NYFA New York Flora Association

Mitchelliana

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New York Flora Association Newsletter

Editor's Note: In this issue we have not one, but two articles by Michael Hough - a very useful and timely article on *Spiranthes* identification and a report detailing some *Juniperus* finds in Onondaga County. We also have several field trip reports (and are happy that trips are back in full swing!), and Joe McMullen rounded out the newsletter with interesting bits of information on spring wildflowers. And be sure to take a look at the note from the NYFA Board on page 14 and the annual meeting announcement on page 27.

Articles Inside:

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Spiranthes sheviakii, a new orchid species

by Michael Hough

There are 14 species of *Spiranthes* (ladies' tresses) currently listed in the New York Flora Atlas. Mitchell (1986) initially included *S. casei*, *S. cernua*, *S. lacera* (two varieties), *S. lucida*, *S. ochroleuca*, *S. romanzoffiana*, *S. tuberosa*, and *S. vernalis*. The accepted species remained unchanged in the Atlas as recently as 2016 based on a search of the genus page using the Wayback Machine (web.archive.org).

New species have gradually been discovered or recognized in New York beginning with the discovery of *S. magnicamporum* in 2013 by Dan Brunton in northern New York (Brunton 2015). Two new species, *S. arcisepala* and *S. incurva*, that were previously treated as several different ecotypes of *S. cernua* were described in 2016 by Matthew Pace (Pace & Cameron 2016) and are now known to be rather widely distributed throughout the state. The more narrowly defined *S. cernua* is now thought to only occur in the southern portion of the state near the coastal plain. The discovery of *Spiranthes ovalis* var. *erostellata* was reported shortly after by Steven Daniel and Anne Johnson (Daniel and Johnson 2017), having been found by the authors in St. Lawrence County in 2015, and has since been found in Chautauqua, Onondaga, and Tompkins Counties. Just last year the primarily southern species *S. odorata* was reported to be present in central New York by McMullen et al. (2021), though the population of this species had been known since 2014. That same year Pace (2021) described a new coastal species, *S. bightensis*, that occurred historically in southern NY but no extant populations are currently known.

The most recently described species, *S. sheviakii*, was found while conducting a field and genetic survey of the genus in New York and surrounding states (Hough and Young, 2022). We were interested in identifying and determining the range in New York of three species described by Pace and Cameron: *S. arcisepala*, *S. cernua*, and *S. incurva*. The traits used to tell them apart did not work very well for many plants we observed, so genetic sampling was incorporated into the study to allow for more definitive determinations. Some of the samples, collected near the Great Lakes in New York and Pennsylvania, turned out to represent a taxon that did not match those from previous studies. We described this taxon last year as *S. sheviakii* in honor of Charles Sheviak who recognized this taxon as an ecotype associated with old fields.

Spiranthes Identification

Despite a better current understanding of the genus, identifying many species is still challenging due to their cryptic morphology. To simplify things, we can start by eliminating species that have passed peak bloom by August 15th in New York (Figure 1): *S. lacera* var. *lacera* (northern slender ladies' tresses), *S. lucida* (shining ladies' tresses), and *S. romanzoffiana* (hooded ladies' tresses).

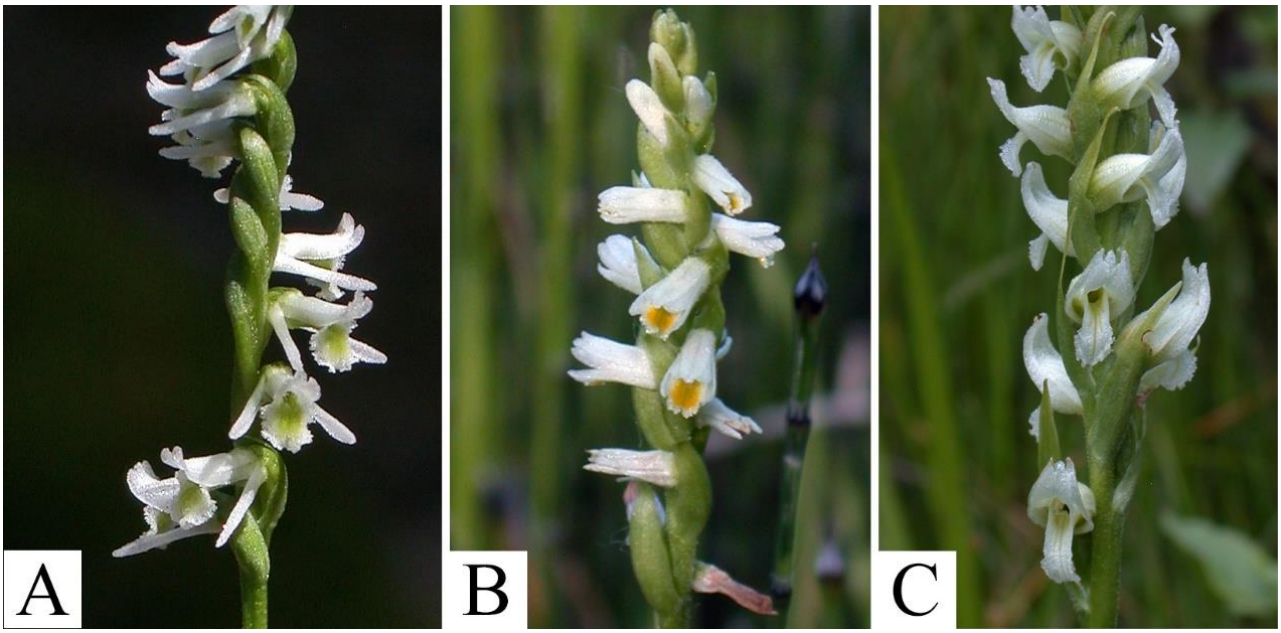

Figure 1. A. *Spiranthes lacera* var. *lacera*. B. *S. lucida*. C. *S. romanzoffiana*.

Two taxa that may still be blooming in southern NY until the beginning of September are *S. vernalis* (grass-leaved ladies' tresses) and *S. lacera* var. *gracilis* (southern slender ladies' tresses). *Spiranthes vernalis* has hairs within the inflorescence (rachis, pedicels, etc.) that are tapered at the tip, while all other species are either hairless or with gland-tipped hairs. *Spiranthes lacera* has flowers in a single rank (5 or more per cycle), a perianth 2.5-5.5 mm long, and a deep green center to the lip; other species with such small flowers in a single rank will have a lip with a white or yellowish center. *Spiranthes lacera* var. *gracilis* has flowers indistinguishable from var. *lacera*, and mainly differs by its slightly later bloom date, southern distribution, and lack of basal leaves at flowering. *Spiranthes tuberosa* (little ladies' tresses) is a diminutive species that has a rachis (axis of the inflorescence) lacking any hairs, and is restricted to the coastal plain in New York.

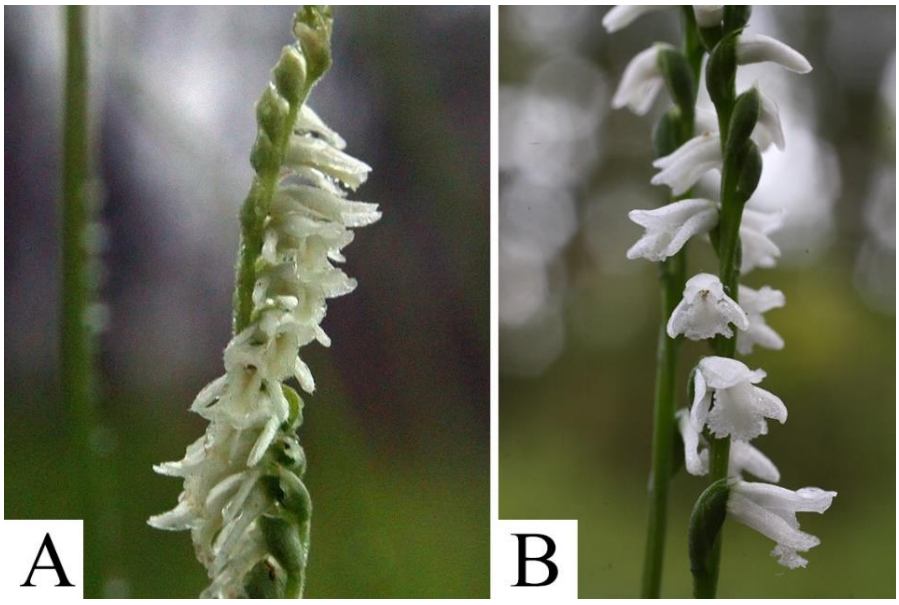

Figure 2. A. *Spiranthes vernalis*. B. *Spiranthes tuberosa* (photo by Charles Ufford).

All other species have at least some glandular hairs on the rachis. With the exception of *S. casei* (Case's ladies' tresses), the remaining species begin flowering after August 15th in New York and usually later. *Spiranthes casei* and *S. ovalis* var. *erostellata* (October ladies' tresses) have the smallest flowers (2.5-5.5 mm long). In *S. casei* var. *casei* the lip is centrally yellowish and the flowers are in a single rank, while in *S. ovalis* var. *erostellata* the lip is white or somewhat greenish and the inflorescence is often multi-ranked.

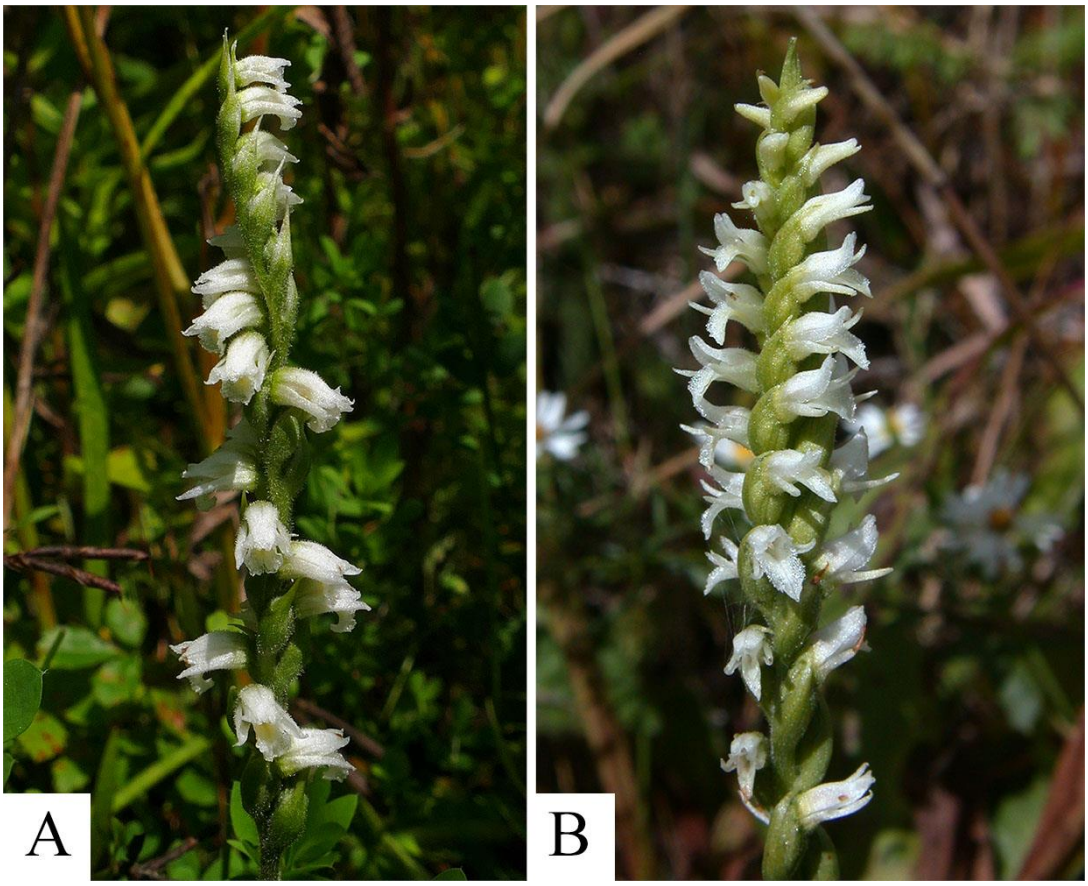

Figure 3. A. *Spiranthes casei* var. *casei*. B. *Spiranthes ovalis* var. *erostellata*.

The taxa that remain have traditionally been treated as a single taxon, the highly variable *S. cernua* in New York. The following species (in addition to *S. casei* and *S. ovalis*) encompass the *Spiranthes cernua* species complex, which includes several allopolyploid species (species derived from ancient hybridization). The allopolyploids are triploid or tetraploid and have seeds that each contain multiple embryos (polyembryonic). A few others are diploid species that have seeds that contain a single embryo (monoembryonic). While a diploid *S. cernua* has not yet been identified, it is likely to have existed at some time in past, serving as a diploid progenitor to some of the allopolyploid species, and may still be extant but has yet to be found.

Spiranthes ochroleuca (yellow ladies' tresses) is one of the diploid species with consistently monoembryonic seeds (Figure 4). It occurs on dry, acid soils that are often silty, rocky, or sandy. It has the yellowest flowers of any of the species, though it is a subtle yellow externally and often overlooked as white, particularly on overcast days. The center of the lip is a deep yellow or yellow-orange; the color is most apparent on the underside of the intact flower. This species has relatively long nectar glands (also called callosities - the two bumps or horns at the base of the lip), and the lateral sepals tend to be relatively low on the flower, sometimes leaving a gap that allows part of the underside of the lip to be seen in profile.

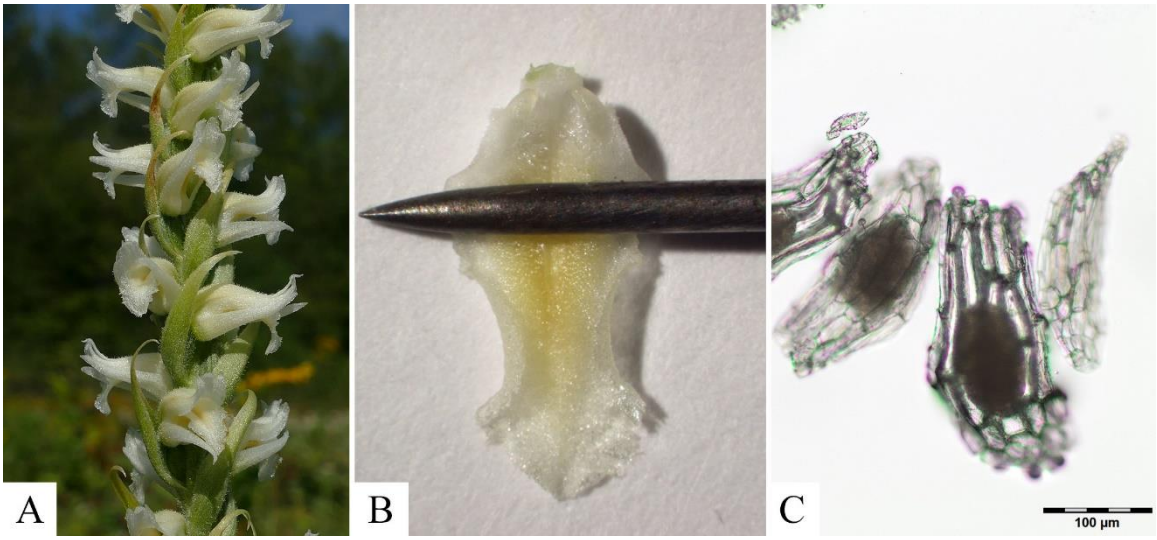

Figure 4. *Spiranthes ochroleuca*. A. Inflorescence. B. Lip showing long nectar glands. C. Monoembryonic seeds.

Spiranthes magnicamporum (Great Plains ladies' tresses) is currently known only from Jefferson and St. Lawrence counties in New York. It is primarily found on alvars (or other calcareous grasslands) and normally lacks basal leaves at flowering. It is a diploid species and usually has monoembryonic seeds. It can be separated from the other species by the presence of a centrally thickened, often yellow or yellow-orange lip, with highly reduced nectar glands at the base. The margin of the lip is relatively thick, while other species (except *S. odorata*) have a lip that is thinner and more lacerate along the margins.

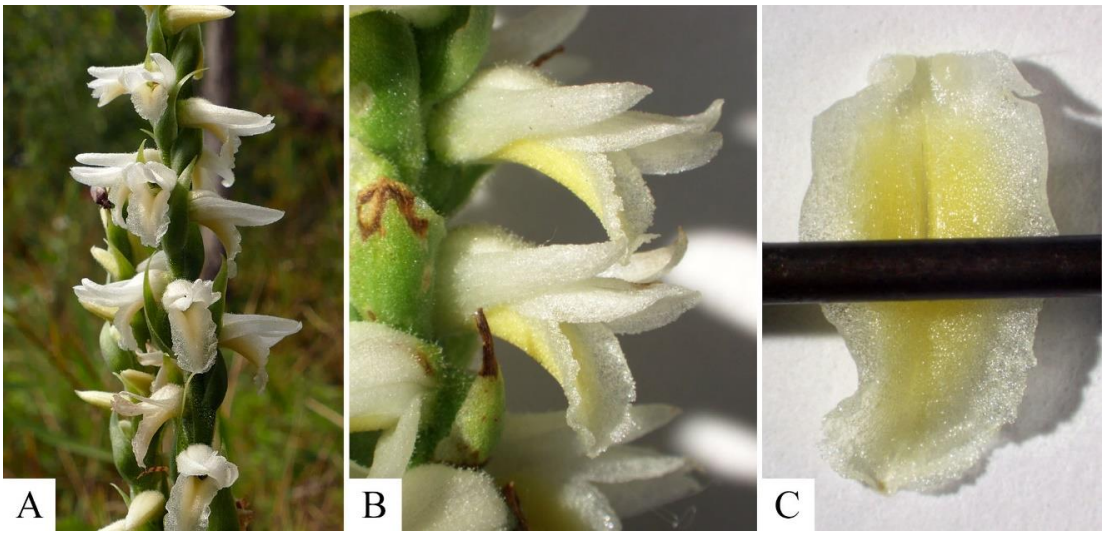

Figure 5. *Spiranthes magnicamporum*. A. Inflorescence. B. Closeup of flowers. C. Lip showing highly reduced nectar glands and relatively thick margin.

Spiranthes odorata (fragrant ladies' tresses) is currently only known from Onondaga County in New York and is found in habitats quite different from other species, mainly bottomland and floodplain swamps. Like *S. magnicamporum*, it is a diploid species with monoembronic seeds with a centrally thickened and yellowish lip. Unlike *S. magnicamporum*, the basal nectar glands are usually well-developed. Large leaves are present at flowering, these are wider than in any other species, and are aerenchymous, allowing them to float during flood events.

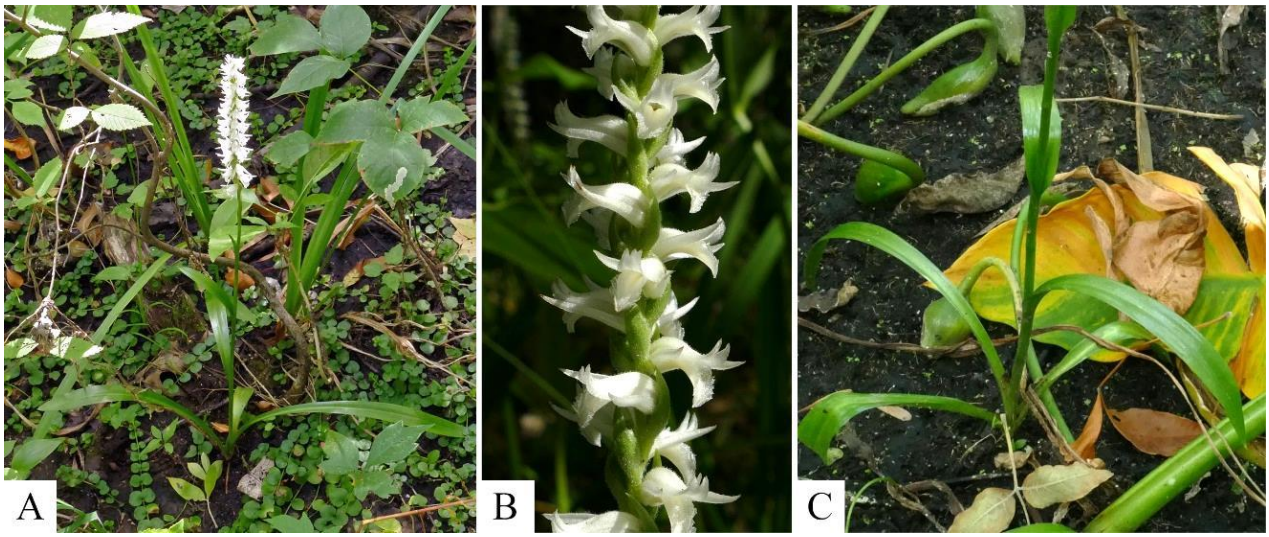

Figure 6. *Spiranthes odorata*. A. Overall habit. B. Inflorescence. C. Basal leaves.

Spiranthes bightensis (Atlantic ladies' tresses), recently described by Pace (2021) and suspected to be a hybrid of *S. cernua* and *S. odorata* by Charles Sheviak (1982), has been collected in New York along the coastal plain on Long Island and the lower Hudson River estuary, but no extant populations are currently known. The cultivar 'Chadds Ford', long sold as either *S. cernua* or *S. odorata*, represents this species. *Spiranthes bightensis* has flowers similar to other species, though it is a more robust plant, and is perhaps best distinguished by its leaf morphology and growth habit which are most similar to *S. odorata*, one of its ancient parents (Figure 7A-C). The lower leaves are often more than 1.4 cm wide and the roots are stoloniferous in both *S. bightensis* and *S. odorata*, however *S. bightensis* is a tetraploid with polyembryonic seeds. All of the remaining species have polyembryonic seeds (Figure 7D), leaves less than 1.4 cm wide, and lack stoloniferous roots.

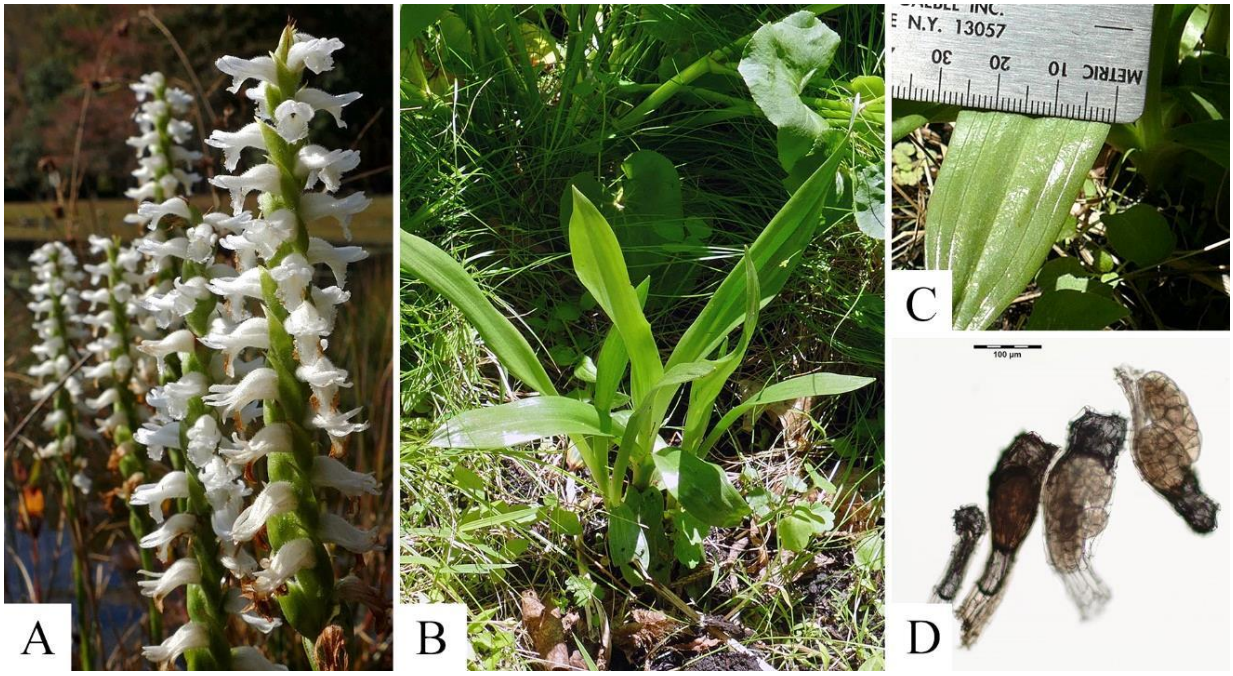

Figure 7. *Spiranthes bightensis*. A. inflorescence. B. Leaves. C. Leaf width. D. Polyembryonic seeds of *S. incurva*, typical of polyploid taxa including *S. bightensis*.

Spiranthes incurva (Sphinx ladies' tresses) is a likely allopolyploid with *S. magnicamporum* as one of the parents. It is one of the earlier species to flower, sometimes with flowers opening as early as mid-August. Like *S. magnicamporum*, the flowers are usually spreading (perpendicular to rachis) or ascending, and often arranged in 3-4 vertical ranks (Figure 8). In other species the flowers are usually somewhat nodding, though sometimes spreading, and not arranged in distinct ranks or occasionally in a single rank. The lip petals of *S. incurva* and *S. arcisepala* tend to be broader at the base than in the remaining species, though in *S. incurva* the lip can also sometimes be extremely narrow and is usually more pointed at the apex.

The floral bracts can be useful for identification of *S. incurva*, and there are two rather distinct forms that are commonly encountered. One form has the bracts spreading or recurved, and green with white margins or almost completely white. The other form has only green bracts but these can be spreading or ascending and curved only at the tips. In both forms the bracts are relatively flat; in other species the bracts are consistently green, more concave, and curve inward from the base.

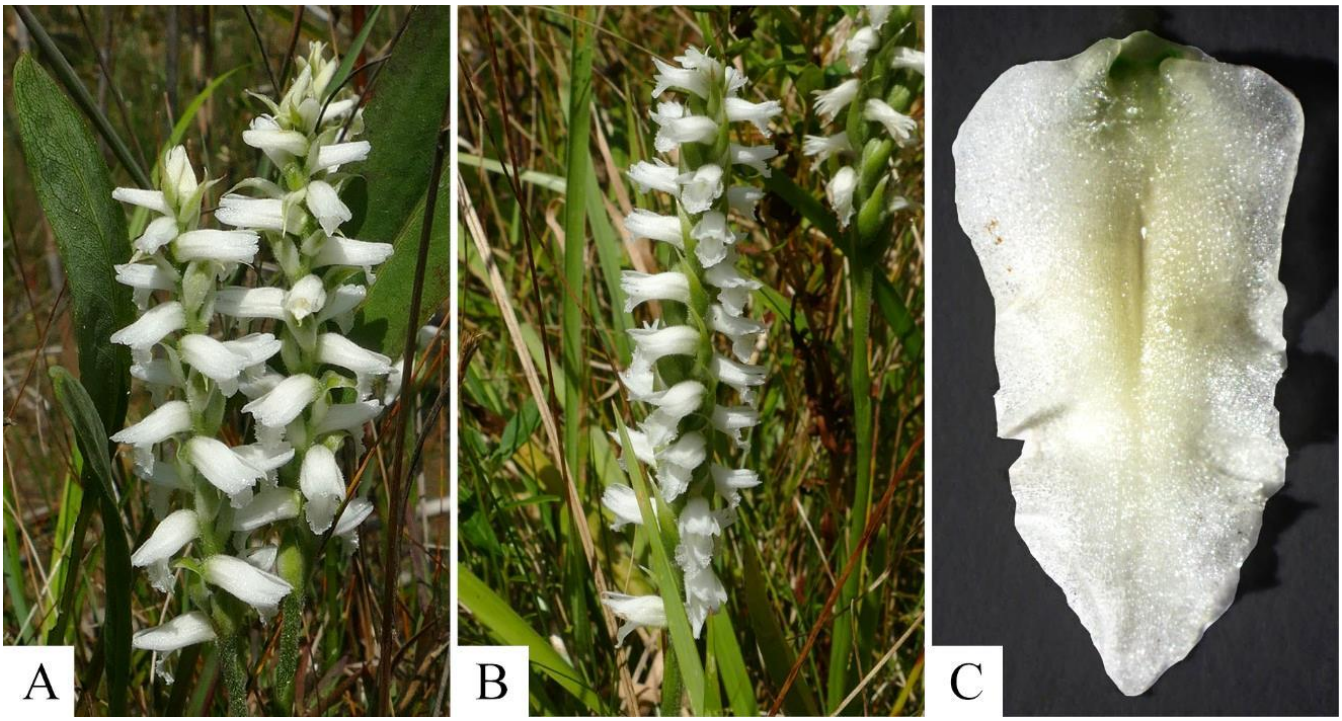

Figure 8. *Spiranthes incurva*. A. Form with recurved and white-margined bracts. B. Form with green, straight and ascending bracts. C. Typical lip shape.

Spiranthes arcisepala (Appalachian ladies' tresses) was named for its lateral sepals, which arc downward in many specimens. However, we identified a number of specimens with straight lateral sepals, and in some populations the presence of downward curving sepals can vary from one plant to the next (Figure 9), and relative abundance of one form or the other can change from one season to the next. The most consistent characteristic we found was a relatively short lip that is rounded at the apex, prominent round glands on the underside of the lip (Figure 10-D), and in general the flowers are shorter and more bell-shaped than in other species. The upper profile of the flower often appears inflated at the base, forming a hump, particularly the flowers in the lower half of the inflorescence. Unlike *S. incurva*, the flowers rarely form distinct ranks within the inflorescence, except in very large plants, and occasionally the inflorescence is single ranked (Figure 9-B).

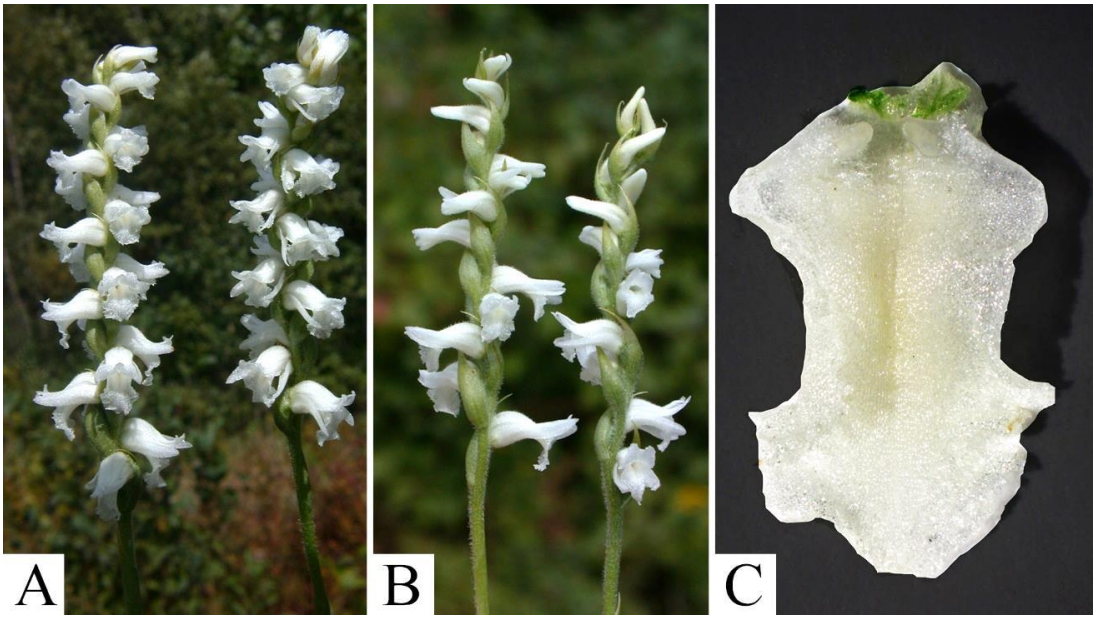

Figure 9. *Spiranthes arcisepala*. A. Examples of plants with straight and downwardly falcate lateral sepals found within one population (genetically confirmed). B. Another population, this one with more slender flowers in a single rank, but also exhibiting both straight and falcate lateral sepals in different individuals (genetically confirmed). C. Typical lip shape.

Spiranthes cernua (nodding ladies' tresses) has a more southern distribution than most other species in the complex and seems to only reach as far north as the Hudson Valley in New York. It is similar to *S. arcisepala* in having flowers that frequently nod, but differs in having relatively slender flowers that are scarcely inflated at the base (Figure 10). While other species often exhibit some yellow on the lip, *S. cernua* has flowers that are frequently pure white with at most a slight yellowish tint restricted to the center of the lip. The lip also tends to be thinner than in other species. A consistent character appears to be obscure flattened glands on the underside of the lip (Figure 10-C), unlike the more prominent spherical ones found on most other species (Figure 10-D). This is a subtle character but should be looked for with a hand lens.

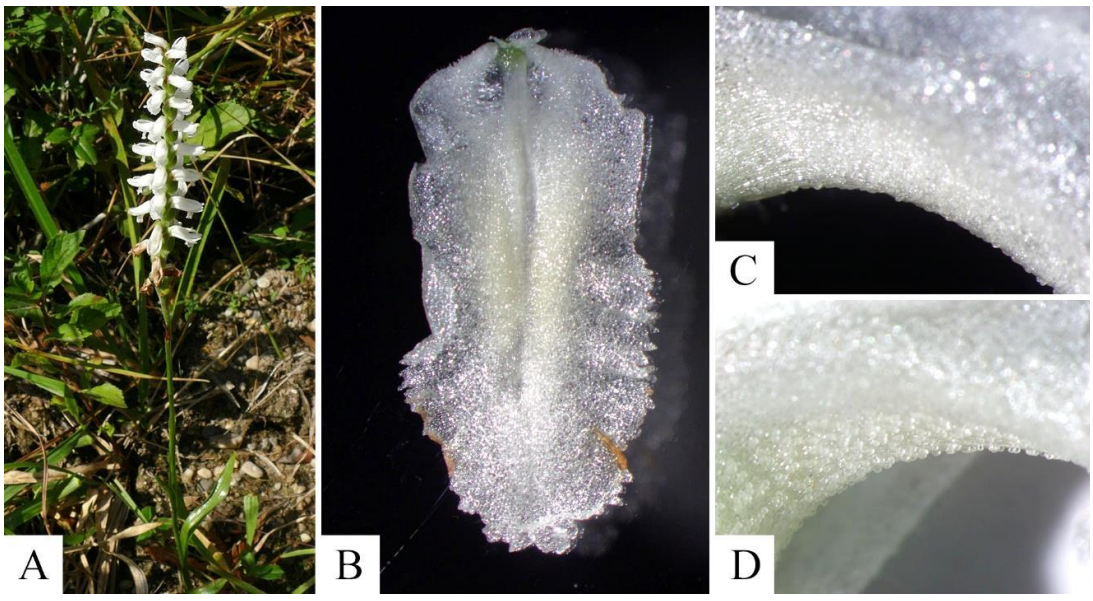

Figure 10. *Spiranthes cernua*. A. Leaves and inflorescence. B. Typical lip shape. C. Underside of lip showing reduced, flattened glands. D. Underside of lip of *S. arcisepala* showing spherical glands for comparison.

Spiranthes sheviakii (old field ladies' tresses) is the most recent member of the genus to be described (Figure 11) and, like *S. arcisepala* and *S. incurva*, genetic analyses played a role in determining its identity. This species was first noticed within a population of *S. ochroleuca* in Onondaga County, and later found near the type location of *S. incurva* on Presque Isle in Erie, Pennsylvania. In New York, it appears to be restricted to sandy soils along the lake plains of Lake Erie and Lake Ontario. The overall shape of the flowers is most similar to those of *S. cernua*, but differs in having more yellow on the lip and the underside of the lip has glands that are more rounded, as in other members of the complex other than *S. cernua*.

In the northern part of its range the leaves often senesce around the time of flowering, similar to *S. magnicamporum*. Like *S. ochroleuca*, it appears to prefer soils that are acidic and rather dry and sandy. A consistent character is that the lateral sepals curve inward at the tips over the top of the flower, a trait also observed in some specimens of *S. cernua* – from a distance the two species look similar.

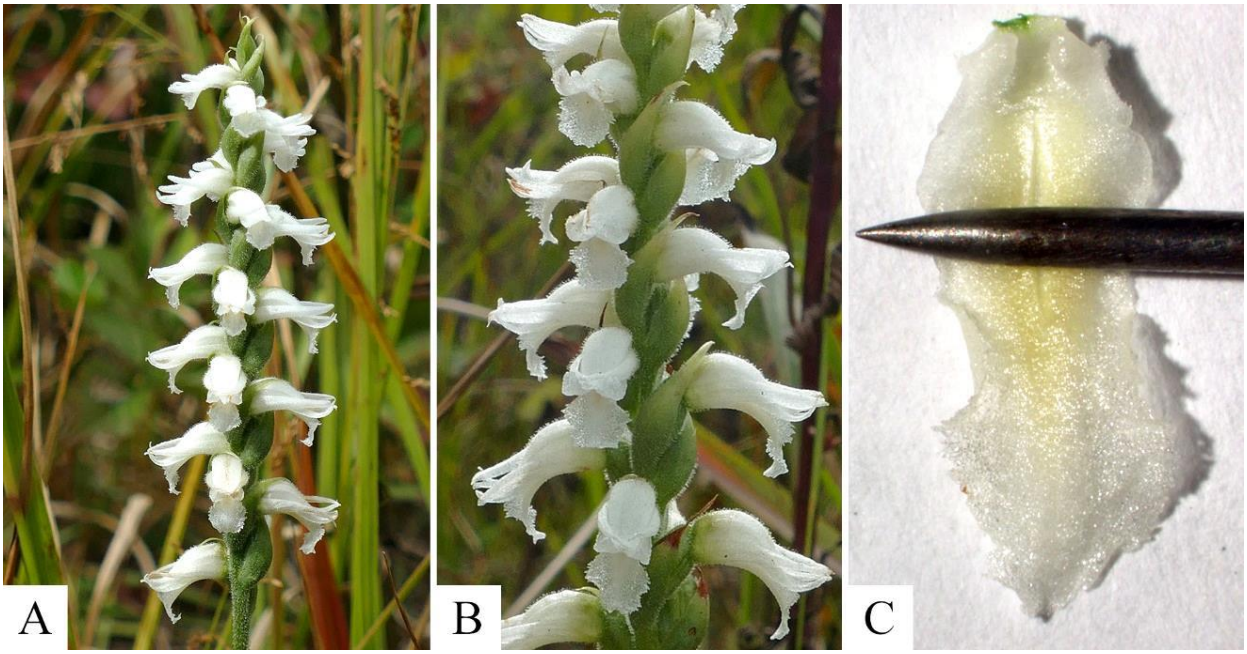

Figure 11. *Spiranthes sheviakii*. A. Inflorescence. B. Flowers. C. Typical lip shape and color.

We named this species to honor Charles J. Sheviak, former Curator of Botany at the New York State Museum, who laid much of the theoretical groundwork for our modern understanding of North American *Spiranthes*. When we compared our specimens to illustrations by Sheviak (1982), we found that they bore a striking similarity to what he called the 'old field ecotype' of *S. cernua* (Figure 12). This ecotype is said to occur on acidic soils in the forested region to the southeast of the prairies in the Midwest. The specific habitat of this ecotype was described as "dry open woodland on bluff crowns and ravine rims.", and as a "a colonizer of old fields undergoing succession to oak-hickory and mixed hardwood-pine forests." (Sheviak 1982). This is similar to many of the locations from our study (dry, successional, acidic) and the description of this ecotype as having characteristics suggesting *S. ochroleuca* influence, being a "calciphobe" with some specimens exhibiting "decidedly yellowish flowers" (Sheviak 1974), matched our observations very closely.

Sheviak (1974) noted that the old-field ecotype (*S. sheviakii*) did not start blooming until "mid-October in the northern portion of its range and late October in the extreme south". At our study site in north-central New York the first species to flower was *S. incurva* in late August, followed by *S. arcisepala* in early September, and these were mostly past anthesis before the peak bloom of *S. ochroleuca* and *S. sheviakii* from mid-September to mid-October with *S. ochroleuca* being the latest to flower.

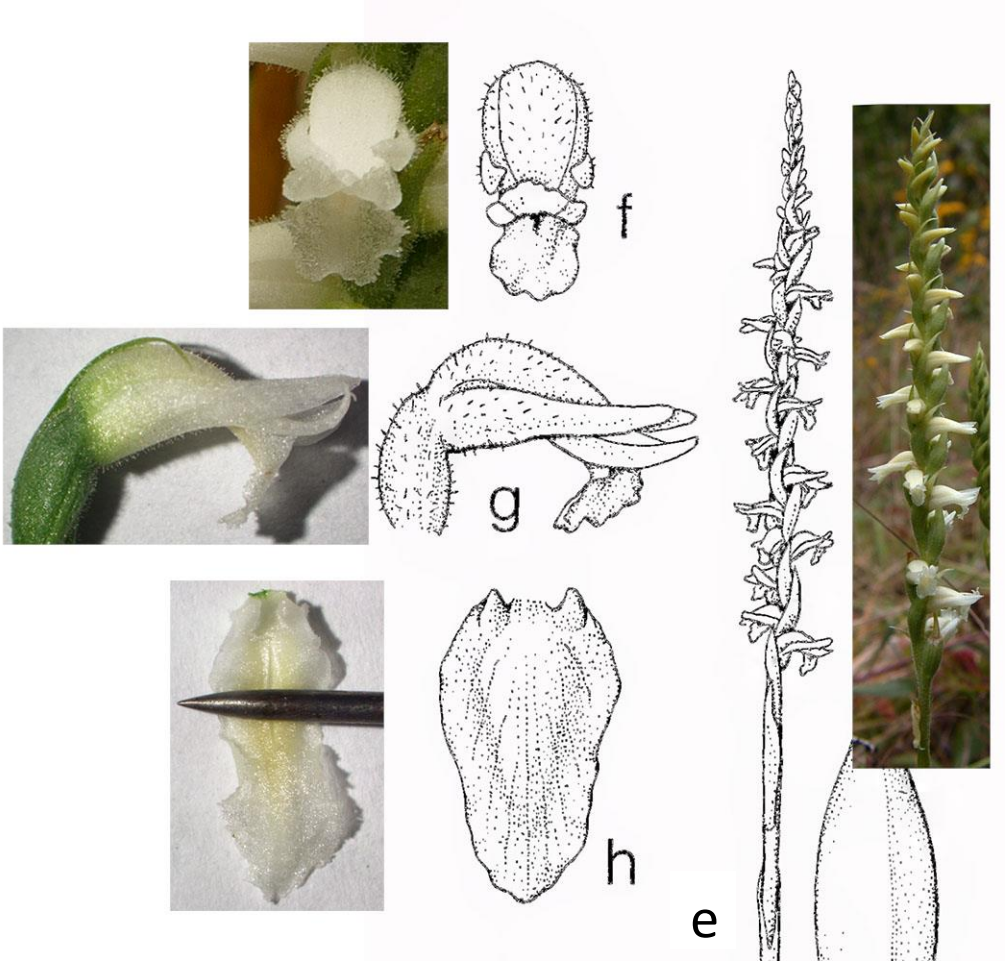

Figure 12. Photographs of *S. sheviakii* from plant collected in Onondaga County, New York, aligned with illustration of 'old field ecotype' drawn from plants collected in central and southern Illinois (Sheviak 1982, Figure 20 e–h).

The goal of this article has been to describe and illustrate subtle characters that can be used as a starting point for understanding the species within this complex. Our original paper describing *S. sheviakii* (Hough and Young 2021), accessible from the Native Orchid Conference Journal website, contains additional supporting information including additional images, illustrations, range maps, a dichotomous key, and a list of genetic and specimen vouchers.

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The Why and How of Spring Wildflower Development

by Joseph McMullen joymcmullen2@msn.com

When I discuss spring wildflowers with a group, I always start by asking two questions: 1) **why** are spring wildflowers in such a hurry to develop and 2) **how** can spring wildflowers develop so quickly so early in the growing season?

The Why

Spring wildflowers grow, flower, and fruit in a very short time frame, usually in just two or three weeks, at the very beginning of the growing season. So, why are they in such a hurry? The reason of course relates to the one key element that all green plants need to survive – light. Most of our spring wildflowers are found in deciduous forests under trees that leaf out as spring progresses, with full canopy closure around May 15 or so. These spring plants need to go through their life cycle of flowering and fruiting between the brief period of when the soils warm enough for growth and the trees shut off their light supply. Several of them even flower before the leaves expand. They have to act fast to survive the coming darkness.

Many of our spring wildflowers die back completely or partially once they complete their yearly life cycle. Some of them lose all their visible above-ground parts very quickly, and it is for this reason we often refer to them as spring ephemerals. They come and go quickly.

The How

Now that we know the why, let's turn to the how. How can these plants develop so quickly and so early in the growing season when conditions, especially soil conditions, are not favorable to rapid development? Many of our spring wildflowers start to grow as soon as the snow melts and the frost leaves the soil. Soil temperature at that time is not conducive to plants taking up nutrients or expanding their roots, so where do these plants get the energy they need to zoom their development ahead? The answer is that they mostly all have some form of underground structure that stores energy. They use that energy to foster this early growth. And, since nearly all our spring wildflowers are perennials, they are able to gather enough energy in a short period to add stock to their underground structure every year. This yearly bolstering of their underground structure is the reason that some of our spring plants, like jack-in-the-pulpit (*Arisaema* spp.), produce much larger specimens as they get older; and why others, like mayapple (*Podophyllum peltatum*), do not flower until they reach a certain age.

Underground Structures

There are several different kinds of underground structures and not everyone is familiar with how they are defined. The types that spring wildflowers possess vary, and which species has which structure is often misunderstood and not always agreed upon. The following is a summary of underground structures, with an emphasis on spring wildflowers.

Storage Roots – Some perennial herbaceous plants have a thickened root. Roots are underground structures that take up nutrients and water from the soil substrate. They lack nodes and leaves, and can be thickened and store energy, in which case they are described as storage roots. The commercially valuable underground herbal product of American ginseng (*Panax quiquefolius)* is a storage root.

Thickened storage structures of American ginseng (*Panax quinquefolius*) are true roots.

Rhizomes – Rhizomes are underground stems that usually grow horizontally. They are often confused with roots. Rhizomes occur in most ferns and many flowering plants, especially grasses. The invasive common reed grass (*Phragmites australis)* has a thick, ropy rhizome that allows it to spread aggressively. Many of our spring wildflowers develop from rhizomes, including: violets (*Viola* spp.), mayapple, trilliums (*Trillium* spp.), and others. The blood red namesake "root" of bloodroot (*Sanguinaria canadensis*) is actually a rhizome, as is the filamentous golden thread of gold thread (*Coptis trifolia)*.

Beautiful golden filaments of gold thread (*Coptis trifolia*) are rhizomes.

Namesake blood red "root" of bloodroot (*Sanguinaria canadensis*) is actually a rhizome.

Stolons – Like rhizomes, stolons are stems that grow horizontally, but differ in that they occur above the ground/substrate surface. Those runners you see on strawberries (*Fragaria* spp.) are stolons. John Titus (SUNY Binghamton) indicated to me that sometimes tapegrass (*Vallisneria americana*) produces rhizomes below the substrate and other times horizontal stems above the substrate that would be classified as stolons. His thought is that when the substrate is soft, they produce rhizomes, but when the substrate is hardened, an above the surface stolon is produced. I would agree, and see the same behavior in common reed grass when soil/substrate conditions differ.

Tubers – The thickened portion of a rhizome is a tuber. White potato is the most familiar example of a tuber. It is actually a storage branch with buds (those are the eyes). The corn kernel-like structure in squirrel corn (*Dicentra canadensis*) is a tuber, as supposedly is the round, enlarged base of dwarf ginseng (*Panax trifolius*).

Squirrel corn's (*Dicentra canadensis*) distinctive kernel-like structures are tubers.

Bulbs – True bulbs are short, thickened underground buds (or stems) with many fleshy scalelike leaves. They are positioned vertically. Cut through an onion from top to bottom and you get the picture of a bulb. Wild leeks or ramps (*Allium tricoccum*) have a bulb.

The edible white bases of ramps (*Allium tricoccum*) are bulbs, like the closely related onion.

Corms – A short, solid, underground stem that grows vertically is a corm. It is basically a compact bulb with thin papery leaves. These solid bulbs occur in crocus (*Crocus* spp.), jack-in-the-pulpit (*Arisaema* spp.), trout lily (*Erythronium americanum*), and others.

Native Americans ate (after boiling) the nutritious corm of jack-in-the-pulpit (*Arisaema* spp.). It was called Indian turnip where I grew up.

Spring Wildflower Trip in Chenango County, May 14, 2022

by Selma Rosenthal

After driving along beautiful country roads on a gorgeous sunny day, a group of us from both near and far away met on Pigeon Hill Road (named Pidgeon Hill Road on the other end). Joe McMullen introduced us to a property with a remarkable diversity of microhabitats and plants that stretches adjacent to portions of Cole Brook and extends up a hill through a hemlock stand. The creek is in the Susquehanna River Basin and flows on to the Chesapeake Bay. Above the creek there is a mixed deciduous forest on an east-facing hill going up to about 1900 feet in elevation. We began by looking at plants in the grassy area where we parked, then climbed uphill, and finished by coming down through the hemlock and along the creek. The forest was dry and filled with a wonderful understory, an effect of limited deer because of hunting pressure on the property, which has allowed shrubs and other plants to thrive. We were promised no poison ivy (none found!) and while Joe found showy orchid (*Galearis spectabilis*) a few years ago, it remained hidden on this trip. Turns out, we were early, as Joe found the leaves on June 5th, when the golden ragwort was in flower and ramp leaves were gone.

We saw representatives from 40 different plant families. In a grassy area in the sun, we found dandelions, dog tooth violets, strawberry and pussy toes. Also present was golden ragwort, not yet in bloom, in a slightly moister spot. Along the creek we found false hellebore and tall meadow rue. Crossing the creek into the forest, swamp saxifrage was beginning to form flower buds, and nearby a patch of dwarf ginseng was blooming. Moving up the hill, we saw a rotting log with a luminescent blue fungus called foxfire and nearby a nice patch of tree clubmoss. The speckled trout lily leaves were abundant, and we found foam flower in bloom. We saw Canada mayflower and extensive dwarf dewberry patches. American ginseng plants were growing on the slope, the leaves mostly fully emerged. Looking closely, we saw the hidden flower of wild ginger and we inspected the fruit of the partridge berry which forms from twin flowers that

have a fused ovary.

Last year's partridgeberry (*Mitchella repens*) drupe showing the remnants of the fused ovary.

We found no Dutchman's breeches in flower, but lots of flowering squirrel corn. Joe dug some up for us and we saw the yellowy corn-like tubers that give the plant its name. We also saw the turnip-like corm of Jack-in-the-pulpit.

Some of us tasted the bulb of two-leaved toothwort (a nutty taste) and the yellow root of goldthread (definitely bitter), wood sorrel (sour) and young basswood leaves. We smelled the fragrant smooth white violets and unpleasant aroma (mildly stinky) of wake robin. We couldn't help but notice the ramps with their pungent garlic smell that were abundant on the slope. We heard and saw toads, saw a red eft, and along the creek found a small, raised mound with a hole, evidence of crayfish.

The diverse microhabitats supported an amazing variety of ferns. We saw 18 species, thanks to Eddie Watkins (Colgate University) sharing his expertise with us. Along the creek and in depressions before going uphill we saw cinnamon fern, interrupted fern, and sensitive fern. We looked for hairs, scales and indusium as we identified these ferns, and found that on old fronds it was hard to find the hairs characteristic of some species (e.g. Boott's wood fern), but on unfurled fronds, hairs were easy to spot. On the hillside we found Christmas fern, glade fern, wood ferns, lady fern and red lady fern (lady fern with a red stem which develops from a one-gene mutation). We would have missed the rattlesnake fern had we not stopped for a break, which happened to be right where we were snacking. We found two patches of oak fern growing on the rich soil near the creek. Fun fact: by coincidence, wood ferns whose specific epithet begins with a "c" are not diploids. For example, the *D. intermedia* we saw is a diploid, while *D. clintoniana* is a fertile hexaploid, and *D. cristata* and *D. carthusiana* are tetraploids.
The following is a partial list of plants we saw and discussed (* flowering).

Herbs

Actaea sp.	baneberry
Acer pensylvanicum	striped maple
Allium tricoccum	common wild leek
Antennaria sp.	pussy toes
Aralia nudicaulis	wild sarsaparilla
*Arisaema triphyllum**	common Jack-in-the-pulpit
*Asarum canadense**	wild ginger
Betula alleghaniensis	yellow birch
*Cardamine diphylla**	two-leaved toothwort
*Carex plantaginea**	plantain-leaved sedge
*Caulophyllum giganteum**	early blue cohosh
Claytonia caroliniana	Carolina spring beauty
*Coptis trifolia**	goldthread
Cornus alternifolia	alternate-leaved dogwood
*Dicentra canadensis**	squirrel corn
Dicentra cucullaria	Dutchman's breeches
*Erythronium americanum**	Yellow trout lily
*Fragaria virginiana**	strawberry
Hepatica acutiloba	sharp-lobed hepatica
Hydrophyllum sp.	waterleaf
Impatiens capensis	spotted jewelweed
*Lonicera canadensis**	American fly honeysuckle
Lysimachia borealis	starflower
*Maianthemum canadense**	Canada mayflower
Micranthes pensylvanica	swamp saxifrage
Mitchella repens	partridge berry
Nabalus sp.	rattlesnake root
Ostrya virginiana	hop hornbeam
Oxalis montana	wood sorrel
Oxalis stricta	common yellow sorrel
Packera aurea	golden ragwort
Panax quinquefolius	American ginseng
*Panax trifolius**	dwarf ginseng
Picea abies	Norway spruce
Ranunculus sp.	buttercup
Ribes americana	wild black current
*Rubus pubescens**	dwarf dewberry
Rubus repens	dewdrop
Sambucus racemosa	red elderberry
*Taraxacum officinale**	common dandelion
Thalictrum pubescens	tall meadow rue
*Tiarella cordifolia**	foam flower
Tilia americana	basswood

Tsuga canadensis	eastern hemlock
Laportea canadensis	wood nettle
Veratrum viride	false hellebore
*Viola canadensis**	Canada violet
*Viola labradorica**	American dog violet
*Viola pallens**	smooth white violet
*Viola pubescens**	smooth yellow violet
*Viola sororia**	common blue violet
Ferns and Lycophytes	
Amauropelta noveboracensis	New York fern
Asplenium trichomanes	maidenhair spleenwort
Athyrium angustum	northern lady fern
Botrychium virginianum	rattlesnake fern
Dendrolycopodium obscurum	tree clubmoss
Deparia acrostichoides	silvery spleenwort
Dryopteris cristata	crested wood fern
Dryopteris goldiana	Goldie's wood fern
Dryopteris intermedia	common wood fern
Dryopteris xbootii	Boott's wood fern
Gymnocarpium dryopteris	oak fern
Homalosorus pycnocarpos	glade fern
Matteuccia struthiopteris	ostrich fern
Onoclea sensibilis	sensitive fern
Osmunda claytoniana	interrupted fern
Osmundastrum cinnamomeum	cinnamon fern
Phegopteris connectilis	long beech fern
Polystichum acrostichoides	Christmas fern

Group photo (left to right): Eddie Watkins, Kevin Shultis, Kaitlyn Morang, Jim Molloy, Phil Bonn, Selma Rosenthal, Elizabeth Shaefer, Donna Coon, Joe McMullen (below). Photo credit Joe McMullen

Note from the Board

Karen Strong, NYFA's strategic planning consultant, is asking for input from readers:

NYFA's board is developing a strategic plan to guide the association's work over the next several years. Through the strategic planning process, we will define our future vision, clarify our mission, set goals, and identify strategies that will best achieve the vision and mission. As part of the process, we will be talking with botanical societies throughout the state and the continent as well as conducting an online survey to better understand people's interests in New York's plants.

That's where you come in. We want to hear from as many people as possible—current members, former members, followers, NY Flora Atlas users, and people who love NY's plants that aren't connected with NYFA or our projects. You can help us by taking the survey yourself and sharing it with other plant enthusiasts you know.

The survey will come out later this summer. Please watch your email and NYFA's social media feeds for more information.

First Report of *Chaerophyllum tainturieri* (Apiaceae) for New York State

by Daniel Atha

The Southern Chervil or Hairyfruit Chervil, *Chaerophyllum tainturieri* Hook. (Apiaceae) is reported for New York State for the first time (Werier, 2017). Four spontaneous populations are documented, three on Manhattan island and one on Governors Island in New York county, southeastern New York state.

The Manhattan island plants were first found by David J. Ringer at Hudson River Park on 27 April 2019 (iNaturalist observations 23410708; 25315369), then by Emily Curtis-Murphy on the east side of the island at Stuyvesant Cove Park on 10 February 2020 (38504629) and again at Stuyvesant Cove Park by Eve Levine on 1 May 2021 (77965385). The third Manhattan population was discovered by the author at Chelsea Waterside Park, near the Hudson River on 10 May 2021 (Atha collection number 16202, iNaturalist observations 78221208; 78221206). An additional population was discovered on Governors Island by the author and Kevin Sisco on 30 April 2022 (Atha collection number 16213, iNaturalist observations 114695684; 114695687; 114695688; 114695694; 114008610).

The discovery of spontaneous populations in four separate locations four years in a row is a strong indication that the plants are naturalized in southeastern New York State. Plants in the Apiaceae (carrot family) are notoriously difficult to identify. The foliage and flowers of *Chaerophyllum* are typical for the family (ternately compound leaves with finely divided segments and small, white flowers in reduced umbels). They superficially resemble wild carrot (*Daucus carota*) and cow parsley (*Anthriscus sylvestris*), especially when young. Additional populations undoubtedly occur in the area but have likely been overlooked.

Chaerophyllum tainturieri is native to the southeastern United States from Texas to Florida, north to Virginia, Kentucky, southern Indiana and Missouri. In its native range, it is typically found in moist to dry, sandy disturbed soils in full sun or light shade. It can be distinguished from the congener, *Chaerophyllum procumbens* (L.) Crantz by the upright, sparsely branched stems that are evenly pubescent (stems usually sprawling and branched, glabrous to sparsely pubescent in *Chaerophyllum procumbens*); pedicels swollen at the apex, and fruit broadest below the middle.

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Werier, D. 2017. Catalogue of the vascular plants of New York State. Mem. Torrey Bot. Soc. 27: 1–542.

Figure 1. *Chaerophyllum tainturieri* on Governors Island, New York County.

Botanizing Along the South Taconic Trail, May 22, 2022

By Claudia Knab-Vispo

Although the forecast called for temps in the mid-nineties, a dozen participants met on the morning of May 22nd at the trailhead on Sunset Rock Road in Copake, NY, to explore the plant (and insect) life along the South Taconic Trail. We walked south along the ridge through an open forest of stunted oaks (northern red and white), red maple, and birches (gray, white, and black). The understory was dominated by mountain laurel and many other ericaceous plants. Eventually, we reached the rock outcrops of Sunset Rock and surrounding area. Along the way, we focused our botanical attention mostly on the heath family and the orchids. large whorled pogonia (*Isotria verticillata*) and pink lady's-slippers (*Cypripedium acaule*) had just begun flowering.

Large Whorled Pogonia (*Isotria verticillata*); photo by Conrad Vispo).

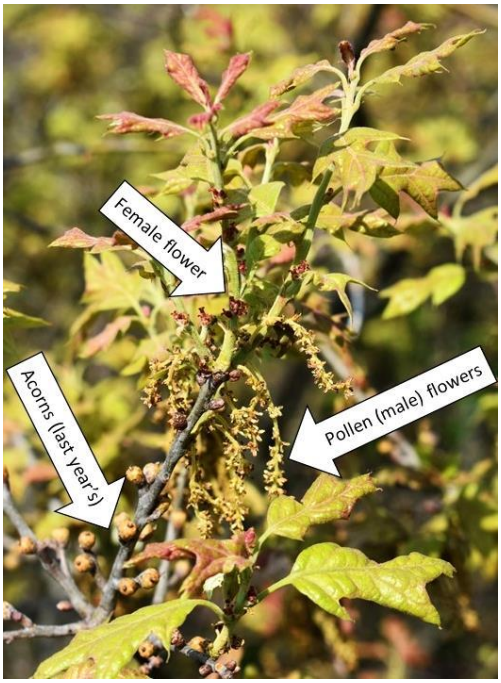
A close look at all the ericaceous plants along the way resulted in a list of 12 species.

Bearberry, Kinnikinnick	Arctostaphylos uva-ursi
Common (Early) Lowbush Blueberry	Vaccinium angustifolium
Deerberry	Vaccinium stamineum
Early Azalea	Rhododendron prinophyllum
Hillside (Late Lowbush) Blueberry	Vaccinium pallidum
(Black) Huckleberry	Gaylussacia baccata
Maleberry	Lyonia ligustrina var. ligustrina
Mountain Laurel	Kalmia latifolia
Sheep Laurel	Kalmia angustifolia var. angustifolia
Trailing Arbutus	Epigaea repens
Velvet-leaved Blueberry	Vaccinium myrtilloides
Wintergreen	Gaultheria procumbens

We determined that all the pink-flowering azaleas were early azalea (*Rhododenron prinophyllum*), based on the glandular hairs on the pedicels and corolla tubes.

*Early Azalea (*Rhododendron prinophyllum*) with glandular hairs on corolla tube (insert; photos by Conrad Vispo).*

Other plants typical of the oak-heath barrens on the Taconic Ridge in Columbia County that we observed were: scrub oak (*Quercus ilicifolia*), which presented last year's immature acorns together with this year's male catkins and female flowers conveniently at eye level for close observation; pitch pine (*Pinus rigida*) in full bloom; bastard toadflax (*Comandra umbellata*) just starting to open its flowers; three-toothed cinquefoil (*Sibbaldiopsis tridentata*) not yet in bloom; and common hairgrass (*Avenella flexuosa*).



A branch of Scub Oak (*Quercus ilicifolia*; photo by Claudia Knab-Vispo).

After a snack on Sunset Rock, with a view west across Columbia County and into the Catskills, we returned to the trailhead along the same path, making sure to find our 12th ericaceous plant along the way. We were all happy that the morning had stayed cooler than expected, grateful for the rich plant (and insect) life we were able to observe, and delighted by the company of fellow botanists and naturalists.

Many images from that day were shared in a blog: https://progressoftheseasons.wordpress.com/2022/05/25/wonder-wander-24-may-2022-flowers-a-few-insects-of-the-taconic-ridge-sunset-rock/, which is complemented by an earlier (June 2015) blog https://hvfarmscape.wordpress.com/?s=sunset+rock, describing another walk through the Oak-Heath Barrens along the same trail.

Participants in the 2022 Sunset Rock trip. From left to right: Frank Parisio, Sue Mackson, Mark Carabetta, Kathryn Alessi, Daniel Atha, Lindsey Feinberg, Claudia Knab-Vispo, Kevin Sisco, John Meierhoffer, Will Flemer, Marc Wolf (photo by Conrad Vispo).

Lorraine Gulf Trip June 25, 2022

by Robert Wesley

On a sunny day in June, ten intrepid people met and headed down and into Lorraine Gulf by way of Abijah Creek from County Route 189 in the town of Lorraine, Jefferson County. NYFA did a similar walk 12 years ago but entered the gulf via South Sandy Creek from the Bullock's Corners bridge (County Route 95), quite a bit farther away from the plants of interest, and the stream is bigger, full of long meanders, and challenging to cross in places; they had a good time but didn't emerge from the gulf until 7 PM.

Abijah Creek winds its way tortuously toward the main gulf, its bottom covered with flat rock and shingles between the steep shale walls. Wading was easy and many small fossils were seen. There was so much to look at, and we started to see Canadian (or bird's-eye) primrose (*Primula mistassinica*) and shrubby cinquefoil (*Dasiphora floribunda*) even before we got to its junction with South Sandy Creek. The creek bottom had, in places, lush stands of tall herbaceous plants bordered by *Carex torta* at the water's edge, but

for the most part we spent our time scanning the rock walls.

Fern covered shale wall. Photo by Kyle Webster.

The highlights in the gulf proper included very nice stands of yellow mountain saxifrage (*Saxifraga aizoides*) in full bloom, many rosettes of the bird's-eye primrose, a large patch of swamp currant (*Ribes lacustre*) and all the lush, moist walls covered with luxuriant growths of ferns and mosses. The currant was something I had never seen, though I had searched for it at historic sites previously. It's shiny, very cut leaves are quite distinct.

Perusing the walls in Lorraine Gulf. Photo by Robert Wesley.

Saxifraga aizoides, photo by Robert Wesley.

The group before descending Abijah Creek. Photo by Robert Wesley.

Unfortunately, there were a number of infestations of goutweed (*Aegopodium podagraria*) and Japanese knotweed (*Reynoutria japonica*) near and in the stream. Overall, the walk was a well-rounded trip with all kinds of moth, butterfly and odonate information provided by Steven Daniel and moss and liverwort identifications provided by Norm Trigoboff. The group made it out earlier than the previous trip, but still a bit later than anticipated. For a full list of vascular plants (as well as other sightings of interest, contact the editor (editor@nyflora.org).

Rediscovery of *Juniperus horizontalis* in Onondaga County and the first record of *J.* × *ambigens* in New York

by Michael Hough

In May of this year, Don Leopold emailed me several photos of *Juniperus horizontalis* (creeping juniper) that he found growing on a gravelly hillside near Erie Boulevard in Dewitt, New York (Figure 1). In total he estimated about 40 plants present at the site. He was searching the area for deposits of gypsum, a common calcium-bearing mineral sometimes associated with minerotrophic fens (Godwin et al. 2000). One such outcrop (Figure 2) was found on another hillside within walking distance of this one.

Figure 1. *Juniperus horizontalis*.

Juniperus horizontalis is a state endangered species, with only two native populations prior to this discovery known to be extant in Genesee County in New York. There are historic sites from Onondaga, Madison, Oneida, Chenango, and Clinton Counties (NYNHP 2022), and one of these was the Great Lodi Swamp east of Syracuse, also known as Tamarac Swamp. This site is notable as one of the few places where the now extirpated *Calypso bulbosa* was known to occur. *Juniperus horizontalis* was last collected there in 1906, and only a few years later House (1915) described it as "probably now obliterated by the encroaching manufacturing district, and with its passing, which is sincerely regretted by many botanists, disappears one of the most interesting localities, botanically known in the State."

Associated vascular plants at the present site include *Apocynum cannabinum*, *Asclepias tuberosa*, *Carex aurea*, *Carex granularis*, *Danthonia spicata*, *Dichanthelium* sp., *Elaeagnus umbellata*, *Fraxinus americana*, *Phragmites australis*, *Physocarpus opulifolius*, *Populus deltoides*, *Rhamnus cathartica*, *Scirpus pendulus*, and *Thuja occidentalis*.

Figure 2. Gypsum deposit near site of *J. horizontalis*.

Also present at the site is *J. virginiana* (Figure 3) and a plant that Dr. Leopold identified as a possible hybrid based on more ascending branches and more shrubby habit compared to *J. horizontalis* (Figure 4). The name *J. virginiana* var. *ambigens* was originally applied to the hybrid of *J. horizontalis* and *J. virginiana* (Fassett 1945), despite being recognized as a hybrid at the time, and the currently accepted name is *J.* × *ambigens* (Fassett) R.P. Adams (Adams 2018).

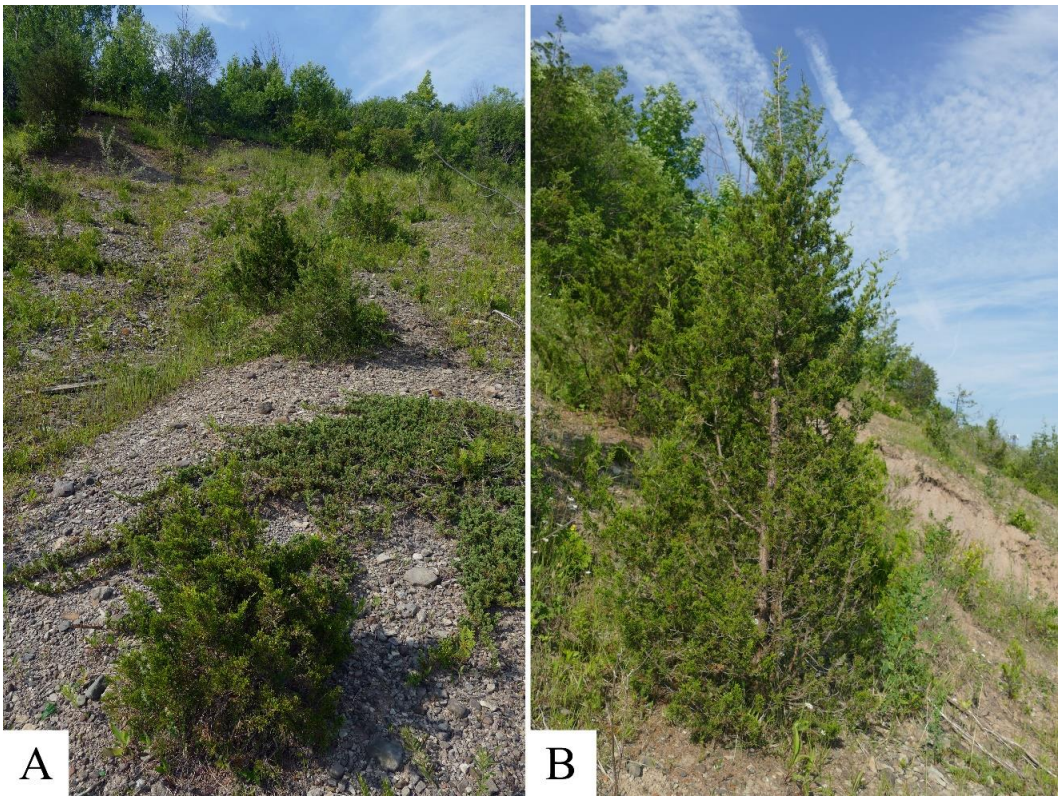


Figure 3. A. *Juniperus horizontalis* with *J. virginiana* in foreground and background. B. *Juniperus virginiana*.

The hybrid had previously only been reported from coastal Maine and New Hampshire (Haines 2011) and the Driftless area of Wisconsin (Fassett 1945). It is said to exhibit intermediacy in characters, including habit, seed cone size, peduncle morphology, and number of seeds per cone (Haines 2011). The large number of both parent species growing in close proximity at the present site makes the possibility of this hybrid likely. To increase confidence in the identification I decided to make some detailed measurements of the important distinguishing characters.

Methods

In addition to comparing overall growth habit and leaf morphology, measurements were taken of mature seed cone diameter and number of seeds per cone of *J. horizontalis*, *J. virginiana*, and the putative hybrid. The diameter of the cones was measured using a basic dial caliper (General Tools & Instruments LLC) to the nearest 0.5 mm. After measurement each cone was dissected to determine the number of seeds. Box plots of these characters were generated using the online version of BoxPlotR (Spitzer et al. 2014).

Photographs of leaves and seed cone peduncles were taken with an Olympus SZX7 stereo microscope (Olympus Corporation, Tokyo, Japan) equipped with an Olympus DP26 digital camera using Olympus cellSens Standard 1.18 software that was calibrated for the microscope. Measurements of the peduncle were made using the same software and rounded to the nearest 0.1 mm.

Results

Growth habit of the hybrid is intermediate, with branches ascending to a maximum measured height of 1.2 m (Figure 4-A). Like *J. horizontalis*, some of the branches are rooted, with others emerging from the substrate (Figure 4-B). The bark is similar to that of *J. horizontalis*, exfoliating in wide strips or plates (Figure 4-C). The cones were maturing at about the same rate as *J. horizontalis* at the site (Figure 4-D), a little further ahead of the cones of associated *J. virginiana*.

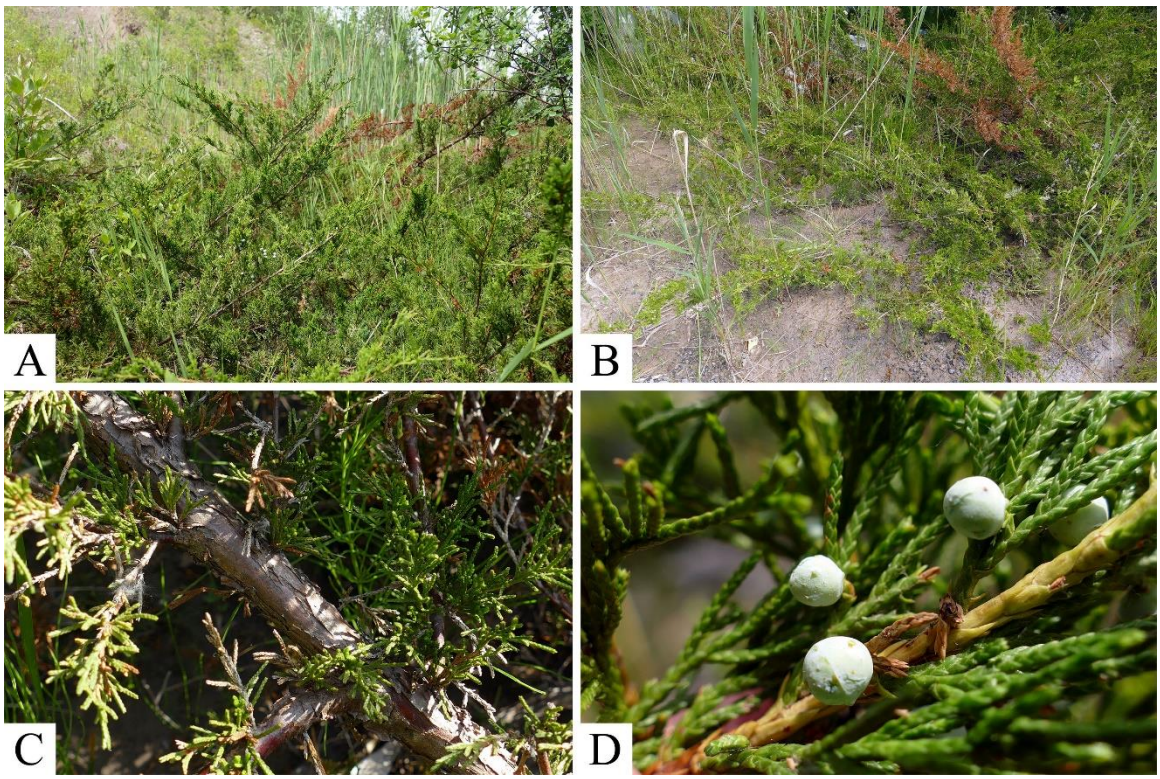


Figure 4. *Juniperus* × *ambigens*. A. Habit. B. Buried branches. C. Bark. D. Closeup of cones.

The leaf morphology of the hybrid is similar to *J. horizontalis*, with most exhibiting distinct apiculate apices (Figure 5-A & B. In contrast, *J. virginiana* has most leaves with merely acute apices or at most an obscure apiculum (Figure 5-C).

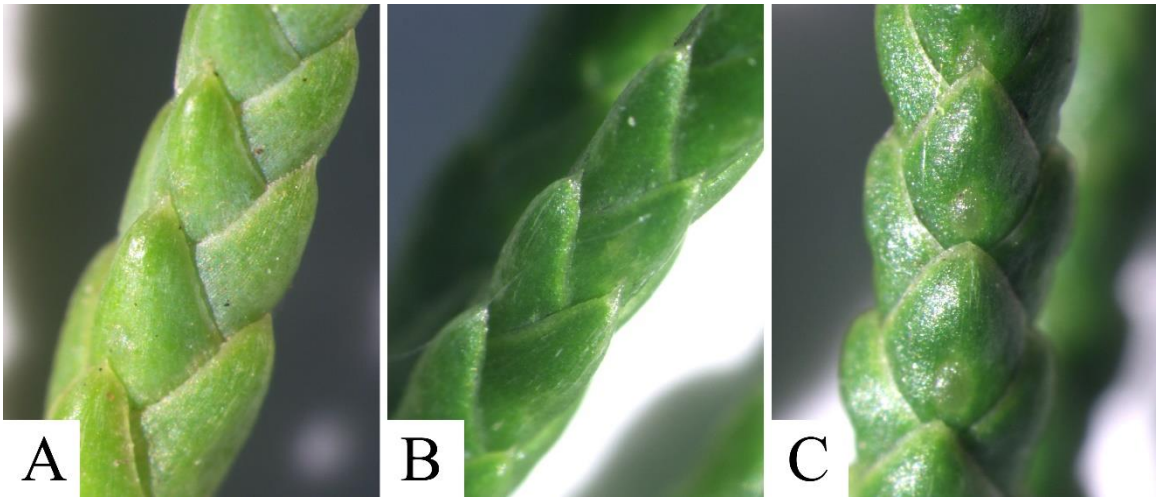


Figure 5. Comparison of leaves. A. *Juniperus horizontalis*. B. *Juniperus* × *ambigens*. C. *Juniperus virginiana*.

While the gross morphology of the hybrid is most similar to *J. horizontalis*, the measurements of cones and subtending peduncles more closely resemble those of *J. virginiana*. The cone diameter of *J. horizontalis* ranged from 6.0–7.5 mm with a mean of 6.7 mm, while the cones of the hybrid were 4.0–6.0 mm and the mean 5.1 mm, and the cones of *J. virginiana* 4.0–5.5 mm and the mean 4.8 mm (Figure 6).

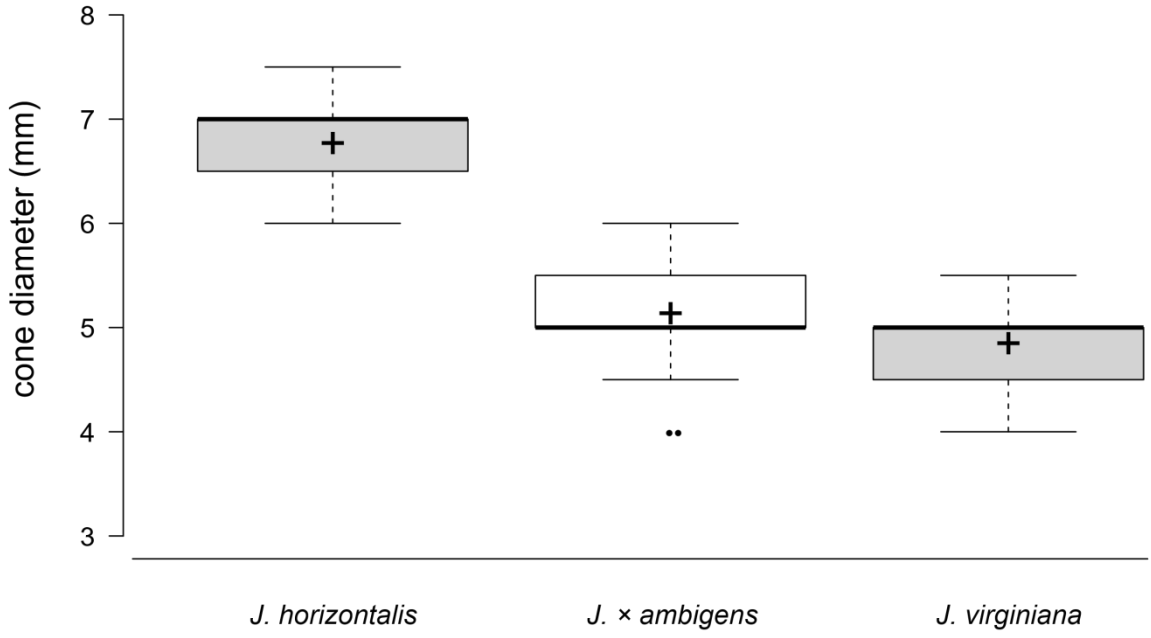


Figure 6. Boxplot of mature seed cone diameter for *J. horizontalis* (N=20), *J.* × *ambigens* (N=22), and *J. virginiana* (N=23). Sample means indicated by the + symbol.

The number of seeds per cone was rather consistent. *Juniperus horizontalis* had 2–4 seeds per cone and averaged about 3 seeds per cone. Both *J.* × *ambigens* and *J. virginiana* had 1–2 seeds per cone, with both

averaging 1.6 seeds per cone (Figure 7).

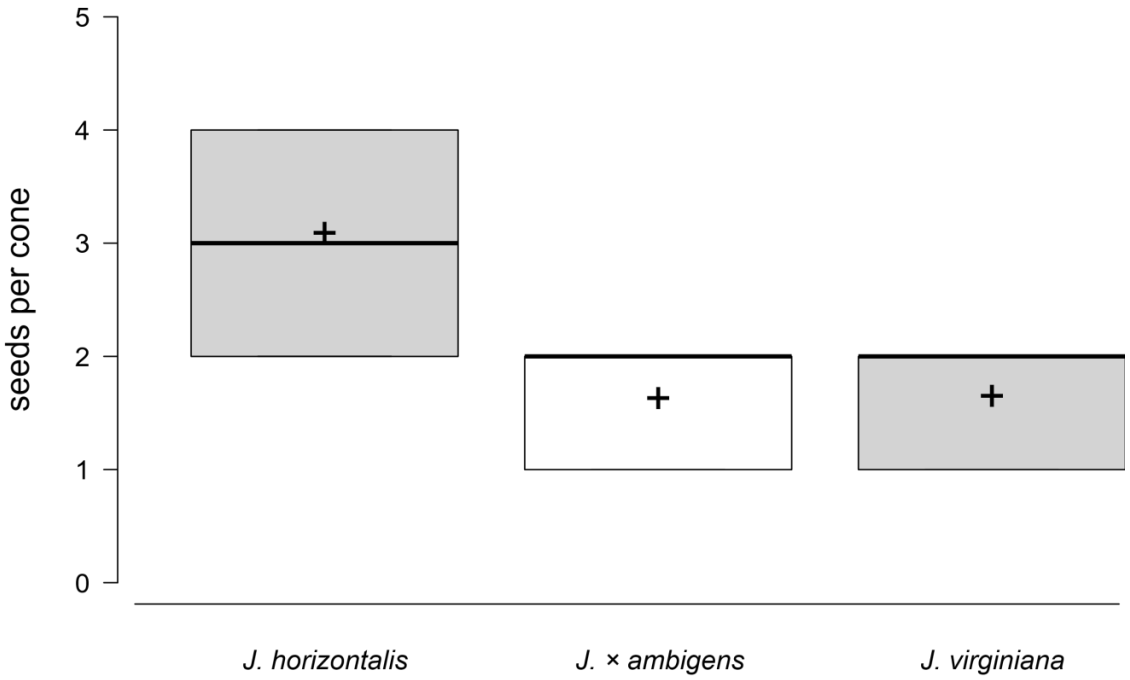


Figure 7. Boxplot of the number of seeds per mature seed cone of *J. horizontalis* (N=20), *J.* × *ambigens* (N=22), and *J. virginiana* (N=23). The mean is indicated by the + symbol.

Finally, the average peduncle length of *J. horizontalis* was 5.4 mm and ranged from 3.4–7.4 mm, while those of *J.* × *ambigens* averaged 2.6 mm with a range of 1.4–4.9 mm, and those of *J. virginiana* averaged 2.0 mm with a range of 1.2–3.4 mm (Figure 8).

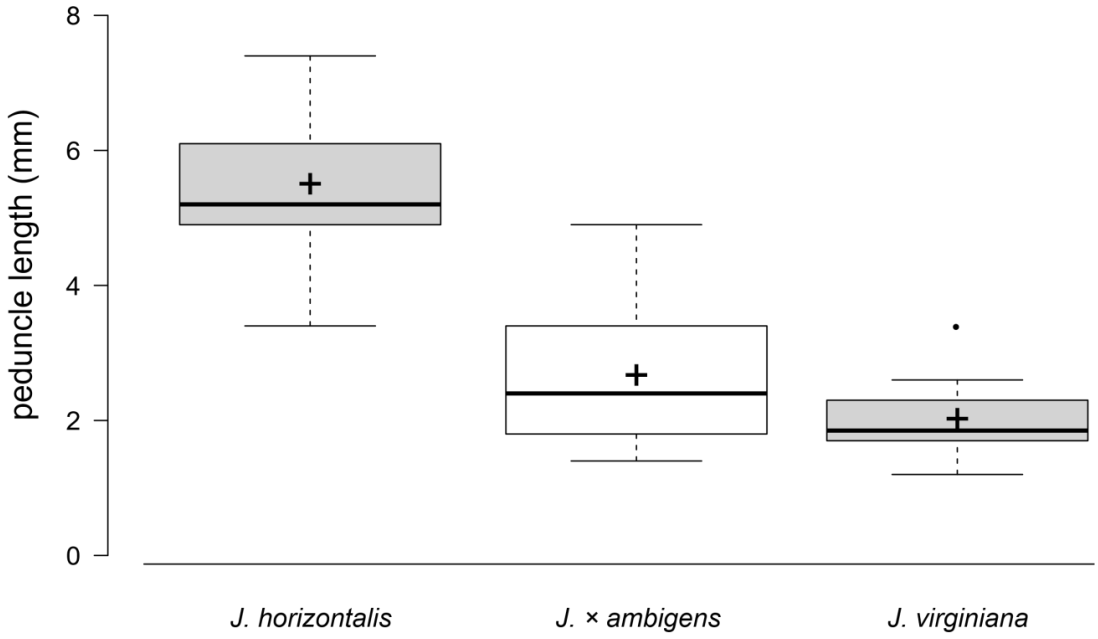


Figure 8. Comparison of peduncle lengths of *Juniperus horizontalis* (N=20), *J.* × *ambigens* (N=18), and *J. virginiana* (N=20). The mean is indicated by the + symbol.

The peduncles of *J. horizontalis* and *J.* × *ambigens* were more consistently curved. Those of *J. virginiana* were more often straight or nearly so (Figure 9).

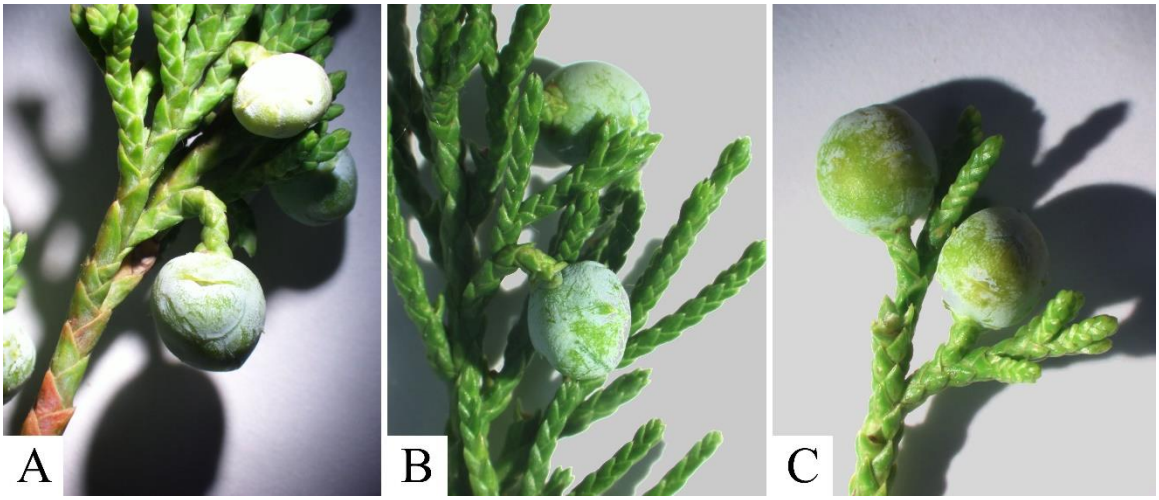


Figure 9. Comparison of fruit and peduncles. A. *Juniperus horizontalis*. B. *Juniperus* × *ambigens*. C. *Juniperus virginiana*.

Discussion

Juniperus horizontalis is widely cultivated, with many horticultural varieties, and has become naturalized from cultivation at Valcour Island in Clinton County in New York (NYNHP 2022). Given that the newly discovered population is in a heavily developed area, consideration was given to the likelihood that it is a native occurrence.

In New York, *J. horizontalis* is primarily associated with marl fens without a tree or large shrub canopy cover (Werier et al. 2022). The last collection in Onondaga County was from Lodi swamp in 1906 (NYS), and this location seems to have the most supporting evidence, including vouchers. Beauchamp reported a low cedar from the Beaver Lake area, and this was apparently followed up on by Faust (unpublished notes at SYRF), but no further information appears to be available for this account. It was also reported from the banks of Onondaga Creek (Goodrich 1912).

Figure 10. Historical map of Syracuse area from the archives of the American Philosophical Society, ca. 1825 (Landis 2018). Blue arrow indicates likely headwaters of South Branch Ley Creek.

On an old map of the area (Figure 10) there is a spring east of Syracuse near the Erie Canal that feeds a creek that flows north and then west into Onondaga Lake. This most likely represents the headwaters of South Branch Ley Creek, and is very close to the present population of *J. horizontalis*. The shaded areas on the map are thought to indicate wetlands (Landis 2018), and the portion near the arrow may indicate the eastern extent of the former Lodi Swamp, where this species was collected in 1890 and 1906 (NYS). The swamp was essentially destroyed over time by development, including construction of Erie Boulevard (Landis 2018). A few remnant marl fens and northern white cedar swamps are still found in this area, though they are a fraction of their original size and most have been badly degraded by development and encroachment by non-native species (e.g. *Phragmites*).

Aerial photos (https://digital.library.cornell.edu/collections/aerialny) seem to indicate that the site was undeveloped in 1938, a strip mall constructed at the base of the vegetated slope by 1951, and erosion occurring by 1966, though there is no evidence of construction occurring directly on the site at any time in the past. Given that the species was known to occur in the general area, it is possible that it has persisted at this site, or became established here from a natural source that had gone unnoticed since its last collection in the area in 1906. Specimens have been made of all three taxa and will eventually be deposited in the SUNY Cortland Herbarium (CORT).

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Werier, D., K. Webster, T. Weldy, A. Nelson, R. Mitchell†, and R. Ingalls†. 2022. New York Flora Atlas. [S.M. Landry and K.N. Campbell (original application development), USF Water Institute. University of South Florida]. New York Flora Association, Albany, New York.

New York Flora Association 2022 Annual Meeting

Date: Saturday, September 10 from 10 am to 4 pm
Five Rivers Environmental Center, Delmar, N.Y.

This year's activities will include the presentation of the 2021 Plant Conservationist Award, botanizing at nearby sites, the Annual Meeting, the 2022 Board of Directors election, Steve's Plant Quiz, and more! Lunch will be provided. Events are open to NYFA members, past, present, and future. Friends and family welcome! Please RSVP by September 2nd. https://nyflora.org/2022-nyfa-annual-meeting/ or look for the registration link on the NYFA website!

In accordance with the Organization and Bylaws of the New York Flora Association, the Nominating Committee is recommending that the following current Directors whose terms expire in 2022 return for another three-year term: **Emily DeBolt, Ed Frantz, Michael Hough, Anna Stalter, and David Werier.** Write-in candidates are also accepted. Please cast your ballots by mail, email, or other form of technology, **prior to, or in person, at the NYFA Annual Meeting.** Electronic votes can be sent to: elections@nyflora.org Paper ballots should be sent to New York Flora Association, PO Box 22, Albany, NY 12201.

Find us on **Facebook** Follow us on instagram and **@newyorkflora**

And check out what's on our Website www.nyflora.org and YouTube Channel: NY Flora

NYFA Mission:

To promote a greater appreciation and knowledge of the flora of New York through conservation, research, and public education and outreach.

NEW YORK FLORA ASSOCIATION MEMBERSHIP FORM 2022
We are a 501c3 Tax Deductible Organization!

Annual Membership dues:
_____ Student Member – FREE – Please visit the website to join – www.nyflora.org/membership
_____ Regular Membership $20 per year
_____ Associate Membership $30 ($20 plus $10 donation)
_____ Supporting Membership $40 ($20 plus $20 donation)
_____ Sustaining Membership $70 ($20 plus $50 donation)
_____ Lifetime Membership $500
_____ **Check if renewing your membership**
_____ **Check if your address has changed**

Name:_____

Address:_____

Address:_____ County:_____

City: _____ State: _____Zip Code:_____

E-mail address: _____

We are only accepting credit card payments through PayPal at this time. If you would like to use a credit card, please use the link on our website: http://www.nyflora.org/membership/

If by check, mail with form to: Treasurer, NY Flora Association, 17 Quail Path, Liverpool, NY 13090

Thank you for supporting NYFA and the flora of New York State

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