NYFA New York Flora Association

Quarterly Newsletter

Fall 2014 Volume 25 Issue 4

New York Flora Association

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Editors Note: We are happy to have an article by Tierney Rosenstock and two field trip reports in this issue as well as some excellent photographs. We'd like to encourage others to contribute articles on botanical or botanically related topics as well as photographs. If you are so inclined, please send them to editor@nyflora.org.

Hail Fall Foliage

By Tierney Rosenstock

By now it is obvious to those residing in the Northeast that summer has given way to Fall, a season marked by shorter days, cooler nights, migrating birds, and a wardrobe change. This is the time of year when locals and tourists alike flock to orchards for hay rides, corn field mazes, hot apple cider, and of course those delicious donuts! But, nothing marks the change of season like the fall foliage. The hues of red, orange, yellow, and even brown combine to create an awe-inspiring mosaic that attracts thousands of "leaf peepers" and significantly boosts economic revenue every October[1]. Such a popular, annual, natural phenomenon of these proportions begs the question: how and why does it occur? To understand the answers we must turn to our understanding of plant physiology.

Unlike evergreens (such as pine, spruce, fir, and hemlocks) that keep their green, scale-like leaves throughout the winter, deciduous trees lose their leaves via a process known as leaf senescence. Senescence is just a fancy way to describe the death and nutrient assimilation of a particular part of a plant[2]. The first phase of leaf senescence is the breakdown of the chloroplast, the part of the cell that contains chlorophyll; the power house of photosynthesis. Chlorophylls are a class of pigment that absorb mostly blue and some red light, but reflect light in the green portion of the spectrum, which is why leaves appear green to our eyes.

However, chlorophylls are not the only pigments found in plant leaves. In addition to the chlorophylls, leaves contain pigments known as carotenoids and anthocyanins. Carotenoids are a class of over 600 pigments (e.g. beta carotene) that reflect yellow, orange, and brown light giving color to familiar items such as bananas and carrots. Anthocyanins, on the other hand, reflect red and purple light, thus giving us the colors we associate with red delicious apples and cherries. The key to understanding the change of color is to remember that these pigments are present in leaves all the time. It's just that during the summer, the leaves are dominated by chlorophylls which mask the other

colors associated with the carotenoids and anthocyanins[3].

Phase two of this process begins after the summer solstice has passed in June. As the days shorten little by little each day, the light-sensing mechanism in leaves, called phytochromes, along with cooling temperatures of autumn, signal to the plant that winter is on the way. These two mechanisms cause chlorophyll production to slow and eventually stop[4]. It is at this juncture that the ratio of chlorophyll to other pigments begins to tip unveiling the carotenoids and anthocyanins. Gradually the vibrant colors of orange, yellow, brown, red, or purple become visible. The final stage of leaf senescence occurs as a layer of cells, referred to as the abscission layer, form at the base of the leaf petioles (where the leaves are connected to the stem). This seals the leaves off from the stem, and eventually the leaves fall off[5], leaving us humans with the laborious work of fall leaf clean up.

While the process is always the same, the richness, vibrancy, timing, and duration of fall color is inconsistent from year to year as any Northeastern native will attest. The variation in the quality of fall color is tightly correlated with the type of weather we have leading up to and during fall.

As a result of the formation of the abscission layer, the vascular structures that allow the passage of fluids and sugar molecules (i.e. xylem, phloem, and leaf veins) begin to close. This traps the sugars in the leaves and allows for even greater production of carotenoids and anthocyanins. Bright sunny days produce more sugars (when photosynthetic rates are highest) and cool nights above freezing trigger greater closure of vascular tissues, resulting in the brightest fall colors.

Lastly, another factor that can alter color type and quality is the moisture content of the soil. A late spring or severe summer drought will decrease the amount of water available in the soil for use in photosynthesis resulting in a decrease in sugar production (and thus pigment production)[1]. Therefore, a warm wet spring and favorable summer weather like the one we've had this year is most favorable for brilliant color. All we need now is an autumn filled with warm, sunny days coupled with cool nights. Let's keep our fingers crossed!

[1] North East State Foresters Association. 2013. *The Economic Importance of New York's Forest-Based Economy*.
[2] *Gan and Amasino. 1997. Making Sense of Senescence: Molecular Genetic Regulation and Manipulation of Leaf Senescence*. Plant Physiology.
[3] Chadde. 2012. *Leaf Changes.* Michigan Nature Association.
[4] Clatterbuck. 1999. *Changing Colors of Leaves.* Agricultural Extension Service at the University of Tennessee.
[5] Coder. 1999. F*alling Tree Leaves: Leaf Abscission*. School of Forest Resources at the University of Georgia.

Fall foliage photos by Natalie Aldrich, Canton

Field Trip to Allenburg Bog - July 12, 2014

By Joanne Schlegel

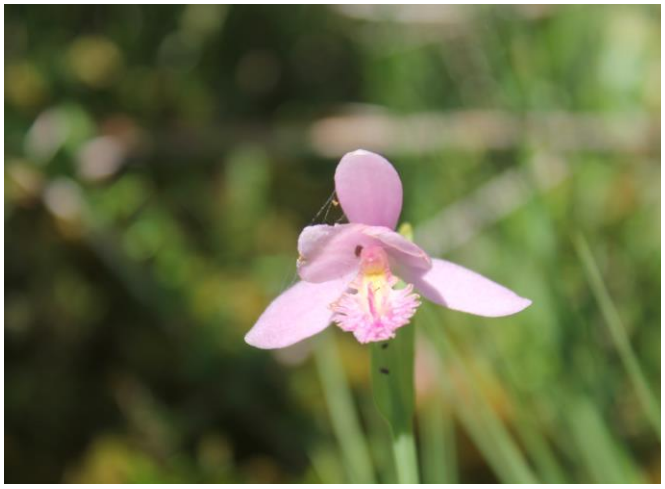
Fourteen members of NYFA, the Niagara Frontier Botanical Society, and the Western Pennsylvania Conservancy joined forces on June 12 to visit Allenburg Bog near the hamlet of Napoli in southern Cattauraugus County. Participants were Charles Bartlett, Jim Battaglia, Richard Cook, Ed Fuchs, Howard & Sheri Forman, Charlene Kowalczewski, Kendall Kowalczewski, Tim Lyons, Sue Murawski, Lauren O'Meara, Joanne Schlegel, Michael Siuta, and Mike Smith.

Allenburg Bog is the centerpiece of a 390 acre preserve which has been owned by the Audubon Society since 1957. Prior to that it was long renowned as a place to find diverse orchids, sedges, ferns, and liverworts. It was also famous as the site for the northernmost known population of Great Rosebay (*Rhododendron maximum)*.

On a beautiful summer morning our group descended toward the bog through a cool forest of hemlock, yellow birch, black cherry and red maple. In the understory we noted striped maple, goldthread, and a plethora of clubmosses and blueberries. At the upper rim of the bog we came upon the famed *Rhododendron maximum* shrubs in full flower (footnote: I have been to this bog several times on the second Saturday of July and never have I timed it right—every year I am too early or too late. On this day, for once, the timing was perfect.)

Great Rosebay (*Rhododendron maximum*)

The bog itself contains an extensive sphagnum mat, with a lesser amount of open water. We noted the presence of many plants commonly associated with northeastern bogs, including leatherleaf (*Chamaedaphne calyculata*), Labrador tea (*Rhododendron groenlandicum*), bog rosemary (*Andromeda polifolia* var *glaucophylla*), black chokeberry (*Aronia melanocarpa*), water willow (*Decodon verticillatus*), tawny cottongrass (*Eriophorum virginicum*), white beakrush (Rhyn*chospora alba*), larch (*Larix laricina*), and black spruce (*Picea mariana*). A number of camera-worthy rose pogonia orchids (*Pogonia ophioglossoides*) were in bloom, and three species of carnivorous plants were found. These were purple pitcher plant (*Sarracenia purpurea*), roundleaf sundew (*Drosera rotundifololia*), and greater bladderwort (*Utricularia vulgaris*). Also noteworthy were significant populations of buckbean (*Menyanthes trifoliata*) and wild calla (*Calla palustris*).

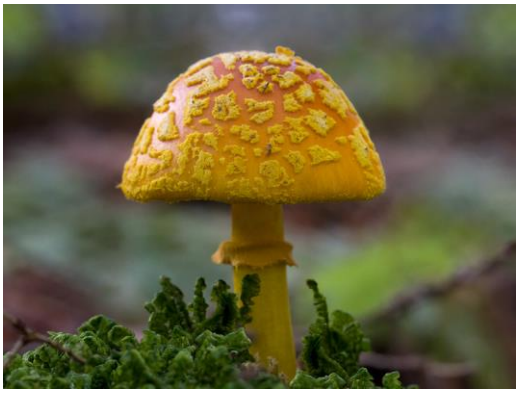


Rose Pogonia (*Pogonia ophioglossoides*)

The find of the day was a plant collected just beyond the mat in open water as the group was about to leave. Initially assumed to be some kind of *Eleocharis*, it was eventually identified by Michael Hough at ESF as Carolina Yellow-eyed Grass (*Xyris difformis)* in bud.

Yellow-eyed grass (*Xyris montana*)

The plant list was compiled by Michael Siuta, Joanne Schlegel, and Jim Battaglia (lichens). Others made verbal contributions along the way.



Amanita muscaria

FERNS AND LYCOPODS

Dendrolycopodium hickeyi	Pennsylvania Clubmoss
Dendrolycopodium obscurum	Ground Pine
Dennstaedtia punctilobula	Hayscented Fern
Diphasiastrum digitatum	Fan Clubmoss
Dryopteris cristata	Crested Shield Fern
Dryopteris intermedia	Intermediate Wood Fern
Huperzia lucidula	Shining Clubmoss
Lycopodium clavatum	Staghorn Clubmoss
Onoclea sensibilis	Sensitive Fern
Osmunda cinnamomea	Cinnamon Fern
Osmunda claytoniana	Interrupted Fern
Osmunda regalis	Royal Fern
Pteridium aquilinum	Bracken Fern
Thelypteris noveboracensis	New York Fern
Thelypteris palustris	Marsh Fern

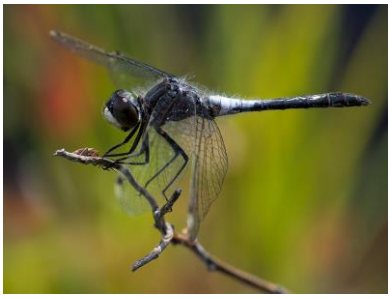
CONIFERS

Larix laricina	Eastern Larch
Picea mariana	Black Spruce
Pinus strobus	White Pine
Tsuga canadensis	Eastern Hemlock

FLOWERING PLANTS

Acer pensylvanicum	Striped Maple
Acer rubrum	Red Maple
Acer saccharum	Sugar Maple
Agrostis gigantea	Redtop
Amelanchier cf arborea	Downy Serviceberry
Andromeda polifolia	Bog Rosemary
Aralia nudicaulis	Wild Sarsaparilla
Aronia melanocarpa	Black Chokeberry
Asclepias incarnata	Swamp Milkweed
Betula alleghaniensis	Yellow Birch
Calla palustris	Wild Calla
Carex crinita	Sickle Sedge
Carex gracillima	Graceful Sedge
Carex lurida	Shallow Sedge
Carex scoparia	Pointed Broom Sedge
Chamaedaphne calyculata	Leatherleaf
Circaea lutetiana	Enchanter's Nightshade

Coptis trifolia	Goldthread
Cornus alternifolia	Alternate-leaf Dogwood
Cypripedium acaule	Pink Lady's Slipper
Danthonia sp	Poverty Grass
Decodon verticillatus	Water-willow
Drosera rotundifolia	Round-leaf Sundew
Dulichium arundinaceum	Three-way Sedge
Eriophorum virginicum	Tawny Cottongrass
Fagus grandifolia	American Beech
Glyceria canadensis	Canada Manna Grass
Ilex verticillata	Winterberry
Iris cf versicolor	Blue Flag Iris
Juncus effusus	Common Rush
Juncus tenuis	Path Rush
Lycopus sp	Water Horehound
Magnolia acuminata	Cucumber Tree
Maianthemum canadense	Canada Mayflower
Medeola virginiana	Indian Cucumber Root
Menyanthes trifoliata	Buckbean
Mitchella repens	Partridge-berry
Nemopanthus mucronatus	Mountain Holly
Nymphaea odorata	Fragrant Water Lily
Oclemena acuminata	Whorled Aster
Oxalis montana	Mountain Wood Sorrel
Pogonia ophioglossoides	Rose Pogonia
Prunus serotina	Black Cherry
Rhododendron groenlandicum	Labrador Tea
Rhododendron maximum	Great Rosebay
Rhynchospora alba	White Beakrush
Rubus allegheniensis	Common Highbush Blackberry
Rubus hispidus	Swamp Dewberry
Sambucus nigra ssp canadensis	Common Elderberry
Sarracenia purpurea	Pitcher Plant
Scirpus cyperinus	Woolgrass
Scirpus atrovirens	Black Bulrush
Solanum carolinense	Horse Nettle
Solidago rugosa	Rough Goldenrod
Sorbus americana	American Mountain Ash
Stachys hispida	Hispid Hedge-nettle
Triadenum virginicum	Marsh St-Johnswort
Trillium undulatum	Painted Trillium
Utricularia macrorhiza	Greater Bladderwort
Vaccinium corymbosum	Highbush Blueberry
Vaccinium macrocarpon	Large Cranberry
Vaccinium myrtilloides	Velvet-leaf Blueberry
Veratrum viride	False Hellebore
Viburnum lantanoides	Hobblebush
Xyris difformis	Carolina Yellow-eyed Grass



Frosted Whiteface

Photos: Rhododendron, mushroom, and dragonfly by Tim Lyons; Pogonia by Chuck Bartlett; Xyris by A. Johnson.

Indian River Lakes Conservancy Field Trip, August 2014

By Don Faber-Langendoen

Anne Johnson and Steven Daniel met us as we gradually assembled in the parking lot on Burns Road, on property owned by the Indian River Lakes Conservancy in Jefferson County. We came from various locations, including the Hudson Valley, Syracuse, Rochester, Lake Placid... For a few of us, this was an opportunity to join a 2nd trip in recent years to the lands owned by the Indian River Lakes Conservancy, but this time we were headed east, towards Grass Lake. By 8:00, the day was already bright and sunny, and we looked forward to a pleasant botanical hike in the woods. We were not disappointed. Moreover, Steven proved to be a source of knowledge about insects, fungi, and slime molds. Thus our trek through the woodlands was interspersed with identification of ferns, flowers, shrubs, trees, butterflies, moths, and a walking stick. A porcupine graced us with a close-up view.

Our walk first took us through limestone woodlands, dominated by sugar maple, basswood and hop-hornbeam, and scattered rock elm and shagbark hickory. Anne provided us with a list of plants encountered on the property during previous visits. We admired the diversity of calciphitic shrubs, ferns, sedges, and wildflowers. Naturally, our progress was appropriately slow, as we keyed out the variety of plants we encountered. But our trip came to a halt when Steven pointed out a striking patch of orange fungi. Soon some of us were loading up on the sulfur shelf (*Laetiporus sulphureus*) for appetizers with dinner that night. That soon us got to thinking and, not too much later, munching on lunch.

Eventually the trail led us up through a series of acidic rocky outcrops (the geology in this region is complex, so the alkaline and acidic rocks are interwoven throughout the property). The first open rocky barrens proved a challenge to negotiate, mostly because it lacked a clear set of trail markers. Thus we scoured the rocks more thoroughly than we otherwise might have. We were rewarded with a list of distinctive plants, including lowbush blueberry, huckleberry, common juniper, sedges (and possibly *Carex tonsa*), crustose lichens, and wildflowers, with scrubby white pines. Common sumac was present, looking right at home in this more natural habitat.

As we crested one large rocky outcrop, we got our first view of Grass Lake. The trail then led us down and around and eventually to the shore of the lake. But this was a short detour, as Anne reoriented us to the loop trail that would take us back to the parking lot. We made relatively quick progress on the straight, abandoned road. By 3:30 we were back in our cars. Some of us made plans to meet up the next day for a canoe trip on the lakes, and take a closer look at the aquatic life. We thank Anne and Steven for a pleasant, relaxed hike, and for sharing with us their botanical skills!

Note from Anne Johnson: On day two of the Indian River Lakes field trip we kayaked (or canoed) Grass Lake, putting in at the small state boat launch off the Burns Road. David Werier had joined us at that point and he provided us with a good lesson on some of the aquatic plants present in the lake. We enjoyed the calm clear day, the strange rocks, good views of two water snakes, and nice displays of smooth cliff brake (*Pellaea glabella*), a state-listed threatened species. Some of the group continued on to the island newly acquired by the conservancy to stretch their legs on a newly built trail. A list of the plants found at Grass Lake can be accessed through the New York Flora Association's web site (nyflora.org) under the Plant List tab.

Photos: Porcupine and sulfur shelf by Betsy Potter; group photo by Steven Daniel, rocks and cliff brake by A. Johnson

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