Montgomery Botanical Spatner/Summer 2022 NEWS Volume 50, Number 1

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Forest Restored pages 4-5

Advancing Research, Conservation, and Education through Scientific Plant Collections

Montgomery Botanical Center Established 1959

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To advance science, education & conservation of tropical plants, emphasizing palms and cycads, Montgomery Botanical Center grows living plants from around the world in population-based, documented, scientific collections in a 120-acre botanical garden exemplifying excellent landscape design.

Montgomery Botanical Center is a tax-exempt, nonprofit institution established by Eleanor "Nell" Montgomery Jennings in memory of her husband, Colonel Robert H. Montgomery, and his love of palms and cycads.

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From the Executive Director

Dear Friends,

n exciting year ahead! *Fresh enthusiasm abounds:* Montgomery is reaching more students, exploring more places, and doing even more for palm and cycad conservation.

The facing page summarizes how far we have come in developing plant talent; Montgomery brings botany to more young scholars than before with great new programs. Speaking of young scholars with plant talent, we are thrilled to have a report from Cornell Ph.D. student Ayress Grinage on her studies of the mysterious palmettoes of Louisiana (page 6). We are glad to support her research fieldwork as she unravels this complex question. As a bona fide SABAL SEEKER, Ayress fits in perfectly here – see our palmetto photos on this page, page 9, page 11, and even the back cover.

We are also glad to honor Dr. Karl Smiley for his many years of service and generosity (see page 4). Our team is grateful to have his good advice – medical and general – and his friendship over the years. We move forward because of people like Karl who put in hard work, generosity, and commitment.

These pages only allow a small snapshot of our work, so please visit our website, call, write, or drop by to get the full picture. Because of your amazing help (see pages 9, 10, and 11), we continue to accomplish a great deal!

Pictured: Dr. Griffith collecting research specimens of *Sabal antillensis* on Curaçao (to be discussed in a future issue).

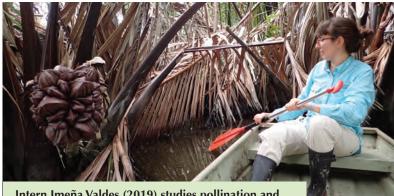
On the Cover: Ayress Grinage with an interesting population of *Sabal* at Whitelake Wildlife Management Area, Louisiana.

Students Grow Our Outcomes

/ith support and students from many places, V Montgomery grew a thriving summer internship program in plant sciences. Thanks to a generous endowment from Peter R. Jennings, each year we provide two undergraduate internships to inspire exceptional students in botany. Since 2017, Montgomery also hosts a Tropical Conservation Intern from Florida International University (FIU). In addition, geography students from East Carolina University and awardees of the Dickerson Montgomery Botanical Center Scholarship intern at MBC for about five weeks every summer. With nearly 18,000 plants on MBC property (see page 9), these interns have ample opportunity to hone their geographic skills and explore the unique application of maps to plant curation.

These internships show the broad diversity of training that we offer, from pollination and pollen viability studies, to studies of floral scent chemistry and leaf anatomy. Student research has contributed to estimates of carbon stored by our entire garden, how palms mitigate soil erosion, and impacts of salt water intrusion on economically important palm species. Interns not only observe, measure, and describe our plants, but also write articles for well-known scientific journals – see our website for details.

Over 100 FIU biology students visited Montgomery last semester in a new initiative led by FIU Professor and MBC Research Fellow Dr. Javier Francisco-Ortega. Follow-up evaluations show a significant increase in appreciation for botany. Montgomery has grown its role in training the next generation of botanists.



Intern Imeña Valdes (2019) studies pollination and fruit set in *Nypa fruticans*.



Intern Michelle Marrero (2021) studies the effects of salinity and drought on *Oncosperma tigillarium* seedlings.



Intern Ezra Remer (2020) studies the effect of Acrocomia aculaeata roots on soil moisture levels to assess potential role in mitigating soil erosion.

Intern Alex Crow (2021) freezes Attalea phalerata palm flowers in liquid nitrogen to study the chemistry of floral pigments.



Dr. Joanna Tucker Lima, Collections Manager joannat@montgomerybotanical.org

Local Native Helps our Native Forest Thrive

We were glad to host a gathering in November to dedicate the hammock forest onsite in honor of Dr. Karl Smiley. Karl's family and friends gathered to unveil the plaque, hear remarks from our President Patrick Kelly, Karl's son Tom, and then from Karl himself, who recounted his experiences here going all the way back to meeting Colonel Montgomery.

As a young man born and raised nearby, Karl met Colonel Montgomery through Karl's father Nixon Smiley, the beginning of a lifelong connection to our garden. Karl has served as a Director on Montgomery's Board since 1991, the year after our Founder Nell Montgomery passed away. Karl also put in countless volunteer hours in our Seedbank – as well as many days of effort removing exotic vines from the Hammock that now bears his name. Karl states:

I think that the gift of Nell Montgomery to form the Montgomery Botanical Center was every bit as important to our region as the development of Fairchild Garden by the Colonel himself. It would have been a disaster for this property to have been subdivided and sold. For years, John Popenoe and I were very interested in maintaining these hammocks and often worked on Saturdays getting rid of the vines choking off the native plants.

Karl's generous gifts allowed us to move forward with a major restoration effort for this stand of native trees on our landsite. The hammock now stands free of vines, and welcomes school fieldtrips and other visitors with an accessible pathway. This natural forest goes back well before the era of Colonel Montgomery – and now will continue to host the increasingly rare native flora of our region for many more years to come, thanks to Karl's generous support: *an esteemed local native helping our native forest thrive*.

Tropical Hardwood Hammocks are closed-canopy forests found in South Florida that form unique "ecological islands" within the larger ecosystem. Many of the tree species found in these Hammocks are also native to the West Indies, showing the Caribbean influence on South Florida's flora. Within the developed areas of Greater Miami, there are few native hammocks still standing. These native forests provide habitat not only for the many native plant species that make up the hammock, but also many native bird, reptile, and insect species.

This native hammock on Montgomery's landsite is officially recognized as a Natural Forest Community by the Miami-Dade County Department of Natural Resources Management. Consultation with county biologists helped to permit and guide the exotic plant removal process, as well as provide a native plant palette for restoration plantings. Karl's support allowed Montgomery to retain a full time Forest Restoration Specialist to lead the restoration project. Dr. Karl Smiley Tropical Hardwood Hammock

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Through the Bayous in Pursuit

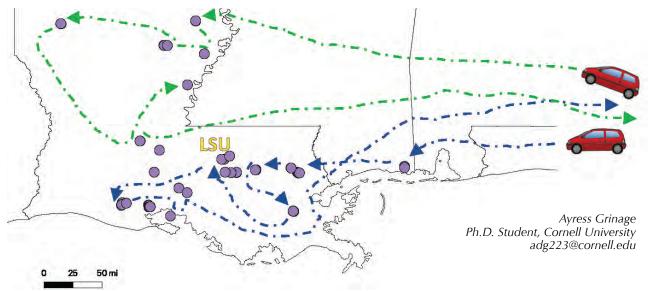
As a graduate student, I study the understory palmetto of the southeastern US, *Sabal minor* or the Dwarf Palmetto. The name "Dwarf" suggests differences from the Cabbage Palmetto (*Sabal palmetto*) through its typically smaller size with a compact subterranean trunk and an overall reduced leaf size. *Sabal minor* is a very common understory palmetto that occurs abundantly from North Carolina down and across into northeastern Mexico.

But interestingly, in Louisiana, Mississippi, and Alabama, *S. minor* can develop a robust above ground trunk that resembles the Cabbage palmetto. This deviation from "Trunkless" to "Trunked" in populations along the Gulf Coast (Louisiana, Mississippi, and Alabama) is what I study using genetic, morphological, and ecological data.

With funding from Montgomery Botanical Center, I traveled to Louisiana twice between December 2021 and January 2022 to kick off a series of collection trips to collect both the 'Trunked' and 'Trunkless' growth forms of *Sabal minor* across its native range. In preparation for my trips to Louisiana, I spent the past year working in the L.H. Bailey Hortorium (the Cornell University Herbarium) combing through the handwritten notes and maps created by L.H. Bailey, J.K. Small, and Miriam Bomhard nearly 100 years ago to lay out the historic distribution of *Sabal minor* in Louisiana.

Because *Sabal minor* used to be split into two species based on trunk form, *Sabal louisiana*, the 'Trunked' form, and *Sabal minor* s.s., the 'Trunkless' form, it was relatively easy to identify historical locations where each form occurred. Some locations have both forms present.

Once I had an idea of the historical distribution of both trunk forms, I used modern mapping tools to identify if any of the historical sites still exist. I was wonderfully surprised to find that not only many of the historical sites still existed but that they are now protected as either a park or a management area! With a solid understanding of the locations of both the 'Trunkless' and 'Trunked' growth forms in Louisiana, I narrowed down the sites for these trips. Splitting the sites between southern and northern populations, I was able to cover the entire range of these intriguing palms, and also examine important specimens at the Shirley C. Tucker Herbarium at LSU. I am now studying the specimens I collected at Cornell, and seeds of these intriguing palms are now germinating at Montgomery.



Map showing populations visited in December 2021 (Blue) and January 2022 (Green) to collect *Sabal minor* – based on careful review of century-old notes and specimens.

of the "Tall Dwarf" Palmetto



A Trunked Dwarf Palmetto at Fairview Riverside State Park.



Ayress with a trunked Sabal palm at Palmetto Island State Park.



A Green Tree Frog (*Hyla cinerea*, the state amphibian of Louisiana) hides from the winter weather in the folds of this palmetto leaf at Manchac State Park

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Research Updates

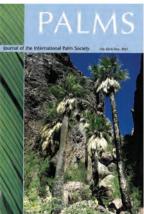


Palm and cycad studies move further forward with Montgomery's help. Here are just a few of the latest advances:

*Larry Noblick and his colleagues published an in-depth study of the *Washingtonia* population from the Kofa Mountains (Arizona). These look quite different than other washingtonias, and were once called *Washingtonia arizonica*. The paper was featured on the cover of the latest PALMS (see photo at right).

*Larry also put forward an interesting conundrum – leaf anatomy can differ greatly along a single palm leaf. Using 4 species of *Butia* as an example, Larry and his coauthor showed how comparisons between species should consider within-leaf variation (published in the journal PHYTOKEYS).

*A new cycad species, *Ceratozamia dominguezii*, was published in the journal TAXONOMY. Miguel Pérez-Farrera and his colleagues (including our own Michael Calonje) located these elusive plants in Mexico (see photo at top), which feature caramel-brown emergent leaves.



Shayla Salzman, Michael, and colleagues show how cycad pollination requires very specific and rapidly-evolving chemical communication, as reported in the journal FRONTIERS IN PLANT SCIENCE. The work made extensive use of Montgomery's living plants.

*Patrick Griffith and his colleague Quirijn Coolen officially Red Listed the Bonaire Palm, Sabal lougheediana. The new official designation of Critically Endangered allows the Bonaire government to enact specific protective measures to prevent the palm's extinction (see also p. 11).

*Patrick, working with colleagues Abby Meyer and Ayress Grinage (see also on pages 6-7), analyzed the collective holdings of the world's botanic gardens – the map below shows every garden in the dataset – and found that only around half of all known palm species are in cultivation. Furthermore, the more threatened the palm, the less broadly the species is grown; highlighting priorities for palm conservation. The study appears in FRONTIERS IN FORESTS AND GLOBAL CHANGE.





Team News

Our team is growing!

Natalia Herrera-Blitman joins us from FIU as our Conservation Horticulture Fellow. Natalia comes highly recommended and with solid experience in botany and conservation fieldwork. We are grateful to THE BATCHELOR FOUNDATION for funding this thriving conservation program.

Clyde DeQuesada is a recent graduate in Agriculture from Miami Dade College, who joined our team as a Landscaper in January. Clyde began at Montgomery as an Intern in Summer 2021.

David Ramirez also joined the team in February, as a landscaper, bringing expertise and cheer to the role.

Carolina Diaz from Miami Dade College began as our Assistant Curator in February, helping care for our plant collection.

Elina Frieder Lopez, a Swiss horticulturist, worked with us over the summer and fall assisting with the nursery and tree collection.

We welcome **Anqi Liu**, our FIU Tropical Conservation Intern (see also page 3), who works on thermogenesis patterns in palm inflorescences. The energy and enthusiasm of these great people moves us forward!



MONTGOMERY BOTANICAL CENTER 2021 COLLECTION INVENTORY

	Palms	Cycads	Other		Palms	Cycads	Other
Total Taxa in ground in nursery	422 391 97	261 244 70	504 499 11	Total Plants in ground in nursery	8,783 6,911 1,872	6,741 5,749 992	2,280 2,253 27
Total Accessions in ground in nursery	2,250 2,030 279	1,867 1,728 211	1,906 1,900 11		17,804 Plants !		

THANK YOU TO OUR 2021 VOLUNTEERS

Aleman, Priscilla Brown, Colin Carrollton School of the Sacred Heart 4th graders Castillo, Samuel Coconut Grove Garden Club Coulombe, Ciara Danielson, Laurie English, Ed English, Janet Fonsece Peña, Lina Maria Frieder Lopez, Elina Gobaira, Lilia Griffith, Bella Griffith, Clara Guandique, Josue Gulliver Academy Hernandez, Kevin Hicks, Trish Jacobson, Kay Jordan, Vivian Kraus, Mark Lagos, Marlos Laurel, Leah Leverett, Lynn Luzardo, Rodolfo Martin, Margaret Martin-Rami Fund Mauricio MBC Board of Directors (page 2) Nghiem-Phu, Lan Noblick, Daniela Park, Lane Pincus, Linda Sacher, Charles P. St. Philips Episcopal 2nd graders Street, Michael Troop 427 Eagle Scout

Background: Sabal bermudana leaf at Montgomery. This species is only found in Bermuda but is widely grown in botanic gardens.

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Montgomery Botanical News Spring/Summer 2023

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HELPING ISLAND PALMS THRIVE



This January, BonBèrdè and Montgomery formally dedicated the emergency fence protecting the species *Sabal lougheediana*, gathering government officials and media for the event. The project (detailed in our Fall 2021 Newsletter) was kickstarted with a generous grant from SEACOLOGY, advancing their mission to protect threatened island ecosystems. SEACOLOGY's investment in our conservation project inspired other supporters to give as well, and the Island government now seeks to preserve the entire habitat as a "Sabalpalm Park."

Mary Randolph of SEACOLOGY writes, "I'm so glad the project has gone well and that it's having a real effect. We are delighted to have played a part in protecting the palm." Thank you SEACOLOGY – we are very grateful for this essential support!

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FROM THE MONTGOMERY ARCHIVE

COLONEL MONTGOMERY WITH SABAL PALMETTO, CA. 1932

The very first year that Colonel Montgomery started collecting palms, the *Sabal* collection was a primary focus at his Coconut Grove Palmetum – in fact, on the very first day his staff began keeping records (December 5, 1932) the Colonel logged 17 new *Sabal* palms acquired as mature plants from around the state of Florida. This series of photos in our archive show how many of these first palms were brought in as very tall trees – shipped by rail and then by truck – and transplanted into his garden.

Correspondence between the Colonel's first Superintendent (Mr. Adolph Jordahn) and Dr. Liberty Hyde Bailey highlight how important these palmettoes were to the early garden. Jordahn shipped many herbarium specimens and photos of the Colonel's *Sabal* plants to Dr. Bailey for proper identification. Colonel Montgomery came to rely on Dr. Bailey's expertise with the genus, and also celebrated his many contributions in the wider field of botany (see our Spring 2020 Newsletter). That historic connection still thrives, with Montgomery Botanical Center collaborating with students of Cornell's L.H. Bailey Hortorium (see pp. 6-7).

Our fondness for *Sabal* continues – in addition to Ms. Grinage's article on page 6, page 11 offers yet another example. Montgomery now holds perhaps the most complete living collection of the genus, supporting research and conservation efforts. As seen in this issue, there is much more to discover about the palmettoes!

