

# Sarracenia

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*Minuartia marcescens*: Todd Boland See p. 19

## Upcoming Meetings

### Tuesday December 8<sup>th</sup> at 7:30 p.m.

Annual Christmas get together and members' slide show (no competition this year) . Slides should have already been forwarded to John.

### Tentative indoor programme for 2016

(N.B. we do not meet in January). Meetings at 7:30 p.m. at the Botanical Garden Field Centre.

### Tuesday February 9<sup>th</sup>.

**Todd Boland:** The Flora and Fauna of the Cerrado and Pantanal of Brazil.

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## Unusual Plants of the Avalon 2: Horseweed, *Erigeron canadensis* L.

(syn. *Conyza canadensis* (L.) Cronquist)

By Howard Clase.

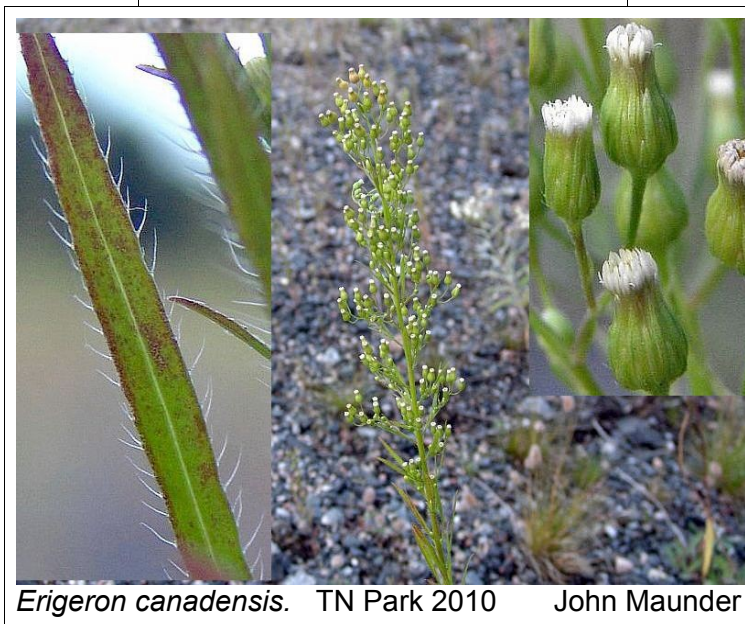
Like Shaggy Soldier, the first member of this series (Sarracenia Vol. 21 #1), the Horseweed is an inconspicuous wasteland weed that has recently arrived on the Avalon. It is native to temperate North America and has spread to Europe where it's a fairly common weed in southern England and known as Canadian Fleabane, so it's surprising that it hasn't been noticed here earlier. I first noticed it in 1997 growing at the base of a newly planted tree on the MUN campus and a few years later growing on the side of the lane through Holland Nurseries on Torbay Rd. Todd Boland had also noticed it growing around Murray's Nursery, so, even though none of these persisted it's fairly clear what the probable source of introduction is.

John Maunder has also photographed it by the Roadside in Terra Nova Park in 2010. And in 2014 he found a fairly extensive colony just west of the old Railway Station at the

central road division by the Allandale Road – Prince Phillip Drive intersection, it seems to be becoming an established weed

It's like a very tall thin groundsel with whitish lavender petals instead of yellow ones, but the leaves are quite different, greyish-green, long and narrow with distinctive well separated long hairs on the edges. It flowers in Fall.

Linnaeus placed it in the genus *Erigeron*, and so it stayed until a dozen or so years ago when a taxonomist called Cronquist moved it into the related genus *Conyza*. Recently the botanical world has decided that Linnaeus was right after all and put it back where it started so you might find it under either name in your flora or field guide.



*Erigeron canadensis*. TN Park 2010 John Maunder

end of Water St. This October John discovered it growing on Battery Road and I noticed some on the

# Serpentine Barrens of Newfoundland, Canada

By Todd Boland

Newfoundland is no doubt the best place in eastern North America for encountering a wide variety of arctic-alpine plants. Many of these are calciphiles restricted to the limestone barrens along the west coast of the Great Northern Peninsula. Here, the combination of exposure, climate and soil (or lack thereof) restricts the growth of typical boreal forest species such as Fir, *Abies*, Larch, *Larix* and Spruce, *Picea*. With the lack of competition, arctic-alpines can survive. As it happens, many of our alpines have a Holarctic distribution so would be familiar to people from northern Europe. Examples include Encrusted Saxifrage, *Saxifraga paniculata*, Diapensia, *Diapensia lapponica*, Swedish Bunchberry, *Cornus suecica*, Velvetbells, *Bartsia alpina* and Moss Champion, *Silene acaulis*, just to name a few. However, Newfoundland's alpine flora has another surprise. In three widely separated regions of Newfoundland, we have outcrops of serpentine rock, a rock type rare in the world and one that is often home to endemic species or those with wide ecological tolerances.

So what is serpentine rock? Serpentine is metamorphosed peridotite. Peridotite is the main rock that composes the oceanic crust. Only through extreme geological uplift and folding, does oceanic crust become heaved above sea-level. The pressures involved in achieving this change the peridotite into the olive-green serpentinite. There are often white veins through the serpentinite, appearing like snake-skin, hence the common name. When exposed to the effects of

weathering, the surface of serpentine becomes rusty-orange, the distinctive colour seen throughout our Newfoundland serpentine outcrops.

From a plant perspective, serpentine produces a host of issues for plant growth. The soils derived from serpentine are high in toxic heavy metals such as chromium, cobalt and nickel. Add to this the fact that the resulting soils are low in potassium and phosphorous and

have a low ratio of calcium/magnesium. The resulting vegetation is often specially adapted to these soils. However, a few plants simply have wide ecological tolerances allowing them to survive in this hostile environment. The resulting 'serpentine barrens', at least in Newfoundland, appear devoid of plants but close inspection will reveal a surprising variety, albeit thinly distributed. There are even a few



Fig 1. *Sarracenia purpurea*

stunted shrubs and conifers that add to the haunting beauty of this landscape.

As mentioned, we have three significant outcrops of serpentine in three general areas: 1. the Blow-me-Down Mountains and the Lewis Hills south of the Bay of Islands, 2. North Arm Mountain and the Tablelands of Gros Morne National Park, both north of the Bay of islands and, 3. the White Hills west of St. Anthony. The only easily accessible area is the Tablelands, where a highway passes along the base of the 'mountains' (really plateaus at about 600 feet above sea level). Here, the national park has several hiking trails that will bring you into the heart of the serpentine barrens and allow access to the unique plants that grow there. The serpentine barrens of the Tablelands are just one of many reasons that Gros Morne National Park was declared a UNESCO World Heritage Site in 1987. {There is also a small exposed "doughnut" of serpentine that is crossed by the road down to the Conaigre Penninsula. Visited on our 1999 field trip. Ed.}

So what plants can you expect to



Fig. 2: *Armeria maritima* subsp. *siberica*

see among the serpentine barrens? Well, it should first be noted that although initial appearance would suggest the area is desert-like, that is far from the truth. There are certainly dry ridges in the summer months, but the top of the Tablelands is actually covered in bogs and everyone knows that water travels downhill. This water does flow as streams in places, but more often than not, the water travels just below the surface rock layer. So while the surface looks dry, just a few inches below, the gravel (I am reticent to say 'soil'!) is actually quite wet. So, the most bizarre plant seen among the serpentine rock is Pitcher-plant, *Sarracenia purpurea*, (Fig 1. p 19) our official Provincial flower, a common plant throughout Newfoundland's copious bogs. Seeing them growing on gravel is a bit disconcerting until you realize how wet the substrate is below. Pitcher-plants are not the only insectivorous plant found here; three species of sundew as well as Butterwort, *Pinguicula vulgaris*, are also commonly encountered. {Like bogs, the serpentine is very nutrient poor. Ed.}

The pink-family, Caryophyllaceae, appear to be the most serpentine-tolerant and/or adapted. *Minuartia marcescens* (See cover picture) is nearly endemic to Newfoundland. It is also found on the Shickshock Mountains of the Gaspé Peninsula, Quebec, which is the other serpentine region in eastern Canada. This evergreen sandwort has needle-like foliage and small white flowers throughout June and July. Similar but more tufted in appearance is Reddish Sandwort, *M. rubella*. Also similar, but with broader foliage, is the mat-like Low Sandwort, *Arenaria humifusa*. These sandworts share the serpentine barrens with other pink-family relatives including Knotty Pearlwort, *Sagina nodosa*, New-

foundland Chickweed, *Cerastium terrae-novae* (an endemic), Alpine



Fig. 3: *Primula mistassinica* forma *leucantha*

Catchfly, *Viscaria alpina* and *Silene acaulis*.

Other species rarely encountered away from serpentine include Labrador Sea-thrift, *Armeria maritima* subsp. *siberica*, (Fig. 2) Aleutian Maidenhair Fern, *Adiantum aleuticum* (Fig. 4 p. 21 - an eastern North America disjunct population of this western North America species) and Field Wormwood, *Artemisia campestris* subsp. *caudata*. The remaining herbaceous alpine found on the serpentine barrens are also found on our limestone barrens: Yellow Mountain Saxifrage, *Saxifraga aizoides*, Alpine Ragwort, *Packera paupercula*, Small Tofieldia, *Tofieldia pusilla*, Sticky Tofieldia, *Triantha glutinosa*, Northern Anemone, *Anemone parviflora*, Greenland Primrose, *Primula egaliksensis*, Mistassini Primrose, *Primula mistassinica* (Fig. 3 - strangely the white form is more common on serpentine than the typical lilac-pink), Hyssop-leaved Fleabane, *Erigeron hyssopifolius*, Bog Goldenrod, *Solidago uliginosa* and a genetically dwarf form of Royal Fern, *Osmunda regalis*.

Fig.4 *Adiantum aleuticum*

*arctica* and Lapland Rosebay, *Rhododendron lapponicum*. The only plant more bizarre to see on serpentine than pitcher-plants is Lapland Rosebay. It may be rarely encountered on our limestone barrens but is far more common among the serpentine. So much for the theory that rhododendrons need acidic soil!

Bearberry, *Arctostaphylos uva-ursi* is another ericaceous plant that seems at home among the serpentine. Here too, grows a genetically dwarf form of Soapberry, *Shepherdia canadensis*. Both Junipers, *Juniperus horizontalis* and *J. communis*, may be encountered with the forms of *J. communis* very flat and dense. Rounding out the list of woodies in this unique habitat are stunted forms of Shrubby Cinquefoil, *Dasiphora fruticosa*, Tamarack, *Larix laricina* and Dwarf Birch, *Betula pumila*.

The serpentine barrens of Newfoundland are like no other place on earth. While they appear lifeless at first glance, a stroll among this otherworldly landscape will reveal a host of hidden treasures.

There are even a few 'alpines' here that are widespread across Newfoundland including New York Aster, *Symphotrichum novi-belgii*, Gieseck's Harebell, *Campanula gieseckiana* and Three-toothed

Cinquefoil, *Sibbaldiopsis tridentata*.

There are also several woody plants which call the serpentine barrens home. Two Newfoundland woodies are almost restricted to serpentine, namely Arctic Willow, *Salix*

*A version of this article originally appeared in the Spring 2015 edition of "The Rock Garden", the journal of the North American Rock-garden Society. All the illustrations are Todd's.*

## Agnes Marion Ayre – Citizen Scholar

By John E. Maunder

### Preamble:

It has often been said that true scholars are born, not made.

From their earliest years, such special individuals invariably demonstrate a great sense of wonder, an intense curiosity, an insatiable thirst for learning, and a burning desire to share what they discover.

We have all seen the small child with an all-consuming passion for spiders, shells, flowers, fossils, or even astronomy, who spends count-

less hours observing, sketching, recording, asking endless questions, and, where questions are not enough, devouring books, and, nowadays, the Internet, because, it seems, the child just HAS to know!

Sometimes, the source of such passion is quite a mystery. Other times, it is much more obvious; being an inspired relative, a special teacher, or some respected figure in the community; or, perhaps, even some-

thing seen in books. But, whatever the source, in those destined to excel, the underlying seed is always there!

The key to the transitioning of childhood passions into adult scholarship almost always transcends mere "book learning". Three things are consistently critical. First, the initiative and drive to learn on one's own. Second, the capacity to seek out and find answers from all sources avail-

able. Third, the sense that things can be achieved. The ultimate satisfaction comes when the developing scholar gains enough knowledge and understanding to begin to share her discoveries and insights with others. The ultimate reward comes from the enthusiastic acceptance and respect of her peers.

Many young scholars actively advance their passions by undertaking extensive post-secondary education. Of these, many eventually find employment in institutions which foster these passions, and allow them to grow further and flourish.

However, many others, for reasons that are both practical and contingent, follow the more curious path of “citizen scholar”; often in directions that they never anticipated. It is a great irony that, through the ages, many of the greatest “citizen scholars” have distinguished themselves most thoroughly in fields entirely separate from those in which they received their formal “education” or apprenticeship.

By way of example, English teenager, Phillip Henry Gosse (1810-1888), made the first detailed scientific observations and illustrations of insects in Newfoundland while serving “overseas” as an apprentice clerk for a merchant firm in Carbonear; only later did he become both an accomplished theologian and

a world-class scientist, who corresponded regularly with Charles Darwin. The Reverend Moses Harvey (1820-1901), an Irish-born Newfoundland clergyman, historian, and author, became an expert on Giant Squid, primarily because of his deep fascination with these strange creatures which periodically washed up on local shores, and his ongoing correspondence with the great American zoologist Dr. Addison Verrill. James P. Howley (1847-1919), who apprenticed in geology under Sir Alexander Murray, the Director of the Geological Survey of Newfoundland, became, in addition to the next Director of the Survey, the curator of Newfoundland’s first public museum, and the pre-eminent scholar on the extinct Beothuk Indian. The Reverend Arthur C. Wagborne (1851-1900) somehow balanced his substantial clerical duties in a number of small towns along the Newfoundland coast, with prodigious scientific collecting – all the while corresponding furiously with dozens of experts worldwide – on his way to becoming the “Father of Newfoundland Botany”. And the list goes on: Joseph R. Smallwood (1900-1991), a young political junkie who went on to become “a Father of [Canadian] Confederation” and Newfoundland’s longest serving Premier, also became its most prolific assembler of historic documents, including

the 6 volume “Book of Newfoundland” and the 5 volume “Encyclopedia of Newfoundland and Labrador”. And, traditional farmer Aloysius (Ally) O’Brien (1915-2008), a self-taught linguist, historian, and philosopher, became Newfoundland’s foremost (and last) home grown Gaelic scholar.

Indeed, the tradition of “citizen scholar” is a long and noble one. Until at least the early years of the 20th century, even in the western world, few had access to institutes of higher learning. Most serious scholarship, even amongst those who were fortunate enough to HAVE some post-secondary education, arose in association with citizen-generated library and literary societies, mechanic’s institutes, athenaeums, and similar enlightened “adult education” groups, which provided home-grown opportunities for learning from one’s peers and for availing of the knowledge of any visiting scholar who happened to be passing through town and could be prevailed upon to offer a lecture. Building upon connections derived from such community-based enterprises, those with a thirst for further knowledge regularly engaged in extensive correspondence with far-off experts, whom they had likely never met and probably never would. Such was the practical path to intellectual advancement in years gone by.

## Agnes Marion Ayre:



Agnes Marion Ayre entered this noble tradition as a young woman. Already a talented artist, thanks to Dr. Nichols’ local “School of Art”, she was particularly fond of landscapes. But, she

was also very active in both the intellectual and social life of her community. As a member of the Women’s Franchise League, she was an active suffragette. She was also a founding member (and President for a time) of the Newfoundland Society of Art, a founding member of the Newfoundland Historical Society, and a life-long member of the local Cur-

rent Events Club and the Ladies Reading Room.

But, as luck would have it, it was not long before Agnes Ayre’s life took an unexpected turn. When Jennie (Mrs. Phillip) Knowling came out from Wales, and perceived the need for a list of Newfoundland plants, she asked young Agnes to paint the plant specimens she had started to collect.

Unfortunately, Knowling soon found herself unable to continue with her ambitious collecting efforts. So, Agnes Ayre bravely took on the whole project herself. Despite knowing almost nothing about botany in the beginning, she instantly took it upon herself to learn everything she possibly could about the subject, and soon became a very proficient, self-taught, botanical scholar.

Not only did Agnes Ayre master the specialized ability to search out, collect, and identify plants, but she also learned to document and curate both her specimens and her illustrations, which eventually amounted to 2440 pressed plant collections and 1890 finely-rendered plant paintings – the eventual basis of a professional herbarium that now bears her name.

Agnes Ayre was certainly inspired by those who went before her: particularly the Reverend Arthur C. Waghorne, Mary Southcott (Waghorne's onetime girlfriend, a flower collector and sometime flower painter, and an author in her own right; later to become a distinguished figure in the nursing profession), Jennie Knowling of course, and most significantly in the end, the illustrious Harvard University botanist Merritt Lyndon Fernald. With Fernald's support and encouragement, Agnes blossomed

and grew.

Her visit to see Fernald, at his Gray Herbarium, was a telling indication of her fierce determination to make sure that she "had gotten the science right" while preparing her ambitious book on Newfoundland plants (due to financial circumstances, and her untimely death at the age of 50, only volume 3 of an intended 5 was ever published). Fernald appears to have held Agnes Ayre in high esteem, and to have regarded her as a scientific colleague. Indeed, he wrote in his seminal "Gray's Manual of Botany, Eighth Edition" (p. vii) of the "unlimited encouragement" provided to him by Agnes Marion Ayre". Significantly, of the full list of colleagues mentioned in this same regard, Agnes Ayre was the ONLY "citizen scholar".

... To be accepted into the company of your peers is surely the ultimate confirmation of your scholarship, and your worth.

While Agnes Marion Ayre's greatest legacy is certainly her contribution to Newfoundland botany, she demonstrated similar passions, and an impressive level of general scholarship in a number of additional areas: corresponding widely on the subjects of genealogy, place names, and natural history folklore; and writ-

ing frequently on diverse topics.

It is true that Agnes Marion Ayre came from a privileged family, and that she was well educated in a liberal sense. In this she had a tremendous initial boost. In addition, she had a supportive family, and the financial wherewithal to pursue her passions relatively unrestricted. However, her developing skills in art, and her insatiable new passion for botany, took her far beyond anything that she had ever "learned in school". And, all of this was accomplished without the direct support of any institutes of higher learning (apart from the personal support of Merritt Lyndon Fernald), while raising a family of three children. For the record, Agnes Ayre was 35 years old when Newfoundland offered its very first (first and second year) university level courses, at the brand new Memorial College!

It is my hope that this short essay will help to demonstrate the high degree to which scholarship can arise within a motivated and passionate citizen, working within her community, without traditional institutional support. Agnes Marion Ayre contributed greatly to her world as a "citizen scholar", and should be well remembered for it.

## Additional reading:

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**Memorial University, Centre for Newfoundland Studies** - Agnes Marion Ayre Herbarium Artwork [http://collections.mun.ca/cdm/search/collection/cns\\_ayre/display/100/order/title/ad/asc](http://collections.mun.ca/cdm/search/collection/cns_ayre/display/100/order/title/ad/asc) [a selection of 57 images from a larger collection]

**Scott, Peter.** 1992. Agnes Marion Ayre (1890- 1940). Sarracenia 2(4): 6-7. [www.wildflowersocietynl.ca/page9/files/Sarracenia\\_Vol\\_2-4.pdf](http://www.wildflowersocietynl.ca/page9/files/Sarracenia_Vol_2-4.pdf)

## Uncommon Wildflowers of Newfoundland 15: The Arrowheads (*Sagittaria* spp.)

By Henry Mann

We have three arrowheads in the province, Grassy Arrowhead (*Sagittaria graminea*), Broadleaf Arrowhead (*S. latifolia*) and Northern Arrowhead (*S. cuneata*). All are aquatics, growing in shallow waters, but may be exposed on muddy shores during low water periods. Each produces three-petaled white flowers similar in all three species. Flowering occurs in July and August.



**Figure 1: Grassy Arrowhead with three female flowers.**

Grassy Arrowhead (Figure 1) is the most common occurring throughout much of the Island and into southern Labrador. Despite its widespread distribution, relatively few in-

dividuals frequent muddy shores and have seen it in bloom. Unlike the other two species it does not have arrowhead (sagittate) leaves, rather the leaf blades broaden into a narrow elongate ellipse.

Although widespread across North America, provincially Broadleaf Arrowhead is considered a rare species only occurring on the Island restricted to western Newfoundland, originally only known from a few localities, most notably the shallows of the Humber River above Deer Lake. In recent times there has been some dispersion of this species in western Newfoundland by several human agencies, however, it is still fairly uncommon and a treat to locate and photograph in bloom (Mann 1986, 2007). The leaf blades can be quite variable from very slender to considerably broader with the two narrow basal lobes sometimes slightly spreading outward (Figure 2). Our plants seem to have consistently narrower sagittate blades compared to often much broader blades in their continental North American range. Flowers are borne on a stalk in whorls of three, the lower whorls female with only pistils and the upper whorls male with only stamens (Figures 3, 4, 5). As petals are shed and pistils mature in the female flowers, a rounded "seed ball" is formed by the tight cluster of achene fruits. Each individual achene resembles in outline the head of a bird with a pointy beak. The achene shape differs markedly from that of Northern Arrowhead and can be used to readily distinguish the two (Figure 6). Broadleaf Arrowhead also has a number of other common

names throughout North America including "Wapato" and "Duck Potato". The latter refers to tubers produced in the muddy rooting substrate relished by waterfowl and have also been utilized for food by indigenous natives. Apparently all of our species produce rhizomes in the substrate sometimes bearing tubers at their ends.

Northern Arrowhead is spread across much of temperate and boreal North America and was only known from the Labrador portion of the province around Goose Bay. Recently a population was located in Rapid Pond in the village of Little Rapids, Humber Valley. The old railway bed borders the pond on the northern boundary and the old TCH on the southern boundary. The pond is used for trout, swimming and canoeing, and a "duck pond" extension at the western end was used for domestic waterfowl. A number of aquatic species are known or suspected to have been introduced to this pond (Mann 2007, 2008) so this may also suggest the origin of Northern Arrowhead. Currently I am only aware of this one population on the Island. It is surviving and apparently flourishing since it was first noticed at least eight years ago (Figure 7). Northern Arrowhead is similar to Broadleaf Arrowhead although sagittate leaf blades are shaped somewhat differently at least in our populations as seen in Figures 2 and 8. One certain way of distinguishing the two is by achene shape. Unlike in Broadleaf Arrowhead, the beak is vertical (Figure 6).





**Figure 2: Typical sagittate leaf blades of our Broadleaf Arrowhead.**



**Figure 3: A male flower of Broadleaf Arrowhead.**



**Figure 4: Female flowers of Northern Arrowhead showing the tight central cluster of receptive pistils.**



**Left: Figure 5: A flowering stalk at right showing a female flower whorl below and a male flower whorl above in Broadleaf Arrowhead.**



**Right: Figure 8: Typical leaf blades of Northern Arrowhead. Lower whorls of the flowering stalk exhibit "seed balls" of tightly clustered achene fruits.**



**Figure 7: Northern Arrowhead in the shallow margins of Rapid Pond.**



**Figure 6: Mature achenes of Northern Arrowhead on left and Broadleaf Arrowhead on right.**

Searching out and photographing emergent aquatic wildflowers can be accomplished with boots or waders along muddy shores. However, those individuals with a canoe will not only

enjoy the thrill of gliding effortlessly over ponds and shorelines, but will navigate a world unimaginable to those with boots stuck in organic ooze fighting off mosquitoes,

blackflies and stouts. Canoeing is highly recommended, even for joint-creaking oldsters!

Happy Botanizing!

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Botany can be fun!

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