



# NEWSLETTER

 June 2019  
 Vol. 2 , Issue 1

## ATTEMPT TO RESUSCITATE MAYAPPLE AT EMORY'S LULLWATER PRESERVE

Mayapple (*Podophyllum peltatum* L.) has been used for a variety of medicinal purposes by Native Americans. It is an herbaceous perennial plant in the family Berberidaceae. Mayapples spread by underground rhizomes, so a colony of mayapple usually represents just one individual. To multiply, mayapples must be pollinated to produce seeds. Since mayapples are self-incompatible, flowers must receive pollen that comes from a different colony. Due to this, mayapples are endangered in their native range. This colony has not produced fruit for many years since it does not have a donor colony in the vicinity to receive pollen. This spring, the colony produced a lot of flowers. With the help of Emory graduate student Loy Xingwen, who works with bees, we attempted to hand pollinate one third of bloomed mayapple flowers with pollen from a different colony. We hope to see some baby mayapples in our preserve as a result.

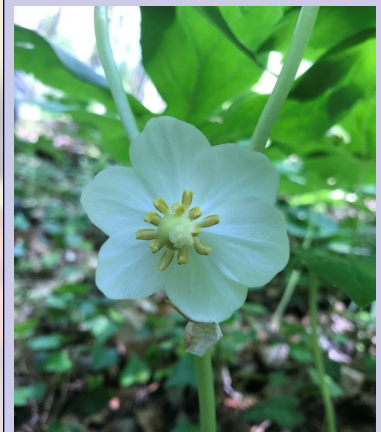


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Hand pollinating mayapple flowers with pollen from a different colony.







“This was my first year attending the expo. As a Georgia native, I was shocked that I had never attended the event before. It was incredible! There were hundreds of interactive booths for families to explore, and the park was filled with people.”

## **VOLUNTEER SPOTLIGHT: TANIKA DEUSKAR**



Tanika Deuskar has earned the spring 2019 volunteer spotlight by contributing more than one hundred thirty hours of her time as a volunteer researcher in the herbarium. Tanika is from Bangalore, India. She is planning to double major in Biology and Creative Writing. She finds plants fascinating because of the vital role they play in ecosystems. She thinks that making the products that we use in our day to day lives from chemicals extracted directly from plants is important, both in terms of our health and the environment.

# **EDUCATION AND THE EMORY UNIVERSITY HERBARIUM**

By Emily Edwards

The mission of the Emory University Herbarium is “supporting botanical research and education.” As a volunteer in the herbarium, it is my job to help support the mission of botanical education, both within the Emory community and beyond. Although I only began working in the herbarium this January, I quickly learned the importance of botany to medical research here at Emory. By working to digitalize the thousands of specimens in the Emory University Herbarium, I am a part of a team that is increasing educational access to botany across the world.

One way the herbarium worked to educate the public about the subject of botany was by hosting a booth at the Atlanta Science Festival. The Atlanta Science Festival was founded in 2014 by Emory University, Georgia Tech, and the Metro Atlanta Chamber. The expo that took place on March 23, 2019, brought over 25,000 attendees, and worked to strengthen the science community around Atlanta (Atlanta Science Festival). As one of the founders, Emory always has a strong presence at the festival.

This was my first year attending the expo. As a Georgia native, I was shocked that I had never attended the event before. It was incredible! There were hundreds of interactive booths for families to explore, and the park was filled with people. The free admission drew families from all over Georgia to learn about science at the interactive booths. At the herbarium booth, we had activities designed to teach people about the work of a botanist and about plants around the world. My favorite activity was one where people had to guess where different plants originated from around the world. It truly demonstrated what a globalized world we live in, as plants with origins in China and Africa, such as oranges and coffee, are a part of everyday life in the United States. Many people were surprised to learn that they had never considered where their favorite spices originated. Our booth encouraged people to stop and think about how plants can connect people from all over the world.

We also helped people create their own herbarium specimen voucher. In order to do this, they mounted a dried plant specimen to herbarium paper, identified the plant, and properly labeled the document. This activity was very similar to the work we do in the herbarium, and was a fun way to teach people about the role of an herbarium in the study of botany. We then told people about the 21,000 specimens we have at the Emory University Herbarium. Many people signed up for our email list so that they could continue to stay informed on the progress at our herbarium. This event helped us to become more connected with local people interested in our work.

The Atlanta Science Festival is just one of the many ways that the herbarium stays active within our community. It is the largest event we attended this semester and enabled us to reach the most people. We look forward to continuing to work with the Atlanta Science Festival in the future as we continue our mission of botanical education. I am excited to keep learning and teaching about botany with the herbarium, and my experience at the Atlanta Science Festival showed me how interested Georgia families are in learning more about the scientific work of the Emory community.



## Foraging For Wild Food To Connect With The Natural World

By Courtney Andrew

Are you as excited for summer produce as I am? Those of us residing in Georgia are fortunate enough to experience the many benefits of a humid subtropical climate perfect for growing some of the most delicious fruits and vegetables. With strawberry season in full swing, and peach and blueberry season on the horizon, Atlanta farmers markets are kicking it into high-gear, offering a wide variety of local products you don't want to miss! However, this is also the time of year where those berries in your backyard are also calling your name. Yes, you read that right, your backyard! You may not know it, but the Emory grounds are also offering some specialty produce of their own. Although I will never discourage anyone from buying local and enjoying Georgia grown peaches or strawberries, I think it is important to know that there are a number of plants growing in the area that allow you to experience the satisfaction of harvesting your own food. As members of the Emory community, we

are lucky enough to share our grounds with two plant species that are currently, or soon-to-be, ready for harvest. Although you may not be aware of it, Emory is home to a number of mulberry and serviceberry trees, both of which fruit in early summer months, meaning they should be ready, or near-ready, right now! Where can you go to find these delicious fruits you may ask? The serviceberry trees are scattered across campus, with a couple located over by Raoul Hall, one right near Turman Hall, and four over by the village. The mulberry trees are a little harder to find, with one on Haygood Drive, one on Clairmont Campus, and another just across the street from the campus. You likely haven't seen these plants before because, well, you weren't looking, but they are there, and they are waiting for you! Therefore, I encourage you to go out and look. Go hunt down those plants. Go find your fruits, while they are in season, and experience that special connection specific to the harvesting of your own food!

### Common garden plant: Tickseed

By Claire Torre



Tickseed is a common garden plant with beautiful yellow, small, daisy-like flowers. It is called tickseed because its tiny seeds resemble ticks. The scientific name is *Coreopsis tinctoria* Nutt. (Asteraceae) and there are 75 to 80 species native to North, Central and South America. Early settlers would stuff their mattresses with the dried tickseed plants to repel bedbugs. Some types of tickseed, such as golden tickseed were used by Native Americans to make a tea to relieve abdominal discomforts. Folklore reports noted that tickseed tea could protect the drinker from being hit by lightning. Tickseed is available at any plant nursery if you want to add it to your garden.



"There are a number of plants growing in the area that allow you to experience the satisfaction of harvesting your own food."





Emory Undergraduate Daisy Li

*“Once peeled away, the cross-section of all the organic structures on the exposed surface of the coal ball would transfer onto the acetate sheet and can be imaged under a microscope. What results are stunningly clear cross-sections of archaic organisms.....”*



## TREASURES OF THE HERBARIUM:

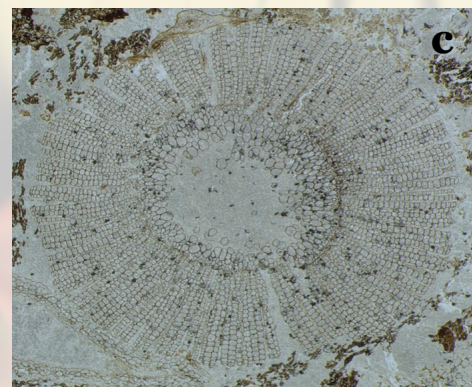
### CARBONIFEROUS REMNANTS OF THE PRESENT DAY

By Daisy Li

It all started with a cleaning session. While clearing out some drawers in the herbarium office, Dr. Samarakoon came across a series of dusty, yellowed envelopes. There were around fifty of them and she was about to throw them away until she looked inside and realized they contained fossils. According to the labels on the envelopes, they were fossils of a long-extinct species called *Lepidodendron*, a prehistoric tree of the Carboniferous era some 300 million years ago. The period in which these botanical giants grew is known for its biodiverse ecosystems with giant dragonflies, centipedes and coal swamps that gave rise to the coal veins that we use today as fossil fuels. In the wet environment of the swamps, peat — dead organic matter — would build up and gradually compress underground. In some cases, minerals would seep in, hardening the decaying matter and forming lumps called coal

balls. These permineralized balls would be able to withstand enormous underground pressure and preserve the microstructures of the fossils inside. In fact, the fossils in the herbarium came from coal balls via a technique called coal ball peels. The process involves finely sawing the coal in half and dipping the exposed surface into a cocktail of chemicals before pressing it down onto a cellulose acetate sheet. Once peeled away, the cross-section of all the organic structures on the exposed surface of the coal ball would transfer onto the acetate sheet and can be imaged under a microscope. What results are stunningly clear cross-sections of archaic organisms.

So how did these fossils turn up in a forgotten corner of the Emory University Herbarium? No one really knows for sure. Little is known of the origins of these fossils, other than the fact that they are coal ball peels of *Lepidodendrons*. But since being



*a, b: A *Lepidodendron* Coal Ball Peels of the stem section. c: stem sections under microscope*



(re)discovered, these fossils have been studied in conjunction with species of clubmoss, specifically the *Lycopodium* genus which contain modern descendants of *Lepidodendron*.

Morphologically, clubmoss resemble the ancient *Lepidodendrons* in many ways, but the most apparent evolutionary discrepancy is height. Clubmosses are generally 10-20 centimeters tall, a far cry from the 40 meter *Lepidodendrons* that once dominated the Carboniferous landscape. But clubmosses still reproduce via spores like the *Lepidodendrons* and some species, like stiff clubmoss, still have their strobili (cones) perched on top of the main, unbranched stem.

For the purposes of this intra-species comparison, two species of clubmoss are being investigated specifically: *Lycopodium digitatum*

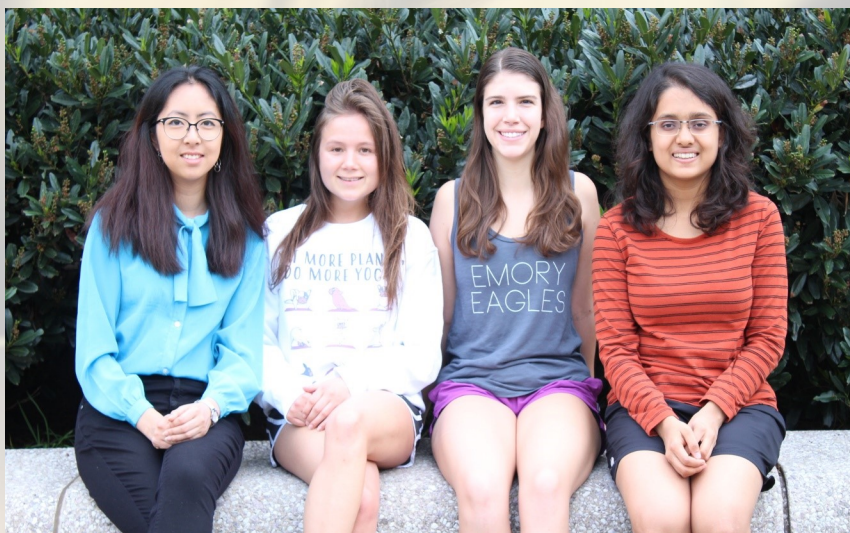
(fan clubmoss) and *Lycopodium annotinum* (stiff clubmoss). Cross-sections were made of these plants from dried herbarium specimens and imaged alongside the *Lepidodendron* fossils (Fig a,b, c). The xylem structures and conducting tissues of the specimens are being compared to see what evolutionary changes have been sustained by this lineage of plants and so far, they have yielded some interesting observations. In the coming weeks, we're hoping to get fresh clubmoss samples to prepare better cross-section slides and keep imaging new specimens. The fossils have also found a home in one of the newer, cleaner drawers in the herbarium office. For a bunch of dusty envelopes that were about to be thrown out, they sure have been fascinating to study and explore.



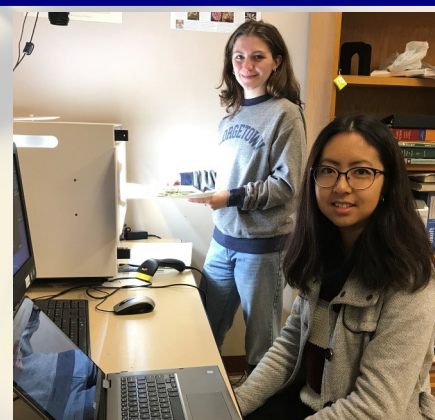
## OUR MISSION

The mission of the Emory University Herbarium (GEO) is to serve as a botanical research and educational resource for the Emory University and global community. GEO aims to foster understanding of the human-nature interface by collecting, preserving, researching and exhibiting botanical specimens and ethno-botanical objects.

## THANK YOU TO OUR SPRING 2019 VOLUNTEERS



**From left to right:** Daisy Li, Courtney Andrews, Emily Edwards, Tanika Deuskar. **Right:** Courtney Noetzel and Daisy. **Down:** Gloria Jung. **Students not in the photo:** Anjali Mann, Anna Wassel, Burhan Mubeen, Claire Torre, Georgia Spice, Rachel Deininger, Zhuoran Wei.





## Retired Winship Cancer Researcher, Claire Torre, Joins Volunteers at Emory Herbarium



I love flowers and gardening especially in spring when the tickseed blooms. Recently retired from Emory University's Winship Cancer Institute, I worked as a lead research technologist in the laboratory of Dr. Sagar

Lonial whose area of inter-

est in cancer research is multiple myeloma. I became interested in volunteering at the Herbarium when I came across *The Plant Hunters*, an article on the Emory Homepage, which introduced me to Dr. Cassandra Quave, an ethnobotanist, herbarium curator, and assistant professor at Emory University. The article described her trip to Ichauway in south Georgia with her team to collect native plants which have the potential to be used as medicines. Volunteering at the Herbarium seemed the perfect fit for me and my interest in plants. Herbarium volunteers collect plant samples, mount them on archival paper, make digital images of them and enter the plant information into an ever growing database. I have mounted plant specimens found locally as well as from all over the US and other parts of the world. Most recently, I remounted salt water red algae samples collected at Falmouth, Massachusetts.

Some of the plant specimens to be processed were close to 90 years old and still in very good condition. They were wrapped in local newspapers printed when the plants were collected. My husband and I considered it an added benefit to read the "current" news and see fashions of bygone days. One article I remember in particular retold the story of the Marquis de Lafayette, who at the age of 67 returned to the US in 1825 at the invitation of Congress to tour the 24 United States. The article noted that the Georgia roads were so treacherous because of potholes and ruts that Lafayette's four-horse carriage nearly broke down, and the general became ill from the jostling and jolts. Some things never change...

At the invitation of Dr. Cassandra Quave, my husband and I attended her course on Food, Health and

Society. It was fun to be in a classroom again with all the students especially when we didn't have to take the tests. Besides Dr. Quave's own lectures and classroom demonstrations, I found the recommended reading, *Salt, Sugar, Fat*, a frightening realization of how the public's tastes are manipulated by the food industry. There were two guest lecturers who made a significant impression on me. The first was Maryn McKenna, author of *Big Chicken*, whose research about the abuse of antibiotics in animal agriculture revealed the cruel treatment of animals and the threat to our own survival because of antibiotic resistance.

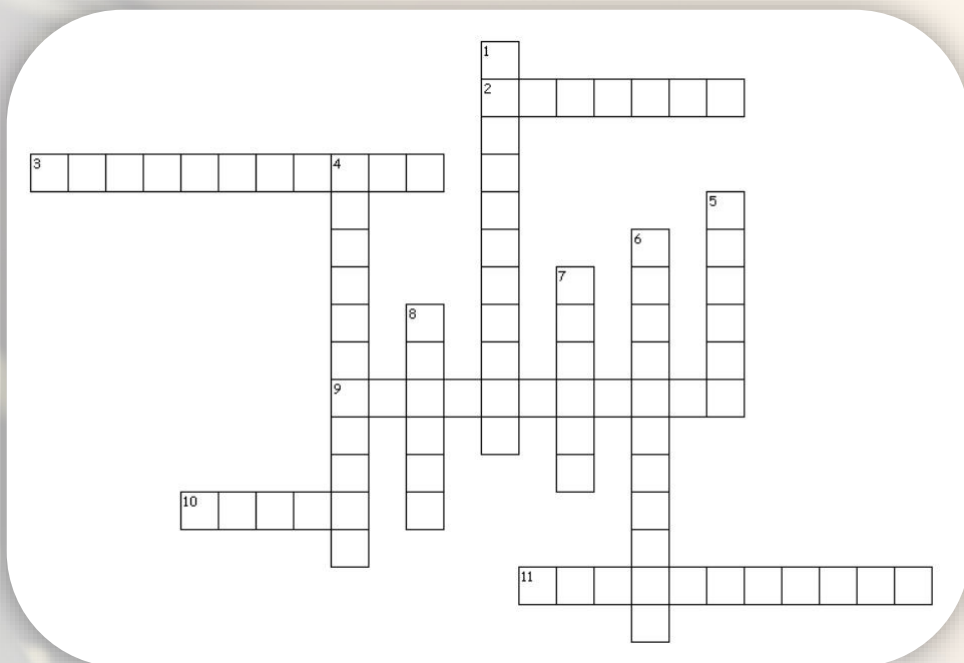
The second lecturer was Professor Janelle Baker living in Alberta, Canada, who spoke to us via Skype. Professor Baker works as an intermediary between the Cree Indians and the Canadian government and industry. She is coordinating efforts to test animal and plant samples taken from around the edges of the Cree Reservation in order to document the contamination of water, wildlife and fruits with heavy metals by Canadian industry extracting crude oil. When Professor Baker began her lecture she was wearing gloves. She said the temperature in Alberta was minus 22° F and she was very cold.

Volunteering at the Emory Herbarium has been such a positive experience for me. Tharanga Samarakoon, Ph.D., the collections manager, was a patient teacher of Herbarium techniques to a newbie and she always greeted you with a smile. I enjoyed meeting the dedicated students who donate their precious spare time to volunteer and learning about their pursuits at Emory. I would like to thank Dr. Cassandra Quave for the knowledge I've gained to be an informed consumer.



# HERBARIUM CROSSWORD

BURHAN MUBEEN



## Across

- 2) Part of the cell that acts as the "brain"
- 3) The organelle of a plant responsible for photosynthesis
- 9) Moving pollen from one flower to another
- 10) The part of the plant that transports water from roots to stems
- 11) Green pigment found in plants

## Down

- 1) Water-soluble vacuolar pigments that change colors depending on the pH
- 4) A taxonomic group made up of flowering plants
- 5) Male part of a flower
- 6) Breaking down food to make energy
- 7) Brightly colored part of a flower that attracts pollinators
- 8) The structural feature of a plant that transports the products of photosynthesis

Like us on our Facebook & follow us on Twitter and Instagram to stay up to date with all our exciting activities!



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**Across:** 2, Nucleus; 3, Chloroplast; 9, Pollination; 10, Xylem; 11, Chlorophyll  
**Down:** 1, Anthocyanin; 4, Angiosperms; 5, Stamen; 6, Respiration; 7, Petals; 8, Phloem



## HERBARIUM CONTACT INFO

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Schedule a visit or tour! We are open 9 a.m.-5 p.m. Monday-Friday.

**Support our research and outreach activities with a tax-deductible donation. Information on how to give is available on our website.**

Learn more on our website:

<https://scholarblogs.emory.edu/emoryherbarium/>