

SPORE PRINTS

BULLETIN OF THE PUGET SOUND MYCOLOGICAL SOCIETY
Number 412 May 2005



TRADITIONAL REMEDY GOES UNDERGROUND *Phuket Gazette* via Denny Bowman

AMNAT CHAROEN - A woman in this northeastern province of Thailand was the latest to take a controversial folk remedy to cure herself of the effects of some poisonous mushrooms she gathered and ate.

She was recently pictured on the front page of a Thai-language newspaper buried up to her neck, mouth agape, as she underwent the treatment. Before she was buried, villagers stripped copper filaments from electrical cables and ground them up in a mortar. The metal was then mixed with a variety of herbs and given to the woman, who ate the concoction. She was then buried, which the villagers believe allows the surrounding soil to absorb the toxins released through the skin once they are liberated by the copper. After an unspecified period of time the patient was then dug up and, with a nod to modern medical science, rushed to a hospital.

Local public health officials in the province have tried without success to dissuade residents from using this potentially dangerous treatment, but old habits die hard and local people still believe it is a miracle cure for mushroom poisoning.

Meanwhile, the officials can do little except warn against using the treatment and advise people to exercise caution when eating wild mushrooms.

PRESIDENT'S MESSAGE

Ron Post

Many of you have asked me what started my interest in this club, so I will tell it again. I dropped most of my high school science classes to study literature, but my curiosity about science was unabated. When I saw my first couple of PSMS exhibits at the Pacific Science Center, I realized that there was room in the world for those of us who were not so expert, or even adequate, at science.

I remember talking on the phone to a faculty member when I was a student (in the early 80s) reporting for the *UW Daily*. His name was Joe Ammirati. He suffered through my questions with the grace of a saint but the impatience of a scientist who wanted to get on with helping the real students—some of them amateurs. We are still fortunate to have Dr. Ammirati as our advisor.

The late "Gib" Austin asked me to help with publicity the year after I joined PSMS. I felt it necessary to interview and get to know as many leading members as I could, and I got to know some of the reasons they had joined. I remember hearing from Carl Hermanson all about his study of color in fungi. And Ben Woo gave me his opinions on the opportunities (and setbacks) confronting amateur science in this country. I listened carefully to people at meetings and field trips, often attended by more than 100 members. Having this knowledge of PSMS traditions, I can spend my second year as president continuing to push two priorities: Fostering the development of identifiers to serve the club and the public (again, thanks to Dr. Ammirati for his efforts) and

doing my best to keep up the society's traditions, such as maintaining our library.

In my first year I found these two goals somewhat challenging, partly because of vocal suggestions that PSMS should sell our microscopes and give away our library. In the makeup of the current board I see a deep-seated interest in amateur science and upholding the club's traditions.

Many of us, though, as pot hunters, just like to hang out together and eat. Almost a quarter of our membership attended the Survivor's Banquet in March and did just that. Yum.

I confess that my interests are in the ecological and scientific realm. One of my dreams is to help initiate a permanent display for the annual exhibit dealing with conservation and ecology.

After a year in this office I still am surprised that so many members are willing to take on one responsibility after another. A handful of wonderful people turns into a dozen, then fifty. The new board members (as well as the existing members) are prime examples of this spirit.

Even if your time is short, you may want to learn more about the work involved in our Society. I'm at your service. Call me at (206) 527-2996, and I can refer you to the proper resource.

COPPER CANYON MUSHROOM TOUR

Hildegard Hendrickson

Visiting the Copper Canyon in Mexico had been on my traveling agenda. When I saw in *Spore Prints* that a mushrooming expedition was scheduled for August 15–22, 2004, I signed up. My expectations about the scenery and the fungi were exceeded. Mexican's Copper Canyon is many times larger and deeper than the American Grand Canyon, and in the 7000 to 8000 feet elevation of the Sierra Madre, the rains had come in time to produce an abundant fruiting of fungi for us to collect. Four outstanding mycologists (Drs. Arturo Estrada, Joaquin Cifuentes, Adriana Montoya, and Alejandro Kong) accompanied the seventeen participants and two organizers (Gundi Jeffries and Erik Purre). On Thursday, Dr. Gaston Guzman and his wife, Isabel, joined us at Creel to start a vacation in the Copper Canyon. Dr. Guzman is considered the founder of modern mycology in Mexico. A red



Colorful Mexican mushroom baskets

bus took us to all places in the canyon hill country, except into the Copper Canyon, where we rode the famous Chihuahua–al Pacifico train.

Some participants had arrived early

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PUGET SOUND MYCOLOGICAL SOCIETY

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CALENDAR

Apr. 30 Circle 8 Field Trip
May 8 Mother's Day
May 10 Membership Meeting, 7:30 PM, CUH
May 13-15 Cispus Foray
May 16 Board Meeting, 7:30 PM, CUH
May 21 29 Pines Field Trip
May 24 *Spore Prints* Deadline
May 30 Memorial Day
June 4 Swauk Creek Field Trip

BOARD NEWS

Dennis Oliver

The April meeting of the board of trustees welcomed four new members—Steve Haynack, Molly Bernstein, Lynn Phillips, and Carissa Thornock—and the return of seasoned officers Patrice Benson and Dennis Oliver. The treasurer's report by John Goldman showed an increase as many members have shaken off the winter doldrums and are paying their dues. The preparations for the spring foray are progressing and we are down to the final details. It should be an excellent event. Ron Post proposed hiring an information science student this summer to develop a database for the library. The database would be used to inventory and track books. Steve Bigelow will be stepping down as webmaster because of demands of his new job. The board approved participation in this year's Issaquah salmon days. The board has also agreed that it would be nice to have a local speaker for this year's mushroom show. A number of possible candidates were discussed, and Ron Post will investigate further.

MEMBERSHIP MEETING

Tuesday, May 10, 2005, at the Center for Urban Horticulture, 3501 NE 41st Street, Seattle

May is the month of morels, and we will be celebrating this delectable and interesting fungus with a multimedia Morel Happening at PSMS. In addition to a panel of morel hunters and experts ready to reveal the secrets of morel hunting, there will be cooking and tasting, photos, artwork, and artifacts. Please come a little early and bring morelabilia which will be placed in the morelabilia display for others to admire and covet. Anything goes.

Forestry Officer Kelli Burke will briefly explain the new limits which are in the process of formation through the State Park system. She will be glad to answer questions and listen to comments.

Please bring something to share after the meeting if your last name begins with the letters A-L.

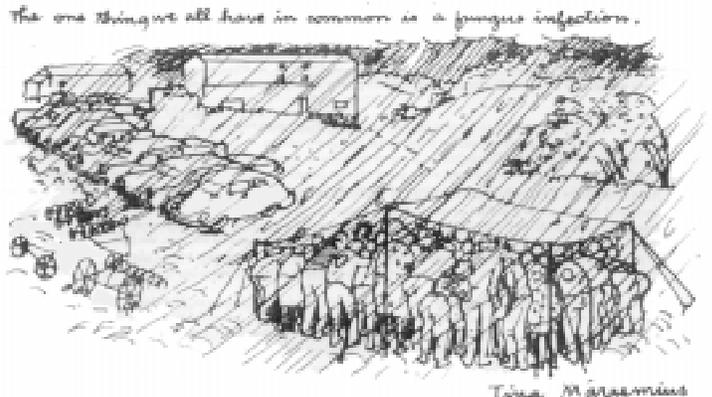
FIELD TRIP HOSTS NEEDED, SPRING 2005

Cathy Lennebacker

Once again we are looking for some friendly folks willing to give some time and effort to make our club work. Field trips are an excellent opportunity to make friends, help new people get started, spend a fun day, and fulfill a vital part of the club's programs. This is not rocket science. A host picks up some goodies and arrives by 9 AM with the stocked PSMS host box. The box includes signs to put up so people can find you. If it's cold weather, go ahead and make a campfire. We ask that people sign in on the sheets included in the box. An all-day field trip has a place on the form to find out how many are staying for the potluck (between 4 and 6 PM, your call). The host box includes a camp stove and coffee fixings or you can pick up coffee at Starbucks, Safeway, wherever. There is also instant coffee in the box if you want to go low key. All questions cheerfully answered. Just call (425) 742-3163.

My daughter is having a baby in the middle of May, so the host box will be in the PSMS office at CUH.

Thanks so much to all of you who have done this in the past. You did a super job! Kudos to Mrs. Birkebak and Hildegard Hendrickson, who generously hosted the first two Verpa trips this spring.



SPRING FIELD TRIPS

Cathy Lennebacker

April 30

Circle 8 Ranch

(elev. 200 ft, 75 miles east of Seattle)

Twenty miles east of Snoqualmie Pass on I-90 take exit #74 West Nelson Siding Road. Turn right. After 2 miles look for the sign to Circle 8. It's two interlocking squares, which is the symbol for square dancing as that is what this place really does between Memorial Day and Labor Day. Turn right, follow the road through the woods, and look for the PSMS signs. There will be a usage fee of \$3 per person payable to the host.

May 21

29 Pines Forest Camp

(elev. 2500 ft, 102 mi. east of Seattle)

need one or more hosts

Take I-90 over Snoqualmie Pass to exit #85. Follow signs to Hwy. 970 east of Cle Elum for 2.5 miles. Turn left on Hwy. 970 and go 4.5 miles. Turn left onto Teanaway River Road. Continue about 6 miles, bearing right at the fork onto the Teanaway North Fork Road and continue another 6 miles just past the new fish hatchery on the left and Jack Creek. Twenty-Nine Pines is on the left. There is no shelter or water, but there are outhouses. You may certainly use the Lennebacker picnic shelter if it looks like rain. Camping is free at this lovely riverside campground. There is lots of free firewood nearby.

June 4

Swauk Creek Campground

(2500 ft elev, 110 mi. east of Seattle)

Swauk Creek campground is 4 miles south of Swauk Pass between east-west routes I-90 and Hwy. 2.

Driving directions: Take I-5 over Snoqualmie Pass to exit #85. Follow Hwy. 10 east of Cle Elum for 2½ miles. Turn left onto Hwy. 970. After 7 miles bear left onto US Hwy. 97 (north) and continue another 16 miles. The campground is on the right. Tony Tschanz is hosting, bless his heart.



MACDONALD PARK FIELD TRIP REPORT

Hildegard Hendrickson

Traditionally, the first PSMS field trip of the spring season is to MacDonald Park on the Tolt River in Carnation. We always advertise that this trip will be held rain or shine, mushrooms or no mushrooms. This year, the weather took us literally, and March 26 produced record rain. Twenty hardy mushroomers checked in. Hildegard Hendrickson gave a short lecture on fungi collecting basics, and we all took off for collecting on private property. Within minutes of arriving, a small *Ptychoverpa bohemica* was spotted, so the newcomers could see what we were looking for. Because of the dry weather during the prior weeks, the mushrooms were barely poking through the duff. Everyone found a few verpas. Two experienced members checked the area on the shelter side of the river and came back with empty baskets.

When we returned to the shelter, Brian Luther identified our finds, accompanied by explanations about the structures, spore size, etc. PSMS is so fortunate to have an identifier with Brian's expertise and his willingness to share his time with us. Every field trip with Brian is a mushroom course. I think everyone who came was glad they did, even though it was raining hard the whole time and there were few mushrooms.

The host for the field trip had to cancel, because she still had a fever. We wish her a complete recovery so she can participate on later field trips. Most people brought goodies: a stollen, a box of doughnuts; Pink Lady apples; candied ginger and dried figs; coffee, and raspberry juice.

The following mushrooms were identified:

<i>Cyathus</i> sp.	<i>Ptychoverpa bohemica</i>
<i>Fomitopsis pinicola</i>	<i>Schizophyllum commune</i>
<i>Mycena</i> sp.	<i>Trametes versicolor</i>
<i>Pleurotus ostreatus</i> (too far gone)	<i>Xylaria hypoxylon</i>
<i>Polyporus elegans</i>	



Copper Canyon Mushroom Tour, cont. from page 1

and toured the city of Chihuahua, capital of the largest state in Mexico of the same name, famous for boots of all colors made of alligator, ostrich, anteater, and other exotic leathers. It also was the place where Pancho Villa first started the insurrection that became the Mexican Revolution of 1910. During the welcoming dinner and introductions, many participants renewed their friendships from previous Mexican mushroom tours in other locations.

On the way to the Sierra Tarahumara, we ate breakfast at a Mennonite restaurant. The local Mennonite Community is involved in agriculture and apple growing. Many speak better German than Spanish. In the Sierra Tarahumara we met Raramuri (which means: people who run fast) who are among the poorest people in this part of Mexico. Women and children dressed in a rainbow of colors, showed their handcrafted wares, and many of us bought shawls, belts, beaded bracelets, etc. The collecting baskets provided by the tour organizers had been purchased here.

Our first destination was Cabanas Noritari, elevation 7800 feet. We stayed in comfortable cabins with running water and electricity generated from solar power. It is located ten miles from the small town of San Juanito, where they had celebrated a mushroom festival the day before. The festival was started to educate the local community in identifying mushrooms, since there are a dozen fatalities a year from *Amanita* poisoning.

On the way to Creel we forayed around the beautiful Lake Arareko. Our red bus, then on a gravel road, took us to the "Valley of the Monks," where glacier-carved rocks have taken on many forms. Some look like monks and other identifiable items, and some look like mushrooms. Freddy the bus driver showed us where to apply pressure on the multi-ton mushroom cap so as to get it rocking.



Mushroom rocks in Valley of the Monks

After the Wednesday morning foray, we had a delicious lunch at the luxurious Copper Canyon Sierra Lodge, which chooses to not have electricity. After lunch we visited Cusare, an indigenous Tarahumara village where Jesuit Fr. Verplancken established a clinic to help local children. He also restored the crumbling village church and rescued major classic religious artworks from the church, which are displayed in the museum. Fr. Verplancken still carries on his good works.

On Thursday after returning to Creel, from our foray to the famous Cusare waterfall, we could visit museums (a cultural one, and one featuring fossils of a dinosaur found there), buy more souvenirs, use an ATM, and sip a cappuccino.

Another side trip which I did not participate in but wished I had, was from Creel deep into the Copper Canyon to a hot springs. It turned out that the hot springs were not so hot. But that the hour long ride in a four-wheel van was. The switchback turns on a gravel road were so sharp that the van had to back up to successfully make the turns. The participants met a native family at the hot springs. For the return trip the children asked for a ride. Since

there was no room inside the van, the children rode on the roof. I was told there are no liability laws in Mexico.

The train ride into the Barranca del Cobre alone could have been the topic for this article. The train is the only transportation into the Copper Canyon, crossing over 100 bridges, trestles, and tunnels and making a big loop while dropping from 8000 feet to 1500 feet. The scenery is unique. The train stops at Divisidero where we could disembark and go to the lookout to get a spectacular view of a most dramatic and deep section of the canyon. Our destination was Bahuichivo, where a small bus and van took us over a dirt and gravel road to the Hotel El Paraiso del Oso, where we stayed overnight, before returning to Creel and Chihuahua, where the tour ended Sunday.

Now let me get to the mushroom hunting. The middle of August is the rainy season in the Sierra, and the rains had come on time and the mushrooms fruited profusely. It rained most nights, but the days were sunny and pleasant around the mid-seventies. I never had to put on my rain gear. On Monday, we collected nearly fifty varieties of mushrooms around Cabanas Noritare. For me the surprise was the 12 species of *Amanita* collected, including *A. verna*. Our experts identified our finds, and the edibles were included in our dinner. For the first time I ate Amanitas: *A. caesarea* and *A. rubescens*. Other edibles included *Boletus edulis*, *Cantharellus cibarius*, *Tricholoma equestre*, *Hypomyces lactifluorum*, *Helvella crispa*, and a *Leccinum* species. Except when we stayed in Creel, our edible finds were included in the evening meal. Deep in the Barranca del Cobre, we were treated to an outdoor discasa dinner (a regional specialty) which is a stir fry, cooked on a big wok-like disc over a bonfire, with everyone sitting around. After dinner, the music started and everybody partied.

Dr. Cifuentes gave a slide-illustrated lecture of biological relationships and diversity, with a focus on fungi and their role and importance. Dr. Adriana Montoya lectured on a study of the local indigenous people and their traditional use and knowledge of mushrooms. After the tour, every participant was provided with a list of the fungi found in each location where we forayed. The most treasured find for Dr. Arturo Estrada was a tiny Bird's Nest fungus, visible only with a magnifying lens. My find of a single *Lactarius indigo* was welcomed by our mycologists. They said it was rare.

I wrote this article because I wanted to highlight that a mushrooming event can include both forays and beautiful scenery and culture. I don't speak Spanish, but did not hesitate to make reservations, because the organizers assured me that I would get along fine. This tour was well organized. Once I checked in at the meeting place in Chihuahua, everything was taken care of. The accommodations everywhere were comfortable with running water and electricity, and the local food was excellent. The repeat participants (from excursions with the same organizers) attest that they enjoyed expeditions with these organizers. Since the tour, I have communicated with several new friends. For the destinations of future trips, go to Google and search for "Mexican Mushroom Tours."

LOS ANGELES COUNTY BANS WILD MUSHROOM SALES

Southland Farmers' Market Association,
www.cafarmersmarkets.org,
via *The Sporeprint*, L.A. Myco. Soc., April 2005

21 March 2005 - The Los Angeles County Department of Health Services recently took the unprecedented action of banning sales of wild mushrooms in certified farmers' markets. The reason given

was that the source of the wild mushrooms was not “an approved source” according to their definition. Protests from customers and calls to the County Supervisors advising them that all wild mushrooms come from the same source brought pressure on the Department of Health Services. In the end, the Department backed off its ban on wild mushrooms in Los Angeles County. The reason they gave was that it was a State matter to develop standards for approved sources of wild mushrooms. We think the Department simply got in over its political head on a decision that made sense to no one.

Much credit for the change in the Departments decision goes to David West, a long time vendor of wild mushrooms at the Santa Monica Certified Farmers’ Market, who was essentially put out



of business and who was persuasive in getting customers and supporters to call and write on his behalf. Laura Avery, President and Supervisor of the Santa Monica Farmers’ Markets, championed David’s cause and was significant in getting the word out to radio listeners and market participants.

FLAMING GEYSER FIELD TRIP Joshua Birkebak

The morning of April 2 was cool but sunny as PSMS members arrived at the shelter to see the river higher than in years past. The Geyser was still flaming despite the wet ground. Twenty two members attended, many of them on their first field trip with PSMS. After an informative and interesting talk by Hildegard Hendrickson, a first group walked the path by the river in search of the Early Morel, *Ptychoverpa* (= *Verpa*) *bohemica*. A little later the Park Ranger stopped by the shelter and informed a second group that the season seemed to have started a few weeks ago, and that we may well be catching the tail end of the verpas at best. He pointed out how large the cottonwood leaves were now, and made a recommendation to the second group to one of his favorite spots in the other direction.

After a couple of hours of hunting, members of the initial group began trickling back to the shelter, most with a small number of verpas and a few with a dozen or more. The second group was not as successful, yet Hildegard assured all that the collecting was better this day than on the previous week’s trip to Carnation (more a matter of timing). As far as other edibles go, collections were found of the Oyster Mushroom (*Pleurotus ostreatus*) and The Mica Inky (*Coprinus micaceus*), though neither in considerable quantity. Other species identified were *Tuburia furfuracea*, *Mycena leptcephala*, *Psathyrella candolleana* grp., *Schizophyllum commune*, *Polyporus varius* grp., *Nolanea sericea/verna* grp., *Stereum* sp., *Panaeolus* sp., *Polyporus badius* grp., and *Trametes versicolor*.



The most exciting non-fungus find was an old ammo canister half buried under moss in the forest. Not knowing what it could be, the finder called in the Park Ranger, who later retrieved it. A bit later, the park official showed up and explained the canister’s strange placing. It turns out that it was a Geocache, part of an internet-based “game” where one looks for certain “treasures,” often an old ammo canister, involving coordinates that one downloads onto their GPS device. Finders are to sign the ledger, trade some small item from the can, and replace it. As host I “signed” PSMS in and left a pamphlet with some of our club’s information. We will have to keep an eye out for it next year.

PROPOSED CHANGES TO MUSHROOM PICKING REGULATIONS IN WASHINGTON STATE PARKS

John Goldman

Washington State Parks are considering changes to their mushroom picking regulations. Currently the regulations state that picking for personal consumption is allowed and no maximum quantity is specified. However the definition of what constitutes commercial picking is not defined, and last year the park system experienced problems with people who raked for matsutake and trampled habitat collecting large amounts of chanterelles, boletes, and morels. The other problem they face is that State Park lands are not to be used for making money by commercial collection of the habitat and that enjoyment is to be for all. So they feel that they need to make a distinction between collecting for personal use and commercial picking and they intend to quantify the difference. The new regulations will state a maximum quantity for personal consumption (2 gallons per person has been discussed). Anything beyond that will be considered commercial picking and warnings and penalties can be assessed.

It should be stressed that the rules have not been cast in stone yet, but they will be sometime in June and will go into effect immediately. So I am writing this to alert PSMS members that there will be a public comment period where you can voice your opinion, and I’m sure many of you have one and would like to. This could affect you as an individual or affect the club for outings at Deception Pass State Park and at Twanoh State Park. (PSMS may be able to get an educational permit so that the quantity rules don’t affect us for our field trips.)

The comment period has not begun yet. Kelli Burke, Washington State Park Environmental Specialist, will speak briefly about the proposed rule changes at the PSMS membership meeting on May 10 (she was supposed to be at our April meeting but got sick). At that point she will be able to tell us where comments can be sent. She will take names of interested parties so that you can receive a comment postcard or you will be able to write the State Parks directly. The public comment period will be June 9 in Colville, WA (north of Spokane). Therefore all comments must be submitted prior to that date.

Please attend the May meeting so that you can hear from Kelli what is being discussed and so that you can get the address to send your comments or the address of the public meeting if you’d like to attend and be heard. Further updates will be posted on the members YahooGroups e-mail list, but this will be the last notice in *Spore Prints* since the June issue will probably be getting to you too late to send in comments prior to the June 9 cutoff.

THE STRANGE CASE OF DR JEKYLL AND MR HYDE Karin Goodwin

20 March 2005, *The Sunday Times*, Scotland, via *The Sporeprint*, L.A. Myco. Soc., April 2005

According to new research, *The Strange Case of Dr Jekyll and Mr Hyde* was written by Robert Louis Stevenson while he was under the influence of a hallucinogenic drug similar to LSD. Doctors believe the Scots author wrote the classic exploration of good and evil two weeks after being treated with a derivative of ergot (*Claviceps purpurea*), a potentially deadly hallucinogenic fungus used by doctors during the Victorian era to stop bleeding. Stevenson, who suffered from tuberculosis, was given injections of the drug to stop bleeding in his lungs.

Stevenson always claimed that the plot of Jekyll and Hyde came to him in a fevered dream while he was seriously ill.

ANTI-VIRAL FUNGUS

Press release, 24 March 2005 - *Fomitopsis officinalis* is a wood conk, known for thousands of years as Agarikon. It is extinct or nearly so in Europe and Asia, but is still found in the old-growth forests of the American Pacific Northwest. Recent *in vitro* tests demonstrate that a specially prepared extract from *F. officinalis* is highly selective against viruses and may provide novel anti-viral drugs useful for protecting against pox and other viruses.

That is the forecast of Paul Stamets, owner and director of the research laboratories of Fungi Perfecti of Kamilche Point, Washington. For the past two years, Stamets has prepared more than a hundred strains of medicinal mushroom extracts for testing by the National Institute of Allergy and Infectious Diseases (NIAID), part of the National Institutes of Health and the US Army Medical Research Institute of Infectious Diseases (USAMRIID), in their joint biodefense antiviral screening program. The results to date promise breakthroughs on this biomedical frontier.



Fomitopsis officinalis

Dr. John A. Secrist III, vice president of Southern Research Institute's Drug Discovery Division, who oversees an NIAID contract to evaluate potential antiviral drugs, notes that "Several of Stamets' medicinal mushroom extracts have shown very interesting activity against pox viruses in cell culture assays performed through NIAID, and we are hopeful that they will also prove effective in the animal model systems. The number of different classes of compounds that show promising activity is small, so finding something new would be of great benefit to the scientific community." In fact, of more than 200,000 samples submitted over several years, only a handful are slated for animal testing each year. In the past year, approximately ten samples showed activity warranting approval for animal testing; of these, two are from strains of Agarikon discovered by Stamets. Moreover, Stamets' samples are the only natural products extracts tested through this program that have demonstrated very active anti-pox activity.

The NIH/USAMRIID screening program tests the mushroom extracts against viruses that could be used as weapons, including the viruses causing yellow fever, dengue fever, SARS, respiratory illnesses, and poxes. Of the Agarikon samples submitted to date, several showed potent activity for reducing infection from vaccinia and cowpox viruses, which are in the same family as the smallpox virus. This activity was shown during two different viral evaluations, demonstrating the reproducibility of the results.

Stamets has filed several patents, both US and international, on the anti-viral properties of mushrooms in the *Fomitopsis* family. However, only compounds derived using his proprietary, patent-pending methodology for cell cultures show activity; simple extracts (such as tea or infusions) from the woody conks are not active. Harvesting these rare conks from the forests will not provide therapeutic benefits and could impair the reproduction of the fungus.

While several strains of extract generated strong anti-pox activity, other strains were less potent, underscoring the importance of conserving mycodiversity, as more potent strains may yet be discovered.

"The ecological niche for these unique mushrooms is increasingly jeopardized as humans destroy old-growth habitats," comments Stamets. "As this happens, the pool of available strains will be further reduced. Acquiring as many strains as possible should be an international priority so that preventive or curative medicines against pox and related viruses can be developed. Personally, I believe we should be saving our old growth forests as a matter of national defense."

Besides having a direct anti-viral or anti-bacterial effect, mushroom derivatives can also activate the natural immune system. Evaluations in an animal model are planned for the near future. "Until then," Stamets cautions, "we cannot draw conclusions about the ultimate effectiveness of these mycologically based antivirals." Testing against other viruses continues. Stamets has already been granted a patent on fungus-derived products; several more are in the offing.

MUSHROOM OF THE MONTH

Dick Sieger

This month's mushroom, *Discina perlata*, is commonly encountered on forest floors during the morel season.

We have several *Discina* species in the northwest. It's hard to say how many. One spring a couple of decades ago, I set out to identify all that I could find. At the end of the season I hadn't identified any. They are best separated by the nature of the mature spores but it's difficult to find mature spores even in virtually rotten collections. *Discina* species mature so slowly that one wonders why they are so common.



Discina perlata may be a complex of similar species. It has a medium to dark-reddish-brown cup that is wrinkled and distorted. Older specimens flatten and may not have upturned margins. The underside is pallid and may have a short stalk. The diameter ranges from an inch to well over 4 inches but is usually 2 to 3 inches. The spores

look like kayaks and have a long and pointed apiculus (beak) at each end.

Discina olympiana (also known as *Discina apiculata*) is quite similar to *D. perlata* but starts out with an inrolled margin and has a paler color. Its spores have blunt apiculi.

Discina leucoxantha, unlike our other *Discina* species, has a pale yellowish brown color. It's rare in the northwest.

Disciotis venosa and *Rhizina undulata*, infrequently encountered, might be mistaken for *Discina* species.

Disciotis venosa is a close relative of morels. It looks like a sagging cup with a dark-brown veined interior and a pale pimply exterior. It is marked by strong odor of chlorine laundry bleach.

Rhizina undulata is a parasite of conifer seedlings. It is irregularly flattened and very dark brown with a pale yellow margin and underside. The underside is attached to the ground by yellow rhizoids (root like structures).

I dried and ate *Discina* before becoming a proficient morel hunter, but most books advise avoidance.



FALSE MORELS Ben Sostrin and David Shykind

MushRumors, Oregon Myco. Soc., Mar./Apr. 2005

With spring here the false morels are a timely topic. Generally false morels fall into one of three genera: *Verpa*, *Gyromitra*, and *Helvella*. (See *Mushrooms Demystified*, pages 793, 799, and 805.) Many people enjoy eating these mushrooms. In fact, *Gyromitra esculenta* means “edible or succulent *Gyromitra*.” This is not the case, as we shall see.

A salient feature of these mushrooms is they are all ascomycetes. In the fungal kingdom, classifications are assigned on the basis of how the organisms reproduce. “Asci” is Latin for sack. The ascomycetes produce their spores in a sack as opposed to the basidiomycetes, which produce theirs on a “club.” Another salient feature is their toxicity. They should not be eaten. We will discuss each genus separately.

Gyromitra

Many *Gyromitra* contain amounts of gyromitrin. The predominant mycotoxin which is found in various *Gyromitra* species belongs to a class of organic compounds called hydrazones, which are combinations of hydrazine and aldehydes.¹ Hydrazine is chemically related to ammonia; in fact it resembles a pair of ammonia molecules stuck together. Hydrazine and its derivatives are widely used in industrial processes, pharmaceutical chemistry (the anti-inflammatory drug Celebrex is synthesized from hydrazine derivatives), aerospace applications (as propellants for thrusters on the space shuttle), and numerous other applications.²



Gyromitra gigas

Hydrazine and its associated compounds are also widely recognized as acute and chronic toxins. Methyl hydrazine, a breakdown product of gyromitrin, is approximately one hundred times more toxic than benzene orally,³ and many other derivatives are suspected or listed carcinogens.^{4,5}

Gyromitrin may be regarded simply as a combination of one molecule of methyl hydrazine, one molecule of acetaldehyde, and one molecule of formaldehyde all linked together. When gyromitrin is allowed to react with water in an acidic solution, such as is present in your stomach, the three molecules are released, with the methyl hydrazine contributing most of the toxic effects⁶ (not that formaldehyde and acetaldehyde are particularly good for one either). Methyl hydrazine is not only toxic by ingestion, but also by inhalation, the hazardous concentration being roughly forty parts per billion of air for a two-hour period; see NIOSH data.⁵ Thus this compound is more toxic than benzene. As stated above, the hydrazines are known carcinogens. They are both acute and cumulative toxins. A goofy argument put forth by those who advocate eating species in this genus goes something like this, “I have eaten these for years and nothing has happened.” Smokers ten years away from emphysema and/or lung cancer use similar arguments. Many consumers of these mushrooms argue that you can parboil the mushrooms and change the water and thus render the mushrooms safe to eat. While this may or may not be true, (in all probability it is not), one thing is certain: heating these mushrooms releases the hydrazines into the air where the cook and company, rather than eating the toxins, are now inhaling them.

Gyromitrin is a hemolytic toxin. It is toxic to the central nervous system and damages the liver and gastrointestinal tract. The symp-

toms include nausea, vomiting, diarrhea, cramps, distention, weakness, lassitude, and headache. If the condition is severe, these may develop into jaundice, convulsions, coma, and death.⁷

Gyromitra gigas, or the False Snowbank Mushroom, is an interesting case. Some consider this mushroom a safe edible. According to OMS Toxicology Chair, Judy Roger, *G. gigas* is a European species. What we have around here in western Oregon is more properly called *Gyromitra montana*. This too, is considered by some to be edible. It has, however, been listed as a mushroom containing gyromitrin.⁸ In eastern Oregon there is a similar mushroom, *Gyromitra korfii*. *Gyromitra korfii* is almost certainly toxic, regardless of preparation. *Gyromitra gigas* appears to be a complex of species that differ in their amount of toxin, so care should be taken if you’re going to eat these. Current taxonomic methods do not allow for easy differentiation between the several species in this complex.⁹

Gyromitrin is found in most *Gyromitra* species in significant amounts.¹⁰ The experts are in agreement. Dr. Dennis Benjamin states: “...no one should condone or support the practice of eating members of this group of fungi¹¹....It seems foolhardy to risk eating the MMH containing species, yet many people do.”¹² Or in the words of Dr. Tom Volk, “I do not recommend eating false morels.”¹³

Verpa

Verpa bohemica is another mushroom that many eat as a morel substitute. Aside from the reportedly bland taste, there is another reason not to consume them. The specific toxicology of the *Verpa* is not known. Many consumers experience uncoordination and gastrointestinal distress.¹⁴

Helvella

“The edibility of certain *Helvella* species, [e.g.,] the elfin saddle, has always been in doubt and recent studies have demonstrated the presence of toxins in this genus.”¹⁵

For further reading on mushrooms and their toxins the authors highly recommend the book *Mushrooms, Poisons and Panaceas* by Dr. Denis Benjamin. For specific information on *Gyromitra*, see Dr. Tom Volk’s website <http://botit.botany.wisc.edu/toms-fungi/may2002.html> and emedicine at www.emedicine.com/topic459.htm.

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- 2 Budvari, Susan et al. (eds.), *The Merck Index*, 12th ed., Merck Research Laboratories, Merck & Co., Rahway, NJ, 1996
- 3 Budvari et al., pp. 1039 and 816; LD50 for benzene ~ gm/kg, MMH – 0.03 g/kg
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- 7 http://botit.botany.wisc.edu/toms_fungi/may2002.html, herein “Volk”
- 8 Benjamin, p. 268
- 9 Volk
- 10 Volk

cont. on page 8

POTATO PANCAKE WITH MORELS **Jean Gula**
The Arizona Fun-Gi, Summer 2001

3–4 medium sized potatoes
(Yukon Gold are best if they are available)
1 TBs butter
1 TBs vegetable oil
2 TBs dried morels

Boil potatoes just until they are tender—do not overcook! Let them cool completely, then shred as if for hash browns.

Place 1 TBs each of butter and vegetable oil in a 10-inch heavy nonstick skillet over a medium high heat. Let butter and oil get very hot but not smoking.

While the fats heat, chop or break dried morels into small pieces and put into enough water to cover. Leave until soft and pliable, about 5 minutes.

Dry morels and add to skillet. Cook until mushrooms have imparted their wonderful essence into the oil and butter mixture. Remove mushrooms with slotted spoon and set aside.

Now add potatoes all at once, and pat down to fill skillet with an even layer. Layer morels over the top of the potato pancake and let cook for approximately 12 to 15 minutes.

You're looking for a nice golden brown crust on the bottom, Turn out onto plate and give your taste buds a treat!

Thanks for the Books

Ron Post

Many thanks to Susan Casey for her generous donation of mycological books from around the country.

False Morels, cont. from page 7

¹¹Benjamin, p. 277

¹²Arora, David, *Mushrooms Demystified*, 2nd ed., Ten Speed Press, Berkeley, CA 1986.

¹³Volk

¹⁴Benjamin, pp. 267–268

¹⁵Benjamin, p. 267



I'M READY FOR MOREL HUNTING

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