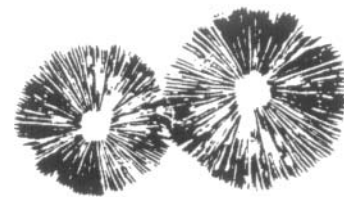


SPORE PRINTS

BULLETIN OF THE PUGET SOUND MYCOLOGICAL SOCIETY
Number 447 December 2008



SEASON'S



GREETINGS!



Spore Prints

is published monthly, September through June by the

PUGET SOUND MYCOLOGICAL SOCIETY

Center for Urban Horticulture, Box 354115
University of Washington, Seattle, Washington 98195
(206) 522-6031 <http://www.psms.org>

User name: Password:

OFFICERS: Patrice Benson, President
Joanne Young, Vice President
John Goldman, Treasurer
Dennis Oliver, Secretary

TRUSTEES: Brenda Fong, Cathy Lennebacker,
Don Lennebacker, Dennis Notman,
Jamie Notman, Lynn Phillips,
Jennifer Slack, Kim Traverse,
Doug Ward, Jean Zatochill,
Ron Post (Immed. Past Pres.)

ALTERNATE: Luis Felix

SCI. ADVISOR: Dr. Joseph F. Ammirati

EDITOR: Agnes A. Sieger, 271 Harmony Lane,
Port Angeles, WA 98362
sieger@att.net

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

CALENDAR

- Dec. 9 Membership Meeting & Holiday Cookie Bash,
7:30 pm, CUH
- Dec. 15 Board Meeting, 7:30 pm, Isaacson Boardroom, CUH
- Dec. 16 *Spore Prints* deadline (early)

BOARD NEWS

Dennis Oliver

With the waning of the mushroom season the board gathered for the November meeting to discuss the past and plan for the future. Treasurer John Goldman presented the monthly report and reported on the results from the annual show. The show took in \$19,803.94 in receipts and had expenses of \$11,310.04. The show was quite successful, with 103 new members. Preference would still be given to members, but the board voted to charge nonmembers attending PSMS classes double the fee for members. The annual cookie bash will be held at the December meeting hosted by the board. Ron Post has started planning for a spring foray at Cispus which will honor Ben Woo and which is planned for the last weekend in May. Thoughts of spring: Elections, the Survivor's Banquet, and Mushroom Maynia! at the Burke all are beginning to come into focus; more to come.

YAHOO DISCUSSION GROUP

Want to stay in touch over the winter? The PSMS e-mail discussion group maintained by Yahoo Groups is an easy way to keep in contact with other members, circulate information about PSMS events, and post general mushroom information. To join, follow the directions on the PSMS Website (<http://psms.org/members/index.html>) or on page 40 of the PSMS roster.

MEMBERSHIP MEETING

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



December's meeting will be our famous "Cookie Bash." This annual event, hosted by your Board of Directors, will showcase the culinary and creative talents of our members. Please bring a dish of hors d'oeuvres, other treats, baked goods, or desserts to share. Beverages will be provided. Be sure to wear your best mushroom-themed jewelry, clothing, and/or hats and be prepared for a good time. This is a family event, so children are especially welcome.

Enter the art contest! Members of all ages are encouraged to create and bring some form of original art with a fungal theme. Edible entries are preferred, but are not required. We will select the winners by popular vote and prizes will be awarded for the best entries.

The projector and microphone will be on, so please share your stories and digital photos (10–12 maximum per person) with us from your mushrooming forays, travel adventures, or other experiences this past year. Your presentation need not be mushroom-related, but could be anything your fellow members would appreciate seeing. Please put your photos on a compact disc or a USB flash drive and give them to Milton Tam or Patrice Benson before the start of the meeting. You can also e-mail them to Milton (miltontam@aol.com) until December 8. Short video presentations on a DVD format are also welcome. As usual, the club library located in the PSMS office will be open before and during the meeting.



BOARD NEWS

Dennis Oliver

SILVER SPRINGS FIELD TRIP

Marian Maxwell

We were fortunate to have a very nice day for the foray at Silver Springs Campground on October 25. The weather cleared and we had intermittent sunshine. Bill Bridges and Marilyn Droege had identified much of what had been collected and was on the table by the time I arrived at 11:00. Our fantastic hosts were Martha Phelps, Denise Banaszewski, and Debie Boyd, who all did a great job of making people feel welcome. The nice potluck included Lisa Ramey's and Debie Boyd's mushroom soups. Both were fantastic!

We had a visit from a Russian family who were hunting in the area... and two people who came as guests of members were from Norway and Denmark.

Quite a variety of mushrooms were found. Scott Maxwell found *Tricholoma caligata* which will go to Dr. Ammirati for the herbarium. We had a great time, and it was so nice meeting all the NEW people that came as well as seeing friends.

Edibles: *Cantharellus formosus*, *Lycoperdon perlatum*, *Lycoperdon foetidum*, *Boletus zelleri* (*Xerocomus zelleri*—Zeller's Bolete), *Clavariadelphus truncatus*, *Gomphus clavatus*, *Polyozellus multiplex*, *Phlogiotis helvelloides*, *Hydnum repandum* (Hedgehog), *Hypomyces lactifluorum* on *Russula brevipes* (Lobster Mushroom), *Helvella lacunosa* (Black Fluted Elfín Saddle), *Pleurocybella*

porrigens (Angel Wings), *Tricholoma magnivelare* (American Matsutake), *Tricholoma caligata* (a close relative to the Japanese Matsutake), *Rozites caperata* (Gypsy), *Laccaria laccata*, *Laccaria amethysteo-occidentalis*, *Laccaria bicolor*, *Gomphidius subroseus*, *Russula brevipes*, *Hygrophorus bakerensis*, *Leccinum scabrum* (Birch Bolete from Enumclaw area), *Cantharellus tubaeformis* (Winter Chanterelle or Yellow Foot), *Lactarius deliciosus* (Delicious Milky Cap), *Lactarius rubrilacteus* (Bleeding Milky Cap), *Lyophyllum decastes* (Fried Chicken Mushroom), *Boletus mirabilis* (Admirable Bolete), *Leccinum aurantiacum*, *Hericium abietis* (Conifer Coral—although it is not in the coral fungi group), *Pseudohydnum gelatinosum*.

Caution: Questionable Edibility: *Stropharia ambigua* (Questionable Stropharia), *Clitocybe odora* (blue-green anise mushroom), *Tricholoma zelleri*, *Cortinarius traganus*, *Gomphus floccosus*, *Hygrophoropsis aurantiaca* (False Chanterelle), *Lentinellus ursinus*, *Amanita pachycolea*, *Paxillus atrotomentosus*, *Russula fragrantissima*, *Gymnopilus* sp., *Cystoderma fallax*, *Cortinarius violaceus*, *Clavulinopsis laeticolor*, *Otidea* sp.

Poisonous or Possibly Poisonous: *Tricholoma saponaceum*, *Amanita silvicola*, *Lepiota* sp., *Amanita aspera*, *Clitocybe dilatata*, *Phaeolus schweinitzii*, *Gyromitra infula*, *Boletus calopus*.

TWANOH STATE PARK FIELD TRIP Brian Luther



For this outing on November 1, the last of the fall field trips, we had mild temperatures but intermittent rain throughout the day, sometimes so heavy that we had to duck into the shelter until it passed. Larry Baxter and I were down at the shelter before daylight to get it swept out and organized, but Park Ranger Stacy Czebotar had already beaten us there, turned on the lights and power, and given us garbage cans with liners. What incredible service. Thank you, Stacy. We love ya. Stacy (nee Ruland) got married in September and is now Stacy Czebotar (you don't pronounce the C). Her lucky husband is a Washington State Wildlife Ranger, so they're both Washington State officers.

It soon got light, so we started a fire going in an outside fire pit. About that time Tony Tschanz and Ron Post showed up to share hosting duties for the day. After folks started arriving, nobody seemed a bit shy about digging into the abundant goodies, coffee, and assorted munchies that our hosts had spread out over a large picnic table inside the shelter. Thank you, Tony and Ron, for a great job.

At 10:00 am I gave another of my required brief introductions (with a handout) about collecting fungi in Washington State Parks, discussed proper collecting techniques, and distributed data slips for those who wanted to collect in the park. However, most people went outside the park for collecting, so the majority of finds were not from the park.

One of our visitors for the day was Dan Christian, a park ranger from Penrose State Park on the Longbranch Peninsula, who had brought a large selection of fungi and spread them out over an entire picnic table, hoping to get our help. He was taking notes as fast as he could as I went through his specimens and reviewed what he had found. It was great to see such commitment and interest from a park ranger.

Lots of fungi (130+ species) were brought in and spread out on several large picnic tables outside the shelter. Larry Baxter helped me with identification all day and Josh Birkebak helped out also.

Some of the especially rare, unusual, or interesting fungi found included *Mycena aurantiummarginata*, with its distinctive olive-brown colored caps and startling bright orange gills (which, by the way I had not seen since 1985!); a brilliant coral-red *M. adonis*; a couple of collections of the beautiful and very slimy, bright yellow *Cortinarius percomis* with a strong odor of ripe peaches; *Hygrophoropsis olida* smelling like tutti-frutti drops; *Lepiota roseifolia*, a pale creamy colored species which dramatically and instantly stains red-orange where touched on the cap, gills, or stem; and a single ascocarp of the lovely *Spathularia flavida*.

Various edibles found included both yellow and white Chanterelles, Matsutake, several species of *Suillus*, some hedgehog mushrooms (*Dentinum*) lots of *Boletus zelleri*, some *Boletus mirabilis*, and *Leccinum aurantiacum*. Many of the edibles were in pretty good condition, while others were somewhat past their prime.

The off-and-on showers turned into a downpour just as I needed to document all the State Park fungi on the tables, which naturally were exposed outside. I had two people holding umbrellas over me as I was trying to look at and write down the species on the data slips, and every once in a while one of the umbrellas would tip a bit and I'd get a good soaking down my shirt; also my pens didn't want to work in the wet. Thanks to the group effort of all who stayed to help because everything got done, packed up, cleaned up, and put away just as it got dark.

A small group who stayed to the end came over to our cabin afterwards (just a mile away) to get warm inside by the wood stove, have a piece of freshly baked berry pie with whipped cream, and a glass of red wine. We are quite fortunate to have this beautiful park on Hood Canal available to us. It's an old friend that we'll see again next year.

My genuine hope is that all members enjoyed this year's fall field trips, because it takes a lot of effort by a lot of dedicated people to make them happen. Please consider volunteering for the spring field trips. We can always use help. Why not make it a new year's resolution?

Hoping you all have a wonderful holiday season and a happy new year, and I look forward to seeing you on some of the exciting morel hunts we'll be having next spring!

RED-GILLED DERMOCYBES WANTED

I am looking for large collections of red-gilled dermocybes: *Cortinarius semisanguineus*, *C. phoeniceus* var. *occidentalis*, *C. sanguineus*, and also *C. californicus* which is all more or less red. If possible, include a digital photo, location, date, and tree associates, and be sure to keep all collections separate. Just dry and send them to me,

Joe Ammirati
Professor, Department of Biology,
Box 355325
235 Johnson Hall
University of Washington Seattle, WA 98195

I'll pay postage.



THE NORTH AMERICAN SULPHUR SHELVES— OR WHY DID THE CHICKEN OF THE WOODS CROSS THE NOMENCLATURAL ROAD?

Brian Luther

Popular mushroom guides and older literature list *Laetiporus* (*Polyporus*) *sulphureus* as our common Sulfur Shelf, or Chicken of the Woods, and we used to think that we had only one Chicken of the Woods here in North America. Recent mycological research, however, has shown that we actually



Laetiporus conifericola

have six: *Laetiporus cincinnatus*, *L. conifericola*, *L. gilbertsonii*, *L. huroniensis*, *L. persicinus*, and *L. sulphureus*. Anyone who has encountered these when they are fresh, actively growing, and in their prime will acknowledge that they're some of the most gorgeous fungi, often having bright orange or red-orange pilei with brilliant sulfur-yellow pores. Unfortunately, they lose their color within a few weeks and then have the unfortunate appearance of what I describe as "old cardboard," and it's usually been in this condition that specimens are brought in to me at mycological field trips, forays, and mushroom shows for identification.

At the PSMS 45th Annual Mushroom Show this year a couple from Snohomish County brought me some photos of a Chicken of the Woods growing on an old plum tree. I was quite astonished, because our common western species is found only on conifers. This prompted me to write this article about these conspicuous fungi, giving you, in a brief, condensed form, the latest results of mycological research on the genus here in North America, including a key to the currently recognized species.

In simple terms, the fruiting bodies of polypores and related fungi are composed of different hyphae forming tissues to support structural strength. Three common hyphal types are found within the tougher higher fungi: (1) *generative hyphae*, which are thin walled and with or without clamps, (2) *skeletal hyphae*, which are very thick walled and often encrusted and irregular and add structural strength to a fruiting body, in combination with generative hyphae, and, finally, (3) *binding hyphae*, which are exceptionally thick-walled, sometimes almost appearing solid, generally occur in short, very irregular segments that are often highly branched (to bind with the other hyphae), and are scattered throughout the tissue of fungi possessing them, again adding significantly to the strength or rigidity of the fruiting body. Combinations of these different types of hyphae in fruiting bodies are called hyphal systems.

Generally the tougher the fruiting body, the more hyphal systems there are. Softer fruiting bodies are composed only of generative hyphae; examples include the genera *Tyromyces*, *Leptoporus*, and *Albatrellus* to name just a few. Slightly tougher or leathery polypores often are composed of both generative and skeletal hyphae, for example, the genus *Polyporus*. Usually (but not always) the toughest have generative, skeletal, and binding hyphae together, such as in the genera *Ganoderma* and *Trametes*, etc.

Within the Polyporaceae, the genus *Laetiporus* is unusual in possessing fruiting bodies with a peculiar and unusual mix of only generative hyphae and binding hyphae, lacking any skeletal hyphae at all. It is uncommon to see a combination of generative and binding hyphae alone, without any skeletal hyphae, but that's a peculiar characteristic of the genus *Laetiporus*.

Polypores and related fungi that only have generative hyphae are called *monomitic*, those with generative and skeletal hyphae (or

any combination of two types of hyphae) are called *dimitic*, and those with all three hyphal systems are called *trimitic*.

This is a simplification of a more complex system, but it gives you a basic understanding of how different hyphal types, at the cellular level, contribute significantly to the texture or toughness of a fruiting body.

An especially interesting feature of the binding hyphae in the genus *Laetiporus* is that they almost completely dissolve in 3% KOH in a microscopic mount, right before your eyes. So, it is advisable to use other clear basic mounting media when examining *Laetiporus* tissue microscopically. I use 3% ammonium hydroxide, glycerine, lactic acid, or lacto-phenol when examining this genus because these media will not dissolve the binding hyphae.

Most fungi are white-rot fungi, but *Laetiporus* is a brown-rot genus. Only 20 out of 96 polypore genera are brown-rot fungi (Gilbertson & Ryvarden, 1986). The genus *Laetiporus* lacks the polyphenol oxidase enzymes necessary to break down the complex, dark component of wood called lignin, leaving the final, decomposed wood a dark brown in color, still loaded with lignins. Thus, all of the normal polyphenol oxidase enzyme testing reagents, such as tincture of guaiac resin ("gum guaiac"), phenol, guaiacol, a-naphthol, p-cresol, L-Tyrosine, Pyrogallol, and Syringaldazine (to name just a few) and gallic and tannic acids in culture, will be negative—that is no color change will occur when these reagents are applied to *Laetiporus* fruiting bodies or cultures.

For a basic understanding of white rot and brown rot fungi, please refer to my article in *Spore Prints* issue 428 (January, 2007): "White Rot vs Brown Rot and How to Distinguish Them."

A critical study of the genus *Laetiporus* in North America was published in 2001 by Burdsall and Banik, which was a welcome and needed project. Their research found differences in morphology, some microscopic differences, differences in cultural studies (mating experiments between the different species and also DNA and other biochemical analyses), and, of course, differences in hosts and geographic distributions. All species are similar microscopically, with the basidiospores varying only slightly in size throughout the species complex, certainly nothing that offers useful distinctions, although Burdsall and Banik do use spore size in their key as a distinguishing character between two species.

Read the references at the end of this article or check on the Internet for further details on these species.

Quick Key to North American Species of *Laetiporus*

- 1a. Growing only on conifers and common in western North America *Laetiporus conifericola*
This is our common Chicken of the Woods.
- 1b. Growing on conifers or hardwoods, but if on conifers never in western North America 2
- 2a. Growing on older growth conifers, only in the extreme upper Great Lake States *Laetiporus huroniensis*
L. huroniensis is similar in appearance to *L. conifericola*, but cultures of the two are mostly incompatible (mating studies), plus there are DNA and other biochemical differences, besides the obvious geographic restrictions of the species. Burdsall and Banik (2001) give a very slight spore size difference between these two conifer-inhabiting species, with *L. huroniensis* having spores averaging one micron shorter than those of *L. conifericola*.
- 2b. Growing mostly on hardwoods (see 3a), throughout North America and not restricted to the upper Great Lake states 3

3a. Pileal surface distinctly brown or pinkish-brown when fresh and actively growing, never bright orange or red-orange; hymenium (pores) a creamy-pinkish color, not bright sulfur yellow; mostly on Live Oak (and cultivated oaks, and occasionally on conifer) and restricted to the southeastern US and Gulf states

..... *L. persicinus*

3b. Pileal surface orange, red-orange, or bright salmon orange when actively growing, not brown, pinkish-brown or any of various shades of brown; pores bright sulphur yellow or creamy to whitish, but never with the above combination of colors as in *L. persicinus*; on various hardwoods, not exclusively Live Oak or cultivated oaks and not restricted to the southeastern US or Gulf states 4

4a. Growing on the ground as a basal rosette at the base of hardwood trees, but not directly on wood; pore surface very pale creamy white or whitish; distribution in upper mid-west to NE US only *L. cincinnatus*

4b. Growing directly on hardwoods, never terrestrial; pore surface when actively growing bright sulphur yellow, never creamy or whitish..... 5

5a. Common on hardwoods in eastern North America, east of the Mississippi River, but not occurring on the west coast, nor in the western US at all *L. sulphureus*

5b. Restricted in range along the western coastal states of California, Oregon, and Washington on both native and cultivated hardwoods, including fruit trees *L. gilbertsonii*

Note: *Laetiporus gilbertsonii* var. *pallidus* does occur in the southern United States. This variety has a very pale pileus and pores which are distinctive.

So, as far as we're concerned here in Washington State, we only have two species of Sulphur Shelf or Chicken of the Woods—*L. conifericola* on conifers and *L. gilbertsonii* on hardwoods, with the latter of these two species being quite rare; but apparently when they are found in Washington State they are most often on species of *Prunus* (plums, cherries, etc.). Both of these fungi have a similar appearance, but fruiting bodies of *L. conifericola* tend to be much larger and more robust.

My personal experience of having eaten *L. conifericola* over the years is not, shall we say, favorable. "Acid wood chips" is my most glowing description of texture and taste, but others have had very different experiences. The particular wood substrate may, in fact, contribute significantly to the palatability, and of course some of these newly described species haven't been sufficiently experimented with concerning their potential culinary merits. Some sampling has taken place at forays where the specimens were freshly prepared for a large group, but I might add that many of the conclusions that have been reached concerning outstanding edibility may have been influenced by the abundant red wine that often flows at such events.

References

Burdsall, Harold H. and Mark T. Banik. 2001. "The Genus *Laetiporus* in North America." *Harvard Papers in Botany*, 6(1): 43–55.

Gilbertson, R. L. and Leaf Ryvarden. 1986. *North American Polypores* (vol. 1). *Fungiflora*

Bibliography

Overholts, L. E. 1953. *The Polyporaceae of the United States, Alaska and Canada*. Univ. of Michigan Press, Ann Arbor.



A THREE-WAY SYMBIOSIS

scienceblogs.com
October 14, 2008

There is a grass called *Dichanthelium lanuginosum* that grows in Yellowstone National Park (among other places). There's nothing much special about it—except that it can grow in soil around thermal vents, soil that has a temperature of about 150°F (65°C).



Actually, its not the plant itself that's remarkable. If you or I would order seeds of *Dichanthelium lanuginosum* and throw them in a pot, the grass wouldn't be happy outside of a "normal" upper plant temperature range of about 100°F (38°C). The grass has to be infected with a fungus, *Curvularia protuberata*. Grasses that aren't infected with this fungus can't survive in thermal vents.

Actually, it's not the fungus itself that's important. The fungus has to first be infected with a dsRNA virus, "*Curvularia thermal tolerance virus*."

If that virus infects a fungus and that fungus infects a grass, the grass gains the ability to grow in an extreme environment. In other scenarios, with other plants and other viruses, persistently infected plants have an advantage in colder temperatures or drought.

In brief, a three-way symbiosis is required for thermal tolerance.

PRESIDENT'S MESSAGE

Patrice Benson



The mushrooms continue to pop up with the mild temperatures and rains here in Puget Sound country. We gained 103 new members from the mushroom exhibit, and it seemed a good number came to the November meeting and heard Dr. Thom O'Dell's lecture about myco-remediation and other great mushroom stories.

Our mushroom calendars continue to fly off the shelves and will be available at the December meeting for \$8. If you can't make it to the meeting you can have one or more sent to you for \$10 each, shipping and handling included. Send your payment along with your mailing address and phone number to Milton Tam, 7501 21st Ave. NE, Seattle, WA 98115.

The PSMS financial report will be available at the membership meetings for the next 3 months so that you can have a look at our financial status. We are in the process of planning a new edition of our roster, so send in your membership dues by the end of January to be included and to continue to receive the *Spore Prints*.

Mail your contact info including mailing and e-mail addresses and phone number and \$25 to Bernice Velategui, 2929 76th Ave. SE, #504, Mercer Island, WA 98040. If you are a new member and joined at the exhibit or later, you membership is current through 2009.

You will need to be a current member to participate in the voting process contained in the February *Spore Prints*. Nominations are being collected for the offices of Vice President, Secretary, and five board positions. Call Doug Ward or Brenda Fong to volunteer. You can also e-mail president@psms.org.

cont. on page 6

President's Message, cont. from page 5

You will also notice that this issue contains a brochure with the latest information about the Daniel E. Stuntz Memorial Foundation and its UW endowment. Please consider supporting the efforts of the Stuntz Foundation as we prepare for Mushroom Maynia! on May 3, 2009. This event is sponsored by the foundation to raise awareness about the mushroom world in our community. The Stuntz Foundation will continue to raise funds toward the goal of funding an academic position to care for the fungal herbarium and the lofty goal of a professorship sometime in the future. Consider what it might be like to not have a mycologist at our great University. Many of our members have been trained as amateur and professional taxonomists by the last two mycology professors at the UW. We would like to make this a permanent resource in the Pacific Northwest. Consider giving now or in your wills to this effort.

Stay tuned for more information about a spring regional foray at the Cispus Environmental Learning Center near Randle, Washington. This foray will not be just for PSMS members, but we will also be inviting other clubs from our region to participate. It will be a great learning experience and fun too! It will be dedicated to the memory of our first president, Benjamin Woo. Ron Post has offered to chair this effort, and he will need volunteers to assist him. New members should try to attend to get to know our wonderful resource mycologists and other members of this club.

Be sure to wear your mushroom paraphernalia to the next meeting. There will be a fabulous art contest open to all members. Entries can be edible or not. There will be prizes! Bring an hors d'oeuvre or sweet treats to share. The theme is (what else?) Mushroom Bling!* Have Happy Holidays with your families and friends!

*Bling: Rapper slang for any shiny thing that is gaudy, over the top, hideous, and wholly unnecessary. Often takes the form of jewelry, may be expensive but is commonly cheap, used to give the impression of wealth.

CHOLESTEROL RESEARCHER HONORED

Associated Press, Sept. 14, 2008

New York - A Japanese scientist whose breakthrough research led to the most popular cholesterol drugs and four other scientists who made pioneering discoveries have won prestigious medical prizes. The \$300,000 Albert Lasker Medical Research Award was presented Sept. 26 in New York by the Albert & Mary Lasker Foundation.

Akira Endo, 74, of Biopharm Research Laboratories Inc. of Tokyo won the clinical research award for discovering the first of the statins, the cholesterol-controlling drugs that are now among the most widely used medications in the world.

Endo began his work in 1971 with a novel idea. Scientists knew that the body makes cholesterol with the help of a particular enzyme, and reasoned that interfering with this enzyme might lower cholesterol. Endo thought some organisms might use such an interfering substance as a means of defense.

Over the next two years, Endo and colleagues grew more than 6000 fungi, harvested the broth in which each had grown, and tested whether the material could interfere with an early step of cholesterol synthesis in a test tube. They then separated its components from one another, keeping track of the active material. By this and additional methods, Endo eventually purified an enzyme-blocker from the fungus *Penicillium citrinum* called mevastatin

or compactin. He showed in 1979 that compactin could sharply lower cholesterol in dogs and monkeys.

Endo's work inspired others, and in 1987 a similar drug (called lovastatin or Mevacor) was the first statin to be approved by the U.S. Food and Drug Administration.

"Endo ushered in a new era in preventing and treating (coronary heart disease)," the Lasker Foundation said. "His work has touched millions of people."

FUNGAL DIESEL

Tom Lutey

Billings Gazette, Nov. 10, 2008

Billings, Montana - In a world squeezed by the politics and price of petroleum, a Montana State University scientist has unveiled a discovery that may have people turning to a fungus for fuel.

Gary Strobel, introduced the world to "myco-diesel," a volatile gas generated by a Patagonian tree fungus called *Gliocladium roseum*, or *G. roseum* for short. It has many of the characteristics of diesel fuel and grabbed the attention of the international media last week as the American news media focused on the general election.



Gliocladium roseum

An article on the discovery appears in the latest edition of *Microbiology*, a professional journal based in the United Kingdom, and in *Science* magazine, which came out earlier last week. Strobel collaborated on the research with several MSU faculty members and with undergraduates at Yale University, where his son, Scott, is mapping *G. roseum*'s DNA.

Strobel's discovery is big. The dreams of how the fungus-fuel concept might produce diesel on a broad scale are even bigger. Think about cellulose-rich yard clippings, leaves, or even newspaper dropped in a vat where hungry fungi feed like yeast and produce vaporous diesel fuel as a by-product. Not some crude substance that then has to be refined, but a gaseous product with a chemical profile nearly identical to diesel, which could be collected, condensed, and used in cars or jets.

"Nobody has ever seen anything like this before. It has some of the most important hydrocarbons found in diesel fuel," Strobel said. "When I saw the data every hair on my body stood up."

"Strobel's research on a microbial route from biomass to hydrocarbon-based fuels is resulting in very exciting findings," said Bruce Hamilton of the National Science Foundation, whose bioengineering division helped fund the research. NSF has other biofuel projects in the works, some further along than myco-diesel, but it likes what Strobel has reported and that his work is already under review by peers.



Strobel is the first to say that miles of research stand between myco-diesel and the gas pump. For starters, it isn't clear how much myco-diesel the fungus can produce. The genes behind *G. roseum*'s fuel-producing ways could be the real find, Strobel said, if scientists can transfer them to another organism to develop an even better fuel producer. That process, if successful, could take years to complete, but even in this early stage, the potential of myco-diesel is attracting attention.

Emporia, Kansas - I have written a couple of these columns about microbes in the past few months. They seemed to be of interest because I got a good many comments about them. Therefore, I would try that subject again, if I had my way.

Actually, this column is about a somewhat different micro-organism, but one quite different from the bacteria and viruses about which I wrote earlier—fungi.

What are fungi? They are multicellular microbes that include molds, yeasts, mushrooms, toadstools, puffballs, rusts, smuts, etc. Some of them are very much involved with humans, our activities, and our history. Those are some of the things I want to tell you about, so let us get on with it.

Why the British Drink Tea. The British have long been drinkers of tea rather than coffee. Fungi are responsible for that. The big island just east of India used to be Ceylon. It was a British possession. It is Sri Lanka today and independent. Back in those British days, it was a huge producer of coffee for British use.

A fungal disease hit the coffee and literally wiped out the possibility of coffee growing there. Coffee would grow in South America, but the British had no possessions there. Tea would grow on Ceylon, so it became a huge tea producing area. And the British became tea drinkers.



Why Truffles Are Expensive. One of the most expensive and delightful gourmet foods in the world is a fungus. It is the truffle. Truffles are puffball-like fungi which are produced under the ground. They are most common in the European area around Italy, but they are found in other areas of the world, also.

Since they are underground, they have to be located and dug out. Dogs are trained to do that. A good truffle-hunting dog is worth several thousand dollars. That is because a bushel of truffles, also, is worth thousands.

Obviously, when they are ready for human consumption, they will be very, very costly. They are. We don't get them much in America. That is too bad, because they are superb food.



The Case of the Vanishing Trees.

We have a song about "chestnuts roasting by the open fire." And a poem about the village smithy "under a spreading chestnut tree." Such songs and poems are old because you and I have never seen the American chestnut tree. Once, however, the entire Appalachian uplift, from Maine to Georgia, was a great chestnut forest.

A different chestnut tree was brought to America from Asia in about 1902. A fungus, *Endothia parasitica*, was brought in on the Asian trees. It attacked the American trees, and by about 1934 the chestnut forest was gone. That is why you and I have never eaten chestnuts roasted over a fire.



American chestnut

Our elm trees, also, have been threatened by a fungus. It came over from Europe in imported elm logs. It was soon devastating to our elms and was known as Dutch Elm Disease. Fortunately, after much trouble, our elms have pretty much survived.

The Truth Behind "King Tut's Curse." The tomb of King Tut in Egypt was first entered in modern times in 1922. Several people entered it in following years. About two dozen of them died soon afterward. This led to disturbing King Tut's tomb being called "The Pharaoh's Curse." Actually, the deaths were all caused by fungi.

When King Tut died in 1,350 B.C., fruits, vegetables, and other organic things were put in the tomb with him. Blue, green, and brown molds grew on those things. The fungi did not survive the 3,000 years, but their spores and hyphae turned into a dust. Those who entered, breathed this old fungal stuff and died of severe implications. It was a "fungal curse," not the "Pharaoh's Curse."



Antibiotic Mud. Early explorers in western America were taught by the Native Americans to pack certain types of mud in their wounds. Or in the wounds of their horses. Mud into sores and wounds? Sounds crazy, but it worked. Why? Because, we know today, that mud contained Penicillin and other fungi. They produced antibiotics which healed the wounds.

Mycorrhizae. Not all fungi are detrimental to us humans. Many of them form mycorrhizae and benefit our plants very much. That word means "fungus root." Fungi are in many plant roots. They are beneficial. Orchids could not grow without them. Many pines must have them and on-and-on with many plants.

Hallucinogens. A good many fungi produce hallucinogenic chemicals. They have been used by humans to produce mind-boggling sensations for centuries. Lots of stories about that role of fungi, but they will have to wait.

Enough stories about fungal and human relations for now. Perhaps I will tell more at another time. After all, I did teach mycology for 18 years at the University of Missouri. And plant pathology, too, where fungi cause about 80 percent of all diseases. So fungi are in my memory bank.

In the meantime, do think, as I have for years, that fungi are marvelous and important members of our biological world. You would think that way, if I had my way.

LUXURY CONDO RESIDENTS URGED TO FLEE AFTER SUSPECTED FUNGUS FOUND

<http://www.myfoxwghp.com/>, Sept. 29, 2008
digtriad.com, Oct. 2, 2008

Winston-Salem, N.C. - Residents of a recently opened luxury condominium in downtown Winston-Salem were urged to move out temporarily last week after consultants found what they suspected was a rare fungus reported to grow only in the Middle East. On Monday, according to officials, a national expert on microbiology said she was virtually certain the sample in question was not the suspected fungus. Samples were sent to labs for further testing. In the meantime, however, residents were asked to stay away from the building until the fungus could be identified.

An independent expert confirmed that the sample in question was not the potentially hazardous fungus suspected, and the Greensboro consultant coordinating the testing recommended that the building be re-opened

One Park Vista, which opened in August, is an eight story, \$18 million building with 32 luxury condos and a restaurant.

MARINATED MUSHROOMS

Stella

<http://allrecipes.com/Recipe/Marinated-Mushrooms>

Ingredients

1 cup red wine
½ cup red wine vinegar
⅓ cup olive oil
2 tablespoons brown sugar
2 cloves garlic, minced
1 teaspoon crushed red pepper flakes
¼ cup red bell pepper, diced
1 pound fresh mushrooms, stems removed
¼ cup chopped green onions
1 teaspoon dried oregano
½ teaspoon salt
¼ teaspoon ground black pepper

Directions

In a saucepan over medium heat, combine the wine, vinegar, oil, sugar, garlic, bell pepper, red pepper flakes, and mushrooms. Bring to a boil, cover, and set aside to cool.

Once cooled, stir in the green onions, oregano, salt, and pepper. Serve chilled or room temperature. *Serves 9.*



Please consider putting your name forward as a candidate for one of these important positions. Ideally, we will have a mix of veteran and recently joined members on the board so all viewpoints will be represented.

If you would consider being a candidate, please phone or e-mail Pacita Roberts at (206) 362-2713 (pacitaroberts@gmail.com), Brenda Fong at (206) 329-5948 (bmlfong@gmail.com), or Doug Ward at 523-0781 (deward007@comcast.net).

SOMA (SONOMA CO. MYCO. ASS.) CAMP

To be held January 17-19, 2009, this annual gathering is packed with activities, lectures, and workshops focused on learning about wild mushrooms. It is held near Occidental, about an hour north of San Francisco. The featured speaker is Gary Lincoff. To register, go to <http://www.somamushrooms.org/camp/camp.html> and either download the registration form to mail in and pay by check, or register directly online using PayPal!

AMANITA PHALLOIDES FOUND IN VANCOUVER

Paul Kroeger

I found *Amanita phalloides* in my neighborhood a few days ago, the first in Vancouver! They were under *Carpinus betulus*, or European Hornbeam. *Amanita phalloides* has been found previously in Victoria under Hornbeam and under *Tilia spp.* (Lime or Linden) trees as well as *Quercus robur* (oak) and *Fagus* (Beech) spp. These hosts are in addition to *Castanea sativa* (Sweet Chestnut) and *Corylus avellana* (Hazelnut) on the Lower Mainland. Looks like the invasion is well under way! Mushroom hunting to eat is becoming much more Darwinian.

NOMINATIONS ARE OPEN FOR OFFICERS AND BOARD MEMBERS

Doug Ward

Every year at this time, we begin seeking candidates for PSMS officers and board members whose terms are expiring. This year we need nominations for Vice President, Secretary, and five of the 10 board members.

Have a Happy Holliday!



page 8



Puget Sound Mycological Society
Center for Urban Horticulture
Box 354115, University of Washington
Seattle, Washington 98195

RETURN SERVICE REQUESTED

Non-Profit Org.
U.S. POSTAGE
PAID
SEATTLE, WA
PERMIT NO. 6545