OMPHALINA

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Newsletter of FORAY NEWFOUNDLAND AND LABRADOR

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FORAY NEWFOUNDLAND AND LABRADOR

is an amateur, volunteer-run, community, not-for-profit organization with a mission to organize enjoyable and informative amateur mushroom forays in Newfoundland and Labrador and disseminate the knowledge gained.

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OMPHALINA *is the lackadaisical newsletter of Foray Newfoundland & Labrador. There is no schedule of publications, no promise to appear again. Its primary purpose is to serve as a conduit of information to registrants of the upcoming foray and secondarily as a communications tool with members.*

Issues of OMPHALINA *are archived in:*

Library and Archives Canada's Electronic Collection <http://epe.lac-bac.gc.ca/100/201/300/omphalina/index.html>, and

Centre for Newfoundland Studies, Queen Elizabeth II Library, where a copy is also printed and archived <http://collections.mun.ca/cdm4/description.php?phpReturn=typeListing.php&id=162>.

COVER

Cerrena unicolor photographed by Maria Voitk March 2, 2011, in the woods towards Barry's Lookout, Humber Village, a reminder of the beautiful days we get in March. In Newfoundland and Labrador *C. unicolor* is commonly found on dead birch or alder, both standing and fallen, where it causes white rot. Woodpeckers prefer brown rot for nesting, and, indeed, this hole was just a hole, not a nest cavity. The lead article gives a glimpse into the amazing life of this bracket fungus—another coevolutionary unbroken chain linking many organisms with ties that eventually bind us all together, provide us succor, but limit our freedom.

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CONTENT

Message from the Editor

The first day of spring!

A bit of a Polypore Issue, sprinkled with a few other wood eaters from David Boyle's mushroom growing workshop in 2010. For your information, we are trying to bring David back this year for another Grow-Op Workshop—details still pending.

In addition to the amazing *Cerrena unicolor* story—another unbroken chain—followed by a short reminder of others in the chain that profit from wood rotting conks, we commend to your attention Leif Ryvarden's article on *Fomitopsis ochracea*. This is a very significant paper about a large and common species, essentially unknown to the whole world. It was described in a journal even more obscure than Omphalina, and unknown to anybody since. All that is known about it is in this article, and you get it first!

A nice thing about having a journal is the ability to publish updates to the Foray Report, if needed. So far, we haven not needed it, but this time we did.

As mentioned, David Boyle's mushroom growing workshop from the 2010 Foray is still bearing fruit. Indeed, we have been the happy recipients of at least one crop of shiitakes from one of the participants. More people should keep the toiling Editor of Omphalina in mind, when visited by such bounty of the edible kind. On page 16 David Boyle answers a question from Jeff Siddall about the vigour and virility of his culture. From this arose an idea: if you have any questions about how fungi lead their lives, particularly their love lives, we'll gladly open our pages to the mycological equivalent of Ann Landers. David has kindly agreed to take on the task of answering, but if your question is more appropriate to some other specialized interest, he can farm it out. So do write in and ask.

By the way, the time lag between question and published answer was so great that Jeff had time to try his own solutions. He added more wood chips to the medium and the flagging oysters picked right up. Just needed food! However, they still have not grown pearls, like David's cultured oysters.

The article by Michael Beug is followed by one inspired by another of his articles. Michael's longer discussion of both topics, as well as the 2011 Toxicology Report, appear in NAMA's **McIlvainea**, and a shorter one in NAMA's **Mycophile.** You can find **McIlvainea** as well as **Mycophile** on NAMA's website <http://www.namyco.org/>. Shiitake dermatitis is sufficiently interesting to warrant reporting here, even if it has been published elsewhere.

Foray Newfoundland & Labrador is a NAMA member, and **Mycophile** can be read on our website, along with newsletters of other sister organizations with whom we share journals. That page is password protected, and available to members only, to comply with requirements by some of these organizations. An e-mail was sent to members with the username and password to gain access to the members-only page. If you did not get this e-mail, please write Jim Cornish <webmaster AT nlmushrooms DOT ca>. Have alook. We now have four journals there, three replaced with new issues, since it was opened.

For the future, we think duplication of material freely available on our own website seems pointless. Therefore, no more, unless we run dry of material! That is called an editorial decision. However, Omphalina should serve its readers, not its Editor, so if you prefer the reproduction of important information here, even if it is freely available elsewhere, write in and say so. Just be polite!

Happy mushrooming!

andrus

Description

Cap: Usually kidney to fan shaped, 3-9 cm across, surface hairy, buff to brownish, often with a green algal coating. Often zonate. At times resupinate. **Pore Surface**: Whitish, becoming gray, maze like, becoming spine-like in age. **Flesh**: White to gray, with a dark line under the cap surface, leathery. **Spore deposit**: white. **Spores**: inamyloid, 5-7 x 2.5-4 mμ, smooth, elliptical to elongated. **Ecology**: A common saprobe, causing a white rot of broadleaf trees. It is annual and grows in overlapping rows or clusters, visible year around, widely distributed.

This species resembles *Trametes versicolor* and other common turkey tail polypores and stereums. See Omphalina II (2) pp 6-8 for keys to identify these bracket fungi.

The story

Horntail woodwasps in the genus *Tremex* are propagators of this fungus which provides a food source for its larvae and also makes the wood more digestible for the grubs. The ovipositor of the horntail wasp contains asexual spores of the fungus. These are called oidia. The structures holding the spores in the ovipositor are call mycangium. The wasp deposits its eggs and the spores into the wood where the fungus grows quickly, providing nourishment for the larvae. This symbiosis is tenuous with the fungus both benefiting and suffering from the relationship. Nature has checks and balances. The old ditty "Big fleas have little fleas upon their backs to bite'em, And little fleas have lesser fleas, and so on ad infinitum" applies here. *Cerrena unicolor* fights back by emitting a pheromone which attracts another insect, the ichneumon parasitoid wasp in the genus *Megarhyssa*. This wasp drills into the wood, depositing its own eggs. The larvae when hatched, feed on the horntail wasp larvae. This protects the fungus from being totally consumed.

There are other fungal species with similar insect

connections. There is often a lot more than meets the eye when admiring a pretty mushrooms.

References

1. Kuo M: *Cerrena unicolor*. Retrieved from the MushroomExpert.Com Web site. <http://www.mushroomexpert.com/cerrena_unicolor.html>. 2007.
2. Benjamin R K, Blackwell M, Chapella, Humber RA, Jones KG, Klepzig KA, Lichtwardt RIW, Malloch D, Noda H, Roeper RA, Spatafora JW, Weir. A: The search for diversity of insects and other arthropod associated fungi. pp. 395-433. In: Biodiversity of Fungi: Standard Methods for Inventory and Monitoring. Eds. Mueller GM, Bills GF, Foster M. Academic Press, New York. 2007.
3. Šrůtka P, Pažoutová S: Symbiotic relationship between *Cerrena unicolor* and the horntail *Tremex fuscicornis* recorded in the Czech Republic. Czech Mycology, 59: 83-90. 2007.
4. Ristich S: Sam's Corner, Fourth Quarter 2003. <http://www.mushroomthejournal.com/mma/SC200304.html>. 2003.

Well worth your while to look up at least the Kuo and Ristich references on the web.

UNBROKEN CHAIN, SONG OF THE MARTEN & MERGANSER

Henry Mann, Prez,
Pinecraft Synthetic Cavities (PSC)

A walk in the woods never ceases to inform, amuse and amaze. As discussed in "Unbroken Chain, Song of the Saw-Whet Owl" (OMPHALINA II No. 5) uncountable ties and feed-back loops interconnect the organisms of the forest into a huge chain of life. Everything is connected to everything else and surprises appear behind every tree, stump and rock for those willing to wander the trails and keenly observe. Mycorrhizal fungi help grow the trees and other fungi decay them, allowing woodpeckers to excavate cavities for their own nests, and also provide nesting sites for other birds including Boreal and Saw-Whet Owls. We humans often attempt to slip our simple solutions into these complex intermeshing chains as we "manage" the forest or wildlife populations, or just tinker for our own pleasure. In this case, we build nest boxes to attract more owls.

Looking up at an owl box in a relatively young second growth forest, one does not expect to see a Pine Marten looking back. While overjoyed at the rare photo-op, a myriad of questions flow from the encounter. Is the marten saying, "I could thrive in a not-so-old-growth forest if it just had more homes for me to occupy where I could loaf and raise my young safe from those nasty fox predators"? In this young forest, time has not yet provided the large trees heart-rotted by *Fomitopsis* conk fungi for the excavation of sizeable nest holes and dens. Nature has its own time schedule in closing ecological chains, but humans can and do intervene, sometimes with disastrous results, and sometimes with beneficial results, though it is not always clear which the ultimate outcome will be in any intervention.

Surely enhancing the ability of Pine Marten to flourish in younger growth forests is not just as simple as providing more owl nest boxes? Or maybe it is!

And speaking of chains, and "everything is connected to everything else", what about ducks?

PSC Patented Owl Boxes: $477.64, batteries, taxes, handling and shipping not included. Guaranteed to attract owl, duck or marten—money back if empty over two weeks, less $355.03 administrative fee.

IS *FOMITOPSIS OCHRACEA* ENDEMIC IN CANADA?

LEIF RYVARDEN

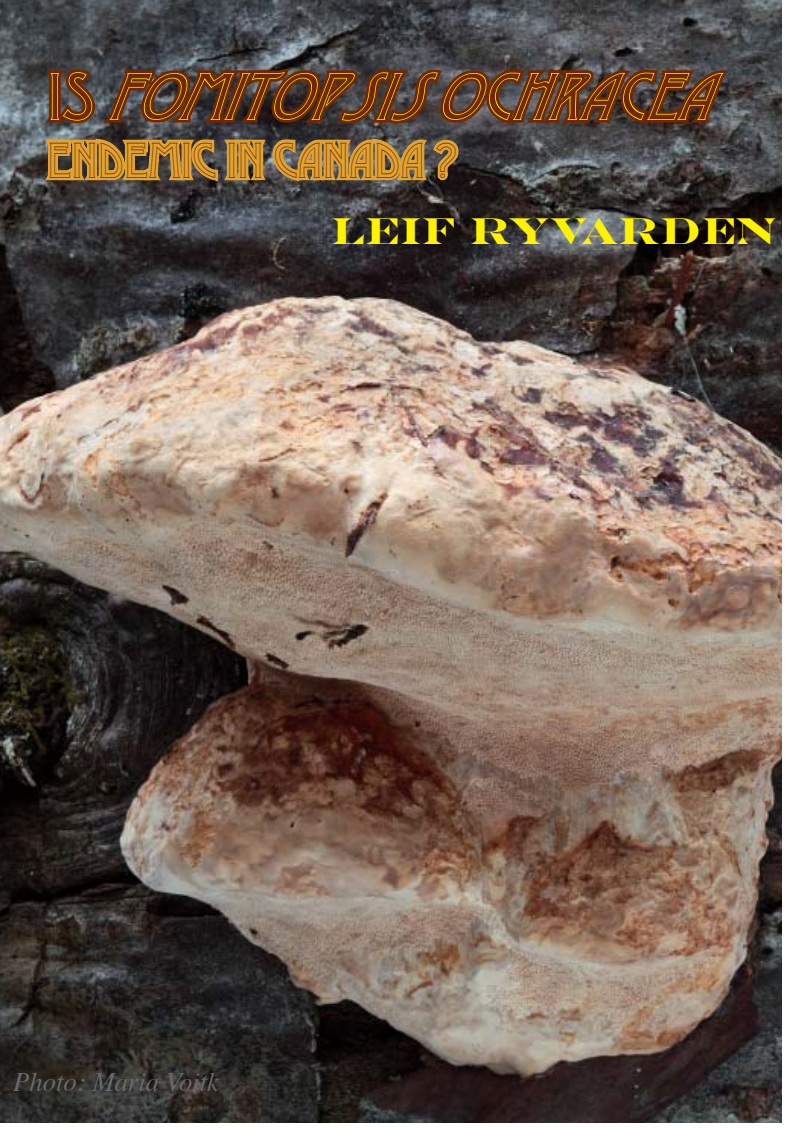


Photo: Maria Voitk

Photo: Andrus Voitk

Photo: Andrus Voitk

Fomitopsis ochracea Stokland & Ryvarden was described only 4 years ago, based on specimens collected on *Populus tremuloides* in Alberta.[1] The type specimen and other specimens collected at the same time all had fairly large perennial basidiocarps, so that initially it was a bit difficult to believe that nobody had noted it before. In an attempt to ensure that the species had not been described earlier under a name that had gone unnoticed, specimens were circulated to some North American mycologists well acquainted with the wood inhabiting species on their continent. It turned out that until then this species had avoided detection by masquerading under a false name.

The second report of the species occurred a year ago, when Andrus Voitk reported in Omphalina finding the species on *Betula papyrifera* and *B. alleghaniensis* in Newfoundland, extending the distribution and host ranges.[2] I have examined those specimens and confirmed them to be *Fomitopsis ochracea*. Since all hosts documented so far were deciduous trees, and since Andrus was not aware of seeing the same species on conifers, for a while we believed it to be a species limited to hardwood.

During the recent foray to Newfoundland I found several specimens on *Picea* and *Abies* of a species which some of the participants called "the deviant form of *Fomitopsis pinicola*". However, I saw immediately that this was not true, since *F. pinicola* has a distinct resinous, shiny, laccate cuticle, while the "deviant" specimens had a dull pileus in greyish to ochraceous colours. Admittedly, their general shape was the same as that of *F. pinicola*, as was the smell. To convince those of little faith, I did the well known test with a match, which melts the cuticle of *F. pinicola* specimens. Indeed, this happened on the "normal" *F. pinicola*. The pileus of the "deviants", on the other hand, was only charred by the flame. Convinced that we had a new species, we kept ourselves amused arguing about suitable names, while awaiting definitive studies.

Back at the University of Oslo, Professor Karl-Henrik Larsson, head curator of the Mycological Herbarium, kindly sequenced a specimen that I had brought back. A few days later he smilingly handed me the specimen back and said, "*Fomitopsis ochracea*, your own species—a perfect match with sequences from the isotype in Oslo and the new Newfoundland specimens from coniferous wood!"

In retrospect it is easy to see that finding it on conifer had derailed my memory and imagination. Multiple hosts are not unusual for *Fomitopsis*. After all, *F. pinicola* is notorious for its very high diver-

Photo: Maria Voitk

Photo: Andrus Voitk

Photo: Maria Voitk

sity of host species: although in Norway it is most common on conifers and *Alnus* spp. Therefore, the ability of *F. ochracea* to infest both hardwood and softwood should have been expected.

Quite likely there are many specimens of *F. ochracea* in Canadian herbaria filed as *F. pinicola* (see next page for FNL collections) and a review will no doubt show that the species has a wide distribution in the country. It will be more than remarkable if it does not occur in the area between Alberta and Newfoundland, since there is a wide continuous zone with suitable hosts between the two provinces. It will also be interesting to learn whether *F. ochracea* is a real boreal species, primarily endemic in Canada, or whether it is common in the United States as well. I should be very interested to hear of any new information about its distribution <Leif.ryvarden@bio.uio.no>.

References

1. Stokland J, Ryvarden L: *Fomitopsis ochracea*. Synopsis Fungorum, 25:44-47. 2008.
2. Voitk A: Requiem for a conk. Omphalina 2(2):9-11. 2011.

Illustrations: The many faces of *Fomitopsis ochracea*. Opposite page: on conifer; top to bottom: young conks in April, more mature one in June, mature conk in September. This page: on birch; young to mature conks between January and April.

Editorial comment:

How common is *Fomitopsis ochracea* in Newfoundland and Labrador?

As opposed to *Fomitopsis pinicola*, which looks the same on deciduous and coniferous wood (Omphalina, 2(2):12-13), *F. ochracea* seems to be lighter on birch (Omphalina, 2(2):9-11), and darker on coniferous wood.

Shown are all photos of "*F. pinicola*" from our forays. Of 18 photos, two are of the underside (2006-9948, 2007-6814), preventing identification. Of the remaining 16, only 4 have the red laccate band of *F. pinicola* (2008-4434, 2009-3492, 2009-3560, 2011-3585). 12 all look like *F. ochracea*. One looks like it grows on birch (2007-6830—host not noted), and 11 have the appearance of *F. ochracea* on conifer. The host tree was marked only for two, conifer both times (2006-0157, 2008-4434); the first is *F. ochracea* and the second *F. pinicola*.

Omphalina, 2(4):12 shows cross sections of *Fomitopsis*; 1 picture of 3 (the last) is *F. ochracea* on conifer, the other two *F. pinicola* on conifer.

If our foray photos are representative, *F. ochracea* seems to be commoner than *F. pinicola*, growing mostly on conifer. Like *F. pinicola*, *F. ochracea* is uncommon on deciduous wood. On the West Coast (2004) and the Avalon (2006, 2007), it seems to be the commoner species. In Central Newfoundland and along the Main River (2008, 2009, 2011) *F. pinicola* seems to be the commoner. Both are uncommon in Labrador and the Great Northern Peninsula. (Photos: Roger Smith)


CM
2007-6686


2009-3492


CM
2007-6814


2009-3560


CM
2007-6830


2011-3585


2008-4434


2011-3623

THE BLUE MIATA

Andrus & Maria Voitk

One upon a time, when they were very young, A bought M a blue Miata (OK, used). It had just come out and was exciting and cute, and they were, as said, young (OK, in their 50-s). M loved it! They had not paid a lot of attention to cars before, but thought blue sports cars were unusual. Now it seemed that every day, all they saw was blue Miatas. Everywhere!

In Newfoundland guttation by growing F. pinicola *is uncommon. Breeding studies suggest that* F. pinicola *is a species complex of at least three morphologically similar species, one in Europe and two in North America. Is it possible that the genetic programming for guttation is present in the European species, but not in that found in Newfoundland—guttation may provide macroscopic means to differentiate some cryptic species.*

A helped pen the above eminently forgettable lines in an article on guttation, the activity of some mushrooms to secrete water during periods of active metabolism.[1] That was his impression, but before writing it he checked with our mycologists and naturalists, who spend a lot of time outdoors observing natural history phenomena. All agreed with A that ours do not guttate, so the words were writ. Here is M's spectacular record of the blue Miata phenomenon. Seems that those words made every metabolically active *Fomitopsis* in Newfoundland and Labrador weep—note the guttation "holes", above.

Reference

1. Parmasto E, Voitk A: Why do mushrooms weep? Fungi 3(4):15-17. 2010.

The Bishop's Sketchbook

ADDENDUM TO 2011 FORAYSPECIES LIST

LEIF RYVARDEN, ANDRUS VOITK

After the 2011 Foray Report was out, Leif Ryvarden sent in a list of polypores, corticates and relatives that he had collected during the foray and taken home to identify. There were 87 collections of 67 species, 64 from the Main River area and 10 (green) from Terra Nova National Park (TNNP), all from the Sandy Pond Trail, led by Leif. 47 species (highlighted) were new to our cumulative list, 45 from Main River and 2 from TNNP.

Most of the time when this has happened in the past, the numbers have been relatively small, and the collections have been entered in our database first, usually with a copy left here. We have revised the list to change the names or added the few additional species names, without much ado. These collections, however, did not go through our database, and their number is so significant that this warrants an Addendum to the Foray Report.

Adding these specimens to our database brings the total cumulative species recorded since 2003 to 1,163. The total species from Main River is now 259 and from TNNP 160. Updated species lists for the 2011 Faculty Foray at Main River, the 2011 Annual Foray at TNNP, and the cumulative list have been posted on our website.

Leif's list follows, with his collection number. White on black background indicates that the specimen was judged to be so common that it was not kept. The others have all been deposited in the Mycological Herbarium of the University of Oslo (O).

NAME	AUTHORITY	Host	Location	Leif number
Amphinema byssoides	(Fr.) Erikss.	*Betula papyrifera*	Big Steady	48668
Amphinema byssoides	(Fr.) Erikss.	*Betula papyrifera*	Rivermouth	48773
Amphinema byssoides	(Fr.) Erikss.	*Betula papyrifera*	TNNP-Sandy Pond	48797
Antrodia heteropmorpha	(Fr.) Fr.	*Picea mariana*	Big Steady	48687
Antrodia serialis	(Fr.) Donk	*Picea mariana*	TNNP-Sandy Pond	48791
Antrodia variiformis	(Pk.) Donk	*Picea mariana*	Big Steady	48728
Antrodia variiformis	(Pk.) Donk	*Picea mariana*	TNNP-Sandy Pond	48758
Athelia epiphylla	Pers.	*Betula papyrifera*	Big Steady	48735
Athelopsis subinconspicua	(Litsch.) Jülich	*Picea mariana*	Deep Valley	48775
Boidinia propinqua	(Jackson & Dearden) Hjortstam & Ryvarden	*Picea mariana*	Deep Valley	48709
Boidinia propinqua	(Jackson & Dearden) Hjortstam & Ryvarden	*Picea mariana*	Rivermouth	48780
Botryobasidium isabellinus	(Fr.) Rogers	*Betula papyrifera*	Rivermouth	48803
Botryobasidium vagum	(Overh.) Parmasto	*Picea mariana*	Big Steady	48746
Ceraceomyces eludens	K.-H. Larsson	*Picea mariana*	Big Steady	48749
Ceraceomyces microsporus	K.H. Larsson	*Picea mariana*	Big Steady	48808
Cinereomyces lindbladii	(Berk.) Jülich	*Picea mariana*	TNNP-Sandy Pond	48789
Coniophora olivacea	(Fr.) P. Karst.	*Picea mariana*	Deep Valley	48713
Dacryobolus sudans	Fr.	*Picea mariana*	Big Steady	48736
Diplomitoporus crustulinus	(Bres.) Domanski	*Picea mariana*	Big Steady	48748
Fomitopsis ochracea	Stokland & Ryvarden	*Picea mariana*	Big Steady	48800
Fomitopsis ochracea	Stokland & Ryvarden	*Picea mariana*	TNNP-Sandy Pond	48767
Fomitopsis pinicola	(Sw.:Fr.) P. Karst.	*Picea mariana*	Big Steady	48768
Fomitopsis pinicola	(Sw.:Fr.) P. Karst.	*Picea mariana*	Deep Valley	48768
Fomitopsis pinicola	(Sw.:Fr.) P. Karst.	*Picea mariana*	TNNP-Sandy Pond	48794
Fomitopsis rosea	(Fr.) Karst.	*Picea mariana*	Sandy Pool	48806
Gloeocystidiellum leucoxanthum	(Bres.) Boidin	*Salix* sp.	Rivermouth	48774
Gloeocystidiellum porosum	(Berk. & Curtis) Donk	*Betula papyrifera*	Rivermouth	48779
Gloeodontia subasperispora	(Litsch.) K.H Larsson & E. Larsson	*Picea mariana*	Rivermouth	48684
Gloeoporus taxicola	(Fr.) Gilb. & Ryvarden	*Picea mariana*	Deep Valley	48712
Gloiothele lactescens	(Berk.) Donk	*Betula papyrifera*	Rivermouth	48771

NAME	AUTHORITY	Host	Location	Leif number
Henningsomyces candidus	(Fr.) Kuntze	*Picea mariana*	Big Steady	48732
Henningsomyces candidus	(Fr.) Kuntze	*Picea mariana*	Rivermouth	48731
Hymenochaete cinnamomea	(Pers.) Bres.	*Betula papyrifera*	Rivermouth	48666
Hymenochaete fuliginosa	(Pers.) Bres.	*Picea mariana*	Big Steady	48726
Hyphoderma argillaceum	(Bres.) Donk N Abies 48688	*Abies balsamea*	Deep Valley	48688
Hyphoderma setigerum	(Fr.) Donk	*Picea mariana*	Deep Valley	48706
Hyphodontia alutaria	(Burt) J. Eriksson	*Picea mariana*	Big Steady	48710
Hyphodontia alutaria	(Burt) J. Eriksson	*Picea mariana*	Deep Valley	48717
Hyphodontia alutaria	(Burt) J. Eriksson	*Picea mariana*	Rivermouth	48733
Hyphodontia aspera	(Fr.) J. Eriksson	*Picea mariana*	Deep Valley	48721
Hyphodontia breviseta	(Fr.) Eriksson	*Picea mariana*	Big Steady	48698
Hyphodontia pallidula	(Bres.) J. Eriksson	*Picea mariana*	Deep Valley	48702
Hyphodontia pallidula	(Bres.) J. Eriksson	*Picea mariana*	TNNP-Sandy Pond	48786
Leifia flabelliradiata	(Erikss. & Hjortstam) Ginns	*Picea mariana*	Rivermouth	48778
Leucogyrophana romellii	Ginns	*Picea mariana*	Rivermouth	48772
Mucronella calva	(Fr.) Fr.	*Picea mariana*	Big Steady	48751
Paullicorticium allantosporum	J. Eriksson	*Picea mariana*	Rivermouth	48683
Peniophorella puberua	(Fr.) Wallroth	*Picea mariana*	Rivermouth	48772
Phanerochaete sordida	(P. Karst.) J. Eriksson. & Ryvarden	*Picea mariana*	Big Steady	48703
Phanerochaete sordida	(P. Karst.) J. Eriksson. & Ryvarden	*Picea mariana*	Deep Valley	no nr
Phanerochaete velutina	(Fr.) Eriksson	*Betula papyrifera*	Sandy Pool	48805
Phellinus chrysoloma	(Fr.) Donk.	*Picea mariana*	Big Steady	48750
Phellinus chrysoloma	(Fr.) Donk.	*Picea mariana*	Deep Valley	48744
Phellinus chrysoloma	(Fr.) Donk.	*Picea mariana*	Rivermouth	48778
Phellinus chrysoloma	(Fr.) Donk.	*Picea mariana*	TNNP-Sandy Pond	48795
Phellinus ferreus	(Pers.) Bourdot & Galzin	*Betula papyrifera*	Rivermouth	48670
Phellinus igniarius	(Fr.) Quelet	*Betula papyrifera*	Rivermouth	48671
Phellinus laevigatus	(Fr.) Bourdot & Galzin	*Betula papyrifera*	Rivermouth	48770
Phlebia livida	(Fr.) Bres.	*Picea mariana*	Big Steady	48741
Phlebiella christiansenii	(Parmasto) K.H. Larss. & Hjortstam	*Picea mariana*	Rivermouth	48690
Phlebiopsis gigantea	(Fr.) Rattan	*Abies balsamea*	Big Steady	48743
Postia caesia	(Fr.) Gilb. & Ryvarden	*Picea mariana*	Rivermouth	48764
Postia sericeomollis	(Romell) Bourdot	*Picea mariana*	Big Steady	48759
Resinicium bicolor	(Fr.) Parmasto	*Abies balsamea*	Deep Valley	48693
Scytinostroma galactinum	(Fr.) Donk	*Picea mariana*	Big Steady	48692
Scytinostroma galactinum	(Fr.) Donk	*Picea mariana*	Deep Valley	48692
Scytinostroma galactinum	(Fr.) Donk	*Picea mariana*	Rivermouth	48773
Scytinostroma galactinum	(Fr.) Donk	*Picea mariana*	TNNP-Sandy Pond	48787
Sistotrema octosporum	(Höhnel& Litsch.) Hallenberg	*Fomitopsis pinicol*	Big Steady	48755
Sistotremastrum suecicum	J. Eriksson	*Abies balsamea*	Big Steady	48742
Stereum hirsutum	(Willd.:Fr.) Pers.	*Betula papyrifera*	Big Steady	48804
Stereum ochraceoflavum	(Schw.) Ellis	*Salix* sp.	Deep Valley	48720
Stereum rugosum	(Pers.) Pers.	*Betula papyrifera*	Big Steady	48737
Stereum sanguinolentum	(Alb. & Schw.:Fr.) Fr.	*Picea mariana*	Deep Valley	48711
Stypella subgelatinosa	(P. Karst.) P. Roberts	*Abies balsamea*	Big Steady	48752
Stypella vermiformis	(Berk. & Br.) P. Roberts	*Picea mariana*	Deep Valley	48700
Trechispora confinis	(Bourd. & Galzin) Liberta	*Picea mariana*	Big Steady	48761
Trichaptum abietinum	(Fr.) Ryvarden	*Picea mariana*	Big Steady	48734
Trichaptum abietinum	(Fr.) Ryvarden	*Picea mariana*	Deep Valley	48724
Trichaptum fuscoviolaceum	(Fr.) Ryvarden	*Picea mariana*	Big Steady	48728
Trichaptum laricinum	(P. Karst.) Ryvarden	*Picea mariana*	Big Steady	48725
Tyromyces chioneus	(Fr.) P. Karst.	*Betula papyrifera*	Big Steady	48708
Vararia gallica	(Bourd. & Galzin) Boidin	*Picea mariana*	Rivermouth	48781
Vararia racemosa	(Berk.) Jackson & Rogers	*Abies balsamea*	Deep Valley	48695
Veluticeps abietina	(Fr.) Hjortstam & Nakasone	*Picea mariana*	Big Steady	48727
Xenasmatella vaga	(Fr.) P. Karst.	*Picea mariana*	Rivermouth	48682
Xenasmatella vaga	(Fr.) P. Karst.	*Picea mariana*	TNNP-Sandy Pond	48792

BRIEF COMMENT ON THE DATA

This collection demonstrates the Visiting Specialist Effect at its extreme: of the 47 new species collected by Leif, only three were collected at the same foray outside his "private collection". And as the nine black numbers show, some were so common that they were deigned not worth keeping! In addition, Leif stated that several common species were noted, but not collected, since they already appeared in our 2011 lists.

Because they bypassed our databasing, we have no specimens. This is not a problem, because collections deposited in the Oslo Herbarium will be available on loan to scientists wishing to investigate some of our species. However, we also do not have photos of these species, new to us.

The Faculty Foray took place before the Annual Foray, so that some species collected at Main River may have been skipped as repeats in TNNP. Also, there were three collecting days along Main River, and only one in TNNP. Even after taking these differences into account, it seems that the disproportionately higher number of species collected at Main River (64) than the 10 from TNNP is significant. This difference was even more evident with respect to new species: 45 at Main River and 2 in TNNP. The same sort of discrepancy in diversity was seen at the foray as a whole.

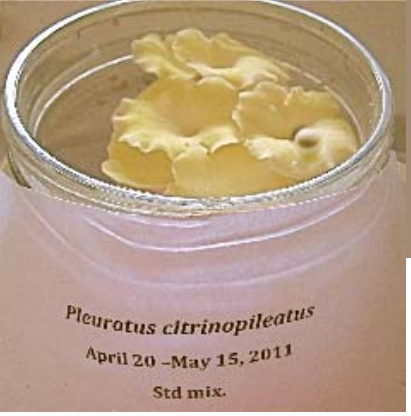
One of the more interesting results of Leif's collecting was a much fuller understanding of the species *Fomitopsis ochracea*. As explained, looking back on our own experience we now suspect it is a very common species in our province, possibly more common than the *F. pinicola* with which it has been confused, and most often found on coniferous wood. We are very curious to hear reports from other areas in North America about the distribution of this species.

You did not miss the *Leifia* in Leif's list, did you?

Leifia flabelliradiata on *Alnus incana*. White annual corticate (resupnate) mushroom with frond-like, fibrillose margin. Grows on hardwood. Causes white rot. Known from northern North America and Europe.

The genus *Leifia* was erected by Canadian mycologist Jim Ginns, naming it to acknowledge the contributions of Leif Ryvarden to the systematics of Hymenomycetes.

Photo courtesy of Heikki Kotiranta, Helsinki.



BOYLE'S PEARLS

DAVID BOYLE

Dear David,

Do basidiomycota reproduce asexually as well as sexually?

If I could maintain the right conditions in the bag of sawdust that I have my oysters living in (on their second flush right now), would they reproduce indefinitely, or what will cause the reproduction to stop? Would I need another "mating type" of the same species to propagate the mushrooms? Does one species produce more than one mating type itself? Clearly I need to do more reading about this, but pesky math, chemistry and physics finals are getting in the way...
Jeff Siddall, Meadows

Dear Jeff,

Your questions are good, and bring up lots of areas for discussion. I shall try to answer them piece meal.

However, first I must say that I think you should drop the math, chemistry and physics and take something useful, like mycology. Mushrooms will soon inherit the earth, so why waste your time on all that silly stuff?

Do basidiomycota reproduce asexually as well as sexually?

The short answers are "Yes", "Yes" and "Yes". Fungi (including Basidiomycetes like Oyster mushrooms) do it sexually, asexually, and every other way.

Asexual. Fragments of the mycelium (the fuzzy growth that supports the mushroom) can form an infinite number of genetically identical clones. In fact, this is how spawn (mushroom "seed") is made: small pieces of mycelium from a suitable starter culture (or from the upper part of a mushroom's stem where it joins the cap) are aseptically transferred to fresh medium. After contaminating organisms (e.g. bacteria, moulds) are eliminated (not always easy), new colonies will grow from the fragments. These can be further broken up and used to inoculate more medium, and so on, to give the desired quantity of colonies (bottles, bags, whatever).

The mycelial fragments can be very small. As long as pieces of hyphae (the tubular cells of which the mycelium are composed) are long enough that they contain cells with intact septa at either end, there is a chance for growth if they land on the right substrate. Mushroom cultivators can take advantage of this feature. Mycelium can be aseptically blended with sterile water in a food processor for a minute or so, and each of the thousands of little pieces can be grown on fresh medium, giving new, genetically identical clones. (Do not try this with humans).

This type of asexual reproduction can also happen in nature. For example, a deer's hoof might serve to transfer a plug of mycelium from one part of the forest floor to another, which might make someone who did DNA fingerprinting of the colony think that it was a very large (and very old!) clone. Some fungi make specialized mycelium that fragments more easily, thereby facilitating asexual reproduction. Wind or rain could easily move mycelial fragments. Basidiomycetes (and many other fungi) are proficient at asexual reproduction.

Sexual. Many mushrooms (including oysters) do this via basidiospores. Millions (or even billions) of spores form on microscopic structures called basidia. Oyster mushrooms can release so many spores that they can clog up the ventilation fans of mushroom farms!

These basidiospores generally contain haploid nuclei (contain half the normal chromosomes, 1N). They discharge from the gills at maturity, and after landing on a suitable substrate may germinate to give a 1N mycelium (monokaryon). This monokaryon can grow through the substrate, sometimes for an extended period, until it meets a different, hopefully compatible monokaryon with which it may fuse. This would produce cells with a full set of chromosomes (dikaryon, 2N), which can make mushrooms, and that is where sexual reproduction occurs.

In oysters and many other mushrooms, two mating type genes (lets call them A and B) control whether two monokaryons are compatible, so they can mate. Each of these genes from the mushroom may have one of two alleles (A1 or A2; B1 or B2). Both alleles must differ for two monokaryons to be compatible. For example, A1B1 will cross with A2B2, but not with A1B1, A1B2, or A2B1. Thus, 25% of the monokaryons from the same mushroom will be compatible with each other. When the monokaryons come from different individuals of the same species, this proportion may be much higher, since different individuals usually have different mating type alleles (A3B3, or A4B3, or A9B22, depending on how many alleles there are in the

population). Any of them might cross with A1B1 or A2B2 from the first mushroom, since the alleles of both genes differ. To some degree relatedness between mushroom individuals can be quantified by measuring their percentage of compatible monokaryons. Outbreeding is favored by this system, but not to the exclusion of inbreeding.

In the dikaryon, the two nuclei reproduce separately as the hyphae grow, but sexual reproduction (mixing of the genetic material or fusion of the genetic material in both nuclei) does not occur—yet. The dikaryon will continue growing until some signal (rain, temperature change, CO_2 concentration change) triggers it to have sex. To mark the occasion, the dikaryon elaborates mushrooms. Within the gills of the mushroom, in the base of the basidium, sexual recombination happens: the two nuclei fuse and their genetic material combines (Yipee!). Then it splits again (meiosis) and once again, millions of genetically distinct 1N spores are produced. And so the cycle continues.

Your oyster culture is a shameless dikaryotic mycelial culture that is probably having both sexual and asexual reproduction, right in front of you!

If I could maintain the right conditions in the bag of sawdust that I have my oysters living in (on their second flush right now), would they reproduce indefinitely, or what will cause the reproduction to stop?

As far as keeping the same (dikaryotic) oyster culture making mushrooms, normally one gets a series of crops (flushes—congratulations for having the right term!), each successive one with a smaller yield. Are the nutrients running out? Possibly. With shiitake mushrooms, I measured the nitrogen and carbon concentrations in blocks after four flushes. Although the dry weight of the blocks had dropped about 75%, the concentrations of most micronutrients that I could measure (N, PO_4, etc) did not drop a lot. However, possibly they were not in the right form. For example, if the mushroom can digest only lignin, and cellulose is left, then the carbon and other good stuff in the cellulose is not available to the mushroom. It would be interesting to test the nutrient limiting idea. Perhaps adding a nutrient solution to 'stalling' mushroom cultures would increase yields. To this end, a hydroponic mushroom production system might have some possibilities.

Photo: Jeff Siddall

From a practical point of view, the end of a mushroom crop is often brought on by contaminants, usually other fungi. *Trichoderma* sp. is very common, and is quite happy to grow on oyster mushrooms. It might scupper the above experiment. However, if tests were made in a sterile growth room that excluded contaminants, nutrient addition might keep the mushrooms coming.

There may be other possibilities. For example, maybe the supporting dikaryotic mycelium's libido has faltered, or whatever the equivalent might be for oyster mushrooms. Ironic, since oysters are considered aphrodisiacs. Who knows, maybe adding a virile young mycelium to the spent substrate would result in renewed crop production. This may already be happening as the spores of the current crop rain down onto the substrate, germinate, and 25% of the resulting monokaryons anastomose in the hopes that it may soon be their turn. Maybe this process could be hurried along through judicious use of the equivalent of mushroom Viagra! Still, the cultured oysters in my title photo may look flaccid compared to Jeff's tumescent bagful, but mine have a pearl (cultured, of course). No question, but mycology could be a lot more exciting than dry old math, chemistry or physics!

Mushroom Photography: Get the most from your Autofocus

Jim Cornish

If you have read an followed the advice in past articles, you are keeping the camera steady, composing the picture and selecting the right aperture for the best depth-of-field. These are important steps for shooting great mushroom photographs. However, unless you control the focus, you will be cheated out of your great shot.

This article, explains how the auto focus (AF) system and AF lock works on a P&S camera, and provides some tips on how to work with these camera features to create quality images. The next article will show how you can manually bypass the autofocus in close-up work.

Determining correct exposure and sharpest focus are the last decisions a P&S camera makes before finally taking a photograph. The process is largely automatic, completed by the camera when the shutter release is pressed halfway. Since sharp focus and proper exposure often play a large role in our decision to either keep or delete an image, getting these settings right in the field is critical. While exposure, colour saturation, image brightness, and cropping can be adjusted in software later, there is no fix for poor focus in an image already shot.

The P&S Auto Focus System

As its name suggests, a P&S camera's AF system is activated automatically. Whenever the shutter release button is pressed half way down, the camera emits a pulse of infrared light called an AF assist beam, from an opening usually located near the viewfinder. This beam is reflected by the subject back to the camera. A microprocessor in the camera computes the difference between the time the beam was sent and the time the reflected beam returns to determine the exact camera-subject distance. Based on that computation, the microprocessor instructs the focus motor to turn the lens to where a sharp focus will be achieved. This all happens in less than the blink of an eye! To take the photograph, the shutter is pressed the rest of the way.

Infrared focus assist beam of P&S camera when the shutter button is depressed half-way.

Troubleshooting AF Challenges

Because a point-and-shoot's AF system is light based, it can be fooled under some shooting conditions, such as photographing mushrooms close up. Obstructions such as twigs and leaves between the mushroom and the camera may block or deflect the outbound and/or inbound infrared light beam and prevent the camera's electronics from accurately determining the camera- subject distance. The result is an incorrect focusing of the lens, therefore a blurred image. This is easily fixed by clearing the path between the camera and the mushroom. This may seem rather obvious, but often the obstructions are not visible in the viewfinder or upon viewing the image on the LCD, particularly in bright light. It is not until much later, when the image is loaded onto a computer, that the focus problem is discovered. Then, it's too late to do a retake.

Cortinarius caperatus. *Note large out-of-focus branch in left foreground, spoiling picture. It was sufficiently blurry that it was not obvious in the viewfinder. The same branch in the middle could block or deflect the infrared focus beam, result in a blurred mushroom, not visible until you get home.*

Certain lighting conditions like black surfaces, bright subjects and bright lighting (even candle light) can affect the AF system. Black surfaces may absorb some of the infrared light and bright lights might make it difficult for the camera to "see" the reflected infrared beam. This too can be easily fixed. Focusing on a surface other than a black one will eliminate light absorption. Shading the subject will help eliminate the brightness problems.

Auto Focus Lock

Subject placement may also cause problems for the AF system. P&S cameras have their focusing sensor centered in the viewfinder. If the mushroom, or any other subject, is not exactly in the middle of the viewfinder, the beam can go right past it and bounce off something in the background. The result is that the wrong part of the image is in focus. Centering the subject will solve the focusing problem, but it may create a compositional one. Quite often, a slightly off-centered subject is creatively better. Fortunately, the camera has some built-in technology to solve this problem—the autofocus (AF) lock.

As its name suggests, AF lock means the camera is deliberately focused on the subject, and the focus is locked at that exact distance until the picture is taken. The follow steps will engage AF lock on just about any camera, P&S or dSLR.

1. Look through the viewfinder and position its central focus point on the most important part of the scene, usually the main subject.

2. Press the shutter button halfway down, until the green "focus OK" light in the viewfinder glows steadily.

3. While holding the shutter button halfway down, reorient the camera so that your desired composition appears in the viewfinder.

4. Press the shutter button all the way down to take the picture.

Some advanced P&S cameras may have a separate button dedicated to AF lock which does not require the use of the shutter release, likely marked by an asterisk.

Today's P&S cameras are nearly as sophisticated as some of the top selling dSLR cameras. In fact, some of the image processing capabilities being added to the latest P&S cameras can only be done using post processing software on images shot with the latest dSLR. Differences between the two camera types is decreasing rapidly. In fact, when some professionals have to do a fast shoot, some of them will whip out their P&S to get the job done. Some day soon, we will all be using P&S cameras with interchangeable lenses and full framed sensors—a very familiar concept to those who once owned the early version of some P&S film cameras.

Shiitake dermatitis alert

Michael W Beug

Photo: Michael Burzynski

History Shiitake dermatitis was first reported by Nakamura in 1977[1],who later reviewed 51 cases[2]. The cause is consumption of either raw or only lightly cooked Shiitake. The syndrome was long thought to be restricted to Asia since most of the world's production of Shiitake [*Lentinula edodes* (Berk.) Pegler] occurs in Asia. However, a case was reported in England in 2006[3] and in France in 2010[4]. The February 18, 2011 New York Times carried an article by Lisa Sanders, MD, about a 56 year-old Portland, Oregon woman who developed a rash that initially stumped her dermatologists, until one of them enquired whether she had recently consumed raw or undercooked Shiitake.[5] She had tasted a sample at her local grocery store three days before the rash appeared. Googling "shiitake dermatitis" reveals a surprising number of descriptions from North America.

Clinical presentation The rash is a flagellate dermatitis, resembling that caused by Bleomycin, a sulfur-containing polypeptide derived from *Streptomyces verticillus*. Flagella means small whip and the rash appears as longitudinal streaks, as if the victim had been flogged (or has been vigourously scratching a poison oak rash). It usually begins about 48 hours after consumption of raw or undercooked Shiitake and lasts for about 10 days. Typically, the initial longitudinal red streaks neither hurt nor itch. Soon red blisters follow and harden over the streaks. The streaks then turn to purple raised welts that persist for days. The rash may appear all over the body, is relatively symptomless, but has been reported along the throat and upper airway, where it may cause critical breathing problems.

Pathophysiology The rash is a toxic reaction, not allergic, and is believed to result from lentinan, a starch-like polysaccharide found in *Lentinula edodes*. It is decomposed upon heating, so that only consumption of raw or partially cooked Shiitake poses a problem. Lentinan triggers blood vessels to dilate, allowing small amounts of inflammatory compounds to leak out just beneath the skin. Because it is not an allergic reaction, it is not reproduced by the prick tests used by dermatologists to diagnose allergy. Since the immune system is not involved, there is no initial pain or itch. As irritants leak into the tissues some degree of discomfort may eventually be felt. Because the pathogenesis is toxic, anti-inflammatory drugs like antihistamines and cortisone have little effect on the pathogenesis, but may alleviate symptoms in the later phase.

Lentinan has antitumor activity and is used as an adjunctive treatment for colorectal and gastric malignancies in Japan.[6] Because it is used medicinally, a fair amount is known about it. Of over 500 patients given intravenous lentinan, only nine developed this streaky rash. This helps to explain why the rash is still not very well known in North America. Less than 2% of people eating raw or undercooked Shiitake are likely to be affected.

Other reactions to Shiitake In addition to the toxic Shiitake dermatitis, consumption of large amounts of raw Shiitake in individuals may lead to an allergic response.[7] Sensitized individuals react strongly when pricked with raw Shiitake but not with cooked Shiitake, indicating that they have developed an allergy. Some workers in Shiitake grow houses develop an eczema-like rash due to Shiitake specific immunoglobulin.[8] There are also documented cases of allergic and chronic hypersensitivity pneumonitis induced by spores of Shiitake.

Information about this toxic reaction to mushrooms will be added to the toxic mushrooms syndromes page on the NAMA website <www.namyco.org> as part of an effort to provide detailed information about the varied causes of mushroom poisoning in one convenient location.

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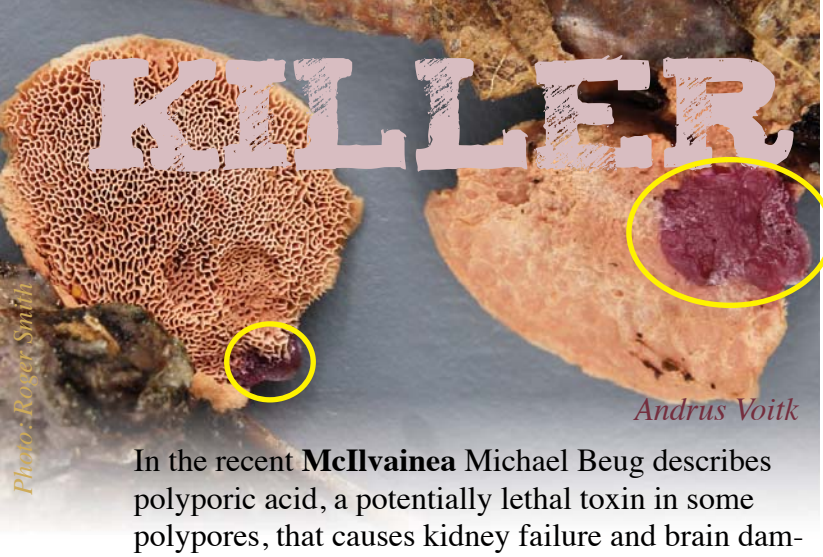
KILLER CONKS



In the recent **McIlvainea** Michael Beug describes polyporic acid, a potentially lethal toxin in some polypores, that causes kidney failure and brain damage. Such conks turn violet on contact with KOH (circled in the title banner). We have identified three polypores in Newfoundland and Labrador that turn violet with KOH, a presumed sign of polyporic acid. There may be more mushrooms with these toxins and other chemicals may also turn purple with KOH. Polyporic acid is closely related to vulpinic acid, found in *Vulpicida pinastri*, the beautiful powdered sunshine lichen used to kill foxes [Omphalina II(7):13, Aug 2011]. Fungi with these toxins produce beautiful pigments for dyeing. Here is a brief description of the three conks.

Hapalopilus nidulans. Title banner and upper photo. Found on birch and alder, reported rarely on conifer. Annual, August-November. Causes white rot. Loosely attached. Gregarious to nestled conks, 2-8 x 0.5-4 x 1.5-6 cm. Cap cinnamon, finely fuzzy, azonate, smoothly radially ridged in age. Edge sharp. Context light brown. Poremouths brown, pores round to irregular, 2-4/mm. Sporeprint white.

Leptoporus mollis. Middle photo. On conifers only, primarily spruce. Annual, May-August. Causes cubical brown rot. Firmly adherent, often incorporating surrounding matter. One to a few conks, 3-8 x 1.5-4 x 3-10 cm. Cap white to pink, turns red with handling; ferrous brown and insect-eaten in age; thick stubby hair in youth, becomes velvety, azonate. Edge blunt. Context white, soft, stains red. Poremouths white to pink, stain red; pores round to irregular, 2-4/mm.

Pychnoporellus fulgens. Lower photo. Found on birch and fir, reported often on wood invaded by other polypores. Annual, May-August. Causes cubical brown rot. Firmly adherent, often incorporating surrounding matter. Several fused conks, 4-10 x .5-3 x 2-8 cm. Cap bright orange, markedly hairy in youth, smoothly ridged in age, strongly zonate. Edge sharp. Context orange. Poremouths orange, pores angular, irregular, partly lacerated, 2-3/mm. Sporeprint light.

Meet the Boreal Felt Lichen

Mac Pitcher

Named Boreal Felt Lichen, by Nova Scotia lichenologist Wolfgang Maass, it is also known by the scientific binomial, *Erioderma pedicellatum*.

Look for this conspicuous grayish to khaki-coloured lichen, often at about eye-level, on the boles of old Balsam Fir of relatively small-diameter, most frequently in moist sites. It also rarely occurs on twigs. It occurs more widely on the Avalon Peninsula and South Coast, often accompanied by the reddish-brown tree liverwort *Frullania asagrayana* and by the somewhat similar looking (and related) lichen *Coccocarpia palmicola*.

This attractive macrolichen of moist coastal conifer forests was first found in Newfoundland by Teuvo Ahti in 1956, in the vicinity of Swift Current. It was subsequently found at many Newfoundland locations during the early eighties by Wolfgang Maass in his extensive lichenological explorations of the island and of southern Labrador. Wolfgang was also responsible for a number of finds of the species in Nova Scotia.

The Ahti collection remained unidentified in the herbarium at Helsinki for nearly fifteen years, until examined by the leading authority on lichens in this family (the Pannariaceae), Per Magnus Jørgensen of Norway. Jørgensen (Ahti & Jørgensen 1971) determined this lichen to be *Erioderma boreale*, described in 1948 by Swedish lichenologist Sten Ahlner and reported as being endemic to Norway and Sweden. Jørgensen also determined that BFL had been found by W. G. Farlow in New Brunswick in 1902. At that time, the species was described as new to science (Hue 1911), and given the name *Pannaria pedicellata*. In 1972 Jørgensen examined material from both North American and Scandinavia, and determined them to be the same species. He assigned the name *Erioderma pedicellatum*, a combination of the two.

Today Boreal Felt Lichen is of Special Concern, even if well-represented in Newfoundland; endangered in Nova Scotia; and extinct in New Brunswick.

Photo: Claudia Hanel

The species also occurs on the IUCN Red List as critically endangered. In recent years, the species has also been found in Denali Park, Alaska, and in north-east Siberia. While it still occurs in Scandinavia, at present a single thallus is known in Norway, and the species has not been seen since the 1940's in Sweden. Indeed, it appears the species has never been common in Scandinavia, and all historic Norwegian records combined identify a total of only 14 thalli.

During the mid- 1990's, the presence and possible rarity of Boreal Felt Lichen was brought to the table during the District One Forest Ecosystem Planning Process of the former Department of Forest Resources (and Agrifoods). Initially dismissed as of no concern, considerable effort was (and continues to be) expended by both NGO and government agencies, with the net result that the species was listed by COSEWIC for Newfoundland in 2006 as Special Concern. Although not as rare in this province as initially assumed, Boreal Felt Lichen appears to have the bulk (estimated 99%) of its global population here. Consequently, Newfoundland has an international responsibility to ensure the health and persistence of this species.

Dr. Christoph Scheidegger, lichen specialist of the International Union for the Conservation of Nature, has referred to the Boreal Felt Lichen as 'the Panda Bear of lichens", and a "flagship species" because it is globally rare, and both distinctive and conspicuous. It is representative of a whole suite of other less "attractive" lichens which are in peril globally from the combined threats of habitat loss, air pollution and climate change.

In Newfoundland, this rare lichen community is further threatened by habitat loss arising from over-browsing by the introduced moose. Balsam Fir, the preferred tree species of Boreal Felt Lichen in Newfoundland, is being gradually replaced by spruce due to the over-browsing. A similar fate haunts other rare Newfoundland lichens that thrive on old-growth Yellow Birch. As these old trees die and collapse, they are not being replaced since moose are browsing the regenerating seedlings. Eventually there will be few hospitable trees for these rare lichens, and they may eventually disappear altogether from our landscape.


Photo: Aare Voitk


Photo: Aare Voitk


Photo: Claudia Hanel

Photos illustrate the colour variation seen with this lichen, depending on moisture, light and other variables. Note the association with liverwort.

THE MAIL BAG

OR WHY THE PASSENGER PIGEONS ASSIGNED TO SERVE THE LAVISH CORPORATE AND EDITORIAL OFFICES OF OMPHALINA GET HERNIAS

Hey, if mistakes = more issues of OMPHALINA .....make a few more mistakes.

GREAT newsletter!

Bill Roody

Your review … of Larry Millman's book … is so positive and well reasoned that you would be in great demand as a promoter should I ever strive [for a] career as a writer.

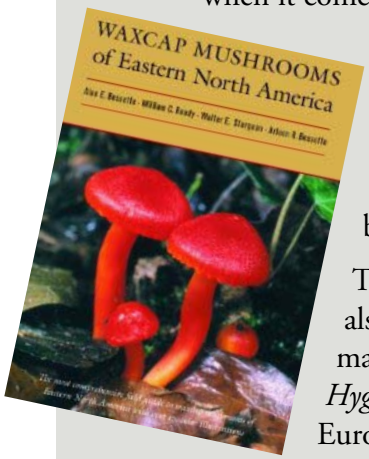
Tony (Wright)

Thank you for the splendid review! I agree with almost every word... Thus far you're the only person who's even mentioned the Lophodermium at the end. For which you get high marks.

Larry (Millman)

Walt Sturgeon, faculty member of the 2012 foray, writes to tell us of a new *Hygrocybe* book to appear soon. It can be preordered at a reduced rate from Amazon at <http://www.amazon.com/Waxcap-Mushrooms-Eastern-North-America/dp/0815632681/ref=sr_1_1?s=books&ie=UTF8&qid=1328557682&sr=1-1>.

One for North America is much overdue, and we suspect this will be well worth having, if these small beauties interest you. We hope to review it for you, when it comes out, but odds are it is a very safe buy. All Besettes-and-friends' books, have been very meticulous, even if some have been a little skimpy of species not found below the 49th parallel.



To complement it, you may also want to get David Boertmann's superb "The genus *Hygrocybe*", primarily treating European species, which has excellent coverage of northern species. Not as easy to get in North America, but you can find European distributors by Googling it.

Response to the Taxonomy issue, updated (mostly because the next issue came too soon and comments kept coming in, and also to fill the page, for goodness' sake!)

Overall good reading, with reference to taxonomy II.
Unbelievable! II *favourable comments on the idea of a Taxonomy issue, even if most were from the pros. (I said taxonomy is "interesting" and I said it is "confusing").*
Breakdown:
Professional mycologists – 4.
Very advanced amateur mycophiles – 6.
"Neophyte" mycophile – 1.

Liked the Macrotyphula article 6.

Liked the Phyllotopsis page (the last-minute non-taxonomic filler, inserted just to make an even number of pages) 4.

Interesting to learn that Hygrocybe nitida is a good and true species 4.
Ed note: The two rticles by David Boertmann have been translated into French by René Lebeuf for publication in the newsletter of the Cercle des Mycologues de Montréal, and have also been slated for reproduction in Mycophile, the newsletter of the North American Mycological Association. We do get around.

The primer on DNA sequencing is a model of its kind 1.

Loved the cover photo 1.

I really loved the Christmas Issue 1.
Ed note: The most diplomatic way yet to comment on the Taxonomy Issue...

Will be sure to try the recipe 1.
Ed note: there was no recipe!

OUR PARTNER ORGANIZATIONS

People of Newfoundland and Labrador, through

- Department of Environment and Conservation
  - Parks and Natural Areas Division
  - Wildlife Division
- Department of Natural Resources
  - Center for Forest Science and Innovation

People of Canada, through

- Parks Canada
  - Terra Nova National Park
  - Gros Morne National Park

Model Forest of Newfoundland and Labrador

- Forest Communities Program

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Memeorial University of Newfoundland

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- St John's Campus

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LICHENS added!

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