Montgomery Botanical News

Advancing Research, Conservation, and Education through Scientific Plant Collections

Fall/Winter 2017 Volume 25, Number 2

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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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11901 Old Cutler Road
Coral Gables, Florida 33156

Phone 305.667.3800
Fax 305.661.5984

mbc@montgomerybotanical.org
www.montgomerybotanical.org

Edited by Tracy Magellan

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From the Executive Director

Dear Friends,

Something major happened at Montgomery this summer: Hurricane Irma. Around our neighborhood, our County, and indeed throughout Florida, trees saw major damage. We lost many old favorites: trees that gave shade and habitat, held delightful stories, marked our way on the land – and even some that *won titles*.

The garden is changed, but time has taught me that gardens are always changing – you never "finish" a garden. The coming years will have new spaces to plant and new opportunities to refine the landscape, the positive side to these losses. We will move forward!

Please see my account of the hurricane on the facing page; there is also some historic context on our back cover. I take comfort in knowing that Montgomery has weathered many such hurricanes since 1932, and every time, we recovered and moved forward. Just look at where we are now, 25 years after Hurricane Andrew, with more plants and many more successes. That trajectory cannot be stopped by Irma.

I am grateful, honored and humbled to see your great generosity and concern. In the weeks after the storm, many of you donated funds, volunteered to cut branches, and called to check on us. Montgomery's recovery has significant costs, and I greatly appreciate any help you may consider. Call, write me, or see our webpage for ways to give.

While that major storm still affects our lives and our work, there are still many wonderful successes to celebrate! It has been a great summer for building the team, with wonderful new staff, interns and students (page 7). Regarding students, I am excited to report a new endowment given by Peter Jennings to support early career botanists (page 6). This is a big step forward for our work!

Finally, I am delighted to share a special discovery with you – a new palmetto species! Pages 4 and 5 tell the story of this new find. Palmettoes are among my favorite palms, and this new one has a very unique habit. It is thrilling to see that even in a well-known group of palms, there are further discoveries yet to be made!

Pictured: Dr. Griffith with a large tree of *Sterculia apetala*, collected in Panama over 30 years ago and lost to Hurricane Irma.

HURRICANE IRMA

Replanting, Recovery, Research

Hurricane Irma brought fast wind, deep rains, high seas, and great damage to Montgomery on September 9th and 10th. On the 11th, emerging from the fortified guesthouse, I met Lee Anderson, glad to see he survived also. Our initial scene was shocking: oaks were downed, broken, or uprooted; Royal Palms stood bare of fronds; beloved Champion Trees – those largest of their kind – lay prone or stood shattered. Walking the site, *wearing a bike helmet,* I found myself lost along paths trod for years, so dense and tangled were the windfalls.

Two days of saw work by our dedicated team allowed us to, at least and at last, pass on the roadways. Assessment could then proceed. At last count, we are working to save 109 palms, but we now say goodbye to at least 150 more – and we are still counting lost trees.

Comparisons with the past are a topic: not nearly as bad as Andrew ('92), but so much worse than Wilma ('05), it is said. Our preparation and response are shaped by both, and by lessons from earlier also (see page 8). Rapid triage of plants, followed by a thorough assessment of damage is critical to a scientific collection. These efforts must be balanced with cutting and hauling trunks and limbs.

Today, two weeks after I opened that first storm shutter, things look better already. We have months of work ahead, but this team is up to the task – I look forward to showing you a beautiful garden – *changed but still beautiful* – when you next visit.

M. Patrick Griffith, Executive Director
patrick@montgomerybotanical.org

With emergency funding from the National Science Foundation (DBI-1762781), we righted this felled *Corypa taliera*. This incredibly rare species is extinct in the wild, and very few survive in gardens – so rescuing this plant was never a question!

The Loyd G. Kelly Plant Conservation Nursery fared well; both greenhouses were intact, and irrigation and airflow were sustained by our backup generators and tanks, supplied by the National Science Foundation (DBI-1561346). A generator from the NSF kept our cold-stored pollen safe. Only one shadehouse was damaged.

While this *Attalea butyracea* is lost, it can still provide knowledge. Joanna Tucker Lima, Marlee Garcia, Stella Cuestas, Marco Perez-Alvarez, and Xavier Gratacos (not in shot) dissected this felled palm to study its reproductive development.

State Champion *Kigelia pinnata* lost all limbs.

The State Champion *Cananga odorata* was lost in the storm. The MBC Team is clearing roads, staking palms, hauling debris, and keeping high morale throughout! There is still much work ahead to restore Montgomery.

New Palmetto Discovered!

A remote and rare *Sabal*.

An unexpected find in palm science! A new palmetto species, *Sabal antillensis*, was published this year – the new species is only known to grow in the Dutch Caribbean, and has a striking appearance, with a swollen trunk (see front cover) and short leaf stalks.

The palmetto genus includes some of the best known and most widely planted palms. Florida's own state tree, *Sabal palmetto*, is a beloved and common feature of avenues, gardens, and wild landscapes. The new species *Sabal antillensis* has been known about for some time, but not officially designated until this April. Quoting from the species description: "The single native palm species on Curaçao and Bonaire did not receive much attention, or even a determination, for many decades." The first specimens are only from the late 1940s, and botanists only began to mention its distinctiveness in the 1970s.

A collaborative effort between Montgomery Botanical Center and the Carmabi Foundation (Curaçao) thoroughly studied the geography, morphology and anatomy of these palms, and found they deserve their own new name – chosen to honor the Dutch Antilles where they are found.

Sabal antillensis grows on windswept, rocky hillsides on the leeward side of Christoffelberg, often on exposed ridges. The leaflets appear to be adapted to this windy, dry habitat.

Montgomery is very grateful to Dr. Lin Lougheed for generously funding this exploratory plant research, and to the Carmabi Foundation (Curaçao), the Government of the Public Entity of Bonaire, and the USDA for permission to study and collect these important specimens. Reference: Griffith, M. P., J. de Freitas, M. Barros, and L. R. Noblick. 2017. *Sabal antillensis* (Arecaceae): a new palmetto species from the Leeward Antilles. Phytotaxa 303(1): 056–064.

On Bonaire, sabalpalm grows on low elevation limestone terraces. The first botanist to study these palms, Ms. Winkleman, noted that the Bonaire palms tend to be taller than those on Curaçao. The palms have protected status on Bonaire, and the Echo Foundation successfully cultivates sabalpalm seeds locally.

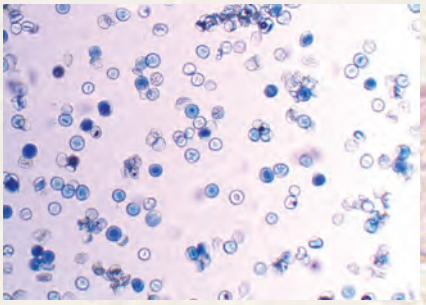
A distinctive feature of *Sabal antillensis* is the short leaf stalk, which is always shorter than the leaf blade.

The majority of *Sabal antillensis* are protected within Christoffelpark; seeds, seedlings, and young plants are abundant there.

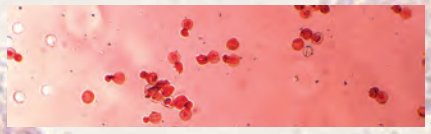
The species description, featured on the cover of Phytotaxa 303(1), is freely available on the Phytotaxa website.

Background: *Sabal antillensis* is found only on the islands of Bonaire and Curaçao, in the southern Caribbean, where it is locally known as "cabana" or "sabalpalm." This photo shows the view from the west slope of Christoffelberg, the type locality of the species.

Remembering Stuart Jennings with a Gift for Botany



Lactophenol cotton blue (LPCB) stained *Zamia* pollen.



Aceto-orcein stained *Ceratozamia* pollen.

Stages in the germination of pollen of *Lepidozamia peroffskyana*.

Gregory Barber calibrating our new dissecting microscope in the Chris Tyson Plant Conservation Building.

A generous endowment contribution from Dr. Peter R. Jennings in memory of his late brother, Stuart Jennings, establishes the new Peter R. and Stuart Y. Jennings Fund. The Fund will support botany and horticulture interns at Montgomery every summer, to work on science and conservation projects with the Montgomery plant collection.

Our first Peter R. and Stuart Y. Jennings Intern is Gregory Barber. Greg is a recent graduate ('16) from New College in Sarasota, Florida, and is bringing his expertise (see page 7) to advance three projects this summer. First, Greg has been working with Michael Calonje, Jessica Sparks, and Joanna Tucker Lima to figure out optimal ways to store cycad pollen. He has also worked with Michelle Barros and Patrick Griffith to study sea-level change in the garden. Finally, Greg is also working with biometric data on palms, to see if patterns emerge with regard to plant age and shape, as part of a project developed by Barry Tomlinson, volunteer Debb DuMond and Tracy Magellan.

Please join us in thanking Peter R. Jennings for his great generosity. Peter's generous gift provides a permanent, sustainable benefit to Montgomery, as well as to future generations of botanists and horticulturists. This gift also confers a lasting legacy to honor the memory of Stuart Jennings. Peter states, "Many years ago an unknown benefactor guided me from chaos into botany that led to grad degrees in plant pathology and a 50-year career as a rice breeder. Our undertaking holds the promise of doing the same for young, promising interns. I am delighted."

M. Patrick Griffith, Executive Director
patrick@montgomerybotanical.org

Background: *Zamia* pollen germinating in a sucrose solution.

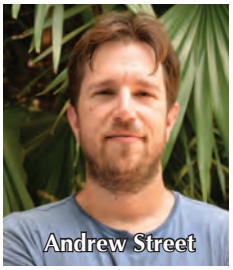
Research Notes: Palms and cycads from Montgomery move science forward!

- **Palm evolution in Brazil.**
  A new study by Christine Bacon and colleagues looks at biogeography of savanna floras. By modeling the relationships of palms in that region, they found that *Allagoptera* palms have adapted to drier habitats over time. The work appears in Molecular Phylogenetics and Evolution.
- **Cycad biogeography in The Bahamas.**
  A major finding of the Caribbean Cycad Project (Funded by the National Science Foundation, led by Javier Francisco Ortega and Alan Meerow – and involving Montgomery's experts) appears in the American Journal of Botany. This paper shows how *Zamia* have migrated in the Bahamas over time.
- **A closer look at palm leaflets.**
  Montgomery's Larry Noblick published an anatomical key to *Syagrus*, which allows identification of difficult to determine species via leaflet cross-section (appearing in the latest PhytoKeys).
- **Conservation through cultivation.**
  The Collections Genetics Project – funded by the Institute of Museum and Library Services (MA-05-12-0336-12 and MA-30-14-0123-14), and led by Montgomery – had a big outcome this summer, with the publication of a comparative study of two cycad species. The paper (in Biodiversity and Conservation) compared collections at Montgomery to wild plants, and examined how life history – fast or slow growth – can influence conservation.

Space limits what we can showcase here: Montgomery's plants support many more interesting findings! For a full account of how our collections contribute to science, please visit our research page at www.montgomerybotanical.org.

Team News

It has been a busy hiring season at Montgomery with seven new people on the team! **Andrew Street** was hired as the Assistant Palm Curator. He comes to Montgomery with a background in biology and great experience working in horticulture at the Miami Beach Botanical Garden. **Alex Whitworth** and **Dakota Moore** are two Interns from East Carolina University's Department of Geography, Planning, and Environment funded by a generous gift from Lyman Dickerson. They come with strong mapping experience and have already increased our efficiency greatly, by adding this season's new plants to the map. **Gregory Barber** is our first Intern supported by the Peter R. and Stuart Y. Jennings Fund (see page 6). Gregory has been working on a series of botanical and horticultural projects here at Montgomery, leveraging his background in biology and mathematics. Our 2017-2018 Conservation Horticulture Fellows, **Marlee Garcia** and **Michelle Horne**, join us from Miami Dade College, bringing big enthusiasm and effort to Montgomery as they learn about daily botanic garden operations in this program supported by the Batchelor Foundation. **Matthew Miller** is our first Coral Gables Community Foundation Research and Conservation Intern. He is learning about conservation horticulture while rotating among the different departments. Please join us in welcoming our new talent!


Andrew Street


Alex Whitworth


Dakota Moore


Gregory Barber


Marlee Garcia


Michelle Horne


Matthew Miller

Plant Recycling Center

Generously supported by the Vaughn-Jordan Foundation


Fellows Michelle and Marlee working with finished compost with Laurie.

Recycling is a very important task at Montgomery. With 120 acres of plants being trimmed daily, you can imagine a lot of plant debris is collected. The Plant Recycling Center has organized our mulch and compost production to maximize efficiency and allow for a structured turning schedule, aiming to produce useful compost quicker.

The project included the sifting of our existing mulch pile of plant trimmings. The mulch and compost was reorganized into rows.

We would like to thank the Vaughn-Jordan Foundation for its generosity in supporting this important project. Montgomery now has five organized rows, a new system of processing, and has trained three Conservation Horticulture Fellows from Miami-Dade College to learn about the development and utilization of the system. Thank you Vaughn-Jordan Foundation!

Tracy M. Magellan, Outreach Manager
tracym@montgomerybotanical.org

MONTGOMERY BOTANICAL CENTER
11901 Old Cutler Road
Coral Gables, FL 33156-4242

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FROM THE
MONTGOMERY ARCHIVE

Hurricane Donna, 1960

Hurricanes are a part of Caribbean life, and Montgomery has experienced many over its history. Hurricane Andrew (1992) is still a fresh memory for many locals. When Hurricane Donna hit in September of 1960, it was the strongest storm of its year (Category 4), and it remains one of the most damaging storms in Florida history.

These photos are labeled "*Ficus* sp. south of pool," and "Nell Jennings & Ray Vernon after hurricane – shaving brush tree cut back and propped up." Similar photos in the file date from late 1960 into early 1961 – showing the time and effort needed to recover from this storm. The shaving brush tree survived many years, but was finally lost to lightning in 2009.

These photos show Nell's confidence as well as the major effort required to put the garden back together. As Montgomery works to recover from Hurricane Irma (see page 3), that historic confidence and effort can inspire our own progress.