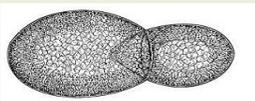
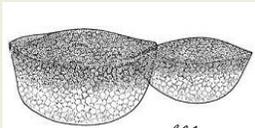
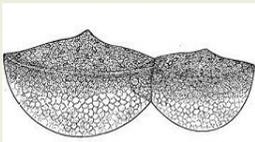


**New York Flora
Association**

Address: P.O. Box 122,
Albany, NY 12201
Phone: (518)250-6054
Email: editor@nyflora.org
Website: www.nyflora.org
Blog: www.nyfablog.org
Editor: Steve Young



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Wolffia in New York

By Connie Tedesco

Some of the most interesting native aquatic plants in New York are also the smallest- species of the genus *Wolffia*, one of the five genera of the Lemnoideae, the Duckweed subfamily of the Araceae, the Arum family. These tiny plants are the smallest flowering plants known. They are most likely underreported as a species in New York, possibly due to their inconspicuousness and their problematic size for making vouchers.

Habitat and Range

There are 11 species of *Wolffia* known worldwide, primarily in warmer climates (Landolt 1997). There are three species found in New York: *Wolffia columbiana* Karst (Columbian watermeal), *Wolffia borealis* (Engelm.) Landolt (dotted watermeal), and *Wolffia brasiliensis* Wedd. (Brazilian watermeal) (Weldy and Werier 2012). Two or more species may be found together floating in the same quiet pond, lake, or marsh, often amongst *Lemna minor* or other floating aquatics. The texture of the plants feels grainy or mealy when rubbed through the fingers.

Taxonomy and Identification

Most systems of plant classification place duckweeds in the family Lemnaceae. However, recent molecular research places the duckweeds in [Araceae](#) as subfamily Lemnoideae (Les et al. 2002).

Wolffia is named after Johann Friedrich Wolff (1778-1806), a German botanist and physician. *Wolffia* is distinguished from *Spirodela* and *Lemna* by the absence of roots and by veinless fronds (leaves in Lemnoideae), and by their small size- less than 1.6 mm. The fronds in *Wolffia* are 3-dimensional (globular, ovoid, or boat-shaped) without air spaces, as opposed to *Wolffiella*, whose fronds are flat and contain air spaces (Landolt, 1997). The size and shape of the plant body are important in identification, preferably with 10X or higher microscope (Armstrong, 2012).

Reproduction

A single pistil and single unilocular stamen compose the tiny (0.3 mm) flower in a dorsal cavity and produce a single fruit called an utricle. However, flowering, from late spring to fall, is rare, and plants reproduce primarily vegetatively. Vegetative reproduction produces daughter buds from a basal or side pouch. The plants are short-lived (16.8 days in *Wolffia borealis*) but productive (0.62 daughter frond produced/day) (White and Wise, 1998). Turions, dormant vegetative buds, may survive for weeks or even months imbedded in mud or silt (Armstrong, 2012). Dispersal may occur by streams, wind, waterfowl, and humans (e.g. boats).



Wolffia in relation to other common duckweeds:

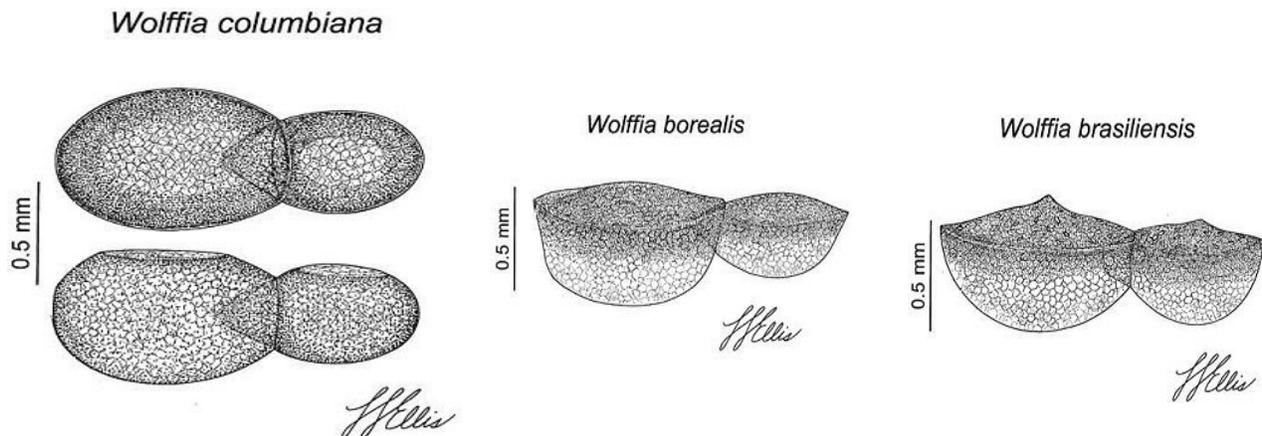
Spirodela (largest),
Lemna (mid-sized)
and *Wolffia*
(smallest),
scale in millimeters.

Photo by Dr. Gerald Carr.



Key to the 3 species of *Wolffia* in New York (adapted with permission from [Wayne Armstrong](#)):

1. Tip of plant body clearly pointed (and slightly upturned), upper surface distinctly flattened; dead plants dotted with brown pigment cells - [*Wolffia borealis*](#)
2. Tip of plant body rounded (not slightly upturned), upper surface more or less rounded or flattened with a central papule.
 1. Upper surface of mature plant body flattened with a minute-prominent papule in the center; dead plants dotted with brown pigment cells – [*Wolffia brasiliensis*](#)
 2. Upper surface of mature plant body smooth; dead plants without brown pigment cells. Plant body 0.8-1.2 mm, almost spheric, most of upper surface clearly rounded, the uppermost top area flat – [*Wolffia columbiana*](#)



Illustrations by Linda Ellis, University of Wisconsin- Stevens Point, Robert W. Freckmann Herbarium



Making herbarium specimens

Making herbarium specimens of *Wolffia* can be problematic. They are so small, and gluing individual specimens is very time-consuming. The glue itself obscures the view of the tiny specimens under a microscope. Drying specimens on blotter paper and placing them in an envelope is the preferred method; a few specimens can be reconstituted if the need arises. Remember, however, there is often more than one type of *Wolffia* species in a given sample!

Interesting facts

Like other members of Lemnoideae, *Wolffia* species are highly productive and have a high percentage of amino acids. *Wolffia* species are used as animal feed and eaten as a vegetable in SE Asia. Climate warming and increased eutrophication of waters have led to an overall increase in *Wolffia* (Landolt, 1997).

Taxonomic Status (Stevens, 2012)

Clade	Angiosperms
Clade	Monocots
Order	Alismatales
Family	Araceae
Subfamily	*Lemnoideae - duckweeds
Genus	Wolffia Horkel ex Schleid.

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Sedge Workshop With Tony Reznicek June 20-21

SUNY ESF Wanakena Ranger School

By Kim Smith – NY Natural Heritage Program

This was the 8th year NYFA has been fortunate enough to have Tony Reznicek come to New York to teach a sedge workshop. Despite the extremely hot weather, we had a great turnout of sedge enthusiasts and visited some interesting sites in the Adirondacks and alvar of northern New York. The workshop started at the SUNY Ranger School in Wanakena where Tony gave a lecture on taxonomy and morphology of sedges. We had a chance to look at some specimens and Tony helped us with the more troublesome ones.

Then we headed out for the field. Our first stop was Streeter Lake in the Aldrich Pond Wild Forest, where we mostly tried to stay cool examining woodland sedges, but couldn't miss the opportunity to check out the bog as well. Although we were very focused on learning sedges, we did find some other interesting plants in the bog, including white fringed orchis and mistletoe. We spent most of the day at this site and between the woods and the bog, we learned to identify 28 different sedges. The next stop was the Wanakena River Trail, where we checked out seven more sedges in the ice meadows along the river before calling it a day.

On day 2 we started out at the Black River where we explored the beautiful limestone flats along the river's edge. On the vegetated bank and in the cracks of the rocks, we found a lot of characteristic sedges. One particularly noteworthy find was a single large clump of cloud sedge (*Carex haydenii*), a state-endangered sedge that was only previously known from historical records in the area. The next and final site we visited was the Three Mile Creek alvar barrens and grasslands, a Nature Conservancy property. This was a great opportunity to learn some unique and uncommon sedges that are restricted to these habitat types in New York.

Overall, it was a great workshop and we had fun exploring the north and learning more about the sedges of New York. Amazingly, we covered 70 different sedge species in two days! We hope Tony will come back next year since with sedges there is always more to learn!



Sedge Workshop Plant List

Streeter Lake Woods and Bog

Carex vulpinoidea
Carex gynandra
Carex scoparia
Carex debilis var. *rudgei*
Carex novae-angliae
Carex communis
Carex utriculata
Carex stricta
Carex magellanica
Carex canescens
Carex echinata
Scirpus atrocinctus
Carex trisperma
Eriophorum virginicum
Carex baileyi
Carex leptonevia
Carex oligosperma
Rhynchospora alba
Carex pauciflora
Carex billingsii
Eriophorum vaginatum
Carex exilis
Carex atlantica ssp. *capillacea*
Carex lasiocarpa
Dulichium arundaceum
Scirpus hattorianus
Eleocharis palustris
Carex intumescens

Wanakena River Trail

Carex lurida
Carex projecta
Carex stipata
Carex folliculata
Carex michauxiana
Carex leptalea
Carex brunnescens

Black River

Carex lacustris
Schoenoplectus tabernaemontanae
Carex trichocarpa
Carex crinita
Eleocharis erythropoda
Scirpus cyperinus
Schoenoplectus pungens
Carex hystericina
Scirpus microcarpus
Carex tribuloides
Carex aurea
Carex granularis
Carex vesicaria
Carex haydenii

Three Mile Creek

Carex annectans
Carex cristatella
Carex molesta
Carex bebbii
Eleocharis compressa
Carex crawei
Carex castanea
Carex umbellata
Carex conoidea
Carex brevior
Carex blanda
Carex pennsylvanica
Carex woodii
Carex rosea
Carex backii
Carex pedunculata
Carex cephalophora
Carex arctata
Carex radiata
Carex gracillima
Carex alopecoidea



What is Dick Mitchell Doing?

By Dick Mitchell

Steve Young said that he sometimes gets that question, and he kindly asked me to write a few words for the newsletter after ten years in Florida. Many of you in NYFA don't know me personally, since I retired as State Botanist on the last day of 2002. I have a great fondness for the organization and its goals, since I co-founded it in 1989, and pretty much ran it from my desk for twelve years. And, yes I do miss the field trips and a lot of you whom I do know and admire as botanists.

Steve Young and the NYFA board have done a wonderful job of expanding the organization and its outreach to people who want to study and document the plant life of the region through field trips and workshops. I feel that these are the only truly healthy and surviving pursuits left in the field of systematic botany, which has been distorted in the academic world until it is barely recognizable. I don't mean to pick a fight about this, but just to remain a geezer with opinions, who has always spoken his mind.

Foremost in my mind is the gratification I feel when I see that NYFA is reaching the goals that I always hoped it would. I'm so thankful that field botany maintains its allure, and that experts in botanically difficult groups still want to teach. We got off to an excellent start in the 90s, with over 250 members, and that level of interest has been maintained and increased, due to promotion of the cause, especially in recent years. We didn't have tee-shirts, caps and mugs back in the day, but we would have had them if I had thought of it.

On a personal level, I love going to the many parks we have in the Tarpon Springs/Crystal Beach area of Florida, and my wonderful life-partner, Karen, and I have been nature walking for nearly six years now. When I retired to help my mother through many health crises, I was extremely lucky to rediscover all the members of my college dance band, living right in this area. We organized, recorded and played for our own 50th reunion dances in both Tampa and Tallahassee. It was amazing to play on stage while watching 200 of my high school class mates bopping to the rock and roll of those days. In addition, I try to write novels, and I've recently published a full length e-book, which may be found on Amazon (cheap) and read with Kindle software. It's an Everglades fantasy and social commentary about a girl raised in isolation in the Great Cypress Swamp. You can search "Karme" at Amazon.com. My botany book collection is largely for sale, too – some rarities and volumes, like Torrey (1843) with color plates, given to me by my predecessor, Eugene Ogden.

So, contact me if you just want to say "hi" or reminisce, or if you want a book list. I miss you guys and the comradery, particularly the feeling of slogging through a swampforest or bog, or climbing a mountain, which I can't do anymore. What I can do is to wish you and NYFA a wonderful future and a lot of joy of discovery, as you explore all the complexities of the flora of New York State.

Thanks for all you've done and will do.

Dick

(Richard S. Mitchell, N. Y. State Botanist, Emeritus)

rmitchell80@tampabay.rr.com



The Standing Ones and the Completed Circle

By [Johnie Leverett](#), Native American, 1941-2004

“As a tree gets older and older and can no longer give forth its leaves, a great wind may come.”

The Standing Ones, (trees) would serve humans by creating fresh air, holding the soil in place, and providing wood for shelter and fire. The Medicine People (small plants) would serve as food and medicine for the human body. The Creator gave life and death to humans and to all of his creations. Trees are a special creation. This is what was told to me. Trees do not go into Spirit like those of the animal kingdom. When they are ready to go, they call out to all the little things in the forest and invite them in. These little things in turn provide food and create shelter for other small things. The birds make their home in the hollow spaces and, as these spaces enlarge, perhaps they will become home for the rabbit, raccoon, squirrel or possum.

As a tree gets older and older and can no longer give forth its leaves, a great wind may come. This wind

will carry the words of the Creator that it is time for the tree to rest. With this the wind will lay the great one upon the ground. But its job is not finished. As the seasons turn, a change takes place within the tree. It will become the home of a new type of small thing.

As the tree slowly melts into the ground, seeds from the Medicine People will be invited in and fall upon its length. These will be mosses, ferns, wood sorrel, mushrooms and yes, the seeds of other Standing Ones. The log has become part of the Mother and nurtures Medicine People and young Standing Ones. As the plants mature, the great tree’s remains continue melting to become new soil for many things list from business reply cards, customer information sheets, business tolive upon. Even humans. Thus the circle is completed.

Reprinted from the Mianus River Gorge Newsletter 1995

The NY Natural Heritage Program Moves to SUNY ESF (not physically)

NY Natural Heritage Program
Website

www.nynhp.org

The NY Natural Heritage Program has recently transferred from The Nature Conservancy to the SUNY Research Foundation under SUNY ESF. The move will be gradual with some employees moving over before others depending upon the contracts they are working on. The program will remain in the Department of Environmental Conservation at 625 Broadway, Albany and continue to work on the rare and endangered plants, animals, and ecological communities of New York as well as invasive species. Their contact information will not be changing.



Chemung Valley Field Trip – June 23-24

From David Werier: Thanks for a great weekend. It really was a lot of fun for me. I am glad my voice held out (barely) and thanks for your patience regarding my voice. I am glad you were all interested in exploring a really exciting part of New York State. Thanks for botanizing together.



Photo John Habermehl



Photo Louise Raimondo



Photo Louise Raimondo



Photo John Habermehl



Photo John Habermehl



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Carex haydenii

NYFA Sedge Workshop

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Contribute to Our Newsletter

Do you have a photograph, article or poem, or pondering that you would like to share with other NYFA members? We are always looking for interesting contributions for our newsletter and blog. Please send your contributions and suggestions to:

EDITOR@NYFLORA.ORG

We would also like to know what articles are most interesting to you about our flora. **We like feedback!**

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All of NY's programs and trips are posted on the calendar at:

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



The only extant occurrence for Suffolk County of *Asclepias viridiflora*, green milkweed, found by Dave Taft in Commack, July 2012.