OMPHALINA

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FORAY NEWFOUNDLAND AND LABRADOR

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

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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

Three *Arion subfuscus* feeding on one *Amanita muscaria* var. *guessowii*. Slugs are every bit as selective about their mushroom meal as we are. However, their choices are not always our choices. For example, they seem to do well with a meal of *Amanita bisporigera*, which is lethal for us by destroying our liver. Perhaps that is because slugs do not have livers such as ours, giving amatoxins no target cells. Having evloved together with mushrooms, perhaps they have worked out different mechanisms by which to be mutually beneficial, or to avoid each other. The lead article is a research project taking a very limited look into this association.

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CONTENT

Message from the Editor

Summer solstice. Throughout centuries the ancients have celebrated this day. They knew that when the sun was at its highest and the day at its longest, there were less than 10 days left to register for our foray with the savings of the Early Bird Special. A very magical turning point in the flow of time, observed in almost all cultures with various celebrations, both spiritual and profane.

As some readers have noticed, Omphalina issues have shrunk a wee bit. See Mail Basket, p. 20: some readers have suggested that reading many articles is difficult online. In response, we decided to experiment with a shorter issue on a monthly basis. Without permanent paid staff this will not keep up, but it is interesting to see if there is enough material in an amateur setting to support a monthly issue. Of course, this is a lead-in to the usual invitation to all our readers to try your hand at sharing some of your discoveries with fellow members.

We are not the only mycophagists around. Some of our smaller rivals probably regularly add protein to our mushroom sauce. They, as we, have their dietary preferences, as explained in the lead article. The next article shows that fungi also have very strict dietary preferences. These two articles illustrate some of the "research" the curious amateur can undertake without grants, tenure, technicians, postgraduate students, or even p values or clade trees. As the second article shows, perhaps also without "useful" results. A classical case of amateurs doing what they know not and finding they know not what it means which expressing they have difficulty with. However, perhaps it will provoke the curiosity of somebody erudite, with better knowledge and resources, who will do it right. She may get the answer, but we had all the fun!

Please note that we have gone against our word with respect to Glynn Bishop's aquarelle sketches. We invited readers to submit attempted identifications, and promised in return to publish our own, but to remain mum if no attempts were sent in. To our disappointment, none have come, so we did not offer our own. However, this time we could not resist. First, the present crop of sketches are seasonal, but to be helpful, in addition to their aesthetic value, some kind of identification would be useful. Secondly we were spurred to this by the virtually simultaneous appearance in our in box of two examples of the same mushroom, a photo from Pasadena, and a sketch from the Avalon. Then another photo came, and then Judy rolled a whole wheelbarrowful in the door. It must be spring!

As mushrooms begin to pop up, please remember to share your photos with others via the Mushroom of the Month feature on our web page.

Happy mushrooming!

andrus

FORAY MATTERS…

The 2012 foray will be held in beautiful Terra Nova National Park, Sep 28-30. Information and Registration Forms are on our website <**www.nlmushrooms.ca**>.

1. **EARLY BIRD SPECIAL**. About one week left to register before the Early Bird special discount runs out. So…
2. **FRIDAY MYCOBLITZ**. The Friday Mycoblitz is back by popular demand from several members. This year's foray begins with a mycoblitz of Lockston Path Provincial Park (map below). Bring your own drink and lunch to eat on the trail, because there are no stores nearby. Be at the Administrative Building before 12:00 noon, Friday, September 28, 2012, when teams disperse. After that, everybody will be gone! If you cannot make it, see you at the reception!
3. **REGISTRATION** begins at Terra Nova Hospitality Home at 4:00 PM. Before that the Registrars will be at the Lockston Path Mycoblitz, so be patient, if early.
4. **INFORMATION**. Please make sure that you read all the pertinent information about the Foray, both general and specific, on our website.
5. **LIMITED PARTICIPATION**. The board decided that 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. If you plan to come, please register early, as it's first come, first served.
6. **WORKSHOP**. Please do not forget to sign up for the workshops of your choice. These are also first come, first-served, and this year assigned by signing up at the time of registration to the foray.
7. **REGISTRATION PROBLEMS**. There have been two instances where registrations have been returned by the Post Office as "Undeliverable". Should this happen, please let Geoff know <geoffthurlow AT gmail DOT com> to ensure your rightful place for workshops and accommodation.

Slugs and mushrooms

Aare Voitk, John Maunder, Andrus Voitk

Every mycophile is aware of a very strong association between slugs and mushrooms. More observant mushroomers may also note that slugs favour some mushroom species while shunning others. However, such preferences and their mechanism remain poorly understood by malacologist and mycologist alike. In 2010 Maunder and Voitk published a preliminary review of the relationship in Newfoundland and Labrador, with an overview of available literature on the subject.[1] Their study documented slug-mushroom associations retrospectively, primarily based upon their existing personal photo collections. The profile of slugs recorded corresponded to that expected for the regions surveyed. However, the profile of mushrooms where slugs tarried deviated significantly from the regional mycotal pattern. Maunder and Voitk concluded that slugs showed significant preference for some mushroom species over others, and that this preference was unrelated to the prevalence and distribution of the latter in the habitat.

Because it was retrospective, the 2010 study was uncontrolled and almost certainly subject to whatever non-random variables that led the authors to photograph their subjects. The present study attempts to eliminate most such variables by prospectively noting all slug and mushroom associations during the course of a regional all-taxa mushroom census.

Methods

The study was carried out during the Annual Foray of Foray Newfoundland & Labrador (FNL), September 11-13, 2009, in Central Newfoundland. FNL foray procedure is for small groups of participants to collect as many macrofungal species as possible along designated trails. The mushrooms are then identified by invited mycologists, and photographed, and voucher collections are deposited in the FNL fungarium. A species list, with the number of collections used as a primitive estimated of abundance, is developed. A Report, with this list and other data for the 2009 foray, is available on the FNL website <http://www.nlmushrooms.ca>.

The study was conducted along four of the trails surveyed—two trails in and around the Max Simms Camp grounds and environs (south of Bishop's Falls), Notre Dame Provincial Park (between Grand Falls-Windsor and Gander), and Thomas Howe Demonstration Model Forest (near Gander)—on September 12, 2009. One person was assigned to each trail as a designated slug collector. Because slugs are far less common in trees and other above-ground environments, the study was limited to terrestrial mushrooms. All terrestrial mushrooms collected along the designated trails on September 12, 2009, formed the mushroom control population. All slugs encountered on terrestrial mushrooms were collected live in a container, and labeled to link to their respective mushroom collection. Slugs were photographed, sacrificed in water, preserved in alcohol and placed with the Natural History Unit of the provincial museum (NFM). The specimens were identified by John Maunder at a later date.

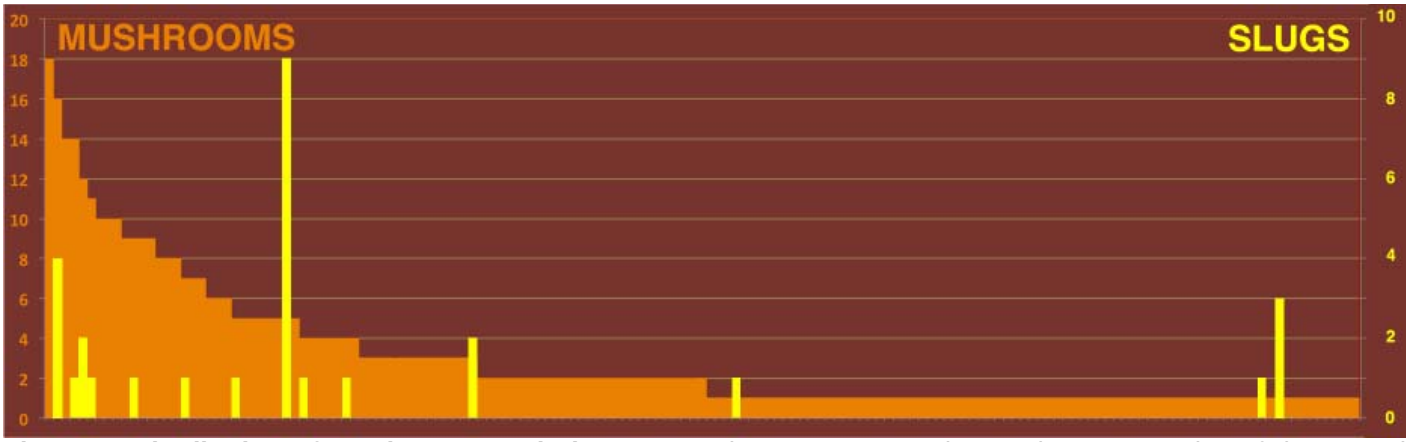

Figure 1. Distribution of mushrooms and slugs. Tan columns represent the mushrooms species of the control population, arranged in decreasing order of number of collections (scale on left). Yellow columns indicate the number of mushroom-associated slugs overlying their respective host species (scale on the right). Although, as one might expect, more slugs were collected from the more abundant mushroom species, clearly the slug preference for mushrooms does not mirror mushroom abundance alone. Some quite wide discrepancies are noted, with some very common species with no slugs and some uncommon species with a moderate to high amount of slugs.

Results

The control mushroom population was made up of 455 collections, accounting for 155 species; the number of collections of each species varied from 1-18 (Figure 1). Pedestrian (uncommonly abundant) mushroom species were defined as species with collections in excess of 2 standard deviations above the mean number of collections for all the species. There were nine such species (Table 1). Detailed species list available on request.

A total of 63 slugs were collected for a "slug rate" of 13% (63 slugs on 455 mushroom collections). Owing to labelling problems, the data linking 34 slugs to their associated mushroom collection were incomplete, leaving study groups of 29 slug

Table 1. Pedestrian* (the "commonest") mushrooms in study area

Number of collections of each in brackets.
Bold print face indicates species on which slugs were found.

Cortinarius collinitus (18)
Cortinarius caperatus (16)
Cortinarius flexipes (14)
Lactarius deceptivus (14)
Leccinum scabrum (12)
Paxillus involutus (11)
Cortinarius semisanguineus (10)
Laccaria laccata (10)
Leccinum holopus (10)

*2 standard deviations above the mean number of species' collections for the area

Table 2. Slug-mushroom association

Amanita fulva	*Arion fasciatus* var. *silvaticus*
Amanita muscaria	*Arion subfuscus*
Boletus huronensis	*Deroceras laeve*
Cortinarius anomalus	*Arion subfuscus*
Cortinarius caperatus	*Arion subfuscus*
Cortinarius caperatus	*Arion distinctus*
Cortinarius caperatus	*Arion subfuscus*
Cortinarius caperatus	*Deroceras reticulatum*
Cortinarius solis-occasus	*Arion distinctus*
Lactarius deceptivus	*Arion sp.*
Leccinum scabrum	*Arion subfuscus*
Leccinum scabrum	*Arion subfuscus*
Paxillus involutus	*Arion subfuscus*
Russula adusta	*Arion subfuscus*
Russula brevipes	*Deroceras reticulatum* (× 3)
Russula paludosa	*Arion subfuscus*
Suillus granulatus	*Deroceras laeve*
Suillus granulatus	*Arion* cf. *distinctus*
Suillus clintonianus	*Deroceras reticulatum*
Suillus clintonianus	*Arion subfuscus*
Suillus clintonianus	*Arion subfuscus*
Suillus clintonianus	*Deroceras laeve*
Suillus clintonianus	*Arion subfuscus*
Suillus clintonianus	*Arion subfuscus*
Suillus clintonianus	*Arion subfuscus*
Suillus clintonianus	*Arion subfuscus*
Suillus clintonianus	*Arion subfuscus*

Table 3. Mushroom species with slugs in order of slug frequency

Number of slug collections in brackets
Bold print face indicates pedestrian mushroom species.

Suillus clintonianus (9)
Cortinarius caperatus (4)
Leccinum scabrum (2)
Suillus granulatus (2)
Amanita fulva (1)
Amanita muscaria (1)
Boletus huronensis (1)
Cortinarius anomalus (1)
Cortinarius solis-occasus (1)
Lactarius deceptivus (1)
Paxillus involutus (1)
Russula adusta (1)
Russula brevipes (1)
Russula paludosa (1)

collections and 27 mushroom collections, where individual slug species could be directly connected to their associated individual mushroom species (Table 2). Species richness and abundance of the 29-slug study group were similar to the group representing all 63 collected slugs (Figure 2), suggesting that the study group is a valid sample of the mushroom-associated slug population. The 29 slug collections represented five species from two genera. The 27 mushroom collections represented fourteen species from eight genera (Table 3).

Although slugs were commoner on the commoner mushroom species, the profile for slug preferences did not match mushroom abundance (Figure 1). Five of the nine pedestrian mushroom species (Table 1) were slugless, while some relatively uncommon mushrooms (Table 3) had several slugs. The species most favoured by slugs was the *Suillus clintonianus/grevillei* complex, which yielded 9 slugs from 5 collections. Boletes were the group most favoured by slugs: 53 bolete collections yielded 14 slugs (26%). *Russula* species were also popular, with 3 slugs from 13 collections (23%). In comparison, only 4% of the 146 collections of the genus *Cortinarius* yielded slugs, and most of this total was due to slug fondness for *Cortinarius caperatus*: four of the six *Cortinarius*-associated slugs came from this species.

Discussion

The "slug rate" seems low, compared to our notion of the frequency of the slug-mushroom association. Perhaps the rate is higher in our minds because of the emotional overtones it acquires when collecting edibles—damage done to even one bit of our intended meal by our rival mycophagists seems so personal! The rate is also influenced by the units used; had we used individual sporocarps instead of collections, the rate would have been even lower. In addition, the rate is likely influenced by habitat, season, dampness, time of day, abundance of other slug food, and many other factors. Our results are limited to identifying actual slugs at the moment of collection, which in no way excludes slug visits to other mushrooms at other times.

If slugs visited mushrooms indiscriminately, they should be distributed among mushroom species in proportion to the commonness of the species in an area. While more slugs were indeed found on the more common mushroom species, within this general trend it was quite evident that slugs did not visit mushroom species in proportion to the latter's relative abundance. Five of the nine commonest mushroom species, had no slugs on them at all. The three most common mushrooms in the control mycota were species of *Cortinarius*: 32 collections of *C. collinitus* and *C. flexipes* combined had no slugs, as opposed to 16 collections of *C. caperatus*, with a 25% slug rate. The largest genus, *Cortinarius*, had a 4% slug rate on 146 collections. Boletes made up the most popular group, with a 26% slug rate in 53 collections, twice the overall slug rate. Among these, the *Suillus clintonianus/grevillei* complex yielded 9 slugs from 5 collections.

Intuitively, these findings may not be overly surprising. If offered a wide range of foods, all of us would end up preferring a relatively small selection of the available spectrum. Some of the mushrooms we study show a very rigid and unyielding preference for specific hosts. No matter how many trees are available, some will grow on alder only, and some of these only on one of our two alder species. Why should we expect slugs to be different from mushrooms and us? On the other hand, while our findings may seem obvious intuitively, to date such intuition has not been translated into scientific information. To our knowledge, this represents the first prospective study, simultaneously using a matched control mycota, to confirm that in their natural habitat slugs do, indeed, prefer some mushrooms over others, and

may even avoid some, no matter how prevalent. This opens the door for speculation about reasons for this behaviour, formulating theories that can be tested by further enquiry.

A potential explanation is that this behaviour is tied to different sporulation strategies evolved by different mushroom species. During centuries of coevolution, perhaps mushrooms and slugs have worked out some kind of mutually accommodating relationship that guides their interaction. For example, perhaps some mushrooms and slugs have coevolved, so that slugs play a role in spore distribution. Those mushrooms may have evolved to produce some form of slug attractant, explaining, as an example, why we found slugs on 23% of *Russula* species. The relationship need not be obvious or direct. For example, the said *Russula* species seem to be a favourite of mycophagous *Drosophila* flies, who may be the vectors. Slug-eaten mushrooms produce more than twice as many flies as similar slug-free mushrooms.[2] Thus, slugs may play an enhancing role in a very complicated chain that joins several species for mutual benefit.

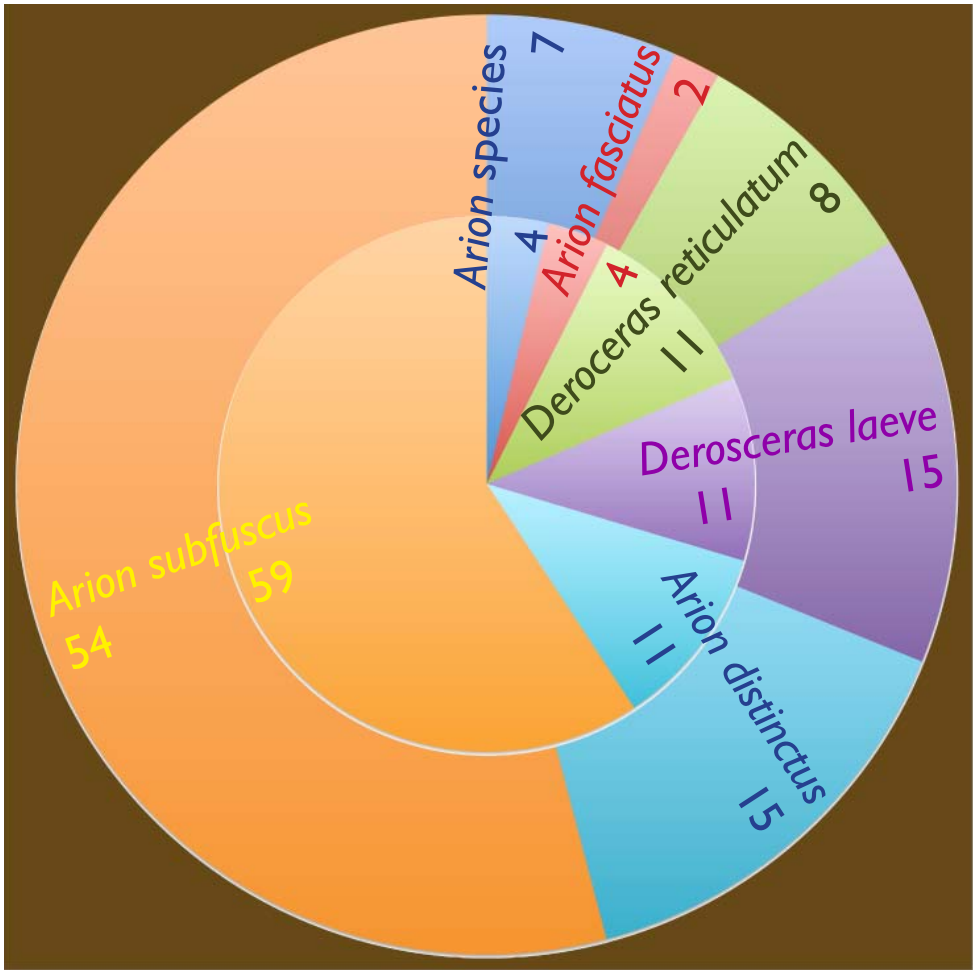

Figure 2. Slug abundance ratios. The inner circle represents the study group. Numbers indicate the per cent occupied by each species. Arion subfuscus is by far the commonest. The others seem to be evenly distributed between meadow dwellers and forest dwellers. The outer circle shows the same distribution for all 63 collected slugs. The similarity of the distributions suggests that although some mushroom-associated slugs were lost to the analysis, the study group is a valid sample of the mushroom-associated slug population.

Perhaps other mushroom species have evolved to employ different spore dispersal mechanisms, to which slugs might pose a threat. Have some of these mushroom species evolved repellant mechanisms such as antifeedants to keep slugs away? Is this the evolutionary path chosen by the ubiquitous and common *Laccaria* species, explaining why no slugs were found on 13 collections?

Conclusions

Despite their omnivorous reputation, slugs show marked preferences and avoidance patterns to mushrooms selected for mycophagy. The reasons are not known, but the results encourage speculation about the role of selective coevolution to promote spore distribution or prevent spore destruction. These results encourage investigation of possible attractants and antifeedants to mediate these relationships.

Acknowledgments

The authors thank all the participants of Foray Newfoundland & Labrador's 2009 Annual Foray, and particularly members of the Database Team, who doubled as slug collectors for this study, and helped with the recording, photography and processing of collected specimens.

References

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2. Worthen WB: Slugs (*Arion* spp.) facilitate mycophagous drosophilids in laboratory and field experiments. OIKOS 53:161-166. 2008.

Why does *Taphrina* infect only one alder species?

Andrus Voitk, Henry Mann

Life is interdependent; no organism is an island, but all are parts of a chain, linked to each other by visible and invisible ties. Coevolution is one mechanism of mutual accommodation to facilitate specific ties. For example, as trees evolve, some fungi evolve that decay wood in favour of other materials. Some wood decayers are generalists, able to decay all wood. In other cases, an association becomes very specialized, so that some fungi decompose only hardwood and some only very specific species of hardwood.

The evolutionary changes that make an organism receptive to another may occur at all levels, from the chemical, mediated by specific receptor sites or enzymes, to the very obvious physical. For example, of the 10-12 bumble bee species in Newfoundland and Labrador, only three have probisci long enough to reach the nectar of *Goodyera oblongifolia*; these three are the pollinators of this orchid.

It is well known that species of the *Taphrina alni* complex infect species of the *Alnus incana* complex, but not of the *Alnus viridis* complex. (For a discussion of these fungi and trees, see Omphalina, Volume II, Issue 4). Why? Of course, it could be chemical with "personalized" attractants or repellents. The reason could also be physical coevolution, not unlike probiscus length and depth of nectar storage in the previous example. Although members of the same genus, *A. incana* and *A. viridis* are genetically quite distant within the genus. This is also reflected in readily apparent differences, two of which might play a role here:

1. Female cones of speckled alder (*A. incana* ssp. *rugosa*, our member of the *A. incana* complex) are exposed throughout their development (Figure 1); those of mountain alder (*A. viridis* ssp. *crispa*, our member of the *A. viridis* complex) are enclosed in

Figure 1. *A. rugosa* L and *A. crispa* R, April 30, 2011. Note that the former is in full bloom, while the latter is still tight—it blooms a month later. Note the exposed female cones of *A. rugosa* (green ring), while those of *A. crispa* are encased in a bud with closed scales (blue ring).

Figure 2. *A. crispa* female cones. L, May 15, 2011, just beginning to break out of the bud. R, May 29, 2011, beginning to bloom. If tongues were to develop by direct infection of cones, and if sporulation were to finish by the beginning of May, *A. crispa* cones would be forever protected. Meanwhile, the developing female cones of *A. rugosa* have been exposed the entire season, from the fall on. It is easy to imagine their falling prey to infecting spores.

Figure 3. Alder tongue galls on last season's female cones of *A. rugosa*.

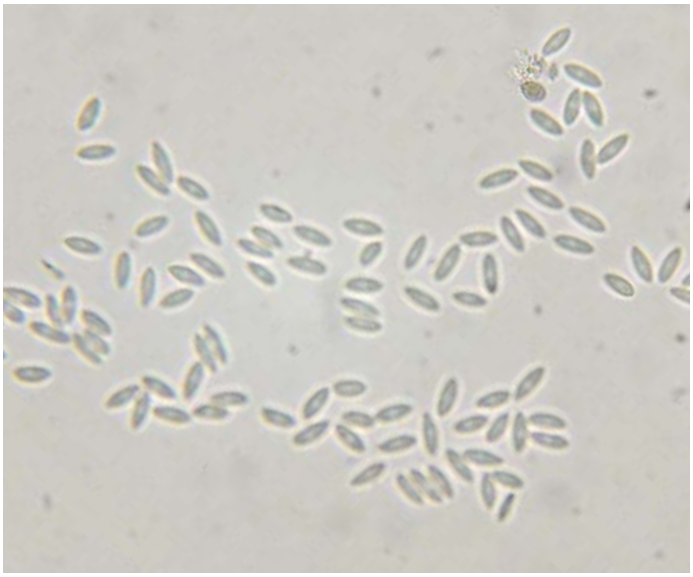

Figure 4. Spores recovered from tongue galls on last season's female cones of *A. rugosa* (original magnification 400x). These spindle-shaped spores look entirely different from the only published diagrams of spores from the *Taphrina alni* complex that we could find. Although these spores were recovered from the tongue galls, this does not necessarily confirm that these are the spores of *T. robinsoniana*. It is quite possible that these are the spores of some mold or other fungus that took up residence on the galls. If they are the spores of *T. robinsoniana*, this would suggest that the fungus goes through several sporulation cycles, and these may not be the spores that produce infection in the host.

a bud (Figure 1), and burst through its scales only after they have begun to grow (Figure 2).

2. In our area speckled alder begins blooming at the end of April, whereas mountain alder about the end of May.

Taphrina robinsoniana (our member of the *T. alni* complex) infection produces swellings of the ovaries and bracts of female cones known as alder tongue galls (Figure 3). The teleological explanation is that these protrusions make it easier for the spores they produce to disperse. Although it has not been determined, workers have suggested either wind or rain as the dispersal vector. Until they meet up with other developing mycelia, the spores produce a yeast-like growth on the host twig that can survive a long time. If the infection occurs either via spores or yeast gaining access directly into receptive female cones, the differences between our alder species would suggest that

1. the infective agents gain access to exposed cones, not covered ones,
2. and/or that the time these agents are available corresponds to its host's blooming time, when female cones are receptive to infection, and the agents are blown or washed away well before mountain alder female cones break out of bud and begin to bloom.

The aim of this study was to test this hypothesis by exposing mountain alder female cones to *Taphrina* spores during blooming time.

Method

An alder thicket was selected that had both alder subspecies in the same microclimate. The presence of spores on infected alder tongues was confirmed (Figure 4). Infected female cones of speckled alder with several tongues were gathered and put in a transparent plastic bag on April 10, 2011, before blooming time of either tree. 12 such bags were wrapped around buds of mountain alder female cone buds on separate twigs of 6 trees, secured to the twig by tape (Figure 5). The assumption was that even if sporulation from the tongues were to finish before the mountain alder cones became exposed, most

Figure 5. Experimental set-up. Last year's female cones of *A. rugosa*, with alder gall tongues collected and put in clear plastic bag (pink circle). Bag wrapped around twig with developing female cone bud of *A. crispa* (yellow ring). "Untreated" normal female cone bud as control on adjacent twig of same tree. Bags removed at the end of blooming in June and treated cones marked. Results checked in October.

spores would be trapped in the bag and contact with exposed or blooming cones should be enhanced in the closed space. When blooming was over, the bags were removed and the experimental cones marked. Results were assessed at the end of the season, Oct. 9, 2011.

Results

Cones developed normally inside the bags, just as their free sisters. Some rainwater collected in the bottom of most bags and washed over the infected speckled alder cones and twigs as well as the opening and blooming mountain alder female cones when agitated by wind. At the end of the season, 6 treated twigs were found that had borne fruit. No fruit could be seen on two twigs and the remaining four bags could not be relocated. No difference could be seen between experimental cones and their free sisters on the same tree. Specifically, no alder tongue galls developed on any mountain alder, treated or untreated. By contrast, a "normal amount" of new galls appeared on free female cones of neighbouring speckled alders.

Discussion

The experiment assumed that alder tongue gall infection is caused by direct infection of opening or blooming female cones (Figure 6) by spores or other fungal material from the previous year's tongue galls. It also assumed that the spores that were found on the previous year's tongue galls were those of *T. robinsoniana*, and specifically the stage that infects

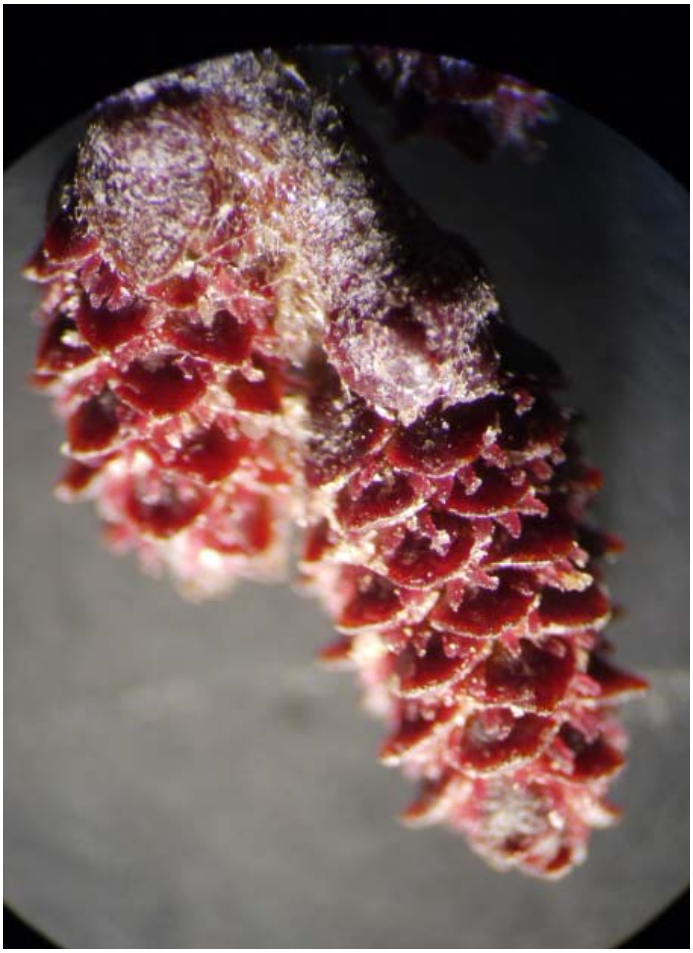

Figure 6. Flowering cones of *A. rugosa*, April 30, 2011. Note fully open scales with exposed female sexual organs, receptive to pollination. Note also white filaments at the base (upper end). Are these a mold stage of *T. robinsoniana*? Is this the way alder tongue gall infection is transmitted? These and many other perplexing questions will have to be answered by more knowledgeable mycologists or endowed investigators.

cones. Therefore, bringing them in contact with opening or developing female cones should produce an infection in susceptible female cones. Because this did not happen:

1. mountain alder is resistant to alder tongue gall infection for unknown reasons, or
2. the spores detected were not of *T. robinsoniana*, or
3. the spores detected were not of the infective stage, or
4. infection does not come about at that time, or
5. infection does not come about directly through cones, or
6. any combination of the above.

We do not know enough of the life cycle of *Taphrina robinsoniana* or its mechanism of infecting alder. The exposed female cones of speckled alder are formed in the fall, so that infection could occur then, not the spring—i.e. we assumed the wrong time. *Taphrina robinsoniana* also produces leaf galls, so that it may cause a systemic infection, whose entry into the host may not be the female cone at all. The latter may only be one of the expressions of this systemic disease. In other words, we may have assumed a wrong port of entry.

On the only published picture of free *Taphrina alni* spores that we could find they looked like a child's drawing: little round balls varying markedly in size, with a very irregular wall.[1] Drawings of unreleased spores inside asci are a bit smoother-walled, do not vary as much in size, and are round or just a little longer in one axis.[2] In contrast, the free spores that we found were fusiform, even-walled and uniform in size. This raises the possibility of more than one spore stage, only one of which infects the host; equally possible is that what we found were not spores of *T. robinsoniana* at all, but some other organism that happened to reside and sporulate on the galls in April.

This experiment did not answer the question in the title. We have learned that we know little about the fungus and how it interacts with its host tree. Perhaps this will stimulate somebody with better resources to pursue the life cycle of the fungus and then conduct a more valid experiment into the mechanism of coevolution.

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Megacollybia rodmanii

—the *Megacollybia* in Newfoundland and Labrador

Andrus Voitk

People who attended our 2006 foray will remember Ron Petersen's discussion, **The hunt for *Megacollybia*: one name fits all?**[1] He showed that *M. platyphylla*, originally described in Europe, is part of a species complex with morphologically similar but genetically different species. Their genetic difference, despite their similar appearance, was confirmed by an inability to mate under laboratory conditions. North America is blessed with at least four species, two with smaller geographic distribution and two more widely spread. Evolution of these strains was likely helped by several north-south migrations in response to successive glaciations, with genetic mixing probably taking place in Central American refugia. A year after this presentation the species were formally described by Hughes et al[2], and the present article is an attempt to update us based on that report.

In North America the geographically more limited species are *M. texensis* (in Texas) and *M. subfurfuracea* (in Arkansas and Tennessee). The species with wider distribution are *M. fallax*, limited to west of the Rockies (reputedly, if inaccurately, the only *Megacollybia* to rot coniferous wood), and *M. rodmanii* to the east. *M. fusca* is limited to Central and northern South America. The "original" *M. platyphylla* is limited to Europe, with *M. marginata* and *M. clitocyboidea* in Russia, the latter extending to the Far East. No doubt other related species still await discovery.

Which of these cryptic species do we have in Newfoundland and Labrador? Ron Petersen requested specimens from our collections for this work. He presented a slide showing that our mushrooms were a genetic match for the species found in eastern North America. Our material enabled the published report to state that the habitat for ***M. rodmanii*** is "Eastern North America … Costa Rica to Newfoundland". Thus, our collections have helped to demarcate the distribution of this newly discovered species, and in return we know exactly which species grows in our woods: not *M. platyphylla*, but ***M. rodmanii***. The only place you can find *M. platyphylla* in Newfoundland and Labrador is in your mushroom books, printed before this work had been done.

M. rodmanii is a large, whitespored wood decayer, caps up to 10 cm or more across. Although said to grow on dead, rotten hardwood only, at least in Newfoundland and Labrador it grows on both deciduous and coniferous wood. It appears early in the season, peaking in June-July, found into the autumn. Two forms have been described, f. *rodmanii* and f. *murina*, apparently readily separated by a certain set of macroscopic characteristics, like cap colour, involution of cap edge, robustness and flaring of the stem, and rhizome ("root") formation. Our mushrooms have all those characteristics, but seemingly randomly distributed, independent of each other, without separating into two forms. Microscopic morphology and drying characteristics also help to separate the forms, but if relatively obvious macroscopic character sets do not cluster well for us, additional features are unlikely to be meaningful. These two forms are indistinguishable by DNA. Perhaps the genetic molecules know something? In summary, our *Megacollybia* is *M. rodmanii*, but differs from its original description by growing on coniferous as well as deciduous wood, and by not separating into two forms. Perhaps the last word about this species was not the last?

M. rodmanii is reported as edible, but when cooked, smells and tastes foul, or "off", and leaves an increasingly bitter aftertaste. So, why bother? Apparently very young mushrooms do not have the

unpleasant taste, a report I do not plan to test.

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Mushroom Photography: Composition

Jim Cornish

Unlike painters, who start their artwork with a clean canvas, photographers usually don't have the luxury of choosing which objects to include in their photographs or how to arrange them within the confines of a small photographic frame. Photographers have to work with an existing scene, and find the best lens and a point of view to compose a shot that grabs and holds the viewer's attention. The photographer must also develop the ability to see objects as shapes, lines, forms and masses and not just objects. For some people, the whole process is intuitive. For others, it is an acquired skill. This article, the third in a series on mushroom photography, will help you compose mushroom images that follow one or more elements of design, no matter what kind of camera you use. The resulting images might not be documentary in style and suitable for a guidebook, but they will certainly be beautiful when printed and framed or be stunning desktops for your monitor.

It has often been argued that there are no rules in art and photography. Yet, the drawings, paintings and photographs that appeal to us often show some use of the elements and principles of design such as leading lines, pattern, texture, rhythm and balance to name a few. While not strictly rules, these elements and principles do serve as guidelines in composition (the way we arrange things), and help create artwork that contains a message and often elicits an emotional response from the viewer.

Xeromphalina cornui. *Using the rule of thirds leaves a lot of space to be filled. Choosing the right aperture (see next issue) helps fill that space with a softly blurred background.*

Rule of thirds

One of the first compositional guidelines photographers learn is the "rule of thirds": placing the subject on or near one of the four points created by two pairs of evenly spaced intersecting lines (a tick-tack-toe grid) is more pleasing to the eye than placing it in the bull's eye. This slightly off-center positioning also creates tension, energy and interest in the composition. But, be careful. Overuse of the rule of thirds can make your images predictable. So, it is as important to know how to break "compositional rules" as it is to know how to follow them.

When composing for the rule of thirds, photographers often start by placing the subject in the center of the viewfinder, then pressing and holding the shutter release button half way down to focus and to meter the light. Then, they reposition the camera to recompose the scene before pressing the shutter release the rest of the way. Some cameras have the rule-of-thirds grid lines visible in the viewfinder or LCD to help position the subject.

Shape

Photography is a universal visual language that uses shapes, textures, patterns, lines, colours and shades of light to con-

Shooting a cluster of Coprinopsis atramentaria *from various angles to find the best composition. A small aperture ensures all the mushrooms are in focus. This draws the viewer's eye through the frame, but the eye is drawn back to the closest mushroom because the water captured by the curled margins add interest to the image.*

The underside of these Panellus stipticus *creates a pattern that is easily sensed without touching. This image also captures a key feature to identify this species: the sharp demarcation between gills and stem.*

vey a message. In mushroom photography, that message can be about the mushroom, its telltale features, shape, size and colour, and about the environment in which it is growing. The message can also be about the natural beauty of fungi, a beauty many people fail to see. That beauty is conveyed through the mushroom's smooth curving lines and gentle shapes like cones, bells, and bonnets. When captured close-up and in soft light, these lines and shapes also convey a sense of the fragile nature of certain mushrooms. While getting both messages in the same shot is often challenging, the resulting image is spectacular, at least to a mycophile or to someone who understands and appreciates good photography, well worth the time it takes to get it.

Texture

Textures are also an important part of composition. Textures provide details and appeal to our sense of touch. Mushrooms have a variety of textures, often evident in their scaly, slimy, tomentose or satin-like caps and stems. How well textures or changes in textures are captured, depends on the quality of light and the angle of the light source. Bold textures such as the scales on a mushroom cap, are best revealed by strong, direct sidelight. Smooth, viscous and more finely detailed textures are best revealed by gentler, oblique or diffused light. You know you have captured the texture correctly when a mushroom image creates in the viewer a sense of how it feels.

Simplicity

When communicating using words, we often strive to convey our messages in a coherent way using as few words as possible. Photographers accomplish this by using the least number of elements to tell the story in the briefest way possible. This is called simplification and is a matter of deciding what elements to include and which ones to leave out. In mushroom photography this is easily done by filling the frame with the subject

Using the rule of thirds opens up some space. After taking six shots, each with a different apertures setting, the best background proved to be the one with subtle details that are not distracting. The point of view also captured a little sheen on this slimy Cortinarius collinitus.

A small part of a weeping Fomitopsis pinicola *fills the frame to create "surprise" in this macro photo. The margin between the top and the underside is placed on the diagonal to add tension. The balsam fir needle provides a scale to size the droplets.*

so nothing else but the mushroom is visible, or by placing the mushroom in a small portion of the frame with little in the background to draw away the viewer's attention. Mushrooms don't always choose simplistic environments in which to grow. They often pop up amid leaf litter, branches and twigs. While including this "detritus" in the image might create a great context, it might also create a great deal of distracting clutter. One way of reducing distractions is to make the backgrounds blurred and unrecognizable. This is done using a shallow depth-of-field created by a large aperture, a topic covered in the next issue, Omphalina Vol. III No 3.

Patterns

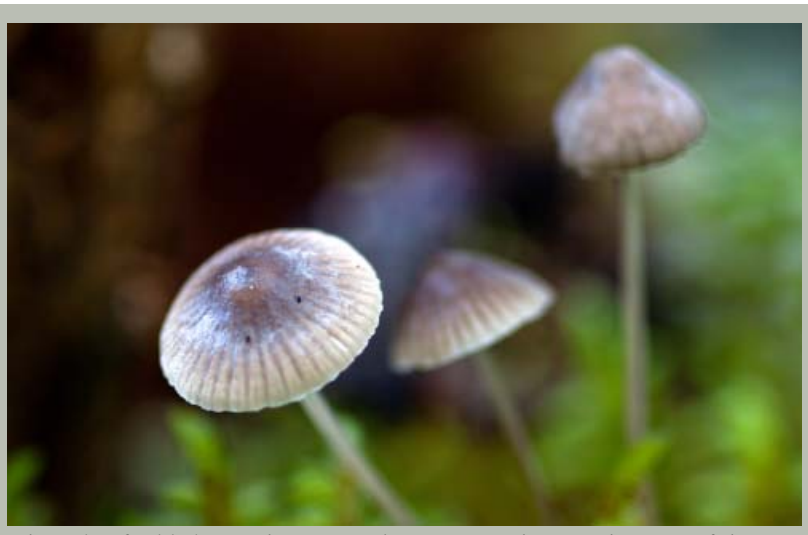
A cluster of Phellodon tomentosus *repeats a basic shape that creates an unusual and eye catching pattern.*

Patterns, both natural and man-made, bring a sense of visual rhythm and harmony to photographs and are another important consideration in composition. Patterns appear whenever strong graphic elements such as lines, colors, shapes, or forms repeat themselves. Whatever emotional response one element in the pattern creates, is recreated by the rest that from the pattern. The result is a very powerful image. In mushroom photography, pattern is apparent in a cluster of mushrooms, where the same elements of size, shape and colour in one mushroom are repeated in the remaining ones in the cluster. Pattern also appears in mushrooms features such as striated, scaly and wart-covered caps and in the fan-shaped arrangement of the gills. Patterns aren't always obvious so finding them is a matter of exploring the subject from a variety of angles. Emphasizing the patterns is best achieved by isolating them from their surroundings, which can be accomplished by using shallow depth-of-filed or filling the frame which often creates the illusion that the repetition is infinite.

Surprise

Surprise is an important ingredient in photography. By exploring a subject beyond the predictable first impression, you can create new and startling compositions. Surprises often result when shooting from unexpected angles. Mushroom make good subjects for this compositional technique. Mushrooms force us outside our comfort zone; the normal angles with which we view things- looking down at a flower, out over a landscape and up a building. In mushroom photography, we are forced to walk, or more often crawl, around the mushroom and then find the lowest angle to photograph them. The surprise is in the way in which low angles tend to exaggerate their height or reveal something unseen and unexpected. Photographing mushrooms at these angles also forces our bodies close to the ground where we experience the feel, dampness and smells of the earth, all important parts of the mushroom photography experience. You may feel silly in getting to such a vantage point and may draw

Finding a surface that slopes away from a mushroom provides an opportunity to change the point of view. Shooting upward reveals the damage done by slugs and the brusing on the underside of the cap. This point-of-view gives the mushroom a "larger than life" appearance and adds interest to the images.



The rule of odds keeps the main subject to just three in the case of these Mycenae. *The closest one is in focus. That is where the eye looks first. Then it shifts to the remaining two which are also positioned diagonally across the frame. The eye is aware of their presence despite that they are not in focus.*

lots of attention from passers-by who might think you have gone off the deep end, but the resulting photographs will make the effort and the odd stares worth while.

Leading lines

Good composition can also be enhanced by creating implicit, subtle or inferred leading lines. These lines direct the eye through the image, keeping the viewer longer as they experience the entire frame. One technique that does this is called the "power of three" or as some photographers like to call it, the "rule of odds". This rule states that including three points of interest (essentially creating a triangle) draws the eye through the image along an inferred line. Often used in landscape photography, it has its place in mushroom photography too. Shooting three mushrooms positioned at different points in the frame leads the eye and fills the frame. Leading line are even more powerful when flow diagonally to create a sense of direction and purpose.

Leading lines work best when in focus and when coming into the frame from or near the corners. The stem of this Laccaria bicolor *lead the eye to the gills, which are quite spectacular in this golden light.*

Books have been written on composition, so it shouldn't be surprising that this short article has touched but a few points. What has been covered represents a start, a few areas in which you can strive to improve your photography. The final piece of advice on composition is actually the one most frequently given: study the photographs of others and determine the techniques used. One great source of images is the Flickr web site: www.flickr.com. It has many mushroom photography groups filled with wonderful, and some not so wonderful, photographs from which you can learn.

The Bishop's Sketchbook


Photo: Maria Voitk

This time, something seasonal: photo from Henry Mann on west coast and aquarelle from Glynn on Avalon within 24 hrs of each other. *Agrocybe dura* complex. Note partial veil, evanescent ring, brown sporeprint, early season appearance, and association with wood and grass. Second crop caught by Henry with classical cracked cap. Finally, Judy May brought in a motherlode from the Codroy Valley, growing on sheep dung mixed with wood chips.

On the right, below, two takes on the spring *Entoloma*, *Entoloma verna*. Note straight, tall, twisted stalk, peaked cap, pink sporeprint (real, not painted), conifer association and appearance early in the season.

The empty skillet

Maria Voitk
Editor

Morue aux morilles

POISSONNIER: Ian Manuel

SAUCIER: Andrus Voitk

INGREDIENTS

Cod
4 fillets fresh-frozen cod
olive oil
butter
1 egg, flour, seasoning

Sauce
2 cups dried morels
1 cup skim milk
2 eggs
120 gm butter
onion
pine nuts

PROCEDURE

Pan fried cod

Make thin batter with egg and flour, season with salt and pepper.

Heat pan with little olive oil, add little butter. Dip half-frozen cod in batter (not too much!) and put on heated pan. Cod remains flaky but does not crumble if pan-fried half-fozen.

Sauce

Soak morels in skim milk & water 1 hr. Slice as desired.

Hard boil eggs. Chop coarse.

Melt butter. Add chopped egg.

Sauté onions in butter until almost brown. Add morels. Reduce soaking milk and water mixture. Add small amount of pine nuts or sliced almonds.

Add morels to eggs and melted butter. Season to taste. Stir gently. Reheat, if required.

Place cod on warm plates. Pour sauce over fillets. Garnish with fresh chives (not shown).

Serve with new potatoes with fresh dill, and fiddleheads with Hollandaise sauce (not shown).

Experiment with different fish, mushrooms and other ingredients.

THE MAIL BAG

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

OMPHALINA is something to be savored in the midst of cystidia and clamp connections.

Ron Petersen

Ed comment:

Our star is rising! That is a whole lot better than, say, "suitable for perusing while in the midst of a root canal."

I saw OMPHALINA on your website. The photos in the new newsletter/magazine are amazing—is the issue for sale ?
Thank you, Tracy

Ed response:

Dear Tracy,

Thank you for the kind words.

OMPHALINA is exclusively an electronic publication and is not printed. It has no set schedule of publication, and is distributed to Foray Newfoundland & Labrador members as it comes out (we're aiming for 12 issues this yr).

You can become a member of FNL by either coming to the foray, or by taking out a separate membership (form on website). The fee covers an annual subscription to FUNGI, a printed mainstream glossy mushroom magazine with significant Canadian content (5 issues a year). Members also get access to the journals of some 3-5 sister organizations, as they come out, posted on our website.

If you do not wish to become a member, OMPHALINA is posted on our website upon publication, where it is available free to the public, both for reading in an on-line journal format and as a downloadable pdf document. The disadvantage is that you have to monitor the site yourself to find out when a new issue has come out and then either read or download it.

Dear Andrus,

One every month! Any secrets to share?

Susan Goldhor

Ed comment:

Susan is not the only one to ask about this. Here is the explanation. Just for fun, I decided see if it a peripheral, dare I say insular, amateur club could generate enough material to publish a newsletter once a month. I had a little prompting: some readers VERY GENTLY mentioned that the issues were just a bit too long to read at one go. It appears many goal-oriented people want to read or otherwise deal with matters, as they come up. Electronic journals are not as easy to plow through, or to lay down and pick up again, and printing them defeats the save-a-tree benefit. So, I tried to make more, but a bit shorter. This is only an experiment, and I guarantee that a monthly journal will NOT be permanent, unless we get a paid staff!!! Funding agencies, pay attention—here's a chance to put your funds into useful action. Otherwise, I am too old to keep this up. So, enjoy it until December, or until the material dries up …

Hint: write something up and submit. If you are not a writer, we have an idle stable of experienced editorial staff willing to work with you.

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People of Newfoundland and Labrador, through

- Department of Environment and Conservation
  - Parks and Natural Areas Division
  - Wildlife Division
- Department of Natural Resources
  - Center 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

- Forest Communities Program

RED Ochre Develpoment Board

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Tuckamore Lodge

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