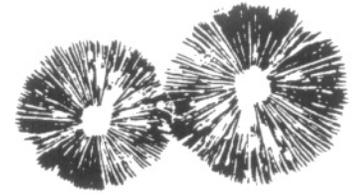


SPORE PRINTS



BULLETIN OF THE PUGET SOUND MYCOLOGICAL SOCIETY
Number 444 September 2008



2008 MUSHROOM EXHIBIT

Kim Traverse

45th ANNUAL

WILD MUSHROOM SHOW

OCT. 11–12 at

THE CENTER FOR URBAN HORTICULTURE

It's that time of year again—wild mushrooms start to appear in droves and PSMS shares them with the world!

This is the big event of the year for PSMS and an opportunity for volunteers to have more fun in a few days than seems possible. No matter what your experience, we can use your help to pull off another incredible show. Sign-up sheets will be available at the membership meeting on September 9, but you can also contact me by phone at 206-380-3222 or via e-mail at traverse.kim@gmail.com. This is a wonderful way to help the club, meet great people, and promote the greater appreciation of fungi. The camaraderie is warm, the food is delicious, and the cause is righteous!

Come prepared to sign up!

CUH proved to be a wonderful location last year, and Ron Post has graciously agreed to mentor me and co-chair Daniel Winkler in how the show gets to run so smoothly. This year we will have Chef Kathy Casey demonstrating the magic that mushrooms contribute to cuisine and Else Vellinga from UC-Berkeley will speak about how fungi contribute to the entire planet.

Vellinga works at UC-Berkeley studying the *Lepiota* group of Agarics and has contributed to *The Flora Agaricina Neerlandica*. She is especially concerned with the fungal component of biodiversity, noting that mushrooms have always been treated as a step-child of the biological sciences. Check out this website for a list of her other published articles: plant-bio.berkeley.edu/~bruns/people/ev.html.

Please plan on helping the show by collecting mushrooms on Thursday, October 9, and Friday, October 10. These can be delivered to the Head House at CUH after noon on Friday or very early Saturday morning.



JOY SPURR DONATES MUSHROOM BOOKS AND SLIDES TO CUH

In June, Joy Spurr donated her substantial collection of books on mushrooms (105) to the library at the Center for Urban Horticulture. A few are guidebooks written in recent years by U.S. authors, but most are beautiful books from Europe, such as France, Switzerland, Germany, etc., as well as books specializing in a particular species.

This collection is available to PSMS members to use in the CUH library which is open 6 days per week. Phone 206-543-8616 for hours open.

Joy also donated over 8,000 color slides of plant species, including about 1,000 mushrooms, to CUH to use for educational purposes.

BEGINNING MUSHROOM ID WORKSHOP

Colin Meyer

What: PSMS Beginning Mushroom ID Course

Where: Center For Urban Horticulture, Douglas Classroom

When: Thursday Evenings, 7:00 pm – 9:00 pm
9/25–10/16 (first series)
10/23–11/13 (second series)

Cost: \$35, cash or check payable to PSMS (bring on first day of class)

Book: *Mushrooms Demystified*, by David Arora

Bring: Fresh mushroom specimens

Contact: education@psms.org
(for questions or to register)

PSMS will offer a beginning mushroom identification class this fall on four consecutive Thursdays, beginning on September 25. 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 (subject to possible rearranging):

- Sept. 25 - Introduction to Mushroom ID
- Oct. 2 - Identifying Mushrooms with Dichotomous Keys
- Oct. 9 - Cooking and Collecting
- Oct. 16 - 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.

Class cost is \$35 for four sessions. For questions or to register, please send e-mail to education@psms.org with your name or names. If you don't have access to e-mail, you may call 206-354-7789, but e-mail is preferred.

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MEMBERSHIP MEETING

Tuesday, September 9, 2008, at 7:30 pm at the Center for Urban Horticulture, 3501 NE 41st Street, Seattle.



We will kick off our fall meetings with a new presentation by our scientific advisor, Dr. Joseph Ammirati, who will speak on "Pacific Northwest Cortinarii—A New Perspective!" Dr. Ammirati, a professor in the Department of Biology at the University of Washington, is respected for his work with the Cortinarii, toxicology, fungal systematics, and forest ecology. His revision of *The New Savory Wild Mushroom* earned him a certificate of achievement from the Society for Technical Communication. He serves on the editorial board of *Mushroom: the Journal of Wild Mushrooming* and is co-author of *Poisonous Mushrooms of the Northern United States and Canada*. Dr. Ammirati is a keen supporter of mushroom hobbyists, and attends and/or speaks at numerous meetings, events, and forays, including our recent "Mushroom Maynia!" at the Burke Museum. He was the advisor for our Barlow Pass study, the Oregon chanterelle project, and the Pacific Northwest Key Council. He is a member of the Toxicology Committee of the North American Mycological Association and has been a foray mycologist for NAMA and amateur societies.

Would persons with last names beginning with the letters A to K please bring refreshments for the social hour?

CALENDAR

- Sept. 9 Membership Meeting, 7:30 pm, CUH
- Sept. 15 Board Meeting, 7:30 pm, CUH
- Sept. 16 *Spore Prints* deadline (**early**)
- Sept. 25 Beginner's ID Class, 7:00 pm, Douglass Classroom, CUH
- Oct. 2 Beginner's ID Class, 7:00 pm, Douglass Classroom, CUH
- Oct. 4 Field Trip, Ohanapecosh River.
- Oct. 7 Membership Meeting, 7:30 pm, CUH (**early**)
- Oct. 9 Beginner's ID Class, 7:00 pm, Douglass Classroom, CUH
- Oct. 11–12 **PSMS Wild Mushroom Exhibit, CUH**

JUNE BOARD NEWS

Dennis Oliver

Ah, it seems such a long time ago, but the board did meet in June. We said goodbye to Kevin and Molly Bernstein, who are moving to the great plains of Kansas. Doug Ward returns to the board as a replacement for Cynthia Nuzzi, who is retuning to Canada.

The board passed a motion to sell our mushroom pin machine and free it from Hildegard's basement. Volunteers are needed for the Mushroom Festival in Lacy. Planning is beginning for the 45th annual wild mushroom exhibit, which is co-chaired this year by Kim Traverse and Daniel Winkler. We need a book chair for the show. We will continue with mushroom Mondays with the Master Gardeners; volunteers and interested people are needed. Planning also continues for our mushroom calendar.

FALL FIELD TRIPS

Cathy Lennebacker



All this rain is having the desired effect, and there are mushrooms, edible ones at that, in them thar hills. Our first field trip will be to the Ohanapecosh River. This pristine area of giant trees has yielded both white and yellow chanterelles, matsutake, hedgehogs, pig's ears, and hericium in abundance in past wet autumns. There are numerous nonedible interesting specimens plus dye mushrooms. Even though this is a drive, it's well worth the trip. There is free primitive camping at the site or you can go up the road to Ohanapecosh campground at the SE corner of Mt. Rainier National Park for bathrooms, picnic tables, and flush toilets. This is by far the most beautiful site of the season and promises to be the most prolific.

October 4

Near La Wis Wis Campground

This site is just outside the southeastern corner of Mt. Rainier National Park in old growth forest with thick moss cover near the La Wis Wis forest service campground. The campground closes September 30, but there are lovely free primitive sites just north along the Ohanapecosh River. There are no bathrooms, so be prepared. It's a long way but worth the drive.

Driving Directions. Take I-5 south to exit 68 and turn east on US 12. Drive 65 miles to Packwood. Continue 7 miles east on US 12, then drive ½ mile west on forest service road 1272. The main campground will be closed, so follow the PSMS signs north from there to a free spot between the campground and Mt. Rainier National Park.

Alternate Route. Go east on Hwy. 410 over Cayuse Pass, past the southeast entrance to Mt. Rainier National Park toward Packwood. The La Wis Wis campground entrance is on the west side of the road 7 miles past the Ohanapecosh campground.

Follow the PSMS signs from both directions.

CHILIES DEVELOPED HEAT TO BEAT FUNGUS, UW RESEARCH FINDS

Sandi Doughton

Seattle Times, Monday, August 11, 2008

Why are chilies hot? University of Washington scientists say spice protects the plants from fungus.

The delicious burn that chili lovers savor is the result of an evolutionary duel between the plants and their predators, according to new research from the University of Washington.



Working in South America, ancestral home of all chilies, scientists showed that the chemical that gives peppers their punch also helps ward off a seed-killing fungus, *Fusarium semitectum*.

“To me, this answers the fundamental question of why chilies are hot in the first place,” said UW biologist Joshua Tewksbury, lead author of the study published online today in the *Proceedings of the National Academy of Sciences*.

The research adds to evidence that capsaicinoids (cap-say-sin-oids), the spicy compounds in chilies, can be deadly to a wide range of microbes. Many experts believe that germ-fighting power is the reason ancient people began eating peppers. “People probably added chilies to their stews because spicy stews were less likely to kill them,” Tewksbury said.

Chiles were first cultivated in the New World 6,000 years ago. Traders and explorers, including Christopher Columbus, brought them to Europe. They spread quickly around the globe, and are now part of the daily menu for a quarter of the planet’s population.

Tewksbury and his colleagues studied a Bolivian chili that comes in different versions, from hot as a jalapeño to bland as a bell pepper. They found the mild peppers were more than twice as likely to be infected with fungus as the spicy versions.

The fungus slips inside chili pods after their protective skins are pierced by insects with beaklike snouts. In areas where those bugs were plentiful, most of the chili plants produced spicy fruit. And in areas where there were few insects and little danger of fungal infection, most of the chilies were mild.

The scientists also tested their hypothesis in the lab, creating a kind of artificial chili soup that contained the same nutrient mix as the real chilies. They added varying amounts of capsaicinoids, then inoculated the cultures with the fungus. In mixtures that contained the spicy chemicals, the fungus grew much more slowly.

Tewksbury’s earlier studies in Arizona found that producing spicy fruits also helps protect chili plants from being eaten by packrats, mice, and other mammals, which can’t stomach the heat. But birds are oblivious to spice. Chile seeds pass unscathed through their digestive tracts and are dispersed across the landscape.

EAST COAST MUSHROOMS PROLIFERATING IN RAINY CONDITIONS

Cari Scribner

dailygazetter.com, Schenectady, NY, August 15, 2008

Clifton Park, NY — Rainy days and cool nights this summer on the East Coast have spawned an unusually large crop of poisonous mushrooms.

Experts are warning people to be on the lookout for one of the most dangerous, several closely related species of *Amanita* commonly known as the “Death Cap” or “Destroying Angel.”

Although not posing a risk if smelled or touched, the mushroom can be fatal—even in the smallest doses—when eaten by animals or people, according to health officials.

Late summer is the typical start to the growing season for mushrooms, but this year’s crop arrived early and in greater numbers than usual, according to agricultural scientists.

“There are mushroom species out there that haven’t been showing up in this area for several years,” said Dr. John Haines, a mycology expert and scientist emeritus for the New York State Museum. “The hot, dry conditions the last two summers have kept them largely underground; these poisonous mushrooms have been waiting for the right conditions to pop up, and this year that’s happening.”

At the end of July, the state Health Department issued a warning to New York residents to avoid eating all wild mushrooms, after two Rensselaer County residents were hospitalized with severe illness last month after eating wild mushrooms.

[The Putnam County, NY, Health Department issued a similar warning following the death of a White Plains woman who ate “Death Angel” mushrooms picked in a wooded area along a high-way rest area in Bedford.]

Mushrooms have also sickened at least three local dogs, one fatally. Clinic Manager Toufic Diab at the Capital District Animal Emergency Clinic in Latham, which takes in sick animals requiring 24-hour care, confirmed that a young 8-pound dog from Clifton Park died Tuesday after eating what was believed to be an *Amanita* mushroom in its backyard. Another sickened dog was in the emergency clinic this week, but a third, poisoned two weeks ago, made a full recovery after being treated there.

A newsletter of Cornell Cooperative Extension in Greene County warned people not to self-identify any wild mushrooms they find around their houses or wooded areas. “There are absolutely no hard and fast rules or ways to determine if a given species is toxic or not,” said the article’s writer, Bob Beyfuss. “Some people do play Russian Roulette by eating unknown mushroom species; that’s an enormous risk they shouldn’t dream of taking.”



Destroying Angel

BEWARE OF WASPS IN THE WOODS

Kim Westad

Victoria Times Colonist, August 16, 2008

A young hiker died yesterday after he was swarmed and stung by bees, wasps, or hornets on Mount Brenton, west of Chemainus, B.C. The man’s name has not been released, but those at the scene said he appeared to be in his 20s. He was a tourist from Germany hiking with a youth group on the mountain, witnesses said.



“We were called in with a report that a man had been swarmed by what looked like hornets and appeared to be having a severe allergic reaction,” said Rick Ruppenthal, the central Vancouver Island superintendent for the B.C. Ambulance Service. “Apparently he had no previous history of allergies.” The call to 9-1-1 came in at 9:30 a.m. yesterday from another hiker with a cell phone.

The ambulance service sent out its advanced life support helicopter, and area police, fire, and search-and-rescue crews were also called. But the hikers were on a part of the mountain that could not be reached by vehicle. At 11:10 a.m., the Victoria Rescue

cont. on page 4

Coordination Centre received a call from the ambulance service asking for their aircraft, as rescuers believed air crews could get to the man faster than personnel on foot. The rescue center sent out a Cormorant helicopter and Buffalo fixed-wing plane. Search-and-rescue crews in the Buffalo were guided to the site on the mountain by hikers at the scene who had cell phones, said Capt. Aaron Twa.



Yellow jacket nest.

Two rescue workers parachuted down from the Buffalo. Twa said the man was on the ground and rescuers began giving medical aid immediately. "I was told the man was not in very good condition," he said. The victim was unconscious and unresponsive. He was put in a basket stretcher, taken out in the helicopter, and flown to the B.C. air ambulance, waiting at the nearby Chemainus mill site. Paramedics continued working on him there, to no avail. He was pronounced dead at the scene.

Other hikers said the man had no previous known allergy to stings, Ruppenthal said.

"If you have no previous history or knowledge of an allergy, a couple of stings can be enough," he said. It appeared the man went into anaphylactic shock, Ruppenthal said. That can lead to death in minutes, as it causes the throat to swell and close. Several other people are also believed to have been stung, but not injured. Just what stung the man is not yet clear. Initial reports said the insects were hornets. But Victoria bee expert Bill Spriggs said they were more likely to have been yellow jacket wasps.

Hornets, he said, nest high in branches and are not overly aggressive. Yellow jackets, however, often nest in the ground in rotten tree stumps, where it is relatively easy for hikers to disturb them, Spriggs said.

The man's name will not be released until his next of kin are notified. Victoria coroner Rose Stanton said her office will investigate the death, as it does all sudden fatalities. An autopsy may be done on the young man to determine the exact cause of his death, she said.

The *Merck Manual* advises, "Persons with known hypersensitivity to such stings should carry a kit containing an antihistamine and epinephrine ..."

THE BEST WAY TO REMOVE A TICK Les Leaf

Kitsap Peninsula Myco. Soc.
via the Olympic Peninsula Myco. Soc. *Newsletter*, June 2008

This information should be useful for garden enthusiasts, campers, hunters, or those with children or grandchildren who play outdoors as well as mushroom hunters.

A school nurse wrote this: "I had a pediatrician tell me what she believes is the best way to remove a tick. This is great, because it works in those places where it's difficult to reach with tweezers: Apply a glob of liquid soap to a cotton ball. Cover the tick with the soap-soaked cotton ball and let it stay on the insect for 15–20 seconds, after which the tick will come out on its own and be stuck to the cotton ball when you lift it away. This technique has worked every time I've used it, and it's much less traumatic for the patient. Unless someone is allergic to soap, I can't see that this would be damaging in any way. I even had my doctor's wife call me for advice. She used this method and immediately called me back to say, 'It worked!'"

SPECIAL SUMMER FIELD TRIP TO THE OLYMPIC MOUNTAINS

Ron Post

Seventeen people converged in the northern Olympics on a bright, very warm day in July to follow PSMS trustees Jamie and Dennis Notman as we searched for native orchids. Jamie explained on the way over that orchids are all mycorrhizal and their fungal partner is in many cases a mystery; thus few North American species are cultivated. To see them, you must go where they grow. No one was disappointed thanks to our knowledgeable and generous leaders.



E. gigantea

The first orchid we encountered, *Epipactis gigantea*, was perhaps the most striking. Growing just inches from the water by a lowland lake, it presented a challenge for those wishing to obtain a photograph. For a good close-up, see the following Web page:

<http://pnwflowers.com/flower/epipactis-gigantea>.

In that location the Cooley's hedge-nettle, *Stachys chammisonis*, was also in full bloom. As we would find to our delight, there were many other species of wildflower blooming in and around Olympic National Park. The higher we traveled, the more spring-like the blossoms.

After a stop for a delicious potluck lunch, and losing but refinding a few wayward members of our group (the driver of the rental van was yours truly and I became very distracted, either by my esteemed companions or so many lovely blossoms, or both), we proceeded up the road toward Hurricane Ridge—but not before sighting an individual specimen of *Corallorrhiza*.

To our astonishment, the ranger at the park gate told us there are no orchids in Olympic National Park. That would be like saying there are no fungi in the forest! Jamie and Dennis knew better, and a short distance up the road, we found more orchid species in the genera *Goodyera*, *Piperia*, *Platanthera* and *Spiranthes*.

Many of these were growing just by the roadside, some in wet ditches. In one area, the cars of road crews were seen to be parked on top of orchid plants. So much for the general public being aware of botanical treasure!

As we neared the ridgeline, there seemed to be fewer orchids blooming but many spring flowers such as Indian paintbrush and Tiger lily. We searched for other orchid plants but found few clues that they had flowered at the higher elevation. Opportunities for a later trip!

As you can imagine, mushrooms were not fruiting, search as we might. It was midsummer. The National Park Service provided one bright spot to our trip: we found the 1962 publication "Introduction to the Quinault Valley Rain Forest," by the late Irene O'Connor, a longtime PSMS member, still in print and on sale at the visitor's center.

Although there were some minor scheduling glitches, we ferried over and banded together to begin our trip well before noon. And on our way back, Dick and Agnes Sieger hosted the group for a wine and cheese buffet. Many, many thanks.

On the return trip, some of us had the idea to make this an annual club outing, replacing the July picnic we haven't held for about the past three years. Sounded good to me! I will take it up with the board.



OTTAWA SHOPPERS LINE UP TO BUY FANCY FUNGI

Laura Robin, *The Ottawa Citizen*, August 7, 2008

What's new? Le Coprin is now selling exotic mushrooms at the Ottawa Farmer's Market at Lansdowne Park on Sundays.

As many as 100 area chefs have been cooking with Le Coprin mushrooms for the last few years. Dozens of the region's best restaurants feature them by name on their menus. A couple of local food stores sell some of them. But until he set up a stand at Lansdowne on a recent Sunday, Le Coprin's owner Christophe Marineau-Mes did not sell directly to the public.

What was the response?

Overwhelming. People immediately lined up to buy them. "It's been great," says Marineau-Mes. "It's too much for us to handle and it's all good," he laughs.

Why are these mushrooms so special?

While Ottawans have long been able to get good local button mushrooms from Continental Mushroom Farm near Metcalfe, most of the fancier types of mushrooms—even ones that grow wild in the woods in the Ottawa area—have been imported. "They might come from Tanzania or Turkey or Thailand," says Marineau-Mes. "Ours are fresher, they're certified organic, they're cleaner, they're cheaper, and they're local."

What does organic mean when it comes to growing mushrooms?

"We don't use harsh chemicals to wash out our growing rooms," says Marineau-Mes. "People use all kinds of stuff, like formaldehyde. We just clean more often with soap and water. We don't use antibiotics to control bacteria. Instead of packing the rooms to the max, we let the mushrooms breathe a little, give them more air."

Where does he grow them?

In special growing rooms he built near the home he shares with his wife Marie-Elise Trottier and two young sons in Farrelton, Que., about 30 kilometers from central Ottawa. "Because they're not coming from halfway around the world, with each person at each step of the way charging their fees, they're cheaper," he says. "And, anyway, I think the environmental cost of sending mushrooms around the world is ridiculous."

What kinds of mushrooms does he grow?

"I've always got a few experiments on the go, but we are usually growing king oysters, pearl oysters, winter mushrooms, nameko, reishi, blue oysters, phoenix oysters, elm oysters, lion's mane, white beech, and shimeji."

Whew. Is that it?

Nope. He also picks wild mushrooms in season and sells them too. "I've been picking mushrooms for about 20 years. I have my favorite places, all within a 100-kilometer radius of my farm. Porcinis are just ending and now it's black trumpet, chanterelles, and lobster mushrooms."

So how many mushrooms are we talking about?

Marineau-Mes grows a ton and half every month. He can't even guess how many individual mushrooms that is, but says it adds up to about 7,000 brown paper bags of the delicate fungi. ("Plastic is the worst thing in the world to wrap mushrooms in. They're still living after they've been picked. They need oxygen.") He also picks a huge amount of wild mushrooms. "In a good season, we also pick 600 to 800 pounds of chanterelles. This has been a great season for mushrooms; we had 22 days of rain in June."

Is there a demand for that many mushrooms?

"We can't grow or pick enough. We haven't been able to take on a new restaurant client in years."

If they're already that popular, why is he selling at Lansdowne too?

"People have been calling and e-mailing, and asking for a retail spot where they can buy our mushrooms. I want the public to actually be able to taste the mushrooms, not just the versions in restaurants. We also need to fix the bad image some mushrooms have got from crappy ones sold in grocery stores. I like what I do and I don't just want to do it for the fancy food industry. I like to do it for everyone."

Did Marineau-Mes always see his future in fungus?

Hardly. He grew up in Aylmer and studied arts in university. But he's loved mushrooms since he began foraging for them when he was a teenager. He worked in forestry, then helped a friend sell mushrooms to chefs and restaurants before he built his own operation, which began operating in February 2006. His wife is about to quit her day job to help out with the burgeoning business, and they have one employee.

And do they still eat mushrooms at home?

"Just about every day," says Marineau-Mes. He says they like to prepare them "simply, cooked in butter and oil with salt and pepper and French shallots." They have them on their own, on toast, on salads, on pizza, and in pasta dishes. They haven't yet offered mushrooms to their eight-month-old son, but Marineau-Mes says that when their two-year-old was barely able to walk, he toddled into one of the growing rooms "and started chomping away. "It was really cute."



Marineau-Mes

FUNGUS SLOWS SPREAD OF GYPSY MOTHS

Rebecca Finneran

The Grand Rapids Press, July 20, 2008

Hundreds of people in West Michigan looking for county-wide spray programs to kill caterpillars of the gypsy moth (*Lymantria dispar*) soon may be thanking the power of a natural fungus that is doing the job for them. Large-scale spray programs can be difficult to manage and may upset the natural balance of this pest's predators.



Gypsy moth caterpillars, which feed mostly on oak but also will defoliate birch and poplar, have been on the rise around the state this year, according to David Smitley, a Michigan State University entomologist. Although their feeding damage and excrement soon will end for 2008, widespread aerial spraying next spring to prevent invasion may be unnecessary, Smitley says.

"Hold on a minute: There is a good fungus among us," he said.

Because of intensely dry springs, gypsy moth populations have been on the increase. "Gypsy moth caterpillars are dramatically more abundant in many parts of the state because of a cycle driven by their natural enemies," Smitley says.



One of the most effective enemies is a fungus called *Entomophaga maimaiga*, which thrives in a season that has plentiful rainfall. This fungus infects caterpillars, and they die head down on the trunk of the tree. As the

cont. on page 6

Gypsy Moths, cont. from page 5

days wear on, the insect body will shrivel, dry up, and fall to the ground.

Once the fungus is inside the caterpillar, it not only kills the caterpillar but turns its body into a spore-producing “mushroom” in about a week. Just like mold on bread, the fungus will produce thousands of spores that will be the best defense against gypsy moth outbreaks next year. Caterpillars that do turn into moths, mate, and lay eggs will be affected upon hatching next spring. Small caterpillars will die quickly and continue the spore-infection cycle, Smitley says.

I live in oak woods, and for the last four weeks, I have noticed these shriveled, dry gypsy moth caterpillars lying on the sidewalk or under the rim of a planter. With recent rains, I observed hundreds, if not thousands, of caterpillars that are soft but dead and are facing down.

Insects, such as gypsy moths, always will be in Michigan, but we can expect to see increases and declines in populations as weather cycles perpetuate natural enemies.

“Fortunately, *Entomophaga* is very host-specific and only infects the gypsy moth and not any other animals,” Smitley says.

This is the time of year to be looking for this phenomenon. If *Entomophaga* is active in your area, the gypsy moth population will naturally decline. If you choose to spray next spring, you may never give the natural enemies a chance to shine.

Gypsy moth caterpillars killed by Entomophaga maimaiga, hanging head down.



READING THE SIGNS: “COLORADO UNDER CONSTRUCTION”

Spores Afield

Colorado Myco. Soc., July 2008

In past articles in *Spores*, I have written about learning how to read the “signs” that point to finding choice edible mushrooms. These “signs” are the individual components of our local portion of the earth’s ecosystem. With careful observation, it is easy to learn the growth stage that some common and easy-to-find plants are in at the time when your favorite mushrooms are fruiting. In addition, it is easy to observe what other common plants like the same geology and conditions that your favorite mushrooms like. By learning this, you will become much more successful in finding your favorite mushrooms; it’s as simple as “reading the signs.”

Prior to the technological age, the ability to observe and understand the “signs” of nature was essential to human survival. Over many years most human cultures have become dependent upon technological solutions to providing foods and goods to the point that for most of us, we no longer know how to read the “signs” placed by nature clearly in our view.

Environmental change is not something that may happen in the future, it is under way now on a global scale. For anyone who has recently driven through the mountains of Colorado, our ecosystems has placed a HUGE “sign” before us. Colorado is under construction. Our ecology is rebuilding Colorado in a very significant way.

Our pines and aspens are dying off, our mountains are being stripped of their forests. Within the next 10 years, Colorado is

going to be a very different place than it is now and as it has been for tens of thousands of years.

There can be no doubt that the changes in Colorado forests are going to have a substantial impact on mycosystems. Will the forests regenerate or permanently change to a different environment? Only time will tell. This spring I visited one of my “secret” morel producing areas in Frasier. Last year I collected about 100 black morels from that area. This year the morel zone was nearly dead and I did not find a single morel there. Undergrowth such as Arnica and Oregon Grape was struggling to grow there as well. I had not anticipated a major impact to black morels, but that “sign” was clear enough to read.

With the die-off of Lodgepole Pine, I expect we will also see a substantial impact on Matsutake and on what I think may be a subspecies of *Boletus edulis*, the golden-brown-capped King Bolete that grows among Lodgepole Pine.

There is a lot of discussion in the news about global warming and its causes and impacts. Some say current conditions are just a regular occurring natural cycle. Some say that human-derived environmental pollutants are generating the change. I am not going to pretend that I know the answer to that, but I think it is important that we as individuals, as a society, and as a species take a hard look at our individual and collective impact on the earth’s ecosystem. The “signs” are no longer obscure; change is taking place, big change.

FINNISH WILD MUSHROOMS ARE STILL RADIOACTIVE

Helsingin Sanomat

International Edition, August 11, 2008

The wild mushrooms tested in various parts of Finland still exhibit elevated levels of the radioactive caesium-137 that originates from the Chernobyl accident in 1986, while the caesium content of berries and animals has already become almost zero.

In addition to mushrooms, some hares and the predatory fish in small lakes still contain radioactive caesium.

“In the areas with the largest fallout, the level of radioactive caesium can be considerable. However, mushrooms can be eaten in moderation, even when the contents are high, exceeding the highest permissible level recommended for commercial mushrooms,” said researcher Eila Kostianen from the Nuclear Safety Authority.

The easiest way to reduce the caesium content is to pre-process the mushrooms with water.

“Caesium is water-soluble and can be disposed of with water. The most important thing is to soak or boil the fresh, dried, or salted mushrooms in abundant water and to throw away the water after the process.”

The drying of mushrooms alone does not reduce the level of radioactive caesium.

NOMADIC ANTS HUNT MUSHROOMS

Susan Milius, Science News, July 25, 2008

A newly discovered ant lifestyle is one of roaming and picking. No anthills. Just a place to stay for a while, and then it’s off wherever the next mushroom leads.

Colonies of *Euprenolepis procera* live a lifestyle new to ant science, according to Volker Witte of Ludwig-Maximilians University

in Munich. The ants move nomadically around rainforests at night in Malaysia, hunting and gathering mushrooms.

Such patchy food makes life tricky, but the ants seem to have adapted to the problems, say Witte and Ulrich Maschwitz of Johann-Wolfgang-Goethe University in Frankfurt in an upcoming issue of the journal *Naturwissenschaften*.

“This is a sensational discovery,” says ant biologist Bert Hölldobler of Arizona State University in Tempe.

The nomadic life of this species is different from—in a sense the opposite of—the ways of the fungus-farming attine ants of the Western Hemisphere. The farmer ant lineage invented agriculture millions of years before people did, and today’s 200-plus species construct permanent homes where they tend and eat spongy masses of interlocking threads of fungus.

These masses are nonreproductive tissue, the mycelium that makes up most of a fungus and typically remains hidden in the soil, a log, a molding bread slice. A particular farm grows just one type of fungus, often one that sprouts nubbins that make nutritious ant snacks.

The Malaysian ants aren’t farmers, but hunter-gatherers. They don’t have a special fungus buddy-species, and they don’t bother with thready masses. Instead the harvester ants target the reproductive structures, such as the fleshy little umbrellas that open from the ground after a rain and make spores.

The newly discovered harvesters aren’t related to the farmers, Hölldobler says. “It might very well be that ancestral attines gathered fungi before they became fungus cultivators.”

“One of the coolest things about this paper is that it may provide clues to the evolutionary precursors of fungus-growing,” says Ted Schultz of the Smithsonian Institution in Washington, D.C. “This is a great paper.”

Ants have diversified into societies with elaborate specialties: slave-raiding other ant colonies, doing bodyguard duty for plants, sweeping through forests in “armies” of pillagers, tending herds of plant-sucking insects. Nevertheless, Witte says, ant biologists have not seen it all.

Before Witte began studying *E. procera* in 2006, biologists knew virtually nothing about the ants’ biology. For a basic test to see if the ants had any special interest in fungi, Witte dotted the forest with dozens of fresh mushrooms from a market. Within 4 hours, these ants had found and swarmed over 44 percent of the windfalls. Nibble by nibble, the ants typically dismantled and carried away almost three-quarters of a mushroom within 4 hours. Twenty-four hours later, the mushroom was gone.

To test the ants’ preferences, Witte picked some 80 kinds of mushrooms from around the forest and set them in the middle of columns of ants out foraging. The ants ignored many offerings but swarmed to break up and take home 30 of the species, clearly more adventurous eaters than the fungus farmers.

Looking for nests, Witte backtracked along columns of foragers. Ants didn’t dig their own homes. Colonies with as many

as 20,000 members sheltered in some nook among tree roots or in gaps within the leaf litter. Within days the colonies moved on, carrying everything with them, including their eggs and larvae.

The researchers transplanted some (of the smaller) ant colonies into the lab and found that harvesters pile their crumbs in little heaps in their shelters. The ants then process the haul, gathering around to chew and regurgitate what will eventually feed the colony.

The processed mound of soft, dark pulp exudes a “sweetish-sourish smell,” Witte says. “I wouldn’t eat it, but it doesn’t smell bad.” Something about the chewing seems to prolong the shelf life of the fungi, he says.

In the lab, the researchers discovered that the ants will also eat a dead cricket if given a chance. That’s probably not a chance they often get in the wild, Witte says. He hasn’t seen much take-down power among the ants. When he fed colonies nothing but mushrooms for months, the ants thrived.

Living in a rainforest could give the ants their best shot at finding year-round mushrooms in a moist environment. For seasons there, “the difference is between rain and a lot of rain,” Witte says.

Rainforests also crawl with ants, so competition gets fierce for ant food, he says. The rare skills of mushroom harvesting open up a new lunch basket.

Mushroom eating could make the ants an overlooked player in forest dynamics, Witte says. Carrying around the mushrooms might distribute the spores and may influence the spread of plants that need mushroom partners to thrive.

Mushroom-eating ants could be overlooked, period, says Cameron Currie of the University of Wisconsin–Madison. Hearing about the paper reminded him of ants he’s seen scurrying over mushrooms in the Western Hemisphere but didn’t take time to follow around. Maybe, he says, there are more mushroom nomads.



Euprenolepis procera at work.

SHARP-EYED EXPERT SPOTS RARE FUNGUS ON WAY HOME

Jenny Haworth

The Scotsman, Edinburgh, August 5, 2008

A fungi expert stumbled across a new species in Scotland as he walked home from work.

Dr. Andy Taylor, a mushroom expert from the Macaulay Institute in Aberdeen, noticed the *Xerocomus bubalinus* growing near a lime tree in Albyn Place. The extremely rare fungus was described for the first time in 1991 in the Netherlands, but it has not previously been recorded anywhere in Scotland.

Dr. Taylor said: “I couldn’t quite believe it that I had found this species, which isn’t supposed to occur here in Scotland, and that it was living right here under our noses.”

cont. on page 8



Euprenolepis procera

Rare Find in Scotland, cont. from page 7

He recently discovered another very rare species, *Buchwaldobolus lignicola*, in the grounds of the institute.

“The main reason for my amazing finds is that there are so few people in the UK with the necessary identification skills to be able to spot these species,” he said. There are few professional fungi specialists, known as mycologists, left in the UK, unlike in many other European countries.

Xerocomus bubalinus



**LAMB SHANKS WITH MUSHROOM
ORRECHIETTE** www.pinkolive.com.au/index.htm

- 4 lamb shanks
- Sea salt and freshly ground pepper
- 1 lb mixed fresh mushrooms such as morels, shiitake, chanterelles, and domestic, roughly chopped
- 1 tablespoon minced garlic
- 1 cup diced onion (¼ inch dice)
- ½ cup diced carrot (¼ inch dice)
- ½ cup diced celery (¼ inch dice)
- 2 cups dry red wine
- 1 bay leaf
- 3 cups chicken stock or canned low-salt chicken broth
- 3 cups peeled, seeded, and chopped tomatoes (fresh or canned, depending on season)
- ½ pound dried orecchiette
- 3 tablespoons finely chopped fresh basil
- 1 tablespoon finely chopped fresh oregano

Preheat the oven to 300°F. Heat 3 tablespoons of the olive oil in a large, deep, ovenproof pot over medium heat until hot. Season

the shanks with salt and pepper and brown on all sides, about 10 minutes. Remove to a plate.

Raise the heat to medium-high, add the mushrooms, and do not move them until they begin to brown, about 1 minute. Season with salt and pepper and sauté until brown all over, about 5 minutes. Remove to another plate and reserve for final assembly.

Reduce the heat to medium, add the remaining 3 tablespoons olive oil to the pot, and heat until hot. Add the garlic and sauté briefly until light brown. Add the onion, carrot, and celery, season with salt and pepper, and sauté until light brown, about 8 minutes.

Add the wine and bay leaf, bring to a boil over high heat, and cook until reduced by half. Add the stock and tomatoes and bring to a boil again. Season with salt and pepper. Return the meat to the pot, cover, and place in the oven to braise until fork tender. Test at 2 hours, but the shanks may take as long as 4 hours.

Let the meat cool in the liquid to room temperature. Remove from the braising liquid and reserve separately. Skim off and discard the fat from the braising liquids. (The recipe may be made to this point a day ahead, covered, and refrigerated.)

Bring a large pot of water to a boil. Add salt and the pasta and cook until al dente, about 12 minutes. Drain.

Meanwhile, pour the defatted braising liquids into a saucepan and bring to a boil over high heat. Reduce the heat and simmer for about 10 minutes, skimming the surface all the while. Add the basil and oregano.

Return the shanks to the sauce and simmer gently just until heated through, then remove and keep warm. Add the mushrooms and pasta to the sauce and heat gently until warm through. Pour onto a large, deep platter or divide among serving bowls and top with the shanks. Serve immediately. *Serves 4.*

Paris mushrooms: it's when they're in your mouth that they're the happiest." Go make them happy.
– French mushroom ad



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