

Montgomery Botanical NEWS

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Zamia!**
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Advancing Research, Conservation, and Education through Scientific Plant Collections

Montgomery Botanical Center
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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 122-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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Edited by Tracy Magellan



From the Executive Director

Dear Friends,

An amazing summer for Montgomery! We kept our forward momentum: advancing botany, horticulture, and growing compelling palms and cycads. Things are moving ahead beautifully!

On the facing page I am delighted to share great news – we achieved permanent, onsite protection for a cherished palm species. A truth in our field is that TAXONOMY IS CONSERVATION – and this outcome shows that *precisely*. Before the Loughheed Palm was named, it struggled without any concern or protection. But our research to figure out where it 'fits' botanically finally got these plants the care they deserved!

Our cover features an incredible new discovery, and that story continues on pages 4-5. There are still many surprises in the plant kingdom! And we have an exciting update on pages 6-7, where we partner with the US Navy to help conserve a rare cycad in the remote Pacific. We want all these treasured plants to be shared, so we constantly work to bring them into cultivation here. On pages 8-9, Xavier shares his viewpoints on how we display that compelling diversity.

All these great outcomes are only possible through your support and collaboration. I remain deeply grateful for every way you move Montgomery forward!

PS: My photo here may look a bit different! This amazing creature specializes in pollinating rare *Zamia* plants. May I follow in his tiny footsteps and grow as many cycads as I can!

Pictured: *Pharaonotha griffithi*, a new beetle species recently named after Dr. Griffith "for his leadership in the conservation and research of cycads."

On the cover: Dr. Michael Calonje and his colleagues with *Zamia urarinorum*, a newly discovered aquatic cycad from Peru (see pages 4-5).

Perpetual Protection FOR THE RAREST OF PALMS

A major success for palm conservation! The BONAIRE SABAL PALM PARK was recently dedicated; a protected space for the entire native population of Loughheed Palm, *Sabal loughheediana*.

This amazing success started with our plant exploration efforts in 2017 in Bonaire, a Dutch Special Municipality in the Caribbean. Collecting seeds of this new species, assessing threats, and studying the DNA led to a broad community effort to protect this living treasure.

These unique palms had little botanical attention until 2019, when Montgomery discovered and described the Loughheed Palm. Long thought to be 'just a regular palmetto,' this unique, imperiled species numbered no more than 25

mature palms and has since dwindled down to only 18 plants! Montgomery now has numerous *S. loughheediana* growing here and have shared many more globally. Our studies on this palm have informed botany, taxonomy and genetics. With focused scientific attention, this rare species now has official

CRITICALLY ENDANGERED status, Bonaire Government protection, and a new fence to protect seedlings from donkeys and goats.

After a large effort to secure funding and permission, government officials, conservation experts, and community leaders gathered to officially open BONAIRE SABAL PALM PARK on May 21. With a stout fence around its 370 acres, marked trails to observe the palms, and interpretive signage, this represents a huge step forward for conserving this beautiful palm and its habitat.

M. Patrick Griffith, Ph.D.
Executive Director

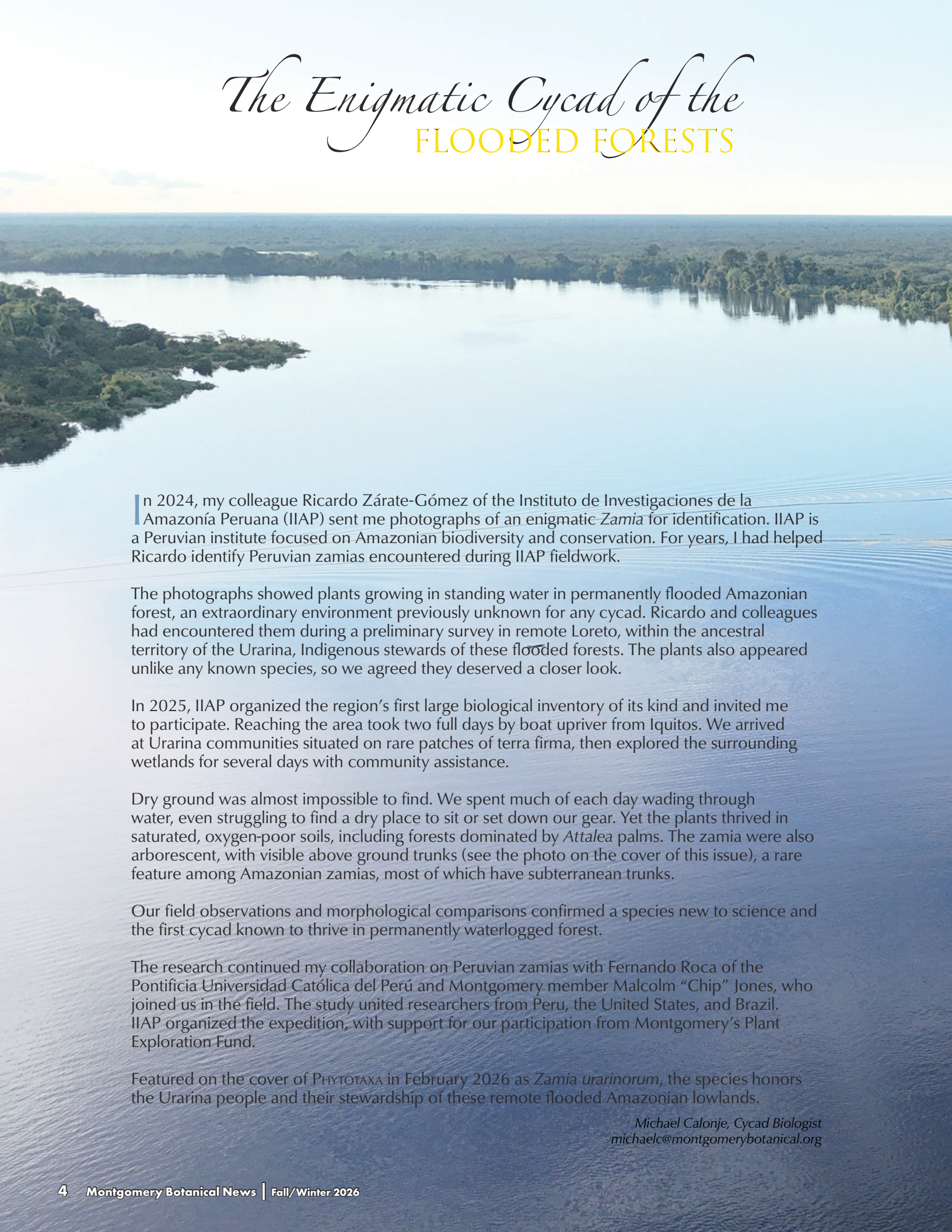


Sabal loughheediana now has its own safe, dedicated, wild place to grow and thrive!

We thank QUIRIJN COOLEN and BONBÈRDÈ for the vision and hard work to get this success accomplished! We also thank OPENBAAR LICHAAM BONAIRE, CARGILL, NOS TA BIBA DI NATURELESA, and SEACOLOGY for support, encouragement and permission. The scientific and botanical efforts that laid the foundation for this outcome were generously funded by Montgomery's PLANT EXPLORATION FUND.

Left: Quirijn Coolen and Patrick Griffith with the newly unveiled signage detailing the palms and the hiking trails.





The Enigmatic Cycad of the FLOODED FORESTS

In 2024, my colleague Ricardo Zárate-Gómez of the Instituto de Investigaciones de la Amazonía Peruana (IIAP) sent me photographs of an enigmatic *Zamia* for identification. IIAP is a Peruvian institute focused on Amazonian biodiversity and conservation. For years, I had helped Ricardo identify Peruvian zamias encountered during IIAP fieldwork.

The photographs showed plants growing in standing water in permanently flooded Amazonian forest, an extraordinary environment previously unknown for any cycad. Ricardo and colleagues had encountered them during a preliminary survey in remote Loreto, within the ancestral territory of the Urarina, Indigenous stewards of these flooded forests. The plants also appeared unlike any known species, so we agreed they deserved a closer look.

In 2025, IIAP organized the region's first large biological inventory of its kind and invited me to participate. Reaching the area took two full days by boat upriver from Iquitos. We arrived at Urarina communities situated on rare patches of terra firma, then explored the surrounding wetlands for several days with community assistance.

Dry ground was almost impossible to find. We spent much of each day wading through water, even struggling to find a dry place to sit or set down our gear. Yet the plants thrived in saturated, oxygen-poor soils, including forests dominated by *Attalea* palms. The zamia were also arborescent, with visible above ground trunks (see the photo on the cover of this issue), a rare feature among Amazonian zamias, most of which have subterranean trunks.

Our field observations and morphological comparisons confirmed a species new to science and the first cycad known to thrive in permanently waterlogged forest.

The research continued my collaboration on Peruvian zamias with Fernando Roca of the Pontificia Universidad Católica del Perú and Montgomery member Malcolm "Chip" Jones, who joined us in the field. The study united researchers from Peru, the United States, and Brazil. IIAP organized the expedition, with support for our participation from Montgomery's Plant Exploration Fund.

Featured on the cover of PHYTOTAXA in February 2026 as *Zamia urarinorum*, the species honors the Urarina people and their stewardship of these remote flooded Amazonian lowlands.

Michael Calonje, Cycad Biologist
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A species new to science and the first cycad known to thrive in permanently waterlogged forest.



The paper is open access
and free to read online in
Phytotaxa Vol. 741.

Background: Dawn over the Marañón River, a major tributary of the Amazon and the gateway to our expedition in search of *Zamia urarinorum*.

Up to the CHALLENGE



Montgomery partners with the Navy to help Micronesia's Cycad

Cycas micronesica, formerly the most abundant tree in Guam's forests, has faced a series of threats for over twenty years. Locally known as fadang, this iconic gymnosperm tree was a traditional food source of the Chamorro peoples as well as a prominent component of the idyllic forests of Guam. Since the accidental introduction of cycad aulacaspis scale (CAS), populations in Guam have been severely reduced; less than 5% of the original plants remain. Combined with other cycad specialist pests such as the cycad blue butterfly, (*Luthordes pandava*) *Cycas micronesica* faces a conservation crisis and was red listed by the IUCN in 2006 and listed as threatened by USFWS (United States Fish and Wildlife Service) in 2015. Although the 2015 federal listing of *C. micronesica* as a threatened species marked a somber milestone for a plant that was once among the most abundant in Guam's forests, the designation extended meaningful protections under the U.S. Endangered Species Act and helped open the door to dedicated conservation funding and recovery planning. Montgomery Botanical Center recently entered into an agreement with the U.S. Department of the Navy (DON) to help save the iconic fadang from extinction. Our project has 3 main objectives:

1

COLLECT SEEDS IN GUAM & TINIAN

After arranging permitting, Montgomery sent Patrick Griffith and Ben Deloso to Guam and Tinian to begin field collecting of *Cycas micronesica*, in collaboration with population managers working on both islands, to promote effective conservation.

2

GENOTYPING AND BREEDING STRATEGY

We seek to propagate and maintain ex situ populations through a "studbook" of *C. micronesica* ex situ collections, informed by genomic data, allowing for optimized controlled pollinations.

3

PARTNER ENGAGEMENT

We coordinate this work with the IUCN Specialist Group and the USFWS-Fadang Working Group, to keep stakeholders involved in the process and aware of progress made in ex situ collections.

Biologists from Tāno, Tāsi, yan Todu – a Guam-based non-profit focused on conservation projects – are assisting the MBC team with fieldwork. "Working with MBC and the DON on the conservation of one of Guam's most iconic plants is a truly rewarding experience as a Chamoru," said Charles (CJ) Paulino, a lead biologist with TTT. Several goals are central to this project. We are working to expand the number of fadang in cultivation throughout U.S. based botanical gardens, determine the population genetic structure of fadang populations throughout Andersen Air Force Base and an offsite reserve located on nearby Tinian island, as well as determine optimized breeding pairs among the surviving plants for future management. While addressing the biotic threats to the continued existence of *Cycas micronesica* in the wild is still of paramount importance, this project aligns perfectly with Montgomery's mission and aligns with the Cycad 2050 Strategy – that no cycad will go extinct under the watchful eye of our global Cycad Specialist Group.





Page 6 (top): Megasporophyll and immature ovules of *Cycas micronesica* growing at Montgomery.

Page 6 (bottom left): New seed received from Guam on a recent collecting expedition.

Page 6 (bottom right): A large, venerable fadang plant in Andersen Air Force Base. These survivors can help restore the once-abundant native population in Guam and elsewhere.

Page 7 (top): *Cycas micronesica* seeds collected in Guam and Tinian in 2025 beginning to sprout in the nursery.

Page 7 (bottom): (Left to right): NAVFAC natural resource specialists Mario Martinez and Gerard Chargualaf, NTBG/FIU/MBC graduate fellow Benjamin Deloso, and TTT biologists Charles (CJ) Paulino and Ian Entilla, the fieldwork team, posing with a stately *Cycas micronesica* in the background.



The views, opinions, and/or findings expressed are those of the authors and should not be interpreted as representing the official views or policies of NAVFAC MARIANAS. These data were taken in connection with research authorized under the USFWS Recovery Permit PER22638508 and funded by the Department of the Navy on behalf of Joint Region Marianas as part of cooperative agreement N40192-25-2-8011: A long-term ex-situ conservation program for *Cycas micronesica*.

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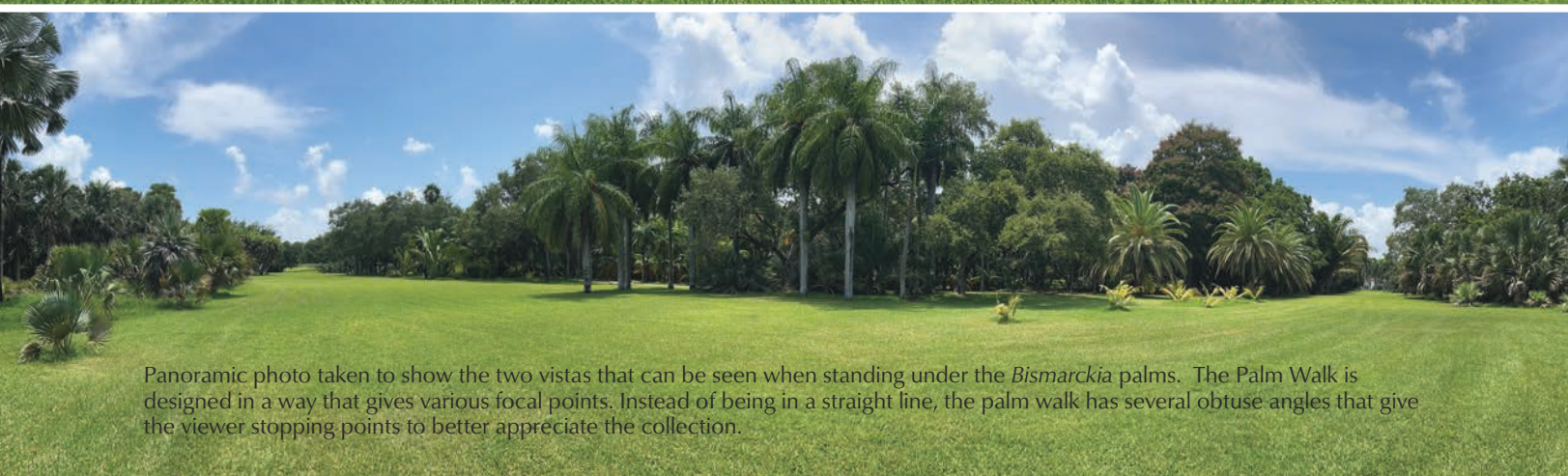
View south, facing the *Bismarckia nobilis* palms on the Palm Walk. Several solitary palm species like the *Copernicia baileyana* on the close right make up a majority of this section.



View north, facing grove of *Attalea cohune* by Royal Lake. On the east are two species of royal palms, *Roystonea oleracea* and *Roystonea princeps*, while the west showcases *Tahina spectabilis*.



View east from Nell's House towards the *Copernicia baileyana* palms at the end of the vista. **Inset:** Joe Hibbard describing his planting plan to the palm biologists and curators.



Panoramic photo taken to show the two vistas that can be seen when standing under the *Bismarckia* palms. The Palm Walk is designed in a way that gives various focal points. Instead of being in a straight line, the palm walk has several obtuse angles that give the viewer stopping points to better appreciate the collection.



View north towards Nell's House from Palm Walk. Nell's House was the original residence of Nell and Colonel Robert Montgomery. Built in 1932, along with the still active Arthur Montgomery Guesthouse built in 1933, the white and terracotta structures are highlighted by towering *Roystonea* palms and shrubs of *Zamia* and *Dioon* species.

Taking the Long View

ESSENTIAL VISTAS AT MONTGOMERY

Montgomery Botanical Center is focused on the conservation of threatened and endangered species, specifically palms and cycads collected throughout the world. Each plant has been carefully placed in a specific area to maximize the likelihood that it would thrive and produce a seed source that will aid in species conservation. We prioritize plant health, but also make incredible efforts to ensure that the aesthetic of the garden matches its scientific value.

Montgomery has had the pleasure of working with the same landscape architect, Joe Hibbard, for 34 years. In that time his vision has remained the same, though the layout and Master Plan has constantly evolved.

Our master design is built around the concept of the vista. Large openings have been created that

direct the viewer's eyes to key points throughout the property. Beginning at Nell's House, guests can walk out behind the house and are presented with two options: first, a long view to Coconut Lake that cuts through a section of the Silver Bluff Escarpment, and second, a view of the Palm Walk, a long walking path flanked by palms from around the world.

The vista by the lakes highlights several coastal species as well as provides water features that are highlighted by some of our larger specimens – like a *Ceiba pentandra*, royal palms and coconut palms. The view eventually ending in a distant grove of *Attalea cohune*.

The other vista guides guests down the Palm Walk, comprised of many different species arranged along a wide path with an distant, planned view. If viewing from

Nell's House one could enjoy the vista terminating with a population of large *Bismarckia nobilis* palms. These were collected in Madagascar over 30 years ago and their distinct thick smooth trunks along with their silvery blue leaves stand out amongst the varying shades of green the species around them provide. If one were to stand under those *Bismarckia* one could see two more terminating vistas, one being Nell's House itself and the other being a wild population of *Serenoa repens*, a clumping native Florida palm species that shares a similar hue to the *Bismarckia*.

With Montgomery Botanical Center's hundreds of different species to observe, these vistas help guide guests through the landscape and provide structure to their views.

Xavier Gratacos, Superintendent
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Jade Stryker, a Ph.D. student at the University of Georgia working with Dr. Shayla Salzman, has been examining the signals and cues responsible for maintaining obligate brood-site mutualisms in cycads.

This summer, Jade visited the garden along with Piper Cole, a fellow Ph.D. student studying entomology in the evolving field of plant-insect chemical ecology.

Together they collected information about cone thermogenesis, respiration, and scent emission on the cycads in the collection. Jade and Piper have been working in the Salzman Lab since 2024 and 2023, respectively.



RESEARCH UPDATES

The Montgomery Team keeps moving botanical science forward. In addition to the studies highlighted elsewhere in this issue, here are a few other exciting examples:

Michael Calonje, **James Clugston**, and **Mario Coiro** put forward a new comprehensive phylogeny of cycads. The paper appears in volume 275 of *PHYTOKEYS*.

Larry Noblick, our Palm Biologist Emeritus, recently coauthored a new species of palm, *Bactris atlantica*, from the Atlantic Forest of Brazil. The study appears in *PHYTOTAXA* volume 768.

James Clugston led a new study of the conservation genomics of *Cycas* in northern Australia (image at right). The paper can be read in *ANNALS OF BOTANY*, volume 137.

Joanna Tucker Lima coauthored a large-scale study of seed dispersal across ocean distances, available to read in *PLOS ONE*, volume 21.



For a complete list of research findings, please see our website:
montgomerybotanical.org

We are glad to have a new group of interns this summer! Two of our volunteer interns from last year, **Yanelis Valdes** and **Jaylon Small**, were promoted to CONSERVATION HORTICULTURE FELLOWS and will be completing a year long internship at Montgomery. **Sylas Anand** is our 2026 ROBERT K. ZUCK AND PETER R. JENNINGS INTERN and **Erika Ardila** is our 2026 PETER R. & STUART Y. JENNINGS INTERN. EAST CAROLINA UNIVERSITY sent three GIS INTERNS: **Pascalle Aldib** – a senior majoring in Environmental Studies with a minor in Geology, **Evelyn Ross** – a senior majoring in Coastal and Marine Studies with a minor in Geology, and **Emerson Bradshaw**, – junior majoring in Environmental Studies with a minor in Coastal and Marine Studies. Our ECU Interns are generously funded by our Honorary Member, Lyman Dickerson. We also have two new FIU COLLEGE OF ARTS, SCIENCES, AND EDUCATION (CASE) INTERNS, **Alia Salim** and **Nicole Lozano**, earning FIU credits for their summer internships. There are also three new VOLUNTEER SUMMER INTERNS, **Quinn Garilli**, **Andrew Groff**, and **Arianne Lopez del Rincon**. Ms. Garilli volunteered at Montgomery while in high school and has returned for the summer before starting college at the UNIVERSITY OF MIAMI (UM). Mr. Groff is also a student at UM studying Ecosystem Science and Policy. Ms. Lopez del Rincon just graduated from the University of Florida with a B.S. in Botanical Research. Please join us in welcoming our new Fellows and Interns!

TEAM NEWS



Yanelis Valdes



Jaylon Small



Sylas Anand



Erika Ardila



Pascalle Aldib



Evelyn Ross



Emerson Bradshaw



Arianne Lopez del Rincon



Alia Salim



Nicole Lozano



Quinn Garilli



Andrew Groff

Background: By the Nell's House parking lot, there is a lovely group of *Coccothrinax barbadensis* brought into the collection by Colonel Robert Montgomery on February 22, 1933. In this background photo, you can see the orange hastula that is distinctive of the species contrasting with its bright green leaves. The starburst radiating out into the round palmate leaf gives a warm sunlike feeling.

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FROM THE MONTGOMERY ARCHIVE

CYCAD CONSERVATION IN GUAM, 2007



Cycas micronesica is a large, arborescent cycad found in the remote Pacific islands of Guam, Rota, Palau, and Yap. This fascinating cycad has been extensively studied in many ways. Its morphology – with free, unfused megasporophylls – is suggestive of early cycad fossils known from paleobotany, making it a kind of “living fossil” which provides insight on ancient plant evolution.

Montgomery first grew this species in 1998, with a limited number of plants. In this photo taken in 2007, you can see Dr. Michael Calonje with a large specimen of *C. micronesica* in Guam. That year, Montgomery collected 561 seeds from 24 different populations. There are currently 110 *Cycas micronesica* plants growing at Montgomery from those efforts, one of the most extensive conservation plantings on the property.

In 2015, plants derived from that 2007 expedition began producing seeds through our artificial pollination program. Montgomery has sent 1,722 seeds back to Guam for research, as well as for a reforestation project to increase the backup population numbers. Our current work in Guam and nearby islands (see pages 6-7) further helps to conserve this iconic species.