OMPHALINA

ISSN 1925-1858

Newsletter of FORAY NEWFOUNDLAND AND LABRADOR

Vol. III, No 5
May 22, 2012

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:*

Library and Archives Canada's Electronic Collection <http://epe.lac-bac.gc.ca/100/201/300/omphalina/index.html>, and

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

Mycena adonis, beside Cobb's Pond walking trail, Gander, Oct. 13, 2011; photo Jim Cornish. Undoubtedly one of the prettiest mushrooms in our province, and a natural for a cover picture; see lead article.

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CONTENT

Message from the Editor

Colourful spring flowers are already here. Not to be outdone, Jim Cornish offers up one of our prettiest mushrooms, followed by photography advice, again using this beauty as a model. One of the things that gives us great pleasure is making up the covers for OMPHALINA. The cover picture of this issue can grace any cover on beauty and quality of photography alone. These qualities feature highly in the choice of our covers, but we always make a selection for reasons beyond those. In this case it is to acknowledge the *My favourite mushroom* series.

The mycological wishes of most of us are simple: we should like to learn a few reasonably common mushroom species, so that we can identify them when we meet them. Articles answering that need are the backbone of any amateur mushroom journal. A consistent supply of such articles gives an Editor the freedom to pursue more remote corners of the mushroom world, to amaze the readership and satisfy its eclectic and varied interests.

The same words can also be said about Mac Pitcher's series introducing us to various lichenized ascomycetes in our province. A few readers have missed these in the last few issues. After contributing six articles, Mac has taken a sabbatical. Until his return, fully recharged, we shall try to fill the void in at least some issues.

If you enjoy OMPHALINA, please take this as a thanks to all contributors, who have helped shape the journal. This is also an invitation: should you come upon something interesting or noteworthy, by all means try to write it up and send it along. As you can see, there is a lot of talent among our amateur group, and we surely would welcome some of our untapped resources…

ERRATA. Several observant readers wrote in to correct taxonomic errors concerning the *Entoloma* in last issue's article about big white fleshy mushrooms. First, the proper noun, "Entoloma", despite ending in "a", is neuter, and takes a neuter gender ending (-um), not the feminine -a, as was written in a few places. Secondly, in the discussion of *E. sinuatum*, the epithets *lividum* and *luridum* were inadvertently exchanged. To set this aright, and tell us what the two white entolomas in our province are, we turned to Machiel Noordeloos, who started this ball rolling in 2005. You will note that his is just a brief preliminary report with these species. He is wrapping up a more detailed study of them and others, which should see the light of day soon. Therefore, it is possible that further genetic analysis will eventually conclude that our *E. sinuatum* differs genetically from that of Europe. Should that happen, we shall try to keep you informed.

Happy mushrooming!

andrus

FORAY MATTERS...

Yes, the foray will happen again this year! In beautiful Terra Nova National Park, Sep 28-30. Information and Registration Forms are on our website <**www.nlmushrooms.ca**>.

1. INFORMATION. We will not devote an issue of Omphalina to foray information this year. Since revamping our website, we elected to use it as a the natural distribution vehicle for this information, and use Omphalina only to notify you when the information is ready. Please make sure that you read all the pertinent information about the Foray, both general and specific, on our website.
2. NOTICE. First notice was given to members, to allow them first crack at registering. Therefore, the last issue of Omphalina was mailed out to non-members 2 weeks later.
3. EARLY BIRD SPECIAL. Over one month to register before the Early Bird special discount runs out. Seems like a long time, but now that the good weather is here, it goes by quickly. So…
4. LIMITED PARTICIPATION. The last three years we have operated with a waiting list, so that early registration is encouraged. Last year we allowed all registrants in, even past the comfortable capacity cut-off of our facilities. There were a few grumbles, and the board decided the cut-off should be strictly observed this year. We hate to turn anybody away, but it is not fair to make it uncomfortable for participants.
5. MEXICAN MUSHROOM TOURS' VISITORS. As announced in the 2011 Christmas issue [Omphalina 2(9):22], a mycological tour group organized by Mexican Mushroom Tours, was to join our foray. Your board and the Mexican group have worked very diligently to bring this about, with some changes to the foray to help accommodate our visitors. We thought that this group would add a lot of interest and excitement to our mix. Unfortunately, we just received word that the tour will be cancelled. Despite much hard work to keep costs down, financial considerations dictated a need to change plans. We are unhappy about this, but recognize the prudence of cancelling before participants have paid for travel, hotels and the like, some of which may not be recoverable.
6. FINANCES. For the first time since our first foray in 2003, finances have become a serious matter for us. The recent cut-backs in federal and provincial budgets were very real, and have more than trickled down to us in a very palpable manner. Had we anticipated this, perhaps we should have set a different fee, avoided having headquarters at a commercial establishment, not made costly workshops free, cut back on some activities, etc. Fortunately board policy has kept our finances healthy, so that despite our apparent generosity, we are not threatened, for this year. Please enjoy what we can offer this time, but be prepared for something different next year. It should be possible to organize enjoyable forays without significant fee increases—they may just have to be done a little differently.

My Favourite Mushroom: *Mycena adonis*

Jim Cornish

One of the joys of perusing my favourite walking trails is being surprised by the "new to me" species of mushrooms, which happens just about every time I set foot in a mushroom habitat. After this fall's Foray, I purposely extend my walks a little more off the beaten track. On one of these jaunts, I found a real beauty growing in a wet mossy hollow in a stand of black spruce—*Mycena adonis*. One photograph with my macro lens and this mushroom instantly became one of my favourites. Lucky for me, because it was the only *M. adonis* I spotted for the remainder of our mushroom season.

Mycenaceae

As its name suggests, *Mycena adonis* belongs to the Mycenaceae family. With 10 genera and over 700 species, it is one of the largest families in the Fungi Kingdom. Mycenaceae are cosmopolitan in distribution and present in all ecological zones. They are saprotrophic and live on decaying stumps, logs, forest floor debris and on the bark of living and dead trees.

The genus *Mycena* is the most populated (about 500 species worldwide) and the best represented (at least 35 species documented so far) of the Mycenaceae family in Newfoundland and Labrador. Mycenas are generally small (rarely more than a centimetre in width) and easily overlooked. Most are gray or brown with a few, like *M. adonis*, brightly colored. Most mycenas also have a translucent striated cap and many produce a bleach, radish, iodine, or mealy odour when crushed. Most are difficult to identify to species without microscopic study. In North America, most mycenas go by their European names, a situation that is likely to change with DNA analysis.

The edibility of most *Mycenae* is unknown as they are considered too small to be useful in cooking. Since some contain toxins, adding the genus to your "what not to eat" list might be a good idea.

Mycenas are not without a few oddities. Thirty-three species are known to be bioluminescent, creating a glow known as foxfire. One variety, *Mycena haematopus*, present in this province, bleeds red when the foot of the stem of a fresh specimen is cut.

Mycena adonis (Bull) Gray

Mycena adonis is one of the prettiest species in a genus filled with "beautiful and elegant mushrooms" (Michael Kuo). The genus name "mycena" is derived from the ancient Greek word mycēs meaning mushroom. The specific epithet "adonis" refers to the Greek god of beauty and desire.

Mycena adonis is one of the easiest of all mycenas to identify. Commonly called the scarlet bonnet, it has an orange to reddish conical to bell-shaped delicate cap typically less than 1.5 cm across and attached to a white fragile stem up to 4cm long and just a few millimetres wide. The gills are well spaced, narrow, whitish, yellowish or reddish tinged and appear to curve upward toward the stem. Two or three lamellulae (short gills) fill in the space between the gills that extend from the cap margin to the stem. The cap is hygrophanous and fades to an orange buff color when dry. *M. adonis* grows singly or in clusters. Preferred habitats include acidic boreal forest soils and patches of *Sphagnum*. Unlike many *Mycenae*, the odour of *M. adonis* is indistinct.

When I first came upon these *Mycena adonis*, I was reminder of this variation of an old saying, "small things come in beautiful packages."

Mushroom Photography: Aperture —Getting Great Details and Backgrounds

Jim Cornish

The first article of this series on photography (OMPHALINA Vol 2, #6), focused on ways to reduce blur. If you followed this advice, your images should be clearer. You might notice, however, that only a small amount of the subject is in sharp focus or that the background is very detailed and distracting. Both of these problems can be fixed by experimenting with aperture and depth-of-field (DOF).

Depth-of-field (DOF) is defined as the distance between the nearest and farthest objects in a scene that appear acceptably sharp in a photograph. In landscape photography, DOF can extend from a metre in front of the camera, all the way back to the horizon and beyond. In portrait photography that distance could extend from the tip of the nose back several centimeters to the ears. In close-up and macro photography, DOF can be reduced to millimetres.

The size of the DOF is controlled by aperture, which is defined as the size of the opening in the barrel of a lens. This opening determines the amount of light that reaches the camera's sensor. The size of the aperture is controlled by a series of moving blades, something like the iris of your eye. The blades turn inward to reduce the aperture, allowing in less light, just like a narrow pupil. The blades turn outward to increase the aperture, allowing in more light, just like a wide open or dilated pupil.

Aperture is measured in f-stops, a throwback to the days of film cameras when an external lens ring was moved a predetermined distance (a stop) to change the size of the aperture. F-stops can be a little confusing at first. Depending on the lens, they usually range from f/2.8 to f/22. That's easy enough! Now, the confusing part. F-stops of 2.8 (a small number) allow more light to reach the sensor because the aperture is wide open. F-stops of 22 (a larger number) allow less light to reach the sensor because the aperture is nearly closed. Knowing this is important in understanding what aperture settings to choose and how your choice affects the DOF.

Because of the physics of light and lenses, there is a direct relationship between aperture and DOF. As the aperture increases, the DOF decreases. And, as aperture decreases, the DOF increases. This means that as f-stops move toward f/2.8, less and less of the subject is in focus and the background can be blurred. And as f-stops move toward f/22, more and more of the subject is on focus and the background

Relationship between f-stop and the size of the opening in the lens (aperture) and the amount of light reaching the camera sensor.

The Exposure Triangle

Whether you use a P&S or the top of the line dSLR, every image you shoot is controlled by three camera settings: ISO, aperture and shutter speed. They work together in balance to create a correctly exposed image.

ISO **controls the sensor's sensitivity to light. A low ISO, say 100, makes the sensor the least sensitive. This setting is used in bright lighting situations like outside on a sunny day and produces the best quality images. A high ISO, say 800 or more, makes the sensor very sensitive to light.**

Shutter speed **is a measure of how long the sensor is exposed to light. Slow shutter speeds are used in low light conditions to give the dimness a chance to register on the sensor. Fast shutter speeds are used in brighter light or when you want to freeze an action.**

Aperture **is a measure of the size of the opening in the barrel of the lens. The increment in digital cameras is one-third of a stop.**

becomes more detailed and distinguishable.

Changing an aperture setting cannot be done in **AUTO** mode. The best mode to use is aperture priority, labeled as **Av** (aperture value) or **A** (aperture) on the camera's mode dial. In aperture priority, you choose (give priority to) the aperture size and the camera selects the time it stays open for the given light conditions.

Changing aperture settings in **Av** mode varies from one camera manufacturer to another and from cameras with viewfinder and LCDs to cameras with LCDs only. The procedure generally goes like this. Turn on the camera and turn the dial to **Av** or **A** (aperture). The LCD should now indicate you are in aperture priority mode.

Somewhere on the screen, you should see the current aperture setting written as f 2.8 or some other number. To change this aperture, press or turn whatever control or button you would normally move to increase or decrease other settings on your camera. On some models, it might be the right and left sides of the large button on the back of your camera. Touch LCDs might have a plus or a minus sign or and an up or down (left or right) arrow to make aperture changes. Your camera's manual likely lists the steps. On dSLRs, changing the aperture is normally done by turning the main dial next to the shutter release while in **Av** mode. Now, take the picture.

What Aperture Setting Do I Use

What aperture you choose depends on how much of the subject you want in acceptably sharp focus and how much detail you want in the background. If you want all of the mushroom in detail, a larger depth of field is better, so you should select a small aperture, closer to f/22. If you want less of the mushroom in focus and want some beautiful blur in the background, a wider aperture, closer to f/2.8 is required. The best approach is to set up your camera for the composition you want, and then shoot a series of images, changing the aperture f-stop after each shot. Start at the widest aperture and change a stop at a time until you get to the smallest aperture. When you get home, look at the series of images on your computer to find the one that best represents what you wanted to achieve. You can practice this at home using a 3-D object, a colourful pattern as the background (placed 10-30 cam behind the object) near a good source of natural light.

Keeping Aperture/DOF Straight

F/22, a large number, a large depth of field.
F/2.8, a small number, a small depth of field.

How to Check the Settings Used

In the days of film, photographers had to record the camera settings (ISO, shutter speed, aperture, lens focal length and exposure mode etc.) after each shot. In the digital age, these settings are recorded as part of the image in a file header called an EXIF (Exposure Information File). This data can be viewed on the photo review feature of your camera or later in image editing software. Refer to

Decreasing the DOF (increasing the f-stop) blurs and then eliminates distracting branches in the background, without losing sharpness of foreground mushrooms. Note increased fading of the mushroom cap on the right into the background.

this information to check how each aperture change affected the depth of field.

Mushroom Photography

There are two types of mushroom photography. One is documentary. It captures features like a ring on the mushroom's stem, warts and zonation on the cap or colour and attachment of the gills, (all important features in mushroom identification) in sharp focus. These images are great for field guides. The other is creative photography, the one that uses your control of light, shadow and depth of field to create a stunning image suitable for a coffee table book. Though challenging, getting both in the same shot is thrilling!

When shooting mushrooms in aperture priority mode and in low light, the camera's choice of shutter speed is likely to be too slow for you to hold the camera steady enough to prevent blur. A tripod or some other method of steadying the camera is a must. (See Omphalina Vol 2, #6).

Tips to improve your mushroom photography:

1. For maximum benefit from a shallow depth of field, shoot the mushroom at eye level with the back of your camera parallel to the stem of the mushroom.

2. Try varying your position to the left or right of the mushroom. Sometimes even a slight shift in position will capture a more pleasing background in your image.

3. Shoot on the downslope side of the mushroom to get a better shot of the underside of the fruiting body.

4. Remove detritus if it obscures details of the mushroom. Some of the more sticky species may have leaf litter attached. Get at least a few shots of this to help convey the mushroom's viscous nature.

5. Include a little foreground. Don't worry about it being out of focus, as foreground is often less important than the subject, just like the background.

6. To capture context, use a wide angle shot to include a mushroom and a wider view of its background.

7. Shoot a cluster of mushrooms with the closest one to the camera in the sharpest focus and the remainder fading into the background.

Comparison of European *Tricholomopsis osiliensis* with putative *Tricholomopsis sulfureoides* of Newfoundland

Jukka Vauras, Irja Saar, Andrus Voitk

Since Charles Peck described *Agaricus sulfureoides* in 1872[1] (Figure 1), the species has undergone several combinations, to be known currently as *Tricholomopsis sulfureoides* (Peck) Singer. For over 130 years smooth-capped species of *Tricholomopsis* Singer were unknown in Europe, until *Tricholomopsis osiliensis* was described from Saaremaa, Estonia, where Vauras discussed its resemblance to North America smooth-capped species.[2] Subsequently Voitk pointed out the macromorphologic similarity of *T. osiliensis* to *T. sulfureoides* found in Newfoundland.[3] Here we report results of the comparison of macro- and micromorphology, as well as genetic markers of these two species.

Methods

Macroscopic appearance of fresh fruit bodies was recorded and photographed. Microscopic examination was done by Jukka Vauras and DNA analysis by Irja Saar. DNA was extracted using High pure PCR template preparation kit (Roche Applied Science) according to the protocol of the manufacturer, followed by successive procedures as previously described.[4]

Results

Macroscopically both were similar (title banner and Figure 2). Microscopic differences were within the limits of intraspecies variation. Analysis of genetic marker sequences showed that both collections clustered as one species (Figure 3).

Discussion

The morphologic and genetic match of

Figure 1. Peck's hand coloured drawing of the holotype for *Agaricus sulfureoides*. Note that Peck shows a bit more scaliness of the cap than seen on the photographs. Image supplied with kind permission to use by the New York State Museum, Albany NY.

the Newfoundland and Estonian collections is evidence that they are conspecific. The likelihood, therefore, is that *Tricholomopsis osiliensis* is synonymous with *T. sulfureoides*. However, it is theoretically conceivable that the species found in Newfoundland is something other than the *Agaricus sulfureoides* described by Peck from the Catskills, so for the present the synonymy should be considered tentative, but unconfirmed. We hope to pursue this question with type material and/or fresh material collected near the type locality, and report the findings in a future communication.

Since the initial find of *Tricholomopsis osiliensis*, a second record was made from another island in Estonia,[5] and Jan Holec has deposited three nuclear sequences with GenBank form the Slovakia. It is intriguing to speculate why a European species could have remained unknown in Europe for over 130 years after its description in North America. The mycota of Estonia has been studied quite intensively for over 60 years and that of Europe considerably longer. Nevertheless, it is possible that the discovery by Vauras represents a previously overlooked species in Europe, there being more forests than mycologists in Europe, so that the right mycologist may not be in the right place at the right time. Another possibility is that the species is a relative newcomer to Europe, arriving by some means of transcontinental migration. A third possibility is that *Tricholomopsis osiliensis* is an alien species introduced by man. In that case, being contained in one small geographic area is quite possible at first. However, there is little to support this theory, because there is no evidence that either locality in Estonia had imported forest or rotten logs from North America. Both Estonian localities are natural, rich forests with mainly *Picea abies* on calcareous soil, characterized by several rare and demanding fungi, e.g. *Cortinarius caesiocinctus*, *Sarcodon fuligineoviolaceus* and *Inocybe terrigena*.

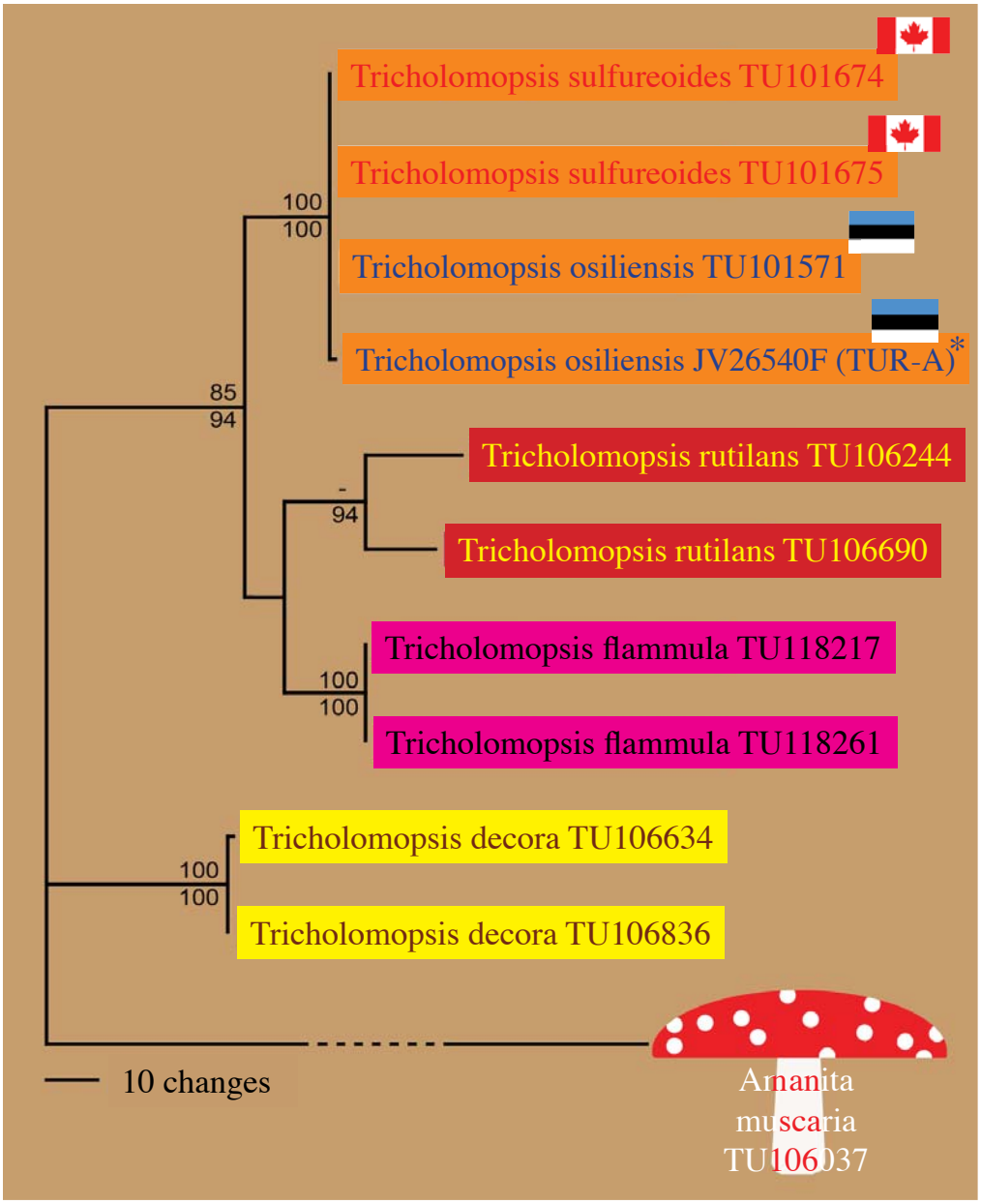
Once populations become separated across oceans, the opportunity for genetic mixing between them

Figure 2. *Tricholomopsis sulfureoides* in situ from Vormsi Island, Estonia (photo: Vello Liiv). Compare with Peck's drawing (Figure 1) and in situ pictures of from Newfoundland The macroscopic similarity is obvious. For photos of other Newfoundland collections and the first Estonian find, see the Omphalina article in reference 3.

Figure 3. Maximum parsimony tree of the species of *Tricholomopsis* found in Estonia. The specimens of *T. sulphureoides* are from Newfoundland. Note that the sequences of these cluster together with Estonian *T. osiliensis*, with very little genetic variation. We have not seen *Tricholomopsis flammula* in Newfoundland and Labrador—probably not found in North America.

Bootstrap support (≥70%) and posterior probabilities (≥90%) are shown above and below branches (bs/pp), respectively. The type specimen is marked with an asterisk (*).

Interpret this tree and then go to page 18 to compare your interpretation with that of an expert. You may want to review the first two articles about such trees in Omphalina vol. III, nr 1, from this January.



decreases significantly and the likelihood of evolutionary divergence increases. Because the Newfoundland and Estonian collections match genetically, the species is either genetically very stable or the separation (migration) is relatively recent (in evolutionary terms). As you see, fungi still have numerous secrets—the possible long-term existence of *T. sulfureoides* in Europe being one of them—that await a curious mind to unravel them.

Acknowledgments

The authors thank the New York State Museum for supplying the image of Peck's original illustration, Vello Liiv for the photograph of the second find of *Tricholomopsis osiliensis* (TU 101571) in Estonia, and Maria Voitk for the photo of the Newfoundland collection in the title banner.

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The Bishop's Sketchbook

Big white *Entoloma* species in Newfoundland and Labrador

Machiel Noordeloos

My first encounter with these mushrooms was very confusing. In Europe *Entoloma sinuatum*, has a gray-brown cap and yellow gills, but in Newfoundland and Labrador it has white cap, gills and stem. Except for the gill colour, it is very similar to another North American white species, with a little brownish pigment on the cap and yellow gills (somewhat like the description for *E. sinuatum* in Europe). In Newfoundland we could identify only these two species. The most consistent macroscopic difference between them was gill colour—one had white gills and the other yellow.

Microscopically, the white-gilled one had larger, slightly more oblong spores with thicker walls and more marked angularity, and the yellow-gilled one had small, thin-walled, subglobose spores. Initial DNA analysis in my laboratory showed that genetically the white-gilled one matched the European *Entoloma sinuatum* and the yellow-gilled one matched the North American *Entoloma luridum*. Further analysis of more collections and/or different genetic marker sites might reveal geographic genetic differentiation, possibly even cryptic species status; such investigations are nearing completion, and I hope to report a detailed study soon.

The pictures show them side by side on the lawn of Killdevil Camp on Labour Day, 2005. On the left of both pictures is ***Entoloma sinuatum* (Persoon) Paul Kummer** (synonyms, *E. lividum, E. subsinuatum*). Gills are white and average sporocarps slightly larger. The cap often has a central hump. Cap, gills and stem are white, and the stem more floccose-fibrillose than that of the other. This one is commoner, and according to FNL records has been collected in Labrador, the west coast and Central Newfoundland.

On the right of both pictures is the yellow-gilled ***Entoloma luridum* Hesler**. Yellow gills are the key feature with variable yellow on cap and stem. The centre of the cap is a darker yellowish tan to butterscotch. The central hump is occasionally presents as a blunt peak. An uncommon species here, so far collected only from the west coast of Newfoundland. In Canada also known from some parts of Québec.

In summary, the prime macroscopic difference between these two species in Newfoundland and Labrador is gill colour, seen in younger individuals. As they mature and sporulate, spores make the gills of both turn pink and obliterate the colour difference. If you are not interested in taxonomy, just avoid both, as both make you seriously ill if you eat them.

The grasshopper & the blonde

Lactarius helvus

Andrus Voitk

A fictionalized account based on a real e-mail correspondence that conveys the frustration of never getting a straight answer. Having gone through it, the mushroom is forever and irreversibly fixed in the brain. A straight answer may have become just another foreign name, registered by the eyes without leaving an imprint in cerebral tissue. Possibly the tedium of reading this may even fix it in the mind of the reader forever?

Oh, and don't send me pictures expecting to play the same game again…

Master, my unworthy eyes found this in moss in the woods. The nutty smell makes me think it a Lepista.

You didn't say if it snapped like chalk when you broke it, Grasshopper, or was soft and mostly bent.

It didn't bend, Master. More snapped, I guess.

So where does that put it?

Russulas, I guess, Master, because there was no milk.

Why are you hiding the smell and milk from me, Grasshopper?

Lowly Grasshopper did not notice any milk, Master.

But it smelled nutty.

Aah, Grasshopper, smell carefully! By nutty, do you mean fenugreek, burnt maple sugar, or curry?

My lowly nose knows not burnt maple sugar, Master, and fenugreek is not a standard part of the diet for Newfoundland Grasshoppers. But curry, yes, now that you mention it, Master, it does smell like curry. And seems to be getting stronger, too, as it dries.

Grasshopper, are you saying that curry is a Newfoundland dietary staple? And the milk, Grasshopper?

Grasshopper begs forgiveness, Master, but he saw no milk.

Pay attention, Grasshopper! In *Sphagnum* and wet places that it likes, there is a lot of milk. Elsewhere the milk is as described in most books, "scant". Why is it hard to see if you don't look closely?

Forgive me, Master. I looked again with a loop—there were tiny droplets of clear fluid on some gills. When I broke fresh tissue, I could clearly see a few tiny clear droplets form. There's clear latex, Master.

Silence.

After 24 hrs: *Please enlighten Grasshopper, Master. In the* Lactarius *section of Master Phillips there are only 2 with maple sugar smell*, L. aquifluus and L. camphoratus. *Which one is this, Master?*

You already know the size, colour and milk colour of yours, Grasshopper.

Master, L. camphoratus *is dark, small and has white milk.* L. aquifluus *is light, big, with clear latex. Grasshopper thinks that is the one.*

Good, Grasshopper! What does Master Michael Kuo say?

According to Master Kuo, it's the same as L. helvus *of Europe, Master.*

If that's so, which name is correct?

The European is the earlier, Master.

Yes, and by convention that's the one that should be used if they are the same.

How do we know that they are, Master?

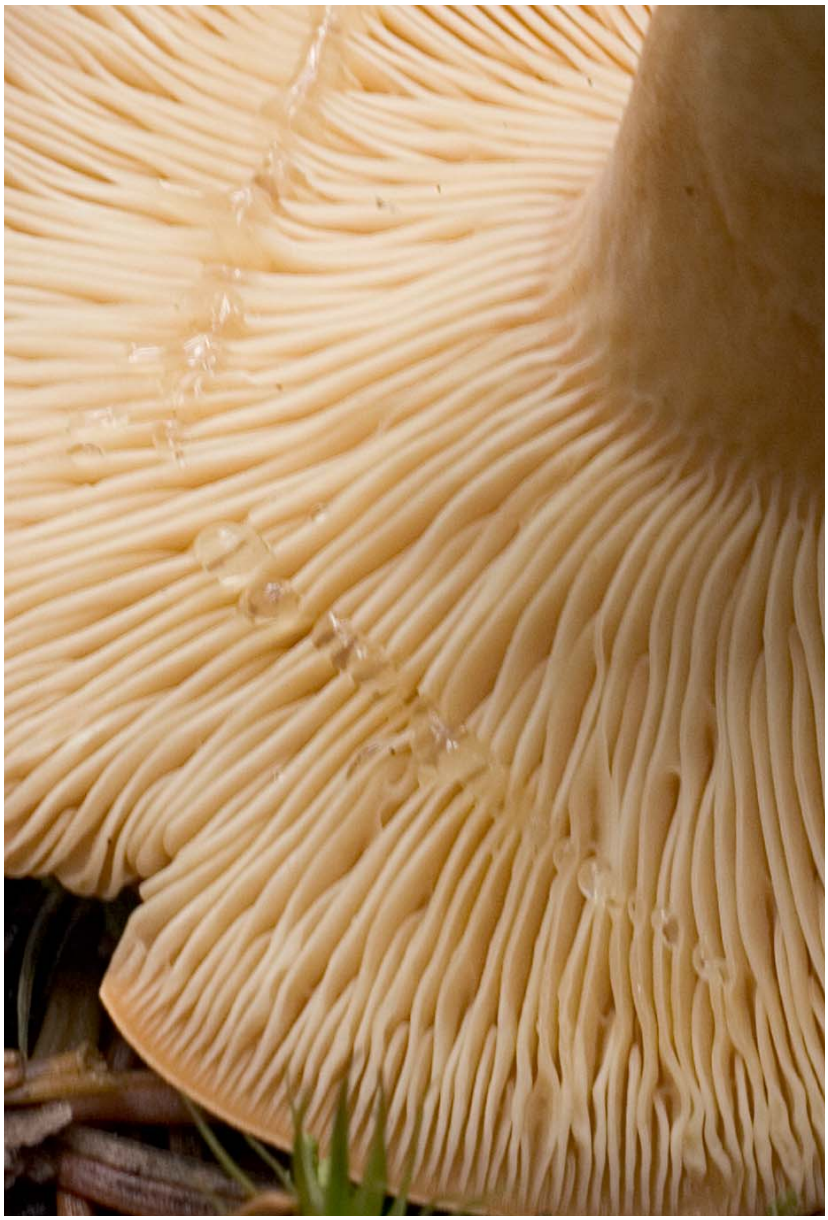
For now, they are the same by the classical criteria of macroscopic and microscopic appearance, so for now we should use the older, the European name. Should examination of their DNA show that they have continued to evolve along different paths since their separation on two continents, enough to produce a significant genetic difference, then the North American one should get a different name, likely back to *L. aquifluus*.

So, Lactarius helvus *then, Master?*

What does "helvus" mean, Grasshopper?

Blonde, Master.

Now I see how "getting down and dirty" with the mushrooms, as you teach us, is required to understand these organisms. Grasshopper very humbly begs the Master to accept his lowly and unworthy thanks for these invaluable lessons.



Connopus acervatus in Newfoundland and Labrador

Andrus Voitk

Fig. 1. *Connopus acervatus* TENN061292 from Newfoundland, Canada. Numerals on the label are 4 mm high.

Connopus, you say. Never heard of it! Perhaps you have heard of it under the name *Gymnopus acervatus*? Or, if you are the lucky owner of more classic mycological literature, you may find it listed under the name *Collybia acervata*. So, what's with this *Connopus*? Well, for this you can again thank DNA—the currently fashionable fascination of looking at genetic material for a clue of how organisms relate to each other. You may recall the visit of Ron Petersen as faculty to our 2006 foray. As many visiting mycologists, he collected mushrooms for his own studies, while visiting. Among these was a nice bunch of *Gymnopus acervatus*.

This is a relatively common hygrophanous fall mushroom in our province. Caps are bowl-shaped, but flatten out in late maturity, 2-4 cm across. Sporeprint is white. One diagnostic feature of this mushroom is that it grows on wood in very tight bunches, the long dark stems almost fused together. Another diagnostic feature is that the stems are covered with a very marked white furry layer at their bases, rising to varying levels. It is considered a reasonable edible, but great care should be taken not to confuse it with troops of the lethally toxic brownspored *Galerina marginata*. If you know both intimately, they are totally different, but if you are not certain, a mistake is much easier than one might think. And costlier.

Ron and his colleagues were studying the genus *Gymnopus*, and found that according to its genetics, this mushroom did not fit into the genus too well. It was sufficiently removed from the others, that at least by genetic criteria a separate genus seemed more reasonable. They proposed the name *Connopus*, thus preserving the tie with its previous name through the pus (foot), and describing it as connate or almost fused together.[1] The interesting thing is that as we have seen in many other instances, when we look back, we can see that there are morphologic features that support this decision, which we had elected to ignore. Gymnopus means nude foot in the sense of smooth or uncovered. Of all the species in that genus, this one was characterized by the hairiest of feet—not well placed with all the nudes.

The team also discovered that there are two different genetic strains of this mushroom in North America, one found on the West Coast, and one on the East. There seems to be sufficient difference genetically, that we may reasonably anticipate the reassignment into two distinct species. What was interesting about the eastern species, was that it seemed to be conspecific with the species found in Scandinavia and Europe. This pattern differs from that usually observed for our province. Whenever there are different European and North American species of a complex, Newfoundland and Labrador has stood squarely as part of North America, not with Europe, despite being closest. The finding that we have the same species as found in Europe might suggest that the travel pattern of this species complex may be different from the north-south movements proposed for others. Being the same as the European species, if the western strain becomes reassigned as a separate species, we still get to keep the old name *acervatus*, so for once we do not have to make another change!

Big deal! So what's the difference, wether we call it *Connopus acervatus*, *Gymnopus acervatus*, *Collybia acervata*, or even *Agaricus acervatus*, the name under which Fries originally described it?[2] It will still grow in our woods and happily decompose our rotten coniferous wood, uncaring whether we call it Bob or don't call it at all. True. The name is not for the fungus, it is for us. If we are able to compartmentalize organisms according to evolutionary propinquity, we gain certain insights into the world around us. We can deduce the pattern of migration of organisms across continent and time these events. We can understand when some trees evolved and when enzymes evolved to decompose them.

And, of course, breaking down the thousands of mushrooms we may encounter in our province into smaller groups makes it easier to remember and know them. That enables us to speak about them with others, using shared names and terms, so that we understand each other. Names are for us.

Foray Newfoundland & Labrador is delighted that our foray has contributed, even peripherally, to sorting out some of these puzzles. FNL is also delighted to note that the article of Hughes and coworkers features a prominent picture of nice mushrooms from Newfoundland and Labrador (see title banner).

Acknowledgment

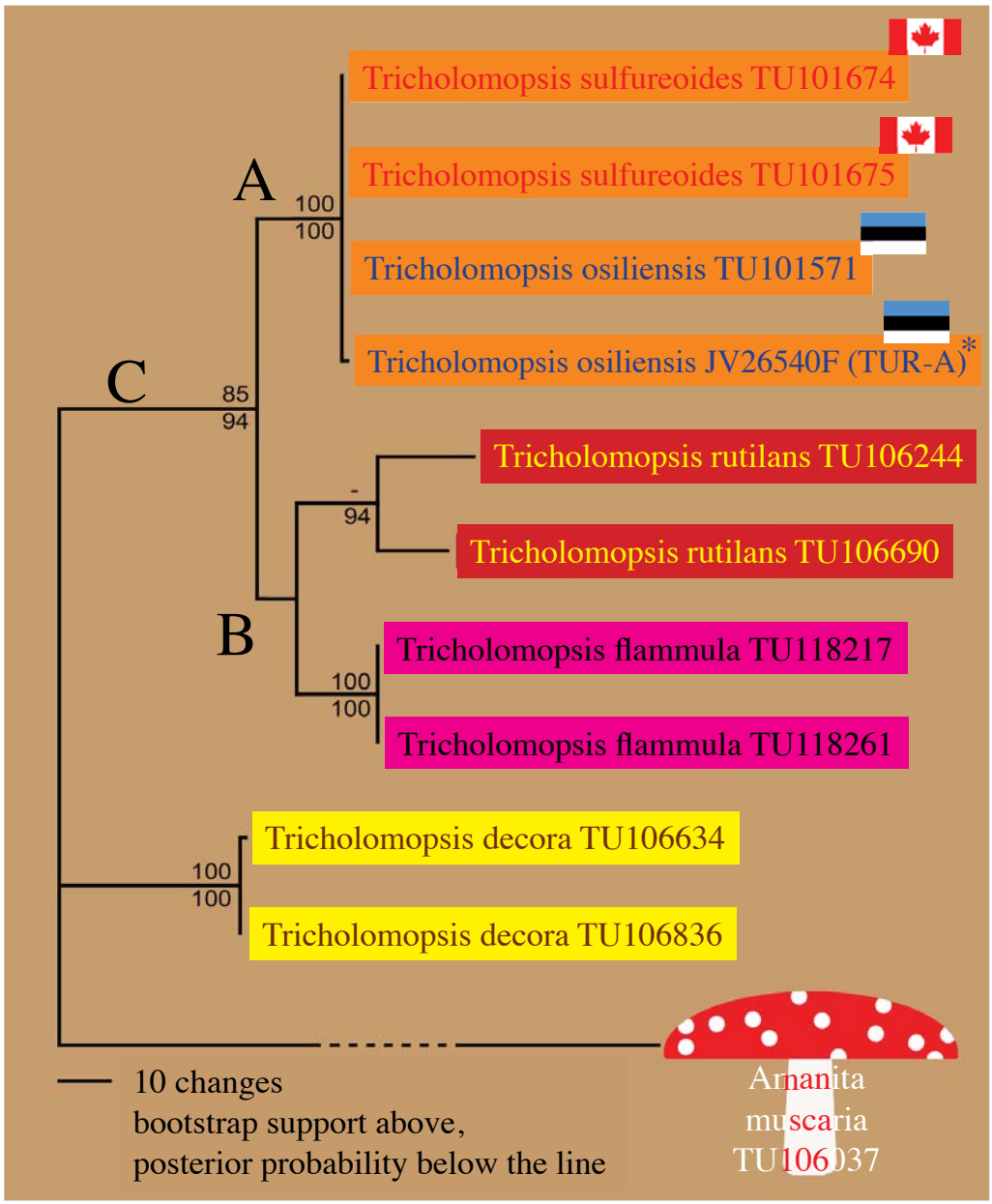
Title banner photo and caption from the Mycologia article[1], used with the kind permission of Ron Petersen.

References

1. Hughes K, Mather DA, Petersen RH: a new genus to accommodate *Gymnopus acervatus* (Agaricales). Mycologia 102:1463-1478. 2010.
2. Fries EM: Agaricus acervatus. Syst. mycol. Lundae 1: 122. 1821.

Interpreting a phylogenetic tree

Michele Piercey-Normore



Bootstrap support. *The percentage of time the same tree was derived from many computations (usually 500) using different random starting points in the source data; the higher the percentage, the better the cluster patterns fit with their evolutionary history (based on the data tested).*

Posterior probability. *The probability of getting the same taxa to cluster together; the higher the percentage, the higher the probability that the cluster patterns represent the "most likely" evolutionary history (based on the data tested).*

The evolutionary root of this tree is *Amanita muscaria*, which is most distantly related to any of the species in tree. The first branch that splits off contains two specimens of *Tricholomopsis decora* and has 100% bootstrap support and 100% posterior probability. These two samples are more closely related to each other than they are related to any other sample in the tree. They are also more evolutionarily distant from all other species, but not as distant as *A. muscaria*. The next lineage that diverges is lineage **C**, which has high support and leads to eight more specimens in the tree. The high support values on lineage **C** suggest that lineage **C** diverged from an ancestral lineage similar to *T. decora* and *A. muscaria*. This divergence must have occurred over a time period that was long enough so that all samples within lineage **C** are more similar to one another than they are to *T. decora* and *A. muscaria* and all members within **C** belong to one large genetic grouping. Even though there are three genetic species represented by lineage **C**, they are more evolutionarily related to one another relative to *T. decora* and *A. muscaria*.

Branch **C** splits into secondary branches **A** and **B**. Branch **A** groups all four samples of *Tricholomopsis sulfureoides* and *T. osiliensis*, with 100% bootstrap support and 100% posterior probability support for the clustering together of the four samples, the highest support that any clade can receive. The absence of any horizontal line along the vertical line connecting the terminal taxa indicates that no evolutionary changes occurred to get to those taxa i.e. they are identical based on the genes used in this tree. Lineage **A** is a monophyletic clade and the four taxa may be considered to belong to the same species. In a monophyletic clade such as this one, all terminal taxa can be traced back to a single progenitor at lineage **A**.

Branch **B** splits off from Branch **C** to connect two clades, *T. rutilans* and *T. flammula*, with support levels that are too low to be recorded (in this case, below 70% bootstrap and 90% posterior probability). These low levels of support suggest that branch **B** may not be a true lineage and the relationship between *T. rutilans* and *T. flammula* may be more distant than they appear in this tree. On the other hand, the relationship may become stronger if other species are added to the tree.

The lineage connecting the two samples of *T. rutilans* has low bootstrap support, less than 70%, but a high posterior probability value of 94%. These values are not considered to be strong support for this cluster but they may be strong enough to suggest that the taxa are probably the same species. Less than 100% support means that these species have some similarities (and some evolutionary relatedness) with other samples in the tree. The two samples of *T. rutilans* have a larger number of differences between them than the two samples of *T. flammula*, its sister species. The lineage connecting the two samples of *T. flammula* contains strong support values with 100% for both bootstrap and posterior probability. These high values indicate a low level of similarity with other samples in the tree but high similarity with each other.

To summarize these results, one interpretation is that *T. sulfureoides* and *T. osiliensis* are the same species. Morphological similarities of the fruitbodies support this interpretation. This interpretation might be tested by sampling other genes in the genome for additional similarities or differences between the "species".

A second interpretation from this tree is that *T. flammula* is a separate species from *T. rutilans*. However, *T. rutilans* may be either in the process of splitting into separate species or converging into the same species because there are some differences between their sequences. To test this theory, more samples of *T. rutilans* may be collected from widely differing geographic regions. Another phylogenetic analysis with additional genes can be done to determine whether the two samples of *T. rutilans* will fall together with stronger support than they have here, or remain weakly supported.

MORELS IN 2012 IN WESTERN NEWFOUNDLAND

It is difficult to put out a May issue without mention of morels, even if in passing. An average year around the Editorial Suites of Omphalina. First one collected May 8 (single, small), and a grand total of 36 for the month to date. This year we did not eat the 1-4 cm Lilliputians fresh, 1-4 at a time, but dried them and save them for one meal, where we might actually taste them.

Maria Voitk

Ramalina dilacerata

This lichen only drew our eyes when reviewing photos of a more dramatic orange *Xanthora*. The beautiful small bushy lichen on an old balsam fir twig was likely dismissed in the field as just another old man's beard with a brush cut. Although quite distinct, we were unable to identify it using the keys in our two books. However, it was kindly identified for us by Teuvo Ahti as *Ramalina dilacerata*, which he said was not that common. It is a short, pale, bushy lichen, with concolourous apothecial discs at the ends of many branches. The branches are hollow, and characteristically have several small perforations.

Brodo et al. say that it is found near lakeshores and seacoasts.[1] Dead branches are dry, and lichens on them depend on the air for all their moisture. Those that need more than supplied by rain, often seek out foggy littoral areas. This specimen was found in Pasadena, near a stream within the Humber River-Deer Lake fog belt.

Hinds and Hinds state that in Scandinavia it has been used as an indicator for old growth boreal forest.[2] Another organism preferring old growth forest is the Newfoundland pine marten. This past winter we monitored several pine marten hair snag traps in the valley and hills around our home behind Humber Village. No marten was detected. At the same time, marten hair was recovered from several traps in the woods near Pasadena. Our lichen was found near Pasadena, while we have not noted this species during 12 years of exploring the woods around Humber Village. Do both *Ramalina* and marten suggest that Pasadena is surrounded by old growth forest, while the woods around Humber Village have been logged repeatedly? Is that true? Perhaps *Ramalina dilacerata* is a good indicator for Newfoundland pine marten?

References

1. Brodo I, Sharnoff SD, Sharnoff S: Lichens of North America. Yale University Press, New Haven, Conn. 2001
2. Hinds JW, Hinds PL: Macrolichens of New England. New York Botanical Garden Press, Bronx, NY. 2007.

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