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Advancing Research, Conservation, and Education through Scientific Plant Collections

The Search for Australia's Blue Cycads

Australia is a diversity hotspot for cycads, boasting 79 species, 76 of which are endemic. This rich diversity includes some of the world's most iconic cycads. Among them, species with pale blue leaves belonging to the *Cycas cairnsiana* group have captivated plant collectors worldwide. This heightened horticultural appeal has led to increased global demand, resulting in significant population declines due to plant and seed collection.

The *Cycas cairnsiana* group, distributed in Northern Queensland, includes *C. cairnsiana*, *C. couttsiana*, *C. cupida*, *C. desolata*, and *C. platyphylla*. While these species vary geographically, their morphological similarities make accurate species identification challenging. Conservation efforts are further complicated by the underrepresentation of these species in botanic garden collections. Notably, *C. cupida* and *C. desolata* are absent from most collections and are on the brink of being listed as critically endangered. To safeguard their future, these species must be included in assurance colonies that can support their long-term conservation.



Photos on page 4 and Background Image: Habitat of *Cycas platyphylla*.

Objectives

To support the conservation of the *Cycas cairnsiana* group, we travelled to northern Queensland, Australia, to collect herbarium specimens, seeds, and DNA samples. These contributions will enhance the DNA tissue library at MBC and complete the genetic sampling necessary for conservation genomic analysis. Utilizing a new set of genetic markers, we aim to identify both inter- and intraspecific differences, clarify species boundaries, and establish genetic conservation units. Additionally, the project focuses on developing ex-situ assurance colonies, particularly for *C. cupida* and *C. desolata*.



Michael and James with *Cycas cairnsiana*.



Michael and James with *Bowenia spectabilis* near Tinaroo Dam.

Achievements

Although we encountered access restrictions at the type locality of *C. desolata*, we discovered a new population, expanding its known range beyond the previously single recorded population. At the *C. cupida* site, also limited to one location, we successfully collected a substantial number of seeds. In total, we gathered over 1,800 seeds from *C. cairnsiana*, *C. cupida*, *C. desolata*, and *C. platyphylla*, representing various maternal lines. Half of these seeds are being propagated and cultivated in Australia, while the other half are now a part MBC's living collections, supporting the development of assurance colonies.

Next Steps

Next for this project is to conduct a genomic analysis to determine conservation management units and clarify species concepts. This work will also help us understand the genomic diversity of these species and the differences between populations.

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