



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



Nestled against Ko'olau Mountains behind the famous Waikīkī Beach, GGI-Gardens Award recipient Lyon Arboretum is an idyllic setting for important rare plant conservation and research. Photo courtesy Lyon Arboretum

Harold L. Lyon Arboretum Becomes Latest Recipient of GGI-Gardens Award!



We are thrilled to announce that Hawai'i's Harold L. Lyon Arboretum is the latest GGI-Gardens partner to have a collecting project funded by the GGI-Gardens Awards Program. These annual awards, funded by United States Botanic Garden in partnership with GGI-Gardens and administered by Botanic Gardens Conservation International (BGCI), are issued to botanic institutions with noteworthy living collections of interest for their genomic novelty.

With support of this award funding, the Arboretum will contribute significantly to GGI-Garden's mission with their project "The Hidden Gem of Mānoa: Uncovering Lyon Arboretum's Genetic Resources". The ambitious project, led by Senior Research Associate Jesse

Contact GGI-Gardens:

Email: mgostel@brit.org, ggi@brit.org / Facebook: [@ggismithsonian](https://www.facebook.com/ggismithsonian/) /

Online: [GGI-Gardens Website](https://www.ggi-gardens.org/) / Twitter: [#GGIGardens](https://twitter.com/GGIGardens)

Adams, will preserve genome-quality vouchers of their extensive plant accessions, adding up to ten new families, hundreds of new genera, and several thousand species to the Global Genome Biorepository Network (GGBN) that will become accessible to researchers.

A research unit of the University of Hawai'i at Mānoa, the Harold L. Lyon Arboretum is a 194-acre public garden at the base of the Ko'olau Mountains which overlook O'ahu's famous Waikīkī Beach. The Arboretum was conceived by Dr. Harold L. Lyon in 1918 to protect the watershed by reforesting Mānoa Valley. Since then, the collection has blossomed to over 5,660 taxa of tropical and sub-tropical plants. Much of it focuses on Aroids, Palms, the native flora, and Zingibers. The breadth of their palmetum is extensive and encompasses roughly 731 species-making it one of the world's largest collections. Many of the large palms and trees found on the grounds are Dr. Lyon's original plantings from the early 1900's.

“Moving into the Arboretum’s next 100 years, members of the Grounds and Collections Department have established their commitment as stewards of the land through protecting and conserving the native flora”



Past to Present at Lyon Arboretum: The Grounds and Collections Department works to plant native species like ‘Ōhi’a- *Metrosideros polymorpha* (upper right) and Loulu- *Pritchardia minor* (lower left). Images courtesy of Lyon Arboretum and Jesse Adams.

Moving into the Arboretum’s next 100 years, members of the Grounds and Collections Department have established their commitment as stewards of the land through protecting and conserving the native flora. The staff strive to expand native plant communities, implement a restoration forest, and provide ex situ sites for state and federal partners to establish populations of native threatened and endangered species like *Cyrtandra kaulantha*. Unfortunately, many of the species planted by Dr. Lyon have proven to be invasive. In conjunction with the watershed partnership, Grounds and Collections staff trial new removal/treatment methods for these weeds and share the findings with the community. Building upon their commitment to research the Grounds and Collections Department seek to establish population level conservation collections of native *Pritchardia* palms and investigate the production of pure seed lines. Additionally, they seek to build a new collection of tropical conifers.

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“With more GGI-Gardens Awards issued this year than ever before, there will be an unprecedented amount of novel genomic tissue added to Global Genome Biorepository Network (GGBN) partners”



Jerrod Stone, GGI-Garden's new barcoding technician, at work in the BRIT Summer Laboratory

Jerrod Stone Joins GGI-Gardens Team as Barcoding Technician!

We are pleased to welcome Jerrod Stone as the newest member of the GGI-Gardens team! Jerrod began working with us in August as a barcoding technician! Jerrod began volunteering in the herbarium at Fort Worth Botanical Garden | Botanical Research Institute of Texas (FWBG|BRIT) several years ago and has assisted GGI-Gardens director, Morgan Gostel, with the organization of plant tissue specimens in the BRIT biorepository. Soon after BRIT's Summer Laboratory opened in December 2018, Jerrod quickly learned molecular methods while helping perform DNA extractions and PCRs for various research projects. Jerrod's knowledge, laboratory skills, and years of experience at BRIT have made him an asset to the GGI-Gardens team.

As part of the GGI-Gardens program, we are able to sequence plant DNA barcodes from families and genera of plants that have not yet had plant DNA barcodes sequenced and deposited in the Barcode of Life Database (BOLD, <https://www.boldsystems.org/>) not already accessible in GenBank. With more GGI-Gardens Awards funded this year than ever before, there will be an unprecedented amount of novel genomic tissue soon submitted to Global Genome Biorepository Network partners, including the BRIT's biorepository. Jerrod will have is hands full, but is ready for the challenge!

Resources

This month we will feature sequencing initiatives that include a focus on increasing our understanding of the plant tree of life.



[Earth BioGenome Project \(EBP\)](#)

The EBP was launched in 2018 as an international effort that aims to sequence the genomes of all the eukaryotic species on Earth. EBP is coordinating its sequencing activities with other well-coordinated genomic sequencing programs and aims to complete this goal by 2028. GGI-Gardens collections will help provide material for sequences generated by EBP.



[1000 Plants Transcriptomes Initiative](#)

The 1,000 plants initiative (or 1KP) is an international partnership dedicated to sequencing the transcriptome of more than 1,000 species across the plant tree of life. Results of this massive sequencing effort are publicly accessible and were [published in Nature](#) as a capstone paper in 2019.



[10,000 Plant Genomes Project \(10KP\)](#)

The 10KP project was announced in 2017 during the XIX International Botanical Congress and aims to sequence the whole genome of more than 10,000 species on the plant tree of life. This international effort is led by the Beijing Genomics Institute and China National Gene Bank. 10KP has developed a strategic approach to sampling evolutionarily significant taxa and is part of the Earth BioGenome Project.



[Darwin Tree of Life](#)

The Darwin Tree of Life is an ambitious and regionally focused sequencing program that aims to sequence the whole genome of all 70,000 eukaryotic species from Britain and Ireland. This project is supported by the Wellcome Sanger Institute and is coordinating its efforts together with the Earth BioGenome Project.



[Open Green Genomes Initiative](#)

The Open Green Genomes Initiative is supported by the Joint Genome Institute and was launched in 2017. The mission of this program is to generate genomes for representatives of key evolutionary plant lineages.

Events & Opportunities

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

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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