# SPORE PRINTS

**BULLETIN OF THE PUGET SOUND MYCOLOGICAL SOCIETY**
**Number 510** **March 2015**

## SURVIVORS' BANQUET

**Marian Maxwell**

Saturday, March 7, 7:30 pm (doors open at 6:30 pm) at the Center for Urban Horticulture.

Our theme for the 2015 Survivors' Banquet and yearly business meeting is **"Banchetto Italiano!"** Our last Italian-themed banquet was in 2005…and was a big hit! We would encourage you to bring potluck dishes in line with Italian cuisine. Sign-ups are online and seating is limited, so register early to guarantee a seat! The cost is $5/person, and the banquet is members only. If your significant other or dinner partner is not a member you can still invite them, but the event is closed to the public because we will be having a banquet permit for alcohol at the event. You may bring your favorite wine or beer! No hard liquor!

Remember this banquet on Saturday replaces our general meeting for March.

We will have a short presentation on truffling by James Nowak (aka Animal), a presentation of new officers for 2015–2017, an announcement of the 2015 Golden Mushroom Award winner, and a silent auction. Proceeds from the silent auction will benefit our Ben Woo Scholarship program. Rumor has it that we will have some tastings with truffle butter. This promises to be a fun evening with friends and family, so come join us—Unitevi a noi!

## 2015 MUSHROOM MAYNIA

**Kim Traverse**

Where: The Center for Urban Horticulture, UW Campus
When: Sunday, May 17, 10:00 am – 4:30 pm

Many PSMS members will remember when Mushroom Maynia was at the Burke Museum and sponsored by the Daniel E. Stuntz Foundation. This year PSMS will be the sponsor. Our vision is that Mushroom Maynia will be educational as well as entertaining and designed for kids and their families. We will showcase how fungi play an important role in our lives and also how we all can have some "fun" with "fungi." Kim Traverse and Milton Tam will be the co-chairs this year. We encourage our fellow PSMS members to step up, provide ideas, and help develop new and innovative activities. Please help us plan this event. We don't envision Mushroom Maynia as a spring version of our fall show, mainly because we have relatively few species of spring mushrooms compared with the fall. Rather, Mushroom Maynia will be an opportunity to present activities and displays that cannot easily be added to the fall show. Mostly, we want to make sure this is every bit as fun for us and the public as the fall show.

**Some Possible Activities**

Coloring with mushroom crayons
Felting
Touch/feel/smell
Oyster mushroom cultivation
Making spore prints
Book corner
Watercolor painting
Cooking and tasting
Mushrooms as dyes
Microscopy
Storytelling
Scavenger hunt

**Some Possible Displays**

Canned and dried edible fungi
Mushrooms on stamps (Brian)
Fungi, decay, & forest ecology
Cultivated mushrooms
Photography
Fresh specimens (send people out to collect)
Mushrooms as dyes
Remediation
Permaculture
Medicinal mushrooms
UV light box
Dried specimens from someone's collection

**Movies and Lectures?**

???

## DINOSAURS GRAZED ON PSYCHEDELIC FUNGUS?

**Michael Blaustein**

*New York Post*, Feb. 11, 2015

Gigantic grass-eating dinosaurs probably munched on the parasite-infected grasses that are the precursor to LSD, according to scientists at Oregon State University.

The far-out hypothesis was made after the researchers found a 100 million-year-old piece of amber in Myanmar that contained the ergot fungus, which can be turned into the active ingredient in LSD.

Even if it isn't turned into the psychedelic drug, ergot can cause animals to experience hallucinations, delirium, and convulsions when ingested, according to Mirror.co.uk.

"It seems ergot has been involved with animals and humans almost forever," Dr. George Poinar, a zoology professor at Oregon State University, said in the journal *Palaeodiversity*.

"There's no doubt in my mind that it would have been eaten by sauropod dinosaurs, although we can't know what exact effect it had on them."

*This grass spikelet from the middle Cretaceous is the earliest grass specimen ever discovered, and is covered on its tip by the parasite ergot.*

# Spore Prints

is published monthly, September through June by the

PUGET SOUND MYCOLOGICAL SOCIETY
Center for Urban Horticulture, Box 354115
University of Washington, Seattle, Washington 98195
(206) 522-6031 http://www.psms.org

OFFICERS: Marian Maxwell, President[2012–2015]
*president@psms.org* (425) 235-8557
Daniel Winkler, Vice President[2014–2016]
*me@danielwinkler.com* (425)-822-5080
John Goldman, Treasurer[2014–2016]
*treasurer@psms.org* (206) 933-0838
Denise Banaszewski, Secretary[2013–2015]

TRUSTEES: 2014–2016:
Shannon Adams, Larry Lee, Danny Miller, Donna Naruo, James Nowak,

2013–2015:
Luise Asif, Teddy Basladynski, Jon Hall, Andrea Rose, Reba Tam

ALTERNATES: Michael Hilliard

SCI. ADVISOR: Dr. Steve Trudell

EDITOR: Agnes A. Sieger, 271 Harmony Lane, Port Angeles, WA 98362
*sieger@att.net*

Annual dues: single or family $30; full-time students $20


## CALENDAR

| | |
|---|---|
| Mar. 7 | Annual Meeting and Survivors' Banquet, 7:30 pm, CUH (doors open at 6:30 pm) |
| Mar. 14 | *Spore Prints* deadline |
| Mar. 16 | Board Meeting, 7:30 pm, CUH |

## BOARD NEWS — Denise Banaszewski

The online election tool seems to be working well, but next year we would like to have a direct link from the ballot to the candidate bios so that it is easier to find them. Our annual Survivors' Banquet is March 7, and will have an Italian theme. We are planning on having a speaker tell us all about truffling with a dog in the Pacific Northwest while we enjoy appetizers and possibly also a dessert containing truffles! As always, we will present the Patrice Benson Golden Mushroom Award, along with a gold mushroom pin, at the banquet. We had only one pin left and the original supplier is no longer available. We had a mold of the pin along with five more pins made, so we will have more flexibility on suppliers in the future. In strategic news, we may have an exciting opportunity to develop a mutually beneficial relationship with the local National Forest Service. The Forest Service will hire a new botanist shortly, and that person is apparently required to know something about mushrooms. The Forest Service is looking for input on streamlining the rules for collection, and we will work to ensure our input is heard on this subject. Thank you, Larry Lee, for getting this process started!

## ANNUAL MEETING AND SURVIVORS' BANQUET

Saturday, March 7, 7:30 pm (doors open at 6:30 pm) at the Center for Urban Horticulture

Our program in March consists of the PSMS annual meeting and survivor's banquet. At the banquet James (Animal) Nowak will give a short presentation on Northwest edible truffles. Habitat and collecting techniques and will be covered, and the talk will be accompanied by truffle tasting for your edification and delight.

James Nowak grew up in the Seattle area foraging mushrooms on family outings, which instilled in him a love of everything mushroom. He pursued a career in glass blowing while developing a business in mushroom cultivation and guided forays (http://www.terra-fleurs.com/). He has a deep interest in truffles, has planted an orchard to grow truffles, and has trained his own dog to find truffles. James currently sits on the board of directors for PSMS and continues to be active in the mushroom society.

Daniel Winkler

*Nowak, friend, and NW truffles.*

## PRESIDENT'S MESSAGE — Marian Maxwell

Thank you to all of the great candidates who chose to run this year and to Jon Hall and Luise Asif for their work on the nomination committee. The winners in this election will be announced at the Survivors' Banquet and Annual Meeting on Saturday, March 7. (Please see the article on the banquet on page 1 of this issue.)

I want to thank you for giving me the opportunity to serve PSMS in the capacity of President for these past 5 years. It has been a fulfilling experience for me. The PSMS members on the Board of Trustees throughout the 5 years have been outstanding, and it has been great to work with these people! We have accomplished much together in these busy 5 years—bringing member registration online, hosting the North American Mycological Association, reviewing and revising the bylaws, revamping the website, tending to the monthly business of running the organization, developing our free Monday night ID clinic, determining scholarship grants for the Ben Woo fund, bringing the PSMS library online to be more accessible to members, continuing to have great success in the Fall Mushroom Exhibit, restructuring the ID classes, reexamining safety issues for the field trips, continuing our great tradition of wonderful field trips to exciting places, partnering with some of the other groups in the area on presentations, filling the gaps from the untimely loss of Patrice Benson and Hildegard Hendrickson, and much more. Amazing teamwork! Thank you! I especially want to thank our Treasurer, John Goldman, for all your help during these 5 years and for giving me reminders when things got hectic!

I look forward to helping the new President and Board with a smooth transition, as well as continuing to serve on the board as Immediate Past President until the next President's term is done. This is an incredible organization because of all the wonderful people who make up this group. It was an honor to be your President.

## A PEEK INTO THE WORLD OF FUNGI

**Vijay Ravikuar**

http://www.millenniumpost.in/, Feb. 14, 2015

New Delhi - From the time they inhabited the landmasses some 500 million years ago, fungi have played a fundamental role in Earth's geochemical cycles. They are important ingredients for healthy and agriculturally viable soil as they decompose dead organic matter to provide necessary nutrients to plants. The balance of fungal communities can even directly affect the carbon cycle and, thereby, the pace of climate change. Yet, because of their concealed existence—most fungi are microscopic and live beneath the soil—we know very little of their global ecology.

In the recent past, several studies have sought to advance our understanding of fungal ecosystems and highlight the important role soil fungi play in sustainable soil management, forest preservation, and climate change mitigation. Now, in a first-of-its-kind study, a team of scientists, led by Leho Tedersoo of the University of Tartu, Estonia, sampled the microbial life of the soil at 365 locations across six continents to know about the basic drivers of fungal biodiversity. They studied the distribution of fungal communities at each site along with soil pH, rainfall pattern, plant diversity, and spatial variables.

**Global Fungal Biodiversity**

Tedersoo and his team collected and studied 40 soil cores from each of the 365 sites in over 40 countries, including India and Sri Lanka. The massive work required the coordination of 35 research institutes. Soil samples were taken from a diverse set of ecosystems, including the Amazon rainforest, the Himalayas, and Siberia. The team studied the fungal DNA in these samples. They found that fungal diversity is not primarily determined by plant diversity.

The study shows that mean annual precipitation is the strongest driver of species diversity among soil fungi, meaning a more diverse set of soil fungal communities will be present in areas with large amounts of rain or snow. Soil pH and soil calcium concentration also significantly increase diversity. The overall fungal diversity increases toward the Equator, with the notable exception of certain fungal groups such as ectomycorrhizal fungi.

There are about 100,000 known fungal species, and nearly half of them were observed in the study, which is the most extensive analysis of fungal distribution to date, according to Colin Averill, who studies fungal ecology at the University of Texas, Austin. He was not part of the study, which was published on November 28, 2014, in the journal *Science*.

**Impact on Climate Change**

This understanding of fungal biodiversity assumes significance in the face of climate change. In a comment on the study published in the same issue of *Science*, David Wardle from the Department of Forest Ecology and Management and Björn Lindahl from the Department of Soil and Environment, Swedish University of Agricultural Sciences, write, "Improved knowledge about links between macro-climate and fungal communities will help predict how global climate change is likely to affect the relative abundance of key fungal groups and thereby alter fungal-driven ecological processes."

The study classifies fungi into groups on the basis of their ecological role. Two of these groups figure prominently in the carbon cycle. The first group consists of "saprotrophs" or decomposers, which recycle the nitrogen in dead plant matter and release it back into the atmosphere as carbon dioxide ($CO_2$). The second group consists of "ecto-mycorrhizal" (EcM) fungi, which grow in extensive filament networks around the roots of certain woody plants like birch, willow, pine, and rose. They are classic symbionts, exchanging nitrogen for carbohydrates manufactured by plants through photosynthesis.

Earth's soil can store three times the carbon as the atmosphere. But a 2014 paper in *Nature* by Averill and scientists at the Smithsonian Tropical Research Institute shows that soil with EcM fungi can store 70 percent more carbon than soil without EcM fungi. The study suggests that EcM fungi snatch nitrogen from dead plant matter before saprotrophs can get to it, leaving less nitrogen to saprotrophs for decomposition. The end result is more carbon in the soil and less in the atmosphere.

In other words, the relative balance of saprotrophs and EcM fungi determines the amount of carbon stored in the soil and the rate at which carbon is released into the atmosphere as $CO_2$. Since these fungi are directly responsible, a better understanding of the drivers of their global diversity is necessary to fight climate change.

For example, the study shows that EcM fungi are driven primarily by host plant diversity and high soil pH, while saprotroph diversity is correlated to mean annual precipitation. According to Tedersoo, drying and desertification due to climate change will have a direct impact on these fungal communities. "Concurrent changes in vegetation may further alter the functional composition of fungi," he says. His study suggests that prevalent climate change might reduce EcM fungal diversity and abundance. This reduction could, in turn, expedite the release of $CO_2$ into the atmosphere, quickening the pace of climate change.

But further research is required. "We know very little about how other fungal species or functional groups of fungi affect carbon cycling and storage. If we did, we might be able to make better predictions about how these fungi respond to climate change and in turn affect the rate at which carbon dioxide is released into the atmosphere," Averill says.

The biodiversity pattern of soil fungi was also explored by Richard Bardgett of the University of Manchester and Wim van der Putten of the Netherlands Institute of Ecology in the November 2014 issue of *Nature*. The authors conclude that there is little evidence to prove that biodiversity of soil organisms follows the same pattern as plant or insect diversity. "It is important to understand the biodiversity of soil fungi because soils with many fungi are in general more resistant to extreme events, such as drought. Soil fungi provide structure to soil which is important for soil fertility," Putten explains. He adds that in a heavily populated country like India, sustainable soil management should be high on the agenda.

## I ACCIDENTALLY FED MY MUM MAGIC MUSHROOMS FOR DINNER

**Jana Hocking**

http://www.dailylife.com.au, Feb. 16, 2015

I have a confession to make. I fed my mother hallucinogenic mushrooms.

But, please let me say, it was not my fault.

*cont. on page 4*

**I Accidentally Poisoned My Mum**, *cont. from page 3*

It started out like any Friday night, a *quiet* Friday night even. After an insane week, I craved nothing but a peaceful night at the farm with a big dinner, a glass of wine, my mum's company, and a good movie.

But it did not turn out that way. Oh no.

After discovering our dog had a tic, my mum had to rush him to the vet, leaving me to make dinner.

I had been craving fettuccine boscaiola all week. Well, let's be honest, it's the only thing I can actually cook.

I scouted the kitchen for the ingredients. Bacon... check! Cream… check! Mushrooms... what are they doing in the freezer? Oh well, check! I taste tested it (not bad, if I do say so myself) and set the table.

By the time Mum arrived home, we were both starving and we ploughed into it. And then, boy did things get interesting.

Feeling a little drunk (I'd sunk a big glass of wine), I told Mum I needed to lie down. I couldn't understand? I only had one glass.

I tried to watch TV but the room was spinning and everything turned a little blurry. Hang on a second. *light bulb* "Muuuuum!" I shouted. "Where did you get those mushrooms in the freezer?"

"Oh we picked them from the bottom paddock a few weeks ago. I didn't want them going off, so I creamed them and put them in the freezer."

*another light bulb* (not metaphorically this time)

"Mum... I think we're off our faces on *magic mushrooms*!"

We looked at each other. Could we be? We burst into fits of laughter. I'm talking fall on the floor, tears streaming out laughter.

I realized I had put *all* the mushrooms into the dish. At least six of the suckers. Enter paranoia. Aren't there psychiatric wards filled with people who never got out of their trips?

I looked up at mum and her pupils were *huge* and very dark. I raced to the mirror. Mine had turned into giant alien eyes as well.

I turned on the tap to wash my face and spiders came racing out. In hindsight, I realize these were not in fact real spiders. But heck that was what I was seeing.

I shouted that I thought we should go to hospital (upon memory, I think I was shouting "hos-sta-pit-all").

Mum called a friend who is a doctor and he said we just needed to "wait it out." With all those spiders popping out from everywhere and Mum's giant eyes freaking me out, I decided to do the obvious thing and pop on my joggers for some hot laps of the farm.

Thankfully, Mum's paranoia had not yet kicked in and she locked the doors and told me to pull myself together.

I made a teepee fort out of a doona [blanket]. No spiders could get me in there.

And then Mum's hallucinations started to kick in. "Oh look at Drew Barrymore's hair! It's pink and green... Ooooh, now she's grown a mustache!"

Mum was Off. Her. Face.

I calmly assured her that Drew Barrymore's hair was actually blonde but there's convincing someone on magic mushrooms that they're not seeing what they're seeing.

And so we waited. And waited.

Finally, at 4 am our eyes were getting tired, our heart rate was coming down, and the spiders had bid us adieu.

So that was my *quiet* Friday night.

And what a lesson it was. Never again will I pick mushrooms from the back paddock.

## WOULD YOU WEAR A WEDDING DRESS MADE FROM FUNGUS?

**Rich McEachran**

http://www.theguardian.com, Feb. 17, 2015

Would you wear clothing grown from a mixture of yeast, bacteria, and a sugary green tea solution? How about from a combination of plant matter and microscopic mushrooms? These odd materials may sound like something out of the Jetsons' wardrobe, but they could have an influence on how fashion is manufactured.

"I think the ability for us to grow our own clothing could have great positive potential," says Erin Smith, artist in residence at Microsoft Research who brewed her own wedding dress. "Growing clothing from scratch could both eliminate carbon emissions caused by transportation and allow for a garment that can be grown to your precise dimensions and specifications."

Smith produced her dress using a combination of tree mulch and mycelium—a type of naturally white fungus. The mycelium was grown in a tub of agricultural waste requiring very little added energy. Once the dress had been worn, it could be composted in the garden. She made the decision to grow her own dress because she didn't want her wedding to be dictated by tradition and to have to wear something that would just sit in her wardrobe after the event.

"The concept behind a grown wedding dress was to take a one-time-use object and rethink its construction in order to have an appropriate material lifespan. The average cost of a wedding dress in the US is roughly $1,200 (£792) and it can contain nearly 12 yards (11 m) of fabric," explains Smith, adding that making the fashion chain circular not only brings us closer to the environment but also reflects how needless our consumption habits are: "The wedding dress is a perfect example of a one-time-use, energy intensive, and entirely non-sustainable model that is representative of so many of the choices that we make daily."

## MAN VERSUS FUNGI ON A 1903's AIRSHIP

**Eric Hopton**

http://www.redorbit.com/, Feb. 14, 2015

Eighty-five years ago, as if to prove that for scientists the world really is your lab, one particular experiment saw science go weird. As part of this strange steampunk-type research, the captain of a British Airship, the R100, stuck a rubber-gloved hand holding

a Vaseline-smeared Petri dish out of the airship's window. This captain, Squadron Leader Ralph Sleigh Booth, was catching spores—Wheat Rust spores to be precise.

Meanwhile, 2,000 feet or so below was a luxury ocean liner, the R.M.S. *Ausonia*, carrying the eccentric scientist behind all this wacky (and expensive) research. As Booth waved his dish, desperately seeking fungi, mycologist Doctor Lester Dillon Weston from UK's Cambridge University, threw open his porthole and watched through a telescope.

The R100 was making a transatlantic crossing from England to Canada and for the rest of the trip scientists repeated the frantic dish-dangling action in hopes of finding the dangerous fungus.

This fantastic tale of science from a very different era has been told by Ruth Horry, from Cambridge's Department of History and Philosophy of Science, for the university's website.

The R100 was on its maiden transatlantic voyage. At the time the story captured the public imagination and *Picture Post* magazine covered it as a "man-versus-fungi battle." Weston had a mission to tackle the scourge of Wheat Rust and similar fungi which threatened food production worldwide, from the American and Canadian wheat fields to tea plantations in Ceylon, now known as Sri Lanka.

Dillon Weston was just one of many scientists who believed that the spores were being transmitted over vast distances through air currents. But, while other scientists pondered, Weston decided to make the huge personal sacrifice of travelling across the Pond in a luxury cruise ship so he could wave his telescope out of the cabin. Such dedication, and all in the name of science.

Weston probably had the safer deal compared to Booth, considering airships relied on volatile hydrogen to fly. These flying cruisers had their own take on luxury travel, and the R100 featured a double staircase leading down to an opulent dining room, aiming to emulate the pampering of the cruise liners. But as its 100 wealthy passengers enjoyed their fat Havanas in the asbestos-lined smoking room, how many pondered on the fact they were really sitting on a flying bomb filled with millions of cubic feet of hydrogen?

Sadly, there was no historic success story for Weston's experiments, and the results from the airship adventure were never published. The airship story too came to a tragic end not long after the first R100 flights. The R100's successor, the R101, crashed on its first voyage to India and all lives were lost, ending the short-lived age of the airship.

But Doctor Weston left a different legacy, a collection of beautiful and scientifically accurate glass models of fungal spores like *Phytophthora infestans*, the devastating potato blight pathogen. 400 times larger than the real thing, these fragile and intricate creations are testament to a truly creative scientific mind.

*Glass model by Weston of Aspergillus herbariorum.*

*Dr. Weston making a glass model of fungal spores.*

## IT'S CALLED WHAT NOW? Noah Siegel

*In the February 2015 issue of* Mycolog*, the newsletter of the Humboldt Bay Mycological Society, Brendan Twieg provided the following summary of a lecture the previous month by Noah Siegel.*

[In January] Noah Siegel led the HBMS on an academic and philosophical journey through the sometimes frustrating world of fungal taxonomy—a world where the moment one feels they have a decent grasp on what a given unique fungal species looks like and what to call it, something changes, and has changed. The names are now different. Hence the title of Noah's presentation—"It's Called What Now?"

And it may make us feel old. And we may curse the advent of systematic taxonomists' use of DNA sequence data. Or maybe we instead enjoy this game and get some perverse pleasure out of telling our friends something like, "*Actually*, that isn't (insert old name) any longer, it's (insert new name)…and it's actually more related to *Suillus* than *Boletus*. Yeah, they figured that out like four years ago by sequencing the (list four to six acronyms) loci. Support was nearly 100% at all of the nodes." Let's be honest. Sometimes we think, "Really? Not again. $%#!" Note the author is using implied expletives here only to reflect the speaker's presentation accurately.

Lest we think we have it worse than previous generations of fungal enthusiasts with regards to this constant name changing, Noah reminds us that names have always been changing since people started naming things. People are always figuring out new words to describe things. See the urban dictionary or look into what new words are now accepted by the Oxford English Dictionary. Hell, I guess lots of people change their own *names*, for that matter. Noah's simple and elegant description for the flux of fungal nomenclature is that when you look more closely at things, you see differences that you didn't before. There might be similar reasons why your friend Bob now sees himself as "Govinda" or why Jeff Lebowski became "The Dude" (or "His Royal Dudeness").

The detail at which you're looking could be macroscopic, microscopic, or on the molecular level. At the molecular level, which is now a basic requirement of taxonomic work, there is one "barcode" DNA region—the internal transcribed spacer (ITS) region that tends to be the most variable among strong morpho-species but tends to be conserved just enough within each species to be a useful distinguishing characteristic. However, to understand the phylogenetic (evolutionary) relationships among groups of species, genera, etc., several more conserved locations in the DNA are used.

This is so much more involved than it used to be. Apparently when you look back to the early 1800s, everything was either in the genus *Agaricus* if it had gills or *Boletus* if it had pores. Nowadays you'd get laughed off the stage, given a swirlie, and/or lose the affections of an aspiring botanist for calling a *Trametes* a *Boletus*. But once upon a time you would have been looked upon as a savvy mycologist simply for discerning the hymenophore type. Ah, to go back in time and not have to be a fungal genius like Noah to feel privy to all the new stuff!

Noah provided us with several examples of adventures with new fungal names, but to set the context he noted that out of the 411

*cont. on page 6*

**It's Called What Now?**, *cont. from page 5*

species published in the *Audubon Society Field Guide to North American Mushrooms* in 1981, 104 names have since been changed. Similarly, 153 of the 737 species described in *Mushrooms Demystified* (published 1986) had their names changed by 2007. Noah mentioned one mushroom species, *Megacollybia rodmanii*, having had five names since 1972. Rampant renaming.

Other than providing super fun taxonomy-stats bar trivia, Noah also talked about how the name game can play into what happens (or doesn't) happen to the names and taxonomic placement of culturally important mushrooms. Take, for instance, the (locally popular) hallucinogenic species of the genus *Psilocybe*, like *P. cyanescens* etc., that imbue psychedelic magic by means of a chemical known as psilocybin. It turns out that the type species for *Psilocybe*, *P. montana*, is different enough (including its DNA) from the psilocybin-containing members of the genus to warrant being in a different genus. *Psilocybe montana* doesn't have psilocybin, either. Because of the archaeological and anthropological history, and modern vernacular, associated with *Psilocybe* being the magic mushroom genus, several prominent mycologists (Redhead and others) have recommended that the hallucinogenic members get to stay in *Psilocybe*, while the type species should get the boot somewhere else. I'm sure most of those consuming and/or trading illicit mushrooms agree. It helps to know what you're eating.

Another interesting case is presented by what we tend to locally call our "matsutake." Lots of us still think this is *Tricholoma magnivelare*, but Noah tells us the evidence weighs in on that being the accurate name for a similar, but distinct, east coast North America species. In 1912, what we have over here was originally called *Armillaria arenicola* in Oregon, but then Singer changed this to *Tricholoma murrillianum*. The latter seems to be the most appropriate name. However, there is a long history of commercial trade in this species here, and this history is reflected widely in literature. Thus there is a movement to keep the name *T. magnivelare* here. Let those east coasters change *their* name, dammit!

The matsutake situation brings up a central theme of taxonomy and name changing—the theme that we continue to realize that European species are by and large different from those we have here, and similarly that the species that we have on the west coast are generally different from those on the east coast (and the Rocky Mountain region has mostly species that differ from both coasts). We didn't secede from Britain because of this, as far as I know. But, it does tend to explain why it's often frustrating to force a European species' description to fit specimens collected in North America…it almost looks right, but…

It also explains why what we call the same species in N. America as they do in Europe doesn't necessarily have the same mystique here as there. For instance, the "delicious milkcap," *Lactarius deliciosus*, that people love to eat in Europe has morphologically similar species here that are edible but not enjoyed by many. Noah informed us that the *L. deliciosus* (*sensu lato*) actually comprises several species in N. America—species that indeed are orange and bleed some shade of orange at some point in time, but that have enough other unique qualities to distinguish them as different species. He also presented a hilarious framework for coming up with new common names for all of these, which would range from indicating good to horrible flavor (I wish I could reproduce the humor).

*cont. on page 8*

## SOME WINTER MYCOLOGY

**Brian S. Luther**

My wife and I went over to the Lake Quinault Lodge and then to the ocean in early February, and I wanted to show you some interesting fungi that were fruiting at that time here on the Washington coast. We have such mild winters in western Washington that you can usually find an assortment of different species with a preference for the cooler months. Temperatures were in the mid to high 50s, which is typical.

***Pleurotopsis longinqua***

BSL coll. #2015-24-1
Pacific Ocean Beach #3 on Hwy. 101 north of Kalaloch, Jefferson Co., WA, Feb. 4, 2015

Brian S. Luther

*Pleurotopsis longinqua.*

This is a little pale pinkish pleurotoid fungus (cap arising from the substrate with little or no stem) which is found in winter and early spring in western Washington. It's lignicolous, meaning the mycelium always grows on or in wood. It's often found on dead Alder but is also recorded growing on conifers. The collection shown here was growing on a driftwood log on the ocean beach, most likely Red Alder (*Alnus rubra*), but I photographed it on a different substrate for better lighting. The original collection found by Hooker and then named by Berkeley (1847) was also found "on dead wood near the sea."

*Pleurotopsis longinqua* has a gelatinous or rubbery texture and a short lateral stipe (stem), or sometimes lacks a stipe entirely. At first the pileal (cap) surface is composed of a trichodermial layer (short, tightly arranged hairs), and it has a distinct gelatinous layer in the pileal context. The basidiospores are white, range from 6–11(13) × 3–5 µm, and are lightly amyloid (blue gray or darker in Iodine solutions such as Melzer's reagent). It has thick-walled caulocystidia (stipe cystidia). The spores in my collection shown here measured 9 × 4 µm on average. Singer (1951) notes that many of the basidia are "transformed into cystidioles," which is a character I noticed right away in my collection. Superficially it could easily be mistaken for some species of *Panellus*, as well as *Crepidotus*, especially when it gets older and loses its pinkish colors. *Panellus* also has white spores, but they're smaller and allantoid (sausage shaped) and *Crepidotus* has brown, ornamented spores.

This fungus was originally described by the Rev. M. J. Berkeley (1847) as *Agaricus longinquus* from a collection made by Hooker a few years earlier on Hermite Island, Cape Horn, Chile. It was then transferred to the genus *Panellus* by Singer (1951) and most recently to the current genus by Horak (1983). The genus *Pleurotopsis* was originally proposed by Earle (1909), based on a section of the genus *Marasmius* with the same name by P.C. Hennings. *Pleurotopsis* is also a genus of butterflies, but there is no conflict since insects and fungi are governed by different international nomenclatural codes.

Only rarely is this species brought into PSMS functions or field trips, most likely because of when it fruits as well as its small size, yet it's widespread here in our maritime areas. Oddly, in the monograph of the genus *Panellus* for North America by Miller (1970), the author makes no mention of this species at all.

*Pleurotopsis longinqua* is an interesting case study because it has a curious disjunct distribution, occurring in three distinct coastal regions around the Pacific Ocean: (1) SE Australia & New Zealand, (2) Southwestern South America (Argentina & Chile), and (3) along the Pacific Coast of North America from Washington to Alaska. Libonati-Barnes and Redhead (1984) published a new subspecies of this fungus (subsp. *pacificus*) separating it from the Southern Hemisphere populations by several characteristics. However, cultural inter-fertility studies and a comparison of the micromorphology by Petersen (1992) showed that the only difference was that our west coast populations had slightly longer basidiospores. All other characteristics were consistent with the overall variation seen in the collections from these distinct regions. He therefore discounted the majority of the features used to separate and distinguish this subspecies. Finally Hughes et al. (1998) did a fascinating DNA study showing that there are no significant differences between the collections from these widely separated geographical areas. All the collections of *Pleurotopsis longinqua* from these distant regions showed a high degree of genetic uniformity. The authors offer some possible explanations for this. If interested, refer to these articles, which also provide further references to consult on this subject.

***Marasmiellus candidus***

BSL coll. #2015-24-2
Kalaloch Campground, Hwy. 101, overlooking the ocean, Jefferson Co, WA, Feb. 4, 2015

Brian S. Luther

*Marasmiellus candidus in situ.*

Brian S .Luther

*Closeup of Marasmiellus candidus.*

This species is common and actually abundant on dead Salmonberry (*Rubus spectabilis*) canes in winter and early spring, but it's also found on other woody substrates. It's white at first, but often becomes pinkish or brownish with age. It has a short dark grayish to blackish eccentric stem and widely spaced wavy gills that are intervenose. The gills are very distinctive and pretty much unique amongst our mushroom flora. The bright white basidiocarps stand out prominently on the leafless stems in winter making them easy to see. The basidiospores are white, 10–15 × 4–6 µm, and narrowly lacrymoid (tear-drop shaped), and it has other interesting microscopic features. Smith (1949) provides an excellent description as well as a color photo of this species (as *Marasmius candidus*).

***Dacrymyces stillatus***

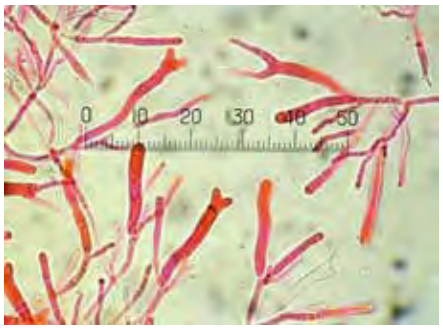
BSL coll. #2015-24-3
Ocean beach at Kalaloch, Jefferson Co., WA, Feb. 4, 2015

This is one of several colorful jelly fungi we find in winter. This species is pretty easy to distinguish because most of the time it forms distinct pulvinate (cushion-shaped) gelatinous basidiocarps that range from 1–5 mm, compared with the larger irregular and amorphous masses or blobs formed by related jelly fungi. It also

Brian S. Luther

*Dacrymyces stillatus in situ.*

Brian S. Luther




*Dacrymyces stillatus. Basidia are clavate at first, then form a branched apex, then develop into a tuning fork basidium and eventually form two spores (400×, KOH & Phloxine).*

produces two different kinds of fruiting bodies: (1) an anamorphic stage that forms only conidia (arthrospores) and is usually a dark reddish-orange, and (2) a teleomorphic stage that produces basidia and basidiospores and is usually a lighter yellow or yellow-orange. This last form (the one producing basidia) is the actual basidiocarp.

This species is widespread on conifer wood. The collection described here was found on a huge Western Red Cedar stump that was on the ocean beach and subject to wave action. Another characteristic of this species is the simple-septate, unclamped hyphae. The young basidia start out cylindrical or narrowly subclavate, but then form a forked apex. When mature, they become what we call "tuning fork" basidia, with two long sterigmata and two spores per basidium. This is a diagnostic feature of the Class Dacrymycetes, Order Dacrymycetales. The basidiospores are 12–15 × 4–6 µm, allantoid. and have thick walls with 1–3 transverse septa. The name *Dacrymyces deliquescens* shown in some references is considered a synonym. See photomicrograph.

Lots of other interesting fungi can be found here in February and March, so remember to keep an eye out for what might be fruiting when you're out and about at that time.

Just a reminder that all of these articles in the hard copy of *Spore Prints*, which are in black and white, can be seen in color by going to the online version at www.psms.org.

**References**


Berkeley, M. J. 1847. Fungi, in Hooker, J. D. Flora Antarctica, Part 2. Botany of Fuegia, the Falklands, Kerguelen's Land, etc. *Trans. Linnaean Soc. London 20*: 447–454. The Botany of the Antarctic voyage of H. M. Discovery ships *Erebus* and *Terror* in the years 1839–1843.

Earle, F. S. 1909. The genera of North American gill fungi. *Bull. New York Bot. Garden 5*: 373–451.

Horak, E. 1983. Mycogeography in the South Pacific region: Agaricales, Boletales. *Austral. J. Bot. Suppl. Ser. 13*(10): 1–42.

Hughes, Karen W., Takeshi L. Toyohara & Ronald H. Petersen. 1998. DNA sequence and RFLP analysis of *Pleurotopsis longinqua* from three distinct populations. *Mycologia 90*(4): 595–600.

Libonati-Barnes, S. D. & S. A. Redhead. 1984. *Panellus longinquus* subsp. *pacificus*, a new west coast North American agaric associated with red alder. *Mycotaxon 20*: 205–212.

Miller, Orson K. 1970. The genus *Panellus* in North America. *The Michigan Botanist 9*(1): 17–30.

Petersen, R. H. 1992. Mating systems in three New Zealand agarics. *New Zealand J. Bot. 30*: 189–197.

Smith, Alexander H. 1949. *Mushrooms in Their Natural Habitat*. Hafner Press, New York. 626 pp.

**It's Called What Know?**, *cont. from page 6*

There were many, many more examples of how taxonomy changes have touched us all…*Cantharellus cibarius* not actually being here and instead we have several different west coast chanterelles… *Hydnellum* being in the Thelephorales while *Hydnum* is more related to the chanterelles…there are a few different genera in what we used to think of as *Hygrocybe*…*Amanita muscaria* here isn't really *A. muscaria.* However, Noah decided that maybe he should just roll with it as a mycologist instead of picking a new group of organisms over which to fawn and obsess. After all, the same rapid accumulation of new species information seems to be happening with salamanders. And convergent evolution, while it may seem to happen *most* in fungi, also happens in animals (Noah gave the example of quills in porcupines and hedgehogs and echidnas, which aren't actually all related)....

Thank you to Noah Siegel for an action packed talk and comedic delivery. Fun was had by all. And if you want to change your name to something that better describes you, we're cool with that.

## MAKING A SPORE PRINT — Dick Sieger

To obtain a spore print from a fresh gilled mushroom, cut off the stalk if there is one. Put the mushroom cap, gills down, on white paper. (Pale yellow and pale pink spore prints can be mistaken for white if made on black paper.) If the mushroom is dry, put a few drops of water on the top of the cap. Cover with a drinking glass to retain moisture. Wait at least an hour, perhaps overnight. Hold the paper to a bright light and look for a pattern of the gills. Don't mistake a pigment stain for a spore print. Failure to obtain a spore print isn't uncommon.

In the field, I sometimes put a mushroom cap on a piece of paper, wrap it in waxed paper, put it in my collecting basket gills down, and hope to have a spore print when I get home. Sometimes one mushroom will overlap another and leave a spore print on the lower mushroom. Updrafts may leave a spore deposit on the top of shelving polypores.

## MUSHROOM ASTROLOGY — Bob Lehman, LAMS

**Pisces** (Feb. 19 – Mar. 20): You love the idyllic romanticism of hunting mushrooms. You like mushrooms for being part of the wonder of nature and are little concerned about their details. Your examination of a mushroom is more apt to lead to a poem or a song than a taxonomic description. You don't have the physical endurance of other mushroomers and so you don't end up with as many mushrooms, but it doesn't matter because you can rhapsodize about one mushroom as well as about ten. Besides, you find plenty of wonderful mushrooms in your fantasies.



RETURN SERVICE REQUESTED

**Puget Sound Mycological Society**
Center for Urban Horticulture
Box 354115, University of Washington
Seattle, Washington 98195

Non-Profit Org.
U.S. POSTAGE
**PAID**
SEATTLE, WA
PERMIT NO. 6545