

SPORE PRINTS

BULLETIN OF THE PUGET SOUND MYCOLOGICAL SOCIETY
Number 475 October 2011



ANNUAL EXHIBIT

Kim Traverse

OK, so you probably knew we were going to have the show again. After 47 years that's pretty predictable. And you probably heard that we would be at a new location. So is there anything I can tell you about the show that you don't already know?

Well, if you have never been to The Mountaineers new facility at Sand Point you will be pleasantly surprised at how spacious and beautiful it is. Starting with the old Navy motor pool they have created one of the nicest meeting spaces in Seattle. It will be a real pleasure to fill their Goodman Auditorium with the wonders of the fungal kingdom and share them with the public.

Britt Bunyard, PhD and Editor-in-Chief/Publisher of *Fungi Magazine*, will be with us again. In his own words, his lectures will be: "Weird weird weird chemistry and physiology of mushrooms. Covers edibility, smells, toxins, bioluminescence, psychedelics, etc....an overview, with pretty pics, animations, and is very fun."

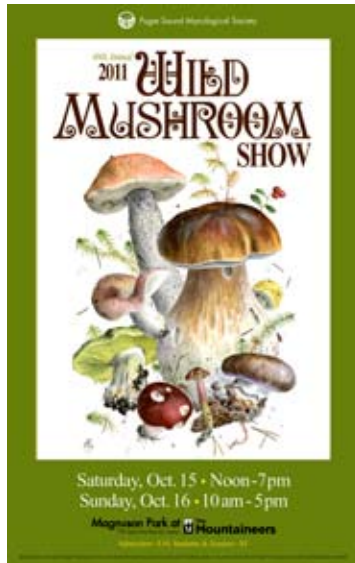
Hard to imagine anything better...BUT WAIT! We will also be having talks by "THE BRAT PACK"

Noah Siegel talked to us last November about the incredibly colorful and unusually closed-up mushrooms of New Zealand, and he will be back with his fellow Brat Packers Erin Page Blanchard and Christian Schwarz to tell us about their adventures as itinerant mycophiles/photographers and how they each, at very young ages and without anyone telling them they should, became fascinated with fungi.

We will also be having a very special guest this year. Artist Alexander Viazmensky, from St. Petersburg, Russia, who created the paintings we've used this year for our posters and pins, will be demonstrating how he brings to life the mushrooms of his fungal portraits.

Most of the rest of the show will be the stuff we always do: Displays of more species of mushrooms than most people realize exist, cooking demonstrations, identification of mushrooms any attendee brings in, mushroom arts/photography/crafts, mushroom book sales, kids activities, lichen displays, a mushroom-themed art contest, educational displays, slide shows, vendors of all things fungal...in other words, one of the most amazing mushroom shows that exists anywhere in the universe is right here in Western Washington.

Saturday and Sunday, October 15 and 16, The Mountaineers, 7700 Sand Point Way—Be there or be hexagonal!



PRESIDENT'S MESSAGE

Marian Maxwell

Our field trips are in full swing, and our 48th annual mushroom show is around the corner. The show is the highlight of the year as well as our major fund raiser. We depend on the money generated at the show to provide the level of support that we give at PSMS. I encourage you as a member to sign up, even for a few hours, to help out. The show is also a great opportunity to learn about mushrooms. Our show chair is Kim Traverse, who can be contacted by e-mail at show@psms.org or by phone at (206) 380-3222. Linda Haba is our volunteer co-coordinator and can be contacted by e-mail at showvolunteer@psms.org. You can sign up to help on our member's page. The following committees could use your help:

Arts & Crafts - Help give breaks to the people selling crafts and art, Sat. or Sun.

Book Sales - Sell books, T-shirts, hats, etc., Sat. or Sun.; clean up Saturday at noon in Tray Arranging area.

Cooking & Tasting - Help as needed in cooking as well as in cleaning and preparing ingredients, Sat. or Sun.

Construction - Friday from 3-9 pm for set-up or Sunday from 5-7 pm for take-down.

Crowd Control & Greeting - Direct people, say hello, Sat. and Sun.

Decoration - Friday night only, 3-7 pm.

Hospitality - Help with refreshments and food for the show workers and bring potluck items, Sat. or Sun.

Kid's Table - Staff feel and sniff table, speak to kids and parents about fungi, Sat. or Sun.

Membership - Help to sign up new members, Sat. and Sun.

Mushroom Collection - Several days prior to the show; deliver mushrooms 3-9 pm Fri. night to receiving area.

Publicity - Now till show.

Ticket Sales - Sell admission tickets, Sat. and Sun.

Tray Arrangement & Display Set-up - Fri. night: shovel sand into trays; Sat. morning from 7:30 am-noon: help arrange mushrooms or carry completed trays.

Willing to help where needed - This is an important one! Friday, Saturday, and Sunday!!

Much of the bonding within our group takes place during our show and during field trips. In addition, I always look to the show as a measure of what our Society means to the public and to our members. The smiles and wonderment when people see the fungi and the excitement generated by our show are electric. Knowing that I have a hand in it always gives me a sense of satisfaction. If you miss helping, you are missing out on experiencing the inner heart of our group.

Questions? Contact me at president@psms.org.



Spore Prints

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PUGET SOUND MYCOLOGICAL SOCIETY

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CALENDAR

Oct. 8	Field Trip (see website)
Oct. 11	Membership Meeting, 7:30 pm, CUH
Oct. 15-16	PSMS Annual Exhibit, The Mountaineers, 7700 Sand Point Way. Saturday, noon-7 pm; Sunday, 9 am-5 pm
Oct. 18	<i>Spore Prints</i> Deadline Board Meeting, 7:30 pm, CUH
Oct. 20-23	Breitenbush Mushroom Conference
Oct. 22	Field Trip (see website)

BOARD NEWS

Denise Banaszewski

We will be holding a raffle for a beautiful, limited edition 2011 print by Jean Emmons, who lives on Vashon Island. The print depicts 12 fungi, and it won the gold medal at the Royal Horticultural Society's Botanical Art Exhibition this year. The raffle winner will be chosen at the end of the December membership meeting. Raffle tickets will be available at the upcoming membership meetings and the Annual Exhibit. We will also purchase three other framed mushroom prints by Jean Emmons, which we will resell at the exhibit. We are planning to hold a Spring Foray at Cispus on the weekend of May 18. The vouchersing group is seeking additional participants for their trips, so please contact Carlos Cruz if you would like to participate. Teddy Basladynski, a board member who is also a website designer, proposed a redesigned version of our website, which the Board previewed and unanimously approved. It's beautiful, and we're very excited about the new look!

MEMBERSHIP MEETING

Tuesday, October 11, 2011 at 7:30 pm at the Center for Urban Horticulture, 3501 NE 41st Street, Seattle.

Our fall series of speakers continues with the dynamic duo of Daniel Winkler and Larry Evans. They will speak on The Fungi of Amazonia, sharing their photos, travel stories, and encounters with the exotic and often spectacular mushrooms of Bolivia and Ecuador.

PSMS member *Daniel Winkler* is a popular lecturer at mushroom forays and gatherings and is a frequent speaker at PSMS, where he has enlightened and entertained us with accounts of his journeys to far-flung places. He was raised in Munich, Germany, and started hunting mushrooms as soon as he could keep up with his family in the forests. He has studied geography, botany, and ecology and worked on environmental issues in the Himalayas and Tibet as a researcher and consultant. Daniel moved to Seattle in 1996. He has recently focused his research on the medicinal and edible mushrooms of Tibet, particularly on the genus *Cordyceps*, Ascomycete fungi that are parasitic on insects. He has published on forest ecology, forestry, land use, and medicinal plants and fungi. His most recent publication is *A Field Guide to Mushrooms of the Pacific Northwest*. An expert on wild edible mushrooms on three continents, Daniel organizes mushroom expeditions to both local and exotic destinations (see <http://mushrooming.com>).



Larry Evans is probably the original Fun Guy. He is the founder and fearless leader of the Western Montana Mycological Association, is a fixture at the Telluride Mushroom Festival, and edits the *Fungal Jungle* newsletter. He writes for *Fungi* magazine, is a contributing editor for *Mushroom: the Journal of Wild Mushrooming*, and appeared in the movie "Know Your Mushrooms." His CDs *Fungal Boogie* and *Fungal Boogieman* feature songs about fungi, edible and otherwise, written and sung (some by Larry) in a range of musical styles that include blues, calypso, polka, and rockabilly. You can listen to them on <http://www.fungaljungal.org/music.htm>. Larry earned his bachelor's degree in Botany with a minor in Microbiology from the University of Montana. He has been collecting mushrooms and teaching about them since 1980 and is currently working on a guide to the mushrooms of Bolivia.



Would members with last names beginning with the letters A-K please bring a plate of refreshments for the social hour.



Field Guide to Edible Mushrooms of the Pacific Northwest

by Daniel Winkler

Convenient, lightweight, pocket-sized, laminated field guide containing 43 edible and 8 poisonous mushrooms common in the Pacific Northwest. All mushrooms are depicted with sharp, full-color photos and descriptions. Furthermore, habitat, fruiting season, edibility and difficulty of identification are indicated. Available from the author, at PSMS meetings, and on the web from www.MushRoaming.com.

THE POWERFUL SHAGGY MANE Nick Iadanza *MushRumors, Ore. Myco. Soc., Sept./Oct. 2011*

One of the first edible mushrooms I collected, and still one of my favorites, is the shaggy mane, *Coprinus comatus*. I picked my first batch on the recommendation of one my graduate school professors, prepared a chicken-mushroom dish in a white wine sauce, and promptly got sick. The discomfort turned out to be a first-exposure event, and I've enjoyed them ever since with no problems.



Something I find fascinating about this fragile mushroom is its ability to force its way up through pavement. I've observed chunks of asphalt displaced by shaggy manes, and people occasionally send us photos of this seemingly impossible event. The force exerted by mushrooms was noted in the 19th century, with reports of pavement and hearthstones (one weighing 83 lb) being lifted by mushrooms. A report in the *Bulletin of the Torrey Botanical Club*, October 1882, 9(10): 129–30, describes the floor of the grain elevator, composed of a 1 foot thick layer of asphalt, with 6 inches of tar and gravel underneath, developing a bulge that eventually burst open, revealing a "perfectly formed toadstool."

This phenomenon has been explained in some detail (*New Scientist*, 1995; *Spores Illustrated*, Winter 2002), and the basic concept is that the mushrooms function as vertical hydraulic jacks. The upward pressure comes from the turgor pressure (pressure exerted by water inside the cell against the cell wall) of the individual cells making up the wall of the stalk. Each cell has a helical arrangement of chitin fibers as a major structural component and grows as a vertical column by inserting new cell-wall material along its length. Chitin is an exceptionally strong bio-polymer, making the cell wall like a carbon fiber composite, and gives significant lateral strength to the fungal cell wall, so that internal pressure is confined as a vertical column. The cells gradually absorb water and expand, and the resulting turgor pressure provides a powerful mechanical force that allows the mushroom to push upward.

The mycologist A.H.R Buller (1874–1944) describes measuring the lifting power of mushrooms in his *Researches on Fungi*. He placed weights on a *Coprinus* sp. growing in a glass tube and measured an upward pressure of approximately 9.9 lb/in² (balance a 10 lb weight only in the center of your palm to get a sense of this). A report in *Science* (Sept. 17, 1999; 285:1896–99) calculated the drilling force of the hyphae of an invasive cereal pathogen as 54.4 kg/cm² (773 lbs/in²). This has been described as perhaps 50 times more force than an adult elephant can exert with its foot.

So, the next time you hold one of these seemingly fragile shaggy manes in your hand, and watch it deliquesce into a black goo, be aware of its hidden power.

SCORES IN ENGLAND POISONED BY WILD MUSHROOMS

Stephen Adams
The Telegraph, Sept. 16, 2011

Scores of people have been poisoned by eating wild mushrooms this autumn, the Health Protection Agency (HPA) has warned.

So far 129 people have received advice or treatment for mushroom poisoning from the National Poisons Information Service, including 45 for moderate or severe symptoms. Most cases involve children eating wild mushrooms—which can be deadly—believing

them to be as benign as the cultivated varieties. However, almost 40 have involved adults deliberately eating them.

Different species of wild mushroom can be very hard to distinguish, meaning it is possible to mistake a toxic variety for an edible one.

Dr. John Thompson, director of the NPIS, said: "While many mushrooms growing in the wild are delicious and safe to eat, it is not always easy, even for people with experience, to differentiate between toxic and non-toxic species.

"The NPIS therefore advises that people should not eat mushrooms collected in the wild unless they are familiar with the various species that grow in the UK and are sure that the mushrooms they have collected are safe to eat."

WANTED: Small, Blue, Terrestrial Polypore

Neoalbatrellus caeruleoporus

Brian Luther

I'm looking for any fresh collections of the **western form** of *Neoalbatrellus caeruleoporus*, formerly known as *Albatrellus caeruleoporus*, that you might find on field trips, at forays, or out collecting on your own. Any collections from Washington, Oregon, California, British Columbia, or other western locations would be appreciated.

Neoalbatrellus caeruleoporus is a rather small terrestrial polypore and is unique by being completely blue or blue gray, including the pores, when fresh. The fruiting body takes on ochraceous or orangish colors at maturity, mixed with the blue or blue gray. It has the same color as the caps of *Albatrellopsis flettii* (formerly *Albatrellus flettii*) but that species is much larger and has white pores. Refer to the following website for a good color photo: <http://www.rogersmushrooms.com/gallery/DisplayBlock-bid-5512.asp>.

If you think you've found a collection, please take careful notes on its location and let me know right away at a2zluther@comcast.net or (206) 522-1051. Sending me a digital photo (also showing the pores) would be a good confirmation. After confirming that you've found a collection, I'll pay you for expedited delivery and will give you instructions on how to package it and where to send it.

BOLIVIA MUSHROOM TOUR:

Jan. 20–Feb. 2, 2012

Daniel Winkler



D. Winkler

Lentinellus crinitus

After last February's awesome tour in Ecuador, Larry Evans and I will be teaming up again for an eco-tour exploring Bolivia's rich biodiversity and especially its mushrooms. Montana mushroom guru Larry Evans is an expert on Amazonian fungi and a star of the fungal cult movie "Know your Mushrooms." I am the founder and leader of the Mush-Roaming exotic mushroom tours. We will meet in La Paz, explore the city and the high altitude environment for a few days, and then slowly travel down the Andes to the cloud forest Yungas. Down in the Amazon rain forest we will travel half a day by canoe up the Beni River to an eco-lodge where will stay for 5 days surrounded by stunning pristine Amazon Rain Forest to explore the local fungi, flora, and fauna. Here we will have additional knowledgeable local guides assisting Larry and me. More details on www.MushRoaming.com.



Cookeina tricholoma

D. Winkler

RESUPINATE FUNGUS OF THE MONTH:
The genus *Peniophora* and the *P. incarnata*
group © Brian Luther



B. Luther

Peniophora incarnata

The genus *Peniophora* has fruiting bodies that are always resupinate and more often than not, perennial, very tough, and able to withstand harsh and arid conditions. The margin can be strongly adherent to the substrate or loose and slightly free. Basidiocarp color varies with species—some are bright yellow, orange, red, or pinkish; others are gray, bluish-gray, violaceous gray, or brownish. The hyphal system is monomitic, the hyphae can be hyaline or brownish, and clamps are frequently, but not always, seen on the hyphae and basidia, depending on the species. Dendrohyphidia (irregularly or strongly branched hyphal ends) are present in some species. Generally two distinct types of cystidia are found: 1. Metuloids or lamprocystidia, which are pointed or rounded, thick-walled, and heavily incrustated with crystals and 2. Gloeocystidia (pronounced “glee-o-cystidia”), which are often long and thin-walled, have granular or globular inclusions in the cytoplasm, and stain very dark, almost black, in sulfo-benzaldehyde* and related reagents. Some species may lack one or the other of these cystidia. Usually, fresh collections give a reddish spore print. The spores are hyaline, smooth, inamyloid, and often allantoid (=sausage shaped), or ellipsoid. Species of *Peniophora* are frequently found on branches and limbs; some are found only on bark, and others are always (or mostly) found on decorticated (barkless) wood of both conifers and hardwoods. Fairly common, species of *Peniophora* are widespread.

My feature fungus, *Peniophora incarnata*, is truly beautiful, and the brilliant orange color places it in a rather select grouping of

*Also called sulphuric benzaldehyde, or S, sulfo-benzaldehyde is a combination of concentrated sulphuric acid, water, and benzaldehyde. Only trained and experienced mycologists should attempt making mounts out of this extremely corrosive reagent. Sulfo-vanillin and sulfo-formalin (sulphuric formaldehyde) are two other acidified reagents that result in the same reaction. Hydrochloric acid (HCl) can, in many cases, be substituted for sulphuric acid and is not as damaging to fungal tissue. Several different formulations for these reagents are given by Lange & Hora (1963), Singer (1975), Largent, Johnson & Watling (1977), Moser (1978), Breitenbach & Kranzlin (1986), and Hjortstam, Larsson & Ryvarden (1987). I need to point out here that not all gloeocystidia react positively with these reagents and turn dark. If they do have a positive reaction then they are called *sulfocystidia* (Bernicchia & Gorjón, 2010), usually abbreviated as S+, SA+ or SV+ in mycological descriptions. There is also a safer alternative stain for demonstrating gloeocystidia, but it's not widely known or frequently used in mycology labs: Brilliant Cresyl Blue.

species in the genus. Although it's easy to identify this small group in the *Peniophora* subgenus *Gloeopeniophora* (Eriksson et al., 1978) because of the bright colors, all definitive characteristics are microscopic and require ultra-thin sections, various mounting media, and reagents as well as modern keys for positive identification.

The specimen reported on here was found during my collecting on Cypress Island (San Juan Island archipelago) and is the second species from that research that I've featured in an article.

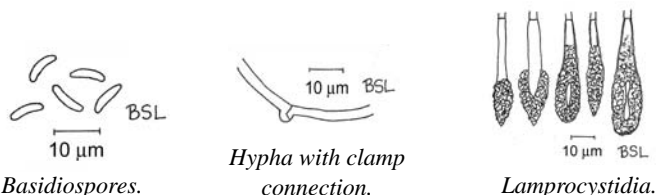
Description of Collection

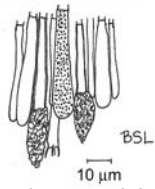
Peniophora incarnata (Fr.) Karst.
 Brian S. Luther coll. # 2011-48-14

On very hard, decorticated branches of Madrone (*Arbutus menziesii*) lying in and on deep conifer duff in mixed Madrone, Douglas Fir (*Pseudotsuga menziesii*) woods. Off of the main old logging road going from Secret Harbor to Cypress Lake, east of Strawberry Bay, Cypress Island, Skagit Co., WA., approx. 500 ft. above sea level. April 8, 2011.

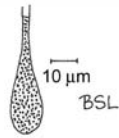
Basidiocarp: Fully resupinate, covering several square inches and spreading over the long axis on the underside of the branch, adnate and tightly adhering to the substrate and very difficult to remove, very firmly ceraceous (waxy), up to 0.2 to 0.25 mm thick in section, smooth but with a light frosting as viewed under the highest power of the dissecting microscope due to crystalline incrustation of the lamprocystidia; “Light Orange Yellow,” “Orange Buff,” “Deep Chrome” to “Capucine Yellow” when fresh, drying “Xanthene Orange” to “Mars Yellow”; margin abrupt, concolorous or only slightly paler, but wood adjacent to the margin may display a distinct narrow dark zone in some areas. Colors in quotes are from Ridgway (1912). Please see color habitat photo in on-line version of *Spore Prints*.

Microstructures: *Hyphal system* monomitic; hymenial and subhymenial hyphae 2–4 µm wide, closely appressed, often slightly contorted, thin-walled, hyaline with clamps on only some of the septa, but these are difficult to observe; contextual and subicular hyphae often agglutinated into a solid mass making it difficult to distinguish individual hyphae, hyaline, thick-walled up to 3 µm; *cystidia* of two kinds: *lamprocystidia* variable, 37–60 × 13–15 (18) µm, conical to rounded, becoming heavily crystal incrustated on the upper half at maturity, hyaline or lightly colored, thick-walled up to 3 µm or more, sometimes with only a very narrow lumen, imbedded in the context or equal with the basidia or also projecting beyond the basidia; *gloeocystidia* also variable, 35–60 × 7–13 µm, broadly clavate at first, becoming narrowly clavate at maturity; many are apically rounded, but can also be mucronate or acuminate, thin-walled, with granular contents in the cytoplasm, reacting positively (S+) and darkening with sulfo-benzaldehyde, blue when mounted in an aqueous saline solution of Brilliant Cresyl Blue. *Basidia* 30–36 × 4–6 µm, narrowly clavate to sub-cylindrical, thin-walled, hyaline and basal clamp connections not seen, but this is very difficult to observe; sterigmata four, up to 5 µm long, usually straight or hardly spreading; *Basidiospores* 7.5–9 × 2.5–3.5 µm, allantoid, thin-walled, smooth and inamyloid. Refer to photomicrograph and line drawings.

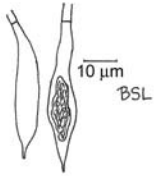




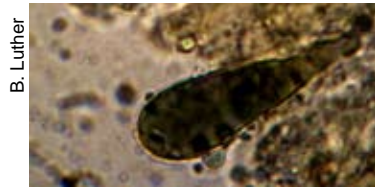
Hymenial view with basidia, lamprocystidia, and gloeocystidia.



Gloeocystidium with granular contents in 3% NH₄OH and Phloxine.



Mucronate and acuminate gloeocystidial-like cells.



Peniophora incarnata gloeocystidium stained dark in sulfobenzaldehyde, 1000 ×.

Comments

My collection differs from typical material by having infrequent to rare clamps (or at least difficult to see) and possessing a very dense basal layer of hyphae more often seen in *P. aurantiaca*. However, all other diagnostic characters are typical for *P. incarnata*. Considerable variation is seen in this species in terms of the abundance, shape, and dimensions of both kinds of cystidia, as noted by Eriksson (1950). His illustration (Fig. 1., p. 12) shows both the rounded apex and pointed gloeocystidia that are so common in the collection reported on here.

North American collections of this species were studied in detail by Burt (1925) and Slysh (1960), and they both found the basidiospores to be smaller and narrower than European material. They give the spore dimensions as “6–10 × 3–4½ µ” and “7–10 × 2.5–4 µ” respectively. These ranges match perfectly with my collection. European specimens have spores that average 8–12 × 3.5–5 µm, just slightly longer and wider, but with all other characteristics consistent with the species.

This species is very much cosmopolitan in distribution, occurring almost exclusively on hardwoods, rarely conifers. Burt (1925) studied seven different collections of *P. incarnata* just from Washington State, all found near Bingen in Klickitat Co., by the well known early collector W. N. Suksdorf.

Beautiful color plates of this species can be found in the works by Jahn (1979, p. 85), Breitenbach & Kranzlin (1986, p. 147), and Bernicchia & Gorjón (2010, p. 873).

Other Species in *Peniophora*

Peniophora incarnata is similar in outward appearance to several other brightly colored species. *P. laeta* is yellowish to reddish to orangish, has hyphal pegs (slight basidiocarp projections with bundles of vertically aligned hyphae), and has distinctive, longer and narrower spores. *P. aurantiaca* has enormous ellipsoid spores along with clamp connections on the hyphae. *P. carnea* is “ochraceous flesh color” (Burt, 1925) with larger spores. *P. carnosa* is yellow, not orange, has smaller spores and is found on conifer wood. *P. erikssonii* has very large ellipsoid spores, but lacks clamps and is found only on Alder (*Alnus* sp.). *P. laurentii* has a more reddish-orange basidiocarp, larger spores, and no clamps. Except for the presence or absence of clamps, *P. aurantiaca* and *P. erikssonii* are virtually indistinguishable. Nakasone (1990) did cultural studies on four of these species and found no differences in the cultures

of *P. aurantiaca* and *P. erikssonii*, with the only reliable character for their separation being the presence or absence of clamps. She also found that only *P. incarnata* produced gloeocystidia in culture whereas *P. aurantiaca*, *P. laeta*, and *P. erikssonii* did not.

Early studies of the genus by Burt (1925), Bourdot & Galzin (1927), and Slysh (1960) treat the genus in a very broad sense and include species which are now scattered in numerous, unrelated genera. More modern studies that treat the genus as currently circumscribed are described by Eriksson (1950), Christiansen (1960), Eriksson et al. (1978), Boidin (1994), Julich & Stalpers (1980), Hansen & Knudsen (1997), Andreasen & Hallenberg (2009), and Bernicchia & Gorjón (2010).

Ginns & Lefebvre (1993) list 35 species in the genus from North America, and Ginns (1998) says there are 36. The following eight species are recorded from Washington State by Ginns & Lefebvre (1993): *P. aurantiaca*, *P. carnea*, *P. cinerea*, *P. decorticans*, *P. erikssonii*, *P. incarnata*, *P. nuda*, and *P. polygonia*.

Recent DNA studies seem to indicate that the genus is mostly monophyletic (derived from a common ancestor) and according to Larsson (2007) belongs in the order Russulales, Family Peniophoraceae. The genus *Peniophora* is unusual for the order Russulales by lacking any amyloid reaction for the spores, as pointed out by Larsson & Larsson (2003).

Related genera in the family Peniophoraceae are *Dendrophora*, which has brown dendrohyphidia, and *Duportella*, which has a dimitic hyphal system and brown pseudocystidia (Bernicchia & Gorjón, 2010).

Classification Hierarchy

- Kingdom Mycota
- Division Basidiomycota
- Subdivision Agaricomycotina
- Class Agaricomycetes
- Subclass Agaricomycetidae
- Order Russulales
- Family Peniophoraceae
- Genus *Peniophora*
- Species *incarnata*

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Resupinate, cont. from page 5

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SCOTS PUPILS FIND RARE TRUFFLES GROWING IN THE SCHOOL VEGETABLE PATCH

<http://news.stv.tv/>, Sept. 19, 2011

A group of students at Moncrieff Primary School have found what is thought to be the first edible white truffles growing in the UK.

As the youngsters weeded out their vegetable patch at the school last week, pupil Jason McMillan stumbled across the truffle, which is the size of a golf ball, and initially thought it was a potato.

Jane Savage, a teacher at the primary, said: “The children are very excited.

“It’s quite hard for them to understand because the only truffle they’ve ever heard of is a chocolate truffle, so we had to have an assembly and show them what a truffle looked like and explain what a truffle was and how it was a kind of fungi—but still they wish we’d found chocolate truffles.”

At least ten other truffles are still growing at the school, and it is hoped it will be turned into truffle oil to raise funds for a new kitchen at the school where the pupils can learn to cook what they’ve grown.

Graeme Pallister, head chef at the 63 Tay Street restaurant in Perth, who is mentoring the pupils in growing and cooking their own vegetables, said: “It’s a white truffle, a variety called *Tuber maculatum*. It’s not the best of the class of white truffle but it’s still used in cooking and we have had it identified as a proper truffle which is very important.

“We need the extra funds to put towards the kitchen and here they have found an absolute treasure, an absolute peach so yeah it’s good for them. They had the savvy to say ‘what’s this?’ because the smell was so pungent from it, it’s lucky they did and not just throw it away.”



Tuber maculatum found by pupils in Scotland.

CATALOGING NEWLY DISCOVERED SPECIES LAGS: DR. WATLING’S VERY OWN MUSHROOM

Gautam Naik

The Wall Street Journal, Sept. 7, 2011

DAWYCK, Scotland - On a recent ramble through the Scottish woods, Dr. Roy Watling fingered a dull yellow mushroom and said proudly: “Do you know whose fungus that is? It’s mine.”

The mushroom, *Boletus porosporus*, isn’t especially rare, isn’t poisonous, and, Watling says, “It has a taste like old socks.”



Dr. Roy Watling, British Botanic Garden Edinburgh.

He knows what he is talking about: He discovered and officially named the species more than four decades ago. After a lifetime spent rummaging in the woods, Watling, 74 years old, has discovered and classified more than 50 fungus species around the world. But now, like some of the toadstools he studies, Dr. Watling is part of a vanishing breed.

“I wouldn’t say there’s a shortage of mycological taxonomists in the U.K.,” says Watling, formerly of the Royal Botanic Garden in Edinburgh. “There ain’t any.”

Who wants to spend his life rooting around dusty museum drawers and delving into field identification manuals in order to meticulously classify bugs and toadstools? A precious few.

Founded in 1758 by Swede Carl Linnaeus, taxonomy was long a flourishing science. Even today, it underpins the study of biodiversity, evolution, and animal conservation.

But Britain doesn't have enough taxonomists to help it catalog lichens, fungi, and insects. In the U.S. and elsewhere a similar shortage exists for specialists of certain types of black flies, beetles, nematodes, mites, spiders, centipedes, millipedes, clams, and parasitic wasps.

Fewer students are choosing the discipline, preferring more glitzy and modern fields such as molecular biology. Simultaneously, the grand old men and women of taxonomy are in or approaching their retirement.

"There's a false impression that taxonomy is old-fashioned, like stamp collecting," says Dr. Quentin Wheeler of Arizona State University, an expert in slime-mold and fungus-feeding beetles. "But to me there's no greater thrill than being the first human being to knowingly lay eyes on a new life form in the solar system."

Wheeler, whose doctorate is in entomology, has tried to convince others of the allure. In 2005, he and a colleague named three new species of beetle after President George W. Bush and two members of his administration: *Agathidium bushi*, *A. cheneyi*, and *A. rumsfeldi*.

To Wheeler's surprise, President Bush called him. "He said he was honored," recalls Dr. Wheeler, who has also named beetles after Roy Orbison, the late singer-songwriter, and Stephen Colbert, of Comedy Central fame.

It's a time-honored practice; taxonomists, after all, can have fun, too. There's a spider called *Apopyllus now*, and a small, furry fly known as *Pieza kake*. A snail species has been called *turbo*.

Taxonomy, nonetheless, hasn't managed to shake off its fusty reputation. Today, there isn't a single lichen taxonomist at British universities, according to the British Lichen Society. A recent House of Lords report similarly noted a "clear decline" in insect taxonomists.

CABI International, a U.K. nonprofit group that helps countries fight agricultural pests and diseases, employed a dozen formally trained taxonomists in the 1980s. Today, the demand for taxonomic services is greater, but CABI employs just two such specialists.

Watling, who wears hearing aids in both ears, belongs to a dwindling generation of obsessed taxonomists.

Three mushroom species bear his name, including the rare *Ramaria watlingii*. He has been described as "a fun guy." His wife gave him a sweater printed with the words: "Mycology—a good walk spoiled."

"Once you get fungi under your skin, you can't let it go," says Watling, who is now training amateurs to do the mushroom-spotting job that professional scientists used to do.

On a recent walk in the woods here, Watling and three colleagues collected several mushroom specimens and took them back to a lab at the Edinburgh Botanic Garden.

They inspected the features of each specimen under a microscope. Those details were then laboriously checked against illustrations in a thick field identification manual.

"It is hard work," said Watling. "After a day of this, I'm knackered."

A nearby closet was stacked with boxes of unidentified mushroom species collected in New Guinea, Burma, and Nigeria, among other places. Hundreds of other specimens were stored in an adjoining room. Many have yet to be inspected.

The problem isn't restricted to fungi. From microbes to mollusks to marine algae, thousands of organisms are discovered each year. Yet there are fewer taxonomists to say what they are—and where on the tree of life they fit. One recent study estimated that 40 percent of no-name plants are currently being stored in museums around the world.

"If you want to conserve things, how... can you do that if you don't accurately describe what they are?" says Watling. "We believe we know only 15% to 20% of all the fungi out there, so there's a lot of work to do."

About 1.2 million species of living things have been cataloged so far, according to one estimate. A recent study suggests that another 7.5 million have yet to be identified. Scientists are racing to tabulate new species—even as many become extinct.

Knowledge about individual species can be useful. When Nicholas Evans, author of "The Horse Whisperer," fell dangerously ill after picking and then eating some mystery mushrooms in 2008, British doctors sent the contents of the author's stomach to Watling.

He immediately identified the fungal culprit as the highly toxic species *Cortinarius rubellus*, or the Deadly Webcap, and advised doctors on how to treat Evans. The author had to go on dialysis and later had a kidney transplant. Watling says he is frequently called on for help in mushroom-poisoning incidents.

Watling has had other indirect encounters with celebrity. A few years ago, when real-estate tycoon and reality-TV star Donald Trump announced plans to build a new golf resort on the sand dunes of Scotland, Watling was one of many local residents who tried—and eventually failed—to scuttle the plan.

He was worried about the mushrooms. "We've got enough bloody golf courses in Scotland," says Watling. "But we know so little about the fungi that live among the sand dunes."

BOOK REVIEW

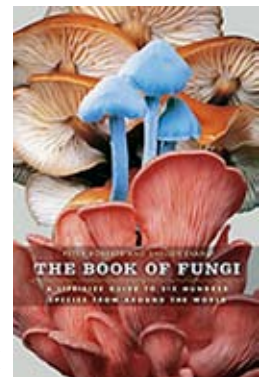
Ron Post

The Book of Fungi
(University of Chicago Press, 2011)
by Peter Roberts and Shelley Evans

The best feature of this immense pictorial of the world's fungi is its simplicity, with location maps and useful tidbits of information on every page and actual-size photos rivaling any you've seen in other books. One of the real joys for me (besides scientific accuracy and great color rendition) is the 100-page section on "brackets, crusts and jelly fungi." I know that Joy Spurr, a late member of our society, would also have enjoyed it.

You might believe that a geographic bias of two eminent British scientists would show through in the text. Yet these two authors always seem to link in interesting ways the many similar European and North American species. Even species that grow in Eastern North America versus the West are noted appropriately, and the known relation between European and North American species is usually addressed.

I found all the British common names somehow quaint and not disconcerting at all. Perhaps we'll all be calling our hothouse mush-



cont. on page 8

Book Review, cont. from page 7

rooms (*Leucocoprinus birnbaumii* aka *Lepiota lutea*) by the name Plantpot Dapperling, and hereafter our Russulas will be known as Brittlegills. (One of the rare confusing terms I encountered occurs in the description of *Leccinum holopus* as edible but tasteless and “pappy,” meaning mushy. Is this, too, a Britishism?)

Other local quibbles can be found. My search for a photo of our common, pink-spored *Pluteus* that grows from wood turned up *P. atromarginatus*. In my experience in the Northwest, *P. cervinus* is much more common. Maybe I’m just out of date! Anyway, I found that *cervinus* does get a mention in the text, if not a photograph. As with most mushroom books, one must be aware that searching a general reference requires some familiarity with the names of mushrooms and their look-alikes, local and faraway, past and present.

However, one needn’t read far to find information about the important macroscopic differences between similar species in this book. (Some readers will be relieved that microscopic characteristics are all but dispensed with.) The authors also decline to promote strange color definitions such as “yellowish-buff,” sticking to much simpler descriptions. I wasn’t left scratching my head trying to imagine what “vinaceous-brown” might look like since much easier terms such as “reddish,” or simply “yellow-orange” or “gray-brown” are most often encountered in the short descriptions with the photos.

Of course, one must take note of the fact that 600 species are included in this book and many of them vary in color! *The Book of Fungi* is not meant to be a field guide (as it weighs about two kilograms.) No identification key is provided, although an introductory guide using physiological types is very helpful, especially if you are used to seeing these types at our annual exhibit! On the whole, I would have to present this book as a “must-read.” Its price tag (I found copies from \$35–\$55 depending on condition) should be no barrier since the overall excellence makes it stand out as one of the foremost mushroom books in the English language.

FUNGI FRAUDSTERS’ MOST BIZARRE TRICKS REVEALED

Austrian Independent, Aug. 25, 2011

A member of a special mountain authority unit set up to crack down on overeager mushroom pickers has revealed the often obscure actions offenders use to flout restrictions.

Bylaws specify people must not collect more than two kilograms per person each day in the southern province of Carinthia. The region installed a group of mountain rescue members called SoKo Schwammerl (Mushroom) in 2007 to fight the rampant clearing out of woods.

Carinthian mountain rescue chief Johannes Leitner told the *Salzburger Nachrichten* newspaper some people were using cars registered in other countries than in their homeland to get their loot over the border. He also disclosed SoKo Schwammerl officials dealt with cases in which people put special tracking devices on mushrooms hidden in holed-out trees before their accomplices came to pick them up.

Police and mountain rescue authorities checked 600 cars on the A2 southern motorway for too-large amounts of fungi at the weekend. Around 100 kg were confiscated, Leitner explained. One Italian was found trying to transport 15 kg of mushrooms in his car to his homeland.

Leitner dismissed the widely held assumption that shoals of Italians were ransacking Austrian forests for mushrooms. “The number of Austrian offenders is on the rise,” he said speaking to the *Salzburger Nachrichten*. However, the local mountain rescue authority said in October 2010 that 96 percent of all offenders caught that summer—when 350 kg of mushrooms were seized—were Italians.

People ignoring regional limits on the amount of collected mushrooms face fines of up to 3,630 Euros. Mushroom pickers who are found guilty of repeated offences must brace for fines twice this sum. However, most lawbreakers are reportedly only reprimanded or fined significantly lower sums.



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