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FORAY NEWFOUNDLAND AND LABRADOR

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

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COVER

Gyromitra ambigua, Birchy Brook

Nordic Ski Club trails, Goose Bay, Labrador, August 8, 2012. Those of sharp memory will know that we have used this photo once before inside the journal, but we liked it so much that now it will grace the cover of an issue devoted to the false morels. This will be the only time in this issue you will see that term.

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Message from the Editor

Welcome to our *Gyromitra* issue, timed to help you identify these spring species. Ordinarily, the earliest ones begin fruiting at press time, and continue until the end of May, but this year you may have to wait a few weeks for the snow to melt a bit first! Only a few fruit in the autumn, like the one on the cover. And one found underground, but see inside for yourself.

There is a big advantage to multiauthor articles. Up to the last proof, the name of the last author was misspelled. Only one co-author spotted it. Had we had only six authors, such an intolerable calamity would have remained! However, an article is not only a product of the authors; there are many other contributors. The results would have been different had we not had good European material, much of it sent by two of our past faculty, Gro Gulden and Esteri Ohenoja. We are very grateful for their help.

Then, check out the Mail page, taken over by the announcement of a new find for North America. The best part is that you already know this mushroom from last issue, only this time it bears a different name.

This is also the issue when we announce our upcoming Foray, as the editor is doing from a Gros Morne Red Chair, with the Western Brook Gorge behind him. Please see Foray Matters, next page, and the Registration Form, page 18. Since our Foray will take place again in our spectacular UNESCO World Heritage Site, Gros Morne National Park, we are not going to repeat

the same information this year as last.

Please refer to our website <www.nlmushrooms.ca> for information, as well as last year's Foray issue [OMPHALINA 5(4)], also downloadable from the website. In addition each of the four subsequent issues carried a description of each of the four econiches in Gros Morne National Park that you may want to download.

Because for six years our Foray has been fully subscribed, with more people on the waiting list than we can accommodate, distribution of the Foray notice issue is staggered: members first, and general release later. Take advantage of this privilege of membership to register early, if you are planning to join us this year. It may be difficult to think Foray with oodles of snow still on the ground, but we are already in the last half of April, so time is moving faster than the seasons.

By the way, of the *Gyromitra* authors, the two Andy Ms will be among our faculty this year. If there is something in the article that you liked, don't bottle it up. Come to the Foray and tell the Andys yourself!

Now, register, then stride forth boldly and identify gyromitras!

See you at the Foray!

andrus

FORAY MATTERS...

Foray 2015 in Gros Morne!

I've lived and worked in the Gros Morne National Park area for more than 25 years. I know many parts of the park as intimately as I know my own garden. I've hiked and climbed and skied and boated and helicoptered to places that few visitors will ever experience. But I still do not really understand Gros Morne—there is so much that goes on out of sight, and so much of it is fungal.

Until Foray Newfoundland and Labrador held its first event in Gros Morne in 2003, almost no work had been done on the fungi of the area. Lichens had been collected by Teuvo Ahti, Stephen Clayden, and others, and some forest fungi had been identified, but apart from that, the mycota of the park was unknown. We have now held four forays in Gros Morne, and our fifth will occur in September. According to the cumulative species curve that Andrus compiles each year, we are nowhere near exhausting the potential of Gros Morne to provide new species. And I don't just mean new to us. Several fungi collected in the park area have turned out to be previously unknown to science. Four years of forays in Gros Morne have only scratched the surface.

Foray Newfoundland and Labrador has raised the profile of fungi and lichens throughout this province. The work that we do during forays is fun and educational, and it is also extremely valuable. No province could afford to hire all of the experts who have so generously donated their time and expertise to us over the years. No government agency could mobilize the

hundreds of volunteer collectors who have scoured the province during the last twelve forays. Each of us who has brought back a mushroom for identification during a foray has contributed to the fungal herbarium, the photograph collection, and the specimen database that FNL has amassed. Those specimens have been shipped to researchers around the globe, and have helped them clarify the murky world of fungal relationships.

With each foray we learn a bit more about the diversity and distribution of mushrooms and lichens in this province. With each foray we make a small contribution to the worldwide understanding of fungi. With each foray, someone gains an appreciation of organisms that they had completely overlooked in the past.

Perhaps a rare mushroom that you find will be the star of Foray 2015, but even a common species can add to our knowledge of the park and the province. Forays are fun, the people who attend are fascinating, and the results are scientifically important. As the title almost says: **Forays Matter.**

Please note that as last year, we will begin the foray with a mycoblitz at Sir Richard Squires Memorial Provincial Park, leaving the parking lot at exactly 11:00 am, Friday September 25th. If you can join us, please bring your own lunch!

Our website nlmushrooms.ca and *OMPHALINA* vol 5, nr 4, has information on how to get there and other important matters.

Michael Burzynski

THE GENUS *GYROMITRA* IN NL

Andrew N. Miller, Abraham Matlak, Daniel Raudabaugh,
Kadri Pärtel, Heidi Tamm, Andrew S. Methven, Andrus Voitek

ABSTRACT Investigation of Newfoundland and Labrador (NL) *Gyromitra* revealed six species (including *Hydnотrya*) in the province, adding two new molecularly confirmed species to what has been reported for the continent. The phylogeny for *G. gigas* suggests that globally it may be a species complex; further study is required. Molecular data are reported for the first time for *G. ambigua*, distinct from *G. infula*, and for *G. leucoxantha*.

The ascomata (fruit bodies) of the genus *Gyromitra* are of three types: stipitate (cap and stem), discoid (flat, cup or disc-like, with or without a rudimentary stem) and hypogeous (underground). Most are spring mushrooms, many fruiting at snowmelt. Both a recent review of the genus in North America¹ and a recent book of North American ascomycetes² listed 10 species of the genus on this continent. To these must be added the species of *Hydnотrya*, a hypogeous genus, which has been shown to fall entirely within the genus *Gyromitra* through phylogenetic analysis. Several other genera have also been placed in or removed from the genus, most significantly *Discina*, whose members have

been shown to be gyromitras. The aim of this study is to use morphologic examination and nuclear analysis to determine and describe the species of the genus that sporulate in NL.

Method

All specimens of the genus from collections made by AV over a decade were examined by standard methods and then subjected to molecular analysis, using techniques published previously.¹ Several collections from Europe were used for comparison. Sequences from this study were deposited in GenBank.

LSU-based
phylogeny of
North American
(mostly) species of
Gyromitra, rooted
with Morchella.

Species found in NL
in colour panels,
showing individual
collections.

New molecularly
confirmed species
for North America
from this study
marked with gold
star.

Gray panels show
species not found
here (at least to
date).

We also added two
Eurasian species,
Gyromitra infula
var. apiculatispora
and G. splendida.
One collection
of the former
separated as a
good species clade,
while the other, the
holotype, nestled
comfortably in the
G. ambigua clade.
The single G.
splendida collection
clustered with G.
esculenta.

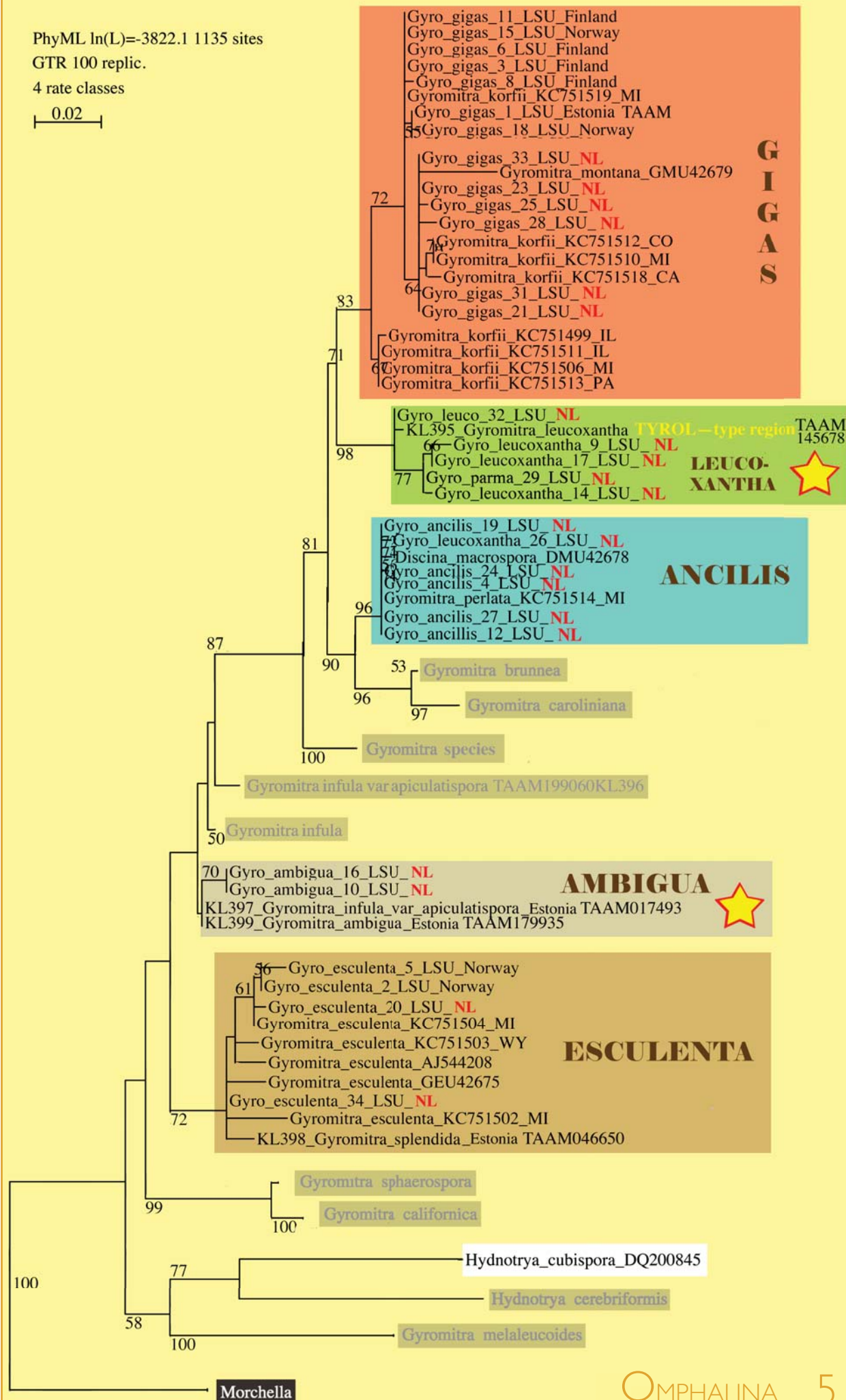
Note that species of
the former Discina
are subsumed
into Gyromitra.
Note also, that
Hydnотrya is
completely
within the genus
Gyromitra—the
article on p. 16 may
be the last time you
read about it under
that name. Or
maybe not...

PhyML ln(L)=-3822.1 1135 sites

GTR 100 replic.

4 rate classes

0.02



Results

A total of six species were identified. There were three stipitate species: *G. ambigua*, *G. esculenta*, and *G. gigas*. Two discoid species were identified: *G. ancilis* and *G. leucoxantha*. One hypogeous species, *Hydnотrya cubispora*, was also identified morphologically. *G. ambigua* had not been identified in either recent review of North American gyromitras,^{1,2} and *G. leucoxantha* may have been misidentified; our identification was made with a match to a collection from the Tyrol, the type region for the species. The phylogeny of the genus is shown on the previous page.

Discussion

This study shows the value of exploring regional mycota. Global and continental studies are unable to probe the full diversity of every region under study, and such studies depend on regional material for completeness. Material collected over a decade in our province added 20% to the known diversity of molecularly confirmed North American species of *Gyromitra*. This is not a provincial overview: collections come primarily from the west coast of Newfoundland and a few collections from limited regions of Labrador.

In the descriptions, we report observations and measurements on our own material, not that from the literature. In some cases these observations are limited, and may differ with more material from other regions. Characters useful to distinguish species in NL may not apply to regions with more or different species.

Edibility

NONE of these mushrooms should be eaten.

Gyromitras are very tasty, of an enjoyable texture and flavour. AV has eaten two of the species described (at a time the toxin story was not well known). *Gyromitra gigas* is the favourite edible mushroom in Finland, ahead of morels and probably even ahead of most fall mushrooms. A serious toxin, monomethylhydrazine (MMH), has been found in *G. esculenta* and *G. gigas*, and its presence can be

assumed in the other species. MMH is a cytotoxin that kills liver cells, causing death from liver failure. Should you escape that, it is also a carcinogen, so it may get you later.

The amount of MMH varies by species, season, locality and other factors, but its presence in harmful, nay, lethal, quantities must always be assumed. MMH is heat labile, “boiling off” at about 96°C. People who eat these mushrooms take advantage of that and parboil them (bring to a boil 5-10 min., discard water, repeat) to remove the toxin. In theory this should work perfectly. In practice, deaths from eating gyromitras are documented each year. You may say that those people did not take the proper precautions, but if the mushrooms were avoided altogether, the deaths would have been avoided. Just for the record, death from liver failure has even been reported for people inhaling the steam from the parboiling pot.

Take delight, but do not bite!

Acknowledgments

We thank Gro Gulden, Esteri Ohenoja, Ilmi Parmasto and Bellis Kullmann for providing additional European material for this study.

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GYROMITRA ESCULENTA

OVERALL: Up to 16 cm tall, knobbly, wrinkled cap about 50% of height and up to 14 cm in wide, common in springtime coniferous woods.

CAP: Greatest diameter up to 14 × 12 cm wide, 9 cm tall; variously described as knobbly, wrinkled or brain-like, often in asymmetrical lobes, flowing down to but not attached to stem, chambered; velvety brown to very dark brown with dark purplish overtones. **STEM:** Up to 14 cm long × 25 mm wide, smooth, cylindrical, becoming wrinkled, hollow or slightly chambered, downy to grainy, light tan, becoming dark brown, often with purplish overtones, covered by short, white tomentose layer in advanced age. **CONTEXT:** Friable, up to 6 mm thick. **MICROSCOPIC:** Ascospores 16–28 × 9.6–12.1 μm, smooth, apiculus lacking; paraphyses branched, clavate. **HABITAT:** Coniferous forest areas with dappled light; plentiful after forest fire. **SUBSTRATE:** Sandy soil, usually rich in coniferous duff. **PHENOLOGY:** Beginning of May to end of June.

COMMENTS: Thin, hollow, taller stem, dark brown, purplish hue and coniferous habitat distinguish it from *G. gigas*. Spring fruiting separates it from *G. ambigua*, which fruits in the fall.



Top: Mature fruit body in situ.

Middle: Chambered cap, not attached to stem.

Bottom: Spore print on blue background, white for most gyromitras, as here, and light yellow for a few.



GYROMITRA GIGAS

OVERALL: Up to 14 cm tall, chunky, squat mushroom with knobbly, wrinkled cap at least 75% of height and up to 12 cm wide, uncommon, in springtime deciduous or mixed deciduous-coniferous woods, close to snowmelt. **CAP:** Greatest diameter up to 12 × 12 cm wide, 12 cm tall; variously described as knobbly, wrinkled or brain-like, relatively symmetrical, flowing down to but not attached to stem, chambered; velvety, yellowish tan. **STEM:** Up to 10 cm long × 60 mm wide, cylindrical, wrinkled, solid or densely chambered, downy to grainy, white. **CONTEXT:** Friable, up to 9 mm thick. **MICROSCOPIC:** Ascospores 19-36.6 × 9.5-17.4 μm, truncated apiculus up to 3 μm; paraphyses slender, cylindric to subclavate. **HABITAT:** Deciduous (birch) or mixed deciduous-coniferous forest with dappled light.

SUBSTRATE: Sandy soil, limestone bedrock, usually rich in deciduous litter. **PHENOLOGY:** Snowmelt, middle of April to middle of May.

COMMENTS: White, solid, chunky stem, yellowish tan hue, deciduous habitat and appearance at snowmelt distinguish it from *G. esculenta*. Spring fruiting separate it from *G. ambigua*. Relationship with the former *Discina* and *Gyromitra* is evident: ascomata first appear as a flat, discoid structures with virtually no stem, akin to species of the former *Discina*, and then assume their characteristic shape as they grow (see photos, next page).

Raitviir³ and Harmaja⁴ described two species in North America. These were synonymized with *G. gigas* after microscopic reassessment,⁵ but DNA analysis may restore the three species (see p. 10).



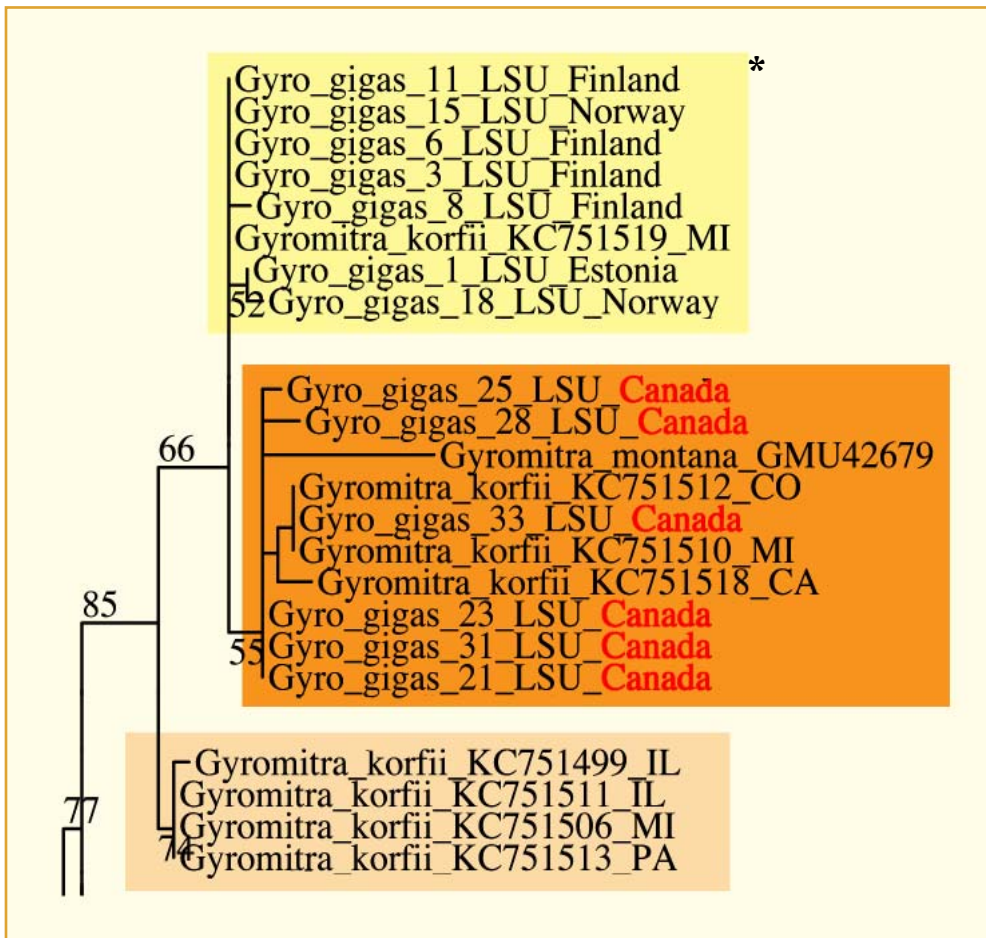
Above: Habitat, fruit bodies circled. Note patches of remaining snow. Our species thrives in birch and mixed coniferous-deciduous forests. The European species is said to prefer coniferous woods, again raising the possibility of a species complex.

Below: Cross section to show thick, solid but chambered stem and relatively thin, convolute cap.



Ascoma development from discoid to stipitate. Top down: April 10, 14 and 23. Further development undocumented, because the specimen had become dislodged by some passing animal. Confirmed by sequencing.

Gyromitra gigas—a species or a species complex?



Enter the era of phylogeny. Our molecular studies were done using the genetic marker LSU (large subunit ribosomal DNA). All specimens of *G. gigas* s.l. fell into one clade, as expected. But note on the illustration, from an earlier phylogram, that all the European collections, identified as *G. gigas*, cluster as one group (top). * Another cluster is formed by collections from eastern NA (Pennsylvania, Michigan and Illinois), all identified as *G. korfii* (bottom). This leaves a group in the middle with various identifications, primarily from the west, but with some from elsewhere—including all our collections. Most of these come from the northern edge of the boreal forest or from high elevations.

Gyromitra gigas was described in 1834 by Kromholz from Bohemian collections. Similar mushrooms in North America were initially known by the same name. Closer studies by Raitviir and Harmaja led to the descriptions of *G. korfii* in 1970³ and *G. montana* in 1973⁴ as the North American relatives of the European *G. gigas*. *Gyromitra korfii* was thought to be the eastern species and *G. montana* the western taxon. Harmaja also reported *G. montana* from the Austrian Alps.

This situation persisted until Abbot and Curragh reviewed the group microscopically and synonymized all three as one species, *G. gigas*, because they could not confirm the different spore characters used to define them.⁵ The ascospores of the species found in this province resemble those described for *G. montana*, not the *G. korfii* expected in eastern North America.⁶ Were it not that the three were considered one, the NL collections would have been identified as *G. montana*, not *G. gigas*.

This raises the possibility that the three species, postulated by Raitviir and Harmaja, have been confirmed by phylogenetic analysis. The European species would likely be *G. gigas*, and the one in eastern NA, *G. korfii*. The northern species could turn out to be *G. montana*. Thus, the split between *G. korfii* and *G. montana* need not be a matter of east–west, but also north–south, with northern species being transcontinental, and also found at higher altitudes a bit southwards. NL collections could logically be expected in that group (as could collections from the Austrian Alps).

Our results suggest this as a distinct possibility, making a good argument for an ITS or a multilocus study of this complex. Parenthetically, the same may apply to *G. esculenta*, although not as convincingly presented in our results. That is the trouble with science: it does not produce answers, but more questions!

*Not only investigators contribute to results. Had our European colleagues not sent us specimens, the apparent three-clade relationship would not have been evident. Without a clear upper clade, separation of North American collections into two potential clades may not have been as apparent.



GYROMITRA AMBIGUA

OVERALL: Up to 55 mm tall, bi- or trilobed cap about 60% of height and up to 60 mm wide, uncommon in the fall on coniferous wood. **CAP:** Bi- or trilobed, lobes up to 24 mm long $\times$ 45 mm wide, with an upper seam; surface uneven to slightly wrinkled, covered by fine hairs, becoming knobbly with maturity; velvety brown to dark brown with purplish overtones. **STEM:** Up to 35 mm long $\times$ 18 mm wide, cylindrical, often ridged, may be branched, hollow, downy to hairy, lilac to dark purple, turning brown with age, often covered by dense white tomentum. **CONTEXT:** Friable, up to 4 mm thick. **MICROSCOPIC:** Ascospores (without apiculi) $21.2\text{--}27.5 \times 7.7\text{--}9.6 \mu\text{m}$, apiculi $1\text{--}3.5 \mu\text{m}$; paraphyses slender, clavate to subcapitate. **HABITAT:** Coniferous forest. **SUBSTRATE:** Coniferous wood or debris. **PHENOLOGY:** August–September.

COMMENTS: Fruiting in autumn separates this species

from our other stipitate gyromitras, which are vernal.

We have only two collections of this species, the one illustrated on the cover, and the one shown above. Both come from Labrador, one on chips from local softwood on a ski trail near Goose Bay, and the other from a walking trail to Overfalls Brook near Forteau. Their macroscopic difference is likely due to age; microscopically they are virtually indistinguishable. Ascospores measure $21.2\text{--}27.5 \times 7.7\text{--}9.6 \mu\text{m}$ with an apiculus projecting $1\text{--}3.5 \mu\text{m}$ at each end of the spore, as described by Harmaja in his review of this species.⁷ Compared to *G. infula* (not found here to date), *G. ambigua* is smaller, has a smoother cap, more purple colouration (particularly the stem), larger spores with larger apiculi, thinner paraphyses, and has a more northerly distribution. Both have been identified morphologically from both sides of North America.

This is the first DNA report for *G. ambigua*.



GYROMITRA ANCILIS

OVERALL: Up to 70 mm diameter knobbly, purplish brown disc with radial wrinkling, on a very squat stem, common in springtime wet areas. **CAP:** Up to 70 mm wide; smooth, velvety surface soon becoming knobbly, developing radial wrinkling, puckered at the centre; hymenial layer brown to dark brown with purplish tones; dries dark purple; sterile undersurface tomentose to granular, beige. **STEM:** Up to 6 mm tall × 10 mm wide, solid or

chambered, downy to grainy, white. **CONTEXT:** Friable, up to 4 mm thick, layered. **MICROSCOPY:** Ascospores $20.2\text{--}30.8 \times 8.7\text{--}11.6 \mu\text{m}$, mature spores reticulate, reportedly with pointed apiculi (we did not find any); paraphyses $7\text{--}9 \mu\text{m}$ wide, filiform, uniformly subclavate with no capitate ends seen, granular, light brown. **HABITAT:** Wet ground in coniferous or mixed coniferous-deciduous forest. **SUBSTRATE:** Soil, limestone bedrock, usually rich in deciduous litter. **PHENOLOGY:** After snowmelt, throughout May.



COMMENTS: Also known as *Gyromitra* / *Discina perlata*; ancilis is the older name and takes precedence. Obtaining mature spores can be very difficult. Differs from *G. leucoxantha* by its purplish hue and drying purple (see p. 15), wider disc, thinner and less layered context, beige underside, uniform, unbranching, subclavate paraphyses and pointed apiculi (if you can find mature spores), slightly later fruiting time and preference for coniferous woods.

GYROMITRA LEUCOXANTHA





GYROMITRA LEUCOXANTHA

OVERALL: Up to 45 mm wide somewhat irregular, yellowish brown disc with radial wrinkling, on a very squat stem, common in wet areas at snowmelt.

CAP: Up to 45 mm wide; smooth, velvety surface becoming somewhat knobbly, developing radial wrinkling, puckered at the centre; hymenial layer yellowish brown with no purplish tones; dries dark brown; sterile undersurface tomentose to granular, white. **STEM:** Up to 6 mm tall × 10 mm wide, solid or densely chambered, downy to grainy, white. **CONTEXT:** Friable, up to 7 mm thick. Note rudimentary chambering of rudimentary stem (photo, previous page). **MICROSCOPY:** Ascospores $20.2\text{--}38.6 \times 9.6\text{--}17.4 \mu\text{m}$, apiculi with squared ends, at times asymmetrical, up to $4 \mu\text{m}$ long; paraphyses $7\text{--}12 \mu\text{m}$ wide, filiform, branched, subclavate, occasionally subcapitate, granular, yellowish. **HABITAT:** Wet ground in deciduous or mixed coniferous-deciduous forest at snowmelt. **SUBSTRATE:** Soil, limestone bedrock, usually rich in deciduous litter. **PHENOLOGY:** At and just after snowmelt, middle of April to middle of May.

COMMENTS: Differs from *Gyromitra ancilis* by its yellowish hue, lack of purple, drying a warm brown, almost pure white underside, thicker obviously layered context, wider spores, somewhat squared apiculi (if you can find mature spores), wider, branching and even capitate paraphyses, earlier fruiting time and preference for deciduous woods.

This is the first report of *Gyromitra leucoxantha* in North America confirmed by molecular studies, and the first report of its DNA. The DNA of our collections matches that of *G. leucoxantha* collected from the Tyrol, the type locality from which Bresadola first described the species. The likelihood of an unknown similar species in the type locality is extremely remote suggesting that DNA in an earlier study¹ referred to this taxon came from misidentified collections. See p. 24 for another Tyrolean species just discovered here—another first for North America—named after the same Bresadola.

It is interesting to note that *G. leucoxantha* shares with its sister species, *Gyromitra gigas*, the same yellowish colour and lack of purple, a preference for deciduous woods, and an early fruiting time, usually in the presence of melting snow.

KEY TO NL GYROMITRAS

Stipitate (cap and stem)

Autumn.....*G. ambigua*

Spring

Purplish brown, thin, tall stem, coniferous woods, after mid-May.....*G. esculenta*

Yellowish tan, stout stem, deciduous or mixed conif.-decid. forest, late April.....*G. gigas*

Discoid (flat, with rudimentary stem)

Yellowish brown, dries brown, white undersurface, deciduous or mixed deciduous-coniferous woods, snowmelt.....*G. leucoxantha*

Dark brown, purplish hue, dries dark purple, beige undersurface, conifer. woods, mid May.....*G. ancilis*

Underground

Spores becoming cuboid.....*Hydnotrya cubispora*

The key works well with the species identified from NL to date. If you have trouble, turn to the descriptions for more details. Should additional species be identified, the key may need to be altered. Caution is advised about using it elsewhere—it may not work.

So far, we have found only one hypogeous species, so its identification (provided you realize it is a *Gyromitra*!) is not problematic. The stipitate gyromitras are relatively distinct. The disc-like ones can be difficult to identify, especially if you have a single specimen. Looking at many collections, the variation in colour becomes evident, but it also becomes evident that *G. ancilis* (left column on the illustration) always has a purplish cast. *G. sp. TN-1* (right column) always has a yellow hue, and no sign of purple. If there is doubt, dry the collections. *G. ancilis* always turns a dark purple, whereas *G. leucoxantha* becomes dark brown. The dried specimens of the top two mushrooms are at the bottom. As opposed to the variable colour of each species in situ, all dried specimens of each species looked the same, and there was no mistake about the difference in colour for the two species.





Hydnотrya cubispora —the Pasadena moose truffle

Henry Mann

In the Newfoundland autumn talk invariably turns to moose at some point, so those walking the woodland trails tend to keep an eye out for moose or fresh moose sign even when only hunting mushrooms. So it was, that beautiful September day wandering the trails of the Pasadena Ski and Nature Park. On a bare section of trail fresh moose tracks were noted, and immediately beside one print was a small amount of disturbed soil with what appeared to be a mushroom fragment.

Now, I have been noted to occasionally front-kick, back-kick or side-kick the odd mushroom just for kicks, but I know that moose don't side-kick mushrooms. This was one of those curious observations that are usually quickly passed off as an unexplainable quirk of nature. Then, two or three steps further I noticed little mounds of freshly

pushed up soil not associated with moose tracks, so I took a poke at one and discovered an erupting mushroom beneath. Nothing startling, as mushrooms do pop up from underground. Luckily there was still a tiny ounce (~28.35 grams) of curiosity left and I dug out the "mushroom" with my finger. To my surprise what appeared was a misshaped lumpy mass about 6 cm across with internal cavities and no evidence of a stalk.

Not having seen anything like this before, I rushed my "rarie" home for examination and determined it was a hypogeous (underground) Ascomycete, a cup fungus with internal cups. A few of the lumps near the exposed surfaces had holes that looked like they might have been slug-chewed, but perhaps they do open normally. With some help and the 2014 "Ascomycete Fungi of North America" by Beug et al., it was determined that the lumpy mass

was *Hydnотrya cubispora*—an ascomycete related to the false morels (*Gyromitra*)—that largely remains underground except for some pushed up loose soil above. Spores are produced inside the enclosed inner cups on their white felty surfaces in elongated sacs called asci, 8 spores in each. Young spores appear rounded inside the asci, but as they mature they take on a cubical appearance characteristic of this species and the source of the specific name, *cubispora*. Does it, like true truffles, depend on spore dispersal by being dug up and eaten by some animal (squirrel, vole, slug, insect, etc.)? I don't know. This species is reported from across the forested boreal region of Canada and southward into the mid U.S., but because of its subterranean habit is probably rarely encountered and reported.

So you see, in this discovery there was a moose connection

which resulted in a puzzling observation (possible moose side-kick), which led to a subsequent observation (little disturbed soil mounds), which spurred a further investigation (finger probing), which resulted in a new find (at least for me) of the Pasadena Moose Truffle, which is not really a “true” truffle, but sort of behaves like one. It is also a lesson in how local common names are born. To me “Moose Truffle” makes a lot of sense considering the process of discovery as explained above. And as I tell and retell this story (no doubt in ever embellished form) others will pick up on the name, and so on.

Taxonomists, tear your hair out!

Illustrations

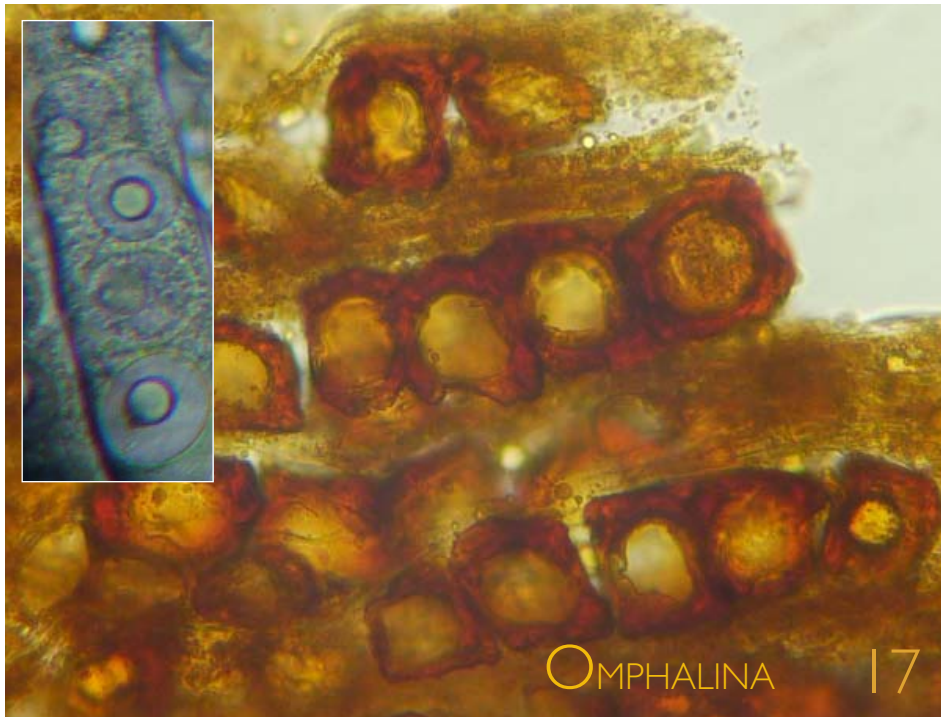
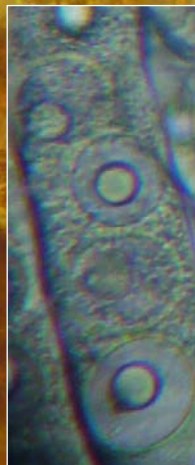
Title banner: Small mushroom in situ beside moose track.

R Top: Hydnotrya cubispora removed from the ground. A reputed saprobe, it was found growing in soil containing balsam fir debris.

R Middle: Cut section to show cavities in this convoluted ascocarp.

R Bottom: Mature spores with the characteristic cuboidal shape. Immature round spores a week earlier in insert.

L Below: Freshly dug holes in the path at the growth site, found three months later, during a thaw in December. Are the truffles eaten and their spores spread by a rodent vector? Maybe we should hire these squirrels for the next soil survey—they seem to be able to find the mushrooms in our soil that elude the scientists.





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

Gros Morne National Park, September 25 to 27, 2015

1. Please note: registrations must be received by August 28.
2. *Spaces are limited*, so registrations are accepted on a first-come first-served basis. We can only accept payment by cheque or cash. A Registration is only recorded when full payment and a signed Acknowledgement have been received. Please submit a completed Registration and Acknowledgement form for each participant.
3. Please print out both pages of this form, fill out, sign, and send along with a cheque to:

Mr. Geoff Thurlow, 16 Hammond Drive
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Before registering, please read the
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Tel: (____) _____ - _____ e-mail: _____

Participation fee (in CAD)

Adult	\$250.00	_____
Youth 13 to 17 pay 50% (Children 12 or younger participate for free)	\$125.00	_____
Database Team: Students - no fee; Non-student team veterans 50%*	\$125.00	_____

This is a "Members-only" foray. Your membership is included in the participation fee. The membership lasts until the following year's foray. The participation fee covers accommodation and meals at the foray. Places are limited in the Watercolour workshop, and will be allotted on a first-come first-served basis. If the session is full, your fee will be refunded.

Watercolour Workshop - painting kit \$41.00 (do not pay if you have your own) + _____

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.

FUNGI Magazine: I wish to subscribe to FUNGI Magazine, five issues for \$52.30 + _____

As a service to members, ForayNL will place a block subscription, at cost, right after the Foray.

TOTAL _____

Special needs/wishes:

Dietary or other needs _____

Expertise preference

Willing to (co)lead a field trip _____ Willing to identify specimens _____

Wish to help in other ways (please suggest) _____

* Database team members with organizational support please pay full fee. Contact M. Burzynski if you have questions:
info@nlmushrooms.ca

** PLEASE NOTE: Bring soap, shampoo, and a towel. If you wish, you can pay \$3.50 to Killdevil Camp and it will supply them.

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: 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:

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;

I will pay any costs and fees for the Foray;

I choose to participate in the Foray of my free will, being fully aware of the risks involved; and

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.

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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 legal guardian must sign this Agreement on your behalf.

I hereby agree and consent to the foregoing **Acknowledgment** on behalf of the minor named here: _____

Relationship: _____

Signed: _____

Date: _____

SUILLUS BRESADOLAE



Pierre-Arthur Moreau, Christiane Corbeil, Andrus Voith

Yes, you saw this photo before! In the last issue it bore the name *Suillus sibiricus*. That article generated the following e-mail:

To answer Christiane Corbeil about her nice (and odd) find of *Suillus sibiricus* without *Pinus*, I think she found the first American record of *Suillus bresadolae*, a *Larix* associate I am quite familiar with from the French Alps. It is a member of the *S. viscidus/serotinus* complex, but distinct by the yellow and dry cotton-like ring.

With best wishes,
Pierre-Arthur Moreau

Thank you, Pierre-Arthur. Such commentary makes it worthwhile to publish new finds. We were puzzled by this mushroom until Christiane found a solution. But the solution was still a bit uncomfortable, because a few finds in northeastern North America would then be the only ones in all the world not growing with pine. A known larch associate, as

you suggest, fits much better.

We have had great difficulty identifying some of the species in the *Suillus*



serotinus complex. Microscopically these species

are similar. Supposedly good differentiating macroscopic characters also seemed to overlap, and after several attempts to sort them out, discussions with Dave Malloch and Greg Thorn led us to believe that we could not tell them apart with consistency. We decided to label all of them *Suillus serotinus*. The exception has been *S. grisellus*, which we believe we can differentiate. And now *S. bresadolae*, because of the distinct yellow ring, which none of the others have.

This whole group deserves careful morphologic and phylogenetic review.

The image is painted by Father Bresadola of the mushroom named in his honour by Lucien Quélet, so in a way it is an autoportrait. Bresadola lived his whole life in his native Tyrol, where he collected and described much. At least two of his mushrooms are also found in NL, both in this issue—this one and *Gyromitra leucoxantha*, p. 14.

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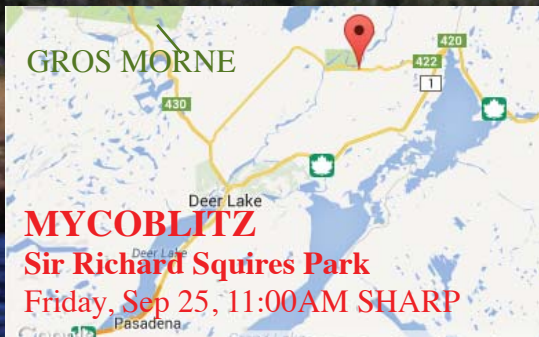
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September 25-27, 2015



GUEST FACULTY*

Nils Hallenberg
Andy Methven
Andy Miller
Michele Piercey-Normore
Roger Smith
Greg Thorn

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