OMPHALINA

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Newsletter of FORAY NEWFOUNDLAND AND LABRADOR

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Mar. 1, 2013

FORAY NEWFOUNDLAND AND LABRADOR

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

Webpage: www.nlmushrooms.c

ADDRESS
Foray Newfoundland & Labrador
21 Pond Rd.
Rocky Harbour NL
A0K 4N0
CANADA
E-mail: info AT nlmushrooms DOT ca

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

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

COVER

Entoloma pseudoparasiticum, growing on *Cantharellus roseocanus*, collected October 1, 2012, by Margaret Boyle on Ship Island, just off Herring Neck, near Twillingate. NL. The rarity of this mushroom presents its own problems for taxonomy and identification, but only for those who feel the need to put an exact name on it. The name we have assigned to it suggests to scientists that it is not the same as a very similar taxon, called *Entoloma parasiticum*. A more literal translation would be that this is a fake parasite—possibly a more prescient appellation than perhaps was the intent. Read the two lead articles to find out more than you ever wanted to know about these issues.

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CONTENT

Message from the Editor

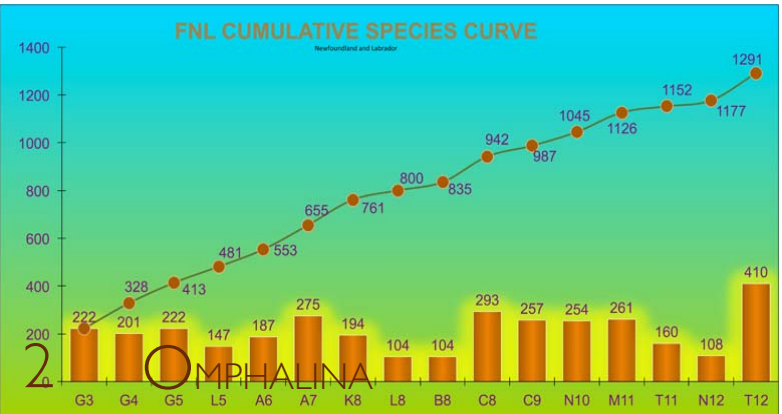
We are proud to bring to you lead articles that are a first for OMPHALINA: an International, Cooperative, Multicentre Investigative Team of authors, just as you see in the real journals. Note our team's democratic policy: authors listed in alphabetical order, first A to Z, then Z to A. What a cool way to do the serious stuff of science!

Jim Ginns and Dave Malloch offer commentary and further information about subjects published earlier. We are fortunate to get such feedback, and are very grateful to the contributors.

NB Special request

Please fill out the questionnaire on p. 14 and send to April Muirhead. April was one of our databasers at the 2012 foray, and now is pursuing some independent mycological investigation. For the results to be meaningful, a pattern needs to develop, which can only happen if there are a lot of responses. Therefore, please do your best to fill out a copy of the form for each of your favourite mushroom patches. If this produces good findings, perhaps we shall read about it in a future issue.

Renée Lebeuf and Nils Hallenberg sent in reports of specimens they had taken home to identify. This added several species to our already impressive 2012 list. Total species recorded for 2012 now is 410 "mushrooms" and 175 lichens, and the cumulative total is 144 for lichenized ascomycetes and 1,291 for other fungi, including 17 slime molds, which really are not fungi at all.



An update on morels: review of two important publications and what they tell us about our species.

Finally, note the invitation to the Québec Foray, pp 27-28, initiated by Renée Lebeuf. Might be fun to go and see how others do it. And kind of cool to have a corner of Newfoundlanders in their green chanterelle T-shirts and orange caps. Renée said she'd join us and so will Greg Thorn. If you'd like to make the trip, please let Maria Voitk know <medemari AT gmail DOT com>.

Happy mushrooming!

andrus

and the Webmaster

Among other things, the Members-only page has been removed. It was used primarily to make available to members the journals and newsletters of sister organizations, with whom we had made arrangements to exchange newsletters. (Some organizations preferred that their journal not be e-mailed, and shared it only if they were placed on a secure members-only web page.) Over the course of the year two things happened simultaneously: visits to that page by our members fell to zero and all but one of our sister organizations slowly got out of the habit of sending us new issues.

As always, comments and suggestions from users welcome.

Jim

Entoloma pseudoparasiticum

Jon-Otto Larnaes, Margaret Boyle, Gro Gulden, Greg Thorn, Andrus Voitk

As for its name, that's not so easy to decide.

Walter Little, Editor of McIlvainea.

Subheading added by Editor to a 1985 article about one such mushroom.[1]

The mushrooms on our cover were collected October 1, 2012, by MB on Ship Island, just off Herring Neck, near Twillingate, growing on the cap of an overmature but seemingly healthy *Cantharellus roseocanus*. Their cap diameter was about 4 mm, the slightly eccentric stem about the same length. Gill edges had visible minute projections, giving them a granular appearance. The specimens were immature. Exhaustive microscopic examination by JOA, GG, AV yielded only three (presumably immature) angular spores: two five-sided and one six-sided, measuring 5.7-7.7x4.1-6.2µm. Some clamp connections and a few 4-spored basidia were seen. The hyphae had evenly colored, brown walls; cheilocystidia were not seen.

Angular spores suggest a species of *Entoloma*, and its small size and general habitus places it in subgenus *Claudopus*, section *Claudopus*. But which *Claudopus*? Our experience suggests that nothing has changed since the comment by Little, which is as apt to-day as it was in 1985.

Section *Claudopus* is small, with around 10 species: three gray and the rest white.[10] Four species of this section have been described on chanterelles, some gray, some white (see side panel). However, colour is not always as overt or objective a character as one might expect. For example, Quélet described *Leptonia parasitica* as snow white (blanc de neige). 107 years later, Spurr and coworkers describe a mushroom with gray cap, gills and stem, and identify it as *Claudopus parasiticus* (Figure 4).[1] Batsch described *Agaricus depluens* as light gray (blassgrau),[4] and 129 years later Fitzpatrick names a white mushroom *Claudopus subdepluens* to mark its resemblance to Batsch's species[5]. Noordeloos describes *Entoloma parasiticum* as white, yet on the illustration in his 2004 monograph[10] the mushrooms are unmistakably gray, nowhere close to the blanc de neige of Quélet (Figure 3).

The situation is no better with microscopic characters. For example, the presence or absence of cystidia or clamp connections, both used to separate *E. parasiticum* and *E. pseudoparasiticum*, create difficulty for the world's leading expert on the genus *Entoloma*, even when a holotype is available: for *Entoloma pseudoparasiticum* Noordeloos reports cheilocystidia absent in 1987[3] and 1992[7], present in 2004[10], then absent again

In 1879 Lucien Quélet described *Leptonia parasitica* (*Entoloma parasiticum*), a small white mushroom growing on *Cantharellus cibarius*.[2] Since then, *E. parasiticum* has been reported from many substrates, including earth, wood, rotten bark, living moss, *Trametes versicolor* and *Coltricia perennis*.[3]

In 1786 August Johann Georg Karl Batsch described *Agaricus depluens* (*Entoloma depluens*) a small, gray, terrestrial mushroom with an eccentric stem.[4] In 1915 Harry Morton Fitzpatrick described a somewhat similar white species growing on *Coltricia perennis*.[5] Because it was smaller than Batsch's species, which Fitzpatrick erroneously believed to be white, and grew on a mushroom, Fitzpatrick reported it as a new species, *Claudopus subdepluens*, the species name indicating the proximity of this North American species to its European relative. In 1987 Machiel Evert Noordeloos synonymized this taxon with *Entoloma parasiticum*.[3] In 2006 a *Cantharellus roseocanus* fruitbody with similar small mushrooms was forwarded to Yves Lamoureux in Montréal. Because it did not fit with the then current descriptions of either *E. parasiticum* or *E. pseudoparasiticum*, Lamoureux considered the possibility that Fitzpatrick's North American species may differ from both European species, and reported it as *Claudopus subdepluens*.[6] Although Noordeloos elected to synonymize it with *E. parasiticum*, it would not be the first time that North American and European counterparts have evolved into divergent species—as illustrated so dramatically by their respective chanterelle hosts.

In his 1992 monograph on *Entoloma*, Noordeloos described a new pigmented chanterellicolous species, *Entoloma pseudoparasiticum*, which differed from *E. parasiticum* by: 1) pigmented fruitbodies (seen in the microscope as brown hyphal walls) and, 2) smaller and slightly different spores.[7]

In 1993 Gerog Wölffel and Walther Winterhoff described a new white species in section *Claudopus*, *Entoloma jahnii*,[8] and in 2012, Andreas Kunze and Joschi Siembida reported it growing on a chanterelle.[9]

A comparison of all the gray or pigmented chanterellicolous *Claudopus* species we could get together. Seeing them side by side, added to the dozens of pictures reviewed for this article, suggested two differences between pigmented and unpigmented mushrooms: the pigmented ones seem more robust than the fragile white ones (see Figures 5-7), and have a gray mycelium that dries white (accounting for reports of white mycelium). The habitus of all pigmented ones is so similar that one could be forgiven for suspecting them to be conspecific, no matter how they were identified.

Figure 1: Our *Entoloma pseudoparasiticum*. The mushroom seems to be subhygrphanous. In situ (1a) our specimen is brownish. After 24 hrs (1b), despite being kept in a small sealed jar to prevent dehydration, it is a paler gray. The same happens with the mycelium. Despite the whitish hairs, it is not a white mushroom, and has unmistakable brown-gray or gray pigmentation.

Figure 2: *Entoloma pseudoparasiticum* from Norway.[13]

Figure 3: Eric Danell's picture from Sweden, labelled in Noordeloos' monograph as *Entoloma parasiticum*. Could this be inadvertent mislabelling? Perhaps that accounts for the vacillation of some of the microscopic characters. If it is not mislabelled, one must conclude that pigment is not a meaningful differentiating character for these species.

Figure 4. *Claudopus parasiticus* by Joy Spurr.[1] The mushrooms are pigmented, and resemble the others on this page. Even some gray mycelium can be seen. They are described as gray, even if given the name of a white species. Note: the gray *Entoloma pseudoparasiticum* was not described at that time, thus unavailable as a choice for identification.

in 2008[11] and 2012[12]; clamp connections present in 1987[3] and 1992[7], absent in 2004[10], 2008[11] and 2012[12].

How can we explain such variability? These are very rare species. Because of their rarity, nobody has experience with their intra- and interspecific limitations. Descriptions are often based on the only collection encountered. Old descriptions are unhelpfully laconic. For example, the description of the current *Entoloma parasiticum* by Quélet[2] would fit all the white species of section *Claudopus*. The holotype (the original collection

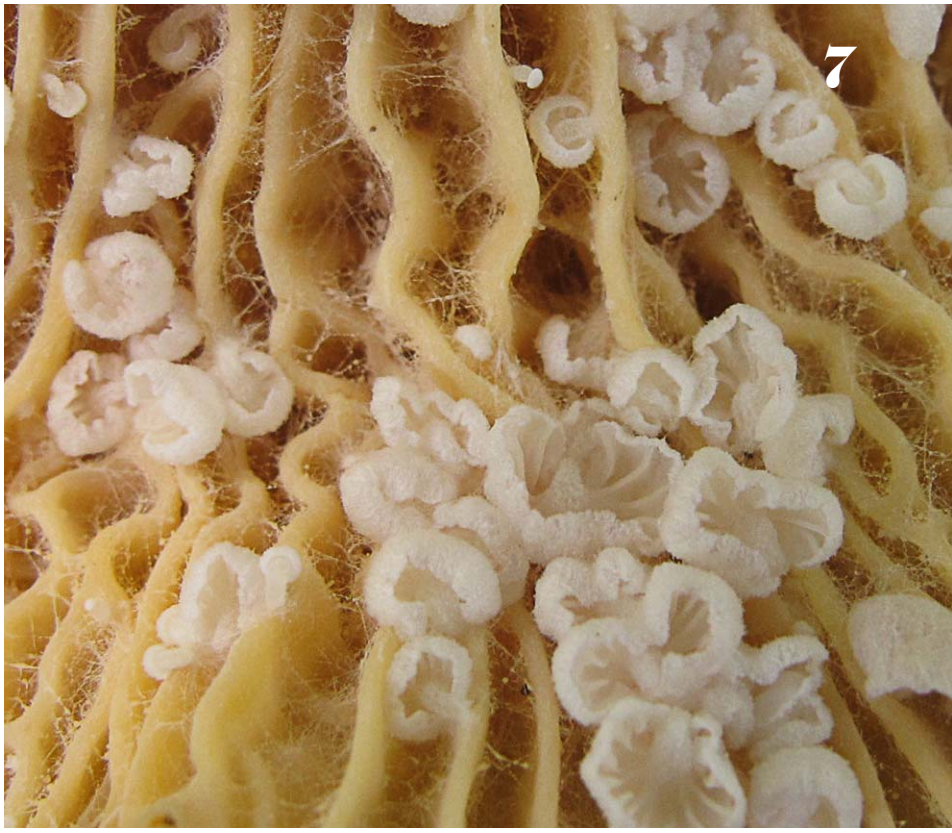
Figure 5: *Entoloma parasiticum* from France.[14]

Figure 6: *Claudopus subdepluens* from Québec.[6]

Figure 7: *Entoloma jahnii* from Germany[9].

Note the similarity of these mushrooms, particularly Figures 5 and 6. Figure 7, a younger specimen, bears some resemblance to the younger specimens in Figure 6. While the white specimens resemble each other, note that they do not resemble the gray specimens (Figures 1-4), which also resemble each other.

These pictures and dozens of others we have seen, suggest to us that there are consistent morphological differences between white and pigmented species. All the photographs of gray mushrooms likely represent one species. Whether the white specimens represent a single plastic species or several distinct species, or how they relate to Quélet's original description is a matter of speculation, inviting further investigation.



from which the species was described) of *Entoloma parasiticum* is lost and no new type designation (paratype or lectotype) has been made, so that there is no specimen for verification; the same is true for many of the other older species in the section. Microscopic characters were not part of the original description of the older species. Over time the concept of species may change, so that unverifiable characters not in the original description seem to be added and removed at will.

Important changes in the last few years have improved this situation markedly. Communication is cheap and immediate. The cost of colour printing has plummeted, making accurate colour pictures available in journals and books. Online publication is virtually costless. Digital technology has made quality photography accessible to everybody, with the ability to share rare finds instantly. We consulted with many colleagues, read many journals and books, and examined a plethora of photos online. This enabled us to get ersatz field experience with a rare group one might otherwise see only once in a lifetime. We decided to ignore generic macroscopic descriptions and insecure microscopic characters. That left us with colour. We decided to consider only

the descriptions of colour in the original description. That gave three gray species of section *Claudopus*; only one has been reported to grow on chanterelles: *Entoloma pseudoparasiticum*. Ours fit.

Once we segregated the chanterellicolous species by colour, gray (brown) or white, we were impressed with the seemingly uniform appearance of the gray species on *Cantharellus* and *Craterellus*. They all seemed to be the same shade of gray, had a gray mycelium that dried white, and seemed more robust than their white relatives (Figures 1-4 vs 5-7). Although our field experience with this species is negligible, after looking at many pictures, we felt we could recognize the gray species on sight (Figures 1-4).

However, because of the uncertainty in the area, our identification must be considered provisional only. Speaking about two *Claudopus* species, Noordeloos observed,

"**recorded from many places … but doubtful whether this is always the same species**" and, "**our knowledge of the variability and distribution pattern is very incomplete**".

These insights seem equally valid about the remainder.

For the record, our mushroom had clamp connections. It also had visible projections on the gill edges resembling cystidia, but cystidia were not seen microscopically. This resembles a pigmented *Entoloma* found recently on *Cantharellus cibarius* in Norway (Figure 2), also with clamps and visible gill edge projections.[13] Microscopically there were no cheilocystidia, but protruding hyphal terminal branches; either the cystidia eluded us, or the projections were of hyphal origin. Thus, a macroscopic picture may suggest cystidia, while microscopy may reveal that the visible projections are caused by structures other than cystidial cells, possibly contributing to vacillation in their description.

Summary and conclusion

We report a rare find and the confusion surrounding the identification of species in its small group. We believe that DNA analysis is required to sort out the many unanswered questions. Section *Claudopus* is of manageable size for focussed investigation, and seems to hold promise for interesting discoveries.

Acknowledgements

We thank the following for generously permitting us to use their photos:

Figure 2, Frode Øen and Agaricus.[13]

Figure 3, photo: Eric Danell, supplied by Machiel Noordeloos.[10]

Figure 4, photo by Joy Spurr, permission from NAMA/McIlvainea via Michael Beug, and the Puget Sound Mycological Society via Marian Maxewll, digital image provided by Ian Gibson.[1]

Figure 5, Dominique Schott (photo) and Société mycologique de Strasbourg.[14]

Figure 6, © Cercle des mycologues de Montréal inc. Photo: Yves Lamoureux[6].

Figure 7, photo: Joschi Siembida and Der Tintling.[9]

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Entoloma parasiticum & *pseudoparasiticum*: parasites or pseudoparasites?

Andrus Voitk, Greg Thorn, Gro Gulden, Margaret Boyle, Jon-Otto Aarnaes

The mushrooms on the title banner appear on normal fruit bodies of some *Russula* species. These then begin to die, become soft, and decompose. Almost all the *Russula* fruit bodies in a group seem to be involved. Those that appear healthy soon develop a putrid smell, followed by the appearance of the small mushrooms and necrosis. This pattern suggests that the colonizer is probably present on or in the host's mycelium, coming to the surface through the host's fruit bodies. Regardless of the exact mechanism, this small colonizing organism is a parasite that kills and eats its host mushroom in order to sporulate to perpetuate its own species. Thus, it is aptly named *Asterophora parasitica*.

E. pseudoparasiticum and other *Entoloma* species found on chaterelles, do not behave this way. Our chanterelle was firm, intact, had a delicious smell and did not seem unwell in any way. It was similar to the others in the group. Chanterelles on pictures of other collections also do not look unwell, apart from being somewhat overmature. In his report of *Claudopus subdepluens* growing on *Coltrichia perennis*, Fitzpatrick dissected out the visitor's hyphae and remarked that there did not seem to be macroscopic or microscopic damage to the host. Claudoputian hyphae seemed to traverse those of the host in apparent peace, and, "**It is possible that they extend through its stipe to the soil.**"[1] Perhaps our *Claudopes* are using fruit bodies of other fungi for reasons other than food. They choose species with less ephemeral fruit bodies: those of *Cantharellus* and *Craterellus* species last over a month, and those of *Coltrichia* and

Harry Morton Fitzpatrick; image from Cybertruffle.

Trametes the season.

How likely is it to have several very rare species fruit on chanterelles? In our province the genus *Collybia* consists of three species that all grow on mushrooms. All three can be distinguished readily by both macro- and microscopic morphology.[2] Their morphological differences seem to have evolutionary meaning, as all three morphotypes separate into distinct species clades on DNA analysis.

A seemingly significant difference between *Collybia* and *Claudopus* is that the *Collybia* species grow on dead fungal fruit bodies only—pure saprobes with a defined substrate. *E. pseudoparasiticum* is reported growing on species of *Cantherellus* and *Craterellus* only, and *E. parasiticum* on many other substrates as well, including earth, wood, rotten bark, living moss, *Trametes versicolor* and *Coltrichia perennis*.[3] It would seem a little unlikely that an organism coevolves to produce appropriate exoenzymes and other biochemical and structural accommodations to allow parasitism of a specific living host or set of similar living hosts, and also evolves to produce the structural and biochemical accoutrements needed to thrive on humus, dead bark, live moss and dead wood. Only humans practice a braces-and-belt approach.

However, if *E. parasiticum* and *pseudoparasiticum* were not mycophagous, but along for the ride on a chanterelle for other reasons, their presence on assorted substrates could be more acceptable in evolutionary terms. After all, being on a chanterelle is not necessarily parasitism in flagrante delicto, no more than being in a bank is evidence that one is a bank robber. There are reasons other than robbery to visit a bank or a chanterelle. One alternate explanation might be to suggest that because fungal mycelia are everywhere, on substrates other than mushrooms, these fungi parasitize unseen mycelia. The picture of *E. jahnii* on ground and on *Cantharellus subpruinosus* on this page (photo: Joschi Siembidia)[4] could be interpreted in that way, but most of the time this explanation seems a bit of a stretch. Another obvious explanation of the described multitude of substrates is that other similar organisms have been misidentified as that species. Because of their rarity, it is certainly true that the borders of the *Claudopus* species have not been drawn with the same certainty as for *Collybia*. These rare mushrooms may well be hiding some historic misidentifications. However, the above photo suggests that the "real thing" may well be found on a variety of substrates. It does not give a hint about

what it is doing on these substrates, no more than we know what it is doing on the chanterelles. Perhaps these rare mushrooms are not the parasites they have been thought to be, and have some very interesting physiologic secrets to reveal.

If they are not parasites, the choice of species epithet for our taxon is felicitous. In scientific parlance "pseudo" means "un" or "non", when referring to another name (as in Bob and Un-Bob). But in current vernacular use, "pseudo" is used to indicate "fake". Possibly fake parasite is an apt description for *Entoloma pseudoparasiticum*.

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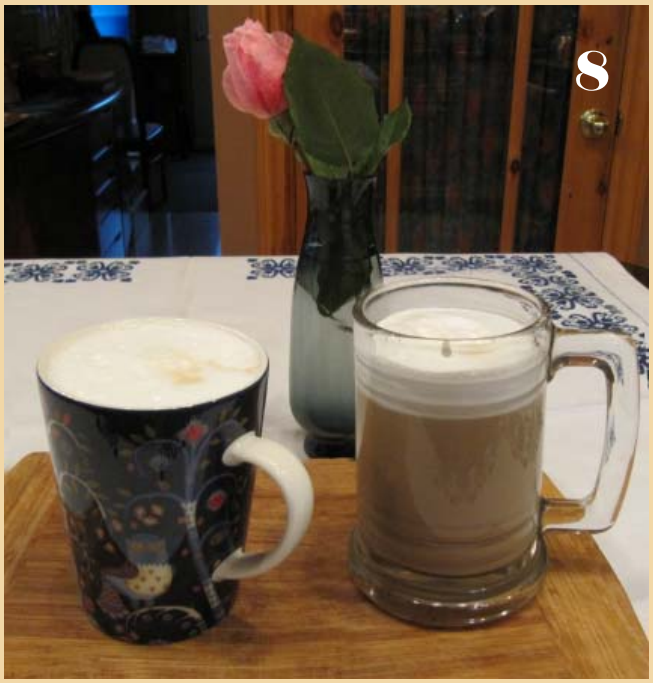
The empty skillet

CHAGA LATTE

Maria Voitk

Hardware & Software *Bodum type coffee press, 2% milk, coffee grinder, Crowsnest <www.crowsnestcoffeecompany.com> or other fine roast coffee, old filter coffee maker, jar of Chagaman's LG (latte grind) chaga http://chagaontherock.wix.com/chaga>.*

1. *Grind coffee beans to fine grind.*
2. *Fill coffe maker with 10 cups water, place filter, add 5 heaping scoops ground coffee in filter.*
3. *Add 3 full teaspoons of chaga. Close lid, swing filter in, place coffee pot on element. Press ON. (**NB!!!**)*
4. *Fill Bodum 1/4-1/3 full with 2% milk.*
5. *Heat in microwave about 2 minutes. Do not boil over.*
6. *Hold Bodum lid with one hand and froth milk with other. Rapid, short up-and-down plunges at air-milk level until Bodum is full.*
7. *Half fill cup or mug with frothed milk. Slowly add brewed chaga coffee to fill cup.*
8. Serve on bamboo cutting board, with rose in vase.



I was interested in your discussion of *Rhizomarasmius epidryas* in Omphalina 3(11):22-23; 2012. In September, 2012, Stephen Clayden and I visited an odd north-facing gypsum cliff in southeastern New Brunswick which claims the only population of *Dryas integrifolia* in the Maritime Provinces. The soft gypsum bedrock (note the chunk of gypsum on the picture) of the site shifts constantly, mimicking the thermal shifting of arctic soil, making it difficult for larger plants to take root, and supplies the calcium liked by many arctic plants. This combination makes the site a small refugium of arctic pants from the last ice age 13,000 years ago—outside the continuous *Dryas* distribution range. And, sure enough, there was *Rhizomarasmius epidryas*, three sporocarps, bringing the range of this species to its southernmost point on the North American east coast. It seems that if you find *Dryas* you will find *Rhizomarasmius epidryas*.

Stephen and I envision 3 more trips there next season. Then we shall write up some of the records from this odd *Dryas* locality, which so far only include 6 species of mushrooms.

Ed comment

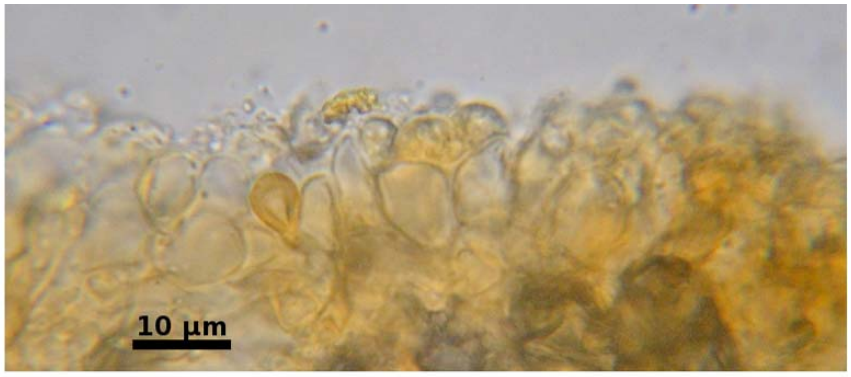
Congratulations!

Not always so easy, in our experience. After six years of looking in our limestone barrens, the cited report—the result of eight pairs of eyes peeled for it—was our first find, a single mushroom. Perhaps we'll have better luck after rain, when they are expanded?

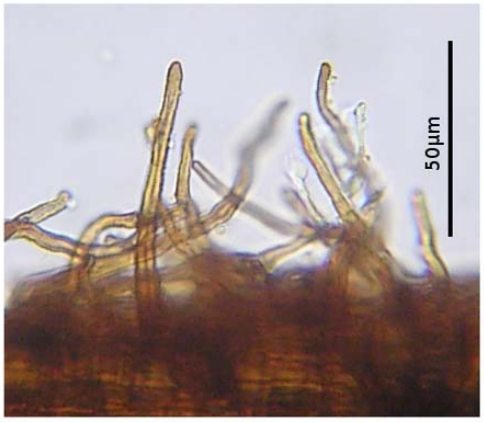
Acknowledgments

Map next page by kind permission of Ania Ronikier.

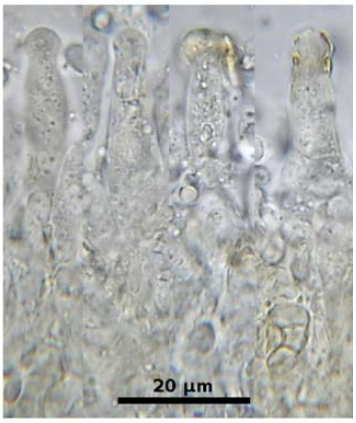
Rhizomarasmius epidryas
02-10-12/02



Pileipellis



Stipe surface

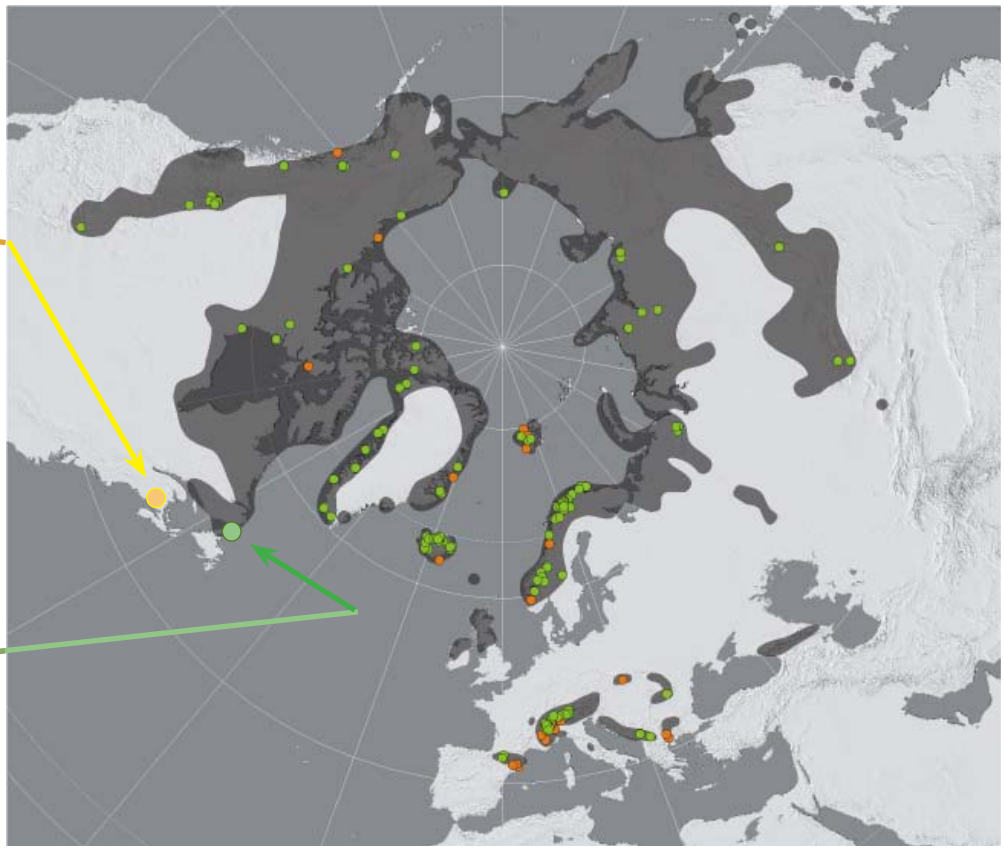


Cheilocystidia

Composite picture of the New Brunswick *Rhizomarasmius epidryas*. Whole mushrooms, far left. Top: foamy club-like cells of the cap, typical of *Marasmius*. Middle: hyphal projections, seen with the naked eye as fuzzy stem. Next are the cystidia lining the gills. Bottom bar shows the spores, shaped like a lopsided almond (amygdaliform), pear (pyriform) or gourd (cucurbitoid).

NB
find in Albert County, just below the 46th parallel, is the southernmost coastal report of *Rhizomarasmius epidryas* in North America.

NL
find, on Burnt Cape, at 51°31'0" becomes the penultimate southerly report on the Atlantic coast of North America



Fungi on polypores

Who rots the rotters?

Jim Ginns

Leif Ryvarden wrote of 11 species of polypores (wood rotters) whose fruiting bodies frequently or always grow in association with other, unrelated species of polypores.[1] Leif asked us a number of thought provoking questions about the nature of the association between the rotters and the rotters that grow on rotters. For example, are some polypores getting nutrition (feeding on) other polypores? Is one polypore parasitic (feeding on live tissue) on the other?

Two polypores not mentioned by Ryvarden are pictured below. Both are Newfoundland polypores and have distinctive fruiting bodies that should make identification fairly easy.

One purpose of this note is to encourage collecting and saving in herbaria of these uncommon polypores and help determine whether they are associated with one or several other polypores.

Antrodiella semisupina

Fruiting bodies are often next to or growing over those of species of *Fomes*, *Fomitopsis* and *Trichaptum*.[2]

Although variable, the small size (~ 2 cm across) and typically yellow cap are the principal field characters of the fungus. Photo: Brenda Callan, Victoria, BC.

Pycnoporellus fulgens

Orange fruiting bodies adjacent to one of *Fomitopsis pinicola*. Kroeger et al., working on Haida Gwaii observed that *P. fulgens* seemed to occur as a late succession wood decay species and may be parasitic on *Fomitopsis pinicola*.[3] The orange, medium-sized, relatively soft (not woody hard) fruiting bodies are distinctive. Photo: Bryce Kendrick, Sidney-by-the-sea, BC.

References

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3. Kroeger P, Kendrick B, Ceska O, Roberts C: The outer spores: mushrooms of Haida Gwaii. Mycologue Publications, Sidney-by-the-sea, BC. 189 p. 2012.

Who rots the rotter rotters?

Andrus Voitk

A recent interest in pyrenomycetes brought to light three instances of an unidentified polypore/corticoid fungus growing on *Annulohypoxylon multiforme*. In all three instances, the *Annulohypoxylon* grew on birch, and each time the polypore/corticoid was green, presumably from algae. Unfortunately the it was a bit long in the tooth in each find, and beyond my ability to identify it.

Once you begin to look at pyrenomycetes, you will note very many fungi seeming to fruit on them. The usual explanation is that growing on another fungus is but one way for fungi to find increased Nitrogen, needed for amino acids, protein synthesis, enzymes, and many other bits of vital infrastructure. The pursuit of Nitrogen is a fascinating subject: a universal need that is solved very many interesting ways by different species. For fungi that eat fungi to solve this need, pyrenomycetes are a common source, giving them a very central role in their niche.

Like everybody else, pyrenomycetes also have Nitrogen needs. Who supplies them? Here is a case that seems to operate on the laughs best who laughs last principle. The upper picture shows the unknown polypore/corticoid growing on *Annulohypoxylon multiforme*, which, in its turn, was growing on felled birch. Turnabout is fair play, and the bottom picture shows the same log one year later, a bit worse for wear by its rotters. The lushest remaining colony of *A. multiforme* is on and around what was formerly an unidentified polypore/corticoid. What goes around, comes around. *A. multiforme* came back to collect all the previously donated Nitrogen—clearly a loan, not a gift. Given for a good time, not a long time.

Photos: Maria Voitk

A predictive model of suitable sites for select edible mushrooms in western Newfoundland

April Muirhead, Darin Brooks

After exposure to the 2012 foray, I chose this for my major project in the GIS (geographic information system) post-diploma program at the College of the North Atlantic. My supervisor is Darin Brooks, and I am required to complete it in May and June.

The two main objectives of our project are:

1. To locate suitable areas in Western Newfoundland where select edible mushroom are likely to be found.
2. To predict future mushroom sites, given expected environmental and ecological changes over time.

The study is limited to six edibles:

- Newfoundland Chanterelle (*Cantharellus roseocanus*)
- Winter Chanterelle (*Craterellus tubaeformis*)
- Hedgehog (*Hydnum repandum*)
- Sweet Tooth (*Hydnum umbilicatum*)
- King Bolete (*Boletus edulis*)
- Morels (*Morchella* spp.)

The results are expected to offer a guide for mushroom pickers to locate suitable sites where these mushrooms are likely to grow. Time limits me to analyze the West Coast, where I live and study, but the project can easily be expanded to cover the entire province.

For meaningful results, we need many sets of data. The information can come from anywhere, because it is specific to the mushroom, not the region. **We ask for the help of all NL mushroom pickers.**

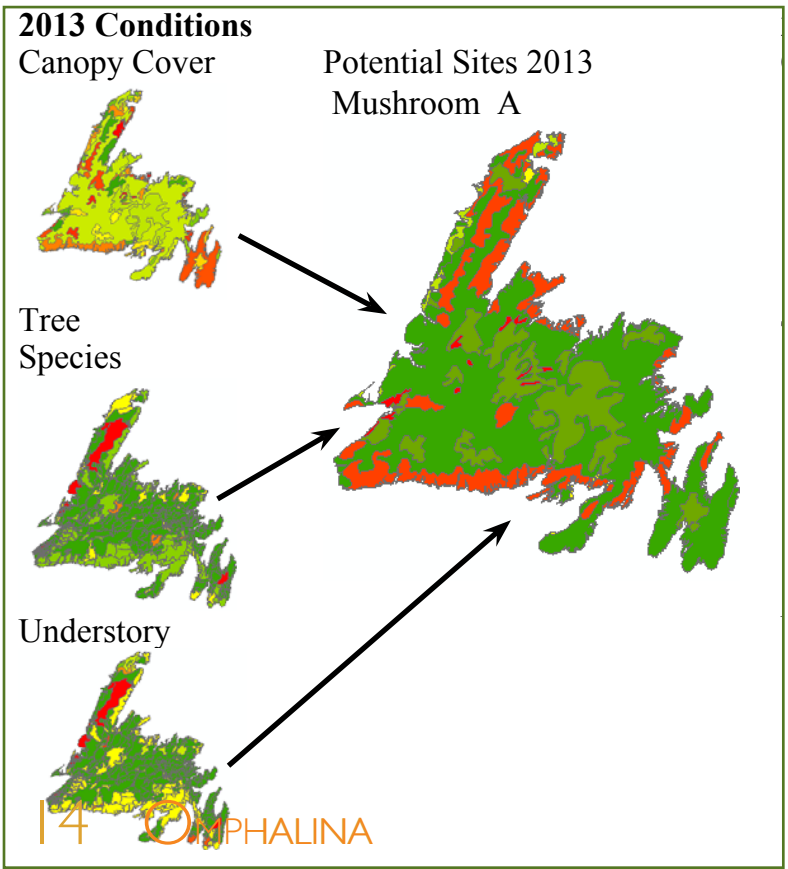
Please use the form on the next page to describe the site conditions where you find your mushrooms. NOT the coordinates or geographical locations of the sites—your mushroom patch remains safe with you!

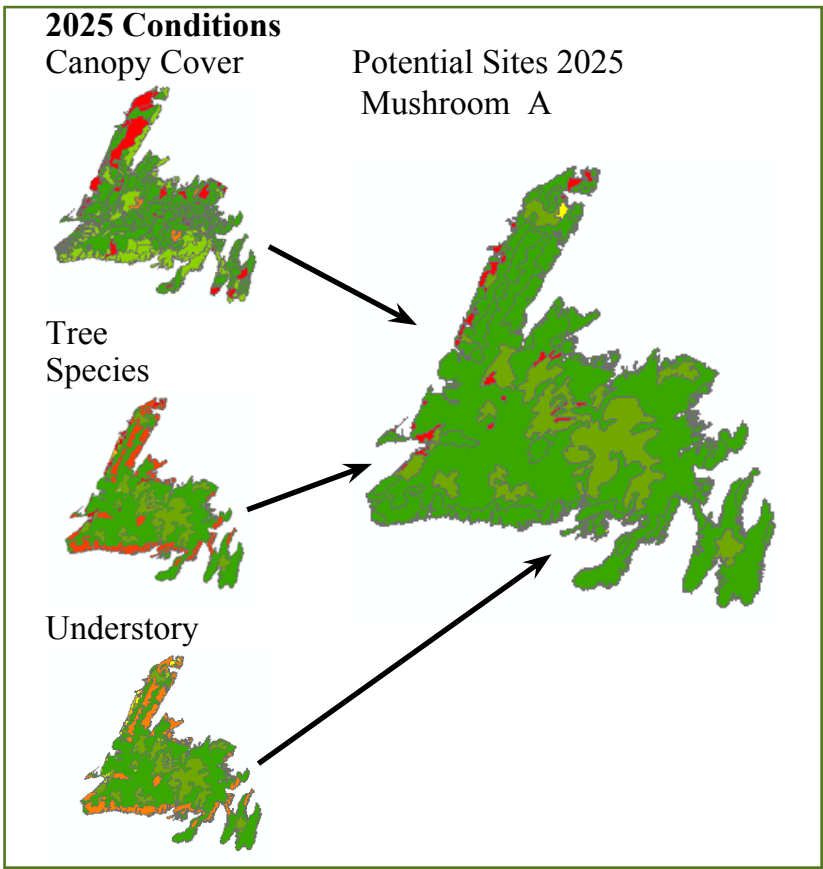
Print the form on the next page (specify only one page, or you'll print the whole issue!). Alternately, go to the FNL website <www.nlmushrooms.ca>, where you can download just the form. If we get sufficient input to be meaningful, we shall publish the results in OMPHALINA.

Here is how your data will be used:

1. GIS layers will be created for each site indicator and ranked by importance.
2. GIS analysis will combine and intersect layers to indicate the potential sites where the mushrooms might be found.
3. A secondary analysis based on environmental and ecological data will change some of the site indicators to predict potential sites in the future.

Example: Mushroom A prefers to grow under 30% canopy of 80-100 year old white spruce, with very low understory. These areas are plotted and then combined to show places where all three indicator requirements of Mushroom A are expected to coincide (left picture). These (the red areas) are the most likely regions where Mushroom A might be found. The right picture plots regions where the same indicators are expected to be 12 years hence, and combines them to show the most likely areas to find Mushroom A in 2025.





Please fill out one form for each mushroom patch and for each species. Fill out what you can. Any information is helpful **even if it is a single indicator**, so don't fret if you have to leave many blanks. Extra details are happily accepted: trends over various years or specifics from a particular harvest past. E-mail me with any questions.

Please send the forms in **before April 23**, so that we have time to gather all results, as my project time is limited.

E-mail: <april.muirhead@ed.cna.nl.ca>.

Fax: **(709) 634-2126 (Attention: Darin Brooks)**

Post address: **College of the North Atlantic
GIS Applications Specialist Program
Attn: Darin Brooks
P.O. Box 822
Corner Brook, NL, A2H 6H6**

INDICATORS	EXAMPLE	YOUR SITE, please fill out
Species	Mushroom A	
Year	2012	
Leading Tree Species	Picea glauca (white spruce) and Acer spicatum (mountain maple)	
Age of stand	50-70 years	
% Composition of leading tree species	50% P. glauca, 40% A. spicatum, 10% A. balsamea	
Canopy Cover	40%	
Understory: Amount & Height	Poor, very little; low	
Indicator plant species	Matteuccia struthiopteris (osterich fern), Cornus canandensis (crackerberry or bunchberry)	
Moss around mushrooms: Deep, Low, None	Low to none	
Soil (disturbed, gravel, sandy, loam, rich, poor; with/without duff)	rich, with duff	
Moisture (dry, earth moist, saturated, wet, water covered)	saturated	
Seasonal Climate Information Spring, Summer, Fall	Spring wet; Summer warm & wet, Fall dry & sunny	
Elevation	~20 m ASL	
Slope	60% Found near the bottom	
Aspect	South facing	
Growing Season	Last week of August – Mid October	
Pre-commercial Thinning (Forestry practice where select trees are removed to improve the growth or "health" of the other trees. This is an indicator of the amount of wood fibre on the ground and its age or degree of decomposition.)	Yes, around 1995	
Other prominent mushroom species	Amanita flavoconia	

The Bishop's Sketchbook

Morel update

Andrus Voitk

Some years back I wrote a small book about mushrooms I had encountered and photographed in Newfoundland and Labrador. I named each one. Some of them incorrectly, but they all got a name. All, except morels. At the time, the best I could do was say if a morel was black or yellow, no fancy Latin names. And in Newfoundland and Labrador I had not encountered any yellow morels, so all were black. Unable to come any closer than "black morel" was the only genus I was obliged to abandon unnamed in the Cimmerian desert. This bothered me, and I have paid morels particular attention since. Now I am certain that we have at least two distinct species, but thus far have not been able to find any description or name for our commonest species, and nothing convincing for the other.

No more! In 2012 two important works about morels have been published, enabling our understanding of them to take giant steps forward. The first, by a few days, is a monograph of world morels by the French mycologist, Philippe Clowez,[1] and the second a multi-author North American study led by Michael Kuo.[2] Both describe several new species. As an aside, because the Clowez monograph appeared first, any species that are the same in both, but differently named, should end up with the Clowez name after the dust settles.

The studies are entirely different in approach and cannot be compared. Clowez's monograph, the fruit of much study and thought about the genus, is a total reclassification of the genus *Morchella* based on ecological relationships. In this day, when almost every mushroom article presents some sequencing data, even if of questionable pertinence to the content, it may seem a bit anachronistic to read a major global study, where sequencing results seem peripheral curiosities. However, perhaps in a hundred years our obsession with the present way of sequencing will seem risible, while ecological studies will still retain meaning, who knows?

Unfortunately, Clowez's small book is extremely difficult to obtain. Even locating it on the web is a chore and I was not able to order it online. Finally, I was able to borrow a copy. It is published in the Bulletin of the Mycological Society of France, which has an annoying, dare I say unforgivable, two-year lag: the date on the publication is 2010, and only in small print on the last page do you read that it was printed in April, 2012! To make up for this frustration, it has superb photos, some by our own René Lebeuf. Good for Renée—soon I cannot imagine any mushroom book appearing anywhere these days without her beautiful pictures.

Kuo and coworkers present a phylogenetic study, based on genetic sequencing. As we have learned from the pages of Omphalina, this generates a tree-like diagram, where each species hangs like a leaf from the ends of a branching network, the leaves of the same species clustering on the same terminal branch. 20 North American species are described, most for the first time. Once identified in this way, Kuo and colleagues went back and compared these genetic species to each other in appearance (macroscopic and microscopic), ecology, distribution, or any other factor that might help us to differentiate the species from each other. In many cases they were successful, at least to some degree, but it seems that some species can only be separated by sequencing. This study is readily available to all readers with access to the internet; Kuo's website gives a link to the document as well as a more non-technical presentation of the results on his morel pages.[3]

This may surprise those of you who have followed the writings of Kuo over the years. If there is one overriding idea in his writings at all, it surely is his repeated exhortation to collect mushrooms and note their ecology, for in that relationship must lie the deepest secrets to speciation. Yet, it is not Kuo, but his French colleague, who carried out the ecological study—and Kuo could not wish for a more dedicated follower of his preachings than Philippe Clowez.*

* *This should not be misinterpreted to mean that Clowez was a student of Kuo! The North American team is on record as having been totally unaware of the simultaneous activity of their French colleague.[4] That two major investigations of the same high-profile genus were so blithely ignorant of each other as to pass like ships in the night is regrettable. In to-day's information age, such innocent unworldliness almost beggars belief.*

Different findings in two such differing approaches should not be surprising. What is surprising, is how well they actually match each other. In the broad sense, where the two studies describe the same mycota, the overlap is amazing—much better than the overlap of members of the same species in most phylograms! This is high praise, indeed, for Kuo's tenet: clearly an ecological approach does hold the clues to speciation. And because the ecological study was done by an independent investigator, objectivity is impeccable.

Sure, a few things were not "discovered" by the ecological approach. For example, Kuo identified more morel species that appear after a fire in conifer woods than Clowez. However, two of Kuo's species are indistinguishable from each other by any identifiable characters, apart from genetic analysis, so the lumping is understandable and the distinction not of practical value for the amateur mycophile. Similarly, on the basis of clear genetic differences Kuo distinguishes two peaked black morels of North America, *Morchella angusticeps* and *M. septentrionalis*. Clowez describes only *M. angusticeps* (seemingly, with some reservation), presumably lumping the other with it. These, and a few other lacunae could have been eliminated, had the studies been combined into one major robust work; nevertheless, overall the two approaches confirm each others' findings well.

What do these studies tell us about the morels of our province? You may have observed that our morels, in addition to being uncommon, are very small. Indeed, our commonest morel, one none too common at that, fits the description of Kuo's, *Morchella septentrionalis* (photo title banner and p. 19). This is a morel species with a northern distribution, in appearance like the classical black morel: dark ridges and lighter pits. Kuo describes it as 40-75 mm high; ours seem to begin below 20 mm, and very rarely reach above 60. 2011 was a banner morel year: we collected about 80 specimens for the season, over twice what we would find most years. However, they were strung out over several months, so that finding over three at a time only happened in the peak of the season. Two morels 35 mm high do not go far on their own. The only way to get a meal to share with friends, is to collect and dry them from the beginning of the season, to have enough at the end for one festive meal.

The other species that we have collected here resembles Kuo's *Morchella importuna* (photo below), so named because of its importune habit of appearing in profusion in gardens. Here it is not encountered often, but when seen, produces a copious harvest. Its appearance is akin to the fire morel, it erupts once only, the year after mulching or building a garden or flower bed with wood chips or wood based manure, then is not seen again. Kuo describes it as primarily a western species, mentioning that Tom Volk has seen it as far east as Wisconsin. My guess is that the species is probably transcontinental. I have seen such flushes in Ontario. Renée Lebeuf says that in Québec it is known as "morille des paillis" (mulch morel), published on her Flickr site.[5] In our province I have heard two reports of it in St. John's, and have seen it four times on the Newfoundland west coast, where we live.

Possibly it extends even beyond this continent. Kuo had pictures and samples of a similar morel sent to him from Belgium, which proved to be the same species on DNA analysis. Perusal of European species led him to suspect that it may be the same as the European *Morchella costata*. Clowez also identified Renée's mulch morels from Québec as European *M. costata*.[5] In his monograph he has subsequently synonymized *M. costata* with *M. elata*. Breitenbach and Kränzlin describe the European *M. elata* as having its cap flow gradually

into the stem,[6] whereas Clowez describes a furrow* (inturned cap edge around the cap-stem junction) present, if not always obvious. This suggests that at least superficially the concept of *M. elata* in Europe might still be somewhat unsettled. Our mulch morels have an obvious furrow. Because the matter does not appear to be clear yet, for the moment I have elected to use Kuo's North American name, but am prepared to change in response to additional evidence, which I eagerly await.

These two species are the most commonly encountered here, but no doubt we have more. In the unusually productive morel year 2011 "larger black morels" were reported in the wild, and I have heard similar morels described from Labrador. Without seeing them, I am unable to speculate whether they represent additional species in the province. In addition, we may have very rare examples of some "yellow morel" species, morels with ridges lighter in colour than their pits. I have no specimens to confirm this, but have seen one photo and have heard two credible reports of such sightings.

What about fire morels? For several years Maria and I have scouted the areas of forest fires in our province the following spring, but nowhere did we find morels. Some places yielded *Gyromitra esculenta* by the bucketful, but no morels. It got so that we lost faith in the stories, and had to go out west ourselves to check it out—reported on these pages.[7] The phenomenon is real and the morels appear as thick as they say they do: we could have collected as many morels as we were able to carry from burns high in the Rocky Mountains. Different morel behaviour? No, different morel species. According to Kuo, four morel species appear in huge quantities the year after a forest fire, and all four are reported to be western species. Apparently at least some of these species also extend eastward across the continent, even if not to this Island: Renée tells me that they have fire morels in Québec, identified as *Morchella capitata*, one of the four fire morels reported by Kuo et al.

At present, efforts are being made to reconcile these two big studies; it will be fun to watch the developments in this area over the next year or so.

An effort was made to get this update to you before the morel season. The earliest we have ever recorded a morel is in March and the latest at the end of June. **Let us make this the spring of MorelWatch.** If you come across a morel, please take a picture and collect the mushroom(s). Send me the picture and I'll likely ask for a dried specimen or two. Eat the rest. Maybe in time another article can describe more than two species in our province.

References

1. Clowez P: Les morilles, une nouvelle approche mondiale du genre *Morchella*. Bulletin trimestriel de la société mycologique de France, 126:199-384. 2012.
2. Kuo M, Dewsbury DR, O'Donnell K, Carter MC, Rehner SA, Moore JD, Moncalvo J-M, Canfield SA, Stephenson SL, Methven AS, Volk TJ: Taxonomic revision of true morels (*Morchella*) in Canada and the United States. Mycologia, 104:1159-1177. 2012.
3. Kuo M: The Morchellaceae: True morels and verpas. MushroomExpert. Com Web site <http://www.mushroomexpert.com/morchellaceae.html>. Last accessed Feb 22, 2013.
4. Du X-H,, Zhao Q, Zhu L. Yang ZL, Hansen K, Hatira Taşkin H, Büyükalaca S, Dewsbury D, Moncalvo J-M, Douhan GW, Robert VARG, Crous PW, Rehner SA, Rooney AP, Sink S, O'Donnell K: How well do ITS rDNA sequences differentiate species of true morels (*Morchella*)? Mycologia 104:1351-1368. 2012.
5. Lebeuf R: *Morchella costata*. <http://www.flickr.com/photos/21189203@N05/5531844598/>.Last accessed Feb 22, 2013.
6. Breitenbach J, Kränzlin F: Fungi of Switzeralnd, Vol 1. Verlag Mycologia, Luzern. 1984
7. Howse I: Morelling on Canada Day. Omphalina, 3(7):17-18. 2012.

* *English choices to describe the structure include canal, furrow, groove, rut. Clowez uses vallécule, a fraconization of the Latin vallecula, little valley. Common French choices include cannelure, ornière, sillon. For spin doctors and other imago-makers, who feel that a touch of Latin is mandatory to lend one's writing the smell of scientific profundity, "vallecula" (small valley) might strive for uniformity with Clowez, although "sulcus" probably obtains more uniformity with common bioscience joual. Sulcus is an open tract, and sinus is an enclosed tract. The latter is erroneous here and should be abandoned alacritously.*

NEMF – FQGM - 2013
UNIVERSITÉ DU QUÉBEC À RIMOUSKI
du (6) 7 au 10 août

14e rencontre annuelle de la FQGM (Fédération québécoise des groupes de mycologues)
2013 NEMF Samuel Ristich Foray - 37th Annual Foray of the Northeast Mycological Federation
En collaboration avec la Chaire de recherche sur la forêt habitée de l'UQÀR

Rencontre 2013 de la FQGM

Information générale

Dates

Rencontre PLUS : du mardi 6 août, 16 heures, au samedi 10 août, après le dîner.
Rencontre régulière : du mercredi 7 août, 16 heures, au samedi 10 août, après le dîner.

Endroit

Campus de l'Université du Québec à Rimouski
(300 Allée des Ursulines, Rimouski, QC)

Forfaits

1 - Hébergement dans les résidences de l'Université (appartements de quatre chambres simples), plus tous les repas à l'Université et toutes les activités
Rencontre PLUS : 380$
Rencontre régulière : 300$

2 - Hébergement à l'extérieur à l'**hôtel** (en occupation double), plus tous les repas à l'Université et toutes les activités
Rencontre PLUS : 480$
Rencontre régulière : 375$

3 – Aucun hébergement, mais tous les repas à l'Université et toutes les activités
Rencontre PLUS : 230$
Rencontre régulière : 190$

Formulaire d'inscription

http://www.mycomontreal.qc.ca/actualit.htm

Programme de la rencontre

Le programme préliminaire (presque définitif) sera disponible sur le site internet du CMM vers le 25 février 2013. Le programme est bilingue (anglais et français).

2013 NEMF Samuel Ristich Foray

General Information

Dates

Foray PLUS: from Tuesday, August 6, 4:00 pm, to Saturday, August 10, after lunch.
Regular Foray: from Wednesday, August 7, 4:00 pm, to Saturday, August 10, after lunch.

Location

Campus of University of Québec at Rimouski
(300, Allée des Ursulines, Rimouski, QC)

Packages

1 – Accommodation on site at the University (apartments of four single rooms), plus all meals at the University and all activities
Foray PLUS: $380
Regular Foray: $300

2 – Accommodation off site at a **hotel** (double occupancy), plus all meals at the University and all activities
Foray PLUS: $480
Regular Foray: $375

3 – No accommodation, but all meals at the University and all activities
Foray PLUS: $230
Regular Foray: $190

Registration form

http://www.mycomontreal.qc.ca/actualit.htm

Schedule

A preliminary program will be available on the CMM web site around February 25. The program is bilingual (French and English).

Registration Form also available on FNL website <www.nlmushrooms.ca>.

Mycologues et autres invités spéciaux (en ordre alphabétique des prénoms)
(Quelques autres invitations à venir.)

Annemieke Verbeken (Belgique)
Catherine Boudreault (Québec), Lichens
Franck Stefani (Québec)
Gary Lincoff (USA)
Greg Marley (USA)
Greg Thorn (Ontario, Canada)
Herman Lambert (Québec)
Jean Faubert (Québec), Bryophytes
Jean Gagnon (Québec), Lichens
John Plischke III (USA)
Luc Sirois (Québec)
Marianne Meyer (France), Myxomycètes
Michaeline Mulvey (USA)
Mireille Lenne (Belgique), Myxomycètes
Myriam Lambany (Québec)
Noah Siegel (USA)
Peterjürgen Neumann (Québec)
Pierre-Arthur Moreau (France)
Raymond Archambault (Québec)
Raymond McNeil (Québec)
Renée Lebeuf (Québec)
Roland Labbé (Québec)
Serge Audet (Québec)
Susan Hopkins (USA)
Véronique Cloutier (Québec)
Walt Sturgeon (USA)
Yolande Dalpé (Québec)

Aperçu des sujets abordés et des activités

Toutes les activités sont offertes en français ou en anglais, ou elles sont bilingues.

Plusieurs sorties de cueillette en forêt, dont une excursion sur la Côte-Nord (en traversier) et deux sorties à l'île St-Barnabé (en canot pneumatique). *
Exposition et identification des récoltes.
Tours de table pour débutants.
Tours de table spécialisés (petits groupes).
Plusieurs conférences durant la journée.
Animation et exposés en soirée.
Introduction au Myxomycètes.
Introduction aux Lichens.
Teinture avec les champignons.
Introduction aux Bryophytes.
Sorties aux algues marines.
Champignons médicinaux.
Cueillette commerciale des champignons.
Rencontres sociales et dégustation de champignons.
Ventes de livres et d'objets mycologiques.

* Frais additionnels pour ces activités.

Mycologists and other special guests (in alphabetic order)
(Some others still have to be confirmed.)

Annemieke Verbeken (Belgium)
Catherine Boudreault (Québec), Lichens
Franck Stefani (Québec)
Gary Lincoff (USA),
Greg Marley (USA)
Greg Thorn (Ontario, Canada)
Herman Lambert (Québec)
Jean Faubert (Québec), Bryophytes
Jean Gagnon (Québec), Lichens
John Plischke III (USA)
Luc Sirois (Québec)
Marianne Meyer (France), Myxomycetes
Michaeline Mulvey (USA)
Mireille Lenne (Belgium), Myxomycetes
Myriam Lambany (Québec)
Noah Siegel (USA)
Peterjürgen Neumann (Québec)
Pierre-Arthur Moreau (France)
Raymond Archambault (Québec)
Raymond McNeil (Québec)
Renée Lebeuf (Québec)
Roland Labbé (Québec)
Serge Audet (Québec)
Susan Hopkins (USA)
Véronique Cloutier (Québec)
Walt Sturgeon (USA)
Yolande Dalpé (Québec)

Overview of topics and activities

All the activities are either in English or in French, or are bilingual.

Many walks in the wood, including one to the North Shore (by ferry), and two to St-Barnabé Island (by Zodiac dinghy). *
Mushrooms display and identification.
Collection review for beginners.
Collection review for advanced amateurs.
Many lectures during the day.
Evening presentations.
Introduction to Myxomycetes.
Introduction to Lichens.
Dyeing with mushrooms.
Introduction to Bryophytes.
Walk along the shore to see marine algae.
Medicinal mushrooms.
Commercial harvesting of mushrooms.
Socials and mycophagy.
Sale of mushrooms books and other related things.

*Extra costs for these activities.

Registration Form also available on FNL website <www.nlmushrooms.ca>.

THE MAIL BAG

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

… about the Pyrenomycetes, I've never heard of them, can't pronounce their names and will never remember them, won't eat them, and am unlikely to look at them. Nice pictures, though. Why not teach me to identify some common mushrooms instead?

HL

Ed comment:

Dear HL,

The earlier *Gymnosporangium* articles prompted a similar comment. Since this may become a repeat annoyance for a few readers, this time it deserves a public answer.

Before Dave Malloch submitted his *Biscogniauxia* article, I vaguely knew the term pyrenomycete, but that was it. I got curious, went and collected a lot, tried to read about them and identify them, had them identified by two experts, read again and compared the appearance to descriptions. Eventually, I worked out a few patterns for a very small number that could be identified by their appearance alone with reasonable accuracy—at least in this province. Realizing how few resources there are for amateurs to get to know this group, I wrote the 12 species article as an introduction.

The purpose of the article was not to show off my knowledge—I was not aware of them a year ago—but to share with those readers who might be curious about these things some of the results of my discoveries. The idea was not to imprint them on the mind of the rare person with a photographic memory. Rather, they were meant to be a reference resource for the interested. Any reader who comes across a pyrenomycete and wants to identify it, now has a place to turn for a beginning. There are not too many places for a curious non-professional to turn to for help with identifying these very common fungi.

Common? As a group, pyrenomycetes are probably more common than any other group of macrofungi I can think of. However, I know what you mean: we don't usually look at them. OMPHALINA tries to balance such articles with articles on "common" mushrooms and lichens. The same issue had an article on *Craterellus tubaeformis*, and one on our very common *Xanthoria* species. Every article may not be not for every reader, but every issue tries to have something for every reader.

As for "knowing them", we are both in the same boat. Although I wrote the 12-species article, I don't remember the names. I looked at some on a birch branch yesterday and when my wife asked me what they were, I could not remember (although I did remember to cut them tangentially to see if they were green inside—they were). At home I looked in OMPHALINA and identified them as *Diatrypella betulina* for her.

***

Below are two different opinions on the same articles. Both are from professional mycologists, so perhaps HL has a point. OMPHALINA serves many kinds of readers, and should remain approachable. Are we straying too much toward the esoteric? Opinions like HL's are valuable checks. What do other readers think? After all, I have yet to get a letter asking me not to waste time with articles on *Craterellus tubaeformis*, and do a feature on Pyrenomycetes or *Gymnosporangia*!

Another splendid issue. I especially enjoyed reading about the Pyrenomycetes, since these fungi are often overlooked in favor of their more flashy, fleshy relatives. The article about *Biscogniauxia repanda* is terrific, and inclusion of the historical background of the name adds a fascinating element. The overview of some NL Pyrenomycetes adds a valuable basis for identifying some of these fungi in the field.

Suzanne Visser
University of Calgary

Most authoritative and comprehensive brief non-technical discussion of pyrenomycetes that I have read. Well done!

Kadri Pärtel
University of Tartu, Estonia
Friend of *Biscogniauxia* and other pyrenomycetes.

OUR PARTNER ORGANIZATIONS

- People of Newfoundland and Labrador, through
  - Department of Environment and Conservation
    - Parks and Natural Areas Division
    - Wildlife Division
  - Department of Natural Resources
    - Center for Forest Science and Innovation
- People of Canada, through
  - Parks Canada
    - Terra Nova National Park
    - Gros Morne National Park
- Model Forest of Newfoundland and Labrador
- Memorial University of Newfoundland
  - St. John's Campus
  - Grenfell Campus
- Tuckamore Lodge
- Quidi Vidi Brewing Company
- Rodrigues Winery
- Shorefast Foundation

FORAY NEWFOUNDLAND AND LABRADOR

2013 2013 2013 2013 2013 2013 2013 2013 2013 2013 2013 2013 2013 2013 2013 2013 2013 2013

The second decade

FOGO ISLAND

Headquarters: *Joe Batt's Arm*

September 6-8, 2013

GUEST FACULTY

Cathie Aime
Renée Lebeuf
Esteri Ohenoja
Michele Piercy-Normore
André Paul
Irja Saar
Roger Smith
Greg Thorn

Get to know our MUSHROOMS & LICHENS!

Look on our website in the spring of 2013 for Registration Forms & Information:

<www.nlmushrooms.ca>