OMPHALINA

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Newsletter of FORAY NEWFOUNDLAND AND LABRADOR

Vol. IV, No 5
Jun. 20, 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.

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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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COVER

Peniophora cinerea, Humber Village, May 5, 2011, on fallen dead branch of speckled alder. Note the seemingly intimate association with an unidentified pyrenomycete, best seen along the left border. See lead articles for more details of the genus in our province.

Two other things of interest to note on this photo. First, note the guttation (beads of water droplets) of this actively metabolizing fungus. Second, note the two small black pin-like fungi on the right side of the branch. These are likely *Stenocybe pullulata*, tiny-tiny fungi growing on alder bark. Some species in the genus are considered lichens by some people, although this species is not associated with algae.

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CONTENT

Message from the Editor

Here we are, on the longest eve of the year, still full daylight at 9:00 PM, putting this issue to bed.

Some of our efforts are paying off: we are now able to review genera or groups of fungi, and bring to you descriptions of the species found in our province. After ten years of collecting, the picture should be reasonably complete. As you go forward to our next foray, know this: knowledge that we did not have a decade ago, is now available, thanks to a decade of such forays. This issue has two such articles, one on *Peniophora* and one on our earth tongues. We hope that we can bring you many such articles in future issues. One day, all you have to do is put them together to get a book of our mushrooms, a much more accurate one than could be done before the forays.

One such feature that we hope to publish will deal with our morels. Many thanks to all those who responded to our appeal and reported and sent in some specimens this spring. Out of this a question arose about their distribution. We have heard reports of morels in the St. John's area and even seen at least one picture. We have also seen pictures of morels in Labrador. Yet, we have no specimens or records.

See you at the foray!

andrus

Editor photo: Joe Brazil

An appeal to all our readers in the province:

Please write us <seened AT gmail DOT com> of ANY MOREL that you have seen. If you have a photo, all the better, but that is not necessary. We should like a rough location (you need not share your secret morel patch with us, but the general area), and rough information about amount, date and habitat.

FORAY MATTERS...

The 2013 foray will be held on Fogo Island, Sep 6-8, one of the four corners of the world, and one of the top ten places to visit in the world. Information found on our website <**www.nlmushrooms.ca**>.

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

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

2. **SIGN-IN** on site begins at The Fogo Island Inn, Joe Batt's Arm, at 3:00 PM, Fri Sep. 6, 2013. If you arrive earlier, please wait, look around, enjoy yourself, as the registrars are unable to get there sooner.

3. **INFORMATION.** For specific details about the foray and Fogo Island, see the Foray issue of Omphalina (vol 4, Nr 3), entirely devoted to these topics. It can be downloaded from our website. All the information is not in that issue, so please read all the information on our website.

4. **PROGRAM**. For a rough outline, please see the last issue of Omphalina.

5. **CRAFT TABLE**. Word is that we shall have an arts and crafts table. Please start to think of mushroom related art or craft you might like to show or sell. More details next issue. Owner responsible for items, sales and monies. No commission.

6. **MOOSE BURGERS**. Yes, there will be moose burgers again this year! Barb Gege of Tuckamore Lodge send us some moose meat, all ground up. Many thanks, Barb and Tuckamore!

7. **WAITING LIST**. At the moment we have registered more participants than our cut-off, thanks to the generosity of Shorefast in finding more lodging and food. Because we are so far above optimal numbers, even with an unusual number of cancellations it is unlikely that we shall be able to take on additional registrants.

8. **IF YOU MISSED OUT THIS YEAR.** We hope to return to Fogo Island next year, so that there will be an opportunity to get there, if you missed it this time. Our suggestion is to take out or renew your membership (See Membership on our website), so that you will get advance notice, and register as soon as you get it next year. If we run into an oversubscription situation again, we hope to give preference to members not registered this year, provided they get their registrations in early next year.

THE GENUS PENIOPHORA *in* NEWFOUNDLAND AND LABRADOR

Andrus Voitk, Nils Hallenberg

Peniophora species cause primary white rot of dead wood. They belong to the primary decayers and are often found on newly dead branches. In addition to being one of the more colourful and attractive of the corticiate genera, the genus has several unusual and interesting features. For example, many of its species have evolved to narrow host specificity, yet the specificity changes on different continents.[1] Another interesting feature is that many species accommodate several morphologic forms within one genetic species.[2] Often they differ more among themselves both macro- and microscopically, than some genetic species from each other. We have examples of both in our collections. Of the continental host change we learned in an earlier communication; [1] the macro and micromorphologic variation within a plastic species will be discussed in another article in this issue. Do a sporeprint: the spores of these species are red.

Peniophora species have been collected at our forays only since 2008 and by AV since 2009. We present an overview of these collections in the belief that they probably represent most of the species in the province, although the survey cannot be considered exhaustive in time or distribution.

Methods

All foray collections were identified by a mycologist. AV's personal collections were identified without microscopy, using a combination of macromorphology and host tree. All collections but one were reviewed microscopically by NH. The exception, identified by a mycologist at a foray, had been confirmed by Matti Kulju.

Results

All determinations at our forays were confirmed as identified, whereas some changes were made to AV's identifications. There were 19 collections, representing six species. Figure 1 shows the species and number of collections and Figure 2 shows the distribution of the collections in the province. Table 1 lists the hosts and month of collection for the species. The seven collections from the forays came from diverse localities in the province, where forays were held. The twelve personal collections all came from around AV's home on the west coast

Table 1. *Peniophora* host and season

P. aurantiaca	*Alnus, Salix*	July, September
P. erikssonii	*Alnus*	September
P. cinerea	*Alnus, Betula, Corylus*	March, April, May
P. "nuda"	*Betula*	May
P. incarnata	*Acer, Alnus, Populus*	March, April
P. polygonia	*Acer, Alnus, Populus*	April

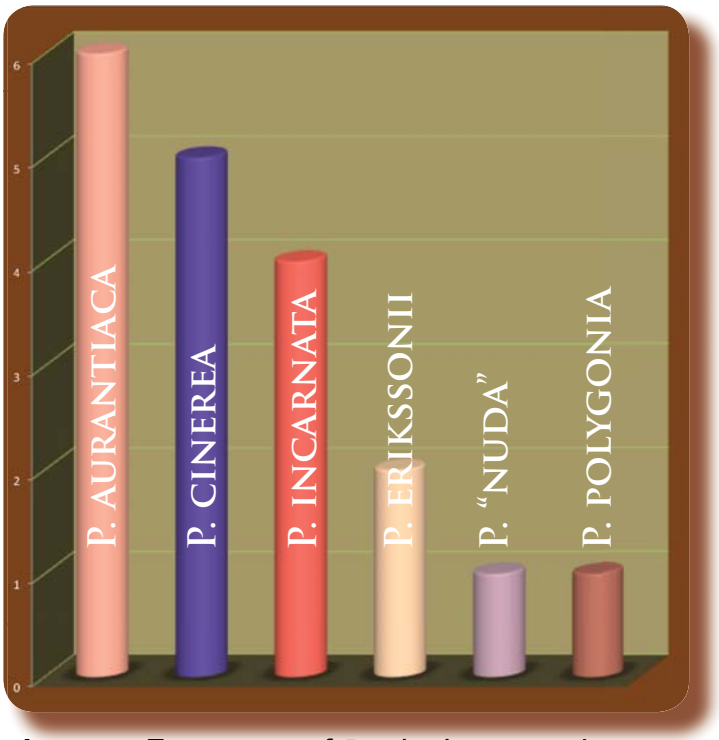


Figure 1. Frequency of *Peniophora* species collected. Despite different collecting methods, this probably does represent the relative abundance of these species in the province reasonably accurately.

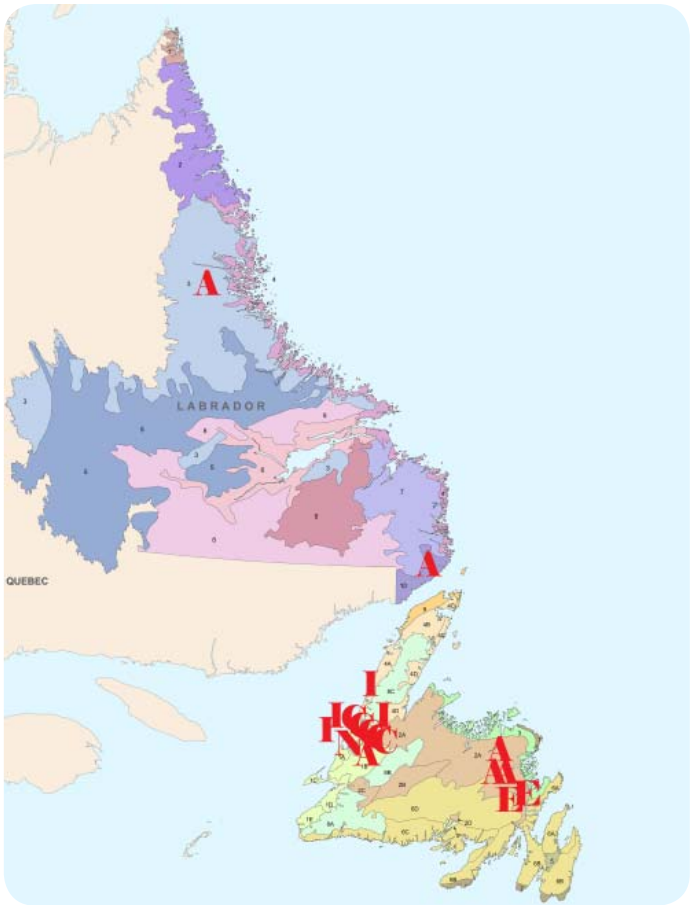


Figure 2. Distribution of *Peniophora* collections. A = *P. aurantiaca*, C = *P. cinerea*, E = *P. erikssonii*, I = *P. incarnata*, N = *P.* "nuda", P = *P. polygonia*. Three foray sites are represented, and a west coast cluster from around the first author's home. The difference in species between foray and private collections is probably more a matter of season than real geographic preference. *P. aurantiaca* and *P. erikssonii* seem to prefer fall fruiting, whereas the others seem to fruit just after snowmelt or before snowfall.

of Newfoundland. With one exception, there was no overlap of species from the two sources: all *P. cinerea* and *P. incarnata* were collected on the west coast, and *P erikssonii* and *P. aurantiaca* (save one collection) came from the forays. The foray collections were limited to foray times, usually September, whereas the west coast collections all came from early spring or late fall (Table 1).

Discussion

Although not rare, *Peniophora* species are not common in our province. The seeming geographic distribution is probably more related to season: *P. cinerea* and *P. incarnata* seem to prefer colder weather for fruiting, usually either side of the snow. Some species resemble each other and others have several morphological forms within one species. Most of our species are not overly narrowly host-specific, and as we saw with *P. aurantiaca* and *erikssonii*, host specificity is changed on this continent from that reported from Europe.[1] As a result, accurate identification of some species is not possible without microscopy, as illustrated by AV's experience.

References

1. Hallenberg N: *Peniophora aurantiaca* or *P. erikssonii*? Omphalina 3(12):6-7. 2012.
2. Hallenberg N, Yurchenko E, Ghobad-Nejhad M: *Peniophora pseudonuda* is a synonym for *P. laeta*. Mycotaxon 112:153-162. 2010.
3. Ginns J, Lefebvre MNL: Lignicolous corticoid fungi (Basidiomycota) of North America. Systematics, distribution and ecology. (Mycologia Memoir 19). APS Press, St Paul. 1993.

Figure 3. *Peniophora rufa*, a poplar rotter and the commonest *Peniophora* species in mushroom books and field guides, has not been collected in ten years of forays. However, it has been reported from Newfoundland and Labrador by Ginns and Lefebvre.[3] (Photo from Alberta)

Our PENIOPHORA SPECIES

Nils Hallenberg

For identification purposes, we shall consider the reddish *Peniophora aurantiaca*, *P. erikssonii* et al. first and the purplish *P. cinerea* and *P. nuda* second. In both groups, microscopic examination is required to distinguish between the group members. A fuller discussion of *Peniophora aurantiaca* and *P. erikssonii* can be reviewed in Omphalina 3(11):6-7, 2012. An article discussing the second group follows this description of the species.

You may wonder why most *Peniophora* species are so specific about their host. The reason is that the spores that get established in wood, start their growth very early in the decay process and some part of the wooden tissue in such a branch may still be living. Such wooden tissue contains antifungal compounds which make it difficult for most fungal species to get a foothold. Only a few specialists have found the key to access the delicious smörgåsbord of undecayed wood, as yet unplundered by other competitors.

Warning: contains reference to microscopy!

Photo: Andrus Voitk

Peniophora aurantiaca

This is is a smooth, orange, corticioid fungus growing on dead branches of alder. The striking colour and its preference for a specific host should make the species easy to recognize. The exception is guaranteed confusion with *P. erikssonii*, another species also growing on alder that superficially looks identical to *P. aurantiaca*.

Under the microscope the species is easily recognized due to the big, ellipsoid spores, 14-16 x 8-10 µm, and the presence of clamp connections on the hyphae, lacking in the other.

Photo: Roger Smith

Peniophora erikssonii

Exactly like *P. aurantiaca*, except that with the microscope you can see that the hyphae lack clamps at their septa (cross-walls).

Why create two species that look the same and feed on the same substrate? The answer is not in what we see now, but in the history of the species. Initially one of them (we are quite sure that it was *P. aurantiaca*) fed on *Alnus* branches in extreme conditions, in the mountains or tundra. Like all species, now and then it produced somewhat different offspring, some with the ability to invade new territory, such as lowland *Alnus* species living under less harsh climatic conditions. Fungi can create sterility barriers between populations. The new habitat favoured such a development, and voilà! a new species was born. This happens often with fungi. Sometimes the new species gets a morphological indicator which makes it possible for us to recognize it, and a give it a new name. In this case it is microscopic (lack of clamps).

In time vegetation changes due to big changes in climate sent both species migrating to explore new territories. Eventually they forgot about their differences, and meet again in a new found part of the world. However, they can no longer interbreed: once genetically divergent, they will never join again.

Photo: Andrus Voitk

Peniophora incarnata

Superficially, this looks like the two preceding species: a smooth to slightly uneven fruitbody, bright orange when in good condition, producing numerous spores. The colours originate from the spores—other parts of the fruitbody are unstained (white to our eyes). The difference is again seen with the microscope: instead of the big, ellipsoid spores these are broadly cylindrical, 8-12 x 3.5-5 µm. To the naked eye, the margin of the fruitbody is narrower, more distinct than in the preceding ones, although this is not a very reliable character. Ecologically, *P. incarnarta* is less specific; it occurs on all kind of woods, mainly from broadleaved trees but even conifers. It is among the pioneer species occupying cut and debarked surfaces of wood, where it can be recognized easily by its orange colour. In the herbarium, and with time, the beautiful vivid colour turns brownish yellow. Found in temperate areas all over the world.

Photo: Henry Mann

Photo: Andrus Voitk

Peniophora polygonia

This species differs in many respects from the preceeding ones. The fruitbody is often composed of small, smooth but elevated patches, emerging from inside the bark, sometimes merging to form larger units, gelatinous hard, bony when dry. The fruitbody has a reddish-pinkish-violaceous colour, at the surface with a greyish pruina (floury coating) caused by crystals which can be scraped off. The species occurs typically on *Populus* but has also been collected on *Acer* and *Alnus*.

Microscopically it looks different from other *Peniophora* species due to the absence of encrusted cystidia. Instead, there are numerous small branched structures in the hymenium, called dendrohyphidia, and these are heavily encrusted with crystals of calcium-oxalate. Those crystals are responsible for the greyish pruina on the fruitbody. Deeper, inside the fruitbody, you can find big globose (saclike) gloeocystidia.

Photo: Andrus Voitk

Peniophora rufa

Although it has not been recorded in these collections, because it has been reported from Newfoundland and Labrador, we should include a description of *Peniophora rufa* in our discussion of provincial peniophoras.

This is a close relative of *Peniophora polygonia*, and another specialist on *Populus* branches.

This species is small and thick, up to 1 cm in diameter and up to 1 mm thick, wartlike, emerging from lenticles in the bark. As with *P. polygonia*, the fruitbody is gelatinous and hard, becoming very hard on drying. The colour is red to reddish brown—not violaceous—partly because of the spores and partly because of the coloured crystals on cystidia, which are abundant in the surface of the fruitbody. In the microscope you will see that both the dendrohyphidia and gloeocystidia are more elongated than in the previous species.

Photo: Andrus Voitk

Peniophora cinerea

Like most other *Peniophora* species, *P. cinerea* has a smooth fruitbody which spreads over the surface of a dead branch of a broad-leaved tree. *P. cinerea* is not very specific about the host, and like *P. incarnata*, it is spread word-wide in temperate areas. In contrast to the previous species, *P. cinerea* appears as greyish violaceous, but can vary from deep violaceous to violaceous with a distinct rose-coloured surface. The red colour comes from the spores again, and is something of a sign for all true *Peniophora* species. The violaceous colour is a result of an optical phenomenon. The basal part of the fruitbody consists of brownish hyphae, spreading over the surface of the bark and upon which the hyaline cells develop, including all other elements of a fruitbody. When our eyes observe the fruitbody from a distance, the brownish colour from the basal hyphae is filtered through the hyaline fruitbody mass and

Photo: Andrus Voitk

the result is a violaceous colour which deepens under humid conditions.

Microscopically, *P. cinerea* is a typical *Peniophora* of the ”violaceous type”, i.e. among those species producing such a brown basal layer of hyphae, the case for most *Peniophora* species word-wide. We can see brown basal hyphae, encrusted cystidia, but no gloeocystidia. The spores are sausage shaped, also normal for most *Peniophora* species.

Peniophora nuda

This species is very similar to *P. cinerea*, the principal difference being the presence of numerous, rounded gloeocystidia in the context, only seen microscopically. This is the traditional way to present the two species, which may occur in similar types of forests and on similar substrates. However, when expanding our studies from Scandinavia to North America, we were startled to find that these differences are no longer as valid and we have to re-consider the whole thing. Sometimes the world is not so easy to understand. More in the next article!

Photo: Andrus Voitk

PENIOPHORA CINEREA *and* ITS ALLIES

Nils Hallenberg

As mentioned in the previous article, *Peniophora cinerea* and *P. nuda* are impossible to distinguish from each other with the naked eye, but easily separated microscopically. Both species are widely distributed over (at least) the northern hemisphere and both can be found on branches of a great number of tree species: several broadleaved species, and occasionally even conifers.

Well, similar species are common in many species complexes. To separate them, scientists may use other complementary methods, apart from microscopy: compare DNA sequences and do real mating tests, using mycelia from single spore isolates from different specimens. After such tests have been done on a number of specimens, it is possible to sort the material: who mates with whom, and whose ITS sequence clusters with whose. The specimens can be lumped in different piles for comparison. What are the similarities and differences between individuals in each pile? This should be simple to determine with so many advanced tools available and, in fact, it has all been done. Here is what we have found out:

Europe

A. Mating tests

1. *P. cinerea* did not mate with *P. nuda*.
2. *P. cinerea* separated into two non-mating groups:
   i. Those growing on *Fagus* (*P. cinerea* subspecies *fagicola*), and
   ii. those growing on all other trees.
3. *P. nuda* separated into two non-mating groups:
   i. Those growing on *Ulmus carpinifolia*, and
   ii. those growing on all other trees.

B. ITS sequencing

1. *P. cinerea*—both non-mating groups clustered as one.
2. *P. nuda*—all clustered as one with *P. cinerea* (!), EXCEPT
3. the group on *Ulmus carpinifolia*, which made a separate cluster.

Are you getting confused? Wait, there is more.

North America

A. Mating tests

1. *P. cinerea* did not mate with *P. nuda*.
2. *P. cinerea* of North America mated with BOTH *P. cinerea* and P. cinerea ssp. *fagicola* of Europe (those two did not mate with each other)!
3. *P. nuda* of North America did not mate with either non-mating *P. nuda* group from Europe.

B. ITS sequencing

1. *P. cinerea* and *P. nuda* clustered as one!

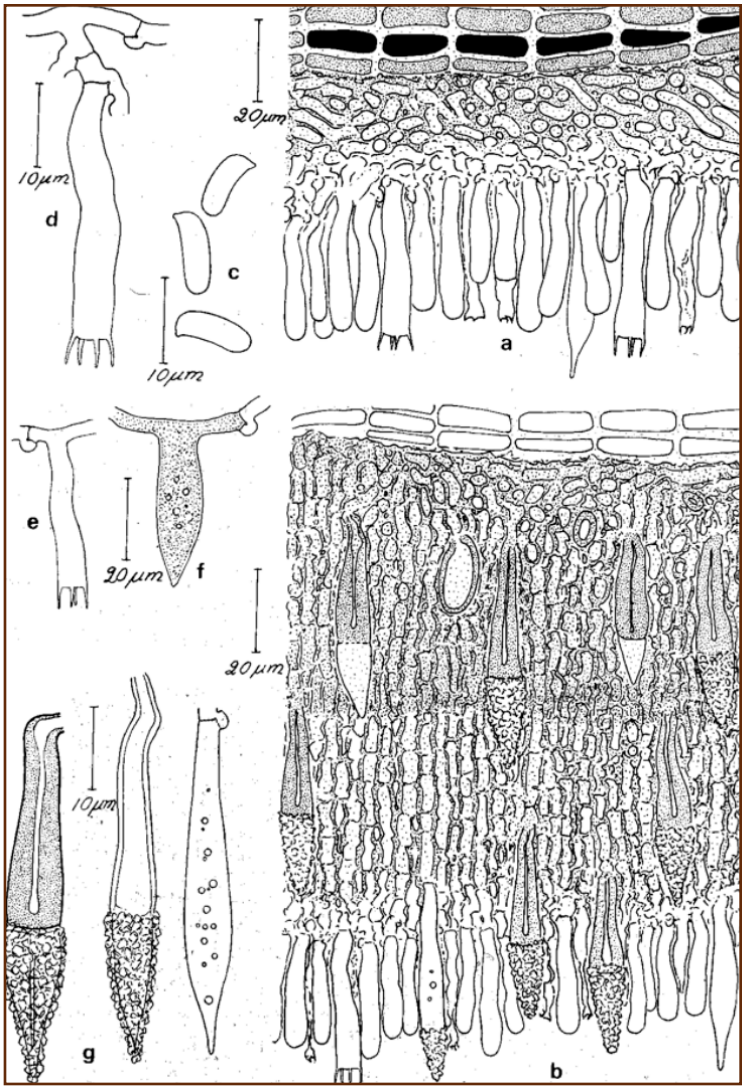
What can we learn from this?

A. Speciation is a process when one species splits into two. This may allow offspring of a species to get established in an environment that is virgin territory for the species: e.g. *P. cinerea* from other trees gets established on *Fagus* in beech forests. Sterility barriers prevent mixing of the two but the genetic distance is not big enough to prevent laboratory crossings between samples from Europe and North America. This is the beginning of true speciation.

B. *Peniophora nuda* also splits into two species but here the form specialized to *Ulmus carpinifolia* is distinct in both crossing tests and in molecular phylogeny. The speciation has here gone further.

C. Morphology does not give us the whole picture. However, at least within a limited geographic area, morphology helps us come very close to the "real" species in nature.

D. Remember—ITS is only one small genetic marker site. Genetic changes may not have taken place there, but may be evident in other sites. Short of a whole genome, the current ideal is multi-marker testing, which may show genetic differences not noted on in a single site.



Illustrations reproduced from Corticiaceae of North Europe, vol. 5, with permission from Fungiflora, Leif Ryvarden. Microscopic drawings by John Eriksson.

Upper

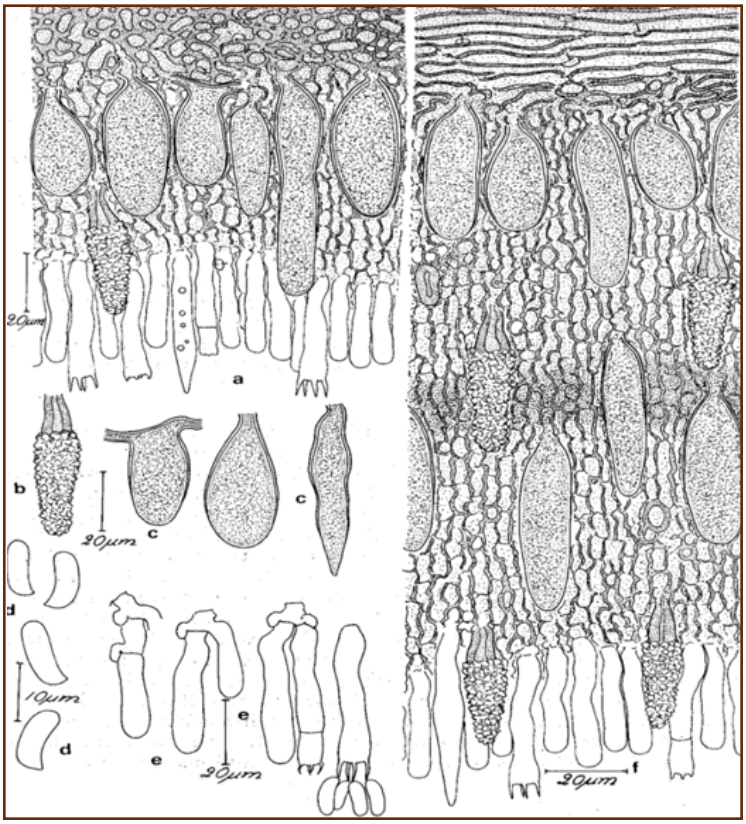
Peniophora cinerea, microscopic morphology

Lower

Peniophora nuda, microscopic morphology

Macroscopically they look the same. The microscopic picture is obviously different, even to a non-mycologist. Yet, as you learn in the text, there is unexpected variability in their ability to interbreed and in the DNA sequences of at least one marker site, becoming even more variable across different continents.

This permits us a small glimpse into evolution in progress.



Update on *Lactarius lignyotus*

Andrus Voitk

In a review of *Lactarius lignyotus* in Newfoundland and Labrador, with the help of Dirk Stubbe I assembled five taxa that we thought might be found in the province [Omphalina 3(7):4-7, 2012]. Two stained purple, differentiated from each other by the presence or absence of marginate gills. In Labrador and at high elevations on the Island, we have collected *L. lignyotus* var. *marginatus*: stains purple with time and has marginate gills. The purple staining one with amarginate gills had not been encountered yet.

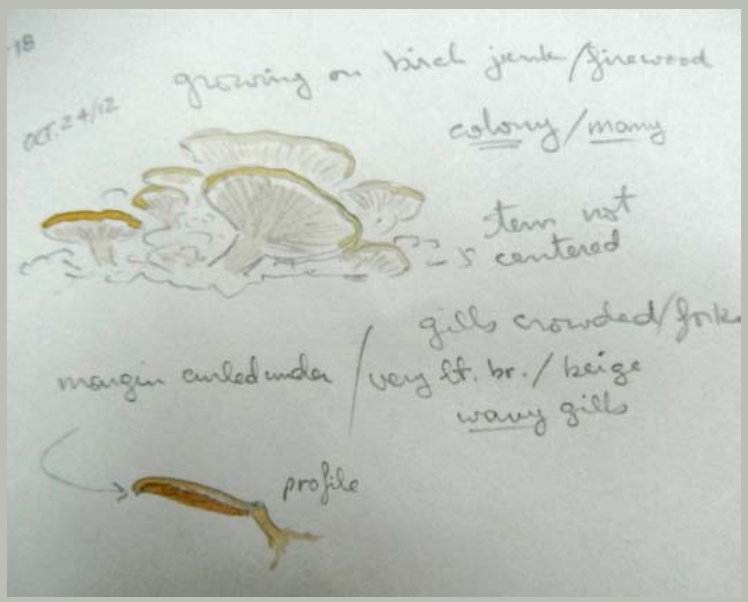
At the 2012 foray a specimen was collected form a *Sphagnum* bog near Terra Nova with amarginate gills. Neither collector nor identifier noted any lilac staining, but by the time it had been sorted, identified, entered in the database and got to its turn for photography, the camera recorded purple stains on the gills. Thus, our first record of *Lactarius lignyotus* var. *nigroviolascens*. As var. *marginatus*, it seems that the purple staining takes time; hence it may be commoner than appreciated.

Photo: Roger Smith

We also collected pink staining specimens with amarginate gills, *L. lignyotus* var. *lignyotus*. I had doubted its existence, because most mushrooms that seemed to be amarginate, had a very light brown edge to their gills, one that could easily be overlooked, more a matter of degree than an absolute. Now, however, I am satisfied that we do, indeed, have some pink staining mushrooms without any suggestion of darkened gill edges.

At present the only species in the group we have yet to find in the province is *Lactarius lignyotellus*: a small mushroom with dark gill edges that does not stain at all (or very weakly pink at the base of the stem after hours). Keep looking!

The Bishop's Sketchbook



Earth tongues of Newfoundland and Labrador

Andrus Voitk

Many fungi produce fruitbodies resembling small clubs. For this article, let us limit the concept of **earth tongues** to four genera: *Geoglossum, Microglossum, Thuemenidium* and *Trichoglossum*. Phylogenetically this is a mixed bag, but to the naturalist trying to identify macrofungi, this grouping works well. All are ascomycetes, fungi that produce their spores inside sacs, which discharge them on maturity. The fertile or sporulating tissue (hymenium) is on the outside of the upper, widened club part of the mushroom.

Earth tongues are infrequent finds. In 10 years of forays we have amassed 11 collections. During the same time I have also enriched my own fungarium with 11 collections. These 22 collections encompass 12 species (Table 1). In ordinary circumstances it might be reasonable to suspect that most species have been recovered after 10 years of collecting. However, earth tongues may be much more common than reflected by the number of collections. Most are very inconspicuous, a tiny club less than 1 cm wide and about 3 cm above visible ground layer (another 3 cm in moss or duff), usually black in colour. They are easy to overlook, and it is not surprising to learn that three of the 12 species were added in the 10th collecting year. The most species-rich genus in our province is *Geoglossum*, and the commonest species *G. umbratile* and *G. fallax*. The data for *Thuemenidium arenarium* are somewhat misleading: several collections of it were made from a single area in the Labrador Straits for a study. The map on the next page shows the distribution of the collections in the province.

Table 1

NL EARTH TONGUE COLLCTIONS

GEOGLOSSUM	
G. umbratile	6
G. fallax	3
G. cookeianum	1
G. glabrum	1
G. simile	1
MICROGLOSSUM	
M. fumosum	1
M. olivaceisquamosum	1
M. rufum	1
THUEMENIDIUM	
T. arenarium (Geo)	4
T. atropurpureum (Micro)	1
TRICHOGLOSSUM	
T. hirsutum	1
T. walteri	1

Table 2 provides a key to the genera. As you see, *Thuemenidium* is missing. It is a misfit with two species in our province. In this key, *T. arenarium* keys out to *Geoglossum.* The other, *T. atropurpureum*, may as well, if it is nearly black. Usually it is reddish brown and keys out as a *Microglossum*. In that case you would have placed both well, from a

Table 2. Earth tongue key

Black or **very dark** brown

- No hairs on the sporulating surface when examined with a loupe ..... ***Geoglossum***
- Hairs seen with loupe ..... ***Trichoglossum***

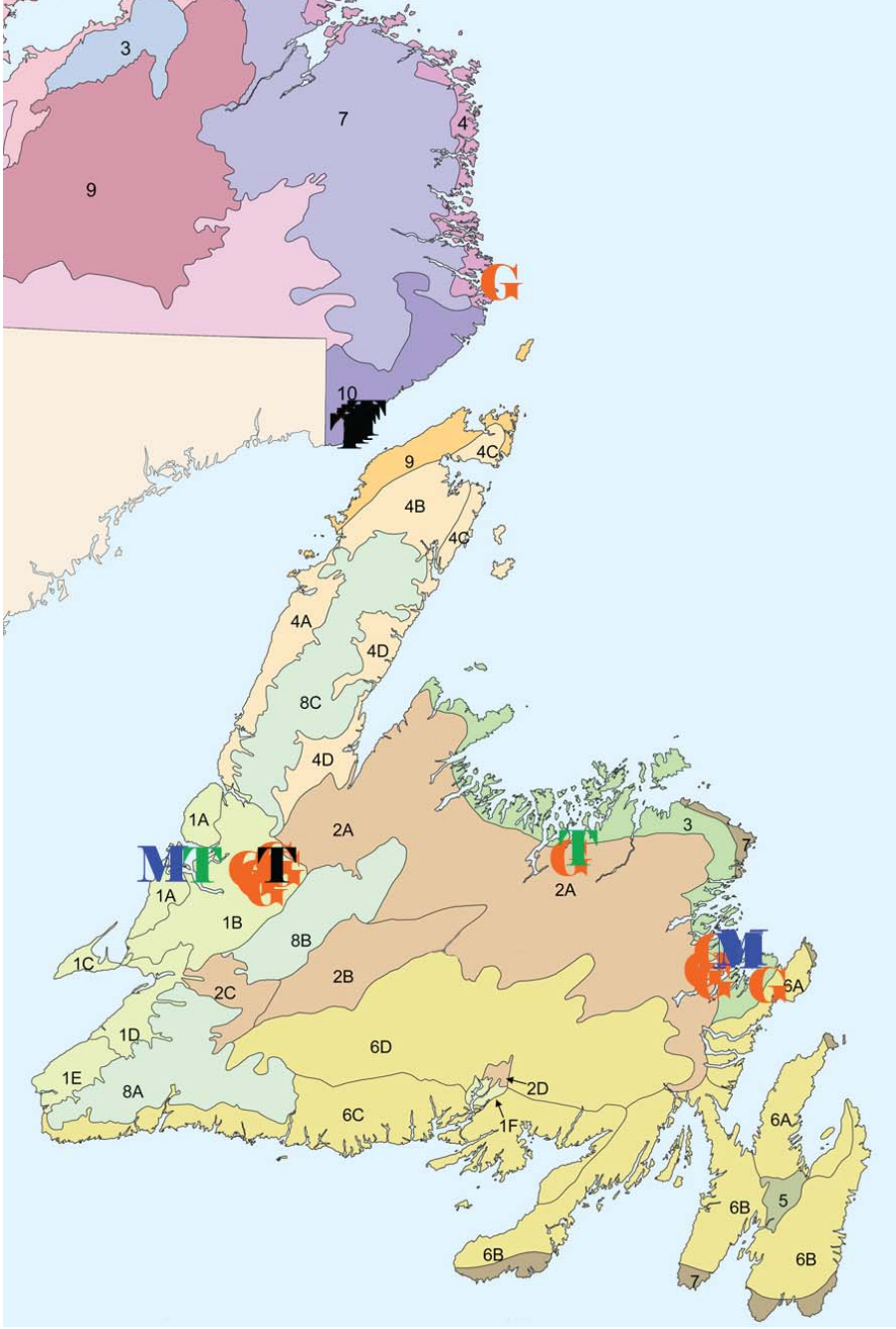
Colour other than above ..... ***Microglossum***

phylogenetic point of view. Microscopic examination will always place them in those two genera. In time, all *Thuemenidium* species will likely find homes elsewhere, and *Thuemenidium* will likely become a redundant genus.

While the genera are easy to separate, the species are not. A lot of experience is required to recognize where the normal variation within a species stops and variation between species begins. Species that are encountered only infrequently do not provide such experience, and we do not know which characters are useful for species separation. As a result, for many earth tongues identification to species is not possible without the aid of a microscope. While there seems to be great latitude and overlap of relatively few macroscopic characters, the microscopic appearance of earth tongues has several characters, that are usually readily distinguished between species.

The primary aim of this article is to show you how to identify earth tongues to genus in the field (Table 2), and to introduce you to the species you might meet in our province, without making you into an instant microscopist. To provide a glimpse into the contribution of the microscope, the article closes with a look at some microscopic characters, and their contribution to identification. Who knows, perhaps some of you will become interested to pursue microscopy?

Identification of foray collections were done by the mycologists. Ten of my collections were identified by me. Although I am not an experienced microscopist, the microscopic appearance of earth tongues seemed to fall into place much better than for many other species, with usually quite clear differences.



Distribution of earth tongue collections in Newfoundland and Labrador. **G** = *Geoglossum*, **M** = *Microglossum*, **T** = *Thuemenidium*, **T** = *Trichoglossum*. Clusters are more indicative of areas surveyed than "real" distribution in the province. My own surveying was done primarily where we live in the Humber Valley and Bay of Islands area, explaining the cluster on the west coast. One foray and several collecting trips were made to the Labrador Straits, explaining the concentration of *Thuemenidium arenarium* collections there, a species of special interest. Of note is the cluster around Terra Nova National Park, all from the 2012 foray in a very productive mushroom year. The same site in a poor year produced none, again showing how little can be concluded from the scant data produced by infrequently collected mushrooms. No collections were found on the Great Northern Peninsula, Main River, and Avalon, all areas that were also surveyed (the last for two years).


A
Photo: Roger Smith


B


C


E


D

Illustrations

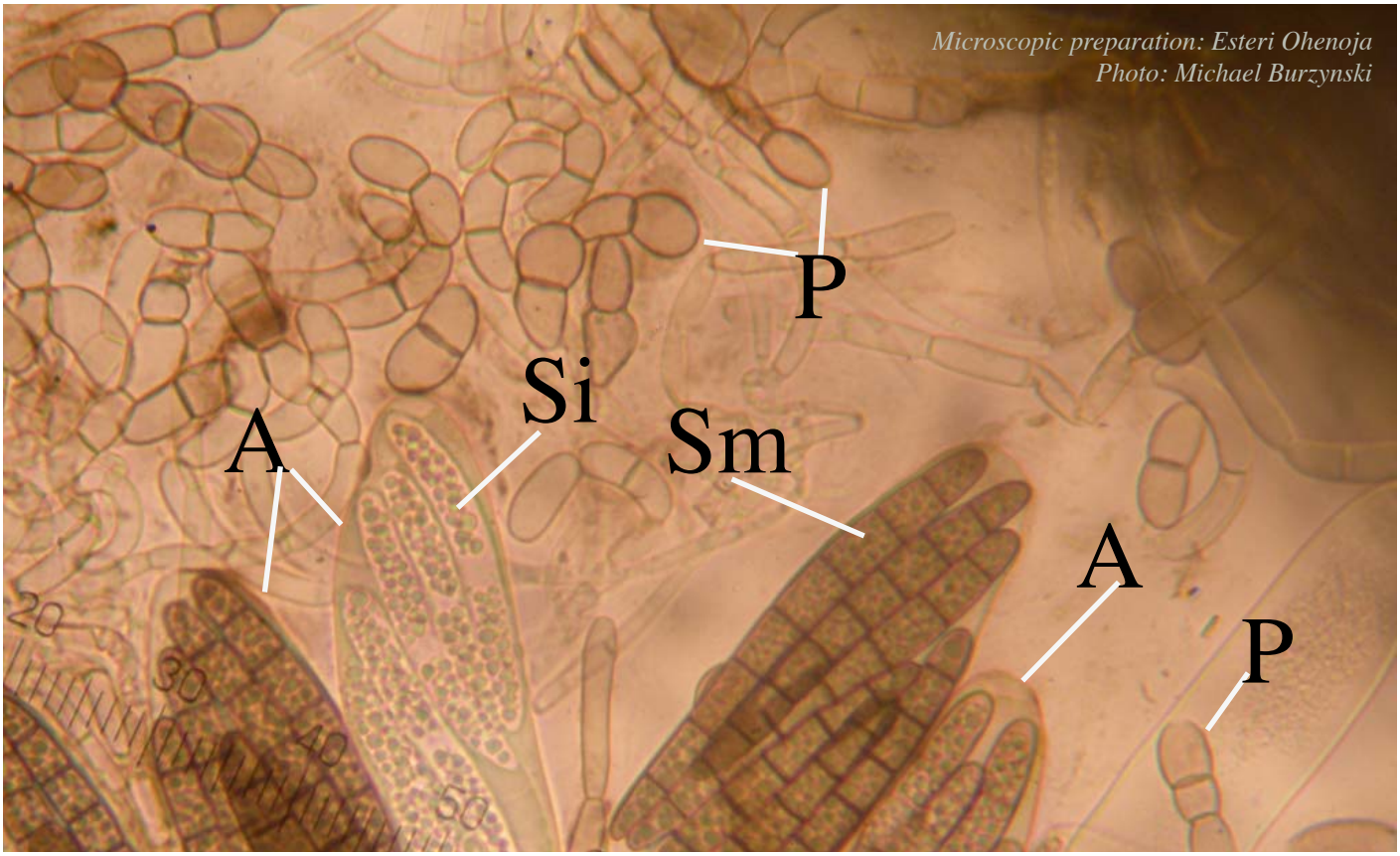
Title banner: *Geoglossum fallax*, 15 Sep., 2005, Humber Vill.

Page 10:

A *Geoglossum glabrum*, 13 Aug., 2008, Notre Dame Provincial Park;
B *Geoglossum simile*, 6 Oct., 2012, Mount Ignoble, behind Humber Village;
C *Thuemenidium arenarium*, 2 Nov., 2011, Forteau sand dunes;
D *Trichoglossum walteri*, 14 Oct., 2011, old baseball diamond, Gillams;
E *Geoglossum umbratile*, 21 Oct., 2008, Humber Village.

This page:

A *Trichoglossum hirsutum*, 12 Sep., 2009, Notre Dame Provincial Park—the notch is an artefact from sampling for microscopy;
B *Microglossum fumosusm*, 9 Oct., 2012, Blow Me Down Provincial Park;
C *Thuemenidium atropurpureum*, 17 Nov, 2012, Mount Ignoble, behind Humber Village—the polka dots are a light artefact;
D *Microglossum rufum*, 26 Sep., 2012, South Broad Cove, Terra Nova Provincial Park.

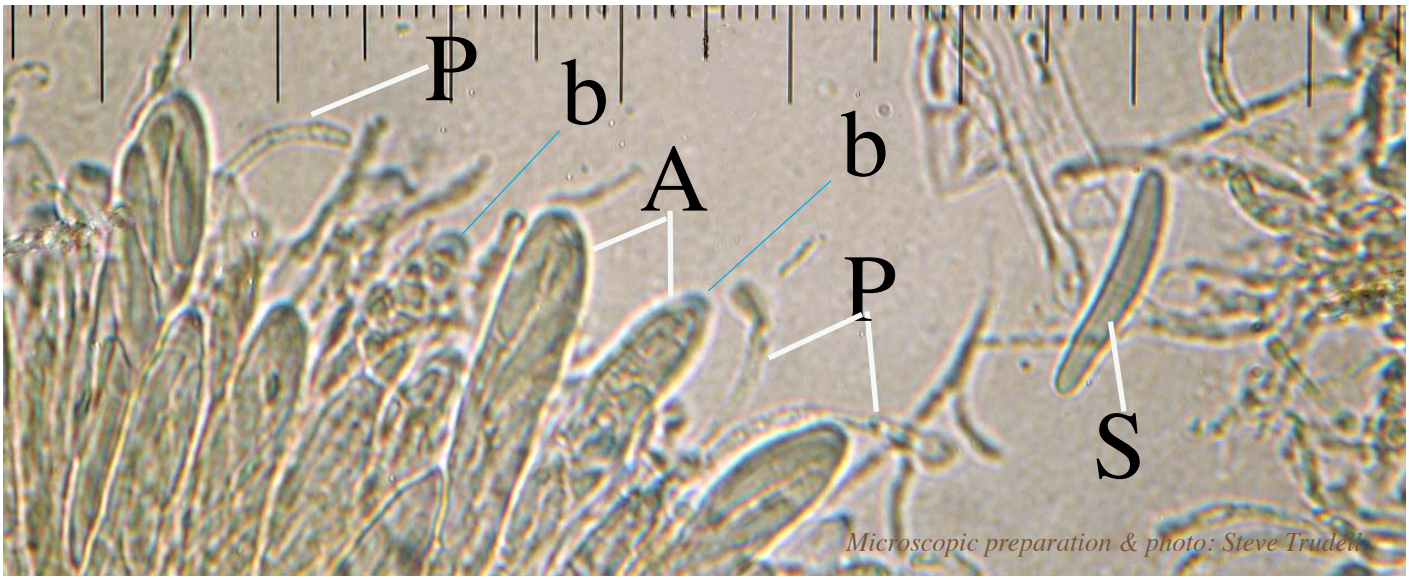


Microscopic preparation: Esteri Ohenoja
Photo: Michael Burzynski

Above: *Geoglossum cookeianum* from Great Caribou Island, Labrador, Aug. 21, 2008. Micrometer scale bottom left corner. A = asci, P = paraphyses, S = spore (i=immature, m = mature). No free spores shown. There are eight spores per ascus and eight cells per mature spore (or seven dividing walls, called septa). Mature spores brown, immature spores (no cells) do not take up dye and appear lighter in colour. Earth tongues differ by the proportion of immature and mature spores. Also, species vary in their ability to take up dyes, or their colour reactions to chemicals. The paraphyses between asci are straight, or curved at the tip, made up of short, cylindric and round cells, constricted at the junctions, so that the wall indents with some cells looking like barrels, and others like round or oval balls.

Below: *Microglossum olivaceisquamulosum* from the Blue Hill Pond trail, Terra Nova National Park, Sep. 29, 2012. Reproduced at same magnification as above; micrometer scale seen at the top.One free spore seen. Both asci and spores are smaller than for *G. cookeianum*. Spores hyaline (uncoloured). Ascus tips turn blue (b) with Melzer's reagent. Eight spores per ascus and mature spores may have over eight cells (not seen here). The paraphyses are thin, slightly longer than the asci, straight or bent, with tubular cells meeting flush (parallel sides, without indentation at the junction), and a similar or slightly swollen terminal cell.

This is a very accurate picture and description of the microscopic appearance of *Microglossum rufum*.



Microscopic preparation & photo: Steve Trudell

Microglossum olivaceisquamulosum (microscopy on the previous page). Fruit bodies 6 cm tall with about 1/3 occupied by widened, distinct, yellowish olivaceous heads, often twisted. Stems olivaceous brown, with small squamules (use loupe). Growing solitary or in small groups. This is an accurate picture and description for *Microglossum olivaceum*.

As you can see, there are very many microscopic characters that are constant for each species. By noting these, it is possible to key out a species, which seemed nearly hopeless macroscopically. Consider the illustrated *Microglossum olivaceisquamulosum*. Macroscopically you would think you have collected *M. olivaceum*. However, under the microscope it is not at all like that species, but looks like *M. rufum*. This macro-micro morpho-chimerism identifies it.

In 1967 Grund and Harrison described this new earth tongue from Nova Scotia, a hircocervus that "resembles *M. olivaceum* with respect to colour and *M. rufum* with respect to microscopic characteristics." As far as I can find out, the species has not been reported since, until Steve Trudell identified this one from our 2102 foray.

What a delight to close this report with the relocation of an H&G species! Harrison and Grund left an enviable legacy, of which the many, many new species they described is the lesser part. I had the good fortune to attend the first mushroom foray in Nova Scotia in 2008. There was no pre-registration, so there was no idea of participant numbers. Well, people turned out in droves! The enthusiasm was palpable. Surprised by this outpouring and heady atmosphere, I asked people what had motivated them to come. A large number, including the organizers, said that they still remember vividly going collecting with either or both Harrison and Grund during student days at university, an experience that stuck with them. Hearing of a mushroom event, they just had to come, hoping to relive those inspiring moments, when they rubbed shoulders with the two mycological giants, and were turned on to mushrooms for life.

Acknowledgment I thank Steve Trudell for identifying *Microglossum olivaceisquamulosum*, supplying the photographs, and for critically reviewing the manuscript.

Clavate *Hypocrea*, our two species

Andrus Voitk

Leif Ryvarden introduced me to the genus *Hypocrea*, when he collected *H. pulvinata* at our 2011 foray: a nondescript somewhat dirty looking amber coloured crust-like layer covering the pore surface of an old *Fomitopsis* conk (title banner). Once I became aware of it, I have noticed that this, or a very similar fungus, is even more common on our old *Piptoporus betulina* conks.

The genus has over 100 species, many decomposing polypores, many/most of them resembling each other. Microscopic differences are also quite subtle, so that exact identification to species can be difficult. Although several are colourful, as the names *H. citrina* and *H. rufa* might indicate, this does not narrow the field sufficiently. They have an interesting life cycle with asexual yeast-like forms; observing these together with the other factors can give more certainty to an identification. Intriguing, but everybody has a limit, and I decided to content myself with a condescending nod toward *Hypocrea* as a genus of small crust-like ascomycetes that decompose polypore conks. Steeds in the stable of rotter rotters, but hardly sufficient to write an article.

That changed when I met two upright members of their clan, ***Hypocrea alutacea*** and ***H. leucopus***. Macroscopically these clubs bear no resemblance to their crusty kin, and were in their own genus, *Podostroma*, until more detailed research reassigned them to *Hypocrea*[1], subsequently confirmed by phylogeny studies[2].This is an amazing example of parallel evolution, where the ability to form clubs for sporulation is reinvented several times along several fungal lineages. Or, perhaps the club shape is not “reinvented” at all. Perhaps all ascomycetes bear the ability to make clubs deep in their genes, and these genes are allowed to dominate in circumstances where such shape gives the organism an advantage. In other words, perhaps ascomycetes carry in their genes a totipotentiality for various shapes, and conditions of environment and habitat dictate which are most beneficial to a line, which then allows this shape to be brought into effect.

Were it not for this exciting insight, even with their club shape they are only marginally more remarkable than the crusty of their kin. But for someone who likes to identify mushrooms by their appearance to the naked eye, they are much more sympathetic then their flat peers. Both species are uncommon: we have collected only one during ten years of forays and in the same time I have collected two others (one at the Goose Bay foray). However, even if uncommon, in this case their differences are easy to see, so that one does not need a great familiarity to be able to tell them apart. *Hypocrea alutacea* grows only on wood, and the demarcation between its stem and the fertile surface over the head (the hymenium) is indistinct. *Hypocrea luecopus* grows on the ground, not on wood (but often on litter), and the distinction between stem and hymenium is more evident. Their difference is not difficult to ascertain—it is much more difficult to recognize them as species of *Hypocrea* and not some other club fungus. At my first encounter with *H. leucopus*, I thought it was a rather robust *Macrotyphula fistulosa*, because both of these ochre-tan clubs are hollow inside. However, had I looked at the fertile surface with a magnifying loop, I should have seen the ostioles, small openings of perithecia, cavities where the asci are

produced that release the spores. Or, had I behaved like a mycologist and immediately subjected it to microscopic magnification, I should have seen the perithecia, asci and spores typical of an ascomycete, and not the basidial structure of *Macrotyphula*, *Clavaria*, *Clavaiadelphus* or some other similar basidiomycete club. I did look with a microscope, of course, but three months later, because it continued to bother me. Hence this account.

References

1. Chamberlain HL, Rossman AY, Stewart EL, Ulvinen T, Samuels GJ: The stipitate species of *Hypocrea* (Hypocreales, Hypocreaceae), including *Podostroma*. Karstenia, 44:1-24. 2004.
2. Jaklitsch W: European species of *Hypocrea*, part II: species with hyaline ascocpores. Fungal diversity 48:1-250. 2011.

Illustrations

Previous page

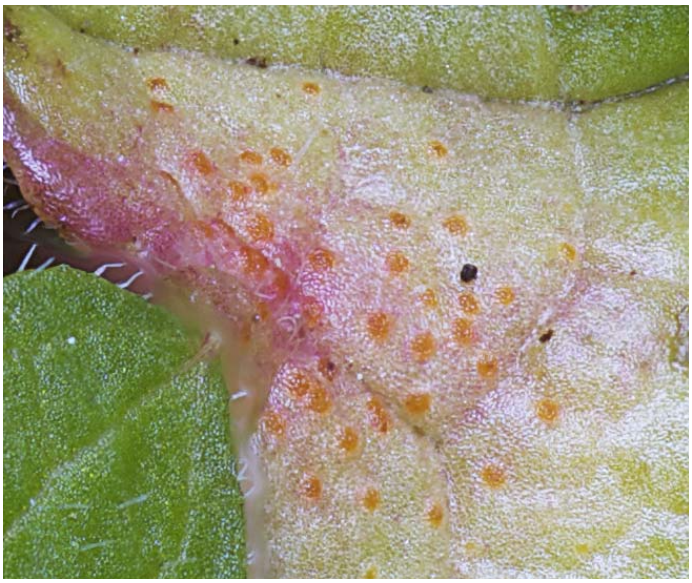
Title banner: *Hypocrea pulvinata* on the pore surface of an old *Fomitopsis* conk, Main River, Big Steady Section, 7 Sep, 2011.

This page

Top: *Hypocrea alutacea*, 3 Sep, 2004, Humber Village. Photo does not allow good view of hymenium/stem junction, but growth on bare wood is obvious.

Middle: *Hypocrea leucopus*, 25 Aug., 2012. Birch Brook Ski Trails, HappyValley-Goose Bay, Labrador. Obviously growing on needle duff in moss. A distiction between the yellow head and white stem is evident, even if not markedly sharp.

Bottom: *Hypocrea leucopus*, magnified details of same specimen as middle photo. Despite less than ideal focus, the small ostia on the fertile surface can be seen, confirming this to be an ascomycete and not a basidiomycetous club fungus.



Rust walk on Fogo

Andrus & Maria Voitk

Puccinia caricina* var. *pringheimiana, collected by Henry Mann on leaves of skunk currant, *Ribes glandulosum*. This is one of the rusts, with a complicated life cycle, spent on two hosts, springtime on currant and summer-winter on *Carex*. Upper picture shows an aecium on the underside of the leaf on the left (magnified on lower photo), and to the right, three spermatogonia on the upper leaf surface. The latter (magnified on middle photo) produce sexual spores, "male" in the pit and "female" in hairs surrounding the pit. They induce the host to donate sugars to make nectar in the pit, and secrete chemicals to cause the leaf to change to red centre blotches with a concentric yellow periphery. Thus, they make the host leaf mimic a flower, to attract pollinators, who are attracted first by colour, then by the nectar. As they sup on the nectar, some of the "male" spores adhere to the pollinators, which they carry to the next leaf, where the receptive "female" hairs around the next pit are strategically placed to receive these for mating.

Cool, eh? And that's only part of the story.

For more details, see Omphalina vol III, nr 10, which explains sex for *Gymnosporangium*, a very parallel situation.

If this fascinates you, and you are coming to the Foray, one of the Sunday workshops is a **RUST WALK** with Cathie Aime and Esteri Ohenoja. You won't find better guides for this group of fungi on this earth in your lifetime—guaranteed.

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