



Symbiosis[©]

The newsletter of the Prairie States Mushroom Club

Volume 31:1

Winter

<http://iowamushroom.org>

Looking Back at 2013

by PSMC President Glen Schwartz

Mushrooming in 2013 was hit-or-miss all year. We started out cold and wet, with two of our first three forays held in the pouring rain. Early summer was near perfect weather, but nobody looks for mushrooms at that time of year. Mid to late summer brought a state-wide drought, so bad we canceled a foray. Moisture was restored in the fall, and the mushrooms responded with abundant fruiting.

Our forays were well attended this year, even though our membership is low. Every year we plan a few forays to hunt morels, and we invite the public to join us, as there are still a few Iowans that don't know what a morel looks like. For the third or fourth year in a row, our morel forays were a great disappointment. We found a few morels in Mitchell County, but nothing to write home about. Maybe we need to schedule only short-notice forays during the morel season. Our last three forays were very well attended as we worked with county naturalists to publicize the events. The season ending foray and annual meeting had about 40 participants, truly amazing for early November. There, we found Giant Puffballs, *Amanita muscaria*, Brick Tops, Knothole Oysters, and many other species. See our SmugMug site — <http://iowamushroom.smugmug.com/Foray2013/Wickiup-Hill-1122013> – for photos from this foray.



Our annual meeting was held at the Wickiup Hill Learning Center after the last foray. We feasted on potluck lunch, with many dishes featuring mushrooms. We munched on popcorn while watching a movie, *Now Forager*, about a couple trying to make a living by harvesting mushrooms. During the movie, I thought about past annual meetings held around the back of a pickup in

the cold and the wind. I much prefer indoor heat, plumbing, and hot food for the meeting. As always, we had a lively meeting with many good ideas presented.



Two of the most exciting are Gabby and Cody! Gabby has agreed to be the Newsletter Editor (thank you, thank you, thank you), and Cody will be our Publicist, a first for PSMC. All of the club officers were reelected for 2014; however, Mike and Barbara changed places. So, for 2014, Glen is President, Barbara is Vice President, Dean is Secretary, Roger is Treasurer, and Mike is the at-large Board Member.

Calendar sales are down just a bit from last year. We ordered 200 calendars, so we still have a lot remaining. These make great gifts to family and friends that are interested in mushrooms. Contact Roger Heidt 125 Timber Lane, Robins IA 52328-9632 (Phone 319-573-4795) for cost and shipping. My wife and I have purchased 12 calendars for our family, and sold another 60 to friends, accounting for 2/3 of the total calendar sales. I am already planning that the 2015 calendar will feature edible mushrooms that cannot be confused with anything else, like the Giant Puffball and the Shaggy Mane. Send your photos to me GlenASchwartz@gamil.com for consideration for the 2015 calendar.

The newsletter keeps us all connected and is the official record of the PSMC. We are very excited Gabby has agreed to be the editor as he has previous experience with similar publications. Our previous editors, Mike, and before him, Dave, made our newsletter truly outstanding for such a small organization. We will help

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Change in Editors

by Mike Krebill and Gabby Schulz

Mike — Volume 30:3, the Summer 2013 issue of *Symbiosis*, was my last as editor. My thanks to Club President Glen Schwartz for producing Volume 30:4, the four-page Fall special edition, which alerted members to the soon-to-happen PSMC Annual Meeting, provided insight on our activities and plans, and suggested the PSMC 2014 calendar as a gift idea. At the annual meeting, to everyone's delight, Gabby Schulz volunteered to become our next newsletter editor. There are two reasons why I stepped down. My philosophy is that demanding volunteer jobs in any organization are more pleasant to the volunteer when they are short, and I felt a two-year stint met that for me. Organizations also benefit from new blood, with new insights and fresh ideas. It's very easy for committee members to get burned out if they do the same job year in and year out. While I enjoyed serving as your editor, and had wonderful support from the Board and members, I felt it was time to mix things up, to keep our club vibrant and alive. That's also the reason why I was happy to trade my position as Vice President with Barbara Ching for her position as Member At Large. Gabby is a relative newcomer to PSMC, but his enthusiasm and passion for mushrooms and mycophagy is apparent to those of us who have been present on forays with him. He's knowledgeable, eager to learn, and personable. He's also witty and creative, as well as artistically talented... just check out his website and blog at <http://www.gabbysplayhouse.com/>. I am tickled to have Gabby take over, and as I hope all of you will do, I pledge my support to him as he undertakes the editorship of our newsletter.

Gabby — Hello! Many of you are probably as surprised as I am to see me credited as the new *Symbiosis* editor, as Cody and I just joined the PSMC this year! (Or, rather, all the way back in 2013.) Joining the club has been a great pleasure for us, as well as an invaluable education — which I hope to repay by making *Symbiosis* a pleasure to read.

If you're looking for ways to fill the hours during these relatively fungus-free winter months, I recommend submitting your own article for *Symbiosis*! Contributions of identification tips, foray stories,

cultivation how-to, hi-res art, or favorite cooking recipes are always welcome — you can send them to me at fantods@gmail.com.

Also, if you read any interesting mycological articles in other publications — like the fascinating piece in this issue about ways electricity might affect fungal growth — feel free to pass along the link; I'll be happy to contact the authors about getting permission to reprint it in these pages.

And if you haven't yet attended a PSMC foray and want to learn more about mushrooms, everyone's invited! You can find out about upcoming forays on the PSMC website (<http://iowamushroom.org/forays.php>), or by contacting PSMC Secretary Dean Abel: by email at dean-abel@uiowa.edu or by phone at (319) 354-3510.

Also, don't forget to check out the PSMC website's archive of beautiful foray photographs at <http://iowamushroom.smugmug.com> — to which Cody and I will soon be adding our own cache of humble pictures.



Left to right, Gabby Schulz, Glen Schwartz, Rosanne Healy, Dean Abel, Cody Gieselman *Photo by Mike Krebill*

Ryerson's Woods Foray, Iowa City, August 3, 2013. 57 species of fungi were identified, along with 5 different slime molds.

Big Beautiful Blewits Bring Bounty But Beware!

by Dave Layton



Bounty of blewits



*Blewit spores compared with unknown *Clitocybe**

I apologize for the over the top alliteration, but it's true. The more I get to know this delightful fungi the more I learn to beware. *Lepista nuda* (blewit) is simultaneously distinctive yet easily mistaken for several other mushrooms, some of which may even be poisonous. I've been picking blewits for decades, yet just this year an unknown species of *Clitocybe* made it into my blewit bag briefly before I noticed the differences. These *Clitocybes* were not as robust as blewits with a fainter, less wholesome odor and pure white spores, not light pink like *Lepista*. These unknowns were much larger than *C. dealbata*. Plus they were growing during the wrong season (although they had some characteristics similar to that poisonous species). To further complicate identification, these unknown *Clitocybes* grew saprophytically on leaf litter right next to blewits, with a very similar shape of both stem and cap. Plus a light rain had leached tannic acid out of the leaves, through which both species emerged and had stained the caps similarly brown. Even so, my first clue that these were different was that younger caps had no shades of purple or lavender.

Interestingly, shades of purple or lavender are exactly what can create confusion between blewits and a few other varieties. A number of species of *Cortinarius* (corts) have shades of purple or lavender. However, they also have a web-like veil over gills when young, and their spores are rust colored when mature — unlike blewits, which never have any veil. Several years ago, PSMC had a foray at Wildcat Den led by Jim Frink. He

showed us an amazing variety of mushrooms, including at least two species of *Cortinarius* with different shades of purple growing right next to blewits. The leaf litter gave both corts and blewits a brown color on their caps, and some corts had lost their veil but had not yet showed spore color. I could barely distinguish between them once they were picked and sitting next to each other. More distinguishing was their texture, smell, and growth pattern, which was key. Blewit mycelium grows on the leaf litter, but corts grow in the ground mycorrhizally with oak trees. They emerge *through* the leaf litter rather than from it. A lot is unknown with so many species of corts, but it is known that some have deadly toxins.

Several years back, a young mushroom hunter brought what he called blewits to a foray. I was excited because I wasn't expecting to find them quite that early in the season. It turned out that he'd found *Laccaria ochropurpurea*. He failed to distinguish the thick, tall stem and more reddish-purple, broadly spaced gills. Fortunately that was a harmless mistake, since the *Laccarias* are edible, but they're nowhere near as tasty as blewits.

With its variety of impostors, one might conclude that blewits aren't worth hunting — but nothing could be further from the truth. One easy way to tell that you've found blewits is if the woods are full of them, ranging

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The PSMC 2013 annual meeting at Wickiup Outdoor Learning Center was on a pleasant sunny day. While poking about in the woods I came upon several handsome shelf fungi on a downed log. The variety of textures seemed to say: lovely autumn composition. Warm light was being bounced about, reflecting off trees and vegetation with no dappled light on the fungi themselves. Good, a nice place to make an image.

Notice the blotch of light on the left-hand photo that crept in after I chose the camera's vantage point. Or

perhaps it appeared just before I pressed the shutter. I looked up to see it and knew the image was a discard. Given another chance and opening the umbrella I almost always carry when photographing in the woods, I was able to make an image without the light blemish. Sometimes a hat, or jacket, or nearby person can be a good light-spot blocker. The goal is to block the offending shaft of light without changing the ambient light quality very much. Sometimes discards have a second life as teaching images. 🍄

High 5 to Dr. Healy!

by Mike Krebill

PSMC member Rosanne Healy earned her Ph.D. from the University of Minnesota in the summer of 2013, doing her doctoral research on truffles. Wish we could have kept her in Iowa, for she was a treasure when it came to identifying mushrooms, and a delight to have with us on a foray.

She's now at Harvard. If you ever get out that way, or have occasion to write her, her work address is: Harvard University Herbarium, 22 Divinity Ave, 4 Farlow, Cambridge, MA 02138.

Rosanne remains active on Facebook and you can communicate with her that way, share photos, etc. Here's the link: <https://www.facebook.com/rosanne.healy> 🍄

Looking Back...

(cont. from cover)

Gabby any way we can to continue to produce a publication that exceeds expectations. We are equally excited to have Cody agree to be our publicist. Maybe with a publicist, we can start to grow the membership of the PSMC back to the levels we had ten years ago. We also look forward to expanding our demographics. We hope that, with a publicist, we can reach minorities and attract some younger members. Things are definitely looking up for the Prairie States Mushroom Club, and I cannot wait for great things to happen in 2014. 🍄



Phyllotopsis nidulans

ZAP! Lightning, Gods, and Mushrooms

By Miwa Oseki Robbins

Reprinted from the Cornell Mushroom Blog: <http://blog.mycology.cornell.edu/2013/01/20/zap-lightning-gods-and-mushrooms/>
via Robbins's blog: <http://sculptingearth.wordpress.com/>

The farmers of Japan say thunderstorms are good luck — they make the mushrooms grow.¹ And mushrooms and thunderstorms are partners in folklore all over the world. The ancient god Soma may even have been a mushroom himself. In the book *Soma: Divine Mushroom of Immortality*, Gordon Wasson² argues that *Amanita muscaria*, the classic red or yellow fly agaric, is the identity of the mysterious Soma, god of the RgVeda, a sacred collection of ancient Vedic Sanskrit hymns. These hymns are some of the world's oldest religious texts, and from them we know Soma is “the child of the thunderstorm.” Is Soma really a mushroom? Are mushrooms the children of thunderstorms? Read on.

Science, alas, has had little to say about mushrooms and thunderstorms. Until now. Recently, scientists in Japan have demonstrated a link between lightning and prolific mushroom fruiting.¹ Although their interest in lightning and mushrooms is not driven by a religious quest, their research may inadvertently shed light on an ethnographic mystery.

In Japan, mushrooms are particularly coveted for their delicious, nutritional, and medicinal qualities, and demand is outstripping supply. But now scientists are finding ways to harness the power of electricity to increase mushroom production. Can you imagine farms where man-made lightning bolts strike the ground and induce large flushes of mushrooms? Well, this is what scientists in Japan are doing.³

Today, shiitake (*Lentinula edodes*), buna-shimeji (*Hypsizygus marmoreus*), eryngii (*Pleurotus eryngii*), and matsutake (*Tricholoma matsutake*) mushrooms are high-value health foods in Japan.^{1,3} Matsutakes now sell for US \$439 a pound.³ Before you think you might get rich by growing some, you must consider that these are ectomycorrhizal mushrooms that only grow symbiotically with their pine-tree hosts, so the world's harvest is entirely collected from the wild. Although harvest of these mushrooms in Japan peaked at 12,000 metric tons in 1941, harvest declined to 34 metric tons in 2005, not due to lack of demand but to many threats

to these red-pine forests, including a pine-wood nematode infestation that has been wreaking havoc in these ecosystems.³ People want more mushrooms. Let's harness the power of lightning.

The use of direct current (DC) electric fields on living tissue is not a new idea, but has a long and contentious history. Even back in 1985, when Robinson⁴ wrote a review of the topic, he was able to find eight reliable reports involving plant cells, and four on animal cells, responding to DC fields. The reports ranged from growth of neurons towards the negative electrode, to a “healing” response of wounds. Many of these observations seem to have been dismissed as “laboratory curiosities,” unlikely to have much real-world application. In Japan though, electrical stimulation has been used in the production of shiitake, buna-shimeji, and eryngii mushrooms for almost half a decade. And this technology doesn't seem to be limited to mushrooms, as farmers are also using electromagnetic field technology in the production of tomato, lettuce, strawberry, and some ornamental plants.

Lightning is notoriously disobedient, so Islam and Ohga built a “Small Population Lightning Generator” (SPLG), conveniently powered by rechargeable AA batteries.³ This device can be wheeled through the forest, and administers 50kV electric pulses to the ground through its electrode wheels. No, it isn't exactly like lightning — it's more like the shock you get from a metal doorknob after dancing in your polyester leisure suit. The SPLG delivers maybe 500 milliJoules of energy per zap; a bolt of lightning might deliver one billion times more than that. Other studies have delivered shocks as low as 30kV and shown increases in mushroom yields.¹ One fall day in a Japanese forest, Islam and Ohga trundled the SPLG across their 2-by-3-meter experimental plots in parallel passes that were each 0.10 meters apart.³

The results were yields of matsutake mushrooms just about double the yields in unzapped control plots. A

(cont. on pg. 6)

ZAP! Lightning, Gods...

(cont. from pg. 5)

monstrous flush came two weeks after the pulse and a second one nearly as large 3 weeks after. But it wasn't just the quantity that increased — the quality, as measured by weight and size of individual matsutake mushrooms, also showed dramatic increases. Harvests from the zapped plots were, on average, almost 70% heavier than controls.³ If you thought mushrooms were magical all on their own, the combination of mushrooms and electricity might knock your socks off.

Fungi are mysterious things, and the mechanism by which electrical stimulation promotes mushroom fruiting is still not much understood. Perhaps the mushroom mycelium is responding to an apparent threat of death by redoubling its reproductive efforts? Many electrifying questions remain. Like: how does the zapping affect forest trees? Can the high fruiting rates be sustained without damaging the mushroom-tree symbiosis? When's the next thunderstorm due in my neighborhood?

In the meantime, if you feel like experimenting (safely, of course) with mushrooms and electricity, you might want to check out this intriguing post about a New York City mycophile who grew his mushrooms amid Jazz music, artificial fog, and static electricity:

<http://blog.modernmechanix.com/tiny-thunderbolts-help-mushrooms-grow/>

Or, next time you go in the woods foraging for mushrooms, look for trees recently struck by lightning. Who knows what you will find. Maybe you will even have an encounter with the god Soma, child of the thunderstorm.

An assortment of References:

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2. R.G. Wasson. "Soma: Divine Mushroom of Immortality." 1968.

3. F. Islam and S. Ohga, "The response of fruit body formation on *Tricholoma matsutake* in situ condition by applying electric pulse stimulator," *ISRN Agronomy*, vol. 2012, Article ID 462724, 6 pages, 2012. doi:10.5402/2012/462724

4. K. R. Robinson, "The responses of cells to electrical fields: a review," *Journal of Cell Biology*, vol. 101(6): 2023–2027, 1985.

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6. W. R. Adey, "Biological Effects of Electromagnetic Fields," in *Journal of Cellular Biochemistry* 51:410-416. 1993.

7. S. Ohga and S. Iida. "Effect of electric impulse on sporocarp formation of ectomycorrhizal fungus *Laccaria laccata* in Japanese red pine plantation." *J. Forest Res.* 6: 37-41. 2001. 

Big Beautiful Blewits...

(cont. from pg. 3)

from cute little bread-loaf shaped lavender caps to giant floppy toad-sofas. Also they're one of the most mushroomy tasting mushrooms there is, and they cook to a rich, dark, purplish-caramel color that looks wonderful mixed with lighter-colored mushrooms. Especially lovely are young perfectly mushroom-shaped caps, which should be cooked in ways so they remain visible. They also freeze well, gaining a little firmness that larger ones lack when fresh cooked. I'll either blanch them and leave them in large chunks, or slice and partly sauté them for the freezer. The blanched ones go better in stews and baked dishes, and the sliced ones go better in stir-fries and omelets, etc.

Even if you know you've found blewits you should still beware, at least at first. Some people have trouble digesting them. They're very rich and can overwhelm some dishes. Also, not all blewits are equal. They can grow on hardwood leaf litter, pine needles, and even grass clippings. What they grow on affects their flavor. Blewits I've found on pine needles are pretty good, but not as good as the ones growing on mixed hardwood leaves. One time we found dozens growing on a pile of grass clippings next to a cemetery. We harvested and cooked some of them, but they were useless because they had a musty, grassy taste, with a faint aroma of Weed & Feed or — dare I say — embalming fluid?

I hope everyone who reads this gets to know blewits better, because for me there is no better joy of mushroom hunting than spotting the first blewit right next to the trail. Then I refocus my eyes to see their subtle colors in the leaf litter, and I realize I'm looking at dozens of them, if not hundreds. 

Foray List, Wickiup Hill Outdoor Learning Center, Linn County, November 2, 2013

Amanita (muscaria) gussowii — Fly Amanita

Our mushrooms are usually more orange than red, but some very red specimens were found.

Armillaria gallica — Honey Mushroom

Bisporella citrinia — Tiny Yellow Cups

Bjerkandera adusta — Smoky Gray Polypore

Calvatia gigantea — Giant Puffball

Chroogomphus ochraceus — Pine Spikes

MushroomExpert says that this is *Chroogomphus rutilans* in the sense used by many North American authors.

Coprinus atramentarius — Alcohol Inky
(poisonous if consumed with alcohol)

Coprinus comatus — Shaggy Mane or Lawyer's Wig
(no longer regarded as a true *Coprinus*)

Coprinus sp. — Inky Cap

Entoloma abortivum — Aborted Entoloma or Cottage Cheese Mushroom

Both the normal form (mushrooms with blue-gray caps and pink gills) and the parasitized form (lumpy white marshmallows resulting from the infection of Honey Mushrooms by the *Entoloma* fungus).

Exidia glandulosa — Black Jelly

Exidia recisa — Brown Jelly

Ganoderma applanatum — Artist's Conk

Grifola frondosa — Hen-of-the-Woods or Goat's Beard

Irpex lacteus — Milk Tooth

Ischnoderma resinatum — Resinous Polypore

Hygrophorus subsalmonius — Glutinous Orange

Hygrophorus

Hypoloma sublateralium — Brick Top

Hypsizygus ulmarius — Elm Oyster or Knothole Oyster

Lactarius indigo — Blue Milk Cap

Lactarius volemus — copious white latex, fishy odor, stains brown

Laetiporus sulphureus — Chicken-of-the-Woods or Sulphur Shelf

Lycoperdon pyriforme — Pear-shaped Puffball

Index Fungorum states that *Morganella pyriformis* is a synonym but not the current accepted name.

Metatrachia vesparium — Multi-goblet Slime Mold (myxomycete)

Mycena cf. inclinata — Little Gray Mushroom (LGM)

Mycena luteopallens — Yellow Hickory Nut *Mycena*

Omphalotus illudens — Jack-O-Lantern

(glows in the dark, poisonous) [extralimital – not from Wickiup]

Panellus stipticus — Luminescent Panellus (= *Panus stipticus*)

(another glow-in-the-dark mushroom)

Phellinus gilvus — Tiger Eye Polypore

Phlebia tremellosa — Trembling Wrinkled Gill (= *Merulius tremellosus*)

Pleurotus cf. citrinopileatus — Yellow Oyster

Pleurotus ostreatus — Oyster Mushroom

Pluteus cervinus — Deer Mushroom

(free pink gills, lacking annulus and volva, lignicolous)

Polyporus alveolarius — Hickory Stick Polypore

(orange with large angular honeycomb-like pores)

Polyporus badius — Big Black Foot Polypore

(tough and leathery, ribs like canvas)

Polyporus elegans — Ambiguous Polypore (= *Daedalia ambigua*) glancing pore surface

Polyporus radicata — Rooting Polypore
(at first glance it looks like a bolete)

Polyporus schweinitzii — Dyers Polypore

Sarcoscypha dudleyi — Spring Red Cup

(this has previously been recorded as early as November)

Schizophyllum commune — Split Gill

Scutellinia scutellata — Eyelash Cup

Stereum complicatum — Orange Log Leaves

Stereum ostrea — False Turkey Tail

(parchment fungus with smooth hymenium)

Suillus americana — Slippery Jack Bolete

Suillus lactifluus — another of the Slippery Jacks
(pores exude milky drops when fresh)

Trametes elegans — Little Black Foot Polypore

Tremella fuciformis — Transparent White Jelly or Snow Fungus

Trichaptum biforme — Purple Tooth

Xylaria longipes — Dead Man's Fingers

This specimen differs from the larger *Xylaria polymorpha* in that the surface is decorated with cracks and fissures, and the ovoid spores are smaller (10-12 X 5.5-6.3 μm) with a spiral germ slit. 

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Book Review

by Linda Scarth

The Mushroom Hunters: On the Trail of an Underground America by Langdon Cook.
New York: Ballantine Books, 2013. ISBN 9780345536259. 290p.

Books are said to transport readers. This one does — into a fascinating world of enormous contrasts, with a cast of characters usually only found in fiction.

Although the author has changed some names, this story is real: one where mushrooms are hunted, bought, sold and prepared both for home-cooked meals and for the trendiest restaurants in the country. It is the backstory of an underground economy, one that includes both marginalized immigrant pickers and wealthy society chefs with bestseller cookbooks. The author leads readers, pied-piper fashion, into his passion for mushrooms and his fascination with the people who hunt and cook wild foods, including mushrooms.

The story is anchored around several pickers in the Pacific Northwest — a buyer and several chefs in the commercial mushroom market. There are cameos by many other characters: West Coast Asian and Hispanic pickers, survivors of the economic downturn in the Pacific Northwest, itinerant pickers and buyers of Eastern European descent from throughout North America, recreational pickers, and the Seattle-area restaurant scene. Along the way the reader will learn a bit about mushroom taxonomy, discover delicious recipes in paragraphs about picker living conditions, and stand in line in a Montana airport with buyers shipping hundreds of pounds of mushrooms to markets and restaurants in New York. 