OMPHALINA

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Newsletter of FORAY NEWFOUNDLAND AND LABRADOR

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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.

Webpage: www.nlmushrooms.ca

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

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Please address comments, complaints, contributions to the self-appointed Editor, Andrus Voitk:

seened AT *gmail* DOT *com*,

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COVER

Multiclavula vernalis, above Konrad Brook Pond, Labrador, August 24, 2008. The genus in our province is reviewed and our misidentification, published in the last issue, corrected.

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CONTENT

Message from the Editor

Happy 2017, and welcome to the **Fungarium Issue**, to open our 8th year. Yes, 8th year. Whoda thunk it?

Memories of participants and others involved aside, our Foray Report Issue is the only record of our forays, were it not for the preserved specimens collected—our fungarium. This issue features several stories about unlocking the rich stores of information about fungi that reside inside fungaria.

The first article corrects an error: when I learned that I had misidentified a species in our last issue, I was able to correct it, thanks to having the specimen available for study in our fungarium. From there it was a small step to review all our fungarium collections of this genus, to give you a comparative overview of these relatively uncommon species.

Fungaria, with their preserved records, permit this sort of sleuthing across the world. In the second story we look into a decision about the synonymy of a species that did not seem to fit with our own experience; to settle the question, we follow the popular Detective in the Herbarium to the Swiss Alps for an answer. We were spared the cost of airfare, thanks to the kindness of Philippe Clerc, curator of l'Herbier du Conservatoire et Jardin Botaniques de Genève, who examined the pertinent collections in his fungarium and provided the Detective with a conclusive answer. Admittedly, this is just a bagatelle, a bit of fun: most people can lead a successful life without ever having to bother with the name *Omphalia luteolilacina*—ever. Some may think we should not have, either.

Sleuthing in fungaria not only lets you learn about the fungi kept there, but also about the people who collect them, and their times. Like using atom bombs to dig a harbour, WW II bombers and much more. Tremble at the sight of the wicked terrorist, Bill Pruitt (p. 12), blackballed because he almost single-handedly brought US nuc-e-lar warfare to its knees. I felt strong kinship to the man, another example of ties that bind us. And, of course, specimens kept properly are as useful 50 years later as they were when originally deposited. As a result, once the specimens in the Murray-Pruitt collection are identified, we can compare the lichens of Happy Valley-Goose Bay of 50 years ago to those we collected there this past foray. The authors have promised to keep us posted with installments, as the identification proceeds.

This brings us to our own fungarium. Michael Burzynski, who has been the prime mover and keeper of our collection, writes about its transfer to the Herbarium of Memorial University, Grenfell Campus (SWGC). Before this year is out, we hope to have all our specimens accessioned, making a full database, with photos, available to the mycological community.

This issue closes with a look at a new book about boletes, one of our past faculty, Bill Roody, as coauthor. Which reminds me: we try to run reviews of books that could be useful to you, depending on how deep your mycological interests run. Even after reading a review, sometimes it is difficult to know whether a book would be helpful for any one person. We have a large number of books, including all reviewed in these pages, which are brought to each foray. If you wonder about a book—or would just like to see some of them—come to the identification lab next foray and look them over. This should help you decide whether to buy or not.

We sign off with some of Glynn Bishop's aquarelle sketches. Thank you to the many correspondents, who wrote to praise Marian's **Foray Report Issue**. Seemed a bit much to print so much praise in one place, so, ever coy, we did not, but that does not mean we do not appreciate it. Even more, we appreciate contributions. Sincere thanks to those who sent material for this issue.

Happy mushrooming!

ERRATUM!

Multiclavula of NL

Andrus Voitk

Photo: Roger Smith

In addition to active Foray Newfoundland & Labrador members, each issue of OMPHALINA is sent to past faculty in appreciation of their help. This courtesy has proven valuable over the years, enabling past faculty members to continue contributing after their tour of duty is over. Consider this e-mail from Teuvo Ahti, in response to an article in our last issue, describing a collection of putative *Multiclavula mucida*.[1]

*My guess, based on your photo, is that your "*Multiclavula mucida*" might be* Multiclavula corynoides *instead. My colleague Tea von Bonsdorff supports this identification.* M. mucida *normally grows on wet rotten wood in shady forests, whereas* M. corynoides *typically grows on damp, exposed, sandy, roadside soil.*

No use keeping you in suspense: Teuvo is right, of course.

Figure 1. *Reproduction from Internet of* Clavaria fragilis, *as illustrated in Holmskiold's book. Lack of wood substrate excludes* M. mucida. *Colour and shape exclude* M. vernalis, *but fit* M. corynoides, *for which it may be an earlier name, awaiting transfer. Compare to Figure 4.*

Erroneously, I thought that *M. corynoides* was a western North American species—information I picked up somewhere some years ago, when writing about the other two[2]—and therefore dismissed it as a possible candidate. Had I checked a bit more thoroughly at the time, I should have learned that *M. corynoides* was first described from the Adirondack Mountains,[3] thus very much an eastern species. In fact, current thinking is that it is even more eastern, with the first description coming from Denmark by Holmskiold in 1790, as *Clavaria fragilis*.[4] This is interesting, because for some reason the common *Multiclavula* species in Denmark seems to be *M. vernalis*, but Holmskiold's illustration (Figure 1) leaves no doubt that he did not describe the commoner taxon. Note the similarity of Figure 1 to the photo of *M. corynoides* in the title banner.

Microscopic examination supported Teuvo's identification (Figures 2, 3). Both *M. mucida* and *M. corynoides* have short, squat basidia with 4–6 short sterigmata, but the spores of the latter are longer, as was the case here (8.1 × 3.2 µm, 37 spores, 3

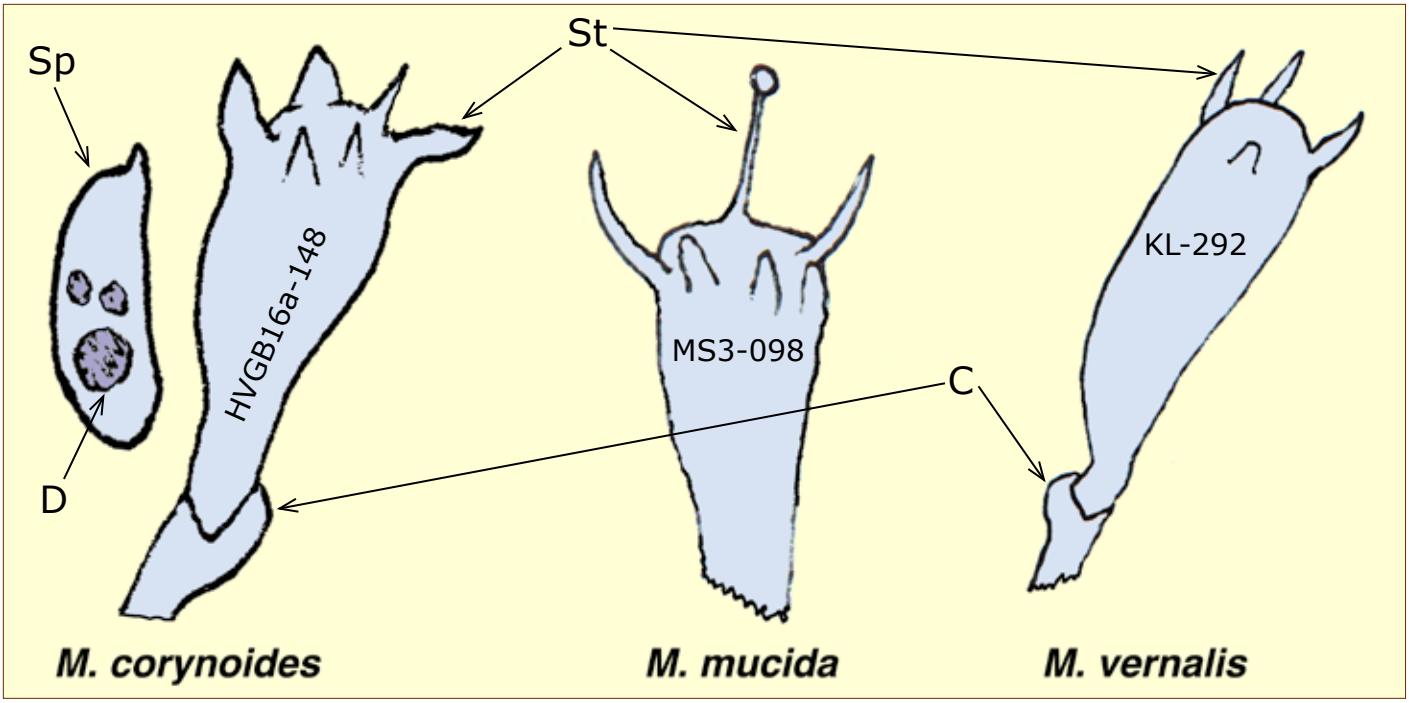

Figure 2. *Microscopic appearance of the basidia of our three* Multiclavula *species (not to scale). Sterigmata, the spore-bearing projections (St) numbered 4–6 for two species. Basal clamp connections (C). The number of basidia with sterigmata was very low, only 1–3 per species. Sausage-shaped (allantoid) spore (Sp) with droplets (D) shown for* M. corynoides*; others differ in size only (Figure 3). Numbers are our collection numbers.*

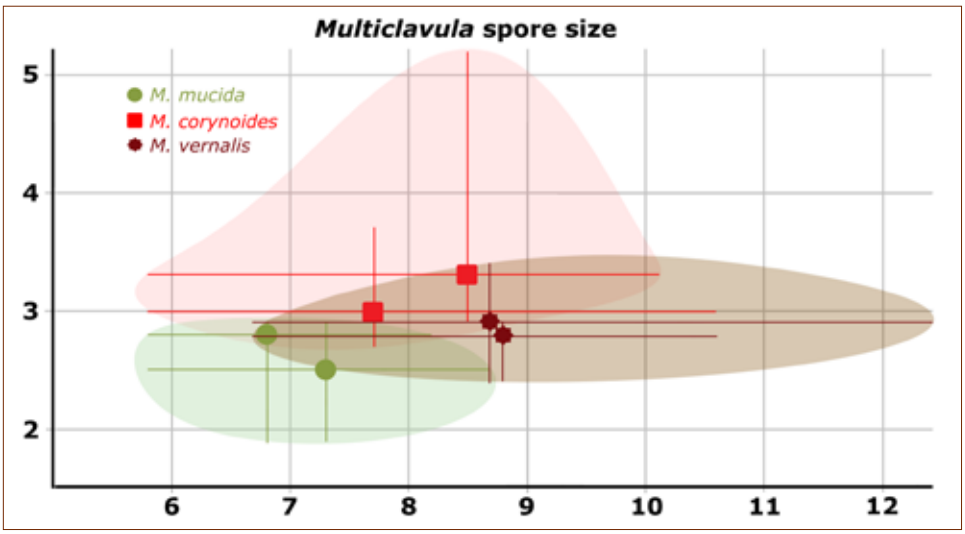

Figure 3. *Average spore size and range, as measured from our three species, two collections each. For an accurate average, usually at least 20 spores are needed. Spores were so few, that several sporocarps per collection had to be examined to get that number. There is sufficient overlap, so that a single measurement, possibly even several of a single specimen, may not distinguish them. Fortunately, the differences in substrate and macroscopic appearance are so distinct that microscopy is not required for identification.*

sporocarps, 2 collections). Spores were rather scarce, necessitating several examinations to measure enough for a reliable average size. Basidia with sterigmata were even less evident. Scanning hymenial samples from three sporocarps, I found only three basidia with fully developed and inflated sterigmata, one with 4, one with 5, and one with 6. The other two species were no better in this regard (see captions to Figures 2 & 3). Most basidiomycetes have 4-spored basidia. "Supernumerary" sterigmata is a character of chanterelles, so it is not entirely surprising to learn that genus *Multiclavula* belongs in Cantharellales, the same order where chanterelles belong.

The genus *Multiclavula* was erected by Ron Petersen in 1967 for about a dozen similar species associated with alga, moss or liverworts.[5] Chanterelles, of course, are mycorrhizal, so that photobiont partnership is another similarity common to members of that order.

The foray brings in many collections in a short time, so that identification time is at a premium. Triage—signing off those you think you know, to get them out of the way—may introduce errors, if you mistake similar species, as I did this time. Would we have discovered our error? In this particular case, yes, because Greg Thorn had enough doubts about the identity of these collections that he took some home for sequencing. His molecular

Figure 4. Multiclavula corynoides. *See also title banner. Seemed to be quite common in the HVGB region. Look very much like* M. mucida, *but fruit on wet silt and sand, particularly along roadsides. The substrate difference is so obvious (once you know its importance) that no key or further examination is required to differentiate between the two. Micromorphology of its lichen thallus described and illustrated in the previous issue.*[1]

Figure 5. Multiclavula mucida. *Most common in North America, but not in our province, where it has been reported only from central NL. Described from Europe in 1797.*[6] *Fruit in sheltered woods on moist dead wood, usually poplar, but reported also from coniferous wood. The wood is always covered with a heavy mat of lichen thallus, microscopically similar to that described for* M. cornyoides in the last issue.[1]

Figure 6. Multiclavula vernalis. *So far only found in NL on wet pioneer soil in the northern Labrador subtundra region; in Europe relatively common in lower peatlands. Described from North Carolina in 1882.*[7] *Differ from the other two by their orange hymenium, clearly distinct from the stem, shorter stature, and a thickened, furrowed apex (see also title banner). Thallus seems less dense than for others, but is otherwise microscopically similar.*

studies would have alerted us. Most of the time, though, once identified, species are not re-examined unless they are involved in a later study. The value of keeping specimens—a fungarium—is exactly to have them available for precision by such studies—or even for such reexaminations as this.

This delightful discovery brings to three the species of *Multiclavula* we have identified in our province: *M. corynoides*, *M. mucida*, and *M. vernalis* (Figures 4–6). As you see, sequencing, microscopy, or even a formal key, are not required to tell our three apart. Of the two thin ones, one grows on wood and the other on silicate soil. The third grows on wet soil, is stockier and has a furrowed, yellow-orange hymenium, distinct from the stem. This simplicity of identification may not hold for regions of greater multiclavular diversity.

It is possible that not everything identified with these names the world over is genetically conspecific, and some of the three species may have some regional genetic variation. Should we get time to look into it, and find something of interest, we shall keep you posted.

Acknowledgments

Above all, I thank the sharp eyes of Teuvo Ahti for setting me on the right path. I thank Teuvo, Ron Petersen and Greg Thorn for reviewing the MS: Ron admitted that he had also come to the same conclusion as Teuvo, and Greg had enough doubts to take samples for molecular confirmation.

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Detective in the herbarium: *Omphalia luteolilacina*

Andrus Voitk
Greg Thorn

In the course of studies of the genus *Lichenomphalia*, we came across the taxon *Omphalia luteolilacina*.[1] The epithet (lutus = yellow, lila = lilac) immediately brought to mind the great mimic, *Lichenomphalia umbellifera*, with its cap of various yellowish shades and stem with slight purplish tinges (title banner). Therefore, we were surprised to learn that the species had been synonymized with *L. hudsoniana*,[2, 3] a species with a more pure yellow cap, but whose stem, in our recollection, was invariably white, with no hint of lilac. Time to put on the deerstalker cap of Sherlock Holmes, for another episode of the Detective in the herbarium series.[4] Since there is no manual for herbarial detection, as there is for the private kind (Clovis Anderson: The principles of private detection, used to great effect by Mma Precious Ramotswe, founder of the No 1 Ladies' Detective Agency), we set down the seven steps for successful resolution of this case, as a guide for budding herbarial detectives.

Step 1: Review the original description to get an idea of what is meant by "lilac". **Result**: Stems described "lilacin pâle hyaline quand imbu, blanc pur par le sec". If your French is rusty, a version in German is available, but language is rendered immaterial by a delightful aquarelle by Favre's wife that shows the delicate lilac hues very clearly (Figure 1). Unfortunately, no mention or image of an associated lichen thallus (vide infra).

Step 2: Review our collections of *L. hudsoniana* for comparison. **Result**: Stems white; the faintest hint of lilac hue may be construed for two of 26 visible stems if your imagination runs on rocket fuel (Figure 2).

Step 3: Review our collections of the much more common *L. umbellifera*. **Result**: Most collections have stems with lilac tones, very obvious in many (Figure 2).

Step 4: Review reports of the original synonymization of *Omphalia luteolilacina* with *Botrydina viridis* The current *L. hudsoniana*).[2] **Result**: Authors state that North American fruit bodies have white stems, while European ones are often lilac. Sounds good, but, same authors do not list Favre's type specimens of *O. luteolilacina* among collections studied.

Step 5: Review Internet images of *L. hudsoniana*.

Figure 1. Aquarelle of Omphalia luteolilacina *by Mme Favre. Note the orange-yellow cap, white when dry (right), and the light lilac hues of the stem when moist, also drying white. Lichen thallus not illustrated.*

Figure 2. All our 15 photographed collections of Lichenomphalia hudsoniana, *above, and selected photographs from our much more numerous* L. umbellifera *collections, below. The* Coriscium *type of leafy thallus of* L. hudsoniana *is readily apparent on every image. The small green granules of* L. umbellifera *lichen thallus are not seen at this magnification, better evident as a green mat on the title banner photo. Photos: Roger Smith, Aare Voitk, Maria Voitk, AV.*

Result: None found with convincingly lilac stems.

Step 6: Review descriptions and photos in European books. **Result**: Fungi of Switzerland[5] mentions lilac stems; photo shows only white stems. Arctic and Alpine Fungi[6] mentions lilac stems; photo shows stem with a faint suggestion of lilac.

Up to this point, no incontrovertible conclusions can be drawn. An impression that the epithet might fit better with *L. umbellifera* is only that—an impression, and quite remote from certainty. However, there is one step that might resolve the question without room for doubt. *L. hudsoniana* is the only *Lichenomphalia* species with a leafy, or *Coriscium*, type lichen thallus. The thallus (fungus-alga structure) of all other *Lichenomphalia* species consists of green *Botrydina* type granules on the ground around the base of the stem, as seen in the title banner. Therefore, examination of the type specimen may settle the issue completely. If there is no substrate with the specimen, no lichen thallus will be seen, and our present state of uncertainty remains unaltered. If there is substrate but no *Coriscium* is seen, it suggests rather strongly, but does not prove, that the type is likely not *L. hudsoniana*. But if there is substrate with visible *Coriscium*, then the type species must be *L. hudsoniana*, settling the matter.

Step 7: Review type specimens. **Result**: There were three specimens labeled TYPUS in l'Herbier du Conservatoire et Jardin Botaniques de Genève (G). Two of these were mentioned in Favre's protologue (first description). Because he did not declare either a holotype, taxonomically both are syntypes. However, there is a note on the 1943 collection that Heinz Clémençon declared it the lectotype for the species in 1981. A lectotype is the official name-bearing collection to which all scientists may turn as the representative for the species. Clémençon's choice was likely made on the grounds that this was the first collection of the two, had the most fruit bodies, and also was the one from which Mme Favre had made her charming aquarelle, showing the delicate lilac of the stem. Examination of the substrate at the base of the fruit bodies of this type collection revealed the presence of leafy lichen thallus of the *Coriscium* type—also seen on the other two collections labelled TYPUS.

Case closed.

Because *L. hudsoniana* is the only species of *Lichenomphalia* with a *Coriscium* type thallus, *Omphalia luteolilacina* must be the same species as *Lichenomphalia hudsoniana*. The synonymization was made correctly on the basis of available evidence. Clearly, the white stem of this species has a lilac tint at times, more evident in Europe than North America. There is no other possibility.

Or is there? Well, yes. *L. hudsoniana* could represent a complex of two or more cryptic species, for the moment known by the one name. How likely is this? Probably not very, because molecular analysis has already shown that the species is monophyletic.[7] But is it possible? Theoretically, yes, because the number of specimens analyzed is small, most from Alaska, and none from the Swiss Alps, toporegion for *O. luteolilacina*. Conceivably, sequencing of Favre's type specimens, or fresh collections from the toporegion might uncover some unsuspected relationships. Although possible, such investigations seem to us more characteristic of literary characters like Don Quixote, maybe even the good soldier Švejk. Both admirable idealists, but neither as a good a role model for us detectives, as our idols Sherlock Holmes or Mma Precious Ramotswe. Parenthetically, if you have not read of the exploits of the latter, your life is unfulfilled.

Acknowledgments

We thank Philippe Clerc, curator at G, for examining and reporting on the status of *Coriscium* of the type specimens.

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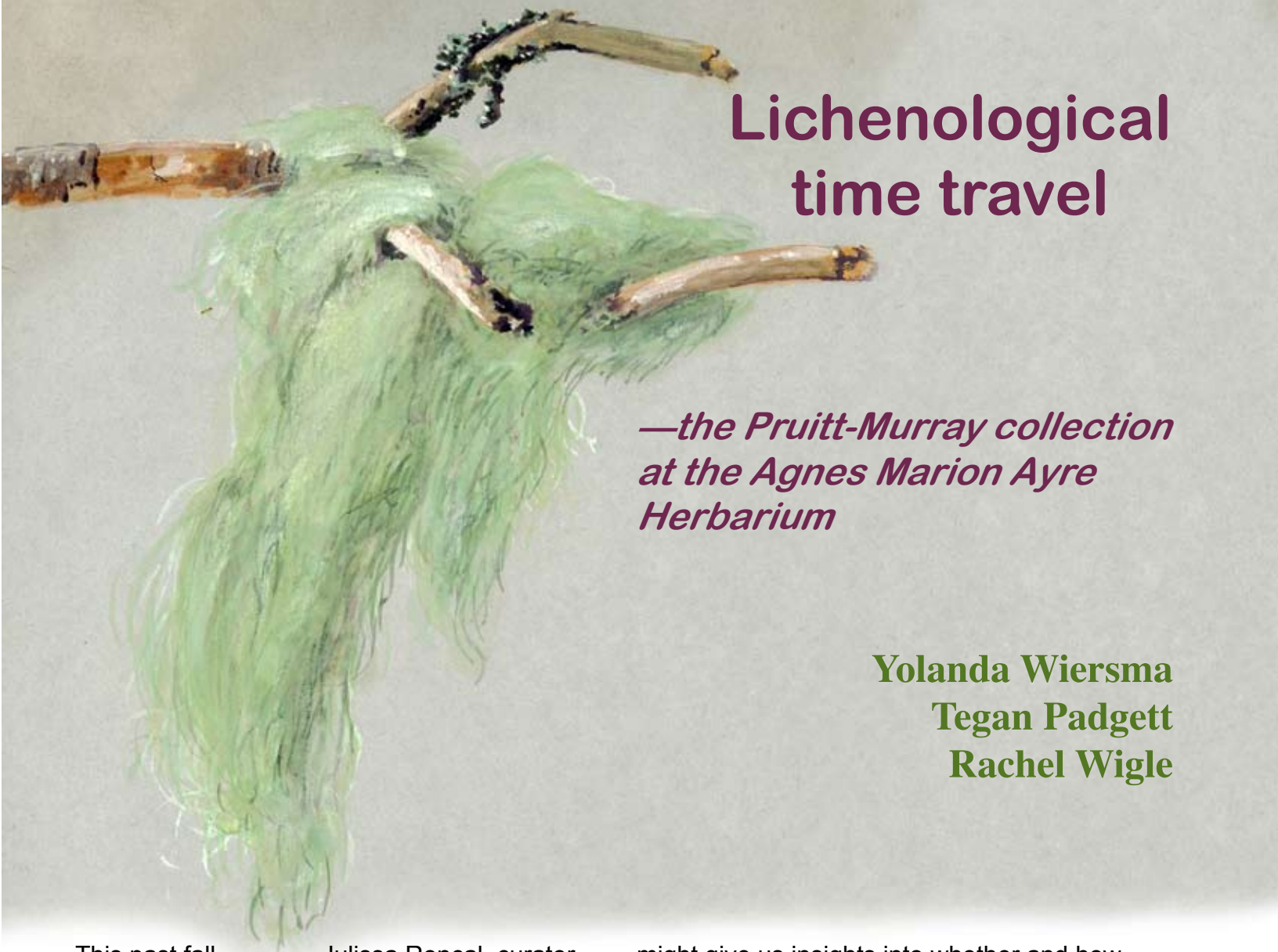

Lichenological time travel

—the Pruitt-Murray collection at the Agnes Marion Ayre Herbarium

Yolanda Wiersma
Tegan Padgett
Rachel Wigle

This past fall, Julissa Roncal, curator of the Agnes Marion Ayre Herbarium (Index Herbariorum code NFLD) here at Memorial University asked our lab group to take a look at three boxes of lichen specimens. These were neatly labelled with dates, locations and collector information but no species identification (Fig. 1). She wanted to have the specimens identified, which presented a challenge for three people still relatively new to lichenology. But as it also seemed like a good learning opportunity, we agreed to give it a try (Fig. 2).

The specimens were collected by two people, W.O. Pruitt (Figure 3) and D.F. Murray (Figure 4), in 1967. A large number of them were collected from Labrador, and given that the most recent Foray was held there, this seemed somewhat interesting—how would the lichen population half a century ago compare to that seen last fall? These historical specimens might give us insights into whether and how lichen diversity had changed in province. We quickly realized that Pruitt and Murray were not lichenologists, because some of the unidentified specimens were quite common and easy, even for beginners like us, to identify. We became curious about who these people might be and what they were doing in Labrador half a century ago.

Some internet sleuthing led us to the obituary of William (Bill) O. Pruitt. He died in 2009 in Winnipeg, and was described as a “Senior Scholar in the Department of Biological Sciences at the University of Manitoba”. His lengthy and laudatory obituary also spoke to an interesting character committed to the natural world. After completing his PhD, he was hired as a field biologist at the University of Alaska-Fairbanks, where, in the 1950s, he and two colleagues were asked by the US Atomic Energy Commission to comment on a project

Figure 1. *Box and specimens from the Pruitt-Murray collection (photo by Travis Heckford).*

Figure 2. *Authors identifying specimens from the Pruitt-Murray collection. L to R: Rachel Wigle, Yolanda Wiersma and Tegan Padgett from the Landscape Ecology and Spatial Analysis Lab, Department of Biology, Memorial University, St. John's, and Julissa Roncal, curator of NFLD (photo by Travis Heckford).*

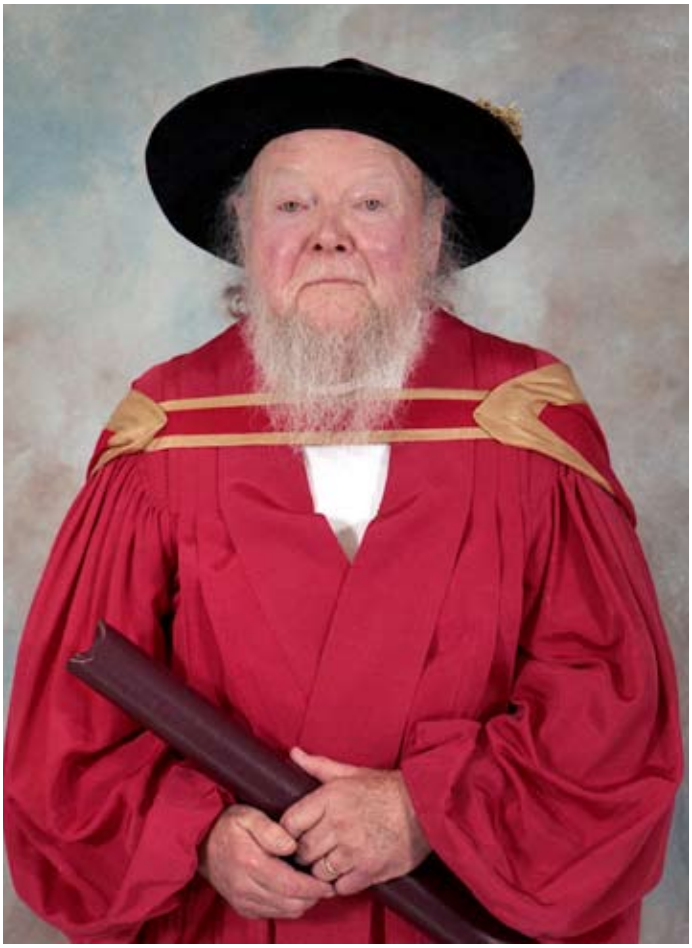

***Figure 3**. Bill Pruitt on the occasion of receiving an Honorary Doctor of Science degree from Memorial University in 2001 (photo courtesy of MUN Gazette)*

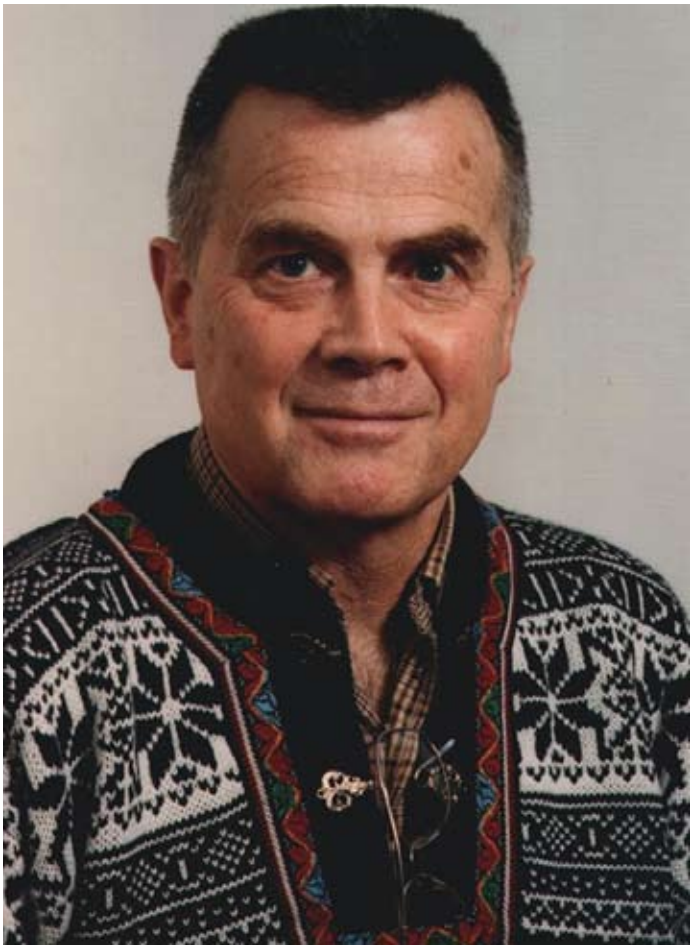

***Figure 4**. Dave Murray during his time at the Centre for Advanced Study (CAS), Oslo, Norway in 1998/1999 (photo courtesy of CAS).*

that proposed to detonate six nuclear explosions along the coast of Alaska to create a deep water harbour for future mineral extraction. Their research suggested that using nuclear devices to this end was, to put it simply, a bad idea, and they refused to condone the project. Given that this was the height of the Cold War, one can imagine that frowning on the use of nuclear technology for (presumably) good ends was not welcome. The University censored the report of Pruitt and colleagues to the AEC (so much for academic freedom), and modified or removed parts of their conclusions. None of their contracts were renewed. Pruitt discovered that he'd been black-listed, and no university in the United States would hire him. Thus, in 1965 he decamped for the Island of Newfoundland and took up a post as a professor of mammalogy in the Biology department at Memorial University. His obituary mentions that he was admired by students at Memorial and was involved in helping to define the boundaries of Gros Morne National Park, but there was no mention of any lichen-collecting expeditions to Labrador. He moved to the University of Manitoba in 1969.

More sleuthing led us to discover that David F. Murray is currently Curator Emeritus at the Herbarium of the University of Alaska-Fairbanks. His online CV filled in a few connections—he was a professor of Botany and Curator of the Herbarium at Memorial University from 1966-1969. An e-mail to Dr. Murray filled in the rest of the blanks. He explained that Bill Pruitt had been his professor at Alaska-Fairbanks when he was an MSc student. On completion of his PhD, Bill encouraged him to apply for a job at Memorial, which he did and got. Pruitt somehow arranged the Labrador trip in 1967, which Dr. Murray described as follows:

"We took the Forest Service PBY to Goose Bay, spent the night at a little cabin, botanized the

next day, and flew back to St. John's. A brief trip but a wonderful look at landscapes I would not otherwise have seen." Dr. Murray seemed pretty surprised and pleased to hear that the three of us were looking at his 50-year old specimens, and we are just as excited to see what we might discover.

We plan to describe some of the lichens from the Pruitt-Murray collection in coming issues of Omphalina, a few at a time, comparing them to the collections of the 2016 Foray around Happy Valley-Goose Bay. Meanwhile, Figure 5 is meant for those of you who wonder what a "Forest Service PBY" is. The more curious can see a restored aircraft at the Aviation Museum, beside the Trans Canada Highway in Gander. Finally, those of you interested in more history are strongly urged to read John Maunder's short biography of Agnes Marion Ayre, to learn why NFLD (our herbarium) bears her name.[1] The title banner shows Ayre's aquarelle of old man's beard, permission from the Agnes Marion Ayre Herbarium Collection, Archives and Special Collections, Memorial University Libraries.

Reference

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***Figure 5**. NL Forest Service PBY on display in Goose Bay. These aircraft, built as waterboats during WW II, were the most successful bombers used by the Allies. After the war landing gear was added to make them amphibian and they were used for many civilian purposes, including a very successful role as water bombers by various forest services. A few are still in operation. PBY stands for Patrol Bomber Consolidated, to indicate that it was manufactured by the Consolidated Aircraft Corporation. You may think that C might be a more appropriate code letter for Consolidated than Y, but C was already taken as the code for Curtiss Aeroplane and Motor Company, so Consolidated was assigned Y. Not unlike lichens and other fungi, where each species epithet is unique for one organism, and cannot be used by another in the same genus, even if it results in somewhat inappropriate names (photo courtesy of Tom Clenche).*

Our fungarium finds a home

(Did you know we had a fungarium?)

Michael Burzynski

Anne with the 2016 collection—our 13th year of collecting—sorted and alphabetized, in our living room.

Perhaps you've seen the driers and smelled the specimens during a foray, and wondered what was going on. For years, we have been amassing a collection of preserved fungi that increases with each foray. These specimens are not just vouchers that prove that we have collected particular species—they are valuable resources that are being used by researchers from around the world to sort out genetic and evolutionary relationships between species

Our collections are in constant and active use. To date we have four peer-reviewed scientific publications, authored by FNL members in cooperation with other investigators, based on our material. Another two are in the late stages of the review process and more than a dozen projects are moving along in various earlier stages. In addition, many studies using our collections have been published by scientists who have requested our material for their work. Each year we spend almost $500 on postage to mail specimens around the world—so even Canada Post benefits from FNL activities!

Our first foray, in 2003, was the only year that we did not preserve identified specimens for future examination. Ever since then we have dried up to 1,000 specimens per event, and they form our collection of fungus and lichen specimens—our fungarium. We now have almost 11,000 specimens, representing more than 1,500 species. We keep

"Fungarium" is a place where fungal collections are archived and studied, while "herbarium" is a place for plant collections; the latter term is often used as a synonym for fungarium, or to indicate a place that contains an aggregate of herbaria, fungaria, and other non-zoological systematic natural history collections. Museums of natural history contain zoological and non-zoological collections.

multiple specimens of each species because we try to build a representative collection for each foray location. Also, over the years we have found that molecular study of a group often uncovers several species hiding under one name; these would have remained undetected, had we kept only one representative specimen for the "species".

Each dried identified specimen is kept with its data card in a sealed plastic bag. The data card contains all of the information that we have about the specimen: its scientific name, its collection number, its photograph number, who collected it, where, when, and notes about the soil conditions and nearby plants—information that is useful for identifying the specimen and re-locating where it grew. Until now, the bags of dried specimens have been stored in plastic bins kept in a cool, dry location.

In order to find an institution to house the collection, we knew that we had to upgrade the specimen information. Before 2007, we did not use collection numbers to identify individual specimens, but as the collection grew it became obvious that we needed a way to link each specimen clearly to its entry in the database. Over the last couple of years, Anne and I have added collection numbers to each data card, and to corresponding entries in the database.

We were also lax in describing collection sites, sometimes just using a number, an abbreviation, or a local name to represent a trail. To make our database more scientifically valuable, I have been working with Chris Deduke, who has volunteered to standardize collection site names and other collection information and to add geographic coordinates to our databases for the thousands of collections made 2004-2014.

Since he took on the job of our webmaster, Jim Cornish has done a fantastic job maintaining a Flickr site of our mushroom photographs. You can visit it through our website <nlmushrooms.ca>. Unfortunately, it is difficult to link the photographs to our collection data. Now, Andy Miller (member of our faculty in 2015) and his team are incorporating our photos and data into Mycology Collections Portal (MyCoPortal), a digital compendium recording data from all collections in participating North American fungaria. These data can be searched, viewed, read

Above: *Specimen bag with duly filled out collecting slip (data card). Microscopic findings or other comments are put on the back. All the data from there has been copied to the database, and is available with the electronic record for the collection. Geographic coordinates are added.*

Below: *New fungarium box on the left and old specimen bin on the right. In order to maximize use of fungarium space, specimen bags are arranged in three rows on their side. Specimens in larger bags required re-bagging to fit. Tedious and time consuming, but the result is that we have space in reserve for several years.*

Above: *Andrus, Maria and Anne doing various chores involved with the acquisition of the FNL collections by SWGC. Freezing the collections in large closed bags prevents absorption of moisture by the dried specimens during the thawing process.*

Below: *Dmitry, the author, Katherine and Michele looking at some filed specimens. Katherine is an example of the advantage of doing this in a university: curious students pass by and some volunteer to help.*

and displayed on maps by researchers and interested amateurs. As we update our databases we send them to MyCoPortal along with Roger Smith's specimen photographs for those years. Selecting any of our collections will enable you to click a thumbnail or an icon to view the image of that collection. You can visit the site at <mycoportal.org>.

For many years the growing fungarium was housed in my office at Gros Morne National Park. When I could not fit into my office any longer, the collection was transferred to our home, while we searched for an institution that could provide proper quarters for this important resource. By the time that we had accumulated more than 50 boxes of specimens, the collection was pushing Anne and me out of our house. In 2013, Wildlife Division (Dep't of Environment and Climate Change) in Corner Brook generously agreed to store our fungarium in their lab in Corner Brook while our house was being renovated.

In 2012, Grenfell Campus, Memorial University of Newfoundland, expanded its science building, and added a generous new herbarium room to house the existing plant collections. Because of past and present involvement of some Grenfell students and staff, Grenfell's mandate for community involvement, and the scientific value of our collection, the University graciously agreed that curating the FNL collection was a natural fit for its herbarium.

Spearheaded by Dmitry Sveshnikov, the Grenfell herbarium was restructured to conform to the requirements of Index Herbariorum—an international registry of herbaria—and Henry Mann designed a beautiful logo for the new herbarium (title banner). All registered herbaria are assigned a code, and because G was already taken by l'Herbier du Conservatoire et Jardin Botaniques de Genève (the Geneva Herbarium), Grenfell's is now known internationally as SWGC, a fitting tribute to the nominate history of the institution.

The fact that the Grenfell herbarium is registered with Index Herbariorum is important, because

it means that it conforms to internationally accepted standards, and also shows that it is a serious institution. Herbaria lend their specimens to other herbaria, not to private individuals, and most herbaria only lend collections to properly accredited herbaria. Therefore, if researchers at Grenfell want to request specimens, especially valuable type material (the actual specimen used to describe a species), Index Herbariorum registry is essential. Also, when one publishes studies involving collections, a reference to those collections is required, so that others can find and study the same material. To be accessible, those specimens must be housed in public accredited herbaria.

After a few problems were solved, the Grenfell plant collection was moved into its new quarters, and the original space was made available for our fungarium. In the interim, our board member, lichenologist Michele Piercey-Normore, moved to Grenfell Campus as Dean of the School of Science and the Environment. Among her many responsibilities is the welfare of Herbarium SWGC, housing our fungarium.

With help from Michele and Dmitry, Andrus Voitk, Maria Voitk, Anne Marceau, Katherine Flores, and I have spent several days examining, re-bagging, and correcting the data cards of thousands of dried fungal specimens so that they will fit the new herbarium boxes. Once ready, the boxes of specimens are frozen for a week to kill insects and fungi that might damage the specimens. Then they are slid into shelves in steel herbarium cabinets for long-term protection. Over the next months we will add the remainder of the FNL fungarium to this facility.

This whole process begins with you. As a foray participant, the specimens that you find and collect in the field and those yellow datacards that you fill out are the reason for all this activity. Those little bags of dried tissue and the information on the cards are the tangible scientific treasure won with each foray. We are slowly shifting the FNL fungarium to a more professional and permanent home, thus making our data more complete and collections more widely available. I would like to take this opportunity to thank everyone involved, and to encourage you to join us again for the next treasure hunt!

Above: *Michele checking progress, while on a break from the Dean's Office.*

Below: *Appearance of the final product—specimens neatly boxed in herbarium cabinets. Bins atop the cabinets (and elsewhere) are waiting their turn.*

Book review

Andrus Voitk

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ISBN 978-0-8156-3482-8
528 pp
2016

At time of writing, new paperback volumes available under CAD 75.00, incl. shipping, from Amazon.ca

BOLETES OF EASTERN NORTH AMERICA

Alan E. Bessette, William C. Roody, Arleen R. Bessette

Much has happened in mycology since North American Boletes by Bessette, Roody and Bessette, describing over 300 species, was published in 2000, so even after only 16 years an update is welcome. Boletes of eastern North America, limited to the eastern half of the continent, describes more than 200 species. In 13 years of forays—with good help, including one of the authors, Bill Roody, for two of those years—we have identified under 50 bolete species. To identify 50 from a field of 200, for us keys remain key. The Bessettes have a large key experience, ranging from a book mostly made up of keys to one with none, so that even though I have not had a chance to try them yet (it's 24 below as I write) they should work well—after all, they certainly worked like a charm in the previous bolete book. Ignore the keys and try picture-matching at your own peril. I did, when I identified *Boletus bicolor*, and put it in my own book—a species that I now know does not grow in this province. At all. O, opprobrium!

Field keys depend on macroscopic characters and habitat-ecology. In the simple introductory part, the authors advise the reader to key out some familiar species, just to get the feel. Keys begin with the (usually) readily evident stem characters (ring, net, gland, scaber, or no/other decoration), and go on from there. Very similar species are left as a cluster of 2–4, so you can determine the species you have by comparing it directly to their descriptions.

Descriptions begin with the scientific name, common name, authors and synonyms. Scientific names are translated or explained. Thus we learn that *Boletus frostii* was named for Charles Frost, who, in turn, dedicated *Aureoboletus roxanae* to his wife, Roxanna; Charles Peck named *Boletus gertrudiae* for Gertrude Wells, a New England painter and naturalist; and *Boletus roodyi* was named for one of the authors. Photos are informative, often several to illustrate the spectrum. Descriptions are complete and understandable, giving details of the mushroom, its habitat, distribution, commonness, edibility, and a discussion of lookalikes. The book is not technical, but does give pertinent microscopic findings for each species. All in all, a satisfyingly complete and competent account of the subject matter.

Not surprisingly, in the DNA era problems, both assumed and real, come in the area of the ever-changing taxonomy. Phylogenetic analysis since 2000 has revealed many new groupings among fungi. The first book had 17 genera of boletes for the continent, whereas this one, covering only half the continent, has 40. Introducing several new genera with very few species each may seem to make things cumbersome, but compared to the gilled agarics, the number of bolete genera is still small: the sooner we get used to them, the better. Sure, we may carp that names like *Boletus*, *Boletellus*, *Boletinellus*, represent a purposeful plot to confuse us—but this is a question for the scientists, not the authors. At times we may wonder where the line is between useful phylogenetic distance and indiscriminate generic noise—again, a question beyond the control of the authors. Taxonomy is a tool designed to help scientist and mycophile alike. If the tool does not serve its purpose, it will alter with time and use. Most of these genera seem here to stay, so the best policy is to try to accommodate to them. The Index helps the transition, listing specific epithets independently; you can look up taxa by either genus or species name.

The real taxonomic problem lies with the inability of authors to predict the future. Somebody told me that publishing a mushroom book these days is a mug's game, because no sooner has the printer's ink dried, but species concepts and names change. Nothing illustrates that better than this book. Almost the same day that it rolled off the press, the preliminary publication of a global review of the large genus *Suillus* appeared.[1] Many of the names that we have used for years for species of *Suillus* turned out invalid in North America. Two examples:

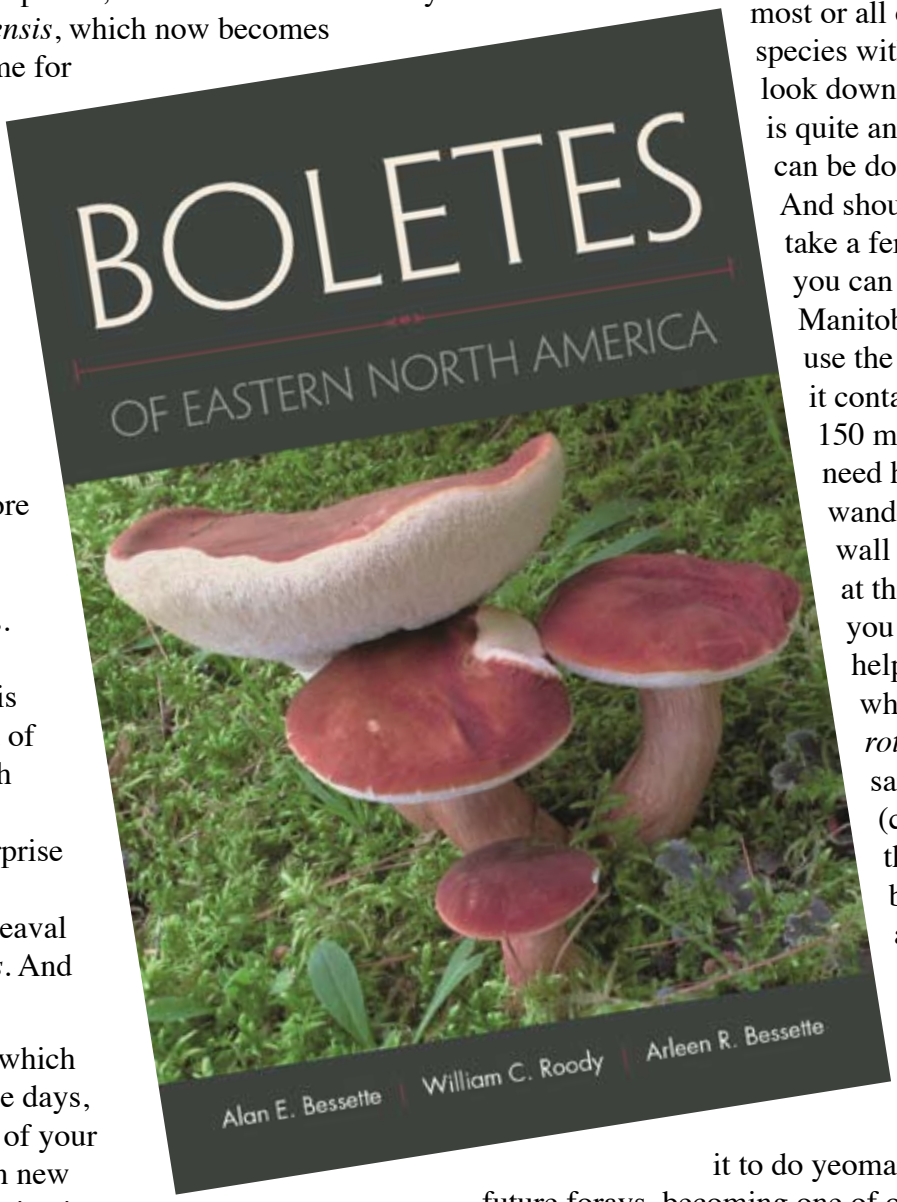
1. All these years you thought you picked the common *Suillus cavipes*, but it turns out that

what you really picked was *Suillus ampliporus*.

2. Early on at our forays we found that we could not distinguish between *Suillus laricinus*, *serotinus*, and *viscidus*: whenever we found one with supposedly diagnostic characters of one species, it also had putative diagnostic characters of another; in frustration we eventually lumped them all as *S. serotinus*. Turns out they are, indeed, all one species, but one first described by Peck as *S. elbensis*, which now becomes the correct name for all three in North America.

For our province there are about 8–9 such name changes, more for regions with greater diversity. Having Nguyen's *Suillus* article before publication would have been a great help to the authors. The much larger genus, *Leccinum*, is even more in need of reworking in North America. Maybe somebody will surprise us next week with another major upheaval there. Or *Tylopilus*. And so on.

It does not matter which book you buy these days, expect to use a lot of your own ink to write in new names. The alternative is no mushroom books, because almost exclusively they are written by accomplished field mycologists with formidable identification prowess, developed by repeated observation of mushrooms in their natural setting. Such pursuits usually keep them elsewhere than the forefront of the laboratory bench or the annals of taxonomic finesse. These days, rapid change beyond the authors' control is part of the territory of publishing mushroom books.



Should you buy this book? If you are a casual mushroomer, probably 1–2 general mushroom books will serve you well. Once you have accumulated three general books, and still need more help to identify your finds, you should seriously consider acquiring specialized books. This one about boletes is a very good place to start, because of its accessibility and completeness With minor effort to use the keys, you should be able to identify most or all of our 40–50 bolete species without ever having to look down a microscope. That is quite an achievement, but can be done by repeated use. And should you foolishly take a ferry to the mainland, you can drive as far as the Manitoba border and still use the same book, because it contains as spare baggage 150 more species than you need here. Should you wander far north of the wall under construction at the Canada-US border, you may need additional help with, say, deciding whether *Leccinum rotundifoliae* is the same as *L. scabrum* (confession: I identify them as separate, but am a bit foggy about exactly why), and the like, but generally the book should remain a very serviceable helpmate. I expect it to do yeoman's service in future forays, becoming one of our staple resources: thoroughly thumbed and dog-eared by heavy usage.

Image supplied by publisher

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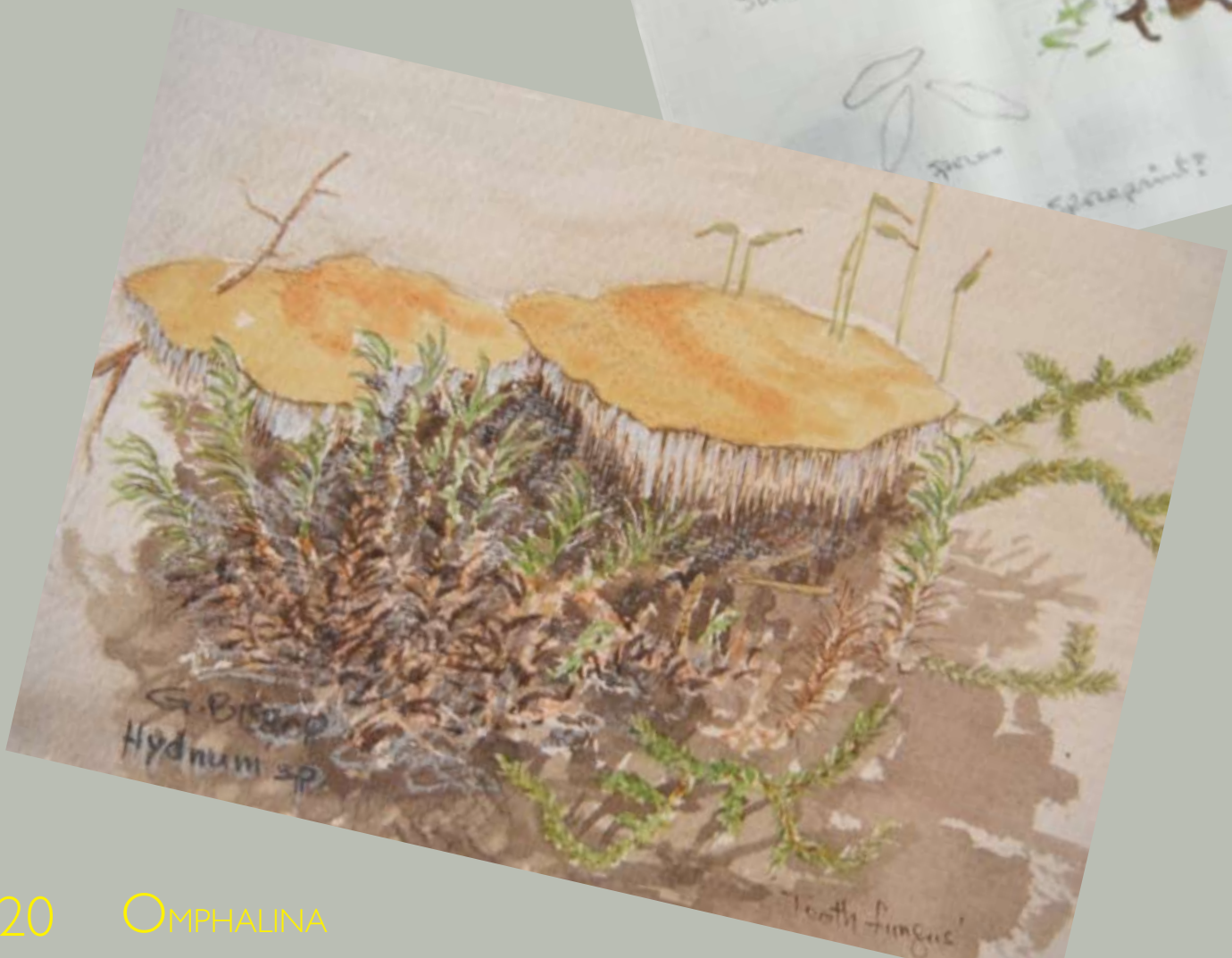
The Bishop's Sketchbook



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- Forestry and Agrifoods Agency
  - Center for Forest Science and Innovation

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