



This newsletter will serve to better connect GGI-Garden partners by providing news from the botanic garden community regarding collections and collections preservation; highlighting partner collections and contributions to GGI-Gardens and sharing opportunities such as the GGI-Gardens Partner Awards.

The Global Genome Initiative for Gardens is an international partnership dedicated to collecting and preserving genome quality tissues for all species of plants on Earth



Montgomery Botanical Center staff and interns selecting a *Corypha taliera* leaf to collect for an herbarium voucher

Adventures in Palm Collecting at Montgomery Botanical Center

By Joanna M. Tucker Lima & Leah Materna-Laurel

Montgomery Botanical Center (MBC) is situated in Coral Gables, Florida, where the subtropical climate makes growing a wide diversity of tropical plants possible. The botanic garden's living *ex situ* collections specifically emphasize palms and cycads, including nearly 400 unique palm taxa and 240 different cycad taxa. Guided by our mission to *advance research, conservation, and education through living plant collections*, MBC fosters and participates in scientific research by collecting and maintaining scientific data on its nearly 14,850 plants, including nationally accredited collections of palms, cycads and tropical conifers. We strive to maintain genetically diverse population samples of wild-collected palms and cycads with thorough



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documentation and provenance for each plant, ensuring a diverse living plant collection and accurate data records.

“Today this palm is extinct in the wild and only exists in cultivation”

With generous support from BGCI, GGI-Gardens, GGBN (Global Genome Biodiversity Network), and the US Botanic Garden through the GGI-Gardens Awards program, we are collecting leaf tissues samples and herbarium vouchers for 49 palm and 46 tropical dicot species growing on MBC property to help fill current gaps in GGBN repositories. Montgomery’s collection comprises numerous taxa that are considered of special conservation importance and classified as either endangered or critically endangered species, according to the IUCN Red List. One such species is *Corypha taliera*. Today this palm is extinct in the wild and only exists in cultivation. Palm herbarium specimens can be challenging to collect due to their unique morphology, sometimes including sharp petiole and leaf spines and often oversized leaves and infructescences. *Corypha taliera*, in particular, presents an interesting dilemma due to its impressive stature (image below). We recently collected a tissue sample and herbarium voucher from one of our 25 year-old *C. taliera* specimens at MBC as part of the GGI-Gardens program.



MBC intern, Leah Materna-Laurel, getting ready to measure *C. taliera* leaf for herbarium label.

“Figuring out how to represent Corypha taliera on an herbarium sheet was daunting at first”

The leaf we collected of *C. taliera* measured a staggering 235 cm long by 335 cm wide, with a petiole stretching 274 cm. Figuring out how to represent *C. taliera* on an herbarium sheet was daunting at first. Accurate measurements are critical to voucher collection of such massive specimens, and careful trimming, folding, and presentation of voucher material is tricky but doable. Prioritizing the most important features to include on the voucher sheet was key. In the case of *C. taliera*, it was unnecessary, and quite frankly impossible, to include an entire leaf in the herbarium voucher. For our voucher we included a sample of middle and apical leaf segments, basal leaf segments still attached to the hastula, a piece of the petiole with spines, and

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a section of the leaf sheath. Our herbarium sheet label (shown below) details complete leaf and stem dimensions in order to provide a comprehensive the picture of the specimen and reflect the greater overall size of the palm. *Corypha taliera* is monocarpic, so reproductive material is rarely available for vouchering, making it all the more important to include as many details as possible with the voucher.

Dr. Larry Noblick, MBC's Palm Biologist, with intern Alex Crow selecting portions of the *C. taliera* leaf to be included on the herbarium specimen (Left) separating the petiole from the basal leaf segment and hastula. The resulting *Corypha taliera* herbarium voucher (Right) as it is being dried in the drying oven at the Fairchild Tropical Botanic Garden Herbarium.



FAIRCHILD TROPICAL BOTANIC GARDEN
Miami, Florida

ARECACEAE
Corypha taliera Roxb.

U.S.A., Florida, Miami-Dade County, Miami, Montgomery Botanical Center, 11901 Old Cutler Road, MBC garden accession number 9642*E. Seed giving rise to this cultivated plant not of known wild origin collected from Botanical Garden in West Bengal, Calcutta collected by Shri Dhar.

Solitary palm; Stem height 104 cm tall. Stem diameter 90 cm.
LEAVES costapalmate, with costa 142 cm long; 17 leaves in crown; armed petiole measuring 274 cm × 6 cm × 7 cm. Leaf blade 235 cm long and 335 cm wide; 117 total leaflet segments in the fan blade; basal leaflet segment 107 cm × 4.75 cm with free portion 15 cm; middle leaflet segment 177 cm × 7.5 cm with free portion 90 cm with second free portion 56 cm; apical leaf segment 90 cm × 5.0 cm with free portion 61 cm; fibers at sinuses.

L. Materna-Laurel M-26 23 June 2021
with L. Noblick, J. Tucker-Lima &
A. Crow

Herbarium label for a 25 year-old *Corypha taliera* specimen collected at Montgomery Botanical Center.

Living collections at botanic gardens represent a crucial resource in expanding the diversity of genomic collections representing plant life across the globe. Our collection efforts at MBC, together with other botanic gardens from the U.S. and overseas, will help augment and expand the diversity of plant material and genomic resources available to researchers through the GGBN, bolstering botanical research and deepening our knowledge and understanding of plants.

GGI-Gardens Down Under – The Australian National Botanic Gardens

**Rosemary Purdie, Living Collections Botanist (Honorary)
Australian National Botanic Gardens, Canberra, Australia Botanical Garden**

The Centre for Australian National Biodiversity Research is delighted to be one of the recipients of the Global Genome Initiative for Gardens 2020-2021 Award Program. Located in the nation's capital city Canberra, the Centre brings together the collections of the Australian National Herbarium (ANH) and the Australian National Botanic Gardens (ANBG). The latter was the first botanic garden in the country to grow only plants that are native to Australia. Opened in 1970, it now supports a living collection of around 83,000 plants comprising 4,300 species which represent around a fifth of the Australian native flora. All the ANBG's living collections are propagated from plants collected in the wild and are accompanied by herbarium specimens lodged at the ANH where they are available for study. This scientific basis of the living collections makes the Centre ideally placed to contribute to the Global Genome Initiative for Gardens (GGI-Gardens).

“...ANBG's Conservation Collection comprises species of high conservation value for which ex situ plants growing in the Gardens and/or held in its seed bank help ensure their genotypes are preserved”

Deciding which species to include in the genotype collections for GGI-Gardens has been greatly facilitated by interrogating the Centre's *Integrated Botanical Information System*. This database holds records of every species in the ANBG living collection, including full propagation history and lineage of each plant along with provenance of its original parent, date of collection and propagation material obtained. Links with the ANH *Specimen Information Register* database ensure that each plant in the living collection is accurately named, while the searchable on-line system *Find A Plant* provides either the exact location of each plant within a garden bed or shows which bed it's growing in.



The habitats of *Eucryphia wilkiei* (left) and *Dracophyllum sayeri* (right), that grow only on the summits of mountains in far north Queensland, are threatened by global warming. Both species are in cultivation at ANBG and their genetic material will be included in Centre's GGI-G collection. Photos: Murray Fagg, Australian Plant Image Index

Species in ANBG's Conservation Collection will feature in the Centre's GGI-G contribution. This collection comprises species of high conservation value for which *ex situ* plants growing in the Gardens and/or held in its seed bank help ensure their genotypes are preserved. It covers species declared Critically Endangered, Endangered and Vulnerable at a national level, highly

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localised endemic species (many of which were affected by the catastrophic 2019/20 summer wildfires in eastern Australia), and species growing in habitats most at risk from global warming (e.g. alpine or tropical montane species).

Around two-thirds of the Centre's target of 250-300 species have already been short-listed for inclusion. Deciding on the remaining third, and using *Find A Plant* to map out efficient routes for collecting genetic material, will continue through the winter months. Come spring, we'll be out in the gardens handling real plants at last!

Resources

GGI-Gardens Instructional Video Series – Making Herbarium and Genomic Biorepository Vouchers

During the recent 2021 American Public Gardens Association annual virtual conference, The GGI-Gardens team partnered with Dr. Jennifer Ackerfield from Denver Botanic Garden to present a virtual workshop “Fieldwork for the 21st Century: How to Grow your Garden's Impact for Research Through Herbarium and Genomic Biorepository Vouchers”. Workshop participants learned about the importance of modern methods for both vouchering herbarium and genomic specimens for accessibility to the research community.

Of interest to GGI-Gardens partners are the series of eight short instructional videos the team made for the workshop that supplemented the live workshop content. These videos are [now publicly available on YouTube here](#), or **click on the individual video links to the left**. Each video covers all the basic aspects of vouchering including necessary materials and the various steps from start to finish for making both herbarium specimens and genomic tissue collections. Added bonuses are sneak peeks into Fort Worth Botanic Garden's renowned living collection of *Begonia* species (accredited by the Plant Collections Network), and Botanical Research Institute of Texas' herbarium and molecular lab.

Events & Opportunities

The [Global Genome Biodiversity Network Conference](#) in Shenzhen, China has been postponed until March 21-25, 2022.

We would love to feature your organization in an upcoming issue of this newsletter!

We welcome written/photographic submissions from GGI-Gardens partners in action, highlighting exciting updates on your collecting efforts or other pertinent activities. Please email GGI-Gardens Program Coordinator Adam Black ablack@brit.org for more information on contributions and deadlines.

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GGI-Gardens Vouchering Videos:

1. [Introduction](#)
2. [Materials](#)
3. [How to Prepare the Herbarium Voucher](#)
4. [How to Prepare the Genomic Tissue Voucher](#)
5. [How to Close The Plant Press](#)
6. [Preparing the Plant Press for the Drying Oven](#)
7. [What Does the Final Herbarium Voucher Look Like?](#)
8. [What Does the Final Genomic Voucher Look Like?](#)