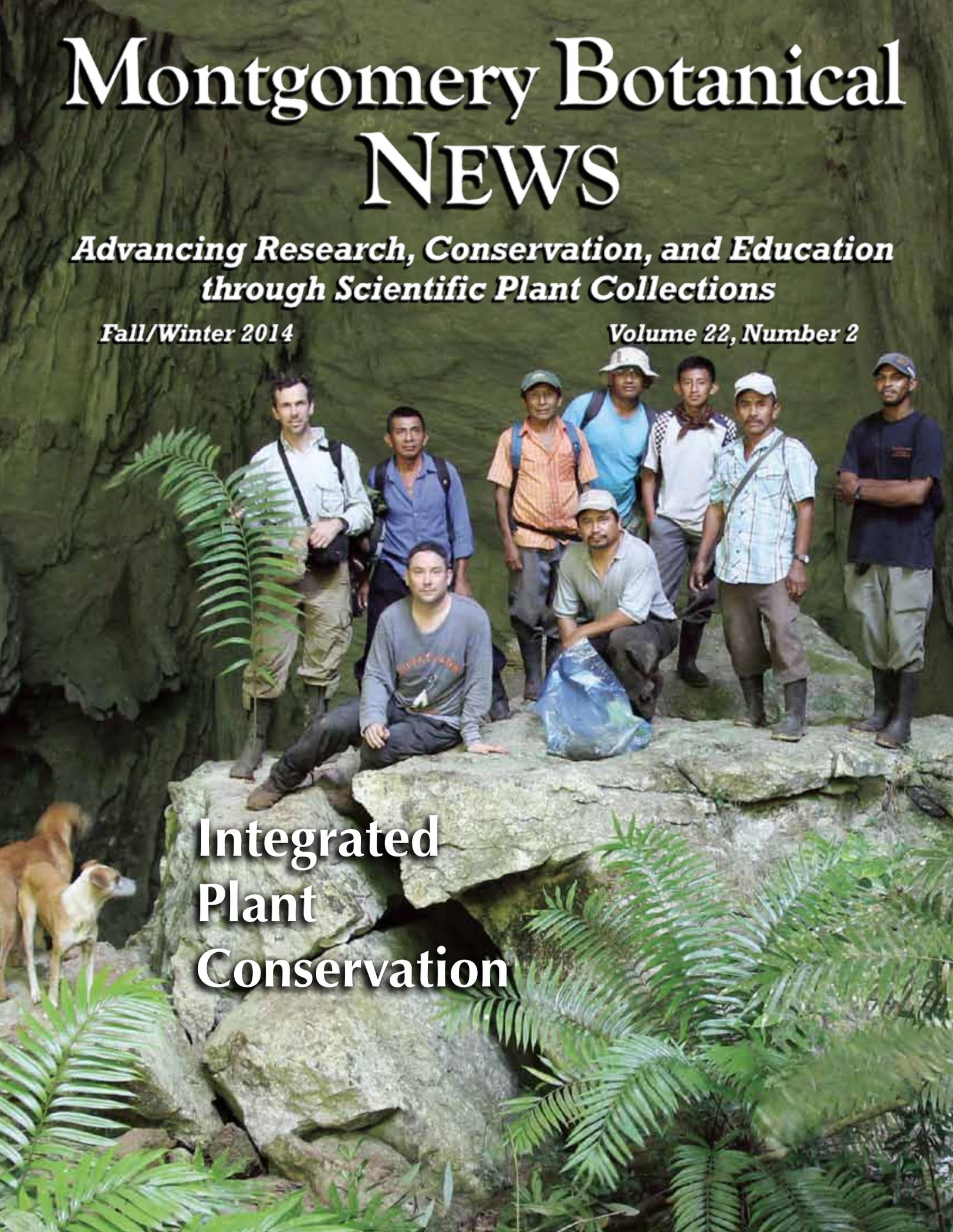


# Montgomery Botanical NEWS

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

*Fall/Winter 2014*

*Volume 22, Number 2*



**Integrated  
Plant  
Conservation**

**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 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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F r o m t h e  
**Executive Director**

Dear Friends,

*"The whole is greater than the sum of its parts."* This SPECIAL ISSUE is exactly the right place for that old axiom. Here we focus on our SINKHOLE CYCAD PROJECT, which illustrates that idea nicely – through both the team and the objectives.

Let us start with *the team*: This project involved experts from Montgomery, USDA Chapman Field, Botanic Gardens Conservation International (BGCI) and Belize Botanic Gardens, leveraging the diverse expertise from each (see pages 2-5). Truly an international effort! Bringing together these colleagues assembles a skill set no one organization can match.

And now, consider *the objectives*: The Project goals come together in a unique way, organized around one rare species, with an overriding mission to prevent extinction. Investigating garden conservation collections via genetic study is a great step forward. Then, to ensure this species can thrive in cultivation, we add in training for propagation and horticulture technique.

What is the result? The EMERGENT OUTCOME certainly exceeds the parts; these efforts come together to ensure the safety and security of *Zamia decumbens* into the future. On the next three pages, you will see how this work was done, and how we apply the results for further progress.

I am certainly enthusiastic about this project! Firstly, the data confirm we are on the right track. But more importantly, I see a GREAT future for Montgomery's work, applying this model and method to other imperiled palms and cycads. Through the support of our generous funders detailed in these articles – and also your generous gifts, efforts and encouragement – we are able to do this unique and important work. Another example of how we come together to create something greater!

Pictured: Dr. Griffith speaking about the Sinkhole Cycad Project at the 3RD SCIENCE IN BOTANIC GARDENS CONGRESS, Gran Canaria.

# Underground Plants

shed light on conservation

## Conservation in a garden

Palms and cycads are living treasures! For DECADES Montgomery has carefully collected and stewarded these green gems in the service of conservation and research.

In the 1990s, MBC adopted a new way to grow these special plants, borrowing some strategies used for crop development – many plants from a single population grown together to preserve genetic diversity. Given the loss of wild plants around the world, this method is now more widely practiced in the botanic garden field.

## Testing the theory

Our strategy is grounded in good theory, but we did not know if our method was really capturing and saving the diversity found in nature. Answering the question could be fairly straightforward: measure the garden gene pool and compare it to what grows afield! But while the study of *conservation genetics* has made great advances, very little attention has been given to plants specifically grown for conservation.

Thus, we were delighted to have the opportunity to test our collecting protocol with new genetic tools. Our friends at USDA Chapman Field have the machines and expertise to examine the DNA of wild Caribbean cycads. Accessing these powerful resources for our own plants was a logical step forward. All we needed was a good test case.

## The right plant for the job

Of the many cycads at Montgomery, one species stood out as a prime candidate – The Sinkhole Cycad, *Zamia decumbens*. We had many seedlings onsite, of known origin, and our team had detailed firsthand knowledge of the wild populations (see pages 4 and 5). Since this plant is mainly known from two distinct “underground” sinkholes, it provides a neat, uncomplicated model to evaluate geographic considerations in collecting.

## Sharing the insight

We hope our insight reaches those that can use it – it is too good to keep secret! So, we have worked to share the news. Upcoming papers in INTERNATIONAL JOURNAL OF PLANT SCIENCES and ENCEPHALARTOS, JOURNAL OF THE CYCAD SOCIETY OF SOUTH AFRICA will reach scientists and cycad lovers. For those of us at gardens, our friends at Botanic Gardens Conservation International (BGCI) adapted our work into an online guide to help any garden ramp up its genetic diversity. And, to reach anyone else who wants to know, we dedicated a webpage to this area of work (see below).

## A team effort

As mentioned above, Montgomery could not have moved forward on this project without USDA and BGCI, our formal partners; we especially thank Alan Meerow, Abby Hird and Andrea Kramer. This innovative plant collections project was generously funded by the INSTITUTE OF MUSEUM AND LIBRARY SERVICES.

Please keep reading: our broader work – with this fascinating plant and with more of our great colleagues – is featured overleaf!

## Download the guide:

*Building living plant collections for conservation: a guide for public gardens.*

See this guide and other resources at:

[www.montgomerybotanical.org/Pages/Collection\\_Genetics.htm](http://www.montgomerybotanical.org/Pages/Collection_Genetics.htm)



Michael and Darius field-processing DNA specimens



Online Guide



Dayana, Michael, Alan and Kyoko at the USDA lab



# A new model for cycad

Integrated

## A Remote Expedition

Patrick Griffith and Michael Calonje recently led a collaborative team to distant caves in the Maya Mountains. In addition to the Montgomery staff, the team included botany, horticulture and wildlife experts from Belize Botanic Gardens (BBG), Teakettle Enterprises, and the Ya'axché Conservation Trust, in addition to local and national support teams – a total of 18 people, three horses and three dogs!

The species at the center of this work – The Sinkhole Cycad, *Zamia decumbens* – has been of great recent interest (please see page 2 and also the back cover). The same geographic circumstances that make this cycad ideal for research and conservation – remote caves in the mountain forest – prompt careful logistics and planning. The field sites are over a full day's walk beyond where the roads end and quite near the Guatemalan border. Three nights of distant bivouac with food, camp gear and botanical tools – for such a large group – necessitated the significant pack train. In addition, the increased presence of xateros (palm poachers) in the area made security support necessary.

These major efforts were absolutely worth it: Michael and Patrick were delighted to learn of and document a third major remote population of this cycad! The team took extensive notes, photographs, DNA samples and seeds for research and conservation. These seeds will augment conservation plantings at BBG and Montgomery. Based on our recent DNA studies (see page 2), seed collection from multiple sites and different years will be vital to represent the full range of genetic diversity in the wild.

## Closing the Loop

In addition to the field study, initial work on conservation outreach and education began at BBG. To "close the loop" on conserving this rare cycad, BBG expert Rudy Aguilar is incorporating cycad horticulture into their very successful Professional Gardeners Training Program.

These carefully integrated efforts – DNA analysis, field survey, horticulture and education – are designed to fully envelop this living treasure in a safe, secure and thriving network of protection and understanding. For Montgomery, this level of integrated effort sets an even higher standard to apply in future projects.

Background: The largest known population of *Zamia decumbens* thrives in a unique sinkhole habitat  
Front cover: The expedition team studying cycads – 200 feet below ground level!

# conservation

horticulture, science and education



Professional Gardeners Training at Belize Botanic Gardens



The team packing up camp —Top row, left to right: Chaparro, Patrick, Valentino, Darius, Freddy, William, Orleano, Helen, Kevin & Marmaduke. Bottom row, left to right: Michael, Jose, Katarina & Marvin.



صندوق محمد بن زايد



للمحافظة على الكائنات الحية

The Mohamed bin Zayed SPECIES CONSERVATION FUND

This field and outreach project was generously supported by SOS - SAVE OUR SPECIES, with additional funding from the MOHAMED BIN ZAYED SPECIES CONSERVATION FUND, as well as staff time provided by the participating organizations. duPLOOY's JUNGLE LODGE also very generously provided in-kind support of food and lodging for the project. We are especially grateful to the BELIZE FOREST DEPARTMENT for permission to study and collect these plants.

# International Palm

Palm people  
at



A first look at Montgomery!



Lunch on the lawn



Live music



Montgomery is especially grateful to our sponsors Jill Menzel and Redland Nursery for generously funding this event.

## LOCAL AND NATIONAL RECOGNITION FOR MONTGOMERY



MDC Community Partner of the Year Award

Montgomery was recently named *Community Partner of the Year* by Miami Dade College's Institute for Civic Engagement and Democracy. MBC has many joint efforts with Miami Dade College (MDC), including a robust service learning program, field trips and class projects, and also recruitment for early career horticulturists through the Conservation Horticulture Fellows Program (see page 7, right). The award reads, "*In appreciation for outstanding contributions to Miami Dade College and Miami-Dade County. Your leadership and commitment have made a difference in our community.*" Tracy Magellan accepted the award (see photo at left) from MDC and stated, "Service learning programs play an important role directing students to take what they have learned from their courses and use that knowledge and involve themselves in their community. While students learn to apply special skills, the garden gains help caring for the collection. Miami Dade College's program is wonderful educational arrangement that Montgomery is pleased to participate in."

Montgomery received the **highest level accreditation**, Level IV, from ArbNet, the interactive community of arboreta. The ArbNet Arboretum Accreditation Program is sponsored and coordinated by The Morton Arboretum in cooperation with American Public Gardens Association and Botanic Gardens Conservation International. This recognition was based on review of Montgomery's planning, governance and staffing as well as tree science, planting and conservation efforts.

**For more updates from Montgomery, please see our website – or find us on Facebook.**

# Society

converge  
Montgomery

Over one hundred serious palm enthusiasts – from over 20 countries and from every habitable continent – came to Montgomery as part of the 2014 International Palm Society Biennial. The MBC Team was delighted to welcome the group, and spent a great afternoon sharing the palm collection, landscapes, lunch and seeds with the delegation.

The IPS promotes scientific and educational purposes for palms. In addition to publishing the wonderful journal *PALMS*, the IPS is a leading supporter of palm research and conservation projects through their Endowment Fund Grants. These grants have helped projects at MBC, including palm genetics research and palm collecting expeditions.



## TEAM NEWS



Jason Maldonado



Marvin Rodriguez



Jeffrey Summers



Michelle Barros

Montgomery has great new people! **Jason Maldonado** is our new Assistant Curator of Palms. Jason has extensive training, experience and certifications in horticulture, and worked with plants at both Chapman Field and Miami Dade College. Jason's careful, diligent work with the palms is already appreciated. **Marvin Rodriguez** and **Jeffrey Summers** are the 2014-2015 Conservation Horticulture Fellows. Marvin is an MDC horticulture student and Jeff is a recent MDC and FIU biology graduate. Working in each department at MBC, Marvin and Jeff provide vital help and gain great experience. Our Fellows Program is generously funded by the ELIZABETH ORDWAY DUNN FOUNDATION and the BATCHELOR FOUNDATION. **Michelle Barros** is our new Collections Specialist, running our mapping and labeling work. With degrees and background in horticulture and science, Michelle gained rare experience at our neighbor garden, The Kampong, where she maintained the plant records and labels – a highly desired skill set for MBC. These four have already improved our great team!

FROM THE  
MONTGOMERY ARCHIVE

A CYCAD DISCOVERY: MONTGOMERY'S BELIZE 1999 EXPEDITION

**P**ictured here is Valentino Tzub, MBC's collaborator in Belize (see also front cover and pages 4-5), with the Sinkhole Cycad, as part of the Belize 1999 Expedition. The 1999 photos were the first time these important cycads were brought to the attention of the scientific community. Specimens and seeds brought to MBC were unlike any cycad known at the time. It was not until 2009 –ten years later– that MBC's Michael Calonje formally described this species. Now known as *Zamia decumbens*, this cycad has geographic and population characteristics which are perfectly suited for studying botanic garden conservation planning (see page 3).

The MBC-sponsored Belize 1999 Expedition was led by John Janovec ("JJ" on this slide) of Texas A&M University. His work was focused

on trees of the Nutmeg Family. John's handwritten correspondence briefly mentioned the "very rare" zamia depicted on this slide. Review of his notes and photographs in the Montgomery Archive prompted Michael to take a closer look at these species. Michael performed a very detailed field study in 2008.

This sequence of studies over 15 years illustrates how botanical science can often progress. In this case, primary field botany prompted deeper taxonomic study, which in turn provided an ideal model for conservation science. Montgomery fieldwork today will lead to even further advances!

