OMPHALINA

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Newsletter of FORAY NEWFOUNDLAND AND LABRADOR

Vol. II, No 7
Aug. 24, 2011

FORAY NEWFOUNDLAND AND LABRADOR

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

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

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

foray AT nlmushrooms DOT ca,

… who eagerly invites contributions to OMPHALINA*, dealing with any aspect even remotely related to mushrooms. 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

Hygrocybe vitellina, 9 Aug., 2008, La Jacques-Cartier, QC; photo Renée Lebeuf. This is one of several viscid hygrocybes, colorful and pretty. 2008 seemed to be a bumper year for it on the West Coast of Newfoundland, and the first year when *H. vitellina* was recorded in our foray.

See the lead article about work on this species, using material from Québec and our collection. This laconic communication illustrates ways good collections enable scientists to enhance our understanding of the nature around us. It explains why FNL and CMM spend much energy on their collections, in addition to learning about mushrooms and enjoying each others' company at their respective forays. It also illustrates the benefit of several collections of the same species: these allow a researcher to develop a better overview of the species in its area than a single collection.

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CONTENT

Message from the Editor

This issue represents OMPHALINA's entry into the titillating and sordid world of yellow journalism: a yellow mushroom on the cover, followed by one yellow mushroom after another to the flaxen-haired beauty on the last page. Even a yellow lichen. If you think *Armillaria* is brown, remember that honey is yellow. Julius Schäffer is father of the Schäffer Reaction, a chemical identification test that turns some yellow-staining *Agaricus* species orange. Only the brown *Paxillus* sneaks in on Julius' coattails. Although we have not sunk to the level of discussing *Rigidoporus erectus* or the genus *Phallus*, elements characteristic of yellow journalism are rampant: sensational use of misleading titles and pictures (p. 14), letters with scatological overtones (p. 21) or pictures of drop dead gorgeous blondes (pp. 21-22).

We organize forays to have fun, but in the course of them also generate data. The only real purpose to keep a database and specimens in a fungarium (the only reason to have a museum) is to keep and make available collections to investigators, who can help us understand the world around us. Several of these articles illustrate the new knowledge such activity can bring: we now know the species that grow in our province, something nobody knew before these studies. Until this, we called these mushrooms (and still do for many more) by names of close lookalikes, with no idea what really grew here. As you can see, some of these investigations are still ongoing; we aim to keep you abreast of future developments.

We hope that these discoveries are also of interest to our partners, good reasons to make them both continue and increase their support of our efforts. And, of course, we hope that these reports about our own fungi are of interest to the reader, even if the reports are preliminary, of ongoing work that will be reported in scientific publications, once completed.

You get it first!

Happy mushrooming and see you at the foray!

andrus

NB! Membership matters

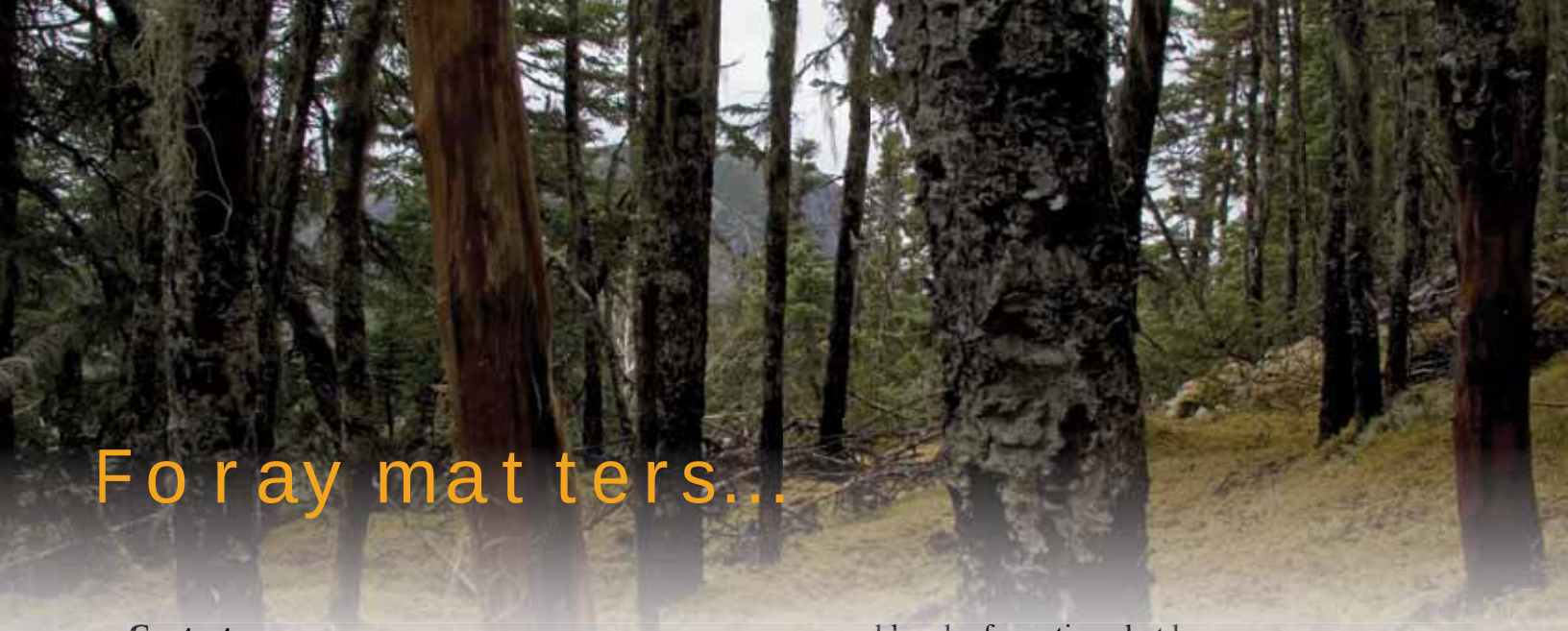
For those members, who are not attending our foray this year, this is your last issue of OMPHALINA that will be mailed to you directly, as a benefit of membership. If you would like to continue getting OMPHALINA mailed directly, or like to continue getting FUNGI at a ridiculously reduced price, or like to get the free electronic journals of our sister organizations with whom we have a journal exchange agreement, or just like to remain a member of our group, please renew your membership. Perhaps you get OMPHALINA from another source and would like to join our club. Forms can be downloaded from <http://www.nlmushrooms.ca/index.php?page=membership>. For a mere $40.00 CAD you can get all this, and more. And we accept US dollars at par!

To get FUNGI without interruption, forms with payment must be in our Treasurer's hands before Sep. 30, 2011.

After that date, memberships become effective at the 2012 foray and FUNGI subscription will start after September, 2012.

This will be your only reminder.

If circumstances have you cruising in economy mode and you prefer not to renew at this time, thank you for the pleasure of your company; we have enjoyed having you with us and hope you will join us again in the future. Until then you can always monitor our website and download all new issues of OMPHALINA as they appear. You can remain on the cutting edge free of charge, but have to do the monitoring and downloading yourself.



Foray matters...

Contact

This is our last communication before the foray. For the week before the foray, some of the organizers will be attending the Faculty Foray in White Bay South. To reach our President, Michael Burzynski, the Program Director, Anne Marceau, the Workshop Director, Maria Voitk, or even the unnamed ever-slaving Editor of OMPHALINA during that time, normal e-mail channels should work, although answers may be even slower to come and service is not guaranteed. For urgent matters, you can leave a message at the Riversea Resort, Faculty Foray headquarters: 1-877-480-2300.

Whistles & caps

Our risk management and legal advisors tell us we should require that everybody carry the whistle and wear the cap supplied, when in the woods during foray time.

If you got one in the past, please remember to bring it. If you didn't, it will be supplied. If you forgot yours at home, new ones will be available. In that case, we'd appreciate a VOLUNTARY donation of $15 per cap and $10 per whistle. This is voluntary—whether you donate or not, please take a cap and whistle. When you take it, it is yours. Please do not return, as some people are fussy about used stuff, so we cannot reuse them.

Bugs

We have had more rain and cold weather than I can recall in a decade. Some things don't grow and some do. Like mosquitoes—more than usual. Probably not a problem by foray time, but be aware.

Oh, and boots...

Workshops

A few spaces are still left in both the Dyeing and the Cooking Workshops. If you kind of regret not signing up and wish you had, you can do it at the foray, so long as space is available. Do not send a fee or registration at this late stage, but pay on site.

Accommodations

The accommodations are quite luxurious, compared to our usual standard. After reviewing the accommodations, the Board at its last meeting decided to extend participation limits to include all people on the waiting list at the time. This results in some friendly propinquity. Unfortunately we cannot take more, lest we slip into enforced intimacy.

For more information about the foray, please refer to our Foray Issue, OMPHALINA Vol II, Nr 3. If you do not have one, it can be downloaded from our website <nlmushrooms.ca>.

Relationship of *Hygrocybe vitellina* and *H. nitida* —preliminary report

David Boertmann

Because the original description of *Hygrocybe vitellina* by Fries[1] has been interpreted several ways, I reviewed the European interpretations of this and closely allied species[2]. By comparing collections of the different interpretations, I could assign these to several existing taxa. Orton's 1964 interpretation of *Hygrocybe vitellina*[3] seemed to fit best with the description of Fries. Other descriptions seem to fit best with the arctic/alpine species *Hygrocybe citrinopallida* originally described from North America by Smith & Hesler.[4]

In the course of these studies I also referred briefly to the very similar North American species, *Hygrocybe nitida*, described by Berkeley and Curtis[5]. This species is thought to be slightly larger, with more oblong spores than *H. vitellina*. However, intermediate collections are frequent and overlapping spore shapes have been described.[2] Because I had not studied enough North American *H. nitida* in detail, I preferred to consider the two as separate species for the time being.

In an effort to investigate the relationship of these two species further, 10 collections of North American *H. nitida/vitellina** were sent to me from the fungaria of Foray Newfoundland & Labrador (FNL; 6 collections), Andrus Voitk (3 collections), and le Circle des Mycologues de Montréal (CMM; 1 collection). Examination of these samples, with comparison to European collections showed that the two species were identical both micro- and macroscopically. The cover photograph shows a collection from Québec, the banner photo (above) one from western Newfoundland, and the photo on the next page (Figure 1), one with very small fruitbodies from Denmark. The features to note are that both cap and stem are viscid, and, as well illustrated in Figure 2, there is mucus on the gill edge (a sterile gill margin). Line drawing of the gill edge from a Newfoundland collection is shown in Figure 3, and of spores from two Newfoundland collections and two from Europe are illustrated in Figure 4.

Thus, by morphologic criteria the two seem to be conspecific (the same species). However, because they have lived continents apart without genetic intermingling for a long time, each may have evolved slightly differently. In that case, DNA studies should

Figure 2. *Detail of cover photo to show mucus on sterile gill edge on the left. Photo: Renée Lebeuf.*

*Because the single morphological differentiator between the two species, spore shape, had been noted to overlap for both species, Yves Lamoureux considered them synonymous. This led the CMM to use the earlier epithet, *H. vitellina*, for the North American species. Noting Lamoureux' reasoning, a similar decision was made by FNL. Thus, the North American material sent to Boertmann was labelled *H. vitellina*, but would have been considered *H. nitida* by most North American authorities. *Ed.*

Figure 1. *Collection of* Hygrocybe vitellina *from Denmark. Similar small fruitbodies have been found in Québec and Western Newfoundland in young specimens. Photo: Jens H. Petersen.*

show small genetic differences. These studies are underway.

A similar species *H. chromolimonea* is known from Australia and New Zealand, and it is most likely part of the same complex, if not conspecific with the North American and European species.

Finally, if this interpretation of Fries' description is not acceptable because Fries and the earlier mycologists did not describe the sterile gill edges, then the taxon should be considered *H. luteolaeta*. This was applied in 1985 to a Dutch collection of the same fungus by Arnolds, who was the first to note the viscid gill edge, a feature overlooked by all previous mycologists who studied *H. vitellina/nitida*.[6]

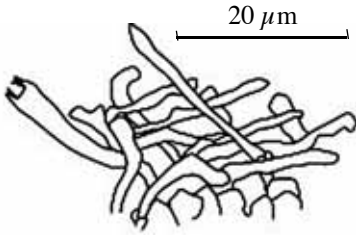


Figure 3. *Gill edge preparation from a Newfoundland collection (13 Sept. 2004) with the gelatinised edge cells above. Note single basidium. In old fruitbodies the sterile, gelatinised edge is sometimes almost entirely replaced by fertile tissue.*

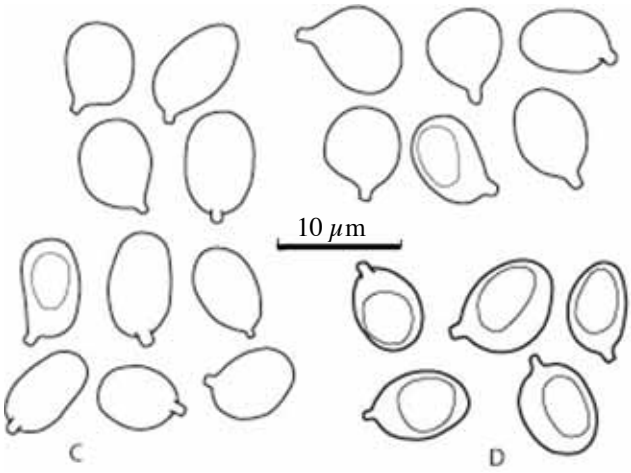


Figure 4. *Spores from two European collections (A/ from Wales 8 Sept. 1989 (K), B/ from Denmark, DB 2001/41) and from two Newfoundland collections (C/ 12 Sept. 2009, D/ 13 Sept. 2004).*

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Tricholomopsis of Newfoundland & Labrador

Andrus Voitk

Although I have seen only three species of the genus *Tricholomopsis* in Newfoundland and Labrador, I have been confused by this small genus. Not because the three are not clearly distinct from each other, but because I had a difficult time correlating descriptions in words to the mushroom I held in my hand. These are medium sized fleshy gilled whitespored mushrooms that grow on dead or rotten coniferous wood.

The name "Tricholomopsis" means Tricholoma-like, a quality that has not impressed me as much as it did Singer, who named the genus in 1939. The ones we usually see have a scaly cap, with the scale tips turned upwards to give them a spiky look.

Two species are well known and treated in almost every text: *T. rutilans* and *T. decora*. However, a third, *T. sulfureoides*, confused me. Some descriptions seem to

Tricholomopsis rutilans. Whitespored yellow mushroom with a red scaly skin, growing on dead conifer wood. Mature to post-mature specimens, above; young specimen on left. The bright yellow fades toward cream with age and the red fades toward brown. However, even if faded, the look is characteristic and the species is unmistakable. Not edible. The flesh has no particular smell, tastes a bit bitter and may stain brownish or darker on handling injury. Commonest in August. Slug probably ate scales, carving an interesting design into one mushroom. *Left photo: Maria Voitk*




The beautiful *Tricholomopsis decora*. Upper left: black scales, Upper right: gray scales. Title banner: dark brown scales, some yellowish in edges. Lower left: lighter brown scales, some yellowish at edges. Lower right: all yellow scales. This spectrum is normal, often with brown and gray mixed as well. Mushrooms with almost pure yellow scales seem to be commoner in the Avalon Forest. Commonest in September.

suggest that it and *T. decora* are alike, differing only in the colour of their spine tips: black or gray spine tips characterizing *T. decora* and brown or yellow spine tips *T. sulphureoides.* Sure enough, if you start to look at the spine tips, you find mushrooms with either yellow-brown or gray-black spine tips. If you only photograph those, you can make a case for two species (as I did in my book[1]), but it soon becomes apparent that it is at the cost of ignoring a whole spectrum of yellow-gray or brown-black or mixed spine tips. In other words, this morphologic characteristic did not correlate with what I saw and close examination suggested there was only one species with a variable spine tip colour (or a host of species, each with it own spine tip shade!).

Then I found an occasional smooth-capped yellow species, usually late in the season. Instead of a dimple, it often had a small bump in the middle of the cap. That made life even more complicated. At least three yellow species are described in North America with smooth caps, but trying to make my find fit any of those descriptions was also hopeless. To the rescue came McNeil's book [2], which showed an exact picture of my smooth-capped mushroom, naming it

T. sulfureoides! There: despite being often described as scaly, the words seemed to be mere convention and the species is, in fact, smooth. Checking this picture in many other books and websites showed that almost everybody was in agreement: the smooth-capped yellow *Tricholomopsis* in our woods is *T. sulfureoides*, descriptions of scaliness notwithstanding.

In 2009 Jukka Vauras described a new species of *Tricholomopsis* he had collected on the Island of Saaremaa in Estonia, giving it the name *T. osiliensis*, "osiliensis" indicating the Latinized version of its origin in Saaremaa.[3] As the picture on the next page shows, macromorphologically the species is almost indistinguishable from our *T. sulfureoides*. Although smooth-capped

Tricholomopsis sulfureoides. Smooth cap, adpressed scales and very few small burrs, well seen on central nipple if they have stained brown (middle right three pictures). Said not to stain, it does in fact stain reddish brown on prolonged injury. Commonest in October, and often frozen when found, as collection on the two pictures to the right. Note brown staining of gill edges of large mushroom (upper picture). It grew over the obviously stained mushroom on lower photo, the dark gills overhanging and rubbing against the dark part of the cap.

species are known in North America, they are new for Europe.

Is it the same species? Could be. However, if the fungi have been isolated from each other for centuries without a chance of genetic intermingling, it is quite possible that over time the organism in each place evolved along somewhat different genetic lines. To check this possibility, Vauras has kindly arranged the study of the DNA of all our collections of *T. sulfureoides*, to compare with his Saaremaa mushrooms.

This sort of analysis has several benefits. First, we shall know whether all our somewhat different collections are genetically a single taxon, or whether this morphologic entity hides within it some cryptic species. Secondly, of course, we shall find out if the two similar mushrooms really are the same species, or sister species across the ocean, evolved from a common progenitor. And thirdly, to my knowledge the DNA of the genus *Tricholomopsis* has not been studied in North America. Although documenting the molecular sequences for our mushroom is far less than a study of North American taxa, it will provide a basis on which future work can be placed, possibly even a stimulus for it to be undertaken in the near future.

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Tricholomopsis osiliensis, type specimen photo by Jukka Vauras, on a moss-covered dead conifer log in Saaremaa, Estonia. The stems seem to be a bit longer and more slender than ours. Note seeming readiness to stain, perhaps more than our species. Some genetic differentiation is likely over the centuries. Like the places on the West Coast of Newfoundland where our smooth-capped tricholomopses have been found, the bedrock in Saaremaa is calcareous.

My Favourite Mushroom: *Armillaria ostoyae*

Jim Cornish

Mycorrhizal, parasitic and saprophytic fungi play important roles in creating and maintaining healthy forests. Living in a mutualistic relationship with trees, mycorrhizal fungi colonize their roots and provide the tree with water and minerals that the trees' root hairs can easily absorb. In return, the trees provide the carbohydrates that the nonphotosynthetic fungi need for growth but cannot produce on their own. Parasitic fungi, on the other hand, are destructive. They cause rot in living, damaged and diseased trees. Once the trees die, saprophytic fungi decompose their host, returning essential organic material to enrich forest soils for future generations of trees and other plants.

A Honey of a Fungus

Some of the most pathogenic mushrooms in the world belong to the genus *Armillaria*, often called the honey mushrooms. My favourite is our largest and commonest, *Armillaria ostoyae*. An *A. ostoyae* in Oregon has mycelia that cover about 890 hectares (about 1,600 football fields) and weigh in at an estimated 600 tonnes. It started growing when Plato wrote his Socratic dialogues, some 2400 years ago. It is often cited as the oldest and largest living organism on the planet, although some experts award this honour to monoclonic poplar woods and other similar phenomena.

Taxonomy

Armillaria is derived from a Latin word meaning ring. Ostoyae honours French mycologist Paul Ostoya. There has been a concerted effort recently to rename *Armillaria ostoyae* based on early 1900's records describing and naming a similar and perhaps the same species *A. solidipes*. The argument seems to rest on examination of a few western collections, and some mycologists prefer to await more evidence. For the moment

I shall sidestep this issue and use the name familiar to most mushroomers; an Internet search using *Armillaria ostoyae* will yield many sites that include the *A. solidipes* epithet.

Tom Volk and others have shown that the honey mushroom complex consists of several species that share similar morphological features and are difficult to identify in the field. Breeding studies or DNA studies are needed to tell some of them apart. Because of the confusing state of *Armillaria* taxonomy over the years, Tom Volk describes them as the "bane of mycologists" since they were first described in the early 1800's.

Size and Appearance

Armillaria ostoyae typically grows in clusters that originate from a single point (cespitose). Although a serious hardwood parasite, in Newfoundland and Labrador most are found on conifer, usually near the bottoms of trees, from August to October. Large fruitings often occur after the first night frost.

The strict *A. ostoyae* has a 3-20 cm convex cap that flattens in age and is dry or slightly moist to the touch. It is covered in darker scales and ranges in colour from dark- to red-brown. The gills are close and whitish but often show a pinkish brown hue with reddish brown spots at maturity. They are attached but may appear slightly decurrent on some specimens. The stalk can be finely haired (downy) and has a well developed whitish ring with a brown edge. It is 6-15 cm long and 2-3 cm thick, whitish, becoming brownish to nearly black toward a slightly tapered base, often covered with some white mycelium. The spores are white.

The strict *A. ostoyae* lacks yellow, but there are others in the complex with various degrees of yellow.

Three clusters of honey mushrooms of increasing age. Note the scales on the cap that tend to be lost with time, the stout ring and the cespitose growth pattern. These are all A. ostoyae*, although the middle one seems a bit yellowish and could be a related species in the complex.*

Young honey mushrooms appear like little buttons, closed until the ring and cap separate. Note ring under cap in lower picture. The yellow top picture likely is A. sinapina, *possibly the lower one as well.*

Freaky Fungi

Honey mushrooms have some freaky characteristics that set them apart from most other fungi. They have a unique feature called rhizomorphs, thick cable-like accumulations of hyphae that look like black boot laces, giving them their common name boot-lace fungi. Rhizomorphs are usually found beneath the bark and spread from an infected tree to an adjacent healthy tree under the ground.

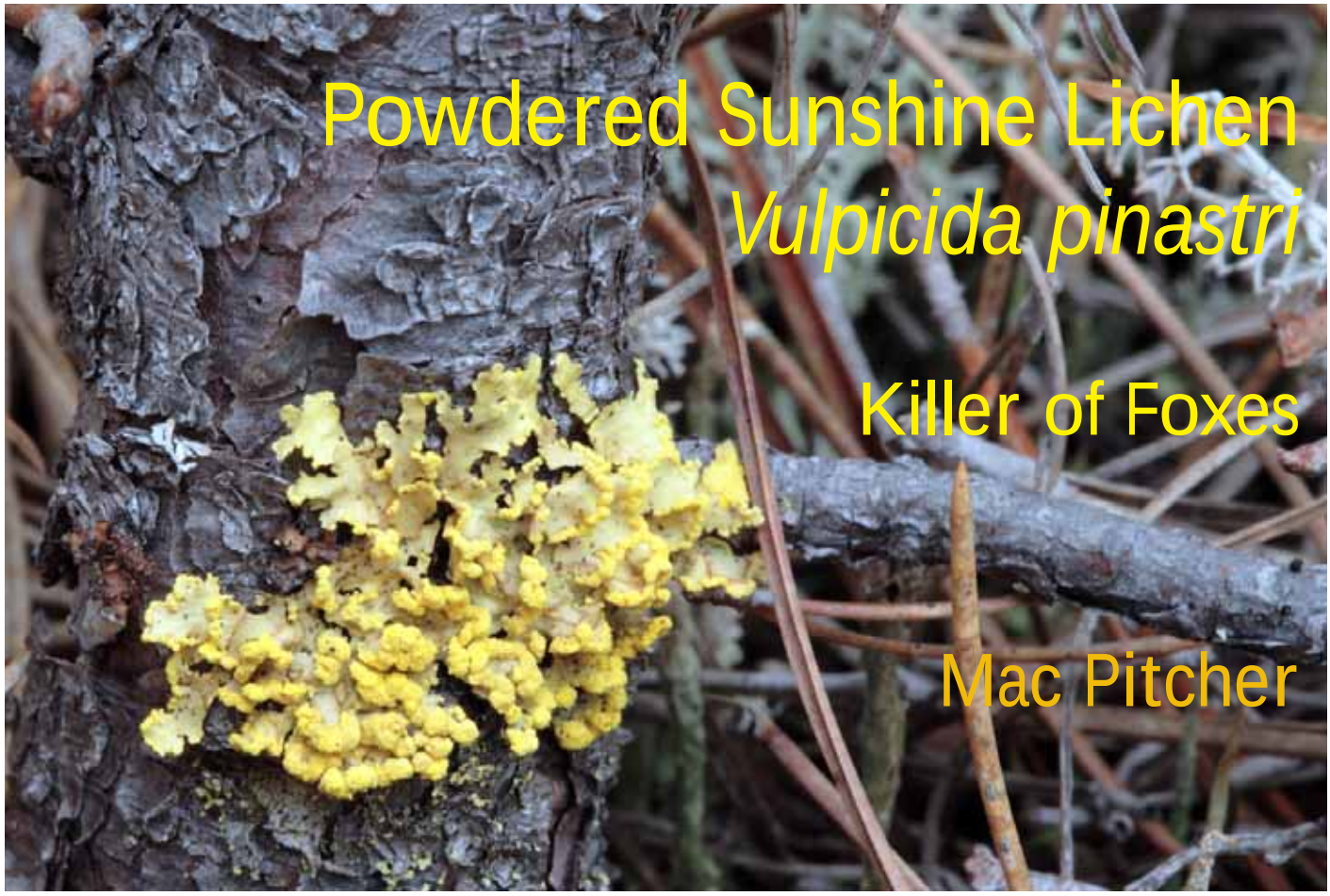
Some honey mushrooms are bioluminescent. They glow in the dark! Studies suggest that this is an adaptation to living in closed-canopy forests where spore dispersal by wind is limited. The greenish glow attracts nocturnal animals and insects that help disperse the spores. The bioluminescence, also called "Foxfire" is a substrate-enzyme controlled reaction that occurs in the presence of water and oxygen. Its occurrence is restricted to the vegetative structures of the mushrooms.

***Armillaria* and Our Forests**

Armillaria ostoyae is common mostly in the Boreal Forest, the cooler regions of the northern hemisphere. Loggers dread its appearance. It is considered the most aggressive and widespread fungal pathogen of living trees. The disease affects healthy and insect-damaged trees of all ages and height classes in natural stands. Trees affected by root rot usually display premature wilting and leaf discoloration as well as excessive sap leakage through cracks in the bark.

Edibility

Honey mushrooms are considered among the best edibles. However, some people report gastric distress on eating them, so caution and moderation is advised in the beginning. They get their name from their honey colour not their taste. The stalks are woody and tough and are often discarded. As with all mushrooms, collecting honey mushrooms for eating should be done with great care, initially with a knowledgeable collector. You need not tell the species of the complex apart, as all are equally edible. **You MUST, however, learn to distinguish them from the lethal *Galerina marginalis*.** Once you learn to recognize both, you are unlikely to mistake one for the other.



Powdered Sunshine Lichen
Vulpicida pinastri

Killer of Foxes

Mac Pitcher

This usually small, bright, yellow, foliose lichen is found on scrub spruce and larch in both boreal forest and heathland areas. Its bright colour and usually exposed location frequently makes it relatively easy to spot. However, occasionally, when growing in a somewhat shaded setting, the Powdered Sunshine Lichen will appear greenish-yellow. It can also be found on dead decorticate wood, occasionally on weathered lumber, and even on the stems of typical heath plants such as *Kalmia angustifolia* (Sheep Laurel). This latter combination is somewhat amusing—the Fox Killer residing with the Sheep Killer.

The eminent Swedish lichenologist Theodor Magnus Fries, in 1871 recounted the use of this lichen by the peasants of Härjedalen, in Sweden, to kill foxes, though they claimed it would not kill dogs or wolves.

This supposed ability to kill foxes was attributed to the presence of vulpinic acid in the medulla (the inner lichen thallus, comprised mainly of fungal hyphae). This, along with usnic acid, gives the lichen its bright sunshine colour. Although this lichen had remained for about two centuries as a member of the lichen genus *Cetraria*, it and five other bright-yellow close relatives were in 1993 separated into a new genus *Vulpicida*. The origin of the new genus name is no surprise: "vulpes" is Latin for fox and "cida" refers to killer.

Of the six *Vulpicida* species, only one other (*Vulpicida tilesii*, the Limestone Sunshine Lichen) occurs rarely in southwestern Newfoundland on calcium-enriched soil. The Powdered Sunshine Lichen is named for the abundance of "powdery" yellow soredia evident along the lichen margins in the accompanying photo. These soredia are a vegetative means of propagation for many lichens. Although the Powdered Sunshine Lichen has also been reported to bear apothecia, this occurrence is considered extremely rare.

The Newfoundland chanterelle

R. Greg Thorn, Andrus Voitk

The title banner is a lie: the depicted mushroom does not grow in Newfoundland. The picture is of *Cantharellus cibarius*, photographed by Vello Liiv in Saaremaa, Estonia. *C. cibarius* is a European species, described by Fries in 1821[1], and despite what your books tell you (including a book about Newfoundland and Labrador mushrooms by one of the coauthors![2]), it does not grow in Newfoundland and Labrador or anywhere else in North America. Repetitive, but true.

If that is so, then what is the chanterelle found in Newfoundland and Labrador? The answer comes as an interesting by-product of a study by Vilneff and Thorn to look into the reason for a seeming difference in the amount of slug and insect damage to chanterelles from the East and West Coasts of Newfoundland.[3] They examined the DNA of the chanterelles of the two regions, to learn if the difference in damage had a genetic basis. There was a very small regional genetic variation, but the most likely explanation is that damage difference is due to differing unidentified habitat factors.

We have since discovered that the DNA from both East and West Coast chanterelles matched that on deposit at GenBank for *Cantharellus cibarius* var. *roseocanus*, which was first described in 1997 by Redhead, Norvell and Danell. It was found growing with conifers in the Pacific Northwest and was thought to be an exclusively west coast entity[4].

Two of its major macroscopic features were listed as:

1. the folds or gills are deep yellow to orange, as opposed to the lemon yellow gills of the classical mushroom, and
2. it has a striking pinkish "bloom" (matte, powdery appearance), especially on the cap. This feature led to giving it the scientific name roseocanus (rose = pink, canus = hoary) and the common name, rainbow chanterelle.

A few weeks ago Foltz, Perez and Volk reported it from Wisconsin, based on DNA studies[5]. Confirmation of its presence in Newfoundland suggests the taxon is distributed transcontinentally in the coniferous boreal forest. A review of pictures in mushroom books from mid and northern North America supports this theory. It is probably the most common chanterelle in North American boreal coniferous woods, our answer to *C. cibarius* of northern Europe.

Why did we not recognize this earlier here, in Wisconsin and elsewhere? First, we have been

content to call most yellow chanterelles *C. cibarius*. The likeliest second reason is that the dramatic feature chosen to name the taxon is the least consistent. On many pictures from the Pacific Northwest the pink bloom is very obvious. However, this is not the case elsewhere in North America, where chanterelles resemble ours: they seldom have a significant bloom, and if they do, it is more pale or whitish, than pink. As so often is the case, once it is pointed out, it is recognized more often and at times a pinkish hue can be discerned. Figure 1 shows what must be the most extreme pinkish hue in our province—still only evident in retrospect!

The much more consistent macroscopic feature across the continent is the deep yellow to orange of the gill-folds, often also with a pinkish tinge; once pointed out, it is unmistakable. The colour difference may not be apparent when a collection is seen alone, but when compared side to side it is obvious (Figure 2). Another distinguishing feature of this species is the salmon coloured sporeprint, pinker and more intense than that of other North American species (Figure 3).

The other thing that became apparent on studying the DNA of our chanterelles was that this taxon is genetically sufficiently removed from *Cantharellus cibarius*, that it should be considered a separate species, rather than a variety of that species. This is not unexpected, because that is the common observation of most other complexes, where taxa differ on the two continents. Redhead and colleagues examined preliminary DNA findings, and two of the coauthors stated in a subsequent publication, "The authors conservatively named this chanterelle as a variety of *C. cibarius* because the available genetic data were preliminary. Subsequent research might indicate it merits the status of a separate species".[6] Once a more detailed picture of the DNA became evident, others also commented that the taxon deserves upgrading to species[7], but so far this has not been undertaken. We plan to make that part of our formal scientific report of these findings, if not done by that time. *Cantharellus cibarius* var. *roseocanus* will

Figure 1. *Cantharellus cibarius* var. *roseocanus* from Western Newfoundland showing pink bloom. Reproduced from *A little illustrated book of common mushrooms of Newfoundland and Labrador*[2]. Not much for the Pacific Northwest, this is an uncommon amount of pink for our mushrooms.

Figure 2. *Cantharellus cibarius* var. *roseocanus* from the Great Northern Peninsula on the left and *Cantharellus cibarius* from Estonia (detail from title banner) on the right. Perhaps not evident separately, the colour difference is obvious side by side.

soon be its own species (then you can omit "*cibarius* var". from the name). Since the common name suggested for it, "rainbow chanterelle", does not make sense here, and since it is the commonest chanterelle in our woods, we suggest that from here on we refer to it locally as **The Newfoundland Chanterelle.**

Are there some other chanterelle species in our province? Well, it seems that there are. In our birch forests or mixed forests under birch, a morphologically different chanterelle has been found. Smaller than the Newfoundland chanterelle, it is much less common and does not fruit in as copious or gregarious groups. Often it is scattered singly or a few separated individuals. The colour is paler, with less orange and the fruitbodies are often fused, so that the stem is thick and some specimens have several heads. The sporulating surface is more fold-like, shallower and more sinuous (Figure 4.)

Analysis of these collections is ongoing and will be reported here in due course. Perhaps our first author will be able to update us at the foray, where he will discuss some of this work. We are not prepared to report on this species yet; it is included here not to advertise the above-mentioned lecture, but rather to alert you to this different mushroom. We hope that alerted, you will look for it in your travels through our woods. If you find any, we should appreciate some photos and descriptions of the area and what grows there, as well as dried specimens. This will give us more material to work on and also help us define the range of this uncommon chanterelle.

Figure 3. Pinkish yellow sporeprint of *Cantharellus cibarius* var. *roseocanus* from the West Coast of Newfoundland.

Those are our chanterelles. You read it here first.

Summary

Our studies of the chanterelles of this province have revealed that

1. the difference in slug and insect damage on the West Coast and Avalon is real, but probably due to habitat rather than mushroom differences,
2. the common coniferous woods chanterelle of this province is *C. cibarius* var. *roseocanus*
3. its genetic distance from *C. cibarius* suggests it is a separate species, not a variety,
4. it is likely a transcontinental taxon with a significant variation in the amount and colour of its bloom,
5. there is at least one other chanterelle species in the province, growing with birch, undergoing further assessment.

Acknowledgements

We thank Ralph Jarvis, Director of Salmonier Nature Park, and the Salmonier Nature Park for assistance with collections in 2009 and 2010. We also thank Cassia Vilneff for collecting the material and Yesul Hwang, Dan Sionov and Rachel Beretta for obtaining and cleaning the DNA sequences.

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Figure 4. The "other" chanterelle from a birch forest in Western Newfoundland. Note paler colour, tendency to fusion of fruitbodies and markedly reduced gill-fold structure. Upper specimens fresh, lower specimens old and/or dried, which may have influenced their colour.

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JULIUS SCHÄFFER

Andrus Voitk

Not from a wealthy family, Julius Schäffer gained entry into secondary education by excellent academic performance. After finishing among the top ten in Germany, his teachers convinced his parents to allow him to pursue further studies. Julius entered the seminary, but on graduating, felt he was too young to take spiritual charge of a congregation, and elected to teach theology instead. He completed pedagogic studies to become a high school teacher of chemistry, physics and mathematics, and later a teacher of high school teachers. As a teacher he practiced and promoted the novel concept of outdoor excursions for students.

Apart from teaching, his interest was consumed by mycology. He studied mushrooms and communicated with the leading authorities of the time. Schäffer's main contribution was a systematic study of the agarics, in particular the genera *Agaricus*, *Cortinarius* and *Russula*. At his wife's urging, his descriptions were augmented by his watercolour paintings of the mushrooms, not common practice at the time. His monograph on *Russula* became the authoratative source on the genus at the time and appeared in the series Die Pilze Mitteleuropas. His picture of *Russula nitida* in the banner illustration is taken from there, via the internet.

Born in 1882, married in 1912, blessed with two daughters, he was well established as a teacher and mycologist when the National Socialist Party came to power in Germany. Schäffer disliked its philosophy and found the obligatory teaching of ethnic and racial principles repugnant. In 1939 he arranged for a discharge from teaching duties on medical grounds and retired to the country with his wife. There he devoted himself mostly to mycology, doing a little teaching in a teacher's college for girls.

On a fall outing with his charges in 1944 they came across a nice patch of *Paxillus involutus*, a very prized edible at the time, and a mushroom which Schäffer had relished in the past. Because he constantly tasted mushrooms in the field for his descriptions, Schäffer had decided a few years earlier to take a break from their consumption at the table. However, the sourish *P. involutus* was one of his favourites, and he asked his wife to prepare them for a lunch that they shared.

In the afternoon Schäffer became ill with symptoms of mushroom poisoning. A doctor was summoned, but in war-time Germany he could not find tubes to pump out the stomach. Telephone service had been interrupted, so no contact with the regional hospital could be made. Even worse, transport to hospital was impeded by lack of gasoline for the ambulance. Gasoline was finally located three days later and Schäffer taken to hospital. Unfortunately, he was beyond salvage, and succumbed at the age of 62 after 17 days in hospital.

*

What guides our decisions and actions? What really led Schäffer to give up eating mushrooms, which he liked? And what really moved him to break that abstinence? We make decisions like these, none of which seem momentous at the time, daily.

*

Although seemingly a gentle and conventional man, Julius Schäffer had the strength to reject popular views, even those proffered by a totalitarian régime. Imagine the potential opprobrium of openly expressing an opposition to the Afghan war in some democratic countries to-day. The effects of war are not limited to the armed forces or direct injury. Julius Schäffer's exit illustrates very dramatically the indirect effects of war on the civilian population.

Paxillus involutus & Paxillus syndrome

Andrus Voitk

Paxillus involutus is a common brownspored, gilled mushroom, found all over our province, mycorrhizal with a variety of deciduous and coniferous trees. This is one mushroom that seems equally at home in our cities, gardens and forests. Genetic studies have shown that it is a gilled bolete, rather than a member of the agarics. It can be recognized by its brown colour, the markedly inrolled 3-13 cm diameter cap, decurrent pale gills changing to brown, short, firm and straight stem and a reddish to dark brown staining reaction to injury and handling. In age the mushroom becomes very dark and the cap flattens out or even becomes funnel-shaped.

As many common species, *P. involutus* is one of a complex of similar species. We have recorded the similar *Paxillus vernalis* that grows with aspen in one foray and the slightly more common *P. rubicundulus*, found under alders on sandy soil, in a few others. Although known to cause some gastrointestinal distress in some people, at one time it was a favourite edible. The death of German mycologist Julius Schäffer served as warning about a potentially fatal reaction to *Paxillus involutus*, although many remained

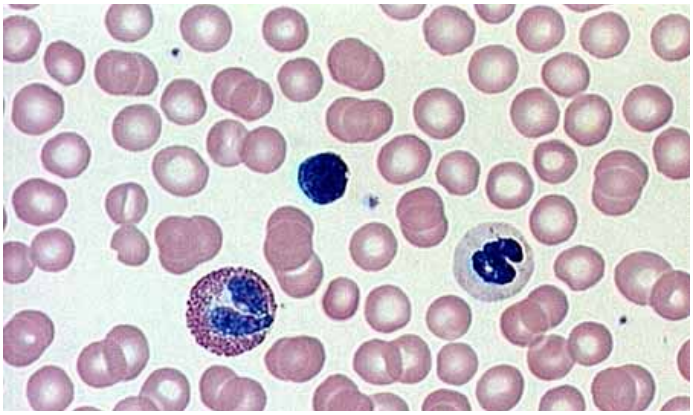
Paxillus involutus, *above, and* P. rubicundulus, *below. The bottom illustration, right, shows the ready separation of the gill layer, just as the pore layer of most boletes, suggesting the relationship to boletes and not gilled mushrooms. Gills of agarics grow out of the cap tissue and are not readily separable from it.*

skeptical that this prized and safe edible, eaten for generations, could be harmful. A rash of deaths in the 1960-s, related to *P. involutus*, confirmed its toxicity. Unfortunately, people still continue to eat and die from this mushroom. Although it is claimed that the Paxillus syndrome has not been seen in North America, Denis Benjamin in his book, Mushrooms: poisons and panaceas, describes a report of a couple who suffered what surely must be this entity after eating *P. involutus*.

Paxillus syndrome is characterized by vomiting and diarrhoea, cramps, stomach ache, back pain, acute anemia and collapse. It may be accompanied by clotting throughout the vascular system, kidney failure, often followed by multi-organ failure and death. Onset of symptoms occurs within a few hours of eating the mushroom. Characteristically, it affects people who have eaten the mushroom without incident for several years in the past.

In 1985 a Swiss physician, R. Flammer, elucidated the mechanism for the Paxillus syndrome: an allergic reaction known as immunohaemolysis. For unknown reasons the body at some point defines an unidentified component of *P. involutus* as "foreign" (the antigen) and starts to form antibodies to it. Subsequent exposures may accelerate antibody formation, and a future exposure may precipitate a massive reaction of antibodies in the blood stream "attacking" (combining with) the antigen in an effort to "neutralize" it. These antigen-antibody complexes have an affinity for the walls of red blood corpuscles, where they initiate a reaction with another body defense compound, complement, that breaks the walls. Haemoglobin from the red blood cells is released into the blood stream. Free haemoglobin molecules are small enough to pass through the filtering system of the kidneys, where they damage the small tubules, bringing kidney function to a standstill. Haemolysis causes loss of blood volume, loss of hemoglobin required for oxygen transport and loss of kidney function.

Paxillus syndrome is not a poisoning, but an allergic (immunologic) reaction to food. Peanuts, shellfish, strawberries are a few examples of other "normal" foods that cause allergic reactions, although expressed in different ways. As with most allergic reactions, it is difficult to predict who will develop the syndrome or when. For example, both Julius Schäffer and his wife ate *P. involutus*, but only Julius developed Paxillus syndrome. Clearly the incidence is quite low, given the popularity of this mushroom as a desirable edible



Microscopic slide of human blood, stained to see the cells better (with permission from the net). Red blood cells are round disks without a nucleus, somewhat dimpled in the middle, and contain the hemoglobin. The uppermost dark blue cell is a lymphocyte. It is some of these cells that make antibodies to protect the body against invasion by foreign materials. In the Paxillus syndrome, erroneous triggering of this process causes antigen-antibody complexes which are attracted to the walls of the red blood cells, starting a process which ends up with a sudden destruction of red cells, eventual kidney failure, collapse and death; see text.

If you are beginning to feel that this sounds more like a medical than a mushroom journal, you got the point. We are all connected, and should not wonder that an interest in mushrooms opens a small window on conditions in war-time Germany or on the way our own red corpuscles function. It would be perfectly logical for the picture of human red blood cells to grace the cover of a mushroom journal (or the picture of P. involutus *to grace the cover of a history or haematology journal).*

in Europe for well over a century. Contact with the antigen is required to program antibody formation, in order to develop the syndrome. Therefore most people who develop it have eaten the mushroom for a considerable time before, with no harmful effect. This makes it likely the link of the syndrome to *P. involutus* has gone undetected in the past.

No antidote is available, although some success has been reported with either filtering or exchanging blood or plasma. These procedures remove the offending antigen-antibody complexes, as well as the harmful free hemoglobin, and transfusion can replace the lost red blood cells.

the mail bag

or why the passenger pigeons assigned to serve the lavish Corporate and Editorial offices of OMPHALINA get hernias

Dear Editor,

Here's a reminder of your humbler past, before you started using the pompous editorial "we" all over the pages of Omphalina. With Maria you gave a mushroom course at the Brother Brennan Environmental Education Centre in support of the Centre's development. The money made after two years allowed the erection of two outhouses, so that the Centre could be used in the winter, when the water is turned off. Do you still remember the commemoration services after two years' work?

Here are two pictures from the formal unveiling ceremony, ribbon cut by the event director, Helen Spencer, that I forgot to send to you at the time.

The Premier of the time couldn't make it, being busy at some other outhouse.

You are, Sir, the only person I know to have a memorial outhouse dedicated in his lifetime.

Fond regards,

John,

who forgot the mushrooms, but not the course.

Greetings from Alaska!

What a great big country! Everything is on a grand and majestic scale. Newfoundland and Labrador has all the same things on a lesser scale, so that in Newfoundland and Labrador it is a bit more accessible.

Here I am handing a *Cortinarius bivelus* to my parents, Tuula & Kare. See the birch behind me? This is a birch associate.

We'll soon fly home to Finland, directly over your foray. We'll all wave to you.

Have fun on your foray!

Your friend Aava (with some help)

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  - Parks and Natural Areas Division
  - Wildlife Division
- Department of Natural Resources
  - Center for Forest Science and Innovation

People of Canada, through
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  - Gros Morne National Park

Model Forest of Newfoundland and Labrador
- Forest Communities Program

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