

Sarracenia

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Newsletter of the Wildflower Society of Newfoundland and Labrador.

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Sarracenia pitcher tip - see p. 35

John Maunder

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Fall Meetings.

7.30 p.m. at the MUN Botanical Garden

November 4. Allan Whittick will give us a talk on *Newfoundland Seaweeds*.

December 2. Annual Christmas Party, Photo Competition and Members' Slide Show. Pictorial contributions to the competition or show should be submitted by November 4th to John Maunder, P.O.Box 250, Pouch Cove, NL, A0A 3L0; jem@nl.rogers.com, or brought to the November meeting. For full details see p.25 in the previous issue of Sarracenia. Indicate clearly whether your contributions are to the competition or show.

Sarracenia gets an ISSN.

Editorial.

Every six months or so Leila and I get a very entertaining newsletter from New Zealand called Pīpipi. This is a photocopy of a handwritten account of the goings on at a wonderful native plant regeneration area called Hinewai on the Banks Peninsula of South Island. While reading the latest issue I noticed that it has an ISSN, (International Standard Serial Number.) which is a unique eight-digit number used to identify a print or electronic periodical publication (similar to the ISBN for books). I then noticed that "The Osprey" has one too; so I thought, if Hugh Wilson can have one for his handwritten effort and the Natural History Society for theirs, then why not Sarracenia too? With the approval of the Executive I applied to the National Library of Canada (NLC) who dole out these things in this country. I had to email them all the details and after a couple of

days back came our numbers – two actually, as we have to have a different one for the printed and electronic versions – even though they are identical. These now appear on our masthead.

One side result of this was that the NLC were now aware of our existence, and I have just received an letter from them pointing out that anyone who publishes anything, however modest, in Canada is required **by law** to deposit copies of the publication with the NLC within one week and at their own expense. This was accompanied by another lot of forms to fill in with more or less the same information that I had already given them. Fortunately, I think we can do this electronically, so it won't cost us much! They also asked in a friendlier fashion if I could kindly supply them with a set of past issues of Sarracenia and its one-issue predecessor, The Newsletter of the Wildflower Society of Canada: Newfoundland Chapter. I think our personal set is complete, but if there is any other member who also does I'd like to check, as some volumes in our collection have fewer than four issues and, although I think some were shorter, it's just possible that we have lost the odd issue. Please get in touch.



Lycopodium annotinum

John Maunder

Meetinghouse Rd, Pouch Cove. Sept 2003

See p.36

Botanical Miscellany.

Collated by the Editor.

During the summer quite a number of e-mails about interesting botanical discoveries or plant pictures to identify pass through my computer one way or another. Some of these may be reported in more detail later, but I thought it might be an idea to pass some of the more interesting of these to members.

In late June John Maunder reported finding *Potentilla simplex* on the Johnson Family Foundation trail (JFF) about 200 m. below the Logy Bay Road bridge over the Virginia River in St John's. This species was the first of Henry's "Uncommon Wildflowers" series (Vol 16 #3, p.27) in which he said that there were only three sites for the Island, one of which, at Haricot, was washed away during a winter storm, so its good to have another on the Avalon. A week or so later on a walk alongside Rennie's River between Elizabeth Ave. and the Parkway he found the native form of Lady's Smock (*Cardamine pratense* var. *angustifolia*) and what appeared to be Large-leaved Watercress (*Nasturtium officinale*). This is the



Cardamine pratense var. *angustifolia* John Maunder 2009

introduced "watercress sandwich" taxon and hasn't been confirmed as growing here, although there's an old report. (*Nasturtium microphyllum* is fairly common.). Another, less common native is *Cardamine pennsylvanica*, which has smaller white flowers; John found this by the river on Middle Cove beach and I have noticed it by the Virginia River where an extension of the JFF trail crosses the stream on the section between Penney Crescent and the Outer Ring Road.



Nasturtium officinale
John Maunder 2009

In mid-August John sent around some pictures of *Alisma triviale* from one of the Province's two known sites: the Higgins Line end of the North shore of Long Pond, where another local speciality, the Lesser Spearwort (*Ranunculus flammula* ssp. *flammula*) also grows. At about the same time Leila and I noticed the distinctive fuzzy flowerheads of quite a big patch of Rabbit's-foot Clover (*Trifolium arvense*) growing alongside Allandale Rd between the Outer Ring Rd. and Mt. Scio Rd., this seems to have finally reached the city as we also saw it by Princess Auto at the end of the Society's September 2nd evening walk. It has

probably been introduced by hydroseeding.



Chamerion angustifolium f. *albiflorum* Betty Anne Fequet 2009

On August 10th, in another part of the Province, Betty Anne Fequet and her husband noticed a small clump of White Fireweed, (*Chamerion angustifolium* f. *albiflorum*) growing beside the road from Cartwright to Port Hope Simpson in Labrador. This is a lovely form which is seldom seen.

On September 1 Todd Boland sent a reference to an interesting article on what has happened to our asters: <http://www.woodlotalt.com/publications/BotNotesv1n7.PDF>. Genetic detective work, much of it by Luc Brouillet and co-workers, have shown that they are not true asters at all, those are only found in Eurasia, but a complex of genera that also includes the goldenrods and fleabanes – flower colour is no good indication of relationship!

Illustration of all of the species mentioned can be found at:-
<http://www.digitalnaturalhistory.com/flora.htm>

Why did the chicken cross the road?

By Andrus Voitk and Maria Voitk.

Recovery from surgery includes a stage where a sortie to the front yard is a major adventure, temporarily limiting observations of natural history to the propinquitous¹ and familiar. This serenity of the commonplace provides a special lucidity, laying bare even the big questions in life, such as that in the title. In a busy life one might entertain the question as legitimate,

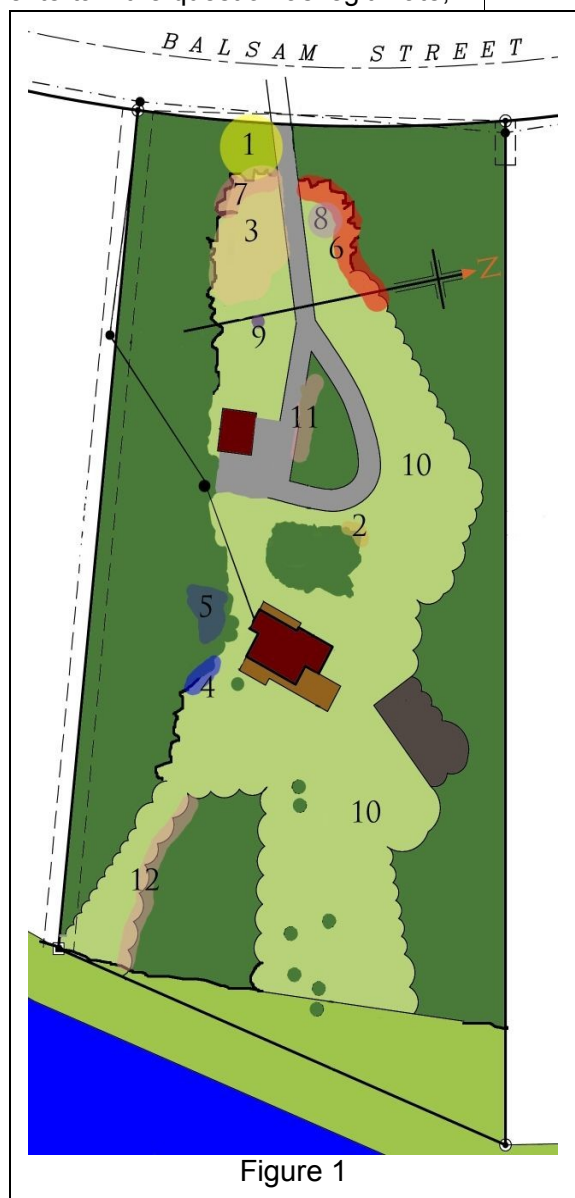


Figure 1

1 Propinquitous: Habitat suitable for *Gentianella propinqua* (Ed).



Figure 2: *Cypripedium acaule*

accepting the questioner's assumption that a road traverses territory indistinguishably similar on both sides, as if it were but a virtual path, leaving no trace on the land it crosses. However, given the opportunity to contemplate one's own road at close quarters, one immediately recognizes that the road is entirely different from the territory it traverses and its two sides evolve into different habitats. Thus, one no longer accepts the question's smug implication that the chicken is a fool for failing to recognize the similarity of both sides, thus having no reason on earth to seek any better fortune on the other side. Instead, one begins to suspect that the questioner is the fool, who has never taken

the time to see a road, let alone understand its nature, using a misguided premise of similar sides to falsely ridicule a poor defenseless chicken.

Figure 1 shows our property, running almost exactly in an east-west axis from the Humber River to the street. The dark green areas are forested and the light green is meadowland—lawn would be overly pretentious for this weed-infested clearing, where grass is a visible minority, that has not received the benefits of fertilizer, weedkiller or much mowing. On this lot grow several of our native orchids. Come, join us on a postoperative perambulation in their contemplation!

Cypripedium acaule (Figure 2)

In 2000, *Cypripedium acaule* grew on the west end of the property, along the forest edge bordering the meadow. It seems that the driveway split the lady's slipper belt into a

northern and southern section, Sites 6 and 7, respectively. Site 6 has been very vigorous, doubling from some 50 flower stems in 2000 to 103 stems in 2009. Site 7 has never thrived, ranging from 14-22 flower stems, 18 counted this year. These flowers are smaller, appear 1-3 weeks later and some do not develop from bud to full flower. In addition to these areas, over the 10 years of observation small populations of *C. acaule* have appeared in Sites 11 and 12.

Although we suspect that *C. acaule* is found on several properties in our community and know of a few transplanted to gardens, we have not seen it in the common areas accessible by walking within our community. It is, however, found in the woods surrounding the community. Plants produce healthy seed capsules and the old spikes usually remain visible the next year. New plants and spikes grow from the same sites.

Corallorhiza trifida (Figure 3)

In 2000, we discovered a colony of *C. trifida* in the forest just beside our driveway at Site 1, over 20 individual flower spikes within a relatively small area. For no obvious reason, their number began to dwindle from a high of 24 in 2001 to 4 weak looking plants in 2005, after which no more were seen. In 2008 4 clumps of robust inflorescences totaling 17 spikes, appeared in Site 2, a shady north west corner of a small forest island in front of our house. To date these have not reappeared this year, but we found 13 widely separate individual spikes in Site 3, sufficiently far from Site 1 that spread from a common root system is unlikely.

C. trifida is not overly common in the forests adjacent to Humber Village. However, within our community, it has become increasingly common over the last 5 years. Prior to 2005 we have not been aware of any outside our own property. Since then, we have found more instances of clumps appearing on the meadow areas bordering the roads, usually quite close to the forest edge. This season there were many more such clumps than ever, but as of this writing the majority, well over a hundred spikes, fell victim to a local contagious disease, lawn mowing. Virtually all plants that reach maturity produce plump seed capsules. New plants grow in the same area, but usually not at exactly the same sites.



Figure 3: *Corallorhiza trifida*

Other orchids

In addition to the two above, we have seen four other orchids on our property. In 2002 we discovered 7 spikes of *Corallorhiza maculata* in

Site 4. These formed plump seed capsules and reappeared in the same area, not the exact site, of previous spikes for three years. Then they disappeared, possibly related to some traffic in the area. However, in 2004 some spikes were found in Site 5, just far enough away to suggest the spread was not from the same root system. These persisted for 3 years and have not been seen since; Site 5 is in the forest with no traffic to suggest that as a cause for its disappearance. *C. maculata* is found in the woods around our community. Site 8 is a shallow depression before rising slightly to the forest edge and is always somewhat moist. Every year this site yields 1-4 spikes of *Platanthera dilatata*, a very common orchid in our area. In 2006 we had a single spike of *Platanthera psychodes* appear at Site 9. It produced a few seedpods but did not come back since its single appearance nor are we aware of this species in the wilds around our area. Finally, each September the northern half of all the meadow area of our property along its entire length (Site 10) is full of hundreds of *Spiranthes romanzoffiana*, a common meadow orchid in our area. Its distribution is as if the property were bisected along an arbitrary east-west line running down its middle, with virtually no plants on the southern half of the meadow area.

Discussion

How many times have you wondered why there are more mushrooms along path-sides than in the forest? Or flowers, or berries? Although not always valid, it does seem to be a common observation. If we think of our driveway and meadow as a wide path, then perhaps we are seeing the same phenomenon here. *Cyripedium*

acaule, a well-known woodland flower, given the opportunity, elects to grow at the edge of the forest rather than in it. Over 10 years, it has spread along the forest edge and appeared at two other forest edge locations (Sites 11 & 12), but not a single plant has spread into the forest itself. Is it a meadow plant, preferring full sun, but with an obligatory relationship to trees, preventing it from straying too far from the forest? Elsewhere it also seems to be more frequent beside woodland paths than in the woods themselves. When found in the woods, these are not dense and the understory is open. This flower definitely prefers light and only an invisible but seemingly firm link to trees keeps it in or near the woods. The behaviour of *Corallorhiza trifida*, seems to be similar, albeit on a somewhat longer leash. Sites 1, 2 and 3 are all near the meadow-forest border, Site 1 a little bit inside the forest and Site 3 a little bit inside the meadow, but on the average still at or near the edge.

What curbs the ability of these orchids to be meadow plants, like *Spiranthes romanzoffiana*? The answer may perhaps be related to their fungal partners. The seeds of orchids are the smallest of all vascular plants, fine like dust. They contain no nutrition for the germinating plant; in order to develop, seedlings need a fungus to supply nutrition. Most orchids have rather narrow specificity for fungal partners. *Corallorhiza trifida* forms mycorrhizal relationships with species of Genus *Tomentella*. These are unassuming mushrooms, whose fruiting bodies are corticate (like layers of skin) and resupinate (pasted on their “back”, sporulating surface outwards), found on the underside of rotten logs and other debris. Growing on rotting organic

matter they resemble saprophytes, but in reality tomentellas are the commonest mycorrhizals, when tree root tip colonization is analyzed. (For more about this genus, see “The austere *Tomentella*” in the upcoming July, 2009 *Osprey*). Active tree mycorrhizal partners, tomentellas cannot stray far from trees. Orchids dependent on tomentellas for their nutrition are, therefore, restricted to areas of tree roots. The fungal partner of *Cypripedium acaule* comes from Genus *Tulasnella*, a thinner corticoid, resupinate mycorrhizal mushroom. *Tulasnellas* are probably smaller than tomentellas, accounting for the shorter distance this orchid can stray from the woods.

These speculations may provide at least a partial explanation for the common observation that some organisms do seem to be more prevalent along paths than in the forest. That is half the story. How many times have you noticed something grow consistently on one side of a path or clearing, but not the other? A short distance from our lot there is an east-west right-of-way to the Humber River. Every spring we find copious amounts of *Gyromitra esculenta* along this path, but exclusively on the sunny north side, never on the shaded south. Again, if we consider our driveway and meadow as the equivalent of a wide path, our orchids show a clear preference for one side or the other. The original soil and forest on both sides was similar, so in this instance any difference in flora of the sides is probably directly related to the unequal distribution of direct sunlight brought in by opening up this trail. The northern edge of the meadow, including the meadow-forest border, is bathed in sunlight all day and if the forest edge reflects any sunlight, then this border is the warmest place on

our lot. In contrast, the southern half of the meadow spends most of the day in the shade of the forest, with the southern forest-meadow border perpetually shaded. Apart from the orchids, the difference in flora is obvious: the northern meadow is lush with all kinds of grass and weeds, while most of the “lawn” of the southern meadow has been replaced by moss, especially along the forest edge.

Cypripedium acaule has made its love of warmth and direct sunlight quite obvious. It has fared well along the exposed northern side, doubled the flower count and doubled the length of the colony (Site 6). In contradistinction, the southern side (Site 7) has demonstrated a clear failure to thrive during the same 10 years. It is not by accident that the new plants that we have seen crop up, have been along two northern sides of their respective meadow-forest borders (Sites 11 & 12). *C. acaule* has large green leaves full of chlorophyll and clearly wants to take full advantage of the sun for photosynthesis. In this, its behaviour is much like that of *Spiranthes romanzoffiana*, another active photosynthesizer, and is limited exclusively to the sunny northern half of the available meadowland. Was the failure of the once-observed *Platanthera psychodes* to establish itself related to its unfortunate landing on the southern half of the meadow, instead of the northern?

Quite distinctly from the photosynthesizers, species of the leafless Genus *Corallorhiza* seem to prefer indirect sunlight. Sites 1, 2 & 3 of *C. trifida* are all in the shade, along the southern edge of the meadow-forest border. Interestingly, a very similar habitat was sought out by *C. maculata*, again along the shady southern meadow-forest border

(Sites 4 & 5). Although corallorhizas lack leaves, they do have some chlorophyll. *C. trifida* has more chlorophyll than other corallorhizas and is the only species of the genus that has not lost genetic control of photosynthesis: it derives a significant portion of its nutrition from this means. Still, it depends on its fungal partner for most of its nutrition and, therefore, is understandably limited to the extent of this partner. Much more interestingly, *Cyripedium acaule*, fully photosynthesizing as an adult, also seems to be limited by the reach of its fungal partner. Clearly, although *Corallorhiza trifida* seems to prefer light to dark, shown by its preference for meadow-forest border locations

just like *Cyripedium acaule*, it prefers to avoid the direct sunlight enjoyed by the latter, as evidenced by its choice of the shady southern half of the lot. Although *Corallorhiza maculata* does not photosynthesize, its choice of location suggests that perhaps it, too, prefers some degree of indirect light over the much darker deep woods or direct sun.

There, then, is the story of our *Cyripedium acaule* and *Corallorhiza trifida*, forever looking at each other across our meadow, kept apart because of their individual preferred ways to enjoy our golden sun of summer. Yes, many flowers, berries and mushrooms are more common along paths than in the forests where

the paths go. And yes, what grows on one side of the path may be quite different from what grows on the other. As we have seen, all organisms are interdependent and interconnected—a change in conditions making one side preferable for one organism results in the migration of others as well. Once we understand that, the reason why the chicken crossed the road becomes obvious. Considering this is the bicentennial year of Darwin's birth, it is interesting to note that observations of change led Darwin to *Origin of the species*, at about the same time that failure to contemplate change led to the publication of the first chicken-crossing joke.

Avalonia Field Trip Memories Day 1: Sunday, July 19, 2009

By Ed Hayden

On Saturday night I felt flu-ish and not up to going on my first week-long field trip with the Newfoundland Wildflower Society. The next morning, the sight of drizzle and fog at 7 a.m. made staying home even more attractive. My wife suggested that I go back to sleep and not be so foolish as to go out there and catch my death. She said that I was off my head, that no one would show up anyway, and for the love of God stop gallivanting and go back to sleep and enjoy my first day of summer vacation. At breakfast I was still having second thoughts.

At 9 a.m. in a convoy of twelve cars leaving Confederation Building, the fog was so thick that we couldn't see the outline of the building from the east parking lot. At Salmonier

Line, where other cars joined us, we merged into the eastbound traffic on our way to Avalonia's first stop.

Hawke Hill

At the top of Hawke Hill, in a pea-soup fog and an unrelenting gale of wind from the northeast, glasses were pocketed, being more of a nuisance than an aid to sight. After brief introductory comments from John Maunder, our undaunted botanical guide, and a count of twenty-five heads, we battened down our hoods and leaned into the wind to follow John across the most easterly alpine barrens in North America.

Weather notwithstanding, Hawke Hill turned out to be quite an adventure. The variety of arctic-

alpine plants growing there is rarely seen in North America this far east and south. We came upon numerous mounds of summer-blooming *Diapensia* (*Diapensia lapponica* subsp. *lapponica*). What a delight to gently spread one's outstretched palm over their tight pincushion-like forms, evolved to create a micro-climate to conserve heat and prevent desiccation in cool windy places like this. Another amazing feature of these little buns of flowers is the length of their roots – up to four feet, John said – adapted to seek out scarce moisture and nutrients in dry, gravelly, alpine soils. The summer-blooming variety was in bloom all over the place, though John noted that when he was there two weeks ago not a bloom could be seen. In

contrast, the spring-blooming variety, which blooms in May and June, was now just solid mounds gone to seed. John's theory to explain the spring and summer blooming times of the same species, but not on the same plants, is that during the last glaciation, some *Diapensia* were probably isolated in the high north, and some others in the south, down in the Appalachians. When the glaciers left, the two groups melded, but still retained their genetic memory, with the southern ones blooming in spring and the northern ones blooming in summer. John acknowledged that there's no conclusive proof of this, but it's a good enough theory for me.

On the path down to a nearby gully, we crossed patterned ground, or frost boils, which are natural arrangements of stones in rough geometric shapes caused by exposure to severe freeze-thaw cycles in open, elevated areas like this where snow cover is thin. In the winter, rain drips into the soil, and when it freezes, the expansion, by about 9%, causes stones to heave up to the surface. A few years ago on a Natural History Society field trip, John Jacobs pointed out similar patterns at nearby Butterpot Mountain in Butterpot Provincial Park, which is about the same altitude (302 metres).

Pink Crowberry (*Empetrum eamesii*) also grows on Hawke Hill, and John pointed out the distinguishing delicate white hairs on the tips of its twigs, unlike the hairless tips of the twigs of the Black Crowberry (*Empetrum nigrum*). Mountain Azalea (*Loiseleuria procumbens*) was in fruit, the blooms long gone since May. The still-green berries of Alpine Bilberry (*Vaccinium uliginosum*) were out, and the tiny leaves of Northern Blueberry (*Vaccinium boreale*) were abundant, as were clumps of the

Highland Rush (*Juncus trifidus*).

Seven varieties of club moss were identified here: Interrupted Clubmoss (*Lycopodium annotinum*), which gets its name from the regular constrictions along the leafy branches that mark rest periods between annual spurts of growths (See p. 30) Running Clubmoss (*Lycopodium clavatum*), Southern Running-pine (*Diphasiastrum digitatum*), Sitka Clubmoss (*Diphasiastrum sitchense*), Blue Groundcedar (*Diphasiastrum tristachyum*), Northern Firmoss (*Huperzia selago*) and Appalachian Firmoss (*Huperzia appalachiana*).

A variety of woodland plants, including Crackerberry (*Cornus canadensis*), Canada Mayflower (*Maianthemum canadense* subsp. *canadense*) and Corn Lily (*Clintonia borealis*) grow on these exposed barrens. Three-leaf Cinquefoil (*Sibbaldiopsis tridentata*) thrives here as well, as does Dwarf Juniper (*Juniperus communis*), the one that pricks you when you sit on it; Sweet Gale (*Myrica gale*), normally growing by the side of ponds; and Alpine Bearberry (*Arctous alpina*), with its lovely little bell-shaped flowers and network pattern in the leaf.

The Pitcher Plant (*Sarracenia purpurea*) was also present, as expected, with attractive patterns on its hood (see cover picture).

John noted that much of what we've been told about this plant is wrong, including the supposition that ALL of the insects and other organisms found in the Pitcher Plant pitchers have been drowned and are being digested directly by the plant. That said, it IS true that many organisms DO fall in and drown. We touched our fingertips on the down-pointing hairs and slippery insides, which make it pretty tough for insects to climb out of these pitchers.

What really happens in Pitcher Plant pitchers is absolutely fascinating. A few specialized organisms, including a particular flesh fly (*Fletcherimyia* [= *Blaesoxipha fletcheri*]), a particular mosquito (*Wyeomyia smithii*) and a particular midge (*Metriocnemus knabi*), lay their eggs exclusively in Pitcher Plant pitchers. Their larvae develop and thrive in these isolated little microcosms. A number of mites, roundworms, bacteria and protozoa also live inside the walls of the pitchers. There is even one rotifer – a tiny aquatic animal that gets its name from having rotary organs used in swimming and feeding – that is found only in the Pitcher Plant! Together, these varied organisms participate in a well organized 'food-processing chain,' not unlike that which operates on the African plains, where large species such as lions tear up initial kills, but, being rather messy, leave considerable portions to be scavenged by jackals and vultures, who, in turn leave smaller portions for the smaller birds, reptiles, insects and, ultimately, bacteria. Interestingly, in the aquatic environment of the Pitcher Plant pitcher, a secondary consumer loop also operates, wherein many of the smaller organisms, including protozoa and bacteria, are consumed by the filter-feeding mosquito larvae and rotifers. Truly, an ecosystem in a jar! And what does the Pitcher Plant get by providing such luxurious accommodation? Sweet, lovely, delicious, nutritious 'poop soup,' I believe is what John called it. When I was fifteen and in St. John's for high school, I stayed at Mrs. Power's Boarding House on Water Street. For a cozy room in the attic, plenty of heat, good grub and a game of Auction with other boarders in the dining room every night – whether homework was done or not, no one asked – I paid \$50 a month

that I received as a bursary from the provincial government. I had found a little slice of heaven in an attic on Water Street, and I knew it. But the way John was describing the denizens of the Pitcher Plant Boarding House on Hawke Hill, they have struck an even sweeter deal – live here for poop! Our Pitcher Plant, which doesn't create enough of its own digestive enzymes to break down its drowned prey, provides a home for these divers creatures, which, in return, provide the fertilizer-type minerals that the Pitcher Plant needs to survive in nutrient-poor soils. Apart from the creatures that live inside the pitchers, there are others that specialize in eating the pitchers themselves! Talk about fussy eaters: one kind of insect larvae will eat only the outside surface of the pitcher, while another, not wishing to drown, bores a hole in the base of the pitcher, to drain it, before crawling inside to eat its inside surface.

The Newfoundland Dwarf Birch (*Betula michauxii*), with its leaves coming directly off the stem, stood in the water near the edge of the gully,

along with Water Lobelia (*Lobelia dortmanna*), White Buttons (*Eriocaulon aquaticum*) under water, due to the recent rain, and Military Rush (*Juncus militaris*), its stems hollow except for cross platforms all the way to the top (Figure 1).

Other plants we found at Hawke Hill included Cinnamon Fern (*Osmunda cinnamomea*), Black Spruce (*Picea mariana*), Bramble (*Rubus* sp.), Caribou Moss (*Cladina* spp.), which is not a moss but a lichen, Sheep Laurel (*Kalmia angustifolia*), Bog Laurel (*Kalmia polifolia*), Rhodora (*Rhododendron canadense*) and Yarrow (*Achillea millefolium*).

Whitbourne

On the way to Whitbourne, the sky brightened, and by noon, near the old train station, we were delighted to step out of our cars and be surrounded by massive blooms of Evening Primrose (*Oenothera* sp.) and Fireweed (*Chamerion angustifolium*). Near a sign advertising 'Rod's Cold Beer, Chicken and Fries,' all of which now

sounded attractive, John pointed out the weird-looking hybrid 'Black Dogberries' (*Sorbaronia* sp.), their terminal leaflets big and sometimes fused. This remarkable inter-generic hybrid is a cross between the Mountain Ash (*Sorbus* spp.) and the Purple Chokeberry (*Photinia prunifolia*). The leaves are distinctly blue-tinted; later, the berries will be brick red, not orange like in regular Dogberries. A fertile hybrid, it can re-cross with Mountain Ash and, perhaps, even Chokeberry. However, the resulting second- and third-generation plants generally tend to look more and more like Dogberries. Chokeberries and Dogberries, being in the notoriously flexible Rose family, are not fussy and will cross with anything that comes by, as John so delicately put it, as long as their breeding seasons coincide, which they do on the south coast and at Whitbourne. And it's not just the Mountain Ash and the Chokeberries that were getting it on – the blue-striped and yellow Toadflax (*Linaria repens* and *Linaria vulgaris*) were hybridizing madly, too, resulting in flowers that were whitish or had blue stripes on whitish or pale yellow backgrounds.

Not hybridizing, but growing madly all over the place in Whitbourne, is Scottish Heather (*Calluna vulgaris*), about which there are unconfirmed rumours of it having been brought there by Sir Robert Bond. It was in full bud and would bloom in a month.

Just outside the gate of Sir Robert Bond Park, we were enthralled by a gorgeous mass of Water Horsetail (*Equisetum fluviatile*) growing in shallow water along the concave shore of the pond, extending out about fifteen yards for the length of a football field – a stunning image that will stay with me forever. Also at the



Figure 1: *Juncus militaris*

shore near the park entrance, three Floating Hearts (*Nymphoides cordata*) in tiny bloom were enough to excite some members to don rubber boots and wade around in the mud.

In the park, we ate lunch under a canopy of trees. At a picnic table near the lake, covered with Daphne's blue-and-white-checked tablecloth, Heather shared a round of her home-made partridgeberry jam on cream crackers, the most delicious partridgeberry jam I have ever tasted in my life.

When I visit Sir Robert Bond Park from now on, I shall pine for 'Heather's Most Delicious Partridgeberry Jam' and crackers served on Daphne's blue-and-white-checked tablecloth. I had been so taken with the Jane Austen lunch in the park that when John indicated that it was time to get a move on, I had not taken any notes on the rare lichens, the trees or any other plants. On balance, though, memories of the lunch are well worth the momentary lapse.

Heather's Most Delicious
Partridgeberry Jam

3 cups partridgeberries
1 cup sugar
1 cup water

Bring all ingredients to a full boil. Turn down to a good boil for 30 to 40 minutes, stirring often. Put in bottle. Although it won't appear to be thick at first, do not worry, it will thicken by and by.

Colinet

In a pleasant light rain, we stopped briefly at Colinet Junction in the early afternoon to see a patch of Purplestem Angelica (*Angelica atropurpurea*), which John had originally identified wrongly as

Angelica sylvestris and for which he says *Mea culpa!* Nevertheless, it is still an interesting and not-often encountered plant, huge, like Cow Parsnip, its sap sticky and smelly, growing at the side of the road by the Colinet River.

Across the road, away from the river, as our convoy drove away, I stayed to watch a small old gentleman in a white Sunday shirt and suspenders feed a Ring-billed Gull on the rail of a small verandah in front of his house. The man smiled at the gull as it rose briefly in the air and pitched again near him to take more bits of Sunday dinner. He looked across the road at me.

"You tamed a gull, did you, sir?" I shouted.

"Yes, I feeds him every day," he said. "Is it the same one that keeps coming back," I asked?

"Yes, always the same one," he said. "She comes every day."

Heather had gone off to find a nearby garage to fix a flat tire, but the tire was stuck so tightly that it took quite a while to get the lug nuts loose, so Heather and friends missed the next stop entirely. What a pity for them, for it was varied and intriguing.

Haricot Salt Marsh

One of the delightful elements of this divinely planned trip (you may know our leader as St. John, ma'am) is the diversity of microcosms we visited. We arrived at low tide, as planned, at a huge, flat, beachy marsh, loaded with plants both on the outside, at the top of the beach, and on the inside, around a lagoon. A purple variety of Meadow Rue (*Thalictrum pubescens*) grows here, a first for me. Scads of the more usual cream-coloured variety of Meadow Rue were in bloom here, too, the male with its many erect, thread-like stamens protruding

beautifully above the tall plants.

I have affection for Tall Meadow Rue because it was the first plant I identified on my own from my first plant book – *The Audubon Society Field Guide to North American Wildflowers, Eastern Region*. The Rue was growing on Hayden's Point in Petite Forte, in a meadow in front of a house painted Dory Buff, where an old iron pipe from a kitchen sink drained onto a field gently sloping towards the seashore. Plants grew tall there, and to this day, when I return on vacation, I stroll by to admire the Tall Meadow Rue. Kitchen drain pipe was advanced technology for the place and time, a far cry from the slop bucket, and if recent trends continue, with water becoming a more precious commodity, I daresay new houses may soon be built with similar technology again, providing the option of turning a valve to allow the nutritious bath and sink water to flow into the garden.

The aptly named Bottlebrush (*Sanguisorba canadensis*) was also blooming in abundance at Haricot, its spikes of small white flowers looking just like a brush for cleaning bottles. The genus name is from the Latin *sanguis* (blood) and *sorba* (to drink up, as in absorb), as the juice of this plant was believed to stop bleeding. In abundance, too, was Silverweed (*Argentina anserina*), a creeper with solitary yellow flowers on leafless stalks, but which, even when not in bloom, can be identified easily by the distinctive silvery-white undersides of its sharply toothed leaflets. Often growing along sandy shores and banks, the roots of Silverweed are said to be tasty, resembling parsnips when boiled, though I have yet to taste it.

Northern Sand Spurry (*Spergula-*

aria canadensis) was also there, opening when the tide is out but closing up to avoid the salt water when the tide comes back in. The whole place was maggoty with Lamb's Quarters (*Chenopodium album*) and Seaside Plantain (*Plantago maritima* subsp. *juncooides*). Mounds of dead, brown Eel Grass (*Zostera marina*) were rolled up on the beach at the upper reaches of high tide. We found one of my favourite sedges growing here, the Chaffy Sedge (*Carex paleacea*), with its pointy scales and long, hangy-down tops (Figure 2.). In the biblical expression of separating the wheat from the chaff, we are being exhorted to distinguish the valuable seeds of wheat and corn from their husks, the chaff. In this case, though, we saw the beauty of the chaff, as this sedge is just stunning, waving its big 'chaffy' flowers on long, bent stems.



Figure 2: *Carex paleacea*

What a delight we came upon as we were leaving the Haricot Salt Marsh: brilliant green and black caterpillars, probably the larvae of a Swallowtail Butterfly², resting on the leaves of

² The Short-tailed Swallowtail (*Papilio brevicaudata*) (Ed.)

Scotch Lovage (*Ligusticum scoticum*). Just to see these again would be worth a trip back to the Haricot Salt Marsh. The brilliant green against the black markings on the caterpillars was awesome, and we came upon bunch after bunch of them all over the marsh. We were delighted, too, to find a tiny patch of Blue-eyed Grass (*Sisyrinchium montanum* var. *crebrum*), always a treat wherever found.

Deer Park Road

At 4:50 p.m., off Deer Park Road, John led us for a few minutes through tall woods to find the botanical highlight of the day – *Platanthera macrophylla*, the Big Round-leaved Orchid – which is so rare that only a few have been found on the Avalon, a first for all of us, I believe. Several plants of this species are located here (Figure 3).

After another minute's walk through the woods, but not visible from the road, we came upon an enormous bog surrounding a small gully, which we strolled around to find numerous orchids and other exotic plants blooming, including the Grasspink orchid (*Calopogon tuberosus* var. *tuberosus*) the second most common and second to bloom of the pink bog orchids. The commonest and earliest to bloom, according to *Orchids on the Rock* by Andrus and Maria Voitk, is Dragon's Mouth orchid (*Arethusa bulbosa*). To round out the splendour of the day, we found White Fringed Orchid (*Platanthera blephariglottis*), Dwarf Huckleberry (*Gaylussacia dumosa*), with its gorgeous white bell, White Sedge (*Rhynchospora alba*), Horned Bladderwort (*Utricularia cornuta*), Virginia Cottongrass (*Eriophorum virginicum*) and Sundew (*Drosera* spp.) in abundance.

What a grand bog on which to wind down a glorious first day of the Avalonia Field Trip 2009. What a grand time with friends, admiring the intricate beauty of barrens, beaches, marshes and woods. I drove back to St. John's while most of the party went to The Wilds for lodging and refreshment. At home after supper, feeling good and tired, I lay on the couch to relish in the many sights and smells and sounds of a wonderful day outdoors.



Figure 3: *Platanthera macrophylla*

Notes:

While all errors and omissions are mine alone, I thank John Maunder for reviewing an earlier draft and providing many helpful suggestions.

Thanks also to John for permission to use the pictures from his website:

www.digitalnaturalhistory.com

Uncommon Wildflowers of Newfoundland 4: Dwarf Mistletoe (*Arceuthobium pusillum* Peck)

By Henry Mann

Dwarf Mistletoe, our smallest shrub, is loaded and ready for action! This miniature marvel, often less than a centimetre tall, can blast its seeds up to 15 metres, but more often less than ten metres. Remarkably, this outperforms the trajectory of a WWII battleship's guns if scaled up to their size! As the fruit matures, pressure builds up within, which eventually bursts, cannonading the single seed to a new growing site on a tree branch. The seed coat is sticky so it readily attaches to whatever it lands upon. The dwarf mistletoes have the most highly developed and efficient explosive mechanism of seed dispersal in the plant kingdom. Some fungi have also developed similar mechanisms for spore dispersal. A few plants like *Impatiens* and *Geranium* also "shoot" their seeds, but through different mechanisms.



Figure 1: Witches Brooms of *Picea mariana*, Pasadena Ski and Nature Park, March 5, 2009.

Our Dwarf Mistletoe (*A. pusillum*) is a parasitic plant infecting the branches of Black Spruce (*Picea mariana*) although elsewhere in eastern North America there are reports of it also sometimes infecting White Spruce (*Picea glauca*), Red

Spruce (*Picea rubens*), Larch (*Larix laricina*) and White Pine (*Pinus strobus*). To my knowledge it has only been reported from Black Spruce in Newfoundland.

Characteristically, a mistletoe infection in Black Spruce stimulates the proliferation of branching resulting in abnormal bushy-like growths known as "witches brooms" (Figure 1). (Witches brooms commonly seen on Balsam Fir (*Abies balsamea*) in our forests are caused by the rust fungus, *Melampsorella caryophyllacearum*). Trees heavily infected with dwarf mistletoe often become contorted and stunted rendering them unsuitable for lumber or pulp production. Often stunted trees have yellowish-green smaller needles as compared to healthy non-infested trees.



Figure 2: Female *A. pusillum* stems with early stages of fruit development, July 14, 2009

The tiny brown mistletoe plants are similar in size to the spruce needles and are easy to overlook or dismiss as dead twig stubs or needles (Figure 2). Although plants

are brown in appearance, they do contain some green chlorophyll and carry out some photosynthesis, but apparently not enough for their needs. The bulk of their nourishment is derived from the host tree. Dwarf Mistletoe has plants that are either male or female (dioecious). Often the sexes are on separate trees or separate branches of the same tree.



Figure 3: Male *A. pusillum*, Corner Brook, May 23, 2007

Tiny flowers mature early in spring, April to May and early June in the Humber Valley. Male flowers have 3 "sepals" each with a tiny yellow anther sac on its upper surface (Figure 3). Female flowers are inconspicuous at the tips of the brown stubs (Figure 4). Both male and female flowers exude nectar indicating that insect pollination is the chief agent of transfer, but apparently some wind pollination also occurs. It takes about 5 months for fruits to mature, so by late August or September the cannonade begins (Figure 5). Some sticky seeds land on nearby trees while others become attached to and dispersed by animals.



Figure 4: Female *A. pusillum*, Corner Brook, May 23, 2007

can easily be overlooked, particularly in poorer sites where trees already exhibit an undernourished appearance. It appears that there are still no confirmed reports from most of the Great Northern Peninsula, from south-central Newfoundland, and from the Burin and Avalon Peninsulas. Also no reports are known from Labrador. No doubt it will be located in at least some of these areas in the future.

Reports indicate that at least 5% of forest birds sampled carry Dwarf Mistletoe seeds attached to their feathers, especially Juncos and Gray Jays and these presumably provide some dispersal for the species. Likewise, Red Squirrels also transfer seeds. Likely preening and grooming dislodge seeds to start long distance infections.

Seeds germinate the following spring after dispersal. At germination, the "rooting" tip develops into a wedge-shaped

penetrating structure known as a haustorium. The haustorium forces its way into the more tender bark of branches less than five years old and produces a branching haustorial network within the internal living tissues by which it absorbs nutrients from the tree host. After penetration, an incubation period of 2 to 5 years elapses before mistletoe shoots emerge from the tree branches. In our species shoots die after flowering, but evidence of their presence can be noted by the

remaining "basal cup" attachment points.

Arceuthobium pusillum is an endemic species of north-eastern and north-central North America. It has been listed as a rare species in Newfoundland, but it now appears to be more common than previously reported, especially in the western and central forested regions of the Island. Because of its small stature it

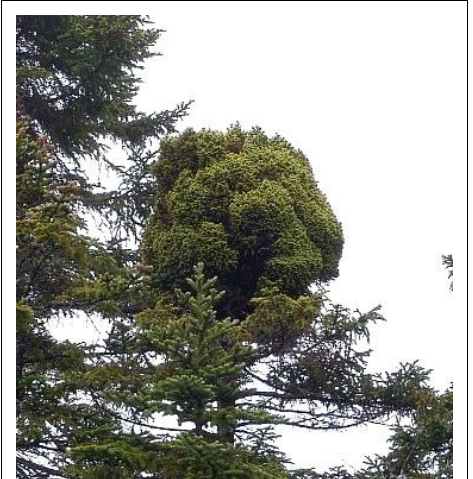


Figure 6: John Maunder's photo of witches broom growth on White Spruce, Mobile, Avalon Peninsula, June 22, 2009

(Note: Since this article was written, I received a communication with photos from John Maunder, of a witches broom resembling that of Dwarf Mistletoe on White Spruce (*Picea glauca*) from Mobile on the Avalon Peninsula (Figure 6). A closer examination should determine whether this broom is of *A. pusillum* origin or of some other agent, several of which are also potentially capable of producing similar appearing growths.)

Thanks to John Maunder for reading the draft manuscript and for the useful comments and suggestions.

Happy Botanizing!



Figure 5: Mistletoe fruits nearing maturity. August 28, 2009, Pasadena.

Selected Literature

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(Scientific names without authorities follow: "Annotated Checklist of the Vascular Plants of Newfoundland and Labrador" by Susan J. Meades, Stuart G. Hay, and Luc Brouillet, 2000.)

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