



Funga Scripta

WINTER 2024
VOLUME 3, ISSUE 1

NEWSLETTER OF THE NEW BRUNSWICK MYCOLOGICAL SOCIETY

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UPCOMING EVENTS & NEWS

Online Lectures

Winter is a great time for learning! While you wait for the 2024 MycoNB Society Walks to start up again, consider attending some online lectures posted in these Facebook groups in the meantime:

[Mushroom Events in Canada](#)

[MUSHZOOMS: Online Fungal Lectures](#)

MEET OUR TEAM

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Special thanks to Kendra Driscoll for donating her time toward reviewing and proofreading the newsletter.



CONNECT ON FACEBOOK

[Soci t  MycoNB Society Forum](#)

[\(New Brunswick mycological society.\)](#)

WRITE FOR THE NEWSLETTER!

Fungi Scripta is always looking for submissions! Topic ideas include (but are not limited to):

- Stories from MycoNB events
- Highlights on NB fungi
- Scientific processes related to fungi
- Personal accounts or stories related to mushrooming
- Poetry/prose, art, photography
- Most interesting fungus you've found
- Recipes and tips for storing mushrooms

Send your submissions to newsletter@myconb.org

Winner of the Newsletter-Naming Contest!

Way back in November 2023, we hosted a [newsletter naming contest](#) on the Society Facebook page. It's taken us a couple of months to deliberate and vote. Thank you to all who entered the contest. We had many wonderful entries, but of course, we could only choose one. Announcing: The winner!

Anthony Brooks for *Funga Scripta*

Introducing: *Funga Scripta*!

HOLLY JONES | Fredericton, NB

Please take a moment to reflect on the newsletter's new title, *Funga Scripta*. Why funga and not fungi, you ask? The reasoning is two-fold:

First, we're part of the movement pushing to veer away from the historical use of botanical language to describe fungi by using new language to describe the fungal diversity of a particular environment (in this case, New Brunswick). For context, it wasn't until the 1970s that fungi were recognized as a separate kingdom from plants (Kingdom Plantae). Furthermore, it wasn't until 2018 that *The International Code of Botanical Nomenclature* was changed to the *International Code of Nomenclature for Algae, Fungi, and Plants*, effectively removing some of the historical baggage that referred to fungi as plants (Pfister, 2020).

Secondly, Funga is the preferred term from a mycology standpoint and parallels the use of Flora and Fauna. D. Pfister (2020) notes that although the term Mycobiota is correct linguistically, Funga is preferable for educational and conservation purposes and "completes the trilogy of Funga, Flora and Fauna" (para. 8).

So, when the MycoNB Society team began deliberating on the newsletter name, we weighed the implications of the term Funga and determined that it was not only mycologically significant, but it also sounded better with Scripta (Latin for "written"), as they both end with *-a*, hence, the birth of *Funga Scripta*! We're excited to be a part of this step toward more "fungal-centric vocabulary" in New Brunswick by reflecting this in our newsletter name.

Read more/Reference:

Pfister, D. (2020, July 15). Fantastic funga: Why language matters. *Deep Funga Blog*.
<https://fundis.org/resources/blog/127-fantastic-funga-why-language-matters>



Lentinus brumalis

PAT ALLEN | January 2024 | Durham Bridge, NB



*Winter is here; there's frost and snow!
Yet I've found a mushroom that dares to grow.*

*How small and delicate she seems to be,
Standing alone on that dead alder tree.*

*She must be freezing, but her skirt's held high!
One thin, tanned leg pushing up to the sky.*

*Under her skirt, white belly is showing.
Proud as can be, her cap is near glowing.*

*Oh, that we all should be so bold,
To face the north wind and the biting cold.*

*As I take her picture, she whispers to me,
"Sit here a while, just let life be."*

Photo credits: (L) Pat Allen; (R) Holly Jones

The Wonderful World of Winter Polypores

JESSIKA GAUVIN | MycoNB Society President | Moncton, NB



What is a Polypore?

A polypore is the fruiting body of a mushroom that lives in wood. Polypores almost ALWAYS grow directly from wood. Occasionally, they will grow on the ground around the tree, but USUALLY, polypores are wood decomposers, so you are going to find them (almost always) on dead wood.

When it comes to targeting specific polypores, it is imperative to know what **kind of tree** a polypore associates with.

Disclaimer: This article is for informational and educational purposes only, and does not constitute or substitute professional medical advice. Readers are encouraged to confirm the information contained herein with other sources and, if considering ingestion, to review the information carefully with their professional health care provider.

Trametes versicolor

KEY ID FEATURES: Thin, almost leathery, bands of deeply saturated colors on top; tiny pores on the bottom (2-3 per mm).

HABITAT: Hardwood decomposer

Containing antioxidants, polysaccharides/ beta-glucans, sterols, fatty acids, and phenolic compounds, this mushroom is commonly used as an adjunct in cancer treatments. In addition to having cancer-fighting compounds, it also has properties that protect healthy cells from the damage associated with chemotherapy and radiation. It is used in traditional Chinese medicine (TCM) to support the immune system, the digestive system, the liver, lungs, and spleen and to move excess fluids out of the body. Great for supporting a healthy gut microbiome.





Ganoderma applanatum

KEY ID FEATURES: Smooth, greyish or brownish cap with white margin; bright white underside that stains dark brown when scratched.

HABITAT: Hardwood decomposer

The genus *Ganoderma* is home to the potent adaptogenic mushroom, Reishi, which shares a very similar chemical composition. Antioxidants, specifically triterpenoids, beta glucans, and over 600 other compounds call this mushroom home. Some studies have shown antibiotic activity, anti-inflammatory activity, anti-cancer activity, and of course, like Reishi, has beautiful adaptogenic properties. In TCM, *Ganoderma* mushrooms are used for stress and fatigue, both physical and mental, blood and qi strengthening, and organ support.



Fomitopsis betulina

KEY ID FEATURES: Smooth, somewhat squishy brown top; pure white underside when young; grows teeth as it ages.

HABITAT: Birch wood decomposer

Compounds include phenolic acid, indole compounds, sterols and triterpenes; activities include anti-inflammatory, anti-septic, antiviral, styptic, immunomodulating, vermifuge, anti-cancer, and even neuroprotection. Traditional uses of *F. betulina* are many, from helping with infections to purging parasites. Otzi the Iceman, Europe's oldest mummy, was found with this mushroom in a pouch around his neck.





Fomitopsis mounceae

KEY ID FEATURES: Dense and hard, mottled flesh, often having a black “core” and a red “belt” and white margin; underside is white and stains faintly yellow when bruised. Sometimes smells citrusy.

HABITAT: SOFTWOOD DECOMPOSER

Studies on this mushroom have shown potent anti-cancer properties, antioxidant properties, and anti-inflammatory properties. It has been used as an anti-inflammatory in TCM.



About the Author

Jessika Gauvin is the president of the MycoNB Society and the owner of Enchanted Mushroom Forest - Foraging and Folk Medicine. Based in Moncton, NB, she offers foraging walks, herbalism classes, and more, both in-person throughout New Brunswick and online. To learn more about her offerings, visit the [Enchanted Mushroom Forest - Foraging and Folk Medicine Facebook page](#).



The Canvas of the Conk

JENNIFER ROBYN BURKE | Miramichi Bay, NB

The first time I saw fungus art, it was love at first sight. I was so inspired to work with some as an art material. After my father-in-law harvested some conks and dehydrated them, I got to work connecting to the creative spirits and connecting to nature. I love co-creating with these magical conks. I use a wood burner and burn directly into them.

I am an artist living and working in Miramichi Bay, New Brunswick. If you're interested in contacting me for commissions or viewing more of my art, please visit my website: www.jenniferrobynburke.com



Honey bee and eagle
burned on *Fomitopsis*
mounceae



O Chaga, Who Art Thou?

Get to know *Inonotus obliquus* and Why You're Looking For It

MATTHEA SCHUMPELT | MycoNB Newsletter Coordinator | Miramichi, NB



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When the weather turns frosty and snow sends our beloved mushrooms to sleep, we mushroom hunters start turning our eyes toward the trees. These days, everyone and their aunt Sally is most likely looking for Chaga (*Inonotus obliquus*), either because they need to scratch the foraging itch or they're looking to use it medicinally. Before we get into identifying this sought-after member of the Hymenochaetaceae family, let's look at some of its health risks and precautions.

Health Risks and Precautions

Before deciding to consume Chaga, it's important to know that there are **very real health risks and precautions** that come with it. In recent years, Chaga's popularity has skyrocketed due to its marketing as a miracle cure for just about anything. Due to its properties, we have to understand that **Chaga is not for everyone!** So if you're planning on consuming Chaga, take note of the precautions listed here and be sure to do your research using reputable sources.

Oxalate Nephropathy

The first precaution to note is that excessive ingestion of Chaga can cause acute [oxalate nephropathy](#), which is a "cause of kidney disease and failure" (Healthline, n.d.). According to Sentis et al., 2011 in Kwon et al., 2022:

It has been reported that the ingestion of excessive Chaga mushroom can result in acute oxalate nephropathy caused by the deposition of calcium oxalate crystals in the renal tubules. This leads to acute kidney injury (AKI) and chronic renal tubular changes, such as interstitial fibrosis and tubular atrophy. (Section 1)

To read more, here is the link to the article on [Chaga mushroom-induced oxalate nephropathy](#).

Other Side Effects

In addition to oxalate nephropathy, be aware that Chaga may have the following side effects (WebMD Editorial Contributors, n.d.):

- **Can cause hypoglycemia (lowering of blood sugar):** Chaga can lower blood sugar, making it dangerous for those taking insulin or other blood sugar-lowering medications.
- **Can interfere with blood clotting:** Chaga may increase the risk of bleeding. As such, do not consume before or after surgery, if you have a bleeding disorder, or if are on blood thinning medication such as warfarin or clopidogrel. Chaga may add to the effects of your blood thinner.
- **Increases immune activity:** While this sounds good to most of us, those who suffer from auto-immune diseases, such as multiple sclerosis (MS), lupus, rheumatoid arthritis, or other conditions, should avoid consuming. Chaga could increase the symptoms of auto-immune diseases.
- **Has unknown effects on pregnancy and breastfeeding:** As there isn't enough information to know if Chaga is safe to use when pregnant and breastfeeding, the recommendation is to stay on the safe side and avoid use.
- Potential of Chaga as an immune system enhancer during chemotherapy: [“Immunomodulatory Activity of the Water Extract from Medicinal Mushroom *Inonotus obliquus*”](#) (Kim, 2005)
- Biological activities of Chaga main components:
 - Polysaccharide – anti-cancer, anti-inflammatory, anti-viral, anti-oxidant, immunomodulatory, hypoglycemic, hypolipidemic, etc.
 - Polyphenol – anti-oxidant
 - Triterpenoid – anti-cancer, anti-inflammatory, anti-viral, anti-oxidant
 - Melanin – antioxidant, anti-inflammatory, anti-viral, hypolipidemic, immunomodulatory

From [“Recent Developments in *Inonotus obliquus* \(Chaga mushroom\) Polysaccharides: Isolation, Structural Characteristics, Biological Activities and Application”](#) (Lu et al., 2021).

Evidence-Based Health Benefits

Chaga contains compounds such as betulin and betulinic acid. Here are some studies that seek to understand Chaga's potential benefits. Note that most studies listed were conducted on mice and lack data from human trials.

- Anti-tumor/cancer: [“Continuous Intake of the Chaga Mushroom \(*Inonotus obliquus*\) Aqueous Extract Suppresses Cancer Progression and Maintains Body Temperature in Mice”](#) (Arata et al., 2016)



Identifying and Harvesting Chaga

Inonotus obliquus is not a difficult fungus to identify, but if you don't know what to look for, anything could be a lookalike! (The same applies to all mushrooms, not just Chaga.) For instance, some just look for a bump on a tree. The problem with this is that Chaga doesn't grow on just any tree. And there are plenty of burls, knots, tree diseases, along with old shelf/polypore mushrooms, that get mistaken for Chaga all the time.

1. Get to Know your Trees

Chaga is parasitic on specific trees, so you'll have to be able identify the trees it grows on. Although most commonly found on birch (*Betula* sp.), Chaga can also be found on alder, beech, and hornbeams.

Since birch is the most common host for Chaga, make sure you know the difference between birch and poplar. Most often, young poplar (right, bottom) are confused for birch (right, top) due to their white bark and predisposition to black, crusty cankers. Black cherry (*Prunus serotina*) is also often confused with birch. Once you get a handle on what these trees look like, you'll be less likely to misidentify a burl growing on a non-Chaga host!



Inonotus obliquus found in November 2023

2. Get to Know Chaga's Features

Unlike other tree-growing fungi, *Inonotus obliquus* will not have a porous underside like conks, polypores, and other shelf or bracket mushrooms. They won't have gills, either. In fact, they're irregularly formed protrusions/eruptions with a very **black burnt-charcoal** appearance. In contrast, the interior will be a beautiful golden yellow-ochre colour with a cork-like texture. Sometimes, the golden yellow interior can be visible from the outside.

As with any fungus identification, do not rely on one characteristic alone. Host tree, exterior sclerotia, interior colour, texture, colour, and growth pattern all matter. Some burls and old polypores can have a golden yellow interior, but that doesn't make it Chaga. While their growing patterns and appearance can vary, Chaga remains

a fairly easy fungus to identify after some study. Take some time to look up [Chaga observations on iNaturalist](#) or join the [Inonotus obliquus/Chaga Demystified](#) Facebook group.

Images: Bottom left - *Inonotus obliquus* jutting out of birch in a pyramidal shape; bottom right - Interior of the Chaga (on previous page) that I harvested. Note the colour and cork-like texture.



Why Aren't These Chaga?

The following images are examples of things commonly mistaken for Chaga. The bottom left is an image of a tree burl. Note its large, lumpy spherical shape that is bark-like in colour and texture. The image on the bottom right shows *Fomes* sp. conks. They have a smooth, greyish exterior with patterns of concentric ridges and porous undersides. Neither are growing on birch.



3. When and How to Harvest

If you've found a nice chunk of Chaga and wish to harvest some, here are a few tips:

- Make sure the tree host is living.
- Season: In a NB study, [Wontcheu Fotso et al., \(2023\)](#) found that Chaga contains beneficial compounds in all four seasons, but:
 - **Fall and winter** harvesting yielded the highest amounts of **betulinic acid** obtained by water extraction at room temperature and at 70°C (360.8 ng/mL and 384.5 ng/mL, respectively).
 - **Fall and winter** harvesting yielded the highest amounts of **betulin** obtained by ethanol extraction at room temperature (53.93 ng/mL and 90.49 ng/mL, respectively).
- Tools: Chaga is very hard. You'll need a hatchet, or a hammer and chisel.
- How much? Chaga grows very slowly and can live for decades. It's recommended to harvest one third and be careful not to gash the wood/bark for other pathogens to enter.

4. Processing Chaga

Chaga must be dehydrated before storage. After harvesting, chop Chaga into smaller chunks and let dry in a dehydrator or oven until all moisture has been removed. Failure to do so will lead to mould growth. Once dried, store in an air-tight container or bag in a cool, dark place.



One of the Chaga trees I'm observing

How to Brew Chaga Tea

So you've made it this far and would like to know how to brew a cuppa Chaga. For posterity's sake, please be reminded of the health risks presented earlier in this article and that too much Chaga consumption can lead to acute kidney injury. A good rule of thumb is to limit consumption to one cup a day as a maximum, as Chaga is high in oxalates. Be sure to drink the same amount of water as Chaga tea that you drank that day.

Chaga Tea Recipe (2 servings)

- Take 2 pieces of Chaga (about the size of a fingertip) and boil in 20oz of water for 15-30 minutes. Water will become a dark tea-like colour. The longer you boil it, the darker it will be.
- Pour your Chaga tea into mugs and add milk and sugar if you like. Can also be served black.

You can re-use the same Chaga chunks at least 3 times. After you have finished brewing your tea, store your wet Chaga chunks in the freezer until the next brew.

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Recent Literature in New Brunswick Mycology

KENDRA DRISCOLL | Curatorial and Research Technician, Botany and Mycology | New Brunswick Museum

Dear friends in mycology,

The following is a bibliography of scientific research on the topic of New Brunswick fungi published in journals over the course of 2023 (and the beginning of 2024). Not all papers are strictly focused on NB but all include sample sites or specimens from NB. The list should be reasonably complete, but it is not 100% comprehensive. Our goal is to produce such a bibliography once per year to highlight the wonderful research that is happening on the fungi of our beautiful province.

A lot of interesting research came out this past year on a variety of mycological topics, and winter is the perfect time to catch up on new findings from the past year. Much of the research on taxonomy and natural history of fungi was conducted by staff and research associates of the New Brunswick Museum, with more of the applied science and experimental work coming from universities, including local work by students and faculty of the University of New Brunswick in Saint John. Most of the articles listed below are open access (i.e., free to read), and for those that are behind a paywall (marked with a dollar sign: \$), you can always request a copy by contacting the corresponding author by email or creating a Research Gate profile and requesting the full text with the click of a button. Most scientists are more than happy to share their research! If all else fails, you can request an interlibrary loan through your local library (an underappreciated option but often involving a small fee).

Perhaps the most notable result of all this research is the description of two species from New Brunswick that are entirely new to science: *Hydnum atlanticum*, a decent sized hedgehog mushroom (Justo et al. 2023, see also Justo 2023 in *MycoNB Newsletter 2(1): 7-15*); and *Niesslia endophytica*, a tiny endophytic ascomycete isolated in culture from inside the needles of black spruce (*Picea mariana*) and so far known only from its asexual state (Tanney et al. 2023).



Hydnum atlanticum

In a happy marriage of mycology and chemistry, multiple papers were published on the subject of natural chemical compounds produced by fungi. This is a field that can have concrete applications with direct benefits to human society, leading to the development of new medicines and other applications. The Natural Products Research Group at UNBSJ has found and tested the antimicrobial properties of chemical substances produced by fungi isolated from black crowberry (*Empetrum nigrum*), eastern white cedar (*Thuja occidentalis*), the seaweed *Spongomorpha arcta*, and elsewhere in the

marine environment (Morehouse et al. 2023a, b, c, d); some were found to have an inhibitory effect on the bacterium that causes tuberculosis, *Mycobacterium tuberculosis*. Tanney et al. (2023) isolated and characterized natural chemical products with moderate antifungal activity from several endophytic fungi, including the new *Niesslia endophytica* and other species, rarely or never before reported in New Brunswick.

On the agriculture front, DesRochers et al. (2023) investigated extracts of 288 endophytic fungi isolated from berry and grape plants, identifying dozens of compounds including seven not previously discovered; the authors suggest that some of these fungi have the potential to reduce reliance on chemical pesticides for these crops (another practical benefit of the study of natural product chemistry). McLaughlin et al. (2023) studied the fungi found in Honeycrisp apples from orchards of New Brunswick and Nova Scotia, concluding that the growing season has the largest impact on changes in the fungal species found in these popular fruits. Sennett et al. (2023) conducted experimental research on soil samples from potato fields at the Fredericton Research and Development Centre



of Agriculture and Agri-Food Canada, comparing impacts of different combinations of treatments on the diversity of plant pathogens as well as general diversity of bacteria and fungi. Chen and Nahar (2023) published a brief note reporting *Fusarium commune* as a pathogen on field peas from New Brunswick and Prince Edward Island for the first time in Canada.



Violet-toothed polypore species

One paper (Kinneberg et al. 2023) delves into the likely evolutionary history of two species of violet-toothed polypore, *Trichaptum abietinum* and *T. fuscoviolaceum*, using specimens from New Brunswick and Italy. The study authors completed mating studies in culture, confirming that the species are not reproductively compatible. Their comparison of genomes nonetheless suggests that the species did occasionally interbreed long after they diverged, and perhaps relatively recently. The study was conducted mainly at the University of Oslo in Norway, but two of the researchers spent time in the field with New Brunswick Museum employees and research associates during a research visit in 2018 and small

duplicate specimens of the original New Brunswick sample material used for this study are deposited at the NBM herbarium.

Finally, several research papers published observations and occurrence data on a wide variety of fungi, including: lichens (Clayden et al. 2023; Selva et al. 2023); mushrooms including *Cortinarius* (Malloch et al. 2023), *Pluteus* (Ševčíková et al. 2023) and spooky *Coprinopsis laanii* growing on animal carcasses in a mine (Vanderwolf et al. 2024); asexual morphs of endophytes in culture (Crous et al. 2023); small

ascomycetes growing on mosses and liverworts (Döbbeler et al. 2023); and slime molds (Zoll et al. 2023). Dozens of species were reported for the first time in the province, and most of these papers contain useful, relevant information for identifying species or putting new occurrences in context. One new species described from Quebec—*Pluteus inexpectatus*—is not yet known from anywhere else (Ševčíková et al. 2023) but could turn up in the Maritimes, especially now that we know it exists.

Fingers crossed for lots more interesting research in the coming year. Happy reading!

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Last Season's Finds: Photographic Highlights

TONI DOUCETTE | Saint John, NB

Hi, I'm Toni Doucette, a life-long resident of Saint John. I came into mushrooming rather organically as I wandered an undisturbed, mature wooded area taking amateur smartphone pictures of nature. I began noticing the wonderful variation of mushrooms growing on trees and logs (everywhere it seemed!) now that I was looking for them. In the quiet solitude, I spent countless hours scouring those woods in addition to trips to Rockwood Park. I've been able to combine my love for amateur

photography with a passionate learning of everything mycological. I eagerly await spring so I can continue hands-on discovery, researching, and sharing with (and learning from) a supportive online community of fellow mushroom lovers! I know I'm not alone when I say there is an adrenaline rush that accompanies a beautiful find! It is such a rewarding, calming hobby I know I've adopted for life.



Photos by Toni Doucette



Photos by Toni Doucette



Funga Scripta is the newsletter of the
mycological society of New Brunswick, Canada.
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