SPORE PRINTS

BULLETIN OF THE PUGET SOUND MYCOLOGICAL SOCIETY
Number 470 March 2011

MEET DIRK DIGGLER: SPAWN STAR, SEX GOD, AND SAVIOR OF HIS SPECIES **Ben Cubby**

The Sydney Morning Herald, Feb. 12

It was a hot summer night in 1998 when a solitary spotted tree frog named Dirk went out looking for love. The fertile young male climbed down to a riverbank and began chirping his seductive, distinctive mating call.

But there was no answer.

Dirk was the last of his kind in the last spotted tree frog colony in New South Wales, tucked away in a corner of Kosciuszko National Park. All the rest had died of chytrid fungus, an introduced skin disease that has ravaged frog populations across Australia.

Without females to respond to his mating song, Dirk's future was bleak. Fortunately other ears were listening.

''Within 10 minutes of getting to the site, we heard the call,'' said David Hunter, the leading frog specialist in the NSW environment department, who happened to be leading a last-ditch expedition to search for remnants of the colony just as Dirk announced his amorous intentions.

''We ended up staying at the site for five days after we captured Dirk but there was no sign or sound of any others, so we can accurately say that he was the last,'' Dr. Hunter said. ''The entire fate of the spotted tree frog in NSW rested on Dirk's shoulders.''

Female spotted tree frogs survived at an amphibian research centre in Melbourne and that was when Dirk got his nickname.

''Not long before we found him, a movie came out called *Boogie Nights*,'' Dr. Hunter said. Dirk was named after Dirk Diggler, a fictional porn star from the film.

''Our hope was that he would be a performer. It turned out that he was.''

Surrounded by eager females under the care of Gerry Marantelli, Dirk began ensuring the survival of his species.

Now the NSW Department of Environment and Climate Change is cautiously confident the thumbnail-sized frogs won't become extinct, and regards the program as a breakthrough in captive breeding and release of critically endangered species.


D. Hunter

One of Dirk's prodigy.

Hundreds of Dirk's children and grandchildren have been released back into the Kosciuszko stream their forbear once inhabited, and the latest surveys show that the population appears to have stabilized with a breeding population of about 100.

''It really is starting to look like an extraordinary success,'' Dr. Hunter said. ''The program we started back in 1996 to preserve the colony is now a model for other research around the world where chytrid fungus is concerned.'' The infectious fungus covers the skin of frogs, interfering with their breathing, and is thought to be a major cause of a huge spike in frog extinctions in the past two decades.

As for Dirk, he survived his exertions in the harem. ''He's looking a little grey around the skin, a little tired, but still going strong,'' Dr. Hunter said.

ERRORS OF THE SEASON: OREGON MUSHROOM POISONINGS, 2010 **Jan Lindgren**

MushRumors, Ore. Myco. Soc., Jan./Feb. 2011

A bountiful mushroom season brings with it an increase in mushroom poisoning cases. There were several serious poisoning cases in Oregon this past year with at least two deaths.

One case was written up in detail in *The Oregonian* about a young man who took hallucinogenic mushrooms, became combative, and was finally subdued by officers who used pepper spray and Tased him seven times. A similar case occurred in 2006 with a young man being shot by police officers after they couldn't control him with Tasers or beanbag rounds being fired from a 12-gauge shotgun. The OMS Toxicology Committee was not involved in either of these cases, but it concerns everyone when they see people who can't act in a responsible manner and are putting their lives at risk. Besides, this causes trauma for those who are trying to protect the public.

Judy Roger worked on a case with three adults who ate *Amanita phalloides.* The privacy regulations now prevent us from disclosing any personal information or facts involving the cases we work on. We do know that one person died and two survived. *Amanita phalloides* attacks the liver, and without prompt medical treatment the victims may die. *Amanita smithiana* was the cause of another poisoning case where the kidneys were being damaged by the toxins. Fortunately, doctors were able to stabilize the victim and keep her from needing dialysis. This case was caused by mistaking A. *smithiana* for *Tricholoma magnivelare,* the matsutake.

Less serious cases involved illness caused by chanterelles, *Agaricus augustus,* puff balls, pickled red russulas, and dirty, insect-riddled mushrooms. Even some mushrooms generally considered "safe" can cause problems for some individuals or when eaten in large quantities.

We always have a few calls from veterinarians about dogs that have eaten mushrooms and from parents and care-givers with children or senile individuals who have eaten raw mushrooms. Most never experience more than anxiety or a gastrointestinal upset.

We would like to report exact numbers of cases involving people in Oregon and SW Washington and to gather information about the quantity of mushrooms eaten, the onset time for symptoms, the treatment given, and the outcome of all cases. In the past this information has been most helpful to both mycologists and medical personnel who can publish information that will help with treatment of future victims. The doctors may still have access to this information, but those writing for mycological journals appear to be left out.

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CALENDAR

Mar. 14	Board Meeting, 7:30 pm, CUH
Mar. 19	Annual Meeting and Surviviors' Banquet, 6:30 pm, CUH
Mar. 22	*Spore Prints* Deadline
Mar. 26	Learning Field Trip (see insert and website)

BOARD NEWS — Denise Banaszewski

The Board is planning to hold a strategic planning session. Most of the February board meeting was a presentation by Denis and Vivian Benjamin of how they would facilitate a strategic planning session; we were impressed, and the Benjamins will be our facilitators. Classes continue to be popular and are filling up quickly. We will hold the 2011 Annual Exhibit at the Mountaineer's Facility on Sand Point Way. It's a wonderful space that we think will work better than CUH, given the large number of attendees we've had in recent years. Finally, in celebration of PSMS's 50th anniversary in 2014, we are planning to hold the 2014 NAMA Foray here in the Puget Sound area, tentatively at Fort Warden in early October. More details on that later!

News Flash: Brian Luther, PSMS Identification and Field Trip Chair, reports that the Washington State Department of Natural Resources has granted him permission for a four-year study of resupinate fungi in the 4000 acre DNR nature reserve on Cypress Island. Travel expenses will be covered by a grant from PSMS.

ANNUAL MEMBERSHIP MEETING AND SURVIVORS' BANQUET

Saturday, March 19, 2011, Center for Urban Horticulture, 3501 NE 41st Street, Seattle.

It's time again for our Annual Survivors' Banquet and Business Meeting. The decorating crew will enter at 5:45 pm. The social hour will begin at 6:30 pm, and dinner will be served at 7:30 pm. Our newly elected officers, board members, and Golden Mushroom recipient will be presented. This will be a potluck dinner. Our theme this year will be "Celebrating Scandinavia!" so if you can, please bring an appetizer, entrée, or dessert item for our smorgasbord table that is typical of the Nordic countries. We will auction several baskets of goodies with the proceeds going to the Ben Woo Scholarship Fund, and there will also be door prizes. We will have a banquet permit for the evening so you can bring your own refreshments.

There will be a charge of $5 per person to cover incidental expenses as well as give us an idea of how many people will be attending. Signing up ahead of time will get you an extra ticket for the door prizes! We will, of course, not turn any members away at the door, but only those registering in advance will be guaranteed a seat! Last year it was difficult to find seats for people who decided to come at the last minute. If you didn't pay at the February meeting, please send your check, payable to PSMS, to Andrea Rose, 5819 SW Horton, Seattle, WA 98116. If you have questions, call her at (206) 933–0838. We look forward to seeing you on the 19th!

Here's to surviving another year!

MUSHROOM BASKET CONTEST Debra Lehrberger

Create Your Own Survivor's Banquet Mushroom Basket

Bring out your own creative self-expression, Dress up your mushroom basket(s) and bring them with you to the Banquet, to be displayed and entered in one of the following categories:

- Kid's Baskets
  (age 12 and under please)
- Culinary
- Formal Attire
- High Tech/Low Tech
- Trolls, Gnomes, Faeries, and Keebler Cookie Homes-to-Go
- Dyed and Felted Baskets
  (I FELT the call of the wild mushroom and just DYED to go there.)
- How Do I Handle This?
  Basket Handles with Unusual or Interesting Shapes
- The Earthiness of it All
- Hunting Season is On

How fun is that! See you at the banquet.

BOOK REVIEW

Brian Luther

Fungi Europaei. Vol. 12. *Corticiaceae* s.l. (sensu lato). Annarosa Bernicchia and Sergio Perez Gorjón. 1008 pp. Edizioni Candusso, Alassio, Italy. 2010. Hardback. ISBN 978-88-901057-9-8. 90 Euros (around $123 US, including postage).

Covering more than 800 species in 187 genera and with 455 line drawings, along with 427 color plates, this is a substantial book in both content and weight (6 lb). It is organized into eight chapters, or units:

1. Taxonomical, nomenclatural, and ecological notes, etc.
2. Checklist of Corticiaceae sensu lato present in Europe
3. Key to genera of Corticiaceae sensu lato present in Europe,
4. Descriptions and keys to the species
5. Bibliography
6. Illustrated glossary,
7. Iconography (color plates)
8. Index to genera and species.

The family Corticiaceae, in the broad sense (sensu lato), includes almost all the corticioid (patch- or crust-forming) fungi, whether they are related or not. With 11 orders and almost 50 families, Vol. 12 covers not only most resupinate fungi but also many genera that are usually pileate, such as *Chondrostereum*, *Stereum*, etc. It also includes *Hymenochaete* and the nonresupinate toothed genera *Hericium* and *Auriscalpium* as well as others. This volume is limited to the traditional Homobasidiomycetes; thus numerous other resupinate fungi belonging to the Heterobasidiomycetes are not covered.

The genera are easily accessed because they're organized alphabetically in the book. The initial keys to genera at the beginning are presented in both English and Italian, but all keys under the genera throughout the text are in English only. Bernicchia and Gorjón have included rather brief to extensive descriptions of the genera in different languages based on how the generic names were originally described; for example, immediately following the genus *Coniophora*, the original description in French is given. Mostly, however, the book just repeats the Latin generic description as originally published. Under each genus the authors provide its distribution, by country, and a list of representative specimens examined.

Unfortunately, not all of the species in the keys include descriptions and line drawings, only those in bold print. For some genera, such as *Gloiodon* and *Tubulicrinopsis*, neither descriptions nor drawings are included for any of the species. For others, only one species out of many is illustrated. For others, such as *Trechispora*, most of the species are illustrated. Not all species have color plates, and in some cases the same species has more than one plate, which I found unnecessary. These shortcomings are rather disappointing, making the book not quite as useful as it could have been had descriptions and illustrations been provided for all species covered. The book also has misspellings throughout, but nothing that detracts from the overall usefulness.

On the plus side, the quality of the plates (color and definition) is excellent, and some include higher-magnification insets for a closer look. The paper quality, printing, and binding are all top notch. A useful addition, which I find especially handy (if somewhat old fashioned) is a narrow, permanent cloth page marker.

This tome is important because it brings together—in one volume—the most modern genera assigned to specific species, based on a variety of modern tools such as DNA analysis. As such it is an important reference for mycologists whose first love in the Basidiomycota is these fascinating fungi. The volume has significant application in North America as well as Europe, because many of the same species are found on both continents and, for that matter, circum-borealy for the more northern species.

In summary, we are fortunate to finally have a volume dealing with resupinates that brings us up to speed with modern research. In my study of resupinates I'll definitely be consulting it frequently.

Note: Edizioni Candusso has published 12 other major volumes on fungi focusing on Europe, as well as numerous smaller monographic treatments. All are lavishly illustrated with beautiful color photos. Some are in English and others not. They can be viewed on-line at www.edizionicandusso.it.

CALIFORNIA FORAY

Kim Traverse

The last weekend of January, six of us from PSMS traveled down to Albion, California, to attend the fourth biannual All-California Club Mycological Foray. Our featured speaker at last year's Wild Mushroom Show, Debbie (Amanitarita) Viess, co-founder, with her husband, David Rust, of the Bay Area Mycological Society, the sponsors of this foray, had graciously made all PSMS members "honorary Californians" and invited us to attend.

It was my first venture to a regional event, and I was the only one of our group to drive (I wanted to take my microscope). Don and Cathy Lennebacker, Joanne Young, Patrice Benson, and Hildegard Hendrickson all took the cheaper and probably safer option of flying.

In some ways it was a drive into spring for me, but I certainly had other feelings. I saw some of the most beautiful scenery and landscapes I have ever driven through, but almost without exception, the abject ugliness of everything built during the past half-century marred every concentration of human population.

But the foray was a real delight. Oluna Ceska was the lecturer, and, aided by microphotographs by her husband, Adolf, she encouraged us all to tackle the notorious "LBM's" of the world. The day before she had first amazed me by *finding* the tiny *Hemimycena tortuosa*, (cap 1 mm in diameter!) and then showing me the diagnostic tortuous cystidia on the cap pilosities and stipe base. Very cool.

There were very nice and knowledgeable people from all around California and even other parts of the county and beautiful country to collect both a wide array of odd specimens but also quite a few edibles. I brought back decent quantities of Sweet Tooth, Black Trumpets, and Winter Chanterelles.

One thing that struck me was that there were three main approaches that people were taking toward mushroom identification. There were about seven microscopes and sometimes a line to use a free one. It seemed like there was a fairly discrete group that approached fungi that way. Quite a number of people utilized various books and macroscopic examination of the many specimens collected and displayed. That group was probably the majority. But another group seemed to almost entirely utilize on-line resources, mainly for the confirmation of their hunches about identification. At the most they might occasionally check a feature under a scope or look up a name in a book. Age did *not* seem to be perfectly correlated with any of those approaches. And, in fact, the boundaries between approaches were much less important than the fascination with fungi shared by everyone.

NEW PAPER REVEALS 100 NEW SPECIES OF LICHENIZED FUNGI **Press Release**

The Field Museum, Chicago, Feb. 14, 2011

In an unprecedented coming-out party, 100 newly discovered species were revealed to the world in a single scholarly paper coordinated by scientists of The Field Museum in Chicago.

The 100 organisms are lichens, a type of fungus that forms associations with algae and populates environments from arctic tundra to tropical rain forests. And the usual inattention bestowed upon new lichens is one reason for aggregating so many new ones in a single paper in the Feb. 18 issue of the journal *Phytotaxa*.

A massive collaboration such as the lichen project has some benefits over traditional biology that is done by individuals or small groups, Thorsten Lumbsch of the Field Museum said. Descriptions of the lichen species provided in the *Phytotaxa* article are more uniform than would likely be true if the 100 new species each appeared in a single article.

Lumbsch and his Field Museum colleague Robert Lücking recruited 102 lichenologists from 37 countries to write the massive paper to help draw attention to huge shortfalls in our knowledge of the diverse life on Earth.

The lichen collaboration is intended to demonstrate to biologists that even though they join with a large group in presenting their findings, they still receive full credit and don't lose authority over their discovery, he said. "We wanted to show these scientists how easy it is to contribute their information to the Encyclopedia of Life and how useful that is," said Lumbsch.

While biology traditionally has been more solitary, many in the field acquired an appetite for larger collaborations with the project to map the human genome more than a decade ago. Since then, such collaborations have become more common, especially in projects that seek to coordinate understanding of life on the planet, Lumbsch said.

Recruiting biologists to join the lichen collaboration wasn't difficult, he said, but "sometimes getting them to pay attention to deadlines wasn't so easy."

The project, which took about a year to complete, would have been impossible without the Internet and e-mail, Lumbsch said, but even with e-mail, communications were very time consuming.

"I would like to do it again," he said. "But first I will talk to some information specialists to learn how we might facilitate communications so my e-mail inbox doesn't keep overflowing!"

MAN ON MUSHROOMS CLAIMS TO BE GOD, WITHSTANDS TWO TASER BLASTS **Matt Steiner**

Colorado Springs Gazette, Feb. 17

A man claiming to be God fended off two Taser blasts before Colorado Springs police tackled and arrested him Thursday morning.

Jorelle Antivo, 21, charged police in the hallway at an apartment building in central Colorado Springs just after 3:30 a.m., according to police reports.

Officers had been called to the tesidence at Austin Bluffs, 4130 Morning Sun Ave., to investigate a burglary. They found Antivo, who police later learned had been smoking hallucinogenic psilocybin mushrooms, also known as magic mushrooms.

The officers ordered Antivo to lie down, but he refused. That's when he was shot with the first Taser blast, which had no effect, according to the report.

Antivo advanced on the officers, at some point professing his divine status, and the officers pushed him away and hit him a second time with the Taser. Once again, Antivo didn't slow, and this time tried to run from the officers. He was tackled in the hallway.

According to the report, it took four officers to finally control Antivo. He was taken to an area hospital, arrested for obstructing an officer, and later released.

Antivo had not been trying to burglarize apartments, police said, but had mistaken the apartment building for his own dwelling and was attempting to open apartment doors with his house key.

WHEN TREES ATTACK, FUNGUS CAN PARRY **Sara Reardon**

http://news.sciencemag.org/sciencenow/, Jan. 24, 2011

All across British Columbia, from the Pacific Ocean past the Rocky Mountains, more than 40 million acres of coniferous forest stand brown and desiccated, ravaged by the mountain pine beetle. Over the past decade, the pest has spread virtually unchecked, rupturing ecosystems and maiming British Columbia's timber industry. A new genetic analysis reveals how the beetle's partner in crime—the fungus *Grosmannia clavigera*—helps the insect elude pine trees' natural defenses, providing it safe passage to the tree's core.

Wood stained blue by G. clavigera.

Although the pine beetle gets most of the blame for destroying forests, many researchers think that *G. clavigera* is the more deadly of the duo. Commonly known as blue stain fungus for the color it leaves on the wood of trees, *G. clavigera* travels from tree to tree in the beetle's mouth. The fungus, beetle, and pine tree are three competitors in a "never-ending arms race," says molecular biologist Joerg Bohlmann of the University of British Columbia, Vancouver, in Canada.

To learn more about how *G. clavigera* helps the beetle do its dirty work, Bohlmann and colleagues took the fungus back to the lab. When a beetle burrows through the bark of a pine tree, the tree secretes a toxic resin into the tunnel, trapping—and often killing—the beetle. (This pine resin is an ingredient in Pine-Sol antimicrobial cleaner, which kills most fungi.) But when the researchers treated cultures of *G. clavigera* with substances from the resin or with extracts from the bark of a tree in the process of repelling a beetle, the fungus continued growing happily. Under attack by these toxins, the fungus switched on a different set of genes. Some of these genes allow it to break the toxins down and even use them as food. The researchers suspect that this ability helps protect the beetle from being poisoned as it burrows through the tree.

"[The fungus] has taken a step further in evolution: It can not only tolerate the resin but can use it as a carbon source for its own benefit," says Bohlmann, whose team reports its findings online today in the *Proceedings of the National Academy of Sciences*. His interdisciplinary group of researchers, known as the Tria Project, plans to determine what other genomic mechanisms may help the fungus kill trees and interact with the beetle.

So far, the pine beetle epidemic has mostly killed lodgepole pines, which make up the majority of British Columbia's forests. But if

the fungus/beetle combo can adjust its counter-defense system to overcome the weaponry of other pines, it could spread much farther. "The potential to spread into Alberta's jack pines would provide the beetle a conduit to the east coast [of Canada]," says forest entomologist Brian Aukema of the University of Minnesota, Twin Cities, who was not involved in the research. He adds that from there, it could easily move south into the United States. "The genome analysis gives us an insight into what's going on under the hood."

MEN EXPEND MORE ENERGY IN MUSHROOM GATHERING THAN WOMEN

Evolution and Human Behaviour, May 2010
via *MushRumors*, Ore. Myco. Soc., Jul./Aug. 2010

A recent study tracked the foraging pathways of 21 pairs of men and women from an indigenous Mexican community searching for mushrooms in a natural environment. Using GPS navigation devices and heart rate monitors, Luis Pacheco-Cobos of the National Autonomous University of Mexico and his colleagues followed mushroom gatherers from a village in the state of Tlaxcala for two rainy seasons to see how many mushrooms they gathered and how long it took. The GPS system mapped all the routes taken, and the heart-rate monitors detailed the energy expended.

Results indicated that although men and women collected similar quantities of mushrooms, men traveled farther, climbed higher, and used a lot more energy—70 percent more—than the women.

The men did not move any faster, but they searched for spots with lots of mushrooms. The women made many more stops, apparently satisfied with, or perhaps better at finding, patches of fewer mushrooms.

According to the study, these findings are consistent with arguments that male and female navigational skills evolved differently over time because men were the hunters and women the gatherers. The male strategy is the most useful for hunting down prey—a practice that has led modern man to navigate by creating a mental map, then imagining their positions on it. Women, however, are more likely to recall their routes by using landmarks if they are retracing paths to the most productive patches of plants.

CHINESE PUPIL FINDS DANGER IN MUSHROOMS

Xu Fang and Pan Zheng
Shanghai Daily Publishing House, Dec. 1, 2010

An experiment by a grade-six pupil in Beijing found that more than 90 percent of fresh mushrooms on the market were tainted with fluorescent brightener, a compound considered a potential cause of cancer, The *Beijing News* reported yesterday.

And his results were backed by microbiologist Gao Ruifang, of the China Agricultural University, who called the pupil's method 100 percent reliable. But the Beijing Industrial and Commercial Administrative Bureau said the experiment and the results were "not scientific."

FUNGAL THREADS ARE THE INTERNET OF THE PLANT WORLD

Michael Marshall
www.newscientist.com/, Nov. 12, 2010

Gardeners, keep an eye on your tomato plants. There's no knowing what they are plotting underground.

Some 80 percent of plants are colonized by fungi which form the familiar network of fine white threads that hang off many roots. The threads, called mycorrhizae, take in water and minerals from the soil and hand some over to the plant in exchange for nutrients. Now it seems plants use them to communicate, too.

The original world wide web?

Ren Sen Zeng and colleagues at South China Agricultural University in Guangzhou grew pairs of tomato plants in pots. The team allowed some pairs to form mycorrhizal networks between their roots. Plants connected this way can exchange nutrients and water, staving off the effects of drought. But Zeng wanted to know if the networks had any other function.

The team sprayed one plant in each pair with *Alternaria solani*, a fungus which causes early blight. Sixty-five hours later, they infected the second plant and observed how well it coped.

Plants sharing a mycorrhizal network were less likely to develop the blight, and when they did, symptoms were milder. They were also more likely to activate defensive genes and enzymes.

The first plant was signaling to its neighbor, Zeng says, and he has dubbed mycorrhizae "the internet of plant communities."

Although nobody knows how they pass signals, the networks could be more reliable and efficient than other plant-to-plant signaling systems. These include chemicals released into the air to warn neighbors of impending attacks—which Zeng blocked by encasing the tomato plants in airtight bags. Airborne signals are slow and depend on the weather. Roots can also release chemicals, though these do not travel far.

"The research is a milestone in our understanding of communication between plants," says Suzanne Simard of the University of British Columbia in Vancouver, Canada. She points out that intensively farmed plants don't have mycorrhizae. With access to ample fertilizer and water they do not bother to grow them. As a result, they may be missing out on health benefits.

Together with Dan Durall of the University of British Columbia in Kelowna, Simard has shown that mycorrhizal networks can be enormous. Last year they found a network weaving its way through an entire Canadian forest, with each tree connected to dozens of its neighbors over distances of 30 m (*New Phytologist*, vol 185, p 543).

"It's a very robust system that could allow for the movement of signal proteins over many meters," Durall says. Mycorrhizal networks even tie together plants of different species, which means different species might be able to communicate with each other.

Durall cautions that nobody has looked for Zeng's kind of communication outside the lab. But if the signaling system works as well in the messy real world as it did in the lab, then many plants could well be chatting away beneath our feet.

RESUPINATE FUNGUS OF THE MONTH: The Genus *Coniophora*

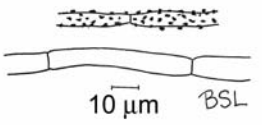
© Brian Luther

B. Luther

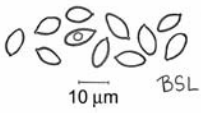
Coniophora olivacea, *BSL coll. # 2010-65-3*

Always resupinate, the genus *Coniophora* is characterized by a smooth or irregularly roughened, ridged, or granular hymenium that varies from pale to sulphur yellow at first, becoming yellowish, yellow-brown, olivaceous-brown, or reddish-brown at maturity. Many have a rhizomorphic, fan-like margin. They are most frequently found on the underside of decaying woody debris of both hardwoods and conifers.

The hyphal system can be monomitic, dimitic, or trimitic. The generative hyphae can be hyaline but are usually yellowish or brownish and mostly without clamps; however, peculiar verticellate (whorled) clamps are sometimes seen on wider hyphae in some species. Hyphal strands (distinct bundles of hyphae forming string-like strands) are often present. Hymenial hyphidia (hyphal ends mixed in with the basidia) are sometimes present, but cystidia are absent, except in one species. The spores vary from ellipsoid, ovoid, and obovoid to rarely navicular-subfusiform; they are yellow to brownish, are usually somewhat thick-walled and smooth, and have a noticeable apiculus and an apical germ pore; they are usually strongly to weakly dextrinoid (turn reddish-brown in Melzer's reagent or IKI) and are cyanophilous (staining blue in Cotton Blue).



Incrusted and non-incrusted hyphae.



Basidiospores.

All species of *Coniophora* are brown rot fungi and decompose the cellulose and hemi-cellulose in wood. They are incapable of breaking down the dark, complex lignin component in wood, and all test negative for the presence of polyphenol oxidase enzymes. (For a brief review of white rot and brown rot caused by fungi, please refer to Luther, 2007.) The genus *Coniophora* has an economic impact on human affairs by causing the decay and destruction of wood and timbers in buildings, boats, and other man-made structures (Mez, 1908; Ginns, 1982; Hansen & Knudsen, 1997). Because of its tendency to grow on untreated wood in dark cellars and basements, it's called Kellerschwamm (cellar fungus) in German (Jahn, 1979). In nature, the genus plays a significant role in forest ecology by causing disease in trees. Eriksson (1958, pp. 14–15 and plates 7–9) discusses "brown cubical butt-rot of *Coniophora*" on spruce in northern Sweden caused by *C. olivacea*, including full page illustrations and photos of the demise of a spruce tree, over time, as witnessed by him.

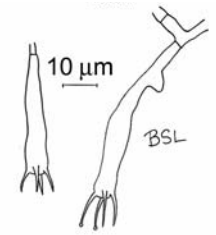
Bourdot & Galzin (1927), Eriksson (1958), Christiansen (1960), Hallenberg (1985), Breitenbach & Kranzlin (1986), Hansen & Knudsen (1997), and Bernicchia & Garjón (2010) discuss several species of *Coniophora* from Europe, some of which also occur in North America. Burt (1917) published a regional treatment of *Coniophora* for North America. The most detailed study of the genus was done by Ginns (1982), whose monograph on *Coniophora* looks at collections from around the world and has excellent descriptions, line drawings, habitat photographs, and photomicrographs. He also did cultural studies. His work is a standard and very useful reference for the genus, and his key covers 15 species. In another publication by Ginns (1998), he says there are nine species of *Coniophora* known from North America. Ginns & Lefebvre (1993) list four species as having been recorded from Washington State: *C. arida* var. arida, *C. fusispora*, *C. olivacea*, and *C. puteana*. Species of *Coniophora* are always fun to find and study and it's not a large genus with an overwhelming number of taxa.

Description of collection

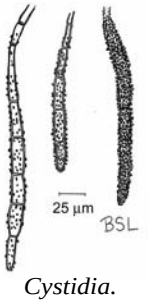
Coniophora olivacea (Pers.: Fr.) Karst.
Brian S. Luther collection #2010-65-3
On conifer wood, Swauk Campground, Hwy. 97, south of Blewett Pass, Wenatchee Mountains, Kittitas Co., WA. Elevation 3,200 ft. June 5, 2010.

Basidiocarp: Resupinate, olivaceous-brown on mature hymenium, progressively paler outward; *surface* somewhat irregular and slightly ridged from underlying hyphal strands; *margin* pallid or creamy and strongly fan-like, fimbriate rhizomorphic; *rhizomorphs* aggregated together and extending a centimeter or more outward beyond the hymenium. Please see my habitat photo.

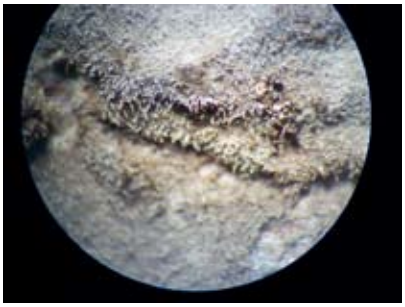
Microstructures: *Hyphal system* monomitic; *hyphae* 3–12 µm wide, hyaline to light yellowish or pale brown, smooth or often with abundant crystalline incrustation, lacking clamp connections (simple septate), often branching; *hyphal strands* conspicuous, up to 90 µm wide or more, composed of tightly adhering, rather short parallel hyaline hyphae up to 7 µm in diameter but having larger, darker central hyphae up to 15 µm wide and long celled. *Basidia* 40–50 × 6–7 µm, narrowly clavate, sometimes centrally constricted, thin-walled, without a basal clamp, showing a tendency to be pleural (forming other basidia by a basal proliferation); *sterigmata* four, unusually long, with up to 8 µm being observed on some basidia. *Basidiospores* 8–10 × 5–6 µm, yellowish-brown, ellipsoid, smooth, slightly thick-walled, dextrinoid, with a prominent apiculus and often appearing slightly truncate distally because of a germ pore. *Cystidia* 150–250 × 9–15 µm, irregularly lanceolate to narrowly clavate, multi-septate, thick-walled up to 1.5 µm or more, light brown, lightly to heavily incrusted with coarse hyaline crystals, cells 20–36 µm in length, lower cells narrow, middle cells widest and again narrowing toward the apex, often slightly constricted at the septa; apex varying from slightly rounded, acute or acuminate; incrustation so heavy on some that it obliterates the ability to observe individual cells. Refer to



Basidia.



Cystidia.


B. Luther

photomicrograph taken at 45× under the dissecting microscope showing the cystidia on the basidiocarp, as well as my line drawings.

Photomicrograph of Coniophora olivacea *showing crystal incrusted cystidia at 45*x.

Comments

This is a fascinating fungus and the only species in the genus with pronounced cystidia, making it easy to identify microscopically. The multi-septate cystidia can have light or very heavy incrustation—this varies quite a bit with different collections and even within a single collection. Also, often only a certain area of the fertile basidiocarp produces the cystidia, perhaps having to do with maturity. That's why it's important to carefully inspect the basidiocarp under a dissecting microscope, looking only for areas to sample that show the cystidia. Specimens could be misidentified as other species of *Coniophora* if slides did not include mature cystidia.

Bourdot & Galzin (1927), Christiansen (1960), Gilbertson (1974), and Lindsey & Gilbertson (1978) treat this species under the genus *Coniophorella*. In their description Bourdot & Galzin (1927) say "boucles rares" (clamps rare). Ginns (1982) states "simple septate, typically with some septa having verticellate clamps on the broader hyphae." Christiansen (1960), and Hansen & Knudsen (1997) both say it has no clamps. My collection featured above is entirely without clamps.

Coniophora puteana is similar in appearance, but has a thicker, felty basidiocarp, larger spores, and no cystidia. *Coniophora arida* has a different colored basidiocarp (light to bright yellowish), larger spores, and no cystidia. *Coniophora prasinoides* has spores the same size as *C. olivacea*, but has only hyaline hyphae, again without any cystidia; otherwise the two are similar in outward appearance. The only other species known in Washington State, *C. fusispora*, is easy to identify because of the large navicular fusiform spores and the lack of cystidia.

DNA studies currently place the genus *Coniophora* in the order Boletales, family Coniophoraceae (Larsson, 2007).

Classification Hierarchy

Kingdom Mycota
Division Basidiomycota
Subdivision Agaricomycotina
Class Agaricomycetes
Order Boletales
Family Coniophoraceae
Genus *Coniophora*
Species *olivacea*

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SOME USEFUL WEBSITES

Marcia Jacob

Boston Myco. Club *Bulletin*, Vol. 65, 1010

I love Michael Kuo's website—http://www.mushroomexpert.com.

It is very well written, in fact, enjoyable. It is not just enumeration of ID criteria; it has a pretty good search capability (e.g., if you know only the species name, it will give you responses) and covers a lot of species. The photos are pretty good, but not so good in showing close-up details.

I also like Tom Volk's idiosyncratic, personal, and informative website—http://botit.botany.wisc.edu/Toms fungi—including his mushroom of the month!

http://www.rogersmushrooms.com/—I appreciate the fact that Roger Phillips has put his whole book on the web.

The website of the British Mycological Society—http://www.fungi4schools.org/—has free resources for teachers (including an entire downloadable children's/young adult's book about fungi).

And then there is http://www.mushroomobserver.org.

cont. on page 8

Useful Websites, *cont. from page 7*

Specialized keys can be found at

http://www.nybg.org/bsci/res/col/colintro.html
Roy Halling's *Collybia* keys

http://www.homepages.hetnet.nl/-idakees/
Coprinus keys

http://pluto.njcc.com/-ret/amanita/
Rod Tuloss' *Amanita* keys

http://blog.mycology.cornell.edu/
Kathie Hodge's great Cornell site—colorful, idiosyncratic, and authoritative

http://www.matchmakermushrooms.com
This is mostly for West Coast mushrooms, but worth looking at because of the way they let you do your own identifications, which is the best ever developed (you put all the mushroom's characteristics into the appropriate blanks, using their hints and prompts, and get an answer). To get there, click on the online version on the website.

PSILOCYBIN-INFUSED CHOCOLATE **T. J. Aulds**

http://galvestondailynews.com/, Feb. 15, 2011

A 19-year-old Friendswood man faces drug charges after police said they found drug-infused chocolate candies they claim the man was selling around town well before Valentine's Day. Kory Allen Long was charged Friday after police searched his house on a search warrant.

Police said they also found drug paraphernalia, 1.2 ounces of hydroponic marijuana contained in baggies, some cash, and scales.

Long was charged with possession of a controlled substance with intent to deliver and was in the Galveston County jail on $20,000 bond.

GRUYERE & MUSHROOM TARTS **Aaron McCargo**

www.foodnetwork.com/

Ingredients

2 Tbs olive oil
1 Tbs minced garlic
¼ cup oyster mushrooms, stemmed and sliced
¼ cup button mushrooms, stemmed and sliced
¼ cup shiitake mushrooms, stemmed and sliced
¼ cup crimini mushrooms, stemmed and sliced
Salt and coarsely ground black pepper
3 Tbs freshly chopped chives
Dash sherry vinegar
3 eggs
1½ cups cream
24 mini prebaked tart shells
½ cup Gruyere, finely grated

Directions

Preheat oven to 325ºF.

In a large sauté pan over medium-high heat, add the oil. Add the garlic and sauté for a few seconds. Add the mushrooms, a pinch of salt and pepper, chives, and sherry vinegar. Cook until softened and slightly crisp, about 3 minutes. Remove the mushroom mixture from the pan and add to a food processor. Pulse a few times to chop finely chop the mushrooms and reserve.

In a large bowl, add eggs, cream, and salt and pepper, to taste. Beat well with a whisk until evenly incorporated.

Line the muffin tins with the tart shells and divide the mushroom mixture among the shells. Cover with the egg custard and top with the cheese. Bake until the custard sets, about 22 minutes. Remove from the oven to a serving tray and serve.

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Center for Urban Horticulture
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Seattle, Washington 98195

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