SPORE PRINTS

BULLETIN OF THE PUGET SOUND MYCOLOGICAL SOCIETY

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THE THREE LITTLE BIGS

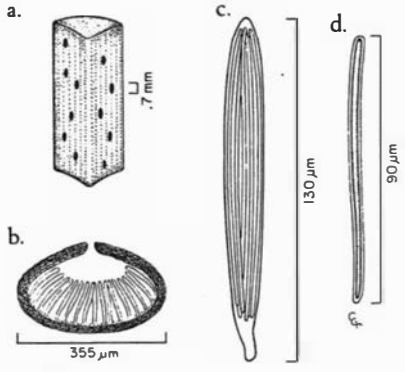
Dick Sieger

You may never have noticed three of the most common macroscopic fungi in our Pacific Northwest. Although they are ubiquitous, you won't find them in your field guides. That's probably because they are black blisters, less than 1 cm across, sunk into the surface of leaves or needles. You can see and recognize them with your naked eye, but it's better to use a 10X hand lens.

Rhytisma punctatum, *Lophodermium pinastri*, and *Coccomyces coronatus* are all in the subdivision Ascomycotina, producing spores inside microscopic tubes called asci. All are Discomycetes, the class that includes things like morels and cup fungi. Unlike morels and cup fungi, which produce their spores on surfaces that are uncovered from the time the spores start to develop, our three little fungi protect their spore-bearing surfaces with a cover until maturity. During development, a stroma (long cells bound together with hard, black pigments) pushes through the surface of the substrate to form the covering layer. A cluster of cells in the stroma develops into the fertile hymenium, or spore-producing layer. Discomycetes that develop like this are classified in the order Phacidiales.

Rhytisma punctatum can be found on almost any leaf fallen from a bigleaf maple (*Acer macrophyllum*) in the Puget Sound area. To beat competing fungi to the dinner table, it starts growing before the leaf falls. The little black spots within yellow or brown patches are distinctive. Looking at a black spot with your hand lens, you can see a weak line on the covering layer that eventually splits open to expose the fertile surface.

Lophodermium pinastri can be found in abundance in the Cascades on fallen needles of pine (*Pinus*) species. It's difficult to find a needle that doesn't sport small black fruiting bodies. Through a hand lens, they look like dark-roasted coffee beans embedded in plant tissue. On maturity, the long slit opens so the spores can escape. In Europe, this fungus is a deadly pathogen that causes premature needle cast. Around here, fortunately, it's harmless.



Lophodermium pinastri. **a.** *Erumpent fruiting body on pine needle.* **b.** *Section through fruiting body with asci.* **c.** *Ascus with ascospores.* **d.** *Mature ascospore with gelatinous sheath.*

Coccomyces coronatus occurs summer and fall on the brown, fallen leaves of Oregon grape (*Berberis aquifolium*). Within zones delineated by fine lines on the leaf surface are black spots. Look at the spots with your 10X hand lens and you will see a shiny black pentagon or hexagon with wedges like a cut pie. Put a drop of alcohol on one and after a while the wedges curl back from the center and form a tiny black "tulip." This remarkable structure is a hysterothecium, which opens and closes in response to the weather. Its function is to protect the fertile surface in dry weather and expose it during wet weather when the spores have a chance to grow. Hysterothecia have two layers of cells. The outer layer is tough, elastic, and waterproof. The inner is hygroscopic (water-absorbing). Moisture doesn't affect the outer cells but swells the inner ones, distorting the covering layer so it peels back like a warped board.

Overlake Hospital Medical Center
1035 116th Avenue NE
Bellevue, WA 98004
November 14, 1993

Dick Sieger
President, Puget Sound Mycological Society
15555 14th Avenue Northeast
Seattle, Washington 98155

Dear Mr. Sieger:

I would like to take the opportunity to thank Brian Luther, a member of the Puget Sound Mycological Society, for his great contribution to the care of a 4-year-old girl who had ingested a mushroom at Snoqualmie Pass today, Sunday, November 14, 1993. Mr. Luther, after being contacted, was very gracious and happy to come to Overlake Hospital to identify the mushroom that the father had brought with him. Although the mushroom was of a harmless variety, I feel that the little girl's care was significantly impacted by the exceedingly rapid and timely help that Brian was able to give us in such a pleasant and gracious manner. It is truly a pleasure for those of us in the healthcare field who are unfamiliar with mushroom identification to know that there are members of your society that we are able to call on in an emergency.

Again, my greatest thanks and appreciation to Brian for his contribution in the care of this young lady and to your society for the service that you are willing to provide to local hospitals and healthcare professionals in rapid mushroom identification.

Sincerely,

Christy Horton

Christy A. Horton, M.D.
Emergency Department Physician
Overlake Hospital Medical Center
Bellevue, Washington

Spore Prints

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PUGET SOUND MYCOLOGICAL SOCIETY
Center for Urban Horticulture, Mail Stop GF-15
University of Washington, Seattle, Washington 98195
(206) 522-6031

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EDITOR:	Agnes A. Sieger, 15555 14th N.E., Seattle, WA 98155

CALENDAR

Jan. 9	Cultivation Group, 1:00 p.m, Douglas Classroom, CUH
Jan. 11	Membership meeting, 7:30 p.m., CUH
Jan. 17	Board meeting, 7:30 p.m., CUH
Jan. 21	*Spore Prints* deadline
Feb. 12	Microscope class #1, 9:00 a.m., Isaacson Classroom, CUH
Feb. 13	Microscope class #2, 9:00 a.m., Isaacson Classroom, CUH
Mar. 11	Survivors' Banquet, Seattle Central Community College

CULTIVATION GROUP

Greg Chew

Act on that New Year's resolution to get involved —come out and preserve mushroom strains. The January meeting of the Cultivation Group will provide all the opportunity to learn and practice sterile techniques. Share your favorite nutrient media recipes. We will be preparing malt extract agar media. Come and use the PSMS laminar flow hood which filters out particulates exceeding 0.3 micron and generates a sterile environment to work in front of. Bring fresh living specimens to learn how to tissue culture.

We will be meeting Sunday, January 9, from 1 to 4 p.m. in the Douglas Classroom at CUH. Bring your best stock cultures to expand our collective species bank.

NEW COMMITTEE CHAIRS

Marshall Palmer has agreed to chair the Education Committee, replacing Paul Yurky. Kathreen Otwell will be the Cispus Foray Chair.

Membership Meeting

Tuesday, January 11, 1994, at 7:30 p.m. at the Center for Urban Horticulture, 3501 N.E. 41st Street, Seattle

For our January meeting, Dr. Scott Redhead will present "A Mycoflora of the Pacific Northwest is an Elusive Goal." Dr. Redhead is best known to PSMS members as a principal mycologist at the 1990 NAMA foray at Whistler and, more recently, at Cispus 1993 and our 1993 NAMA foray at Fort Worden. Dr. Redhead is on sabbatical from Agriculture Agri-food Canada, Center for Land and Biological Resources Research. For the past year, he has been studying Northwest mushrooms in Dr. Ammirati's lab at the University of Washington and on extended field trips. A skilled taxonomist, he has written more than a hundred monographs on a variety of mycological subjects. He was awarded the Alexopoulos Prize by the Mycological Society of America in 1989. Amateurs and students appreciate his indulgence and skill as a teacher. Come join us for an interesting and enlightening evening.

Would PSMS members with last names starting with E-H please bring a dish of refreshments for the social hour?

MUSHROOM MICROSCOPY CLASS

Judy Roger will teach two all-day classes on how to examine mushrooms with the microscope on Saturday, February 12th, and Sunday, February 13th. Judy was a student of Dr. Stuntz and is a former PSMS member who now lives in Oregon. She edits NAMA's *Mycophile* and the Oregon Mycological Society's *Mush Roomers*. She heads the OMS chanterelle project. People who attended her microscope class at the 1993 Cispus Foray can testify to her knowledge of mushrooms, her teaching ability, and her fine microscopic technique.

Beginners attending the class will learn how to use a microscope, how to prepare mushroom slides, and how to recognize important microscopic features of mushrooms. Graduates will be certified to use our society's microscopes. The small size of the class, 12 people, will ensure that each student will have individual attention from Judy and her lab assistant, Dick Sieger. PSMS will provide microscopes, equipment, stains, chemicals, and Judy's wonderful manual. People who want to work through the noon break may bring lunch.

Classes cost $20 (refundable if we can find a student to take your place). They start at 9:00 a.m. at Isaacson Classroom, next door to our office at CUH. The classes may be oversubscribed, so we will accept the first 24 applications we receive by mail from PSMS members. Questions? Call Dick Sieger, 362-6860.

To reserve space, mail your request to

Microscope Class
c/o Mary Taylor
529 SW 294th Street
Federal Way, WA 98023.

Enclose the following:

A $20 check payable to "PSMS"
Your name, address, and phone number
The date of the class (Feb. 12 or 13)
If we could substitute the other date
A self-addressed, stamped envelope

MINING THE WEEDS

Margaret Scherf
Associated Press Writer

WASHINGTON (AP) -- A field full of weeds is a potential gold mine to Rick Bennett.

In his search for such fields, Bennett has traveled to more than a dozen European countries and the former Soviet Union. He has been detained by security guards, stranded without gasoline, and chased by dogs.

A plant pathologist with the Agricultural Research Service, Bennett seeks out foreign weeds to capture the fungi and other natural enemies on them that could be used as biological controls for weeds in the United States. Since 1989, according to the May issue of *Agricultural Research* magazine, Bennett has spent about 18 months overseas searching for leafy spurge, yellow star thistle, and other weeds.

He has brought back more than 80 disease-causing organisms, studied them under quarantine at the agency's Foreign Disease-Weed Science Lab in Frederick, Maryland, and unearthed several prime candidates for biological control.

For instance, a fungus called *Uromyces scutellatus* covered leafy spurge plants in Romania with black spores that block reproduction, stunt growth, and deform stems.

Leafy spurge has spread across 2.5 million acres in the Western states since it was first reported in Massachusetts in 1827, causing ranchers an estimated $34 million to $45 million in damage each year.

Leafy spurge and other weeds are believed to have originated in Europe and hitchhiked here on plants immigrants brought when they came to the United States. The natural enemies of those weeds, including fungi and insects, remained behind or died on the voyage, leaving the weeds to flourish.

"Once we determine the origin of leafy spurge, we can intensify our search for new pathogens," Bennett said. "The fungus *U. scutellatus* is the best we've found so far, but there may be others. It's like putting together a puzzle. We still need more pieces."

But sometimes Bennett's field work arouses suspicion.

"I'm always along roadsides or in fields, digging around, taking pictures, collecting and isolating pathogens," he said. "My portable microscope almost always draws suspicion. In fact, customs agents in Romania took it apart once. They thought it was a camera containing microfilm."

BLACK TRUFFLES GROWN OUTSIDE EUROPE

New Zealand

(Reuter) New Zealand researchers celebrated last August after successfully harvesting the first two of what they hope will be thousands of truffles, a rare delicacy traditionally monopolized by France. The two small truffles —the first French Perigord black truffles (*Tuber melanosporum*) outside the Northern Hemisphere—were found on a farm at Gisborne, in New Zealand's north island, by a truffle-hunting dog from the New Zealand Crop and Food Research Institute.

Scientist Ian Hall, who has spent 8 years researching truffle production for New Zealand, said that the truffles were in good condition, "...with a perfect aroma indistinguishable from first grade French Perigord black truffles."

More than 6,000 trees infected with spores that produce truffles are being grown in New Zealand, mostly by smallholders and other farmers prepared to gamble on incomplete scientific research.

New Zealand Truffle Association president Annie Bowker said a company was being formed to market the coming crops, and growers were talking to the Horticulture Export Authority about setting standards for truffle exports. Bowker said Asian and North American markets had already expressed interest in New Zealand truffles, but initially demand would far outweigh supply.

"The signs that truffles will be harvested in commercial amounts in several years look very positive, but the research has a long way to go before an industry could be established," Hall said.

United States

In related news, Franklin Garland, writing in the current issue of *Mushroom, the Journal of Wild Mushrooming*, describes the first documented black Perigord truffles grown in North America. The 25 truffles were found October 23, 1993, 13 years after he planted the inoculated trees.

U.S. truffle expert Dr. James Trappe reports that most inoculated seedlings in this country were planted after Garland planted his in 1980. Does this mean the (black) gold rush is finally about to pan out?

DEFENSE AGAINST HIV?

TOKYO (UPI) -- A Japanese mushroom can help block HIV, the virus that causes acquired immune deficiency syndrome (AIDS), and also can restrain breast cancer, a researcher in Kobe, western Japan claims.

Prof. Hiroaki Namba of Kobe Women's College of Pharmacy, told the Kyodo News Service Thursday about trials conducted with AIDS patients in the United States and tests on mice. These tests showed that a polysaccharide called glucan extracted from the mushroom maitake (*Grifola frondosa*) activates helper T-cells, a type of white blood cell that attacks infected cells.

"It remains unknown why glucan from the maitake mushroom activates the body's immune functions," said Namba. "But given its effectiveness against symptoms of AIDS, it could be used for the treatment of AIDS patients together with anti-AIDS drugs."

AIDS destroys the immune system, leaving the body vulnerable to infections including tuberculosis, pneumonia and cancer, which are eventually fatal.

The Kobe researcher said he worked with two American doctors living in New York to conduct trials involving 26 AIDS patients, aged between 20 and 40, to see if glucan would activate helper T-cells.

Powdered maitake and glucan tablets, weighing 3 g each, were given to the 26 patients daily for two weeks in April 1992, Kyodo reported.

In 13 patients the number of T-cells increased, and they stopped declining in the other 13. In some cases the number of T-cells doubled.

Drug taking in sports is nothing new. As long ago as 300 B.C., Greek athletes allegedly ate "magic mushrooms," supposedly to increase their endurance.

UPS, 7/23/93

TURN ABOUT IS ONLY FAIR

Margaret Schert,
Associated Press

WASHINGTON (AP) -- The dusky sap beetle was sappy enough to fall for a trick that turned it from a villain in the cornfield into a good guy. Well, a semigood guy.

Agriculture Department scientists say they have tricked the dark brown, hairy insects into carrying to cornfields a natural enemy of the fungus that causes aflatoxin, an extremely potent carcinogen. High levels of aflatoxin mean the corn cannot be fed to livestock.

The aflatoxin also is spread by the beetles, which enter the corn through wounds caused by other insects or through gaps in the husk and spread the spores of the aflatoxin-producing fungus, *Aspergillus flavus*.

If the insect can carry aflatoxin, reasoned entomologists Fernando E. Vega and Patrick F. Dowd of the Agricultural Research Service, why can't it also carry aflatoxin's enemy, *Bacillus subtilis*?

The scientists designed a bacterium dispenser attached to a baited trap. Entomologist Robert J. Bartelt extracted attractants, known as pheromones, from the beetle and synthesized them. Combined with artificial corn odors, they act as the trap's bait.

Lured by the enticing aroma, the insects crawl into the trap, where their hairy bodies pick up the bacterium, which they then spread around the cornfield as they feed.

In tests with a dozen dye-filled devices on a research farm last summer, Dowd said, 10 to 20% of the sap beetles in the area went through the devices. They spread the dye to 58% of nearby wounded corn ears. While that is adequate to move the material around in the field, the scientists are working to find ways to increase the percentage.

As a double whammy, the scientists said, a pathogen could be added to the device after the corn-growing season to kill the sap beetles as they gather to hibernate, without harming the corn or other plants or animals.

YEAST ROLLS WITH MUSHROOMS

Patrice Benson

1/2 C butter	1/2 tsp salt
2-1/4 C flour	1 egg, plus 2 yolks
1 pkg dry yeast	2 Tbs sour cream
1 tsp sugar	Duxelles (recipe follows)

Combine dry ingredients in bowl. Cut butter into flour mixture. Add eggs and sour cream. Knead a few minutes and let rise in a warm place until doubled. Roll into a rectangle 1/4 in. thick. Cut into long 2-in. wide strips. Place a thin strip of duxelles down the center of each strip. Fold dough over filling, sealing with egg. Place seam side down onto greased baking sheet. Bake at 375°F for 20 minutes or until golden. Cut into slices and serve warm with soup or as appetizer.

Duxelles **Bruce Naftaly**

[Prepared by Le Gourmand at the 1986 PSMS exhibit]

1 lb mushrooms, finely chopped	2 minced garlic cloves
2 minced shallots	2 Tbs Cognac or dry sherry
	2 oz demi-glace

1. Saute shallots, garlic slowly.
2. Separately saute mushrooms until dry.
3. Add chopped parsley, cognac.
4. Simmer until all liquid is evaporated.
5. Add salt, pepper to taste.

FEBRUARY ELECTIONS

We have two candidates for the February election: Mary Taylor for Treasurer and Patrice Benson for President. The Nominating Committee will nominate others, and nominations may be made from the floor at the January meeting.

HELP WANTED: Membership Chair Bernice Velategui needs another assistant who can help her and Pat Williams.

Puget Sound Mycological Society
Center for Urban Horticulture
GF-15, University of Washington
Seattle, Washington 98195

RAFANELLI, George & Jennie
1776 S. Columbian Way
Seattle, WA 98108