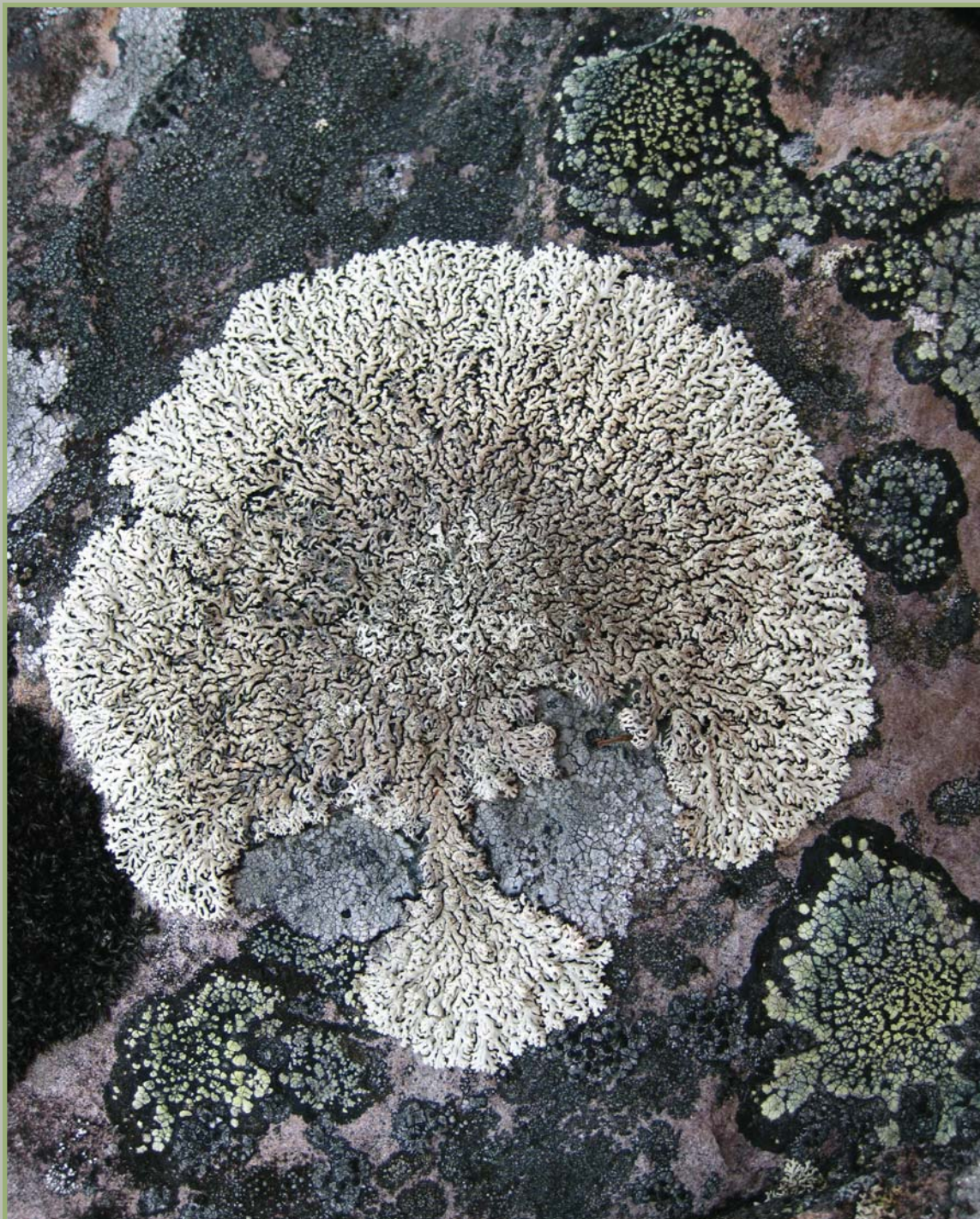




# OMPHALINA

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*Newsletter of*



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May 22, 2013





# 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.*

*Webpage:* [www.nlmushrooms.c](http://www.nlmushrooms.c)

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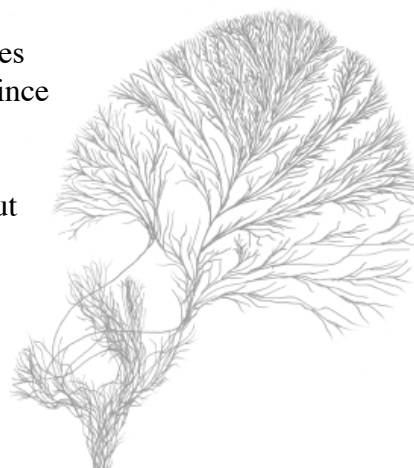
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## COVER

*Tree of Life* by John McCarthy. Compare it to the graphic on the Tree of Life website <[tolweb.org/tree/](http://tolweb.org/tree/)>, a plain image reproduced here.

More about the two *Arctoparmelia* species growing in our province in the lead article, beginning on p. 4. Fact and fiction about the tree of life on p. 21.



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## Message from the Editor

Some of the *Arctoparmelia* photos come from the top of Mt. Ignoble, one of our favourite destinations in the woods near our home. The Editor vignette is from there as well, with Deer Lake in the background (the lake, not the city). By the time you read this, the snow will be gone and a new season well established. This was originally planned as a Mt. Ignoble issue, showcasing several interesting finds from its top, but in the end the main article was pulled. We couldn't identify the featured mushroom with reasonable certainty, and did not think it right to foist it on you under a potentially false name. Not that we have not done that on occasion, as the article on *Naiadolina flavomerulinus* amply demonstrates. However, it is not reasonable to hope that a troika of heavyweights in Canadian, nay, global, mycology will pull our fat out of the fire all the time. Meanwhile, read the *Naiadolina* article and keep your eyes open for *Naiadolina flavomerulina* on its hosts in wet areas. Described as one of Canada's rarest mushrooms, it should grow here, so please look.

--ooo000ooo--

Who would have thought our foray would be full before the end of April? A good thing that we advised members to sign up early—the policy to give members a few weeks lead time over the general public turned out to be a true benefit of membership. Most members were able to take advantage of that and register.

There was a wild scramble just at the end. Very difficult to be fair, especially since folks around Corner Brook have the advantage of hand delivery, not open to those from further out. In the end, our good partner, Shorefast, came through with some extra accommodations, so that all applicants hanging on the finish line could be taken in. Many thanks, Shorefast. However, that was that, so many people will still be disappointed, as we have built up a

waiting list again.

To those for whom we shall not have room, both members and non-members alike, we are very sorry. Except for the last two years, we have always been able to fit in latecomers. So sorry not to be able to do it this time. However, do not despair! Barring unexpected problems, we hope to return to Fogo Island next year. **Renew or take out your membership (see Membership Form on our website) and you will get advance notice of next year's registration.**

To those of you who did register early, a big, big thank you. You cannot imagine how much easier it is to organize the foray, when we know who is coming well ahead of time. This applies to ordering food, assigning housing, determining the number of trails, selecting leaders, and many other things that make planning easier. Doing this at the last minute has always been a nightmare. So, thank you very much. You have earned your Early Bird discount.

--ooo000ooo--

Now that spring is here, **please remember to keep your eyes open for morels this year.** We found our first *Morchella septentrionalis* May 3. Take pictures, measure, collect and dry them and let us know. We'd like to inventory the province, and this is a spring mushroom, one we do not meet during our forays. Surely we have more than this one species!

Happy morelling!  
andrus



**FULLY  
SUBSCRIBED!**

## FORAY MATTERS...

1. **TRAVEL.** We suggest everybody who does not come earlier, aim for the **2:45 ferry from Farewell to Fogo on Fri.** This will likely involve about 20 cars. The ferry can handle this amount, but possibly not 20 cars *in addition to* normal traffic. Some *may* end up waiting for the 5:00 PM ferry. To make sure everybody has a chance to get to the Sign-in desk and find their community and house in daylight, then get some food before the program, the **Reception and supper begin at 7:00 PM.** For the majority, who have arrived earlier, there is so much to see on Fogo Island, that the opportunity to relax and poke around should be delightfully pleasant.

Ferry times are fixed, dictating travel times. Please note the time it takes to drive to Farewell, and the need to be there at least an hour before ferry departure to get on. Like our foray, it is a first-come-first-served system with no reservations.

2. **SIGN-IN** on site begins at The Fogo Island Inn, Joe Batt's Arm, at 3:00 PM, Fri Sep. 6, 2013. If you arrive earlier, please use the time to look around the Island. The Registrars will not be able to man the desk at the Inn earlier.
3. **PROGRAM.** Rough outline to the right.
4. **MISSING MAIL.** If you have registered, but have not received an acknowledgment from the Treasurer-Registrar, Geoff Thurlow, please get in touch with him <geoffthurlow AT gmail DOT com> as soon as you can. We have at least three registrations "lost" and are working with Canada Post on the problem.

### FRI Sep 6

3:00 PM Sign-in desk opens—Fogo Island Inn.  
Sign in, find your house, then return for:  
7:00 PM Reception/Supper—Fogo Island Inn  
8:30 PM President's Welcome—Fogo Island Inn  
8:45 PM Mushroom talks—Fogo Island Inn  
9:47 PM Eventide—go to your rooms and sleep the sound and peaceful sleep of the innocent.

### SAT Sep 7

8:00 AM Breakfast—Barr'd Islands Community Centre  
9:00 AM Forays—various trails  
12:00 NOON Identifiers & DBT members return to start identification  
1:00 PM Lunch—on the trail  
4:00 Return, sort mushrooms— St John The Evangelist Anglican Church, Barr'd Islands  
6:00 PM Quidi Vidi QuuQup—Barr'd Islands Community Centre  
7:30 PM Mushroom talks—Barr'd Islands Community Centre  
10:00 PM Eventide—go to your rooms and sleep the sound and peaceful sleep of the innocent.

### SUN Sep 8

8:00 AM Grenfell Breakfast—Barr'd Islands Community Centre  
8:45 AM Group photo—just outside  
9:00 AM Workshops—various venues  
1:00 PM Lunch—Barr'd Islands Community Centre  
2:00 President's thanks—Barr'd Islands Community Centre  
2:15 PM Annual General Meeting—Barr'd Islands Community Centre  
3:00 PM Foray over for another year— drive to the ferry for departure or go to your rooms and relax overnight (on your own for meals!).



## Rock-loving species of *Arctoparmelia* in Newfoundland and Labrador

John McCarthy

Look on any boulder, rock outcrop or glacial erratic in Newfoundland and Labrador, particularly in well-lit conditions, and for the most part, you'll have a difficult time seeing the actual rock surface. Granitic or siliceous rocks (very common in the province) are often covered with a mantle of lichens. Among these rock-loving or so-called saxicolous (Latin saxum = rock) lichens are two species of the genus *Arctoparmelia*: *Arctoparmelia centrifuga* (L.) Hale and *Arctoparmelia incurva* (Pers.) Hale.



Have you ever come across what seem to be concentric rings of greenish-yellow to whitish-green fungal lobes draping a well-lit boulder on the barrens or along a creek-bed? Chances are, you've spied the concentric ring lichen, *A. centrifuga*. The foliose lichen thallus adheres closely to the rock surface, commonly dying in the centre and forming distinctive concentric rings. Brown apothecia are common.

If you're lucky, you may come across a conspicuous ashy-grey form of the concentric ring lichen. This is due to the absence of the yellow cortical



pigment called usnic acid. This “usnic acid-free mutant” of *A. centrifuga* was once recognized as a separate species, *A. aleuritica*, but is now considered only a chemotype. That usnic acid lack is not of taxonomic significance is, in part, due to the work of Stephen Clayden, curator of the lichen herbarium at the New Brunswick Museum.

A close cousin is the other saxicolous lichen of the same genus, *A. incurva*. This lichen is also closely attached to the rock surface, grayish-green, yellowish-green or grayish-yellow in colour, darkening towards the centre, but what may tip off its identity is the usual presence of large, prominent balls of soralia (algal cells surrounded by and entwined by fungal filaments), as well as the absence of concentric thallus rings. These capitate, globose soralia growing from the tips of interior fungal lobes lie scattered over the thallus surface. It is the only sorediate species of the four species that make up the genus; apothecia are rare for this species.

Both lichens were first described in the early years of lichenology. It was none other than the celebrated Carl Linnaeus, the Swedish grandfather of binomial taxonomy, who first officially described *A. centrifuga* in his 1753 *Species Plantarum*, giving it the name *Lichen centrifugus*. *Arctoparmelia incurva* was described a bit later in 1794 by Christiaan Hendrik Persoon, a South African-born lichenologist (1761-1836), and given the name







*Lichen incurvus.*

The genus of the two lichens changed over the years (*Lichen*, *Parmelia*, then *Xanthoparmelia*) until Mason E. Hale (1928-1990), the well-known lichen curator at the U.S. National Herbarium, Smithsonian Institution, placed them in the new genus *Arctoparmelia* in 1986. As you may guess from the genus name, these lichens are geographically restricted to the Arctic-boreal regions of the globe, but may be found extending southward in high montane areas.



Besides the lack of soralia in *A. centrifuga*, the white lower surface of the thallus distinguishes this species from the sorediate *A. incurva* that generally has a mouse-grey or pale brown lower surface. *Arctoparmelia centrifuga* is the more common of the two species, occurring throughout Newfoundland and Labrador, whereas *A. incurva* is known from most of Labrador and to date, only from eastern sections of the Island. Both are recorded from St. Pierre et Miquelon.



All the photographs on page 5 are of *A. centrifuga*, whereas those on this page are of *A. incurva*. Now that you are thoroughly familiar with the *Arctoparmelia* species found in our province, identify the species on the cover and in the two pictures on page 4. Send your answers to the Editor, <[seened AT gmail DOT com](mailto:seened AT gmail DOT com)>. No doubt there are major prizes to win.



# What does Ötzi have in common with NL moose?

Bill Bryden

While hunting chaga, I noticed moose tracks going along a virtual straight line, from one *Piptoporus betulinus* laden birch to another. The edges of last season's birch polypores at moose height were mangled, while those lower and higher seemed intact. Do moose actually nibble on these? Does the direct line of travel from patch to patch suggested that it is actively seeking out the fungus, and knows exactly where to find it? I got the answer one quiet morning, when I saw a yearling moose calmly munching on one such *Piptoporus betulinus* a few meters from me.

While deer are known to eat *P. betulinus*,<sup>1,2</sup> moose have not been recorded to do so. Why do they eat it? Could it be to treat parasites? The Bronze Age Iceman, Ötzi, carried *Fomes fomentarius* and *Piptoporus betulinus*. It is speculated that he used the latter to combat harmful parasites, whose presence was confirmed in his gut.<sup>3</sup> Did Ötzi know of Mother Nature's

fungal medicine cabinet? Do our moose know? They, too, suffer from several intestinal parasites—is this their way of self-medication?

*Piptoporus betulinus* has been shown to contain numerous compounds that have anti-metazoan<sup>5</sup>, anti-viral<sup>4,5</sup>, and anti-bacterial<sup>6,7</sup> properties, among other things. For example, when administered intravenously to white mice, birch polypore nucleic acids protected them against lethal infection by a tick-borne encephalitis virus.<sup>8</sup>

What is the value of a standing dead birch to moose, man, tick, bacterium or virus? We have no idea, as we clear-cut and alter forests. With our present knowledge, labelling this fungus as (moose) medicine is a stretch, best whispered around a campfire after much grog! But we do know that Ötzi and our moose both harbour pathogens against which *P. betulinus* is reputedly effective, and both seem partial to the polypore.

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Above: Bits of fungi threaded on leather strips, carried by Ötzi. Identified as *Piptoporus betulinus* by 2011 FNL faculty member, Leif Ryvarden. Photo with permission, copyright South Tyrol Museum of Archaeology. Ötzi reconstruction behind text, copyright South Tyrol Museum of Archaeology/ Augustin Ochsenreiter.

Right: Ragged edges of last season's *P. betulinus*, presumably caused by moose, who lack upper incisors and rip their food.

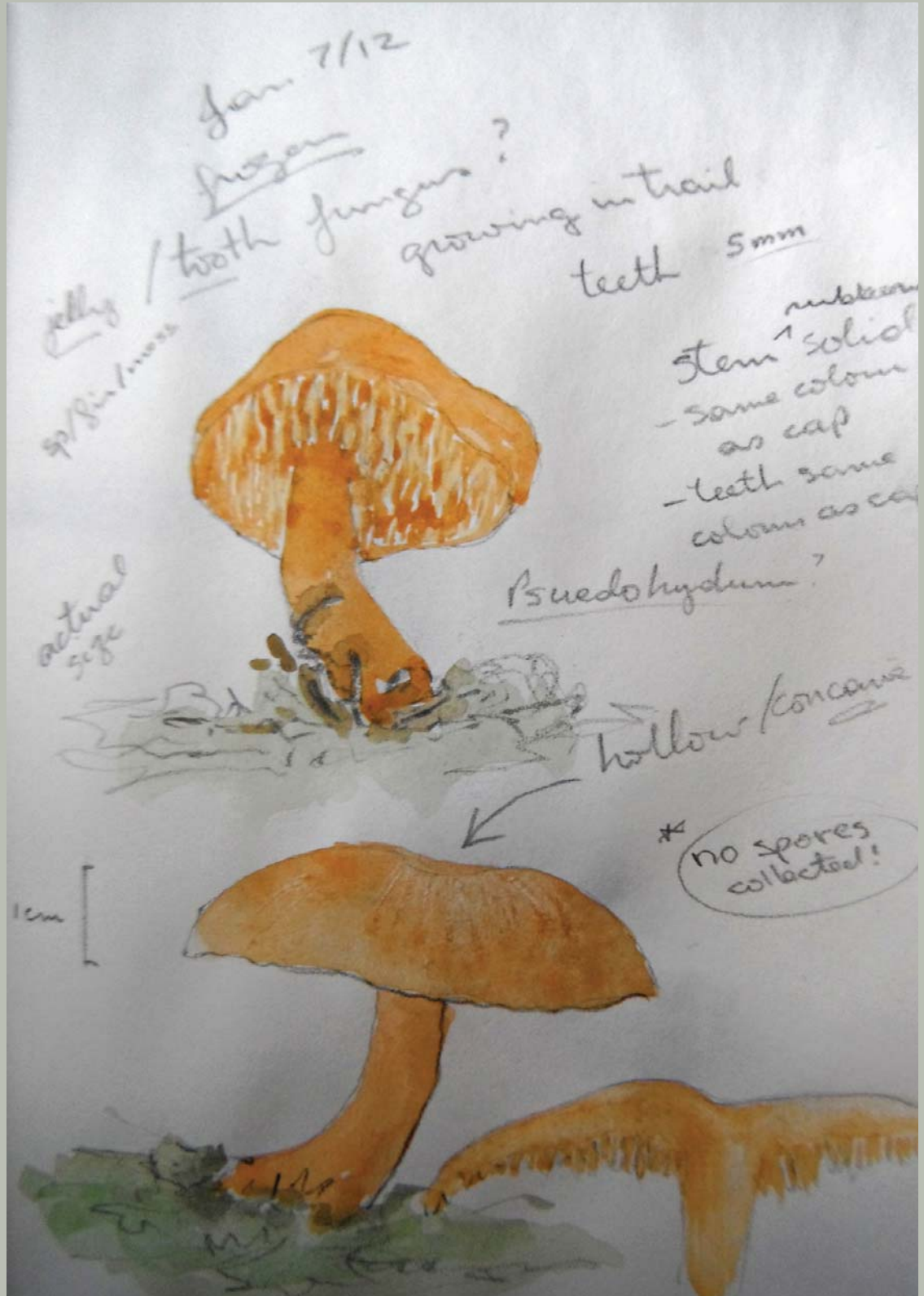






# The Bishop's Sketchbook

Hydnum umbilicatum, frozen





# My Favourite Mushroom

Jim Cornish

## *Hydnum umbilicatum*

Kids say the darndest things... even about mushrooms. During a recent presentation on fungi, I showed a photograph of *Phellodon tomentosus* to a class of 4<sup>th</sup> graders and told them that some mushrooms have teeth instead of gills. That comment drew a few laughs, some curious looks and this comment- “You mean mushrooms chew their food?” The 4<sup>th</sup> grader can be excused for getting the connection wrong. Our use of the same word to name things morphologically similar but functionally different can be very confusing, even for someone much more worldly than a nine year old. That classroom experience, and conversations with a few people during some myco-encounters along my most frequented walking trails, keeps reminding me that when talking about mushrooms to people less knowledgeable about fungi, common terms can be just as confusing as the myco-jargon. This past fall I found another toothed mushroom, *Hydnum umbilicatum*, my first toothed edible. Because it reminded me of that classroom visit and why I enjoyed teaching young children for thirty years, *H. umbilicatum* became one of my favourites.

Elias Fries, father of mushroom taxonomy, believed that all toothed fungi were closely related and originally placed them in a genus, *Hydnum*, meaning toothed. Today, mycologists believe the 900 or so hydroid species worldwide evolved separately and do not form a single “natural” taxonomic group. Based on molecular analysis, species of the original *Hydnum* have been spread across 43 genera and 13 families, one of which includes the chanterelles. The genus is now restricted to the type species *Hydnum repandum* and some 120 relatives. While Foray Newfoundland and Labrador has identified 28 toothed species in seven genera growing in this province, only four are in the genus *Hydnum*; the best known and loved of edible hydroids, *Hydnum umbilicatum* and *H. repandum*, are also the most common.

Although I have been photographing mushrooms for about four years, it wasn't until late October 2012, that I first encountered my first *Hydnum umbilicatum*. It was late afternoon and I had practically given up looking for more mushrooms, when I found a “patch” growing under a fairly open canopy of mixed spruce, birch and alder just off the ski trails west of Gander. The entrance to this opening was a little obscure, and from a distance all











Photo: Andrus Voitk

### COMPARISON of *HYDNUM UMBILICATUM* & *HYDNUM REPANDUM*

		<i>H. umbilicatum</i>	<i>H. repandum</i>
Cap	size	2-6cm, occasionally larger in age	4-18cm
	shape	round	irregular, often oblong
	top	dimpled	gently domed
	colour	orange-tan to reddish brown	ochre to tan
	fusion	independent fruitbodies	fruit bodies often fused, incorporate sticks, etc.
Spines		indented near stem; a few tiny ones on stem in age	decurrent down stem
Stem		central	eccentric, at least to some degree
Tree partner		coniferous or mixed woods	coniferous, mixed or birch woods
Close taxa	<i>H. rufescens</i> (similar, but no dimple and more reddish, staining red-brown). Primarily European species, but also reported from NA. Even though very similar, the two are bona fide spp by DNA.		<i>H. repandum</i> var. <i>album</i> —Same as <i>H. repandum</i> , but fruits later in the season and has bitter taste. You may not recognize it in the field, but will on the plate.
			<i>H. albomagnum</i> (almost white, big, otherwise similar).
			<i>H. albidum</i> , and others. The relationships of all the similar taxa have not been worked out.

I saw was a few small orange coloured caps, only slightly distinguishable from the recent leaf litter covering the forest floor. Once I reached them and checked a few distinguishing features, I knew I had found *Hydnum umbilicatum*. There were at least 20 of these mushrooms over a 16 square metre area, mostly single, with a few clusters of 3-4 close together. Scattered among them were a few *Cortinarius evernius*, still sporting their characteristic white cortina trim on the cap margins.

Caps measured 2-8 cm in diameter. Convex to plane in youth, their margins became noticeably wavy with age. They were firm, dry and fairly smooth, generally orange-tan, a little mottled in some individuals. The teeth or spines on the underside (hence its common

name, hedgehog mushroom) were about 5-7 mm in length, becoming noticeably shorter towards the margins and towards the stalk, where they were the shortest. The stems were central, measured 5-8 cm long by 1-3 cm thick, slightly enlarged at the base, and solid in cross-section. The table shows the difference between *H. umbilicatum* and *H. repandum*; the latter is shown in the right lower corner photo.

Oh, the characteristic feature of *Hydnum umbilicatum* is the obvious navel located in the middle of the cap—hence its specific name *umbilicatum*. Imagine, a mushroom with a belly button! I just can't wait for my return visit to the classroom this fall. What questions will I get this time?



AE Bessette, AR Bessette, WC Roody, SA Trudell

# TRICHOLOMAS

## Of North America

### A MUSHROOM FIELD GUIDE

208 pp.  
Texas University Press  
Austin TX  
2013

\$29.95

An order from Amazon.ca totalled under \$30.00 CAD, taxes and shipping included. The web price at the publishers website, is US\$20.07.

Tricholomas is a soft cover book, printed on quality paper, measuring 18-25 cm. The subtitle, A mushroom field guide, is best ignored. Usually, books devoted to single genera are not taken to the field, so that ability to fit in a pocket is not an issue. The larger size allows use of more and bigger photos, as well as a pleasing design with breathing room, avoiding small print or a tiring and crowded appearance.

A short introduction offers information about the genus, its identification, ecology, edibility, an interesting summary of its investigation in North America, and other good bits and bytes. This is followed by two sets of dichotomous keys, one for eastern North America and one for the west. Both are split into keys for white, yellow, brown and gray species. Detailed instructions on how to use the keys are meant for both the beginner and people like me, who do not like dichotomous keys. That said, the keys of North American Boletes, written by three of the present four coauthors, have worked for me much better than most. At first glance those keys resemble the keys in Tricholomas, so that I am hopeful. Fair comment on the utility and usability of these keys must await the next *Tricholoma* season.

The meat of Tricholomas of North America is the description of 70 species that follows. Descriptions follow a set pattern of subheadings and rarely go beyond 2/3 of a page. The language is readily accessible to amateurs with no mycological background, and a glossary of "scientific" terms is included. Macroscopic description is detailed, and microscopic description is sparse, fleshed out for species where it offers help. A separate page at the end outlines those species where microscopic characters are useful for identification, and lists them. The subheading "Occurrence" sums up growing pattern, hosts, habitat, frequency, distribution and other environmental/ecologic factors. Most valuable is the final subheading, "Comments", which discusses similar species, possible synonymies or cryptic species, and other very helpful facts.

The preface states that Tricholomas of North America is best viewed as an approximation. The "Comments" adhere to that spirit. Time and again the point is made that the current name may turn out to be a misapplication of a European name. (Often that seems almost guaranteed, given that the European mushroom is found under oak and the similar North American one with the same name among conifers.) For many

mushrooms with a large variation in appearance, the point is made that an apparently plastic species may hide a complex. Others are described, with an admission that future studies may show them synonyms with some closely similar species. These comments raise questions that need answers, warn the reader to be prepared for possible name changes in the future, and no doubt provoke scientists into pursuing these questions. A refreshing change from the more authoritative statements of most texts.

A very welcome change from previous books by the prolific senior authors is to find the photographs together with the descriptions. (Did the different publisher play a role here?) Illustrations are an integral part of the description. The day of prohibitive colour print are long gone, so there should be no reason to keep all colour print in a separate section. It is not possible to mention the photographs without dwelling on them in more detail. First of all, their quality varies between excellent and superb. And why not? Some of the best mushroom photographers have contributed pictures, including seven who have been part of the past faculties of Foray Newfoundland & Labrador. Most species are illustrated with more

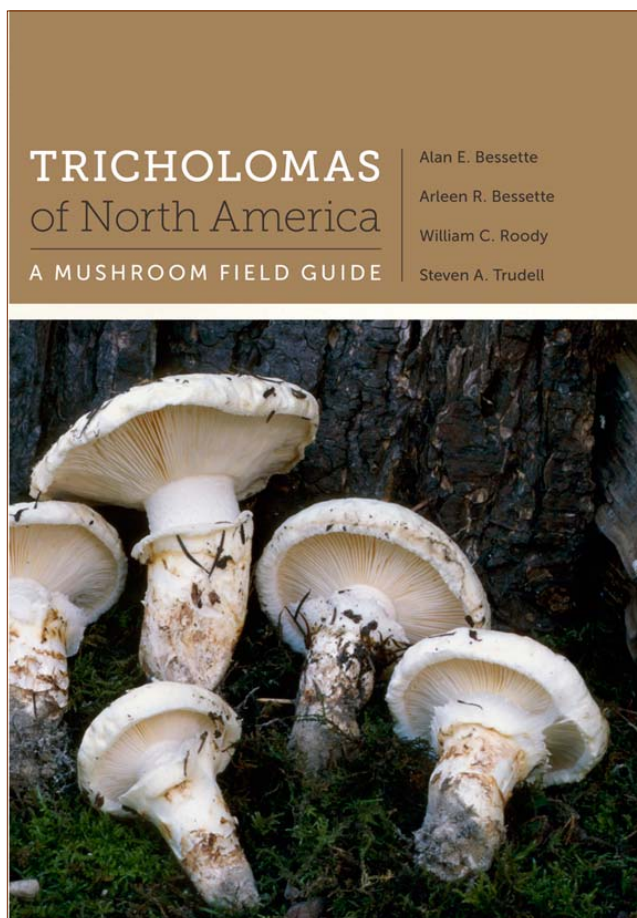


than one photo, some with six or more. Both publisher and authors are to be congratulated for this, something usually not possible outside web publications because of cost. Seeing the full spectrum of variation for a species should be very helpful for the poor amateur struggling to identify a mushroom in her hand.

This book fills a huge void. There is no previous comprehensive treatment of *Tricholoma* in North America. It is a large genus with over 100 species, and most field guides are unable to do it justice. This approximation should serve us well for a long time. Even if genetic studies bring about changes of name, once you learn a species, it is not too difficult to place a different label on it. The difficulty with *Tricholoma* is that until this approximation, it has been difficult to know where to begin. Sure, it contains some species not found in Newfoundland and Labrador. But, surprisingly, most of what has been found here is also in [Tricholomas of North America](#).

Whom would this book serve? If you are struggling with identifying most mushrooms and find that your small general field guide is still a mystery, probably you are not ready for a generic monograph. However, once you can recognize a *Tricholoma*, you will find plenty of them. If you are at all curious to know their identity, this book is for you. For members and participants in our past forays, this would probably encompass most people who have attended 2-3 forays or more.

**Bottom line:** if you are ready for it, buy it! At less than 50¢ per species it is a bargain. Look up a species 10 times and you have probably learned it, at 5¢ per look!



#### Fine print

The comments that follow should not influence your decision to buy [Tricholomas](#), but are a valid part of a review. I noted three opportunities for improvement. Unless I miscounted, 13 species have no picture. Pictures of uncommon mushrooms, reliably identified, may not exist or are difficult to locate, and a bare description is better than none. However, dear authors, do not relax and consider this a job done, but rather make it your mission to get these pictures for the next edition. For another 13 species, the illustrations fall on the overleaf (other side of the page) of the description. Not only does this require flipping of the page back and forth, but it places illustrations of the *previously* described species on the opposite page, causing some confusion—even though the photographs are labeled. There are several ways to get around

this, not all of them requiring additional pages, and these should be explored for future editions. The additional cost of some extra pages is probably justified by the increased convenience and clarity.

Thirdly, at least in my opinion, a book that will be the classic authority for decades should not publish provisional (nom. prov.) species. This designation is given for a short period, pending more investigation to either confirm or negate a species as good. Use the opportunity to work with the author to describe the species formally in the text, possible here without varying too much from its uniform format. A name that has not been withdrawn, modified, or formally published for over 30 years cannot be considered provisional! Once printed in books, the invalid taxon (really, a nom. nud.) will appear in various foray lists and other publications. Scientific names should avoid the confusion of common names, where every region has a different name for the same organism, and the same name is used to identify different organisms in different places.

To balance the last criticism, the primary use of scientific names, listing common names where applicable, is laudable. This is far better than dreaming up phony “common names”. I have great faith in the amateur mycophile and do not consider mastery of scientific names a disincentive to using such a book, but a strength.

The authors are keen generalists, who have drawn exhaustively on specialist knowledge. It was gratifying to see Clark Overbo, possibly the foremost student of the genus on this continent, at the top of the list of acknowledgments; the references provided are an excellent source for further reading.

**Final comment:** I wish we had had this book 10 years ago, when we began our forays. We could easily have fit our finds within the species found here, for stabler uniformity. Once we have a secure concept of a species, changing names is easy, if required. Perhaps this is just my lack of *Tricholoma* expertise speaking?



## Books to hit our bookshelf...

Andrus Voitk

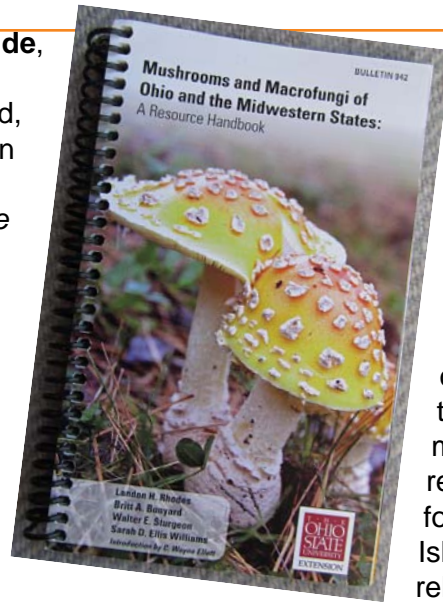
This has been a bumper spring for free books at the Editorial Suites and Executive Offices of **OMPHALINA**! One of the good things about having active faculty, is

that some write books, and if you do not insult them too much, they may send you a copy. Books that are useful must-haves for local mushroomers, like the **Tricholomas of North America** (previous two pages), get a formal review. The two featured here are probably not practical for most Newfoundlanders and Labradoreans, and will not be reviewed formally. Why feature them, then? Well, it is always interesting to see how others do things. Each book has some very good features, that could be applicable here, should anybody consider a parallel effort locally.

### The Ohio mushroom field guide,

by past FNL faculty members Walt Sturgeon and Britt Bunyard, with Sarah Williams and Landon Rhodes. As Britt said, *"I doubt anyone up there needs this little book unless they're absolute collectors of paper. We cover only the most common Midwestern mushroom species."* Indeed, about 150 species are covered, of which over 50 have not been recorded here.

However, there are some good features of this book to consider for any local guide. The photos are excellent for their purpose. The text is very brief, yet informative, making it approachable to all, and allowing for large pictures despite the small

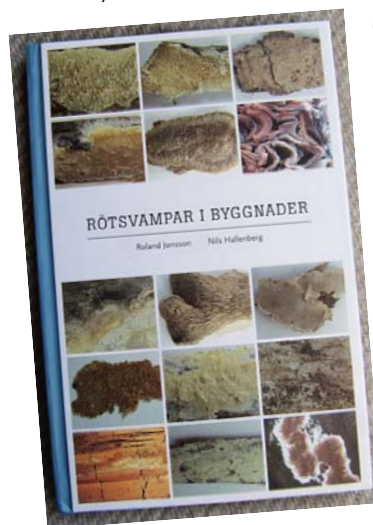


page. The coil binding allows for easy full opening of pages. Limiting it to the most common species keeps both cost and size down. The format fits in your pocket, like a proper field guide. The publisher is the Ohio State University, a good sort of partner to consider, if interested in doing the same sort of thing.

All in all, none of size, amount of text or cost inhibit the potential lay purchaser, and the big pictures of common mushrooms make its use for identification easy and rewarding for the novice. This is an ideal format and style for special places like Fogo Island, Battle Island, Goose Bay and other relatively defined and unique regions to consider for a template, should they wish to produce a regional working field guide, not a coffee table folio.

**Fungi that rot dwellings**, by Roland Jonsson and 2012 FNL faculty member Nils Hallenberg. It is the first treatment of houserotters in Scandinavia, and possibly elsewhere. A small (spine 1 cm wide), author-published, hard cover volume describing 15 fungal species (well, one is actually a slime mold), with text entirely in Swedish. The last part may discourage the occasional local from using this book.

However, while it may not be linguistically practical for us, it has several very good and interesting features worth remarking. The idea is fantastic for the thorough handling of relatively narrow groups, in this case lumped by their actions, not phylogeny. Because the number of species is small, even in a small book, considerable space can be devoted to each. As a result, the

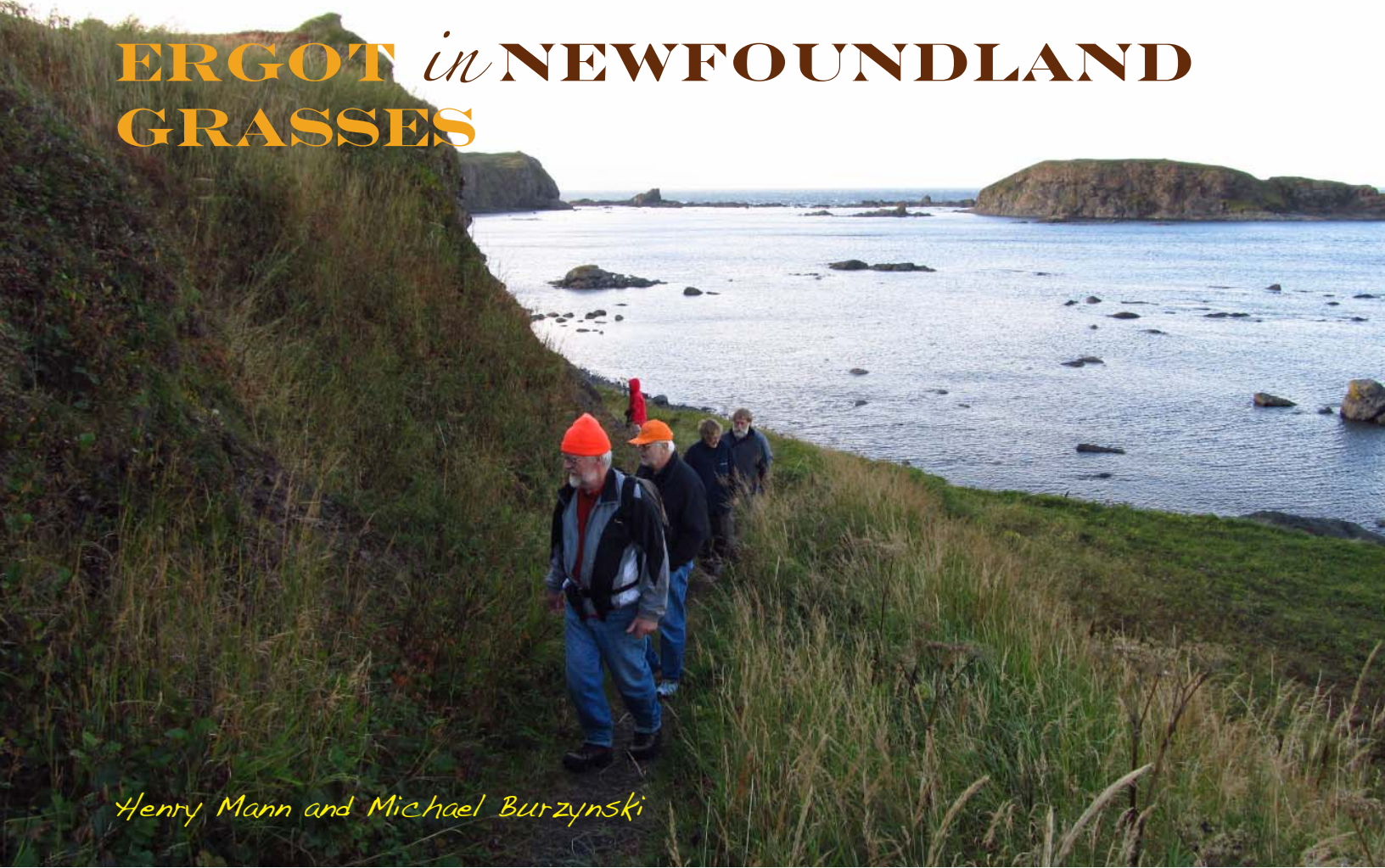


treatment is very thorough, sufficient to satisfy the most scientifically demanding mycologist. At the same time, there is ample room to explain concepts in lay terms, so that the book can be read without any problem by a curious amateur with no mycological background—characteristic of Nils' writing. There is a good introduction, with even a phylogeny tree to show where the various species reside relative to each other. Every species has good drawings of microscopic details, in addition to the obligatory macroscopic picture.

This is a great idea for the treatment of isolated groups of fungi that may have kindled public curiosity through common behaviour, be it destructive or otherwise remarkable. It may prod the casual reader an entry to mycology and to natural history that persists beyond its covers.



# ERGOT *in* NEWFOUNDLAND GRASSES



*Henry Mann and Michael Burzynski*

By the middle of September the tourist season has ground to a halt, moose hunters are scouring the woods, and the last of the winter's firewood has been stacked in neat rows on the Great Northern Peninsula. In 2012 autumn rains promoted an amazing flush of mushrooms in the woods, meadows and barrens along the trails at Cape Onion, L'Anse aux Meadows, Cape Raven and Burnt Cape. Everywhere, tall straw-coloured grass stems wave in the winds on meadows and along roadsides signalling the end of another growing season. Mushroom enthusiasts hardly take notice of the grasses—just more plants blending into the background—until, by chance, hard black structures are noticed in the inflorescences where the paler smaller seeds should be. “Eureka, another fungus!”

These blackish structures are the sclerotia of the ergot fungus (*Claviceps* sp.), an ascomycete that infects grass flowers and replaces the seeds in their inflorescences. There are over 50 species of *Claviceps* worldwide, but in the north temperate regions, *C. purpurea* predominates infecting the cereal grains wheat, rye, and barley, and a wide range of native and introduced grasses. In mid-September four grass species were observed with ergot in the vicinity of Tickle Inn at Cape Onion and other trails of the region. These include Strand Wheat (*Leymus mollis*), Canada Reedgrass

(*Calamagrostis canadensis*), Meadow Foxtail (*Alopecurus pratensis*), and one other unidentified species. Over 30 species of grasses are known susceptible to ergot infection in Canada, perhaps 600 species worldwide, so an observant naturalist could probably find more in this province. Humid summers seem to increase infection rates.

Ergot has a long history with humans and their animals, sometimes beneficial, sometimes detrimental. The fungus produces a number of biologically active chemical compounds (alkaloids). Some and their synthetic derivatives have been used





medicinally for purposes such as hastening labour and preventing postpartum bleeding in childbirth, in alleviating migraine headaches, and for a variety of other conditions. The hallucinogenic drug LSD is an extract of ergot. It was popularized in the 1960's where it created a counterculture of drug abuse especially amongst college youth and was even experimentally investigated by the military as a chemical weapon. Ingestion of ergot-infected grain and flour by humans and cattle has caused impaired blood circulation, gangrene of the extremities, seizures, psychotic delusions, nervous convulsions, abortions, and deaths, and has been suggested as the cause of some unusual historical events such as St. Anthony's Fire of the Middle Ages and the Massachusetts Salem Village witchcraft episode of 1692. Grain containing 1% sclerotia is considered dangerous for humans to eat.

Late in the growing season the fungus appears as cylindrical black horn-like outgrowths (sclerotia) in the place of normal seeds. The size of the sclerotia is related to the size of each species' seeds. Sclerotia eventually drop to the ground and lie dormant in the soil until spring, when they produce tiny fruiting structures that resemble miniature mushrooms with enlarged rounded heads (stroma). Sunken into the rounded heads are flask-shaped structures (perithecia). Within the perithecia are elongated sacs (asci) each containing eight spores (ascospores). Long narrow ascospores are released about the time the host grasses are flowering and are transported to the flowers by wind where they germinate to infect ovary tissue. Another type of spore is produced at this time (conidial spores-conidia). At the same time the fungus stimulates the production of a sugary fluid which attracts insects that transport the conidia to uninfected flower spikes to begin new infections. Conidia are also spread by splashing rain droplets. The proliferating fungal mycelium eventually completely replaces the developing seed resulting in the hard dark sclerotium seen in fall.

Newfoundland naturalists might keep an eye open in autumn for ergot in our grasses. In what other native and naturalized species does ergot occur? Is it prevalent in any of our forage, fodder, or grain crops? Is it more common in some years or others? More details about its life cycle, medical uses, toxic effects and historical and folklore aspects can readily be located on the internet.

Illustrations. Top down: Ergot on Canada Reedgrass, Meadow Foxtail and an unidentified grass species. Bottom next page: Ergot on Strand Wheat. Photos from the Great Northern Peninsula, September, 2012.



**Life cycle of ergot** from Mann & Raju: Ergotism and ergot fungus (*Claviceps purpurea* (Fr.) Tul.), unpubl.

**A** Mature spike of rye infected with ergot sclerotia (arrow) and normal seed (sd).

**B** An ergot sclerotium (sc) with stroma (st).

**C** Magnified long section of stroma showing perithecia (pe) with their openings or ostioles (ot).

**D** Enlarged perithecium showing club-shaped asci (as) inside.

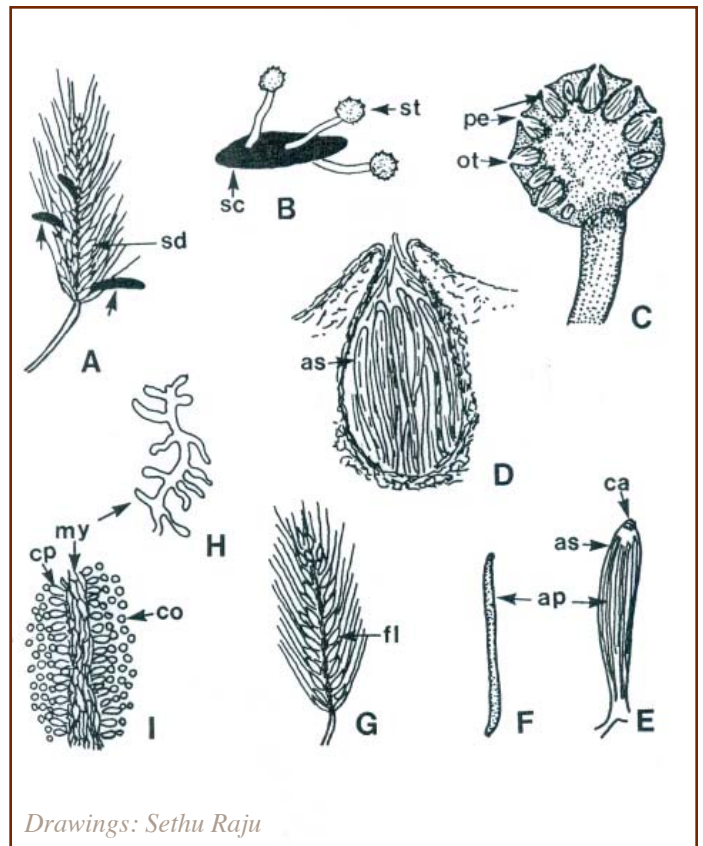
**E** Single ascus showing ascospores (ap) and the cap or operculum at the top.

**F** Elongated thread-like ascospore (ap).

**G** Young spike of rye with unopened flowers (fl).

**H** Highly branched mat of mycelia (my) developed from an ascospore at the base of the flower.

**I** High magnification of mycelial mat (my), showing conidia (co) and conidiophores (cp). Conidia germinate to produce more mycelia, which penetrate and infect the developing seed within the ovary of the flower.





# *Naiadolina flavomerulina*

Scott Redhead, Dave Malloch, Jim Ginns

Ed note: **OMPHALINA** limits itself to mushrooms of Newfoundland and Labrador. However, as you see in the excerpt below, a) this species was introduced in an earlier issue of **OMPHALINA**,<sup>1</sup> so it is incumbent on **OMPHALINA** to include the follow-up, b) the author invited further comment, knowing he had no idea what he was talking about, and, most importantly, c) it is quite possible that the species exists in our province, since both known hosts do. If you see it, we should like to know.

## *Marasmius arundinaceus*

Henry Mann sent this picture from the Wildflower Society field trip to Nova Scotia. He wrote that it grew on last year's dead stalks of threeway sedge (*Dulichium arundinacium*). I have never seen this mushroom and had no idea what it could be. It occurred to me that there are some *Marasmius* species that grow on leaves or grass with primitive gills, like very shallow folds with cross-veining. This opened an opportunity to test the system we may have seen evolve in the past few pictures. It seems that 1) many rotters are very specific to their substrate, and 2) often they are named after their host. Therefore, look up *Marasmius*, to see if it has species named after either *Dulichium* or *arundinacium*.

Bingo!

I can find no picture or description to confirm it. Clearly, it is not a commonly collected species. This story illustrates that even in mycology it is possible to be too smart. This is an open invitation for anybody who recognizes the species or who is familiar with the taxon to weigh in and tell me I am wrong. I shall not be hurt, seeing I have had all the fun.



Photo: Henry Mann



The picture labeled *Marasmius arundinaceus* in [OMPHALINA](#)<sup>1</sup> caught our eye, mostly because the depicted mushroom on *Dulichium arundinacium* resembled *Marasmius flavomerulinus*<sup>2</sup> that we found on *Scirpus rubrotinctus* growing on Jim's former farm in southwestern Québec. Scott described it as a new species in 1981.<sup>2</sup> Since that report, it has not been reported again, except for repeated finds around the type locality, leading us to believe it is one of the rarest mushrooms in Canada. Recently a culture, obtained by Jim in 1985, was sequenced. The results showed that the mushroom was not a true *Marasmius* in the Marasmiaceae, but clustered phylogenetically as a new genus in the Physalacriaceae. Several other former *Marasmius* species, like *Rhizomarasmius* that you have met on these pages, have also ended up in the Physalacriaceae. Scott proposed a new genus to accommodate the species in its new location; in recognition of its wet habitat he named it *Naiadolina* after the water nymphs (Naiads) of Greek mythology, proposing *Naiadolina flavomerulina* as the current name.<sup>3</sup>

Because it is such a rare mushroom, a brief description follows to raise awareness, in the hope that a reader will recognize it.

**Macroscopic** Cap up to 9 mm wide, convex but often becoming flattened, amber to straw coloured, smooth, dry, slightly wrinkled with age. Gills lacking when young, then developing into radiating wrinkles and sometimes bridging wrinkles (meruloid), coloured like the cap. Stem up to 11 mm by 0.8 mm, palest at the top (straw coloured) and darker at the base (brownish), with a slight pubescence overall, and attached by a basal disc of tissue. Odour and taste not distinctive.

**Microscopic**<sup>2</sup> The cuticle of the cap is a layer of

**Images previous page:**

Title banner: Habitat photo by Henry Mann of NS find.

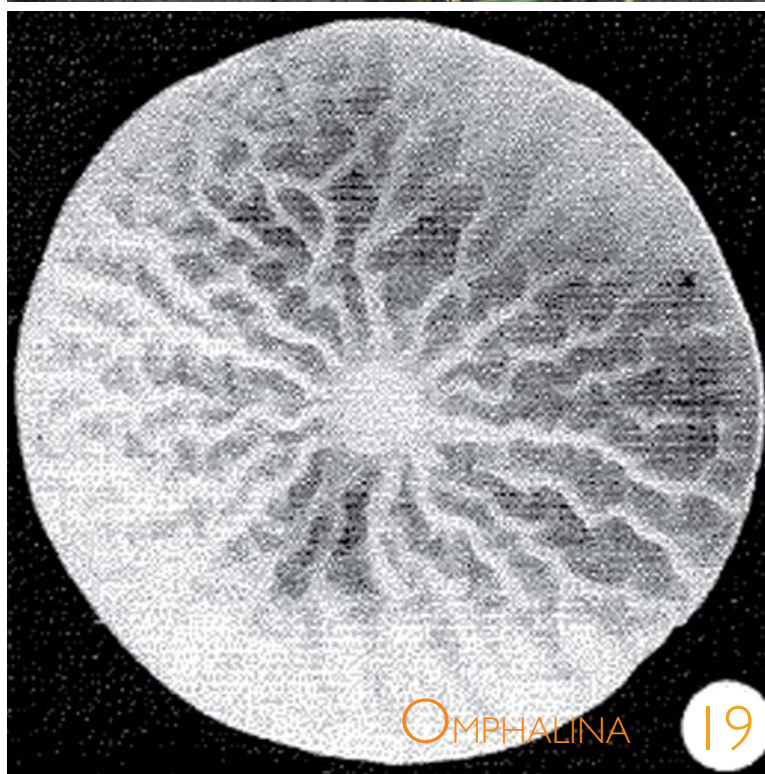
Below: Excerpt from earlier [OMPHALINA](#) article.<sup>1</sup>

**Images this page:**

Above: The Québec *Naiadolina flavomerulina* in situ. Note the basal disc and the pubescence (downy hairiness) of the stem.

Middle: Two in situ clusters in Nova Scotia (photo: Henry Mann). Note footprint beside lower group.

Below: The meruloid pattern of the hymenium in a Quebec cap<sup>2</sup>.





clavate cells or ends, often divided by a septum or two, and smooth or covered with a few or up to 20 small bumps. Basidia are 4-spored. Hymenial cystidia are lacking. Clamp connections are abundant in all tissues. Basidiospores are 7.2-12 x 6-8  $\mu\text{m}$ , ovoid, ellipsoid to reniform, smooth, inamyloid, thin-walled, white in prints. The basal pad has an outer layer with cell ends as in the cap cuticle.

**Ecology** In both Nova Scotia and Québec, the mushrooms were fruiting on dead plant sheaths at the bases of living plants, and near the mud surface exposed by lower water levels. Collections were dated between June 24 and July 28, 1979-1980. The NS sighting was on August 10, 2012. Presumably the fungus grows below the waterline and fruits when the water level drops. In Québec at Jim's former farm they occurred year after year, except for the occasional dry year, when the depressions dried too quickly.

If you should come across this mushroom in Nova Scotia or elsewhere, please take good photographs, then collect several samples and air dry them. Please note the host species (photo and/or sample, if not sure). Call or write the Editor of this journal, who will advise you about drying and will make sure the specimen gets where it should for analysis and archiving.

Every effort should be made to relocate the mushrooms where Henry Mann noted them, in the Jack and Darlene Stone Conservation Lands, near Wilson's Lake, Nova Scotia. A permit to collect should be obtained, and these collected, so that they can be studied and even sequenced. Assuming it is the same species, then its geographic range has been expanded to include another province in Canada and its host range has been expanded to include a second genus in the Cyperaceae. If they are not the same species, then this likely is another very rare new species.

By the way, the species described by Josef Velenovský as *Marasmius arundaceus*, suggested as a possible identity for this find by Andrus Voitk,<sup>1</sup> is a totally different mushroom, one of the *Marasmius rotula* complex, resembling that mushroom, and not the merulioid *Naiadolina*.<sup>4</sup> What was he thinking?

## References

1. Voitk A: Rotters' gallery. *OMPHALINA* 3(9):12-16. 2012.
2. Redhead S: Agaricales on wetland Monocotyledoneae in Canada. *Canadian Journal of Botany* 59:574-589. 1981. (PDF on request from Editor)
3. Redhead S: Nomenclatural novelties. *Index fungorum* 15:1-2. 2013.
4. Velenovský J: Nové druhy špiček (*Marasmius*) v Čechách. *Mykologia* 4:46-48. 1927.

**CONSERVATION LANDS**

**JACK AND DARLENE STONE CONSERVATION LANDS**

These lands are named in honor of the late Jack Stone and his wife Darlene who have been dedicated long-time volunteers, supporters and friends of the Nature Trust. Their deep rooted commitment to private land conservation is an inspiration.

Southwest Nova Scotia is home to a unique group of plants called Atlantic Coastal Plain Flora, many of which are not found anywhere else in Canada. The Jack and Darlene Stone Conservation Lands encompass over 450 acres including 5 km of critical shoreline habitat for these unique plants on Wilsons Lake, Bennetts Lake, Long Lake and Springhaven Duck Lake. These lakes provide some of the only habitat in Canada for the nationally endangered pink cornopsis (*Coreopsis rosea*), and the nationally threatened Plymouth gentian (*Sabatia kennedyana*). The major threats these species face are shoreline alteration and habitat destruction from trampling. Learning to recognize these plants and minimizing impacts on sensitive shorelines are ways that you can help to protect them.

These lands are part of a province-wide network of conservation lands protected by the Nature Trust in partnership with private landowners.

Top Left: Volunteer Rare Plant Monitors visit the property every year to check on the populations of these special plants found along the shorelines.

Top Right: Plymouth gentian a nationally threatened species is found on the rocky shorelines of Wilsons and Bennetts Lake.

Bottom Left: In Canada, pink cornopsis is found only in southwest Nova Scotia, and is listed nationally as an endangered species.

Bottom Right: Jack and Darlene Stone—the legacy of their commitment to the Nature Trust lives on in these special places.

Enjoy, but please respect this protected area. No motorized vehicles or cutting/clearing of vegetation. Help us to preserve this natural treasure for future generations to enjoy.

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Thank you to our major supporters:

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Photo: Bob MacDonald





# THE TREE OF LIFE

*a belletristic exposition through the eyes of a jaded cicerone*

According to the Theory of Evolution, Life on Earth first began some four billion years ago as a combination of molecules of what is now regarded as genetic material, with the happy ability to replicate itself. One night stands of fortuitous fusion and casual combination of these molecules begat tragelaphs of increasing complexity, until some two billion years later very complex unicellular organisms appeared. These creatures had specialized body parts called organelles, which performed dedicated functions. Many had the ability of seemingly purposeful movement, moving toward food and away from noxious stimuli. Food was incorporated and digested to supply energy required for life, growth, repair and reproduction.

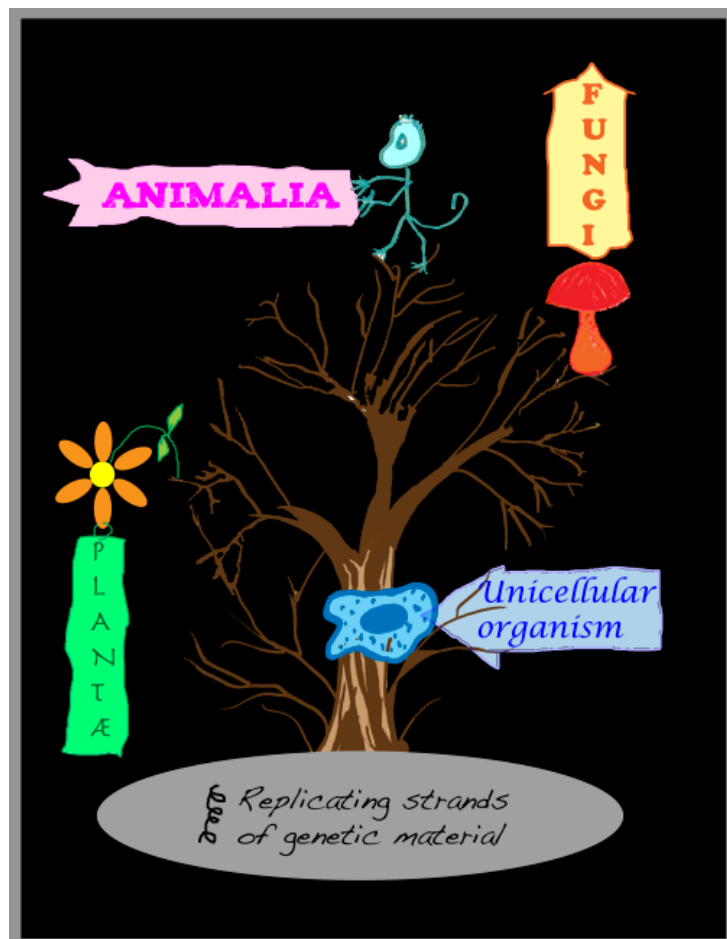
The path was not always a straight line; many trials resulted in smaller, divergent lineages, most of which died out quietly as unsuccessful evolutionary dead ends, but some of which are with us to-day as reminders of the diverse sideroads off the evolutionary experimentation highway.

Another two billion years of trial and error resulted in the most advanced (in terms of complexity) of evolutionary products: three kingdoms of multicellular organisms with specialized tissues and organs, felicitous practitioners of sexual reproduction: plants, animals and fungi. As before, many paths were explored leading to these kingdoms, some of which are with us still, living fossils as testaments to the unpredictability of randomness.

This is the model of life enjoying current favour. The DNA analyses and phylogeny trees that we see now as ultimate arbiters of species, are small parts of this large, branching tree. This system replaces the earlier morphologic or Friesian system, which defined species by similarity of appearance. The phylogenetic system has been described as “democratic” because it considers species as the “top” or final stage of evolution, as opposed to the morphologic system, which was hierarchical from Kingdoms down. Of course, the witting reader of *OMPHALINA* will immediately recognize such distinctions as pellucid

chicanery: a triangle is a triangle, no matter which way you turn it. The old system judged you by your looks and the new by your family connections. Neither seems particularly democratic. We tend to equate democratic with fair, and might be more prone to accept as fair, a system that ranks us according to our behaviour or function, i.e. by our just deserts.

Most schools, kindergarten to university, teach the world sans the right hand limb on the tree image below. Everybody knows that trees do well if limbs are pruned. However, were we to use a functional ranking, we would never consider omitting Fungi, vital to keep the ecological system working. “Biology” is an archaic term, meaning the study of two (bi) Kingdoms—plants and animals—left over from a day when mushrooms were considered to be plants. This barbaric relic may still be found in isolated antediluvian provincial universities, applied indiscriminately to departments, whether they include Mycology or not. Curious, eh?





# THE MAIL BAG

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

Re the Fogo Island Issue:

great work, team! the best OMPHALINA ever!

PM

Ed comment:

Dear PM,

Nice try. Very clever, adding this to e-mailed Foray Registration Forms. We are suckers for flattery, but until your cheque arrives, this will not get you in ahead of others, or a better place to stay at the Foray. Housing is done at arm's length by Shorefast, first-come-first-served, so no use trying to curry favour with us.

That said, we have some advice for our readers: Do keep the flattery coming! We lap it up. Praise need not be sincere to be appreciated.



In response to your report in OMPHALINA 4(2): 13 about pyrenomycetes growing on old polypores, I enclose a photograph taken by Roger Smith from the 2012 Foray at Terra Nova National Park. This photograph shows a pyrenomycete on a bracket fungus. Unfortunately, because neither the polypore nor the pyrenomycete were identified, the specimen was discarded at the end of the Foray.

Greetings,

Michael Burzynski

## TICK ALERT!



Ticks, although not common in NL, seem to be on the rise, riding in on the wings of migratory birds. One study of NF ticks showed about 10% carrying Lyme disease bacteria or other pathogens. Generally, when we are bitten, we assume it is by a mosquito or black fly, scratch the site now and then, or ignore it. This tick's bite-site—itchy, raised and hard—did not change in three days, until scratching suddenly yielded the pictured tick! The recommended method (if known a tick is under the skin) is by careful removal of all body parts, including the mouth, with tweezers. Scratching may leave infectious parts behind, especially the mouth!

Become aware of ticks and take care. Read up on how to avoid them, how to remove them, and what to do when bitten by them. Ticks can fall on unprotected heads, crawl up pant legs, even fall into pants discretely lowered for bladder relief, all of which may leave you more than just ticked off.

Sincerely,

Maria Voitk



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# FORAY

## NEWFOUNDLAND AND LABRADOR

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*The second decade*

FOGO ISLAND

Headquarters: *Joe Smith's Arm*

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*Meet the MUSHROOMS & LICHENS  
of Fogo Island!*