OMPHALINA

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Christmas Issue Newsletter of FORAY NEWFOUNDLAND AND LABRADOR

Vol. II, No 9
Dec. 11, 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 the largely self-appointed Editor, Andrus Voitk:

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 species, close to *H. turunda*, sand dunes, Forteau, Labrador, Oct 2, 2011; photo: Maria Voitk. This gorgeous little beauty was evident all over the banks. Coupled with the equally everpresent *Empetrum nigrum*, it makes a beautiful Christmas cover to wish all of you the best of the season. If you are contemplating pursuit of a PhD in Mycology, and only lack a challenging question worthy of your efforts, then read the lead article for your Christmas present.

Meanwhile, please be assured that we are diligently at work trying to identify the species with exactitude. If and when we do, and it is worthy of note, of course you will get word in OMPHALINA.

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CONTENT

Editorial 2
Hygrocybe aff. *turunda*
Andrus Voitk 3
Lobster mushroom
Henry Mann 4
Corallorhiza and *Tomentella*
Andrus Voitk 6
Angel wing toxin
Michael Beug 8
The Bishop's sketchbook
Glynn Bishop 9
Serpula lacrymans
Andrus Voitk 10
Coprinopsis atramentaria
Jim Cornish 13
Christmas cladonias
Mac Pitcher 15
Russulales salad
Ted Ahti 20
Newfoundland mushroom tour 22
Partners ..... inside back cover
2012 foray notice ..... back cover

Message from the Editor

What message does an Editor have this time of year, but to wish you a warm Christmas and good fortune throughout the upcoming year?

Oh, and also to mention that the 2012 foray dates have been changed to September 28-30.

Also, with respect to our forays, the Report of both the Faculty Foray and "Real" Foray are now out. The former is available for download from our website, and the latter will be in due course. Reports were mailed to all members and Partners. Some members' servers do not accept files over 2 Mb in the mailboxes. If you did not get a Report for this or any other reason, please download one from our website.

Our wishes are conveyed by the beautiful Christmas colours of the cover. Henry Mann's lobster mushroom continues the festive colour theme, as well as the festive gustatory connotation of lobster. The candy cane orchid, *Corallorhiza striata*, has an obvious Christmas association. Equally obvious are angels, as in Michael Beug's angel wings. Enjoy, but do not eat.

The article about *Serpula lacrymans* may seem misplaced. A snake for Christmas? It was an editorial decision that the rollicking story of HMS *Implacable* would make ideal holiday reading. This story was penned almost five years ago. Its author was certain that the mushroom would eventually turn up in the seaport that is St. John's, so the story just bid its time. 'Tis the season often associated with alcoholic excess, so Jim Cornish's discussion of tippler's bane should serve as a gentle adumbration for prudence.

One of the advantages of a dry foray like our last one is that for once there is plenty of time to photograph the paltry finds. In fact, Glynn Bishop had time to paint them! Many decades ago we took an interest in art, and studying the work of the Group of Seven, were struck by the lively spontaneity of their small 8 x 10" on-site oil sketches, as opposed to the more formal studio work. The same vibrance can be seen on Glynn's quick on-the-spot aquarelle notations, made more charming by the transparence of the medium. His is a gift that keeps on giving, because The Bishop's Sketchbook will be a regular feature throughout the coming year. And if this is not enough eye candy, move on to Mac Pitcher's gorgeous feast of red-green lichens.

To help you feast, finally a recipe again! Ted Ahti sent the recipe for something they eat at home at Christmas time. And your present is two full pages of content for 1/4 page of recipe! How do they do that?

Finally—are you looking for a gift for the mushroomer that has everything? How about a mycotour of Newfoundland? Gundi Jeffries and Erik Purre came to our 2011 foray and from what they saw of the province and our foray, decided to make Newfoundland the destination for their exotic tour in 2012. See the notice on p. 22.

Our touring visitors will not impact normal participant numbers: the Board welcomed the group, but increased registration spots, to keep the usual number of places for the usual suspects.

We hope that you have a bounteous mushroom season ahead and will join us with renewed enthusiasm at the 2012 foray.

Happy mushrooming!

andrus

Do you ever wonder

HOW THE ORGANISMS YOU ENCOUNTER MAKE THEIR LIVING?

ANDRUS VOITK

The picture of the title banner poses one such question. It is exactly as found in situ in the sand dunes near the seashore at Forteau, Labrador, Oct 2, 2011. All three mushrooms, *Thuemenidium arenarium*, our new *Alpova*, and the *Hygrocybe* species, were fruiting copiously at the time, sometimes separately and sometimes in various combinations. The first two are well known mycorrhizal organisms, partners with pioneer plant species, *T. arenarium* with *Empetrum* and *Alpova* with *Alnus viridis* ssp. *crispa.* Suitably, the sand dunes were full of *Empetrum nigrum* and *Alnus crispa*, so both had their partner of choice on hand with whom to wend a mutually beneficial path through life on this barren dune. But what of the *Hygrocybe*?

Traditionally it has been regarded as a saprobe, an organism making its living by decomposing dead organic material. What food is there for it in the sand? Well, none, really. I dug down over 40 cm and there was no secret stash of mulch below the sand layer. Yet, it grew primarily in the sand, at the edge of the heath, not among the *Empetrum* where there was some litter available. In fact, the entire genus *Hygrocybe* is known to grow in poor soils and grasslands; some, like *H. cinerella*, are considered pioneer species, the first mushrooms to move into newly formed sand. Often this is before any other life has established itself long enough to create a store of organic waste. One sure way to get rid of *Hygrocybe* from your lawn or a meadow is to fertilize it. How does it get its food?

Putting together what we know of the genus, made so obvious in the sand dunes of Forteau, perhaps this mushroom is not a decomposer at all? To thrive in a foodless environment, surely it must derive its nutrition from some other source, just like the other two and a few others found there in quantities at the same time (e. g. *Rhodocybe fallax*, *Clavaria argillacea*).

This observation has been made before, with less opportunism but higher cost, both in Scotland[1] and New England[2]. The ratios between naturally occuring stable Carbon and Nitrogen isotopes of mushrooms differ, depending on how they get their food. Both these studies showed that *Hygrocybe* has ratios typical of mushrooms getting their sugars from other organisms, not breakdown of organic matter. Makes sense: since there is no food in the sand for any of the three musketeers, the red cap must also get its nutrition from other organisms. What is the partner and the process are questions worthy of a doctoral investigation. Takers? The Labrador beach awaits with answers.

References

1. Griffith GW, Easton GL, Jones AW: Ecology and diversity of waxcap (*Hygrocybe* spp) fungi. Botanical Journal of Scotland, 54:7-22; 2002.
2. Seitzman BH, Ouimette A, Mixon RL, Hobbie EA, Hibbett DS: Conservation of biotrophy in Hygrophoraceae inferred from combined stable isotope and phylogenetic analyses. Mycologia 103:280-290; 2011.

The Lobster Mushroom revisited

Henry Mann

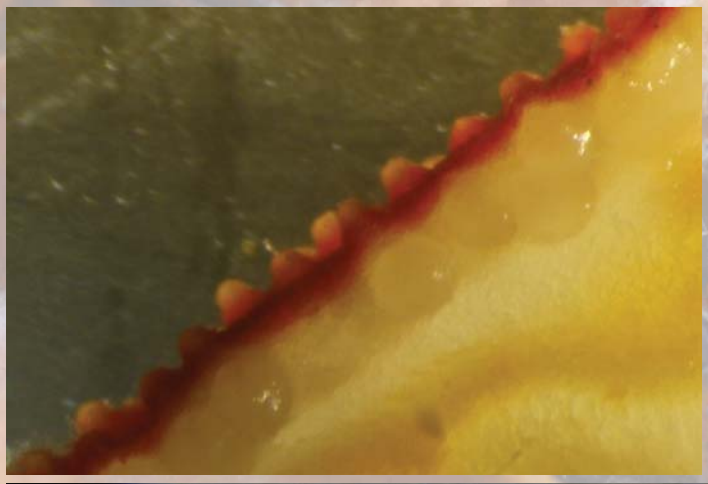
Many years ago, before the advent of popular digital technology, I became acquainted with the Lobster Mushroom in the woods behind my residence in Pasadena. An article was published detailing my observations (The Osprey 15(4): 91-96, 1984) including some crude sketches of the fungus. Since then my residence has moved and I no longer frequent that stretch of woods so memories of the encounter slowly faded from memory. This past fall (2010) I wandered through some other similar woods and there they were again, bright fluorescent orange masses which appeared to have erupted onto the forest floor from their home in the deep nether world. There is no need to rehash those former observations sprinkled with some embarrassing frivolity, however, with recent photographs it may be worth revisiting the basic biology of this interesting fungal relationship.

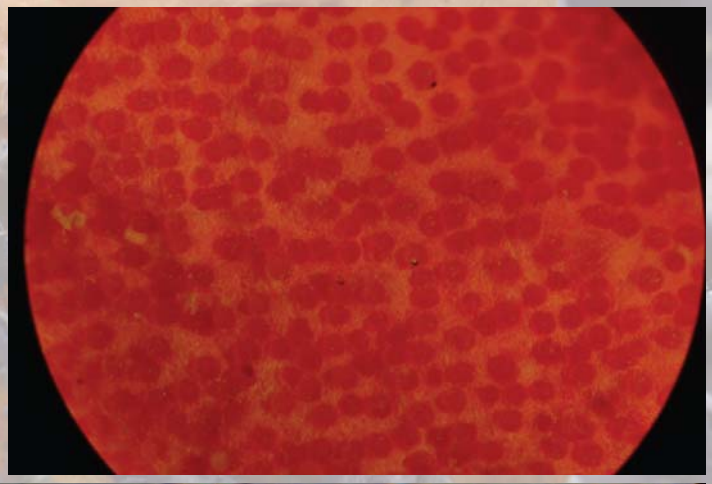
The Lobster Mushroom is actually a composite structure made of two unrelated fungal species. *Hypomyces lactifluorum* is the thin orange skin of the parasite which grows over an emerging host in the genus *Russula* or *Lactarius*, producing a misshapen mass in which the host species is no longer recognizable. The literature suggests that the commonly parasitized species are the very similar *Russula brevipes* and *Lactarius piperatus*, both recorded from Newfoundland, and probably others as well. The host/parasite "mushroom" is edible so apparently *H. lactifluorum* does not parasitize poisonous species. It is suggested that it even improves the taste and flavour of the affected species. Besides resembling the colour of cooked lobster it is said to produce a slight shellfish aroma when prepared. When sliced

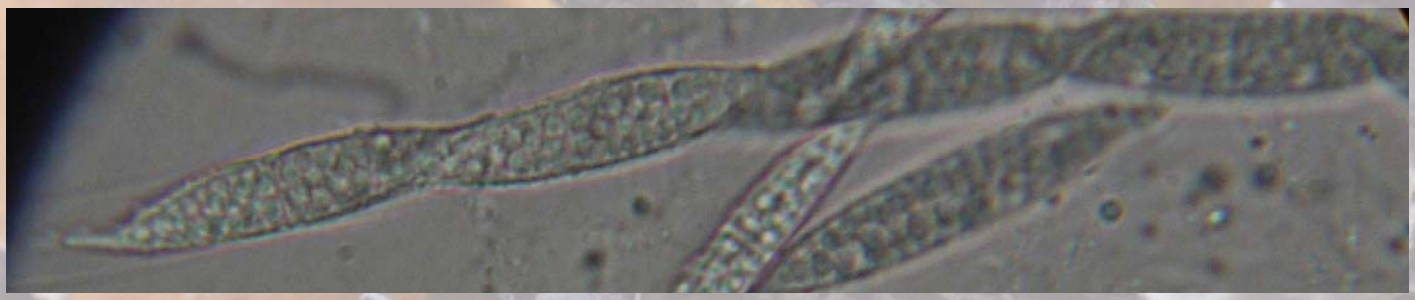
open the white or pale orange flesh of the host species can be observed covered by the thin orange skin of the parasite.

H. lactifluorum is an ascomycete whereas the host species are gilled basidiomycetes. A microscopic examination of the orange layer reveals tiny embedded flask shaped structures (perithecia), each with a pore to the surface. Viewed from the surface with a hand lens the tops of these flasks can be seen as little raised pimples. The perithecia contain asci, elongated sacs each containing eight spores which at maturity are ejected to the outside through the pore.

Russula and *Lactarius* species are mycorrhizal associates, some with the roots of conifers and others with hardwoods. I have encountered the Lobster Mushroom in well drained, dry, spruce/fir/birch Pasadena woods, appearing after the first fall rains of September. It is always a treat to find these colourful and unusual "mushrooms".







Illustrations. Background and opposite page: Lobster Mushroom in its full glory. The ridges are attenuated gills. Top of page: L: *Lactarius piperatus*; R: *Russula brevipes*. Middle Left: surface perithecia and pores. Middle Right: hand lens view of perithecia from above. Bottom of page: Microscopic view of asci with large, spindle-shaped, granular spores.

THE BEAUTY AND THE BEAST

ANDRUS VOITK

Photo: Roger Smith

Do we have a general idea of the Newfoundland distribution of Tomentella fuscocinerea*? ... If so, should we look for* Corallorhiza striata vreelandii *within this distribution?J*

The above question was raised in response to a 2010 report that the orchid *Corallorhiza striata* (photos this and next page) formed a very specific mycorrhizal relationship with *Tomentella fuscocinerea* (banner illustration).[1] All orchids need a fungus to feed them in the beginning because their seeds contain virtually no food to support germination. Because *C. striata* lacks chlorophyll it is unable to synthesize its own sugars and is fully mycoheterotrophic (needs a feeding fungus throughout life). *C. striata* is rare here, so that clearly a marker organism to find additional populations would be helpful. The authors of the article state, "sampling of *C. striata* provides a window into the distribution, abundance, and diversity of these elusive fungi"; it seems logical to wonder about the obverse.

The problem is how to provide a reliable answer. First, most of us, me included, would not recognize a *Tomentella* if it graced our pizza. Even most of our identifiers at forays are not overly familiar with the genus, let alone its species. Until this year, the only time we have recorded species of the genus is 2008, when a coauthor of the cited article and world authority on the genus, Urmas Kõljalg, was one of our identifiers. In other words, Kõljalg sought out "his" fungi, which we had not known to recognize before and which we obviously did not learn to recognize after. As a result, we have a very limited idea of the distribution of *T. fuscocinerea* in the province. It would be too expensive to employ somebody like Kõljalg to survey the whole province. Therefore, we need to look for another way to answer the question. Let us review what is known about both flower and fungus generally, and how that fits with the data we do have.

Generally, *C. striata* is known to be widespread and disjunct in distribution, locally uncommon with fragmented small populations. We have two small populations, 6-24 individual plants, of this orchid in Western Newfoundland, about 30 Km apart. (At least, had. This year no flowers were found in one of the locations.)

About the distribution of *Tomentella fuscocinerea* Kõljalg states that "The *Tomentella fuscocinerea* group is geographically widespread among forests

of the northern hemisphere, but not locally abundant".[1] From this we might infer that this species is likely to be found, albeit not abundantly, throughout the forested parts of our province. The needs of *Tomentella* make this likely, because all our forested areas have what this organism requires to thrive. *T. fuscocinerea* is mycorrhizal with trees, and a surprising 100% of our forested areas supply them. Even if it were specific to one tree species only, the tree species in the areas where we know it must exist—where the known colonies of *Corallorhiza* grow, and Notre Dame Provincial Park, where a specimen was collected—are found in all our forests. Its fruiting body prefers a solid platform, either fallen wood or directly on the ground. Both trees and ground are found throughout our forested areas. It also needs invertebrate vectors to distribute spores. These also are common throughout our forests.

How does this conform to the data we have? Before the 2008 foray Kõljalg collected in an area less than 1 Km from one of the *C. striata* populations, and during the foray he collected from central Newfoundland. Twelve *Tomentella* species were represented by 1-8 collections each. Notre Dame Provincial Park yielded the only collection of *T. fuscocinerea*. This would suggest that *T. fuscocinerea* is a relatively uncommon *Tomentella* species. Since it was found in central Newfoundland, and its obligatory orchid partner grows in western Newfoundland, clearly it must exist in both regions, even if only collected in one.

Putting it together, since it is known to be widely distributed elsewhere and its known requirements are satisfied in all our forested areas, it is quite likely that this fungus exists throughout our province. If this is true, then we might reasonably conclude that *T. fuscocinerea* is unlikely to be a good marker for *C. striata*, which clearly is not found all over the province. Our data, admittedly scant, supports this conclusion. There is no known *C. striata* in Notre Dame Provincial Park, yet *T. fuscocinerea* was collected there. Ergo, the fungus is not a reliable marker for *C. striata*. Although it is theoretically possible that the plant has been missed, it is rather unlikely that the presence of such a striking and uncommon flower has been overlooked inside a provincial park, which attracts staff and many visitors with botanical interest and training.

On the other hand, as the authors state, *C. striata* is quite likely a good marker for the fungus, as the former cannot survive without the latter.

Reference

1. Barrett CF, Freundstein JV, Taylor DL, Kõljalg U: Rangewide analysis of fungal associations in the fully mycoheterotrophic *Corallorhiza striata* complex (Orchidaceae) reveals extreme specificity on ectomycorrhizal *Tomentella* (Thelephoraceae) across North America. American Journal of Botany 97:628-643; 2010.

Pleurocybella porrigens toxin unmasked

Michael W Beug

Photo: Andrus Voitk

In the fall of 2004, 59 people in 9 prefectures of Japan were sickened by *Pleurocybella porrigens*. Seventeen died of acute encephalopathy. All or nearly all of the deaths involved people with compromised kidneys and the average age of the victims was 70. No previous reports are known of poisoning by *Pleurocybella porrigens*. In 2009, there was one additional published report of a death in Japan from *Pleurocybella porrigens*. The more recent case involved a man, 65, who had been on hemodialysis for three months. The causative agent in these deaths has long been a mystery but according to a report in Angewandte Chemie International Edition (Wakimoto et al, 2011) the toxin may be an unusual unstable amino acid that they have named Pleurocybellaziridine.

In Japan in the fall of 2004 heavy rains came early resulting in a monumental harvest of *Pleurocybella porrigens*, known in Japan as Sugihiratake and in North America as "Angel Wings". The mushrooms, which are a popular edible in Japan, reached unusual proportions, as big as an outstretched hand. They were abundant and were consumed in quantity. Symptoms would appear 13 to 18 days after eating the mushrooms and would begin with sub-acute tremor, weakness of the extremities and then consciousness disturbances and intractable seizures accompanied by high fever. Three to eight days after onset, brain images revealed conspicuous diffuse lesions in the cerebral cortex with death typically about 10 days after seizures began. It is possible that the toxin levels in the mushroom were unusually high in Japan during 2004 as a result of the unusual weather conditions, or it just may be that so many individuals ate large quantities of the mushroom that a number of individuals with compromised kidneys crossed a toxic threshold that normally is not breached. We will never know for sure.

Since 2004, numerous attempts have been made in Japan to elucidate the toxins in *Pleurocybella porrigens*. Potential causative agents that were identified included vitamin D analogues, fatty acids, and saccharides. The Wakimoto group (2011) had reported on a lectin and several cytotoxic amino acids, including six novel amino acids. Since all six novel cytotoxic amino acids shared a common β-hydroxyvaline backbone they suspected and went on to prove that these unusual amino acids may all have arisen from one highly reactive aziridine-amino acid precursor, Pleurocybellaziridine, present in the mushroom at an astonishingly high level of 5.75mg/g. The compound consists of a three membered ring with a NH group at the apex, one carbon with two methyl groups attached and the other carbon with a hydrogen and a carboxylic acid (-CO2H) attached. This structure would be readily attacked by alcohols, glycerol, sugars, etc. to yield the novel amino acids that they had isolated. Were it to reach the brain, Pleurocybellaziridine should be capable of causing the demyelinating symptoms observed as a result of damaged oligodendrocytes. Indeed, when tested against rat CG4-16 oligodendrocyte cells, Pleurocybellaziridine at 3 µg/mL had little effect, but at 10 µg/mL caused a 60% reduction in cell viability and at 30 µg/mL reduced cell viability by over 95%.

The Bishop's Sketchbook

THE WEEPING SNAKE IN ST. JOHN'S !

Andrus Voitk

Hey Andrus,

A bit of a fungal mystery has been sent my way by a coworker. Attached is a photo of a fungal "mat" growing on the ground in the basement of an old house here in St. John's, apparently near an old half-buried water pipe. Ring any bells with you? My coworker was mostly concerned that it might be vile and toxic.

Yes, it rang a bell, loud and clear. I had looked for information about this mushroom, expecting it to be well known in St John's for a few hundred years, but found nobody who knew of such a thing. The fungus is *Serpula lacrymans* (loose translation: weeping serpent), native of the Himalayan foothills, where it is an uncommon saprobe and weak parasite. It found its way to England aboard wooden sailing ships, laden with infected timber from India in the heyday of the Empire. Domestic settings provided all of its needs, and there it changed into a very virulent destroyer, worthy of our utmost respect. *Serpula lacrymans* is the agent of the dreaded dry rot that destroyed untold numbers of buildings and ships.

Buildings of the time provided ideal growing conditions: wood, warmth, moisture, and plaster. Wood and moisture were permanent conditions for the great wooden ships as well, so the serpent destroyed the skeletons of ships in short order. These vessels spread the snake throughout all the ports where English ships called, either by bringing in infected timber, or from infected timbers removed from the wooden vessels during repairs in port. It wrought great havoc throughout Europe, but also in other ports. *Serpula lacrymans* starts in a permanently wet spot, caused by a leaking roof, seeping water pipe, poorly insulated basement with condensation, or wet from groundwater. Once established, the snake can provide much of its water needs through water re-

Photo: Michael Samson

leased from the metabolic process, as well as sending out long mycelia seeking water further afield.

At its height, radical methods of eradication like the burning and sinking of ships and burning of buildings infected beyond repair, became standard procedure. Changes in travel and shipping modes, as well as ship and building construction materials have curbed its spread. Its decline on land has come about from watertight construction, less use of timber, central heating, insulation, air circulation and humidity control. Because of these changes, it has become quite uncommon, but can still be found in susceptible buildings, particularly in port cities where it once held sway. Therefore, it was reasonable to expect that it played a very vital part in the history of St. John's, but strangely, until this e-mail, I had not heard of its existence. Perhaps some readers from St John's can recall hearing of it. If so, please let me know.

The virulent domestic species is relatively young in triologic history, but may be old in terms of human history. In the Bible it may be the weeping snake that is referred to as "leprosy on houses" (Leviticus) and used to exterminate the houses of thieves and liars, destroying all timbers and stones (Zechariah).

Serpula lacrymans weaves ties that bind us at several levels. It connects us to our own foray faculty: Leif Ryvarden, one of the world's foremost exponents of polypores, and faculty of 2011, has studied this organism (and confirmed this identification); he hails from the Nordic port city of Oslo, seat of a leading group studying *Serpula lacrymans*, where some of the depicted material is now undergoing genetic studies. It also ties us to Nils Hallenberg, member of our faculty in 2012, from the port city of Göteborg, who did much of the work on the brown rot caused by the cellulose digesting *Serpula lacrymans*. Moreover, it ties us to Canadian resupinate expert Jim Ginns, whose studies determined that it is a member of the bolete family. Thus, we harken back to another theme, parallel evolution: although it looks and behaves like a resupinate polypore, it is in fact a close cousin of the king bolete or cep that we all love to eat.

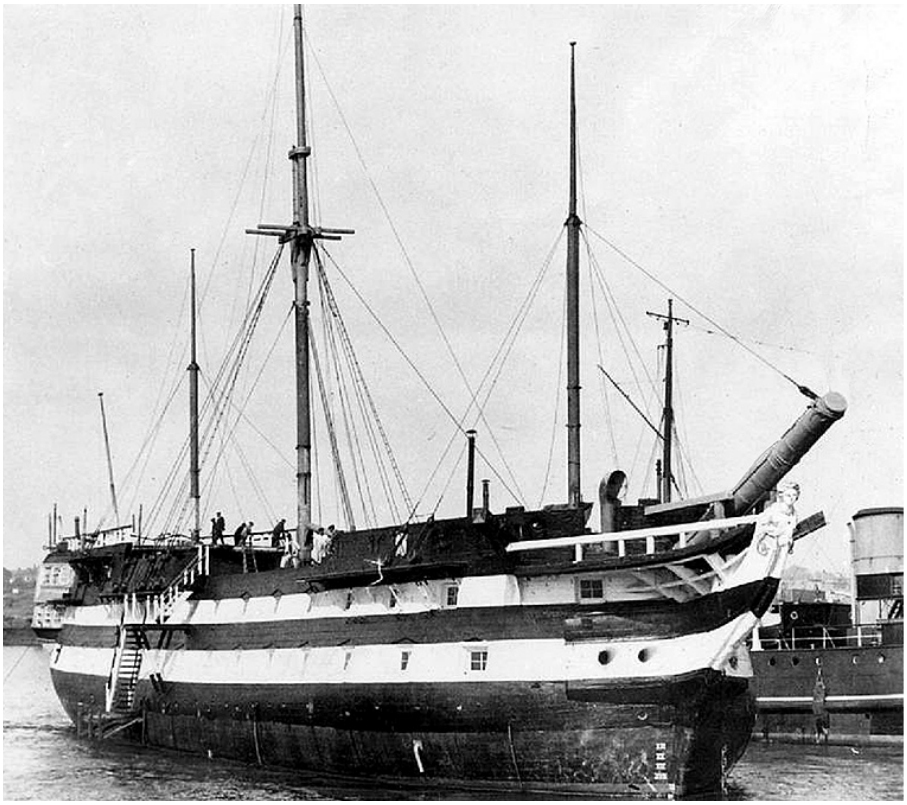
The most fascinating ties that *Serpula lacrymans* forms are those through history: when you hold one in your hands in St John's in 2011, you are directly connected to some major historic events and persons, such as the Battle of Waterloo, Emperor Napoleon and Admiral Nelson.

In the Battle of Waterloo, June 18, 1815, Admiral Nelson dealt the Napoleonic forces a decisive blow, altering the course of history. Nelson died in the effort. His ship, HMS *Victory*, was the only ship to survive on the English side. A few days after the Battle, the English caught up with those French ships that had escaped. All were sunk, save for the *Duguay-Trouin*, which was captured and renamed *Implacable*, a name destined to haunt the phyrric victors. The golden snakes intertwined on the head of Medusa, her figurehead, were equally pregnant with ironic serpentine foreboding. Heavily infested with *Serpula lacrymans*, after brief bellicose service she was reassigned as a training ship, but, alas, trained more carpenters than sailors. Constant repairs became very costly and she was consigned to scuttling. Saved once by direct intervention of King Edward VII, eventually repair costs became untenable for post war Britain, so in 1947 she was graciously offered back to France. Who, equally graciously, declined. Two years later she was dismantled, the figurehead and stern galley saved, and on December 2, 1949, towed to sea for a burial service contrived for the occasion. Flying French and British flags side by friendly side, she was blown up amidst pomp and ceremony, with the British Admiralty saluting in full dress. Engineers, as is their wont, overcalculated the amount of charge required. The last post blew, salutes were held. The hull sank, but the deck, flags of erstwhile foes aflutter, lifted heavenwards and then settled gently on the waves, eventually floating back home to France under a cloud of spores.

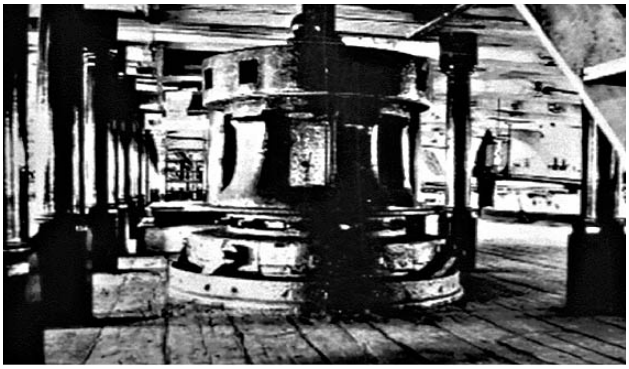
The fate of the HMS *Implacable* (next page) is a colourful historical vignette that illustrates the cost and devastation caused by this fungus. For a humorous account of her burial, see <http://www.opendemocracy.net/democracy-protest/implacable_2950.jsp>.

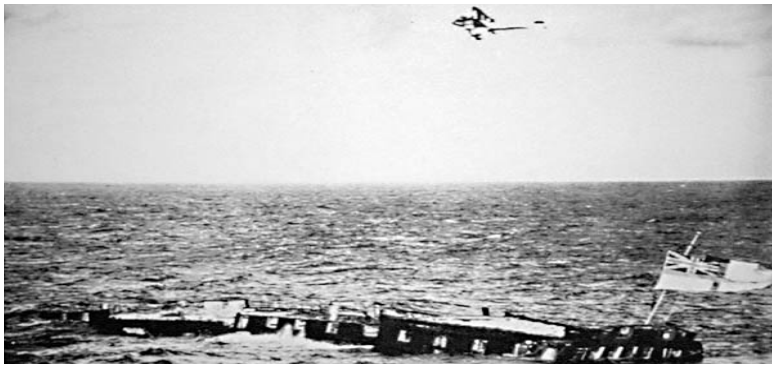
Fine, considering all the ties that bind us is fascinating, but what practical advice do we give our house-owner to battle this poster boy for alien species? Best would be to eliminate all traces of the parasite. This may be possible if the infected timber has no structural purpose. If structural timber is involved, the wood should be checked to ensure its integrity, and weak as well as infested sections should be replaced by professionals. Recurrence can be prevented if all source of humidity is eliminated, leaks and seepages fixed by repair, insulation, drainage, and air circulation. Care should also be given to the disposal of any removed organism and infected timber, to prevent spread by spores or tissue. This enemy is so powerful and so cunning, and a house so expensive, that it would be wise to consult a professional. They used to be quite common in port cities, and after this wet summer, perhaps again?

Photos: Internet



HMS *Implacable*, top. Middle left, her magnificent wooden construction showing evidence of dry rot even on this small image; right, the deck with fluttering flags gently floating under the nervous eye of a British aircraft. Below, her figurehead to the right and stern galley left. These are the only salvaged pieces from the sister ship to Nelson's HMS *Victory*, the only other survivor of the Battle of Trafalgar, subsequently lost to the war against the weeping serpent. Both pieces are on display at the National Maritime Museum in a weak effort to appease the vocal critics, clamouring to this day about the Navy's wanton disrespect for its sacred historic past.





My Favourite Mushroom: *Coprinopsis atramentaria*

Jim Cornish

"All mushrooms are edible; some only once." This Croatian proverb is a reminder that injudicious eating of mushrooms carries significant risk. Although there are quite a few edible species, unless you know them, you risk picking one that may either make you sick or kill you outright. Some ill effects are not direct, but require other, usually benign, substances. One such edible is *Coprinopsis atramentaria*. It is a Chrismas favourite of mine because its common name, tippler's bane, reminds us to moderate our enjoyment of life's pleasures, such as wine, beer and other alcoholic beverages, especially during the holidays.

Another Inky

Coprinopsis atramentaria, previously known as *Coprinus atramentarius*, was first described by French naturalist Pierre Bulliard in 1786 as *Agaricus atramentarius*, before being placed in the large genus *Coprinus* by Elias Magnus Fries in 1838. It was given its current binomial name in 2001. After *Coprinus comatus* (shaggy mane), *Coprinopsis atramentaria* is probably one of the best known coprinoids (inky caps) mushrooms around. It is one of three coprinoids represented in Newfoundland and Labrador. The genus name *Coprinopsis* means "like Coprinus" a Latin word meaning dung, somewhat misrepresentating its actual substrate. The specific name *atramentaria* is also Latin and means darkening, a reference to how all coprinoids change as their spores are released.

Cluster of Coprinopsis atramentaria *on a friend's lawn. Note the subtle striations in the egg-shaped cap, above. These are ripe for eating as there is no sign of autodigestion. Below: the same cluster captured three days later. Note the split and curled caps, white stalks and tanning of the skullcap.*

Description

A young specimens of *Coprinopsis atramentaria* has a smooth or sometimes pleated or striated silky cap. Grey to tan in colour, the cap is typically 3-6 cm high. The cap changes shape from egg-shaped in youth to campannulate (bell-shaped) with age. A mature specimen may show its fibrils (filaments). In a young specimen, the gills are white, crowded and free or infrequently attached becoming black with age. The stalk, typically white or buff, is hollow, 8-15 cm high and 1-2 cm in diameter. A ring

that often disappears early may be present at the base.

A beautiful cluster of Coprinopsis atramentaria. *Note how the recurved cap is holding the water from a recent rainshower. Below: the inky goo and striated cap are clearly visible in this single pinwheel-shaped* Coprinopsis atramentaria. *The cap has also taken on a more tan colour.*

Autolysis: A Spore Releasing Mechanism

Like other coprinoids mushrooms, *C. atramentaria* has a unique method of releasing its spores. The cap is slowly liquefied in a self-digestion process called autolysis. The process is gradual, and begins at the cap margin. When the spores are ready to be released, hydrolytic enzymes liquefy the cap rim into a inky-black goo. The cap then recurves, giving the mushroom a bell shape and creating enough open space near the margins for the spores to escape. While some spores get caught in the goo, most are ejected into the air. The self-digestion process continues upward in a chain-like reaction until all that remains is the stem and maybe a small portion of the skullcap. The whole process lasts just a few days.

Habitat

Coprinopsis atramentaria is saprobic. It typically grows in dense cespitose clusters, scattered or alone. It grows from stumps, old roots and decaying organic matter like buried rotting wood. *C. atramentaria* is quite common on lawns and planted grassy fields in the fall. An early frost may trigger its first appearance.

Toxic to Tipplers

Coprinopsis atramentaria is edible, but like the shaggy mane, it must be picked and prepared before the onset of autolysis.

As previously mentioned, one of its common names is tippler's bane. Tippler is an old English word for one who serves drinks, a bartender, or one who consumes them (drinks, not bartenders). This common name hints at the adverse effects caused when alcohol is taken after eating the mushroom. Maybe it should be called "teetotaler's delight"!

The toxic effects of *C. atramentaria* are caused by a molecule named coprine. Coprine inhibits an enzyme from metabolizing acetaldehyde, the first product of breaking down alcohol. Increased blood acetaldehyde levels create flushing and redness of the skin, accelerated heart rate, palpitations, vertigo, shortness of breath, nausea, cramps, vomiting, even collapse and loss of consciousness. Symptoms can persist up to 48 hours. The coprine effect remains for at least 48-72 hours after eating the mushroom, so that symptoms can occur with alcohol a day or two after. These symptoms are similar to those produced by disulfiram (Antabuse), one of many failed treatments for alcoholism.

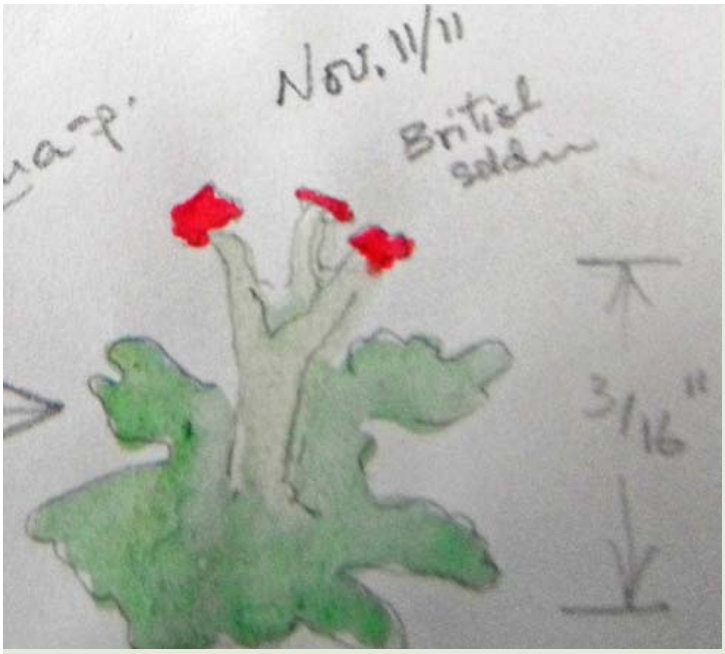
MAC PITCHER

The Chrismas Cladonias

The various *Cladonia* lichens produce apothecia (fruiting bodies) that may be brilliant scarlet, dull brown, or some intermediate colour in this range. Likewise, the *Cladonia* podetium (stalk) may range from a ghostly gray-white to a bronzed golden brown or even a greenish-yellow, depending on the species.

In this holiday season, let us turn our attention to those red-fruited species, which usually are found with a greenish podetium—the red-green or "Christmas Lichens". Therefore, this article will not deal with pink, orange, brown or maroon apothecia, or those whose podetia are primarily brown, gray, yellowish or whitish. (Some of the latter appear light greenish at times, and to make things even more confusing, some of the green ones also appear very light at times. Podetium colour is often influenced by habitat and degree of sunlight exposure.)

That leaves at least eight red-green species in our Province: *Cladonia bellidiflora, C. borealis, C. coccifera, C. cristatella, C. deformis, C. digitata, C. macilenta, and C. sulphurina*.



Far and away, our most ubiquitous and well known of the group are the British Soldiers (*Cladonia cristatella*). These may be found practically anywhere in well-lit settings such as road embankments, rock outcrops and on old stumps and logging detritus. A major distinguishing feature of the species is that it doesn't produce soredia (small scales of fungal tissue and alga, acting as propagules), and so podetia have a smooth, somewhat shiny appearance, free of powder or granularity.

Widely distributed but less common is *Cladonia bellidiflora*, or Toy Soldiers. This striking species has podetia that are usually densely covered in miniature dragon-like scales (squamules), and are tipped with bright red apothecia. It likes humus and can be found on soil or on well-rotted logs and stumps.

Cladonia deformis (above) and *Cladonia sulphurina* (below) are two similar looking species that both have podetia with farinose (flour-like) powdery soredia, known respectively as the Lesser and Greater Sulphur-cup Lichens. *C. sulphurina* is the tallest of the red-fruited cladonias and is easily recognized because of the longitudinal splits and fissures commonly found in its podetia.

The small trumpet or goblet-shaped species, Boreal Pixie Cup (*Cladonia borealis* and *C. coccifera*), are less common, usually found on mineral soil in alpine habitats. They have separate flattened aureoles (plates) on the podetia. Although descriptions say that the podetia of *C. borealis* (left) are asquamulose, while those of *C. coccifera* (right) have squamules, most observers have found this difference to be undependable. Only biochemical tests can separate the species: *C. borealis* contains barbatic acid, whereas *C. coccifera*, contains zeorin. (Not all lichens shown have been tested to make sure of the identification.)

Our last Red Green is the dainty *Cladonia macilenta* (right), known variously as the Pin lichen, or Matchstick Cladonia. This sorediate species may be found on humus soil and rotting logs as well as on soil over rock. Much resembling a stickpin, a single scarlet apothecium usually occurs atop each podetium.

Image credits: p 15: *Cladonia cristatella*—Gene Herzberg; p 16: *Cladonia cristatella* mosaïque—Andrus Voitk; p 17: *Cladonia cristatella* aquarelle—Glynn Bishop, *Cladonia bellidiflora*—Andrus Voitk; p 18: *Cladonia deformis* and *Cladonia sulphurina*—Jim Cornish; p 19: *Cladonia borealis*—Maria Voitk; insert—Andrus Voitk; *Cladonia coccifera*—Gene Herzberg, insert—Michele Piercy-Normore; *Cladonia macilenta*—Mac Pitcher.

The empty skillet

Maria Voitk

CULTURAL MYCOPHAGY

Here is a delightful recipe for "White mushroom salad" from Ted Ahti, commonly served as a garnish or side dish around the festive season in Finland. The wild mushrooms involved in the original recipe are a mixture of *Lactarius torminosus*, *L. trivialis* and *L. rufus*. All three also grow in Newfoundland and Labrador. Of the three, *L. rufus* is very common on the Great Northern Peninsula and Labrador, and has been featured in our 2010 Foray Report as a potential commercial or edible species.

This recipe vividly illustrates the cultural difference to mycophagy between countries like Finland with a long tradition of eating wild mushrooms, and the relatively mycophobic North America. If you look up any of the three species in most North American books, you will be advised to stay clear of these toxic mushrooms. Some may even make reference to torminosus meaning stormy, as an indication of the explosive gastrointestinal activity one may precipitate from ingestion of that species.

The occasional book may state that these are only edible if parboiled first. Indeed, this is what is done in Finland (procedure in insert). If you wish to try the authentic recipe, follow those instructions. We have done so with our Newfoundland and Labrador mushrooms and can verify that their natural acrid taste disappears, and no gastrointestinal or other disturbance results. Initially we parboiled them twice, 10 minutes each time. Then we got braver, and now can report that once is enough and that 10 minutes may be excessive, thus saving both time and flavour.

Parboiling acrid tasting *Lactarius* and *Russula*

1. Clean and cut mushrooms.
2. Let soak in cold water. Discard soaking water.
3. Bring new water to boil, 4 L water / 1 Kg mushrooms.
4. Add mushrooms.
5. Boil mushrooms 5-10 min from time water starts to boil again.
6. Discard water and rinse mushrooms in cold water.
7. Spread them out to dry.
8. Use or freeze for later use.

If parboiling known "toxic" mushrooms does not fit into your psychic make-up, there are reasonable substitutions that are not toxic and require no parboiling. To retain the *Lactarius* consistency, you can use a mixture of *L. lignyotus* and *L. thyinos*. One of the main advantages of these two species is that both are easy to recognize and in Newfoundland and Labrador there are no undesirable lookalikes with which to confuse them. Another very fine choice would be *Russula paludosa* and *R. peckii*, but the possibility to misidentify a potentially undesirable similar species is higher. Make sure that you know how to identify these, if you plan to serve them to your Christmas visitors.

Photos: Roger Smith

Photos, clockwise from top left: *Lactarius thyinos*, *L. lignyotus*, *Russula peckii*, *R. paludosa*.
P 20, L to R: *Lactarius torminosus*, *L. trivialis*, *L. rufus*. Photos: Andrus Voitk

Russulales salad

Ted Ahti

INGREDIENTS

1/2 L parboiled mushrooms
12 ml sour cream
12 ml crème fraîche (or one of: ricotta, lite sour cream, natural yogurt, possibly even buttermilk)
1 medium red onion
diced pickles to taste (not sweet, salt pickling or even fresh cucumber preferred)
salt, pepper, nutmeg; dill

PROCEDURE

Add sour cream to crème fraîche. Season to taste and mix. Add pickle/cucumber and diced mushrooms. Mix. Garnish with dill.

Serve.

Ted Ahti. Photo: Henry Mann

AFTER the FNL Foray in *2012* …

… extend your mycology and travel experience with a very special add-on excursion

Joining the Foray in September 2012 will be a small new group of up to 20 mushroom enthusiasts from the US and Canada, organized by Mexican Mushroom Tours*.

Following the FNL event, these participants will continue for another week of foraying, exploring and enjoying the sights and pleasures of Newfoundland's Bonavista and Avalon peninsulas.

Several spots are still available and you are invited to take part in this additional adventure.

Technical Leader will be top Mexican mycologist Dr. Arturo Estrada joined by Newfoundland mushroom aficionado Andrus Voitk.

On the itinerary, in addition to the weekend FNL foray, we will be touring the Bonavista area, foraying in *Lockston Path Park* and the spectacular coastal *Skerwink Trail,* both with abundant fungi.

We move on to the dramatic, sub-arctic terrain at *Cape St. Mary's* (mushrooms and huge gannet bird colonies) and later to *Salmonier Nature Park*, replete with local fauna and fungi. We wind up in St. John's at the *Battery Hotel* overlooking the scenic harbour. On Saturday October 6, we say farewell, after 9 days of savouring Newfoundland's mushrooms and so much else that this great island offers. We will use comfortable, private lodgings, including a world-acclaimed 4-star inn near Trinity.

The cost for this additional week of foraying and touring will be $2,340 p/p dbl occ., assuming that you register separately for the FNL weekend and stay in the lodgings provided on site.
If you would like to start with the MMT group from the beginning (Sept. 27 in St. John's) and stay in premium lodgings throughout, that can be arranged at an additional charge.

The "NewfMush Tour" will be all-inclusive, with comfortable passenger-van transport, nice accommodations, fine food, good wine for those who wish, and all admissions, guides and tips.

*MMT was started in 2000 by Gundi Jeffrey and Erik Purre – Canadians who have lived in Mexico for 15 years but are still members of the Toronto Mycological Society and NAMA. They have run foray tours in 9 diverse fungi-habitat regions of Mexico ranging from Chihuahua in the north to Chiapas in the south. These "MexMush" excursions have been widely lauded in the media, including in *The New York Times*. In July 2011, MMT took a step out of Mexico with a much-enjoyed tour in Costa Rica. In 2012 they"ve decided to come "back home to Canada" in magnificent Newfoundland.

For more details or to make a tentative booking for this NewfMush week-long add-on, please email us at mexmush@yahoo.com ***For background see www.mexmush.com***

OUR PARTNER ORGANIZATIONS

People of Newfoundland and Labrador, through

- Department of Environment and Conservation
  - Parks and Natural Areas Division
  - Wildlife Division
- Department of Natural Resources
  - Centre for Forest Science and Innovation

People of Canada, through

- Parks Canada
  - Terra Nova National Park
  - Gros Morne National Park

Model Forest of Newfoundland and Labrador

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Terra Nova National Park

Headquarters: *Terra Nova Hospitality Home*

September 28-30, 2012

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David Boertmann
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Nils Hallenberg
Jermy Hayward
Renée Lebeuf
Faye Murrin
Todd Osmundson
André Paul
Michele Piercy-Normore
Roger Smith
Greg Thorn
Steve Trudell
Jukka Vauras

*tentative at time of publication

Please check our website in the Spring, 2012, for Information & Registration Forms:

<www.nlmushrooms.ca>