OMPHALINA

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Newsletter of FORAY NEWFOUNDLAND AND LABRADOR

Vol. IV No 6
Jul. 14, 2013

FORAY NEWFOUNDLAND AND LABRADOR

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

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

Issues of OMPHALINA *are archived in:*

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

COVER

Cypripedium reginae, the showy lady's slipper, proudly displaying the red and white of the Canadian flag, photographed near Humber Village, NL, on Canada Day, 2013.

Orchid seeds grow only if fed by a fungus, and the fungus, in turn, is fed by a tree. Therefore, adult orchids never stray further from trees than their invisible fungal ties permit. The cover orchids grew around *Fraxinus nigra*, (note the black ash leaves the right background), which does not form ectomycorrhiza. Study of both roots revealed that the mechanism on this occasion was an endomycorrhizal one, mediated by species of *Glomus*. The dramatic lead article is the first report of such a relationship for these organisms.

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CONTENT

Message from the Editor

Happy Bastille Day!

No, we have not forgotten Canada Day, July 1. It is celebrated on page 8 with a tense thriller about international skullduggery trying to steal the name "canadensis" from a polypore found first in our capital city. Fortunately, all ends well, and we retain canadensis as the epithet, but not without some major sabre rattling. Read it only if you have taken your heart medicine.

The excitement and drama is started by the famed trio of Crow, Vixen and Moose, back by popular demand, in a taut sequel to their escapades featured in Issue 2 of Volume 2, way back in 2011, discussing ties that bind us in their bog. Yes, that's bog, not blog.

You can believe that there was major disagreement, verging on pitched battle, in the Editorial Suites of Omphalina. One faction wanted to put the rare *Antrodiella canadensis* on the cover, in honour of Canada Day. The more commercially motivated faction fought valiantly for showy lady's slippers, claiming they were prettier, which should increase sales at the newsstands. Things got so bad that the commercially oriented side described the polypore as "rat-eaten", provoking deprecations like "seditious sons of Mammon" to be flung at them. Fortunately peace was restored when the Editor, with the wisdom of Solomon, pointed out that replacing polypore with lady's slipper was not treason, as the blossoms proudly bear aloft the colours of our flag.

If you are hungry for reading material on matters mycological, you are living in exciting times. This issue has three features on books. One is a formal book review by the versatile Jim Cornish, of Jens Petersen's The Kingdom of Fungi. An excellent, graphic and colourful, if brief, dive into the mysteries of these organisms that are the focus of our activities. Then we have an article by Peter Thompson, as an introduction to his book, just out and available from Amazon, on British ascomycetes. Many, if not most, should be found here as well. And lastly, a story by Larry Millman from his upcoming book (due out in a month) full of similar tales.

You may remember that we suggested members attend the NEMF foray this August. It started with an invitation-suggestion by Renée Lebeuf, and we thought it might be interesting for our members to see how others do things, as well as attend a regional foray—meet mushroomers from all over the eastern seaboard and beyond. We had planned to attend, hoping a small NFL group might join us, but it turned out that we are unable to go. While disappointed, we still encourage anybody interested to make the trip. Renée and André would be glad to see a few orange caps and would no doubt give you a warm hug, to make you feel at home. Then tell us all about it—or better still, write a brief report for Omphalina.

For information, Registration Forms and program, see <http://www.mycomontreal.qc.ca/actualit.htm>.

See you on Fogo!

andrus

FORAY MATTERS…

The 2013 foray will be held on Fogo Island, Sep 6-8. Information found on our website <**www.nlmushrooms.ca**>.

1. **TRAVEL. We suggest everybody who does not come earlier, aim for the 2:45 ferry from Farewell to Fogo on Fri.** In case the ferry cannot accommodate all cars, some *may* end up waiting for the 5:00 PM ferry. To make sure everybody has a chance to get to the Sign-in desk and find their community and house in daylight, then get some food before the program, the Reception and supper begin at 7:00 PM. If you arrive earlier, relax and poke around.

   Please note the need to be in Farewell an hour before ferry departure to get on. Like our foray, it is a first-come-first-served system with no reservations.

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

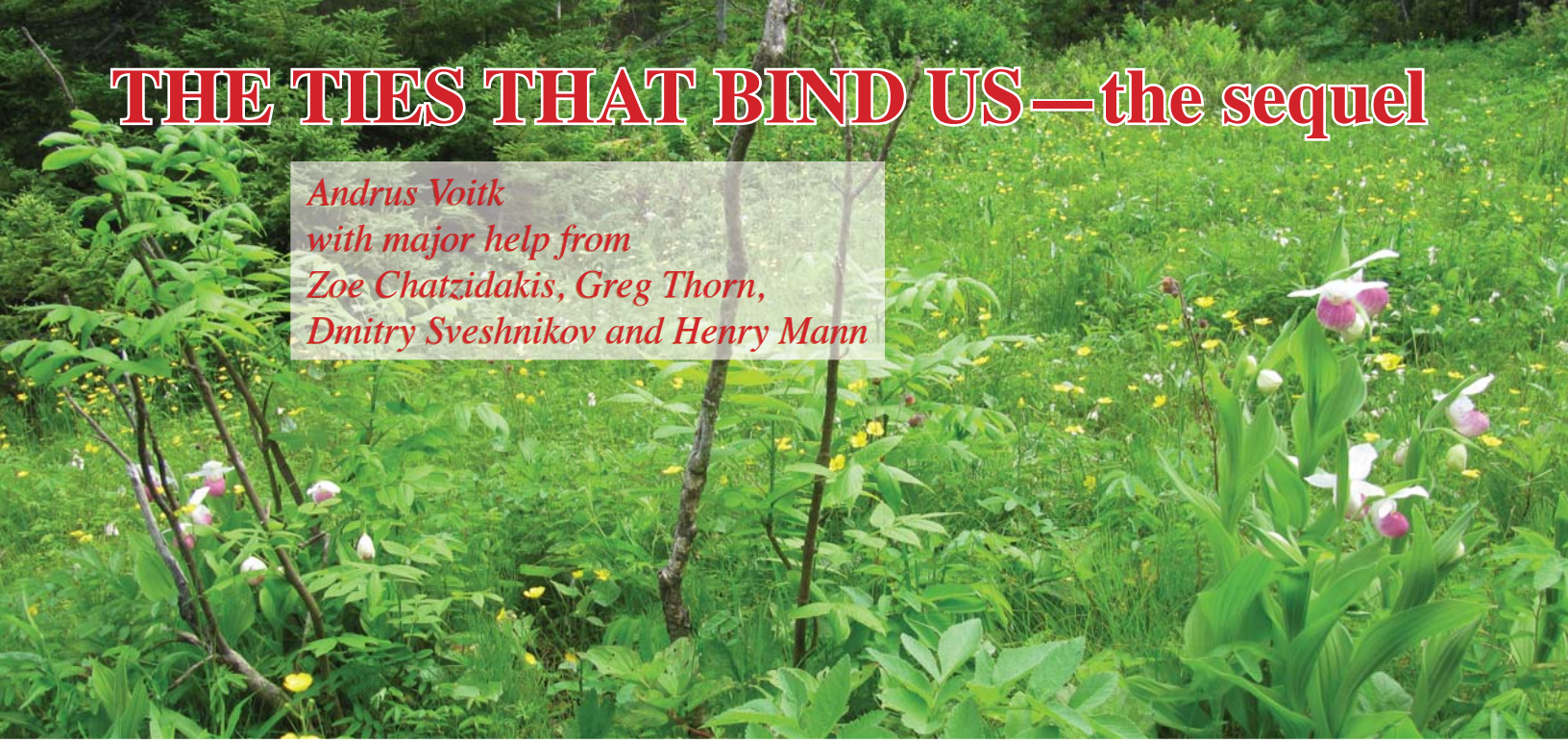
3. **INFORMATION.** For specific details about the foray and Fogo Island, see the Foray issue of Omphalina (vol 4, Nr 3), entirely devoted to these topics, as well as the information on our website.

4. **PROGRAM**. Tentative outline can be downloaded from our website.

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

ATTENTION ARTISTS AND ARTISANS!

THE FOGO ISLAND FORAY awaits your mushroom-related fantastic and phantasmagorical artworks and crafts in all media. Display tables will be available at our headquarters in the Church at Barr'd Islands. Tables are unsupervised and artists are responsible for their own items. Creations may be for show or for sale. Each item must have the artist's name and price (if for sale) attached. Purchaser to approach artist personally. No commission to FNL—artist pockets 100% of the proceeds, but if sales are brisk, discreetly slipping a small flask of fine Cognac to the Editor of Omphalina would not be amiss.



THE TIES THAT BIND US—the sequel

Andrus Voitk
with major help from
Zoe Chatzidakis, Greg Thorn,
Dmitry Sveshnikov and Henry Mann

The long-awaited sequel to the terse and exciting drama, where Moose, Vixen and Crow first made some observations on mycorrhizal restrictions placed on orchids (see Omphalina 2(2):14-19.2011).

A one-act, one-scene play. CHARACTERS: Crow—a wise old crow, Vixen—a sharp young lady fox, and Moose—a dull-but-trying old bull moose.

*Fen, bordered by mixed forest. Bushy black ash (*Fraxinus nigra*), surrounded by showy lady's slippers (*Cypripedium reginae*). Vixen approaches browsing Moose.*

VIXEN: Hey, Moose, have you heard? Remember when we were tromping this fen back in the fall of 2010?

MOOSE: You mean when Crow told us all about them ties that bind us? Or bind lady's slippers, at least. He called them miker-something.

VIXEN: Mycorrhizal. Yes, that's the time I meant.

MOOSE: Myco-whatever. But what of it?

VIXEN: Well, looks like some scientist got wind of our discussions and pooh-poohed Crow's explanation.

MOOSE: Whaddayamean?

VIXEN: Well, remember how we noted that lady's slippers grew around some trees and not others?

MOOSE: Yeah, there was a whole bunch around that black ash over there, I seenem there every year, but none around them maples. Never seenem there.

VIXEN: Exactly. And remember how Crow explained the reason for that?

MOOSE: Yeah, that was cool. He said that orchid seeds are so small that they have no food of their own, and need a mushroom to feed them, if they are to grow. And apparently those mushrooms, in turn, need a tree to feed them.

VIXEN: Exactly. Some fungi give tree roots water and minerals in exchange for sugars. But different fungi match up with different trees for these mycorrhizal associations.

MOOSE: Yes, and Crow said that wherever those mushrooms grow, they help orchid seeds grow. So, he explained that maple trees do not form them myk-whatever relations with the required fungus, but ash trees do. That's why, when seeds tumble all over the fen here, they die out around the maples, but grow around the ash, which has their required mushrooms attached to their roots. So what's the big deal with that scientist fellow?

VIXEN: Well, apparently the scientist wrote in to Omphalina, saying that Crow was right, that

maple does not form mycorrhiza with fungi, but that ash also does not do so. Therefore Crow's explanation cannot be right.

MOOSE: Wow! Who was that smart scientist?

VIXEN: Greg Thorn.

MOOSE: You mean that nice Greg Thorn from London, Ont., who comes to our forays every year? I seenim in the woods many times at foray time. He didn't look to me like a guy who wants to pick a fight.

VIXEN: Exactly what I thought. Guess you can never tell by looking. Here comes Crow now. He's probably feeling bad because his theory was trashed, so don't say anything to him, OK?

MOOSE: Oh, OK. I won't say nuthin. My lips are sealed. Mum's the word.

Pause.
Flap, flap, flap, flap.

VIXEN: Oh, hello, Crow, didn't see you coming, there.

MOOSE: Yeah, didn't see you coming at all, at all. Had no idea you was in the neighbourhood. An we wasn't talking bout nuthin anyways, honest. Specially not about that myko-whatever thing with the ash that you didn't get right.

CROW: Why, hello, Vixen, hello, Moose. Am I glad to see you! I was just hoping to tell you the latest about the lady's slippers.

MOOSE: What lady's slippers? We don't know nothing about them lady's slippers that Greg Thorn wanted to pick a fight with you about. Oops, sorry, I didn't mean…

CROW: That's OK, Moose, you meant well. But Greg wasn't picking a fight.

VIXEN: But I heard that he wrote that your theory was full of hot air.

CROW: That he did. Scientists accept or reject theories on the basis of evidence. There is nothing personal involved. If somebody proposes something that does not fit with known facts, as apparently I did, it is the job of a scientist who knows to question it. To question a theory is not to attack its author.

Bushy red maple (*Acer rubrum*) in same fen—no lady's slippers. Photo: Maria Voitk, as is the title banner.

VIXEN: So, is he saying that lady's slippers don't grow around the black ash? That's not right, because we know they do (title banner).

MOOSE: Yeah, like I said earlier, back when we wasn't talkin bout nothin, there was a whole bunch of lady's slippers around the ash over there, I seenem there every year, but none around them maples. Never seenem there. So, how can that Greg say that's not true?

CROW: No, Moose, Greg was not saying our observation was wrong. Of course not. Science deals with facts, and a valid observation is a fact. What he did, was to question the explanation. If orchid seeds need a fungus to feed them in order to grow, and if the fungus needs a suitable tree, then it is reasonable to expect that trees that do not form relationships with fungi, like the maple, will not have orchids around them. However, apparently ash also does not form mycorrhizal relations with fungi. That puts into question the explanation that I offered, not knowing this about ash.

VIXEN: But if the orchid needs the fungus to grow, then there must be a fungus there that feeds the orchid. And if the fungus, in turn, needs a plant to grow, it must have a partner there. Since there is no other major plant partner there, this fungus must have a relationship with the ash.

CROW: Very good, Vixen! If orchids can't grow alone and fungi can't grow alone, there must be a relationship with the ash. And so there is.

MOOSE: Whaddaya mean, there is? I thought you just told us that Greg said there wasn't. What's the story?

CROW: Well, when Greg wrote in to Omphalina, the Editor, told him that the onus was on him to supply a better explanation.

VIXEN: Wow, threw it back to Greg. What happened?

CROW: Greg accepted the gauntlet. He said to send roots of the orchid and ash to him, and he'd see if they had fungi common to both, fungi that might get sugars from the ash, while feeding the orchid.

VIXEN: So he was looking for the ties that bound the two, ties that weren't supposed to be there? What happened?

Orchid seed—a tiny parafoil for travelling on the winds, with its payload of genetic material. No food packed for the voyage, so for the genes to grow into plants, an external energy source is required. This need has been supplied by a mycorrhizal fungus. Photo: Henry Mann.

CROW: Well, Greg told the story to one of his students, Zoe Chatzidakis and said, "Here are the roots. You figure it out, and I'll pass you."

MOOSE: Gwan, bye, he never!

CROW: He did. As a result, Zoe got a great opportunity to work out a question in a scientific way. She learned a lot and got to do some pretty fancy detective work while at it. That's why I came to tell you the news.

VIXEN: You mean, you have heard the results of Greg's research?

MOOSE: Zoe's, you mean.

CROW: Oh, Moose! Yes, I just heard from Blue Jay, whose cousin heard it presented at the Great Lakes Mycology Meeting in Ontario. Apparently our Editor invited Henry Mann and Dmitry Sveshnikov to come and dig up lady's slipper and ash roots in the rain and then had Dmitry ship them to Greg. Greg had Zoe do the investigation. And guess what she found?

MOOSE: Whaddaya mean, "Guess what she found?" You coulda told us right at the start and spared coupla pages of useless dialogue!

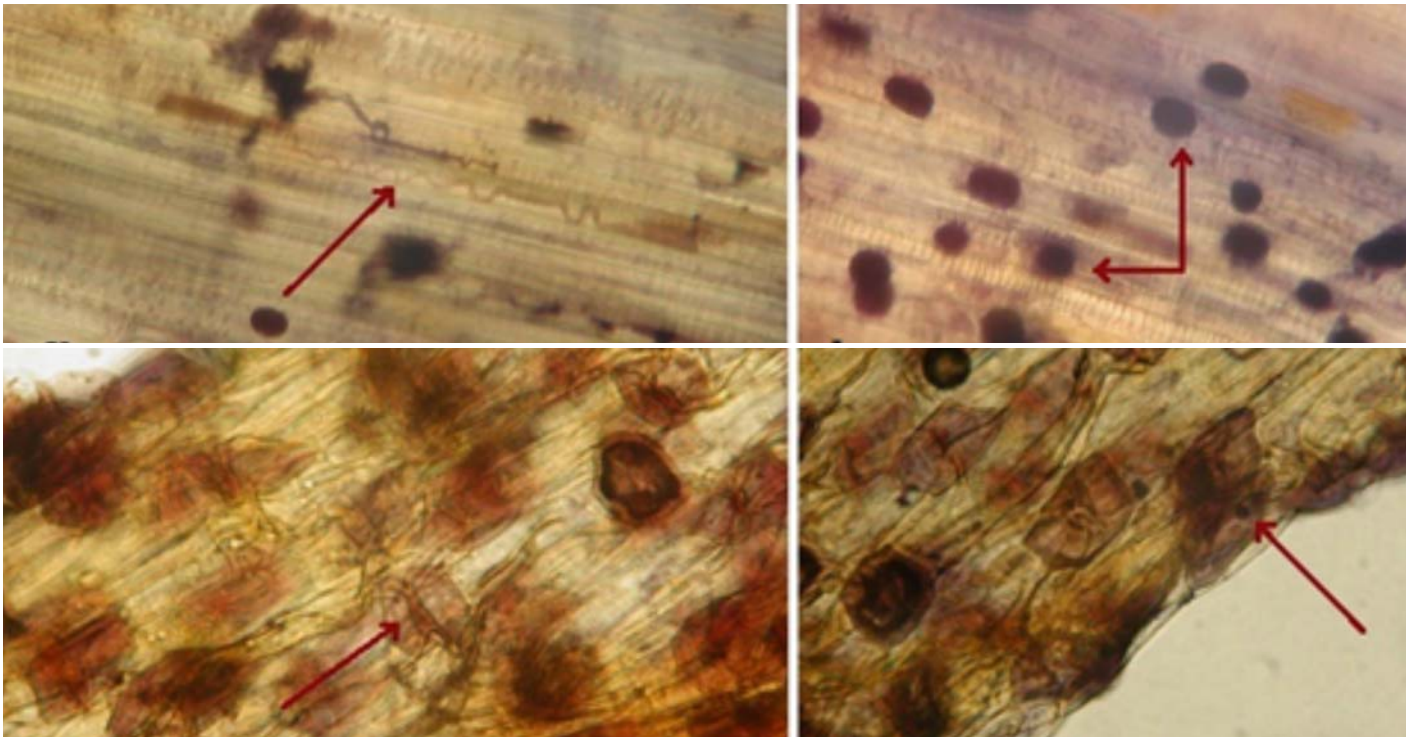
VIXEN: Simmer down, Moose. They gotta fill the pages of Omphalina with something—might as well be our talk. But please, Crow, tell us what Zoe found out.

CROW: Well, turns out there were indeed some fungi on the black ash roots that were also found on the lady's slipper roots. They were from the genus *Glomus*. Only one was identified to species, *Glomus claroideum*. So, it seems that *Glomus claroideum* and other *Glomus* species have a relationship with ash and are also able to form a relationship with showy lady's slipper seeds, presumably nurturing them during development. This is why tiny orchid seeds around ash can develop into plants.

VIXEN: But I thought you said, or Greg said, that ash does not form mycorrhizal relationships.

CROW: True. However, there are several types of mycorrhizal relationships. The type we most commonly speak of is the ectomycorrhizal relationship. Ecto mean outside because in this association, the fungal tissue is wrapped outside the root hairs like a sheath, and small fibers go in but stay outside the root cells. Even commoner is the endomycorrhizal or arbuscular relationship. Endo means inside and here the fungal mycelia enter the root and send out small fibers that actually penetrate the cell walls of the root tissue.

VIXEN: Are you saying that when you said ash



Microscopic examination of root tips. Showy lady's slipper above and black ash below. The arrows point to fungal hyphae (little wiggly brown threads) inside the root (endomycorrhizal) on the left, and to typical vesicles (dark blobs) produced by endomycorrhizal fungi in roots. DNA analyses showed that species of *Glomus* were common to both plants. The interpretation is that *Glomus* species live in association with ash, and form a relationship with lady's slipper seeds to feed them during growth.

is tied to orchid, you should have said via an endomycorrhizal association, while when Greg said ash does not make mycorrhiza, he meant ectomycorrhiza?

CROW: Right on the money, Vixen. When I explained it, I didn't know ash didn't make ectomycorrhizal associations. But what you say is true. *Glomus* is tied to ash and lady's slipper by endomycorrhizal associations.

MOOSE: I find this endo-ecto mumbo-jumbo confusing. If this endo-myco-whatever works, why don't we see lady's slippers around maple?

VIXEN: I know! I know! At least, I think I know. Maybe *Glomus* can form an endomycorrhizal association with ash, but not with maple. Maple may have other endomycorrhizal fungi, but perhaps these are unable to hook up with lady's slippers. Is that it?

CROW: Maples have been shown to have endomycorrhizal relations with *Glomus*, so the explanation must me more complicated—lots for Zoe to work on. Hope we can get her back to work it out. In any case, I think it is the first time anybody has shown this type of relationship with these two plants, tied by this group of fungi through an endomycorrhizal relationship.

MOOSE: Wow! So you say that thanks to our little powwow a few years back, something totally new has been discovered, something nobody knew before?

CROW: Yes, before this nobody knew this. Science is very democratic this way. You don't have to be a famous professor to see things. Anybody can make an observation, form a theory and test it. However, just to be very precise: ***we*** didn't discover it. ***We*** made the observation, but the discovery was made by Zoe and Greg. And made because my explanation didn't hold water. This'll be formally reported by them. Meanwhile we can publish this transcript of our idle chatter without incurring problems with prior publication for them. And yet, the good readers of Omphalina get it first.

MOOSE: I've always said it. That Greg is one very fine fellow! Wait till I go tell the missus!

They scatter.
Tromp, tromp, pad, pad, flap, flap.

Curtain.

Leif Ryvarden

Canada Day Article

Antrodiella canadensis—a rare polypore

In 1941 Overholts described *Polyporus canadensis* based on a collection from Ottawa, the capital of Canada—thus the epithet.[1] It was growing on a stump of *Picea* and the type was the only one he had seen. The species was unknown in Europe until T. Niemelä found it in Finland.[2] To my knowledge, Finland remains the only country in Europe where it has been recorded.

Recently the esteemed Editor of this fine journal sent me some *Trametes* specimens. Among them hid a fine specimen of *A. canadensis*. Fortunately he had taken a picture of it in the field (title banner). Why he thought this was a *Trametes* is beyond me.

Superficially *A. canadensis* looks like an *Oligoporus* or *Tyromyces* species, such as *Oligoporus tephroleucus*. However, microscopically *O. tephroleucus* has only generative hyphae (is monomitic), sausage-shaped spores, and causes brown rot, while *A. canadensis* has both generative and skeletal hyphae (is dimitic), small, elliptical spores, and causes white rot.

The nomenclature for *P. canadensis* has a rocky past. Overholts' description lacked a Latin diagnosis, required since 1935, according to the International Code of Botanical Nomenclature (ICBN); thus his name was illegitimate. This remained unnoticed until Lowe transferred the species to *Tyromyces*.[3] However, Lowe published both *Polyporus canadensis* (an effort to make Overholts' original name valid) and *Tyromyces canadensis* at the same time, which also is not allowed by the IBCN. Again, this went unnoticed until Ryvarden and Gilbertson rejected both names and renamed the taxon *Antrodiella overholtsii*.[4] Niemelä challenged this, and argued that Lowe had only mentioned Overholts' name in passing, thus not making a valid description, and accepted the Lowe combination.[2] Later he transferred the species to *Antrodiella* as *A. canadensis*.

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Encoelia furfuracea

Peter Thompson

Encoelia furfuracea Is a discomycete fungus from the Ascomycota, measuring up to 15mm diameter when fully grown. It fruits mainly in the spring, but can sometimes be found in the autumn as well.

This fungus is a primary coloniser of dead branches and trunks of hazel (*Corylus* spp.) and alder (*Alnus* spp.), which are often still standing, or have been prevented from falling to the ground by other trees. Fruit bodies erupt through the bark, usually in small, but tightly grouped clusters, but occasionally they grow individually. They rest without stalks on the surface of the bark, with several groups of fruit bodies emerging at intervals along their host.

When young, they are more or less ovate, with the fertile surface entirely enclosed by the exterior. This outer surface is covered with loosely attached, creamy whitish to pale brownish flakes, which may be washed off by rain or scraped off by friction. As the fruit bodies mature, their exteriors rupture to expose the brownish yellow to tan coloured hymenium. Initially developing a slit at the uppermost point, the maturing fruit bodies split still further and often crack towards the centre of the hymenium in a starlike fashion. When old, the margin curls outwards to expose the whole of the fertile surface. This hymenium becomes dark brown with age and blackish on drying.

Under the microscope, the ascospores are single celled, sausage-shaped (allantoid), slightly curved, with rounded ends. They are hyaline, smooth and contain a few small droplets, usually at or towards the poles. These guttules fuse together into a larger guttule at each pole when the spore dies. Spores typically measure between 7 and 11 x 2 to 2.5 microns. The asci contain eight spores and the ascus pore shows a positive (blue) reaction to iodine or Lugol's solution. Asci are club-shaped, tapering to a slender base. They may measure up to 120 x 6.5 microns. The paraphyses are quite slender, but gradually widen to slightly swollen tips, about 5 microns wide. They contain one or two large accumulations of matter at their tips when alive, which disappear as the paraphyses die.

The range of *Encoelia furfuracea* tracks that of its hosts, hazel (*Corylus* spp.) and alder (*Alnus* spp.). It may, therefore, be found in North America, Britain and the countries of mainland Europe.

Title banner photo from, and text based on: Thompson PI: **Ascomycetes in colour Found and Photographed in Mainland Britain**. *Xlibris, Bloomington. 2013.*
Lower photos, by Maria and Andrus Voitk, added to show change of appearance with age.

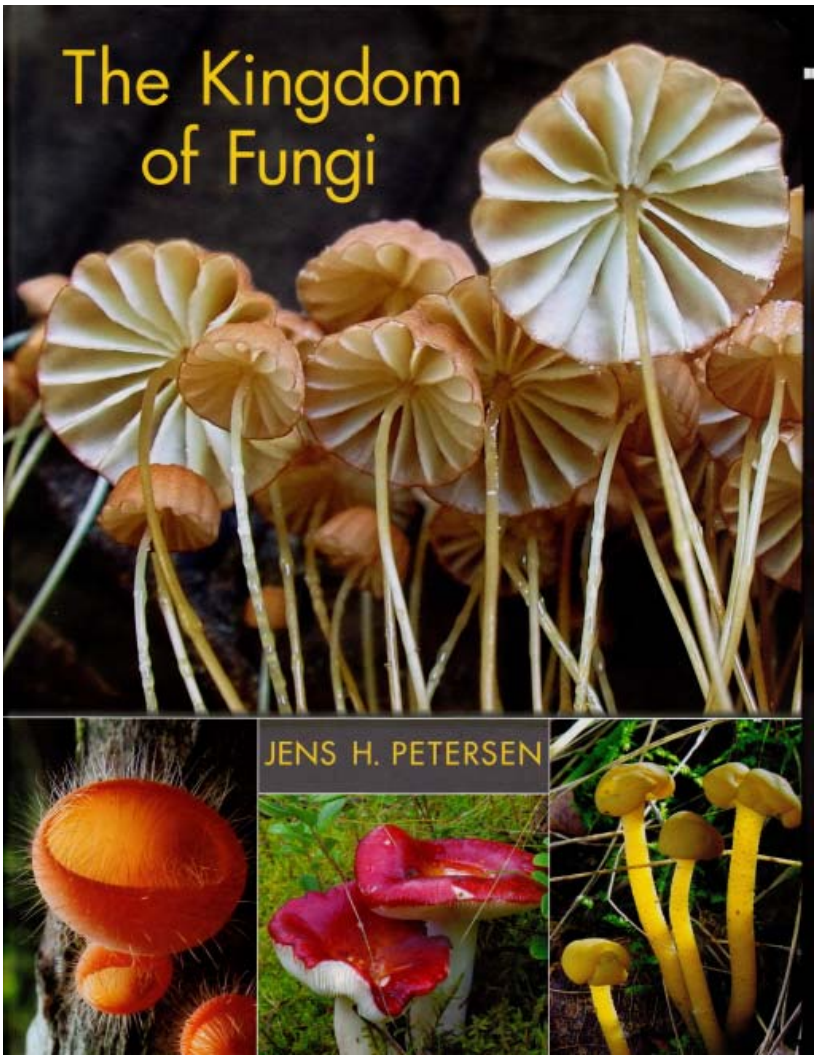
Book review

Jim Cornish

256 pp.
Princeton University Press
2013

U$29.95

$!9.75 CAD from Amazon



In the preface to his book **The Kingdom of Fungi**, Danish mycologist Jens H. Petersen describes Fungi as the "hidden kingdom ... the last great unknown among the multicellular organisms." Fungi are also hidden because of a gap between affordable field guides and expensive university level textbooks. **The Kingdom of Fungi** fills some of this gap, revealing fungi as they are seldom seen or understood.

The Kingdom of Fungi is well organized. The opening chapters beautifully illustrate and briefly describe fungal spores, hyphae, fruiting bodies and kinships. The bulk of the book is divided between Ascomycota and Basidiomycota, the phyla with the most species and visible fruiting bodies. Fungal ecology, the role fungi play in our world and what the future holds complete the last few chapters. Lichens, described by Linnaeus as the "poor trash of vegetation," are given only cursory coverage.

Overall, this is a revealing look into the hidden kingdom. Illustrated with over 800 stunning photographs, the 265-page book is a captivating exposure of a world rarely seen. The photographs include enlarged microscopic and macroscopic views of stringy hyphae, web-like mycorrhizal mycelium, spore filled asci, minute cup-shaped fruiting bodies and pore shape diversity, features not easily seen without the aid of a hand lens or microscope. Scattered throughout the book are dozens of full and half-plate sized photographs of pristine fungi, all of which were shot in situ and look quite stunning on the large 8½ x 11 inch glossy pages. Each time I open the book, I find myself pausing, studying and appreciating what Petersen clearly shows is a fascinating and integral part of our world.

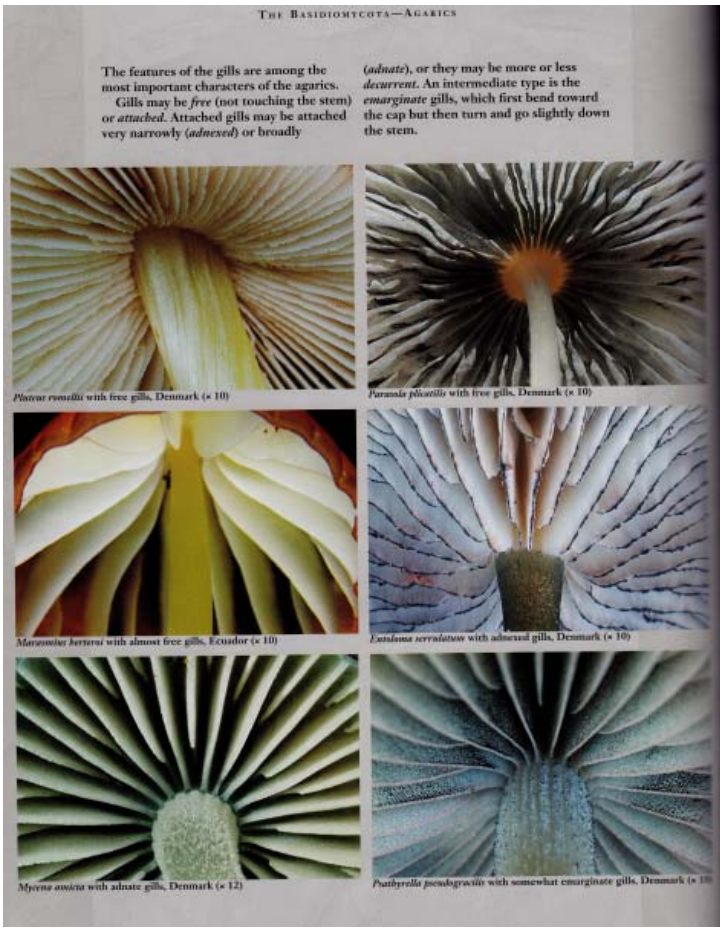
The amount of text in **The Kingdom of Fungi** is rather sparse, often less than 100 words per page. Yet, Petersen manages to explain many basic concepts very simply using facts that are easy to remember and relay to others. I should like to have seen more in-depth coverage of some topics. Since most of the book's scientific terms are defined and/or illustrated in context, the lack of a glossary is really not a problem. But with

so many unfamiliar terms and tongue twisting binomial names, a pronunciation key would be useful for the uninitiated.

While **The Kingdom of Fungi** is not a field guide, Peterson does include two pages of blackline drawings, which he describes as a simplistic key to fungal forms. Photocopied, folded and pushed into a back pocket, this key will help an amateur naturalist identify and name fungal finds to at least their form, a much easier chore than identifying fungi to the species, a task Peterson sees as a specialist's job. Many pages throughout the book will also help when studying one's photographs or collected specimens upon returning home. Used in combination with a field guide, the book's 12 gill closeup photographs, for example, can help identify gill attachments, its 5 photographing of lactating gills can help name a *Lactarius* species and its 12 macro images of pore structures can distinguish boletes and polypores.

Any book on fungi would be incomplete without a section on classification. Today, genetic analyses are rewriting the morphological (Friesian) classification of fungi that first emerged in the early1800's. Petersen briefly addresses the shift in classification from form to kinship by using photographs of disk and club-shaped fruiting bodies to show parallel evolution in these two common forms found in the two genetically distinct phyla of Ascomycotina and Basidiomycota.

With its unique approach, simple explanations and stunning pictures, **The Kingdom of Fungi** is a great reference for any budding mycophile. For an amateur naturalist like myself, it has shown fungi as I have never seen them in any other book and has stimulated my desire to keep looking, observing and photographing any kind of fungi. It is an excellent book to pass along to anyone asking basic questions about the hidden kingdom.



Scanned images of two pages mentioned in the review. Imagine these at 10 1/2 x 12" to get an idea of the photos in this book.

The oysters of NL

Andrus Voitk

Figure 1. *Sarcomyxa serotina*.

Pleurotus ostreatus, the tasty oyster mushroom, does not seem to like our climate. It is often found on sugar maple in Ontario, but has not been seen to date on our red maple. Therefore, for years I have maintained that we do not have oysters in Newfoundland and Labrador. The closest we have come is when fresh oyster or king oyster mushrooms appeared in our supermarkets in 2012, grown in and imported from Ontario. Well, except for those who got some oyster spawn at one of David Boyle's mushroom growing workshops at our foray.[1] In the woods we have had to make do with false oyster, mock oyster, fall oyster or late oyster—all various names I have heard applied to *Sarcomyxa serotina* (the former *Panellus serotinus*—Figure 1).[2] *Pleurocybella porrigens* (Figure 2), the poor man's oyster, commonly called angel wings, is also very common in our province. The former is edible, but the latter should be avoided, because of reports of toxicity.[3]

All this came to an end after a walk in the woods with Gro Gulden this fall. Gro collected a large white mushroom growing on a red

Figure 2. *Pleurocybella porrigens*.

maple. “Yes,” I said, “we see this from time to time on maple, birch and poplar. It is *Hypsizygus ulmarius*, sometimes confused with *Hypsizygus tesselatus*.” Although satisfied at first, something about it bothered her, so at the end of the day Gro decided to examine the specimen a bit closer. Under the microscope it had the long cylindrical spores of *Pleurotus*, not the round spherical ones of *Hypsizygus*. It did not take very long to reach a conclusion that this was *Pleurotus dryinus*, the veiled oyster.

Now it was time for me to feel uncomfortable. I had seen this mushroom before, but had thought that it was *Hypsizygus ulmarius*. At an early encounter I had confirmed that it had round spores, as befits that species. So, I opened up my *Hypsizygus ulmarius* file. Careful restudy of its five collections revealed two populations: three *Hypsizygus ulmarius* and two *Pleurotus dryinus*! Clearly, I had been too hasty in my determinations, influenced by an unfounded belief that there were no oysters in Newfoundland and Labrador. Both species are large, fleshy and white, both project sideways from wood with somewhat eccentric stems, both grow on both dead and living wood, both prefer hardwood and include maple in their diet. We have no beech, elm or oak, listed as their hosts of choice elsewhere, which may be why they are relatively uncommon in our province.

Although superficially similar, once the presence of two species became clear, there was no problem differentiating between them. As the name veiled oyster implies, *Pleurotus dryinus* has a partial veil seen as a bit of a ring on the stem, fuzzy lower stem, and hanging tissue from the cap edge (Figure 3). However, as with many mushrooms with residual veil remnants, these features are best seen on young specimens. With time, the veil and ring disappear, as does the fuzz on the stem (Figure 4). Since they are not that common, it is quite likely that you will encounter one at a mature stage, when these characters are no longer obvious. Fortunately, two characters remain constant throughout, highlighted in red in Table 1. Both are easy to recognize and only one is required to make the correct identification: *Pleurotus dryinus* has decurrent gills, *Hypsizygus ulmaris* does not (Figures 4, 5). Table 1 lists additional characters useful to distinguish between the two species.

Figure 3. *Pleurotus dryinus*. Young specimen, with veil tissue hanging from cap edge. Decurrent gills. Despite poor quality photo, hairiness of cap and stem and fugacious ring remnants can be seen—with the help of a good imagination.

Within two weeks of this discovery, I found one such mushroom at our foray. Now that I was an old hat, the identification was easy: its gills were decurrent, so this was *Pleurotus dryinus*, the oyster of Newfoundland and Labrador. Microscopy confirmed that it was not a different species of *Pleurotus*. The cause for such doubt was because this mushroom grew on dead conifer, a decidedly unusual host for the species. However, a search showed that conifer is known as a rare host, so all is well.

Table 1. Identifying characters

	Pleurotus dryinus	***Hypsizygus ulmarius***
cap	hairy, scaly	smooth, scaly
gills	decurrent	attached ± notched
veil	tissue at edge of cap, ephemeral ring zone	none visible
stem	hairy below ring, tapered point at end	smooth or hairy, enlarged base
spores	cylindrical; 12x4 μm	round; 4x4 μm
trees	red maple, birch, rarely conifer	red maple, birch, poplar

Figure 4 (above). *Pleurotus dryinus*. Old specimen. **Gills decurrent**. No veil tissue, ring or hairiness of the stem left. Note end of even stem narrowing to a point.

Figure 5 (below). *Hypsizygus ulmarius*. Mature specimen. **Gills attached, notched**. No veil tissue on cap or ring zone. Stem clavate (swollen toward the base). Insert shows cap change from white to beige with time.

There is another species, *Pleurotus populinus*, that we might expect to have here that I have not seen yet. It fruits on poplar (aspen) in the spring and early summer, and looks much like *P. dryinus*, but its spores are considerably bigger. If you find one on aspen in the spring, please take a picture, keep a sample, and let me know.

Because both are desirable edibles, two other big, fleshy, stalked mushrooms growing on wood should be mentioned. Although not oysters, they can be confused with both species described here. They differ from the described mushrooms by 1) growing only on dead wood, 2) having a central stalk, not eccentric or lateral, and 3) having a brown or gray cap, not white. The latter character may be confusing, because the cap of both *Pleurotus dryinus* and *Hypsizygus ulmarius* will darken with age to yellow-buff, approaching tan.

One of these, *Megacollybia rodmanii* (Figure 6), has been discussed in a previous issue.[4] Should you mistake it for our oyster, rest assured that it is considered edible, although said to taste quite foul. You may spoil your food, but at least you will not poison yourself.

The remaining mushroom is also relatively easy to recognize, and a mistake would not be critical, because it is a good edible as well:

Neolentinus lepideus. Biggest of them all, it is also not a very common mushroom. Three of my four finds have been on aged timber used for bridges on old lumber roads. One of its major identifying features is a jagged gill edge.

While it is interesting to know what grows in our province and gratifying to be able to identify the organisms, from a culinary point exact identification in the oyster hunt is not imperative. We have no toxic, stalked, big, white or whitish, fleshy mushrooms growing on wood. All are edible, and except for the bad-tasting *Megacollybia rodmanii*, all are good. Unfortunately the good ones occur so infrequently in our province, that they will not support a major mushroom party. But enough for a pleasant change of fare for one or two, once a year or so.

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Figure 6 (above). *Megacollybia rodmanii*. Refer to cited article for more detailed description.

Figure 7 (below). *Neolentinus lepideus*. Large mushroom (cap diameter >25 cm) with scaly brown cap and central stem, growing on old woods road bridge timber (through layer of gravel). Insert shows jagged, serrated gill edges, typical for the species. And some tasty worms. Yum.

The Bishop's Sketchbook

A HOME in the ARCTIC

Lawrence Millman

WARNING: This article contravenes two editorial policies.

1. Omphalina publishes only original material and does not accept articles offered elsewhere. The author has advised us that this article was also offered to the Bulletin of the Boston Mycological Club, where, due to our line-up of material, it appeared well before this publication. Not only that, it is also part of a book, due out around August, 2013: *Giant Polypores & Stoned Reindeer: Rambles in Kingdom Fungi*. If you like the story, look for the book. This cannot possibly be a promotion, because Omphalina does not promote or advertise. Right?

2. Because there are so many good general mushroom journals, but no other place a Newfoundlander and Labradorean can read about her own mushrooms, Omphalina publishes only material dealing with NL mycota. Certainly not Greenland mycota.

Why publish it, then? Well, for one thing, 99% of our members are unlikely to be readers of the Boston Club's Bulletin. As for Newfoundland and Labrador mycota, at the 2012 Foray we recorded our first *Peniophorella praetermissa* (title banner photo), two collections identified by Nils Hallenberg, so it is one of ours, too. OK, those are logical, but weak. The real reason is that we thought you would like it—a change from the usual fare. After all, rules are only guidelines.

East Greenland is not to be confused with West Greenland. The latter has a large percentage of the island's population, forests of fifteen foot high trees, and a region commonly referred to as The Banana Coast even before the assaults of global warming. East Greenland, on the other hand, is wind-blasted, ice-clogged, and far more obviously Arctic in character. Not surprisingly, a number of wood-inhabiting fungi -- mostly corticioid species that occur on finger-thick trunks and branches -- have been found in West Greenland, especially in its valleys. But not a single wood-inhabiting basidiomycete species has ever been documented from East Greenland. Ascomycetes such as *Rosellinia* and *Diatrypella* species, yes; but no basidiomycetes. This is also not surprising, given the lack of sufficiently large woody substrates.

In the summer of 2012, I visited the East Greenland village of Tasiilaq (formerly Angmagssalik), and you can probably guess one of my goals: to find a polypore or crust fungus growing on wood. To that end, I spent a considerable amount of time examining dwarf birches and dwarf willows (the only trees in East

Greenland are dwarves) within five or so miles of the village—and found nothing. There were plenty of fleshy fungi like species of *Russula, Inocybe,* and *Amanita,* but not a single wood inhabitor.

At one point, I indicated my interest in fungi to the Danish curator of the Tasiilaq Museum, and he took me to a turf house situated just below the Museum. It was the sort of dwelling that East Greenlanders, otherwise known as Tunumiut, would have used for their winter habitation until well into the 20th century. Traditionally, such houses would have been entered through a long, low passageway, but nowadays no one seems to enjoy crawling, so the house had been provided with a regular door.

Village of Tassiilaq to-day. All building materials have been brought in. No trees seen in the region—wrong coast!

Inside the structure, the curator shone his flashlight on what looked like a white crust fungus growing along the beam above the door. It had appeared not long after the village snow plough had dumped a large amount of snow on top of the house, he said. Could a large amount of melting snow have created the right conditions for the fungus? he asked me. Maybe, I replied, using one of my favorite mycological terms. Perhaps I should have used another of my favorite mycological terms, "probably", because in 2009 I had investigated wood-rot fungi in several buildings in the Arctic archipelago of Svalbard, and what usually inspired these fungi to produce fruiting bodies was the fact that the inside of the building in question had somehow become unusually wet.

I collected a piece of the white entity and, once I returned home, I looked at it under the microscope. I saw hyphae and all sorts of cystidia, but no spores. Then I tried unsuccessfully to culture it. At last I gave a sample to my friend Bob Blanchette, a mycologist at the University of Minnesota. Bob extracted DNA directlly from the tissue of my sample. The sequencing result was a 99% match with the crust fungus *Peniophorella* (=*Hyphoderma*) *praetermissa*.

This not uncommon species (probably a species complex) is a generalist and widely spread in the northern hemisphere. It has been recorded on *Salix glauca* from several localities in West Greenland, so it seemed possible that some of its spores had traveled east across the Ice Cap and gotten into the beams of the turf house. Or maybe someone from West Greenland had those spores on his person and visited the turf house. Or maybe a visitor from northern Europe had wandered into the turf house. I had a more intriguing explanation for the presence of the fungus in the house, however.

Peniphorella praetermissa is often found in or on Siberian drift logs. The logs are originally infected by its spores or mycelium in Siberia itself, then they end up in one of the regions's great rivers, the Lena, the Yenisei, or the Ob. That river transports them to the seas north of Siberia, where, usually frozen in ice, they tend to be shuffled around the Arctic by the clockwise Beaufort Gyre or the more erratic Transpolar Drift. While many of these logs continue their journey to northern Canada and Alaska, some of them are taken down the coast of East Greenland by the strong East Greenland Current. Their journey from Siberia to a beach in East Greenland might take ten or more years.

Now let's imagine this scenario: a hundred

Replica of an old turf house, with more modern windows and door, outside the local museum. It is easy to see how an enthusiastic snow plow could cover this low structure, markedly increasing the moisture in turf and timber at snowmelt, perhaps ideal to start some spores or hyphae going.

Interior of replica turf house. None of the wood in its construction is local; all was brought in from Denmark.

or so years ago, an East Greenlandic man is constructing a turf house for his family's overwintering. Wandering the shore near Tasiilaq, he finds an appropriately-sized drift log and decides to use it for some of the beams in that house, thus providing that log's resident fungus with a different habitat. The fungus may have infected the core of the wood, but it doesn't produce a fruiting body until shortly after a certain snow plough happens to come along...

You might think that a long Arctic journey like the one I've just described would be the kiss of death for a fungus. Not at all. For fungi are not only robust, but they can also be extremely long-lived. To cite an example: researchers from Texas A&M University have recently found fungi that could be as much as 100 million years old in ocean sediments. The researchers were able to culture those fungi, which turned out to be related to present-day *Penicillium* species. By comparison, ten or so years of being trundled about in frigid seas (conifers are more buoyant, deciduous logs less buoyant) and even as long as four hundred years resting on a frigid beach, like some logs on the Arctic island of Jan Mayen have done, are a mere blip in time.

The explanation turned out to be more prosaic. Not long after returning home, I received an e-mail from Ole Jensen, the former curator of the Tasiilaq Museum, informing me that the turf house in question was a replica, built as recently as 1994. The wood used to construct the house had arrived by ship from Denmark. I consoled myself with the fact that fungi are highly egalitarian: a Danish log, for a fungus, is just as charismatic a substrate as a Siberian drift log, and a replica hut is no different from a genuine one.

If a Danish mycelium produces a fruiting body in East Greenland, then that fruiting body should probably be considered a Danish species. Yet if the *P. praetermissa* mycelium remains in the replica turf house, and if that mycelium decides to produce another fruiting body, and if the next fruiting body produces spores, and if some of those spores insinuate themselves into the wood of a non-replica house in Tasiilaq, then maybe an East Greenlander will have the privilege of documenting the first "native" wood-inhabiting basidiomycete species in this remote part of the Arctic.

THE MAIL BAG

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

Errata in the last issue, pointed out by various authors:

Stenocybe pullatula (not *pullulata*).

Puccinia caricina var. *pringsheimiana* (not *pringheimiana*). The German mycologist was Pringsheim.

In the earth tongue illustrations, reference to page 10 should read page 16.

We appreciate all sharp eyes, who correct any errors, whether typos or more major sins and blunders.

Look what I found :)

Renée

<http://www.flickr.com/photos/21189203@N05/9234094801/in/photostream/lightbox/>

Ed comment: Congratulations! Now to find it in NL, so we can justify its 3rd appearance on these pages…

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