

Advancing Research, Conservation, and Education through Scientific Plant Collections

Spring/Summer 2015

Volume 23, Number 1

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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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Edited by Tracy Magellan

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From the Executive Director

Dear Friends,

EXPLORATION moves ahead at Montgomery! From traveling afoot and over the road to find these plants, to exploring the shape and structure of their forms – even exploring genes hidden from sight within their cells. Finding, saving and sharing plants begins with exploration.

And our recent explorations have taken us both *far* and *near*, as shown in this newsletter. Tracy Magellan went in search of an important palm (see cover and pages 6-7). Although our plant collection is truly GLOBAL in scope, this was one VERY LOCAL species – right here in our county – which is not yet at Montgomery. On pages 4 and 5, Michael searched remote forests in Colombia to help understand, collect and conserve rare mountain cycads.

When our experts ultimately return from these travels, the explorations still continue. The facing page shows the result of Larry's studies, and page 8 highlights other outcomes of our work. And further exploration awaits! I am excited to share great news – a major federal grant to support important conservation science at Montgomery (see page 11).

Not only do we advance our own studies, but we help others coordinate and share their findings in very international ways. With our Colombian Research Fellow, Dr. Cristina Lopez-Gallego, Michael and I are working to organize Cycad 2015, this summer's worldwide conference (page 5). And I am most pleased to announce a strengthened and renewed colleagueship with our friends in Singapore – see the facing page for details.

Seeking and sharing wonderful plants and the stories they hold – both near and far – is the heart of what Montgomery does. And I am thrilled to share these plants and stories with you.

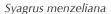
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Pictured: Dr. Griffith with Colonel Montgomery's *Cycas bougainvilleana* (see back cover).

Malm Discoveries

Four new finds in Brazil







Syagrus emasensis



Syagrus guimaraesensis



Syagrus graminifolia subspecies cabraliensis

Recently, I published four palms new to science. These discoveries came from exploring the central western savannas of Brazil last year – the result of many daylight hours in the field, evenings preparing specimens and detailed measurements, and much time over a microscope examining leaflet anatomy.

All four palms have short, underground stems and leaves that often blend in with the native grasses – thus, often overlooked. Two were discovered in southwestern Goiás. *Syagrus menzeliana* was found in a small savanna fragment surrounded by soybean fields. Very little native vegetation remains where this new and attractive palm once thrived. It is named in honor of Jill Menzel, who is a director of the International Palm Society and has also been very helpful and generous to Montgomery.

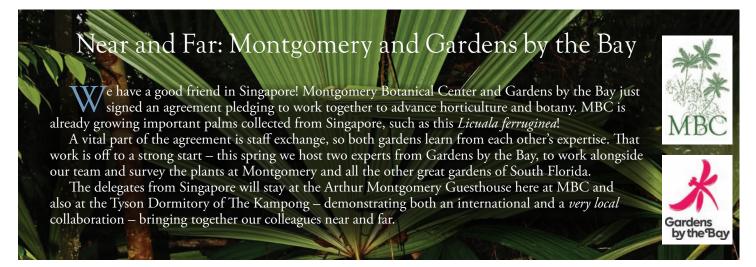
The second palm from southwestern Goiás was found in the Parque Nacional das Emas. The ema (or rhea) is frequently seen throughout the open grassland savannas stretching out over the park's 7 million acres. *Syagrus emasensis* is named for the national park. The palm with unique curly leaflets thrives there, in spite of the frequent grassland fires.

A third palm is near the geodesic center of South America, in and near Parque Nacional da Chapada dos Guimarães. This palm, like *Syagrus emasensis*, is well protected by the Park and is thusly named *Syagrus guimaraesensis*. It grows in decomposed, layered sandstones weathered and eroded into "chapada" topography. It differs from any other known stemless palm.

The last discovery grows in the Serra do Cabral, in the northern part of Minas Gerais. This last palm has an unusual and very specific affinity for iron-rich "canga" soils. Normally canga soils are devoid of vegetation, but this palm only grows on such deposits. This palm's anatomy proved that it was closely related to *Syagrus graminifolia*, but it had consistently unbranched inflorescences. Therefore we designated this as *Syagrus graminifolia* subspecies *cabraliensis*, which refers to the isolated mountain range it calls home.

Reference: Noblick, L. R., H. Lorenzi, and V. C. Souza. 2014. Four new taxa of acaulescent *Syagrus* (Arecaceae) from Brazil. Phytotaxa 188(1): 001–013.

Dr. Larry Noblick, MBC Palm Biologist larryn@montgomerybotanical.org





n highland Zamia

Bringing back a lost cycad

wo Zamia species are found in the cool forests of Colombia's Western Cordillera. Zamia montana, from Antioquia, has been known since 1875, whereas Zamia oligodonta was only discovered in 2003 in Risaralda. Both species have unusual leaflets with prominent veins, and largely based on that similarity, Zamia oligodonta was recently reduced to a synonym, Zamia montana. Despite that decision, these populations of highland cycads are rarely seen and poorly understood – for example, Zamia montana evaded botanists for over 25 years and was presumed to be extinct!

Thus, our team of researchers from Montgomery, Universidad de Antioquia, and Bogotá Botanical Garden visited Antioquia and Risaralda in hopes of finding these *Zamia* and shedding some light on their taxonomy and conservation. For the first time in a quarter century, we successfully re-discovered Zamia montana! Although still found in small numbers, Zamia montana may be the most highly threatened cycad species in Colombia, due to habitat destruction.

In Risaralda, we also found healthy populations of the Risaralda Zamia, and determined it – Zamia oligodonta – was quite distinct from Zamia montana and deserved full recognition as a species. Zamia montana has large treelike stems up to 5 feet tall by 8 inches wide, and up to 10 individual leaves, whereas Z. oligodonta has a subterranean stem and only around 3 leaves - in fact the two species can readily be distinguished by leaflets alone.

With such great luck in our cycad search, some kind of difficulty was overdue. Thus on our way back down the mountain road, a breakdown of our 4x4 forced us to overnight until we could find help the next morning. Luckily a road construction dump truck was able to give us a ride to town to hire a mechanic!



The Research Team with Zamia wallisii leaf: Cristina Lopez-Gallego, Marco Tulio Betancur, Gustavo Morales, Francisco Javier Roldán & Michael Calonje.



A vehicle repair in the field.

Michael Calonje, MBC Cycad Biologist michaelc@montgomerybotanical.org

Cycard 2015 Medellín, Colombia

The premier worldwide gathering for cycad people – scientists, horticulturists and enthusiasts – is happening this summer! The Tenth International Conference on Cycad Biology – Cycad 2015 – will take place August 16 through 21 in Medellín. Montgomery is delighted to be on the organizing committee led by Cristina Lopez-Gallego, and the Academic Committee, led by Michael Calonje.

Student participation is generously sponsored by The Cycad Society and Cycad Society of SOUTH AFRICA – allowing reduced registration fees and travel scholarships. We are also deeply grateful to the Mohamed Bin Zayed Species Conservation Fund for sponsoring the important Conservation Workshop associated with the conference.

Join us in Colombia for this unique gathering!

Please see **www.cycad2015.org** for details including registration deadlines.







In Endangered flore



argent's cherry palm, Pseudophoenix sargentii, though found in many places in the Caribbean, is a Florida Endangered Species occurring only on Elliott Key in the USA. Located in Biscayne National Park, about 20 miles southeast of Montgomery Botanical Center between Biscayne Bay and the Atlantic Ocean, Elliott Key is the last Florida habitat where P. sargentii can be found.

No roads go to Elliott Key, so on the morning of February 11th we set sail near Key Largo for Elliott Key and took a five and a half hour trip to the island. The bay was calm, but the wind was coming from the northwest, so we motored most of the way against the wind. On the first day we landed, tested our GPS points, and found the first palm on the island in a region called Scorpion Bite. We were lucky not to find any scorpions on the site, but the mosquitoes were there ready to bite.

Top: Tracy Magellan with one living *Pseudophoenix* sargentii and one dead trunk on Elliott Key.

Right: Tracy with the sailboat that carried her and her supplies to Elliott Key.





The Pseudophoenix sargentii habitat on the island is a hardwood hammock, with many species including poisonwood, gumbo limbo, Florida thatch palm, and white stopper. Though the Sargent's cherry palm is said to fruit from January through March, no fruit was found this February. This species is extremely slow growing and though there are young introduced and wild *P. sargentii* on the island, it will take a while before they mature.

Hurricane Sandy hit the key in October of 2012 destroying the seawall and harbor, causing the National Park Service to close Elliott Key for 18 months, just reopening in May of 2014. We do not know if the hurricane impacted the remaining adult *P. sargentii* which rise above the dense canopy, but in only 3 years' time the population has once again declined.

A group of South Miami Middle School students were on an educational campout on the key during our time on the island. The teacher and park rangers approached me to give an outreach presentation. They wanted the students to see that scientists are "real people," not just mythical types read about in textbooks and stereotypes portrayed on television. I was happy to tell the students about the Sargent's cherry palm and show them a specimen. It was the first *Pseudophoenix* they had seen on the island. Some recognized the distinctive palm, saying they had seen it in landscaping in town.



Above: Tracy Magellan speaking with 7th grade South Miami Middle School students who camped at Elliott Key.

The Sargent's cherry palm's striking blue grey color contributed to its overharvest throughout Florida and the Caribbean for use in landscaping. It is one of the most wind and salt tolerant palms with the ability to survive occasional salt water inundation, which contributes to its use in the landscaping of coastal regions.

Montgomery Botanical Center currently has five populations of *Pseudophoenix sargentii* in the collection, representing a good, but as of yet incomplete sample of the genetic diversity of the species.

I would like to thank the International Palm Society for supporting the expedition, the National Park Service for helping with permitting and logistics, and Jeremy Schnall for sailing me to the key.

> Tracy Magellan, Outreach Manager tracym@montgomerybotanical.org

Remembering Dorothy Jacher



Charles and Dorothy Sacher at Montgomery.

Orothy Sacher, MBC Heritage Member and wife of Past President Charles P. Sacher, passed away in early February 2015. A great friend of MBC, Dorothy was always our very enthusiastic booster and supporter, giving generously to support plant collecting expeditions, and working to bring great people to Montgomery. In 2012, Charles and Dorothy's sons — Charles, John, and Richard and their families — gifted funds to complete the restoration of the original 1932 Montgomery Greenhouse, on its 80th anniversary, to honor the 50th wedding anniversary of Charles and Dorothy.

I fondly remember Dorothy as always friendly and engaging, offering helpful facts and fun remarks, and doing everything she could to bring people together — she is greatly missed.

Dr. Patrick Griffith, MBC Executive Director patrick@montgomerybotanical.org

Research Updates

Plant studies keep moving forward at Montgomery — Pages 3-7 feature only a portion of this work! Here, we highlight three other recent outcomes.

How is Cycas like a Ficus?

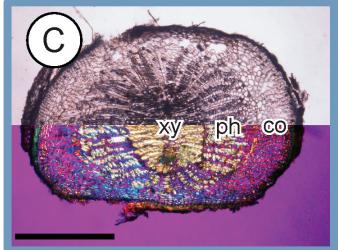
Gelatinous Fibers! **Barry Tomlinson**, along with his colleagues **Tracy Magellan** and **Patrick Griffith**, published a novel anatomical study of cycad roots in the American Journal of Botany. Barry discovered that root contraction in cycads is caused by gelatinous fibers, which were previously only known in just a few other plant families. The appearance of these fibers in such an old lineage as cycads raises interesting questions about their origin. The study was generously supported by the Kelly Foundation. The photo at the left shows a developing cycad root section.

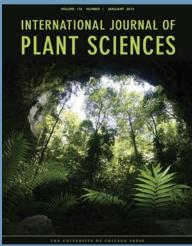
Cycad Conservation Genetics

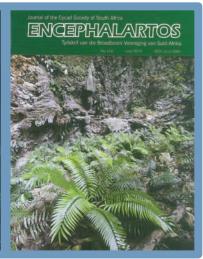
Our recent large scale study of cycad genetics (see Fall 2014 Newsletter) appears on the cover of International Journal of Plant Sciences — and is truly International and multi-institutional, co-authored by **Patrick**, **Michael Calonje**, **Tracy**, and **Chad Husby** of MBC, as well as **Alan Meerow** of USDA, **Freddy Tut** of Belize Botanic Gardens, and **Abby Hird** and **Andrea Kramer** of BGCI. The work was funded primarily by the Institute of Museum and Library Services. This line of investigation continues with further IMLS support (see page 11).

Plant Exploration Article

ENCEPHALARTOS – JOURNAL OF THE CYCAD SOCIETY OF SOUTH AFRICA features Montgomery's Belize 2014 Expedition on a recent cover. This article also was an international effort — co-authored by **Patrick** and **Michael**, along with **William Mesh** and **Freddy Tut** from Belize Botanic Gardens. The account relates the detailed story of exploring remote sites for a rare tropical cycad. We are thankful to SOS-Save Our Species and the Mohamed bin Zayed Species Conservation Fund for making that fieldwork possible.









Jesse Harshaw



Vanessa Sanchez



Nellie Zucker

TEAM NEWS

Jesse Harshaw brings considerable landscape and plant care experience to Montgomery as our newest Landscaper. Jesse is a great addition to the team – diligent, friendly, hardworking, skilled and respectful. We are glad to have him onboard!

Vanessa Sanchez is finessing the expert labwork for our latest Institute of Museum and Library Services project (see page 11). A recent MSc graduate of the FIU Biology department, where she studied pine rockland biology using molecular techniques, Vanessa brings the exact skill set needed to gather the genetic data for our work.

We greatly appreciate the enthusiasm and hard work of **Nellie Zucker**, our Miami-Dade County Public Schools High School Intern with the Honors and Executive Internship Program. Nellie is apprenticing with the tree collections, helping to care for and monitor our important trees as she learns arboriculture from MBC's Christina Dupuy.



Nursery volunteer Kimberly Lynch cleaning seeds

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Montgomery Botanical Center 2014 Collection Inventory

	PALMS	CYCADS	OTHER		PALMS	CYCADS	OTHER
TOTAL TAXA	510	299	867	TOTAL PLANTS	11,398	8,144	4,590
IN GROUND	385	234	589	IN GROUND	6,244	4,938	2,695
IN NURSERY	125	65	278	IN NURSERY	5,154	3,206	1,895
TOTAL ACCESSIONS	2,359	2,185	2,683	24,132 PLANTS!			
IN GROUND	2,035	1,785	2,227				
IN NURSERY	324	400	456				

Montgomery Botanical Center Gratefully Acknowledges Your 2014 Support

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The Science of Cycal Conservation



he Institute of Museum and Library Services provided a Museums for America award to Montgomery for ur project, Mission Based Collections Planning. The \$130,000 grant allows Montgomery to carefully study the genetics of a cycad collection, Zamia lucayana, and compare it to the wild Zamia population in The Bahamas.

The project brings together experts from MBC, the USDA Chapman Field Station, and Botanic Gardens Conservation International – who come together to conserve the plants and records, explore the genes, and share the results widely.

The project follows the successful outcomes from a prior IMLS award, which provided novel scientific findings (see page 8) as well as useful protocols (see Fall 2014 Newsletter). We are excited to build on those great results!



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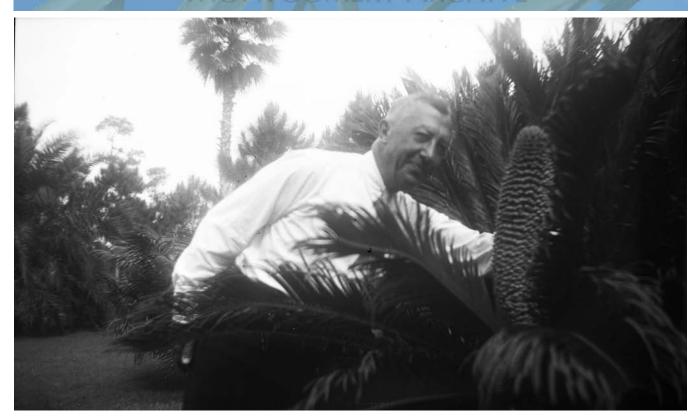
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FROM THE MONTGOMERY ARCHIVE



COLONEL ROBERT H. MONTGOMERY WITH CYCAD CONE, LATE 1930s. After establishing the Coconut Grove Palmetum (now Montgomery Botanical Center) in 1932, Robert Montgomery amassed a leading collection of palms and cycads within a few short years.

Here, he poses with a prized *Cycas bougainvilleana* bearing a male cone. Collected from the wild near Rabaul, on the Island of New Britain (Papua New Guinea), by the US Department of Agriculture, this plant (RM1448*A) was obtained by the Colonel in 1936, most likely from David Fairchild. Still growing at Montgomery to this day, this plant is now one of the largest cycads on site. The photo at right shows it in 2013, nearly 80 years later. Also, please see the page 2 photo taken just this year.

