



OMPHALINA

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Newsletter of



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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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COVER: Pholiota limonella

Photo by TA Loeffler

We did not have to go far to find this little gem. Probably one of the most photographed mushrooms at this year's Foray, it was located right next to the sorting tent at Killdevil Camp.

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Message from the Editor

This year brought the Foray back to its roots, Gros Morne National Park. What a splended place it is. We were lucky enough to be housed at Killdevil Camp, managed by Mac Turner and his excellent staff. The grounds are well kept, the food was good and there was plenty of space for young and old to roam about the property. There were bunks, and a campfire circle, and a warm mess hall and kitchen, and best of all warm showers ... not bad for “roughing” it at camp. I hope you enjoyed it as much as I did!

So much work goes into organising and running a Foray. When I came to my first Foray I came to learn more about mushrooms. I stayed because of the people. I would like to extend my gratitude to all of you who came and participated, and to those who helped organise, but could not attend (we missed you!). A lot of work gets done during a Foray, but a lot of fun is had as well. Some Foray workshops were so popular that we had backups, just like on Everest. Really ... just check out Foray Fotos; page 14.

Oh, and our president is in the middle of house renos and is without internet. We thought we would go ahead and go to press without pestering him for an article.

So here you have it, the long awaited Foray Report. Enjoy!

Marian Wissink



Words from the President





FACULTY

Guest faculty:

Teuvo Ahti
Oluna Ceska
Christiane Corbeil
Renée Lebeuf
Michele Piercey-Normore
Roger Smith

Local Faculty:

Michael Burzynski
Andrus Voitk



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Photo: TA Loeffler

White and lilac *Inocybes*

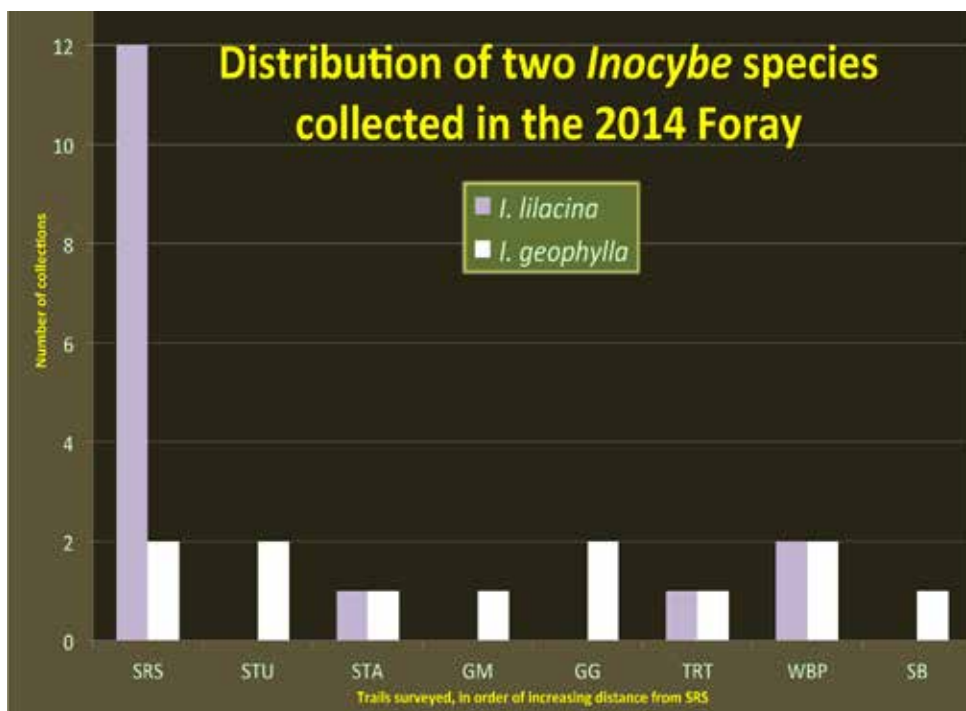


A very common mushroom in our province is the small conical *Inocybe geophylla*, collected each year, except the two forays on the Avalon Peninsula. Along with the white mushroom, we have also collected a lilac mushroom of similar size and shape, identified either as *Inocybe geophylla* var. *lilacina* or *Inocybe lilacina*. Early on I could not distinguish between specimens assigned to the two taxa. No wonder: Dave Malloch told me both were based on the same type specimen, making them obligate synonyms (i.e. the same thing) and either name is correct. We decided that because of their similarity in all but colour, for the time being we should refer to the lilac one as *I. geophylla* var. *lilacina*.

2014 was a good year for these small mushrooms with a total of 28 collections: 12 collections identified as *I. geophylla*, 11 collections as *I. geophylla* var. *lilacina*, and 5 collections as *I. lilacina*. When the distribution of these three names was examined within the foray region, an interesting pattern resulted. Eight of 11 collections (73%) of *I. geophylla* var. *lilacina* came from one place—Sir Richard Squires Memorial Provincial Park. Four of five collections (80%) of *I. lilacina* came from the same site. Thus, in their distribution, *I. geophylla* var. *lilacina* and *I. lilacina* resembled each other—as they should, of course, if they are the same species. Considering the lilac ones as one, we find that 75% of the collections of this species came from one place, with four collections from three other trails. This differs very significantly ($p=0.0063$) from *Inocybe geophylla*, which was evenly distributed throughout the entire foray region, yielding 1-2 collections from each of eight trails, including two from Sir Richard Squires Memorial Provincial Park.

A simple list of species would not give us any information about these three names. Knowing the number of collections and their distribution in the region forayed, gives us additional information about the taxa found. In the case of these three taxa, it confirms that by behaviour the two lilac ones are indeed conspecific, differing entirely from *I. geophylla*.

These data were shared with Brandon Matheny, a student of the genus *Inocybe*. Brandon said that phylogenetically *Inocybe geophylla* and *I. lilacina* are distinct, so that it is more correct to use the species than the variety name for the latter. He also said that both represent a species complex of several similar species. The strict *Inocybe lilacina* is a Peck species, described from New York State; most likely this is the species we have in NL. The strict *I. geophylla* is a European species, and likely not found in North America, where other similar species exist. Brandon offered to sequence our collections to confirm the exact species that we have in our province. Stay tuned.



Faculty Foray Report

Andrus Voitk

PHOTO: MARIA VOITK



This year we had ample lichen faculty, but operated with a minimal mushroom faculty. Lichen faculty was made up by Michele Piercy-Normore, Teuvo Ahti and Chris Deduke, and mushroom faculty by Olga Ceska, Christiane Corbeil and Renée Lebeuf. Chris also acted as databaser, supported by Tony Wright as both databaser and ATF (associate transportation facilitator). Adolf Ceska was the official visiting botanist. Roger Smith* was photographer and Anne Marceau* and Michael Burzynski* took part as much as their house construction allowed this year. Maria* and Andrus Voitk helped to compensate for the decrease in the average age brought about by Chris. The Faculty Foray, slated to begin a day later than usual, began on Monday evening due to changes to travel times for most faculty.

Areas surveyed were the Killdevil grounds, Western Brook Pond trail, Tony's Bay (Eel Brook Beach), Shallow Bay sand dunes, the Tablelands, Trout


River Eastern Point trail, MacKenzie's Brook campgrounds, followed by joining the Foray's mycoblitz of Sir Richard Squires' Memorial Provincial Park on Friday, September 12. After the Foray, the faculty was treated to a catered farewell dinner at Killdevil on Sunday evening.

Faculty members enjoyed the experience and were happy throughout their stay. Many have sent profuse thanks, accompanied by the usual flagons of expensive Cognac. Totally unnecessary, of course. Renée dubbed this the year of *Leptonia* after the numerous species of this small *Entoloma* subgenus found on the lawns of Killdevil and elsewhere. From its trails, the Faculty Foray contributed 179 collections and 125 species. Of these, 61 were not collected during the foray; 25 species were new to our list, of which 21 were only collected during the Faculty Foray.


Recommendations

1. Whenever fiscally possible, keep mushroom faculty above the minimum. This time, microscopic examination was often skipped in favour of processing more collections.
2. If finances at all permit it, initiate a program to purchase microscopes over the years, including a maintenance contract. Two that we borrowed this year were non-functional on arrival.
3. It was a great help not to drive to the farewell dinner and back. Probably this should be the preferred practice.
4. Michael's new method of splitting collections for archiving and display is a big help and should be continued. Never before have we had most of the material packed before supper Sunday! This may not be an exclusive Faculty Foray matter, but in the past all the drying and packing fell to the faculty by default after the Foray was over and participants departed, with further unpacking and drying at home by Michael and Anne. Much of this was eliminated this year.


Mushroom Foray Menu



- Thai curry soup with wild mushrooms four ways: Yellowlegs and jack broth, delicious lactarius and puffball dumpling, lobster satay, morel braised



-Roasted Pork Loin-
Stuffed with birch, gypsy and chanterelle mushrooms on a bed of late summer succotash and hand tossed spaetzle



-Baked strudel-
Filled with Bonne Bay apples, wild berries, and currants
Served with a chaga cream anglaise and candied lichen

Chef: Jason Nesbitt






Photo: Chris Deduke

*Missing from title banner photo. Look for their pictures elsewhere in this issue.

SIR RICHARD SQUIRES MEMORIAL PROVINCIAL PARK MYCOBLITZ

Four groups, led by Park Supervisor Bert Hillier, and FNL members Tina Leonard, Jeri Graham and Andrus Voitk, surveyed different areas of the Park (SRS) for 2-3 hours, Friday, September 12, 2014. The Park was very productive: 250 collections were processed, representing 120 species. For a full species list, please see the SRS column in the foray species list.

Does the fungal population of SRS really differ from that of Gros Morne National Park (GM)? Some findings suggest it does.

1. 52 of the species collected from SRS were not encountered in GM.
2. Four species were found at SRS that we had not encountered in the province in over 10 years of forays.
3. Of particular interest was the marked preference of *Inocybe lilacina* for SRS, subject of a short report elsewhere in this issue.
4. The May Model states that mycotal differences between regions are best demonstrated by comparing common species only. Seven species from SRS were listed as common, and twenty from GM. Only one of these species was shared by both; the others were all different for each. Because we are analysing only mushrooms common in each locality, this difference seems very significant.

A difference in the mushroom population suggests a difference in the ecologic habitat, especially the vascular plant

population on which fungal relationships depend. GM is located at the meeting of three ecoregions of the Island, of which we surveyed parts of two: the Western Newfoundland Forest, and the Northern Peninsula Forest. SRS is located entirely within the Central Newfoundland Forest ecoregion. Thus, the areas surveyed are indeed ecologically different, and therefore it should not be unexpected to find that their mycota reflect this difference. Or, to put it another way, had we not known that they represented different ecoregions, the findings outlined above would suggest it.

To be valid, comparisons of this year's foray results with those of past forays in GM should disregard the collections from SRS.

It was a great privilege for us to survey this beautiful Park. We are grateful to Bert Hillier and Parks staff Tina Leonard and Jeri Graham, as well as to the Department of Environment and Conservation, Parks and Protected Areas Division, for Partnership support to carry out this survey.

Andrus Voitk

Photo: Maria Voitk



Foray Finds

Renée Lebeuf

This year, mycorrhizal fungi were not as abundant as usual because it did not rain soon enough in the weeks preceding the foray. Fortunately, the rain we finally got came just in time to allow an extraordinary fruiting of small species of the genus *Entoloma* (formerly known as *Leptonia*) in the lawns where we forayed, especially on the grounds of Killdevil proper. And among these Entolomas, there were these beautiful *Entoloma incanum*, with their deep green colour and strong smell of mouse urine! An extraordinary sight! And a first record for the Foray!



Foray Fotos



Photos: Maria Voitk



Photos: Maria Voitk



Photo: Roger Smith



Photo: Jamie Graham



Photos: Maria Voitek

Photos: Henry Mann



Photos: Marian Wissink



Photos: Trine Schiolden



Hardly out of the parking lot !





Program

Friday, September 12

11:00 Mycoblitz at *Sir Richard Squires Memorial Provincial Park* (turn off Highway 430, eight kilometres north of Deer Lake).

2:00 Leave to drive to Killdevil Camp.

4:00 Sign-in desk opens at Killdevil Camp.

Sign up sheets will be posted for workshops, please make sure that you add your name during registration.

6:00 Reception/Supper begins

7:30 Words From the President

8:00 Simultaneous Sessions:

- *Mushrooms 101*, Christiane Corbeil.
- *Renée's Picks of NL Mushrooms*, Renée Lebeuf.

Saturday, September 13

- 8:00 Breakfast and announcements.
9:00 Foray teams leave for various trails.
12:00 Lunch on the trail. Identifiers and databasers return to start identification and processing.
3:00 Foray teams return to sort, label, and identify specimens.
6:00 *Quidi Vidi QuuQup* (wild mushrooms and supper).
7:30 Short Talks:
 - *True Morels of Newfoundland -- a detective game*, Andrus Voitk
 - *The Practical Side of Lichens*, Michele Piercey-Normore
 - *Outer Spores-a mushroom survey of Haida Gwaii*, Oluna Czeska

Sunday, September 14

- 8:00 Breakfast.

8:45 Group Photograph.
9:00 Specimen Tables and Workshops:

9:00 to 10:00	<i>Tables with Renée</i>	<i>Watercolour with Glynn Bishop (max. 10)</i>	<i>Mushroom Dyeing with Trine Shioldan (max. 10)</i>	<i>Pick for the Pot with Michael and Anne (max. 12)</i>
10:00 to 11:00	<i>Tables with Michele</i>			
11:00 to 12:00	<i>Tables with Andrus</i>	<i>Lichen Walk Michele Piercey-Normore and Teuvo Ahti (max. 14)</i>		<i>Let it Rot Walk with Henry Mann (max 14)</i>
12:00 to 1:00	<i>Tables with Oluna</i>			

- 1:00 Lunch.
2:00 *President's Thanks.*
2:15 ***Annual General Meeting.***
3:00 Foray 2014 Concludes.

Workshops and Walks

Sunday morning was devoted to workshops, both indoors and out: Let it Rot walk, Pick for the pot, Lichen walk, Watercolour sketching, Mushroom Dyeing, and, of course, Tables sessions. To get a flavour of what they were about, here are six “Reports” by some of the leaders. Most have been edited slightly for length.

Lichen walk

Michele Piercy-Normore

The lichen walk attracted 11 people to accompany Teuvo Ahti and myself along a trail through a heavily forested area at the end of a grassy field. While Teuvo provided taxonomic expertise on the lichens, I provided ecological and additional anecdotal stories to contribute to the discoveries. During the walk we found many of the common lichens on trees and on the ground, including *Baeomyces rufus* on soil among the grassy entrance to the trail. *B. rufus* appeared as a white patch on the surface of the soil and the small stalks with brown caps could only be seen if you kneel down to look closely. *B. rufus* and a similar species with pink apothecia (*Dibaeis baeomyces*) often grow on the soil surface along trail edges. *Lobaria pulmonaria*, the lungwort, was seen on a few large broadleaf trees among the conifers. Pin or stubble lichens were also found on decaying stumps that were still standing in open areas in the forest. The many species of pin or stubble lichens are mostly not lichens but are included with the lichens since many of them can be parasitic on lichens.



Baeomyces rufus



Dibaeis baeomyces (fairy puke)

Many *Cladonia* species were growing among the moss on the ground and over rocks. *Cladonia squamosa* was very common with its many incised leaf-like squamules in the moss and along the podetial stalk. *C. squamosa* fluoresces blue in ultraviolet light because of a secondary metabolite called squamatic acid. *Cladonia ochrochlora* was common on the rotting logs and at bases of trees. It consisted of a single pointed powdery stalk growing from a basal squamule, but the stalks were usually found with many growing together. The larger *C. gracilis* with an olive colored cortex, large brown caps on the tall stalk, a large shallow cup, and few squamules was also common among the moss. Several reindeer lichens were scattered along the trail edge and in open areas of the forest but the habitat was not open enough to allow them to grow in large patches. The lichen sightings were contributions from everyone who were all interested in understanding the lichens, including the two young members of our group who were 10 and 6 years of age. The two boys were eager to learn and were collecting samples of the different lichens to take back to camp with them.

Photo: Andrus Voik

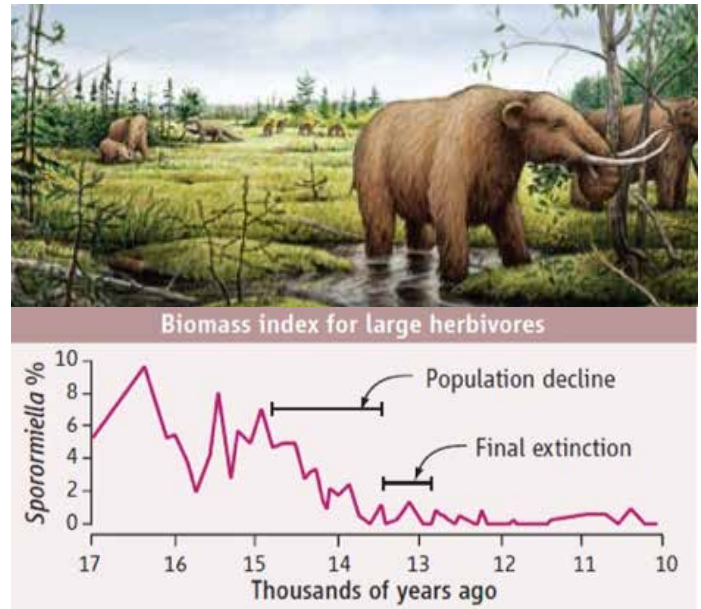
Photo: Maria Voik

Tables sessions

Oluna Ceska

I have to confess that I did not have a clear idea what was expected from me (or others) at the Table Talks. In order to get some ideas, I went to Renée's session. Renée, having the first session, had quite a few interested people. She started with boletes and spent considerable time explaining their identifications, pointing out their differences and edibility. She then moved to gilled mushrooms with white spores, her major interest. She covered amanitas and to some degree also *Cortinarius* and *Inocybe*. Because some people had attended previous sessions, I wanted to show them something not covered by Renée and Andrus. We started with *Leccinum* and chanterelles. Those typical edible mushrooms are always of interest to people, regardless their degree of fungal knowledge. I warned people about the fact that they should be careful when travelling to other parts of the world, since similar look-alike mushrooms may be poisonous. We went back to boletes because people still had a lot of questions on how to collect them for the pot. I had to stress that the best is to collect firm fruiting bodies, and made my usual pitch about the importance of mycorrhizal connections and adjusting logging practices. We moved to bracket fungi and I mentioned that in Canada in the past, more research money was spent on them than on any other groups of fungi due to their importance as timber destroyers. I finished with returning to the genera *Cortinarius* and *Inocybe* as other important mycorrhizal genera, beside *Russula* and *Lactarius*. I showed how to recognize *Cortinarius* and *Inocybe* and warned about the possibility of poisoning from these two genera.

I concluded my session at ascomycetes and mentioned an interesting palynological study of dung-loving *Sporormiella*. In 1987 O. K. Davis used its spores to show the decline and loss of megafauna on Earth about 13 to 14 thousand years ago (Spores of the dung fungus *Sporormiella*: Increased abundance in historic sediments and before Pleistocene megafaunal Extinction. *Quaternary Research* 28(2): 290–294.) The method, originally suggested to Owen Davis by Dr. Jack Rogers, is now used by many other investigators.



This illustration does not explain the work, but if it makes you curious enough to look it up, it will have served its purpose.

To compare this experience with our Victoria mushroom show, your tables seemed better organized and more informative than ours. It seems that we try to display everything collected, and end up with large piles of *Amanita muscaria* and any other common species of that particular year. Never mind, large piles of mushrooms always impress visitors. Tables are then attended by up to six experts simultaneously, to explain and handle the several questions of a large number of viewers at the same time.



Victoria SVIMS Mushroom Show - October 31, 2010

Dye Workshop

Trine Schioldan

Eight enthusiastic dyers participated in dyeing skeins of wool yarn using *Phaeolus schweinitzii* (dyer's mushroom) and *Hypomyces lactifluorum* (lobster mushroom), respectively. They learned about mordanting yarn, preparing mushrooms for the dyepot, and about the dyeing process itself, in this hands-on three hour workshop. After the final rinse bath, they learned how to "windmill" the water out of the skeins of yarn, outside the building ...

Photo: Trine Schioldan



Photo: Tina Leonard



Photo: Trine Schioldan



Photos: Tina Leonard



Thanks to the kind Killdevil staff for sharing their kitchen space and stoves for boiling our four large dye pots and yarns. Thanks to Mac Turner and others for collecting distilled water for the dye baths and rinse baths prior to the Foray. And thanks to Henry Mann and other foragers for bringing in all the dye mushrooms with more than enough to spare! Each dyer went home with two skeins of mushroom-dyed yarn, enough for hat and scarf, or neck-warmer, or ? So I am left with the pleasant thought of what will they create with their yarn and will they continue with mushroom dyeing on their own.

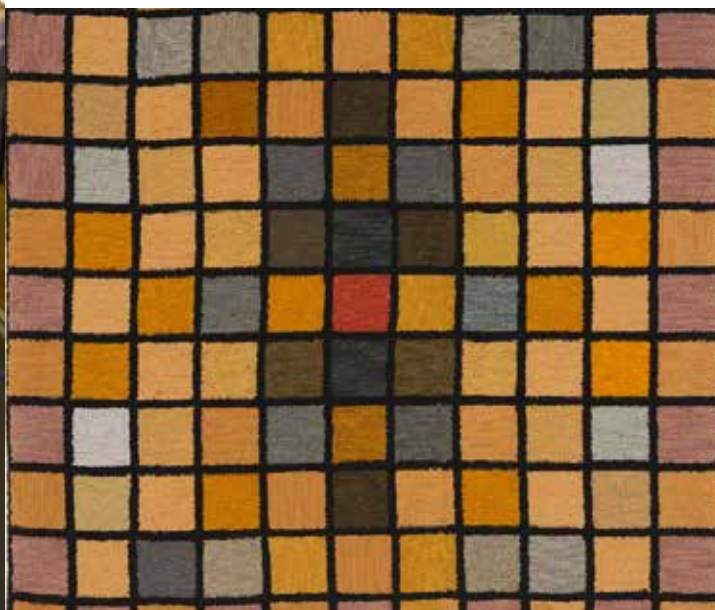


Photo: Trine Schioldan

“Let It Rot” Walk

Henry Mann

A brief introductory level “Show and Tell” using provided specimens, the naked eye and hand lens, gave our eleven enthusiasts a hands-on introduction to wood rotters. Identifiable features of each were stressed. A four-page brochure, “Polypores and other Wood Decay Fungi” was distributed. The group then walked along the Lomond trail, photographing and examining by eye and lens the rotters encountered. Our leader, a broad naturalist both in stature and inclination, although topic-focused, only slightly drifted to such diversions as raspberry stem gall, balsam fir witches broom, a pool of stoneworts, and a moose dung mushroom. The wood recycling fungi encountered were large conks, smaller pored bracket fungi, gilled bracket fungi, jelly fungi, and the ever-present LBM.s. The glut of blow-downs here could give rise to a future “wood rotters foray paradise”.



Photos: TA Loeffler, Marian Wissink

Watercolour Sketching

Glynn Bishop

The watercolour sketching workshop was located in the A-frame chapel at the camp. It was a quiet and unique setting for a small group of seven. There was even a large grouping of puffballs just outside the window, but low temperatures coaxed us to remain inside -- one of the first lessons of painting outside. The eager participants learned how to sketch mushrooms in the wild, and the techniques used to capture their unique features in hand drawn detail. A watercolour field kit is used to record the colours and shadings of the species drawn. Tips on paint mixing and brushwork, combined with outdoor sketching common sense, made for a satisfying Sunday morning art session.



Photos: Roger Smith

Pick-for-the-Pot Walk

Anne Marceau and Michael Burzynski

This year's Pick for the Pot was both a disappointment and a strangely enjoyable event. We were a small group—only nine—and were packed into two pickup trucks and an SUV. The location for the event was one that we have successfully visited many times over the years, and during previous foray Pick for the Pot events—the Microwave Tower Road near Lomond River Lodge. Hopes were high as we bounced down the rough dirt road, carefully straddling washouts and steering around boulders until we reached the site. But search as we might, there were almost no edible mushrooms. We checked Beaked hazels for nuts, tasted cucumber-flavoured Clintonia leaves, examined strangely shaped roots, admired li-

chens, and poked sticks in bear droppings, but all that we found for the pot was a handful of Yellowlegs. Disappointed, we left the Microwave Tower Road, rattled back down the lumpy dirt road, and checked out two other sites without any luck. TA summed up this strange Pick for the Pot as “Driving around back roads in trucks and looking for mushrooms”, and that sounds just about right.



Photos: TA Loeffler

*Michael playing a cow parsnip shawm.

Aare Voitk

The fall weather cooperated nicely, providing a pleasant sunny afternoon in which to enjoy a variety of mushrooms on toast, paired exceptionally with some fine ales from Quidi Vidi Brewery in St. John's.

It was perfect grilling weather, and the mushrooms were cooked up in large roasting pans on BBQs and then served on toast. In one pan, Newfoundland chanterelles were sautéed in a roasted red pepper, garlic, black pepper, and cream sauce, while the other served up a mix of the big cat, parasol mushroom, hedgehog and sweet tooth, lobster mushroom, birch bolete and hollowleg suillus (*Catathelasma ventricosum*, *Chlorophyllum rachodes*, *Hydnum repandum* and *umbilicatum*, *Hypomyces lactifluorum*, *Leccinum scabrum*, and *Suillus cavipes*) fried in butter, with a garlic, onion and crushed black pepper garnish.



Thanks to the generous support from QV brewery, Foray NL was able to offer a selection of craft beers to accompany the mushroom treats, served chilled just enough to perspire slightly in the afternoon sun. On hand were the smooth, Eric's Red Cream Ale, the 1892 Traditional Ale (their darkish ale, perfect for fall and winter), and one of their newer recipes, a delightfully hoppy British India Pale Ale.

After a long day of mushrooming, the refreshing beer and delectable mushrooms were welcomed and thoroughly enjoyed by all of the Foray participants. Encounters with wild fungi were told and re-told between mouthfuls of mushrooms and suds, the tales growing taller as the shadows grew longer.

Thanks to Tina Leonard, for general gophering, providing the cooking supplies, and help in the kitchen. Thanks to Gene Herzberg for help in the

kitchen and on the grill. A toast to the Killdevil kitchen staff for the superb toast. And finally thanks to the volunteers who picked and donated the mushrooms that we all consumed.



Photos: TA Loeffler

Trails

	Gros Morne Mountain	Lomond River Trail	Stuckless Pond Trail	Stanleyville Trail	Green Gardens Trail (Wallace Brook)	Trout River Pond Trail & Campground Mushrooms for Beginners
Terrain	Moist coniferous forest, heath barren, tuckamore, rock barren, rock knob	Rich fen, mixed forest, riverside, insect- and wind-damaged forest, meadow, estuary	Mixed forest, coniferous forest, lakeside, meadow	Mixed forest, insect- and wind- damaged forest, meadow, seacoast	Peridotite barrens, riverside, coniferous forest, seacoast	Mixed forest, lakeside, peridotite barrens, travertine seeps
Difficulty: 1-easy; 5-tough	Beginning of trail- 2 Entire trail- 5	Beginning of trail- 2 Entire trail- 3	Beginning of trail- 2 Entire trail- 3	3	Beginning of trail- 2 Entire trail- 4	Beginning of trail-2 Entire trail- 3
Productivity 1-low; 5-high	5	4	4	3	3	3
Points of Interest	Brook and rich forest understory	River and estuary; unusually diverse forest	Old logging trail, mature conifers	Route to the area's first lumber mill; limestone cliffs	Differences between vegetation of serpentine and normal soils	Glacial trough lake (a former fjord); views of the Tablelands
Length (km) See note below	16 km (loop)	6 km (one way)	9.5 km (loop)	4 km (return)	9 km (return)	14 km (return)
Start	GM Trail parking lot	LR Trail parking lot	LR Trail parking lot	Lomond Campground, Day-use-area parking lot	GG Trail, Wallace Brook parking lot	Trout River Pond Day-use-area parking lot
Leader	Erin McKee	Henry Mann	Jeri Graham	Marian Wissink	Anne Marceau	Jessica Butler
Databaser		Aare Voitk	Tony Wright	April Muirhead	Claudia Hanel	Chris Deduke
Mycologist	Andrus Voitk	Oluna Ceska		Renée Lebeuf	Christiane Corbeil	Michael Burzynski
Lichenologist	Teuvo Ahti		Michele Piercey-Normore			Chris Deduke
Note About Trails: Because of the diversity of mushrooms, forayers often only get a few hundred metres along a trail.						

SPECIES LIST

Andrus Voitk, Michael Burzynski, Tony Wright

NEW SPECIES TO LIST

Common sp for 2014

SRS mycobltz

unique species for its trail

“Unique species” means a species only collected on that trail. In other words, had that trail not been surveyed, this species would not have been recorded for this year’s foray.

TOT = total

RSP = Sir Richard Squires Memorial Provincial Park

KD = Killdevil grounds

LR = Lomond River trail

SP = Stuckless Pond trail

SV = Stanleyville trail

GG = Green Gardens, lower trail

GM = Gros Morne trail

MK = McKenzie’s Brook campground

TR = Trout River headlands trail

WB = Western Brook Pond trail

TL = Tablelands

SB = Shallow Bay sand dunes, north end

WD = Wiltondale

SpeciesName	TOT	RSP	KD	LR	SP	SV	GG	GM	MK	TR	WB	TL	SB	WD
Agaricus arvensis	1		1											
<i>Agaricus micromegethus</i>	3	1	2											
<i>Amanita bisporigera</i>	7			3	1	2		1						
<i>Amanita flavoconia</i>	3	1				1			1					
<i>Amanita fulva</i>	10	3		1			2	4						
<i>Amanita muscaria</i> var. <i>guessowii</i>	13	3	2		1	2	1		1	3				
<i>Amanita porphyria</i>	12	7		1	2	1		1						
<i>Amanita rubescens</i>	2	1							1					
<i>Amanita</i> sp. "precocious amanita"	2				1		1							
<i>Amanita vaginata</i>	1	1												
<i>Ampulloclitocybe clavipes</i>	1						1							
<i>Armillaria ostoyae</i>	7	6				1								
<i>Armillaria sinapina</i>	1						1							
<i>Arrhenia acerosa</i>	2		1						1					
<i>Arrhenia philonotis</i>	1										1			
<i>Atheniella adonis</i>	2										2			
<i>Bankera violascens</i>	1							1						
<i>Bisporella citrina</i>	1					1								
<i>Bjerkandera adusta</i>	1									1				
<i>Boletus edulis</i>	3	1							1	1				
<i>Boletus gracilis</i>	7	3	1	1	1			1						
<i>Boletus subglabripes</i>	1						1							
<i>Bovista pila</i>	5	3	1				1							
<i>Bovista plumbea</i>	1											1		
Calocera furcata	1							1						
<i>Cantharellus roseocanus</i>	2						1			1				
<i>Catathelasma imperiale</i>	1						1							
<i>Catathelasma ventricosum</i>	4	2			1	1								
<i>Cerrena unicolor</i>	1				1									
<i>Chalciporus piperatus</i>	14	2	2		1	2		2		4		1		
<i>Cheimonophyllum candidissimum</i>	1			1										
<i>Chlorociboria aeruginascens</i>	1	1												
<i>Clavaria fumosa</i>	2		2											
<i>Clavaria rosea</i>	1	1												
Clavaria vermicularis	2	1	1											
<i>Clavulina coralloides</i>	8	2		1		1		2		1	1			
<i>Clavulinopsis fusiformis</i>	2	1		1										
Clitocybe odora	1									1				
<i>Clitocybula familia</i>	3			1				2						

SpeciesName	TOT	RSP	KD	LR	SP	SV	GG	GM	MK	TR	WB	TL	SB	WD
<i>Clitopilus prunulus</i>	8			1	1		1		2	3				
<i>Collybia cirrhata</i>	3	3												
<i>Collybia tuberosa</i>	1							1						
<i>Coltricia perennis</i>	3	3												
<i>Connopus acervatus</i>	2	1									1			
<i>Conocybe filaris</i>	1			1										
<i>Conocybe tenera</i>	1					1								
<i>Coprinopsis atramentaria</i>	1	1												
<i>Coprinus comatus</i>	1	1												
<i>Cortinarius acutus</i>	3							2			1			
<i>Cortinarius anomalus</i>	1					1								
<i>Cortinarius argutus</i>	1							1						
<i>Cortinarius armillatus</i>	17	8		5	2	2								
<i>Cortinarius bolaris</i>	2	2												
<i>Cortinarius callisteus</i>	1									1				
<i>Cortinarius camphoratus</i>	2			1				1						
<i>Cortinarius caperatus</i>	8	6			1			1						
<i>Cortinarius clarobrunneus</i>	1			1										
<i>Cortinarius delibutus</i>	2	1				1								
<i>Cortinarius evernius</i>	1				1									
<i>Cortinarius laniger</i>	1	1												
<i>Cortinarius limonius</i>	1										1			
<i>Cortinarius lucorum</i>	1	1												
<i>Cortinarius malicorius</i>	1						1							
<i>Cortinarius pholideus</i>	1			1										
<i>Cortinarius purpurascens</i>	1				1									
<i>Cortinarius scaurus</i>	1			1										
<i>Cortinarius semisanguineus</i>	1	1												
<i>Cortinarius stillatitius</i>	4	1			1		1			1				
<i>Cortinarius subcroceofolius</i>	1										1			
<i>Cortinarius traganus</i>	6	3			3									
<i>Cortinarius trivialis</i>	2	2												
<i>Cortinarius tubarius</i>	1	1												
<i>Craterellus tubaeformis</i>	10	1		2	1	2		3			1			
<i>Cystobasidium hypogymniicola</i>	2	1									1			
<i>Cystoderma amianthinum</i>	1							1						
<i>Dacrymyces chrysospermus</i>	10	3		2		2	1	1			1			
<i>Elaphocordyceps ophioglossoides</i>	2	2												
<i>Elaphomyces muricatus</i>	1	1												
<i>Entoloma conicum</i>	1										1			
<i>Entoloma elodes</i>	1										1			
<i>Entoloma formosum</i>	1										1			
<i>Entoloma incanum</i>	3		3											
<i>Entoloma luridum</i>	1		1											
<i>Entoloma quadratum</i>	2						2							
<i>Entoloma rhodopolium</i>	1	1												
<i>Entoloma sericellum</i>	1	1												
<i>Entoloma serrulatum</i>	2		1							1				
<i>Entoloma sp. "marginata"</i>	1		1											
<i>Entoloma subserrulatum</i>	7		2				1			1		2	1	
<i>Entoloma subsinuatum</i>	2			1						1				
<i>Entoloma violaceum</i>	1												1	
<i>Erysiphe aquilegiae</i>	1								1					
<i>Erysiphe erigeorontis-canadensis</i>	1													1
<i>Exidia pithya</i>	1						1							

SpeciesName	TOT	RSP	KD	LR	SP	SV	GG	GM	MK	TR	WB	TL	SB	WD
<i>Exobasidium savilei</i>	1										1			
<i>Fomes fomentarius</i>	6	1		1			2	1	1					
<i>Fomitopsis ochracea</i>	1					1								
<i>Fomitopsis pinicola</i>	10	3			3	1			3					
<i>Fomitopsis rosea</i>	1			1										
<i>Galerina paludosa</i>	1	1												
<i>Galerina sphagnorum</i>	1										1			
<i>Galerina tibiicystis</i>	1										1			
<i>Ganoderma applanatum</i>	2	1						1						
<i>Geoglossum glabrum</i>	1										1			
<i>Gliophorus laetus</i>	1										1			
<i>Gloeophyllum sepiarium</i>	7	4	1		2									
<i>Gloioxanthomyces nitidus</i>	1			1										
<i>Glovinomyces depressus</i>	1									1				
<i>Glovinomyces cichoracearum</i>	1										1			
<i>Glovinomyces sordidus</i>	1													1
<i>Gomphidius maculatus</i>	1											1		
<i>Gomphus clavatus</i>	1										1			
<i>Gymnopilus bellulus</i>	2			1	1									
<i>Gymnopilus junonius</i>	3			2				1						
<i>Gymnopilus penetrans</i>	1			1										
<i>Gymnopilus picreus</i>	1								1					
<i>Gymnosporangium cornutum</i>	1												1	
<i>Harrya chromapes</i>	2		1			1								
<i>Hebeloma calvinii</i>	1										1			
<i>Hebeloma crustuliniforme</i>	3	1	1						1					
<i>Hebeloma mesophaeum</i>	1	1												
<i>Helvella lacunosa</i>	2	1			1									
<i>Hemipholiota populnea</i> var. <i>edmundii</i>	1	1												
<i>Humidicutis marginata</i> var. <i>concolor</i>	1			1										
<i>Humidicutis marginata</i> var. <i>marginata</i>	1			1										
<i>Hydnellum conrescens</i>	1							1						
<i>Hydnellum scrobiculatum</i>	1							1						
<i>Hydnum albomagnum</i>	1			1										
<i>Hydnum repandum</i>	4	1				1		1		1				
<i>Hydnum umbilicatum</i>	12	2		2	1	1		2		2	2			
<i>Hygrocybe acutoconica</i>	11	4	1		3	1				2				
<i>Hygrocybe aurantiosplendens</i>	1		1											
<i>Hygrocybe cantharellus</i>	5	1		2							1		1	
<i>Hygrocybe coccineocrenata</i>	1										1			
<i>Hygrocybe conica</i>	14	3	1	3	2	1	2			1		1		
<i>Hygrocybe miniata</i>	2	1									1			
<i>Hygrocybe phaecoccinea</i>	1	1												
<i>Hygrocybe singeri</i> var. <i>albifolia</i>	1										1			
<i>Hygrocybe squamulosa</i>	2	2												
<i>Hygrophoropsis aurantiaca</i>	1									1				
<i>Hygrophoropsis rufa</i>	1										1			
<i>Hygrophorus eburneus</i>	1					1								
<i>Hygrophorus purpurascens</i>	1		1											
<i>Hypholoma myosotis</i>	1	1												
<i>Hypocrea pulvinata</i>	1			1										
<i>Hypomyces chrysospermus</i>	1	1												

SpeciesName	TOT	RSP	KD	LR	SP	SV	GG	GM	MK	TR	WB	TL	SB	WD
Hypoxylon fragiforme	1	1												
<i>Hypoxylon fuscum</i>	1							1						
<i>Inocybe geophylla</i>	12	2			2	1	2	1		1	2		1	
<i>Inocybe lilacina</i>	16	12				1				1	2			
<i>Inocybe gymnocarpa</i>	1	1												
<i>Inocybe lanuginosa</i>	1	1												
Inocybe sororia	1		1											
Inocybe terrigena	1										1			
Inocybe umbratica	1										1			
<i>Inonotus obliquus</i>	1	1												
<i>Ischnoderma benzoinum</i>	1			1										
<i>Jahnoporus hirtus</i>	3			1			2							
<i>Laccaria bicolor</i>	7	3				1				1	2			
<i>Laccaria laccata</i>	3	2									1			
<i>Laccaria longipes</i>	1							1						
<i>Lachnellula agassizii</i>	1												1	
<i>Lactarius affinis</i>	2	1									1			
Lactarius aspileoides	1									1				
<i>Lactarius camphoratus</i>	9	1		3	1	1		1		1	1			
<i>Lactarius deceptivus</i>	3	1			1			1						
<i>Lactarius deterrimus</i>	12	2				1	4			3	2			
Lactarius fumosoides	1									1				
<i>Lactarius glyciosmus</i>	1	1												
<i>Lactarius helvus</i>	11	6			4		1							
<i>Lactarius hibbardae</i>	5	2			2			1						
<i>Lactarius lignyotus</i> var. <i>canadensis</i>	1										1			
<i>Lactarius lignyotus</i> var. <i>lignyotus</i>	1						1							
<i>Lactarius nitidus</i>	4			1				1			2			
<i>Lactarius pseudoflexuosus</i>	1	1												
<i>Lactarius rufus</i>	1	1												
<i>Lactarius scrobiculatus</i> var. <i>canadensis</i>	1									1				
<i>Lactarius tabidus</i>	1	1												
<i>Lactarius thynos</i>	12	3		2	2		1	1		2	1			
<i>Lactarius torminosus</i>	7	6									1			
<i>Lactarius uvidus</i>	2	1					1							
<i>Lactarius vietus</i>	1	1												
<i>Lactarius vinaceorufescens</i>	1									1				
<i>Lactarius zonarioides</i>	1				1									
<i>Leccinum holopus</i>	13	2		2		1	1	3		2	2			
<i>Leccinum scabrum</i>	11	2	2	1	1		3			2				
<i>Leccinum vulpinum</i>	10	6	2	1		1								
<i>Leotia lubrica</i>	13	1		6	1		1	2		1	1			
<i>Leotia viscosa</i>	2			1	1									
<i>Lepiota cristata</i>	2		2											
<i>Lycogala epidendrum</i>	1			1										
<i>Lycoperdon curtisii</i>	2		2											
Lycoperdon flavotinctum	4						2					2		
<i>Lycoperdon perlatum</i>	7	1		2	3							1		
<i>Lycoperdon pyriforme</i>	7	2			1	2					1		1	
<i>Lyophyllum connatum</i>	1	1												
<i>Lyophyllum decastes</i>	1		1											
Melampsora populnea	1	1												
<i>Merismodes fasciculata</i>	2							1					1	

SpeciesName	TOT	RSP	KD	LR	SP	SV	GG	GM	MK	TR	WB	TL	SB	WD
<i>Mollisia cinerea</i>	1	1												
<i>Mycena acicula</i>	1			1										
<i>Mycena filipes</i>	1										1			
<i>Mycena galericulata</i>	1										1			
<i>Mycena leptcephala</i>	1		1											
<i>Mycena pura</i>	2									1	1			
<i>Mycena rubromarginata</i>	1										1			
<i>Onnia tomentosa</i>	1	1												
<i>Panaeolina foenisecii</i>	1					1								
<i>Panellus stipticus</i>	1	1												
<i>Paxillus involutus</i>	15	12								1	1	1		
<i>Peniophora cinerea</i>	1												1	
<i>Peziza ammophila</i>	1												1	
<i>Peziza badia</i>	3							3						
<i>Phacopsis oxyspora</i>	1												1	
<i>Phaeolus schweinitzii</i>	1								1					
<i>Phellinus igniarius</i>	1	1												
<i>Phellinus lundellii</i>	1	1												
<i>Phellinus prunicola</i>	1									1				
<i>Phellodon niger</i> var. <i>niger</i>	3			1		2								
<i>Pholiota alnicola</i>	1	1												
<i>Pholiota astragalina</i>	4			1	1		1	1						
<i>Pholiota granulosa</i>	1			1										
<i>Pholiota limonella</i>	1		1											
<i>Pholiota spumosa</i>	1								1					
<i>Piptoporus betulinus</i>	8	7					1							
<i>Pleurocybella porrigens</i>	5			4				1						
<i>Pleurotus dryinus</i>	1							1						
<i>Pleurotus pulmonarius</i>	1	1												
<i>Plicaturopsis crispa</i>	2							1					1	
<i>Pluteus eos</i>	1												1	
<i>Polyporus badius</i>	5	1						4						
<i>Polyporus brumalis</i>	1									1				
<i>Polyporus varius</i>	1	1												
<i>Postia balsamea</i>	3	3												
<i>Postia caesia</i>	2			1		1								
<i>Postia fragilis</i>	1	1												
<i>Postia pythagaster</i>	1						1							
<i>Postia stiptica</i>	1		1											
<i>Postia tephroleuca</i>	3	2					1							
<i>Psathyrella ammophila</i>	1												1	
<i>Psathyrella piluliformis</i>	2							2						
<i>Pseudohydnum gelatinosum</i>	1										1			
<i>Puccinia poarum</i>	1	1												
<i>Pucciniastrum goeppertianum</i>	1									1				
<i>Pycnoporellus fulgens</i>	2					1			1					
<i>Ramaria acrisiccescens</i>	2			2										
<i>Ramariopsis kunzei</i>	2			2										
<i>Rhodocollybia maculata</i>	3		1		1							1		
<i>Rickenella fibula</i>	4			1						1	2			
<i>Russula acetolens</i>	1									1				
<i>Russula adusta</i>	1	1												
<i>Russula aeruginea</i>	1	1												
<i>Russula aquosa</i>	1										1			
<i>Russula brevipes</i>	1										1			

SpeciesName	TOT	RSP	KD	LR	SP	SV	GG	GM	MK	TR	WB	TL	SB	WD
<i>Russula brevipes</i> var. <i>acrior</i>	2									2				
<i>Russula brunneola</i>	2				1						1			
<i>Russula densifolia</i>	1							1						
<i>Russula fragilis</i>	1		1											
<i>Russula laurocerasi</i>	1										1			
<i>Russula paludosa</i>	12	8		1		1		1		1				
<i>Russula peckii</i>	5				2	1			1		1			
<i>Russula puellaris</i>	2	1								1				
<i>Russula queletii</i>	1					1								
<i>Sarcodon scabrosus</i>	1						1							
<i>Stereum rugosum</i>	1				1									
<i>Stromatocyphella conglobata</i>	1							1						
<i>Stropharia alcis</i>	1				1									
<i>Suillus cavipes</i>	2	2												
<i>Suillus clintonianus</i>	14	10			1		1				1	1		
<i>Suillus glandulosus</i>	3	1						2						
<i>Suillus granulatus</i>	1		1											
<i>Suillus grevillei</i>	7	2					2			1		2		
<i>Suillus serotinus</i>	2				1					1				
<i>Suillus sibiricus</i>	2			1	1									
<i>Suillus spectabilis</i>	5						2				2	1		
<i>Taphrina robinsoniana</i>	3							1		1	1			
<i>Tarzetta cupularis</i>	1								1					
<i>Thelephora caryophyllea</i>	4	1			3									
<i>Trametes pubescens</i>	1							1						
<i>Tremella foliacea</i>	1								1					
<i>Tremiscus helvelloides</i>	1					1								
<i>Trichaptum abietinum</i>	5	3					1		1					
<i>Trichaptum bifforme</i>	1	1												
<i>Trichaptum laricinum</i>	1							1						
<i>Tricholoma atosquamosum</i>	1	1												
<i>Tricholoma aurantium</i>	1			1										
<i>Tricholoma fumosoluteum</i>	1			1										
<i>Tricholoma portentosum</i>	2				1			1						
<i>Tricholoma saponaceum</i>	1					1								
<i>Tricholoma subsejunctum</i>	4				3			1						
<i>Tricholoma transmutans</i>	4	1			1			2						
<i>Tricholomopsis decora</i>	3						1		1		1			
<i>Tricholomopsis rutilans</i>	1											1		
<i>Tricholomopsis sulphureoides</i>	1			1										
<i>Tubaria confragosa</i>	3							2			1			
<i>Tylopilus felleus</i>	2	2												
<i>Tyromyces chioneus</i>	4	1		1	1				1					
<i>Xeromphalina campanella</i>	5			1			1	2			1			
total collections	782	246	44	82	66	46	51	68	21	60	69	13	14	2
total spp	298	120	33	59	49	40	40	54	21	45	62	11	14	2
unique spp	298	52	16	21	6	9	9	16	6	14	28	3	8	2

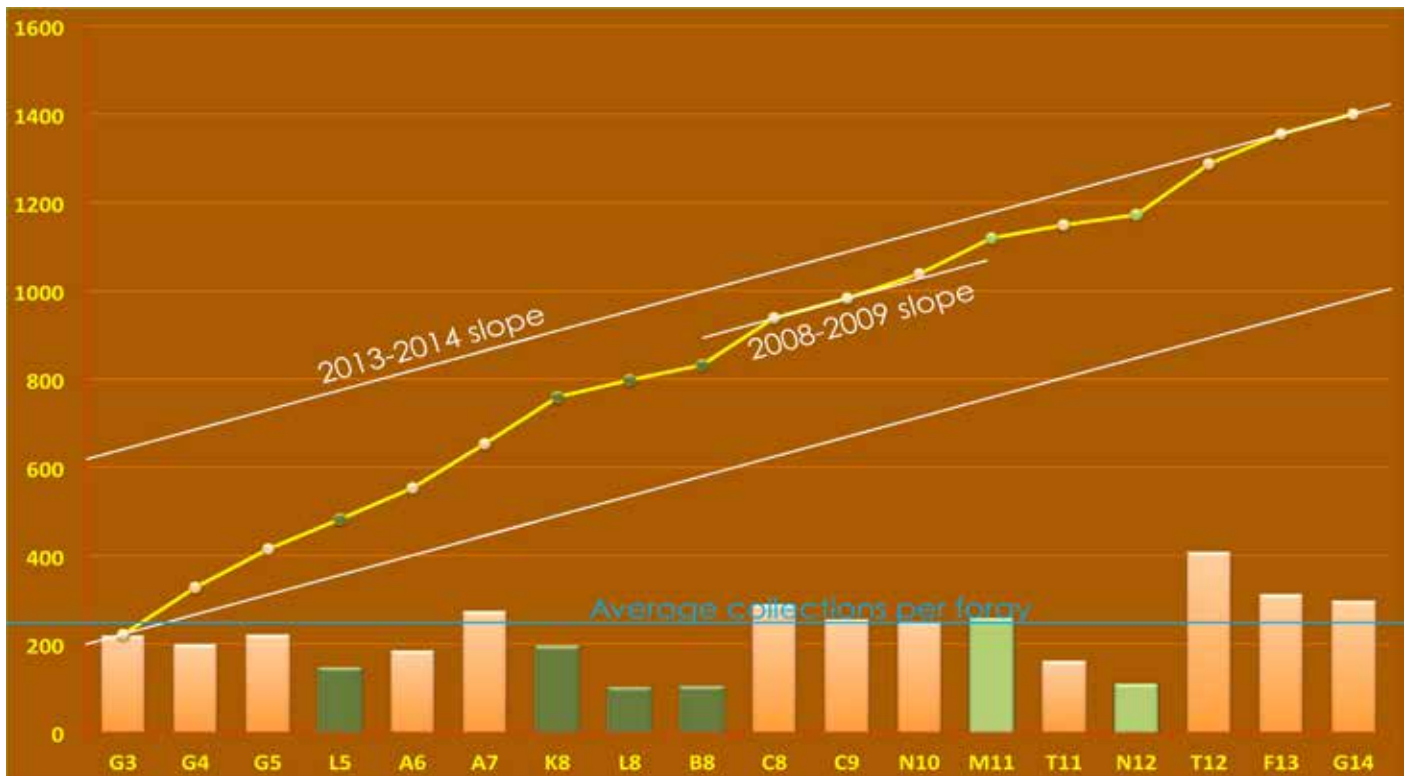
WHAT DO THESE DATA MEAN?

By Andrus Voitk

Note: this discussion is limited to all fungi EXCEPT the lichenized ascomycetes; the latter will be treated in a separate discussion elsewhere in this issue.

The trick of interpretation is not to find what the data say, but to choose what to discuss from the volumes the data speak. Let us start with the simplest number of all, the total number of species identified: 298. The average number of species per full annual foray is around 250. Given that most of these forays did not have a mycoblitiz outside the ecoregion, our slightly higher results seem to be at least average. How does this fit with what you observed? Most people commented that the number of mushrooms seemed down this year, yet were surprised at the variety they were able to collect on the trails. In other words, perhaps not the best, but certainly not bad—i.e. at least average. Thus, the total tallies with what I have heard most people comment.

The next number that warrants our attention is the number of new species added to our cumulative list: 44. This is the lowest number for any regular full foray by about 20, except for 2009. In 2009 the number of new species was also 44, but they came out of a total species count about 50 less than this time. On the cumulative curve, the slope of the line from last year's foray to this year's is the lowest of that between any two regular forays, again with one exception—that between 2008 and 2009. This is disproportionately low for the total number of species identified. How does that fit with participants' experience? I heard only two comments about this, and both felt that they saw few new species. So, within the limits of accuracy of only two observations, perhaps it also rings true.



Cumulative species curve since inception. Total number of species since inception now is 1,401. This image is for those of you with nothing to do, who enjoy interpreting graphs and pondering numbers. Others may go to more productive things, as this graph will not be on the exam. Bars represent total number of species collected per foray. Beige bars represent regular full forays and green bars show various smaller forays. The latter cannot be compared to the former, and hence their slopes of lines leading to or from these are not comparable to other slopes. The dots represent the number of new species contributed to the cumulative by each foray, and the yellow line joins them to show the slope of change. The blue line shows the average number of species collected in regular full forays. The white lines are parallel. They show the 2013-2014 slope of change of new species. As seen, ignoring changes to or from green forays, this is the lowest slope recorded, seen only once in 2008-2009. However, in 2009 there were also less species collected, so that the proportion of new species identified in 2014 is the lowest on record for regular full forays.

What does this mean? I can think of three possible explanations.

1. 2014 may be an abnormal year, much as 2009 seems to have been. Indeed, such years happen. 2011 with its dry foray was a classic example. Being nestled between two smaller limited forays, it is not comparable to others, but the suggestion is that the slope from 2010 to 2011 would have been even lower than the present one. Nothing moves in an absolutely straight line, so ups and downs are a normal part of the journey.
2. After 10 years of surveying various regions of the province with both small and large forays, we may have uncovered most of the macrofungi in the province. Significant additions to the cumulative list will now become increasingly smaller. They can be increased by either surveying specialized habitats, remote regions, or subspecialized niches (e.g. rusts, moulds, etc.). The list can, of course, also be increased by judicious splitting of existing species into several. Thus, for example, we find that what we used to call *Pluteus cervinus*, has been found to contain four species: *P. elaphinus*, *P. eos*, *P. methvenii* and *P. primus*. A 400% increase without finding a single new mushroom—armchair mycodiversification at its best!
 - If we have indeed identified most of the significant macrofungi in the province, it does not mean that finding new species has come to an end. Now we can relax and spend quality time with groups unfamiliar to us. Just as the example above, a session with an expert in russulas can no doubt sort out much of what grows here and show us many, many species we did not know. This would be a great time to learn and study our mycota in depth, without the worry of several hundred new species to learn each year. And a great time to write a book about our mushrooms, if we really do have the majority identified.
 - What support is there that such might be the case? The first suggestion comes from a review of the new species (identified for you by **RED** font in the list). About 20% of species in that list represent microfungi, moulds, rusts, smuts, pyrenomycetes, and the like. Each is a bona fide fungus and an organism very interesting in its own right, but an entity that most mushroomers may not consider as a mainstream mushroom. Certainly not what you'd reach for as an accompaniment to your moose steak. The remaining 36 new macromycetes are not all as "new" as might be supposed. Outside the foray, we have collected and photographed 16 of the 36 "new" species (44%). In other words, although new to the foray, they are common enough to come to the attention of people looking for mushrooms relatively regularly.
3. There are other reasons preventing the identification of all possible species. As has been mentioned on several occasions, we have encountered financial difficulty due to declining partnership support over the last three years. Our prime objective is to organize enjoyable forays, not to do science. It is reasonable to ask participants to pay direct costs, but we depend on our partners to bear the costs of the scientific aspect of the foray. If that support dwindles, the scientific aspect shrinks. In an effort to live within our means, we were forced to cut down on the number of mushroom identifiers as well as the length of the Faculty Foray.
 - Operating with a minimal number of identifiers has consequences beyond the extra eyes and days required to find additional species. The minimal crew takes a generalist approach, and we lack the specialists and subspecialists, who often increase the identified species in their area of knowledge. With little time to study collections, the tendency is to spend time placing names on those collections already known, not studying or keying out others. Two of the microscopes we got on loan did not function on arrival. This could have been a crippling blow in a "normal" situation, but this year it was hardly felt. First of all, the number of people using microscopes was reduced. Secondly, I am sure I was not the only one who did not find time to use a microscope, and limited myself to macroscopic examination only. Having our own microscopes is, again, a matter of finances, of course.

- These are very real concerns, depending entirely on the ability of our partners to support our scientific efforts. When their ability to do so is hampered, so is our ability to “do science”. This is translated directly into a smaller number of species identified, and especially new species, because usually that takes significantly more time.

What did our data tell us this year? The number of new species has decreased disproportionately to the number of all species identified, when compared to past forays. What the data did not tell us, is why this is so. I have outlined three possible reasons. Although we have no proof, we have reason to fear the third. The first two we cannot alter, but somehow the third should be correctable, so it makes sense to eliminate it as a reason, if at all possible.

Note: The data, interpretation and curves derived from them, will continue to change as new information arrives. This may be due to changes in taxonomy and certainly will be due to additional species reported later by identifiers, who took some species home for further study.



Golovinomyces chicoracearum (photo: Roger Smith), one of several powdery mildews collected and identified by Teuvo Ahti this year. These fungi certainly increase the list, but are hardly the main focus of most mushroom hunters. If we really have found most of our big fleshy macrofungi, then one way to complete census of our fungal diversity is to explore such subspecialized fungal groups. Another is to explore specialized habitats. For example, the sand dunes at Shallow Bay yielded a low number of species, but virtually each one was new to our list. Some were featured in our previous issue, and others may get treatment in the future.

SPECIES LIST AND DISTRIBUTION BY FORAY TRAIL - LICHENS

Chris Deduke, Teuvo Ahti and Michele Piercey-Normore

Species Name	Sir Richard Squires Park	Killdevil grounds	Lomond River trail	Stuckless Pond trail	Stanleyville trail	Green Gardens lower trail	Gros Morne trail	McKenzie's Brook Day-use Area	Trout River Eastern Point trail	Western Brook Pond trail	Tablelands	Shallow Bay sand banks	Wiltondale	Tony's Bay (Eal Brook beach)	Sally's Cove
<i>Alectoria sarmentosa</i> (Ach.) Ach.	Yes			Yes						Yes					
<i>Athallia pyracea</i> (Ach.) Arup, Frödén & Söchting												Yes			
<i>Baeomyces rufus</i> (Hudson) Rebent.	Yes								Yes						
<i>Bryoria americana</i> (Motyka) Holien	Yes														
<i>Bryoria trichodes</i> (Michaux) Brodo & D. Hawksw.	Yes									Yes					
<i>Buellia disciformis</i> (Fr.) Mudd										Yes					
<i>Caloplaca discolor</i> (Willey) Fink		Yes													
<i>Caloplaca fraudans</i> (Th. Fr.) H. Olivier											Yes				
<i>Candelariella efflorescens</i> R. C. Harris & W. R. Buck									Yes						
<i>Catinaria atropurpurea</i> (Schaeerer) Vězda & Poelt		Yes		Yes											
<i>Cetraria islandica</i> subsp. <i>crispiformis</i> (Räsänen) Kärnefelt										Yes					
<i>Cetraria muricata</i> (Ach.) Eckfeldt										Yes					
<i>Chaenotheca brunneola</i> (Ach.) Müll. Arg.	Yes			Yes		Yes									
<i>Cladonia acuminata</i> (Ach.) Norrlin											Yes				
<i>Cladonia arbuscula</i> (Wallr.) Flotow				Yes											
<i>Cladonia borealis</i> S. Stenroos				Yes					Yes		Yes				
<i>Cladonia boryi</i> Tuck.										Yes					
<i>Cladonia cariosa</i> (Ach.) Sprengel		Yes							Yes						
<i>Cladonia carneola</i> (Fr.) Fr.	Yes	Yes													Yes
<i>Cladonia cenotea</i> (Ach.) Schaerer	Yes			Yes						Yes					
<i>Cladonia chlorophaea</i> (Flörke ex Sommerf.) Sprengel	Yes			Yes					Yes	Yes	Yes	Yes			
<i>Cladonia coccifera</i> (L.) Willd.										Yes					
<i>Cladonia coniocraea</i> (Flörke) Sprengel	Yes					Yes				Yes					
<i>Cladonia conista</i> (Nyl.) Robbins															
<i>Cladonia cornuta</i> (L.) Hoffm.	Yes														
<i>Cladonia crispata</i> (Ach.) Flotow										Yes					
<i>Cladonia deformis</i> (L.) Hoffm.										Yes					

Species Name	Sir Richard Squires Park	Killdevil grounds	Lomond River trail	Stuckless Pond trail	Stanleyville trail	Green Gardens lower trail	Gros Morne trail	McKenzie's Brook Day-use Area	Trout River Eastern Point trail	Western Brook Pond trail	Tablelands	Shallow Bay sand banks	Wiltondale	Tony's Bay (Eal Brook beach)	Sally's Cove
<i>Cladonia digitata</i> (L.) Hoffm.				Yes						Yes					
<i>Cladonia farinacea</i> (Vainio) A. Evans									Yes						
<i>Cladonia fimbriata</i> (L.) Fr.	Yes	Yes					Yes								
<i>Cladonia gracilis</i> (L.) Willd.				Yes											
<i>Cladonia gracilis</i> ssp. <i>elongata</i> (Jacq.) Vainio										Yes					
<i>Cladonia gracilis</i> ssp. <i>turbinata</i> (Ach.) Ahti	Yes			Yes											
<i>Cladonia macilenta</i> Hoffm.	Yes									Yes					
<i>Cladonia maxima</i> (Asahina) Ahti	Yes										Yes				
<i>Cladonia mitis</i> Sandst.				Yes					Yes	Yes					
<i>Cladonia multiformis</i> G. Merr.	Yes								Yes		Yes				
<i>Cladonia ochrochlora</i> Flörke				Yes			Yes			Yes					
<i>Cladonia peziziformis</i> (With.) J. R. Laundon									Yes						
<i>Cladonia pleurota</i> (Flörke) Schaerer									Yes	Yes					
<i>Cladonia pyxidata</i> (L.) Hoffm.							Yes		Yes	Yes					
<i>Cladonia rangiferina</i> (L.) F. H. Wigg.	Yes			Yes						Yes	Yes				
<i>Cladonia rei</i> Schaerer	Yes			Yes						Yes					
<i>Cladonia scabriuscula</i> (Delise) Nyl.		Yes		Yes					Yes	Yes					
<i>Cladonia squamosa</i> Hoffm.	Yes		Yes	Yes						Yes					
<i>Cladonia stellaris</i> (Opiz) Pouzar & Vězda	Yes										Yes				
<i>Cladonia stygia</i> (Fr.) Ruoss	Yes									Yes	Yes				
<i>Cladonia subulata</i> (L.) F. H. Wigg.															
<i>Cladonia terrae-novae</i> Ahti										Yes					
<i>Cladonia turgida</i> Hoffm.						Yes			Yes		Yes				
<i>Cladonia uncialis</i> (L.) F. H. Wigg.										Yes					
<i>Cladonia verticillata</i> (Hoffm.) Schaerer										Yes					
<i>Cladonia wainioi</i> Savicz										Yes					
<i>Collema furfuraceum</i> (Arnold) Du Rietz												Yes			
<i>Dermatocarpon miniatum</i> (L.) W. Mann												Yes			
<i>Diploschistes scruposus</i> (Schreber) Norman									Yes						
<i>Evernia mesomorpha</i> Nyl.				Yes						Yes					
<i>Flavoplaca citrina</i> (Hoffm.) Arup, Frödén & Søchting									Yes						
<i>Graphis scripta</i> (L.) Ach.				Yes			Yes			Yes					
<i>Hypogymnia incurvoides</i> Rass.	Yes			Yes					Yes	Yes					

Species Name	Sir Richard Squires Park	Killdevil grounds	Lomond River trail	Stuckless Pond trail	Stanleyville trail	Green Gardens lower trail	Gros Morne trail	McKenzie's Brook Day-use Area	Trout River Eastern Point trail	Western Brook Pond trail	Tablelands	Shallow Bay sand banks	Wiltondale	Tony's Bay (Eal Brook beach)	Sally's Cove
<i>Hypogymnia physodes</i> (L.) Nyl.	Yes	Yes		Yes											
<i>Hypogymnia tubulosa</i> (Schaerer) Hav.										Yes					
<i>Hypogymnia vittata</i> (Ach.) Parrique							Yes								
<i>Icmadophila ericetorum</i> (L.) Zahlbr.	Yes									Yes					
<i>Japewia subaurifera</i> Muhr & Tønsberg	Yes														
<i>Lecanora dispersa</i> (Pers.) Sommerf.									Yes						
<i>Lecanora orae-frigidæ</i> R. Sant.									Yes						
<i>Lecanora polytropa</i> (Hoffm.) Rabenh.									Yes						
<i>Lecanora xylophila</i> Hue										Yes					
<i>Lecidella stigmatæa</i> (Ach.) Hertel & Leuckert									Yes						
<i>Lepraria finkii</i> (B. de Lesd.) R. C. Harris				Yes			Yes		Yes						
<i>Lobaria pulmonaria</i> (L.) Hoffm.	Yes		Yes	Yes				Yes				Yes			
<i>Lobaria quercizans</i> Michaux				Yes											
<i>Lobaria scrobiculata</i> (Scop.) P. Gärt.		Yes		Yes											
<i>Lopadium disciforme</i> (Flotow) Kullhem										Yes					
<i>Loxospora elatina</i> (Ach.) A. Massal.	Yes			Yes											
<i>Loxospora ochrophæa</i> (Tuck.) R. C. Harris							Yes		Yes	Yes					
<i>Melanelixia subaurifera</i> (Nyl.) O. Blanco et al.	Yes														
<i>Melanohalea septentrionalis</i> (Lynge) O. Blanco et al.				Yes						Yes					
<i>Mycoblastus affinis</i> (Schaerer) T. Schauer				Yes						Yes					
<i>Mycoblastus sanguinarius</i> (L.) Norman	Yes														
<i>Ochrolechia androgyna</i> (Hoffm.) Arnold										Yes					
<i>Ochrolechia frigida</i> (Sw.) Lynge										Yes					
<i>Parmelia omphalodes</i> (L.) Ach.									Yes						
<i>Parmelia saxatilis</i> (L.) Ach.									Yes						
<i>Parmelia squarrosa</i> Hale				Yes						Yes		Yes			
<i>Parmelia sulcata</i> Taylor									Yes	Yes	Yes				
<i>Parmeliopsis capitata</i> R. C. Harris ex J. W. Hinds & P. L. Hinds										Yes					
<i>Peltigera canina</i> (L.) Willd.	Yes		Yes						Yes	Yes		Yes			

Species Name	Sir Richard Squires Park	Killdevil grounds	Lomond River trail	Stuckless Pond trail	Stanleyville trail	Green Gardens lower trail	Gros Morne trail	McKenzie's Brook Day-use Area	Trout River Eastern Point trail	Western Brook Pond trail	Tablelands	Shallow Bay sand banks	Wiltondale	Tony's Bay (Eal Brook beach)	Sally's Cove
<i>Peltigera degenii</i> Gyelnik	Yes								Yes						
<i>Peltigera didactyla</i> (With.) J. R. Laundon										Yes	Yes	Yes			
<i>Peltigera elisabethae</i> Gyelnik	Yes														
<i>Peltigera horizontalis</i> (Hudson) Baumg.	Yes														
<i>Peltigera membranacea</i> (Ach.) Nyl.	Yes	Yes													
<i>Peltigera polydactylon</i> (Necker) Hoffm.	Yes		Yes											Yes	Yes
<i>Peltigera rufescens</i> (Weiss) Humb.				Yes					Yes			Yes			
<i>Pertusaria dactylina</i> (Ach.) Nyl.										Yes					
<i>Pertusaria macounii</i> (I. M. Lamb) Dibben									Yes						
<i>Phaeocalicium interruptum</i> (Nyl.) Tibell				Yes											
<i>Physcia tenella</i> subsp. <i>marina</i> (A. Nyl.) D. Hawksw.									Yes						
<i>Placynthiella oligotropha</i> (J. R. Laundon) Coppins & P. James									Yes						
<i>Platismatia glauca</i> (L.) W. L. Culb. & C. F. Culb.	Yes	Yes		Yes				Yes	Yes	Yes				Yes	
<i>Platismatia norvegica</i> (Lynge) W. L. Culb. & C. F. Culb. (?)				Yes											
<i>Polyscaulium luteominia</i> (Tuck.) Arup, Frödén & Söchting									Yes						
<i>Polyscaulium polycarpa</i> (Hoffm.) Frödén, Arup, & Söchting									Yes	Yes		Yes			
<i>Porpidia flavocaerulescens</i> (Hornem.) Hertel & A. J. Schwab											Yes				
<i>Porpidia tuberculosa</i> (Sm.) Hertel & Knoph											Yes				
<i>Protopannaria pezizoides</i> (Weber) P. M. Jørg. & S. Ekman														Yes	
<i>Ramalina dilacerata</i> (Hoffm.) Hoffm.	Yes								Yes	Yes					
<i>Ramalina farinacea</i> (L.) Ach.												Yes		Yes	
<i>Ramalina roesleri</i> (Hochst. ex Schaerer) Hue	Yes								Yes			Yes		Yes	
<i>Ramboldia cinnabarina</i> (Sommerf.) Kalb, Lumbsch & Elix														Yes	
<i>Rhizocarpon geographicum</i> (L.) DC.									Yes						
<i>Rhizocarpon lavatum</i> (Fr.) Hazsl.									Yes		Yes				
<i>Rinodina ascociscana</i> (Tuck.) Tuck.									Yes						

Species Name	Sir Richard Squires Park	Killdevil grounds	Lomond River trail	Stuckless Pond trail	Stanleyville trail	Green Gardens lower trail	Gros Morne trail	McKenzie's Brook Day-use Area	Trout River Eastern Point trail	Western Brook Pond trail	Tablelands	Shallow Bay sand banks	Wiltondale	Tony's Bay (Eal Brook beach)	Sally's Cove
<i>Rinodina mniaraea</i> (Ach.) Körber									Yes						
<i>Rusavskia elegans</i> (Link) S. Y. Kondr. & Kärnefelt									Yes						
<i>Scytinium lichenoides</i> (L.) Otálora, P. M. Jørg. & Wedin											Yes				
<i>Sphinctrina turbinata</i> (Pers. : Fr.) De Not.									Yes						
<i>Stereocaulon saxatile</i> H. Magn.									Yes						
<i>Stereocaulon vesuvianum</i> Pers.										Yes					
<i>Tuckermannopsis americana</i> (Sprengel) Hale	Yes									Yes					
<i>Umbilicaria hyperborea</i> (Ach.) Hoffm.									Yes						
<i>Usnea filipendula</i> Stirton			Yes												
<i>Usnea longissima</i> Ach.										Yes					
<i>Variolaria amara</i> Ach.		Yes													
<i>Vulpicida pinastri</i> (Scop.) J.-E. Mattsson & M. J. Lai	Yes									Yes					
<i>Xylographa opegraphella</i> Nyl.									Yes	Yes		Yes			
<i>Xylographa parallela</i> (Ach. : Fr.) Fr.										Yes					

SURVEY OF THE LICHEN-FORMING ASCOMYCETES DURING THE 2014 NL FORAY

Chris Deduke, Teuvo Ahti and Michele Piercey-Normore

Lichens were collected by the authors in addition to other participants of the Foray. Most species have been identified and included in this report but there are other species identifications that will not be ready in time for this report. An effort was made to reduce duplicate collections from each location and to avoid over collecting of species. Most of the collections will be deposited in the NL Foray Herbarium, as well as in the Herbarium of the University of Manitoba (WIN) or the University of Helsinki, Finland (H), which already contain considerable collections of lichens from Newfoundland. Identification keys include Brodo *et al.* (2001), Gowan and Brodo (1988), Hinds and Hinds (2007), Thomson (1984, 1997), Sheard (2010), and Purvis *et al.* (1992). New reports for the province were based on the provisional lists of species from T. Ahti, J. McCarthy, and S. Clayden (January 6, 2014, unpublished), T. Ahti (2007, unpublished) and J. McCarthy (September 17, 2014, unpublished).

Four locations were the focus of the analyses below but all locations were included in the lichen list. The four locations included **Western Brook Pond trail**, which was an extensive area of boreal coniferous forest. The trail also extended over large expanses of raised *Sphagnum* bogs. The **Stuckless Pond trail** was boreal forest with spruce, birch and some maple trees. The forest was very wet in some areas but dry in others. The **Trout River Eastern Point trail** began along grassy meadows and through small depressions with spruce forest and eventually it opened onto a high rocky point overlooking the ocean. The **Sir Richard Squires Memorial Provincial Park** was a mix of evergreen and broad-leaved trees including larch, birch, fir and spruce and some open bog. The trail extended toward the bank of the Humber River where the forest was older, shaded, and damp, especially near the Big Falls. The Killdevil Camp was surrounded by abandoned fields and pastures and some ornamental trees, including one red maple (*Acer rubrum*), which harbored several unusual lichens.

Species highlights

There were 129 species of lichens and 346 specimens collected during the 2014 Foray. There were 40 species of *Cladonia*, three Pin lichens (*Chaenotheca brunneola*, *Sphinctrina turbinata*, and *Phaeocalicium interruptum*), and 16 species of cyanobacterial lichens: *Collema furfuraceum*, *Scytinium lichenoides*, *Lobaria pulmonaria*, *L. quercizans*, *L. scrobiculata*, eight *Peltigera* species *Protopannaria pezizoides*, *Stereocaulon paschale*, and *S. vesuvianum*. One species, *Cladonia peziziformis* is a new report for the province.

Habitat similarity among the locations visited

An analysis of habitat similarity (Table 1) between four of the collection sites with large numbers of species collected, shows that Trout River, a lower meadow/forest and rocky point exposed to the ocean, is very different from Stuckless Pond or Sir Richard Squires Park which are both heavily forested where the comparisons show only 11.0 to 11.8% similarity of locations. The species at Trout River are more similar to those at the Western Brook Pond (with 15.0% similarity) where many specimens were collected in the

open bog than with the forested locations. The two forested locations, Stuckless Pond and Sir Richard Squires Park, were highly similar to one another with respect to lichen species composition, having a 22.6% similarity value. Western Brook was also very similar to these forested locations because of the species collected within the forest on the Western Brook trail.

Table 1: Species diversity is shown in this table by the Jaccard's Index of similarity, which is the percent similarity between two locations based on the species composition. The Jaccard's Index of similarity assumes similarity between locations or habitats using the concept that species are adapted to specific habitat conditions. If the composition of species are similar between habitats, then the habitats must also be similar.

Locations for comparison	Percent similarity
Sir Richard Squires X Stuckless Pond	22.6%
Sir Richard Squires X Trout River	11.8%
Sir Richard Squires X Western Brook	21.8%
Stuckless Pond X Trout River	11.0%
Stuckless Pond X Western Brook	23.0%
Trout River X Western Brook	15.0%

Species diversity

Species diversity was greatest at the Western Brook Pond Trail with 55 species (Figure 1) where we walked through heavily forested areas and open bog/fen. The next most diverse site was Trout River Eastern Point trail with 45 species where the rocky point had many crustose rock lichens as well as some soil lichens. The more sheltered areas at the point were habitats for other species that could not tolerate the exposed rock ridges. The next most diverse location was Sir Richard Squires Park with 39 species and then Stuckless Pond with 33 species. We surprisingly found 15 species in the short stop at the Tablelands compared with only 14 species during the much longer period of time at the Shallow Bay sands.

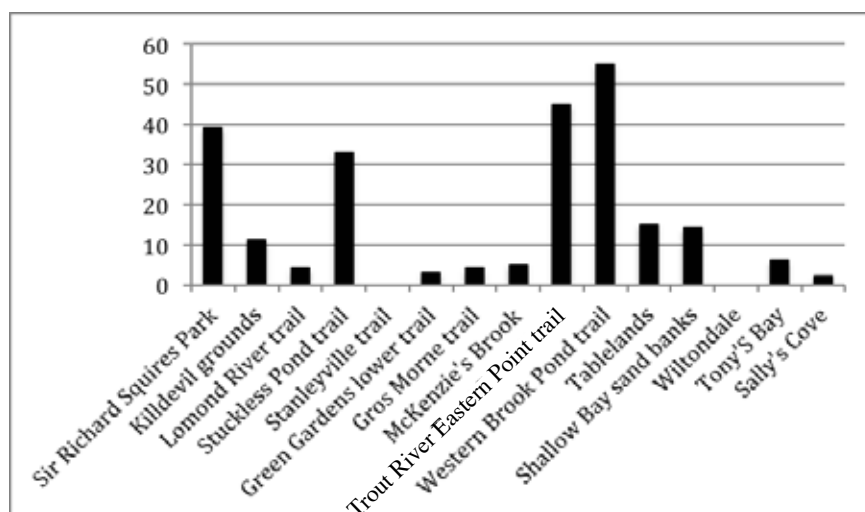


Figure 1: The number of lichen species (y-axis) collected at each location visited (x-axis) during the NL Foray 2014 is shown in this bar graph. The four locations with more than 30 species were compared using Jaccard's Index of similarity.

One of the species collected at the **Sir Richard Squires Park** was a pin or stubble lichen *Chaenotheca brunneola*. This lichen was collected quite often in several locations during the foray. It inhabits standing, debarked stumps with decaying wood but it was also found on old bark. The lichen cannot be easily seen unless the habitat is first sought out and then upon closer inspection a fine black stubble can be seen on the light colored wood. Two other pin or stubble lichens were collected during the foray, *Sphinctrina turbinata* and *Phaeocalicium interruptum*. *S. turbinata* is parasitic on a crustose lichen (*Pertusaria macounii*) and has a black stalk with a round top protruding from the fruit body (apothecium) of the *P. macounii* lichen. *P. interruptum* grows on wood similar to *C. brunneola* but the stalk and spores are different. Many of the pin or stubble lichens are not actually lichens but are included with the lichenized ascomycetes because they are often parasitic on lichens. There were also six different species of *Peltigera* in the Sir Richard Squires Park, which are usually found growing among the moist forest floor moss or over moss covered rocks in the forest. These lichens are large lobed lichens that have cyanobacteria as the photobiont, rather than green algae, which are found in many other lichens. The cyanobacteria fix atmospheric nitrogen to make it suitable for use by other organisms. The *Peltigera* species contribute nitrogen to the ecosystem in which they grow. Fifteen species of *Cladonia* were also collected in the park. One of these was *Cladonia maxima* which was more common in the moist forest near the open bog. *C. maxima* is a common species in Newfoundland but it is striking because of its large size with the smooth tall podetial stalks, which are sometimes capped with small crowned cups. The species can be easily distinguished from nearby plants by breaking the smooth stalk to determine if it has a hollow center, which is a diagnostic feature of all *Cladonia* species.

The **Stuckless Pond trail** was similar in lichen species composition to the Sir Richard Squires Park. One lichen found on birch bark in this area, and other locations, was the script lichen, *Graphis scripta*. *G. scripta* is a crustose lichen that appears as a white stain on birch bark but the distinguishing feature is the black lines appearing as script that the fruiting bodies (apothecia) form on the surface of the white thallus. These are elongate and branched apothecia which function in spore production and dispersal. All three species of *Lobaria* were also found on standing trees in this location, which typically grow in mixed hardwood and evergreen forests such as this one. The cyanobacteria in the thallus of *Lobaria* species also contribute fixed nitrogen to the ecosystem.

The lichen species at the **Trout River Eastern Point trail** were quite different from the boreal forest species (Table 1) because the habitat is much more exposed to high light levels and desiccation from wind and salt spray. Some of the species in this habitat included *Baeomyces rufus*, *Cladonia borealis*, *C. cariosa*, *C. peziziformis*, *C. pyxidata*, *Diploschistes scruposus*, *Flavoplaca citrina*, several *Lecanora* species, rock dwelling (saxicolous) *Parmelia* species, *Pertusaria macounii* on rock, two map lichens *Rhizocarpon geographicum* and the typical oceanic *R. lavatum*, and the common sunburst lichen, *Rusavskia elegans* (previously known as *Xanthoria elegans*). The *Cladonia* species tend to be common in exposed, and sometimes basic (high pH) conditions. Oceanic conditions are often higher pH because of the salt spray. Two crustose species requiring salt spray *Lecanora orae-frigidiae* and *Xylographa opegraphella* were abundant on old fence rails near the sea (also found on driftwood at Shallow Bay with one more ecologically similar species *Lecanora xylophila*). All of them are little-known lichens, but characteristic of NL coasts. *C. peziziformis* is a new report for the province and was found on mounds of soil with moss in slightly more sheltered areas. It was recognizable by the many small round smooth squamules that help to stabilize the soil. The rock dwelling lichens such as *Flavoplaca citrina* (previously *Caloplaca citrina*) is a small crustose lichen with tiny round orange apothecia on rock. *Diploschistes scruposus* and *Pertusaria macounii*, also found on rock, have a thick light colored crustose thallus with double walled apothecia that appear as raised mounds of thallus with a black center. The exposed rocky habitat had many lichens because of the variation in pH conditions and the many micro habitats available between the rocks and in the vegetated areas.



Cladonia peziziformis

The **Western Brook trail** had both a dense forest and an open bog which provided more habitat for the large number of species collected. The forest had many of the beard lichens including the common *Alectoria sarmentosa*, *Bryoria trichodes*, and the more coastal *Usnea longissima*. It also had many more cryptic crustose lichens on tree bark such as the septate spored *Buellia disciformis*, simple spored *Lecanora symmicta*, the script lichen *Graphis scripta*, and species of *Mycoblastus* with large black apothecia. The balsam firs contained the conspicuously soresiate *Loxospora elatina* and *L. ochrophaea*. The bark also contained the inconspicuous brown camouflage lichens *Melanohalea* and *Melanelixia*, as well as the the gray foliose dominant species, *Parmelia squarrosa*, *P. sulcata*, and the rag lichen *Platismatia glauca*. The open bog habitat had a suite of very different species such as those that typically grow on the bark of exposed larch and spruce trees stunted by the harsh conditions. These species include *Tuckermannopsis americana*, *Vulpicida pinastri*, *Parmeliopsis capitata*, *Hypogymnia tubulosa* and *H. incurvoides*, which is so typical of the coastal areas of the maritime provinces. The raised *Sphagnum* hummocks formed suitable habitat for many other lichens because they are drier than the surrounding bog. The hummocks had many *Cladonia* species such as a red fruited *C. coccifera*, a brown cupped *C. crispata*, the squamulose *C. squamosa*, a crustose lichen, *Imadophila ericetorum*, a crustose species with orange-pink apothecia *Ochrolechia frigida*, and two *Xylographa* species on old wood. The moist areas of the bog had two *Cetraria* species, *Cladonia boryi*, and several reindeer lichens, *C. mitis*, *C. arbuscula*, *C. rangiferina*, *C. stellaris*, *C. stygia*, and *C. terrae-novae*. Other lichens that have the appearance of reindeer lichens were also present such as *C. uncialis* and *C. wainioi*.

In summary, one species is reported as a new species to the province, *Cladonia peziziformis*. A number of uncommon or unusual habitats for species were recorded which contribute to the provincial list of species. These include *Collema furfuraceum* containing apothecia and were on trees instead of rock; and the *Ramalina* species on twigs in the Shallow Bay sand dunes; both of which were exposed to ocean spray. A relatively large number of species including *Porpidia tuberculosa* and other crustose lichens were found at the Tablelands in a short period of time. The common sighting of pin or stubble lichens, which were mostly *Chaenotheca brunneola*, suggests a need for further work on this group of fungi.



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