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FIELD BOTANISTS OF ONTARIO

NEWSLETTER

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President's Message

2018 was a busy year for the FBO. We offered 18 field trips, increased our on-line presence, and the AGM was attended by more members than at any previous AGM - that any board member can remember.

The AGM was held at the Orillia Museum of Art and History. Mark Bisset, executive director of the Couchiching Conservancy, was our key note speaker and he delivered an engaging presentation. The Goldie Award, our award recognizing individuals who have made a significant contribution to field botany in Ontario, was presented to John Semple. Several board changes occurred: Tristan Knight, our webmaster, has also taken on the role of vice-president; I moved from vice-president to president; Gwyneth Govers joins us as a trip coordinator; Mike McMurtry moves from past president to secretary; Dan Westerhof moves from president to past president; and I am sad to say that Bill McIlveen has stepped down as membership coordinator, a role he has held for 28 years. Fortunately, he will carry on as a director and the position is now in the capable hands of Mary Anne Young, our past secretary.

Our on-line presence is growing. We now have 2678 members on our Facebook page, which is overseen by Mary Anne Young. Jessica Consiglio initiated a new FBO Instagram account that currently has 165 followers, and we have a much improved website (www.fieldbotanistsofontario.com) thanks to Tristan Knight. At our last board meeting, we decided to offer on-line membership renewal and trip registration in addition to mailing cheques. Mary Anne and Tristan are leading this initiative and we hope to have it running by the time field trips are announced next year. Also, a reminder that the newsletter is available digitally and/or in hard copy, just let the membership coordinator know your preference when renewing your membership.

The FBO relies on the time and expertise of volunteers. I gratefully acknowledge the contributions of the executive board and all of the trip leaders this year: Andrew Dean, Anne Barbour, Anton Reznicek, Brett Woodman, Dale Leadbeater, Dave Jolly, Gavin Miller, Graham Buck, James Kamstra, Jennifer Doubt, Kyra Howes, Lesley Ng, Leslie Farooq, Lisa Riederer, Mike Oldham, Pat Deacon, Peter Middleton, Steve Varga, Walter Muma, Will Kershaw, and Will Van Hemessen.

Looking forward to another successful season of field trips and workshops in 2019.

Yours in the Outdoors,

Troy McMullin

On the cover: Top: Traversing forested valley slopes in Thomas Tract. Photo: Audrey Heagy.
Bottom: Fern gallery. Photo: Harold Smith.

Sidebar artwork: American Mountain-ash (*Sorbus americana*).

Trip location maps generated using NatGeo Mapmaker software.

The suggested standard source for scientific and common names is the Database of Vascular Plants of Canada (VASCAN): (<http://data.canadensys.net/vascan/search>).

Field Botanists of Ontario website: www.trentu.ca/fbo

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Annual memberships are \$20.00 for individuals and \$25.00 for families. Membership forms can be found on the FBO website above.

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(FBO) is a non-profit organization founded in 1984 for those interested in botany and conservation in Ontario.

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Editor's Note

It is late fall now, but all the stories in this issue take us back, or are relevant to, the springtime. Thus, when forest wildflowers emerge in April and May come next year, remember to refresh your knowledge of one of the most common of them: Blue Cohosh.

Chances are you have been "misidentifying" it all these years: very likely, what you have been calling *Caulophyllum thalictroides* was in fact *C. giganteum*! As reported by Dale Leadbeater and Anne Barbour, these two are now recognized not just as two varieties (or even as a single species - *C. thalictroides*, from the times of Asa Gray in 1848, Fernald in 1950, to Voss and Reznicek in 1985) but as *bona fide* separate species. Differences between them are subtle, but distinct. Just bring your magnifying lens and a small ruler and look closely at their flowers...

Surely you will find the Cohosh at the two locations where FBO held some of its spring trips this year, and which are reported in the articles by Miriam Henriques and Audrey Heagy. Miriam's takes us to the base of Bruce Peninsula, which is where ferns often become the most prominent component of the ground flora. Audrey went to one of the locations that are always floristically rich, situated in the Ausable River valley. We have been going to other sites in the general area for many years, and always came back rewarded by botanical findings.

Enjoy the issue.

Chris Zoladeski

Field Trip Reports

West Rocks rocks with ferns

23 June, 2018

By Miriam Henriques

After meeting at a local Tim Horton's in Owen Sound we set out with Leanne Wallis as our group leader. She very generously had volunteered to replace Peter Middleton who had recently injured his knee. Always prepared, Peter sent along copies of his extensive "Ferns of West Rocks" list. Our mission was to locate the 27 species he compiled for the areas above, on and below this part of the escarpment.

We headed off into the upland forest, part of the West Rocks Conservation Area, walking along a hydro right-of-way. Bracken Fern (*Pteridium aquilinum*) grew beside the open path, obviously doing fairly well in the dry sunny area. Cautionary advice was shared about the danger of eating their fiddle heads. Toxicity was also a problem for cattle as large quantities could potentially cause stomach ailments.

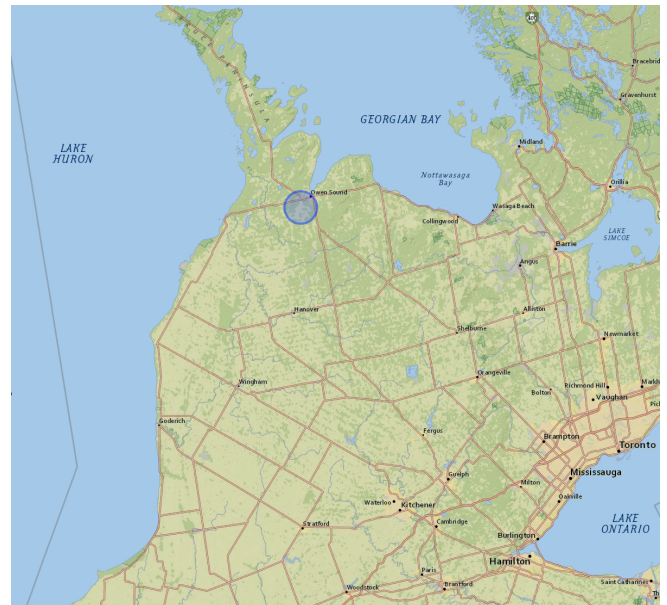
We soon found Northern Holly Fern (*Polystichum lonchitis*) tucked in beside some rocks. Although in the same genus as the Christmas Fern (*Polystichum acrostichoides*), it is more compact, with narrower, shiny dark green and leathery-looking blades with small spines.

The Christmas Fern, one of the more robust and upright evergreen ferns, grew a little

farther along the way. Two interesting details noted were the Christmas stocking shaped pinnae and the more erect, taller fertile fronds on which only the upper portion is fertile and totally covered by sori, while the lower portion is entirely sterile.

Close by were some Marginal Wood Ferns (*Dryopteris marginalis*) growing in individual clumps, the fronds of which are widest at the base, tapering to a point at its tip. Sensitive Fern (*Onoclea sensibilis*) grew happily in one of the wet areas. It was noted that this species really does not resemble other ferns and is so called 'sensitive' because it succumbs to the first frost.

Members began drifting off, scouting areas around the trail and up the slope, all the while being careful to avoid the deep crevices and slippery rock faces.



Rattlesnake Fern (*Botrypus virginianum*), so called because of the rattlesnake tail look-alike that appears at the top of a slender stalk rising above a sterile blade, was soon spotted. The sporophore was also described as grape like.

Stepping through a rather sloped and rock exposed area with an array of Hart's Tongue Ferns (*Asplenium scolopendrium*),



Leanne Wallis explaining ferns. Photo: H. Smith.

necessitated increased vigilance by our group. Although not particularly rare to this area, this fern is considered of Special Concern in Ontario and Canada. It was noted that, when transplanted, it might be fine for 2 – 3 years but does not survive beyond that. The Maidenhair Spleenwort (*Asplenium trichomanes*) also thrived in the deep limestone crevices.

Maidenhair Ferns (*Adiantum pedatum*) were seen growing in a number of areas in and around the pathways, and were always much admired for the delicate and exquisite beauty of their fronds.

Common Polypody (*Polypodium virginianum*) had not been included in the initial list, but checked off just the same. It is a fairly common fern, widely spreading and creeping on rocky surfaces. Blades are dark green on both sides and quite leathery.

Correctly identifying some of the wood ferns presented challenges, initiated discussions and learning opportunities for all. Various field

guides were consulted and information compared. The fact that some ferns hybridize complicated this whole process.

Spinulose Wood Fern (*Dryopteris carthusiana*) presented with a somewhat lacy and more yellow-green look. Its long pinnae tended to be angled upward. The Intermediate Wood Fern (*Dryopteris intermedia*) had a similar lacy look; its pinnae extend out at right angles to the rachis but in the same plane. It is also fully evergreen.

Male Fern (*Dryopteris filix-mas*), one of the taller ferns, has pinnae that are narrow and long pointed. It was noted that there were two kinds of light brown scales on a fairly short stipe - one broad and one hair like.

Of the Crested Shield Wood Fern (*Dryopteris cristata*), it was noted that the individual pinnae are triangular in shape, and also similar to open venetian blinds (i.e., widely spaced and tilting upward towards the light).

One of our largest species is the Goldie's Fern (*Dryopteris goldiana*), with its broad arching fronds. Both the pinnae and the blade are broad and taper abruptly to a pointed tip.



Rock garden of Hart's Tongue and Christmas Ferns. Photo: H. Smith.

Northern Lady Fern (*Athyrium filix-femina*) was noted to have black hairy "legs" with a soft lacy and delicate overall appearance. The two bottom pinnae point down. The tallest frond is fertile with sori that are horseshoe or boomerang shaped.

The identity of the Cinnamon Fern (*Osmundastrum cinnamomeum*) again initiated discussion, as it also has similarities to the Interrupted



Maidenhair Spleenwort. Photo: H. Smith.

Fern (*Osmunda claytoniana*). I'm not sure a conclusive decision was ever reached by the group.

Eventually, we came into the upper area, also part of the Bruce Trail, with a fairly steep drop off. Although it had been a productive morning, we had in fact only covered about 1/5 of the trail at that point. Stomachs were beginning to grumble. It was 12:45 and definitely time to head back to the cars for a quick lunch.

After lunch, the group drove out to the Grey Sauble Conservation Authority headquarters to access the mixed bottomland forested area below the escarpment, where it was noticeably darker under the trees. A stream ran fairly close to first part of the path. A number of ferns that had previously been identified were again seen and noted.

Ostrich Ferns (*Matteuccia struthiopteris*) were easy to distinguish, especially as they grew quite tall in a circular pattern. The blades were sterile and paddle shaped, broadest near the top abruptly ending in a point. Later in the season, a separate fertile stalk would be seen. It was noted that their fiddle heads were edible and not to be confused with Bracken ferns.

The Clinton Wood Fern (*Dryopteris clintoniana*) specimen also warranted careful examination and discussion as it appeared to be a hybrid between the Crested Wood Fern and possibly a Goldie's Fern.

Oak Fern (*Gymnocarpium dryopteris*) as well as Fragile Fern (*Cystopteris fragilis*) were found growing as expected in the moist shady habitat.

The Silvery Glade Fern (*Deparia acrostichoides*) was a special find that day as it is not often seen. Noted were the silvery hairs and pale

sheen on the fronds as well as the silvery coloured sori in a herringbone pattern.

Although checking and finding no bulblets on the Bulblet Fern (*Cystopteris bulbifera*), a number of "babies" were seen around the base of the plant.

New York Fern (*Thelypteris noveboracensis*) and Royal Fern (*Osmunda regalis*) were located growing near to the stream on the way back along the path.

At the end of the day numbers were tallied. Twenty three of the ferns on Peter's list had been successfully located, as well as two additional species (Rattlesnake Fern and Common Polypody) not so listed. Only four were not checked off, primarily due to lack of time (i.e., Ebony Spleenwort, Smooth Cliffbrake, Green Spleenwort and Slender Cliffbrake). Some of the wood ferns along their hybrids, had presented us with identification challenges, especially the "cinnamon ferns".

Along the way, the group had also stopped to check out Scouring Rush (*Equisetum hyemale*), Meadow Horsetail (*Equisetum pratense*), Canada Waterleaf (*Hydrophyllum canadense*), a stunning display of the fungus Hemlock varnish shelf (*Ganoderma tsugae*), as well as lush specimens of various woodland plants.

Even with the possibility of rain, the day had remained overcast and dry. At the end of the trip there was the feeling of accomplishment and time well spent. Leanne who had led the group with Peter's list and instructions in hand, had done an amazing job. Her efforts were much appreciated. *

Botanizing in Thomas Tract on the Ausable River

10 June, 2018

By Audrey Heagy

On June 10th, 2018 Andrew Dean, Brett Woodman and Pat Deacon led an FBO outing to a property on the Ausable River on the western edge of Middlesex County. The 108-acre Thomas Tract" property is owned by Scouts Canada and managed as a conservation reserve, with help from Lambton Wildlife. This parcel is across the road from Scouts Canada's main 240-acre Camp Sylvan property.

prescribed burns. The prairie plantings were last burned in spring 2015 as a burn planned for spring 2018 did not happen.

The prairie habitat species included characteristic prairie grasses such as Big Bluestem (*Andropogon gerardii*), Little Bluestem (*Schizachyrium scoparium*), Indian Grass (*Sorghastrum nutans*) and Switchgrass (*Panicum virgatum*) and forbs such as Butterflyweed (*Asclepias tuberosa*), Showy Tick-trefoil (*Desmodium canadense*), Rounded-headed Bushclover (*Lespedeza capitata*), and Tower Mustard (*Taraxacum officinale*); the latter was one of the few prairie species already in flower. The presence of species such as Cup Plant (*Silphium perfoliatum*) and Gray-headed Prairie Coneflower (*Ratibida pinnata*) is indicative of the cultural origin of the habitat as these species are very rare in Middlesex but are often included in prairie seed mixes. It was less clear whether a young Chinquapin Oak (*Quercus muehlenbergii*) observed near the edge of the field was part of the prairie planting or of natural origin.

Once we entered the woods along the top of the valley slope we were clearly into a much more natural habitat consisting of a mature deciduous forest with a high diversity of tree species. There was some Ebony Spleenwort (*Asplenium platyneuron*) by the trail. Although the property wasn't overly "ferny", we did tally at least a dozen species.

The trip leaders identified some 20 sedge species, including Muskingum Sedge (*Carex muskingumensis*), Gray's Sedge (*Carex grayii*) and Drooping Sedge (*Carex prasina*). As usual on FBO trips,



The Thomas Tract is within the provincially significant Ausable River Valley Life Science Area of Natural and Scientific Interest (ANSI). Other properties in this ANSI include Joany's Woods (Thames Talbot Land Trust), Rock Glen Conservation Area (best known for its Devonian fossils), the Mystery Falls tract, and other Ausable Bayfield Conservation Authority lands. Many of these other properties were included in extensive surveys of the ANSI by Vivian Brownell in 1984. However, no botanical inventories have been completed on the Scouts Canada property.

The property is situated on the east side of the Ausable River valley and includes a wide riparian lowland area, the extensive valley slope, and the flat tableland. The dozen people in the FBO group traversed the property from the tableland to the river, mostly following a walking trail maintained by Lambton Wildlife.

Two farm fields that were on the tablelands when the property was acquired by Scouts Canada had been planted with tallgrass prairie species many years ago. This created prairie habitat is maintained through periodic



Travellers in valley rim forest. Photo: A. Heagy.



Curious Brett Woodman, Don Campbell and Sarah Mainguy identifying ferns. Photo: A. Heagy.

the leaders took the time to highlight the key identification features and provided tips for distinguishing amongst similar-looking species.

We stopped for a lunch break under a large Red Oak (*Quercus rubra*) that was 108 cm diameter at breast height. We saw several other large trees on the valley slopes including large specimens of American Beech (*Fagus grandifolia*) and Basswood (*Tilia americana*). There were also a few Eastern Flowering Dogwood (*Cornus florida*) on the valley slope, although no large examples. The Tulip-tree (*Liriodendron tulipifera*) were flowering, although the flowers were best seen by looking at the trees across the river valley with binoculars.

After we lunch we explored the riparian forest which covers the extensive bench on the east side of the Ausable River. There were many large Black Walnuts (*Juglans nigra*) present. We came up short on our quest for Green Dragon (*Arisaema dracontium*) but did see Cream Violet (*Viola striata*) in flower. Although it wasn't in flower, there was general agreement that the Joe Pye Weed with a green stem and purple nodes was the rare Purple Joe Pye Weed (*Eutrochium purpureum*).

Back on the edge of the woods in the tablelands, the leaders pointed out an Alder-leaved Buckthorn (*Endotroopsis alnifolia*), a native shrub formerly included in *Rhamnus* that is much less prolific than the introduced buckthorns. Black Maple (*Acer nigrum*) and Common Hackberry (*Celtis occidentalis*) were also present along the valley rim. Pat Deacon pointed out the Ovate Beak Grass (*Diarrhena obovata*), noting its striking appearance, rarity (S1), and unusual scientific name.



Viola striata. Photo: D. Campbell.

A non-botanical highlight for me and others on this trip was hearing and then seeing an Acadian Flycatcher. This species is considered Endangered in Canada as it is restricted to mature forests habitat in southwestern Ontario.

Thanks to Andrew, Brett and Pat for arranging and leading this outing. It was great to be able to explore this section of the Ausable River Valley ANSI and see that it was being well managed. ✨

What's in a name? *The 2016 Cohosh Quest in the City of Kawartha Lakes*

By Dale Leadbeater and Anne Barbour

Photos Anne Barbour and Ellie Larsen

When the City of Kawartha Lakes (CKL) FLORA Project began in 2008, we, as designers of the CKL protocols, were resolved to identify plants to the species level. Greater minds than ours have found this approach to be useful, as the haggling over subspecies, varieties and other horrors goes on. We were content to lump the two *varieties* of Blue Cohosh together as *Caulophyllum thalictroides*, one of the few members of the Barberry Family (*Berberidaceae*) in Ontario. That approach was consistent with Edward Voss in the Michigan Flora (1985), and the Flora of North America acknowledged that most authors use that approach. We blissfully ignored the two varieties.

Publishing, however, is entirely a different animal. Cross-checks to the authorities in 2016 revealed that *Caulophyllum giganteum* (Farwell) Loconte & W.H. Blackwell is now recognized as a species distinct from *Caulophyllum thalictroides* (L.) Michx. by Voss and Reznicek (2012) and by Canadensys (Brouillet et al. 2010+), our primary references for nomenclature. With the writing of “The Flora of CKL” in progress, we had the 2016 spring to revisit the properties where *Caulophyllum* had been recorded to differentiate between *giganteum* and *thalictroides*. We were charmed and fascinated by the results.

In the beginning...

Caulophyllum thalictroides was first described in 1803 in the Flora Boreali-Americana by André Michaux, the French “King’s Botanist” based in New Jersey and later South Carolina. For many years all was well, until Canadian botanist Harold Minshall noticed that some plants flower almost two weeks earlier in the spring. This piqued the interest of another Canadian, William Dore, working out of Ottawa (and famous for “Grasses of Ontario”). Dore suggested in 1964 that the early bloomers are *C. thalictroides* var. *giganteum* and perhaps worthy of elevation to full species.

In 1981 Henry Loconte and Will H. Blackwell, working in Ohio, described *Caulophyllum giganteum*: an earlier-flowering plant with



Caulophyllum giganteum, donated to the Royal Ontario Museum Green Plant Herbarium



First confirmed *Caulophyllum thalictroides* for the Flora Project, now at the Royal Ontario Museum



Caulophyllum giganteum: style greater than 1 mm.



Caulophyllum thalictroides: style less than 1 mm.

fewer, larger flowers, and larger leaves and leaflets. The sepal colour was noted to be “typically purple”. In *The Flora of North America* (1997) Loconte confirmed this treatment and elaborated on the differences. *C. giganteum* is among the earliest of spring flowers to emerge, covered in a waxy bloom and looking like gnarled purple hands spreading their fingers around the deep purple, yellow-anthered flowers. The flowers of *C. thalictroides* prefer to sleep in, flowering two to three weeks later, lack the deep purple and are more likely to be green or yellow. The styles are distinctive, being *less* than 1 mm. He also suggests that *C. thalictroides* is a taller plant than *C. giganteum* which has styles *more* than 1 mm and differences in leaf dissection and size.

Loconte noted that *Caulophyllum thalictroides* is “more northern”. Both species are found in mesic forests (i.e., forests that are not subject to drought). Dore (1964) shows *C. giganteum* with a distribution that overlays the Appalachians extending west (but not as far as the Mississippi) and then north into southern Ontario, up to the Ottawa valley then leaping to Quebec City. *C. thalictroides* is much more widely distributed extending to the edge of the Central Lowlands of the United States and Manitoba, and east to Maine and New Brunswick. In Ontario, it occurs as far as Rainy River District and the Sault Ste. Marie area, (M. Oldham, personal communication,

20 April 2017) but with a more patchy presence in Southern Ontario. McKay and Catling (1979) noted that in Ontario, “the yellowish-green flowered variety (*C. thalictroides*) is less common, occurring mostly in rich river bottoms and limestone forests, whereas the maroon-flowered variety (*C. giganteum*) has a general distribution in southern Ontario outside the Canadian Shield region.” The distribution maps provided by Dore (1964) show records of *C. giganteum* onto the Shield that may indicate a tolerance for acidic soils while reinforcing the limestone affinity for *C. thalictroides*.

If that’s the scoop on a continental basis, what is the situation in CKL? The City straddles “The Land Between”², an area of shallow soil over limestone and the Precambrian Shield, best suited to cattle ranching where there is any soil at all. To the south on deeper glacial soils, intensive farming has removed most of the woodland cover. The forests that remain often conceal wetlands or lands where the soil was too poor even for pasture. In the far north lies the Canadian Shield; in the far south, the Oak Ridges Moraine (ORM). So what species occur in the remnant woodlands of the City of Kawartha Lakes?

The CKL Flora project has documented over 75 records for *Caulophyllum*. In early April 2016, when the first leaves were poking through the forest duff, the landowners for these records were asked to watch for the plant and send us photos if they found it – “crowd-siting” the genus! In the end, 50 properties were revisited (some more than once!) in our quest to sort out the correct identifications.

Why the confusion?

We reviewed 32 plant lists and field guides (marked with * in the references and annotated). Two sources did not list either species. We found that *thalictroides* alone was listed in eleven of them; *giganteum* alone was listed in three of them; and the balance (16) mentioned both species (or at least varieties). Both of the popular field guides, used by many botanists (Peterson and Newcomb) were included in the “*thalictroides* only” group which is not surprising since the species were not differentiated until 1981. Their popularity has served to conceal the revision. One of the sources that lists both species features a stunning photo of *C. giganteum* labelled *C. thalictroides*. Another refers to only *C. thalictroides* but provides photos that are clearly *C. giganteum*. And we had 75 CKL records that could be either species! No one had looked.

On May 18, 2016, Dale and Anne were driving slowly around Eldon Township, checking roadside plants in order to add in common species that had been overlooked. On Sandhill Road, we stopped so

that Anne could check the west side and Dale could check the east side. Dale came back to the car brandishing a *Caulophyllum* leaf with flowers and said: “Look what I found!” It was a small plant, by the standards we were used to seeing with *C. giganteum*, with light green leaves and the light yellow-green flowers. Anne said “Get the rest of it! We need to collect and mount that!” This was our very first ‘cognizant’ experience with *Caulophyllum thalictroides*! (mounted as CKL #1877.)

Meanwhile landowner reports were trickling in. There were no *Caulophyllum* records from the Schomberg Clay Plain in Mariposa and Ops Townships. *Caulophyllum* likes well drained soil; not heavy clay. We were able to confirm *thalictroides* in the former Somerville, Eldon and Fenelon Townships; located in central CKL with deeper soils over limestone. There were no records of *C. thalictroides* from the deep sandy soils of the ORM, nor from the townships where limestone rises to the surface or the Shield in the north. We confirmed 51 records of *C. giganteum* that were more widely distributed from Dalton and Digby at the edge of the shield south to Manvers on the Oak Ridges Moraine. Even with a third of the records unconfirmed, those data appear to confirm the distribution and habitat described by Dore, McKay and Catling including records on the Shield.

It all comes down to the styles. There was a lot of variation in the flowers from the classic deep purple, through purple-green, and greenish-yellow with purple highlights. The character that we found most reliable, was the length of the styles. Our three *C. thalictroides* were all late bloomers. Ellie Larsen, co-author of *Flower Guide for Holiday Weekends in Eastern Canada and Northeastern U.S.A (2005)* and one of our volunteers, measured and photographed the styles. There was a clear difference in the shape and length of the styles, visible with a 10x lens (see figures above).

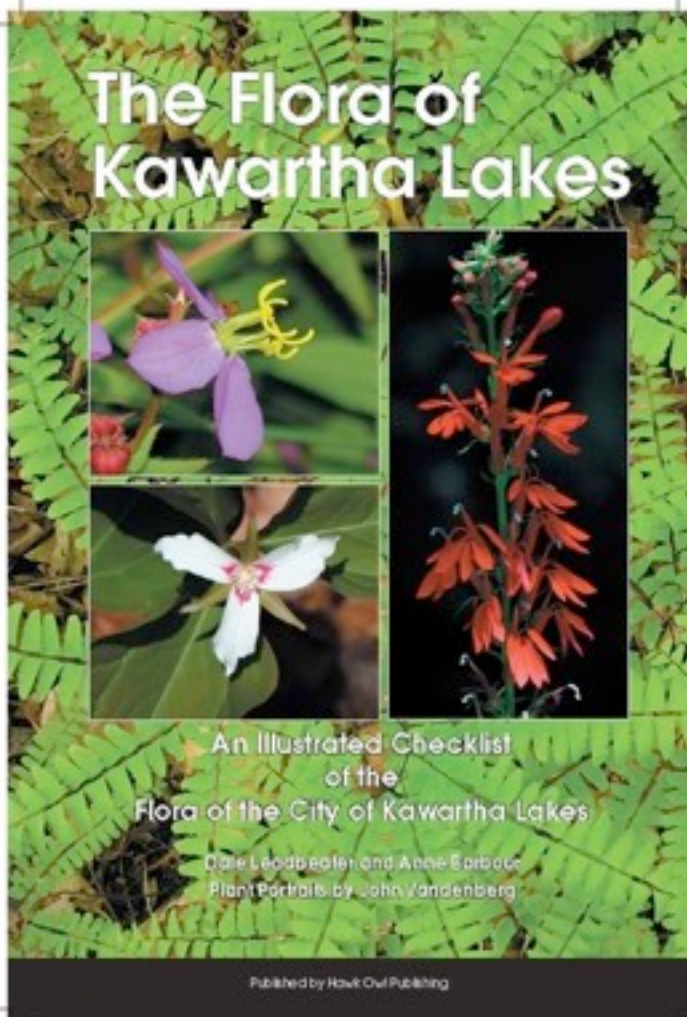
The Field Manual of Michigan Flora (Voss and Reznicek 2012) separates the two species in the key describing each this way:

1. Flowers usually purple or greenish-purple, the first opening with the leaves tightly condensed; style ca. 1–1.5 mm long. *C. giganteum*
1. Flowers yellow, greenish, or yellow lightly tinged with purple, first opening after the leaves are largely expanded; styles ca. 0.1–0.7 mm long. *C. thalictroides*

The hunt continues... ✨

References (* indicates a source reviewed for treatment of *Caulophyllum*) [annotation]

- *Banville, D. 1994. Vascular Plants of Metropolitan Toronto. Toronto Field Naturalists. [This work lists only *C. thalictroides*.]
- *Botham, W., 1981. Plants of Essex County: a preliminary list. Essex Region Conservation Authority. [Wilf writes only about *C. thalictroides*, noting that it was first recorded in Essex County by Dodge in 1914 at Point Pelee and Pelee Island. Wilf noted the flowering times to be “14 April – 23 May”, which would include the earlier flowering dates of *C. giganteum*.]
- *Bowles, R. L., 1996. Checklist of the Flora for Carden Plains Alvar, Carden Township, Victoria County. [This checklist properly listed *C. giganteum* only, for Carden Tp., as our inventories in that township also found.]
- *Brouillet, L., F. Coursol, S.J. Meades, M. Favreau, M. Anions, P. Bélisle & P. Desmet. 2010+. VASCAN, the Database of Vascular Plants of Canada. <http://data.canadensys.net/vascan/> (consulted on 2017-04-17) [Both species are listed.]
- *Brunton, D.F., 1988. Checklist of the Vascular Plants of Algonquin Provincial Park. [Listed “*C. thalictroides* p.pt.” meaning that *C. giganteum* is part of *C. thalictroides* (in other words he recognizes both species, but only *C. giganteum* occurs in the park).]
- *Chambers, B., K. Legasy, Bentley, C.V., 1996. Forest Plants of Central Ontario. Lone Pine Publishing and Queen’s Printer for Ontario. [This guide only discusses *Caulophyllum thalictroides*; no mention of *C. giganteum*.]
- *Confidential, 1997. Flowers of Longford. Toronto, ON. [*Caulophyllum* is noticeably absent from this list of plants from one of the northernmost former townships of the City of Kawartha Lakes, located on the Canadian Shield.]
- *Dickinson, T., D. Metsger, J. Bull, R. Dickinson, 2004. The ROM Field Guide to Wildflowers of Ontario. Royal Ontario Museum and McLelland and Stewart Ltd. [This guide does mention both species *C. thalictroides* and “the earlier flowering *C. giganteum*, which has larger purplish flowers and blooms earlier in the spring”. However, the photo of “emerging leaves and flowers” is misleading, since it is of *C. giganteum*, but placed under the main entry of *C. thalictroides*.]
- *Dore, W. G. 1964. Two Kinds of Blue Cohosh. Ontario Nat. 2(1): 5-9. [First to distinguish between the two as varieties but recommends species recognition. Detailed map of occurrences in Ontario.]
- *FNA Editorial Committee. 1997. Flora of North America north of Mexico. Vol. 3: Magnoliophyta: Magnoliidae and Hammamelidae. Oxford University Press. New York. [Both species are listed.]
- *Gleason, H.A., A. Cronquist. 1991. Manual of Vascular Plants of Northeastern United States and Adjacent Canada. New York Botanical Garden. [Treats *C. thalictroides* with two varieties.]
- *Gould, J., 1985. A Biological Inventory and Evaluation of the Fleetwood Creek Valley in [former] Victoria County Ontario. Ministry of Natural Resources. [This life science inventory listed only *C. thalictroides*. However, in the spring of 2016, investigation by A. Barbour, found only *C. giganteum* growing in the upland deciduous forest of this property.]
- *Jalava, J.V., 2007. Life Science Inventory of Balsam Lake and Indian Point Provincial Parks. Ontario Parks, Central Zone, Huntsville, Ontario. [When discussing the large diversity of herbaceous plants in the deciduous forest, *Caulophyllum thalictroides* is mentioned. Not surprisingly, though, it is *C. giganteum* that is listed in the Vascular Plant list of Appendix A, for both Provincial Parks, noting specifically that D. A. Sutherland had recorded it in 1988 at Balsam Lake Provincial Park while J.V. Jalava reported it from Indian Point.]
- *Kaiser, J., 1983. A Reconnaissance Biological Inventory of Emily Provincial Park. [No *Caulophyllum* listed as habitat is not suitable.]
- *Kaiser, J., 1987. Indian Point Life Science Inventory. In Korol, B. Digital Plant List for Provincial Parks in CKL. [This list includes only *C. thalictroides* at Indian Point Provincial Park.]
- *Kirk, D. 1992. Altberg Southern Shield Nature Reserve: Vegetation Description and Botanical Inventory, a Preliminary Survey. Federation of Ontario Naturalists’ Nature Reserves Committee. [This inventory lists only *C. thalictroides*.]
- *Kirkconnell, W., 1926. Botanical Survey of South Victoria; a local check-list of plants found in the six southern townships of [former] Victoria County, Ontario. Warder Press, Lindsay, ON. [This historical plant list, not surprisingly, only includes *C. thalictroides* as it predates the published split.]
- *Korol, B. 2012. Plant List for Provincial Parks in City of Kawartha Lakes. Queen Elizabeth II Provincial Park. Sutherland, D.A., D.G. Cuddy, J.V. Jalava reports in 1998 for Dalton Tp. [Lists *C. thalictroides* (not *C. giganteum*) for a site largely Precambrian.]
- *Larsen, E.W., B.I. Roots, 2005. Flower Guide for Holiday Weekends in Eastern Canada and Northeastern U.S.A. National Research Council of Canada. [Although the name *Caulophyllum thalictroides* is used, the three photographs showing successive stages of the unfurling plant in spring and its flowers, are *Caulophyllum giganteum*.]
- *Legasy, K., 1995. Forest Plants of Northeastern Ontario. Lone Pine Publishing and Queen’s Printer for Ontario. [No *Caulophyllum* found in the area covered by this field guide.]
- *Loconte, H., 2007. *Caulophyllum* Michaux. Pages 274-275, in “Flora of North America Volume 3” (edited by FNA Editorial Committee). Oxford University Press, Oxford, New York. [Both species are listed confirming the published report from 1981.]
- *Loconte, H., W.H. Blackwell, 1981. A new species of Blue Cohosh (*Caulophyllum*, Berberidaceae) in eastern North America. Phytologia 49: 483. [First published treatment of *C. giganteum*.]
- *McKay, S. M., P. M. Catling, 1979. Trees, Shrubs and Flowers to Know in Ontario. J. M. Dent and Sons. [This detailed out-of-print guide describes the two varieties: “One is early flowering , with dark



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purplish foliage, deep maroon flowers, pointed sepals 6-8 mm long, and styles 1-1.7 mm long. The other blooms later, has lighter-green foliage, pale yellowish-green or pale-yellow flowers, rounded sepals 4-5 mm long, and a short style 0.2-0.6 mm long. The yellowish-green flowered variety is less common, occurring mostly in rich river bottoms and limestone forests, whereas the maroon-flowered variety has a general distribution in southern Ontario outside the Canadian Shield region.”]

*McMurtry, M.J., W.D. Bakowsky, S.R. Brinker, C.D. Jones, M.J. Oldham, D.A. Sutherland, 2008. Life Science Reconnaissance of Selected Sites in The Land Between, Final Report. Natural Heritage Information Centre. [One of the sites included in this report was the Altberg Nature Reserve property, largely Precambrian. McMurtry’s inventory includes both *C. giganteum* and *C. thalictroides*.]

*Michigan Flora Online: A. A. Reznicek, E. G. Voss, & B. S. Walters. University of Michigan. Web. June 16, 2016. <http://michiganflora.net/genus.aspx?id=Caulophyllum>. [Both species are listed.]

*Newcomb, L., 1977. Newcomb’s Wildflower Guide. Little Brown and Co. [Only describes *Caulophyllum thalictroides*.]

Oldham, M.J., Botanist. Personal Communication, 20 April 2017. Ontario Natural Heritage Information Centre, Ontario Ministry of Natural Resources and Forestry.

*Ontario Ministry of Natural Resources. 2001. Natural Heritage Features of the Oak Ridges Moraine. [Only *C. giganteum* listed.]

*Peterson, R.T., M. McKenny, 1996 (1968). A Field Guide to Wildflowers: Northeastern and North-central North America. Houghton Mifflin Co. [This field guide details only *C. thalictroides*. Part of the description “Young plants may have a waxy whitish bloom,” is pertinent to *C. giganteum*.]

*Skelton, E. G., E.W. Skelton, 1990. Haliburton Flora: an annotated list of the vascular plants of the county of Haliburton, Ontario. Royal Ontario Museum. [Only *Caulophyllum thalictroides* (L.) Michaux. for a location that is largely (but not totally) Precambrian.]

*Small, E., P.M. Catling, 1999. Canadian Medical Crops. National Research Council Canada. [Both species are listed with distribution and ethnobotanical notes.]

*Voss, E.G., 1985. Michigan Flora: a guide to the identification and occurrence of the native and naturalized seed-plants of the state. Volume 2. Cranbrook Institute of Science Bulletin 59 and University of Michigan Herbarium. [This reference work points out that “there are two rather well-marked varieties of this plant,” repeating the colour description of the flowers and length of the styles. Voss explains that “Loconte even recognizes *C. giganteum* as a distinct species—as was earlier suggested by Dore.”]

*Voss, E.G., A.A. Reznicek, 2012. Field Manual of Michigan Flora. University of Michigan Press. [Both species are listed.]

ERRATUM

Our apologies to Mike Oldham and Jessica Consiglio for an error in their article on Autumn Coralroot, which appeared in the Summer 2018 Newsletter. A figure on page 5 got inadvertently reversed. Electronic copy members received the corrected version after the discovery. Recipients of the paper copy are requested to use the Leonardo da Vinci method of de-encryption: the mirror... :)