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When the BioBlitz Came to Town

By David Rust

When National Geographic announced the location of their March 28-29, 2014 BioBlitz at Golden Gate National Parks in the San Francisco Bay Area, we jumped at the chance to participate. The pot was sweetened when we learned of a scientists' dinner with celebrated vegetarian fare and exquisite views at Greens Restaurant.
We mulled over the choice of conducting a fungal survey in grasslands at Point Reyes National Seashore, or the famed Muir Woods National Monument (where collecting is normally verboten); we opted for the redwood forest.

The end of March is not peak mushroom season on the California coast. To compound the problem, a severe drought brought one of the worst mushroom seasons ever. The extent of our folly deepened as a dry winter rolled on. Then *voila*! Just in the nick of time, Spring rains changed everything – game on!

The late March event started with a reception for scientists at the California Academy of Science. What a thrill to talk with many of the 300 scientists who signed up for this event — people from all walks of the natural world of science — lichens, aquatic insects, birds, trees, moths and butterflies, and our small contingent of mushroom geeks. This session was definitely one of the highlights of the BioBlitz. Sadly, Greens was unable to accommodate 300 scientists; the dinner before the BioBlitz was held at the Presidio in San Francisco, where we were thanked for our participation after a lovely catered dinner.

Four mycologists participated at Muir Woods: Dr. Else Vellinga, UC Berkeley, one of the top taxonomists in the US; Dr. Kabir Peay, Stanford University, whose lab works primarily on plant-fungal interactions; Debbie Viess, co-founder Bay Area Mycological Society; and me (loosely adapting the term "mycologist").

Staff at the event was enthusiastic. We were initially greeted by Catey Ritchie, Project Manager, Resource Conservation, Golden Gate National Parks Conservancy, who could not say too many times how cool she thought it was to have a BioBlitz in Muir Woods National Monument. Catey coordinated everything with aplomb and efficiency, and herded our group together to begin the walk.

Debbie Viess (right) discusses a mushroom identification with Friday walk participants. Photo by David Rust

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FORAYS & OTHER EVENTS

July 11-13: Gulf States Mycological Society Summer Foray in Wiggins, Mississippi with lodging at the Hampton Inn & Suites. Invited mycologists include Dr. Bart Buyck, his colleague Dr. Valerie Hofstetter and graduate student Brian Looney of the University of Tennessee. Cost is $269/single and $344/dbl. Details and registration form will be posted at http://gsmyco.org or contact dandplewis(@) gmail.com.

July 25-26: West Virginia Mycological Club Foray with Allissa Allen, Bill Roody, Walt Sturgeon, Noah Siegel, Kyle Weaner and Gary Lincoff. Visit wvmushroomclub.org for details and registration form.

July 25-27: Helen Miknis Memorial Foray at Mont Alto, Pennsylvania. Registration form and more information on accomodations, etc. at www.epennmushroomers.org. (See announcement on page 23).

August 7-10: **2014 NEMF Samuel Ristich Foray** at Bowdoin College, Maine. Dr. Seanna Annis, mycologist and plant pathologist at the University of Maine at Orono, will be the host mycologist. Presenters will include Renée Lebeuf, Raymond Archambeault, Greg Marley and Michaeline Mulvey. See www.nemf.org/foraynext.htm.

August 8-10 Third Annual NRVMC and MAW Joint Appalachian Foray with Jay Justice**.** Information about registration can be found at: http://mawdc.org/archives/Foray%2520-%2520Appalachian/4-H%25202014%2520Registration%25206-2%2520revision%2520-%2520typewriter%2520enabled.pdf.

August 15-19: Telluride Mushroom Festival. Full festival passes are $275. See http://www.telluridemushroomfest.org

September 4-7: COMA's annual **Clark Rogerson Foray** will be held at Berkshire Hills Emmanuel Camp in Copake, NY and is easily accessible from NYC, the Hudson Valley, Connecticut and Western Massachusetts. See www.comafungi.org/special-events for information on registration.

September 11-14: **Wildacres Foray** in North Carolina. (See page 23 in ***The Mycophile*** for further information).

September 13: The Fourteenth Annual Gary Lincoff Mid-Atlantic Mushroom Foray (See http://wpamushroomclub.org/lincoff-foray/)

October 9-12: **NAMA's 2014 Patricia Benson Memorial FORAY** at Camp Arnold (http://www.tsacamparnold.org/) in Eatonville, Washington. See www.psms.org/nama2014.

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We led groups on Friday in beautiful sunshine and on Saturday in pouring rain. These were not trained scientists, so the walks became public outreach and education. National Geographic sent a film crew and photographers on our Friday walk, and posted a video of Debbie Viess talking to our group. Everyone found lots of fungi in and around the redwoods. http://sciencenetlinks.com/videos/2014-bioblitz-bobcast-mushroom-hunting/

We were provided with trail maps, documentation instructions, bright orange tee shirts, lunch, and all the tools we needed (b.y.o. baskets and wax bags). We were given an opportunity to set up microscopes and do real lab work right there in the field, but alas, we, and our entire Friday group decided to keep hunting in the field instead, and Saturday was way too wet to have electronics anywhere outside.

A docent participant with a Smartphone updated photos to *iNaturalist* from the field, a sometimes tedious effort involving our stopping to spell Latin and common names. Others on mycologist led walks, or participating independently in the survey, added mushroom sightings to the event list. A list of all lichens and fungi can be found here: http://www.inaturalist.org/lists/109367-Golden-Gate-National-Parks-BioBlitz-2014s. *iNaturalist* lists observations by common name, many of which are fanciful made up names no one ever uses (eg, Lilac Bonnet for *Mycena pura*, and Hairy Curtain Crust for *Stereum hirsutum*). Another really annoying problem with *iNaturalist* is that the program chooses a "best photo" for the curated list, instead of the one we took in the field.

If you use your Superman glasses correctly, you can see researchers in the top of the center redwood, or at least their rope hanging down the middle of the foreground. Our group was allowed to don hard hats and walk through the study area just beyond the yellow caution tape. Photos by Debbie Viess.

Muir Woods is a remnant stand of spectacular old-growth coastal redwoods – the only one in the Bay Area. Because it has been preserved as a national monument for over 100 years, Muir Woods is a richly diverse habitat for many flora and fauna. Hidden in a canyon on the southern edge of Mount Tamalpais, the park is often bathed by fog sweeping up from the ocean.

Forest canopy pioneers Stephen Sillett and Marie Antoine from Humboldt State University climbed and measured one of the taller redwoods in the park and found more than 40 species of lichen covering the tree trunk and branches. This was the first time redwoods in Muir Woods had been climbed. If you haven't heard of Sillett and Antoine's remarkable redwood exploration, I encourage you to purchase the book *Wild Trees* and visit the author's website: http://richardpreston.net/books/wt.html.

As we reviewed the fungal collections on Saturday afternoon, thankfully in a dry office out of the rain, we struggled with posting, naming, and verifying fungi into a "curated" list. This was not a smooth process and some of the observations are still not complete. While the effort of other participants and docents to document fungi was appreciated, having amateur mycologists do the work would have been more efficient.

We even found a morel, *Morchella elata* group. Photo by Debbie Viess.
Thanks to the recent rain, we saw many fresh fungi, including this lovely photo of *Trametes versicolor* by Rachel Lorenz.

Alexandra Picavet, Golden Gate National Parks, summarized her appreciation of the event this way: "There were people who came from Hawaii, Connecticut, and New York just to take part in this amazing event. The number of scientists, their level of training and knowledge, and their availability to the public and the park throughout the event is unsurpassed in any other BioBlitz the National Park Service and National Geographic have partnered in. You could see those life changing, world defining moments, happening all over the park as participants — wet with rain and charged with excitement — had their time to be National Park Rangers for a day and help us learn more about what lives in Golden Gate National Parks." Catey Ritchie adds, "I find myself saying things like…'it was so cool! It was just soooo cool!' over and over again."

If you take away all the limitations, the BioBlitz was a great opportunity to introduce people to mushrooms as an accepted and important part of nature. Over 9,000 people participated, over 2,300 biological species were found and identified, over 110 fungal and lichen species were found, and surveys were conducted by over 320 scientists (an all-time National Geographic BioBlitz record). At Muir Woods, 54 staff members, mostly from the Golden Gate Parks and GGP Conservancy, coordinated logistics, school groups, data entry, or were assigned as inventory docents. Elizabeth Edson noted the many school groups who took part in public walks. She thanked inventory leaders for "inspiring them to open their eyes and get excited to know, and ask questions about, the things that they see around them. It was an awesome weekend!" Alison Forrestel, Golden Gates National Recreation Area, who coordinated a lot of the scientific work, reveled in the success of the event. "From school kids with jaws agape at seeing bats up close to the little boy who asked his inventory leader to sign his copy of Moths of Western North America to the more than 2,300 species observed (and counting!) it was a huge success."

Special thanks to Alison Forrestel, Elizabeth Edson, Kristin Ward, and Catey Ritchie for all their help during the event.

Catey Ritchie examines a cup fungus.
Photo by David Rust

STEM FESTIVAL REPORT by terraBrie Stewart

Many mycophiles keep their eye on the month of April as the month that morels emerge, trumpeting the start of foray season. This year NAMA also had something else very exciting to look forward to -- hosting a booth at the Grand Finale Expo of the 3rd annual USA Science & Engineering Festival at the Walter Washington Convention Center, April 24-27. This event has been described as "the ultimate celebration of science and engineering in the country, designed to inspire thousands of people of all ages to explore careers in STEM (Science, Technology, Engineering, and Math)". Over the course of four days, approximately 325,000 people participated in the event, including students, teachers, government officials, private industry and press. Celebrity science educator, Bill Nye "The Science Guy" was among the main speakers headlining at this event.

Visitors drawn to our booth were greeted by two to four volunteers, backed by a colourful display of NAMA's visually stunning banner designed by Martha Gottlieb; MSA's poster, "What Can You Do With Training in Mycology?"; trifold displays made by students about Amanita species and medicinal mushrooms; a compilation of Taylor Lockwood's photography; and the deadly serious poster, "Warning: Picking and Eating Wild Mushroom Can Kill You". The table space was used to introduce visitors to three areas of mycological interest: i) education, ii) mushroom clubs, and iii) hands-on explorations.

terraBrie Stewart, Connie Durnan and Sandy Sheine
Photo by Jerry Sheine

At the microscope
Photo by Connie Durnan

terraBrie teaching fungi origami to a student
Photo by Jerry Sheine

Young adults visiting the NAMA Display Photo by Jerry Sheine

Parents and children at the NAMA table   Photo by Connie Durnan

The educational section was dedicated to the promotion of terraBrie Stewart's books, *The Fungus Files: An Educator's Guide to Fungi, K-6* (2nd edition) and *The Fungus Files: Young Mycophiles' Activity Book*, which were edited by Dr. Bryce Kendrick, author of *The Fifth Kingdom*. Available were demo copies of the books; bookmarks; promotional brochures for the educator's guide; sample activities from the guide (i.e. connect-the-dots, maze, wordsearch, and crossword); and constructed origami puppets from the activity, "Flora, Fauna, Fungi, or Fiction". These materials flew off the table almost as fast as they could be stocked (500+ printouts were distributed). All promotional materials directed visitors to NAMA's website where they could download a printable version of the guide and discover more about NAMA. There was significant interest in the educational materials by teachers, homeschoolers, outdoor education instructors, and independent learners, all of whom will help drive traffic to NAMA's website.

terraBrie Stewart at NAMA displays
Photo by Connie Durnan

The Mycological Association of Washington's section catered to visitors to the booth who were curious about mushroom identification or harvesting. Connie Durnan was the primary host of this station and tirelessly answered many questions with patience and enthusiasm. A stunning slideshow of wild mushrooms compiled by David Rust kept passive participants engaged. Also available was a demo copy of the impressive book published by Ophelia Barizo's students, Wild Mushrooms of Washington County, Maryland. Visitors who expressed a specific interest in joining a mushroom club were given one of MAW's brochures or one of the NAMA's double-sided promotional postcards to assist them in finding with their local chapter.

The third section of the table was reserved for hands-on explorations. During Sneak Peak Friday, Cody Wainsanen brought samples of microscopic fungi from his lab and maintained a culture of yeast to show students under the microscope, which he ultimately and delightfully set up on the floor to better connect with his excited young audience! During the main event, Jerry Sheine ran a slideshow showcasing a diversity of spores, and assisted visitors in identifying what they were seeing under the microscope. Sandy Sheine maintained a complimentary display of dried mushrooms, including the very mushroom Jerry used to make the microscope slides. The highlight of the dried mushroom collection was a cluster of Leaflike oyster mushroom (*Hohenbuehelia petaloides*) with soil and mycelium attached, which served as an effective model to explain the whole life cycle of a macrofungus.

Supplementary materials were provided by the American Mushroom Institute and Mushroom Farmers of Pennsylvania, who donated 400 cloth grocery bags; and by Tina Ellor of the Phillips Mushroom Farms in Kennett Square, PA, who sent literature about growing mushrooms and recipes. These gifts were very helpful in attracting attention to the booth.

Many thanks is due to all the volunteers who worked together to professionally represent NAMA at this high-profiled public event. In addition to the participants already mentioned, Willow Nero, Ophelia Barizo, Danny Barizo, Martin Livesey and Colin Gore generously donated their time to ensure that the event was a complete success and connected with many future NAMA members that exhibited a passionate interest in learning more about mushrooms.

NAMA/MAW volunteers
Photo by Daniel Barizo

A Word From The President

NAMA participated in a STEM (Science, Technology, Engineering, Math) Festival in Washington DC in April. It wasn't cheap — we needed to pay for the booth and design materials and banners to make the exhibit attractive. NAMA members and the Mycological Association of Washington DC (MAW) pitched in to make it happen. Connie Durnan, Martin Livezey, terraBrie Stewart, Sandy and Jerry Sheine, Willow Nero, Ophelia and Danny Barizo, and others did a remarkable job at the booth. Martha Gottlieb designed a wonderful banner. We had 5x7 cards printed up to promote NAMA. Thank you to all, especially Connie for all her time coordinating the event.

Now we have an exhibit ready to go for other events to promote NAMA and membership. If you have an event or fair where a NAMA booth would be an asset, please let Sandy Sheine or Becky Rader know, and we'll ship you the materials.

The Puget Sound Mycological Society (PSMS), largest club in the United States and not quite the largest in North America, has put together a remarkable list of speakers for their upcoming NAMA foray near Seattle in October 2014. PSMS utilized online registration – a NAMA milestone – for the event, and it nearly sold out in just a few days. As of this writing, the foray is sold out. Congratulations. Programs will be a bit different this year for the board – we're working on a new approach and long term planning. The foray includes two pre-foray workshops: Alissa Allen will lead a mushroom pigments dye workshop; award-winning botanical illustrator Sasha Viazmensky will instruct a watercolor workshop on painting mushrooms. Paul Stamets is the keynote speaker, and Steve Trudell is chief mycologist. Wow! I want to go! Oh, right. I'll be there.

If you haven't taken a peek at the new issue of McIlvainea, it's packed with great articles by a host of mycologists and scientists. Thanks to the hard work of Dr. Michael Beug, this is our fullest issue in five years: Corticoid Fungi in North America, by Dr. Dimitrios Floudas; Cauliflower Tales, by Dr. Ron Petersen; An Interesting Case of Mushroom Poisoning, by Dr. James Addison; 2012 and 2013 Voucher Committee Reports, from Patrick Leacock; Mushrooms as Medicinals – a literature review, by Dr. Lawrence Leonard; and the 2013 Toxicology Committee Report on mushroom poisonings.

As always, thank you to Dianna Smith for putting together another great issue of *The Mycophile*!

There are exciting changes coming to NAMA in the next year. Stay tuned.

David Rust
NAMA President

2014 NAMA Foray Sold Out!

Add your name to the waiting list.

Thanks to everyone who registered for the 2014 NAMA Foray in Eatonville, Washington! We sold out the 250 spots in under 20 days, and will start a waiting list for those still hoping to attend. To add your name to the waiting list, please visit our site at psms.org/nama2014.

For those of you who are a confirmed registrant, there are still spots available in the pre-foray mushroom dye workshop. If you're interested in adding this workshop to your registration, please contact Pacita Roberts at namaregistrar@psms.org.

We're excited to see you in October!
Pacita Roberts and Teddy Basladynski

The Taxonomy of Turkey Tails (*Trametes*) and Related Polypores: One Genus or Too Many?

by Alfredo Justo

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Figure 1. *Trametes versicolor,* the "turkey-tail"

The turkey tails are among the most common and widespread mushroom-forming fungi in the temperate and boreal forests around us (**Fig. 1**). For the most part mycologists have classified this species in the genus *Trametes* Fr., under the scientific name *Trametes versicolor* (L.: Fr.) Lloyd, that roughly translates to "the thin one (*Trametes*) with many colors (*versicolor*)". Because of some morphological differences, back in 1886 the French mycologist Lucien Quélet separated *T. versicolor* and similar species into their own genus, which he named *Coriolus*, and the name *Coriolus versicolor* can still be found in many publications and internet sites nowadays. *Coriolus* is only one of many generic names that has been alternatively put into synonymy with *Trametes* or considered a separate genus based on a combination of certain morphological features. The list of "trametoid" genera includes very familiar names such as *Lenzites* Fr. or *Pycnoporus* P. Karst., and also more obscure (but valid and usable) names such as *Pseudotrametes* Singer or *Cubamyces* Murrill.

As part of the PolyPEET project (http://wordpress.clarku.edu/polypeet/) we set out to study the taxonomy and nomenclature of *Trametes* and related genera. A key aspect of our study was to generate DNA sequence data from a wide representation of species to unravel the evolutionary relationships among the trametoid polypores. With the DNA data we were able to construct phylogenetic trees that will tell us how closely related the trametoid species are to each other, a "family tree" of our species.

One very important aspect when trying to do taxonomy that is based on phylogenies is to include the "type species" of the genera that you want to study. The type species has been designated by the person who described the genus (or by some later mycologist) to serve as a permanent link for the generic name. The position of the type species in the phylogenies will therefore guide the process of "translating" a phylogenetic tree into a formal taxonomic arrangement.

Figure 2 depicts the evolutionary relations of 19 trametoid species, including the 10 type species of the genera that we wanted to analyzed based on DNA data. An easy way to "read" the phylogenetic tree is to start on one of the "tips" of the tree (the species names) and follow the "branch" (the black line) to the closet "node" (the red circles). For example if you start at the tip that represents the turkey tail (*Trametes versicolor*) and follow that branch you will end up in the node that unites *T. versicolor* and *T. ectypa*. This means that, based on our current sampling, *T. versicolor* and *T. ectypa* are more closely related to each other than to any other species in the tree. They are what we call "sister-species". Each node in the tree represents the most recent common ancestor to all the species that can be traced back to that node from the tip.

Now that we have the species phylogeny, it is time to decide how many of the nodes in the tree will be given a formal name, in other words, into how many genera we are going to organize the trametoid polypores. From the many different possible scenarios we are going to explore three different alternatives, graphically represented in Figure 3.

Five genera

If this option is adopted the following genera would be recognized:
Trametes – Species included here fit the traditional morphological concept of *Trametes*, but some species morphologically very similar (e.g. *T. membranacea*, *T. cubensis*) would be left out of *Trametes*.
Lenzites – This would include the common *L. betulinus*, with a lamellate hymenophore, but species with lamellate hymenophores can also be found outside *Lenzites* (e.g. *T. elegans*). The morphological concept of *Lenzites* would have to be expanded to include species with poroid hymenophores (*T. membranacea, T. pavonia*) rendering the traditional division between *Trametes* (poroid) and *Lenzites* (lamellate) as meaningless.
Coriolopsis – This would only include the type species, *C. polyzona*, morphologically separated from *Trametes* by the brown-colored context. All other species traditionally placed in *Coriolopsis* sampled for molecular data (e.g. *C. gallica*, *C. trogii*, *C. caperata*, etc...) have been shown to belong elsewhere in the Polyporales.

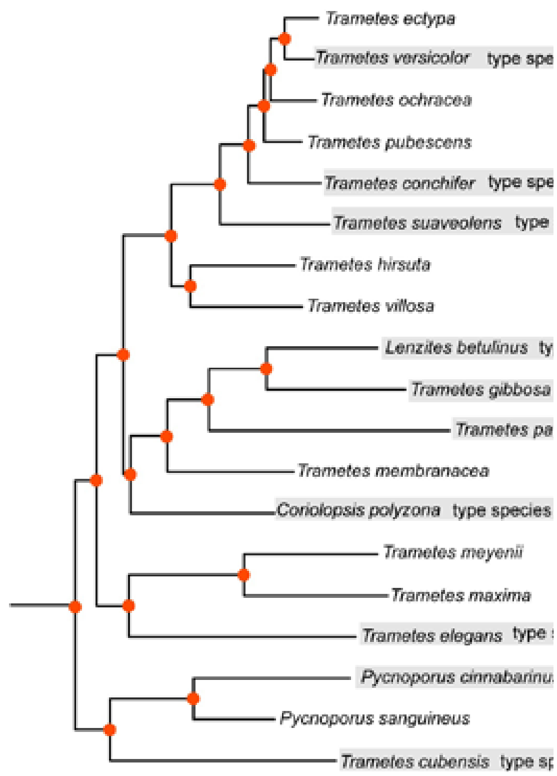


Figure 2. Phylogenetic relations among trametoid polypores, based on the study of Justo & Hibbett (2011)

Artolenzites – This genus would have to be resurrected to accommodate *T. elegans* and the tropical species *T. maxima* and *T. meyenii*. Morphologically there is no uniting feature for these three species that sets them apart from other trametoid species.
Pycnoporus – The genus would accommodate all species with bright red colors (*P. cinnabarinus*, *P. sanguineus* and others) but it would also have to include *T. cubensis,* with grey-brown colors.
After considering this option we found that one of the major problems would be that these five genera would be almost impossible to distinguish from each other based on morphological features: e.g. species with lamellate hymenophores would be classified in *Lenzites* and *Artolenzites* but both genera would include also species with poroid hymenophores. Since the problem was that we were expanding too much the morphological concept of some genera we decided to explore an option in the opposite direction.

Ten genera

In this option we restricted the genus *Lenzites* to include only *L. betulinus* and *Pycnoporus* to include only *P. cinnabarinus*, P. *sanguineus* and other species with red colorations. This way the morphological concept of these genera more commonly used is left unchanged. But that creates another problem: what do we do with all the species that are left without a genus?

In some cases generic names are available for them: *Trametes cubensis* can become again *Cubamyces cubensis* and *Trametes gibbosa* can be *Pseudotrametes gibbosa*. For other species (e.g. *T. maxima*, *T. membranacea*) new generic names would have to be created.

Based on our sampling that would put the total of trametoid genera up to 10, with more genera being erected as more species are sampled for molecular data. The morphological separation of all these genera would be very difficult, and in some cases plainly impossible.

Neither the five genera nor the ten genera options were really satisfying for us, so we considered a third possibility.

One Genus

So what if we stop trying to subdivide the trametoid polypores into smaller units and consider that, taken as a whole, they form a pretty well-defined group that we are going to recognize under one single genus name: *Trametes*. All the differences in hymenophore types, color of the context, presence/absence of certain microscopical structures can still be used to separate the species to one another, but they are no longer defining genera.

This solution is simple and practical, but it has one catch: letting go of well-known and familiar names: *Pycnoporus cinnabarinus* will become *Trametes cinnabarina*; *Lenzites betulinus* will become *Trametes betulina*.

Even with these changes we do believe that when all the pieces are put together (morphology, biogeography, ecology, molecular phylogeny, nomenclature and usage of the names) the use of one generic name (*Trametes*) for all these species is the most practical solution.

References

Bernicchia A. 2005. Polyporaceae s.l. *Fungi Europaei* 10. Alassio, Italy. Ed. Candusso

Gilbertson R.L. & Ryvarden L. 1986. North American Polypores, vol. 1. Synopsis Fungorum Special Volume. Oslo, *Fungiflora*.

Gilbertson R.L. & Ryvarden L. 1987. North American Polypores, vol. 2. Synopsis Fungorum Special Volume. Oslo. *Fungiflora*.

Justo A. & Hibbett DS. 2011. Phylogenetic classification of *Trametes* (Basidiomycota, Polyporales) based on a five-marker dataset. *Taxon* 60:1567–1583.

Justo A. & Hibbett DS. 2014. http://wordpress.clarku.edu/polypeet/projects/trametes/

Ryvarden L. 1991. Genera of polypores: nomenclature and taxonomy. Synopsis Fungorum 5. Oslo. *Fungiflora*.

Welti S., Moreau P.A., Favel A., et al. 2012. Molecular phylogeny of *Trametes* and related genera, and description of a new genus *Leiotrametes*. *Fungal Diversity* 55:47–64.

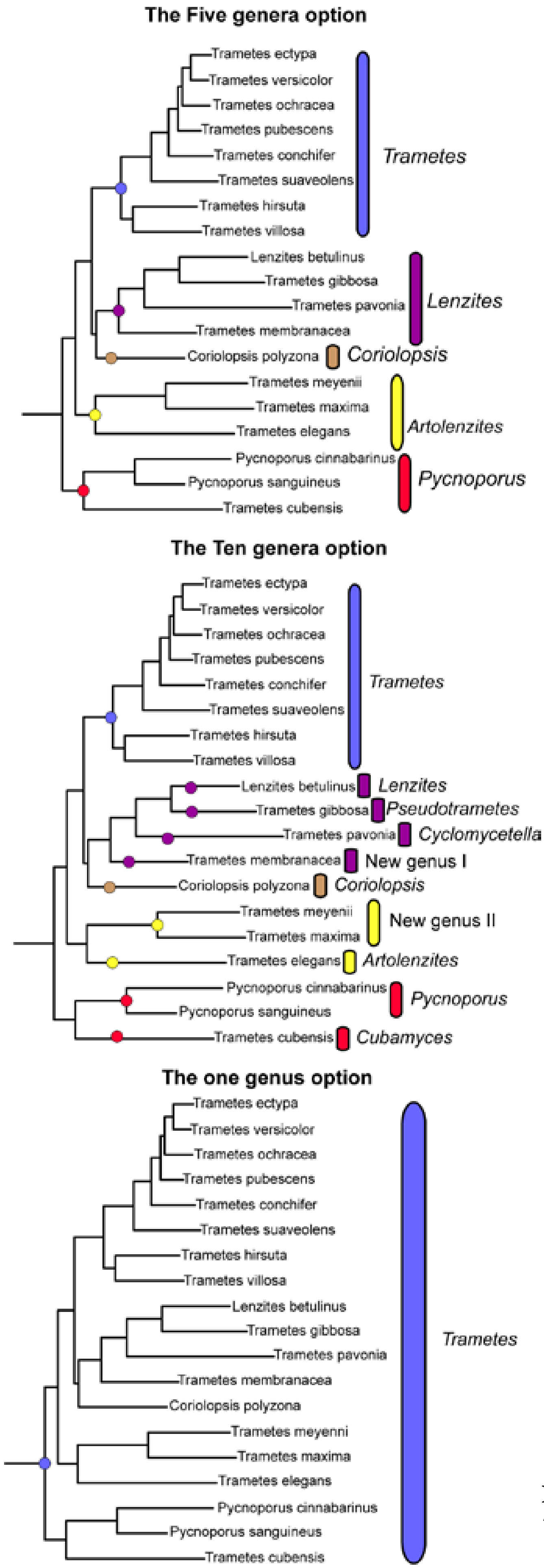


Figure 3. The three possible taxonomic arrangements for *Trametes* discussed in the text

Fungal Diversity…Hiding in Plain Sight

by Rosanne Healy

(This article first appeared in ***FUNGUS FRIENDS***, newsletter of the Illinois Mycological Association, April, 2014)

For mycophiles, there is nothing better than a walk in the woods after a good rainfall to see what has responded. It is rewarding to see old fungal friends and exhilarating to discover new ones. Such walks are personally satisfying, and when done methodically can contribute to basic fungal biology, especially when observations in the field are paired with molecular techniques in the laboratory. With less than 10% of an estimated 1.5 million species known, and the effect of climate change on ectomycorrhizal fungi unknown, the need for fungal systematists, professional as well as citizen scientists, has never been greater. Here I share with you intersecting vignettes of a recent world-wide collaboration among both amateur and professional mycologists that used morphology and molecular techniques to crack open the identities of some common but nondescript fungi on woodland soils.

Imagine being aware of only half of the life cycle of a group of common organisms that are responsible for valuable ecosystem services. Obviously, we would lack a great deal of knowledge about their requirements and interactions. Such gaps in our knowledge are especially common for ectomycorrhizal fungi. This is unfortunate- because ignorance of their biology deters understanding an essential component of healthy forests. These fungi are in a mutually beneficial partnership with tree roots – providing essential nutrients and water to the plant, and in turn getting sugars from the plants. For example, pines and oaks cannot live in the wild without their fungal partners.

I was fortunate to take part in recent research that helped to uncover part of the life cycle of certain truffles and other ectomycorrhizal Pezizales. Commonly known as the cup fungi, they include things like morels and scarlet cups. I was pleased to see this new information integrated with previous work done by such eminent mycologists as Richard P. Korf and Grégoire Hennebert.

A little background information will make the story easier to follow. Fungi reproduce either sexually or asexually (some do both). The two stages often differ in appearance and function. Fungi that were only known as asexual (usually mitosporic, meaning they reproduce as clones of themselves through spores), were referred to as "fungi imperfecti" or deuteromycetes. In the past, multiple stages of a single fungus were described under different names if their connection to each other was not known. In many of these cases, the asexual form was categorized in the fungi imperfecti and the sexual form in the Ascomycota. The practice of giving different names to separate life cycle stages of a single fungal species was formally abandoned by a change in rules of nomenclature at the International Botanical Congress in 2011. But how do we know if two stages that look morphologically different belong to the same species?

Prior to molecular techniques, there were two main ways to link different forms of the same fungus. One way was to observe if they were consistently produced in the same place around the same time. An example is dead man's fingers (*Xylaria*), where conidia (asexual spores) are produced as a white to grey colored powdery spore mass covering the finger-like stroma that later produces numerous tiny flaskshaped fruitbodies in a single stroma. However, the gold standard for linking dissimilar fungal growth forms was to see if one form could produce the other in pure culture. Although the practice of giving two names for one fungus has been discontinued, I will mention both names in the following story in order to provide a link to their history in the literature.

Asexual forms in the ascomycetes have been known since the 1800's. H. Anton de Bary, the founding father of modern mycology, was the first to prove that a species of fungus could have more than one form. In 1854, he showed that mycelia of *Aspergillus glaucus* (mitosporic form) produced *Eurotium herbariorum* (sexual fruitbodies). Asexual states of Pezizales have been known for just as long. In 1853, Louis R. and Charles Tulasne reported an asexual spore type (referred to as *Oedocephalum*) for a species of *Peziza*. Then in1881 J. Oscar Brefeld proved the connection by showing that spores from several *Peziza* species could germinate and the mycelium produce *Oedocephalum*. Morels have an asexual state (referred to *Costantinella*) that was first reported by Molliard in 1904. Hennebert and Korf wrote an in-depth documentation of the production of apothecia from mitospore mats (clusters of hyphae and asexual spores that are large enough to see with the unaided eye) in cultures of *Peziza ostracoderma*. Their paper untangled a web of names, including nine different genera historically given to the various forms of this species. In these cases as well as most others where different morphological forms of the same fungus have been linked, the fungi are saprobic (live on dead material). We know more about saprobic fungal life cycles because these fungi grow more readily in culture than do ectomycorrhizal fungi or obligate parasites. As a general rule (with exceptions!), ectomycorrhizal ascomycetes do not produce different morphological forms at the same time or in the same place, are difficult to grow in culture, and in most cases do not fruit in culture. Previous research suggested that ectomycorrhizal fungi reproduce and disperse primarily through sexual spores produced in fruitbodies (mushrooms, cup fungi, truffles, etc); and that the ectomycorrhizal symbiosis may in some way be incompatible with asexual spore production. Only a relative few ectomycorrhizal fungi have been unequivocally linked to asexual spore forms, and these were linked via molecular methods.

And now the story: Korf, a mycologist at Cornell, spent a number of years collecting and trying to culture conidia from spore mats that grew on woodland soil. He and his students suspected they were related to *Peziza* because they resembled *Peziza ostracoderma* spore mats. While Korf and Hennebert described the link between the spore mat and fruitbodies of *P. ostracoderma*, which frequents mushroom beds and greenhouse soils, their efforts to culture species collected from woodland soil surfaces were unsuccessful. These spore mats were most commonly referred to *Ostracoderma* or *Chromelosporium* in the Deuteromycota. Hennebert summarized what was known in 1973 of asexual forms that were connected to both operculate and inoperculate cup fungi, including elegant drawings and a synoptic key. The Pezizales were represented by six asexual forms, only two (*Dichobotrys* and *Chromelosporium*) of which were connected to a sexual stage. Korf thought the questions surrounding the identity of the Pezizales-like spore mats interesting enough to make them the focus of his address at a 1994 symposium in his honor. When molecular sequencing began to make inroads into resolving fungal identities of the Deuteromycota, Korf gave Keith Egger, a mycologist at the University of Northern British Columbia, a specimen to sequence. Phylogenetic analysis of the sequence suggested that it was related to the truffle genus *Pachyphlodes* (known at the time as *Pachyphloeus*). This was of great interest to me because for my doctoral dissertation, I had set out to revise *Pachyphlodes*, a relatively common genus in the upper Midwest U.S. I wanted to include the asexual form in my study, but didn't know what it looked like to search for it. A discussion with fellow truffler Matthew Smith led me to Harvard to meet with Don Pfister, who was a former Korf student and was familiar with Pezizales anamorphs. Matt, Don's post doc at the time, had been opportunistically collecting Pezizales anamorphs with Don during his time there. Our meeting was productive, as their collections gave me the search image I needed, and we began to collaborate. It turns out that the asexual stage I was interested in were fuzzy looking fungal growths on soil that I had stepped over countless times while searching for truffles!

Back at David McLaughlin's lab at the University of Minnesota, where I was working on my Ph.D., I started sequencing as wide a diversity of the spore mats on soil as I could find. At this time, there were two regions of DNA that were routinely used for ferreting out relationships in fungi: one (called the ITS) that is fast evolving and helps to identify organisms at the species level, and the second (called the 28S or LSU) which evolves more slowly and is conserved enough to show relationships of genera across an entire order. These were employed for identifying spore mats in the Pezizales. Preliminary work revealed a high diversity of *Pachyphlodes* species, easily detected because they are brightly colored white, cream, pink or yellow (Fig. 1). The colors appear to be consistent among closely related species. For example, *Pachyphlodes thysellii* has a pink colored spore mat, and there are at least two closely related undescribed species that also have pinkish hues in their spore mats. We knew that there were potentially other ectomycorrhizal genera with unrecognized spore mats besides *Pachyphlodes* because there were reports of a *Ruhlandiella* (reported as *Muciturbo*) spore mat from Australia in 1989, and two Tuber spore mats from Austria in 2004, as well as miscellaneous Pezizaceae sequences of unknown genera. In order to get a broader geographic and taxonomic sampling of spore mats, Smith, Pfister and I invited mycologists Greg Bonito (Duke University, NC), Gonzalo Guevara (Instituto Tecnológico de Cd. Victoria, Mexico), and Zai-Wei Ge (Kunming Institute of Botany, China) to join the project. Smith collected with Zai-Wei in China, and both Smith and Pfister collected in Argentina and Chile as well. Together we sequenced hundreds of spore mats from three continents and both hemispheres. With assistance and international contributions of truffles from numerous students, mycologists, and citizen scientists, along with the previously reported species,

Figure 1 Sexual stage (left) and asexual stage (right) of *Pachyphlodes* spp.

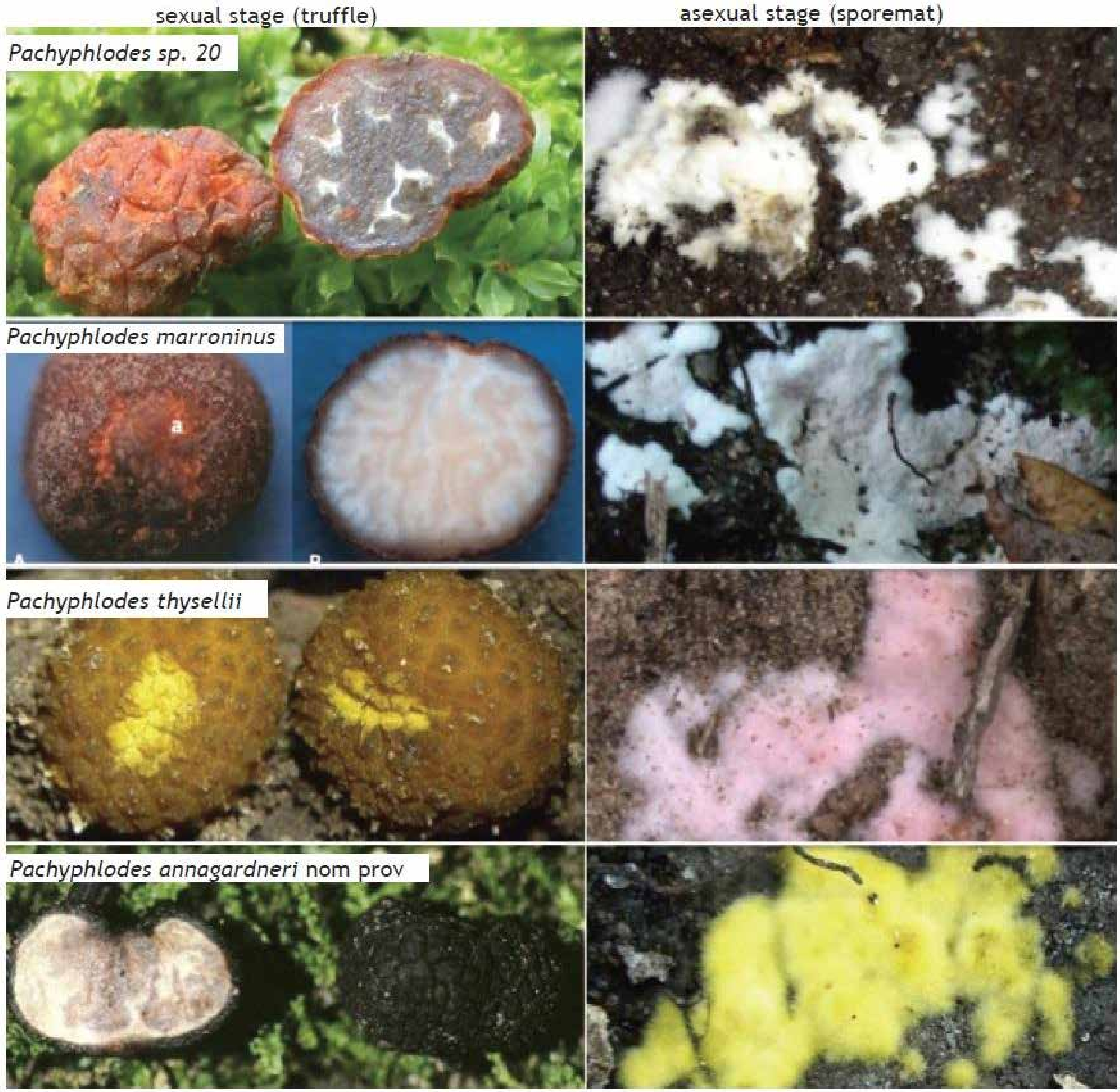


Figure 2 Sexual stage (left) and asexual stage (right) of Pezizales spp.

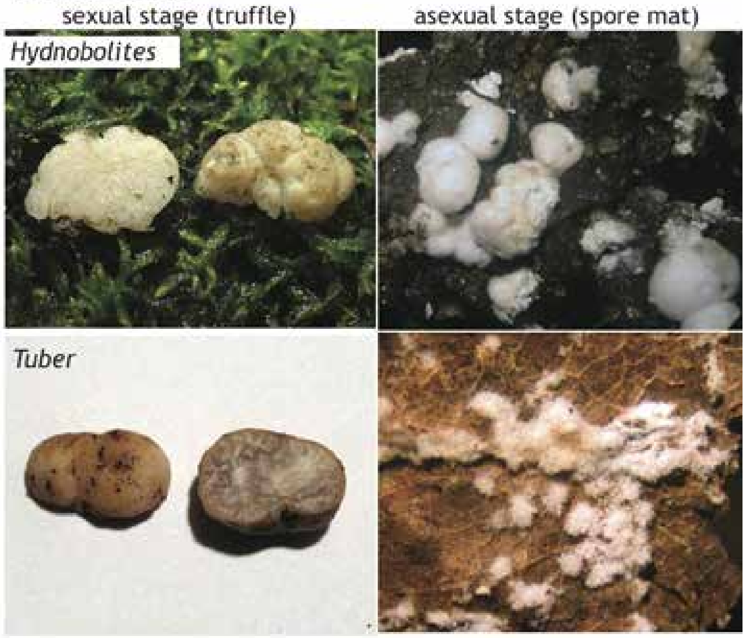


Figure 3 *Chromelosporium* spore mats with no known sexual stage

we found that at least 48 species in six truffle genera produced spore mats on woodland soils on four continents (North America and South America, Europe and Asia). We encountered novel asexual stages in the *Fischerula*, *Hydnobolites, Hydnocystis, Hydnotrya, Ruhlandiella, Pachyphlodes*, and *Tuber* lineages, and of a previously unknown lineage of ectomycorrhizal fungi for which no fruiting body has been described. The form of the spore mats differed among families and sometimes among genera within families. For example, *Hydnobolites* differed from other Pezizaceae in having a distinct covering (peridium) of interwoven hyphae (Fig. 2, top). *Tuber* and *Hydnotrya* were less conspicuous because their sporemats were neither as thick nor as densely assembled as Pezizaceae spore mats (Fig. 2, bottom). The lineage for which no fruitbody was known was affiliated with the Pezizaceae and consisted of at least four species in the U.S. and China. Two of these are depicted in Figure 3.

With DNA sequence analyses, we now knew how our collections fit into the relationships among the cup fungi, but how could they be placed according to older descriptions for which no sequences were available? This was a problem, because there is some superficial similarity between mitospores and mitospore-bearing hyphae in unrelated ascomycetes. For example, in 1973 Hennebert sorted through the erroneous placement of species in *Botrytis,* the asexual form of *Botryotinia* in the Helotiales. He addressed the misplacement of Pezizales asexual states in *Botrytis*, and summarized the morphological characters that signal their relatedness. The herbarium specimens of the types from which the semitospore genera were described were too old to sequence using our methods. The largest, most colorful of the sporemats in our study fit the descriptions and redescriptions provided by Hennebert for species of *Chromelosporium*. *Chromelosporium tuberculatum* is probably affiliated with the *Pachyphlodes* lineage which has "coralloid" conidiophores, and is found on forest soil. *Chromelosporium tuberculatum* is described as being variable in color, which may indicate that sporemats from multiple *Pachyphlodes* species were lumped under this name. *Chromelosporium caerulescens* is likely the same as Fig. 3 of this article, and has no known sexual stage.

The sexual stages of the mitospore genera *Glischroderma* and *Ostracoderma* await discovery. *Glischroderma* asexual forms have a true peridium of interwoven hyphae like that for *Hydnobolites* mitospore mats. However, *Hydnobolites* mitospores are smooth and often angular, while *Glischroderma* has mitospores and mitospore-bearing hyphae similar to that of *Pachyphlodes*. Some *Pachyphlodes* spore mats appear to have a thin, brittle peridium, similar to the *Ostracoderma* descriptions provided by Korf and Hennebert. However, samples collected in the upper Midwest do not appear to have a true peridium of interwoven hyphae. Careful comparsons should be made with herbarium specimens that represent *Ostracoderma* species described in the literature by Korf and Hennebert to understand what is meant by "peridium" for *Ostracoderma*.

Many questions have arisen in conjunction with spore mat identification. Has the sexual stage been lost in the lineage known only from spore mats and ectomycorrhizal root tips? Or have we just failed to collect and/or sequence the sexual stage? Are there more types that we don't recognize as Pezizales? Some of the asexual forms are only seen by microscopy. How can we view those that don't grow in culture? And the burning question: "What role do the spore mats play in the life cycles of these fungi?" Attempts to germinate the conidia have failed, as have attempts to inoculate oak and pine roots with conidia. These failures suggest that they may play a role in mating rather than colonization. If truffle fungi require opposite mating type nuclei in order to fruit, they must have a biological strategy for bringing the two mating types together. Perhaps the conidia, which are produced in high numbers above ground, increase the chances of being dispersed to the opposite mating type by rain, wind or arthropods. The ectomycorrhizal root tips are in large part located in the organic (top) layer of soil. Mitotic spores dispersed above ground may then be worked into the soil by animal activity or by water. If they end up next to ectomycorrhizal root tip hyphae from the same species with the opposite mating type, the nucleus from the mitospore can be assimilated into the root tip hypha. The cell walls of compatible hyphae can break down, and join together, thus sharing cellular contents. Once the compatible mating type nuclei are in the same cell, fruiting can be initiated. This scenario is not exclusive of other possible roles played by asexual spores. Another possibility is that spore mats may provide an alternative mode of dispersal when conditions do not favor fruit body production and maturation. Asexual reproduction is relatively fast, and can be completed after one good rainfall, while fruitbody maturation requires a longer time, and more frequent soaking rainfalls. Therefore, it takes just a few days for a spore mat to initiate and mature, while fruitbody maturation can take weeks.

A practical use of Pezizales sporemats is to include them in biodiversity studies, since they are easier to observe than truffles. There are a number of unrelated non-descript fungi on soil that can be confused with Pezizales spore mats, but some clues help differentiate them. *Tomentella* and their relatives (basidiomycetes) are usually brown, rust-colored or gray, while the Pezizales spore mats have some shade of white, yellow, pink, green, or blue. The blue basidiomycete crusts such as *Byssocorticium* do not produce a powdery spore mass to the same extent as the Pezizales spore mats. If you swipe it with your finger, you will come away with spores from the more mature Pezizales spore mats, while a mass of spores is less likely to swipe off from the basidiomycete crusts. This feature helps to differentiate the spore mats from *Sebacina*, whose white color makes it easy to confuse with Pezizales spore mats. The texture of *Sebacina* is tough and rubbery, while the Pezizales spore mats are powdery and fragile. Some of the basidiomycete soil crusts produce rhizomorphs (string-like mycelial cords), which are lacking in the Pezizales. Microscopically, the basidiomycete crusts eventually produce basidia, and many have clamp connections. The Pezizales spore mats lack either of these features, and produce conidia early in development (within a few days). Other conidial ascomycetes on soil are less easy to distinguish without the aid of microscopy. For example, hypocrealean anamorphs can appear similar. Some of these, such as *Isaria* are insect associated, which helps to distinguish them from ectomycorrhizal species.

[*Note from Patrick Leacock*: The next time you are enjoying the mycological treasures in the woods after a good rainfall, look for the brightly colored Pezizales sporemats along the walking path near oak (and other ectomycorrhizal) trees. Carrie Andrew and I collected several of these on forays last year and sent them on to Rosanne. We now know what some of them are. You may even see some that match the figures in this article.]

About the author: Rosanne Healy recently received her Ph.D. from the University of Minnesota. Her research on Ascomycota focused on evolution of the truffle lineage Pachyphlodes. She is now barcoding cup fungi in Iowa, and doing an ectomycorrhizal fungal project at Harvard. Her fieldwork has included surveys for truffles in Iowa (~40 species, 1997-2000) and Minnesota (~56 species, 2009-2012). From 2000-2007, with the late Dr. Lois Tiffany, she conducted surveys of Iowa macrofungi which culminated in an updated edition of "Mushrooms and Other Fungi of the Midcontinental United States," co-authored with Huffman, Tiffany and Knaphus (2008) and a collaborative website through the Ada Hayden Herbarium at ISU. http://www.herbarium.iastate.edu/fungi/
http://harvard.academia.edu/rosannehealy

In Remembrance of Dr. Kenneth Cochran, November 02,1923 - May 17, 2014

by Sandy Sheine

Dr. Kenneth Cochran received a PhD. in pharmacology from the University of Chicago and was then hired as a Professor of Epidemiology and Pharmacology at the University of Michigan Medical School where he taught for 37 years until he retired. Through his research in viral diseases he became interested in fungi and at the University of Michigan he took a course on fungi with Dr. Robert Shaffer. Ken and his wife, Marti, were invited by Dr. Shaffer and Dr. Alexander Smith to attend their first NAMA Foray in 1971 at the University of Michigan Biological Field Station (fondly called bug camp) in Pellston, Michigan. Together, Ken and Marti attended every NAMA Foray from 1971-1997, until they could no longer attend for health reasons. Ken served NAMA as Executive Secretary for ten years while Marti served as NAMA Secretary at the same time. In 1982, Ken organized the NAMA Toxicology Committee at the NAMA Foray in Stroudsburg, PA. Dr. Sam Mitchel from Colorado was the first Chairman of the Committee. Ken started the Mushroom Poisoning Case Registry for NAMA and maintained it for years until Dr. Michael Beug took it over. However, Ken always remained an active member of the Toxicology Committee. Ken and Marti were jointly given the NAMA Award for Contributions to Amateur Mycology in 2011.

Ken was also a member of the Mycological Society of America. He served as the liaison between NAMA and MSA for many years.

Ken and Marti were instrumental in founding the Michigan Mushroom Hunters Club in 1982. The club schedules about 70 hunts a year and Ken and Marti attended almost all of them every year. At the end of each hunt, Marti would identify the mushrooms while Ken compiled a species list. They were also identifiers and recorders at our annual Fungus Fest weekend. The cumulative annual lists were kept by Ken who made them available to our members. He often presented talks on poisonous mushrooms, the toxins that they contained and the antidotes for poisonings. He was the first one to be called by the Michigan Poison Control Center whenever there was a possible mushroom poisoning. Our club members always felt fortunate to have Ken and Marti as our wise and respected friends and advisors.

DEATH OF A GULF STATES MEMBER

Robert S. Williams, 74, of Sarasota FL, passed away on March 29, after a lengthy illness.

by David Lewis

Robert was born November 13, 1939, in New Orleans and spent most of his childhood and teen years in various places in Texas. He graduated from Texas A&I University in 1962 and received his MS in Electrical Engineering from the University of South Florida. He moved to Sarasota in 1964 and worked at EMR Telemetry for 30 years before retiring in 1994. In his retirement years he enjoyed traveling for pleasure and traipsing around the U.S. with Rosemary, chasing mushrooms for study, photography, and consumption.

Robert studied Gulf States mushrooms for many years and published “A Key to Some Boletes of the Deep South” (McIlvania, 4 (2) 1980). Robert hosted Rolf Singer one winter and co-authored, with him, a new species, *Leccinum roseoscabrum* (Mycologia 84:726.1992), and *Tylopilus williamsii* (Beihefte Zur Nova Hedwigia 102:1-90.1991) is named for him. Robert was a longtime Gulf States Mycological Society and North American Mycological Assoc. member, attended many forays, gave presentations, and won awards for his photographs. His contributions to the study of Gulf coast mushrooms are very evident. He was a good friend and colleague, and will be missed.

Rosemary Williams requests that remembrances be made in the form of contributions to the NAMA Endowment Fund, c/o Patricia Lewis, 262 County Road 3062, Newton, TX 75966.

Wanted! The Cat's tongue, *Pseudohydnum gelatinosum*

Dear Mushroom Seekers,

We are investigating the charismatic jelly fungus, *Pseudohydnum gelatinosum*, and realized very soon, that the California specimens have a different genetic signature than the specimens from British Columbia and from Europe. We also know that the Mexican specimens are different from the two other groups. But, we need your help to fill in the picture.

Questions we have:
Are there more than those three?
Where do these cat's tongues grow?
Does it matter whether it grows on a small twig or on top of a big log?
How can we recognize them without having to take out the genetic breathalyzer?

Keep your eyes open for this jelly, photograph it in the field, make notes where you found it, on what kind of wood, on small branches, on the top or the side of big logs, and write down the trees around it, dry it on a mushroom drier (yes, it turns to nothing but that is enough to work with), and send it to Berkeley [see address below].

We will of course let you know the results as soon as we have them!

Many thanks,

This project is brought to you by the curious mycologists:
Nhu Nguyen (University of Minnesota)
Roberto Garibay (National Autonomous University of Mexico)
Else Vellinga (University of California, Berkeley; ecvellinga@comcast.net)

Send your *Pseudohydnum* collections to:
Else Vellinga
Bruns Lab
111 Koshland Hall #3102
UC Berkeley
Berkeley 94720-3102
USA

Typical California fruitbody on small twigs

Mexican specimens on a trunk

Mycological literature: Ascomycetes

by John Plischke III

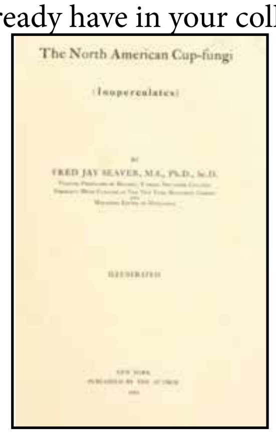
Every year I add a few mushroom books to my collection. The most recent addition to my collection is *Ascomycete Fungi of North America* by Beug, Bessette, and Bessette. It's an excellent book; see the reviews of it in the Mycophile. With the addition to my library of such a wonderful resource, I thought this year I should work on ascos a little more and give my new book a real workout.

Often I will use my books to look up an unusual species or two that I found on a day's hunt; on other occasions I will spend the season trying to learn a mushroom group better. This is going to be a year that I work hard on identifying Ascos. When I started out mushrooming I tried to learn the edibles like morels and chanterelles. To learn them I would get out my collection of books, open them up and lay them out all over the dining room table, then try to compare the chanterelle to the Jack O lantern and see what the photos in the books showed compared to my collection of what I thought were chanterelles. I would look at the photos in several books, read the descriptions and compare them to my mushrooms.

For Ascomycetes I am going to do basically the same thing, but instead of using field guides I will be using literature specifically on Ascos. So I will be using my copy of *Ascomycete Fungi of North America*, in addition to several other works. I will also be using *Ascomycetes in Colour Found and Photographed in Mainland Britain;* see the review in lasts year's *Mycophile* and the *Fungi of Switzerland vol. 1 Ascomycetes* and a few other Asco books I have acquired over the years.

Most of us cannot afford several dozen specialized books on a subject, especially detailed monographs that can often cost 100 to 200 dollars or more. So one of the tricks is to purchase a current book on the subject (and hopefully already having a few others) and supplement these with free literature that's in the public domain, or that the publisher, author, etc. has made available online. Some of these works are older, but are more specialized. They typically contain many more examples of a genus than a field guide will cover.

I am going to go over some of the free literature on ascomycetes that can be found online to supplement other asco books that you may already have in your collection.

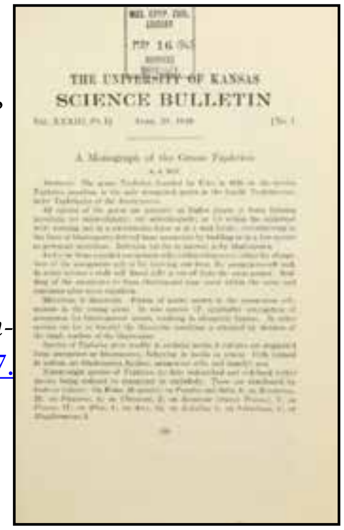

The North American Cup-fungi

(Inoperculates)


The North American Cup-fungi

(Operculates)

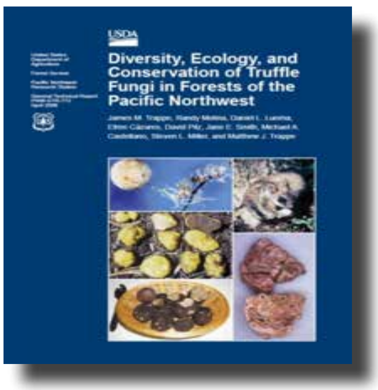
A long time ago when I started out mushrooming a friend of mine, Irene Ackerman, helped me with ascomycetes using her 2 favorite general guide books on the subject, *The North American Cup Fungi: Operculates and North American Cup Fungi: Inoperculates* by Fred Seaver. They are large books of over 500 pages each. As with many older books that are out of print, over time they seem to increase greatly in price. When I purchased my copies about 15 years ago I paid about 65 dollars each. Luckily, now they are available digitally for free from the internet archive at https://archive.org/details/northamericancup1951seav and https://archive.org/details/northamericancup00seav. Although they are somewhat dated, (the more current volume is from 1951), they are still very useful books. There is an update for the names at http://www.huh.harvard.edu/research/discomycetes/keys/revision2.html showing more modern names than listed in one of the books.



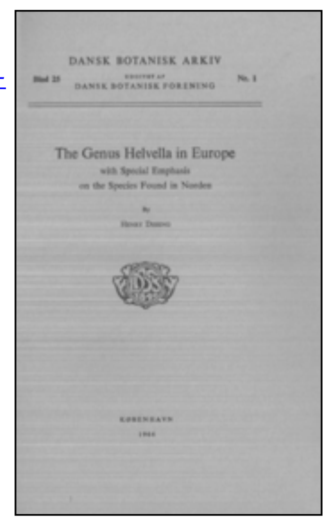
Sometimes more specialized ascomycete works are needed especially if working on a specific group of fungi. *Taphrina* is an interesting group that sometimes shows up on walks or forays. One of the more common ones is the Alder Tongue growing on Alnus, *T. robinsoniana*. *A Monograph of the Genus Taphrina* by Mix 1949 with 166 pages can be used to help identify some of them. It can be downloaded from The Biodiversity Heritage Library at http://www.biodiversitylibrary.org/search?searchTerm=A+Monograph+of+the+Genus+Taphrina#/sections.

Some of the taxonomy has changed since it came out. Most notably the European *Taphrina alni* is now called *T. robinsoniana*. See http://ijs.sgmjournals.org/content/53/2/607.full.pdf+html.

An interesting work *Diversity, Ecology, and Conservation of Truffle Fungi in Forests of the Pacific Northwest* by Trappe, et al 2009 is 202 pages and is available from the US Forest Service at http://www.fs.fed.us/pnw/pubs/pnw_gtr772.pdf .



Not all truffles are ascos. Some are basidios. The book's key does break it down into sections such as Ascomycota Truffle Genera in the Pacific Northwest. Pictured below is the Pecan Truffle - *Tuber lyonii*.



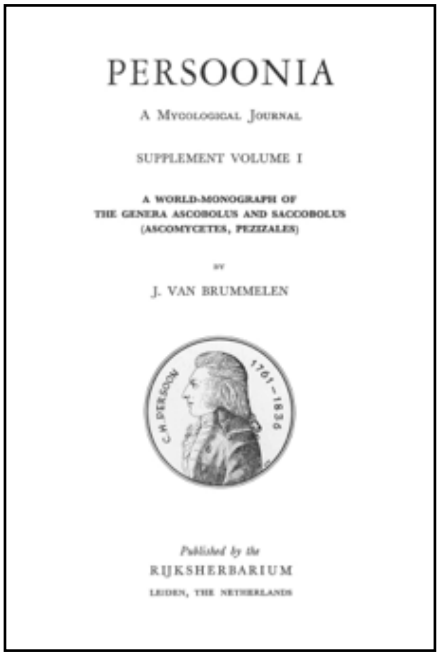
The Genus Helvella in Europe by Dissing 1966 172 pages is available from the Danish Biodiversity Information Facility http://www.multimedia.danbif.dk/literature/dansk-botanisk-arkiv/dansk-botanisk-arkiv-25.

It's also older and names have changed. A more recent name change happened when *Helvella lacunosa* was split into different species. See *The Helvella Lacunosa Species Complex in Western North America: Cryptic Species, Misapplied Names and Parasites*. It is available at http://nature.berkeley.edu/brunslab/papers/nguyen2013b.pdf.

Another work *Z. Mykol. Beih. 5 Die Gattung Helvella* from 1987 has 165 pages and is available from the German Mycological Society at http://www.dgfm-ev.de/sites/default/files/ZB070001Haeffner.pdf.

In the winter when there are not many mushrooms out and the ground here is covered with snow, I will often try to study some dung fungi by bringing a dozen or so pieces
deer or rabbit etc. dung home and placing them on damp paper towels inside old butter dishes. Often several different non asco mushrooms will appear after a period of time and eventually different cup shaped ascomycetes may develop. I often see *Ascobolus* species such as *A. furfuraceus*.

Cyberliber has a number of books and journals online for free reading. One of them is *A World Monograph of the Genera Ascobolus and Saccobolus* by Van Brummelen 1967 has 261 pages and is available to read at http://www.cybertruffle.org.uk/cyberliber/60637/index.htm.


PERSOONIA

A Mycological Journal

SUPPLEMENT VOLUME I

A WORLD-MONOGRAPH OF THE GENERA ASCOBOLUS AND SACCOBOLUS (ASCOMYCETES, PEZIZALES)

by

J. VAN BRUMMELEN

Published by the RIJKSHERBARIUM

LEIDEN, THE NETHERLANDS

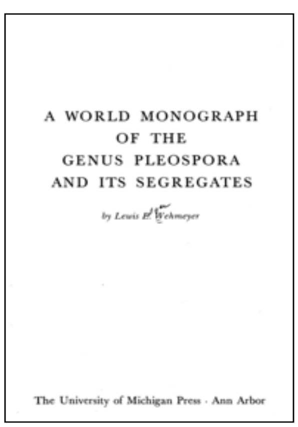

Beihefte zur Zeitschrift für Mykologie

Die Gattung Helvella

Zur Verbreitung und Ökologie der Gattung Russula

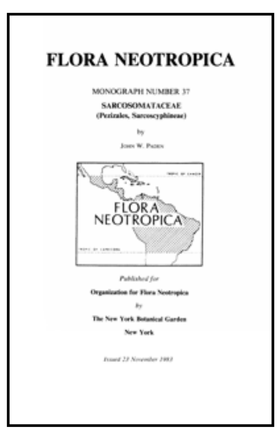
A World Monograph of the Genus Pleospora and its Segregates by Wehmeyer 1961 456 pages is available from the HathiTrust Digital library at http://babel.hathitrust.org/cgi/pt?id=mdp.39015006930682;view=1up;seq=7.

Although not written for our area *Flora Neotropica Sarcosomataceae #37 Sarcosomataceae (Pezizales, Sarcoscyphineae)* by Paden 1983 has 17 pages. It's available to read at from Jstor at http://www.jstor.org/discover/10.2307/4393775?uid=3739864&uid=2&uid=4&uid=3739256&sid=21103688708793. One of the more interesting mushrooms in the publication is *Sarcosoma mexicana*. At the NAMA foray at Scotts Valley, California in 2012, a mushroom labeled as such showed up on the display table. It's important to look up some of the mushrooms that are found and in this case, the mushroom was identified incorrectly. It turns out it was *Urnula padeniana*. Ascomycetes.org has an online Journal available at http://www.ascomycete.org/en-us/journal.aspx . Inside vol 5 (1): 13-24 Janvier 2013 there is an excellent article on the confusion of the 2 species. It is available at http://www.ascomycete.org/Portals/0/Volumes/AscomyceteOrg%2005-01%2013-24.pdf.


A WORLD MONOGRAPH OF THE GENUS PLEOSPORA AND ITS SEGREGATES

by Lewis E. Wehmeyer

The University of Michigan Press · Ann Arbor


FLORA NEOTROPICA

MONOGRAPH NUMBER 37

SARCOSOMATACEAE (Pezizales, Sarcoscyphineae)

by

John W. Paden

FLORA NEOTROPICA

Published for

Organization for Flora Neotropica

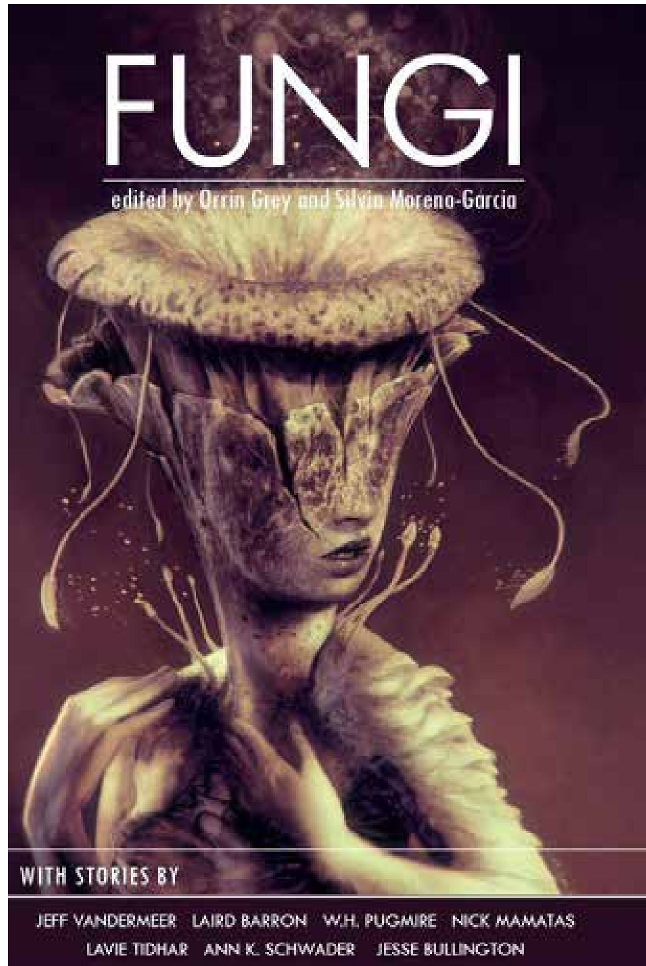
by

The New York Botanical Garden

New York

Hopefully, with a little luck, this will have been a good year for Ascos such as morels and a good time to start studying ascomycetes.

FUNGICIDAL TENDENCIES



Review of *FUNGI*
Edited by Orrin Grey and
Silvia Moreno-Garcia Innsmouth
Free Press, 2012.

by Barbara Ching

When it comes to weird fiction and fantasy, fungi have it covered. They sprout from underneath, spread over the top, and their visionary powers are never far from any surface. This anthology devoted to them features many fatal encounters with fungi, some touching and thought provoking, some predictable mycopocalypses, and some nearly incomprehensibly eccentric shroom trips. In the hardcover version, which includes 3 more stories than the paperback or e-book, many of the selections are followed by a woodcut-style illustration done by Bernie Gonzales. These images reinforce stark black and white contrasts between good and evil, inner and outer space, the real and the hallucinated, the poisonous and the delicious, and life and death. As the editors put it in their brief and lucid introduction, terror and delight struck them as "an appropriate combination for assembling an anthology of fungal stories."

Innsmouth Press specializes in fiction in the H.P. Lovecraft tradition and some of the stories make this lineage quite clear with allusions to Lovecraft's mythology. As a mycophile, I found the mycophobia of many of these stories excessive but I have yet to tire of Oliver Wetter's lovely cover illustration. The strongest selections for me were the metaphysical, speculative, and contemplative stories that explore fungicidal tendencies but let us rest in peace. The opening story, for example, John Langan's "Hyphae," describes the dementia and death of the narrator's father as a transformation into mycorrhizal fertilizer. To the narrator, and the reader, the decay is at first banal, then terrifying, but finally serene, described as "the sound of something come home." Jane Hertenstein's Wild Mushrooms, perhaps the least weird of the stories, is my favorite because it locates both love and fear of mushrooms in our own histories and hearts. The narrator, a daughter of Czech immigrants, grows up ashamed of her parents' accent and customs and the dirt encrusted on her hands due to her role as the mushroom cleaner after her parents' happy foraging. So entwined are the family and fungi that oyster mushrooms colonize the damp basement of their rural home. In his old age, her father disappears on a mushroom hunt. Months later, he is found rotting in the woods with a morel sprouting at his foot. The moldy family home is sold as a teardown and her mother returns to her homeland where she forages to her hearts content. The narrator lives in Chicago, eating mushrooms, when she does at all, bought in Styrofoam. Grief doesn't fruit in her until she spies, in an expressway embankment, a shaggy mane. Stuck in traffic with plenty of time to harvest it, she leaves it by the road, still behaving like the embarrassed child of immigrants. "I couldn't think of why I wanted it and the more I pondered, the more I lost my nerve. Maybe it was the tears, blinding me." In the next sentences, the final lines, the narrator confesses to a subsequent haunting by mushrooms, "in my blood, running through my veins, feeding off the detritus inside me." Loss and rot joins her finally and permanently to her family.

Art itself also creates a heady, well-balanced blend of oppositions. In the biographical note to "The Shaft through the Middle of It All," Nick Mamatas explains that he "writes about fungi because of his avid interest in altered states of consciousness. He writes at all for the same exact reason." This story describes a Lower East Side garden kept verdant by a Puerto Rican woman's mastery over molds. She also uses that mastery to sicken the inhabitants of a gentrifying high rise that destroys her garden. The difference between flourishing and floundering, she explains to her son, is knowing the right words, the words to say when "the fire burns, and the mold enters the breath. Words I'll teach you." The role of art becomes even more explicit in "The Pearl in the Oyster and the Oyster under Glass," by Lisa M. Bradley. The protagonist, tellingly named "Art" is a bear-like wild creature in human form who leads myco-remediation efforts in various disaster areas. The story closes on the shores of Lake Michigan where oyster mushrooms create a sort of infinity for the planet and its creatures. Frugal and resourceful, the Midwestern clean-up crews harvest the mushrooms after they had been "forced to feed on the poison of human error." They feast on these deep fried oysters at supper club dinners. When Art joins them at the banquet table, he sees in the mushrooms gleaming flesh the "colour of infinity." After his first bite, "he swallowed and gave thanks. He was not at peace, but he would eat his piece, and the next, and the next." In Paul Tremblay's "Our Stories Will Live Forever," a writer, hoping for immortality through his writing, begins a plane ride roiled by his fear of flying and his tender artistic ego. His hopes and fears come true, it seems, as he eats a mushroom offered to him by a neighboring passenger. As the plane goes down, his manuscript along with it, his ego and anxiety dissolve into a cosmic optimism of mycelium and hyphae, "fruiting bodies" that communicate in "the tongues of geological age."

The collection concludes with a list of other mushroom-themed fiction, movies, and television shows. I don't know how much of the audience for this type of fiction overlaps neatly with mycological society membership, but I am struck by the way so many of these stories explore the kinds of non-fictional experiences that Eugenia Bone describes in the last chapter of her *Mycophilia: Revelations from the Weird World of Mushrooms* (2011). "Maybe it is no accident that I became obsessed with mushrooms," she writes. "I think we all search for a way to connect with something bigger than ourselves, and mycology opens that window for me. I may have started out interested in mushrooms because I liked to eat them, but I ended up with a more profound understanding not only of the natural world but of myself as a symbiotic organism living within it." For that matter, the stories may expand and illustrate what we experience on forays or when we look in a mirror. In *Fungi*, mushrooms and fungus animate our imaginations, make us human even as they connect us to other life forms, link our past and future, root us to this world and let us see beyond it.

"ENERGIZING" SPORTS DRINK FROM MUSHROOMS

North Korean "scientists and technicians" working at the country's Central Mushroom Institute of the State Academy of Sciences have invented a new sports drink from cultivated mushrooms (genus and species not identified), which allegedly helps athletes quickly recover from sporting event exertion. "This natural drink is very effective in enhancing physical ability of sportspersons and in recovering from their fatigues."

On an early June, 2014 visit to a mushroom farm, North Korean smiling despot Kim Jong-un is surrounded by adoring, screaming and weeping female workers at the site. What a fungi. http://theweek.com/speedreads/index/262561/speedreads-north-korea-concocts-very-effective-sports-drink-from-fungus#axzz33mTSFvoq

Wildacres Foray 2014

The Wildacres 2014 Foray is scheduled for September 11-14, 2014. This foray is held at the Wildacres retreat center located just off the Blue Ridge Parkway near Little Switzerland, not to far from Spruce Pine, North Carolina. Mycologists this year are Brandon Matheny from the University of Tennessee, and Coleman McCleneghan from Boone, North Carolina and the Department of Biology at Appalachian State University. We are very thankful to have these two knowledgeable southern mycologists join us for this foray. Wildacres is renowned for the identification of new species to the foray and to the identification of new species to the mushroom kingdom. You will have the opportunity to search for fungi along the creek sides of Armstrong Creek and Crab Tree Falls, in the highlands of Mount Mitchell, and in many other areas along the beautiful Blue Ridge Parkway. This intimate gathering is sought after by professional and amateur mycologists from across the country. Please register soon as this foray is a sell out each year. Please contact Glenda O'Neal, (423) 246-1882 for more information. Registration fee for this foray is $235 per person and includes three nights lodging and eight meals-double occupancy.

Helen Miknis Memorial Foray

Mont Alto, Pennsylvania, July 25-27, 2014

Again this year, the Mont Alto campus of Penn State University will serve as headquarters for the Eastern Penn Mushroomers' Helen Miknis Memorial Foray. Nearby sites in the Michaux and Tuscarora state forests provide ample opportunities for foraying in a variety of habitats. The Foray begins at noon on Friday, with an early-bird foray Friday afternoon. A full-day foray and several half-day forays will be scheduled on Saturday. John Plischke III will serve as principal identifier, assisted by Dorothy Smullen.

On Friday evening Mr. Plischke will give a presentation on free Internet sources for mushroom identification. Accommodations will be in the Penn Gate II dormitory at Penn State Mont Alto. Meals, beginning with dinner on Friday and ending with breakfast on Sunday, will be in the nearby Mill Creek Café on the campus. Registration deadline for the Foray is July 18, 2014. The registration form is available online at www.epennmushroomers.org .

NEMF FORAY: Thursday, August 7 to Sunday, August 10, 2014

The Maine Mycological Association will host the 2014 NEMF foray at Bowdoin College in Brunswick, Maine.

Bowdoin College is a beautiful and historical liberal arts college located in the mid-coast Maine town of Brunswick. It is easily reached by Interstates 95 and 295, and lies about one and a quarter hours from the New Hampshire border. It is within easy range of a number of different habitats including the Maine coast, central Maine woodlands and the foothills of the Appalachians.

Dr. Seanna Annis, mycologist and plant pathologist at the University of Maine at Orono, will be the host mycologist. Presenters will include Renée Lebeuf, Raymond Archambeault, Greg Marley and Michaeline Mulvey.

The foray is named in honor of the late mushroom guru Samuel Ristich.

Those interested in selling mushroom-related items at the foray should contact Anne Rugh. We anticipate having volunteers available to oversee the exhibition area to add security and assist with sales when vendors aren't present. The charge to vendors will be $10.00 per table.

The Amtrak Downeaster and Concord Coach Lines serve Brunswick, and their station is just one block from the College. There will be a free shuttle service from the station to the dormitories. Please contact Delmar Small with questions about the foray to be placed on a list to be notified when registration opens, or to schedule shuttle service.

North American Mycological Association
c/o Ann Bornstein
61 Devon Court
Watsonville, CA 95076

Change Service Requested

Newsletter of the North American Mycological Association

THE MYCOPHILE

Helvella crispa Photo and text by Alan McClelland, photographer and webmaster of the Ohio Mushroom Society.

Helvella crispa, also known as the White Elfin Saddle is an exquisite Ascomycota fungi species that is found throughout North America, Central America, Europe, Asia, North Africa and New Zealand. It prefers to fruit solitary or scattered near very rotten logs, coniferous and somewhat disturbed wooded areas during summer and fall seasons. It is said to be a popular edible in some parts of Mexico after several parboilings and cooking, although it having many of the same toxins found in the *Gyromitra* species, it is best avoided.