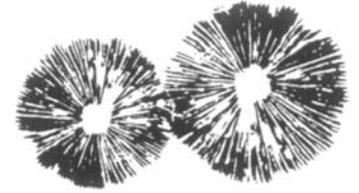


# SPORE PRINTS

BULLETIN OF THE PUGET SOUND MYCOLOGICAL SOCIETY  
Number 465 October 2010



## RESUPINATE FUNGUS OF THE MONTH: *Hypochnicium punctulatum* complex

Brian Luther

Macroscopically this fungus looks like any number of hundreds of resupinates—a whitish patch on or under decomposing wood. The excitement begins only after you make a thin section and mount it for microscopic observation.

### History

Eriksson & Ryvar den (1976) provide an excellent treatment of the common species of *Hypochnicium* known at the time. Boidin & Gilles (2000) revised the genus and included 29 species, doing traditional studies only, but several much more current DNA studies have been done recently. Nilsson & Hallenberg (2003) revised the complex of species surrounding my feature fungus using DNA analysis and provide a key to the four species they include. Paulus et al. (2007, Fig. 1, p. 143) clearly demonstrate in a phylogram based on Bayesian phylogenetic inference that the six species with ornamented spores (but no gloeocystidia\*) are closely related genetically (and distinct from the others). The original genus as treated by Eriksson & Ryvar den (1976) has now been segregated into *Hypochnicium*, *Gyrophanopsis*, *Nodotia*, and *Gloeohypochnicium*. All species with ornamented spores, but lacking gloeocystidia, now go in *Hypochnicium*; those with smooth spores and pronounced, thick-walled and multi-septate cystidia are now placed in *Gyrophanopsis*, and those with smooth spores and odontoid (toothed) basidiocarps having thick-walled skeletocystidia in the tissue are now segregated into *Nodotia* (Paulus et al. 2007). What we used to call *Hypochnicium analogum*, with ornamented spores and pronounced gloeocystidia is now in the genus *Gloeohypochnicium* (Hjortstam, 1987). Even though it has microscopic characteristics that clearly resemble the others, DNA studies have shown that it belongs to an entirely different order of fungi (the Russulales) and is completely un-related (Larsson & Larsson, 2003; Larsson, 2007; Telleria et al., 2010). Crazy.

This is a classic example of how traditional, conventional morphological studies have been shown to be wrong through the revelations of DNA technology. In the most recent DNA study, Telleria et



al. (2010) did a complete re-evaluation of the genus. According to DNA studies by Larsson (2007) the genus *Hypochnicium* belongs in the family Meruliaceae of the order Polyporales.

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## PRESIDENT'S MESSAGE

Marian Maxwell

This month is the 47<sup>th</sup> PSMS Annual Wild Mushroom Show! A weekend of fungal fun!

We will have sign-up sheets for volunteers at our October meeting, or you can volunteer by contacting Show Chair Kim Traverse at [traverse.kim@gmail.com](mailto:traverse.kim@gmail.com) or 206-380-3222. There is something for everyone to do, and an hour or two of your time is so helpful. This show is our fund raiser for the year, and we count on the revenues from this show to operate our Society.

If the increased amount of e-mails and calls that I and others have been receiving is any indication, there is a LARGE amount of interest in fungi right now. I believe that we will have many people attending this year's show.

With a renewed interest in sustainability and foraging for the table, the need for people to learn to identify fungi properly in order to forage safely is greater than ever. The best way to learn this is with field experience coupled with learning from books and other people—in other words in a group like ours.

Ours is not a hobby that should be taken lightly; one needs to take the time to learn to hunt mushrooms safely. We do not go into the woods and “try” the mushrooms. I am continually amazed by people willing to try something that they cannot identify with 100% accuracy (stunned actually).

Last month, for example, we ran into some people on Orcas Island who were going to try what they thought was “The Prince” but which was actually *Agaricus moelleri*. Then there were the people who cooked up a batch of “chanterelles” and served them to everyone at their workplace, which made everyone very nauseated (obviously they weren't all edible chanterelles).

Our reaching out to the public is critical to help them understand the role of fungi in the ecosystem as well as to be able to hunt safely. As well as being our main fund raiser, the Annual Show is also our main outreach to the general public and, for that reason, is doubly important. The more of us who are part of this effort, the more people we can reach.

So are you going to be a truffle and make the interested parties dig the information out of you, or are you going to be a gilled mushroom, spreading the “spores of knowledge” out into the environment freely so that people have a greater understanding of that which we have come to love? I encourage you to spread the “spores of knowledge” and sign up to volunteer at the show. You will be amazed at how much you will learn, and the incredible people that you will meet in the process. You will meet some strange people, too, but that's another topic.

\*Gloeocystidia are sterile, normally large hymenial cells with pronounced oily protoplasmic inclusions that often stain violet, black, or very dark when treated with sulfo-vanillin (a mixture of sulphuric acid and vanillin) or other acid reagent mixtures used in mycology.

# Spore Prints

is published monthly, September through June by the

## PUGET SOUND MYCOLOGICAL SOCIETY

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Annual dues **\$30**; full-time students **\$20**

## MEMBERSHIP MEETING

Tuesday, October 12, 2010, at 7:30 pm at the Center for Urban Horticulture, 3501 NE 41st Street, Seattle.

Our speaker this month is Debbie Viess, known on the Internet to many of you as "Amanitarita." She brings her fascination for amanitas alive in her richly illustrated, informative, and entertaining presentation, "Amanitas: From Deadly to Delicious."



Amanitas are among the most feared, as well as some of the most sought-after edible mushrooms. Come learn about this often maligned but never boring group of colorful, graceful, delicious, and sometimes deadly mushrooms. Debbie will relate her personal experiences with amanitas in California to tales of amanitas from around the world. This promises to be an eye-opening presentation and maybe 'Rita can make an amanita fan out of YOU!

Debbie Viess is a biologist, writer, and artist. She has been obsessed with mushrooms in general, and amanitas in particular, for over 15 years. She co-founded the San Francisco Bay Area's newest mushroom club, the Bay Area Mycological Society (BAMS), and leads mushroom walks, gives mushroom talks, and teaches mushroom classes for nonprofit organizations. She's published on amanitas for *Bay Nature* magazine and *Manzanita*, a local botanical journal, and lectured on amanitas in a "Science Café" presentation sponsored by the U.C. Berkeley Natural History Museum. She also contributes articles to local mushroom club newsletters, online mushroom forums, and *MushroomObserver.org* and is a contributing editor to *FUNGI* magazine. When she is not out collecting and photographing mushrooms, she is at home writing about or illustrating them, or even, sometimes, cooking and eating them.

Would people with last names beginning with the letters L-Z please bring a plate of refreshments to share after the meeting.

## CALENDAR

- Oct. 2 Field Trip (see website for details)
- Oct. 9 Field Trip (see website for details)
- Oct. 12 Membership Meeting, 7:30 pm, CUH  
*Spore Prints* deadline (early)
- Oct. 16-17 Annual Wild Mushroom Show, CUH
- Oct. 18 Board Meeting, 7:30 pm, CUH
- Oct. 23 Field Trip (see website for details)
- Oct. 28 Start of Beginner ID Class, 7-9 pm, Douglas Classroom, CUH
- Oct. 29-31 PSMS/The Mountaineers Mushroom Weekend, Meany Lodge
- Nov. 9 Membership Meeting, 7:30 pm, CUH

### FREE TO THE PUBLIC

"Mycelium Running: Can Mushrooms Save Us?"  
An evening with Paul Stamets  
researcher, author & CEO of Fungi Perfecti, LLC

Thursday, October 7, 7-9 pm  
Marlene's Market & Deli  
2565 So. Gateway Place  
Federal Way, WA 98003  
(253) 839-0933

Book signing immediately following Mr. Stamets' talk.  
No reservations, please arrive early to reserve your seat.

## BOARD NEWS

Denise Banaszewski

The Monday Night ID sessions are proving very popular, and we are going to put together a PSMS flyer that the identifiers can hand out to, we hope, attract new members. PSMS donated baskets containing PSMS and other mushroom-related items to both Seattle Tilth and the Shadow Lake Bog Frog Frolic. Seattle Tilth is contemplating doing a permanent cultivation garden; Milton Tam is discussing this with them. There will be a Fungal Bioblitz at the Arboretum on October 28, with collecting taking place from 10:00 am to 2:00 pm and identification taking place after that. Molly Bernstein, our wonderful webmaster who has moved to Arizona, is stepping down, and Evelyn Stoltz will be taking her place. Thank you, Molly, for all of your hard work! If anyone is interested in setting up and managing a Facebook page for PSMS, please let a Board member know. Lastly, PSMS was approached by the Washington State Department of Agriculture (WSDA) regarding certification of commercial mushroom pickers. We are told that the WSDA is currently revising the Washington Administrative Code to require that anyone in Washington who sells wild mushrooms for public consumption (at farmers markets or restaurants) has to be certified by passing a Certified Identification Class of some sort. The WSDA asked if PSMS would consider certifying commercial pickers through our classes. The Board discussed this and unanimously decided that we are not

interested in doing so for two reasons: first, our mission is not to further commercial purposes and, second, PSMS does not want the liability of certifying commercial pickers

## MEANY LODGE MUSHROOM WEEKEND:

October 29–31, 2010

Jerry Stein



PSMS and The Mountaineers present the annual Meany Lodge Mushroom Weekend, October 29–31, 2010. Sign up is open! Cost is \$90 or \$125, depending on whether you go to the lodge on Friday or wait until Saturday. Food and lodging are included in either price.

This event is an opportunity for PSMS volunteers to share their knowledge with people interested in mushrooms, including members of The Mountaineers, a statewide outdoor recreation club with over 10,500 members. Meany Lodge is a rustic building and grounds with a small ski area located near Stampede Pass, about 65 miles east of Seattle.

The weekend begins at the Lodge with an optional Friday evening program consisting of an introduction to mushroom identification using the Scates keys and other references. On Saturday morning the rest of the participants arrive at Crystal Springs Campground. Participants join up with a PSMS member/leader, typically 7–10 people per leader. Although most participants are primarily interested in foraging for edible mushrooms, this is a “standard” field trip in that we encourage participants to collect one of most everything, using proper collecting techniques. Everyone meets at the Lodge by 3:00 pm, and several PSMS members work to identify the mushrooms that are brought in. (I am pleased that Larry Baxter is planning to be there; his expertise will be appreciated!) On Sunday morning we do a mushroom “tray tour” of the mushrooms found, and cooking and dyeing seminars.

For details and a sign-up link ([brownpapertickets.com](http://www.brownpapertickets.com)), visit

<http://www.meanylodge.com/fall/mushroomwknd/mushroom.html>

I need more group leaders! You do not need to be an identification expert. You should know the common choice edibles, be able to demonstrate proper collection techniques, and be able to keep 7–10 people from getting lost. Group leaders do not pay for Saturday night lodging or meals. If you are interested, contact me at [jerrysteinstein08@gmail.com](mailto:jerrysteinstein08@gmail.com) or 206-763-9113.



## OTHER DANGERS OF MUSHROOM HUNTING

Rosie DiManno

<http://www.thestar.com>, September 3, 2010

Eighteen people died in Italy over a 10-day span in August, all for the lure of delectable fungi. *La Repubblica*, a national daily, headlined its front-page story: “The Massacre of the Mushroom Hunters.”

Misidentifying the edible is not the only cause of mortality. Some of the victims did indeed eat the wrong ‘shrooms or, fatally, cleaved to dangerous old wives’ tales, such as the belief that tossing a silver coin into the frying pan (my mom uses a quarter) will warn against poison, if the coin turns black.

Most of the ill-fated, however, simply fell into crevasses and deep gorges whilst hunting for mushrooms. Yes, it’s Extreme Mushroom

Hunting as a national sport in Italy. They’re dropping off mountains from Piedmont to Calabria.

As one alpine rescue carabinieri scolded: “It’s a problem of mentality, unfortunately. Many arrive in the dark. They set off with lights on their heads, even though it’s banned. They dress in grey or brown to disguise themselves from the others. They do the opposite of what they should.

“Too many cock a snook at the rules and, unfortunately, this is the result.”

I have no clue what “cock a snook” means—that was the English translation provided—but it sounds really dumb.

## KEEPING SAFE

Gaylord HeraldTimes.com,

April 22, 2010

Gaylord, MI - It’s a case of “all’s well that ends well” when searchers found a 13-year-old Charlevoix boy unharmed but cold after being lost in the Pigeon River Country Forest for six and a half hours after being last seen picking mushrooms with his guardian.

This is a tale of taking precautions ... to ensure safety while out in the woods, on the lakes, or wherever your outdoor adventures may take you.

We came up with a list of items that are easy to carry on a hike in the woods and could save your life. Just packing them up, keeping them handy in your vehicle, and remembering to take them with you when you start out could keep you safe or someone with you if some disaster should strike.

Emergency kit should include the following:

- small compass
- whistle
- LED key chain light
- a few waterproof matches and a butane lighter
- wad of dryer lint or small chunk of fire-starter brick
- water purification tablets
- alcohol wipes/bath tissue
- bandages
- fishing line, small hooks
- small signal mirror (old compact discs work well)

Other things to do or bring:

- dress in layers, remove or add clothing as needed
- take along a couple of candy bars, granola bars, or a bag of peanuts
- bring a full, 20-ounce water bottle
- obtain a county or trail map of the area and know how to read it
- take a pocket knife

If you get lost:

- stop, sit down for several minutes, calm your nerves and do not panic
- use your senses to listen for road noise or voices; look for familiar landmarks; determine north, south, east and west by using a compass, shadows, or the sun (it travels east to west)
- shout or use a whistle to signal to others; three blasts of a whistle or three shouts is the universal sign of distress
- head toward the nearest sound of road traffic

## Resupinate of the Month, cont. from page 1

This species complex of *Hypochnicium* is characterized by thin-walled to slightly thick-walled basal hyphae with thin-walled hyphae elsewhere, globose (spherical), subglobose to very broadly ellipsoid spores with cyanophilous<sup>†</sup> walls and distinctive ornamentation, and large hymenial leptocystidia (thin-walled cystidia) of only one kind.

### Classification Hierarchy for *Hypochnicium punctulatum*

Kingdom Fungi = Mycota  
Division Basidiomycota  
Subdivision Agaricomycotina  
Class Agaricomycetes  
Order Polyporales  
Family Meruliaceae  
*Hypochnicium punctulatum* complex

### Description of Collection

Brian S. Luther coll. #s 2010-34-1 (March 4, 2010) and 2010-316-1 (March 16, 2010). Discovery Park, Seattle, King County, Washington State, USA.

**Fruiting body:** resupinate, thin, cottony-granulose to slightly lumpy or smooth under magnification, white to tan, membranous and easily removed or peeled from the substrate when fresh, margin mostly abrupt and distinct without any other noticeable features.

**Microstructures:** *Hyphal system* monomitic, hyphae 2.5–7 μm wide, hyaline, the basal hyphae slightly thick-walled and the hymenial hyphae thin-walled, clamps common, but not on all septa. *Basidia* 25–55 × 5–8 μm, cylindrical to narrowly clavate, thin-walled, four sterigmate and with basal clamps, but often difficult to see. *Spores* 7–8 × 5.5–7 μm, subglobose to broadly ellipsoid, hyaline, slightly thick-walled, cyanophilous, ornamented with distinct echinulae or fine verruculae. *Cystidia* large leptocystidia 93–145 × 8–12 μm, subcylindrical to narrowly lageniform, unicellular, thin-walled, lacking incrustation (smooth), rounded at the apex, sometimes with a basal clamp, contents homogeneous and strongly staining in phloxine, normally projecting beyond the basidia. See line drawings.

**Habit and habitat:** These collections were irregularly lining the vertical inside surface of open-exposed heartwood on a partially hollowed out, five-foot-tall, dead, standing Red Alder (*Alnus rubra*) stump. See habitat photo on page 1.

### Comments

According to Nilsson & Hallenberg (2003) my collections appear to be intermediate between *Hypochnicium punctulatum*,

<sup>†</sup>Cyanophilous means that the fungal structure selectively takes up the biological stain Cotton Blue, becoming dark blue. This stain has fourteen synonyms that are too numerous to mention here. It is also formulated in many different ways, including Cotton Blue in water, in lactic acid, or with lactophenol, but the end result for all of these will be approximately the same quality of staining, assuming a standard amount of the stain is added to all these different mixtures.

*H. albostramineum*, and *H. wakefieldiae*, based on spore size and hyphal characters. My collections have wider spores, which fit the range for the *H. albostramineum-punctulatum* complex, yet they have slightly thick-walled basal hyphae, which are typical for *H. wakefieldiae*. In spore size my collections also fit what Telleria et al. (2010) give for *H. punctulatum*, but again that species has thin-walled basal hyphae. The collections both fit the spore size and have thick-walled basal hyphae similar to *H. aotearoae*, newly described by Paulus et al. (2007) from New Zealand. However, that species has two slightly different kinds of cystidia and is found in the southern hemisphere.

Always a delight to find, species of *Hypochnicium* and its segregates are fascinating to study because of the interesting microscopic features.

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## THE \$178 CHEESE SANDWICH James Plafke <http://www.geekosystem.com>, Sept. 13, 2010

Chef Martin Blunos has created an opulent cheese sandwich that has a costly price tag of \$178 and is the main attraction at the Frome Cheese Show in Somerset, England.

The high price is a result of cheddar cheese blended with white truffles (*Tuber magnatum*), a 100-year-old balsamic vinegar dressing, and sourdough bread topped with edible gold dust. The sandwich also features quail eggs, heirloom black tomatoes, apples, figs, dainty mustard red frills, pea shoots, and red amaranth.

The sandwich looks pretty delicious, though one can probably get a delicious cheese sandwich sans the sprinkling of gold for much, much less than \$178.



## GIRL, 12, WOLFS DOWN TWO DEATH CAP MUSHROOMS AND LIVES TO TELL THE TALE

Andrew Levy

<http://www.dailymail.co.uk>, September 16, 2010



Lucy Adcock

A 12-year-old girl has survived after accidentally eating two mushrooms which were poisonous enough to kill an adult twice over.

Lucy Adcock fought for her life in hospital after she ate two death caps (*Amanita phalloides*) while on a bike ride, having mistaken them for ordinary field mushrooms.

The schoolgirl, who suffered liver failure, yesterday told how she felt “lucky” to be alive. Doctors were astonished that she not only pulled through but may have escaped without any lasting problems.

One death cap mushroom is normally enough to kill an adult. Those who survive often need liver or kidney transplants.

Of her ordeal Lucy said: “I realize I am lucky because they are so poisonous. I was really ill. It was horrible.”

Her mother, Tania Smith, 42, said: “It is hideous to be told by doctors that your daughter may not make it. When I realized what she had eaten, my heart sank.

“She knows quite a bit about mushrooms as we live out in the countryside but this time had forgotten to take her mushroom book with her.”

Lucy was cycling near her home in Lingwood, Norfolk, two Saturdays ago when she spotted the mushrooms—which are predominantly white but have a green or olive tinge—growing in woodland.

The schoolgirl added: “When I go out on my bike I always look out for blackberries, wild plums, and mushrooms.

“The mushrooms I ate were very tasty at the time. I had a few stomach pains before bed, but I didn’t think anything of it. Then I didn’t get any sleep all night and the pains were getting worse and worse.”

She ate them raw after assuming they were field mushrooms, which look very similar except for dark gills underneath the cap. She started vomiting the next morning and a quick check on the Internet revealed the potentially fatal mix-up.

Lucy was taken to Norfolk and Norwich University Hospital where she was diagnosed with liver failure. She was given charcoal-based drinks to prevent her body from absorbing toxins, but a large amount of poison had already entered her system. Lucy was later transferred to Addenbrooke’s Hospital in Cambridge and then to the specialist liver unit at King’s College Hospital in South-East London.

Her mother and sister, Jade, were told at one point that even if she did survive, Lucy might need a liver transplant. Miss Smith, a widow, said: “It began to look really bad. Lucy turned yellow and the toxin levels in her liver peaked at 300 times higher than they should have been.

“Having lost my husband eight years ago I kept saying, ‘Please don’t let my daughter die as well.’”

The mortality rate among those who receive medical treatment for death cap poisoning is about 15 percent and increases among children.

Lucy was finally given the all-clear on Saturday but will be having more blood tests and spend another week recovering at home before returning to Framingham Earl High School.

The death cap is responsible for 90 percent of all fatal mushroom poisonings because it is mistaken for edible varieties, including the caesar’s mushroom and straw mushroom.

Dr. Graham Briars, consultant pediatrician and liver specialist at the Norfolk and Norwich Hospital, said: “Lucy is incredibly lucky. Eating one death cap mushroom can be enough to kill an adult and Lucy had eaten two. Death cap mushrooms are highly toxic and cause very severe, life-threatening liver disease.”

He added: “Identifying mushrooms can be very difficult and getting the identification wrong can have serious and life-threatening consequences.

“Clearly it may be best to err on the side of caution.”



*Amanita phalloides*

*Warning: Don’t think we’re immune just because we live in the Pacific Northwest. Think again. The Death Cap isn’t just a California problem any more. An Amanita phalloides was recently found growing under an oak tree at CUH. How close can you get?*

## HEART ROT: A WOODPECKER’S BEST FRIEND

Cam Gillies

Nature Conservancy of Canada,  
[bclocalnews.com](http://bclocalnews.com), Sept. 16, 2010



*Lewis’s Woodpecker*

Most of us work very hard to keep fungus and other rot out of our houses. Not so for a rare woodpecker that prizes rotten trees above all others when building a home.

Lewis’s Woodpeckers are a threatened species in Canada, found only in the dry areas of British Columbia. They nest in cavities excavated in trees that have heart rot decay, a condition where invading fungi turn the inside of the tree to pulp.

Yet in many areas, trees with this heart rot are hard to find. Often they have been cleared or have fallen over. It can take 100 years or longer for suitable trees to develop.

This is where the Nature Conservancy of Canada (NCC) is stepping in. They and several other partner organizations including the Fish and Wildlife Compensation Program (Columbia Basin), Ministry of Forests, Ministry of Environment, and the Nature Trust of BC are working to create more suitable nesting trees in an area near Canal Flats.

But how does a person create rot in the heart of a healthy tree? In this case, the fungus is injected inside the trees and left to work its magic. The anticipated result in 5 to 15 years is new nesting habitat for Lewis’s Woodpeckers.

Todd Manning, an arborist and forester who has pioneered these techniques in Canada, grows the appropriate heart rot fungus over months, and then works with a tree climber to inject the fungus in

*cont. on page 6*

## **A Woodpecker's Best Friend**, *cont. from page 5*

selected locations partway up the tree trunk. The fungus rots the center of the tree, but the tree survives.

“Live trees with heart rot decay are the most valuable wildlife trees,” says Manning. “They provide good nesting habitat for birds that excavate their nests and the tree usually remains standing longer.”

Once injected, the fungus takes a number of years to decay the tree. “We hope to have trees suitable for cavity excavation and nesting in 5 to 15 years,” says Manning.

This work will also benefit a number of other species besides Lewis Woodpeckers. “Our focus is on restoring grassland habitat and creating nesting trees for Lewis’s Woodpeckers, but any cavity-nesting species is likely to benefit,” says Nancy Newhouse, the Canadian Rockies Program Manager for NCC. “This could include other woodpeckers, chickadees, and bluebirds among others.”

## **SMART FUNGUS DISARMS PLANT, ANIMAL, AND HUMAN IMMUNITY** *ScienceDaily*, Aug. 20, 2010

Fungal and bacterial pathogens are quite capable of infecting plants, animals, and humans despite their immune systems. Fungi penetrate leaves, stalks, and roots or skin, intestines, and lungs to infect their hosts. Researchers from Wageningen UR (University & Research centre) discovered, together with Japanese colleagues, how this is possible. They found that the fungus secretes a protein that makes stray building blocks of the fungal cell wall invisible to the immune system of the plant, such that infection remains unnoticed. They report their findings in the August 20 issue of the journal *Science*.

Fungi prepare their attack rather well. Take, for example, the fungus *Cladosporium fulvum* which causes leaf mold on tomato plants. Once the fungus starts to infect, the tomato plant would recognize the fungus based on the presence of chitin fragments that are derived from the fungal cell wall. Chitin does not naturally occur in plants, but chitin fragments can always be found near fungi, just like cat hairs betray a cat’s presence. The tomato immune system recognizes the chitin fragments as “non-self and unwanted” and alarms the immune system to combat the infection. So far so good.

However, *Cladosporium fulvum* as well as nearly all other fungi carries a secret weapon. A team of researchers under the supervision of plant pathologist Bart Thomma discovered that the fungus secretes the protein Ecp6 during host attack. Ecp6 is the code name for “extracellular protein 6.” Ecp6 finds the chitin fragments that surround the fungus and binds them. This binding makes the chitin fragments invisible to the tomato plant, like a stealth-jet is invisible to radar, such that the immune system is not alarmed. As a result the plant gets diseased. Animal and human fungal pathogens also produce the protein, and are likely to disarm the immune system of their hosts in a similar way.

From experiments that the researchers performed to investigate the role of Ecp6, it appears that a fungus that does not produce Ecp6 is much less aggressive and less capable of causing disease in tomato plants.

Since not only *Cladosporium* but nearly all fungi, including pathogens of humans and animals, have Ecp6, the binding of

chitin fragments appears a general strategy of fungi to evade the immune system of their hosts.

This knowledge may enable scientists to design novel methods to combat fungal diseases in agriculture (leaf mold, root and stalk rot, smut, wilt disease, apple scab, rust, tree cancer) and in health care (dandruff, athlete’s foot, candida infections, *Aspergillosis*, etc.).

## **STUDY FINDS MAGIC MUSHROOMS CALM TERMINALLY ILL PATIENTS** Adam Trunell <http://www.takepart.com/news/>, Sept. 16, 2010

According to a new study published in the *Archives of General Psychiatry*, advanced-stage cancer patients struggling with anxiety over their terminal condition found some much-needed relief from a novel source: Magic mushrooms.

With trained therapists guiding their trips, patients in a test study were given doses of psilocybin—the ingredient that gives mushrooms their “magic”—to see whether the Schedule I drug could ease the fear of their impending mortality. The two six-hour sessions included headphones and music, but reportedly no black light or laser show.

Patients reported feeling less anxious after the doses, and their scores on a common depression index fell by 30 percent. “We also observed no adverse psychological effects from the treatment,” the report states. “All subjects tolerated the treatment sessions well, with no indication of severe anxiety or a ‘bad trip.’ ”

## **RESEARCHERS FUSE YEAST, FUNGUS DNA** *BioFuels Digest*, Sept. 13, 2010

In California, researchers at the University of California, Berkeley, and the Lawrence Livermore National Laboratory have taken genes from *Neospora crassa*, a fungus that grows on grass, and transplanted them into a yeast that is already used to turn sugar into ethanol to create what may be a more efficient process for making ethanol from cellulose.

With the new technique, cellulose must be broken down only into an intermediate stage known as celldextrin, rather than into glucose, and the new yeast will get to work. It could be five years before the new technique is ready for commercial use.

## **THAI POACHERS TURN FUNGI FARMERS IN BID TO SAVE FORESTS** [independent.uk.com](http://independent.uk.com) via *The Spore Print*, L.A. Myco. Soc., Feb. 2010

Nuan Muangchan began to illegally log rosewood as a teenager, creeping at night into Thailand’s largest national park and hiding from animals and rangers to smuggle out her loot.

“One time I jumped off a cliff to escape the authorities,” the 43-year-old recalled, rolling up her sleeve to display her marked limbs. “I still have the scars on my arms and legs.”

Thailand’s lush jungles are under daily attack by illegal loggers and poachers, but conservationists in the country’s northeast are turning to an unlikely remedy—the common mushroom.

A project that turns former wildlife criminals into fungi farmers is proving a surprising success, giving villagers a decent wage

while helping to slow the destruction of forests in the Khao Yai National Park, a World Heritage Site.

Under the scheme, set up by Thailand's Freeland Foundation, Nuan now has her own business as a mushroom farmer and no longer relies on precious rosewood, prized for its perfumed sap, as her only means of regular income. And she has persuaded her 33-year-old nephew Boonrod to join her in abandoning the illegal work.

Boonrod said he earns 300 dollars a month from his mushroom farm—a relatively good income in this impoverished rural belt, and enough he said to stop logging. “Once I started my own business growing mushrooms I started to get a steady income,” said Boonrod. “I love the forest, I want to protect it. I feel sorry for what I did in the past.”

Education levels are low in the northeastern region of Isan and most villagers are landless, with many relying on daily hire for farm or construction work to provide for their families.

As well as giving potential mushroom farmers all the start-up tools they need, the Freeland Foundation also trains up park rangers, who arrest an average of two poachers or loggers every week. But they said that prosecution alone has not been effective in reducing wildlife crime.

“We have to use two strategies: push and pull. The rangers push the poachers out of the forest but we need to pull the villagers into an alternative occupation and convince them to change,” said Mukda Thongnaitham from Freeland.

The group estimates there are more than 500 poachers and loggers at work every day in the exotic wilderness of Khao Yai, home to 800 species of animals including reindeer, gibbons, sambar deer, and bison. Even tigers are rumored to still roam the forests.

But all of the animals are vulnerable to poaching, with parts of bears ending up in places as far away as Japan and South Korea, where customers prize them for their use in traditional Asian medicine, and deer and wild boar meat fetching high prices as a delicacy at local markets.

In its efforts to reduce these illegal activities, the Freeland project consulted villagers on their skills and surveyed the local market to see what would sell, before plumping for mushrooms as an alternative income source.

The fungi are grown in bags filled with sawdust, gypsum, lime, rice bran, and magnesia sulphate and cooked in an oven to keep out germs. The farmers take their pasteurized formula, add mushroom spores, and leave them to grow in nursery barns at home, where the first harvest is ready within a month. The organic oyster mushrooms are sold at the local market and have proved so popular that the farmers cannot grow enough.

“At this stage we still cannot meet the market demand so we need to expand this project to other villages,” said Mukda, who hopes to begin growing yanagi (black popular) or straw mushrooms and shiitake, which can fetch a higher price.

The produce is sold only at the local bazaar for now, but in the future it is hoped the mushrooms will be distributed to bigger markets. “If we make it here we can create more work and generate more income in the community,” said Mukda.

Nuan is busy building new barns to expand her fungi farm and said the work has given her a new sense of worth. “When I see the green of the forest and the white and black of the mushrooms I feel proud,” she said. “I’m happy we no longer destroy nature, we are pure.”

## FUNGUS INFECTS BASIL CROPS FROM COAST TO COAST

Laurel Curran

Food Safety News, July 29, 2010



*Sporulation of Peronospora belbahrii, causal agent of basil downy mildew*

A fungus called basil downy mildew (*Peronospora belbahrii*) is rapidly spreading throughout basil crops all over the country. Though the fungus is not known to negatively affect human health, it does turn basil an unnatural yellow color with a occasional brownish-black mold appearing later on.

This particular type of fungus was first seen in the United States back in 2007. It has been spreading with increasing speed ever since. Today crops on the East Coast have been hit the hardest, and the fungus has been found infecting plants as far west as California.

Some farmers are being harder hit than others. Large industrial farmers have access to different types of fungicides that can stave off the fungus, but organic and small farms have less ability to prevent the disease.

Francesco DeBaggio of DeBaggio's Herb Farm in Virginia reported that he killed about \$18,000 worth of plants since May. “It’s huge for us,” he said. “We’re so small it’s fairly significant. We would have sold 100 percent of those that were destroyed.”

Margaret McGrath, a professor of plant pathology at Cornell University, suggests planting herbs in areas that receive the most sunlight, and spacing plants apart from each other to minimize spreading of the fungus. Experts have also suggested planting varieties of basil that are more resistant to the fungus, including many darker leaf varieties.

Basil is an important ingredient in a number of different types of food, including Italian and Thai food.

Though the fungus does not harm human health, it severely affects sales.

DeBaggio has decided against trying to grow basil again this year. “We’re just not going to take any chances,” he said. “To have another season like this, that would put us out of business. We couldn’t survive that again. Once you ruin your reputation, you can’t get it back.”

### Obits

**Miriam Rice**  
1918–2010

We regret to report that Miriam Rice, mushroom dying expert and



founder of the International Mushroom Dye Institute, died at home on August 30, 2010, of natural causes.

**Ted Heib**  
1922–2010



We are sad to announce that long-time PSMS member Ted Heib passed away on September 9 of heart disease. Our condolences to his wife, Gwendolyn, and their family.

## FRICASSEE OF RABBIT OR HARE

Dick Sieger

(adapted from *Joy of Cooking*)

### Ingredients

1 bunny, cut up  
Flour seasoned with salt & pepper  
2 oz or more butter  
1 cup shallots or onions  
1–2 cups Bolete buttons  
or Chanterelles, in chunks  
2 oz brandy  
3 cups stock or to cover  
Flour & water mixture  
Salt  
Pepper



### Seasoning Packet

Lemon rind  
Peppercorns  
Parsley  
Celery with leaves  
Thyme sprigs

Sauté mushrooms and shallots or onions in the butter. Remove vegetables and reserve. Dredge the rabbit in seasoned flour. Add more butter in pan if necessary and sauté the meat until it is lightly browned. Flame with the brandy. Wrap the seasoning ingredients in cheese cloth. Combine the stock, vegetables, seasoning packet, and meat. Cook covered in a 275°F oven for about 2 hours until meat is tender. Discard the seasoning packet. Remove the rabbit pieces and reserve. Thicken the sauce with a flour and water mixture to make a gravy. Add salt and pepper to taste. Pour the gravy over the meat and serve.

*"I confess, that nothing frightens me more than the appearance of mushrooms on the table, especially in a small provincial town."*

—Alexandre Dumas, early 19th century

## The Wild Mushroom

Carissa Bielamowicz

The Fern,  
With its green fingers  
of lace  
and lilac  
With its heavy lavender tresses  
Are held above you—  
The ugly duckling cousin  
Who hides among  
Fallen leaves  
Or peeks out humbly  
From beneath the  
Tree trunks's shadow.  
Yet not scorned by all  
Is the wild mushroom...  
Who has been  
Chosen by fairies  
Who dance in moonlit circles,  
And riddle-weaving  
Caterpillar of Wonderland  
As his throne.

*During his search for chanterelles, [a SVIMS member] was attacked three times by an outraged llama. If you go to the llama infested areas, carry a stick or push your partner ahead.*

—Adolf Ceska, South Vancouver Island Myco. Soc.

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