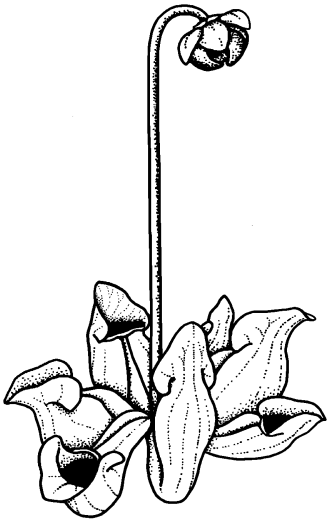


Sarracenia

Volume 23, Numbers 3-4 Fall 2021

ISSNs: 1920-5821 (Print) 1920-583X (Online)

Newsletter of the Wildflower Society of Newfoundland and Labrador.

c/o Botanical Garden, Memorial University, 306 Mt. Scio Rd.,
St. John's, NL, A1C 5S7.

Web www.wildflowersocietynl.ca e-mail: sarracenia@nl.rogers.com

Contents

This issue is dedicated to the memory of Leila Clase.

Who never put personal decorum before looking for an interesting plant.
Winterland, Burin Peninsula, August 2005.

Notices

President

Dear Members!

Despite all the set-backs due to Covid, we now have had two very successful zoom meetings under our belt and appear, with Karen Herzberg's guidance, to be getting rather good at it. We had two very informative presentations, Todd Boland took us to beautiful Georgia and Luise Hermanutz brought us back to our limestone barrens in all their raw beauty. Next month, Sue Meades will begin the first of three presentations on Labrador. Sue will be highlighting the flora of Nain and Adlatok Bay.

We hope, too, that you might take the time to look through some of the important information that will be sent out in the coming days, and which was highlighted by Dr. Hermanutz, as part of her recent talk. It includes WERAC's (Wilderness and Ecological Reserves Advisory Council) important proposal "A Home for Nature: Protected Areas Plan for the Island of Newfoundland", which was recently submitted to our provincial government for consideration. The plan is "a plea to safeguard biodiversity, to create opportunity for ecologically sustainable tourism, recreation and traditional use,with protection of our cultural heritage and sites for further research and education". It would be so appreciated if you could write even a short e-mail to our provincial Minister of Environment, the Honourable Bernard Davis, showing your support of this plan.

And finally, a special thank-you to Howard Clase, our retiring editor, for all his many years of hard work. Howard, with his late-wife, Leila, made Sarracenia an informative, enjoyable, and often humorous read.

The 2021 Executive

President:	Carmel Conway	722-0121
	abcrhynd@nl.rogers.com	
Vice-President:	John Maunder	335-2462
	jem@nl.rogers.com	
Secretary:	Heather Saunders	368-6935
	heathermaries256@gmail.com	
Treasurer & Membership Sec:	Karen Herzberg	753-6568
	karenherzberg@warp.nfld.net	
Sarracenia Editor:	Howard Clase	753-6415
Board Members:	Todd Boland, Daphne Gillingham, Judith Blakeley, Dorothy Parker, Glen Ryan, Clyde Thornhill, and Roger White.	

Editor

As many of you already know this is the last issue of Sarracenia I shall edit. I have enjoyed my stint, which began in 2008 and comprises seven volumes, mostly of four issues. I have enjoyed the challenge of learning how to push Writer, the Word Processor in the free office suite[1] OpenOffice, to its limits and when to give up fighting it – particularly in the positioning of images. Sometimes they have finished up where the software insisted in putting them and not where I wanted them!

On our Central field trip, 2006

However, since I lost Leila, my wife of 51 years who was also my proof-reader, subeditor and co-botanist everything seems to take longer. (She actually wrote the very first article in the newsletter which became Sarracenia, in 1990 – but never a one since.) She was a very important part of my life, and I should like to dedicate my last issue to her memory.

I should like to thank the authors who have kept me supplied with articles to include over the years, especially Henry Mann who must have contributed close to a half of them, and John Maunder whose eagle-eyes have replaced Leila's in proof reading. But the ready supply of articles has slowed down and I don't have the time to write it all myself. There are still unsorted boxes from our 2012 move into the condo that I don't want to leave for my son to deal with – especially as some of the papers are in Finnish. That must be my priority from now on. Getting older doesn't help either.

I have indulged myself in this last issue by using the spaces at the end of the main articles to write about some issues that particularly concern me – you may have heard some of it before!

1 I believe there is also a similar piece of software put out by a company called Microsoft – but you have to pay for that.

Heracleum species in Newfoundland and Labrador

by Susan J. Meades

The only species of *Heracleum* with a range that extends throughout the Province of Newfoundland and Labrador is *Heracleum maximum*, our native **Cow Parsnip**. Insular Newfoundland is also home to two other *Heracleum* species, introduced from Eurasia and now naturalized, primarily, on the Avalon Peninsula: **Giant Hogweed** (*Heracleum mantegazzianum*) and **Common Hogweed** (*Heracleum sphondylium*). In this article, I'll describe how to identify the species correctly and suggest what precautions should be taken when working around these plants.

All three *Heracleum* species share a number of identifying features:

- Plants are **large**, 1–3 metres tall (rarely to 5 m tall for Giant Hogweed).
- Flowering stems are single, upright, **terete** (circular in cross-section), **hollow**, except at the nodes, and are covered with soft hairs or stiff, bristle-like hairs.
- Leaves are basal and cauline (alternate), large, and **ternately compound** (with leaves divided into 3 large, lobed leaflets) or **pinnately compound**, and range from 150 cm to 300 cm long by up to 260 cm wide.
- Petiole bases are large, **inflated**, and sheath the stem. A dense ring of white hairs is often present at the nodes, just below the petioles.
- The inflorescence is a large **compound umbel** of numerous flowers; smaller umbels (**umbellets**) are borne at the end on long branches, called **rays**. The main umbel is terminal on the flowering stem, but smaller lateral umbels may develop below the main umbel.
- Involucral bracts are usually lacking beneath the main umbel at flowering time (anthesis), but an **involucel** of 10–20 linear bracts is usually present at the base of each umbellet.
- Individual flowers share traits characteristic of all plants in the Carrot Family (Apiaceae): the calyx is very reduced, the 5 usually white petals have a pointed apex that is often curved inward towards the centre of the flower, making the petals appear 2-lobed, especially on flowers along the outer margins of the main umbel, which have much larger petals. Also present are 5 stamens and a single pistil with an inferior ovary of 2 fused carpels, and 2 styles, each ending in a small, capitate stigma. The base of the 2 styles is enlarged into a common nectar-producing **stylopodium**. Each flower produces a single fruit.
- Fruits are flat, oval, obovate, or nearly orbicular **schizocarps** composed of 2 parts, each called a **mericarp**. Each mericarp contains 1 seed. The 2 mericarps are held together by a forked structure called a **carpophore** (**Figure 1**), which is the persistent remains of the vascular tissue that provided food to the developing fruit. The ends of the carpophore branches are attached to the stylopodium of each mericarp, which separate independently from the carpophore.
- Young fruits are finely pubescent, but become glabrous (smooth) at maturity. The outer surface of each mericarp is conspicously marked by **4** narrow, tear-drop-shaped, dark brown oil ducts, called **vittae**. The inner surface of each mericarp, called the **commissural surface** (where the 2 carpels are joined in flower), is marked by only **2 vittae**.

The most important traits to look at when trying to identify *Heracleum* species are:

- Whether leaves are ternately or pinnately compound.
- Whether stems are smooth, ridged, evenly hairy throughout the internodes, and of uniform green, greenish-purple, or (occasionally) purple colour, or whether stems are covered with irregular purple blotches, each with short, stiff, bristle-like hairs projecting from the blotches.
- The number of rays (and umbellets) in the main compound umbel.
- The shape of the fruit and the arrangement of vittae on each mericarp.

Figure 1. The schizocarpic fruit of Cow Parsnip, showing the outer surface (mericarp on the left), and inner surface (mericarp on the right) which have different numbers of oil tubes (vittae). Between the two fruits is a carpophore, from which the mericarps have already fallen.

Figure 2. Bill Meades standing next to Cow Parsnip on Whitefish Island, Sault Ste. Marie, ON.

Figure 3. Andy Fyon standing next to Giant Hogweed on Manitoulin Island, ON. *Photo*: Libby Fyon 2010.

Before describing the identifying traits of each species, I want to dispel 2 myths:

Myth 1: *You can identify Giant Hogweed by its size*. I'm sure readers have all heard people say that Giant Hogweed is much taller than Cow Parsnip, that size is the best way to tell them apart. To put it simply, that's 'hogwash'! While it is true that Giant Hogweed *can* reach 5+ metres in height in the right conditions, I have not heard reports of hogweed plants in NL that tall. The Giant Hogweed plants noticed outside Flatrock town hall in 2009 were all 1–2 metres tall and in full flower, so the plants were mature and not capable of growing taller (please note that the Flatrock town council removed all traces of the hogweed; the ditch was filled in and grassed over when I returned in 2011). Photos of other local Giant Hogweed plants I've seen are all between 1–3 metres tall. In contrast, I've seen Cow Parsnip plants that are much taller than Giant Hogweed. One such population is located on Whitefish Island, Sault Ste. Marie, where the St. Mary's River flows out of Lake Superior. Some of the Cow Parsnip plants on Whitefish are about 3 metres tall (**Figure 2**). Whitefish Island receives annual deposits of alluvial nutrients during spring runoff, and there are many centuries of history of fishing from the island, with fish bones and offal probably contributing nutrients to the soil. The amount of nutrients available to *Heracleum* plants likely plays the biggest role in how tall they grow. The tallest Giant Hogweed plants I've seen were on Manitoulin Island, ON, planted at the entrance to a golf course. **Figure 3** shows, Andy Fyon, retired ON geologist, standing next to some Giant Hogweed that is certainly less than 3 metres tall. So, *size does not matter* when trying to differentiate between Giant Hogweed and Cow Parsnip.

Myth 2: *Touching Giant Hogweed (or other Heracleum) plants is dangerous, as they are poisonous.* While the sap of all *Heracleum* plants contain phototoxic chemicals (**furanocoumarins**) that can cause a nasty, blistering rash, simply touching the plant will not hurt you, although I do not recommend grabbing the bristly stems, which could release some sap. The only plants in NL that can hurt you by simply touching them (thorns and prickles excluded) are stinging and burning nettles (*Urtica dioica* and *U. urens*), which are covered with brittle hairs that break upon touch, piercing the skin, and releasing chemicals (mainly formic acid) into your skin that cause a burning, itchy rash. Fortunately, the symptoms of nettle rashes are easier to treat and usually disappear after a few hours, unless you have a serious (anaphylactic) allergy to nettles. In contrast, a rash caused by the sap of *Heracleum* plants will develop only under certain conditions. This is not an allergic reaction, it is more like a chemical burn. This type of rash is called **phytophotodermatitis** (*phyto-* for plant, *-photo-* for light, *-dermatitis* for

skin irritation). To be activated, the sap needs to be in contact with moist (sweaty or wet) skin that is exposed to UV light (sunlight). The chemical reaction that initiates the rash begins about 15 minutes after exposure, damaging the DNA in your skin, and changes the way skin reacts when exposed to UV light (Goldman 2015). Therefore, if you do get sap on your skin, it is important to cover the affected area immediately with a thick cloth (or non-transparent plastic), get out of the sun, and wash your skin with soap and cold water to remove all traces of the sap. Wet-wipes *may* help temporarily if you're not near water or a sink, but cover the area as soon as possible. The longer the sap remains on your skin, the more sensitive your skin will be to sunlight in the future (Goldman 2015). Taking these post-exposure measures should prevent a rash from developing. The blistering rash will develop within 24–48 hours after exposure. After the rash is gone and blisters have healed, it is often recommended that you keep the affected area protected from sunlight for several months (Goldman 2015).

The leaves and stems of *Heracleum* are not broken by a simple touch, so exposure to the sap is unlikely unless you tumble into a patch, walk through a stand with bare legs or arms, or decide to use a whipper-snipper or weed whacker to removed the plants. Wearing long sleeves and pants with long legs will help you avoid unintentional exposure to the sap, but if you intend to remove plants around your property, make sure to wear full **personal protectic equipment** (PPE), including boots, long sleeves and pants, gloves, a face covering, goggles or safety glasses, and a covering over the back of your neck. **Whipper-snippering any of the *Heracleum* plants will only spread the sap everywhere**, covering you with small droplets of sap, all of which will develop into the blistering rash if you are not fully protected. If sap of Giant Hogweed gets into your eyes, it could cause blindness, so learn to protect yourself when working around these plants. Hydrocortisone cream can be used to lessen the itchiness; calamine lotion is ineffective on *Heracleum* rashes. The chemicals in *Heracleum* sap also cause a darkening of your skin, which can last for weeks, years, or permanently, and will make your skin more sensitive to sunlight. All species of *Heracleum* contain furanocoumarin compounds in their sap; Giant Hogweed plants have the highest concentrations, while the lowest concentrations are present in Common Hogweed plants. However, all three of these plants can produce a blistering rash if you expose your skin to their sap during daylight.

How to identify the 3 *Heracleum* species

Heracleum maximum

Cow Parsnip, is also known by the common names American Cow Parsnip, masterwort, and locally, as "hemlock" or "emlock". It is native to boreal North America and eastern Asia. Provincially, it occurs throughout insular Nfld., but is more common on the west coast of the island, and is known only as far north as central and western Labrador. Cow Parsnip is often seen along coastal roadsides and limestone barrens on the Great Northern Peninsula (**Figure 4**), and is an integral part of the coastal snowbed community at the base of limestone terraces in the Strait of Belle Isle Ecoregion; it also occurs throughout forested fens in western and northern Newfoundland (W.J. Meades 1983). In other areas of Newfoundland, Cow Parsnip commonly occurs at the base of coastal cliffs, backshore marshes behind beaches, and along logging roads where soils are wet and humus-enriched; it does not grow in bogs.

Figure 4. Coastal population of cow parsnip on the Great Northern Peninsula.

Along with Beach Lovage (*Ligusticum scoticum*) and purplestem Angelica (*Angelica atropurpurea*), Cow Parsnip provides food for the larvae of Newfoundland's Short-tailed Swallowtail, *Papilio brevicaudata* subsp. *brevicaudata* (**Figure 5**).

Cow Parsnip can be identified by the following traits:

- Plants are polycarpic perennials, meaning they are capable of producing flowers and fruits annually throughout the life of the plant; plant height is usually 1–3 m tall.
- Stems are vertically ridged, stout, usually green, greenish-purple, or sometimes suffused with red-violet, and evenly covered with short, soft, white hairs. Stem diameter is 1–5 cm at the base.
- Leaves are ternately compound (with 3 main leaflets), 1.5–6 dm long; each leaflet is pinnately lobed or divided into several, sharply pointed lobes; margins of the lobes are sharply serrate. The width of the leaf surface (lamina) is very variable; while it's usually fairly wide, as shown in my illustration of a typical leaf (**Figure 6**), we sometimes see basal leaves of Cow Parsnip where the 3 ternate sections are bipinnate with very narrow laminae (**Figure 7**).
- Compound umbels are 1–2 dm wide, flat-topped to slightly domed, with 15–30 rays and umbellets; larger, outer petals are about 6–7 mm long.
- Fruits are obovate to obcordate, 7–12 mm long, and noticeably depressed at the stylopodium; the vittae extend downward about half the length of the fruit.

Figure 5. Larva of short-tailed swallowtail butterfly feeding on Cow Parsnip.

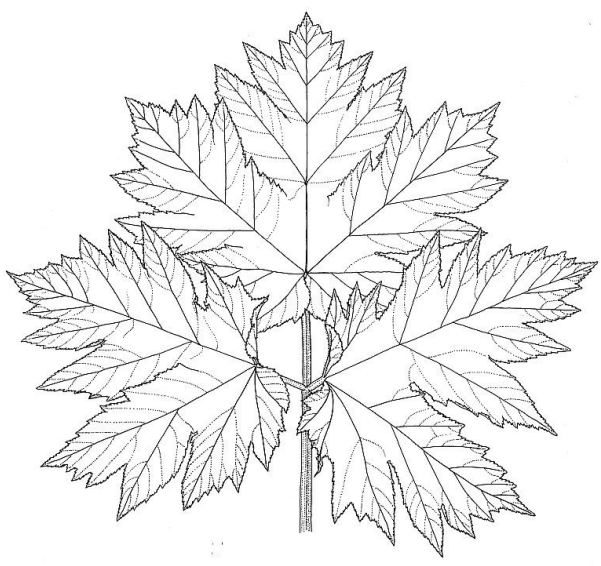


Figure 6. Illustration of a typical, ternately compound leaf of *Heracleum maximum*.

Figure 7. An atypical Cow Parsnip leaf with bipinnate leaflets and narrow lamina.

Heracleum mantegazzianum

Giant Hogweed, is also known by the common names Cartwheel Flower, Giant Cow Parsnip, Giant Cow Parsley, Parsnip Tree, or Giant Russian Hogweed. In Europe, the common names Giant Bearclaw and Wild Rhubarb are also applied to Giant Hogweed (Bhowmik & Chandran 2015), but I have not seen those names used in Canada.

Giant Hogweed is native to the Caucasus region of central Asia, but has long been used in Europe in the horticultural trade by landscape architects who valued the bold statement of these large plants. How it came to Newfoundland is unknown. We know it was not included in Rouleau's 1978 *List of Newfoundland Plants*, nor was it mapped in Rouleau and Lamoureaux's 1992 Atlas, nor reported in my 2000 NL checklist (Meades *et al*. 2000), but it is included in my current checklist (Meades & Brouillet, 2019). *Heracleum mantegazzianum* was featured in the series, *Invasive Alien Plants of Canada* (Page *et al*. 2006), where its provincial range is described as "localized populations" in eastern Newfoundland. A single herbarium specimen from Newfoundland was located at The Rooms by Nathalie Djan-Chékar – an Aug. 24, 2003 collection by John Maunder from the Johnson Family Trail, just west of the Outer Ring Road, near Major's Path, St. John's. Thus, we can assume Giant Hogweed was probably introduced sometime between 2000 and 2003, possibly by an avid gardener who did not understand the implications of this noxious, invasive, ornamental weed. It probably spread from its original location, by whatever means, to its present St. John's locations no later than 2003. Wind is capable of only short-distance dispersal of Giant Hogweed seeds, but seeds can be dispersed for longer distances by water currents within watersheds (Gucker 2009). Although birds are not considered to be dispersers of Giant Hogweed seed in Great Britain, Gucker (2009) reports that birds were the likely source of dispersal in a disjunct Michigan site, so birds, or even muddy tires or boots, could be responsible for spread to areas outside of St. John's.

As previously mentioned, false reports of Giant Hogweed, based on misidentifications, are often received. One such report resulted in the posting of a warning sign about the presence of hogweed along a trail in Port Rexton, but botanists who have checked this trail reported seeing only Cow Parsnip. Another false report was actually printed in a *Wikipedia* article on Newfoundland a few years ago, where a tourist from the mainland, not familiar with Cow Parsnip, warned that Giant Hogweed was "everywhere" in Newfoundland, That erroneous report was quickly removed. Two populations where Giant Hogweed had been confirmed, in Flatrock (2009) (Figure 8) and Shea Heights (2018), were eradicated by their town councils and no reoccurrences have been reported.

Figure 8. Giant hogweed in front of Flatrock Town Hall, 2009 (now eradicated).

Currently, there are only a few sites on the Avalon Peninsula where Giant Hogweed is known to occur; attemps have been made to eradicate at least two of these population, but with only partial success. With just a few extant populations, Giant Hogweed should be considered a rare introduction, and people are very unlikely to encounter it while out hiking. But if someone suspects they have found Giant Hogweed, make sure it is correctly identified by checking the traits listed below and comparing the plant to the traits of our native Cow Parsnip. If a positive identification of Giant Hogweed is reached, take a photo of the stem or petioles and flower/fruiting heads and report the location via Access 311 in St. John's, or to your local town council in areas outside of St. John's.

Figure 9 Comparison of stems of *Heracleum mantegazzianum* (left) *and Heracleum maximum* (right)

Giant Hogweed can be identified by the following traits:

- Plants are monocarpic perennials, meaning that the plants die after producing a single crop of flowers and fruits. Plants are usually 2–3, but occasionally up to 5, years of age at flowering. However older flowering plants have been documented in Europe. Locally, plant height is usually 1–3 m tall, but plants in other areas have been reported to be as tall as 5.5 m.
- Stems and petioles are stout, not ridged, and usually green, with numerous, **irregular, raised, dark purple blotches; coarse white bristle-like hairs** (usually 1 or 2) **project from each blotch** (**Figure 9**). The presence of raised dark purple blotches bearing stiff bristly hairs is the most reliable trait for identifying Giant Hogweed. One article (Bhowmik & Chandran 2015) reports that the hairs contain furanocoumarins, so care should be taken not to touch or grasp the stem or petioles, which would break the hairs, releasing the harmful compounds onto your skin. Stem diameter at the base is 3–15 cm.
- Only basal leaves are produced during the years prior to flowering, and these may have 5 large segments or be ternately compound. **(Figure 10)** Leaves of flowering plants are **ternately compound** (with three main leaflets) and can be as large as **3 m long by 2.6 m wide**. Each leaf segment is pinnately lobed or divided into several jagged and sharply pointed lobes; the central segment of the ternate leaf may be somewhat palmately lobed or divided. The leaves on flowering stems are alternate and ternately compound.
- **Leaf margins are more deeply incised and jagged** than margins of Cow Parsnip leaves. But variation in shape and lobing often makes leaf shape an unreliable trait for identification.
- Compound umbels are up to 80 cm wide, with **50–150 rays and umbellets** (**Figure 11**), up to 8 lateral, or satellite, umbels can develop below the main compound umbel; petals are up to 12 mm long. The number of rays is also a reliable identifying feature, as long as the rays of the main compound umbel are counted and not those of the satellite umbels, which will have fewer rays and umbellets.
- **Fruits are oval, 6–18 mm long**, and barely depressed at the stylopodium; the vittae extend well below the middle the fruit and are wider at the base than the narrow vittae of other *Heracleum* species.

Figure 10. *Basal leaves of Heracleum mantegazzianum. Photo: Howard Clase (2020).*

Figure 11. *Compound umbels of Giant Hogweed have 50–150 rays and umbellets; here, the centres of 55 visible umbellets of Giant Hogweed are marked with a red dot to make counting easier. Photo: Andy Fyon.*

Please remember not to work around or try to remove this plant without full PPE. It is best to hire a professional, such as a weed control specialist, to remove plants from personal property. Plants on public property should be reported to the appropriate council. If possible, plants should be removed before they set fruit, since seeds can remain viable in the ground for 3–7 years (Gucker

2009) or up to 17 years (Bhowmik & Chandran 2015), it is important to monitor known sites of Giant Hogweed for several years to ensure no new plants emerge.

Heracleum sphondylium

Common Hogweed, is also known as Eltrot, Cow Parsley, Prong Plant (local, NL name), Keck, Meadow Cow Parsnip, or Eurasian Hogweed. Several online sites mention its rank, pig-like odour, which is the source of its common name. Common Hogweed is native to Eurasia and is especially common in Europe and Great Britain, where it is often eaten as a wild food by foragers (Wilde 2015). Its arrival to Newfoundland was not documented, but its presence on the island is well established and probably dates back to early settlements on the Avalon's south coast. Populations of Common Hogweed are know from several sites in St. Johns, as well as from the Trepassey area and possibly the Cape Shore. Although exposure to the sap of Common Hogweed is less likely to produce a rash than the sap of the other two species, care should be taken to avoid exposure to the sap of all species of *Heracleum*. More information about the biology of Common Hogweed can be found in Sheppard (1991).

Figure 12. Bipinnately compound leaf of *Heracleum sphondylium*. *Photo*: John Maunder.

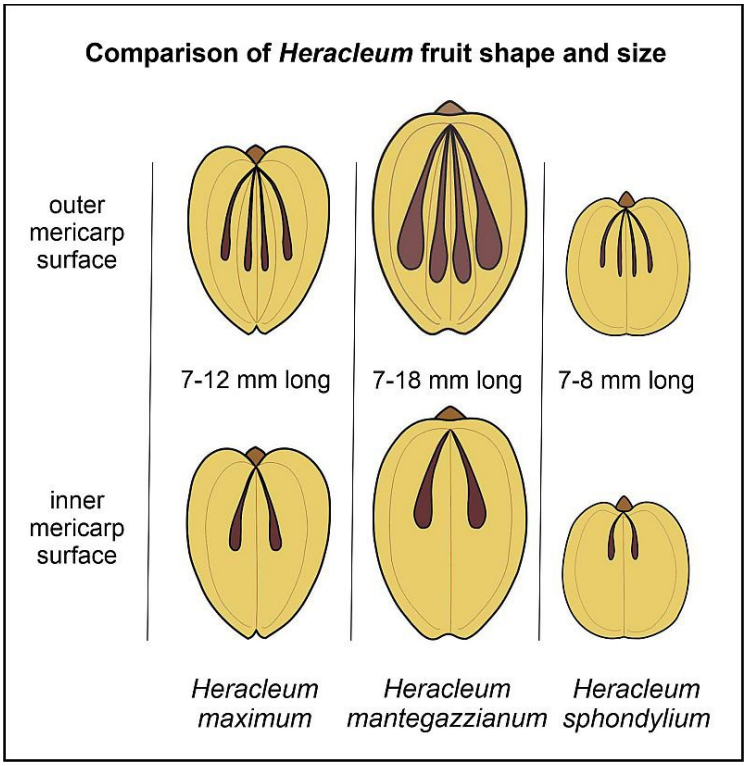


Figure 13. Comparison of the size and shape of *Heracleum* fruits, showing the position of the vittae on the inner and outer surfaces of the mericarp. Please note that the shape of fruits and vittae may vary slightly from the diagrams, but the general outlines are representative of each species.

Common Hogweed can be identified by the following traits:

- Plants are **polycarpic perennials**, producing flowers and fruits annually throughout their lifespan; plant height is usually 1–2 m tall.
- Stems are **vertically ridged**, usually green or greenish-purple, and evenly covered with short, somewhat firm, white hairs.
- Leaves are **bipinnately compound, to 60 cm long, with 5–9 leaflets (Figure 12),** Each leaflet is 4–10 cm

long and has serrate margins.

- Compound umbels are 4–24 cm wide, with **10–20 rays and umbellets**; petals are 2–4 mm long, white, or purplish in bud.
- Fruits are **broadly oval to nearly orbicular, 7–8 mm long**, barely depressed at the stylopodium; the narrow vittae are less than half the length of the fruit. See **Figure 13** for comparions of the shape and size of the fruit of all three *Heracleum* species.

Table 1. Comparison chart of differentiating traits of the three *Heracleum* species in NL.

Traits shared by all three *Heracleum* species are listed at the beginning of this article, so will not be repeated in the following chart, which compares characters that can be used to differentiate these 3 species. Stem traits, the number of rays, and the shape of the fruit are the must reliable characters to use when trying to identify *Heracleum* species.

	Heracleum maximum	*Heracleum mantegazzianum*	*Heracleum sphondylium*
	Cow Parsnip	Giant Hogweed	Common Hogweed
Plants	polycarpic perennial, 1–3 m tall	**monocarpic perennial**, 1–3+ m tall, rarely to 5 m tall	polycarpic perennial, 1–2 m tall
Stems	green to evenly purplish-green, vertically ridged, with short, soft, white hairs	green, **with raised, dark purple blotches, each with 1–2 stiff, bristle-like hairs** projecting from the blotch	green to evenly purplish-green, vertically ridged, with short, ± firm white hairs
Cauline Leaves	ternately compound, 15–60 cm long	ternately compound, **to 3 m long by 2.6 dm wide**	**pinnately compound,** to 60 cm long, **with 5-9** leaflets
Flowers	compound umbels to 20 cm across, **with 15–30 rays**	compound umbels **to 80 cm across, with 50–150 rays**	compound umbels to 25 cm across, **with 10–20 rays**
Fruit	**obcordate, 7–12 mm long**; narrow vittae on mericarp surfaces extend to *about the middle* of the fruit	**oval, 6–18 mm long**; vittae on the mericarp surfaces extend *well below the middle* of the fruit and are wider at the base that the narrow vittae of the other 2 species	**broadly oval, 7–8 mm long**; narrow vittae on mericarp surfaces end *above the middle* of the fruit

In addition to the three *Heracleum* species, there are other species of the carrot Family (Apiaceae) that can cause a rash from handling. Wild Parsnip, *Pastinaca sativa*, is one example. It has been found in various roadside locations across the island and seems to prefer disturbed ground. It has pinnately compound leaves with narrower leaflets than Common Hogweed, but is easy to differentiate from *Heracleum* due to its small yellow petals. This is the wild version of the cultivated parsnip, and I am aware of at least one person who is allergic to parsnip as a food. In the blog by Scottish forager Monica Wilde (2015), she reports that farm workers in Europe sometimes develop rashes from frequent handling of celery, and that celery is the most frequent source of food allergies in Europe! Many plants in this family are either poisonous, like *Cicuta bulbifera* (Bulblet Water-hemlock), or can cause rashes, especially with repeated exposure, so be careful around all members of this plant family. Fortunately, not all plants in the Apiaceae are harmful; species that provide favourite foods (vegetables) or seasoning include Anise (*Pimpinella anisum*), Caraway (*Carum carvi*), Carrot (*Daucus carota*), Celery (*Apium graveolens*), Chervil (*Anthriscus cerefolium*), Coriander (*Coriandrum sativum*), Cumin (*Cuminum cyminum*), Dill (*Anethum graveolens*), Fennel (*Foeniculum vulgare*), Parsley (*Petroselinum crispum*), and Parsnips (*Pastinaca sativa*).

More images of *Heracleum maximum* and *H. mangetazzianum*, as well as image of *Pastinaca sativa* and other Apiaceae species can be seen in the Photo Gallery of my *NL Flora* website, listed alphabetically by their scientific name: https://newfoundland-labradorflora.ca/gallery/

Additional photos of many species in the Apiaceae, including all three *Heracleum* species, can be seen in John Maunder's *Digital Flora* website: https://www.digitalnaturalhistory.com/flora_apiaceae_index.htm

An information sheet on Giant Hogweed with photos of common and giant:
https://www.invasivespecies.scot/sites/sisi8/files/ID_Heracleum_mantegazzianum_%28Giant_Hogweed%29.pdf

Excellent information on how to safely remove Giant Hogweed (but professional help is strongly recommended) is provided in this pdf:
http://www.metrovancouver.org/services/regional-planning/PlanningPublications/InvasiveSpeciesBMP-GiantHogweed-v4.pdf

[All photos and illustrations not attributed to other photographers are by the author.]

References:

Bhowmik, P.C., and R.S. Chandran. 2015. Biology, ecology, distribution, and current status of *Heracleum mantegazzianum* Sommier & Levier. *J. Crop and Weed*. 11(1): 1–17.
URL: http://www.cropandweed.com/archives/2015/vol11issue1/1.1.pdf

Goldman, R. 2018. What you need to know about Giant Hogweed to avoid burns. *Healthline*.
URL: https://www.healthline.com/health/hogweed-burns

Gucker, C.L. 2009. *Heracleum mantegazzianum*. *In*: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). URL: https://www.fs.fed.us/database/feis/plants/forb/herman/all.html

Meades, S.J., and L. Brouillet. 2019. *Annotated Checklist of the Vascular Plants of Newfoundland and Labrador*. Sault Ste. Marie, ON. Published online. URL: https://www.newfoundland-labradorflora.com/checklist/

Meades, S.J. 2015. *Heracleum mantegazzianum* Sommier & Levier. *In*: S.J. Meades, D. Schnare, K. Lawrence, and C. Faulkner. (2004 onwards). *Northern Ontario Plant Database Website*. Version 1, January 2004. Algoma University College and Great Lakes Forestry Centre, Sault Ste. Marie, ON. URL: http://www.northernontarioflora.ca/description.cfm?speciesid=1001945

Meades, S.J. 2015. *Heracleum maximum* W. Bartram. *In*: S.J. Meades, D. Schnare, K. Lawrence, and C. Faulkner. (2004 onwards). *Northern Ontario Plant Database Website*. Version 1, January 2004. Algoma University College and Great Lakes Forestry Centre, Sault Ste. Marie, ON. URL: http://www.northernontarioflora.ca/description.cfm?speciesid=1004531

Meades, S.J., S.G. Hay, and L. Brouillet. 2000. *Annotated Checklist of the Vascular Plants of Newfoundland and Labrador*. Memorial Univ. Botanical Garden, Nature Conservancy of Canada, Nfld. & Labrador Dept. of Forest Resources and Agrifoods, Parks Canada, and the Western Newfoundland Model Forest Inc., St. John's, NL. 237 pp.

Meades, W.J. 1983. Heathlands. pp 265–318. *In*: G.R. South (ed.). *Biogeography and Ecology of the Island of Newfoundland*. Dr. Junk Publishers, The Hague.

Page, N.A., R.E. Wall, S.J. Darbyshire, and G.A. Mulligan. 2006. The biology of invasive alien plants in Canada.

4. *Heracleum mantegazzianum* Sommier & Levier. *Can. J. Plant Sci*. 86: 569-589.

Rouleau, E. 1978. *Rouleau's List of Newfoundland Plants*. Oxen Pond Botanic Park. St. John's, NL. 132 pp.

Rouleau, E., and G. Lamoureux. 1992. *Atlas of the vascular plants of the Island of Newfoundland and the Islands of Saint-Pierre-et-Miquelon*. Fleurbec. Saint-Henri-de-Lévis, Québec. 777 pp.

Sheppard, A.W. 1991. *Heracleum sphondylium* L. Biological Flora of the British Isles. No. 171. *J. Ecol*. 79: 235–**258.**

Tiley, G.E.D., F.S. Dodd, and P.M. Wade. 1996. *Heracleum mantegazzianum* Sommier & Levier. Biological Flora of the British Isles. No. 190. *J. Ecol*. 84: 297–319.

Wilde, M. 2015. Is common hogweed poisonous? In: *Monica Wilde Forager* (blog): https://monicawilde.com/is-common-hogweed-poisonous/

{*While Sue is correct in stating that the earliest confirmed record of Giant Hogweed is from 2003, I have memories of its having been around for far longer than that. I am fairly sure that Bernard Jackson, who had a love for the spectacular, planted some at the head of Oxen Pond in the early days of the Botanical Garden, near the duck feeding area. They are also scattered around the garden at the back of Thimble Cottage, the O'Brien's old home on Oxen Pond Road. Ali O'Brien, who worked at the Botanical Garden during the early days brought several plants from the Botanical Garden back to his Garden – another one was the Himalayan Balsam, Impatiens glandulosum, There ia a very large colony of Giant Hogweed in the fen on the upper Virginia river, now bisected by the outer ring road. When Leila and I first noticed it in 2003 it was well established and must have already been there for some time. (Sarracenia vol. 12, #1,p7)*

If anyone has photos or other evidence of the plant anywhere in Newfoundland from last century please let us know. - Ed}

Botany in the Time of Covid.

By Howard Clase.

Our Society is about outdoors, and in the past we have visited most parts of our local outdoors, from the tip of the Northern Peninsula to the bottom of the Burin - everywhere but Buchans as I usually put it. It's been a great way to see the Island and even the nearest part of Labrador. Sadly there have been no long trips for several years now for various reasons, an ageing membership being one of them. But we were still able to organise some shorter, local trips until Covid19 struck in 2020. I hope that next summer we shall be able to hold some of these again.

But, nature doesn't require a long drive to see it, it's all around us, even in the city, just walking across from my condo to the Churchill Square shops is a botany field trip for me. My regular “exercise” walks take me around Burton's Pond or down the first section of Rennies Mill River after it runs out from Long Pond. Apart from my annual pilgrimage to Bristol's Hope to see the *Baldelia* (Leila's last out of town trip in 2014.) and a few visits to the Botanical Garden and other city spots, this is where I have done most of my botanising in 2021. I call myself an Urban Weed Botanist! This doesn't mean I haven't been seeing any interesting plants though, my list includes two species not known anywhere else in the province and others not commonly found on the Avalon.

One of the books the Hunter Library book group read recently was Barbara Kingsolver's “Unsheltered” which, as well as comparing life under a current demagogue in the USA with that under a local one in Vineland NJ 150 years ago, has introduced me to Mary Treat, a real life botanist and all round naturalist of the 19th century who corresponded with Darwin. It was she who, through hours of patient watching through a microscope, was able to answer Darwin's question as to how the bladderworts actually catch their prey. (There are small hairs at the mouth of the unexpanded bladders that, when touched cause the bladder to expand with a pop, sucking the triggering insect in to its doom!). Her favourite plant, the Curly Grass Fern, is also mine, and I also share the sentiments expressed by her (or more likely Kingsolver) about people not noticing what is around them.

Continued on page 36:-

Strange Clovers, Parasitic Bacteria, and Phloem-eating Leafhoppers!

by John Maunder.

Figure 1.

On August 4, 2018, I led a WFS field trip along the old rail bed trail near the Foxtrap Marina, in Conception Bay. As I was returning to my car, in the company of a few die-hard stragglers not yet left for home, We spotted a very “strange” Alsike Clover (*Trifolium hybridum*) amongst a number of apparently “normal” examples, growing on disturbed ground near the edge of the marina parking lot.

Neither I, nor any of the aforementioned “stragglers”, had ever seen anything like it. The plant was duly photographed, and then collected for eventual deposit in the herbarium of the provincial museum in St. John’s.

In its lower, apparently earlier-developed, flower heads, the plant exhibited clusters of seed pods, perched on exaggerated “stalks” (i.e. pedicels), in spectacular “star-burst” patterns (Figs 1 & 2).

However, in its upper, apparently later-developed, flower heads, the same plant exhibited what appeared to be pinkish “pseudo-flowers”, nestled deeply within a “forest” of leaf-like structures that had clearly arisen through a bizarre re-purposing of the parts of the original flower structures. (Fig 3)

In the lower part of the plant, the leaves looked quite normal (Fig 4 – overleaf). What on Earth were we looking at, we wondered?

Figure 3.

Figure 2

It quickly became apparent that the peculiar state of our Foxtrap Alsike Clover was the result of a strange botanical phenomenon called “phyllody” (the retrograde metamorphosis of floral organs to the condition of leaves) which typically occurs in response to an “infection” by a particular pathological agent.

Figure 4.

The Canadian biologist L. N. Chiykowski (1962) described the progression of “phyllody” in clovers, as it varies, stepwise, according to the timing of infection within the flowering period (the square brackets below are mine):

> “In flowers which have [only just] begun development at the time of infection, individual flower pedicels may be elongated to 3 times the normal length. Calyx lobes which are normally approximately 2 mm long may reach to 6 mm in length …
>
> [This appears to describe the earlier-developed flower heads of our plant]
>
> [In plants infected a little later in their growth period] these calyx lobes become leaf-like in appearance … and are borne at the end of a short pedicel-like organ. The standard, keel, and wings of the flower, while remaining white [or pink], are greatly reduced in size and in advanced infection are absent ... The flower may then consist of only an enlarged ovary ... The ovary may become twice the normal size … and develop a stipe [a “stalk supporting an ovary”].
>
> [Also in plants infected a little later in their growth period] the ovary may proliferate into a simple foliage leaf. This may subsequently develop two leaflets at the base … The final result is a trifoliate leaf, reduced in size but resembling a normal vegetative leaf.
>
> [The latter appears to describe the later-developed flower heads of our plant]
>
> When flowering occurs well after infection, the normal flower is completely replaced by a cluster of either simple or trifoliate leaves.”

All well and good. That is exactly what we were seeing in our Foxtrap Plant. But, what was the mysterious “pathological agent” actually causing all of this strangeness?

Prior to 1967, “phyllody” in clovers, and other plants, was generally thought to be caused by viruses (Kunkel 1926, Chiykowski 1962). However, amidst a growing dissatisfaction with that idea, Doi and others (1967) discovered that the culprits were actually not viruses at all, but, rather, “mycoplasm-like” bacteria – very simple but brilliantly-adapted forms distinguished by being bounded by a three-layered cell membrane instead of a cell wall. These are now known to be species of the “candidate genus” *Phytoplasma* (order Acholeplasmatales).

Specifically, these phytoplasma bacteria turned out to be obligate parasites of plant phloem tissues (the "plumbing" that conducts sugars and other metabolic products throughout the plant).

The life cycle of phytoplasma bacteria is quite complicated! Being too delicate to survive on their own “in the open air”, they require some reliable means of reaching a prospective host plant in order to infect it. This “means” is invariably an “insect vector” (think “mosquito transmitting malaria”).

In fact, it turns out that virtually all phytoplasma infections are facilitated by insects of the order Hemiptera (or “True Bugs”) - usually species of leafhopper (Cicadellidae), although sometimes species of planthopper (Fulgoridae) or jumping plant louse (Psyllidae).

These small, piercing and sucking insects are known to feed on the phloem of at least 700 plant species, including gymnosperms, monocot and dicots. As they feed, they ingest phytoplasma bacteria which have multiplied within the phloem tissues of infested plants. Later, the insects inject these bacteria into the phloem tissues of another, usually uninfested plant. In the interim between ingestion and injection, the parasites pass through the insect’s intestine, move to the haemolymph

(a fluid analogous to “blood”), multiply, and establish themselves in the insect’s salivary glands, a process that can take 7-80 days (Hogenhout et al. 2008).

The genetics of phytoplasma bacteria is still being worked out. However, it is pretty safe to say that the “clover-phyllody phytoplasma” bacteria infecting our Alsike Clover from Foxtrap belongs to the speciose and destructive “aster yellows” group (Staniulis 2000), which affects numerous plants worldwide, including, not surprisingly, many members of the aster family.

Apart from “phyllody”, phytoplasma bacteria cause many other deleterious effects in plants, including “virescence” (the development of green flowers owing to a loss of pigment by petal cells), leaf-yellowing, leaf and stem reddening, proliferation of axillary buds resulting in “witches brooms”, and general stunting. In summary, they cause minor-to-extensive damage to many plants, including both wild native species and commercial crops.

On the other hand, phytoplasma bacteria can also manipulate both their plant hosts and animal hosts in very positive ways. First, they can manipulate particular plants into becoming new hosts for insects which normally do not use those species. Second, they can manipulate particular animal hosts to produce more offspring, and to live longer lives when deprived of a main food source or when exposed to suboptimal temperatures, especially while overwintering. In both scenarios, such manipulations can increase the bacteria’s own chances of survival and dispersal (Hogenhout et al. 2008).

Of particular interest to biologists, phytoplasma bacteria are also known for their remarkable ability to parasitize, and thus live within, BOTH animal AND plant tissues during the course of their life cycles; a feat that requires them to switch between two completely different metabolisms in the process! It is thought that, somehow, this switching ability may be associated with the fact that phytoplasma bacteria genomes, although very small (the smallest of any plant pathogenic bacteria), and notably simplified, contain clusters of repeated gene sequences which, quite possibly, provide them with a variety of metabolic choices as they change hosts (Sugio and Hogenhout 2012).

While much has been learned during the last half century, it is exceedingly likely that most of the myriad wonders and peculiarities of these incredibly minute organisms remain to be discovered!

References:

Phytoplasma. https://en.wikipedia.org/wiki/Phytoplasma (Accessed August 24, 2020)

Chiykowski, L.N. 1962. *Clover phyllody virus in Canada and its transmission*, Canadian Journal of Botany 40: 397-404. . https://www.nrcresearchpress.com/doi/pdf/10.1139/b62-040

Doi, Y., M. Teranaka, K. Yora, H. Asuyama. 1967. *Mycoplasma- or PLT Group-like Microorganisms Found in the Phloem Elements of Plants Infected with Mulberry Dwarf, Potato Witches' Broom, Aster Yellows, or Paulownia Witches' Broom.* Japanese Journal of Phytopathology 33(4): 259-266. https://www.jstage.jst.go.jp/article/jjphytopath1918/33/4/33_4_259/_pdf/-char/en [Japanese with English abstract and figure descriptions]

Hogenhout, S.A., K. Oshima, El-D. Ammar, S. Kakizawa, H.N. Kingdom and S. Namba. 2008. *Phytoplasmas: bacteria that manipulate plants and insects.* Molecular Plant Pathology 9(4): 403-23. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6640453/pdf/MPP-9-403.pdf

Kunkel, L.O. 1926. *Studies on Aster Yellows*. American Journal of Botany 13(10): 646-705.

Sugio, A., and S.A. Hogenhout. 2012. *The genome biology of phytoplasma: modulators of plants and insects.* Current Opinion in Microbiology 15(3)247–254.

Staniulis, J.B., R.E. Davis, R. Jomantiene, A. Kalvelyte, and E.L. Dally. 2000. *Single and mixed phytoplasma infections in phyllody- and dwarf-diseased clover plants in Lithuania.* Plant Disease 84: 1061-1066. https://apsjournals.apsnet.org/doi/pdf/10.1094/PDIS.2000.84.10.1061

The Water Snail and the Waterweed. - How do species get to where they are?

by John Maunder

The water snail

Chinese Mystery Snail

In August of 1983, the late Andrew Crosbie (business man, and brother of the late Honourable John C. Crosbie) collected several live specimens of a very impressive species of freshwater snail near his shoreline home at Virginia Lake, St. John's, Newfoundland.

Eager to know what he'd just found, he contacted the [also] late K. Sundraj ["Sam"] Naidu of the local Federal Department of Fisheries and Oceans. After seeing Mr. Crosbie's specimens, Sam quickly concluded that the mysterious beasts were "Chinese Mystery Snails" [no kidding; that's their common name], scientifically known as *Cipangopaludina chinensis*.

Rather bulbous, and up to about 60-70 mm tall (the size of a large hen's egg), this notoriously invasive species - native to eastern and southeastern Asia - is the largest freshwater snail found in Canada.

It turned out that, at the time of Mr. Crosbie's discovery, the species had NEVER BEFORE BEEN REPORTED for Newfoundland and Labrador (see the article by McAlpine and others, cited below, under "Further reading"). Indeed, Virginia Lake is STILL its only known "provincial locality".

In November of 1987, I managed to collect a number of empty mystery snail shells from near where the river flows into the SW end of Virginia Lake, about 600 m to the SW of Mr. Crosbie's home; an indication, it seemed, that the species was quite widespread within the water body. The next year, in August of 1988, I, and colleague Ronald G. Noseworthy, carried my canoe to the lake where we were able to retrieve several live snails, plus two additional empty shells, from a metre of water about 90 m SSW of Mr. Crosbie's original collection locality. [All of the above collections now reside in the provincial museum.]

Ever since the 1980s, the Chinese Mystery Snail has apparently thrived in Virginia Lake, although very few people know that it's there!

"End of story", or so I'd thought …

The waterweed

In August of 2016, while wading around in Virginia Lake looking for other things (as I'm wont to do!), I stumbled upon a patch of unusual-looking plants, growing underwater, near the shore. After hooking up a few specimens [these, and a more recent collection of the same, are presently destined for the provincial museum], I realized that I was looking at ANOTHER species that had never before been recorded for NL – the Canadian Waterweed (*Elodea canadensis*). It seems that Virginia Lake is FULL of surprises!

For those not familiar with Canadian Waterweed (the name has several variations), it is a rather attractive, trailing, water plant - native to North America - that is commonly used as vegetation in tropical fish aquaria. To learn how to identify this species, see the useful article by Bowmer and others, cited below under "Further reading".

Canadian Waterweed *en masse.*

Where I first found it, the waterweed in Virginia Lake didn't appear to be particularly common. I assumed at the time that one or more of the numerous ducks that habitually frequent the area where the river flows into the lake had probably transported some "bits and pieces" of it to the lake, from elsewhere, and that such "bits and pieces" had managed to take hold, and grow, in that sheltered area.

This was not, at all, a far-fetched idea, since "vegetative reproduction by fragments" is the USUAL form of reproduction for waterweeds. Both male and female plants do occur, but seeds are seldom produced mostly owing to a shortage of either male (most commonly) or female plants. In Europe, for example, only female plants are currently found.

Canadian Waterweed close up.

However, to my great surprise, in August of 2018, while poking further along the Virginia Lake shoreline, I discovered that the lake's waterweed population was actually much larger than I'd ever imagined it to be. In fact, I found quite impressive masses of the plant drifted thickly up against the shore, in a number of places. Moreover, I found that the waterweeds co-occurred with mystery snails in these places!

While I haven't put my canoe back in the lake since 1988, I suspect that the waterweed is now pretty widely-established there.

The question

Back to the title of this article: "How do species get to where they are?"

In the case of the Chinese Mystery Snail and the Canadian Waterweed in Virginia Lake, we don't actually know. However, we can certainly speculate.

A possible answer

Ever since the first discovery of the Chinese Mystery Snail in Virginia Lake, I, along with Sam, often wondered if, sometime in the past, someone had dumped out the contents of a no-longer-wanted tropical fish aquarium into the lake. As it turns out, mystery snails (of various species) are also very commonly used in tropical fish aquaria, primarily because of their talent for cleaning algae from the inside surfaces of the glass.

Interestingly, while being interviewed by Sam, back in 1987, Andrew Crosbie said that he didn't know of any such aquarium-related event. Similarly, John Crosbie, who also used to reside on the shores of Virginia Lake, told me, a few years ago, that he had "no clue" about how the snails might have gotten into the lake and, in fact, he had never actually seen the little "creatures" there.

Nonetheless, TWO possibly aquarium-associated species, occurring together, in only ONE lake in an entire Province (as far as we know), seems to be more than just a coincidence.

Keep looking in ponds!

Further reading -

Bowmer, K. H., S.W.L. Jacobs, and G. R. Sainty. 1995. Identification, Biology and management of *Elodea canadensis*, Hydrocharitaceae. Journal of Aquatic Plant Management 33: 13-19.

http://www.reabic.net/publ/Bowmer_et%20al_1995_Elodea%20canadensis.pdf

Kingsbury, S., M. Fong, D.F. McAlpine and L. Campbell. 2021. Assessing the probable distribution of the potentially invasive Chinese mystery snail, *Cipangopaludina chinensis*, in Nova Scotia using a random forest model approach. Aquatic Invasions 16(1): 167–185. https://www.reabic.net/aquaticinvasions/2021/AI_2021_Kingsbury_etal.pdf

McAlpine, D.F., D.A.W. Lepitzki, F.W. Schueler, F.J.T. Alpine, A. Hebda, R.G. Forsyth, A. Nicolai, J.E. Maunder, and R.G. Noseworthy. 2016. Occurrence of the Chinese mystery snail, *Cipangopaludina chinensis* (Gray, 1834) (Mollusca: Viviparidae) in the Saint John River system, New Brunswick, with review of status in Atlantic Canada. BioInvasions Records 5: 149–154.https://www.reabic.net/journals/bir/2016/3/BIR_2016_McAlpine_etal.pdf

{*In the early 1970s we lived for five years in a house in Gleneyre St that backed onto Virginia Lake through a fairly wide buffer of forest – now known as Carrick Drive! It wasn't us, but any one of our neighbours could have easily contributed these species to the lake's fauna and flora.*

Also, when I was even younger and living in Salisbury, England, Canadian Pondweed (as we called it) was very common in the slower moving streams around the city – it's considered invasive there these days. I can remember gathering it to put into my jam-jar aquaria. It was supposed to oxygenate the water, but even then the minnows didn't last long. - Ed.}

Botany in the time of Covid. *Continued from p.30:-*

"Why bother with writing sponge-cake prose, then?" Thatcher asked. "You've said the professional journals pay more. You have so many questions of science to pursue. With Charles Darwin and Asa Gray as colleagues."

Mary frowned into the cedars. "It has to be done," she said at last. "Most people look at a forest and say, 'Here are trees, and there is dirt.' They will see nothing of interest unless someone takes them by the hand. I am astonished at how little most people can manage to see."

I have similar thoughts when walking down by Rennies River looking at the wide variety of plants I pass. I realise that my co-exercisers see nothing but trees and weeds and probably can't put a name to any of them!

Of course the man-created city habitat is quite foreign to most of our native plants, but you can find them beside the streams and ponds that haven't yet been culverted or paved over. There are also a few tiny refuges that, for one reason or other, have not yet been developed. That doesn't mean that the city streets are devoid of interest though, we have a large collection of urban dwellers that as Bill Hay, our regular visitor from Scotland a few years ago, pointed out are more or less the same as those in any city with a temperate climate. Our Society's forays into the down-town streets have generated a list of at least 150 species, almost all aliens. Even the lawn in front of my condo has some 25 different "weeds" growing in it – including wild strawberries.

Next time you go out, look at the side-walk cracks and the curbside, there is probably something green growing there. If you look closely, you may see two or three different kinds of leaves and in the summer some tiny flowers. Each one of those is a different species with its own name. Do you know what they are though?

What about those "rare" city plants that I mentioned earlier? I'll use my pictures of them to fill a few more blank spaces in this issue.

Avalon rarities 1. Scarlet Pimpernel, *Anagalis arvensis.*

Discovered in 2020 by Catherine Barrett by the roadside near her home on Donovan's Rd, The Goulds. This small patch reappeared this year in the same spot. It's an annual so it has reseeded itself. You can see a seed capsule forming on the left near the top. The tiny scarlet flowers are about 5 mm across and only open on warm sunny days. This is the only location currently known in Newfoundland, but it has been recorded once before at St Catherines, St Mary's Bay. One of the delights of my childhood in Wiltshire. There is also a rare blue form.

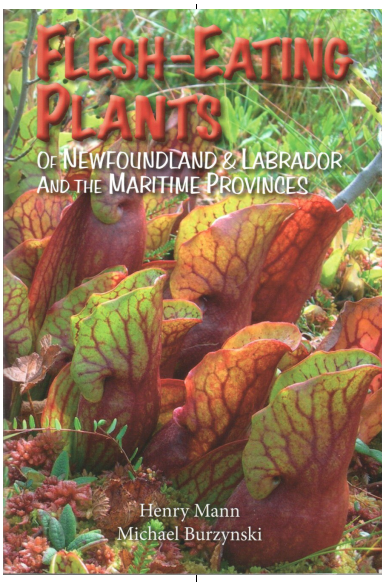
Continued on p. 38

Flesh-Eating Plants, by Henry Mann and Michael Burzynski.

A review by Howard Clase.

Flesh-eating Plants of Newfoundland and the Atlantic Provinces, Henry Mann & Michael Burzynski, Gros Morne Co-operating Association, 2018.

Carnivorous plants, like dinosaurs, fascinate many children, and for some people the fascination never diminishes with age. Members who know him will have realised that Henry is one of these people, they are never just another plant to him. One memorable event on our long field trips was when he showed us some short videos of bladderworts catching daphnia in their bladders with a loud “pop”.



This book is an excellent account of the 15 carnivorous plant species in four families that we have in Newfoundland. It will appeal to the interested amateur and serious botanist alike. Don't be deterred by the use of some botanical terms such as cleistogamous[2], they are explained in glossary at the end.

By adding the four additional species found in the Maritimes it actually extends its coverage to all of the carnivorous plants known in Canada and the neighbouring territories of Greenland and St Pierre et Miquelon. There are of course more species in the warmer parts of the US, including one of Darwin's favourite plants, the Venus Fly-Trap. In parts of the world other than Newfoundland this would be the carnivorous species that most people have heard of, here of course, it's the Pitcher Plant. I'm surprised, though, that so many Townies think that this is a rare, protected plant and have never seen one in the wild. Not true of course, it's common in suitable habitats and there are plenty of those all over the Island, and, while it's not recommended to dig one up, it's not actually illegal. Just for completion a short account of the Venus Fly-Trap is included in an appendix: I was surprised to learn that its natural wild range is limited to the Carolinas in the US and also that it's in the same family as the sundews.

Inside its rather garish cover you will find well illustrated and fairly detailed accounts or each species and also of two hybrids that are frequently found here. Most people know the Pitcher Plant and many are familiar with the Sundew, even if they are surprised to discover that there are several species, only two of which are common The scarcity of the Common Butterwort means that most people will not have met one, even though it is found all over the Island. It is a little different from the other species in that it prefers a wet gravelly habitat rather than a really boggy or waterlogged one. It is my favourite of our carnivorous plants with its purple flowers and bright yellow-green sticky leaves. (I first came across it in Iceland in 1958 while on a student expedition from Cambridge.) On the other hand, it's the invisibility of the most of the 10 species plus one hybrid of bladderwort rather than their scarcity that makes them little known. They mostly live under water or in mud and, with one exception, rarely flower. The Horned Bladderwort, *Utricularia cornuta,* is the odd one out, it flowers prolifically, but its yellow flowers appear in the same habitat as many orchids, and the casual observer may, as some early botanists did, mistake it for a yellow orchid.

There is a chapter devoted to each plant, beginning with a description concentrating on the diagnostic features that distinguish it from its most similar relatives, and a distribution map by province and country only. If you want to know the distribution within a particular province there is a verbal outline, but for more details you will have to look elsewhere.

The strength of the book, however, is in the copious illustrations – both excellent photos and botanical drawings. These show far more botanical detail that could be ever covered in words alone.

After the species by species account of the individual plants there is a series of short chapters on related topics. It begins with a discussion on whether some plants that catch insects on sticky hairs on their stems may be on the way to evolving into carnivory. One of these, Sticky False Asphodel *Triantha glutinosa* is a very

2 Cleistogamous comes from ancient Greek meaning “closed or secret marriage”. It refers to plants that self pollinate within closed buds and set seeds without the flowers ever opening.

close relative of *Triantha occidentalis,* which has very recently (since the publication of this book) been shown to produce the enzymes needed to digest its victims. Following this are a chapter on conservation and one on the all important botanical skill of using a hand lens - particularly useful for this group of plants.

All in all it's a must buy for anyone interested in wild carnivorous plants. Henry and Michael are to be congratulated in putting it together so expertly. One word of warning though, be very careful if you take it into the field with you. I know from experience that books printed on this type of glossy paper do not take well to getting wet – the pages stick together. When will publishers start using waterproof paper? You can buy waterproof field note books, but not, as far as I know, waterproof field guides. And, if you switch to electronic sources of information, those device do not stand up well to water either!

I'm afraid that, as with all books with a fairly limited market, the price is rather high, Amazon lists it at $35, but Henry tells me that the Gros Morne Co-op sells it at less than this – there is no price on their web site.

Avalon Rarities 2. Lawn Daisy, *Bellis perennis.*

One Saturday morning, when turning off Stavanger Drive to meet some friends in The Second Cup I noticed a white patch on the verge outside Montana's. When I went to investigate I found another childhood memory. These daisies grow in profusion on most English lawns, but in Newfoundland I have only seen them in Corner Brook previously – although there is an old record from The St John's area. The flowers are only 15 - 20 mm across, much smaller than the more familiar Oxe-eye or Scentless Mayweed daisies. The leaf rosette fans out low, well clear of any mower blades and the flowers are quickly replenished. It spreads readily by division as well as seed.

Avalon Rarities 3. Hairy Galinsoga, *Galinsoga quadriradiata.*

This scrawny little plant with flowers only about 4 mm across is our smallest daisy. Hailing originally from S. America, it probably arrived here via Europe where it is a frequent city weed. It's established in all other Canadian Provinces, but apparently not here. I first noticed it behind the now demolished Dominion Store in Churchill Square. But it has managed to hang on in two nearby locations: this one, by a parking sign in the Square, and another on the far side of the Aliant building. It seems to like growing in cracks in concrete!

Avalon Rarities 4. Dwarf Scouring-Rush. *Equisetum scirpoides.*

Another scrawny little plant with only one known spot on the Avalon, but native in the more basic areas of the West. (I first came across it on a trail near the Glynmill Inn in Corner Brook.) And we do know exactly how this one got here. In the early days of The MUN Botanical Garden, Lundigans brought over a load of limestone from the west for the construction of the Limestone Garden. This plant must have stowed away in the load, but no-one noticed it until July 2006 when I took this picture showing the fruiting cones. It's still there on the left of the path as you walk up to the top – but there's no label as it's an undocumented resident.

Avalon Rarities 5. Spotted Coralroot, *Corallorhiza maculata.* →

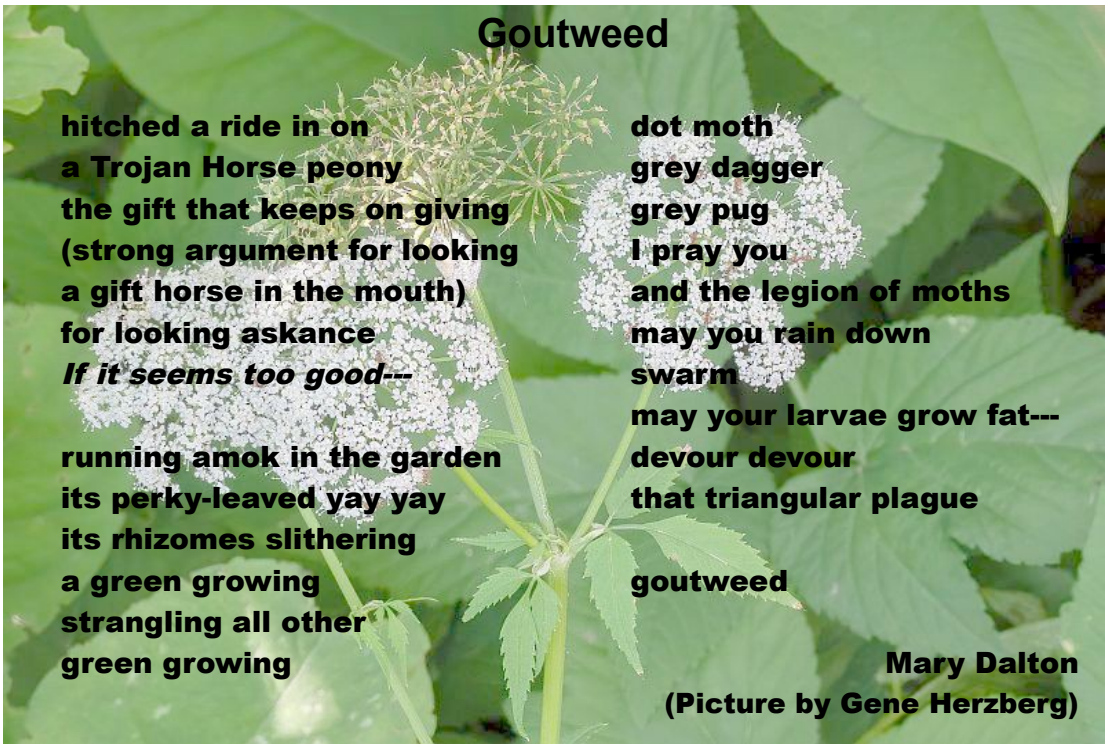
Also in the Botanical Garden, but this time occurring naturally in the wild part of the garden. This orchid has only been reported for a few other locations on the Avalon, but it's very difficult to find as it tends to grow in fairly dark spots, has no leaves and only flowers for a few weeks once every few years. Like the more familiar Ghost Pipes, *Monotropa uniflora,* it is saprophytic. That is that it gets all its nutrients, with the help of a fungus from decaying material in the soil. The only reason it shows itself above ground is to flower and spread its seeds. There is a colony of perhaps 20 or 30 plants at the highest point of Trail 1 (The Yetman Trail) just beyond the point at which it turns down again. Since each plant only flowers rarely, there may be only one or two flower spikes each year. I have only once seen as many as 20. However the dead spikes from last year are often still standing in July when the new ones appear.

Avalon Rarities 6. Water Horsetail, Equisetum fluviatile.

This is the tallest of our 10 horsetails, (eight species and two hybrids) and not the rarest, but there is room to squeeze it in and I only know of one location within the city where it's easy to find it – there's a large patch at the west end of Kents Pond right by the trail. It can be over 1 m tall. This picture was taken in mid-June 2020 when the stems were still immature. By July they would have put out side branches up to 15 cm long and be capped by relatively small fruiting cones.

Horsetails are known scouring rushes because they contain a lot of silica and are quite abrasive. They were used for scouring pots in the kitchen before similar proprietary products became available.

And, lastly, not a rarity – unfortunately:



Index of Scientific Names to Volume 23.

Sarracenia Vols 16 – 23 have been created using OpenOffice Writer.