

SPORE PRINTS

BULLETIN OF THE PUGET SOUND MYCOLOGICAL SOCIETY
Number 468 January 2011



PRESIDENT'S MESSAGE

Marian Maxwell

As we conclude 2010 and start 2011, I am pausing to reflect on what makes this society so amazing! You are all part of a great group that is an asset to the community as well as to each other as members. I am continually amazed at the level of volunteer participation and the desire to learn more about fungi as well as the bonding that takes place over a shared interest. I think one of the most fascinating aspects and strengths in our group is the mix of cultures within our organization and being able to share personal experiences in the pursuit of our common interest.



From seasoned members and hunters to those who have only just joined our club, the wonder of fungi and the impact that it has had on all of our lives are astounding. It is always touching when we can watch someone new develop the passion that we have found. In many ways this renews that wonder in all of us!

In the coming year, we will continue to reach out to the public. We have many speaking engagements and projects planned, and we will be changing our website to include some additional educational components and an online payment option. We will be incorporating some exciting changes that will be announced in the coming months.

We are particularly interested in tying in more with and contributing to the Burke Herbarium under the guidance of Dr. Ammirati at the University of Washington. This month we will be participating in the Hamilton Middle School Science Fair. We have been invited to participate in the Mother Earth News Fair in Puyallup June 4–5 of this coming year. We will also participate in the Mushroom Festival in Lacey in July. Other possibilities this coming year include more Arboretum Bioblitzes and more school outreaches. And, of course, we will continue our successful identification clinics at the Center for Urban Horticulture during the mushroom seasons. If this excites you, too, and you want to be a part of the action, please contact me, one of our board members, or one of the committee chairs to be part of these exciting opportunities. You can e-mail me at president@psms.org or give me a call at 425-235-8557. I would love to hear from you!

PHOTOGRAPHING MUSHROOMS: CAMERAS, LENSES, TRIPODS, AND OTHER ESSENTIALS

Ian Adms

The Mushroom Log, Ohio Mushroom Soc., Jan./Feb. 2010

Wild mushrooms display an amazing variety of shapes, textures, and colors, which make them excellent subjects for close-up photography. Mushrooms are also one of nature's most cooperative subjects, for fungi don't fly away, bite, sting, or wave in a breeze. If you want to practice your macro photography skills, mushrooms are an excellent place to start.

Although you can take snapshots of mushrooms with a hand-held point-and-shoot (P&S) digital camera, you will get much better results using a single-lens-reflex (SLR) digital camera, supported by a sturdy tripod. Most point-and-shoot cameras don't have a usable viewfinder, and trying to compose a photograph of a group of mushrooms holding the P&S camera in front of your face while sprawled on your stomach in the woods is an exercise in frustration. Most P&S cameras also lack manual focusing, which is often needed for precise control of depth-of-field. Unless you plan to make mural size color prints from your mushroom photographs, a digital SLR camera with a 10 megapixel sensor will provide ample resolution for mushroom photography.



Many digital cameras provide a bewildering array of operational features, menu settings, and other controls, but for mushroom photography the following camera settings are the most important:

1. Use the "native" ISO sensitivity of the camera (usually 100 or 200) for the best image quality, unless you are hand holding the camera, when ISO 400, or even ISO 800 or more with some of the latest digital SLR cameras, will allow the use of faster shutter speeds;
2. Set the "white balance" to "automatic" and fine-tune the color of your mushroom photographs on your computer at home, using Photoshop or another image editor;
3. Set the camera's program mode to aperture-preferred (A), which allows you to vary the f/stop setting to control depth-of-field in your mushroom photographs;
4. Set the "color space" to "Adobe RGB" if your camera provides this option, which provides a wider color gamut than sRGB, which is the default color space setting on most digital cameras;
5. Use the multi-segment (or "matrix") metering option for exposure measurement, which is usually the default method on most digital cameras;
6. For the highest quality results, set the image size to the maximum number of pixels that the camera can record, and use "raw" file mode, or the highest quality JPEG setting available;

For mushroom portraits and intimate close-ups of groups of mushrooms, you will need to focus closer than most standard SLR lenses allow. For example, the closest focus distance for both the Nikon and Canon zoom lenses is around 5 feet, which isn't close enough to get frame-filling photos of small mushrooms. The Canon 17–85 mm and Nikon 18–70 mm zoom lenses will focus closer, to just over 1 foot, but this still isn't close enough for portraits of tiny mushrooms. To get these lenses to focus closer, you'll need to invest in some close-up lenses or extension tubes. Close-up lenses screw onto the end of the lens like a filter, while extension tubes are mounted between the camera body and the lens.

Nikon no longer offers the excellent 52 mm 3T and 4T and the 62 mm 5T and 6T close-up filters, though you may be able to

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PUGET SOUND MYCOLOGICAL SOCIETY

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MEMBERSHIP MEETING

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

We are delighted to welcome back, after a decade-long absence, PSMS member Dr. Denis Benjamin, who will speak on "Mushroom Poisoning in 2011; Update on an Expanding Spectrum." His presentation will touch on who gets poisoned and why, mushroom "poisoning" not due to toxins, newly described syndromes, and an update on new treatments for *Amanita* poisoning.



Denis grew up in South Africa and migrated to the Pacific Northwest in 1970. He became interested in mycology soon after his arrival in the United States and joined PSMS. He practiced pediatric pathology at children's hospitals in Seattle and Fort Worth, Texas, and has recently returned to the east slopes of the Cascades in Washington State to continue his passion for mushrooms, the outdoors, and natural history. He was a consultant to the regional poison control center, a former member of the Board of Trustees of PSMS, and a past chairman of the toxicology committee of NAMA. He frequently speaks at mushroom forays and to clubs and societies. In addition to his nearly 100 professional publications, he also contributes to the lay literature and mushroom magazines. He was chosen as a community Op/Ed writer for the Fort Worth *Star Telegram* and is author of the landmark book *Mushrooms: Poisons and Panaceas* on the health effects of mushrooms. He recently published a personal collection of mushroom foraging essays, *Musings of a Mushroom Hunter: a Natural History of Foraging*.

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

CALENDAR

- Jan. 11 Membership Meeting, 7:30 pm, CUH
- Jan. 13 Start of Beginner ID Classes, 7:00 pm, Douglas Classroom, CUH
- Jan. 18 Board Meeting, 7:30 pm, CUH (changed)
Spore Prints Deadline

BOARD NEWS

Marian Maxwell

The nominating committee discussed candidates for Vice President, Secretary, and the Board of Trustees. We still need candidates for Trustees. The floor will be open again to nominations at the January general meeting. If you would like to be a board member or wish to nominate someone, please call Marian Maxwell at 425-235-8557 or e-mail me at marianmaxwell@hotmail.com. Several options are being explored for the Survivor's Banquet in March. John Goldman and Jim Hughes continue to investigate website management and development companies that specialize in nonprofit organizations. A list was started of desired criteria for the website. Queries will be sent to key users of the website to determine additional criteria.

UPCOMING EVENTS

Oregon Truffle Festival, Eugene, Oregon, January 28-30, 2011. For information visit http://www.oregontrufflefestival.com/festival_info.html or www.oregontrufflefestival.com.

NEW GENERA OF ALBATRELOID (ALBATRELLUS LIKE) FUNGI WITH AN EMPHASIS ON SPECIES FROM WASHINGTON STATE

Brian Luther

Up until recently, we recognized *Albatrellus*, *Jahnporus*, and *Polyporoletus* as the three Albatrelloid genera found in Washington State (Gilbertson & Ryvarden, 1986 & 1987). A major revision of this group of polypores was just recently completed by Audet (2010) based on both traditional and DNA studies, and I wanted to tell you about this important research. The old genus *Albatrellus* is still retained, but it has now been segregated into eight other genera, six of which are newly described. With the exception of *Polyporopsis* and *Xanthoporus*, all of the genera are known to occur in Washington State.

The following is a summary of this research, which was published in French. I have included all of the albatrelloid genera and species found here and a representative of the genera not found here, as well as my own comments. Many more species are found in these genera worldwide. A capital "N" after the genera means they were newly described by Serge Audet (2010).

Albatrellopsis: *A. confluens*, *A. flettii*

This genus has convex and sometimes confluent, overlapping caps; one species (*A. flettii*) tends to have bluish colors when fresh, but they all have orange or reddish necro-pigments when dried; clamp

connections are common, but gloeoplerous hyphae in the trama are rare; they have hyphal acantho-appendiges (irregular outgrowths) at the base of the stipe and spores that are mostly weakly amyloid. The flesh and pores turn a lilac color when exposed to KOH and vinaceous when exposed to ferrous sulphate (FeSO₄). Although Gilbertson & Ryvarden (1986) say *A. confluens* occurs in Washington State, Ginns (1997) questions the reports of it from here. Consult his paper for further details.

Albatrellus: *A. avellaneus*, *A. ovinus*, *A. subrubescens*

The genus is characterized by having a combination of simple to confluent fruiting bodies, most species having whitish basidiocarps when young with some yellow pigments on the cap at maturity; having 3–5 small pores per millimeter; having contextual hyphae that are mostly thin-walled but may be thick-walled in the stipe base, mostly without clamps but sometimes containing clamps in the stipe base, having gloeoplerous hyphae, as well as some amyloid contextual hyphae or spores, with small spores 3–5.7 µm long. Chemical reactions include turning yellow with KOH, light brownish-red with sulphuric acid (H₂SO₄), and yellow orange with a red tint with benzidine. *Albatrellus avellaneus* and *A. ovinus* have at least some contextual hyphae that are amyloid, but possess nonamyloid spores, whereas *A. subrubescens* has both amyloid contextual hyphae and amyloid spores.

A color photograph, description, and distribution map of *Albatrellus avellaneus* are given by Castellano et al. (1999, pp. S1–2), but Ginns (1997) provides far more detailed distribution information on this species. According to Ginns (1997, p. 264) it appears that *A. ovinus* does not occur in Washington State, though he doesn't directly say so. He records having studied a collection of *A. ovinus* from "south-central British Columbia... outside the range of *Albatrellus avellaneus*" and treats it only in his key or discusses it briefly with related species. Apparently we have instead confused the two other species listed above with *A. ovinus* in Washington. A recent collection of *A. subrubescens* was found by PSMS members Marian and Scott Maxwell in Chelan Co., which extends the range to a county not listed for collections studied by Ginns (1997).

Jahnporus: *J. hirtus*

This genus is albatrelloid in form, but it is usually growing directly from conifer wood and not terrestrial. The cap and stem are dark brown with subvelvety tomentum, contrasting with the white pores which are often decurrent. It has a distinctive odor of iodoform (especially when cut open), the spores are large and fusiform, and it causes a white rot. *J. hirtus* is common in Washington State.

Laeticutis (N): *L. cristata*

This genus has olive-brown colors, a rimose or splitting cap with squamules (small scales); regularly inflated, but only sometimes thick-walled, amyloid contextual hyphae; some gloeoplerous hyphae, the presence of clamps; and spores that are weakly amyloid. This genus and species are rare with us, with only one documented collection from Washington State (Ginns, 1997), but it is common back east. Important macrochemical reactions include turning a cherry-red color on the flesh and pores in KOH and a red-violet color on the flesh in H₂SO₄.

Nealbatrellus (N): *N. caeruleoporus*

The genus is characterized by having a layer of inflated cells on the pileus, by a lack of clamps, by gloeoplerous hyphae scattered in the context, and by small, inamyloid spores; it causes a white rot and is possibly mycorrhizal. The only species found in Washington State, *N. caeruleoporus*, is very rare, but I've found

it several times over the years. It is quite distinctive because the entire fruiting body is blue or blue-gray when fresh but becomes ochraceous or orangish with old age and after drying or sitting for years in herbaria.

A description, photographs, and distribution map of this species in Washington, Oregon, and California are given by Castellano et al. (1999, pp. S1–3), but I have collections of this fungus from two additional counties not treated



N. caeruleoporus

by those authors or by Ginns (1997), which extends its known range in Washington State. It's always a small to medium sized fungus, but Ginns (1997) says that collections of this species from eastern North America are larger than what's found out here in the west. I have one collection of this species that I found in the southern Appalachians in 1979, and it is just as large as, or slightly smaller than, the collections I've found in Washington State.

Polyporoletus: *P. bulbosus*, *P. sylvestris*, and possibly *P. sublividus* (but not confirmed by DNA studies yet)

This genus has single or multiplex fruiting bodies, caps that are often fleshy with a dark tube layer, and a central or lateral stem. The hyphal system is monomitic. The spores have a distinctive and peculiar double wall that appears internally pitted. Singer et al. (1945) describe it as having a "lacunose spore-wall."

Previously we thought we had only *P. sublividus* in Washington State (Gilbertson & Ryvarden, 1986). A DNA study is currently being conducted to determine whether or not that species actually occurs here. *Polyporoletus sublividus* (or what we've been calling that species) is so rare that it's on the Priority 1 Macrofungi List of the Washington State Natural Heritage Program's Working List of Rare Fungi—one of only eight fungi elevated to this highest priority (refer to <http://www1.dnr.wa.gov/nhp/refdesk/lists/macrofungi.html>).

The original (type) collection for *Polyporoletus sylvestris* was found near Lake Cowichan, Vancouver Island, BC (Canada) in 1929. *Polyporus sylvestris* was invalidly published by Overholts (1941), who failed to provide a Latin description. Pouzar (1972) described it correctly and transferred it to *Albatrellus* as *A. sylvestris* Overholts ex Pouzar. It was listed as a synonym of *P. sublividus* by Gilbertson & Ryvarden (1986), but the current research by Audet (2010) has shown it to be a distinct species, which he transfers to *Polyporoletus* as *P. sylvestris* (Overh. ex Pouzar) Audet.

Serge Audet describes a new species from Mount Rainier National Park, *P. bulbosus*, which was originally collected by Alexander H. Smith in 1948. Both *Polyporoletus* and *Polyporopsis* have peculiar spores with double walls that appear pitted or lacunose, but all other genera have spores that lack double walls and look smooth.

Polyporopsis (N): *P. mexicana* (not found in Washington)

This genus is very similar to *Polyporoletus* in form and possesses the same peculiar spores, but it has a dimittic hyphal system.

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Albatrelloid Fungi, cont. from page 3

Polypus (N): *P. dispansus*

This genus has small, multiple yellow caps (from 10 to 30 or more) arising from a common stem; irregularly swollen and constricted contextual hyphae with no or rare clamp connections, and small spores (not over 5 µm long). The caps turn yellow-orange when treated with KOH (Tylutki, 1987). This fungus is considered rare in Washington State, but my experience is that it's regularly collected in Chelan and Yakima Counties when we have field trips in those areas.

Scutiger: *S. ellisii*, *S. pes-caprae*

Scutiger is characterized by large fruiting bodies with prominently scaly caps and lateral (eccentric) stems; by fresh pores that often stain greenish or greenish-yellow when bruised, especially in *S. ellisii*; by hyphae that are often, but not always clamped, by thin to thick-walled contextual hyphae that may be weakly amyloid, or amyloid hyphae in the pileal scales; and by large tear-drop shaped spores. Gilbertson & Ryvarden (1986) record *S. pes-caprae* from western North America, but Ginns (1997, p. 262) treats it only in his key [in brackets] and does not provide a description, nor does he discuss it any further, indicating that *S. ellisii* appears to be our only species here. In his key lead for *S. pes-caprae* he says "Pileus brown, coarsely tomentose with tomentum aggregated into scales." However, I've often found *S. ellisii* here in Washington State with caps that are completely brown when fresh, as well as olivaceous-yellow or olive-brown. Thus color does not appear to be a reliable distinction, though frequently used. Microscopically, these two species are virtually identical, but according to Gilbertson & Ryvarden (1986), *S. ellisii* has amyloid contextual hyphae, whereas *S. pes-caprae* does not. However, Ginns (1997, p. 267) states that the contextual hyphae of *S. ellisii* have "walls nonamyloid to many weakly amyloid," adding further confusion to the few distinctions we thought we had between these species. Serge Audet (personal communication) informs me that DNA studies show a difference between the two species. *S. ellisii* also shows a strong macrochemical reaction with Melzer's reagent on the cap, pores, etc., whereas *S. pes-caprae* does not. The necro-pigments are also different. It looks like a detailed study focusing just on this species complex alone would be useful.



Scutiger ellisii. cap view (l), pore view (r)

Xanthoporus (N): *X. syringae* (not found in Washington, so far).

This genus has yellowish colors with a light to bright yellow pore surface when fresh, hyphae with and without clamps, gloeoplerous hyphae, basidia with candelabra-like branching, and very small pale brown spores (up to 4.5 µm long). The genus shows no macrochemical reactions to KOH or H₂SO₄.

Gilbertson & Ryvarden (1986) do not mention *X. syringae* at all for North America, but Ginns (1997) reports *X. syringae* (as *Albatrellus*) from next door in British Columbia, Canada. Thus it is possible it may occur here in Washington State as well and eventually will be found. Another species in this genus that's common in eastern North America is *X. peckianus*.

Xeroceps (N): *X. skamania**

This genus has a smooth pileus without scales, pores that are yellow to cream colored when fresh and stain pinkish or reddish when bruised, clamp connections usually, but not always, on the hyphae, gloeoplerous hyphae in the context and in the pore tramal hyphae, ellipsoid, rarely tear-drop shaped spores, and a positive reaction for the presence of laccase. Important macrochemical reactions include giving red tints with KOH and dark gray with FeSO₄.

Comments

Most of the fungi listed above are terrestrial, except for *Jahnoporus*. All of these genera have monomitic hyphal systems, except for *Polyporopsis*, which is dimitic. DNA studies on some of these fungi have shown that they belong to the family Albatrellaceae in the order Russulales (Larsson, 2007).

Acknowledgement

Special thanks to Serge Audet for his constructive comments and input on this review of his recent publication.

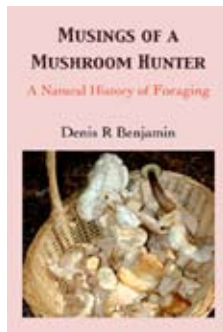
References

- Audet, Serge. 2010. Essai de découpage systématique du genre *Scutiger* (Basidiomycota): *Albatrellopsis*, *Albatrellus*, *Polyporoletus*, *Scutiger* et description de six nouveaux genres. *Mycotaxon III*: 431–464.
- Castellano, Michael A., Jane E. Smith, Thom O'Dell, Eflen Cazares & Susan Nugent. 1999. *Handbook to Strategy I Fungal Species in the Northwest Forest Plan*. USDA, Forest Service, Pacific Northwest Research Station, *General Technical Report PNW GTR-476*.
- Gilbertson, R. L. & Leif Ryvarden. 1986. *North American Polypores*, Vol. 1. *Abortiporus—Lindtneria*. Fungiflora, Oslo. pp. 1–433.
- Gilbertson, R. L. & Leif Ryvarden. 1987. *North American Polypores*, Vol. 2. *Magasporoporia—Wrightoporia*. Fungiflora, Oslo. pp. 434–885.
- Ginns, J. 1997. The taxonomy and distribution of rare or uncommon species of *Albatrellus* in western North America. *Can. J. Bot.* 75: 261–273.
- Larsson, Karl-Henrik. 2007. Re-thinking the classification of corticioid fungi. *Mycol. Res.* III: 1040–1063.
- Luther, Brian. 2010. An extraordinary find—The rediscovery of a rare polypore in China that was previously known only from Washington State. *Spore Prints* 459 (February), on-line at psms.org
- Overholts, L. O. 1941. New species of Polyporaceae. *Mycologia* 33(1): 90–102.
- Pouzar, Z. 1972. Contribution to the knowledge of the genus *Albatrellus* (Polyporaceae) I. A conspectus of species of the North Temperate Zone. *Ceska Mykologie* 26(4): 194–200.
- Singer, Rolf, Walter H. Snell & Lawrence White. 1945. The taxonomic position of *Polyporoletus sublividus*. *Mycologia* 37(1): 124–128.
- Tylutki, Edmund E. 1987. *Mushrooms of Idaho and the Pacific Northwest*. Vol. 2. *Non-Gilled Hymenomycetes*. Univ. of Idaho Press, Moscow. 232 pp.
- *This fungus (as *Albatrellus skamania*) was featured in an article I wrote earlier for *Spore Prints* (Luther, 2010).

BOOK REVIEW

Al Casciero

Just in time to be a great “foray bag stuffer”, rather than the proverbial stocking, has hit the shelves recently. It is *Musings of a Mushroom Hunter, A Natural History of Foraging*, by Denis R. Benjamin, widely known from his previous *Mushrooms, Poisons and Panaceas*. Unlike his earlier work, based on his professional training as a doctor and pathologist and his scientific knowledge of mushrooms, *Musings* is the recounting of personal experiences and observations collected over many decades, about the obsession, which many of us share with him, of gathering wild mushrooms.



It is not the typical book with a story from beginning to end, but rather short chapters focusing on individuals, places, happenings, and opinions that affected Denis' sensitivity in his sustained and unfinished quest for the “ever larger mother lode.” With his usual wry wit, keen insight, and some outrageous moments, Denis amuses the reader from cover to cover. Since the leitmotif is present throughout, the reader can choose to read Chapter 25 before Chapter 5 or 11 or... since each is basically independent.

Perhaps, I should not be the “critic” of *Musings*, since Denis has acknowledged me, and even included me briefly in it. However, and even though I had previous knowledge of many of the events, I can attest to the allure of the prose and the situations with one example. A passage in Chapter 9 held me at end of my seat and gave me goose pimples as I vicariously drove up the Cascade Mountains on an ice-covered highway waiting for the moment in which the vehicle would skid off and crush at the bottom of the slope, even though I know that Denis and his buddy are alive and well. I think it is not because of the suspense of many of the events, but that they resonate with our own experiences during our own quest.

Other critics may pick on minor shortcomings, such as incidental misspelling of mushroom species or similarities with other events told by someone before. But those pesky comments will not detract from appreciating the enthusiasm of the author, the exhilaration of the search, and the charm of the characters and situations depicted. It is also educative for budding amateur mycologists. It is certainly a perfect companion to sit in front of a glowing fire, glass on hand, during the winter interlude as we anticipate our own future reenactments of similar circumstances.

Musings is reading of guaranteed delight. It is available from Tembe Publishing, P.O. Box 399, Cle Elum, WA 98922, and also online at <http://www.bookmasters.com/marktplc/03128.htm#summary>

It can also be downloaded as an e-book or a PDF file.

Mushroom Photography, cont. from page 1

find them used on eBay. Canon offers close-up filters in 52 mm, 58 mm, 72 mm, and 77 mm sizes, ranging in price from \$75 to \$150. Other companies offering close-up filters include Marumi and Raynox. Make sure you purchase apochromatic, two-element close-up lenses for the best results, and avoid cheap single-element close-up filters. You can stack two or more close-up filters to obtain the degree of magnification you need.

Extension tubes also work well. Be sure to get “automatic” extension tubes, such as those made by Kenko, to ensure that you

retain your camera's automatic through-the-lens (TTL) exposure metering facilities. Extension tubes work well with prime lenses, but may interfere with focusing and/or zooming controls on zoom lenses, so be sure to check for compatibility with your lenses before purchasing an extension tube set.

Macro lenses offer the ultimate in convenience and image quality for photographing mushrooms. They allow you to focus close enough to obtain a 1:2 (half life-size) or 1:1 (Life-size) reproduction ratio, and retain all the functions of the digital camera. A macro lens in the 90–105 mm range is ideal for mushroom photography. I use a Sigma 150 mm macro lens for many of my mushroom close-ups. Macro lenses in the 50–60 mm range are very sharp, but have a short working distance, which means you'll need to be on your stomach just a few inches from the mushrooms to get a frame-filling photograph. Longer macro lenses, such as the excellent Nikon 200 mm Micro Nikkor and the equally effective Sigma 180 mm APO Macro lens, have plenty of working distance but are heavier to tote around in the woods and are much more expensive.

Long exposures of several seconds are often needed when photographing mushrooms, so a sturdy tripod with the ability to position the SLR camera near the ground is essential. I use a Gitzo G 1348 carbon fiber tripod, which does not have a center post and can be placed flat on the ground for low-level compositions. The aluminum Manfrotto 190 XB tripod is an affordable tripod that also works well for close-up photography. I use mirror lock-up and a cable release with my Nikon D2X and D700 cameras to further minimize any possibility of camera movement during the exposure. Image stabilization and autofocus are wonderful features for hand-held photography, but you'll want to turn off both of these features and focus the lens manually when photographing mushrooms using a tripod.

Although some photographers like to use flash for their mushroom photography, I prefer natural light, supplemented by the use of a diffusion screen to soften the light on sunny days and a small reflector to add light, when needed, to the shadowed areas under mushrooms. Diffusion screens and reflectors that collapse to allow for easy, compact storage are made by Photoflex and several other companies.



Ian Adams is an environmental photographer, writer, and teacher specializing in natural, rural, historical, and garden areas. Check out his website at www.ianadamsphotography.com.

NOMINATIONS FOR 2011

Marian Maxwell

The election in February will determine our next Vice President, Secretary, and five Trustees. Our board positions are for two years, so the upcoming terms expire in March 2013.

The floor was opened at the December meeting for nominations and will be opened again at the January meeting. Nominations will be closed at the end of the January meeting. You may also nominate someone by

- contacting a member of the nominating committee (John Goldman, Patrice Benson, or Marian Maxwell)
- calling Marian at 425-235-8557
- e-mailing president@psms.org.

Please get the person's approval before nominating him or her.

RESUPINATE FUNGUS OF THE MONTH:

The Genus *Phanerochaete*

© Brian Luther

The genus *Phanerochaete* is common and widespread. Usually if I'm out for several hours collecting resupinates, especially where hardwoods are prevalent, at least one species will turn up. They're always resupinate, and macroscopically most are pallid, whitish, or creamy in color, but a few are brightly colored. They are easy to distinguish microscopically because of the characteristic thick-walled subicular hyphae (hyphae closest to the substrate) with a firm, lattice-like arrangement of distinctive branching; the hyphae can either have or not have clamps. Most species have cystidia that vary from smooth to heavily incrustated, but some are without cystidia entirely. Almost all have ellipsoid, smooth, inamyloid spores.

The most comprehensive single work on the genus was done by Burdsall in 1985, covering 46 species; subsequently many new species have been described worldwide. The Cortbase website currently lists 90 valid species in the genus, almost double the number treated in Burdsall's monograph.

Ginns & Lefebvre (1993) and Ginns (1998) list 28 species of *Phanerochaete* for North America, with five being recorded from Washington State—*P. affinis*, *P. carnosa*, *P. sanguinea*, *P. sordida*, and *P. velutina*.



BSL coll. #2010-327-2

BSL coll. #2010-34-3

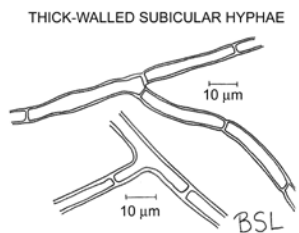
Description of collections

Phanerochaete sp. similar to *P. sordida*

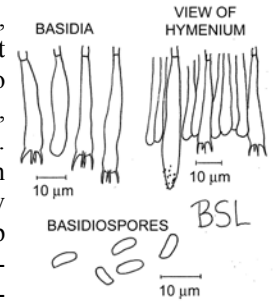
Brian S. Luther coll. #2010-34-3. On decorticated hardwood, Discovery Park, Seattle, King Co., WA., March 4, 2010, and BSL coll. #2010-327-2. On a decorticated Bigleaf Maple stick (*Acer macrophyllum*), MacDonald Park, Carnation, King Co., WA. March 27, 2010.

Basidiocarp: Fully resupinate, up to 0.75 mm thick, white to cream-colored, surface slightly irregular to somewhat sparsely odontoid (resembling small teeth), smooth in some areas and showing distinct cracks in others, consistency thick, felty-cottony, membranous, and easily peeled from the substrate; subiculum loose and open cottony; margin appearing abrupt to the naked eye, finely arachnoid (cobweb-like) under magnification. Refer to habitat photos.

Microstructures: Hyphal system monomitic, hyphae 4–7 μ m wide, hyaline, without clamps; subicular and contextual hyphae thick-walled (up to 2 μ m thick), generally smooth, without incrustation or with occasional scattered large crystals; subhymenial hyphae slightly thick-walled, often with abundant, irregular or knob-like incrustations; hymenial hyphae thin-walled. *Basidia* 27–36 \times

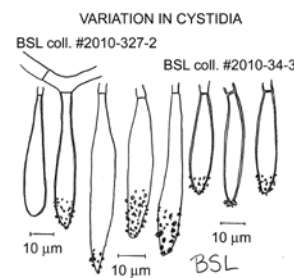


4.5–6 μ m, clavate, hyaline, thin-walled, sometimes centrally constricted, without a basal clamp, with four sterigmata up to 5 μ m long. *Basidiospores* 6–7 \times 3–4 μ m, ellipsoid, hyaline, smooth, inamyloid. *Cystidia* 36–60 \times 5–10 μ m, clavate when immature, becoming subulate (narrow at the base and tapering toward a sharp tip) to lanceolate, thin to slightly thick-walled, hyaline, with or without crystalline incrustation near or on the apex; apex varying from widely acute to somewhat rounded, but sometimes acuminate (gradually narrowing to a sharp point); extending up to 25 μ m beyond the hymenium. Refer to line drawings.



Comments

Microscopically these two collections are very similar, but the Seattle collection was chalky white when fresh and the hymenial surface is slightly irregular, sparsely odontoid, and without cracks, whereas the Carnation collection is a more creamy color and mostly smooth but often shows cracks exposing the contextual or subicular tissues in some areas. Both of these collections are close to *Phanerochaete sordida* in hyphal features and spores, but the cystidia are much shorter and rarely reach even the minimum threshold length given in the literature for that species (Burdsall, 1985; Breitenbach & Kranzlin, 1986; Hansen & Knudsen, 1997), with the vast majority being less than 60 μ m long. The cystidial incrustation, if present, is typically quite variable just as in *P.*



sordida. Eriksson et al. (1978) devote several pages to the variability seen in *P. sordida* and illustrate a whole page of cystidial variation (p. 1031, Fig. 521), but none look precisely like those in my collections. *Phanerochaete australis* has similar-sized cystidia, but they are shaped differently, the spores are smaller, and it's known only from Borneo.

DNA studies conducted on *Phanerochaete* by De Koker et al. (2003), Larsson (2007), and Wu et al. (2010) show that the genus is polyphyletic (i.e., has more than one genetic origin), indicating that further segregation of some species into other genera is warranted. The genus *Rhizochaete* is a prime example of how the genus *Phanerochaete* sensu lato, is now being broken up. A phylogram based on DNA research by Greslebin et al. (2004) clearly shows that the five species segregated into *Rhizochaete* belong in their own (*Rhizochaete*) clade and that *Phanerochaete sordida* belongs in the *Phanerochaetoid* clade (p. 269). Karen Nakasone (personal communication) at the Mycology Lab of the USDA Forest Products Laboratory in Madison, Wisconsin, informs me that active DNA research is currently being done on this group of fungi to try to sort them all out.

Classification Hierarchy

- Kingdom Mycota (Fungi)
- Division Basidiomycota
- Subdivision Agaricomycotina (Hibbett, 2006)
- Class Agaricomycetes
- Order Polyporales
- Family Phanerochaetaceae
- Genus *Phanerochaete*

References

- Breitenbach, J. & F. Kranzlin. 1986. *Fungi of Switzerland*. Vol. 2, *Non-gilled Fungi*. Mycological Soc. of Lucerne. 412 pp.
- Burdsall, Harold H. 1985. A contribution to the taxonomy of the genus *Phanerochaete* (Corticaceae, Aphyllophorales). *Mycologia Memoir No. 10*. J. Cramer. 165 pp.
- DeKoker, Theodorus H., Karen K. Nakasone, Jacques Haarhof, Harold H. Burdsall & Bernard J. H. Janse. 2003. Phylogenetic Relationships of the genus *Phanerochaete* inferred from the internal transcribed spacer region. *Mycol. Res.* 107(9): 1032–1040.
- Eriksson, John, Kurt Hjortstam & Leif Ryvarde. 1978. *The Corticiaceae of North Europe*. Vol. 5. *Mycoaciella—Phanerochaete*. Fungiflora, Oslo. pp. 889–1047.
- GINNS, J. & M. N. L. Lefebvre. 1993. Lignicolous Corticioid Fungi (Basidiomycota) of North America. *Mycologia Memoir No. 19*. APS Press, 247 pp.
- GINNS, J. 1998. Genera of the North American Corticiaceae sensu lato. *Mycologia* 90(1): 1–35.
- Greslebin, A., K. K. Nakasone & M. Rajchenberg. 2004. Rhizochoete, a new genus of phanerochaetoid fungi. *Mycologia* 96: 260–271.
- Hansen, Lise & Henning Knudsen, editors. 1997. *Nordic Macromycetes*, Vol. 3. *Heterobasidioid, Aphyllophoroid and Gastromycetoid Basidiomycetes*. Nordsvamp, Copenhagen. 444 pp.
- Hibbett, David S. 2006. A phylogenetic overview of the Agaricomycotina. *Mycologia* 98(6): 917–925.
- Larsson, Karl-Henrik. 2007. Re-thinking the classification of corticioid fungi. *Mycol. Res.* 111: 1040–1063.
- Wu, Sheng-Hua, Henrik R. Nilsson, Cheng-Tao Chen, Shi-Yi Yu & Nils Hallenberg. 2010. The white-rotting genus *Phanerochaete* is polyphyletic and distributed throughout the phleboid clade of the *Polyporales* (Basidiomycota). *Fungal Diversity*. Published on-line February 6, 2010.

SECRET OF MUSHROOM SHAPE REVEALED

Jody Bourton

BBC Earth News, Dec. 11, 2009

Scientists have worked out just what a perfectly designed gilled mushroom would look like.

Their study reveals that no such fungi exists naturally, but it does show how a mushroom's unique structure helps it reproduce so successfully. The research also sheds light on why different mushrooms possess different arrangements of fleshy gills underneath their caps. The findings are published in the journal *Mycological Research*.

Mushrooms are fruiting bodies produced by fungi, and they grow to spread reproductive spores into the environment. For over a century, mycologists have studied fungi structure, and it has long been known that the soft filamentous structures called gills found on the underside of many capped mushrooms help spread spores.

"Spores are catapulted from the gill surface, travel a short distance horizontally, and then fall vertically to be swept away by air currents swirling around the mushroom cap," explains Professor Nicholas Money from Miami University, Oxford, Ohio, in the US. The spores then start new fungal communities.

In nature, gilled mushrooms have gills arranged so that they fork and branch off. By having this arrangement relative to a flat surface the mushrooms are able to increase their surface area 20-fold and increase their spore dispersal, the researchers say. "Mushrooms are masterpieces of natural engineering," says Prof Money.

But only now have researchers revealed the perfect shape for a mushroom's fleshy gills.

Prof. Money and Dr. Mark Fischer from the College of St Joseph, Cincinnati, also in Ohio, US used theoretical modeling, measurements, and photographs to investigate the optimal gill structure for a mushroom. "We set out to design the perfect mushroom," Prof. Money says.

"A single gill organized as a tight spiral beneath the cap would work very well, and a 'Venetian blind' type arrangement would be very effective too," he says.

But neither optimal arrangement occurs naturally, owing to the constraints imposed by how a fruiting body develops.

For a start, the arrangement of cells requires each mushroom to develop radial symmetry.

"Natural selection has sculpted various radial arrays of gills that work very well, or at least, work well enough to have allowed mushrooms to flourish for tens of millions of years," says Prof. Money.

The next challenge for the researchers is figuring out what kind of mushroom is the most efficient at releasing spores.

"We are going to start by looking at bracket fungi next; these have fruit-bodies that release spores from skinny tubes rather than gills," Prof. Money says.

Preliminary studies indicate that bracket fungi can more than double the surface area for spore release, by a factor of 40 or more. "The storm of spores falling from these giant brackets is a truly amazing sight and well worth an evening trek into the woods," he says.

FRENCH FARMER ARRESTED FOR KILLING ALLEGED CHRISTMAS TRUFFLE THIEF

<http://www.heraldsun.com.au/news/>, Dec. 22, 2010

French police arrested a farmer who allegedly shot dead a man from a neighbouring village who he believed was stealing Christmas truffles from his land.



Laurent Rambaud, the 32-year-old head of the young farmers' association in the southern Drome region, allegedly sat in wait for the suspected thief and shot him twice with a hunting rifle on Monday afternoon, a court source said.

The dead man was a 43-year-old father of two with previous convictions for theft, the source said, although the alleged killer, a volunteer fire fighter, had not recently suffered any truffle thefts.

The much sought-after fungi can fetch up to €1,000 (\$1,300) a piece during the festive season.

The mayor in the nearby town of Grignan, Bruno Durieux, said that truffle theft was an increasing problem in the region and that "people are getting angry."

"I support the truffle farmers but I cannot condone this act," he added.

KROGER CO. RECALLING PET FOOD WITH TOXIC FUNGUS

Kris Alingod

<http://www.allheadlinenews.com/>, Dec. 20, 2010

The Kroger Company is withdrawing pet food from its stores in 19 states because of possible contamination by aflatoxin. Aflatoxin is produced naturally by *Aspergillus flavus*, a mold that is commonly found in corn and nuts and can cause cancer and other diseases of the liver in humans and animals. Pets who ingest food with aflatoxin may refuse to eat, become sluggish, and suffer extreme or bloody diarrhea. They should be immediately brought to a veterinarian.

The recalled products include 3.5-pound and 18-pound bags of Pet Pride Cat Food, Pet Pride Kitten Formula Food, and Pet Pride Tasty Blend Poultry & Seafood Cat Food. Also being recalled are Old Yeller Chunk Dog Food in 22-pound packs and Old Yeller Chunk Dog Food in 50-pound bags.

Three-pound packages of Kroger Value Cat Food are likewise possibly tainted, as is Kroger Value Chunk Dog Food in 15-pound and 50-pound sacks.

All of the products have a sell-by date of Oct. 23, 2011. Kroger is advising customers to return their recalled items for a refund or replacement.

Stores included in the recall are in the following states: Alabama, Arkansas, Georgia, Illinois, Indiana, Kansas, Kentucky, Louisiana, Michigan, Mississippi, Missouri, Nebraska, North Carolina, Ohio, South Carolina, Tennessee, Texas, Virginia, and West Virginia.

CRISPY PORCINI PANGRATTATO

MushRumors, Ore. Myco. Soc., May/June 2009

½ ounce dried porcini
4 ounces artisan bread, preferably stale,
cut into chunks
Salt
Black pepper
2 TBs olive oil
2 cloves garlic, crushed
4-in. sprig fresh rosemary



Process the mushrooms, bread, and garlic with a pinch of salt and pepper in a food processor until the mixture looks like bread crumbs. Heat olive oil in a large frying pan. Add the sprig of rosemary and cook for a minute, then fry the bread crumbs in the oil until golden and crisp. Keep shaking the pan—don't let the bread crumbs stick to the bottom. Discard the rosemary. Cool the bread crumbs and store in the refrigerator.

It isn't often that you discover a new and truly different way to include mushrooms in dishes. "Crispy Porcini Pangrattato" is part of a recipe for "Pappardelle with Slow-Braised Leeks" from the Food Network. The pasta recipe sounds tasty but it is the crispy topping that offers a novel use for dried porcini. Brainstorm ways to use these crumbs, for example, as a topping for a casserole or to garnish vegetables.

Adapted from a recipe in *Jamie at Home*, by Jamie Oliver and available on the Food Network at http://www.foodnetwork.com/food/recipes/recipe/0,1977,FOOD_9936_122644,00.html.

And a Happy New Year!

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