



Founded in 1997.
Logo art of Tall Goldenrod,
Solidago altissima,
by Nat Cleavitt, 2006.

Solidago

Newsletter of the
Finger Lakes Native Plant Society

Volume 16, No. 3



September 2015

PLANT ECOLOGY



Tompkins Co., N. Y.



Cattaraugus Co., N. Y.

Wild Lilies in New York

Top left: **CANADA LILY**, red-orange form (*Lilium canadense*, ssp. *editorum*)
Above: **TURK'S CAP LILY** (*L. superbum*)
Bottom center: **CANADA LILY**, yellow form (*L. canadense*, cf. ssp. *canadense*)
Bottom right: **WOOD LILY** (*L. philadelphicum*)



Butterfly Pollinators of Eastern North American Lilies (*Lilium* spp., Liliaceae)

by **Richard M. Adams, II**

with addenda by Robert Dirig

ABSTRACT: Four of the six eastern North American nodding wild lilies (*Lilium michiganense*, *L. superbum*, *L. michauxii*, and *L. iridollae*) are specialized for pollination by butterflies. In these species, the perianth segments, which recurve more than 180°, provide a landing platform for butterflies, and guide them to the front of the flower, where they feed on nectar inside the flower base. Cross-pollination is achieved when pollen is picked up on the ventral wing surfaces and deposited on the stigma, which lies in proximity to the anthers.

LILY (LILIUM) SPECIES HAVING FLOWERS WITH RECURVED TEPALS (undifferentiated petals and sepals) appear to be specialized for butterfly pollination. This observation is important to botanists, because pollination ecology is one form of reproductive isolation that has helped clarify this taxonomically difficult group of plants. It may also be noteworthy to lepidopterists, for few reports exist of lily pollination by butterflies.

Eastern North American nodding lilies are taxonomically distinguished by relatively few characters, these characters are highly variable, and different degrees of introgressive hybridization occur between several species. For these reasons, the group has been considered difficult as to determination and delineation of relationships. A study and monograph (Adams 1981a), building upon previous description and debate (references



Albany Pine
Bush, N. Y.



Albany Pine
Bush, N. Y.

therein), used several systematic techniques to help elucidate the relationships of species as a basis for formalizing a classification. This classification recognizes six species of nodding *Lilium* in eastern North America (Table I, below). Two species with upright flowers (*Lilium philadelphicum* and *L. catesbaei*) were excluded from this group. Of the six nodding species, two have flowers with non-recurving tepals and are not pollinated by butterflies; while in the remaining four, the tepals recurve and allow butterflies to be effective pollinators.

Table 1: Lily (*Lilium*) Species of Eastern North America

Species with nodding flowers [treated by Adams (1981a)]:

Lilium canadense (flowers bell-shaped, tepals bent back 90° from flower axis)

Lilium grayi (flowers thimble-shaped, tepals recurved 45°)

Lilium superbum (flowers turk's cap-shaped, recurved 270°)

Lilium michiganense (flowers turk's cap-shaped, tepals recurving 270° from stigma)

Lilium michauxii (flowers turk's cap-shaped, tepals recurved 270°-360°)

Lilium iridollae (turk's cap-shaped, tepals recurved 180°-220°)

Species with upright flowers [excluded from Adams (1981a), but included in Barrows (1979)]:

Lilium philadelphicum and *L. catesbaei*

Methods

Wild lily plants were observed intermittently from ca. 9:00 a.m. to 9:00 p.m. Insect visitors were photographed and collected when possible. Voucher specimens were deposited at the Cornell University Insect Collection as *Lot No. 1072*. Botanical vouchers are at the Bailey Hortorium.

Observations

IN FLOWERS WITH RECURVING TEPALS (see next page), the tepal tips covered the base, and prevented the butterflies from reaching the nectar from outside. Instead, the butterflies were forced around to the front of the flower to reach the nectar (page 3, *sepia photo sequence A-C on left, and drawing on the lower right*). As they positioned themselves to drink, their ventral wing surfaces often contacted the anthers (C & D), and sticky pollen adhered to the wing undersides (colored and SEM images labeled D in right column). At the same time, the wing undersides were positioned to contact the stigma, which lies in the same plane as the anthers, and pollen that adhered to the wings from other plants was likely to stick to it (C, left column, & E in diagram).

Numerous specimens of the *Great Spangled Fritillary* (*Speyeria cybele*) were collected on stands of Turk's Cap Lily in the Blue Ridge Mountains of North Carolina. One

specimen of a swallowtail (*Papilio* sp.) was photographed and collected on Michaux's Lily (*L. michauxii*). No visitors to the rare and endangered *L. iridollae* (of the Gulf States) were observed, but a similar mechanism may be expected.


IN FLOWERS WITH NON-RECURVING TEPALS, butterflies were seen landing on the base of the flower, inserting their proboscis between the tepals, and drinking nectar from inside the flower base without accomplishing cross-pollination, a phenomenon known as *nectar thievery* [see page 4 of this newsletter, and Faegri & van der Pijl (1971)].

Conclusions

The evolution of tepal recurvature in lilies may be an adaptation to facilitate butterfly pollination. Tepal recurvature enables butterflies to become effective pollinators of lily flowers, as opposed to robbing nectar.

Butterfly pollination in *Lilium* species with recurved tepals may be recognized as a pollination mechanism distinctly different from *pollination by Sweat Bees* (Halictidae), which occurs in the bell-shaped Canada Lily (*L. canadense*, see page 5), and *hummingbird pollination* of Gray's Lily (*L. grayii*, see silhouette below). However, these different mechanisms do not afford complete reproductive isolation: Sweat Bees visit not only *L. canadense*, but also species with recurved tepals; while hummingbirds visit other lilies besides *L. grayii*. Hummingbirds probably do not pollinate the other species as effectively as *L. grayii* because of the relative positions of the anthers and stigma (Adams 1981b).

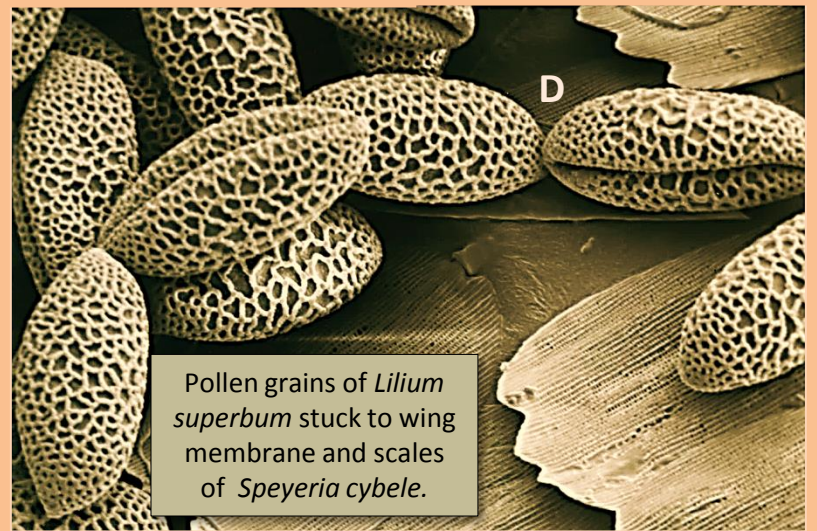
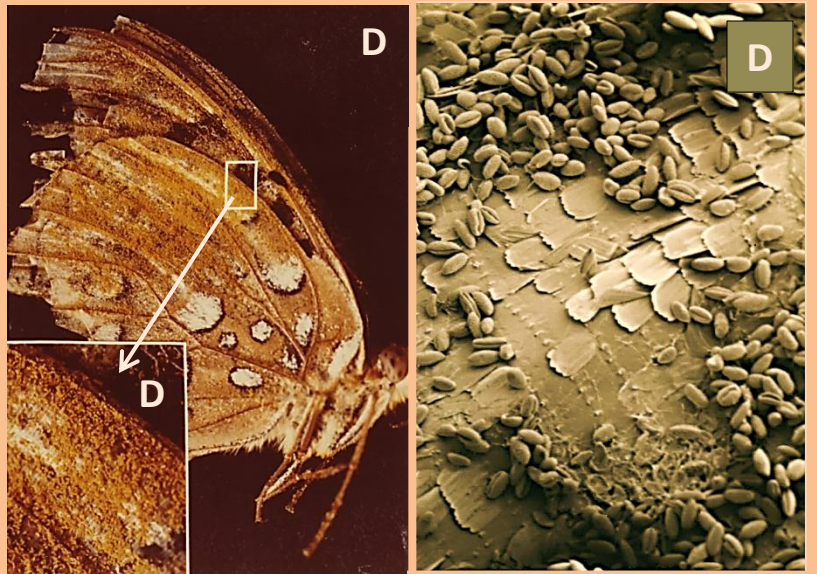
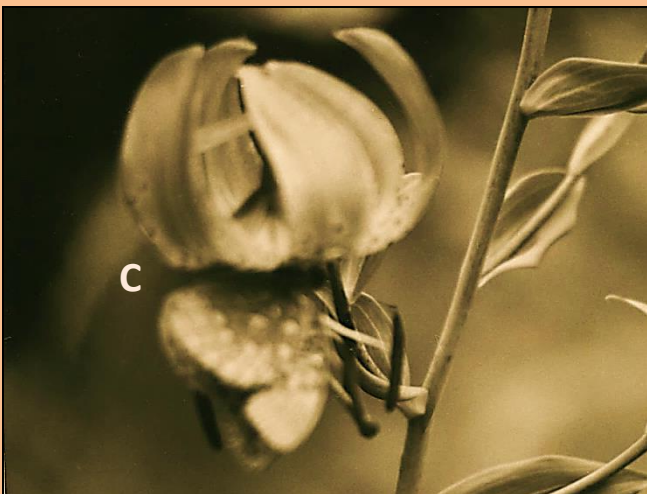
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Butterfly Pollination Mechanism of Lilies with Recurved Tepals

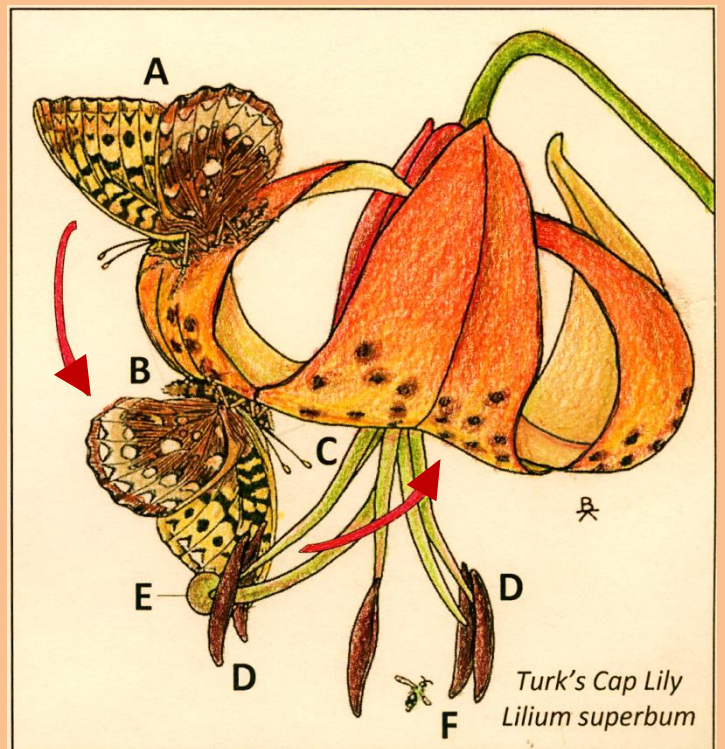
Great Spangled Fritillaries (*Speyeria cybele*) that land on top of lily flowers (A) cannot reach nectar inside the flower from the outside, because the flower base is protected by the recurved tepals (B), which guide the insects around to the front of the flower (C). While positioning themselves to drink nectar, the butterfly's wing undersides contact the anthers and pick up pollen (D). If the wings touch the stigma (E), which is close to the anthers, pollen that has adhered to the wings from other plants may transfer to the sticky stigmatic surface, affecting cross-pollination.* Sweat Bees (*Halictidae*, F) also pollinate these lilies.



Field photographs & SEM images by Richard M. Adams II.



Ink drawing by Bente S. King, labeled and colored by Robert Dirig.



*See Saunders (1932, pp. 155-156 & 167) for a similar discussion and diagram of this pollination mechanism.



Nectar-Thieving Butterflies on Wild Lilies

Lepidoptera must be of sufficient size to pollinate lily flowers. (1) A dark-phase ♀ **Tiger Swallowtail** (*Papilio glaucus*) feeds at a **Turk's Cap Lily** (*L. superbum*) in south-central W.V. Her wings are long enough to reach the anthers and stigma and transfer pollen. (2) Other butterflies, like the much smaller **Pearl Crescent** (*Phyciodes tharos*, arrow), crawl into the center of a **Turk's Cap Lily** flower, but are too small to pollinate it (Cattaraugus Co., N. Y.). (3) Likewise, a **Hoary Edge Skipper** (*Achalarus lyciades*, arrow) drinks nectar from a **Michaux's Lily** (*L. michauxii*) in Clay Co., N.C., but its wings are too small to make contact with anthers and stigma. (4) Lilies with non-recurving tepals, including **Gray's Lily** (*L. grayii*), are vulnerable to nectar-thievery; here a **Great Spangled Fritillary** (*Speyeria cybele*) in Wautauga Co., N. C., is able to insert its proboscis between the tepals to reach nectar inside the flower base. (5) A ♂ **Tiger Swallowtail** feeds at an open, upright flower of **Wood Lily** (*L. philadelphicum*) at the Albany Pine Bush, N. Y. Although his wings are big enough to reach the fertile parts, he will not transfer pollen if he sits on the side of the flower — but may if he lands on top of the tepal platform. (6) A ♀ **Edwards' Hairstreak** (*Satyrium edwardsii*) lands on the tip of a **Wood Lily** tepal, at the Albany Pine Bush, N. Y., crawls down the shaded outer side (7), and moves inside the flower base to reach the nectar (8), but does not contact the anthers or stigma.



“Arrival of the Nectar Thief”

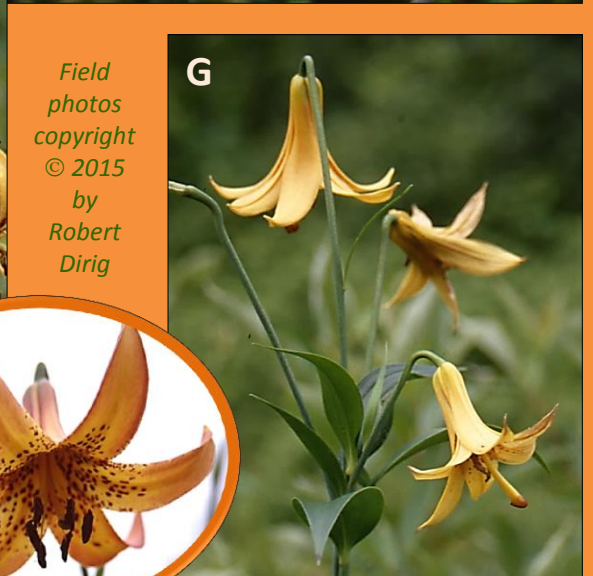
Sepia Figures 3 & 4
by Richard M. Adams, II,
the rest by Robert Dirig





The Finger Lakes' Familiar Nodding Lily

Canada Lily (*Lilium canadense*, ssp. *editorum*, **A-D**) usually grows in fens and other limy wetlands, blooming in late June and July, and has mostly red flowers in this region. The yellow form (cf. ssp. *canadense*, **E-G**) occurs in eastern N. Y. and New England (these growing in damp sandy soil edging a ravine at the Albany Pine Bush, N. Y.).



A, C, & D: 30 June 2011

7 July 2007

E

G

Field photos copyright © 2015 by Robert Dirig

E - G: 19 July 1997

Miscellaneous Notes on Eastern Wild Lilies ★ by Robert Dirig

We are fortunate to have **Richard M. Adams, II**'s essay and illustrations for this issue. Rich was finishing his Ph.D. thesis (Adams 1981a) on wild nodding lilies when I joined the Bailey Hortorium Herbarium's curatorial staff in 1980. We talked about the butterfly pollination mechanism of these lilies, and planned to co-author something about them. Thirty-five years later, it has finally happened! Rich now works as an Associate Professor in the School of Graphic Communications Management at Ryerson University in Toronto.

Here are a few additional reports of butterfly visits to wild lilies: LITERATURE GLEANINGS: *Lilium philadelphicum*: Tiger Swallowtail (*Papilio glaucus*) and Monarch (*Danaus plexippus*), in Edwards & Jordan (1992). *Lilium superbum*: Monarch, in Mathews (1927, p. 52), and Great Spangled Fritillary, in Saunders (1932, pp. 155-156, 167). MY OBSERVATIONS OF BUTTERFLIES AT LILY FLOWERS: *Lilium superbum*: Tiger Swallowtail, Spicebush Swallowtail (*Papilio troilus*), and Pipevine Swallowtail (*Battus philenor*), all in W.V.; Pearl Crescent (*Phyciodes tharos*) in N.Y. At *Lilium philadelphicum*: Tiger Swallowtail, Edwards' Hairstreak (*Satyrium edwardsii*), and Eastern Tailed Blue (*Cupido comyntas*), all at the Albany Pine Bush, N.Y. *Lilium canadense*: None.

Each butterfly has a unique tether to its larval host, wrapping its entire life cycle around the plant's annual rhythms; while the perfect merger of a pollinator's behavior and a flower's structure benefits both. Understanding the rudiments of these butterfly feeding/plant pollination strategies and larval/hostplant interactions provides a basis for further original discoveries in the fascinating outdoor habitats where they occur.

CREDITS: Photographs on p. 1, images 1-2 & 5-8 on p. 4, and all images on pp. 5-6 are copyright © 2015 by Robert Dirig. Photographs on pp. 2-3 and images 3-4 on p. 4 are copyright © 1981, 2015 by Richard M. Adams, II. The ink drawing on p. 3 was rendered by the late Bente S. King (here labeled and colored by the Editor).

The GREAT SPANGLED FRITILLARY (below) is a major pollinator of *Lilium superbum*, and a versatile nectarer on many other flowers throughout its range. The table below presents all of my nectaring records for this large nymphalid.



Great Spangled Fritillaries: Male (left), nectaring at Common Milkweed; wing undersides, showing silver "spangles" (center); and female (right), laying eggs near violets (*Viola* spp.), their larval foodplants. Their proboscis is 13½-14 mm long (Scudder 1889, p. 557; Saunders 1932, p. 41).

Flowers Visited by Great Spangled Fritillaries (*Speyeria cybele*) from 1980-2015

in the Finger Lakes Region, Catskills, and Albany Pine Bush, New York, and at miscellaneous localities in New York, New Hampshire, Vermont, Massachusetts, Pennsylvania, Maryland, West Virginia, and North Carolina, with number of observations in parentheses (50 plants, 627 observations).

Native Wildflowers: *Ageratina altissima* (1), *Apocynum androsaemifolium* (8), *A. cannabinum* (16), *Asclepias amplexicaulis* (2), *A. incarnata* (31), *A. syriaca* (195), *A. tuberosa* (14), *Symphiotrichum laeve* (2), *S. novae-angliae* (1), *Ceanothus americanus* (3), *Cephalanthus occidentalis* (1), *Cirsium discolor* (91), *Erigeron strigosus* (1), *Eupatorium perfoliatum* (2), *Eutrochium maculatum* (2), *E. purpureum* (5), *Monarda fistulosa* (12), *Platanthera psycodes* (1), *Pycnanthemum tenuifolium* (2), *Sambucus nigra*, ssp. *canadensis* (1), *Spiraea alba*, var. *latifolia* (12), *Solidago caesia* (2), *S. canadensis* group (5), *S. nemoralis* (1), and *Vernonia noveboracensis* (1).

Naturalized, Non-native Wildflowers: *Arctium minus* (1), *Centaurea strobilifera*, ssp. *micranthos* (8), *C. nigra* (1), *C. nigrescens* (32), *Cirsium arvense* (2), *C. vulgare* (12), *Daucus carota* (2), *Dianthus armeria* (3), *Dipsacus laciniatus* (63), *Echium vulgare* (1), *Leucanthemum vulgare* (1), *Ligustrum vulgare* (7), *Lythrum salicaria* (1), *Marrubium vulgare* (7), *Myosotis scorpioides* (1), *Prunella vulgaris* (13), *Rudbeckia hirta* (2), *Stellaria graminea* (1), *Trifolium pratense* (34), and *Vicia cracca* (4).

Cultivated Flowers: *Achillea millefolium* [pink flowers] (1), *Buddleia davidii* (8), *Dianthus barbatus* (4), *Echinacea purpurea* (4), and *Zinnia elegans* (2).

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Solidago
Newsletter of the
Finger Lakes Native Plant Society

Volume 16, No. 3

September 2015

Published quarterly at Ithaca, New York, USA.

To receive a colored version when *Solidago* is published, please ask Arieh Tal to join our e-mail distribution list. Each colored version will also be posted on our website (www.flnps.org) after the next issue is produced.

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Lobelia
(*Lobelia
syphilitica*)
rivals local
gentians in
its wonderful
blue color.



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THE FINGER LAKES NATIVE PLANT SOCIETY STEERING COMMITTEE

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Arieh Tal: Membership (Chair),

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Please Contribute to *Solidago*

WE WELCOME CONTRIBUTIONS THAT FEATURE WILD PLANTS OF THE FINGER LAKES REGION OF N.Y. We include cryptogams (bryophytes, lichens, fungi, and algae) as "flora," and recognize that green plants provide habitats and substrates for these and many animals, especially insects. We are interested in zoological associations as long as plants are an integral part of the story.

We can use a wide spectrum of material in a variety of writing styles. Our regular columns include the **NAME THAT PLANT CONTEST** (identifying a mystery plant from images), **LOCAL FLORA** (plant lists from special sites), **OUTINGS** (reports of FLNPS-sponsored excursions), and **PLANT PROFILES** (on specific local plants). We also occasionally publish **APPRECIATIONS** (memorials to local botanists and naturalists), **REVIEWS** (of books, talks, workshops, nurseries), **LETTERS** (commentaries and letters to the editor), **ESSAYS** (on botanical themes), **VERSE** (haiku, sonnets, and poems of less formal structure), **ART** (botanical illustrations, plant designs, pencil sketches, decorations), and **PHOTOGRAPHS** (stand-alone images, photo essays, and full-page composite plates, or originals that can be scanned & returned). We also can always use **FILLERS** (very short notes, small images, cartoons) for the last few inches of a column.

Colored images in the online version will be converted into black and white before printing paper copies for mailing.

Please send *Solidago*
contributions & correspondence
to Robert Dirig, Editor,
at red2@cornell.edu.

Deadline for the December 2015
issue is November 15th!

Name That Plant Contest

The photo from last issue's NAME THAT PLANT CONTEST [*Solidago* 16(2), p. 3] was of **American Ginseng (*Panax quinquefolius*)**. The trick was that the individual in the photograph was a four-leaved variant. This species is typically three-leaved. While not rare in central New York, many populations are small. This may in part be due to people harvesting the roots for sale. Thanks to all those who entered the contest and congratulations to the winners: **BOB DIRIG, BETSY DARLINGTON, BILL PLUMMER, JENNIFER EDMONDSON, and SUSANNE LORBEER.**



THIS ISSUE'S MYSTERY PLANT IS SHOWN ABOVE. This locally uncommon species is quite a beauty, with flowers proportionally large for the size of the plant. The entire plant is rather short, often only 15 cm (6 inches) tall. Finding it in bloom is not always easy. Hints and suggestions are often provided to contest participants who try. Common and/or scientific names are acceptable. More than one guess is allowed. Please submit your answers to

DAVID WERIER (Nakita@lightlink.com).

The photograph was taken by David Werier on 12 June 2015, in Warren Co., N. Y.



Feedback on *Solidago* 16(2), June 2015

Oh Bob, what a wonderful surprise!!! You have outdone yourself. I just love that you are getting the word out about these beautiful creatures, and just in time for National Moth Week!

My Hackberries are still little, but growing more each year. Maybe someday I will enjoy the "fruits" of my labors. Along the way, they have nourished many leps (including a Snout, as you may recall).

Hoping your work gets a wide audience and encourages them to enjoy these beauties!

Thank you and the contributors for another wonderful newsletter.

Colleen Wolpert

Apalachin, N.Y., email of 16 June 2015



Beautiful, Bob; probably your best. I love the stained-glass quality of your 'colorized' drawings.

John F. Cryan

Windham, N.Y., email of 16 June 2015



Bob: I certainly enjoyed reading your article "Winged Giants of Night." Could you recommend a book which identifies moth species? I need to learn more. [David Beadle's & Seabrooke Leckie's *Peterson's Field Guide to Moths of Northeastern North America* is excellent. – Ed.]

Also, Rosemarie played a trick on me, as I initially believed the rare species "*Quercus dandlyonii*," until the inset was noted!

You made it especially difficult to identify this issue's **Mystery Plant**. What a challenge!

Hal Gardner

Carlisle, Pennsylvania, email of 21 June 2015



Page 1 (Jack-in-the-Pulpit): Even though written for an audience of scientists, the drawings and colors (shades of green, touches of yellow and rust red) entice any reader to turn to the next page.

Pages 2-3: Information about the Society is abundant. It is not only informative, but also links the reader with those who publish the newsletter. The interactive NAME THAT PLANT CONTEST is professional yet fun. LETTERS TO THE EDITOR are proof positive that *Solidago* newsletters are well worth the time spent reading them.

Pages 4-5 begin the use of vivid color (photographs of butterflies), along with an essay on most-likely unknown information about the Common Hackberry.

Pages 6-8: Continued reading pays off in interest and delight with the essay "Do Plants Dance, Prance, and Wear Pants?" plus a review of the Ithaca Native Landscape Symposium in March.

Pages 9-16 highlight the gorgeous heart of the newsletter — "Winged Giants of Night," starring the Luna Moth, along with its brothers and sisters, by the Editor, in a brilliant literary style (the dramatic arc of tension) this soulful story demands.

Pages 17-18: Notes of gratitude to contributors, plus a calendar of walks and activities are the *grand finale*, promising more of the same in the next issue of *Solidago*.

Thelma Turner

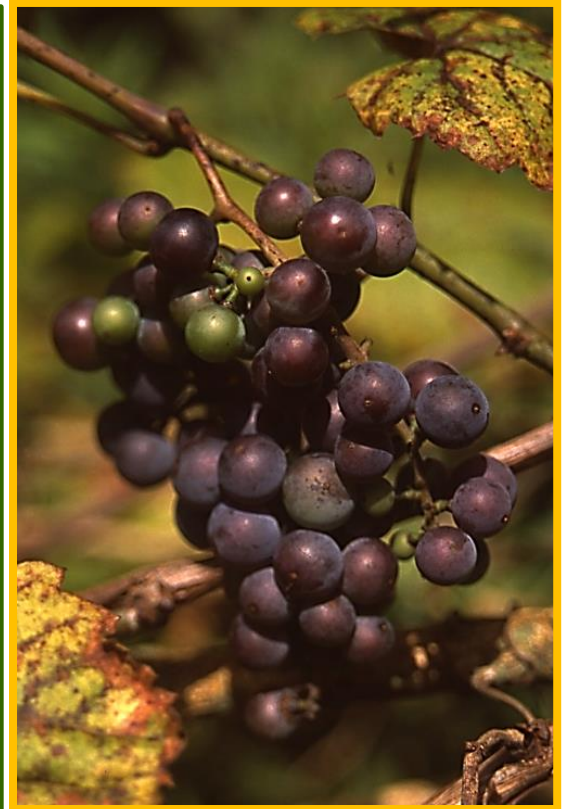
Ithaca, N.Y., email of 13 August 2015



**FLNPS Participates in the
New England Botanical Club's
120th Anniversary Celebration**
by David Werier

THE NEW ENGLAND BOTANICAL CLUB celebrated its 120th anniversary with a conference at Smith College, Northampton, Massachusetts, on June 5-7, 2015. They invited botanical and native plant groups, including FLNPS, from throughout eastern North America. I attended the conference as a representative of FLNPS. I enjoyed the various presentations given at the conference, including one by FLNPS member *Catherine Landis*, who discussed her research on the plants that Frederick Pursh noted when he visited Onondaga County in central New York in 1807. I especially enjoyed the keynote address by *Pamela Diggle* on Learned Societies. It helped me gain perspective on the origin of scientific organizations, like many of the botanical and native plant groups represented at the conference. The NEBC has made available on their website videos of all of the presentations (see www.rhodora.org/conference2015/oral-presentations.html). On Sunday, numerous field trips were offered. I made it to Mt. Tom, one of the traprock ridges that occurs in the area.

As part of the conference, I staffed a table with FLNPS promotional information, including a poster that highlights FLNPS's mission and activities. On the last day, there was a roundtable meeting/discussion, with representatives of about 10 organizations. We discussed how our organizations are doing, and what successes and problems we are facing. One focus of the meeting was how our organizations can continue to thrive in a day and age when interest in the plant world appears to be dwindling. Although we did not come to any overall conclusions, it was good to network with other groups in the region that have goals similar to FLNPS. We may try to meet again in the future.



Frost Grape (*Vitis riparia*): A cluster of wild grapes near McLean, N.Y., Sept. 2014.

Miscellaneous Notes

Correction: In *Solidago* 16(2), June 2015, on page 16, I erroneously reported wild *Promethea* cocoons on Green Ash (*Fraxinus pennsylvanica*). They were actually on a planted European Ash (*Fraxinus excelsior*) along a street in Ithaca, N.Y. Ed Cope identified the tree correctly; the error was in too-hurried interpretation of my notes.

— R. Dirig.

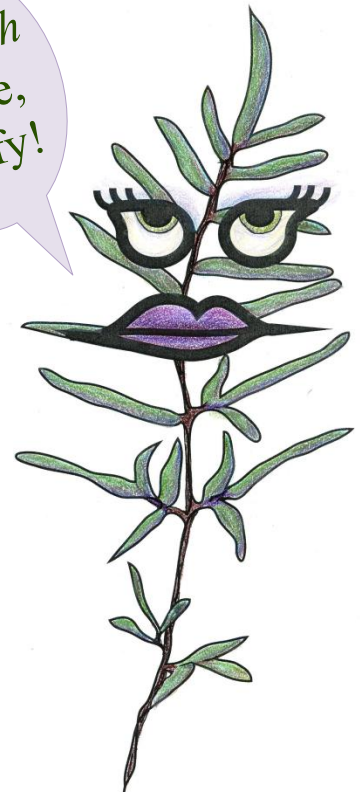
Hal Gardner's article on "Epigenetics" from *Solidago* 15(4), Dec. 2014, pp. 12-13, will be reprinted in the Sept. 2015 issue of *On The Fringe*, quarterly journal of the Native Plant Society of Northeastern Ohio.



***It's So Bad,
It's Good!***

Smooth
move,
Cliffy!

Hey
Purple,
You're a
sight for
sori's!



by **CLIFF BRAKE**,
as told to
SCOTT LAGRECA

IN THIS EPISODE:

Smooth Cliff Brake meets **Purple Cliff Brake**

ESSAY

Importance of Leaf Distribution in Identification of Species

by Arieh Tal

MANY OF US ARE FAMILIAR with three often-used and important botanical terms for describing how leaves are arranged on a stem or branch: *alternate*, *opposite*, and *whorled*. These terms can be crucial for enabling us to distinguish between different species. But, when presented with a large group of similar species, such as the goldenrods, all of which have the same *alternate* leaf arrangement, we may need to consider other characteristics.

However, if we consider the manner in which leaves are distributed vertically on a plant, from base to summit, we may be more successful. Are most or all of a plant's leaves at the time of flowering located at the base of the plant, as in a basal rosette, or are they primarily distributed vertically along the stem, either as well-developed leaves or just greatly reduced, scale-like leaves?

Let's consider a few examples. The **Common Dandelion** (*Taraxacum officinale*) has no stem leaves at all. The **Smaller Pussytoes** (*Antennaria howellii*) has well-developed basal leaves, but only very small, scale-like stem leaves (**Fig. 1**). Other species, like **Tall Goldenrod** (*Solidago altissima*), maintain only well-developed stem leaves at flowering (**Fig. 2**), and quickly lose their basal leaves early in the season. And in between these types, we have many species that maintain both basal and stem leaves at flowering, such as **Early Goldenrod** (*Solidago juncea*, **Fig. 3**).

Gleason & Cronquist (1991) often used the terms *basally-disposed* (i.e., oriented toward the base) and *chiefly cauline* (i.e., mainly on the stem) in their descriptions of species of goldenrods and asters. *Basally disposed* refers to a pattern of leaf distribution, in which a plant's largest leaves are the basal leaves, and the mid- to upper-stem leaves (if present) become progressively smaller toward the summit of the stem. When leaves are basally disposed, leaf shape may also vary by position on the stem. For example, stem leaves may become progressively narrower and/or less prominently lobed or toothed toward the top of the stem.

Solidago juncea maintains leaves that are basally disposed, often with a basal rosette and well-developed stem leaves that become progressively smaller, narrower and less prominently toothed upward along the stem. By comparison, *Solidago altissima* has leaves that are chiefly cauline, and its stem leaves gradually or only slightly become smaller and less prominently toothed toward the inflorescence.

Figure 1: *Antennaria howellii*, with well-developed basal leaves, but only very small, scale-like stem leaves. **Figure 2:** *Solidago altissima*, with only well developed stem leaves at flowering. Photographs by Arieh Tal.

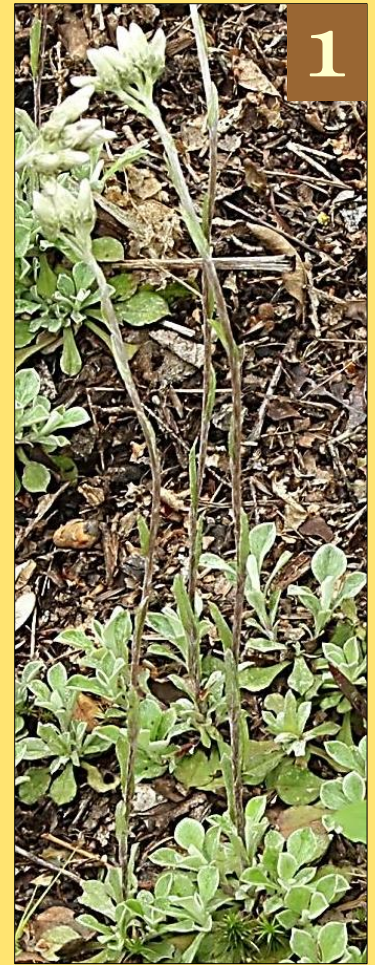





Figure 3: *Solidago juncea* maintains both basal and stem leaves at flowering. **Figure 4:** *Hieracium pilosella* has basally-disposed leaves with only one or two, if any, very diminished stem leaves. Photographs by **Arieh Tal**. See more information and his contact information at <http://botphoto.com>.



However, it gets more interesting than this. The vertical distribution of a plant's leaves affects its ability to compete with other plants in its vicinity, and thus the types of habitats in which it can succeed. Plants with leaves that are basally disposed (or entirely basal), cannot compete well with tall plants that maintain only well-developed leaves at flowering. That's why we find *Solidago juncea* and *Antennaria howellii* in drier, more open and/or disturbed habitats with relatively sparse vegetation. You won't find them in the midst of a damp thicket full of stout bullies, such as *Solidago altissima*. Though the latter can often be found in dry, open places, it doesn't do quite as well there, nor does it spread as aggressively in such places.

There are exceptions to every rule, and some of the hawkweeds that usually grow on lawns are exceptions — sort of. The common *Hieracium pilosella* (*Pilosella officinarum*) is typically found on lawns in early summer, sometimes forming extensive, dense colonies from stolons. Its bright yellow, dandelion-like flowers put on a dazzling display — at least until the lawn is mowed. This species has basally-disposed leaves with only one or two, if any, very diminished stem leaves (**Fig. 4**). And it grows nicely with typical turf-forming lawn grasses. It's able to succeed, ironically, thanks to the mowing, which serves as a great equalizer. For this hawkweed, stolons work just fine, thank

you.

Some goldenrod species similar to *Solidago juncea* (basally-disposed) include: *S. arguta*, *S. nemoralis*, *S. patula*, *S. bicolor*, *S. squarrosa*, and *S. uliginosa*. Goldenrod species similar to *S. altissima* (with chiefly cauline leaves), include: *S. rugosa*, *S. canadensis*, *S. gigantea*, and *S. ulmifolia*. Other characteristics work better for the remaining species of goldenrods, such as *S. caesia* and *S. flexicaulis*. 

LITERATURE CITED

Gleason, H. A., & A. Cronquist, 1991. *Manual of Vascular Plants of Northeastern United States and Adjacent Canada*, 2nd edition. Bronx, N.Y., New York Botanical Garden, lxxv + 910 pp. + map.

Finger Lakes Native Plant Society



From the *Cornell Rural School Leaflet*, Vol. 21, No. 2, November 1927, p. 15 (original ink drawing by *Albert Force* at CUP Herbarium).

Upcoming Walks & Talks, Autumn 2015

September 20 — Sunday — 9:00 a.m. to carpool, or 10:30 a.m. on site (see below). **WALK AT FREMONT FEN**, led by **Mike Hough**.

On this walk, we will visit a little-known gem in the midst of suburbia! We should find *Oligoneuron ohioense* (!), *Agalinis tenuifolia*, *Parnassia glauca*, and a few other common composites like *Eupatorium perfoliatum*. It is an easy walk in. The site has been dry, but if we get some rain between now and then, it could potentially have a few inches of standing water. Come prepared! Please meet at Cornell Cooperative Extension, 615 Willow Avenue, in Ithaca, N.Y., at 9:00 a.m.; or at the Great Outdoors Recreation Center, 7030 Manlius Center Rd., East Syracuse, N.Y., at 10:30 a.m.

Driving directions: From *I-81 North*, take *exit 16A for 481 East*, then *merge onto 690* using the two left lanes. From 690 take *exit 17 for Bridge Street*, and turn left at the end of the ramp. Follow the signs for *Route 290* east at the next light. The parking lot is on the right, a short ways past Fisher Road.

October 17 — Saturday — 1:00 p.m. ANNUAL FLNPS SEED-COLLECTING WALK, rain or shine, led by **Krissy Boys**.

Location to be determined. Please meet at Cornell Cooperative Extension on Willow Avenue in Ithaca, N.Y., to carpool.

October 18 — Sunday — 1:00 p.m. MOSS WALK, led by **Norm Trigoboff**.

Location to be determined. Please meet at the Cornell Cooperative Extension parking lot in Ithaca to carpool.

October 21 — Wednesday — 7:00 p.m. TALK on SOLIDAGO ECOLOGY, by **Andre Kessler**.

Most FLNPS walks begin at the Tompkins County Cooperative Extension center at 615 Willow Avenue in Ithaca, N.Y.

Talks are held at the Unitarian Church Annex (enter on East Buffalo St.) in Ithaca, N.Y. An elevator is available. We are still developing our programs for the year. Please watch our website (www.flnps.org) for updates.

Thank You!

WE ARE GRATEFUL to all who sent material for this issue of *Solidago*! We thank **WRITERS** Richard M. Adams, II, John F. Cryan, Robert Dirig, Hal Gardner, Scott LaGreca, Arieh Tal, Thelma Turner, David Werier, & Colleen Wolpert, whose contributions make this issue special. **CALENDAR ITEMS** and **ANNOUNCEMENTS** were compiled by Rosemarie Parker & Anna Stalter. **ILLUSTRATIONS** were loaned by Richard M. Adams, II (sepia photos and art, pp. 2-4), Robert Dirig (color photos on pp. 1, 4-6, 9), Torben Russo (p. 7), Scott LaGreca (p. 9), Arieh Tal (pp. 10-11), David Werier (p. 8), and the Plant Pathology Herbarium at Cornell (p. 12, *colored by the Editor*). **LAYOUT & DESIGN** by R. Dirig; **PROOF-READING** by Rosemarie Parker, Anna Stalter, & Scott LaGreca; **PRINTING** by Gnomon Copy, Ithaca, N. Y.; and **MAILING** by Rosemarie Parker & Susanne Lorbeer. **VERY BEST WISHES to FLNPS members (and all others in our reading audience) for a joyous autumn, as we celebrate the triumphant close of another botanical season!** — ROBERT DIRIG