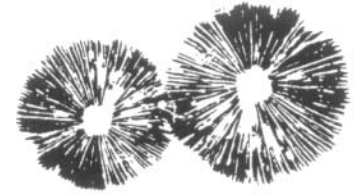


SPORE PRINTS



BULLETIN OF THE PUGET SOUND MYCOLOGICAL SOCIETY
Number 430 March 2007

STAMP SHEETS STILL AVAILABLE Brian Luther

PSMS still has some US Northeast Deciduous Forest stamp sheets available which depict mushrooms on some of the stamps. These are now out of print, are hard to get, and are beautiful and frameable just as they are. They are available through PSMS book sales for around \$7.00/sheet. For the most recent *Spore Prints* update on this sheet, and all US stamps illustrated with fungi, please refer to my article in *Spore Prints* issue 414, pp. 4–5 (September 2005). Old copies of *Spore Prints* can be accessed on line at psms.org.

Also, the US Postal Service just announced that they still have available some of the artist's sketch books and souvenir sheets for this issue, even though the regular sheets are long since sold out. The artist's sketchbook is packed with interesting information and full page illustrations of some of the fungi shown on these stamps, all for \$24.95 from the USPS. Here's a great opportunity to get what will shortly become a collector's item.

Order by calling 1-800-782-6724, Item # 459073. Shipping is only one dollar.

BEGINNING ID CLASSES Colin Meyer

- What:** PSMS Beginning Mushroom ID Course
Where: Center for Urban Horticulture, Douglas Classroom
When: Thursday Evenings, 7:00–9:00 PM,
March 22–April 12 (four evenings)
Cost: \$35, cash or check payable to PSMS
(bring on first day of class)
Book: *Mushrooms Demystified*, by David Arora
Bring: Fresh mushroom specimens

PSMS will offer a beginning mushroom identification class this spring on four consecutive Thursdays, beginning on March 22. Classes will be held at the Center for Urban Horticulture, in the Douglas classroom, from 7:00 PM to 9:00 PM.

The sessions will be:

- March 22 Introduction to Mushroom ID
- March 20 Identifying Mushrooms with Dichotomous Keys
- April 5 Cooking and Collecting
- April 12 Mushroom Toxins

The recommended text is *Mushrooms Demystified* by David Arora. There are several copies available for classroom use from the PSMS library, and the book will be available for sale on the first day of class.

The cost is \$25 for all sessions. For questions or to register please send e-mail to education@psms.org with your name(s). If you don't have access to e-mail, you may call 206-722-6687, but e-mail is preferred.

Participants are encouraged to sign up for the intermediate ID workshop, which immediately follows this class.

PRESIDENT'S MESSAGE Patrice Benson

Lots of things are happening! The Survivor's Banquet is coming up; contact Jamie Notman by sending \$5 per person to reserve a spot for this potluck fun event. The banquet is our official Annual Meeting. We will recognize our Golden Mushroom Awardee and announce the new board members and officers.

A few changes will be coming; stay tuned for some new ideas decided by the board concerning field trips and forays. Kim Traverse is working on the library, ordering some new books and enlisting the help of UW library students. A roster will be produced in the next few months; does anyone out there know how to convert our data in an Access database to a roster type listing format? Please call me if you can! 206-819-4842.

INTERMEDIATE ID WORKSHOP Colin Meyer

- What:** PSMS Intermediate Mushroom ID Workshop
Where: Center For Urban Horticulture, Douglas Classroom
When: Thursday Evenings, 7:00–9:00 PM, April 19–May 3
(three evenings)
Cost: \$25, cash or check payable to PSMS
(bring on first day)
Book: *Mushrooms Demystified* by David Arora
Bring: Fresh mushroom specimens

PSMS will offer an intermediate mushroom identification workshop this spring on three consecutive Thursdays, beginning April 19. Sessions will be held at the Center for Urban Horticulture, in the Douglas classroom, from 7:00 PM to 9:00 PM.

In these workshop sessions, we will practice identifying mushrooms with dichotomous keys, either from *Mushrooms Demystified* or from keys by the Pacific Northwest Key Council (<http://www.svims.ca/council/keys.htm>). At the end of each evening, we will share information we've learned and learn some tips about how to recognize the spring genera.

This workshop is a great opportunity for anyone who has taken the beginning or intermediate ID classes, and wishes to practice their ID skills and pick up a little more knowledge.

We are sad to report that longtime PSMS member **Susan Murosako**, 86, died February 6, 2007, of injuries incurred in a fall. In addition to reading, fishing, and mushrooming, Susie was known for her love of cooking, gardening, and basketry. Our condolences to her husband, Pat, and their family.

Spore Prints

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PUGET SOUND MYCOLOGICAL SOCIETY

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Annual dues \$25; full-time students \$15

CALENDAR

- Mar. 10 PSMS Survivors' Banquet and Annual Meeting,
CUH. Social hour, 6:30 PM; dinner, 7:30 PM
- Mar. 19 Board Meeting, CUH
- Mar. 20 *Spore Prints* Deadline
- Mar. 22 Beginners' ID, 7:00 PM, Douglas Classroom, CUH
- Mar. 29 Beginners' ID, 7:00 PM, Douglas Classroom, CUH
- Apr. 5 Beginners' ID, 7:00 PM, Douglas Classroom, CUH
- Apr. 7 MacDonal Park Field Trip, 9:30 AM
Dye Workshop, 1-3:30 PM, MacDonal Park
- Apr. 10 PSMS Membership Meeting, 7:30 PM, CUH

BOARD NEWS

Dennis Oliver

This board meeting was about preparation for spring and the hopeful return of mushrooms. Our annual Survivor's Banquet is coming together under the expert chairmanship of Jamie Notman. Please register early as spaces are filling. The election of new officers and board members is happening. Ballots are due by March 4. The library is gearing up for the spring season and is open an hour before the membership meetings to check out books or just browse. Spring ID classes are planned (see articles on page 1 of this issue) and will begin on March 22. We are revamping the field trips by having fewer outings and experimenting with a no-host option. The board has joined with the Daniel Stuntz Foundation to begin an endowment fund to support a taxonomic mycology position at the University of Washington. PSMS has donated an initial \$2500 and along with the Stuntz foundation's \$25,000 is a off to a solid start, but much more will need to be raised to be able to secure a mycology position.

MEMBERSHIP MEETING

This month is the **PSMS Annual Meeting and Survivor's Banquet**, Saturday, March 10, at the Center for Urban Horticulture. Festivities begin at 6:30 PM. This year's banquet is again a potluck, so please bring a favorite dish in one of the following four categories: appetizer, main dish, salad, or dessert.

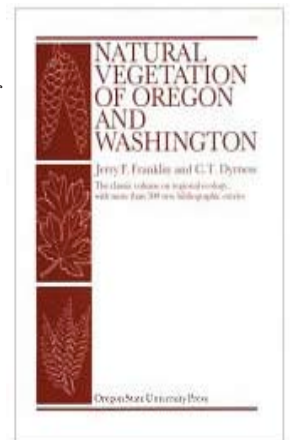


This is an event you won't want to miss. See you there!

BOOK REVIEW

Kim Traverse

Anyone who hunts mushrooms knows that their relationships to plants, living and dead, are the key to finding them consistently. *Natural Vegetation of Oregon and Washington* by Franklin and Dyrness is one of the best treatments of habitat types and distribution for the Pacific Northwest. The text is clear, there are many photographs, and the species lists really help make sense of the differences between the major zones and minor variations.



The PSMS library has this and many other books, pamphlets, VHS tapes, and magazines for members to use.

Many are out-of-print or unusual and all are currently underused. We are hoping to have the catalogue included on our website soon but in the meantime, come in and browse anytime from 5:30 to 6:30 PM on meeting days.

MORELS MAY BE THE ANSWER TO PAIN, TUMORS

The Spore Print, L.A. Myco. Soc., February 2007

New Delhi, India - A humble fungus, the morel mushroom, could soon relieve you from pain and protect you against tumors.

Scientists from Amala Cancer Research Centre, Thrissur, have found significant anti-inflammatory and anti-tumor qualities in the mushroom extract—especially when administered to mice suffering from cancer—compared to the standard reference drug Diclofenac. The extract, scientists say, could be put to therapeutic use in chemotherapy.

Prized by gourmet cooks, morels in India are found only in the upper reaches of Sikkim, Himachal Pradesh, Uttarakhand and Jammu and Kashmir. Most of mushrooms are either dried and eaten by tribals or exported to European countries for over Rs 6,000/kg.

The team of scientists from Amala reported their findings in the latest edition of the Indian journal *Current Science*.

—25 January 2007, Indiatimes.com.



UPCOMING FIELD TRIP

Cathy Lennebacker

April 7

MacDonald Park
30 miles east of Seattle

To start off the spring mushroom season, we will visit MacDonald Park, on the Tolt River about ½ mile south of the town of Carnation in King County. Enter the park on N.E. 40th Street from State Highway 203. Watch for PSMS signs on the corner and use the day-use parking lot.



We will meet at the main shelter across the suspension bridge at 9:30 AM for a general introduction to mushroom hunting. Then we will break into small groups and go out to gather specimens. There should be *Verpa bohemica* under the cottonwoods in the surrounding area. We'll meet rain or shine.

At 1 PM back at the shelter, Cathy Lennebacker will present a workshop on dyeing with mushrooms and lichens. (See below.)

MUSHROOM AND LICHEN DYE WORKSHOP

Cathy Lennebacker

When: Saturday, April 7, 2007, 1 PM to 3:30 PM

Where: MacDonald Park picnic shelter

Cost: \$25 for members and \$30 for nonmembers.
Cost includes yarn samples to take home!

Create beautifully colored yarn using fungi and lichens in this afternoon workshop. We will go over the use of mordants and pH to alter dye colors, different color and texture possibilities using natural animal fiber, and the storage of dyes for later use. Participants will leave with multiple color samples of their yarns and the knowledge to recreate the process at home.

Class size is limited so sign up early!

To sign up, e-mail either Alissa Allen at oemleria@gmail.com or Cathy Lennebacker at calennebacker@msn.com or call 360-379-2459 and leave your contact info.

MEXICO FORAYS

On Sept. 21–30, Mexican Mushroom Tours will take a group of mushroom enthusiasts on a remarkable mycological adventure around the exotic southern state of Chiapas. Habitats will range from cool pine cloud forests to dramatic lakesides to lush, riverside jungles and, as a bonus, the region offers the chance to experience unmatched archeology, indigenous arts and cultures, and colorful local traditions. But, throughout, there will be a focus on fungi, led by top bilingual mycologists in our group.

Early interest from previous Mexican Mushroom Tours participants has been so keen that almost all of the 22 available spots for this tour have already been booked, but a few seats are still open and, based on interest and demand, we may do a second edition of this excursion October 5–14.

Mexican Mushroom Tours

Apdo #73

Tlaxcala, Tlax.

90000 Mexico

Tel/Fax: (from El Norte): 011-52 (246) 461-8829

Website: www.mexmush.com

E-mail: mexmush@yahoo.com

MUSHROOMING FORAYS IN TIBET Dan Winkler

Tibet not only is endowed with an incomparably rich, ancient spiritual culture but also has a long tradition in collecting (for medicinal purposes), eating, and trading mushrooms. Today, with unprecedented demand for caterpillar fungus (*Cordyceps sinensis*), matsutake, and morels, Tibet has the highest fungal income per capita in the world. Of great importance are also boletes, Caesar's mushrooms, chanterelles, ganodermas, wood ears, and many other more exotic species. Yet to fully appreciate the amazing natural and cultural diversity of Tibet, it must be experienced first hand.

I have been to Tibet and the Himalayas more than 30 times for environmental work, including mushroom and medicinal plant research, forestry work, and tour guiding. (See articles in the March and April, 2005, *Spore Prints*). Through the years many people have wanted to accompany me to Tibet. In response I have put together a series of fabulous fungal forays to share the incredible experience of mushrooming in East Tibet, a place rich in natural and cultural diversity. These trips are certain to be a once in a lifetime fungal, botanical, and cultural experience in some of the most stunning landscapes on the planet. All logistics will be expedited by High Asia, a specialist travel logistics provider with more than 13 years experience in Tibet.

Foray 1 - Cordyceps Expedition to Tibet: May 10–25, 2007; \$3,700 plus airfares; 10–12 participants.

Foray 2 - Fungal Foray to Tibet: July 21–Aug. 8, 2007; \$3,900 plus airfares; 12–15 participants.

For details visit www.danielwinkler.com or phone High Asia (609) 269-5332

MUSHROOM MISSIONARIES

On November 13, 2006, **Patrice Benson** gave a 2-hour presentation to the Master Gardeners at CUH. January 17, 2007, she gave a 2-hour presentation to The Mountaineers at their facility on Lower Queen Anne. February 15, 2007, she gave a 1-hour talk on basic edible mushrooms to the Kitsap Mycological Society at the Odd Fellows Hall in Bremerton.

February 1 **Marcia Hiltzheimer** and **Hildegard Hendrickson** participated at Lynndale Elementary School's Science Day. Both gave talks to all the classes on how mushrooms grow and the importance of mushrooms in the ecosystem.

WORLD'S ODDEST CREATURE AT RISK FROM KILLER FUNGUS

Kathy Marks

The Spore Print, L.A. Myco. Soc., February 2007

It is a unique Australian creature—a mammal that lays eggs and has a furry body, a bill like a duck's, and webbed feet. The males are also poisonous. But in Tasmania, one of its principal habitats, the platypus is under threat from mucormycosis, a deadly disease caused by *Mucor amphiborum*, a dimorphic fungus occurring in a yeast form in infected tissues or in a hyphal form in the environment.

More than one-third of the population is believed to have been wiped out in the north of the island state, and there are reports that the disease has now spread to southern areas. It is almost always fatal, causing ulcers that turn into gaping wounds.

cont. on page 4

World's Oddest Creature Endangered, cont. from page 3

The shy, solitary platypus inhabits the waterways of Tasmania and the eastern Australian mainland. The same fungus is found on the mainland, where it kills amphibians, particularly Queensland's green tree frogs, but does not affect platypuses there.

Niall Stewart, a research fellow at the University of Tasmania, believes that the tiny frogs may have carried the fungus into Tasmania in bunches of Queensland bananas. "Platypuses on the mainland have evolved with the fungus, and so they're immune," he said. "But the poor platypuses here haven't seen it before." The island is a haven for platypuses, thanks to its abundant waterways. But Dr. Stewart, who has carried out extensive field work, believes that 35 percent are falling victim to the disease in the affected areas.

Dr. Stewart said nothing was being done to combat the disease. He has repeatedly failed to secure research funding. The problem has been overshadowed by a rare cancer that has killed half of the wild population of another native animal, the Tasmanian devil, and threatens the species' survival.

The ulcers, which appear on a platypus's broad tail or hips, grow to up to 10 cm in diameter. Death is usually caused by secondary bacterial infections or from depletion of body fat, most of which is stored in the tail. The wounds also prevent the platypus from keeping warm in cold water.



Mucormycosis

It is not known how the disease is transmitted—possibly by ticks, or by males fighting, or via burrows. Dr Stewart said it was feasible that mud containing fungal spores was being carried into new areas on hikers' boots or 4×4 vehicles.

Asked if the Tasmanian platypus could develop immunity, he replied: "Possibly, in a few hundred thousand years. The problem is that mature animals with ulcers are still capable of breeding, so they're producing more susceptible animals. It would take a long time for natural selection to sort it out." The platypus is one of only three monotremes—egg-laying mammals—in the world. The others are Australia's two species of echidna, or spiny anteater.

EFFECTS OF POISONING BY *AGARICUS MOELLERI*

Christine Roberts

Fungifama, So. Vancouver Is. Myco. Soc., January 2007

Last evening at my dance class one of my friends of European extraction asked me to identify a mushroom. She pulled out a button *Agaricus*, which was quite a good size, sort of beige, and to her credit had the complete untrimmed stipe. (Some of what I tell folks is actually sinking in!) It puzzled me for a few moments because it did not look grey enough for *Agaricus moelleri* (= *A. praeclaresquamosus*), but on closer examination it had some tiny dark grey scales around the margin. The clincher was the disinfectant-like smell at the base of the stipe, which she was able to detect once it was pointed out. She had confused it with the meadow mushroom, *Agaricus campestris*, telling me that the other ones had pink gills before they went brown.

When I said it was poisonous she looked a bit sheepish—that would explain the 3 days of diarrhea, she said. A bit more cheerfully she pointed out that she was still with us in life, and fit enough to dance, but probably wouldn't eat any more of those particular mushrooms. The lady in question recently celebrated her 88th birthday.

Remember, with *Agaricus* species, good ones smell nice—of anise, almond, or pleasantly mushroomy—whereas bad ones smell of phenol or disinfectant or metallic at the base of the stipe and often while cooking.

If you are not sure, ask yourself the following two questions:

1. How badly do I really need to eat this mushroom?
2. Am I willing to suffer the consequences in the name of science (3 days on the toilet, maybe less, maybe worse)?

CALIFORNIA MATRIARCH DIES AFTER EATING POISONOUS MUSHROOMS

Truong Phuoc Khanh

Mercury News, January 12, 2007

Miranda Epifania, one of six members of a Santa Cruz County family poisoned by wild mushrooms collected from a state park on New Year's day, died Thursday, January 11.

Epifania's age, 83, was surely one of the reasons why she died while five others who consumed the deadly fungi eventually recovered, a hospital spokesman said. "Typically the older you are, the more vulnerable you are to this kind of toxic poisoning," said Kevin McCormack, spokesman for San Francisco's California Pacific Medical Center.

The entire family had been hospitalized. Four members were released after nearly a week; another was released today.

Although the family had asked the hospital not to reveal their names, Epifania's identity was released by the San Francisco Medical Examiner's office.

The family had gone mushroom hunting on New Year's Day at Wilder Ranch State Park in north Santa Cruz. They picked six species of mushrooms. Three were later identified as safe, while one was found to be mildly toxic. The remaining two species had been entirely consumed and could not be identified; however, experts said the one that proved fatal was most likely the "Death Cap," or *Amanita phalloides*, one of the most dangerous mushrooms found in California. Contributing to its deadliness is the fact that it looks like mushrooms that are safe to eat.

In the Bay Area, most mushroom poisonings have involved immigrants who mistake toxic mushrooms for the safer species they regularly picked in their homelands. Officials have said members of the Santa Cruz family are foreign-born.

About 200 of California's 2,000 to 3,000 mushroom species are poisonous, according to the poison control system. *Amanita phalloides* isn't hard to find in the Bay Area.

Their toxicity is not destroyed by cooking, and symptoms occur hours after they're eaten. "You have a good meal, and 8 to 12 hours later, you have severe vomiting and diarrhea over the next days," Olson said. In 10 to 20 percent of the cases, victims will die or require a liver transplant.

The Santa Cruz family was monitored in the weeks to come with blood tests said McCormack, "just to make sure they don't have any unexpected problems."



Amanita phalloides

TRUFFLE FEST 2007

Patrice Benson

A few of PSMS members attended the truffle fest in Eugene, Oregon, on January 26–28.

We experienced the two main edible Oregon truffles, *Tuber oregonense* and *Leucogaster carthusianum*, as food in two banquets. We were successful at the truffle hunt by finding the other edible white truffle, *Tuber gibbosum*, which fruits a little later than the *Tuber oregonense*. We were assisted by mycologist David Pilz and by Hula, Lynn Elwell's truffle-hunting Miniature Australian Shepard. The truffles were placed into a chamber with raw eggs which I enjoyed (cooked!) for about 2 weeks after the festival. The wines of the region were artfully paired with the food for a special weekend of feasting. Most of the other attendees were folks from all over the country interested in or actually cultivating the trees which are associated (and inoculated) with various edible *Tuber* species. It was a fun and memorable weekend with beautiful weather and great companions!



Patrice Benson

Hildegard Hendrickson, Patrice Benson, and Joanne Young showing off finds at the Oregon Truffle Fest

FUNGAL FACTORIES MAY SAVE EASTERN HEMLOCK FORESTS

The Spore Print

L.A. Myco. Soc., February 2007

The Problem: Demise of the Eastern Hemlock Forests

From Georgia to Maine, the once-mighty eastern hemlock is succumbing to an exotic pest, the hemlock woolly adelgid. First detected in the western US in 1924, the adelgid reached Virginia in the 1950s. An aphid-like insect, the adelgid kills eastern hemlocks within a few years after infestation, feeding on the sap at base of their needles and cutting off their nutrients.

In Shenandoah National Park most of the famous towering hemlocks are now dead. The adelgid has ravaged parts of Kentucky, North Carolina, and the Smoky Mountains. Expanding northward, it has moved through Massachusetts into southern Maine and New Hampshire.

The only natural deterrent to the adelgid seems to be a very cold winter. With global warming, their northward spread seems inevitable. Though not officially recorded yet, "it's probably in southern Vermont now at population levels too low to easily detect," says Scott Costa, research assistant professor of plant and soil science

at the University of Vermont. He anticipates that the adelgid will be into Vermont's Champlain Valley in not too many years.

While the era of cutting hemlock for the tanning industry is over, there continues to be use of the tree for fiber and construction, and commercial forest owners have something to lose with the demise of the hemlock. But far more important, as the hemlocks expire they take an ecosystem down as they fall.

In cool hollows and along shady mountain streams the hemlock has grown for millennia where other trees wouldn't thrive—a quiet giant soaring to over 150 feet. With a range from Alabama along the Appalachians into the Canadian Maritimes, its shaggy crown creates a bluish green haven unmistakable to turkeys and deer (and hunters)—a thick understory of duff, deep with shade that accentuates the black furrows of the hemlock's tannin-rich bark.

In winter, chickadees eat the small seed cones of the hemlock, and they are only one species of many that depend on the hemlock not just for food but for the architecture of their world. Some warblers only nest in hemlocks and the mountain fish depend on the trees to keep streams cool.

The Solution? Forest Factories of *Lecanicillium mucarium*

Reaching into a box glowing with fluorescent light, graduate student Stacie Grassano pulls out a tube. "This is a great one," she says, holding the clear plastic up to her face. Inside, a tree branch is speckled with white fluff. "It's growing really well," she says, handing it to Prof. Costa, her advisor in plant and soil science at the University of Vermont.

Costa brings the branch close to his eye. "Yes," he says, with a boyish grin, "this is a fungus success story."

For some, a fungus success story means nothing is growing at the back of their refrigerator. But for Costa and Grassano, the vigorous growth in their laboratory of this fungus, a species called *Lecanicillium mucarium*, means a hopeful new chapter in the otherwise bleak tale of the eastern hemlock.

While the adelgid, originally from Japan and China, appears to have no successful predators in North America, some native fungi—like the one Costa and Grassano have growing on branches in their laboratory—kill the pest.

Last December, Costa, Grassano, and two other researchers, Vladimir Gouli and Jiancai Li, submitted a provisional patent for a new method of cheaply and effectively spreading the fungus, and other similar "biological controls," that might beat back the adelgid without having to use expensive, toxic pesticides. They call their approach a "whey-based fungal micro-factory."

Instead of growing fungi in a conventional factory and then transporting it out to a forest—a costly proposition—their factory will be the forest. Or, more accurately, tiny droplets of sweet whey—a cheap waste product of cheese production, inoculated with the right concentrations of the target fungus—will be their factory. By spraying the whey solution into an infected forest, they



Penn. State

believe they can get the adelgid-killing fungi to reproduce in large numbers on its own.

"The sweet whey only costs 32 cents a
cont. on page 6

Woolly adelgid on eastern hemlock

Fungal Factories, cont. from page 5

pound,” says Costa, who gets his donated from a New York-based cheese company, and receives support for his research from the USDA, EPA, and other funders.

Whey is a far cheaper growing medium than those available in labs for the many fungi now in use as biological controls in agriculture and forestry. And the whey serves as a nutritional resource, making each droplet a cozy biological factory for a fungal colony, pumping spores out into the forest long after the spraying teams have gone home.

If their laboratory tests continue to go well, the researchers anticipate starting field trials in 2008.

“We’re not going to eradicate the adelgid,” Costa says. “The best-case scenario for an insect-killing fungi is you inoculate the environment and get disease outbreaks to start cycling. The idea is to reduce the pest population to a level that is manageable, allowing some of the trees to make seeds, grow, and survive.”

—26 January 2007, sciencedaily.com.

FRUITS OF THE FOREST

Else C. Vellinga

Mycolog, Humboldt Bay Myco. Soc., February 2007

When and where mushrooms fruit is one big mystery. Water and temperature are the main factors, but we do not have a formula to tell us when the boletes will show up at Salt Point. So many days after the first rain, a daily high temperature of x and a low of y , and then they should be popping up. No, it doesn’t work like that.

However, there is a small group of mushrooms that requires some other trigger than just moisture and the right temperature. Some will fruit only when ammonia is available. This can be in the form of a carcass, an animal latrine, or an old wasp nest. In an experimental plot at Salt Point State Park where urea was added to the soil, *Tephrocybe tylicolor*, a small grayish mushroom, responded immediately and its fruit-bodies appeared. This species normally grows on places where cows have peed, around carcasses, and on dung, but here it only grew on the plots treated with urea. The more urea, the better it did. Such mushrooms are called ammonia fungi, as they form fruit-bodies only where ammonia and similar chemicals are available in great quantities.

Tephrocybe is a saprotrophic species, but there are also ectomycorrhizal fungi that only fruit in the presence of ammonia. *Hebeloma radicosoides* from Japan is a striking example. Fruiting of such a species is rare, as there has to be both the host tree and the right amount of ammonia in the same place. It is a big, showy, yellow species, with a long “rooting” stipe and a fringed ring. Whereas most *Hebeloma* species have very well defined smells, such as earthy beet leaves, cacao, or orange blossom, *H. radicosoides* lacks any particular smell.

Hebeloma species have been found on a wide range of strange habitats. They have been reported at the latrine area of a Boy Scout camp, a deserted wasp nest, and on raccoon dog excrement. They like a wide range of chemicals, such as urea, milk casein, arginine, and sodium glutamate.

Hebeloma radicosoides is so far known only in Japan, but its look-alike, *H. radicosum*, is widespread and known in Japan, Europe, and North America. Again, there is a rooting fruit-body connected to an animal midden, but it is inhibited by ammonia. This species has been found mainly on the abandoned latrines of moles.

latrines are in the ground, and there the fungus has its connection with the tree. The soil is full of fine roots with mycorrhizal tips and fungal mycelium. In more northern regions where moles do not occur, e.g., in Scandinavia, wood mouse (*Apodemus*) middens are an alternative.

Similarly, in a beech forest in Switzerland, the mushroom was found growing out of a wood mouse nest. Just like moles, the wood mice have their nests deep in the ground. The mushrooms start at the level of these nests and surface one to two feet above them. In other words, it is what we call a deep rooting species; but of course, it starts at the bottom and grows upwards, not like a plant, which sends its roots down.

These two *Hebeloma* species have been thoroughly investigated by a Japanese mycologist who traveled all over the world in pursuit of these mushrooms.

The two substrate types on which the mushrooms grow seem very similar—urea treatments (including carcasses and raw excrements) versus abandoned middens of moles and wood mice—but apparently there is a difference in the chemicals the fungus can absorb and use. Different fungal species, or even different strains of the same species, use a different form of nitrogen. Some species, such as *H. radicosoides*, are only able to use ammonia and its derivatives; others will only thrive on nitrates. Another group of ectomycorrhizal fungi uses peptides or proteins as its sole nitrogen source.

R. Sabatier, Le Gratin Des Champignons



Hebeloma radicosum

So here again, as in many other aspects of fungal life, much is possible.

In Europe, *Hebeloma radicosum* associates with deciduous trees (beech, etc.), which may be the reason that it does not occur in our area; but the wide array of burrowing little rodents here might invite other species. Perhaps we have not yet recognized the connection.

Further reading:

Kaneko, A. & N. Sagara, 2002. Responses of *Hebeloma radicosum* fruit-bodies to light and gravity: negatively gravitropic and nonphototropic growth. *Mycoscience* 43: 7–13.

Sagara, N., 1995. Association of ectomycorrhizal fungi with decomposed animal wastes in forest habitats: a cleaning symbiosis? *Canadian Journal of Botany* 73 (Supplement 1): S1423–S1433.

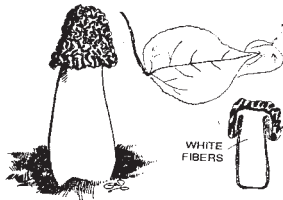
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MUSHROOM OF THE MONTH: *Verpa bohemica*
Agnes Sieger



Verpa bohemica

The first field trips this spring are dedicated to *Verpa* (*Ptychoverpa*) *bohemica*, the first edible mushrooms to lure the mycophagist after the winter doldrums. Often called the early morel because of its timing and superficial resemblance to the true morels, *Verpa bohemica* fruits from

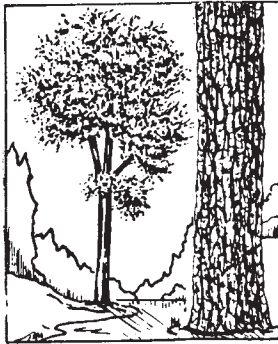
late February through April, depending on the season. In the Pacific Northwest, it is associated with cottonwoods, often fruiting right around the drip line of mature trees “when the cottonwood leaves are the size of a mouse’s ear.” Once you learn to recognize the cottonwood, a tall, dark, poplar-like tree with wrinkled bark that grows in damp river bottoms throughout western Washington, you can spot your hunting ground from afar. Finding your quarry amid the debris of the previous fall, however, isn’t that easy.

Verpa bohemica is a medium-sized (3-in. tall), tannish mushroom with a wrinkled, bell-shaped cap which is attached only at the top, forming a skirt over the stem. The stem is long, at first whitish to cream in color and becoming tan with age, and filled with cottony fibers.

In contrast, true morels have pitted, not wrinkled, caps that are attached to the stems at the bottom (or in some cases part way up); their stems, while hollow, are empty.

Unlike other verpas, and most large Ascomycetes, *Verpa bohemica* has only two spores per ascus instead of eight. For that reason, modern taxonomists have split it into its own genus, *Ptychoverpa*. What each ascus lacks in numbers, however, it makes up for in size; the spores are huge.

Although considered a good edible by many, this mushroom causes gastrointestinal upsets and loss of muscular coordination in some people and should be approached with caution. Many field guides recommend parboiling it and throwing away the water and eating only small amounts at a time. The effects may be cumulative, so don’t pig out on it several days in a row.



Cottonwood tree

*Sing a song of springtime,
 Shiver your last shiver.
 Four and twenty cottonwoods
 Are growing by the river.*

*When their leaf buds open
 Morels will soon spring up.
 Won’t they make a dainty dish
 To tempt you when you sup?*

—Don Goetz, Oregon Myco. Soc.

MYCOPHAGY: IT’S DIFFERENT IN MEXICO
Lorraine Brown

Mycelium, Myco. Soc. of Toronto, Jan.–Mar., 2007

My husband, Andrew, and I recently took part in a Mexican Mushroom eco-adventure led by MST [Mycological Society of Toronto] members Gundi Jeffery and Erik Purre. We ventured

high into the Sierra Juarez mountains of Oaxaca, where we found mushrooms superb in both quantity and diversity and indigenous Zapotec locals for whom mushrooms are a passion as well as a major part of their diet.

Local people prepared mushrooms for us in their homes and small restaurants called comedors. To our surprise, we found that some of the most popular mushrooms in Oaxaca are species our books advise us not to eat. We found ourselves eating mushrooms we never thought we would. (*Mycelium Ed. Note: but not without the advice of a local expert.*)

Our technical leader, mycologist Dr. Arturo Estrada, loves *Helvella lacunosa*. And I have to admit, his helvellas with spinach, bread crumbs, and cheese were divine. But Lincoff recommends avoiding this mushroom because it is closely related to the false morels that contain some fairly serious toxins.

Arturo and other guides who accompanied us are also big fans of *Ramaria*. I have always avoided eating this complex genus because it includes many species with cathartic or laxative properties (not something one usually needs in Mexico!). We made a soup with *Ramaria aurea* in Mexico, and found it to be rather bland.

At a small comedor in the high mountain Zapotec village of Cuajimoloyas, we saw buckets of *Gomphus floccosus* waiting to go into people’s meals. We didn’t eat it, mostly because of all the prep work, but the local people scrape all the skin and gills off, boil it, and then fry it. Lincoff doesn’t recommend eating *Gomphus*; he says it contains “an indigestible acid.”

Are the mushrooms different in their chemical makeup in Mexico? Or are these taste preferences mainly cultural?

Certainly no one had any quibbles about the gastronomic properties of *Armillaria ponderosa*, *Boletus edulis*, and *Amanita caesarea* that we also found in large numbers, nor with any of the five colors of *Cantharellus* that we came across.

SPRING MUSHROOM MIX-AND-MATCH Kim Janik
MushRumors, Oregon Myco. Soc., May/June 2006

To get you in the mood for the spring mushroom season, here is a list of some common spring mushrooms listed by both their common and scientific names. Just write the letter in the space to match the common name with the corresponding scientific name. And remember, sometimes there are other names not listed here that are also commonly used. Good luck!

- | | | | |
|---|--|-----|-----------------------------|
| A | Witch’s Butter | ___ | <i>Boletus edulis</i> |
| B | Oregon White Truffle | ___ | <i>Sarcosphaera crassa</i> |
| C | Morel | ___ | <i>Gyromitra esculenta</i> |
| D | Oyster Mushroom | ___ | <i>Calvatia booniana</i> |
| E | Shaggy Mane | ___ | <i>Amanita phalloides</i> |
| F | Sculptured Puffball | ___ | <i>Verpa bohemica</i> |
| G | Spring King | ___ | <i>Calvatia sculpta</i> |
| H | Violet Star Cup | ___ | <i>Coprinus comatus</i> |
| I | Western Giant Puffball | ___ | <i>Morchella esculenta</i> |
| J | Death Cap | ___ | <i>Pleurotus ostreatus</i> |
| K | False Morel | ___ | <i>Tuber gibbosum</i> |
| L | Early Morel or
Wrinkled Thimble Cap | ___ | <i>Tremella mesenterica</i> |

Answers: A *Tremella mesenterica*; B *Tuber gibbosum*; C *Morchella esculenta*; D *Pleurotus ostreatus*; E *Coprinus comatus*; F *Calvatia sculpta*; G *Boletus edulis*; H *Sarcosphaera crassa*; I *Calvatia booniana*; J *Amanita phalloides*; K *Gyromitra esculenta*; L *Verpa bohemica*

RISOTTO AND WILD MUSHROOM CASSEROLE

Recipe courtesy Emeril Lagasse, *Emeril's Potluck*,
William Morrow Publishers, 2004

Show: "Emeril Live"

Episode: Casseroles for Every Occasion

- ¾-oz dried porcini mushrooms, soaked in
½ cup warm water until soft
- 4 TBs unsalted butter
- 2 TBs extra-virgin olive oil
- 2 cups Arborio rice
- 3 TBs chopped shallots
- 1 TBs minced garlic
- 5 to 6 cups hot chicken stock, or low-sodium chicken broth
- 1½ tsp salt
- 1 tsp finely chopped fresh thyme leaves
- ½ tsp finely chopped fresh rosemary leaves
- ½ tsp plus a pinch freshly ground black pepper
- 2 pounds white button mushrooms, wiped clean and stems
removed, coarsely chopped
- 1 TBs soy sauce
- 2 TBs chopped fresh parsley leaves
- ¼ cup dry white wine
- 1 cup freshly grated Parmesan
- 2 large eggs
- 1 cup heavy cream



Strain the porcini mushrooms in a fine-mesh sieve and reserve the soaking liquid. Chop the mushrooms and set aside.

Heat 2 TBs butter with the olive oil in a large Dutch oven or sauce pan until foamy. Add the Arborio rice and cook, stirring frequently, until the rice is well coated and fragrant, 1 to 2 minutes. Add 1½ TBs shallots and ½ TBs garlic and cook, stirring, until fragrant, about 1 minute. Add the reserved porcini soaking liquid and cook until it evaporates. Reduce the heat to medium and add 2 cups chicken stock and ¾ tsp salt. Cook, stirring constantly, until

the broth has been absorbed. Continue to cook, adding more broth, ½ cup at a time, until it is absorbed and the rice is al dente, 16 to 18 minutes total cooking time. (You may not need all 6 cups of the broth.) Add the thyme, rosemary, and ¼ tsp black pepper. Set aside while you prepare the mushrooms.

Heat the remaining 2 TBs butter in a large skillet until foamy, 1 to 2 minutes. Add the remaining 1½ TBs shallots and the remaining ½ TBs garlic and cook until fragrant, about 1 minute. Add the white button mushrooms, ½ tsp salt and ¼ tsp black pepper and cook, stirring frequently, until the mushrooms release their liquid, about 4 minutes. Add the reserved porcini mushrooms and continue to cook, stirring, for 6 minutes, or until all the liquid evaporates and the mushrooms are golden brown around the edges. Add the soy sauce and parsley and cook for 1 minute. Add the white wine and cook until evaporated, 2 minutes. Remove from the heat.

Layer half of the reserved risotto in a 9 by 9-inch casserole or baking dish and sprinkle with half of the Parmesan. Top with the mushroom mixture. Add the remaining risotto and top with the remaining Parmesan.

In a small bowl, whisk together the eggs, cream, and the remaining ¼ teaspoon salt and pinch of black pepper. Pour the mixture evenly over the top of the casserole and bake, uncovered, for 30 minutes or until golden brown. Remove from the oven and let stand for 5 minutes before serving.



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