat	Special Soil Conditions	Growth Habit
Associated Organism	Medium Descriptor	Medium Qualifier	Smell	Taste

Pileus

Umbrate?	<input type="checkbox"/>	Unicolor or 2-colour	<input type="text"/>	Margin?	<input type="text"/>
Spotted?	<input type="checkbox"/>	Colour in Centre	<input type="text"/>	Hygrophanous?	<input type="checkbox"/>
With remains of Universal Veil?	<input type="checkbox"/>	Colour at Margin	<input type="text"/>	Cortina	<input type="checkbox"/>
		Rugulose	<input type="text"/>		

Lamellae

Tears?	<input type="checkbox"/>	Ave L:	<input type="text"/>	Attachment?	<input type="text"/>
White Fimbriate Edge?	<input type="checkbox"/>	Ave I:	<input type="text"/>	Depth of Gill?	<input type="text"/>

Stipe

Basal Shape:	<input type="text"/>	Discoloring?	<input type="text"/>
Interior:	<input type="text"/>	Rooting?	<input type="text"/>
Floccosity:	<input type="text"/>	Mycelial cords?	<input type="text"/>

Fruitbody Dimensions

	Pileus Width	Length of stipe	Stipe width mid	Stipe width base	L: # of complete gills	L: # lamellules

Add further description, sketches or notes on reverse

Heboloma Collectors should contact Joel Horman at
JLHORMAN@OPTONLINE.NET

Our database has details of more than 5000 collections, of which over 4000 are European and already almost 700 are from North America. The database also contains details of all the European holotypes, isotypes, lectotypes, epitypes and neotypes that we have been able to locate. We have also now started work on the North American types. Our monograph, which was published earlier this year, describes in detail the 84 species of *Hebeloma* that we currently recognize within Europe, provides keys based on morphological characters and also extensive molecular data as well as more than 500 pages of color photographs. It also includes a commentary on all the existing European names, on their synonymies and their various interpretations. We are sure that there are still more new species to be described from Europe (as well as new species from North America) and we hope that our monograph will act as a catalyst to enable this discovery.

As of August 2018, we have 1445 collections from North America on our database. This includes almost all the North American types, although the analysis of many of these is still incomplete. These collections represent eighty-two taxa. Of these, thirty-two are already known from Europe; we can give names to a further 24 of these taxa that are not currently recorded from Europe; this means we currently have 26 taxa, only known for North America, for which we do yet have names. Unfortunately we only have one *Hebeloma* collection on our database from Massachusetts!

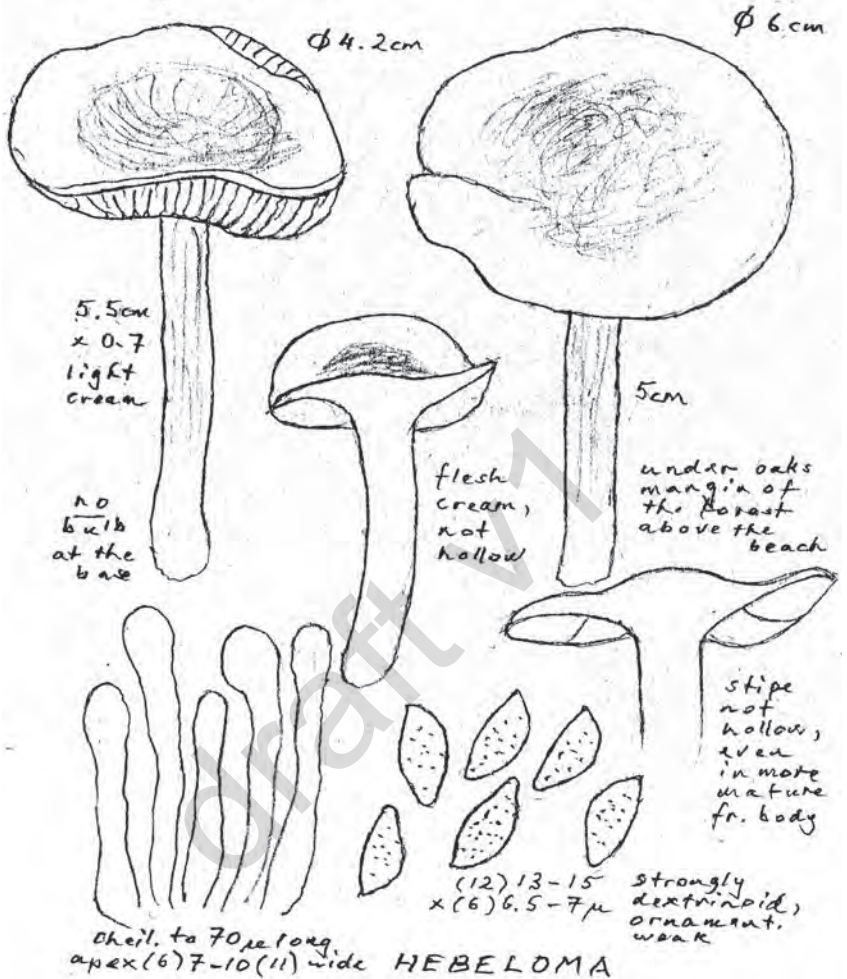
Joel Horman of the Long Island Mycological Club has kindly agreed to act as receiver for North American collections which he will then package together to send on to us. We have set up a FedEx system so that the sender should incur no cost and as little inconvenience as we can manage. Just contact Joel at jlhorman@optonline.net and he will provide delivery instructions. Please include a copy of the filled out form with your specimens.

We appreciate any help we can get with this project.

Henry Beker (henry@hjbeker.com) & Ursula Eberhardt (ursula.eberhardt@smns-bw.de)



group of fruiting bodies
 up to ϕ 6cm, viscid, light ochre margin,
 deep ochre center



Hebeloma velutipes, photographed and illustrated. Important features to notice in *Hebeloma*: sinuate gills, pale to brownish cap, odor sweet to radishy, some species have a cortina, some species root, some species exude droplets on gills when young.

Observation 269403: *Hebeloma velutipes* Bruchet by Oluna & Adolf Ceska (aceska@telus.net)
 used under a CC BY-NC-SA 3.0 license via Mushroom Observer



Chytridiomycota:

Tribute to the Bizarre

By Liam Nokes

This past pollen season was particularly intense, and its corresponding allergic reactions especially debilitating. Those who had the courage and constitution to venture outside this spring may have noticed how widespread the pollen was. Puddles and other bodies of standing water were the most obvious concentrations, often completely blanketed by yellow dust. Those who were BMC members likely wondered what is responsible for the decomposition of all of this excess pollen, and the answer is quite interesting. Among numerous other bacterial decomposers, the fungi of the phylum Chytridiomycota are the most prolific fungal colonizers of pollen grains. Collectively referred to as chytrids, the somewhat understudied fungi are not only an extremely important part of aquatic ecosystems today, but are also vital to the understanding of fungal evolutionary history.

So, what exactly are chytrids? Chytridiomycetes are some of the most primitive fungal species that survive today. For this reason, chytrids are also incredibly unique among the fungi. Most chytrids are unicellular, but what truly sets them apart is the fact that most have a stage in their life cycle where they are free to move around at will. During a large portion of their life, chytrids take the form of zoospores with flagella, a unique trait among fungi. The chytrid life cycles are also quite bizarre, though extremely variable. Most chytrids have a phase where they develop a thallus that contains one center of reproduction (monocentric) or more (polycentric). The thallus can vary immensely in structure: holocarpic thalli are entirely devoted to reproduction, while eucarpic thalli are not and often grow a rhizomycelium¹ that nourishes the chytrid. The reproductive parts of the thallus are often the zoosporangia that asexually produce the motile zoospores and gametes, which can allow for the sexual reproduction of chytrids. This sexual reproduction occurs largely through the copulation of motile gametes or the merging of two non-motile structures.² The production of motile zoospores typically correlates with the presence of excess food source, which is usually followed by a resting phase once the food is not as plentiful.

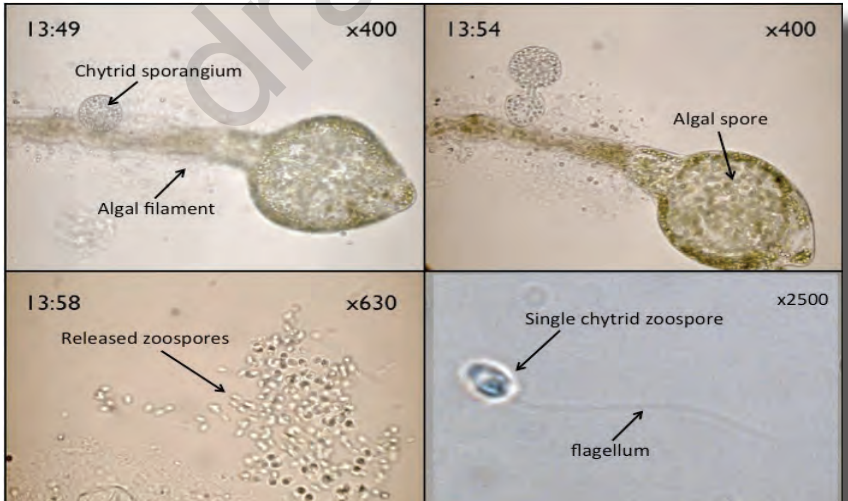
1 A primitive type of mycelium

2 There are a number of exceptions to this and *Monoblepharis polymorpha* is particularly interesting to research

Continued on page 18



Treacy, Ann. "Pollen Swirls on Water." Doodles and Jots, 28 May 2012, www.doodlesandjots.com/2012/05/28/and-the-flowers-and-the-trees/



Citation: Walker, Jason. "Chytridiomycota Zoospore Dispersion." *The Biology Primer*, Orion Scientific, thebiologyprimer.com/the-origin-and-evolution-of-fungi/?rq=opisthokonta

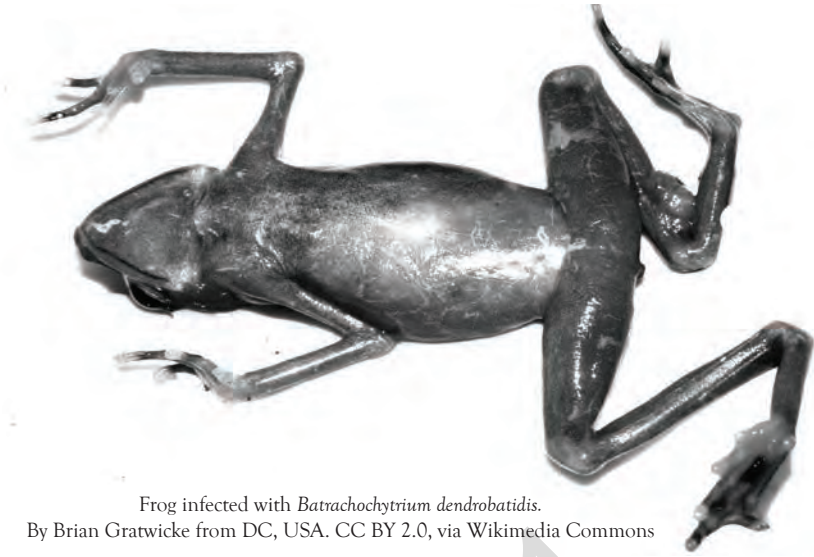
As one might deduce from their possession of a flagellum, chytrids are primarily aquatic (although they have been found in all types of ecosystems and are also prolific in soils). It is, of course, the chytrids that live in the water that colonize pollen grains, and that have gained the most recognition. Their frequent colonization of pollen is also responsible for the dispersal of the extremely valuable nutrient source that comes with pollen in the spring and fall into the aquatic ecosystem. The ecological importance of chytrids is not restricted to the decomposition of pollen, however. They are extremely important for the decomposition of chitin, cellulose, proteins, and many other forms of particulate organic matter that would otherwise not become a source of nutrients for the rest of the ecosystem. On top of that, chytrids are often significant parasites of aquatic animals and plants. Chytrids are also capable of turning inorganic compounds to organic ones.³ The importance of chytrids in aquatic ecosystems has not been fully studied, and their significance in other ecosystems is largely up to speculation, but nonetheless, they are an unignorable corner of the biosphere today.

Chytrids have come into a spotlight of sorts recently after certain chytrid parasites seriously shrunk the worldwide frog population. The nefarious *Batrachochytrium dendrobatidis* is an obligate frog parasite. It causes cysts on the skin of frogs, eventually affecting the regulatory processes of its skin until the frog dies or survives long enough to shed and recover.⁴ Frogs are not the only ones at risk though. A closely related chytrid, *Batrachochytrium salamandrivorans* causes a very similar disease in Salamanders, as well as some other amphibians. Chytridiomycosis swept populations of frogs throughout the world in the past few decades, with South and Central America being hit the hardest. Interestingly, this disease had been around for quite a long time⁵ without much conse-

3 For this reason, some scientists have considered using chytrids to help clear waterways of very small inorganic pollution, as well as large buildups of leaf litter and organic detritus.

4 The symptoms, time of death, and recovery process differ among species, age, fungal exposure, and many other factors not yet fully understood.

5 Since at least the 1970s.



Frog infected with *Batrachochytrium dendrobatidis*.

By Brian Gratwicke from DC, USA. CC BY 2.0, via Wikimedia Commons

quence. The cause of the surge of infections is largely unknown, but there are a number of plausible reasons. Some hypothesize that the frogs are losing resistance to the disease, though an alternate explanation is gaining traction among concerned biologists. *B. dendrobatidis* grows especially well in warmer temperatures, so a potential agent in the fungal attack on amphibians is global warming. The infection of innocent amphibians brings to light the importance, however saddening, of chytrids in the global ecosystem.

Just like the rest of the fungal kingdom, the phylum Chytridiomycota has had a history full of rapid taxonomical change. Chytrids were first described as members of the kingdom Fungi, for they possess chitin in their cell walls. At the beginning of the 1990s, the motile zoospores of the chytrids placed them into the Protists, the kingdom where scientists put things when they seem to have nowhere to go. More recent phylogenetic studies using ribosomal RNA moved chytrids back into the realm of the fungi. That was not the end of the seismic shifts in the phylum of fungi though (is any fungus truly secure in taxonomy and nomenclature?), and there were divisions on the horizon. Two former classes of Chytridiomycota (the Blastocladales and the Neocalimastigales) became their own separate phyla. The three groups are for now static as a whole, grouped together in the group of

Continued on page 20

zoospore producing fungi. The complications in the phylogeny of the Phylum Chytridiomycota and its relatives stem primarily from their primitive structure and age. Chytrid-like organisms are hypothesized to have been the transitional species into the fungi of today, so their morphological characteristics were intuitively grouped with those of fungus-like protists.

The description of Chytridiomycota thickens immensely with the addition of all of the paleomycological discoveries that have placed the phylum in a pivotal role in fungal natural history. Paleomycology is the study of fungi in fossil form, such as the incredibly tall prototaxites that have been unearthed in the past. Because of their primitive⁶ and unique morphology and life cycle as well as a fair amount of fossil evidence, the chytrids are considered to be extremely similar to the first true fungi. The majority of this evidence comes from the Rhynie chert, a sedimentary rock deposit in Scotland. The Rhynie chert is a source of some of the most well-preserved fungi and lichen specimens from the Devonian and younger (it is about 407 million years old), as well as some of the oldest positively identified chytrid-like fungi. The study of fossil chytrids, of course, is an extremely difficult process.⁷ Because of the small size of chytrids, the rare fossilization of fungi in general, and the difficulty of identification of fungal specimens, there is not as much data on the subject as there are for other larger and younger species. That does not mean there is a lack of evidence, though. A recent study in the Rhynie Chert even found fungal specimens attributable to chytrids on the eggs of a crustacean of the early Devonian. The fungus even had identifiable filamentous structures like the rhizoids of certain chytrids, and the colonization of what most things would consider an indigestible material suggests the importance of chytrids in aquatic ecosystems 400 million years ago. This describes only the most pristine specimens, though the molecular clock estimates chytrids to be a group as old as 1.5 billion years.

The identification of chytrid-like fungi from so long ago has

6 Primitive in this case is stating the likeness of chytrids to the first fungi, not suggesting that they are one and the same evolutionarily speaking.

7 The difficulty is even greater when the naming of the fossil fungi comes in, a process one might call more tumultuous than the constant renaming of current fungi.





Rhynie Scotland

By Anne Burgess from geograph.org.uk. CC BY 2.0, via Wikimedia Commons

immense implications of the morphology, life cycles, and ecology of the organisms during the evolutionary branching off of the fungi by observing chytrids today. For one, these very early fungi were aquatic, like the vast majority of organisms at the time. Early fungi started out with a motile stage in their life cycle with one or more flagella. They also likely reproduced both sexually and asexually and gained nutrition parasitically as well as saprotrophically. The chytrid-like organisms of hundreds of millions of years ago were also quite important in aquatic ecosystems. Numerous specimens have conclusively shown the decomposition of pollen by chytrid-like organisms. There have also been examples of parasitic fungal interactions where chytrids infected a number of different land plant spores. The fossils from the Rhynie chert even show chytrids responsible for some of the first examples of a common host reaction to parasitic fungi: hypertrophy.⁸ The fossils of chytrid-like organisms from as early as billions of years ago not only affirm the importance of chytrids in the evolution of the fungi but their overall ecological importance.

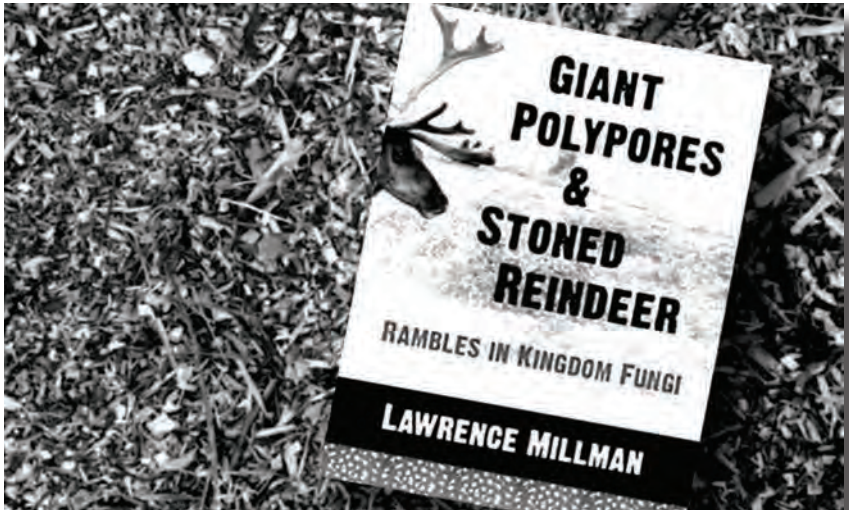
8 Enlargement of cells of a tissue or organism

The fungi in the phylum Chytridiomycota are ancient in origin, and thus are an incredibly important part of fungal evolutionary history. They are also known to be very important members of aquatic ecosystems today, such as in the decomposition of pollen and leaf litter in standing water. However, they remain a fairly understudied portion of the fungal kingdom, and not for lack of research opportunity or ecological significance. The study of chytrids will have an important role in determining ancient fungal relationships, as well as in the study of more recent mycorrhizal relationships. They also have potential to help clean up aquatic ecosystems in the future, for they are avid decomposers of tough materials. So perhaps in the next pollen season, readers will appreciate the important fungi that colonize the pollen, and maybe think less about the symptoms it causes.



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Giant Polypores and Stoned Reindeer

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A Terrestrial Feast

By Andrea Seek

Miranda was a detective for the Boston Police Department, and Angela was the only thing she ever thought twice about. Angela is a psychiatrist at an important suburban hospital. Not quite the Longwood set. But still. She made herself an excellent reputation facilitating organ transplants.

Larrabee had been Angela's lover, and made her reputation in bed. This was a fact known only to Angela, and everyone she ever talked to.

Nikole was European, good with mushrooms, and often had soirées with Angela, especially when it became necessary to make a point to her wife, Geniale.

Geniale was invited to the dinner because she learned from Nikole that Larrabee would be there. Larrabee was distressed to learn that Geniale had been added to the guest list, noting, "She can be mean!" Angela made a mental note to seat them together.

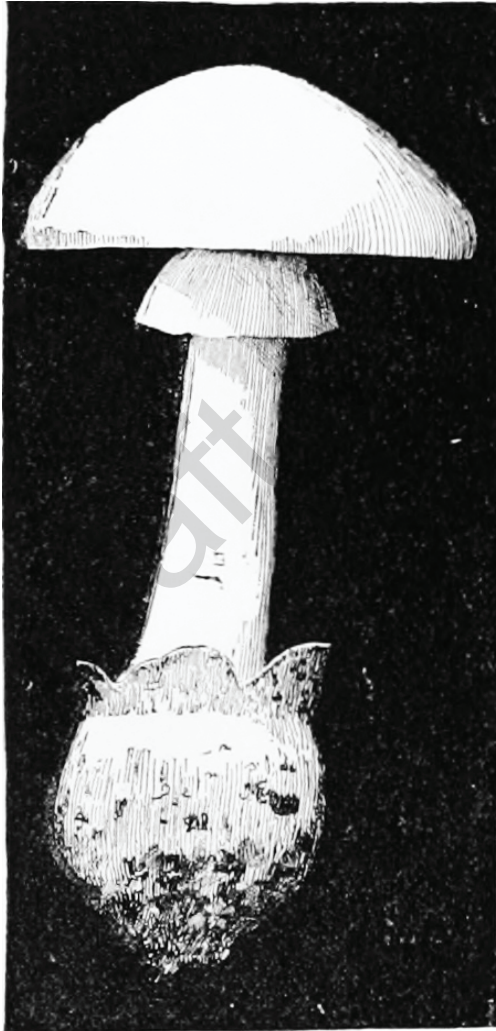
Ekaterina had never been Angela's lover, but they had traveled together through the Soviet Union long ago, as student doctors, linking arms over mugs of tea in a midnight train. Ekaterina had outlived her cancer diagnosis by more than a decade, and was endlessly furious that her sex life was over. "It's NOT okay," she would rage, as they waited for the Psilocibins to take hold. Ekaterina had recently accused Angela of making a pass at her. Angela thought certainly not.

Autumn was a former Mounted Ranger, with a deep knowledge of the forest. Autumn was Angela's lover when they were in their 20's and both new to Boston. Now she sang torch songs in a small, not-smoky, colonial bar, and wrote advertising copy for a living. Angela thought her too vulnerable to reconsider.

Miranda and Angela had spoken once, after the Symphony, three months after they ended their love affair. Miranda informed Angela then that unless Angela would commit to a serious, and faithful, long term relationship, she could not stand to see her again, ever. They both drove away weeping.

The dinner event was lavish: Shaggy Mane and Puffball chowder, Asparagus with Trompette de Mort, a Parsleyed Sorbet, Oyster Mushroom Stroganoff, Creme de Violette cordials, with Tincture of Reishi Tea, Chocolate Truffles. At the end, a little coffee flavored with Destroying Angel for all the guests before they drove home to their beds. Where they would stay.

“I’ll never look at another one of them...ever again,” Angela will tell Miranda. Miranda will learn the awful truth, and say, “I’m going to have to have to take you in. You’ll probably never see the light of day again.” Angela will respond, “Give me just this one night...”

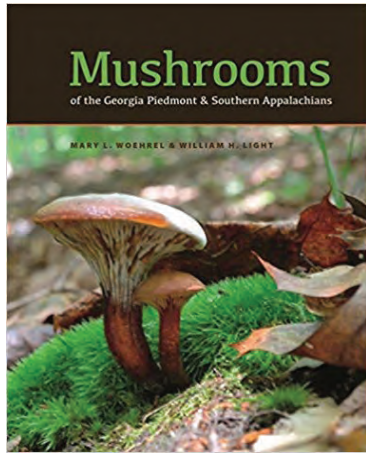


Death Cap, *Amanita phalloides*

Bailey, L. H. (Liberty Hyde), 1858-1954; Miller, Wilhelm, 1869-. *Cyclopedia of American horticulture, comprising suggestions for cultivation of horticultural plants, descriptions of the species of fruits, vegetables, flowers, and ornamental plants sold in the United States and Canada, together with geographical and biographical sketches.* New York [etc.] The Macmillan company. Digitizing Sponsor: NCSU Libraries via Flickr Commons

Mushrooms of the Georgia Piedmont and Southern Appalachians

Mary L. Woehrel / William H. Light
2017, University of Georgia Press
Hardcover, 664 pages
\$56.00



Cover Image *Mushrooms of the Georgia Piedmont and Southern Appalachians* by Mary L. Woehrel and William H. Light

Book Review by Lawrence Millman
Originally published in *Fungi*

If you rely on the internet for your fungal IDs, then *Mushrooms of the Georgia Piedmont and Southern Appalachians* might not be your proverbial cup of tea, since the various websites you're inclined to visit are weightless (often erroneous, too), and this robust tome ranks with Brodo's *Lichens of North America* both in size and weight. But if you're looking for a guidebook that provides you with more than simple diagnostic information, this could be the tome for you.

The book's front matter goes into territory not commonly visited in most guidebooks. It starts out by discussing the various Kingdoms, the better to give the reader a vantage point on the denizens of Kingdom Fungi. Mating types and sexuality are described, as are (rare for a guidebook!) yeasts and chytrids. I was quite pleased to see a few pages on Entomophthorales; so were several entomologists to whom I've shown the book. The photos of spore types and the dichotomous and pictorial keys to fungal morphology that conclude the front matter are excellent.

The bulk of the book consists of 550 pages of species description, with 1000 color photographs. Here, too, the authors venture well beyond the succinctness of most guidebooks. For instance, they provide extremely detailed derivations of species names. Thus you learn that the species name for *Suillus cothurnatus* refers to "a half-boot worn by ancient Athenians in a tragedy." The authors eschew descriptions of *Collybias* (only 2 species), *Clitocybes* (only a single species), and *Inocybes* (no species) in favor of such guidebook rarities as *Climacodon pulcherrimus*, *Leotia atrovirens*, *Anthracoephyllum lateritium*, *Abortiporus biennis*, *Peniophora gigantea*, and *Athelia epiphyllum*. There are over 20 pages on pyrenomycetes

— a record? And here’s another virtue: for their information, the authors primarily use material from published monographs rather than recycle not always accurate information from previous guidebooks.

I know what you’re thinking: Would a person who doesn’t happen to be a resident of the Georgia Piedmont or the southern Appalachians find the book useful? The answer is a definite yes. There’s considerable species overlap in North America, and this overlap is thoroughly referenced in the “Occurrence” sections included with each species. Thus you’ll learn whether the species in question is found in your neighborhood...or in the neighborhood of your rich uncle, whom you plan to visit shortly. For example, the range of *Amanita muscaria* var. *guessowii* is described as follows on p.287-288: “Widespread in North America east of the Great Plains as far south in the Appalachians as North Carolina and Tennessee; our specimens were collected under mixed hardwood and conifer trees in the Atlanta area.”

A book review that doesn’t include any criticism cannot be trusted, so let me mention that I was a little annoyed by the relationship between the photographs and the species descriptions. Those photographs have letters of the alphabet beneath them, and the reader has to parse through the text in order to learn what diagnostic feature and sometimes even which species is in the photo. On occasion, these parsings can take quite a while....

Other complaints: for some reason, a paragraph on the toxicity of *Hypholoma fasciculare* appears with the description of *Hypholoma lateritium*, a non-toxic species; Gaston Guzman can’t be preparing a revision of *Psilocybe* species, since he died several years ago; *Abortiporus fractipes* is omitted from the short list of *Abortiporus* species; while most of the book is taxonomically up-to-date, some binomials are not — for example, *Trametes betulina* appears as *Lenzites betulinus*; the spores of *Tulostoma brumale*, which the authors indicate are “generally of similar size, (3-) 4.2-7 (-8) microns,” is both inaccurate and a little strange. Finally, I should mention a photo on p. 514 that’s described as “a chaotic anamorphic stage of *Trichaptum abietinum*.” To the best of my knowledge, the species doesn’t have an anamorph. The photo shows an attempt by the fruiting body to reposition itself gravitropically.

Such quibbles aside, *Mushrooms of the Georgia Piedmont and Southern Appalachians* is an admirably researched volume. It’s perhaps too sophisticated for the beginning mycophile, but I have no hesitation in recommending it to anyone else. Indeed, I would place it among the very best guidebooks to North American fungi that have appeared in recent years.



Part of the fun of mycology is deciphering the riddle of just what you find when out in the woods.

Identifying a mushroom that you have not seen before can be a daunting task when you are just starting out. Where do you begin?

Most people open a book and look through the pictures to try to spot something that looks like the fungus in front of them. Although it is not impossible to solve your identification puzzle in this way, the human tendency is to start to make your mushroom fit the description in the book. For instance, the description may say “tastes slowly hot .” You taste the mushroom and keep anticipating a hot flavor, before long you have convinced yourself that it is a little hot. The pores should be orange, they look yellow but that is pretty close to orange so it is probably the same. Before long, you will have fabricated half your identification features.

I would suggest going in the complete opposite direction. The absolute last thing you should do is look at pictures in a book or on the internet. (Or god forbid...Facebook, Inc.. That is like looking at the answers before you start a crossword puzzle where the answers are not even right half the time) These options are fine as a final step, once you are pretty sure of your identification.

What I like to do is collect all my data without trying too hard to identify the mushroom. This consists of decent field notes, such as where the fungus is growing and what it is growing on. Which trees are nearby is good information. (a photo showing leaf litter is helpful too)

I created a sheet to help me keep my data organized. I just use a word document and list things that I want to keep track of. Here are some of the things I try to record:

Date Collected: Many mushrooms appear almost the same day each year and it is amazing to watch this.

Collection Location: Where is it growing? On Soil? Sand? Rotting wood? Live Tree? Moss?

Which trees is it near? Is it in the middle of a path or in deep leaf litter?

Conditions: When did it last rain? Is it a hot dry period or cool and moist?

Cap Description: Width and height in centimeters. Shape of cap. (Does it have an “umbo” or raised bump in the center or is the center sunken? What color is it? Does the color change from the center to the margin? Is it hygrophanous? (different color when wet than when dry). Is it slimy, sticky, furry. smooth? Are there warts or loose patches of tissue?)

Mushroom Facts

Collection Date: 5/22/18
Collection Location: Range of Cummins, Natchez
Conditions: in lawn, large tree cut - Dug 2 yrs ago, in wood off Rain Diving wk.

Cap Description:
Cap Dimensions: 3 cm across - thin, almost see-throughly, strongly ~~stems~~ striated
Cap Color & Markings: silky grey w/ yellow streaks

Cap Underside: gray fibrous base, close to base, fine
Stem Description:
Stem dimensions: 3/2 cm x 1 mm
Stem Color & Texture of flesh: cream/white, hollow brittle

Markings/Rings: none
Spore Print: black
Taste/Smell: No taste & smell
Other info: essence clusters - non-debussing
Possible ID: Cephus pulchellus - (Taiwanese Umbrella)



Mushroom Fact

Collection Date: 7/2/18
Collection Location: 28 acres, Natchez
Conditions: in grassy area - stump - hot + humid - Rain last week

Cap Description:
Cap Dimensions: 12 cm across
Cap Color & Markings: cream, brown raised dome in center (lines)
Cap Underside: thin - gills, pale, fresh pink

Stem Description:
Stem dimensions: 9 cm x 1.5 cm
Stem Color & Texture of flesh: white solid stem
Markings/Rings: off white w/ faint brown vertical lines (with a base)

Spore Print: pinkish
Taste/Smell: musty smell / not much taste
Other info: Big essence cluster (could be Borealis mm. name)
Possible ID: Pleurotus petasatus



What about the underside: Does it have gills, pores or Teeth? How do these surfaces connect with the stem? Do they connect straight on or are they decurrent (run down the stem a ways)? What color are they. Do they bruise or change color when touched or cut?

Stem Description: Length, width, shape. What color is it? It is brittle or tough? Hollow or solid? Are there any markings such as tiny dots, reticulation (a net-like pattern on many Boletes). Does the color vary on different parts of the stem? Any color change when bruised or cut? Is there any ring of tissue on the stem?

Taste and smell are important factors. Crush a little of the cap and see if you can identify the smell. (Warning: “Mushroomy” won’t get you far). It is OK to taste a tiny bit but don’t swallow it-spit it out once you get a taste of it.

It is also crucial to get a Spore Print: Cut off most of the stem and just leave a small stub behind.

Place the cap, face down on a piece of paper. (I use paper that is half white and half black), next place a bowl over it and wait.

You may get a print on the paper in an hour or it may take a day or more. Sometimes you can’t get a print if the mushroom is very young or very dry. The color of this print will tell you the spore color.

As a final step I leave a space for other info: I may mention if it is a single mushroom or a clump. I may also use chemicals to test for reactions. Some reactants are easier to get than others.

Most books will refer to reactions to chemicals, especially with Boletes.

I also glue a copy of any photos I took to the page and make a quick line drawing to aid my recollection.

Now, armed with all this info you can open your Id book...

No pictures yet though. Try starting with the keys. These are set up as a series of questions to gradually narrow down your possibilities using the info you have collected. It takes some practice to get the hang of using keys but it is worth the effort. Occasionally a complete Id may require some study using a microscope to actually view the features not visible to the naked eye. Sometimes a simple jeweler’s loop can help too. Once you have” keyed” out your find, then you can look at the pictures and see if it matches your mushroom.

Internet “images” will give you a plethora of photos, many of which are completely different mushrooms but they can occasionally help you confirm your ID.

Identifying fungi can be really challenging but when you achieve success, it’s a really rewarding feeling of accomplishment. Keep working at learning to use keys. Be observant and record everything. Good luck.



Hibbett Lab Exclusive BMC Offer

If you have a cool but mysterious fungus that you would like to ID, but can't make it to the Monday night ID sessions in Cambridge, please consider bringing it to the Hibbett lab at Clark University. We can't promise to put names on everything you bring in, but we are always happy to look at interesting finds from current BMCers. If you would like to consult, please get in touch by e-mail (David Hibbett: dhibbett@clarku.edu) and we can try to find a time to meet.

Bioluminescent Mushroom Stamps Now Available

Big News For Philatelists: for those of us bored with stamps showing flags or evergreens, our PO will issue a set of ten stamps showing bioluminescent organisms and one of these is Taylor Lockwood's gorgeous photo of *Mycena lucentipes*. The other nine are not mycological but they are gorgeous.



2018 *Mycena lucentipes* Stamp

Lockwood, Taylor. *Mycena lucentipes*. Bioluminescent Life Stamps. US Postal Service. 2018



Eagle Hill Courses

Eagle Hill Classes will be posted soon. Check their website or join their mailing list to get the full list. If any look appealing to you and you are willing to take good notes bring information back to the BMC we encourage you to apply for the BMC The Eagle Hill's Scholarship.

MushroomLog Description

By Christopher
Neefus



\$4.99(on iTunes)

Version: 1.7

Size: 20.5 MB

Rated 4+

MushroomLog is a feature-rich iPhone App designed to keep track of when and where you find wild mushrooms. You can log single observations, like when you spot a chicken-of-the-woods during a drive along a back road, or you can use it to track where you go and what you find on a mushroom walk with your local mycological club. In addition to mapping the location of each observation, it lets you record the common name and scientific name of the mushroom, what the mushroom was growing on, the habitat where you found it, how plentiful they were, and how confident you are in your identification. You can save pictures of each mushroom. The App builds a database of your foray locations, where you walked on each foray, each mushroom observation you made, and the pictures you took. Later, you can retrieve and map the track and observations from your walks or search your observation database by species, location, a range of dates. Getting Started tutorials and a complete User Manual are available on the MushroomLog support site.

Since 1897

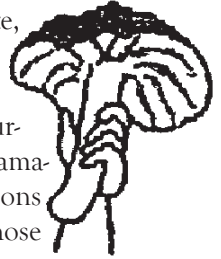
The front of every issue of *The Bulletin* reads “since 1897” and there has been some confusion over what this refers to. It’s not the club. The first Bulletin was published on a single-page type-written document in 1897. To achieve this marvel of technology and organization took the 1895-founded BMC two years.

The Next BMC Bulletin Wants Your Work

Please submit any and all contributions before **February 1**.

CALL FOR SUBMISSIONS

Calling for submissions regarding the pursuits of amateur mycologists: we can receive these in any form from those who write, draw, and capture digital images. We need the utmost generosity of all your expressions to accurately reflect our passion. Remember, *The Bulletin's* most explicit purpose is to broadcast the grandest expressions of the amateur: those vital mycological pursuits whose motivations are far more various, and often profound, than those who pursue for money.



Generously submit all contributions to BulletinBMC@gmail.com

Help Friends of the BMC

When we plan our weekly forays throughout the year, we need to get permission from the owners of the areas we are visiting. Some of the local conservation groups have been very welcoming to our group and deserve our support. Two in particular have helped us substantially, even suggesting places to explore (Like the old growth forest in Cummington that was the site of this year's bus trip). The Trustees of Reservations and Sudbury Valley Trustees are both excellent organizations that you should support if at all possible.

If you are able, we encourage you to join these groups or at least make a donation. It's a lot of work to keep trails clean and free of fallen trees and invasive plants. They make our trips to the woods much more enjoyable.

Sudbury Valley Trustees: www.svtweb.org The Trustees of Reservations: www.thetrustees.org.

Membership for 2019

We invite any interested person to apply for membership. One of the ten best holiday gifts (refer to minutes from the BMC Hygiene Committee, May 11, 1896). Join the BMC online using PayPal or by mailing a completed Membership Application to

Brett Maguire (BMC Membership Secretary)

676 Pleasant St. Apt 3

Worcester, MA 01602

Annual Dues

\$20.00 - Individual member

\$25.00 - Family membership (all at one address)

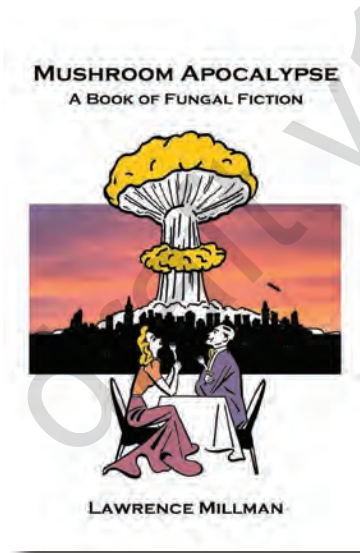
\$10.00 - Junior member (individual under age 21)

Applications received after November 1st will include membership into the coming year.

Mushroom Apocalypse: A Book of Fungal Fiction

Whimsical, satiric, and sometimes even outrageous, *Mushroom Apocalypse* is Lawrence Millman's 16th book and the first ever book of mycological short stories. In its pages, you'll encounter (among other characters) a pair of foodies who contemplate eating a mushroom cloud, the Dalai Lama as a magic mushroom aficionado, and a Russian czar named Ivan who's a terrible mushroom identifier.

The book can be obtained at the Duff Sale or by sending \$16 check/cash (postpaid!) to Lawrence Millman, P.O. Box 381582, Cambridge, MA 02238. Be sure to ask for an inscription!



Cover Image *Mushroom Apocalypse*
by Lawrence Millman

Our Website

<http://www.bostonmycologicalclub.org/>

This is an incredible resource created with the generous patience and extraordinarily talents of Scott Shaffer. Among past lectures and other resources you can use your account to readily view digital back issues of *The Bulletin*.

UPCOMING EVENTS



Henry J Beker a world authority on *Hebeloma*, is visiting from Belgium and touring North America searching for specimen. His most recent publication is *Hebeloma in the United Kingdom*. Henry is a mathematician and for many years worked in the field of Information Security.



Joan Maloof (Above), Professor Emerita at Salisbury University, founded the Old-Growth Forest Network to preserve, protect and promote the country's few remaining stands of old-growth forest. She spends her time lecturing, writing, visiting forests, assisting private landowners, and supporting local groups trying to protect community forests from development.

Monday
October 29
7:30pm **Hebeloma**
Harvard Herbaria Seminar Room
Henry Beker

Sunday
November 4
5:00pm **BMC Banquet**
EVOO Restaurant. \$65
Please sign up on the BMC website to attend our 124th annual banquet.

Monday
November 5
7:30pm **Biology of Old-Growth Forests**
Harvard Herbaria Seminar Room
Joan Maloof

Monday
August 1-4
2019 **2019 NEMF Samuel Ristich Foray**
Lock Haven University, Lock Haven, PA

Join our efforts in sharing all regional mycology related events with BulletinBMC@gmail.com

Mystery Fungus



Dear Mycophiles,
Last issues Mystery Fungus was correctly identified as *Lentinellus ursinus*. It is and David Babik has been promised a prize via post. We also had a few other correct guesses shortly afterwards. Good job all!



So why does this photo of the arctic appear on the page reserved for a *Mystery Fungus*? Because a particular fungal entity was more or less responsible for the exploration of the Canadian Arctic in the 19th century. The first who provides a correct guess for this entity will receive a free copy of my book *Giant Polypores & Stoned Reindeer*. Send your answers to: BulletinBMC@gmail.com Lawrence Millman

Photograph by Lawrence Millman