



New York Flora Association

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Editor's Note: In this issue, we have a special treat - an article from Dick Mitchell, former state botanist (and NYFA's first newsletter editor) on the formation of the New York Flora Association. Dick did quite a bit for New York State botany and we miss him (and miss the position of State Botanist!). Another newsletter high point is NYFA board member Joe McMullen's seasonally appropriate article – Shades of Green. He has promised us another seasonally appropriate article for the Fall issue – Absence of Green.

And please take note of the upcoming symposium at the NYBG on a topic of particular interest to readers of this newsletter (see page 5).

Shades of Green

by Joseph M. McMullen

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The word green has always intrigued me. My thoughts on the word wander from its diverse applications and uses in everyday life to its deeper and varied meaning in the plant kingdom. It is definitely a color of many shades in both worlds.

Applications of Green

A person can be described using green. You can be flush with green, green around the gills, a green recruit, or a greenhorn. Your thumb can be green.

Green surfaces in the animal world. We have a green frog, a green snake, a green sunfish, and a green heron. Mammals are slighted, and I'm sure are green with envy.

Super heroes are green, like the Incredible Hulk or the Green Hornet. Even giants can be green, and of course jolly. And, if you are somewhere near my vintage, Mr. Green Jeans has some meaning.

Green is used to designate the different types of energy generation or other conservation practices considered environmentally friendly. Shopping malls are painted green to advertise their use of these beneficial practices – or is it to attract more customers by sublimating their ultimate goal, which is to make more green.

Green influences food packaging. It is the color that depicts organic food in both packaging and signage. As I write this in early March, the news is full of phrases like the wearing of the green, gone green, and green beer. These phrases signify the importance of green to an entire lineage of people, many of whom have a name similar to McMullen.

Green in the Plant World

But it is really in the plant world where green shines the brightest. Here is where it shows its true colors (so to speak). Here is where the images of green are the most vivid to me and where the variations in its shades are the most dramatic.

Plants have always been associated with green, obviously because most plants are green. The green in plants comes from the presence of chlorophyll, the matter used by plants in the process of photosynthesis. This is the process where light energy is converted to other forms of useable energy, like carbohydrates. The process involves the uptake of carbon dioxide and the discharge of oxygen, which of course has some benefits to us oxygen guzzling, carbon dioxide spewing, bipeds. If you ever hear someone say that plants are not important, your first response to them should be: “take a deep breath”.

Color by Wavelengths

All colors we see, including green, are the result of reflected light in different wavelengths. Your blue jeans appear blue because a pigment that reflects light

wavelengths in the blue range has been added to the cloth. (Interestingly, white is the mix of all colors and black is the absence of color.) Chlorophyll in leaves and other parts of plants reflect wavelengths of light in the green range. It is rather ironic that plants are associated with the color green, because they actually have no use for it. Light primarily in the blue and red wavelength ranges are absorbed and used by chlorophyll to produce energy. Green is cast away unused; it is thrown back into your face as unwanted reflected light. This leads to a question, if a fresh leaf falls in the forest and there is no one there to see it, would it still be green?

Variations of Green

We often hear a shade of green described as forest green or grass green. I'm never quite sure exactly what color that is, because I see so many different shades of green in a forest, a lawn, or actually throughout the natural environment. I have a hard time just looking at a leaf or a plant community and saying that it is green. I want to add an adjective to the green I am seeing, or attach a modifying color to better fit the green reflected to me, like the black-green of evergreens or blue-green of flat-stemmed blue grass (*Poa compressa*).

Black-green is a shade I often see. Evergreen trees, such as eastern hemlock (*Tsuga canadensis*), Norway spruce (*Picea abies*), and firs (*Abies* spp.), reflect a deep black-green, especially when viewed against a backdrop of deciduous trees on a drizzly day. The Black Forest in Germany actually gets its name from its spruce-dominated forests, which give the area its dark, black-green appearance.

Sometimes the word deep is used to modify a color, like deep green. I guess that is to describe the richness or strength of a color, similar to the higher numbers of chroma, a term used in the Munsell Color chart. The Munsell System is a universal method of describing a color using hue, value, and chroma. Many plants can be described as deep green, although when I hear the word deep I tend to picture a place where if I fell in, I might either drown or lose myself in thought.



The Black Forest in Germany actually gets its name from the black-green character of the spruce (*Picea* spp.) dominated forests.





The Norway spruce (*Picea abies*) in the center has a black-green look, and contrasts with the pale green willow (*Salix* sp.) shrubs on the left and American elm (*Ulmus americana*) on the right.

Shades of green with a yellow cast are common in nature. If you have ever seen a dense colony of hay-scented fern (*Dennstaedtia punctilobula*) covering the dappled lit floor of a deciduous forest, you would describe the ferns as yellow-green. A nice yellow-green comes from sugar maple (*Acer saccharum*) leaves, particularly in the spring of the year.



An abundant display of hay-scented fern (*Dennstaedtia punctilobula*) often has a yellow-green appearance.

Then there are leaves that look gray-green to me. The various cattails (*Typha* spp.) are good examples. A marsh full of them has a dusty, gray-green appearance. Trembling aspen (*Populus tremuloides*) leaves can also look gray-green, especially as a gentle breeze stirs the leaves and exposes both sides. Each leaf quakes readily because the leaf blade and petiole are flattened in opposite directions, causing the leaf to flutter with a minor air movement.



The nature of the leaf surface can affect the green we see. Oak (*Quercus* spp.) leaves appear shiny green because a layer of cutin coats the surface of the leaves and polishes the green to a shine. The cutin protects the leaves from excess moisture loss, an important feature to oaks that often occupy dry slopes. A dull, flat green on the other hand, is displayed by the leaves of many trees, including maples and aspens. They are not at all like the shiny green of oak leaves.

Contrasts in Green

Contrasts in the color green are common among plant species and these contrasts can help identify different species. A fern frond with a deep green center and pale green edges is a distinguishing characteristic of Goldie's fern (*Dryopteris goldiana*). Contrasts between the upper and lower surfaces of leaves are often used in plant keys to distinguish species. The two subspecies of jack in the pulpit (*Arisaema triphyllum*) are separated by the lower leaf surface being green (ssp. *pusillum*) or glaucous (ssp. *triphyllum*). In the tree willow group, our native black willow (*Salix nigra*) has a green lower leaf surface, while the introduced crack willow (*S. fragilis*) has a whitened lower leaf surface. There are many other examples of contrasts in green used to distinguish species in the plant world.



A distinguishing feature of Goldie's fern (*Dryopteris goldiana*) is a young frond with a deep green center and pale green edges. An abruptly tapering tip is also characteristic.



The flat gray-green of these trembling aspen (*Populus tremuloides*) leaves contrasts with the older deep green and younger pale green leaves of tulip tree (*Liriodendron tulipifera*).





The whitened (glaucous) lower surface of this jack-in-the-pulpit distinguishes it as *Arisaema triphyllum* ssp. *triphyllum*.

Going Forward

As you wander about in the field, wonder at the greens you see. I'm sure you will find your meanderings through the myriad shades of green a rewarding experience.



Native Plant Summit: Current Status, Conservation, and Outlook for Plants of the Northeast

The New York Botanical Garden would like to announce an upcoming symposium - Native Plant Summit: Current Status, Conservation, and Outlook for Plants of the Northeast on September 18, 2015 from 9 a.m. to 3 p.m. The northeastern U.S. hosts a rich diversity of native plants, many of which play essential roles for humans and the environment. Alarming, a significant number of these species are experiencing a precipitous decline. Many natives are imperiled as a result. New York considers one-quarter of its native plant species to be of conservation concern. Despite these figures, no comprehensive or integrated program exists to study trends in the status of native plants across the region. Through a series of compelling presentations, followed by a panel discussion, this Summit will address our dearth of knowledge by bringing together experts and interested members of the public to present and discuss the state of the area's plant species, plot the best course forward, and highlight ways in which everyone can make a difference for native plants in the Northeast.

Speakers include Robert Naczi, The New York Botanical Garden; **Rebecca Dolan**, Butler University, Dept. of Biological Sciences and Director of Friesner Herbarium; **David Werier**, New York Flora Association recent past President; **Mary Klein**, President & CEO of NatureServe; **Bernd Blossey**, Cornell University, Dept. of Natural Resources; **Jerry Jenkins**, Wildlife Conservation Society, Adirondack Program; and **Donald Leopold**, Chair and Distinguished Teaching Professor, State University of New York College of Environmental Science & Forestry. For information on registration fees and location, see the flyer at www.nybg.org/adulted/lectures.php, and while there, check out their Invasive Species Summit: Challenges, Strategies, and Perspectives to take place on November 6, 2015.



**NYFA 25th Anniversary:
A Message from the Last State Botanist**

by Richard S. Mitchell
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One of my greatest joys has been to see NYFA thrive and grow over the years. Even with its distinguished botanical history, dating back to the 1830's and beyond, New York State reached the late 1980's lacking a botanist's field organization for professionals and enthusiasts. NYFA's inception may be attributed to the late Norton Miller, who was head of the Biological Survey of the New York State Museum during that era. As my supervisor, he came to me in 1988, with a name for the organization already chosen, and, in his well-known fashion, left the rest up to me.

I called Bob Zaremba, of the budding New York Natural Heritage Program, since I knew he would be an excellent co-founder from outside state government. This drew some protest from my boss, but I insisted that we start an organization that shared its beginnings with the private sector. Most people don't know that representatives of the Nature Conservancy came to the State Museum in the late 70's, proposing a joint program in botany, with me as head. I often wonder how that might have turned out. The director of the Science Service, Hugo Jarnback, would have none of it; he sent them away, saying that the museum had been carrying out botanical research since the 1830's and would still be doing so long after TNC was only a memory. How wrong could he be?

I was personally amazed when Bob and I organized some informal meetings, inviting all the field botanists we knew. The first organizational meeting for NYFA drew over 60 botanists when I was expecting fewer than 10, so the meeting room had to be changed and extra doughnut runs were necessary. I met fascinating people I had never even heard about, and left the first meeting overjoyed at the new prospects. A later meeting drew over 150 people, where my good friend, Arthur Cronquist, made a short but elegant speech about the need for a state flora and an organization such as NYFA. Over 250 people joined the organization within the first year of its existence, and the membership soon rose into the 300's, where it has remained in later years, thanks largely to Steve Young and other diligent workers such as David Werier.

With Bob Zaremba's help, especially with his organization of field trips, I began publication of the NYFA Newsletter from my desk top computer, and I continued this until shortly before my retirement in 2003. Steve Young and Laura Lehtonen took over the editorship, and NYFA has continued to maintain and grow since then.

Some Background of State Botanists and Botany in New York State

The official statutory position of New York State Botanist was not established until 1888, but the function of the position was addressed long before. John Torrey, a truly famous American botanist, was commissioned by the State Museum in the 1830's to collect and classify New York State's trees, shrubs, ferns, and other herbs, and to collect and preserve a specimen of each to be cited in a large two volume flora. Starting with Charles Peck, there were four State Botanists, the other three being Homer House, Eugene Ogden, and Richard Mitchell. The tradition has apparently ended, and I offer this review:



Historical Tradition of State Botanists and Field Botanists employed by the State Museum



John Torrey

One of the foremost botanists of 19th century North America, John Torrey explored the state, collected a complete set of voucher specimens, and published “A Flora of the State of New York” (2 Vols.) in 1843.



George W. Clinton (c. 1870)

Son of Governor DeWitt Clinton and Member of the State Board of Regents, George Clinton was an avid naturalist who founded the Buffalo Museum of Science and was instrumental in the establishment of the position of State Botanist of New York, created for the purpose of documenting the flora.



Charles H. Peck (c. 1870)

The first State Botanist of New York, Charles Peck, was North America’s pioneer mycologist, naming over 2,700 species of fungi and many vascular plants.





Homer D. House (c. 1916)

Homer House published a two volume set of the earliest North American wildflower books to contain color photographs.



Homer D. House (c. 1938)

The second State Botanist of New York, Homer House, acquired great knowledge of the flora, established a master file of plant distribution maps, and collected over 30,000 specimens. His 1924 checklist of New York's vascular plants was a voluminous and scholarly work.





Stanley J. Smith (c. 1950)

Stanley Smith, Curator of Botany at the New York State Museum, had an encyclopedic knowledge of New York's vascular plants, bryophytes and fungi. He maintained the herbarium, kept a master file of plant distribution maps, collected over 30,000 vascular plants and as many mosses, fungi and lichens. Although he was disabled, the extent of his field work is legendary.



Eugene C. Ogden (c. 1940)

The third State Botanist of New York, Eugene Ogden was an expert on aquatic plants and an aerobiologist. He was first to use random access keys in a botanical study. His contributions to New York floristics included books on *Potamogeton*, northeastern ferns, and the aquatic flora of Lake George.



J. Kenneth Dean (c. 1980)

Ken Dean, an avid and knowledgeable field botanist was a technician and co-author of museum botany publications for over 30 years, collaborating with both Ogden and Mitchell.





Charles J. Sheviak (c. 1980)

Chuck Sheviak was Curator of the Herbarium of the N. Y. State Museum for over 35 years. His expertise in the taxonomy of orchids is known world-wide, and his field work contributed greatly to the knowledge of New York State's flora.



Richard S. Mitchell (c. 1987)

The fourth State Botanist of New York is the author and co-author of two NY State plant checklists and Contributions to a Flora of New York State as well as the co-founder of NYFA. He also produced a 500 page flora, economic botany and ecology of Hudson Highlands plants, which remains unpublished.

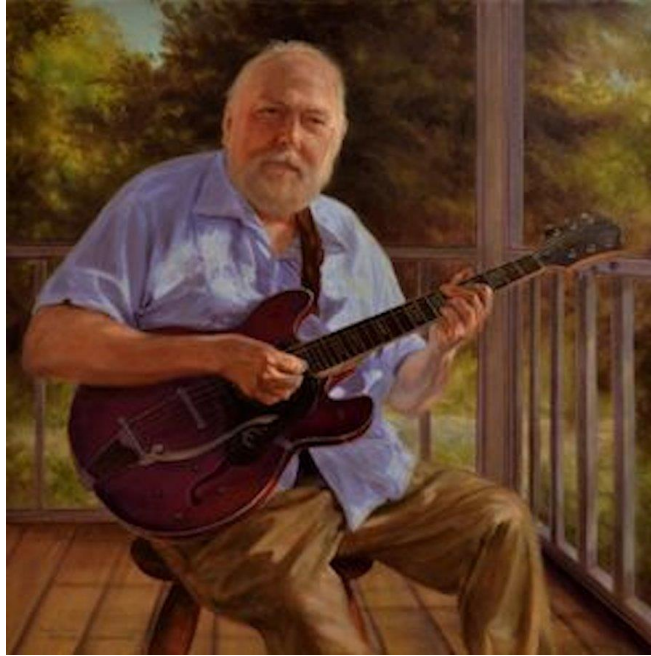
Most of you newer members have only heard of me (or maybe not heard of me). Still, I am very proud to have been part of the start-up of such a fine organization which now addresses education, conservation, and rare and invasive plant species. With what I consider the death of systematic botany in the universities and museums across the country, NYFA and similar organizations in other states have come to fill a huge gap in a dwindling field of expertise.

So-called taxonomists in institutional organizations still thrive as pseudo-chemists and numerical classification dabblers, but most of them know few plants, so the old traditions must be carried on elsewhere. Our NYFA newsletter appears on the internet now, and when I read about workshops, field trips, and gatherings to study difficult groups like the sedges and composites, it warms my ancient heart.

Congratulations on 25 years, and thanks to you all for keeping field botany alive.



Note: Dick Mitchell lives in Crystal Beach, Florida now. He is 77 years old and maintains a lifetime interest in playing guitar and keyboards. He is the author of several novels and other e-books published on Amazon.com. He welcomes communications from old friends and newer NYFA members at rmitchell80@tampabay.rr.com



Oil Portrait by Carin Wiseman (2014)

Requests from readers:

Dorothy Peteet at Lamont Doherty Earth Observatory writes: Really enjoy your quarterly newsletter, and was wondering if you publish “mystery” fossil seeds? I have one that is driving me crazy - about 1 mm in length - I find it in the Hudson marsh sediment cores (Iona, Manitou, Constitution, etc.) in the zone of European impact, so in the upper portions of the core. It is very abundant, and probably is non-native, though I don’t know if it is a wetland species or is blowing into the marsh from elsewhere.



Any help would be much appreciated. Please contact Dorothy Peteet at peteet@ldeo.columbia.edu.



Wanted: Unexpected cyncia observations!

The unexpected cyncia moth (*Cyncia inopinatus*) is a milkweed dependent moth species. It is most easily identified in its larval stage as a bright orange fuzzy caterpillar, but some color variation can occur – their hair tufts can also be darker (light gray to dark brown). First instars are very small (about 2mm), but late instars are about 3/4 – 1 inch long). Caterpillars can be found from spring through early fall (April to September).

Why are we interested? There are still many unknowns about the unexpected cyncia, especially in regards to its habitat. We want to learn more about its habitat and where it can be found.

How can you help? When checking milkweeds, let us know if you see any unexpected cyncia caterpillars. We are looking for presence observations of the unexpected cyncia wherever it is found.

Volunteer-collected data will complement research in north-central Oklahoma where the unexpected cyncia is fairly common. This research will involve studying how land use and parasitism influence unexpected cyncia populations.

For more information or to share an observation:

Please contact Miranda Kersten via email at miranda.kersten@okstate.edu. When submitting an observation, please include the location of your sighting. Pictures are also welcome and greatly appreciated.



Unexpected cyncia caterpillars can be found feeding on milkweed plants. Hairs on unexpected cyncia caterpillars range from bright orange to dark brown. Size depends on instar stage; they start out quite small (about 2mm). Photos by Dr. Kristen Baum.



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Adventures with Freshwater Algae

by Anne M. Johnson

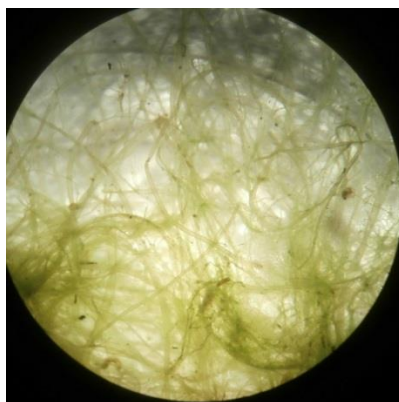
I don't want to start a huge controversy in a newsletter devoted to "flora", but I do want to talk a bit about algae. Despite the fact that: 1) I know almost nothing about identifying freshwater algae, and 2) I know almost nothing about the current state of knowledge of the different species of algae in the state and their distribution, I felt compelled to write an article about these fascinating organisms. Since at least some of them are chlorophyll containing, they can be lumped with plants under the term "flora" and thus I felt justified in including mention of them in this newsletter.

My interest started accidentally. – I had collected a lichen (a *Cladonia*) from the sand of some barren mine tailings along with a tangle of tiny purple brown strands that I initially thought was another lichen. Looking at it closer (see Figure 1), I realized it must be some sort of alga. Trying to identify the tangle led me to read about soil crusts, which then led me to read about algae.



Figure 1. My first mystery.

While I have not* been able to definitely identify it (as I have not been able to identify a lot of the algae I subsequently collected), my interest was piqued and I set out to collect some algae that I **could** identify. In an effort to start with some easy algae, I collected a handful of what I assumed to be *Cladophora* one day while out kayaking. Well, it wasn't *Cladophora*, and it wasn't an easy one with which to begin the learning process. I couldn't even understand what its structure was – it was multi-cellular and almost reminded me of a moss, but it was in long strands (see Figures 2 and 3).



Figures 2 and 3. My second mystery.



After diligent reading and internet searching, I eventually realized it might be tubular and sure enough, when I cut it into sections, it proved itself to be so (Figure 4). I was proud of myself, though I was still not sure of its identification. Perhaps it is a *Blidingia*, though a description for that species says it is primarily a marine species (though it can tolerate a range of salinities to almost freshwater).



Figure 4. Cross section.

After that onerous (though enjoyable) exercise, I did manage to collect a few much more identifiable species such as *Spirogyra*, *Bulbochaetus*, and the "real" *Cladophora*. Finding *Cladophora* itself was eye-opening in another way, as it was covered with algal epiphytes, which led me to discover the wild world of diatoms. Diatoms seem to be present in every drop of water and every clump of algae I have looked at, and they are incredibly diverse.

I'm sure people collecting and trying to identify lichens come across algae "accidentally" upon occasion, when looking at a cross-section perhaps. *Ephebe* is an example: to me it looked like a messy lichen but I wasn't sure it wasn't just an alga by itself and so looked closer, and under oil immersion was excited to see algal cells surrounded by clear hyphae. On another occasion I collected a *Xanthoria elegans* near water level on a rock face and noticed a tiny patch of green ovals in what appeared to be mucilage nestled between some of the orange lobes of the lichen (Figure 5).

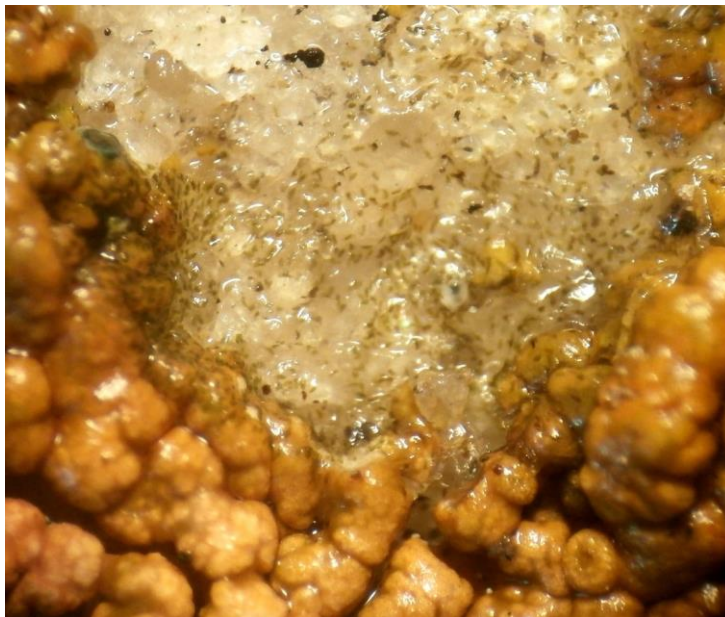


Figure 5. Tiny green ovals with *Xanthoria elegans*.



I looked at that under the microscope and found that it did not **just** consist of little green ovals, but that it was crowded with all kinds of ridiculously shaped things (Figure 6).

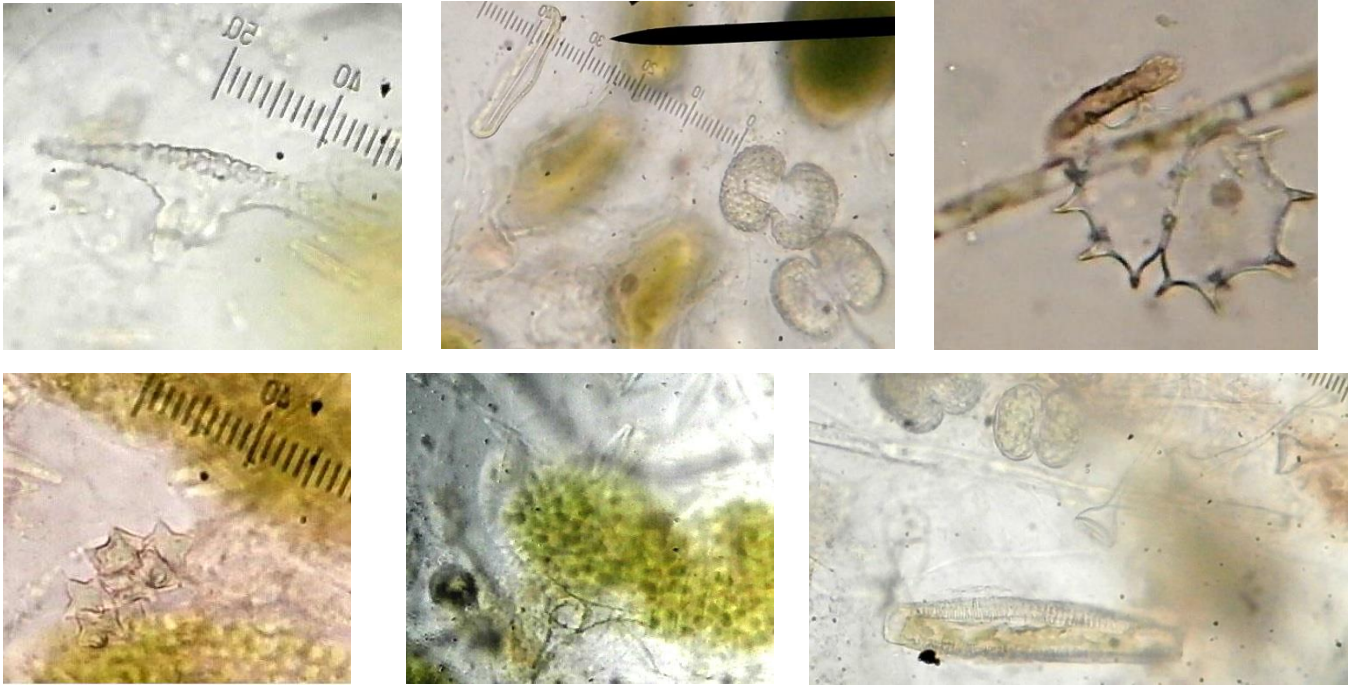


Figure 6. A few of the things in with the tiny green ovals.

To summarize, this article does not contribute to our knowledge of the distribution of algae within New York State, nor does it tell us anything new or useful about algae. In short, this article serves no other purpose than to express my pleasant surprise at stumbling across another layer of life's intricacies (see Figure 7) and my desire to share it with others.

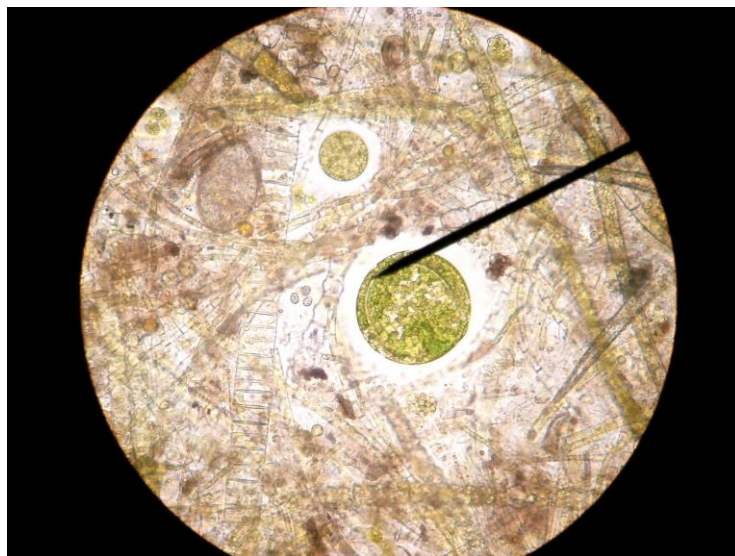


Figure 7. So many things in a small drop of water!

* Perhaps the purple brown tangle is a *Zygonium*, a green alga known to colonize sandy soils.



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