

MushRumors

Newsletter of the Northwest Mushroomers Association

Volume 29, Issue 4

December 2018

Climate surprises culminate in a stellar show *Jack Waytz*



We braved another dry summer here in northwest Washington, with the smoke of many fires around us. Yet this summer wasn't quite so hot, nor quite so dry for as long, and the fall rains came earlier than in the past two years. Good news for the early mushroom season. There was a robust response by our fungi, which appeared more than ready to form primordia and grow into mushrooms. After significant rains in both the alpine and lowlands at the end of the first week of October, an excellent biodiversity among fungi unfolded.

There were area-wide massive fruitings of *Chlorophyllum* mushrooms, as well as *Hericium* and *Sparassis*, and a short lived, but prolific, fruiting of *Boletus edulis* in the alpine. In the lowlands, there was an equally dramatic fruiting of all of the usual fleshy pored suspects: *Xerocomellus chrysenteron*, *X. zelleri*, and *Aureoboletus mirabilis*. *Amanita muscaria* was also observed in vast quantities, providing dramatic splashes of color.

The alpine forests of the North Cascades featured more species and diversity of mushrooms than we've seen since 2013. A single trek up one of my favorite alpine trails yielded more than 30 species. True, there were also anomalies in this early part of the season, most notably, a paucity of species of *Russula* and *Armillaria*, mushrooms that traditionally kick off the fall mushroom season in great numbers, in all elevations.

Still, all of the signs pointed to what was to be an epic season for fall mushrooms. Then as quickly as the rains began to fall, a high pressure ridge moved in off the coast, and we were cut off from the procession of storms that should have followed. Instead, in the middle of October, came 20 consecutive days without

Inside

A year for mushrooms	1
MUSHROOM OF THE MONTH: <i>Pisolithus tinctorius</i>	6
Swede Heaven outing	10
Lummi Island hunt	11
Deception Pass Dilly foray	12
News items	15
<i>Xeromphalina campanelloides</i> revisited	16
Mushroom puzzler	18

Continued page 3

Northwest Mushroomers Association (NMA)
P.O. Box 28581
Bellingham, WA 98228-0581

northwestmushroomers.org
facebook.com/NorthwestMushroomersAssociation

The Northwest Mushroomers Association meets 7–9 p.m. on the second Thursdays of Apr, May, June and Sept, Oct, and Nov, most often at the Squalicum Yacht Club in Bellingham. To stay apprised of forays, events, meetings, and more, please join our googlegroups email list automatically by signing up as a member. Or visit northwestmushroomers.org/events

Annual membership dues are \$25 (general—includes families and individuals); \$50 (benefactor); and \$15 (student). Make checks payable to NMA and mail "Attn: Membership" to address above. Or use Paypal online at northwestmushroomers.org/join-or-renew-membership

MushRumors is published online February 1, June 1, September 1, and December 1 at northwestmushroomers.org.

Club members are encouraged to submit stories, photos, recipes, and artwork. We appreciate your interest! Submissions should be made three weeks prior to the date of publication. Send to chanterellerin@gmail.com.

The Northwest Mushroomers Association promotes the understanding and appreciation of mushrooms: furthering the study of fungi, their identification, natural history, ecology and conservation. We serve mushroom enthusiasts in northwest Washington State, including Whatcom, Skagit, and Island counties.

NMA board and volunteers

BOARD

President: Brennen Brown
(360nmapresident@gmail.com)
Vice-president: Jack Waytz
(360nmavicepresident@gmail.com)
Treasurer: Linda Magee
(360nmatreasurer@gmail.com)
Secretary: Deborah Gilbert
(360nmasecretary@gmail.com)
Martha Dyck
Eva-Maria Gold
Mark Johnson
Steven Jones
Buck McAdoo
Richard Mollette

VOLUNTEERS

Science advisor: Dr. Fred Rhoades
fmrhoades@comcast.net
Forays: Steve Jones
stdojo@gmail.com
Memberships: Eric Worden
360nmamembership@gmail.com
Books and t-shirts: Linda Magee
360nmatreasurer@gmail.com
Website and newsletter: Erin Moore
chanterellerin@gmail.com



Northwest Mushroomers worked together to create a stellar 2018 Wild Mushroom Show. Photo by Migo Biciunas

Continued from page 1

precipitation, conditions unprecedented in my seventeen years living in the Pacific Northwest.

Enthusiasm for the season began to wane along with the rich and myriad flush of mushrooms heralded in by those early rains. But then something fortuitous and interesting happened. Temperate, humid days and cool nights resulted in just enough condensation to keep the mycelia active; and the rains, which came only a few short days before our fall Wild Mushroom Show, caused an immediate response in the mushroom community.

The weather cleared to reveal perfect collecting conditions, just in time for club members to spread out across our area's forests to lovingly piece together their collections. These collections would be used to carefully craft the display trays that breathe life into the science of mycology for the curious throngs of onlookers.

People attending the annual show would not be disappointed: an even greater variety of mushrooms was found in this second flush than in the first. In the lowlands, forest boletes fruited in boisterous quantities, taking the lead on a whole host of mushrooms, from common to genuinely rare. The alpine forests were just as productive, as a Friday sojourn back to one of my favorite collecting sites in the North Cascades yielded 85 species where 32 had been found three weeks before. Included in this collection, were more than thirty different varieties of *Cortinarius* mushrooms alone!

By the time all of the display trays were completed, we ended up showing our community more than 340 named species of mushrooms, plus an additional 15 or so that remain myco-mysteries. This constitutes a record number of documented species for our nearly 30-year-old club. The high diversity of fungi was one of the major reasons that this year's Wild Mushroom Show was perhaps our most successful to date.



Gloiodon occidentale, in the crusts and parchments group of fungi, was one of this year's more interesting fungi to fruit. Photo by Jack Waytz



Cortinarius tray, 2018 Wild Mushroom Show. Photo by Jack Waytz

Thank you!

What else made the show a standout success was all of you who helped under the fearless leadership of show co-chairs Vince Biciunas and Richard Mollette. Thank you to the many Northwest Mushroomers Association members who participated in this year's show and made it a stellar event. And welcome to our many new members. We look forward to seeing more of you in the mushroom year to come.



Fungi on display at the show. Photo by Vince Biciunas



Wild Mushroom Show ID table, featuring identifiers Buck McAdoo and Caleb Brown. Photo by Vince Biciunas



Sarcodon imbricatum. Photo by Jack Waytz



Tricholmopsis rutilans. Photo by Jack Waytz



Show entrance display, beautiful and enticing. Photo by Vince Biciunas



Cantharellus subalbidus. Photo by Jack Waytz



Coprinellus domesticus. Photo by Jack Waytz

MUSHROOM OF THE MONTH

Dyers puffball: *Pisolithus arhizus* group

Fred Rhoades and Eric Worden

Pisolithus: From the Greek, meaning ‘rootless pea-stone’

A.k.a. Dyer’s puffball, Dyeball fungus, Dog turd fungus, Dead man’s foot, Dead man’s fist, Bohemian truffle

“Most people regard it as one of the most unattractive of the fungi.” —Alexander H. Smith et al. (1981)

The magnificent monstrosity you see pictured was not found by any NMA member but by a friend of the coauthor’s (Eric). In Bellingham, really the whole town seems to be in the mushroom game. The mushroom emerged conspicuously on a mown lawn planting strip on Forest street, opposite the big new apartment complex. True to the monster’s nickname—“Dog Turd Fungus”—the discoverer walked by it several times, averting her eyes each time, thinking it was the leavings of an unknown new neighbor’s Great Dane. However the gradual bulging growth of the heap eventually demanded the attention of even her peripheral vision. News of this “mysterious growing” soon spread to me and our group. After the other coauthor (Fred) took the first three photos you see here, the object of his attention remained in place for at least one more day. But then it suspiciously disappeared from view (other than the smudge of brown spores around the place it had grown). The owners of the location seemed insistent to clean up all semblances of its namesake!

Characteristically this puffball-like fungus forms in late summer. It is related to the hard-skinned puffballs in the genus *Scleroderma* and, like them, forms mycorrhizae, in this case likely with a nearby birch tree’s roots (more on this below). Actually, its closest ally is the earthstar, *Astraeus*. But unlike the other puffballs, *Pisolithus* forms its spores in isolated packets that are separated from one another by sterile (non-spore-producing) tissue. This is a holdover from the distant relationship of the Sclerodermatacean family to the Boletes (of all things!) with which they are now scientifically classified. In Illustration 3 you can see these packets up close, with the youngest a bright yellow color and the oldest turning brown as the spores mature (from upper right to lower left). Eventually, the



1. *Pisolithus arhizus*. (Illustrations 1 and 2 by Fred Rhoades)



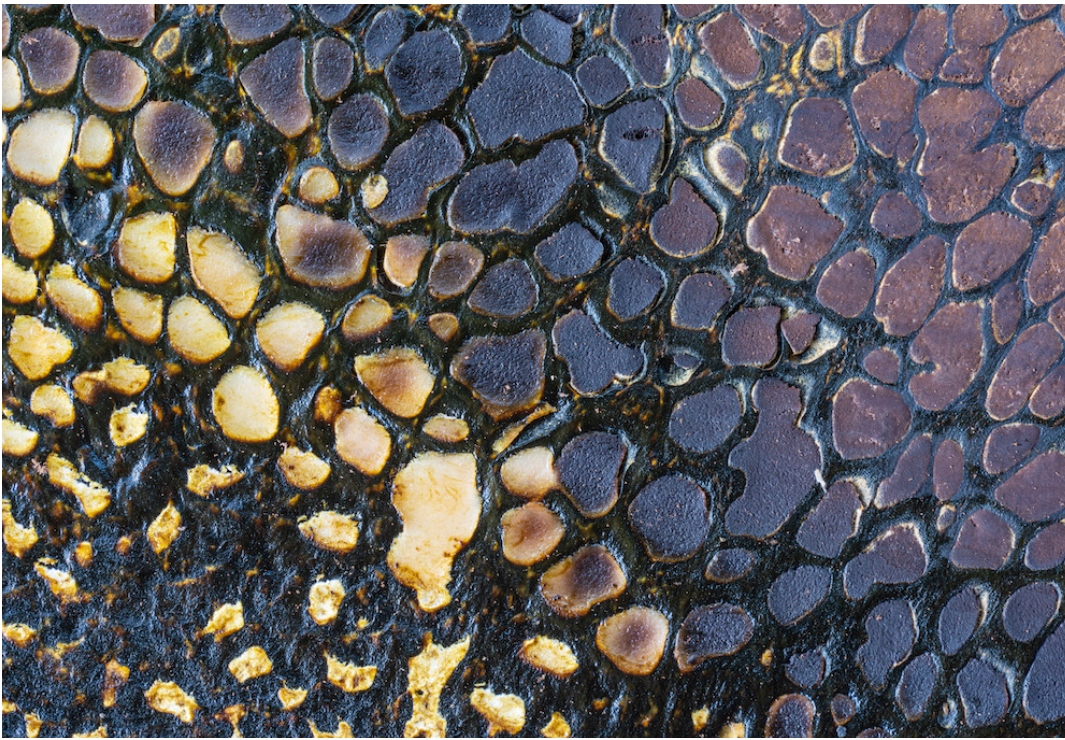
2. *Pisolithus arhizus*, split; oldest part to upper right.

most mature packets break open producing a coating of spores that are dispersed by wind and rain and the odd foot (see first photo).

Pisolithus arhizus and other species of *Pisolithus* have long been a reliable source of natural dye, producing a rich black, brown, or gold color when boiled with fiber (or anything else). According to Betsy Gribble (2012), this is one of the easiest to use sources particularly since it is a substantive dye (not requiring the addition of a mordant). In France and the Canary Islands it was historically used to dye silks.

Coker and Couch examined the mushroom closely and noted the pigments present in different tissues at different stages of development: curiously they report the potent yellow pigment originating in the

Continued next page



3. Spore packets, split, closer. Photo by Fred Rhoades

apparently black sterile tissue between the peridioles, and a purple pigment originating from the half-matured spores inside the peridioles. They do not comment on pigments of the immature yellow peridioles. I wonder if careful processing of the mushroom tissues could yield brighter, cleaner-colored dyes?

Buck McAdoo offered Eric access to his library to find out more about this unusual find. My primary interest—the same as most people’s—can you eat it? And has anyone really done so? The mushroom is described in all the books more or less the same with respect to its identifying features, but I felt it was often treated perfunctorily and with an undertone of disinterest and disgust.

Even scientifically-oriented volumes gasp with prejudicial renderings such as “inedible and highly unappetizing.”

Yet about half of Buck’s books noted that *Pisolithus arhizus* is edible, and I found a couple of tantalizing references to another nickname—“Bohemian Truffle”—and that it

flavors soups. However in a stack of literally 100 books, I found no further information. Gastronomically unsatisfied, I turned my research to the internet. This also was fruitless, until finally I had the brainstorm to search only German websites. I incorrectly thought Bohemia was in Germany. Actually it’s Czech. Happy error, it turns out. I landed at www.passion-pilze-sammeln.com (passion-mushroom-gathering), and with the help of Google Translate, the legend of the Bohemian

Truffle (Böhmische Trüffel) was finally verified. Even in Germany, Bohemian truffle appears to be fairly obscure. The profiled mushroom gatherer says (translated by Google), “That this rarity is today devalued in some source as ‘not edible’ or with the seal ‘no edible mushroom,’ is gross nonsense. That’s a mushroom!”

It does not commonly grow in their ordinary forests, and is mainly found in reforested (pine) coal mining waste fields. (Aside ... should you eat mushrooms that grow in mining waste? And should you eat something that looks like dog turds? I leave this for your own contemplation.) The ideal size for eating is around two inches, when all the peridioles are still yellow, before



4. Yarn dyed by *Pisolithus*. From Gribble 2012



5. Hat dyed with *Pitholithus*. From anon. 2018a



6. Yummy. From Bertram 2018

the spores have developed.

Our German enthusiast tells us that the book “Großmutter’s Sammeltips—Pilze richtig bestimmen, sammeln, zubereiten [Grandmother’s Collective Tips—How to correctly

determine, collect and prepare mushrooms]” by Edmund Michael says, it is “an excellent spice mushroom,” which should be dealt with as follows: “The outer shell is peeled, the meat sliced and dried either in the sun or on the stove. Of these slices one needs only one piece, which is cooked with broth or soup, gives it a very exquisite taste, but at the same time also colors it deep brown; too much, but it spices too much.”

Further, our modern German mushroom enthusiast enjoys it prepared simply: “Sharp sear, pepper, salt—finished the delicacy.” And he writes that Bohemian mushroom has even been favored by the famous [? German] celebrity chef Alexander Herrmann, (translated by Google):

“Not far from Bayreuth, in Wirsberg (Upper Franconia), he has been offering the ‘Franconian Slice Truffle’ as a ‘cult product’ and as ‘one of the region’s finest ambassadors’ in his dainty bistro since 1978. As ‘Creamy soup’ (13 Euro), as ‘Bratwurst with creamy herbs’ (15 Euro) or as ‘Two—A small portion of both’ (13 Euro) these are mushroom dishes of the extra class.”

If you find your curiosity piqued and your appetite aroused, and feel compelled to try this new delicacy, I have good news for you. Though our Bellingham specimen is past its prime for eating (it did barely survive cold storage and was on display at the show in October), you can purchase your own heavy-metal-infused morsels on German ebay; the offering price for this rarity is €20 for 50 grams, equivalent to \$210/lb at current exchange rates!

When one of us (Fred) was a graduate student at Oregon State University and just beginning to learn about the important roles of many mushrooms in forming mycorrhizal connections with plants, a

group of forest ecologists in Georgia had begun to focus on using *Pisolithus tinctorius* (eastern species) as a “one fungus treats all” mycorrhizal partner. In this relationship, the fungus body (mycelium) acts as a fine root system for the trees with which it grows, providing more efficient mineral and water uptake. In exchange, the tree provides the fungus carbohydrate it has made by photosynthesis. It turned out that *Pisolithus* excels in this role for two main reasons: one, it forms mycorrhizae with a great many host plants, and two, it does so in very poor, or disturbed soils allowing the trees to live where they otherwise would not. *P. tinctorius* was so good, the Georgia forest service studied few other species for a while and they touted its use throughout the country as a one-species-of-cure for all mycorrhizal ills.

A typical boast: “Growth of loblolly and slash pines was significantly improved after 4 years on good-quality sites... by *Pisolithus tinctorius* ectomycorrhizae formed in a nursery prior to out-planting. Trees with only naturally occurring ectomycorrhizae from the nursery grew slower especially during years of low rainfall. In the driest years, *Pisolithus* ectomycorrhizae resulted in per-acre volume and weight increases for loblolly pine of 43 and 37



7. A plate of yummy. From Bertram 2018

percent, respectively...” (Marx & Cordell, 1988)

Eventually forest services across the country found that, in different regions, other species might make better partners for local species of trees, and the widespread promotion of *Pisolithus*, particularly as an inoculant of seedlings, died out.

Aside from all the various hoopla about common names, ecology, and economic uses, *Pisolithus arhizus* has a long and twisted scientific naming history.

Just to give you a hint of the often complex gyrations that names go through, I’ll describe a bit of what has

Continued next page

happened in the realm of *Pisolithus* species. Giving a mushroom (and any other organism) a scientific name must be done using an elaborate system of rules. By convention, the obscure South African mycologist, Christiaan Hendrik Persoon is considered the starting author for naming puffballs (in the 1801, *Synopsis methodica fungorum* [Göttingen]). Persoon is also the starting point for naming smuts and rusts, but names for other larger fungi have a different starting author (in a work by the Swede, Elias Fries). Older authors that Persoon referenced also get their due. Linnaeus, for instance, who did name some large fungi. But for our fungus, the first “official” record cited by Persoon (as *Scleroderma arhizum*) in his work was *Lycoperdon arrizon*, first described by the Italian mycologist, Giovanni Antonio Scopoli in a 1786 work, *Deliciae florum et faunae Insubrica* [...]. The fungus had even been mentioned by another author even earlier in 1729 (Micheli) but was not described.

In the same 1801 starting point work, Persoon listed *Scleroderma tinctorium*, citing a different author. Along the way, many authors described both these species and several others, often including species in a great variety of other genera. Some were apparently (to the authors) new things they thought they had just discovered and newly named. Others were new assignments in newly coined genera.

Finally, J. B. Albertini and L. D. von Schweinitz invented the name *psolithus* (pea stone) for this peculiar puffball with the small pockets of spores to separate it from *Scleroderma*.

In this country, Coker and Couch in their 1928 treatise on the puffballs and allies of the US called the *Pisolithus* they knew of *Pisolithus tinctorius*. More recently it has been felt that the West Coast species of *Pisolithus* is more like the European *P. arhizus*.

However, eventually the scientific name used for our local species likely will not be *Pisolithus arhizus*. It is now known that world wide there are many species of *Pisolithus* and even the old *Pisolithus tinctorius* name used widely in this country and elsewhere is likely up to ten species according to recent molecular work. The West Coast likely has its own set of species, at least one of which is closest (but not identical to) the European species, *P. arhizus*. Because of the uncertainty of our species identity it is best regarded by the general name “*Pisolithus arhizus* group.”

References

- Ainsworth & Bisby's Dictionary of Fungi. 1983. Commonwealth Mycological Institute.
- Anonymous. 2018a. <https://hookedanddyeed.net/2014/09/19/new-process-new-color-pisolithus-arhizus-dye/> New Process, New color: *Pisolithus arhizus* Dye. Hooked and Dyed.
- Anonymous. 2018b. <http://www.fungusfactfriday.com/119-pisolithus-arrhizus/> Fungus Fact Friday's piece.
- Bertram, Heinz-Wilhelm. 2018. <https://www.passion-pilze-sammeln.com/boehmische-trueffel.html>, Die Boehmische Trueffel: Auf den Spuren eines hoch edlen Würzpilzes. Passion Pilze sammeln, Pilzsammler in schoenen Portraits.
- Cairney, John W. G. 2002. *Pisolithus*—death of the pan-global super fungus. **New Phytologist**. 153(2):199-201.
- Coker, William Chambers & John Couch. 1974. *The Gasteromycetes of the Eastern United States and Canada*. Dover. 171 pp.
- Gribble, Betsy. 2012 (Winter). Mushroom Dyeing with *Pisolithus Arrhizus* Conference of Northern California Handweavers. Webzine of CNCHnet.
- Martin, Francis, Jesus Diez, Bernard Dell & Christine Delaruelle. 2002. Phylogeography of the ectomycorrhizal *Pisolithus* species as inferred from nuclear ribosomal DNA ITS sequences. **New Phytologist**. 153(2):345-357.
- Marx, Donald H. and Charle E. Cordell. 1988. *PISOLITHUS* Ectomycorrhizae Improve 4-Year Performance of Loblolly and Slash Pines in South Georgia. Georgia Forestry Commission. 1 page
- Rogers, Robert. 2011. *The Fungal Pharmacy*. North Atlantic Books, Berkeley, California. 338 pp.
- Smith, Alexander H., Helen V. Smith & Nancy S. Weber. 1981. *How to Know the Non-gilled Mushrooms*. Second Edition. Wm. C. Brown. Dubuque, Iowa. 324 pages
- Velinga, Elsie 2006, May Dead Man's Foot **Mycena News** (The Mycological Society of San Francisco) Vol 57:05.
- Volk, Tom. 2003. Fungus of the Month for June 2003. http://botit.botany.wisc.edu/toms_fungi/jun2003.html
- Wilson, Andrew W., Manfred Binder & David S. Hibbett. 2012. Diversity and evolution of ectomycorrhizal host associations in the Sclerodermatineae (Boletales, Basidiomycota). **New Phytologist**. 194: 1079–1095

Swede Heaven redux

Linda Magee, foray host

About twenty of us made the drive to the property of Billie Young-Moore in September. Billie is the aunt of our foray chair, Steve Jones. This was a reprise of a June foray at Billie's property earlier this year. I guess the June Forayers minded their Ps & Qs because Billie graciously invited us back to her beautiful home located along Highway 530, between Arlington and Darrington.

The morning was cool and the ground was wet with dew—a great day for mushrooming. Billie met us with a big smile and fresh coffee. We warmed up, signed in, and decided where to forage. Some of our group checked out some nearby logging roads. Others drove further afield, closer to Darrington. And some of us began to walk around Billie's property where we immediately found mushrooms in her yard, in the woods around her property, across the road, and even down by the beautiful creek that runs by her land.

A little before noon, forayers began to trickle in, answering the call of the noon potluck! We set up a couple of tables in the yard and arranged our treats on the deck overlooking the creek. Soon both tables were overflowing with the foraging finds. Our identifiers, Dick Morrison, Buck McAdoo, and Christine Roberts, set to work.

Billie brought out freshly-baked rolls and butter to the delight of the tired and hungry mushroomers. We had presented Billie with an NMA T-shirt. With some encouragement, she donned the shirt and posed with some of our group for a photo shoot at the display table.

With the majority of specimens identified, Dick, Buck and Christine walked us through the identification process, talked about how to identify certain mushrooms, their habitats, and characteristics. They patiently answered our questions while we circled the tables admiring our finds and enjoying our lunch.

It was a treat to forage in the same locales in June and again in October. Why? Because if you compare [this species list](#) with that from the June foray (see our [September newsletter](#), page 8, for the June foray report), you will immediately note a marked difference. In October, the “fall favorites” were out—Russulas were making a strong showing; Amanitas were beginning to pop up, as well as lots of little Mycenas, and, best of all, an Agaricus named after our own Buck McAdoo! This foray was a harbinger of what would be out there waiting to be collected for the annual Mushroom Show on October 21.



A lush forest setting at Swede Heaven. Photo by Linda Magee



With Billy Young-Moore at the display table. Photo: Tom Wilmore

All good things must end. After we cleaned up our mess, thanked Billie again for her hospitality, and collected any mushrooms we wanted to take home, we piled in our cars and made our ways home.

We like that NMA members encourage others to develop an interest in and knowledge of mushrooms. We met a young Frenchman at the NMA September meeting and invited him to join us on this foray. He had just completed the Pacific Crest Trail Hike and was spending a few days in Bellingham before returning home. He was so inspired by our group's enthusiasm and our foraging finds that he was making plans to find a like-minded group in Normandy when he returned home. We all wished him “Bonne chasse aux champignons!”

Finding mushrooms on Lummi Island

Martha Dyck, foray host

More than sixty people packed the Resource Room of the Lummi Island Heritage Land Trust to find and learn about mushrooms on our October foray. Bigleaf maple leaves covered the ground in gold and bronze as sun vied with shade outside the building.

People listened as Fred Rhoades gave introductory remarks about conducting a foray. Judy Bush, assisted by other Land Trust volunteers, laid out options on where to go on the island to collect specimens. Northwest Mushroomers Association was given special permission to pick mushrooms; otherwise collecting is off limits.

The Land Trust owns four properties, and splitting up into separate groups we visited three of them to foray. The Otto Preserve surrounds the Resource Center, with meandering gentle trails looping through second and third growth Northwest forest. The Curry Preserve, a few miles away, boasted cleared meadowlands. Baker Preserve, about two miles away, was a steep trail through fern fields and mixed forest. Everyone split up to explore these areas.

In no time people were returning with mushrooms in hand, MANY of them. The tables were piled high!



Even early on, with only one of three foray groups returned, the table began filling up at Lummi Island. The foray conducted annually by NMA for the Lummi Island Heritage Land Trust was held this year on October 27, 2018. Photo by Martha Dyck



Blewit, *Clitocybe nuda*, spore prints by artist and author Nina Laden

ID'ers went to work; Fred Rhoades and Erin Moore, with help from Jim Fackler, tried to put order to the ever-accumulating masses of fungi, to no avail. Many *Russula brevipes* covered a large area, and the Shrimp *Russula*, *Russula xerampelina*, also showed up in large numbers. Amazingly, no chanterelles. The tables were loaded.

People expressed so much curiosity and eagerness to learn that the identifiers were kept busy with the plethora of questions. People broke off finally to eat the potluck dishes everyone had brought. Help from the Land Trust volunteers was immeasurably appreciated as people queued up to load their plates.

Many attendees to the foray were Lummi Island residents, but the Land Trust volunteers assured me our foray was the largest group they'd ever hosted in their Resource Building. Departing, we figuratively high-fived with them over how successful the outing had been, both for them and us. Just judging from the conversation and questions I heard, I think people had a great time collecting and learning more about this amazing life-form we call fungi.

The 2018 Dilly foray report

Buck McAdoo, with Fred Rhoades

This year 101 species were found that were recognized at least to genus. (To access this list, the Swede Heaven, Lummi Island, and many other lists, consult northwestmushroomers.org/species-lists.) The November 10, 2018, Dilly Foray at Bowman Bay was just that ... a dilly of a foray. Hosted by Margaret and Claude Dilly ever since its inception in the early 1990s, it is always our last foray of the year, virtually closing the mushroom season. At this foray, very appropriately acknowledged by Fred Rhoades, were Margaret and Claude in person.

I can only imagine their reactions as the afternoon wore on ... hordes of forayers accompanied by even larger hordes of fungi. Unprecedented amounts of fungi made it to the two tables set aside for them. Then the benches filled up. One could no longer sit and contemplate the mushrooms. All you could do was mill around, ask questions, and point. In the late afternoon, Margaret was shaking with indignation. It seemed that table number two had no identification notices at all. A closer look would have showed that many of these were also on table number one, and most of those did have labels.

So how did we get here? Our top five identifiers were in attendance. Most of the mushrooms were familiar to us. All I can describe was my own experience. When I arrived at just past 10 a.m. there were about ten species on the table. I proceeded to jot down the names of three taxa and noticed that it was hard to write the names on the table covering paper because the wood grain of the table was so corrugated. As I contemplated my pen navigating these 'waves', a brand new person on his first foray ever approached



Rich collection at the Dilly foray. Photo by Eduard Schwan

me with his basket. He had questions for me. A half hour elapsed before we got through this basket. There were very few new names on the table. I looked around and noticed that my fellow identifiers had been similarly engaged. The room was suddenly crowded with folks who had just joined our mushroom club. I was delighted to see them. They are the ongoing life blood of our membership. They deserved having their questions answered. But when would we actually be



Bowman Bay view—and Deception Pass mushroom. Photos by Eduard Schwan Pictures, schwansongs.com

free to identify?

At this point, Candace hopped into view. She is Margaret's granddaughter and the star finder of last year's Dilly Foray. The top two mushrooms in her basket I had never seen before. So off we trudged to photograph them in their natural habitat. This meant one less identifier at the tables. On the way out to these habitats, we passed another new person heading in. She also had an intriguing specimen.

Of course I wanted to record and photograph all three so we would know them for future forays. But just then Candace noticed a 4" x 6" patch of rusty spore powder on the ground near a conifer. Right behind it was a rusty colored fungus that looked like a pen trying to shed its plastic. By this time Fred had approached. He took a photo of this odd entity and entered it on iNaturalist (see sidebar, page 15, "You too can use iNaturalist"). The answer spat out at us: *Battarrea phalloides*. This was a mushroom normally found in desert landscapes. Finding it here was akin to finding a *Russula* in Antarctica. This process was a marvel to behold. I am hoping Fred will explain more about it. It sort of signifies a major new step in species identification.



It pays to look close for rarer mushrooms like this, *Battarrea phalloides*, the scaly-stalked puffball—good at disguising itself as a dusty stick. See sidebar for more. Photo by Buck McAdoo

A remarkable find

Battarrea phalloides is recognized to be a species of dry regions and normal reports come from further south or east of the Cascades in Washington state. I had heard of a specimen being reported from the east side of the Olympic Mountains, an area that is quite dry because of the rainshadow effect. On checking for herbarium records near the western areas of Washington State in the Consortium of Pacific Northwest Herbaria database, I find two records, one in 2008 from Galiano Island in British Columbia just north of the San Juan Islands and a second in 1995 in Discovery Park in Seattle. All these locations, including Deception Pass State Park, are actually quite dry, being in the rain shadows of mountains to the west: 25 inches per year in Deception Pass State Park, 38 inches in Seattle, and about 34 inches on Galiano Island. So, of all of these nearby observations, our recent one is perhaps the most understandable. Still, a remarkable find! —Fred Rhoades

As usual, the Dilly Foray brought in some amazing species.

But I am digressing. the main point here is that by the time I got back to the tables, potluck had started. It was a great potluck. Who wouldn't rather eat than identify? By the time I finished sampling the fare, I had lost my pen. But just temporarily. Both my fellow identifiers and more relatively new members had questions for me. I had questions for them. It was a very social time. There were so many folks crowding the tables that it was hard to get close. In the end I am

Continued next page

surmising there were a number of species that never got recorded. There are no villains here. We were just plainly engulfed.

Our club is especially blessed with hip organizers. I feel confident that how to handle such a popular foray in the future will be solved. I have a few ideas that could be developed: Have two identifiers that do nothing but answer questions. They sit in two chairs and lines form in front of them. As each questioner arrives at a chair, that identifier addresses the issues, including abandoning the chair to accompany the member to the table for a hands-on experience. Meanwhile three other identifiers are busy recording the fungi. They have their mouths taped shut so no one can interfere with their tasks. And finally, a sixth identifier would be needed to consolidate the collections, move specimens from table number two to table number one so specimens representing one species could all be together.

As usual, the Dilly Foray of 2018 brought in some amazing species. This is not strange since the surrounding habitats are so diverse. Hoypus Point always has the unusual stuff. Then we have the beach with all the driftwood fungi. Then the beaches covered with thick moss under Sitka spruce. Then the madrone forests. Then the ancient Doug firs and hemlocks. Then Lighthouse Point with all the conifer duff paths through the salal. Every year brings up different fungi according to the moisture levels at each of these habitats.

This was our best Dilly foray ever, but also one of the more frustrating. Imagine: Too many mushrooms!



Mushroomers at the Dilly Foray. Photo by Erin Moore



Stereopsis humphreyi looks like a “small fleshless chanterelle” (Trudell). It prefers spruce cones and is rarely reported. This finding during the Dilly Foray might be one of the first records for it in Washington outside of the western Olympic Peninsula (*Mushrooms of the Pacific Northwest*). Photo by Richard Morrison



Tiny but bold: A green-tipped *Ramaria apiculata* var. *apiculata* held by Christine Roberts. Photo by Erin Moore



Armillaria sinapina has more extensive yellow colors than other honey mushrooms. It appears on the ground growing from buried roots (*Mushrooms of the Redwood Coast*). Photo by Buck McAdoo

You too can use iNaturalist . . .

The Dilly foray was the first to attempt to use iNaturalist apps on smart phones to record locations of finds. Several people did this with brief help from those of us (Linda Magee, Tom Wilmore, Mark Johnson, Vince Biciunas, and Fred Rhoades) who knew something about its use.

iNaturalist is available for iPhones and Android phones and also is accessible online with a computer at iNaturalist.org (where you can sign up and learn how to use it).

I think iNaturalist will prove useful for all of us for several reasons.

First of all, it will allow us to photograph the fungi *in situ*, leaving more fungi in the woods for themselves and for others to enjoy. Secondly, it will ultimately provide a set of precise locations (although you can “fuzz” or obscure the location of secret edible locations if you want), dates and, eventually, identifications arranged by site.

Finally, for many of the most common mushrooms, iNaturalist will provide a guess at an observation’s identification. If you have an Internet connection via cellular data, this online ID happens at the time of collection; otherwise, it can happen later when you are connected.

These identifications depend in part on correct identifications of the same thing near by but also are achieved by an obviously very clever AI algorithm that is able to identify any organism, from starfish to earthstar.

In my experience, iNaturalist is now much better at IDing fungi than even just a few months ago, and it is getting better every day. So one of my solutions to the problems Buck describes in the main article is for forayers to use iNaturalist to document what they see and collect fewer things.

If you want to see the 50 or so species that were found, in part, by us this year, register at iNaturalist and search for and join the project: “Decep. Pass & Sharpe Pks—Fungi, Lichens & Slime Molds. —Fred Rhoades



Coastal forest and sunshine at Bowman Bay. Photo by Erin Moore

. . . and foray in the off-season

NMA member Mark Johnson has a keen idea to help you through the winter.

So, the mushroom season usually winds down after the first hard frost? If you still like going foraying as a rationale for getting out in the woods—here is a free resource that could help. Many polypores are quite hardy, and the BC bioregion overlaps with that of Washington pretty well. This book applies to our area nicely!

(a) Go to for.gov.bc.ca/hfd/pubs/Docs/Tr/TR104.htm

(b) Scroll down to the bottom of the page

(c) Click on “Download Technical Report . . .” (It is really a book and will take up about 20 megabytes of space on your drive. Or you can buy a hardcopy for about \$50 USD.)

Save the date for the Survivors Banquet!

When: Saturday, March 16, 2019 Where: YWCA, 1026 N Forest Street, Bellingham



Xeromphalina campanelloides fruiting on a decaying conifer branch in the Stimpson Family Nature Reserve near Bellingham, WA, October 2016. Photo by Richard Morrison

***Xeromphalina campanelloides* revisited**

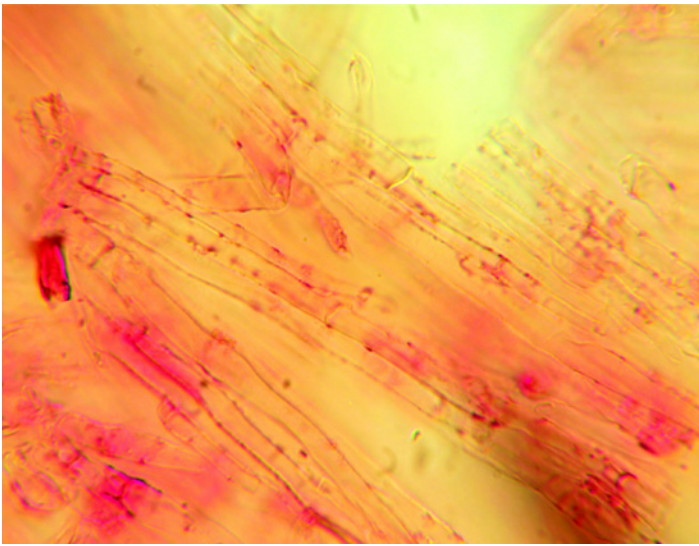
Richard Morrison

It was in late October 2013, near the south end of Lake Whatcom, that I came across a large fruiting of what keyed out as *Xeromphalina campanelloides*, an uncommon, small brownish mushroom. Because this species is considered rare, I dried and preserved a collection for further study, giving it the identification code RHM-13-01. It was almost two years later before I felt confident enough in the identification to write an article on the find, which appeared in the Northwest Mushroomers Association September 2015 Mushroomers newsletter. My identification was based on traditional taxonomy using mushroom morphology, microscopic characters, and ecology. However, as we were now in the age of molecular DNA sequencing technology, the next step was to confirm the identification of RHM-13-01 by comparison with known sequences of *X. campanelloides*.

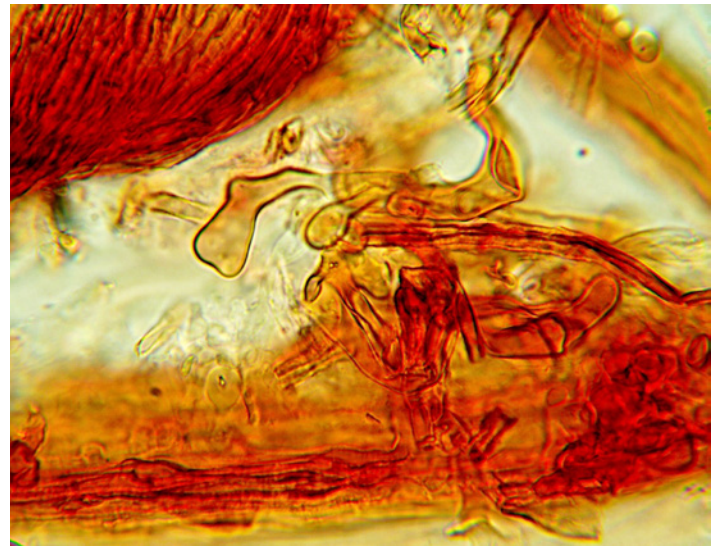
As it turned out, it took until 2018 to accomplish

this, as there was only a single sequence for *X. campanelloides* in GenBank (the NIH genetic sequence database), and it was not from a type specimen, i.e., a preserved collection or specimen on which the description of a species is based. Fortunately, in 2018, Molecular Solutions, the lab doing the sequencing of RHM-13-01, obtained preserved specimens of the holotype (the single herbarium collection on which a species name is based) and two paratypes (additional herbarium collections representing the species) of *X. campanelloides* and sequenced them. Comparison of ITS sequences (ITS = internally transcribed spacer, a DNA region useful for estimating evolutionary distance) showed that RHM-13-01 was an exact match with the holotype, providing conclusive evidence that it was, indeed, *X. campanelloides*.

Following the collection of RHM-13-01, I returned to the South Lake Whatcom site in the fall of 2014



Two important microscopic characters of *Xeromphalina campanelloides*: A. Red flecks in stipe hyphae treated with potassium hydroxide (KOH)



B. Inflated, thin walled caulocystidia found on the upper region of the stipe. Photos by Richard Morrison

and found no evidence of fruiting. Returning, again, in 2015 there was only a smattering of small fruiting bodies at the site. Then, in October 2016, on a trek through Stimpson Family Nature Reserve, I found a large fruiting of *X. campanelloides* on rotting conifer wood and litter just off the main trail. But, in the fall of 2017 there was no evidence of this mushroom at the same Stimpson site.

October 2018, however, had a different story, with eight fruitings of *X. campanelloides* encountered at five geographical locations in our region. These locations ranged from the Stimpson Family Nature Reserve and Lookout Mountain Forest Preserve near Bellingham, the south Lake Whatcom site, to sites near Acme, WA, and Darrington, WA. In fact, in October 2018, I encountered *X. campanelloides* more often than the typically common species, *X. campanella*, *X. cornui*, and *X. fulvipes*.

My observations since 2013 indicate that *X. campanelloides* fruits in our area during October as fall weather turns cool and wet, and that the mushrooms can survive for up to three weeks before decomposing. The 2018 finding of multiple fruitings of *X. campanelloides* in different geographical areas of our region suggests it might be a more common forest component than thought, occurring as vegetative mycelium that is active in decomposing coniferous wood and litter, yet producing fruiting bodies and reproducing sexually only occasionally under specific conditions. The erratic occurrence of fruitings over time at the same sites and on the same substrates at

the south Lake Whatcom and Stimpson Family Nature Reserve locations gives support to this idea.

One of the values of having verified genetic sequences for *X. campanelloides* in GenBank is that scientists studying forest ecology through DNA sequencing of forest litter, soil and other components could look for sequence matches that reveal the presence of *X. campanelloides*. This could provide data to help answer questions about this fungus such as how common or rare it is, its distribution, importance in forest ecology, and the like.

Identifying this LBM on a forest walk

For the mushrooming enthusiast who might enjoy the challenge of identifying a little brown mushroom like *Xeromphalina campanelloides* on a forest walk or foray, here are some field characteristics: 1) mushrooms fruiting in groups on decaying conifer (softwood) logs, branches and litter mats; 2) caps convex, reddish-orange with yellowish margins, gills pale yellow, arched to attached with a short tooth, stems dark brown, often curved; 3) taste quickly bitter (nibble on a tiny bit of gills the cap, then spit it out).

Three common look-alikes are *X. campanella*, *X. cornui*, and *X. fulvipes*. *X. campanella* fruits in groups on decaying conifer stumps and logs, has a funnel shaped cap, decurrent gills and mild taste. *X. cornui* has a mild taste, and occurs in scattered troops on coniferous debris and in wet, boggy locales. *X. fulvipes* has a bitter taste, but the gills are attached (adnate), it fruits on coniferous debris, and the cap is somewhat rubbery.

Foraging for Mushroom Words...

Studying in the dark

K P A R A S
C I N E G O H T A P M B
M L A Z I H R R O C Y M A C
X A R B U S C U L A R P A X R I
O V A S C U L A R G H R C L E C G X
T T O R C H I D R T O N O M V A D S I O
S U G N U F E A H P Y H D I O P I I I T N T
L Y A I U R B O B Z G I L L S O V L L B A X
E A G N B S A R B U S C V H C I A E Y E L X
K M V T N N Z P C O L T A M I O T U L I N C E T
A N N U E I U N O T T U B R M Y C O R R L M Y S
V X E D I X T L Y R R V E C A A P R B B O P S M
I U U E A G I R M D
E U S O S M T B N I
R L R U C C I U H O
O S O F H I S T Y P
P C N V W T A O P O
Y H S E A O R I F R
L W K C N I A D T T
O A L Y S B P U S O
P N A M O M N B O N
X V T K N Y U R H O
G I S Y G S F A P M
E R I C S C I U R F

Puzzle created and
brought to you by
Eduard Schwan of
schwansongs.com
Thanks, Eduard!

1. ANNULUS
2. ARBUSCULAR
3. ARBUTOID
4. BRUISING
5. BUTTON
6. CAP
7. EDIBLE
8. ERICOID
9. FRUITING
10. FUNGUS
11. GILL
12. HOST
13. HYPHAE
14. LATEX
15. MARGIN
16. MONOTROPOID
17. MYCELIA
18. MYCORRHIZAL
19. NMA
20. ORCHID
21. PARASITIC
22. PATHOGENIC
23. POLYPORE
24. SPORE
25. STALK
26. SYMBIOTIC
27. TOXIC
28. VASCULAR
29. VEIL
30. VOLVA