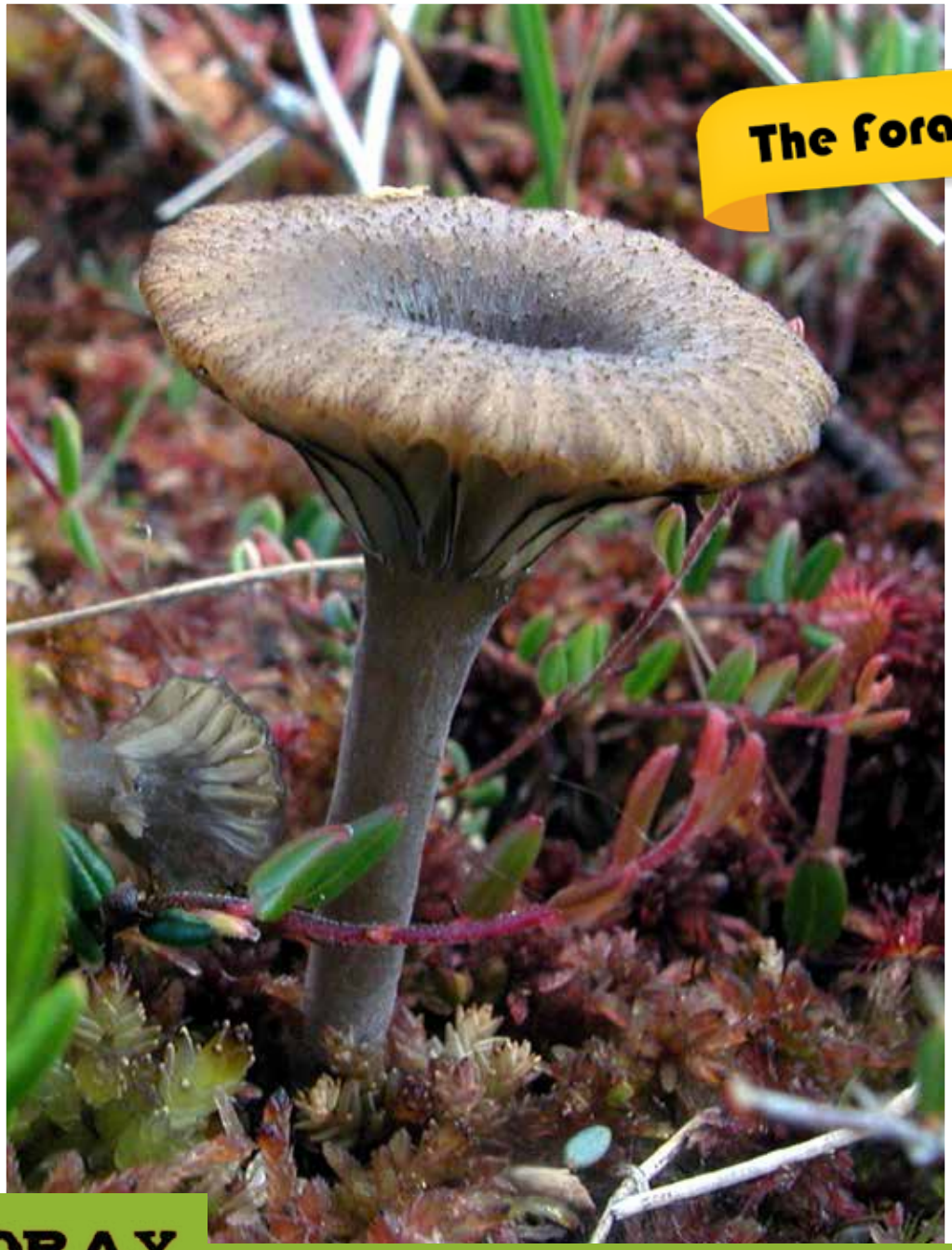
OMPHALINA



The Foray Issue

FORAY NEWFOUNDLAND AND LABRADOR

Newsletter

ISSN 1925-1858 | Sept. 2022 • Vol XIII, No. 2

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.

www.nlmushrooms.ca

ForayNL

info@nlmushrooms.ca

@foraynl

Foray Newfoundland & Labrador
16 Brown's Lane
Torbay, NL, A1K 1J1 Canada

OMPHALINA, newsletter of Foray Newfoundland & Labrador, has no fixed schedule of publication, and 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

Centre for Newfoundland Studies, Queen Elizabeth II Library (printed copy also archived)
https://collections.mun.ca/digital/collection/omphalina/

The content is neither discussed nor approved by the Board of Directors. Therefore, opinions expressed do not represent the views of the Board, the Corporation, the partners, the sponsors, or the members. Opinions are solely those of the authors and uncredited opinions solely those of the Editor.

Please address comments, complaints, and contributions to the Editor, Sara Jenkins at **omphalina.ed@gmail.com**

Accepting Contributions

We eagerly invite contributions to Omphalina, dealing with any aspect even remotely related to NL mushrooms. Authors are guaranteed instant fame—fortune to follow. Issues are freely available to the public on the FNL website.

OMPHALINA

ISSN 1925-1858
Vol XIII, No. 2
September 2022

CONTENT

Cover: *Arrhenia bigelowii* Voitk, Lickey & I. Saar. HOLOTYPE. Photo taken at Rocky Harbour bog, 5 July 2005 by Andrus Voitk. More on our infamous logo mushroom begining on page 71.

Message from the Editor

Hello again, Friend of Fungi!

How's the rain in your neck of the woods? Are your secret mushrooming spots in full swing yet?

In this issue, you'll find additional details about the upcoming Foray (pg. 63–70) to help you prepare, pack, and travel there. I hope we'll see all of you at the famed Friday Mycoblitz, which gives us a pre-Foray chance to meet faculty and make new fungi friends.

If you have not yet registered for this year's Foray, held in central Newfoundland on September 23–25, you're missing out! There are still a few spaces open, so head over to our website at www.nlmushrooms.ca to register now. After two years' disappointing hiatus, it's sure to be a good time. More on that from our President on the next page.

After you wade through the Foray info, Andrus Voitk and colleagues have shared information on the FNL logo mushroom, which, as it turns out, was a bit of mystery.... until now, that is. A thoughtful remembrance of said mushroom's namesake and a poetic interlude follow.

If that's not enough to whet your seasonal mushroom and lichen appetite, we are also pleased to share Jim Cornish's new favourite mushroom, we give you a tour of our urban lichens in St. John's with Kristen Tenwolde and Yolanda Wiersma, and share a few of Glynn Bishop's new beauties. We also thank Greg Thorn (who is, surely, busy with his budding media empire; see *Announcements*) for sending a review of MycoQuébec's excellent new Tricholoma volume.

Happy Hunting everyone!

Sara

Message from the President

Hello Foray NL members and friends,

As of writing this, there are only 25 days until the public weekend foray on September 23 -25. Are you as excited as I am? I can't wait to get back together after almost three years of virtual-only gatherings. There is nothing quite like the enthusiastic energy generated by a group of people who are passionate about mushrooms and lichens. I love it.

As we finalize the last few foray details, emails and phone calls are flying back and forth between the members of the Board of Directors, everyone double and triple checking their task lists. This my 14th foray, but my first as President. It's exciting, but a bit stressful. I take my hat off to past presidents Michael Burzynski and Andrus Voitk for making the previous forays run seamlessly. Happily, both of our former Presidents plan to attend this Foray in other roles so we will all still benefit from their multifaceted expertise. We also have a great Pan-Canadian line-up of faculty experts from whom we will undoubtedly learn a lot.

The Foray returns to **Lion Max Simms Memorial Camp in Central Newfoundland near Bishop's Falls** this year. We were last there in 2008 and 2009. If you're interested in seeing the colourful reports from those forays, they are archived on our website at nlmushrooms.ca. In those early foray days, each foray offered the opportunity to add hundreds of new provincial species records to our cumulative lists: 293 species were identified at the 2008 Foray and 258 in 2009, bringing the total number of mushroom species identified at our forays to 954. By 2018 we had almost reached 1600 species in our full list. That's pretty impressive. We are still adding a significant number of new species records to the provincial mushroom list every foray, and quite regularly, our efforts also result in the identification of completely new species! It's wonderful to be part of this huge citizen science project which is backed up by the expertise of our faculty from both home and abroad.

This year the skies seem dryer than usual which, as you know, is a bad omen for an abundance of mushrooms. When there are fewer mushrooms, we have to look harder. But by looking harder, perhaps we will be rewarded with the rarer species. We need to look for the impressive macrofungi, but this year, let's also remember to take the time to get our eyes and noses closer to the ground and rotting logs to seek out the less common, the weird, the wild, and the wonderful.

Enjoy the run up to the foray. We look forward to seeing you soon!

All the best,

Helen Spencer

Announcements

Foray NL Faculty in the News

Greg Thorn and his research team made the news — not once, but twice — in the past two weeks, talking with Halifax's Saltwire and VOCM's On Target about their work in Newfoundland. Check out the article link or the radio program recording to hear more!

https://www.saltwire.com/halifax/news/what-lies-beneath-researchers-drawn-to-newfoundland-and-labrador-by-fungal-diversity-100766915/

https://soundcloud.com/vocm/tuesday-august-30th-mushrooms-of-newfoundland

The research group, appropriately attired in bespoke Thorn Lab sweatshirts (L–R, top row: Noor, Alicia, Katarine, Nour, Rachel, Bruce; lower row: Marianna, Asina, Elizabeth, Wasan, Greg. Not pictured: Tyler). Photo supplied by Greg, who unwittingly sent it to my unnamed inside source.

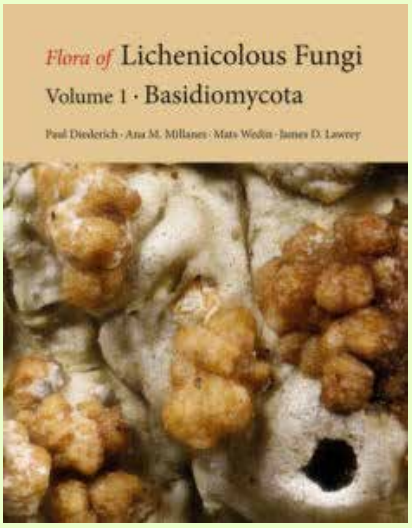
Flora of Lichenicolous Fungi, Vol. 1 Basidiomycota — Now Available

by Paul Diederich, Ana M. Millanes, Mats Wedin & James D. Lawrey

From the author: "Volume 1 features members of the Basidiomycota and treats 197 species in Agaricales (4), Atheliales (2), Boletales (1), Cantharellales (11), Corticiales (12), Filobasidiales (8), Tremellales (129), Agaricostilbales (18), Cyphobasidiales (9), Microbotryomycetes (1) and incertae sedis (2), including three new genera (Kriegeriopsis, Parmeliicida, Zyzygomyces), 74 new species, one new subspecies and three new combinations. Phylogenetic analyses and trees, identification keys, descriptions, macroscopical and microscopical illustrations and distribution maps are given.

You may order the volume directly at the National Museum of Natural History (https://www.mnhn.lu/science/flora-of-lichenicolous-fungi/?lang=en)

A free download is also available. However, as this is a Flora, I strongly recommend everybody interested in lichenicolous fungi or in basidiomycetes to order a hard copy." (Paul Diederich)



Foray Matters

Foray Info

Central Newfoundland Foray 2022:
RETURN TO THE FORAY

When: September 23–25, 2022

Where: Max Simms Camp, Bishop's Falls, NL

Faculty and Friends:

Chris Ellis
John McCarthy
Tony Wright
Renée Lebeuf
Greg Thorn
Roger Smith
Chris Deduke
Michael Burzynski
Andrus Voitk
André Arsenault
Hayley Anne Paquette
Jan Thornhill
Kathy Vatcher

Registration Open Online

www.nlmushrooms.ca

photo: Bill Bryden

Foray Schedule

Foray Info

Friday, September 23 - Mycoblitz and Evening Welcome

11 a.m.	***Mycoblitz* (3 hours)**	Notre Dame Provincial Park - ***BRING YOUR OWN LUNCH***
4 p.m.	**Registration - Max Simms Camp**	Welcome info provided; get settled in
5 p.m.	**Meet and Greet**	
6 p.m.	*Supper*	
7:30 p.m.	**President's Welcome**	
8 p.m.	**Concurrent Evening Talks (2) from Foray Faculty Experts**	

Saturday, September 24 – Field Day

8 a.m.	*Breakfast and announcements*	
9 a.m.	**Field Forays**	Participants depart with Trail Leaders to chosen trails
Noon	*Bag lunch on trail*	
1 p.m.	Identifiers & Database team return	Preparation for participants' return with collections
2:30 p.m.	**Foray Teams return to Camp**	Participants write specimen data cards for collections
5 p.m.	*Supper featuring wild mushrooms, moose, and Quidi Vidi beer*	
7:30 p.m.	**Concurrent Evening Talks (2) from Foray Faculty Experts**	

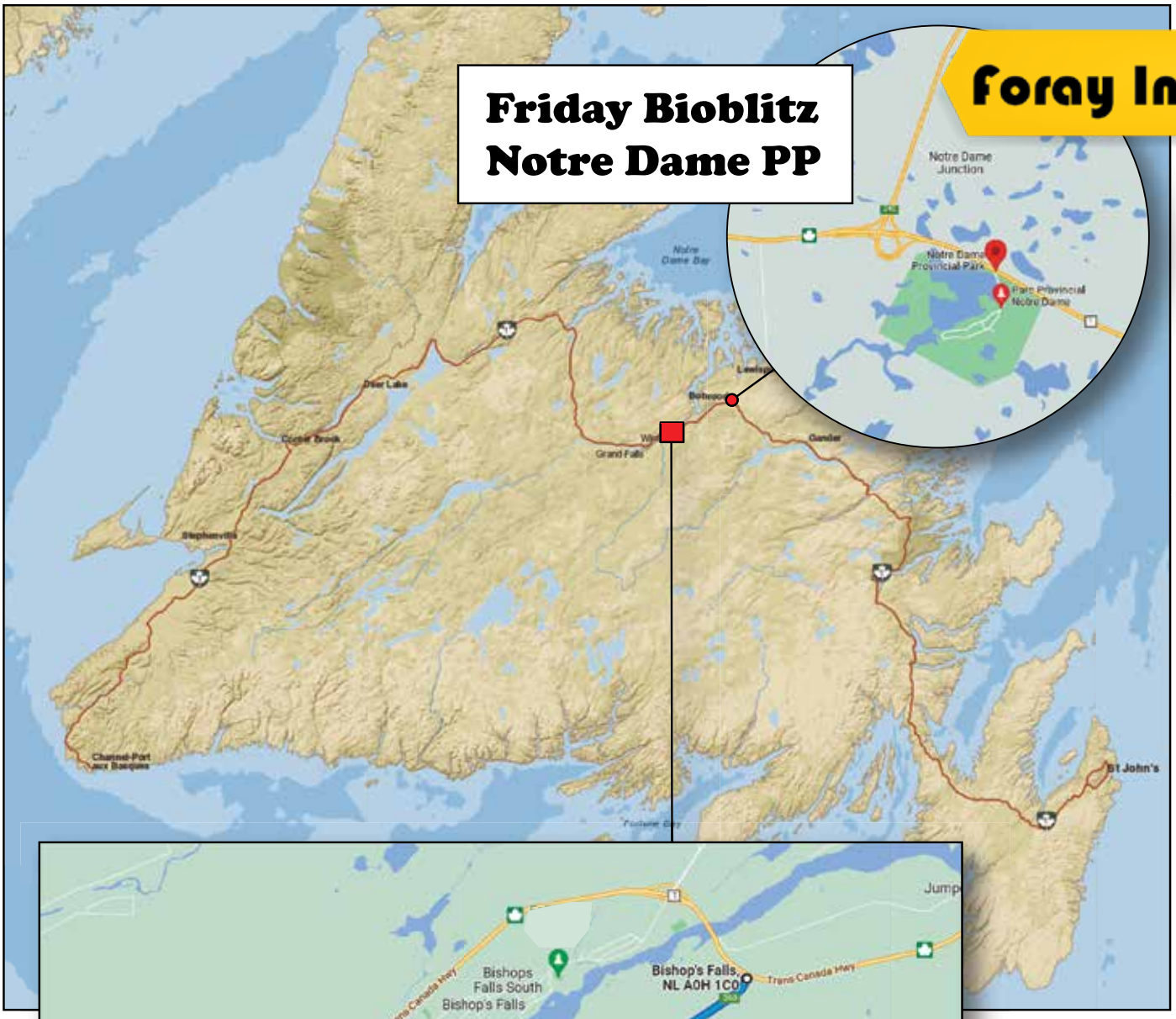
Sunday, September 25 – Workshop Day

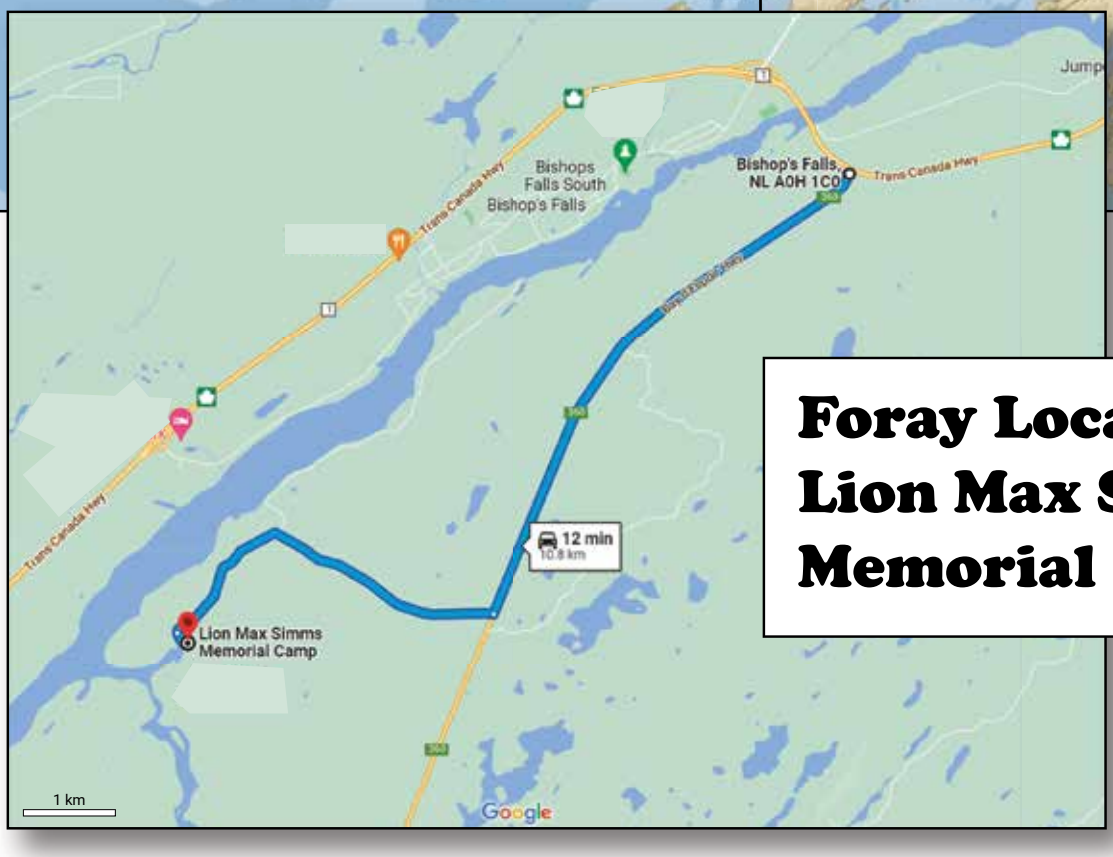
8 a.m.	*Breakfast and announcements*	
9 a.m.	**Group Photo**	
8:45 a.m.	**Concurrent sessions I: Workshops* or Table Sessions with Faculty⁺** (select 2 sessions)	
11 a.m.	**Concurrent sessions II: Workshops or Table Sessions with Faculty** (select 2 sessions)	
1 p.m.	*Lunch*	
1:45 p.m.	**President's Thank You**	
2:15 p.m.	**ForayNL Annual General Mtg**	*Optional; all members are welcome to attend!*
3 p.m.	Foray 2022 concludes	*Safe travels home.... and see you next year!*

* **Workshops** provide a broader range of experience to participants beyond mushroom identification and taxonomy. Previous years' offerings have included artist-led workshops (e.g., watercolour painting; dyeing wool with lichens; other crafts) and gastronomic workshops (e.g., cooking with mushrooms; preserving the harvest), among others. Final workshop offerings will be shared with Foray participants upon arrival.

⁺ **Table Sessions** are impromptu talks by members of our identification team using mushrooms collected during this foray and exhibited on the display tables. This is your chance to learn from experts who work with these species. Each of our identifiers has a different background and different knowledge, so you will have a different experience at each Table Session—attend more than one if you can! You will probably learn more about our mushrooms and lichens from the Table Sessions than you have at any other time during the foray.

Foray Info





Foray Location: Lion Max Simms Memorial Camp

Driving Directions

Foray Info

How to Get to Lion Max Simms Memorial Camp

Lion Max Simm's Camp is a very comfortable residential camp in Central Newfoundland, located off Route 360.

Directions: The camp is a short drive south from the Trans Canada Highway (TCH) near Bishops Falls. Drive time to the camp is a little over 4 hours from St. John's, or 3 hours east from Corner Brook. About 3 km east of Bishops Falls, take Route 360 (Bay D'Espoir Highway) south towards Harbour Breton. The turn for Lion Max Simms Camp will be on the right side of the road after 6.5 km and is marked with a sign. Their phone number is 709-258-5862 should you feel uncertain about the way. The Google or Apple Maps app on mobile devices can also guide you there.

To get there from out of province you can take the ferry from Nova Scotia or the Blanc-Sablon to St. Barbe ferry in Quebec. The closest interprovincial airport is Gander. If you plan on renting a car, be sure to book it a.s.a.p. as rental car inventory has been low this year.

Friday Mycoblitz at Notre Dame Provincial Park

If you are planning on going to the Friday afternoon mycoblitz (Sept. 23) at **Notre Dame Provincial Park**, you may want to go there before making your way to the camp. The park is on the TCH halfway between Gander and Bishops Falls just east of the Lewisport junction.

Meet in the day use parking area at 11 am. As you enter the park, let park personnel know that you are part of Foray NL. Bring a lunch, your mushroom basket and collection box, brown paper bags and or wax paper for specimens, a pencil and a mushroom knife. We will provide cards on which to record data about your finds.

Recommended Packing List

Foray Info

Clothing for Safety & Weather

Bright clothing is a good idea because it will be moose hunting season and it's easier to be spotted when a group is trying to keep together. If you have previously attended a Foray, bring the **safety orange Foray cap and whistle*** that you received at your first Foray check-in. If you have a blaze orange or other **Hi-Vis vest**, consider bringing it.

September could give us any kind of weather, from hot and dry to wet, windy and chilly, so be prepared with **layered clothing** and **waterproof outer layers**. Fingerless gloves might be a good idea if it's cold. **Sturdy shoes or hiking boots** for rough and potentially wet terrain are essential. Bring extra clothing so you have dry options back at camp, if you get caught in a rainstorm on the trails.

*** NOTE:** The Foray supplies an orange cap and whistle to each participant on their first Foray, so bring yours along if you've been to a foray before. If you forget or have lost yours, we can provide a replacement, but a donation to cover the cost is appreciated. The whistles are very loud safety devices — not toys. We use them to signal to the group while out on the trails and to help locate folks who have accidentally strayed from the group.

Supplies for Mushroom Collecting

- Large basket or open weave bag
- Lots of wax paper, paper bags or small containers for keeping specimens separate
- Compartmentalized bait box is great for keeping small specimens separate
- Mushroom knife or box cutter to remove mushrooms carefully from their substrate
- Pencil for completing collections slips (slips are provided)
- Mushroom field guide(s) of your choice

Recommended Personal Items

- Small backpack for carrying supplies & your lunch (Saturday bag lunch provided by Camp)
- Sunscreen
- Bug repellant
- Water bottle
- Cell phone with GPS. Consider caching offline maps for our Foray area (e.g. *maps.me* or similar).
- Camera
- Compass for wayfinding
- Small first-aid kit
- A sit-upon (waterproof mat) (optional, but a good idea for lunch in moist areas)
- A bit of cash in case you want to buy a souvenir Foray tee-shirt or tote bag
- Toiletries, towels, & other personal items. The camp has showers, but does not supply towels. Bedding is provided by the Camp.

Foray Trails List

Foray Info

(1) Exploits Nordic Ski Trails

Location: 35 Scott Ave, Grand Falls - 20 minute drive
Distance: 7.5 km total possible (several loops)
Difficulty (1–4): 1 to 2 (hiking boots recommended)
Description: gravel and grass trails through meadows and light woods of birch, maple, spruce, fir, alder forest. Views of the T'railway and Exploits River.

(3) Airport Nordic Ski Trails

Location: TCH, 3 km W of Gander - 55 minute drive
Distance: 10 km total possible (several loops)
Difficulty (1–4): 3 (hiking boots recommended)
Description: trails loop through mixed woods with grassy areas and bogs.

(5) South Side Rd., Rattling Brook Trail

Location: South Side Rd. - 15 minute drive
Distance: 4 km total possible (2 km + return)
Difficulty (1–4): 2 to 3 (hiking boots recommended)
Description: narrow gravel and packed earth trail with bogs; wooded areas of alder and mixed conifers; views of Rattling Brook Valley.

Other Trail Options

- Jiggs Lookout, 10 minute walk from camp
- Max Simms Rd. Bog - 40 minute walk
- local Farm Trail (4 km return from camp)

(2) Corduroy Brook Trails

Location: Queensway, Grand Falls - 25 minute drive
Distance: 4 km total possible (several loops)
Difficulty (1–4): 1 (running shoes fine)
Description: gravel and packed earth trails and boardwalk. Trails are semi-open and include bogs and a playing field; forests are mainly hardwoods including aspen; views of Corduroy Pond.

(4) Thomas Howe Demonstration Forest Trail

Location: TCH, 1 km E of Gander - 60 minute drive
Distance: 3 km total possible (several loops)
Difficulty (1–4): 1 (running shoes fine)
Description: gravel and grassy trails through wooded areas comprising mixed forests; views of Gander Lake.

(6) Max Simms Camp Grounds

Location: walk around grounds, no driving
Distance: 0.5 km total possible
Difficulty (1–4): 1 (running shoes fine)
Description: the grounds include open meadows and forest transition zones. This option is best for those not planning to attend mushroom ID walks with Faculty on Sunday morning, as they may also peruse the grounds and walking-distance trails/farm roads.

The last Foray at Max SImms Camp, circa 2009 (photo Roger Smith)

FORAY NEWFOUNDLAND AND LABRADOR

Registration & Acknowledgement

of Foray Participant's Responsibility, Express Assumption of Risk, and Release of Liability

Central Newfoundland, September 23–25, 2022

Space is limited. Registrations are accepted on a **first-come first-served basis**. A registration is only recorded when payment and this signed Registration & Acknowledgement form have been received by Foray NL Treasurer. Please read both pages carefully. This form (front and back) must be completed for **each participant.** Submit completed forms and payment to:

Glynn Bishop, 1856 Topsail Road, Paradise, NL, A1L 1Y7, CANADA — or email to foraynltreasurer@gmail.com

Registration

Name: _____

Street: _____

City: _____ Province/State: _____ Code: _____ Country: _____

Tel: _____ E-mail: _____

Membership Fee (Foray partcipants must be Foray NL Members)

☐ New or returning member (if not already paid in 2022; one fee per family/household) ..... $ 20.00

Foray Participation Fees (in Canadian dollars)

Registration includes Friday reception, two breakfasts and lunches (Sat/Sun), Saturday supper, lodging, presentations, trails, and other activities. Your registration also includes membership in Foray NL until the following year's foray.

☐ Adult (age 18 and up) ..... $ 300.00

☐ Youth (age 13 to 17; must be accompanied by a fee paying adult) ..... $ 150.00

☐ Children (under 12; each child must be accompanied by a fee paying adult) ..... $ 0.00

☐ 2022 Student Database Team* and non-student Team Veterans (prearranged) ..... $ 150.00

Workshop Fees Workshops are available for registration on-site at the Foray and may include a small fee for materials. Fees can be paid at the Foray.

Book Purchase I wish to buy ____ NL mushroom field guides @ $20.00 each ..... + $ _____
This is a special members' price. We do not sell the book at the foray.

Donation *Donations to support Foray NL are always welcome. We are not a charity and cannot issue tax receipts* + $ _____

TOTAL ..... **$** _____

E-transfer within 7 days of form submission to: **foraynltreasurer@gmail.com** or contact us for other payment methods.

Dietary needs _____

Please Note: we will do our best, but cannot guarantee all dietary requirements.

Suggested Bunkmate(s) _____

Know someone attending the Foray that you'd like to share a room with? Suggest a roommate here.

I understand that during my participation in the events that together make up the Annual Fall Mushroom Foray, henceforth known as "the Foray" of MUSHROOM FORAY NEWFOUNDLAND & LABRADOR, INC., henceforth known as "FNL", I may be exposed to a variety of hazards and risks, foreseen or unforeseen, which are inherent in the Foray and cannot be eliminated without destroying the unique character of the Foray. These events include, but are not limited to: accommodations, identification outings, scientific presentations and investigations, meals, including as a food course mushrooms selected by participants, leaders, including FNL Organizers and Faculty, and travel to and from the outings and meals. The inherent risks include, but are not limited to: contraction of infectious disease such as COVID-19, the dangers of serious personal injury, property damage, and death, henceforth known as "I&D", from exposure to the hazards of travel; moving in the wilderness, including uneven or insecure terrain; actions of fellow participants, wild animals or third parties, including hunters; mushrooms that may be poisonous, toxic, or cause unforeseen allergic or other adverse reactions in individuals, both independently and in conjunction with other substances, including wine or other alcoholic spirits. FNL Organizers and Faculty have not tried to deny or minimize my understanding of these risks. I know that I&D can occur by natural causes or activities of other persons, FNL Organizers and Faculty, animals, trip members, trip leaders and assistants or third parties, either as a result of negligence or because of other reasons. I understand that risks of such I&D are involved in adventure travel such as the Foray and I appreciate that I may have to exercise extra care for my own person or others around me in the face of such hazards. I further understand that the Foray may not have, or be readily accessible to, rescue, medical facilities, or expertise necessary to deal with the I&D to which I may be exposed.

In consideration for my acceptance as a participant on the Foray and the services and amenities to be provided by FNL Organizers and Faculty in connection with the Foray, I confirm that:

1. I have read these and any other terms, rules, information and conditions applicable to the Foray, made available to me directly or on the FNL website;
2. I will pay any costs and fees for the Foray;
3. I choose to participate in the Foray of my free will, being fully aware of the risks involved; and
4. I acknowledge my participation is at the discretion of the leaders.

The Foray officially begins and ends at the times and location(s) designated by FNL Organizers and Faculty. The Foray does not include carpooling, transportation, or transit to and from the Foray (including ferry) or trails during the Foray, and I am personally responsible for all risks associated with this travel. This is meant to include transportation provided by FNL Organizers and Faculty or participants during the Foray, including transport or carpooling to trails during the Foray and between the accommodations and the Foray trails.

If I decide to leave early and not to complete the Foray as planned, I assume all risks inherent in my decision to leave and waive all liability against FNL Organizers and Faculty arising from that decision. Likewise, if the leaders have concluded the Foray, and I decide to go forward without the leaders, I assume all risks inherent in my decision to go forward and waive all liability against leaders including FNL Organizers and Faculty arising from that decision.

This Agreement is intended to be as broad and inclusive as is permitted by law. If any provision or any part of any provision of this Agreement is held to be invalid or legally unenforceable for any reason, the remainder of this Agreement shall not be affected thereby and shall remain valid and fully enforceable.

To the fullest extent allowed by law, I agree to WAIVE, DISCHARGE CLAIMS, AND RELEASE FROM LIABILITY FNL, its officers, directors, employees, agents, faculty and leaders, from any and all liability on account of, or in any way resulting from I&D, even if caused by negligence of FNL, its officers, directors, employees, agents, faculty and leaders, or any other parties in any way connected with FNL or the Foray. I further agree to HOLD HARMLESS FNL, its officers, directors, employees, agents, faculty and leaders from any claims, damages, injuries or losses caused by my own negligence while a participant in the event. I understand and intend that this Assumption of Risk and Release of Liability is binding upon my heirs, executors, administrators and assigns, and includes any minors accompanying me on the outing.

I have read this document in its entirety and I freely and voluntarily assume all risks of such I&D and notwithstanding such risks, I agree to participate in the Foray.

Signed:

_____

Date: _____

If you are a minor (under age 18), your parent or guardian must sign the Registration & Acknowledgement (above) on your behalf.

The signature above signifies my agreement and consent to the foregoing Acknowledgment on behalf of the minor named here:

_____

Relationship: _____

We take photographs of Foray events and participants for outreach & our newsletter, Omphalina. We assume that registrants consent to this use of their image. If you do not consent, please contact us at info@nlmushrooms.ca

The FNL logo mushroom gets a NAME!

Andrus Voitk, Irja Saar, Bibiana Moncada, Ed Lickey

A quest begun in 2006 finally reached its goal.

To stress the unknown, each of our early forays had an unidentified logo mushroom (Fig. 1). In 2006, when Foray Newfoundland & Labrador (FNL) incorporated to become a provincial organization, the membership voted to make the logo mushroom from the previous year its permanent symbol. Wishing to determine its identity, the first author and organizer of the FNL faculty foray at the time, presented an overview of the varied morphology of our sphagnicolous (growing in *Sphagnum*) arrhenias to the 2006 faculty with an invitation to help investigate their diversity. Had the last author, Ed Lickey, not offered his help, you would not be reading this. Ed's place in the author line-up is not meant as an indication of his relative contribution, but of his anchor position in the tug-of-war to pull the truth out of the bog. A posy of specimens was sent to Ed, from which he constructed our first tentative phylogenetic tree. The most significant

Figure 1: FNL logo mushrooms from even before FNL was FNL. **Top left**: 2003 logo, an unidentified *Amanita* from section *Vaginata*. It will remain unidentified, because a voucher was not kept in those early days. **Top right:** 2004 logo: unidentified (at the time) species of *Mycena*. Subsequent identification as *M. overholtsii* A.H. Sm. & Solheim probably erroneous, because that is a western species growing on coniferous wood, whereas ours grows exclusively on birch (at least here). Subsequently identified as *M. semivestipes* Peck by Scott Redhead (personal communication), a species first collected form the same region in NL by Arthur C. Waghorne, and sent to Peck. Should the type specimen find its way back to NYS after some 17 years of clandestine secondment to a confidential locale, we may be able to sequence it to confirm this identification. Apparently the foray hats with the 2003–2005 logos are collectors' items, fetching handsome prices at Sotheby's annual auctions. **Middle row:** evolution of FNL logo mushroom from specimen photo in Rocky Harbour bog and 2005 logo, to 2006 stylized rendering as its current iteration by IT specialist, commercial artist and FNL member Jim Parsons. **Lower:** the full FNL logo, logoimage (logo mushroom) + logotext, as developed by Jim. The same logo mushroom also appeqars on every cover of the FNL newsletter, Omphalina. The instant success of this logo catapulted Jim into the chairman's seat of the Corner Brook Downtown Businessmen's Association, and thence directly into the mayor's throne, where he can be seen to this day, bedecked with kilograms of jewel-encrusted gold and silver civic regalia. Anyway, this species, misidentified as *Omphalina/Arrhenia gerardiana* var. *fusconigra* for a long time, has finally been described—see text.

feature of that first tree was that it confirmed the existence of two separate scaly-capped sphagnicolous species. At the time most workers believed there was only a single scaly-capped sphagnicolous species of *Arrhenia*. Discovering that our bogs hid more than we knew, was the first step in a long journey of discovery. Many specimens from Europe and North America were examined, and as things became more involved, additional collaborators recruited. Ed spent time in the herbarium of the New York State Museum (NYS) with the collections by Charles Peck, which included the type for *Arrhenia gerardiana*, and explored the bogs where Peck had collected the species. After 16 years, our challenging and interesting pursuits came to an end with the publication of our findings in 2022.[1] If you wish to read the technical account, use the link in the references to download a free copy. Yes, worth every penny!

We found four species of sphagnicolous arrhenias in our bogs, all of them distributed throughout the northern hemisphere: *A. bigelowii*, *A. gerardiana*, *A. philonotis* and *A. telmatiaea*. The first two have a scaly cap, are obligate sphagnophiles (grow only with *Sphagnum*), may grow in the same bog at the same time, and are found throughout the province. *Arrhenia bigelowii* is often slightly darker, at times undergoes a marked darkening reaction, has a little more bowl-shaped cap and longer spores. These differences are not always present, and there is significant overlap, so that often they cannot be identified with certainty without molecular studies. The second pair has smooth caps, is found in Labrador and exposed coastal barrens of the northern part of Newfoundland. *Arrhenia philonotis* is usually light grey, may have sparse fine hairs on the cap and is a facultative sphagnophile (grows with *Sphagnum* as well as with other mosses in barrens where *Sphagnum* grows), and is the least common of the four in our province; we know this species the least. *Arrhenia telmatiaea* is the darkest of all, often almost overly black, and an obligate sphagnophile. It is relatively common in the bogs of Labrador and the northern part of Newfoundland. *Omphalina fusconigra* is a later synonym for the same species. Spore measurements of the smooth-capped species separate them from the scaly-capped ones, and also from each other—most of the time (Fig.2).

The collection giving rise to our logo mushroom was declared the type for *Arrhenia bigelowii*, named after Howard Elson Bigelow (1923–1987). A very influential mycologist, Bigelow made many astute observations about this group of fungi. Two of his students, Roy Halling and Tim Baroni have kindly written a short vignette of their supervisor that follows this article. Why are we naming this species after Bigelow? Well,

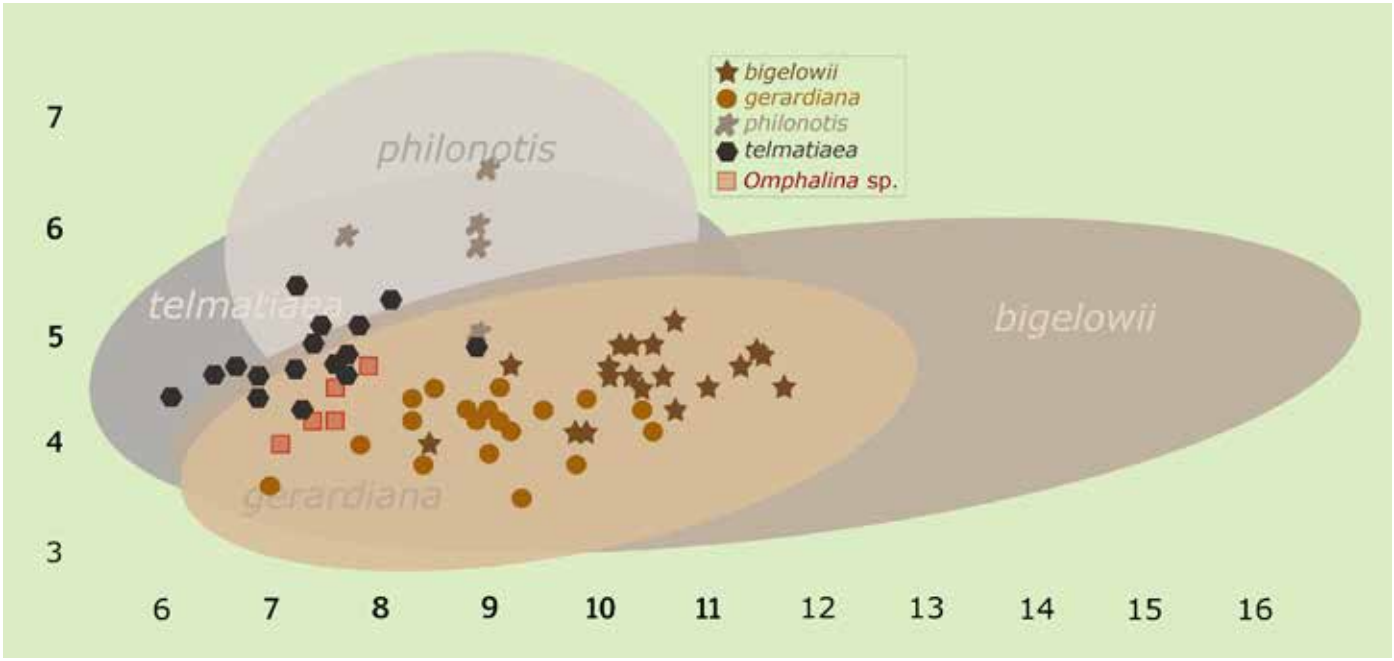


Figure 2: Spore measurements for the five sphagnicolous omphalinoids in NL, data from sequence identified specimens only. Range given by ellipses, and average measurements shown with symbols.

one of his astute observations was to describe this as a new taxon in 1958. You may wonder how we can describe *A. bigelowii* as a new species, when Bigelow already described it 64 years ago. This comes about from using the rules of nomenclature to bring about what seems to us the most prudent result.

Before *Omphalina gerardiana* had been transferred to *Arrhenia*, Bigelow assigned many funnel-shaped omphalinas to the genus *Clitocybe*. Among these was *O. gerardiana*, which became *C. gerardiana*. Bigelow discovered a small darker population of it, which he described as *C. gerardiana* var. *fusca*. Because he did not find other differences from the nominate species, he chose to describe it as a new (darker) variety, not a new species. Sequencing showed that Bigelow's type specimen was a separate species, not a variety, and our logo mushroom fell into the same clade. In such a situation it is customary to elevate the variety to species, using the same name. However, this is not mandatory, because the rules give names at the species level priority, so a previously described variety can be redescribed as a new species, with a new name and a new type specimen.

To us there seemed three reasons not to follow custom in this case.

1. The author himself de facto withdrew his validly described name by synonymizing it with *O. fusconigra*.
2. As the foregoing suggests, *Omphalina fusconigra*, had caused so much confusion in the naming of these species over the years that although there is a difference between fusca and fusconigra, it would be better to avoid the "fuscus" root altogether. Not everybody feels equally at home in the classical languages these days, not even scientists, and some may find the perpetuation of the term confusing.
3. We felt that the type collection designated by Bigelow is potentially problematic. Namely, the collection had whole, partial and fragmentary pieces from over 30 fruiting bodies. We have seldom seen this species grow in groups greater than six, so that it is reasonable to assume that the collection is made up of at least five different individuals. Our experience with these species has also shown us that a) although *A. bigelowii* is darker than *A. gerardiana*, most of the time they are not readily distinguishable from each other, and b) often they grow in the same bog at the same time. The potential for a mixed collection is high. The way to get around this is to sequence a representation of specimens (ideally all) and name the "true" ones lectotypes. However, we had only had a half cap available to us, reduced by about 50% after destructive sampling for studies, and to declare that little piece as the entire lectotype for the future seemed foolish, especially in view of the large varietal type collection available. You may wonder why not sequence the entire collection. Well, over 30 fruiting bodies in multiple pieces would mean hundreds of sequencings. We lack the time and budget for this, and the herbarium may be reluctant to send out its whole collection. No herbarium can take on such a job, which would need to be done for all its thousands of collections. Therefore it seemed preferable to describe it as a new species, with a fully examined type collection from the same individual. The collection declared as type by Bigelow for the variety remains as the varietal type, available for future use, if need be. Bigelow's discovery is acknowledged by naming the species after him, and FNL can feel proud to have a logo tied to this trailblazing mycologist.

Now that we know the name of our logo mushroom and how it came about, let us look at the other sphagnicolous arrhenias. The name of the other scaly-capped species is familiar to us: *A. gerardiana*, described by Charles Peck, an established name used by many. As we have learned, despite its many differences from *A. bigelowii*, due to a wide variation of appearance for both, there is much overlap, making their macroscopic separation difficult. Spore measurements may help to separate most. As we see on Figure 2, in those cases (unfortunately a minority), where the spores are longer than 12–13 µm, it is likely *A. bigelowii*. Average spore size can help to separate many of the remainder: specimens with an average spore length (calculated from a minimum of 20 "random, mature" spore measurements) of 10 µm or more are likely to be

A. bigelowii, and those with shorter average values, *A. gerardiana*. This is short of perfect, and in some cases unfortunately even after adding macroscopic clues, only sequencing may be definitive.

This is a good place to discuss what happened to *A. sphagnicola*. That was the name we used most commonly for scaly-capped sphagnicolous arrhenias, and also used by most of those not using *A. gerardiana*, *A. oniscus*, *A. philonotis* or some other name. Well, in preparation for our review of sphagnicolous arrhenias we looked at all possible names. The story of *A. sphagnicola* was so long and involved, that it was treated as a separate and purely nomenclatural investigation.[2] The conclusion was that *Agaricus sphagnicola* was a later synonym for the current *Lichenomphalia umbellifera*. Therefore, this is a superfluous name and will fall out of use, so long as we adhere to the principle of one fungus = one name.

Of the smooth-capped species we know *A. philonotis* the least. It is a greyish mushroom with a sparsely hairy cap, growing in barrens with *Sphagnum* as well as other mosses. Whether the fungus and *Sphagnum* occur together because they interact, or prefer similar habitat is unknown. It seems to prefer northern latitudes, found only in Labrador and the tip of the Great Northern Peninsula in our province. It has been reported far more commonly in Europe, but at least part of this is due to misidentification or misapplication of the name.

This brings us to the last sphagnicolous *Arrhenia*, *A. telmatiaea*. You are entitled to ask where such a name came from. Although described in 1883, the name has not been used, probably because there was some initial confusion around the species and its correct name, as the type specimen was sold to New York Botanical Gardens, not readily available to investigators in Great Britain, where it was collected and described. Because the name was not in use, the species was erroneously described as new in 1960 with the name *Omphalina fusconigra*. This name has been used much more commonly, but unfortunately often it has been misinterpreted to be scaly-capped, causing that name to be misapplied to scaly-capped species, thus adding to the confusion around these names. We sequenced the types of *Agaricus telmatiaeus* and *O. fusconigra*. Both fell in the same clade, proving that they were conspecific and giving the earlier name priority. Many very dark obligatory sphagnophiles from Labrador, the Great Northern Peninsula and coastal barrens down the east side to at least Bonavista Bay also fell in the same clade. This possibility had been raised before, notably by Bigelow, who suggested comparing *O. fusconigra* with *Agaricus telmatiaeus*. Now this has been done, giving us a name with a wealth of vowels at the end, like a vocalise exercise for a coloratura soprano.

Apologia

This recount makes no secret that we feel euphoric to have finished this enquiry, as evidenced by the use of exclamation marks, not usual fare for scientific reports, and references to "new" discoveries and "finally" solving problems. Honest elation should not be confused with gloating or boastfulness. Captain Kirk had some wisdom, a lot of luck, and good companions, all of which certainly helped, but he was able to go where no man had gone before not because of superior intellectual or physical prowess, but because he had technology and equipment not available before. When we speak of past confusion over names, interpretations, and species concepts, it is not to disparage earlier workers. They lacked tools to go further. Our ability to extract some clarity from taxonomic amorphia is a tribute to phylogenetic analysis—our Starship Enterprise. For the first time we have technology to take us out of the Milky Way Galaxy. We hope future investigators will be as charitable about our attempts to use this tool, as we are respectful of those who went before us.

At this stage of our story you will be aware of two things. First, you may harbour mixed feelings of annoyance and helplessness at all these new names and changes. Secondly, even though we have skirted the subject very superficially (more detail in the references for those who wish!), you cannot fail to note that over the centuries there has been a lot of confusion associated with these names. And we are only dealing with four species! Now you can begin to imagine the confusion around the interpretation and application of all the names created over the decades. But it should not be hopeless. A system of nomenclature has been created for the specific purpose of preventing this problem,

governed by rules designed to make it work. The cornerstone of naming organisms is defining them by a designated type specimen. When such exist, all discussion is settled by whether any other organism or interpretation fits with the type or not. The problem has been the unavailability of type material or its failure to yield required information (e.g., DNA). Part of our work was to look at all names and material, identify and define names by available types, and where types were lacking designate new types, fitting with the original descriptions for the names. The result may seem annoying now, but the advantage is that with types, these names are now fixed. Sure, we may need to rename all the FNL collections that we called *Arrhenia sphagnicola*. But once done, we know exactly what to call all four species, and because the names are fixed by types, there should not be any confusion about these names in the future. Future stability seems well worth the pain when you look at the great difficulties in the past.

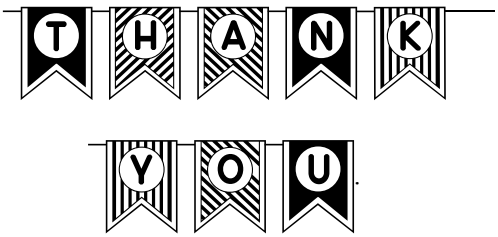
Finding a species of *Omphalina* in *Sphagnum* was unexpected. Like all unexpected findings, it was a pleasant discovery, but it certainly added to the difficulty of identifying these species from each other. Like all omphalinas, this species is more common in mossy-grassy habitats. So far this is the only species of *Omphalina* in its strict sense that we have found in the province, a species in the *Omphalina pyxidata* group that we have not identified with certainty. In the hopes to learn its identity in time, we have made all our *Omphalina* material available to a colleague with experience and interest in this group, who also has access to a lot of types and earlier work on these species.

A description of our four sphagnicolous arrhenias and one errant *Omphalina* will follow. To prepare you for the difficult tasks of differentiating scaly from smooth, dark from light or recognizing the difference between red, brown and grey, please enjoy Figure 3, a brief excursus of the variation of these characters in the five species described. After that, only one last thing to mention before we go to the species descriptions. Because we have a good representation from Europe and North America, unknown species are unlikely in commonly explored regions, but additional species may be found in more remote regions that have escaped exploration. For example, we have a few single specimens from Labrador, without adequate notes or photos, which might represent unknown species of sphagnicolous arrhenias. So far we have not found additional specimens on return trips, but once good collections and data are gathered, more new sphagnicolous arrhenias may be described.

Acknowledgments

In addition to all the good people we thanked in the technical report,[1] (download your free copy and read the names!) we should also thank Bill Bryden, Michael Burzynski, Henry Mann, Roger Smith, Greg Thorn, and Maria Voitk for photos not used in the cited article.

You may wonder why not all photos have been credited in the caption. Over 16 years, a few attributions have become a bit obscure. Everybody gets treated the same. Dear photographers: sorry for losing track; you'll know your photos, so



References

1. Voitk A, Saar I, Moncada B, Lickey EB (2022) Circumscription and typification of sphagnicolous omphalinoid species of *Arrhenia* (Hygrophoraceae) in Newfoundland and Labrador: three obligate and one facultative species. Mycological Progress, 21:57. 2022.

Download pdf: https://link.springer.com/content/pdf/10.1007/s11557-022-01806-z.pdf

2. Voitk A (2021) Typification of *Agaricus cespitosus*, *Ag. oniscus*, and *Ag. sphagnicola* and their synonymy with *Lichenomphalia umbellifera*. Mycotaxon 6:789–818.

Figure 3: Variations in cap texture, darkness, and colour, sequence-identified specimens only. Sometimes differences in colour and darkness are fine, evident clearly when populations are compared side by side, but not equally obvious with only one specimen is in your hand. In addition, the wide range of appearance for these species can make identification very difficult on occasion. Some of these presentations are uncommon; especially those on C, F and J must be considered rare. Spore size (Fig. 2) will help sort out most problems, most of the time. **A–C. *Arrhenia bigelowii*. A.** Two different specimens with normal scaly cap, but marked difference in darkness. The dome-shaped cap is more common with *A. bigelowii* than *A. gerardiana*. **B.** Scales smaller. Note reddish colour, usually thought to characterize omphalinas, not arrhenias, which are reputed to be greyish. **C.** Scales virtually not evident. This is the only unscaly specimen of *A. bigelowii* that we have seen. **D–F. *Arrhenia gerardiana*. D.** Normal scaly cap. Arrhenias and omphalinas are both brownish, but the former are reputed to be on the greyish end and the latter on the reddish. It is not unusual for *A. gerardiana* to be somewhat reddish, especially in full sun. **E.** A more greyish specimen that seems to have lost much of the scale-bearing outer layer of the pileipellis (cap skin). **F.** Occasional large specimens seem to lose their identifying scales. Whether the process is by desquamation, as revealed by B, above, is not known. If the colour were as in D, it would be indistinguishable from the *Omphalina* (G). Brownish grey versions can be confused with *A. philonotis* (H), and *A. telmatiaea* (K). **G. *Omphalina* species.** Colour closest to *A. gerardiana* (D), and cap texture close to *A. gerardiana* (F), *A. philonotis* (H), and *A. telmatiaea* (K). The margin becomes wavy with age for all these species, and is round and even until maturity for these omphalinas as well. **H–I. *Arrhenia philonotis*. H.** A lighter greyish smooth-capped species. **I.** A small and dark specimen, easily confused with *A. telmatiaea*, if it were in Sphagnum. **J–L. *Arrhenia telmatiaea*. J.** Even this very dark species can seem relatively light on occasion. In this case likely bright sun, translucency, and thin pileus play a role, even though most of the cap was shaded. **K.** Darkish grey-brown, readily confused with *A. philonotis*. **L.** Characteristic dark presentation, unlikely to be confused with anything else, but difficult to believe to be the same species as J.

Description Sheet

Arrhenia bigelowii (also see cover image)

Fruiting body: about 8–33 mm tall, brown, central stem, in *Sphagnum*. Lower photos illustrate its uncommon darkening reaction: Left from type collection. Remaining two photos of the same collection, middle in situ, right three hours after collection. Stimulus for this change not known. **Cap:** 4–24 mm diameter, umbilicate, often dome-shaped, then flattening, then wavy, covered with somewhat concentric radially arranged scales with darker brown, burr-like, uplifted, narrowing tips. Translucent, radially ribbed with darker bands over gills, alternating with wider, tan intervening bands. Cap margin darkens with time. **Gills:** moderately spaced, smooth edged, decurrent; a few low crossveins with age, forking rare; light brown, developing darker edge. **Stem:** 10–23 × 2–5 mm, cylindric, straight; brown; hollows with age; minutely tomentose, glabrescent with age, sparse white tomentum at base. **Context:** whitish, odor unremarkable.

Spores: 6.1–17.0 × 3.0–6.1 µm, ave. 10.3 × 4.6 µm, elliptical, Q = 1.6–3.3, ave. 2.3.

Habitat: open raised *Sphagnum* bogs in groups of 1–6, attached to living *Sphagnum* with white mycelium, June–Sept, most plentiful in July. May be found in the same bog at the same time as *A. gerardiana*. **Distribution:** North America and Europe; in NL found throughout the province, more common on the Island than Labrador.

Description Sheet

Arrhenia gerardiana

Fruiting body: about 10–35 mm tall, brown, central stem, in *Sphagnum*. **Cap:** 5–25 mm diameter, umbilicate, edges curved down somewhat at the margin, but rarely dome-bowl shaped, covered with somewhat concentric radially arranged scales with darker brown, burr-like, uplifted, narrowing tips. Scales seem to recede with age, and occasional very mature specimens with large caps may have no scales. Translucent, radially ribbed with darker bands over gills, alternating with wider, tan intervening bands. Cap margin darkens with time. **Gills:** moderately spaced, smooth edged, decurrent; a few low crossveins with age, forking rare; light brown, developing darker edge. **Stem:** 10–23 × 2–5 mm, cylindric, straight; brown; hollows with age; minutely tomentose, glabrescent with age, sparse white tomentum at base. **Context:** whitish, odor unremarkable.

Spores: 6.2–12.9 × 2.8–5.6 µm, ave. 8.9 × 4.2 µm, pip-shaped to elliptical, Q = 1.3 – 3.2, ave. 2.2.

Habitat: open raised *Sphagnum* bogs in groups of 1–6, attached to living *Sphagnum* with white mycelium, June–September, most plentiful in July. May be found in the same bog at the same time as *A. bigelowii*. **Distribution:** Europe and North America; suspect Holarctic distribution. In NL, throughout the province.

Description Sheet

Arrhenia philonotis

Fruiting body: about 10–38 mm tall, lighter grey-brown, central stem, in heaths, bogs and moors with *Sphagnum* or other moss. **Cap**: 5–30 mm diameter, umbilicate, edges curved down becoming plane and wavy with age, translucent, smooth, often covered with thin, fibrillose, adpressed, flat scales, whose tips may become slightly uplifted as scattered thin hairs, denser in the umbilicus. Narrow brownish radial bands over gills, alternating with wider, greyish intervening bands. Cap margin darkens with time. **Gills:** moderately spaced, smooth edged, decurrent; may develop a few low crossveins with age, forking very rare; whitish grey-brown, developing darker edge. **Stem:** 10–25 × 2–5 mm, cylindric, straight; hollowing; minutely tomentose, then glabrescent, brown with sparse white tomentum at base. **Context:** whitish, odor unremarkable.

Spores: 6.6–10.9 × 4.2–7.7 µm, ave. 8.7 × 5.6 µm, pip-shaped to elliptical, Q = 1.2 – 2.1, ave. 1.6.

Habitat: barren moors, heaths, fens, raised *Sphagnum* bogs in groups of 1–6 separate basidiomata, either with *Sphagnum* or other moss, June–September, most plentiful in August. **Distribution:** North America and Europe; Holarctic distribution suspected; in NL so far known only from Labrador.

Description Sheet

Arrhenia telmatiaea (= *Arrhenia fusconigra)*

Fruiting body: about 10–40 mm tall, dark brown, usually almost black, central stem, in *Sphagnum*. **Cap:** 6–32 mm diameter, umbilicate, edges curved down and inturned, flattening, occasionally funnel-shaped with age, translucent, smooth, with occasional floccules in the umbilicus. Usually dark brown verging on black, but occasionally may remain brown; dark radial bands over gills, alternating with somewhat lighter deep brown bands; hygrophanous. Margin darkens with time. **Gills:** closely spaced, smooth edged, decurrent; forking very rare; medium to dark brown, edge darker. **Stem:** 10–28 × 2–6 mm, cylindric, straight; becoming hollow; minutely tomentose, then glabrescent, concolorous with pileus with sparse white tomentum at base. **Context**: lighter brown, odor unremarkable.

Spores: 5.3–11.3 × 3.3–6.6 µm, ave. 7.3 × 4.7 µm, pip-shaped to elliptical, Q = 1.2–2.2, ave. 1.6.

Habitat: raised *Sphagnum* bogs and barrens on *Sphagnum* in groups of 1–6, attached to living *Sphagnum* with white mycelium, July–September, most plentiful in August. May be found in the same bog at the same time as other northern species. **Distribution**: North America and Eurasia; in NL not as southern as the scaly-capped species, known only from Labrador, on the Island only on the Great Northern Peninsula and northeastern coastal barrens.

Description Sheet

Omphalina sp. (*O. pyxidata* complex, not identified to species)

Fruiting body: about 10–44 mm tall, brown, central stem, usually with various mosses in grassland, moor, fen, but at times in bog with *Sphagnum* (three lower rightmost photos). **Cap:** 8–40 mm diameter, umbilicate, downcurved edges quickly flattening, then upturned and wavy with age, translucent, but hygrophanous and opaque when dry, smooth, covered with sparse, thin, fibrillose, adpressed, flat scales. Reddish brown radial bands over gills, alternating with wider, tan intervening bands. Upper photo all from one cluster, illustrating variation of colour within what is assumed to be a single individual. Lower row illustrates variable amount of red. As elsewhere, photos of sequence-identified collections only. **Gills:** moderately spaced, smooth-edged, decurrent; develop low crossveins beyond maturity, forking very rare; very light off-white, contrasting with darker stem and cap. **Stem**: 2–7 × 10–38 mm, cylindric, straight concolorous with cap, sparse white tomentum at base. **Context:** whitish, odor unremarkable.

Spores: 6.3–9.1 × 3.6–5.1 µm, ave 7.8 × 4.4 µm, elliptical, Q = 1.3–2.1, ave. 1.8.

Habitat: with mosses in grassland, fens, moors and bogs; troops of 20 or more in grassland, but rarely over 4 in bogs, June–Sept, most plentiful Jul–Aug. Found in the same bog at the same time as the other species. **Distribution:** North America and Europe; throughout NL.

SPOTLIGHT:

Dr. Howard E. Bigelow (1923-1987)

A kind and generous Professor of Botany at the University of Massachusetts, Amherst (1957–1983), whose sense of humor, smile and gentle nature endeared him to his students

By Roy Halling & Tim Baroni (former postgraduate students)

Howard Elson Bigelow was born in Greenfield Massachusetts and attended Oberlin College (1941-1943), but his education was interrupted in order to serve in the US military during the second World War in Europe. After the war, Howard returned to Oberlin College and finished his BA (1949) and MA (1951), then moved to Michigan to study mycology under the guidance of Alexander H. Smith. He took his saxophone with him and played it for relaxation and comfort during his work on his PhD. Margaret Elizabeth Barr of Manitoba, Canada, Howard's soon to be partner, was also working on her doctoral thesis in mycology at the University of Michigan. They graduated in 1956, wed, and eventually moved to Amherst, Massachusetts in 1957 where they both took on teaching positions in the Department of Botany at the University of Massachusetts.

Howard loved music as much as he loved studying mushrooms and joined a local band in Greenfield, MA for occasional evening concerts in the town's central park, playing saxophone. Howard and Maggie were warm and welcoming to all their students, but especially so to their graduate students. They opened their home in Conway, MA to host dinner parties and picnics during the holiday seasons inviting graduate students (Fig. 1) and other nearby or visiting mycologists including Emory Simmons, Clark Rogerson, Orson Miller, Roger Goos, for example. Maggie's garden was always producing something delicious to eat during the summer and fall. Those meals were the best we'd ever had! Howard and Maggie collaborated on producing taxonomic research publications on the biodiversity of Basidiomycetes and Ascomycetes of the New England

Figure 1: Howard (L) with his two former graduate students Roy Halling (middle) and Tim Baroni (R). July 4th picnic mid 1980s. (Photographer unknown).

Figure 2: Howard (R) with Orson Miller (L) discussing a collection of *Chlorophyllum molybdites*. IMC II, Tampa, 1977.

area for two decades. Howard is best known for his publications on the Tricholomataceae and especially the genus *Clitocybe* (his PhD dissertation topic) and related genera, some of which he described, i.e., *Cantharocybe*. He served the Mycological Society of America in many capacities during his professional career, including most importantly as President of the MSA (1976-77) and as a member of the Executive Committee to organize and run the International Mycological Congress II in Tampa, Florida in 1977 (Fig. 2). Howard made sure Tim and Roy could attend that impactful event and he always made sure that they were well-equipped when attending Peck Forays.

Howard and Maggie were inseparable and loved field work. One of their favorite collecting sites was Monadnock Mountain in New Hampshire, although they traveled and collected widely in the northeastern US and Canada during their active field research years and published articles jointly and separately on their findings. They also recognized the importance of diligent laboratory and library work in justifying research hypotheses. Howard's emphasis was on the Basidiomycetes, and Maggie focused on the Ascomycetes. Their papers are classic works and fundamentally important for North American mycology.

Editorial comment (Andrus Voitk)

With respect to the small group of omphalinoid fungi, Bigelow showed that he was at home in the field, the library, and the laboratory. He studied earlier descriptions critically, immediately recognizing that the *Agaricus oniscus* described by Fries was light, making incompatible the application of that name to a dark species. When discussing Orton's *Omphalina fusconigra*, his awareness of past work enabled him to suggest that *Agaricus telmatiaeus* deserved closer scrutiny as a possible earlier description of this taxon. This thought was left incomplete because where he lived, he was not blessed with the wealth of material available to our investigators, and at the time he lacked the technology to elucidate evolutionary lineages. Before our investigators used the same technology to confirm a second scaly-capped sphagnicolous species of *Arrhenia*, he was the only mycologist to recognize this darker scaly-capped taxon. It is this last achievement that bestows Bigelow's name to our logo mushroom, a tribute to a man remembered here by his students as a kind, gentle, and generous saxophonist, with a sense of humour and ready smile.

A Poet's Moment

Poems by Michel Savard

Arrhenia bigelowii

Arrhénie de Bigelow
Bigelow's Arrhenia

Entonnoirs de faïence dispersés dans la sphaigne,
capteurs paraboliques, les arrhénies répètent
le bruit blanc de nos fens.

««« «« « ○ » »» »»»

Fleshy china funnels, you speck the sphagnum sea,
parabolic antennas repeating
the white noise of our fens.

My Favourite Mushroom: *Helvella lacunosa*

by Jim Cornish

For the past three centuries, we have largely relied on differences in cap and stem sizes, shapes, and colours as well as fine surface details to identify mushrooms to the species. These differences are often subtle, therefore identification based solely on macroscopic anatomical features can be difficult, if not impossible. So, when I encounter mycota with tell-tale features, I tend to get excited, even ecstatic if the mushroom is a serendipitous find! This was the case when I found four *Helvella lacunosa* growing on my front lawn about a decade ago.

H. lacunosa (Fig. 1) is a common but infrequent flusher. So when the mushroom returned unexpectedly on my lawn this past fall (2021) and images of other finds from around the province appeared in posts on the Newfoundland Mushrooms Facebook Group[1], my interest in the mushroom and in writing another My Favourite Mushroom article was renewed.

Figure 1: The largest of the four *Helvella lacunosa* on my lawn about a decade ago. Photo Jim Cornish.

Taxonomically, *H. lacunosa* is placed in Ascomycota, the largest phylum in kingdom Fungi. Ascomycetes are distinguished from other phyla by their single-celled, spore bearing asci (sacs) embedded in a fertile layer (hymenium) covering the outer surface of their cup, cap, or disc shaped fruit bodies (apothecia). Apothecia get their colouration from pigments embedded in the cell walls, membranes, or cytoplasm of strands of sterile hyphae (paraphyses) that occupy the spaces between the asci. Paraphysal hyphae that extend beyond the surface give apothecia their fuzzy (pubescent) texture.[2]

The caps of *H. lacunosa* are odd and quite variable in shape and size. Often bi-, tri- or multi-lobate, caps measure 10–15 cm across and 2–10 cm high. The largest of the specimens on my lawn was more-or-less average for the species (Fig. 2). The remaining mushrooms were smaller, maybe because they had not yet matured, or because the mycelium had put most of its resources into just one of its fruit bodies to ensure reproductive success. The caps of my *H. lacunosa* were smooth but lacked the saddle-like morphology from which *H. lacunosa* gets it common name, "the black elfin saddle". The caps were also highly convoluted, likely an adaptation to increase the apothecial surface area to maximize spore production. The undersides of the caps (receptacle surfaces) were light gray and smooth. The cap margin was inrolled and fused to the stem in a couple of spots on one specimen, and free on the others.

The stem of *H. lacunosa* is equally odd. White in immature specimens, the stem typically turns light to dark grey with age. The stem on my *H. lacunosa* measured 10 cm long and 2 cm in diameter. Its exterior surface was ribbed with stiff strings of tightly interwoven hyphae

that ran straight or slightly twisted from the stem's base to its apex (Fig. 3). The ribs look like reinforcing structures and likely give mechanical strength to the otherwise flexible stem. At the stem apex, the ribs seamlessly branched and extended slightly over the receptacle surface. This type of transition prevents the stem from being detached from the cap.

The surfaces between the stem ribs were sulcate (furrowed or grooved) and frequently pitted, hence the specific epithet *lacunosa,* from the Latin meaning "with holes". Round or elongated in shape, these pits might be ecologically important as they provide temporary shelter for spore dispersing vertebrates. In cross-section, the stem appeared split into two sections: hollow in the center with additional chambered structures along the outside (Fig. 3). Both the cap and stem felt rubbery with a toughness that likely gives the mushroom the longevity lacking in the basidiomycetes that share their habitats.

The odour of the *H. lacunosa* was faintly fishy. Some guidebooks, however, describe the odour as indistinct.[3]

Helvella is known to be mycorrhizal, saprophytic, or parasitic with coniferous and deciduous trees.[2] These associations, if they can be determined, are important in species identification, particularly in species complexes whose indistinguishable members associate with different trees. Because the *H. lacunosa* on my lawn were growing within the root perimeter of a line of birch trees, I concluded, rightly or wrongly, that they are likely mycorrhizal.

Edibility

Can a black mushroom with a tough rubbery texture be edible? I have not eaten *H. lacunosa* or any of the other reportedly edible species within the genus. *H. lacunosa* is reportedly tough and generally unremarkable to subtle in taste. Recent research has discovered that *H. lacunosa* contains the cytocidal (cell killing) and carcinogenic metabolite methylhydrazine. This metabolite is also known to cause gastrointestinal problems when mushrooms containing it are eaten raw or when improperly prepared before cooking. Although *Helvellas* are eaten in Europe and Asia, it prudent to avoid them for food.[2]

Figure 2: Two of the *Helvella lacunosa* from my lawn showing variations in cap shape and stem colour.

Figure 3: Ribbed and pitted stem of *H. lacunosa*. Photo Shirley Elford Taylor.

Figure 4: Cross section of *H. lacunosa* showing chambered stem. Photo Ashley Park.

The Many Variations of *H. lacunosa*

Helvella is an old genus that dates to Linnaeus (1753) who originally named it *Elvela.* In 1882, the Swedish taxonomist Elias Magnus Fries renamed the genus *Helvella*, likely just a different spelling of an ancient Latin name for an aromatic Italian herb. There are currently 128 species of *Helvella* listed in the Catalogue of Life, a global checklist of plants and fungi compiled by the Royal Botanical Society (KEW) in the United Kingdom.[4] But because so many species have been moved in and out of *Helvella* over the years, some 400 names are now ascribed to the genus.[5] *Helvella* is widely distributed in terrestrial biomes throughout the northern and southern hemispheres with species diversity believed to be greatest in northern alpine and temperate regions of Europe and North America.[6]

H. lacunosa is a Nordic species whose name was ascribed to its lookalikes in North America, Europe, and Asia. Elias Fries and his contemporaries accommodated a wide species concept within *Helvella* but advanced technology like microscopy and the recent explosion of molecular techniques have enabled a more precise circumscription of species. We now know that many of the old names were applied to more than one species that may actually form complexes or cryptic (hidden) species. This was confirmed in a study in western North America, where the name *H. lacunosa* was once applied to eleven different species. The study also concluded that the European version of *H. lacunosa* does not actually grow in western North America.[7]

Applying *H. lacunosa* to a group of similar species is likely a global phenomenon, with many cryptic regional and endemic species awaiting discovery. Nhu Nguyen, senior author of the western North America study and a member of the FNL faculty in 2018, suspects (personal communication) that in unstudied eastern North America, including Newfoundland and Labrador, *H. lacunosa* is likely applied to a complex of regional, European, and possibly Asian species. A comprehensive study to verify this hypothesis awaits a keen investigator. The fungarium of Foray Newfoundland and Labrador at the herbarium of Grenfell College (SWGC) has thirty or more databased and professionally identified voucher specimens of the *H. lacunosa* complex, as well as collections of seven other distinct species of *Helvella*, available for such a study.

Acknowledgements

Thanks to Professor Nhu Nguyen for answering my questions, to Andrus Voitk for reviewing the article and to members of the Newfoundland Mushrooms Facebook Group for permission to use their images.

References

1. Cornish J, Newfoundand Mushrooms. Facebook. Accessed 2022: https://www.facebook.com/groups/1626105040960720

2. Beug MW, Bessette AE, Bessette AR (2014) *Ascomycete Fungi of North America: A Mushroom Reference Guide*. 1st Ed. University of Texas Press

3. Baroni TJ (2017) *Mushrooms of the Northeastern United States and Eastern Canada*. Timber Press.

4. Royal Botanical Society (2021) Helvella: Catalogue of Life. Accessed 2022: https://www.catalogueoflife.org/data/taxon/637HC

5. Wang XC, Liu TZ, Chen SL, Li Y, Zhuang WY (2019) A four-locus phylogeny of rib-stiped cupulate species of Helvella (Helvellaceae, Pezizales) with discovery

of three new species. *MycoKeys* 60: 45–67. doi:10.3897/mycokeys.60.38186

6. Landeros F, Iturriaga T, Guzmán-Dávalos L (2012) Type studies in Helvella (Pezizales) 1. *Mycotaxon* 119: 35–63. doi:10.5248/119.35

7. Nguyen N, Landeros F, Garibay-Orijel R, Hansen K, Vellinga EC (2013) The *Helvella lacunosa* species complex in western North America: cryptic species, misapplied names and parasites. *Mycologia* 105(5):1275-1286. doi:10.3852/12-391

Figure 5: Examples of the variations commonly found in cap and stem morphology and colour in *Helvella lacunosa*, in various parts of Newfoundland and Labrador. **A:** this largely bi-lobate version of *H. lacunosa* clearly shows a saddle shape. Photo Shauna Burgess, Labrador. **B:** a very small, capped *H. lacunosa* on what looks like a mature stem. Photo Jim Cornish, Gander. **C:** a pair of mature yet light gray specimens. Photo Marvin Keating, Aquaforte. **D:** a very convoluted cap on a specimen that seems to lack lobes. Photo Ashley Park, St. Anthony. **E:** another very convoluted and massive cap. Photo Pieter van Heerden, Gander. **F:** a specimen with oversized pits and holes in the cap. Photo Pieter van Heerden, Gander.

Urban Lichens in St. John's

By Kristen Tenwolde. Photos by Yolanda Wiersma

Lichens living in urban areas face challenges from a variety of pollution sources, including automobile exhausts, industrial wastes, herbicides, and fertilizers. Lichens are not like plants with roots — they are symbionts of a fungi and an alga (and/or cyanobacterium) and obtain mineral nutrients and water directly from the air.[1] Because of this, lichens have been widely used as bioindicators of air quality.[2]

Urban lichens take advantage of substrates unique to urban areas such as buildings, gravestones, or non-native ornamental trees planted in parks. They are tolerant of some levels of air pollution. Species that are tolerant of some level of air toxins will outcompete those more sensitive, leading to a reduction in the overall biodiversity of lichens in cities compared to natural landscapes. An area void of pollution intolerant species, or an area dominated by a pollution tolerant species, could be used to infer the quality of air in that area.[2]

For the city-dwelling naturalist in St. John's, a guide to urban lichens might be hard to find. Here we present some of the most common urban lichens one will find in the city. We have found lichens in some odd locations including on the brick walls of a Tim Horton's drive thru, buildings and signs on the MUN campus, (header image) and the concrete post at a Metrobus stop.

Lichens are visible all year round — there are no known seasonal changes to lichens[4] so you can spot them around the city, even in the middle of winter! A pack set for an urban lichen enthusiast would include a hand lens (at least 10X is best), a field guide (such as *Common Lichens of Northeastern North America* by McMullin & Anderson), a notebook, pencil, pocketknife (for removing foliose types from their substrate, or cutting a lobe tip to see if it is hollow), GPS, and collection bags or envelopes. A camera with a macro lens is useful for those who seek to take quality photos of lichens up close. Below is a brief description of some of the urban species you will likely encounter.

Header image: Close-up of lichens growing on a metal sign (bottom of the "t" on the Math/Stats sign) on MUN campus. There are two species of *Xanthoria* here (*X. polycarpa* and likely *X. parietina)* as well as *Hypogymica physoides* and a small fragment of *Parmelia sulcata*.

Parmelia sulcata

Parmelia sulcata, the hammered shield lichen, is a widespread urban lichen known to tolerate low to medium levels of air pollution.[2] *P. sulcata* can be identified by its pale green-grey, leaf-like body (thallus). This foliose lichen usually grows flat against its substrate, but one can lift its lobes to see the underside (unlike crustose types of lichen). The lower surface is usually black in color with abundant rhizines used for attachment. This species can be found on a wide range of substrates but most commonly grows on bark. In urban areas, look for *Parmelia sulcata* on wooden structures such as benches, bridges, posts, and fences. This lichen is known to be one of the first species to colonize trees and benches in urban areas.[3]

You can distinguish this lichen from other foliose lichens of similar color with a hand lens by the presence of powdery, or particle-like reproductive structures called soredia. The lobes of the thallus are typically 1–3 mm wide and the upper surface of the thallus typically has pseudocyphellae.[3] Occasionally a network of white ridges is observed on the upper surface of the thallus. In areas of medium-high pollution levels there can be visible bleaching or decaying spots on the thallus and reduced abundance.[2]*Parmelia sulcata* can be used to dye wool; it produces a light-medium yellow color.[4] There has also been research done on the potential antioxidant and antimicrobial properties of this species.[5]

Upper image: *Parmelia sulcata* growing on a park bench. This is one of the most pollution-tolerant lichens. The brown patches are discoloration/necrosis and not a different species.

Lower image: *Parmelia sulcata* growing on an urban tree. Note the tuft of *Ramalina sp.* on the left and the stippled crusts on the surface and small fragments of *Xanthoria* blurred in the background.

Xanthoria spp.

Xanthoria species are foliose lichens known as the sunburst lichens. They appear in a range of colors from pale yellow to deep red-orange, with increased pigmentation in full sun.[3] These lichens can be found on many different substrates in urban areas, including brick and concrete walls (in St. John's we have observed *Xanthoria* on the walls of QEII library, MUN clocktower, and the walls of a drive-thru Tim Hortons), on coastal rocks, trees, and concrete posts lining the sidewalks.

Xanthoria species are found in areas with high nitrogen levels, and as a result are commonly found on substrates exposed to bird or mammal droppings.[3] Due to this fact, historically the sunburst lichens have been used by Inuit hunters to locate mammal burrows, or birds nests.[3] In urban spaces, in addition to the sites mentioned above, we have noticed them on the lower portion of trees surrounding trails with high foot-traffic and dog walkers, such as around Quidi Vidi Lake in St. John's. We suspect that is a "splash zone" from dogs marking the trees that creates high nitrogen conditions at the base of these trees to allow *Xanthoria* to thrive.

Some *Xanthoria* are also known to be found in open areas in direct sunlight. *Xanthoria parietina* has a compound called parietin in the thallus above the algal layer that protects it from UV-B radiation.[6] Common Xanthoria species that can be found in St. John's include *Xanthoria parietina* and *Xanthoria polycarpa*. These lichens have spore-bearing reproductive structures, shaped like jam tartes, or tiny peanut butter cups (apothecia), which are visible with a hand lens. *Xanthoria polycarpa* is typically found on its substrate in little 'cushions' while *Xanthoria parietina* is less mounded, with a flatter appearance.

Large image: *Xanthoria polycarpa* growing on an urban tree limb.

Inset left: Orange *Xanthoria sp.* and an unidentified black/dark grey crust on a cemetery marker in St. John's.

Inset right: *Xanthoria parietina* on a concrete bus stop post.

Hypogymnia physodes

Hypogymnia physodes is known as the monk's hood or the hooded tube lichen. It is a grey-green foliose type with brown undersides. *Hypogymnia* can be distinguished from *P. sulcata* by lack of rhizines on the underside for attachment, and *H. physodes* lobe tips are more upturned, almost curling away from the substrate, with a lip-like appearance.[3] *Hypogymnia* species are hollow inside, with an inflated lobe appearance, making it relatively easy to identify these lichens to genus level in the field with a hand lens.

Reproductive structures of this species are coarse soredia that are visible coming out of the lower surface of up-turned lobe tips, identifiable with a hand lens, although soredia may not be visible on undeveloped thalli of this species.[1] *Hypogymnia physodes* is extremely common to northeastern North America. It is often a key species to use as a bioindicator of the air quality or environmental conditions of an area, being moderately sensitive to compounds like SO_2 and heavy metals in the atmosphere, though it is generally widespread in Newfoundland.[3] *H. physodes* is a species commonly found on conifer and birch trees,[3] and in urban areas often found on wooden structures such as fences or benches. We have spotted these lichens on trail-side benches along Rennies River, Quidi Vidi Lake, and Geo-Vista Park across from the Johnson Geo Center on Signal Hill Rd.

These lichens have been used historically by different cultures in food, medicines, and to produce a brown dye for wool.[3]

Upper image: *Hypogymnia physoides* on a park bench in St. John's. There are 9 species of *Hypogymnia* in Newfoundland and Labrador (see Vol. IX No. 5 of Omphalina); *H. physoides* is the most common in urban areas. **Lower image:** *H. physoides* on a park bench in St. John's. Note the tufts of *Ramalina sp.* poking out between the lobes

Ramalina spp.

Species of the *Ramalina* genus are characterized by their pale greenish yellow fruticose form with flat strap-like, well-branching lobes.[1] Their lobes are attached to the substrate at a basal point, or holdfast.[7] These lichens hang from their substrate like a pendent when of substantial size. Small tufts of *Ramalina* species can be found in the crevices of park benches, hanging from tree trunks, or on wooden bridges, posts, or other structures that mimic tree bark.

Ramalina species have been used to make dye and perfume in Europe, and for food in India.[3] These species have also been known to serve as nesting material for various bird species when other pendent or shrubby lichens (such as the *Usnea* genus) are scarce.[3] *Ramalina farinacea*, known as the dotted Ramalina, is a cosmopolitan species[3] that is common in urban areas in St. John's and can usually be found on bark. Apothecia are rarely seen on *R. farinacea.* Soredia are visible with a hand lens, appearing oval or rounded on the lobe margins, making it distinguishable from other *Ramalina* species that bear abundant apothecia.

We have found *Ramalina* species on trail-side benches, often so small that they are easily missed (see if you can spot the small tuft in the photo of the *Parmelia* on a previous page). Look for larger specimens in the upper branches or trunk of older trees in urban greenspaces in St. John's.

Ramalina farinacea growing on an urban tree

References

1. McMullin T, Anderson F (2014) *Common lichens of Northeastern North America: A field guide.* The New York Botanical Garden Press, Bronx, NY.

2. Monaghan M, and Wiersma YF (2018) *Parmelia sulcata* as a bioindicator of air pollution in Newfoundland, Canada. Evansia, 35(1):30–35.

3. Brodo IM, Sharnoff S, and Sharnoff SD (2001) *Lichens of North America.* Yale University Press.

4. W. R. (2006) Dyeing with Lichens and Mushrooms, Cornell Mushroom Blog. https://blog.mycology.cornell.edu. Accessed April 29, 2022. Published December 12, 2006.

5. Manojlović N, Ranković B, Kosanić M, Vasiljević P, Stanojković T (2012) Chemical composition of three *Parmelia* lichens and antioxidant, antimicrobial and cytotoxic activities of some their major metabolites. Phytomedicine 19:1166–1172.

6. Solhaug KA, Gauslaa Y, Nybakken L, Bilger W (2003) UV-induction of sun-screening pigments in lichens. New Phytologist 158:91–100.

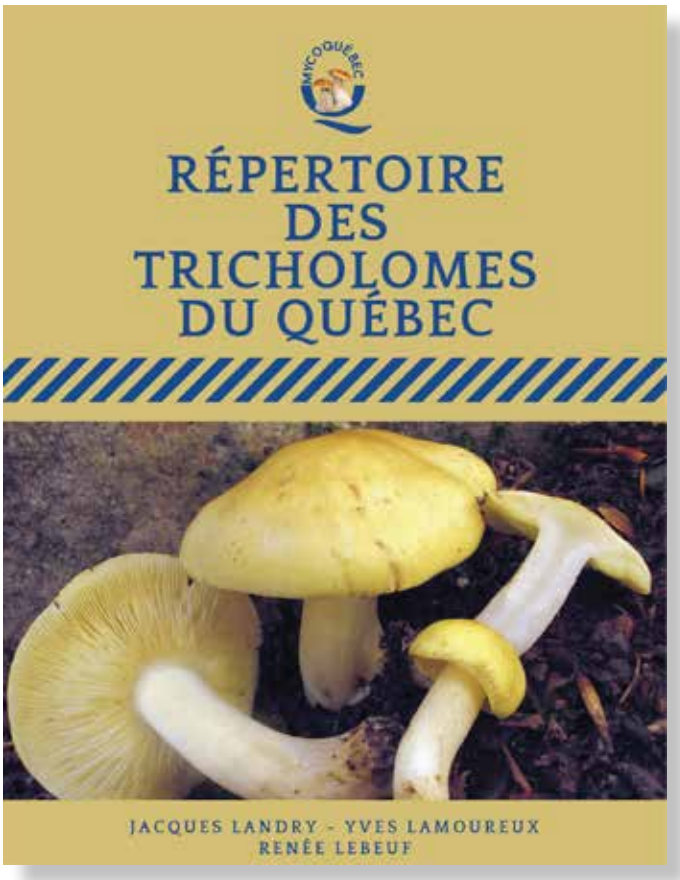
7. *In:* Consortium of North American Lichen Herbaria. https://lichenportal.org/. Accessed May 2022.

Brief Review of MycoQuébec's newest offering:

RÉPERTOIRE DES TRICHOLOMES DU QUÉBEC

Jacques Landry, Yves Lamoureux, Renée Lebeuf. 2022. Répertoire des Tricholomes du Québec, 1re édition: Août 2021. Mycoquébec, 152 p.

Available at https://www.mycoquebec.org/publications/Repertoire%20tricholomes%20Quebec.pdf



Reviewed by Greg Thorn

"Wow."

That pretty much sums it up. And it's free. When have you ever paid nothing for a book of 152 pages, including hundreds of colour photographs?

The authors, Jacques Landry, Yves Lamoureux, and Renée Lebeuf (the latter well known as a key and enthusiastic faculty member at FNL), have produced a volume that presents 68 species of the genus *Tricholoma* that are known from Québec.

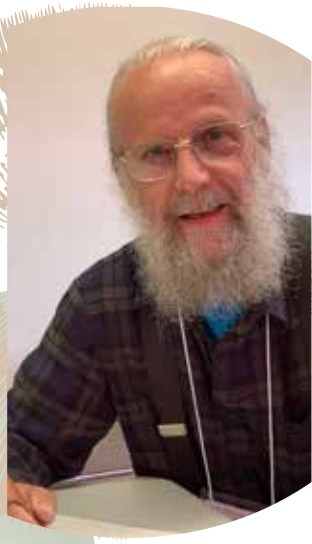
Of course, not all of these, particularly the species that are associated with beech and oaks, will be found in Newfoundland, but it is safe to say that the majority of *Tricholoma* species found in NL will be found in this book. It gets better: there are both dichotomous keys and tabular keys (tables comparing the features of similar species), enabling the identification of species within a group that has been difficult for amateurs and professionals alike for many years. The application of names to the species has been based on sequencing the ITS region of the DNA of over 300 collections, and comparing these, when possible, to sequences derived from type specimens or other authentic representatives of the names. This has allowed the authors to tease out multiple species that have previously been hiding under one name and sort out cases in which the name we have used in North America belongs not to our species, but to a similar one first described in Europe (and still only found there). In the group of species that includes the pine mushroom (matsutake, *Tricholoma matsutake* of Eurasia), the authors nicely sort out *T. magnivelare*, of eastern North America,

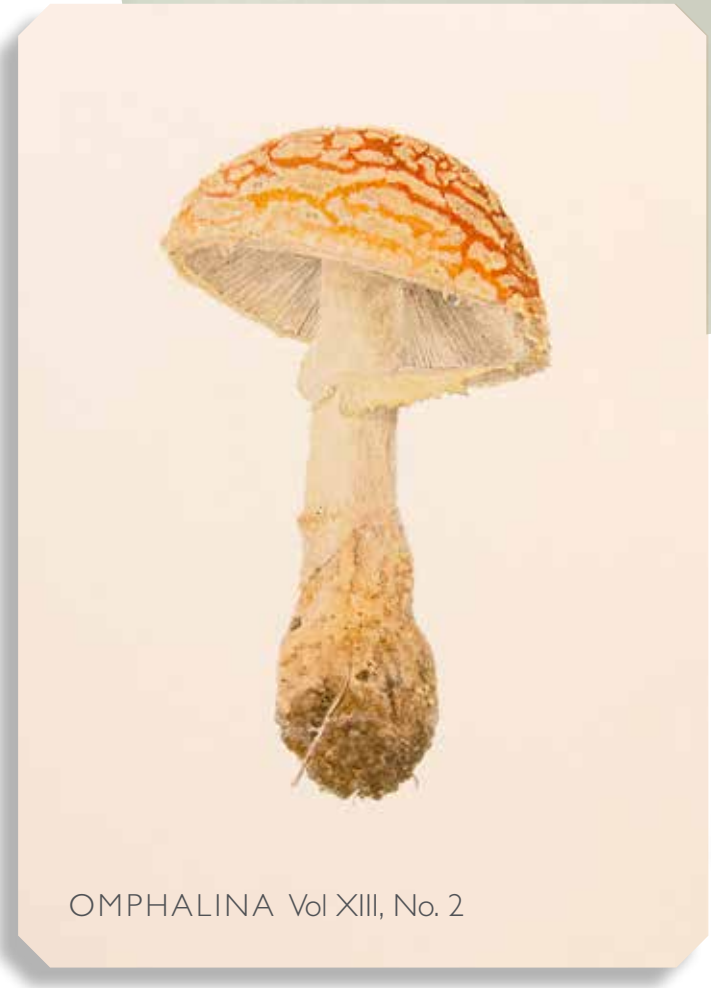
from the western matsutake (*T. murrillianum*), and another species from both Québec and NL that is equally edible and choice, *T. dulciolens*. Newfoundlanders can be happy that they do not have two of the oak-associated species, *Tricholoma* aff. *caligatum*-1, perhaps edible but with a strong odour of old urinals, or *T. odorum*, with an intense odour of coal tar. I can't wait to make use of this new resource at upcoming FNL forays, instead of puzzling over European literature and trying to decide what names fit our finds least poorly.

If you have purchased "Tricholomas of North America" (by Alan Bessette, Arleen Bessette, William C. Roody, and Steven A. Trudell, hard copy out of print, but Kindle edition $29.99 on Amazon.ca), you might wonder how the two volumes compare. Don't get me wrong, I <u>like</u> that book, and it has been a welcome addition to my bookshelf since it appeared in 2013. Those authors included approximately 85 species of *Tricholoma* from North America, of which 59 are listed in their keys to eastern species (which include some not known north of West Virginia). Compare that to the 68 species reported from Québec, and it is clear that the Québec authors have uncovered some additional species diversity. Thirty species names are shared between the two treatments, indicating that about half of the *Tricholoma* names used widely in eastern North America have been incorrect. The "Répertoire des Tricholomes du Québec" is clearly a huge advance in our knowledge of this important group of mushrooms.

The Bishop's Sketchbook

Art by Glynn Bishop





Our Partner Organizations

People of Newfoundland and Labrador, through

Department of Tourism, Culture, Arts and Recreation
Parks Division

Department of Fisheries, Forestry and Agriculture
Wildlife Division
Centre for Forest Science and Innovation

People of Canada, through

Parks Canada, Gros Morne National Park

The Gros Morne Co-operating Association

Memorial University of Newfoundland

St. John's Campus

Grenfell Campus

Tuckamore Lodge

photo: Pieter van Heerden

FORAY
NEWFOUNDLAND
AND LABRADOR

RETURN OF THE FORAY

September 23–25, 2022
Central Newfoundland