Montgomery Botanical

Advancing Research, Conservation, and Education through Scientific Plant Collections

Spring/Summer 2014

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A Major Palm Achievement

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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,

t is an exciting time at Montgomery! Our work with palms and cycads has shown wonderful progress and amazing outcomes. In this newsletter, we are only able to show you some of this nice work – selected news to show the BREADTH and DEPTH of our reach into the botanical field.

In terms of breadth, the facing page shows how widely our work can relate; Montgomery has a NATIONAL ROLE in the science of botanic garden conservation! Our work to examine the *genetics of garden collections* is increasingly relevant, as shown by a new federal grant. I am thrilled that I will be able to report results from this grant to you in future writings. The work takes us into beautiful and interesting habitats in search of palms that provide insight into critical questions – pages 4 and 5 show our recent work with the BAHAMAS NATIONAL TRUST, investigating a cherished Caribbean palm species.

Depth is best exemplified by Dr. Larry Noblick's recent achievement (see pages 6 & 7). This monumental work by the world expert on queen palms includes virtually everything about their biogeography, history, and conservation. This work is not only DEEP in detail – Larry also traveled BROADLY to compose his life's work.

Montgomery is only able to go far and wide in the world and in botany because of your generosity – in addition to page 3, see the great improvements and studies made possible by funders such as the Kelly Foundation (page 8) and the Stanley Smith Horticultural Trust (page 9). When you – our community – help us (pages 10 & 11), you join with these local and national benefactors to move botany forward. I am deeply honored and grateful for your support.

I write this message to you en route to another distant location in search of palms ... I look forward to sharing it with you soon!



Pictured: Dr. Griffith afield in Curaçao; to be detailed in the Fall 2017 Newsletter. On the Cover: Dr. Larry Noblick with the twin palm (*Syagrus cearensis*) that he discovered in Brazil in 1994.

Montgomery Provides National Leadership To safeguard our trees

ontgomery was awarded a National Leadership Grant by the Institute of Museum and Library Services!

The project, Safeguarding our Plant Collections, will develop clear protocols to protect plants, starting with Montgomery's cherished palms and cycads. The project will carefully select which groups of palms to grow by exploring their DNA, and will help protect other trees, from oaks to magnolias, by adapting proven conservation methods from zoos. This research continues a successful line of study on the genetics of botanic garden plant collections led by MBC.

Called "one of the largest advances in tree conservation since the 1970s,

this project will ensure that botanic garden trees can benefit future generations. Led by Montgomery, the project brings together experts at other botanic gardens, organizations and zoos: the Arnold Arboretum of Harvard University, Botanic Gardens Conservation International, the Center for Plant Conservation, Chicago Botanic Garden, Chicago Zoological Society, Morton Arboretum, National Tropical Botanical Garden, and the USDA. The group studies a carefully selected group of plant species, providing comparative case studies which can benefit work at most every garden.

The National Leadership Grant is the largest and most prestigious grant awarded by the IMLS, designed to

address critical needs of the museum field and improve services for the American public. It is thus a highly competitive program with only 13 awards made this year! Within the entire, nationwide museum field – including art, science, history, and even zoos – Montgomery was the only botanic garden thusly honored; another demonstration of how the MBC Team innovates and advances the science of plant collections. As this grant affirms, Montgomery is a National Leader.

> Patrick Griffith, Executive Director patrick@montgomerybotanical.org

Background: the work builds on and expands upon Montgomery's innovative, IMLS-funded conservation research. Projects in 2012 and 2014 studied the Central American cycad, Zamia decumbens (pictured here), and the Caribbean cycad, Zamia lucayana. Museum experts sounded a nationwide call for expanding these studies beyond cycads - thus providing the motivation for this new project, which compares the conservation genetics of cycads and palms to other long-lived tree species.



For more information, and to download our Guides for Living Collections, please see our Collections Genetics webpage:

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http://www.montgomerybotanical.org/ ges/Collection Genetics.htm

Patrick and Tracy assembled experts from around the nation at the Morton Arboretum in October to begin the project.

Bahamian Buccaneers

Provide a model for plants worldwide



The buccaneer palm, Pseudophoenix sargentii, known from the Lesser Antilles to the Yucatan – and even here in Florida – is among the most prized of ornamental palms. Its beauty, ease of transplant, and slowgrowing habit have prompted many to remove these palms from their native soil. But on Eleuthera, large numbers of buccaneers thrive on a prominent hill, in a dense forest preserved for its unique biological diversity.

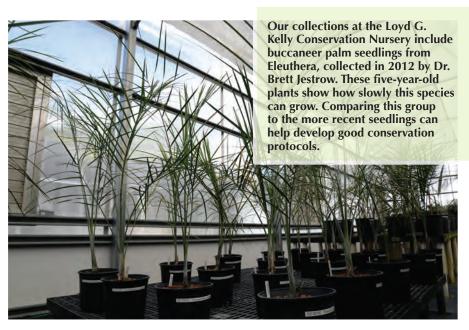
There, at The Leon Levy Native Plant Preserve, *Pseudophoenix sargentii* populations are dense and healthy. Montgomery's recent work in Belize, Cuba, Dominica, Mona Island, and Florida saw far fewer plants than in the preserve, often imperiled. Thus, the Eleuthera plants provide an ideal model for the genetics of these palms (see page 3). How many garden plants do we need to maintain and represent the wild diversity of such a robust forest?

With this research goal in mind, I was delighted to work with experts at the Leon Levy Preserve this winter. The preserve's botanists and experts provided deep knowledge of the plants in their care, gracious hospitality, and access to the invaluable scientific treasure they steward. I am grateful.

Potential comparisons from this work will be informative: How many palms do we need to grow at Montgomery? Do groups of seeds collected in different years capture different genetic diversity? How do these palms compare with palms in Florida and elsewhere?

In pondering these questions, I am most glad to work with these Bahamian botanists; bringing these palms and these colleagues into our large project raises the scope and scale from NATIONAL to INTERNATIONAL.

Patrick Griffith, Executive Director patrick@montgomerybotanical.org



An Update on Florida's Buccaneer Palms

Tracy Magellan's study of this species in Florida was highlighted in our Spring 2015 newsletter. Tracy has just published her findings in the latest issue of Palms (Vol. 61, pages 41-44). Only 3 adult buccaneer palms survive in Florida – demonstrating how vital these genetic studies are for conserving this species.





This trunk of a mature buccaneer palm growing at Montgomery came from seed collected in the Bahamas in 2002. After 15 years, these palms are producing seed of their own.

Acknowledgements

I thank Falon Cartwright and Ethan Freid of the Leon Levy Native Plant Preserve, for guidance and expertise. Permission for this fieldwork was generously provided by the Bahamas National Trust, the Bahamas Environment Science and Technology Commission, the Bahamas Ministry of Agriculture and the USDA. This project informs IMLS National Leadership Grant # MG-30-16-0085-16. Funding was generously donated by Charles and Dorothy Sacher. Finally, I am grateful to my wife Tonya, who provided tireless field assistance.



The Gyagrus Hory

A Major Accomplishment by Montgomery's Palm Expert

published a long awaited revision of the genus *Syagrus*. The most recent revision was published by Dr. Glassman in 1987, 3 decades ago!

Larry's new revision is 262 pages and describes all the known accepted taxa within the genus. Larry first collected *Syagrus* in Bahia, Brazil in August of 1980, while a Peace Corps Volunteer. 37 years later, he has more than doubled the number of known taxa. Glassman's revision recognized 29 species of *Syagrus*. Since that revision SEVEN genera (*Arecastrum, Arikuryroba, Barbosa, Chrysallidosperma, Lytocaryum, Microcoelum,* and *Rhytococos*) were lumped into *Syagrus* greatly increasing the number of species.

Larry also personally described 22 new *Syagrus* species, one of which was described in the current work. The 2017 revision includes 65 species and 2 subspecies – nearly 70 taxa!

WHAT SETS THIS WORK APART?

- * The descriptions are strictly formatted to make them parallel to each other, making it easier to compare one species to another.
- ¥ It contains distribution maps of all 67 taxa and 12 of the hybrids.
- *Many new discoveries have been added doubling the number of taxa.

Phytotaxa 294(1):1-262.

Phytotaxa 29

- * It contains an identification key to all 67 taxa.
- * Original type collections are listed along with other names associated with the genus.
- * Herbaria where you can find representative specimens are listed.
- * This revision is open access and freely available online!



Relly Bolanical Research Lellows Moving science forward at Montgomery

Putting people and plants together! The Kelly Botanical Research Fellows Program advances science by bringing botanists here to study our extensive plant collections (see the bottom of this page). Eighteen distinguished plant scholars and early-career scientists have brought their considerable intellectual capital to Montgomery in the last decade, making 38 research visits to MBC from Europe, South America, Australia, and the United States. Here are just three of our most recent Research Fellowships:



Dr. Fred Stauffer, from the Conservatoire et Jardin botaniques de la ville de Genève (Switzerland), went transatlantic in January, to study Montgomery's extensive *Hyphaene* palm collection. Fred prepared specimens, took measurements, placed our palms under the microscope, and offered a wonderful public lecture about his exciting field projects in West Africa. *Hyphaene* are distinguished by their equal branching; so Fred also took the opportunity to carefully dissect a newly branching stem on a live plant – something difficult to perform in the field.



Dr. Irene Terry, from the University of Utah, studied our cycad collection in March. Irene is an expert in pollination biology, and is looking carefully at the pollination of *Cycas micronesica*. Irene and her colleagues recently established that wind can move cycad pollen in Guam – does this mean that insects are no longer required? Our plants are helping her examine this question. Irene also presented a terrific lecture at our 2017 Members Meeting, highlighting how our plants are advancing her research.



Mario Coiro, a Ph.D. Student from the Institut für Systematische und Evolutionäre Botanik in Zurich (Switzerland), also crossed the ocean in October to survey and examine our cycad collections. Mario's cycad studies began with living scientific collections at the Orto Botanico Napoli, in his native Naples, Italy. He is comparing living cycads to the fossil record to reconstruct the evolutionary history of these amazing plants. His public lecture proved that cycad history is "more lively than most fossils!" Mario's work here has already led to a new discovery – see page 9!

Montgomery is deeply grateful to the Kelly Foundation for supporting this important research. Sharing the work of these scientists through public lectures was made possible with the support of the City of Coral Gables and the Kelly Foundation.



"The projects above depend on well-curated living collections. Our annual inventory ensures accurate and up-to-date records of the plants growing at Montgomery, providing a reliable resource to researchers studying diverse plants and new questions."

Joanna Tucker Lima, Collections Manager joannat@montgomerybotanical.org

Montgomery Botanical Center 2016 Collection Inventory

	PALMS	CYCADS	OTHER		PALMS	CYCADS	OTHER
TOTAL TAXA IN GROUND IN NURSERY	427 390 105	254 229 88	585 571 34	TOTAL PLANTS IN GROUND IN NURSERY	10,290 6,442 3,848	8,376 5,239 3,137	2,690 2,642 48
TOTAL ACCESSIONS IN GROUND IN NURSERY	2,308 2,045 308	1,950 1,744 394	2,201 2,171 35	21,356 PLANTS!			

Jessica Sparks, Joanna Tucker Lima, and Michelle Barros from the MBC Collections Department conducting the annual inventory.

Research Notes & Publications

A major research update is on pages 6 and 7! Our cherished plants have provided many other great outcomes lately:

Palm Seed Germination

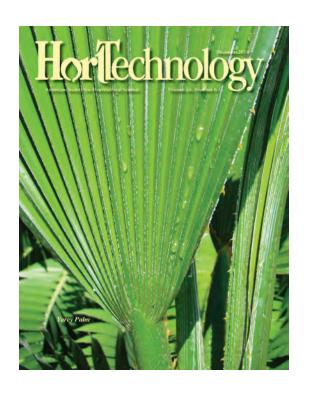
Vickie Murphy led a rigorous study of soil options for germinating rare palms. A collaborative project between Montgomery, Jardin Botanico Rafael Moscoso (Dominican Republic), and Fairchild, this paper was featured on the cover of HORTTECHNOLOGY in December! See image at right.

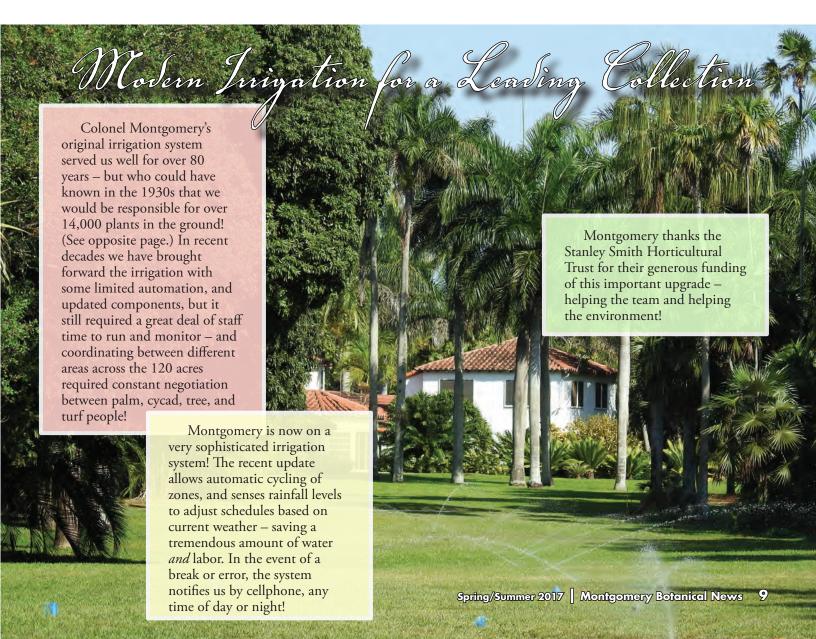
Mangrove Book

Barry Tomlinson, MBC's Senior Research Fellow, published an updated book on the botany of mangrove species, featuring extensive examples from MBC's living collections.

New Fossil Cycad Genus

Mario Coiro (see page 8), compared MBC's cycad "living fossils" to ancient Patagonian foliage, and determined that a new genus, *Eobowenia*, is needed! The work helps clarify the puzzling relationships between ancient South American and Australian cycads. The work appears in the latest issue of BMC EVOLUTIONARY BIOLOGY.





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FROM THE MONTGOMERY ARCHIVE

SYAGRUS DURING ROBERT AND NELL'S TIME, 1938

Col. Robert Montgomery had a great affinity for *Syagrus*, which can be seen in the 1938 photographs below. The left photo highlights the prolific infructescense of the queen palm, *Syagrus romanzoffiana*.

In the landscape photos below, you can see the prominent position of the same queen palm in the landscape. This lovely *Syagrus* can be seen in the center of the image between Nell's House and the Arthur Montgomery Guesthouse.

This palm was likely brought into the collection in 1932. At the time it went by the scientific name, *Cocos plumosa*, which is now a synomyn of its accepted name, *Syagrus romanzoffiana*. For a complete reference on the genus, please see Larry Noblick's new *Syagrus* revision, which can be found online and is described briefly on pages 6 and 7.

