

Montgomery Botanical

NEWS

Fall/Winter 2021

Volume 29, Number 2

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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.

Montgomery Botanical News is published twice a year by Montgomery Botanical Center.

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Coral Gables, Florida 33156
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Edited by Tracy Magellan

Printed on recycled paper



From the
Executive Director

Dear Friends,

Things are moving ahead BEAUTIFULLY at Montgomery. We are meeting our mission in research, conservation and education, and are growing our outcomes in every way. I am always excited to share our work with you!

On pages 4 and 5, Dr. Michael Calonje documents his search for new cycad diversity in remote Colombia. Michael discovered two incredible new *Zamia* – just before the global pandemic paused our international work.

But we are now *back afield* in the service of plants! The facing page is special to me – I saw these exceptionally rare palms for the first time only 4 years ago, and already the vital infrastructure to protect and secure their future is in place. It is a *first* for Montgomery to secure wild palms in their own habitat, but we saw the critical need and simply *had* to act quickly. I am glad to know these living treasures are now safe.

Our work to develop plants and people saw incredible progress over the summer – pages 6 and 7 show some of the innovative research that arises from our plants, and the dedicated people that help those plants thrive. We are building *more* plant talent here than *ever* before, and all these young experts will move the field forward.

Seeing these students grow and mature into enthusiastic conservationists is a real inspiration – like seeing the spectacular flowering of a *Corypha* palm (page 7). We were thrilled to watch that happen at Montgomery this summer – a dream our founders put into motion so many years ago (page 8).

Pictured: Dr. Griffith with *Sabal lougheediana* (see facing page).

On the Cover: Dr. Michael Calonje with the newly discovered *Zamia imbricata* (see pages 4 and 5).

Sabal Sanctuary

Helping the Rarest of Palms

Among the diverse thousands of palm species, a few stand out as exceedingly rare, threatened and precious. The newest of these is *Sabal lougheediana*, discovered only two years ago – see our Spring/Summer 2020 Newsletter.

A dwindling number of these sentinels watched over a salt lake for many decades. Alarmingly, only twenty-five palms persist on this distant rock terrace. Feral donkeys graze the seedlings so thoroughly that none make it to flowering.

This dire threat prompted immediate action to save these rare treasures – an emergency fence now allows those baby palms to thrive without fear! Providing 35 acres of dedicated palm conservation habitat, the fence will see the next generation of Bonaire Palms flourish.

Montgomery and BonBèrdè partnered with the local government – OPENBAAR LICHAAM BONAIRE – to construct this critical palm infrastructure and launch a conservation horticulture effort to multiply the holdings of Bonaire Palm. We are grateful for a generous grant from SEACOLOGY and funding from CARGILL which made this effort possible, and to Montgomery's PLANT EXPLORATION FUND for supporting detailed study of these unique treasures.

New Cycad Discoveries from Colombia

Late January, 2020: As the sun began to set, a large group of howler monkeys foraged in the trees above us as our canoe slowly made its way down the river, a tributary of the Magdalena River in Caldas, Colombia. We had just finished an intense week of plant exploration, and as we floated back to our home base down the tranquil river, we were blissfully unaware that this would be the last fieldwork outing anyone in our team would participate in for the rest of the year due to the global covid-19 pandemic just weeks away.

Our team of researchers – from the Universidad de Caldas, the Colombian Cycad Society and Montgomery – was studying an enigmatic species of *Zamia* occurring in the forest-covered steep hills that surrounded us. This species was only recently discovered in the wild and was thought to be new to science. It had small, soft, fern-like leaves somewhat resembling those of the Mexican species *Zamia vazquezii*, only these leaves were supported by much longer petioles (leaf stalks).

The enigmatic *Zamia* we were studying undoubtedly belonged to a group of seven closely related species distributed primarily in the Magdalena-Uraba moist forests ecoregion of northwestern Colombia, with a single species, *Zamia manicata*, ranging into the neighboring Chocó-Darien moist forest ecoregion of Colombia and neighboring Panama. While this related group of species known as the ‘manicata clade’ occurs in a contiguous geographical area and has several morphological similarities (e.g. subterranean stems, strongly toothed leaflets, small seeds, etc.), they have the most extraordinarily variable leaflet morphology of any closely related group of cycads, and their close relationship was only recently revealed in recent genetic studies.

The extraordinary leaf variation in this group is seen in the distinctly channeled petiolule with a gland-like collar in *Z. manicata*, the membranaceous and prominently veined broad leaflets of *Z. disodon*, and the unique midrib found in the leaflets of *Z. restrepoi*. After extensive fieldwork and careful study of herbarium specimens, the team concluded that this enigmatic species was indeed unique and new to science, and it was named *Zamia imbricata* due to its tightly spaced, overlapping leaflets.

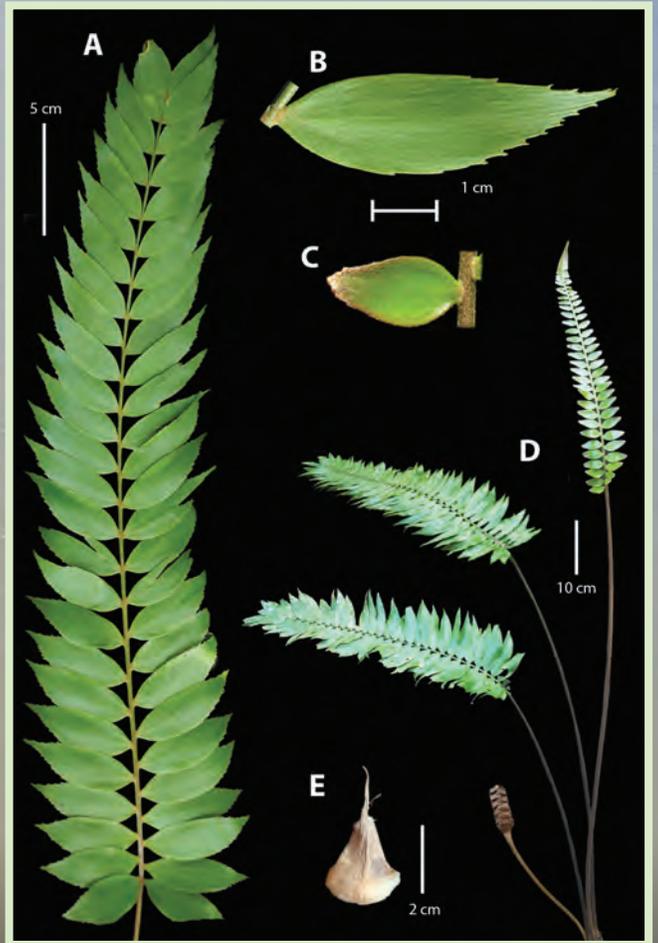
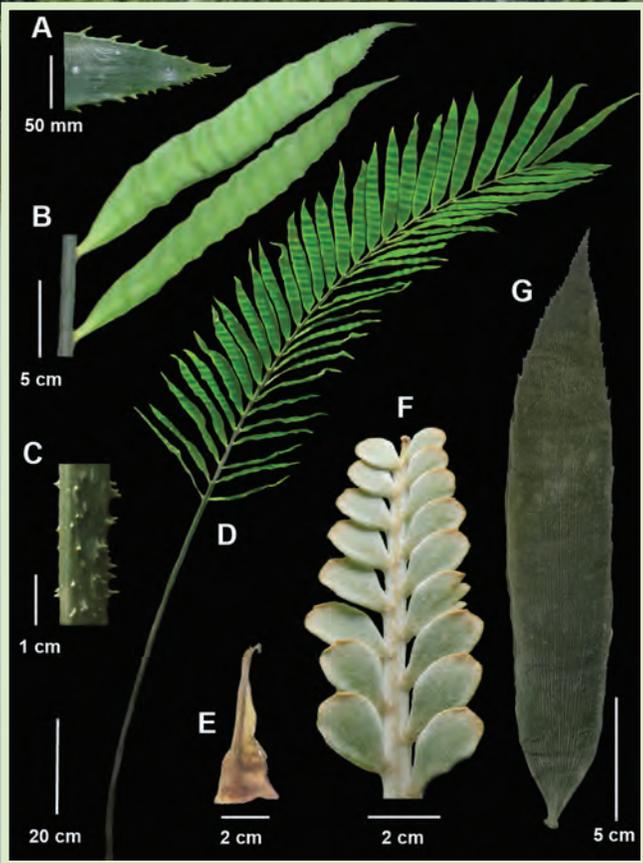


Deeper review of the ‘manicata clade’ through this project revealed that another species collected by the team near the Sinú River in Cordoba was also new to science. This species, which we named *Z. sinuensis* due to its distribution within the Sinú River basin, is a robust species with leaves that can get over 10 feet tall. Adding to the remarkable variability of leaflets exhibited by the manicata clade, this species is unique among all *Zamia* in having strongly undulate leaflets (facing page, lower left).

Dr. Michael Calonje, Cycad Biologist
michaels@montgomerybotanical.org

These two remarkable new species were described in a recent issue of *Phytotaxa* vol. 497 (freely available online). We are grateful to Montgomery’s Plant Exploration Fund and the Sociedad Colombiana de Cycadas for funding this project, and to Dr. Cristina Lopez-Gallego for coordinating these studies.

Background: the botanical team enroute to field sites along the Rio San Jorge. **Facing page:** Upper and lower left shows *Zamia sinuensis*, named after the Sinú river basin – but also evoking the very sinuous foliage! Upper and lower right shows Luis Fernando Coca and Jonatan Castro with *Zamia imbricata*, with strongly overlapping leaflets (see also the cover of this issue).



Research Updates

Among the diverse studies here, this year saw much interest in pollination, predators, and plant reproduction:



✧ Irene Terry, our Kelly Botanical Research Fellow, set up a new experiment to examine pollination in *Cycas*. Irene has studied Montgomery's plants for a number of years. She was helped by our Conservation Horticulture Fellows.

✧ Ben Deloso visited from Guam for two related projects. First, a garden-wide survey of our cycads examined the effects of atala butterflies. Second, Ben worked to refine the cycad propagation techniques he pioneered on Guam – where cycads begin to branch, these branchlets can be removed and re-rooted to create new plants.



✧ Wendy Valencia, a graduate student from Harvard, along with Nanfang Yu and Cheng-Chia Tsai from Columbia, spent July studying cycad pollination and predation. They recruited both weevils and butterflies for innovative projects to document how cycads and insects interact.



✧ Our recent Peter R. and Stuart Y. Jennings Intern, Imena Valdes, published a study of our *Nypa* palms in *Journal of Pollination Ecology*. This treasured palm suddenly started producing viable seeds without hand pollination! Imena completed her undergraduate degree and is now a graduate student in botany at Northwestern University. The paper is freely available online.



For a complete list of research updates, please visit our website: montgomerybotanical.org

Team News

Joe LaFleur is our new Landscaper I, bringing experience to the position. We hired **Liam Wiecher** to care for our forests with a generous gift from Dr. Karl Smiley. **Claudio Fernandez**, our 2021-2022 Conservation Horticulture Fellow, was promoted to Assistant Curator.

Our 2021-2022 Conservation Horticulture Fellows, **Nicole Algarin** and **Ashley Dominguez**, join us from FIU – Thank you to The Batchelor Foundation for funding this important program! [see caption below].

A generous gift from Lyman Dickerson brought three excellent Geography Interns from East Carolina University. **Ryann Knowles**, **Samantha Brandt**, and **Patrick Parker** developed an innovative study of our landsite.

Through generous endowments from Peter Jennings, we hired **Alex Crow** and **Michelle Marrero**, who studied palm reproduction and salt tolerance. A generous grant from Botanic Gardens Conservation International let us hire **Leah Materna-Laurel** as our Global Genome Initiative Intern.

Samuel Castillo from UF helped with cycad care, and **Clyde de Quesada** from Miami Dade College helped with Ben Deloso's cycad research (see facing page). We are deeply grateful to the Coral Gables Community Foundation for providing funds to hire **Ciara Coulumbe**, a local Coral Gables Senior High School student, to care for our seedlings.

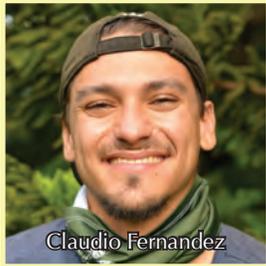
A fantastic summer with lots of help! Background: Ashley and Nicole provide scale for our *Corypha utan* which flowered this summer. These palms flower once at the end of their life cycle in a spectacular show. Page 8 shows another *Corypha*.



Joe LaFleur



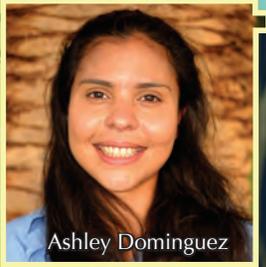
Liam Wiecher



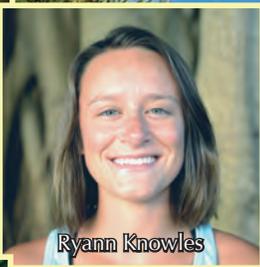
Claudio Fernandez



Nicole Algarin



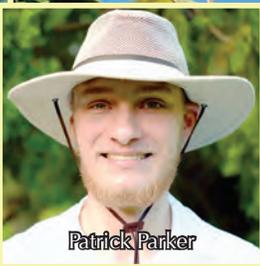
Ashley Dominguez



Ryann Knowles



Samantha Brandt



Patrick Parker



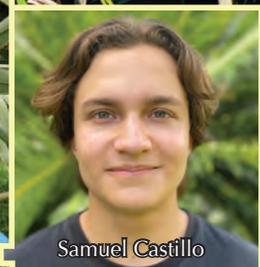
Alex Crow



Michelle Marrero



Leah Materna-Laurel



Samuel Castillo



Clyde de Quesada



Ciara Coulumbe

FROM THE MONTGOMERY ARCHIVE

A PALM GIANT

This 1935 photograph shows Robert and Nell Montgomery – confirmed with magnification – standing beneath a gigantic *Corypha umbraculifera* at Cienfuegos Botanic Garden, Cuba. The Montgomerys' efforts shared many seeds that still thrive as plants today at both gardens (see our Spring 2016 newsletter). Collaborative sharing of palms and cycads is a guiding principle from our founders that governs our work to this day.

Corypha palms include five species found around the eastern Indian Ocean, and in the Philippines and China. Montgomery currently grows three of these species, *Corypha umbraculifera* (like the one pictured here), *C. utan* – pictured on page 7 with a big display of fruits – and *C. taliera*, which is extinct in the wild and only known in cultivation. All of the *Corypha* species are known for a gigantic, final flowering event at the end of their life cycle. We anticipate sharing those seeds on page 7 throughout the botanic garden community, in keeping with the example set by Robert and Nell.

