Montgomery Botanical News

Advancing Research, Conservation, and Education through Scientific Plant Collections

Fall/Winter 2010 Volume 18, Number 2

Syagrus kellyana

Zamia pyrophylla

Butia marmorii

Plant Exploration

New Discoveries by the Montgomery Team

Botany is a science of discovery. A simple count of plant species shows this clearly. Linnaeus' 18th century account showed roughly 6,000 species. De Candolle's 19th century works list 58,000 species in 7 volumes. Recent work by Dr. Robert Thorne counts at least 260,000. Botanists at Kew estimate up to 320,000 species, mostly in the tropics. Finally, one work in progress may yet count at least 400,000!

Our work here at Montgomery Botanical Center contributes to that total. In recent years, the MBC team has brought almost two dozen new species to science—twenty palms and three cycads. Although these are modern discoveries, they happen in the long-established and straightforward way: through hard work afield and patient study of the collection. Working closely with our international colleagues, direct field exploration is at the heart of this science.

As one example, Michael Calonje's new discoveries in *Zamia* began with careful herbarium work and thorough reading; but ultimately, getting out to where the plants grew wild was the deciding factor. Sometimes the pathway is reversed: Dr. Larry Noblick's persistent fieldwork over the last two decades established a rich living collection of *Syagrus* and *Butia* at Montgomery. As these plants slowly grew and matured, new diversity was discovered and shared.

At the left are just three nice examples of our work. At the top, Larry stands next to *Syagrus kellyana* (see page 4) on the Montgomery grounds. This handsome palm was described earlier this year, from plants grown at MBC for over a decade. Center left, Michael and his Colombian collaborators stand with *Zamia pyrophylla*, a beautiful new cycad. A broad international collaboration led to this discovery. At the bottom is one of the smallest palms known, *Butia marmorii*, growing at Montgomery. The diminutive spathes, flower stalks, and dark purple flowers add great interest. Larry discovered this unique living treasure only recently!

Plant exploration is central to botanical science and conservation. Clear understanding of the plant world begins with knowing the plants themselves. Patience and attention to detail matter here—but intrepid dedication to distant fieldwork is absolutely required. Our team continues to advance botany through the important work of plant exploration.

Many discoveries are yet to be made!

Dr. M. Patrick Griffith, Executive Director
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To advance science, education, and conservation of tropical plants, emphasizing palms and cycads, Montgomery Botanical Center keeps living plants from around the world in population-based, documented, scientific collections, for use by botanists, scientists, and educators, in a 120-acre botanical garden exemplifying excellent design.

Montgomery Botanical Center is a tax-exempt, nonprofit institution established by Nell Montgomery Jennings in memory of her husband, Colonel Robert H. Montgomery, and his love of palms and cycads.

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Masthead photo of Montgomery Palm (*Veitchia arecina*)

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From the Executive Director

Dear Friends,

At its heart, Montgomery is all about unique plants. If you read the work of Barry Tomlinson or Knut Norstog, you know that palms and cycads have many unique and interesting features.

This issue is organized around that theme—exceptional plants. The front page highlights some plants discovered by our team through fieldwork and study. On the facing page, Larry relates his most recent exploration, discovering a new population of a Caribbean palm. Chad compared notes with gardens around the world (page 4), and discovered that we have some plants grown nowhere else. Claudia (page 6) shares the story of how the recent cold winter actually helped one of our cycads to thrive—this is a true exception among our plants.

Here on page 2, I want to highlight another group of plants at MBC. I am proud to say that fourteen trees at Montgomery have been recognized as Champion Trees by the Florida Division of Forestry. Champions are the largest and finest trees of their kind in the state, and in some cases, the best in the nation. Our *Coccothrinax bardadensis*, *Microcycas calocoma*, and *Pseudobombax ellipticum* are among these elite trees.

It is wonderful to have our trees honored this way, but I feel the honor illustrates something more fundamental than superlative. Let's ask—how does a tree become a champion? Quite simply, it requires decades of consistent, dedicated stewardship. At Montgomery, we've kept the focus on the plant collection since the Colonel began planting in 1932—almost 80 years of putting plants first.

Finally, one more exceptional plant in this issue honors an exceptional person. Page 4 discusses the Kelly Palm, *Syagrus kellyana*, named for Loyd Kelly, MBC Director Emeritus. At an important time in our history, Loyd's leadership, guidance, and generosity set Montgomery Botanical on the good trajectory we now enjoy.

Please join me in thanking Loyd for his dedicated service to Montgomery for over 30 years. And, thank you for your support and participation in our work this year. I look forward to seeing you here soon, and sharing our wonderful plant collection.

Pictured above: Dr. Griffith with the Champion *Kigelia pinnata*.
Please see back cover for an early photo of *Kigelia* at Montgomery.

Collecting Palms Next To A Volcano

On July 18, 1995, the Soufriere Hills volcano on the Caribbean island of Montserrat erupted after 400 years of dormancy. The capital city of Plymouth was evacuated as numerous pyroclastic flows buried the commercial center. Since then, the volcano has gone through several phases of nearly continuous activity including dome growth with rockfalls, pyroclastic flows, mud flows, and occasional dome collapses and explosive events. Two thirds of the population left the island and the volcano rendered over half of the island (the exclusion zone) uninhabitable with the remaining population re-colonizing the upper northwest corner.

Last February, a large pyroclastic flow raced down the northeast side of the mountain and buried the last remnants of the old airport. Five months later, I considered this as I followed Mappie, my colleague from the Montserrat National Trust, into the exclusion zone and onto a boulder-strewn moonscape, created by last February's pyroclastic flow. Mappie knew this part of the island well, having grown up in the area. He would run his dogs to capture goats and return them to their owners. He reminded me, "I'm a bushman, man" and his agility in jumping from boulder to boulder while not slipping as he climbed up steep muddy trails in his smooth-soled cowboy boots proved it.

I went to Montserrat to collect native palms, particularly *Syagrus amara*, which occurs on only five islands in the Caribbean. Its northernmost limit is Montserrat, which is also the northernmost limit of the entire genus *Syagrus*. Mappie informed me of a fan-leaved palm that he knew from his youth and I was anxious to see what it might be, as no native fan-leaved palms had been recorded from the island.

We entered the exclusion zone and followed the contour of the hills, climbing up and down rocky inclines and across boulders until we arrived at a small population of fruitless *Coccothrinax barbadensis*. They grew in a vulnerable location lying just above last February's pyroclastic flow, barely escaping burial and incineration. I acquired a couple of herbarium specimens for documentation. That collection would be the first record for the island. We then descended the steep slope and returned to the car via the flow itself. The next day, Mappie, Kurt Lee, Glenford James (Forestry, Department of the Environment), and I took a trailhead that led up into the Centre Hills to a place called Locust Valley (elev. ca. 300 meters). Here we collected *Syagrus amara* from a very healthy population. It was a great trip.

Not only did we collect herbarium vouchers of all three naturally occurring palms including *Prestoea acuminata*, but we also collected and cleaned 643 seed, 413 of which were from different accessions of *Syagrus amara.* We shared the seed with the Botanical Garden in Montserrat, the Royal Botanic Gardens at Kew, England, and the Palmetum of Santa Cruz de Tenerife (Canary Islands). Thanks are due to Gerard Gray, Eudora Fergus, and Jervaine Greenaway for helping to acquire permits and organize this successful trip.

Dr. Larry Noblick, Palm Biologist
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Dr. Noblick in front of exclusion zone made by the volcano.

Syagrus amara breaking through the canopy in Montserrat.

Kurt Lee, Dr. Larry Noblick, and Philemon Mappie Murrain.

The Kelly Palm: Honoring Loyd Kelly

A highlight of the 2010 MBC Members Meeting was the honoring of Loyd Kelly for his dedicated service. The MBC Board of Directors unanimously elected to give Loyd the title of Director Emeritus, to honor his leadership and service on the Board, especially as President during Montgomery Botanical Center's important formative years following Nell's death in 1990.

Dr. Patrick Griffith thanked Loyd for his guidance, leadership, and steadfast support of Montgomery, especially in the core mission areas of research and education. Patrick then presented Loyd with three framed drawings on behalf of the MBC team. These drawings are the original botanical illustrations of *Syagrus kellyana*, the Kelly Palm.

Loyd Kelly at the Members Meeting

Dr. Larry Noblick recently named this palm species after Loyd Kelly. Quoting from the formal description, the new species "honors Loyd Kelly and his family who have so generously supported the Montgomery Botanical Center and my research over the years." Larry spoke of his discovery of the Kelly Palm, and his recollections of being hired by Loyd as MBC's first palm biologist.

Charles P. Sacher, MBC President, then offered gratitude on behalf of the Board for Loyd's dedicated leadership and service, noting that Loyd's organizational efforts laid the framework for Montgomery's current successes.

Loyd then shared his thoughts on MBC and his vision for leadership, stating, "In leading this organization, I always believed in a good, rigorous selection process for the people that we bring in. I believe that we should bring in good people, set parameters on what we want to see, and then stand back and let the people do good work. Our successes here come from that philosophy, and I am glad to see all the good work being continued by our group here at MBC."

The formal description for the Kelly Palm can be found in the journal Palms, volume 54 (2010).

Montgomery's Unique Work:
Plants No Other Garden Grows

Montgomery Botanical Center grows 67 plant species that may be found in no other garden in the world. This is the recent finding of Botanic Gardens Conservation International (BGCI). MBC has long served as a refuge for rare and endangered plants from around the world, especially palms and cycads. Until recently no thorough evaluation of the rarity of the plants in MBC's collections had been carried out.

BGCI recently took census of North American living plant collections. Gardens submit the scientific names of living plants in their collection and these records are added to the Garden Search Database* on the BGCI website, making these records accessible to the broader world.

Species	Status
Allagoptera brevicalyx	Vulnerable
Cycas chamaoensis	Critically Endangered
Cycas conferta	Vulnerable
Cycas hongheensis	Critically Endangered
Cycas lindstromii	Vulnerable
Macrozamia machinii	Rare
Rheedia aristata	Endangered
Tabebuia haemantha	Rare

Comparing MBC data to BGCI worldwide garden data, 229 species grown at MBC—23% of our collection—are near threatened, vulnerable, or endangered in the wild. The table here lists some species found at MBC that are both rare in the wild and very rare in cultivation. This assessment gives a deeper appreciation for the importance of MBC's work for conservation and study of tropical plants, as well as directing future efforts—propagating and sharing these rare plants with other gardens will be essential.

* The Garden Search Database can be found on the BGCI website: www.bgci.org

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Supporters Grow Our Garden: Progress on Capital Improvement

Just as plants in the garden grow, our organization also matures, and we must grow our facilities to meet our increased work.

With buildings dating back to 1932 and an expanding plant collection, capital improvement is necessary to keep up with our important work. 2010 has been a very good year for moving forward with our capital improvement projects. With our new building constructed and ready for dedication, and the new full sun nursery and palm shadehouse underway, we are advancing our infrastructure. Please join me in thanking our generous supporters who have made this major capital initiative a reality.

Concrete being smoothed at the Chris Tyson Plant Conservation Building

✷Christiane Tyson very generously enabled the construction of the Chris Tyson Plant Conservation Building, with her major gift. As the centerpiece of our capital improvement plan, this building triples the working space of the Seedbank Program, and provides both visiting researchers and the MBC team a dedicated space to work with plant material and prepare specimens. The building is being put into service currently, and we are preparing for the dedication in November. Our next newsletter will feature the dedication.

✷Walter Haynes provided generous support for restoring access roads on the southwest and central portions of Montgomery. These roads allow for much better circulation and access, and greatly reduce dust, erosion, and vehicle wear. The line of the roads was carefully sited to accentuate appreciation of the landscape.

Concrete restoration of the Arthur Montgomery Guesthouse

✷The Batchelor Foundation generously supported our new full sun nursery and palm shadehouse, phases one and two of a four-phase nursery restoration and upgrade project. Our basic nursery structure dates to 1932, the first year of Montgomery's plant collection. Our work has expanded greatly since then, and we now require a modern plant propagation complex. These improvements will help us keep up with our steady growth in users and plant collections, and allow for greater success in conservation horticulture.

Shadehouse construction

✷Jill Menzel generously provided interior cabinets, counters, a sink, and a dishwasher for the Chris Tyson Plant Conservation Building. This new work area enables improved processing of seeds for the Seedbank Program and research work by visitors or the Montgomery team.

✷The Stanley Smith Horticultural Trust, as part of their 2010 grant cycle, granted funding to construct the new palm shadehouse. With our increasing volume of horticulture work, MBC maintains an exceptionally well cared for but crowded nursery collection. This improvement will provide modern and expanded infrastructure for propagating our beloved and beautiful plants.

✷The Villagers, as part of their 2008, 2009 and 2010 grant programs, have been generously supporting the ongoing restoration work at the Arthur Montgomery Guesthouse. This facility houses our visiting colleagues from around the world. The Villagers' support has enabled Montgomery Botanical Center to restore the 1934 foundation, flooring, and walls.

Tracy Magellan, Outreach Manager
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An Excellent Year for a Special Cycad at MBC

MBC hosts an extensive collection of 88 plants of *Cycas panzhihuaensis* grown from seeds collected in China in 1992, 1993, and 1994.

In 2001, two male plants from the 1993 collection produced their first cones, and two years later the first female plant produced cones. After these first coning events, the staff at MBC was optimistic that the coning events would increase every year and that MBC would be able to produce thousands of seeds of this threatened cycad through its pollination program.

Interestingly, although new plants continued to produce cones in the following years, most of these plants were male, and many plants had not coned at all even though they were large enough to do so. As of last year, only 4 plants had produced female cones compared to 31 producing male cones.

Cycas panzhihuaensis with 5 female cones

This season a total of 10 female plants produced cones for the first time, and other female plants produced cones for a second time. This event is likely the result of especially cold weather at MBC during the 2009-2010 winter season, which was colder than usual and a little closer to the weather in *Cycas panzhihuaensis*' native habitat of Panzhihua, China

Cold spells can be detrimental to our living collections from tropical regions, so we generally don't look forward to them. In this case the 2009-2010 cold spell was a mixed blessing, as it allowed us the opportunity to hand-pollinate several female cones of this threatened and handsome cycad.

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Move It or Lose It! At MBC, a meticulous pattern of planting and removing specimens has evolved over the years. Each year about 1,000 plants are added to our collection. Occasional changes in plans or landscape design make moving plants a necessity.

Some more memorable relocation projects over the years have involved the cannonball tree (*Couroupita guianensis*) and the petticoat palm (*Copernicia macroglossa*). Each went through a root-pruning process over the course of a year before they were deemed ready to move out of the emerging Palm Walk vista.

In contrast to these time consuming techniques, the relocation of *Roystonea regia* and *Sabal palmetto* reflect more of a "grip it and rip it" philosophy. These species have proven easy to move by simply digging out the entire rootball and securing a tree-strap around the trunk. Depending upon where the palms are being transferred to, we either pull them out of the ground onto a flat-bed truck or walk them to their new habitat one at a time with a backhoe or front-end loader. This work follows the City of Coral Gables Tree Ordinance.

Roystonea regia being moved across the palm walk to the lowlands.

MBC's expert curatorial teams and volunteers have a remarkably high success rate. The Horticulture Team knows techniques to move the most delicate or robust of species with a minimal chance of loss.

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Please visit BotanicalAuctions.com for more information about Montgomery Botanical Center's Seedbank.

Notes & Updates

Research Progress: Montgomery is increasingly engaged in current research, both through the living plant collection, and by our team's authorship. Page 1 of this issue highlights our recent descriptive work, and here are some other current examples.

- **Harri Lorenzi**, working with MBC's **Larry Noblick**, as well as **Francis Kahn** and **Evandro Ferreira**, published the book Brazilian Flora Lorenzi: Arecaceae (Palms). This volume covers the 300 palm species native to Brazil, with extensive detailed photography, natural history, use, and propagation info.

- **Claudia Calonje**, **Chad Husby**, and **Michael Calonje** recently published their conservation horticulture study in HortScience, detailing soil choice for growing *Zamia* seedlings. The study compares plant health in organic and inorganic soils (see our Fall 2009 newsletter).

- **Patrick Griffith**, working with **Chad** and **Larry**, **Javier Francisco-Ortega** of F.I.U., and **Sandra Namoff** and **Carl Lewis** of Fairchild, authored a study on palm conservation at botanic gardens, which appears in Biological Conservation. The paper uses DNA data to look at how effectively palms can be conserved in a garden.

- A major study on DNA barcoding at the Instituto de Ecología A. C. (Xalapa, Mexico) by **Fernando Nicolalde-Morejón**, **Francisco Vergara-Silva**, **Jorge González-Astorga**, **Andrew Vovides**, and **Victoria Sosa**, working with **Dennis Stevenson** of The New York Botanical Garden, now appears online in the journal Cladistics. This research focused on the Mexican National Cycad Collection held by the Jardín Botánico Francisco Clavijero. MBC provided additional plant material for the study.

- **Michael**, working with **Alan Meerow** of the USDA, and **Dennis**, published their findings on the correct names for *Zamia* from Puerto Rico, in the journal Taxon. The study employed herbarium data and recent fieldwork by Michael and Alan (see our Fall 2008 Newsletter).

For a complete list of our research please see our website at:
www.montgomerybotanical.org

MBC Team News

John Watson joined MBC as assistant curator and is working with the palm collection. John brings his long-term experience and enthusiam for horticulture to the collections at Montgomery.

Brian Locke joined MBC as a summer employee and is helping to maintain the collections by weeding, trimming, and assisting the curators and assistant curators.

Thank You Volunteers!

I would like to thank all of MBC's volunteers for their hard work and dedication. Working through the humid, hot Florida summer is no small feat. With the sun shining and the weeds growing MBC is very thankful for all the help we received. Special thanks to all of our volunteers who came weekly throughout the summer and helped us outdoors.

Want to Volunteer at Montgomery?
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FROM THE MONTGOMERY ARCHIVE

In this photo from the 1930s, Robert and Nell Montgomery are examining the fruit of the Sausage Tree, *Kigelia pinnata*, one of the original plants obtained for the collection. Robert and Nell had a particular love for palms, cycads, and conifers, but also enjoyed orchids, vines, fruit trees, and flowering trees. *Kigelia* was known to be one of Montgomery's favorites, and records show that Robert had over 80 *Kigelia* planted here early on. Robert was very dedicated to his tree collection. In his 1939 memoirs, he recounts in a dedication speech:

> "We look upon them as friends with pretty much the same temperaments as our animal friends—which includes human beings. When trees suffer, we suffer. When they rejoice as they do in the spring, we rejoice with them…In these and other characteristics trees deserve a more important part in our lives than is now the case."

One of these *Kigelia* trees at MBC has recently been recognized as the largest and finest *Kigelia* in the state (see page 2). Montgomery Botanical Center is proud to carry forward that same dedication to trees, first established here by Colonel Robert Montgomery.