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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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seened AT gmail DOT com,

... who eagerly invites contributions to OMPHALINA, dealing with any aspect even remotely related to mushrooms. No picture, no paper. Material should be original and should deal with the mycota of Newfoundland and Labrador. Authors are guaranteed instant fame—fortune to follow. Authors retain copyright to published material, and submission indicates permission to publish, subject to the usual editorial decisions. Issues are freely available to the public on the FNL website. Because content is protected by authors' copyright, editors of other publications wishing to use any material, should ask first.

COVER

Betula alleghaniensis, Humber Village, April 9, 2012. Photos: Maria Voitk. The lead articles report on lichens and other fungi recovered from it and a neighbouring white birch. The remainder of the issue is devoted to other betulicolous fungi. Oh, and the white stuff? It is on its way, fear not.

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Message from the Editor

The second equinox here with the height of mushroom season, and the foray barely behind us. Report planned for the November issue.

This issue is devoted to a brief look at some fungi that grow on our birch. The lead article demonstrates the usefulness of closer examination of specialized microniches from time to time.

We close with a tip of the hat to Elias Magnus Fries, father of mycotaxonomy. We believe that we have identified his mushroom correctly, but are not sure. Perhaps somebody knows? Comments, opinions invited.

This is the first time since we began with the Bishop's notebook that a page didn't fit the layout. So, you get a yellow jelly fungus on the right instead, to accompany the last two articles.

Happy mushrooming!

andrus



FORAY MATTERS



MONEY. If anybody has spent money on Foray matters and not presented a bill or been paid yet, please let our Treasurer, Geoff Thurlow, know **BEFORE OCT. 6** to get paid <[geoffthurlow AT gmail DOT com](mailto:geoffthurlow@nmlmushrooms.ca)>. After that he will be out of the province for several months.

VENUE 2014. The back cover says we shall return to Fogo Island next year, and that is our hope. If possible, we prefer to foray the same site for two years. Difficulties with more remote regions are cost and logistics, both a problem this year, despite significant help from Shorefast. The financial picture should become clear shortly and the Board will meet in two weeks to confirm our ability to return. Any input and suggestions from participants would be very helpful. If you have any wish, observation or suggestion, this is the time to make it known, to help these deliberations. Please send a quick note to <[info AT nlmushrooms DOT ca](mailto:info@nmlmushrooms.ca)>.

Even though most arboreal lichens do not get their nutrition primarily from their substrata, many show decided host preferences. The need to fell one *Betula papyrifera* (this page) and one *B. alleghaniensis* (next page) for an unrelated study, permitted us to survey the lichen communities on these birch species. *Betula alleghaniensis* is known to host more lichen species than *B. papyrifera*; the reasons are many, of which the most common offered is that the less acidic bark of *B. alleghaniensis* is more user-friendly for most lichens.

Methods

A mature, healthy tree of each species was felled in a birch forest near Humber Village, NL, with a 75:25 *papyrifera:alleghaniensis* ratio. The trees, located within 300m of each other, were cut down in April, 2012, within 10 days of each other. CH and AaV collected every visible lichen species, without attempting to collect all lichens present. MV photographed the lichens, which were then identified by JM and SC. The collections are currently at the New Brunswick Museum.

Results

Forty-one collections were made, representing 18 species, 7 species from *Betula papyrifera* and 13 species from *B. alleghaniensis* (Table). We report *Usnea cornuta* on *Betula papyrifera* and *Gyalecta fagicola* on *B. alleghaniensis* as first records for the province. *Lecanora hybocarpa* has been collected in Newfoundland on spruce and birch in the Central Avalon Forests (Consortium of North American Lichen Herbaria, Wisconsin State Herbarium), but our collection is the first published record. *Pyrrhospora varians* is rarely noted, with the only published records given by the American physician John W. Eckfeldt in his 1895 listing of NL lichens (as *Blatora varians*, based on the collections of Rev. Arthur C. Waghorne, a 19th century Church of England missionary in NL).

The collections included the uncommonly reported *Evernia mesomorpha* from *Betula papyrifera* and two species from *B. alleghaniensis* with only one previous general literature reference for NL, *Scoliciosporum chlorococcum* and *Variolaria multipunctoides*.

Only two lichen species, *Hypogymnia physodes* and *Parmelia sulcata*, were common to both birch species. *Tuckermanopsis orbata*, found on *B. papyrifera*, was also collected from *B. michauxii* (reported elsewhere in this issue). Almost all the collections came from trunks or larger branches; smaller, more terminal branches in the crown did not contribute significantly to the list.

Discussion

This census of all readily visible lichen species on two trees should not be confused with a complete census

Lichens on two birch trees

John McCarthy, Claudia Hanel,
Stephen Clayden, Aare Voitek,
Maria Voitek, Andrus Voitek





of lichens on birch in the province. We have sampled but two of our several birch species. Our 14 species on *B. alleghaniensis* represent less than 25% of all lichen species reported from that birch

species in NL. Sampling more trees from more regions will no doubt increase the number of collected species.

Although our census is limited, it does bear out the observation that *B. alleghaniensis* tends to support a greater diversity of lichens than *B. papyrifera*. Some birch lichens, though not a majority, probably occur more frequently on *B. papyrifera*.

This study illustrates the value of examining specific, narrowly defined substrata or microhabitats. Such focused surveys can yield many interesting finds, overlooked by the usual regional survey method. Two species new to the province were found in an otherwise very incomplete survey of lichens on birch. Some infrequently reported species were actually relatively common within their limited econiche. For example, with eight collections, *Pyrrhospora varians*—not reported in NL for over a century—was the most

common species collected. Furthermore, even though only one collection was made, several growths of *Lecanora hybocarpa*—reported for the first time in our province—were noted.

LICHENS ON WHITE BIRCH	
Species	n
<i>Hypogymnia physodes</i> *	4
<i>Hypogymnia tubulosa</i>	2
<i>Parmelia sulcata</i> *	2
<i>Tuckermanopsis orbata</i> **	2
<i>Bryoria furcellata</i>	1
<i>Evernia mesomorpha</i>	1
<i>Usnea cornuta</i> NEW to NL	1
LICHENS ON YELLOW BIRCH	
Species	n
<i>Pyrrhospora varians</i>	8
<i>Buellia stillingiana</i>	7
<i>Melanelixia subaurifera</i>	2
<i>Physcia aipolia</i>	2
<i>Graphis scripta</i>	1
<i>Gyalecta fagicola</i> NEW to NL	1
<i>Hypogymnia physodes</i> *	1
<i>Lecanora hybocarpa</i> NEW to NL	1
<i>Parmelia sulcata</i> *	1
<i>Platismatia glauca</i>	1
<i>Ramalina dilacerata</i>	1
<i>Scoliciosporum chlorococcum</i>	1
<i>Variolaria multipunctoides</i>	1
<p>* Common to both <i>Betula papyrifera</i> and <i>B. alleghaniensis</i>.</p> <p>** Common to both <i>Betula papyrifera</i> and <i>B. michauxii</i> (discussed in separate report, p. 14).</p>	

For a glossary (dictionary of lichen language) to explain terms, see Michele Piercy-Normore's *Lichen Quick Guide*, *OMPHALINA* 3(12):9, 2012.

John McCarthy

Brief descriptions of eleven lichens found on birch

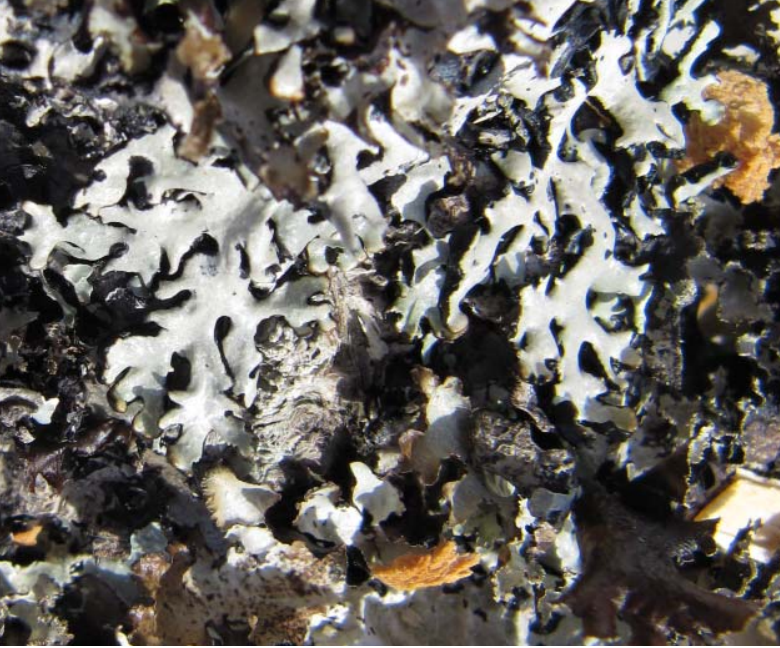
Photos: Maria Voitek

Buellia stillingiana (Genus named by the Italian lichenologist Giuseppe de Notaris (1805-1877) after his friend Esuperanzo Buelli, a distinguished Italian viticulturalist; the epithet, *stillingiana*, is named after the respected pharmacist Albrech von Stilling.) Described by Ferdinand Christian Gustav Arnold (1828-1901), German lichenologist. He identified many of the NL lichens collected by Rev. Arthur C. Waghorne (1851-1890), Church of England missionary in NL and collector of the first major collection of NL lichens in the 19th century. This “common button lichen” is generally found on coniferous and deciduous tree bark, particularly smooth-barked hardwoods.



Graphis scripta (*Graphis* = Latin “instrument for drawing”, from the appearance of the apothecia; *scripta* = Latin *scribere*, “to write”). Linnaeus first described this lichen as *Lichen scriptus* in 1753. The genus *Graphis* is composed of well over 300 species, mostly tropical and subtropical, with a few temperate outliers, two of which are found in the province, *G. scripta* and *G. elegans*. This corticolous lichen is noted for its long, black, slender lirellae (linear apothecia that resemble scribbles on the bark surface). Thallus shape can be quite variable, the shape often determined by the vagaries of bark growth. The thallus is often endophloeodic (growing within the bark tissue) or forming yellowish white or greenish grey patches on the bark surface. More common on bark of *Betula* and *Alnus* than on conifer bark. The much rarer *G. elegans* is best distinguished from *G. scripta* by the presence of several furrows in the lirellar margins.





Hypogymnia physodes (Hypo = Greek “below” and gymn = Greek “naked”, referring to the lack of rhizinae on the underside of the thallus; physo = Greek “bladdery”, referring to the more or less inflated, hollow, tube-like lobes of the thallus). First described by Linnaeus as *Lichen physodes* in 1753, this arboreal or tree lichen is particularly common on balsam fir in humid forests. Characteristic of this species are lip-shaped soralia formed by the rupture of the underside of lobe tips. It can be found growing on rocks and even on the ground in exposed, windy heathlands. See also Mac Pitcher’s description in *OMPHALINA* 2(6) :18, 2011.



Hypogymnia tubulosa (Latin tubus = pipe, tubular, referring to the semi-erect tubular lobes). First described by the Swiss lichenologist Ludwig Schaerer as *Parmelia physodes* var. *tubulosa* in 1840. This corticolous (bark-dwelling) lichen is not as common as its relative *H. physodes* and can be readily distinguished from *H. physodes* by circular-shaped soralia caps at the ends of forked, divergent thallus lobes. Often found on conifer twigs and can be mixed in with *H. physodes*. We have at least seven species of *Hypogymnia* in the province.



Lecanora hybocarpa (Lecanos = Greek “wine bowl”, referring to the shape of the apothecia; hybocarpa = Greek “protuberant fruit”, referring to the apothecia bulging out from the thallus surface). Described by the American lichenologist Edward Tuckerman as *Parmelia hybocarpa* in 1849. This crustose lichen, found on the bark of deciduous trees and rarely on spruce or fir, grows in Europe and North America. Finding this lichen on yellow birch in western Newfoundland is consistent with the lichen’s wide distribution throughout the eastern deciduous forests of Canada and the United States. On the photo the apothecia do not bulge because most of the delicious fertile tissue (the brown matter) in the mature apothecia has been eaten by unidentified lichenophages.

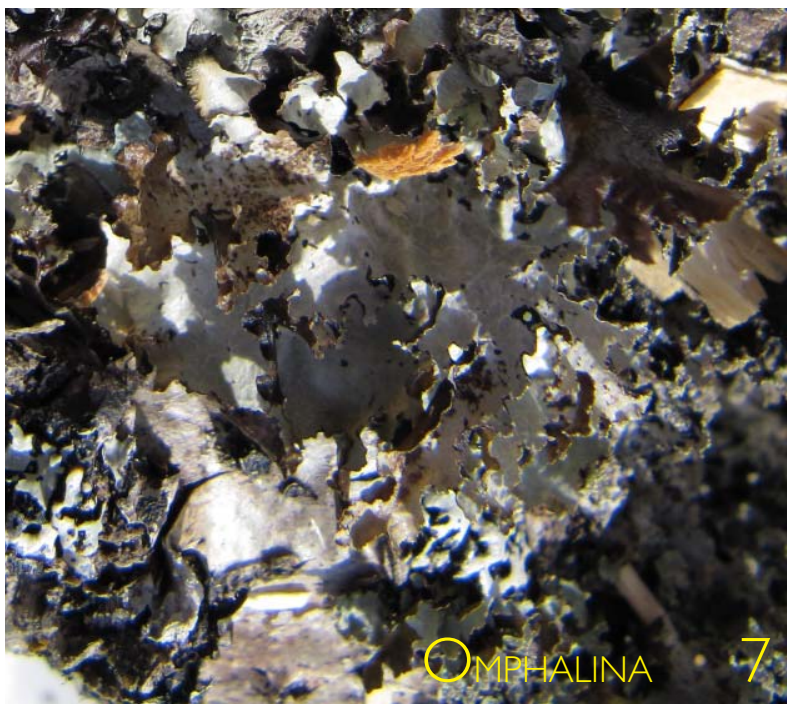
Melanelixia fuliginosa (*Melanelixia* = combination of *Melanelia* = Greek “black or very dark”, referring to thallus colour and *Elix*, John A., Australian, who contributed significantly to lichen systematics and chemistry). Described by the Swiss botanist Jean-Étienne Duby as *Parmelia olivacea* var. *fuliginosa* in 1830. This foliose lichen with a pale green to dark brown thallus grows on coniferous and deciduous trees as well as on siliceous rocks.



Parmelia sulcata (*Parma* = Latin “small round shield”, referring to shape of the apothecia; *sulcatus* = Latin “furrowed or rutted”, referring to the network of sharp ridges and depressions and whitish pseudocyphellae [elongate cracks] on the thallus surface). First described by the English lichenologist Thomas Taylor in 1836 in *Flora Hibernica*, the first complete work of the Irish flora. A common lobed, greenish to whitish mineral grey foliose lichen growing mostly on bark and rocks and even park benches and wood fences. Many early records of this lichen were certainly those of *Parmelia squarrosa* Hale, a lichen described in 1971 by the American lichenologist, Mason Hale and probably more common in NL, particularly on bark. The two are best distinguished by the presence of soralia on the thallus surface of *P. sulcata* and isidia on the thallus surface of *P. squarrosa*. Also, the rhizines of *P. squarrosa* tend to be squarrose, that is, with short, stiff perpendicular branches giving the rhizines a bottle brush appearance. The rhizines of *P. sulcata* are generally slender and unbranched, particularly on the edges of young lobes.



Platismatia glauca (*Platy* = Greek “flat”, referring to the plate-like thalli; *glaucus* = Latin “bluish-grey”, colour of the thallus, usually greenish-grey with mottled black and white and browning at the edges of the lobes). First described by Linnaeus as *Lichen glaucus* in 1753. Examine any balsam fir or spruce tree in Newfoundland, and you’re sure to find this lichen. Look for a leafy (foliose) lichen rather ragged and wrinkled in appearance with abundant growths on the thallus called isidia or breaks in the thallus cortex called soralia. A bewildering range of morphologies can greet the eye. See also Mac Pitcher’s description in *OMPHALINA* 2(6) :19, 2011.





Pyrrhospora varians (Pyr = Greek “fire” = red; spora = Greek “seed”, referring to the ochre or reddish brown colour of the apothecia; varians = Latin “varying”. Described as *Lecidea varians* in 1814 by Erik Acharius (1757-1819), Swedish father of lichenology. Usually found on bark, often on twigs of deciduous trees and shrubs.



Physcia aipolia (Physco = Greek “bladdery”, referring to the inflated or sausage-like form of the type species for the genus, *Physcia tenella*; polia = whitish, a (ai) = un, probably referring to the grayish or somewhat dirty thallus colour). First described in 1793 as *Lichen aipolius* by Fredericus Alexander von Humboldt (1769-1859), Prussian naturalist and geographer. Cosmopolitan (except Antarctica) foliose lichen, found on nutrient-rich or base-rich bark of tree trunks, branches and twigs.



Variolaria multipunctoides (Variolaria = pimpled, as in smallpox [variola]; multi-punctatus = Latin “many pored”, referring to the small fruiting warts on the thallus surface). Described by the American Martyn Dikken as *Pertusaria multipunctoides* in 1980. This corticolous crustose lichen is an endemic but wide-ranging temperate species of northern North America. Recent molecular phylogenetic work has shown that the genus *Pertusaria* is polyphyletic comprising three major clades of which *Variolaria* is one.

Mushrooms in the crown

Andrus Voitk

Photo: Maria Voitk

CROWN MUSHROOM CENSUS

Species	n
<i>Plicaturopsis crispa</i>	9
<i>Merismodes anomala</i>	8
<i>Diatrypella betulina</i>	5
<i>Exidia cartilaginea</i>	2
<i>Hypoxylon fuscum</i>	2
<i>Chlorociboria</i> sp.	1
<i>Daedalopsis confragosa</i>	1
<i>Exidia nigra</i>	1
<i>Exidia repanda</i>	1
<i>Panellus ringens</i>	1
<i>Peniophora cinrerea</i>	1
Pyrenomycete, unidentified	1

Tree crowns making up the forest canopy form a special econiche for fungi able to make a home there. Although many of these mushrooms are quite common in this habitat, because it is so inaccessible to us, high above our heads, we do not meet them often and consider some exotic. This is a report of a mushroom census of the crowns of the two birch described in the lead article. The crowns were carefully examined, and all fungi harvested, removing at least a representative sample of each colony. There were 33 collections, comprising 12 species, listed in the table. One pyrenomycete was not identified, and the green stain of a *Chlorociboria* species was seen without fruiting bodies, preventing determination of which of our two species was involved. 32 grew on *Betula alleghaniensis* and only one on *B. papyryfera*, one of 5 collections of *Diatrype betulina*.

This habitat presents a common set of problems for mushrooms to overcome: intermittent periods of exposure to intense sun, wind, rain, snow and cold. Given the same challenges, you might think they have found a common solution in order to live there. Not at all! These 10 species (leaving aside the two collections not identified to species), display an almost unbelievably diverse approach for coping with the special problems. The pyrenomycetes and polypores have hard fruiting bodies that withstand all kinds of weather without disappearing. Many polypores regenerate their sporulating tissues (hymenium) annually, while some of the smaller pyrenomycetes do not



Photo: Maria Voitk

Snow was on the ground, but where it had melted, spring was making inroads.



The beautiful Plicaturopsis crispa, the commonest mushroom found in these treetops. Not an exclusive denizen of winter, birch or tree crowns, it can be found through the year, on various dead hardwood, whether attached to living tree or lying on the ground. A very common rotter of dead alder, found in practically every alderbush. These are young specimens; with maturity the gills turn grayish.



Merismodes anomala, the second-commonest crown dweller. Small clusters of very small hairy cups that can be made to open up by placing in a closed container with a wet towel or other source of moisture. Note that they seem to grow on top of old pyrenomycelite stroma (the black things seen at lenticular openings in the bark). Seen from October on, most profuse Nov-Dec, last until April, and occasionally seen at other times. Probably requires dead substrate attachment to living tree tissue.

regenerate hymenium, despite their ability to remain in place longer than a year.

All the listed mushrooms fruit on dead wood, dead branches aloft in the crown of living trees. Dead tissue does not conduct water well, and aloft it is kept dry by constant sun and wind. This aridity requires special ability to adapt to a dry environment and to take full advantage of any periods of rain or snow. Fungi that seek out dry environments are known as xerophiles, but actually all fungi need water to live. Water produced as a byproduct of oxidative catabolism is not enough to keep them going without outside help. Polypores may have hyphae deep in the tissues of the tree. Most of the listed species with more ephemeral fruiting bodies (*Exidia*, *Merismodes*, *Panellus*, *Plicaturopsis*) can dry up, to revive unharmed in the presence of new moisture.

Some of these species seem to thrive on dead wood in various settings, and are encountered at ground level as well. These are familiar to us, like *Plicaturopsis crispa*, *Exidia nigra*, *Hypoxyylon fuscum*. Others, like *Panellus ringens*, are seldom, if ever, encountered on dead wood unless it is attached to living wood. Possibly some of these have a mycelial attachment extending to living wood, supplying the fruiting bodies with water.

Just as they seem to withstand several bouts of desiccation, they also seem to recover from freezing without harm. Some of these species with soft fruiting bodies can be seen all year round (*Plicaturopsis crispa*, *Exidia nigra*), while others are seasonal. Most are psychrophiles, mushrooms that seem to prefer fruiting and sporulating in cold weather. They stop when frozen solid, and resume as soon as thawed out. Some extend their season into the adjacent non-freezing month(s), while others (*Merismodes anomala*, *Panellus ringens*) are seldom seen outside November-April.

In terms of completeness, this survey cannot be compared to that of lichens. In the case of lichens, the entire fungal organism is visible, photobiont and all, whereas in the case of most non-lichenized fungi, the only evidence of the fungal organism is its fruiting body,

usually a small and ephemeral part of the organism, emerging only if there is a felicitous coincidence of its nutritional, seasonal and climatic requirements. Thus, while most lichens were evident during the survey, many resident mushrooms likely were not recorded because they did not happen to fruit at census time. Notable among the absentees are *Tectella operculata* and *Macrotyphula fistulosa* var. *contorta*, both rather uncommon elsewhere, but found consistently in this environment. This is most unfortunate, because the reason for felling the trees in the first place was to do a study of *Macrotyphula fistulosa* var. *contorta*. The protocol was drawn up, the trees taken down, but the fungus was not there!

Although they all like the same environment and do well during thaws in the winter, it seems they have preferences for the part of the cold season in which to fruit. For example, *Macrotyphula fistulosa* var. *contorta* can be found already in October-November, becomes most prevalent in December-January, and seems to be gone by the end of March. *Peniophora cinerea*, on the other hand, is occasionally seen in the late fall, but really begins to lay down some brown mycelium in earnest in February, on which the purplish gray hymenium appears by March, with florid fruitings seen in April-May. Knowing this before cutting down the trees to study the respective fungi may spare a lot of embarrassment.

If nothing else, this review has introduced us to two new terms, xerophile and psychrophile, that we can try out on our friends at the next available opportunity. With people who do not know their meaning, they work well as cuss words ("You dirty, rotten xerophile!"). In highly sophisticate company they serve as inventive descriptive terms of personality ("She's so cool, a real psychrophile," or "He has the most xerophilic wit."). If you really want to appear as a profound thinker, wear a black turtleneck, stare into the depths of a snifter of Cognac for a long time, then turn to your companion and ask in a mild voice, "In all likelihood wind is the primary vector for spore dispersal for both arboreal xerophiles and psychrophiles, don't you think?"

Deep, man.



Above: *Exida cartilaginea*, a very common birch rotter found in late winter and early spring. Virtually unseen by late summer. Can reach very florid proportions. Found on dead wood in the crown or on the ground.

Below: Delicate *Panellus ringens*, very common in the crown during winter. Sporulates during periods of thaw. Seems to require attachment of dead wood substrate to living tree tissue to flourish.



The genus *Daedaleopsis* in Newfoundland and Labrador

Andrus Voitk



Figure 1. *Daedaleopsis confragosa* on *Betula alleghaniensis* in background and *D. septentrionalis* from *Acer spicatum* 6m away on the stump in the foreground. The differences between the daedaloid (maze-like) poremouth of the former and the lamelloid (gill-like) of the latter is obvious. Also, it is possible to appreciate the relatively straight poremouth surface of *D. confragosa* and the upward sweep from a central point of *D. septentrionalis*. Their size difference is exaggerated because of perspective.

On a dead yellow birch limb I found what I assumed to be *Daedaleopsis septentrionalis*, because I had just identified one on a dead mountain maple about 6m away. Not so; this one turned to be *Daedaleopsis confragosa*. There we had both of our *Daedaleopsis* species within 6m from each other. Books describe a third, *D. tricolor*. It has a distinct pore pattern and should be easy to recognize. I have not seen it in the province and we have not recorded it during ten years of forays, so either it is extremely rare or does not grow here. *Daedaleopsis* is not a common genus, judging by our foray results: in ten years we have not recorded a single collection. Yet, it seems to be a reasonably common genus around where I live, more so than, for example, the somewhat similar (size, colour and hosts, as well as annual nature) *Hapalopilus nidulans*, which has been collected on four forays.

Daedaleopsis means like *Daedalea* and *Daedalea* is named after Daedalus, architect of the Labyrinth at Knossos. The reference is to the labyrinthine pore pattern of both genus *Daedalea* and *Daedaleopsis*. *Confragosa* means with broken or roughened parts, referring to the upper surface, and *septentrionalis* means northern, indicating distribution.

Both are annual producers of white rot on hardwood. As in this instance, *D. septentrionalis* prefers *Acer spicatum* and *D. confragosa* prefers *Betula*, but I have found

both on either, as well as *Alnus*. *D. confragosa* is described as larger, but here the opposite seems to be true: *D. septentrionalis* is up to 15 cm wide and *D. confragosa* up to 10. They grow singly or in groups of 2-3; larger congregations are uncommon. They differ somewhat in shape. Most of the time mature *D. confragosa* has a downward sloping upper surface that meets an almost horizontal pore surface, whereas *D. septentrionalis* has an almost horizontal upper surface that meets an upward sloping pore surface. The amount of red, pink and brown staining of the pore surface on rubbing is reported to differ between the two. Most of my collections have been past fruiting or staining; the few fresh ones I have seen have not seemed to differ too much in staining properties.

The biggest difference between the two is in their pore patterns. Those of *D. confragosa* are maze-like closed cells of varying size and shape (daedaleoid*). Those of *D. septentrionalis* are radially straight like gills, usually open the entire way to the edge (lamellate). Their walls seem proportionately thinner than those of *D. confragosa*. See the photos for differences between the species. At times a specimen with the shape of *D. septentrionalis* has surprised me with the gill pattern of *D. confragosa*. It seems that in some conks daedaleoid pore walls break down to almost straight "gills" in late maturity.

The above descriptions differ somewhat from those found in books, mostly European. Several decades ago the French mycologist Alix David investigated *Daedaleopsis confragosa*, and discovered that it had two strains in Europe, one in the north and one in the south, that were intersterile. And, what was most annoying, that species could be found with both daedaleoid and lamellate pores. This may explain some of the apparent discrepancies. North American strains may have made the complex more complex. Who knows? This looks like a genus that could do with a little more study.

Meanwhile, for our purposes, in order to speak to each other about them, we have to have names for our mushrooms. Until we know more, it would seem logical that we continue to identify our two species by the classical macroscopic feature, pore morphology, into the daedaleoid *Daedaleopsis confragosa* and the lamellate *Daedaleopsis septentrionalis*. I should be pleased to hear comments, updates and different opinions.



Figure 2. *Daedaleopsis septentrionalis*, top and *D. confragosa*, below. Both on birch, both last season's sporocarp. At this stage, not a huge difference between them from the top. A hint of the differing poremouth shapes is perhaps visible. The difference is all when you turn them over (Figure 1).

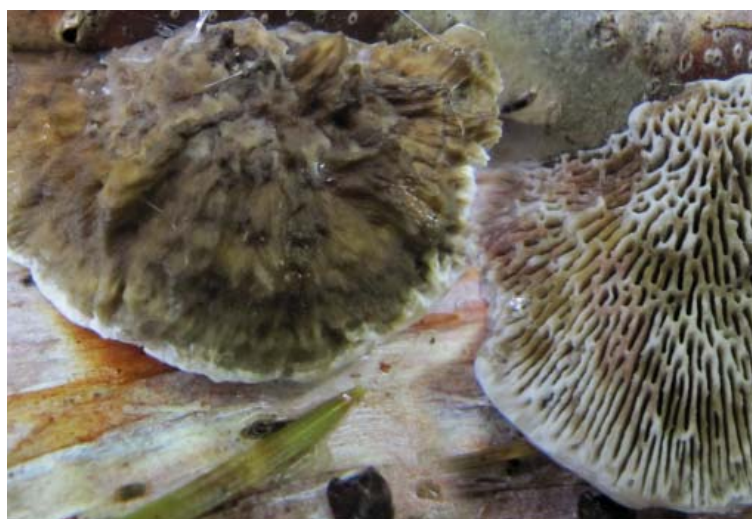


Figure 3. Actively growing and sporulating small *Daedaleopsis confragosa* in August, on birch. Note the reddish staining, pinkish at the back and brownish toward the front, of the overturned specimen.

*For hair splitters only: *Daedalus* (without a second e) was the architect, and *Daedaleus* the mushroom named after him. Thus, daedaleoid means like the architect and daedaleoid means like the mushroom. The terms are often interchanged, the former more common in North America, and the latter in Europe.

Newfoundland birch and its fungi

John McCarthy
Stephen Clayden
Andrus Voitk

Of all the dwarf birches in the world, surely the Newfoundland birch, shown in the title banner, is the prettiest. It is found in wet parts of bogs and fens along the coast of Newfoundland and Labrador. In addition, it is known from Ungava Bay in Québec, Cape Breton Island in Nova Scotia, New Brunswick, and from the French islands of Saint-Pierre-et-Miquelon. The common name, logical given its primary distribution in our province, comes from the pen of the legendary Harvard botanist Merritt Lyndon Fernald (1873-1950).

Its story begins with André Michaux (1746-1802), the King's Botanist of France, sent to America when France still had a king. He described much Canadian flora in his book, "Flora Boreali-Americana", including five species of North American birch. Among these he listed *Betula nana*, a wetland dwarf birch from Ungava Bay, using the name for the similar common dwarf birch in Europe. In Paris, the French botanist Édouard Spach (1801-1879) examined Michaux's specimen, as well as other specimens from Newfoundland, and concluded that these were a new species, distinct from *B. nana*. He reported the species in 1841, naming it in honour of Michaux as *Betula michauxii*. When Fernald found a different dwarf birch in Newfoundland, he compared it with existing descriptions, and concluded that this species had not been described previously. Specifically, the description did not fit with Michaux's description of the specimen from Ungava Bay. Thinking Ungava Bay had one species (now named *B. michauxii*) and Newfoundland another, in 1945 Fernald named the Newfoundland species *Betula terrae-novae*. Subsequently it came to light that the species from Ungava Bay and Newfoundland were the same. The confusion had been created by Michaux, who did not describe the Ungava Bay specimen based

TABLE 1	
FUNGI AND THEIR FREQUENCY	
<i>Lecanora symmicta</i>	18
<i>Lecanora pulicaris</i>	12
<i>Parmeliopsis capitata</i>	10
<i>Tuckermanopsis orbata</i>	8
<i>Vulpicida pinastri</i>	5
<i>Pyrenomyces, unidentified</i>	3

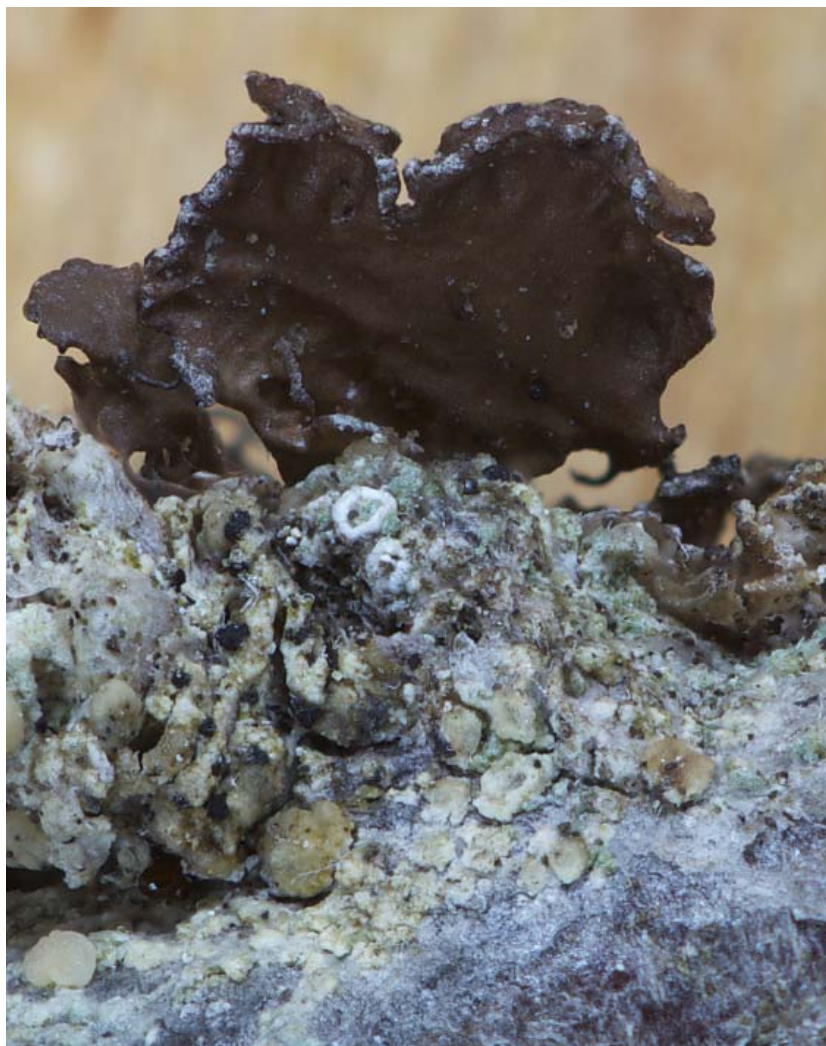
on the findings, but assuming it to be the *B. nana* of Europe, reproduced the description for the European species. Once Fernald learned of this, he published a retraction with explanation, reinstating Spach's name as correct for the coastal wetland dwarf birch found in Newfoundland and Labrador (and a smattering of other places). Thus, the scientific name linking this beautiful little birch to our Island lasted only five years. But the common name has stuck: Newfoundland birch. The photos on this page by Maria Voitek illustrate the male (above) and female (below) catkins of Newfoundland birch. The fungi found on the tree are shown on the next two pages.

We are involved in a limited mycological all-taxa census of fungi on *Betula papyrifera* and *B. alleghaniensis*. It occurred to us that perhaps it would be interesting to add a quick survey of the fungi associated with our own Newfoundland birch. Two live plants and a bagful of dead branches were collected in Gillam's Bog (above Gillams, NL, on the North Shore of the Humber Arm) on June 2, 2012. A powerful magnifying loupe was required to examine the plants, because everything was so small: the "trunk" of the largest "tree" was 6 mm in diameter, and many branches were under 2.

Fifty-six collections yielded five lichen species and three pyrenomycetes. For the more prevalent species, once several collections had been made, additional material was not collected, so that these are proportionately underestimated. Table 1 shows the material collected and its frequency. Like their host, the fungi were markedly scaled down in size, and macrophotography was required to record the images. The pyrenomycetes were not sufficiently developed to be identified. Identification of the lichens also presented challenges, some specimens requiring several attempts, with new material, before a positive identification could be made. Of the five species identified, only *Tuckermanopsis orbata* was also found on our big birch (2 collections on *B. papyrifera*).

Finding a mushroom is not a random event, for as the poet said, no fungus is an island. This knowledge guides the circumspect recorder of diversity to survey specialized habitats. As you see, even a superficial survey of our very own dwarf birch produced an interesting list, including some lichens seldom recorded, but seemingly very common on this substratum.





Lichens of Newfoundland birch

Previous page

Left upper: *Parmeliopsis capitata*.

Left lower: *Vulpicida pinastri*. This beautiful lichen, the fox killer, was described by Mac Pitcher on these pages in greater detail in *OMPHALINA* 2(7):13, 2011.

Right upper & lower: *Tuckermanopsis orbata*. Broken isidia (the granules round the sides of the thalli—"leaves") and one apothecium is seen. A good time to refresh your lichen language, perhaps even print out Michele Piercey-Normore's two pages in *OMPHALINA* 3(12):8-9, 2012, as a handy reference-reminder for the future.

All three of these leafy (foliose) lichens are quite common in our province, found as much larger exemplars on many substrata. On the small Newfoundland birch only the first is relatively common; all are appropriately scaled down in size.

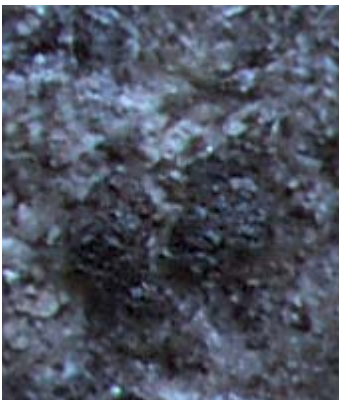
This page

Right upper: *Lecanora pulicaris*. The dark hymenium is visible in one apothecium only; in others it has been eaten by an unknown lichenophage, leaving empty cups. The crustose thallus is the smooth, thin, shiny, silvery blue layer.

Right lower: *Lecanora symmicta*. Apothecia are more cushion-like and vary in colour from straw, through yellowish tan, dusky olive, brown, to almost black. Compared to *L. pulicaris*, its crustose thallus is a bit thicker, more granular and has a greenish colour. Note small *Tuckermanopsis orbata* at the bottom.

Now that you know these two species, go back to the previous page. Three of the four pictures also show either or both. Identify them! Uncommonly reported, they are truly ubiquitous on this host.

Below: macro view of two of our unidentified pyrenomyces, their ostia just discernible.



HUNTING HERICIUM

Bill Bryden

I found one small one this year and none last year. Amateur
Our study shows that foragers are as likely to find them by random chance as they are by seeking them out. Scientist

Did you know that one of the benefits of hunting chaga is finding one of the tastiest edible mushrooms in our forest? That's right, *Hericum americanus* thrives in the same habitat as chaga, such as the birch forest above (see Caga by choice, not by chance in the next issue of [OMPHALINA](#)). Here is a plan to give you an edge over conventional mushroomers, both amateur and scientist.



Sorting out its taxonomy causes a cryptogrammic headache, because the process is so highly dependent on your field guide that talking about *Hericum* species with friends requires a drawing or photo! "Toothed heads" is a convenient name I use for the group, but the multitude and interchangeability of common names are even more confusing than the scientific ones. Key features for differentiating the species are tooth length, tooth position and branching. Just when you think you have it sorted out, you learn that these are quite variable and often overlap between species!

Rather than take you down the road of what was called what and is now known as what for both scientific and common names, etc., let me cut to the chase. The eastern hardwood species of *Hericum* are *H. americanum* (long toothed bear's head) if the teeth are over 1 cm in length, and *H. coralloides* (short toothed bear's head) if short shorter (<1 cm). I am not sure, but suspect that we probably only have the former on the Island.

Fortunately, exact identification is not critical for the foodie. All the *Hericum* species are gourmet class desirable edibles and impossible to confuse with anything else. In many ways an ideal prized edible: consistency and taste of lobster, look appealing, bottle or can well, and can be easily grown on sawdust at home once fresh tissue is found in the forest to use as inoculum. Their only drawback is dental hygiene—



*Ragged gray-to-black haired appearance of *Hericum* on birch in winter. Mark the birch and return next fall.*



Photo: Andrus Voitk

Hericium americanum in wound of birch. Close up of teeth, below. Note variable tooth size.

difficulty cleaning out gritty dirt between all the teeth!

Here is what I have noted about the species:

1. *Hericium* likes the same habitat as chaga, old birch stands, glacial till, conks galore, etc.
2. Like chaga, once you find one, others are usually nearby.
3. They can be seen in winter, even easier than summer. In winter toothies look like orange to grapefruit sized black-green chagas hanging off the dead birch trees, after freeze drying and rotting for weeks or months.
4. They come back in the same place for years.

From these four clues, a plan emerges. First, look for *Hericium* sites where and when you look for chaga. Once you see one, look carefully around. They also fruit on downed wood, so look at the nearby ground under fallen log shadows and peeling bark. Mark the sites on your GPS, and the trees with flagging tape. Return about mid September to late October. Keep an eye on which direction the prevailing windfalls are laying the big sick trees down—the shallow root ball mats can act as giant shade umbrellas if facing the right way on a slope. Pluck or knife the toothies off and gently put in breathable plastic mini-crates that

go in your packsack. Look up: many are high up and may require a light extension pole to pry loose. Have a partner catch them carefully. By travelling quickly and directly from flagging tape to flagging tape a small horde can be amassed to amaze and shock veteran hunters! The toothies will produce for years. What could be simpler?

Do not dry. Eat fresh in stir-fry, chowder, or with wild salmon or trout, or shellfish pasta salads. Parboil and freeze the rest for later, or even better, bottle in oil (OMPHALINA 2(1):7-8).



FEMSJONIA PEZIZIFORMIS

Andrus Voitk, Greg Thorn, Renée Lebeuf, Maria Voitk



Dead birch with florid orange-yellow jelly fungi in January. Against expectations, these turned out to be Femsjonia peziziformis, the same species shown in the title banner in September.



Elias Magnus Fries, L, and the Femsjö manse where he was born. Son of a clergyman, he grew up speaking Latin at home. Photos in the public domain, from the internet.

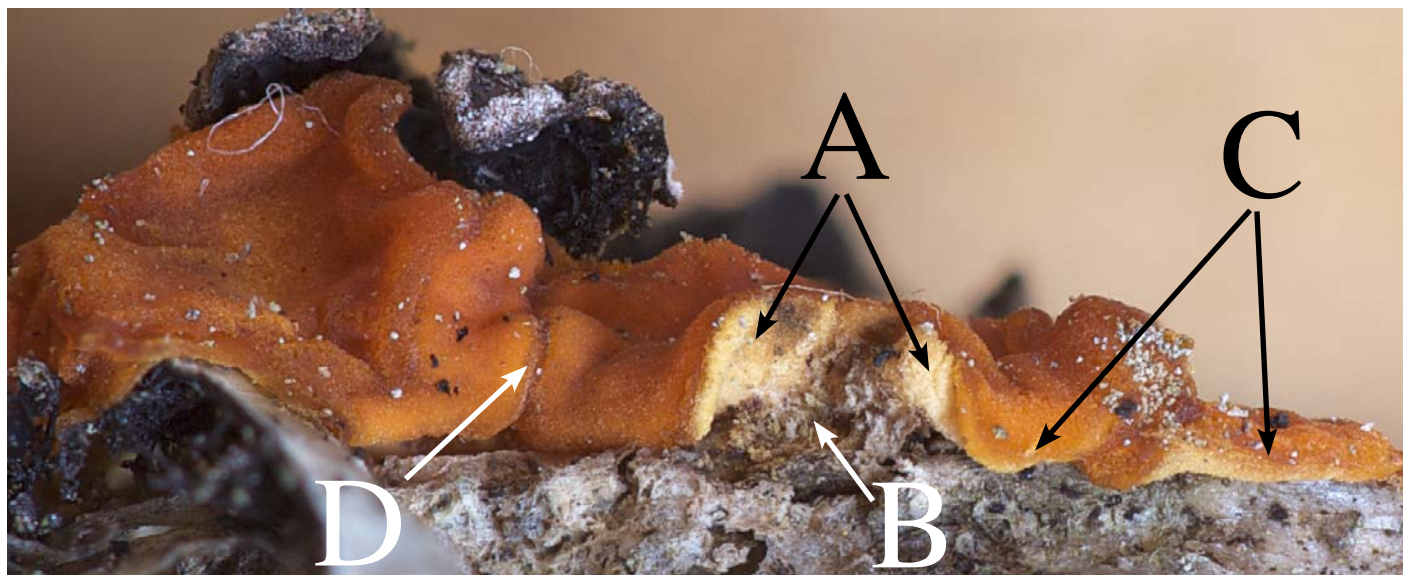


We all know *Femsjonia peziziformis*, a small cup-like basidiomycete growing on dead hardwood. Well, not entirely true. We all do not know *Femsjonia* at all. In fact, very few have even heard of it and fewer less know it. So, do not feel bad, if you are in the same boat—you are with the majority. The species was first described as *Exidia pezizaeformis* in 1848¹ by Joseph-Henri Léveillé, and *Femsjonia luteo-alba* the year after by Elias Magnus Fries². Petter Adolf Karsten concluded that these were synonymous and did not belong in the genus *Exidia*, so he made the new combination of *Femsjonia peziziformis*.³

The genus name is appealing because Femsjö was the birthplace of Fries, the father of Mycological classification. Fem is Swedish for five and sjö is lake, so you can imagine it as a beautiful place in the Swedish countryside, with hills overlooking five blue lakes.

Fries collected this species there and made it the type for a genus he named after his birthplace. When you collect something with that name, it is as if you are personally in contact with one of the greats of mycology. Still, were it not for our forays, most of us should probably never have known a thing about this genus. One of the advantages of being in the chain of people preparing the foray list for publication is meeting every entry, at least in print, an opportunity to look up all interesting, strange or unusual names. This name was looked up in 2008, 2010 and again in 2012. A beautiful, small, yellow jelly cup, combined with the historic name made it memorable. However, note that it is a basidiomycete, not an ascomycete (the usual cup).

Two of us spent much of the 2012-13 winter looking for some other mushrooms on birch, bringing us in



Close up photo of edge of three fruiting bodies, after air drying for 24 hrs and cleaning away bark and lichen. Please note A) the granular white underside, B) a central stem, C) caps free, not adherent to tree bark, and D) caps abut and overlap each other, but remain distinct and are not confluent.

contact with the unexpected other face of *Femsjonina peziziformis*. As mentioned, it is known as a small cup, seen in the title banner, and peziziformis, meaning like a *Peziza* (a cup fungus), reinforces that picture. Instead, Maria found very florid yellow wavy jelly-like excrescences on birch. They resembled very mature *Dacrymyces chrysosperma* (something we have not seen on birch), some species of *Exidia* (*Exidia cartilaginea* is common on our birch and becomes even bigger and wavier, but it is more brownish, not the beautiful orange-yellow of this mushroom), or possibly a flattish *Tremella mesenterica*.

The early or usual *F. peziziformis* is 2-10 mm in diameter, on a central stem with a granular white underside and a whitish finely hairy rim at the edge (Fries' original name, *luteo-alba*, means yellow-white). Superficially, the jelly fungi Maria found seemed like a resupinate, confluent, wavy, gelatinous sheet, adherent

to the wood. However, careful examination showed that the "sheet" was made up of discrete large jelly fungi, so overlapping and intimately abutting each other that they looked like one. Lifting them carefully from the surface showed that they were not adherently resupinate, but large, floppy caps, each arising from a central stem. Finally, an examination of the underside showed it to be granular and white. If wet, the initial appearance was light yellow, but when they dried a bit, the underside was clearly white. The sporeprint was a pretty yellow. Microscopy showed two-spored basidia, clamp connections, and oblong multiseptate (divided into several cells) spores—all fitting *F. peziziformis*.

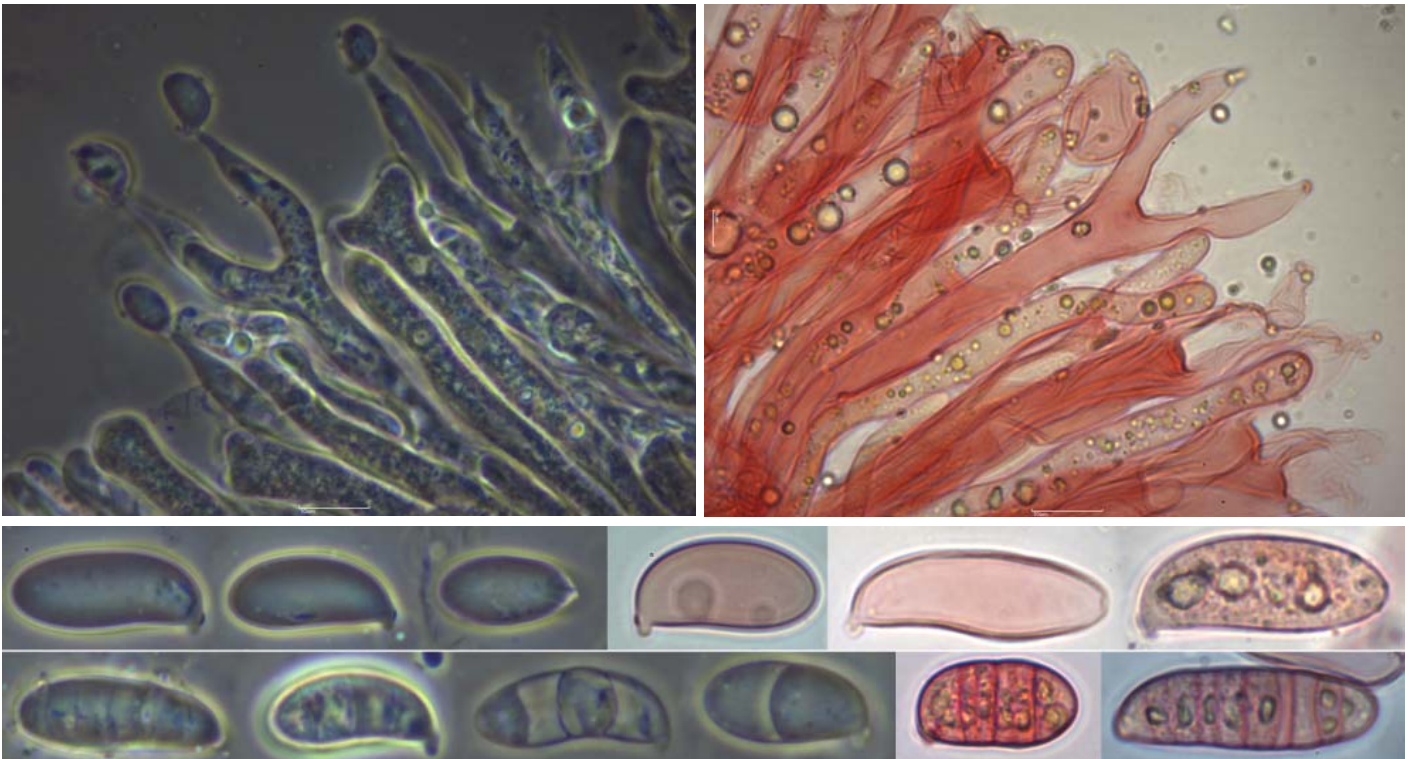
Two species, or extreme forms of the same species? We invite suggestions, opinions, greater insight. Our guess is that the fruiting bodies we encounter during the fall collecting season are immature, giving us the wrong impression of the appearance of this mushroom



ABOVE Pale fruiting body during thaw in March. Feels flabby. Left sided mushroom turned over to show granular lighter underside (it dried white) and central stem. Did not sporulate, and very scant spores recovered from hymenium.

RIGHT Frozen fruiting body during a cold spell in January. On thawing at home, this produced copious spores.





Microscopic morphology. Upper: Two-spored basidia (upper pictures) like tuning forks somewhat mangled by a small child, with a spore at each tine. Lower: Spores like little segmented worms, snout to the ground. Immature, with no septa, on top, septate below. 1-12 cells were seen. The fresh sporeprint had more multiseptate spores than the dried specimen. Size, 21-30x8-10.6 µm.

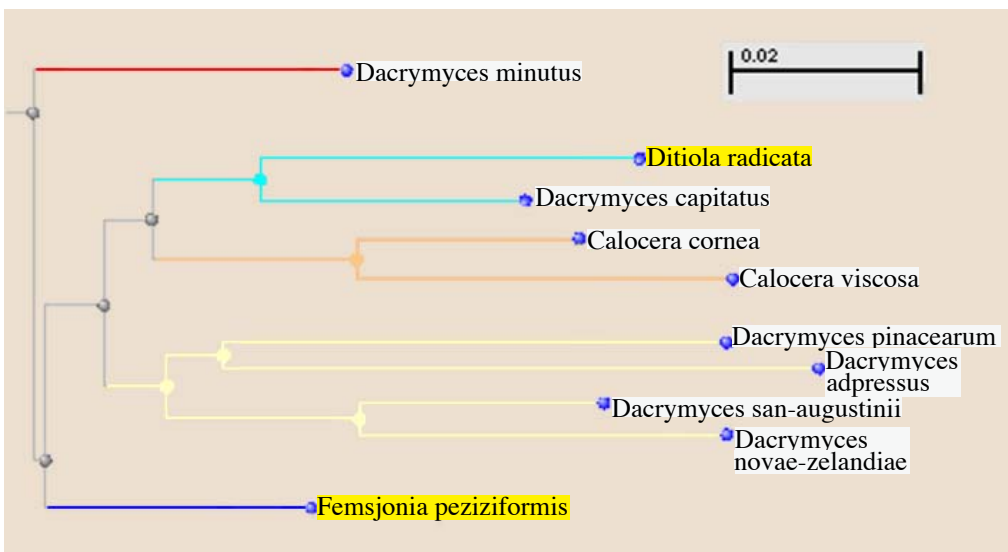
at full maturity. It seems it begins to fruit in cooler weather, and if there is enough moisture, continues to grow into winter, sporulating during thaws. Collections encountered in early January sporulated very abundantly. Very few were seen by March, at which time they were paler in colour, did not look or feel healthy, and yielded very few spores. They are among a large group of psychrophiles, fungi that prefer to sporulate during winter thaws.

Because of similarities with *Ditiola*, the species was recombined as *Ditiola peziziformis*,⁴ but a phylogenetic tree (below) shows it to be quite removed from the type species of *Ditiola*, so for the time being we shall

list it in the genus *Femsjonia*, where Fries² and Karsten³ put it, and await for the rest of the world to join us. Remember, you read it here first.

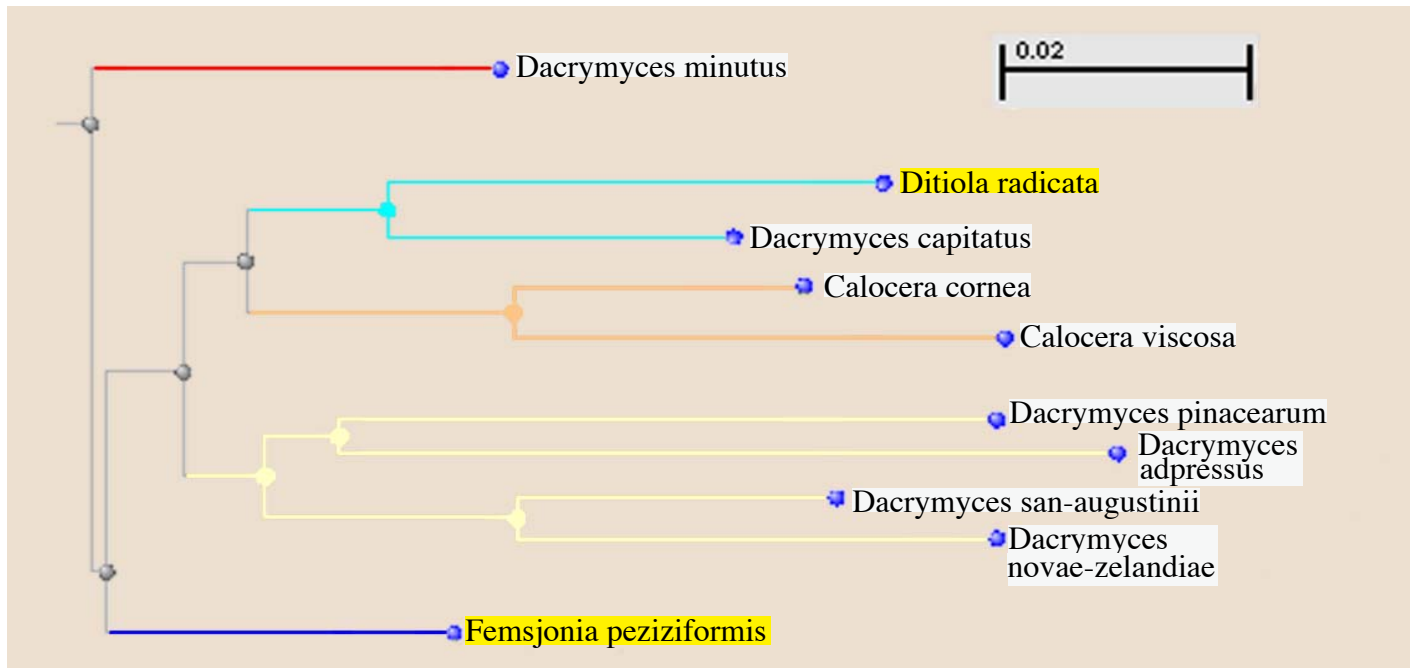
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Clade tree made from selected DNA sequences on deposit at GeneBank. As you see, Femsjonia peziziformis is genetically far removed from Ditiola radicata, the type species for the genus Ditiola. Hence, its recombination to Ditiola probably needs to be reconsidered.

Study this tree and try to interpret it. Then turn the page to compare your interpretation with that of our staff cladologist.



Interpreting a phylogenetic tree

Michele Piercey-Normore

This tree is based on a gene encoding part of the ribosomal RNA for yellow jelly fungi. Its branches are pruned from a larger tree. These ten taxa were chosen because they represent taxa of interest and reflect the overall pattern in the larger tree. Three arguments can be made from the branching pattern in this tree:

1. *Calocera* may be considered a strong genus in this tree because its two species cluster together (tan lineages).
2. *Femsjonia peziziformis* (dark blue lineage) is far removed from *Ditiola radicata* (the type species for the genus *Ditiola*, cyan lineages). Two other genera lie between them (*Dacrymyces* and *Calocera*), suggesting that they belong to very different genera. Members of *Femsjonia* and *Ditiola* have similar hyphal anatomy¹ and have been shown to cluster together with high branch support in other DNA analyses.² These are convincing arguments to place both taxa in the same genus. This tree does not show us if *Femsjonia* species fit better with *Ditiola* but makes it clear that *F. peziziformis* does not fit. Note that *Dacrymyces capitatus*, if correctly identified, could be a *Ditola* (cyan lineages).

3. *Dacrymyces*, reported as a polyphyletic genus before,³ is indeed scattered throughout the tree suggesting it is a weak genus and the morphological features should be reexamined more closely. The four species of *Dacrymyces* on the yellow lineages can be lumped (as they are currently) or split into two groups, depending on features or lifestyle. If the two branches are similar in appearance or lifestyle, lumping them together might be favoured. But if the split fits with lifestyle (e.g. if one arm were mycorrhizal and the other saprotrophic) many taxonomists might argue for a separate mycorrhizal and saprotrophic group. A similar discussion was well illustrated in the last issue.

What did this analysis teach us?

- species of a strong genus always cluster together
- even within the “same” genus a taxonomist may want to lump or split, based on lifestyle, morphology or other considerations.

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THE MAIL BAG

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

Dear Sir,

As a regular reader of your excellent magazine, I discover that I have developed a wide-ranging interest in Mycology. Thus, I send on to you this piece from an unlikely source, the New Yorker of May 20, 2013, about mycelial products designed to do away with Styrofoam.

Kind regards,

John Howse, Calgary.

Dear Mr Howse,

The Editor asked me to reply to your kind letter regarding the evocative article on Ecovate in the New Yorker.

You may be interested to know that in 2011 our Editor wrote a piece in FUNGI about difficulty with foray display trays, and the wish to get away from Styrofoam. At the same time he wrote the people at Ecovate (the firm featured in the New Yorker article) and asked whether they could make mycelial trays for a mushroom club. "How cool is that?" was a memorable quote from his letter. Guess what? His query went unacknowledged and unanswered. According to the New Yorker article, the founders of Ecovate spend their time texting and tweeting each other in the same room, while giving interviews or doing other things. Our antedeluvian Editor wrote in words and sentences, so likely he never got through. A comment on the generational dichotomy.

Thank you for your interest in our journal.

Sincerely,

A Lackey
Junior Associate Gopher (JAG)
Editorial Suites

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