

THE KEYSTONE CAP

Newsletter of the Eastern Penn Mushroomers

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President's Message by Tom Warman

According to club by-laws – yes, we have them – the two-year terms for elected and appointed club officers will be up at the end of 2023. That means that club leadership for 2024-25 will need to be selected at the January 13, 2024 annual meeting. This year, there is a full slate of candidates for your consideration, some old names and some new. All have agreed to serve the club in their respective capacities.

For the elected officers, I have agreed to serve a second and final two-year term as President. George Morrison is stepping down as Vice President/Program Chair to be replaced by Mike Mettler. (A big thank you to George, who reluctantly found himself leading the club during COVID—a job he did magnificently.) Josh Huber will fill the Membership Secretary/Treasurer position vacated by Mike.

Karen Beall will join Niles Lavin as Foray Chair. Returning appointed officers will be Ari Leitzel (Newsletter Editor), Cheryl Dawson (Director-at-Large), Andrew Kimbrel (Culinary Coordinator), Roseann Sachs (NEMF Trustee), and Lynn Nelson (Webmaster), as well as our capable quartet of Foray Recorders: John Dawson, Mike Mettler, Roseann Sachs, and George Morrison.

Please plan to attend the January 13 annual meeting. Mike Mettler has already lined up a great speaker. And you will get the chance to vote on the above slate of officers as well as hear a brief "State of the Club" address. Pretty exciting, eh?

Until next time . . .

Tom

Time to Renew your EPM Membership

EPM club dues for 2024 are now payable. If you joined for the first time after September 1, you have a year's grace and do not need to pay dues until next year. Anyone not renewing by March 1, 2024 will be purged from all lists and the Groups.io collaboration application.

You'll find a membership application form at the end of this newsletter. Update your contact information only if it has changed. You can also renew by PayPal to EPMClub@gmail.com, BUT THE CLUB MUST HAVE A SIGNED FORM AS WELL. That can be scanned and emailed to the same address. For all current members renewing after March 1st, the club will be charging a \$5 surcharge on top of your renewal on order to re-enter all of your information.

The Search for Melzers in the Time of Covid submitted by Bill Kochanov

My story started years ago in Westmoreland County, out on the outer fringes of Pittsburgh, PA. Living on the edge of the wilderness, it just seemed part of life to roam the woodlands, learning to fish, hunt, and "pick mushrooms."

My forays in those early years always seemed to start with my father practically dragging my brothers and I out of bed early on Sunday mornings to go "mushroom hunting." It became ritualized with a hearty breakfast, donning the weather appropriate forest attire and boots, the spirited gathering of the baskets from the basement, lining their bottoms with dated newspaper, and finally stashing them in their temporary home at the back of the station wagon. We traveled along Forbes Road thinking of travelers heading towards Fort Pitt centuries earlier, thinking aloud how the landscape is continually changing. The baskets, like hounds sensing the hunt, sliding from side to side as the car took the curves of those winding western PA roadways. My education of the half-dozen or so fungal types that we foraged in the local forests became more appreciated with age, but it seemed to be falling short of what I was observing as I began ranging further and further afield in distant lands.

Years began to be measured by the seasons, as I began paying attention to rainfall, temperature, vegetative cover... little did I realize that through some indefinable osmotic exchange, I was becoming a naturalist. Referenced material from books, journals, and online sources surely complimented my observations, but it became evident I needed something more. It was during the era of the Covid lockdown that I entered the realm of reagents.

The Search Begins

What did I get into? Even though I had my share of college level chemistry, I was quite unprepared for the onslaught of apparatus, let alone procuring the chemicals, and then the procedures, safety protocols, and what was that in the fine print regarding Melzer's reagent and chloral hydrate? At times I felt as though the investment on my mental budget was only going to be exceeded by the lightening of my wallet!

I adapted to those initial awakenings and began the process by giving myself a budget and building up the supply cabinet little by little. I also began following the finer threads of research and online resources for help in obtaining the basic chemicals and preparatory apparatus.

I was guided by several online sources for the necessary chemical list and basic recipes: John Plischke's powerpoint, Chemical Tests and Stains For Fungi (<u>https://goodmushroom.weebly.com/</u>); Michael Kuos, The Mushroom Expert (<u>https://www.mushroomexpert.com/</u>); the British Mycological Society (<u>https://www.britmycolsoc.org.uk/field_mycology/microscopy/reagents</u>); Robin Dean's Guide to Chemicals for Fungal Microscopy (<u>http://fungus.org.uk/nwfg/chemdec99.htm</u>); David Largent, David Johnson, Roy Watling's, How to Identify Mushrooms to Genus III: Microscopic Features; and Edward Gurr's, Encyclopaedia of Microscopic Stains, among others.

I will not go into the details of the microscopic deciphering that took place on the faded labels of the store-bought cleaning fluids found underneath the kitchen sink, or the grunting that accompanied my hands-and-knees groping into the back recesses of the pantry or the cold sweat that accompanied my arachnophobia as I dusted off squared metal cans within our spider-webbed basement. The garage provided minor relief as I knew there were only corrosive acids and carcinogenic solvents to deal with.

Eventually I accumulated enough labware and chemicals to make Dupont stock surge. There was one item that was missing, however, Melzer's reagent. No problem I thought, I'll just purchase the chemicals and mix up a batch. Now let's see...the ingredients...I needed iodine crystals, potassium iodide, water, and chloral hydrate...

Reality hit me when I found out that I just couldn't go down to the local drugstore (at least in this country) and buy an ample quantity of chloral hydrate off the shelf. It seems that it can be had, but as a schedule IV controlled substance, legal issues became a concern, leading to a surfacing wave of swelling paranoia.

With my enthusiasm waning, I began a half-hearted campaign by trolling through the mushroom network and lucked out by scoring a small amount of Melzers from the secret stash of a kind mushroomer (you know who you are).

However, this did not resolve the issue of maintaining a steady supply down the road. I read the article by Leonard (2019) and thought that I would make the attempt of asking my family physician for a prescription. That should help downplay my over-stressed thoughts of the DEA breaking down the door as I put up a feeble argument that it was just for science. My next phase of the search resumed at one of my quarterly doctor appointments. My doctor was entering the last few notes on the exam room computer as I sat there, tip-tapping my toes, patiently waiting to make my request. I was a bit nervous but realized that it was nothing to get into a twist about, it was either yes or no. As he finished, I cleared my throat and practically blurted out my request, carefully explaining my affliction with fungi and my quasi-desperate need of a prescription for Melzer's reagent. He listened attentively and to my surprise and delight, agreed to write me a prescription. Trying to be helpful, I offered suggestions on what to include in the script. We both agreed that it should include the preparation formula (which I happened to have coincidently brought along) and that perhaps it should also mention that the Melzers was being used for fungal spore analyses or something to that effect. I looked at the script after he handed it to me. The writing was in some strange Sumerian hieroglyphic font. I folded it carefully, tucking it into my pants pocket, reminding myself that doctors truly lack any skill in writing legibly.

It was now up to me to find a compounding pharmacist that would be willing to translate my doctor's scribblings and to prepare the solution. An online search turned up about a dozen or so compounding pharmacists within a hundred-mile radius (no sense being picky) around Harrisburg, so I started the contact process using the inobtrusive approach via email. Luck was on my side as I actually got a response from a pharmacy in Chambersburg. We chatted online and later by phone about preparation and costs. The estimated cost came out to around \$80 for a 20ml amount. It seemed a bit steep, but I figured with the cost of procuring the chemicals, the preparation, and it being the first time around, I was willing to bite the bullet in taking this initial order. I delivered the handwritten script in person (it was a nice sunny day for a drive) and had the Melzer's in my hand within a week. Ah, success.

So as the spores float across the slide like some mycoscopic game of asteroids, I wait in anticipation for that shift of color in Melzerland... my nitrile-gloved hands fine tuning the ocular focus. With Tame Impala in the background, I feel that I can now see for myself what all the fuss is about when it comes to a spore being dextrinoid or amyloid...and also to begin to unlock the mysteries of those squiggly anatomical parts that Michael Kuo keeps referring to. I am such a nerd at times.

Aside: Btw, when I picked up the Melzer's, I asked the pharmacist if it was okay to pass the word to the mushrooming community that their pharmacy would prepare Melzer's (with that prescription) and he said that it was no problem. For those interested, the address is: Noorland Avenue Pharmacy, 12 St Paul Dr #105, Chambersburg, PA 17201.

References and suggested reading

Barol, H.O., 1987, Lugol's solution: IKI versus Melzer's reagent: Hemiamyloidity, a universal feature of the ascus wall: Mycotaxon, v. 29, p. 399-450.

Bunyard, B.A., 2019, Simple Chemistry for Better Mushroom ID: Fungi, v. 12, no.2, p. 5-9.

Leonard, L.M., 2006, Melzer's, Lugol's or Iodine for Identification of white-spored Agaricales?: McIlvainea, v. 16, no. 1, p. 43-51. Melzer's reagent update, 2019: Fungi, v.12, no. 2, p. 10.

Vizzini, A., Consiglio, G., and Setti, L., 2020, Testing spore amyloidity in Agaricales under light microscope: the case study of Tricholoma: BioMed Central, IMA Fungus, 11:24, <u>https://imafungus.biomedcentral.com/articles/10.1186/s43008-020-00046-8</u>

SAVE THE DATES

Mark your calendars so you don't miss these FUNgi activities.

EPM 2024 Winter Meetings Saturday, January 13, 2024 Saturday, February 10th, 2024 Saturday, March 9, 2024

Watch your email inbox for notification of additional events.

FUNGI IN THE NEWS

Amanita Muscaria and Christmas

https://www.seattlemet.com/ discover/magicmushrooms/amanitamuscaria-christmas/ This article shares the rich story behind Amanita muscaria's connection to Christmas folklore.

Weird new fungus: Like humans without bones https://www.nbcnews.com/id

<u>/wbna42995289</u> A strange group of fungi with soft bodies instead of rigid cell walls has now been discovered.

Underground fungi absorb fossil fuel emissions

https://www.newscientist.co m/article/2376827underground-fungi-absorbup-to-a-third-of-our-fossilfuel-emissions/ Researchers estimate that plants transfer more than 13 gigatons of carbon dioxide each year to mycorrhizal fungi.

Monoflora uniflora – a plant that lives off fungi! Submitted by

Roseann K. Sachs

Last summer, I attended an online Penn State Extension Service presentation on ghost pipe (Monoflora uniflora). This was part of their Forest Farming Series. One author of this presentation was Eric Burkhart, who works in the Appalachian Botany and Ethnobotany Program at Penn State. Of course, ghost pipe isn't a fungus, although many beginners think that it is. Given that it doesn't have chlorophyl and can't make its own food, it obtains its food from other organisms. In fact, its hosts are fungi, particularly in the Russula and Lactarius genera, and thus it is a mycoheterotroph. Both radioactive tracing, and genetic analysis of material at the base of the plant were used to map it to these genera. It has been documented in almost all counties of Pennsylvania, and various species are found across most of the United States. Monotropa hypopitys (pinesap) contains more than one flower, is often more darkly colored and will probably soon be placed in its own genus.

Both Native Americans and Europeans settlers have used ghost pipe medicinally for such things as pain relief, eye inflammation or as an anticonvulsive or antispasmodic. Historical records suggest that it was mostly consumed in dried form in the past, but now, it is often used in tinctures. The research reporting the phytochemistry (plant chemistry) in ghost pipe is quite old, and researchers really don't know what all the plant contains. Some studies have indicated that it contains monotropein, which is a glucose derivative known to have anti-inflammatory properties. There is much less known about this plant than you might hope for! Nevertheless, its use by foragers has surged in recent years.

The second presenter was Savannah Anez, a graduate student at Penn State in Eric's laboratory. Her graduate work will attempt to characterize all the compounds in the plant that might contribute to its bioactivity, and then run careful assays to accurately determine any therapeutic activity as well as potential toxicity of these components. She plans to probe the genetic material at the base of the plant and obtain samples across its native range. Honestly, this is far more work than one Ph.D. student will ever be able to accomplish!

The final portion of this presentation was about how we might increase the population of this plant in our forests. If harvested, it is particularly beneficial to leave some flowering tops in each clump, and to potentially spread around some of the seeds in the fall, into similar forest environments, i.e. with trees that have the correct fungal partners! It is also better to just take the top; we know of no benefit to harvesting and using the root ball.

Overall, I was struck by how little we really know about this plant. There is always more science to learn! This entire presentation was recorded and can be viewed at <u>https://psu.mediaspace.kaltura.com/media/1_zyjb90lj</u>.

EPM Winter Meetings and Programs

We have some fantastic presentations for our winter program at Nixon Park. Our winter events will start on January 13th at 10:00am with our annual business meeting followed by our first talk. Nixon Park's address is: **5922 Nixon Drive York, PA 17403**.

Meeting Cancellation Policy: Should it become necessary to cancel a winter meeting due to bad weather, notice of the cancellation will be posted on the club's web site and emailed to all members for whom we have an email address.

January 13th - Lichen biology and ecology

Natalie Howe is an ecologist, educator, and lichen enthusiast. She studied lichen ecology at the University of Pennsylvania and at Rutgers University, where she spent her time trying to understand the little worlds that grow around the lichens of the Pinelands of New Jersey. She currently manages a small research farm in Beltsville MD for the USDA's Natural Resources Conservation Service, conducts lichen surveys for Arlington County VA, and teaches a mycology class at George Mason University. She has led lichen walks and talks for the Mycological Association of Washington DC, Nature Forward, and the MD Naturalists Society, and is so excited to be back in PA for a day with the Eastern Penn Mushroomers.

Natalie will present on lichens. Winter is a great time to find lichens in the forests and on the sidewalks in eastern PA! This program will cover lichen biology and ecology, and will introduce you to some common local lichens. If the weather is nice, we'll take a short walk outside after the talk to find lichens. When you leave, I hope that you'll be seeing (and appreciating) lichens everywhere!

February 10th - A Resilient Planet Needs Fungi Now: The Secret Lives of Fungi

Britt Bunyard, PhD, is the founder, Publisher, and Editor-in-Chief of the mycology journal Fungi. Britt is a former university professor and has published over 100 academic and popular science papers. He has served as an editor for mycological and entomological research journals, and mushroom guide books. Britt has collected fungi and lectured throughout North and South America, Europe, and Asia. A popular evangelizer on all things fungal, Britt has been featured on the BBC World Service's Newshour, NPR's All Things Considered, PBS's NOVA and Wisconsin Foodie television programs; and interviewed or quoted in Discover magazine, The Atlantic, National Geographic, Vox, Vogue, Forbes, Saveur, Eating Well, Hobby Farm, Women's World, and other magazines and newspapers.

Britt serves as Executive Director of the Telluride Mushroom Festival. He has authored several books, including The Lives of Fungi (2022; Princeton University Press), The Beginner's Guide to Mushrooms (2021; Quarry Books), Amanitas of North America (2020; The FUNGI Press), Mushrooms and Macrofungi of Ohio and Midwestern States (2012; The Ohio State University Press), and most recently, The Little Book of Fungi (coming in 2024; Princeton University Press). In 2021 Britt was awarded the Gary Lincoff Award "For Contributions to Amateur Mycology," by the North American Mycological Association—NAMA's most prestigious honor for American mycologists.

Britt will be presenting, "A Resilient Planet Needs Fungi Now: The Secret Lives of Fungi" ...overview: Fungi are weird, fungi are cool, and fungi are beautiful. But how much do we really know about them? For starters, they do much more than just rot things. They control pretty much all life on our planet and are everywhere. Britt Bunyard's lecture will present fascinating stories and beautiful photos of amazing fungi featured in his latest book. Discover the crazy, wonderful life that goes on all around us, mostly hidden in plain sight. For general audiences, no knowledge of mycology is required, and all levels of mycological questions are encouraged for the Q&A. This lecture is based on features from Bunyard's new book, *The Lives of Fungi, A Natural History of Our Planet's Decomposers*.

March 9th - Coral mushrooms of Pennsylvania

Richard Jacob is a scientist working in the field of proteomics identifying and quantitating peptides and proteins. His work has taken him from his home town of Cambridge in the UK to Germany and the USA. He became very interested in mushrooms when he moved to Pittsburgh and found morels growing in his backyard and joined the Western Pennsylvania Mushroom Club so that he could learn how to find more. This new hobby compliments his cooking and photography hobbies. In 2013 Richard used his scientific background to pioneer the club's DNA barcoding project. In 2016 Richard was awarded the Harry and Elsie Knighton Service Award by NAMA for his contributions to the WPMC and wider community.

Richard is also a member of the Mycological & Protists Technical Committee of the Pennsylvania Biological Survey where they are developing a Fungus Conservation Work Plan.

Richard will be presenting on the coral mushrooms of Pennsylvania and their morphological relatives. The clavarioid fungi are a group of fungi typically having erect, simple or branched basidiocarps (fruit bodies) that are formed on the ground, on decaying vegetation, or on dead wood. They are colloquially called club fungi and coral fungi. Many clavarioid fungi are saprotrophic with a terrestrial habit, growing in woodland leaf litter or in mossy grassland. A few grow on wood or on decaying herbaceous stems and fallen leaves. Some species, particularly in the genera Clavulina and Ramaria, are known to be ectomycorrhizal (forming a beneficial association with the roots of living trees).

Mushroom Christmas Tree Recipe

Inspired by a stack of kitchen tickets in his restaurant that resembled a christmas tree, renowned chef Marco Pierre White shares this recipe for a fun mushroom-based holiday meal! With White being an English chef, the recipe takes some mathematical translation but could be a holiday party hit!



60g shallots, peeled 50g flat leaf parsley, chopped 10g garlic, peeled & grated 125g unsalted butter, softened 2 onions, peeled and finely sliced Oil for deep frying 400g oyster mushrooms (preferebly king) Extra virgin olive oil Salt ground pepper parmesan cheese Docket spike or skewers

In a liqudiser or handheld blender, blend the shallots, parsley, and garlic. Add a splash of olive oil. Add softened butter to a smooth, green butter. Shallow fry the sliced onion in olive oil or butter in saute pan. Lay aside. Slice each mushroom into thirds or quarters – the slices should be thick. Heat 1 tbsp of oil in a saute pan over medium heat, add the mushrooms and season with salt and pepper while they're in the pan. Lightly brown the mushrooms on both sides, turning once, adding more oil if required. Lay aside.

Take a larger sauteed mushroom and push in through to the bottom of the docket spike or with the thicker side of the skewer facing down. Impale the next mushroom slice on top, but slightly rotate so that it overlaps the first slice, repeating the fan style until a christmas tree shape forms. You'll have to be creative with skewers in assuring the 'tree' stays upright, a docket spike would work best and can be found easily online. Fit the slices from largest to smallest. After every 2 or 3 mushroom slices, tuck in slices of cheese and scatter the crispy onions. When you reach the top of the 'tree', add extra cheese, more crispy onions and season. Bake for 20-25 minutes.

Once the mushroom tree is out of the oven, melt the beautifully green garlic butter and spoon all over. Scatter the herbs and be generous with them. Finish with a drizzle of olive oil and a pinch of salt. Serve at the table, lifting the mushroom slices from the top and working your way down the 'tree.'

EPM Annual Photo Contest Results

The results are in for EPM's 2023 Photo Contest! Once again this year EPM's photo contest consisted of two categories with three winners in each category. The first category is based on photos along with the work a member used that helped lead to the identification of a mushroom. The second category was judged on photos that were interesting and aesthetically pleasing.

Winners will receive fifty dollars for first place, twenty five dollars for second and one year free membership for third. Congratulations to the following winners!

Category 1 – Identification

First place winner is John Dawson. John's photo of *Mollisia cinerea* was very sharp with good depth of field due to his use of photo stacking. His photomicrograph accompanied with a detailed explanation of spore morphology was outstanding





Category 2 - Aesthetics and Composition

First place winner is Jonathan Jensen. It seemed like there was an abundance of honey mushrooms this fall and that provided plenty of host for *Entoloma abortivum* to parasatize. Jonathan captured a great photo of *Entoloma abortivum* alongside the aborted Armalaria structure.



Second place winner is Karen Beall. Karen's specimen of *Dendrostibella smaragina* found at the multi-club foray at Mont Alto was a head scratcher at first. John Plischke, a top identifier who had only seen this mushroom once in his life, could not recall the name. Working together and with the help of INaturalist, Karen and John identified this tiny fungi. Karen is a huge contributor to INaturalist.



Third place winner is Jarod Albrecht. Boletes can be a hard group to identify, and sometimes just getting it identified to a genus can be challenging. Jarod posted his photo of a bolete on Mushroom Observer seeking help nailing down an ID. Fortunately, he connected with Igor Safonov, an expert bolete identifier, and, with some back and forth communications, it was determined to be *Lanmaoa pallidorosea*.



Second place winner is Roseann Sachs. Roseann's photo of *Hericium coraloides* speaks for itself. Not as common as *H. Erinaceus* but maybe a bit more spectacular.



Third place winner is Lisha Rowe. Lisha's photo of *Gymnopus dryophilus* parasitized by *Syzgospora mycetophila* makes for an interesting photo with a sharp look.



Eastern Penn Mushroomers APPLICATION FOR MEMBERSHIP 2024

NAME(s):	
ADDRESS:	P.O. BOX:
CITY:	STATE: ZIP CODE:
PHONE: Home:	Cell:
E-mail Address:	
	NAL (If renewing with no changes , you may write name and "same" above.)
DUES: (Select one)	
Family Membership (S	See note below at *.) \$20.00 \$15.00
Make check payable to: Ea	astern Penn Mushroomers
Please indicate your interests:	
Learning Mushrooms	Eating Wild Mushrooms
Mushroom Walks	Mushroom Photography
Cooking with Wild Mushrooms	Cultivating Mushrooms
I hereby release the Fastern Penr	n Mushroomers and any officer or member thereof from any legal
responsibility for injuries or accid meeting sponsored by the associ	dents incurred during or as a result of any field trip, excursion, or iation.
	DΔΤΕ·
APPLICANT'S SIGNATURE:	DATE:
*For a family membership, all adu members are signing for all minors of the form.	Ilts covered by the membership must sign. By signing above, adult covered by a family membership. If more space is needed, use the back
Return application and check made	e out to Eastern Penn Mushroomers to:
	C/o Joshua Huber
S aln	315 N Mt. Joy Street
	Elizabetniown, PA. 17022

If you have any questions, call 717-742-8193 or email EPMClub@gmail.com .



