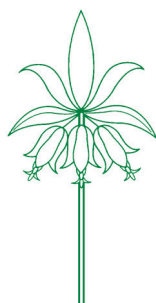


# HUNTIA

A Journal of Botanical History



VOLUME 19 NUMBER 1  
2022

Hunt Institute for Botanical Documentation  
Carnegie Mellon University

Pittsburgh

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ISSN 0073-4071

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# The cycad encounters of botanical explorer David Fairchild

Michael Calonje, Alan W. Meerow and Javier Francisco-Ortega

## Abstract

Although cycads do not appear to have been a priority for David Fairchild's plant introduction activities, he did document photographically and in writing several magnificent specimens encountered during his travels, some of which have a fascinating history. Our historical research at the Archive and Library of Fairchild Tropical Botanic Garden yielded a total of 29 cycad photos taken at this garden, at his home in Miami (The Kampong in Coconut Grove), at Colonel Robert Montgomery's garden (now Montgomery Botanical Center) and during the Lathrop Expedition (1898–1903), the Allison Armour Expedition (1925–1927) and the Cheng Ho Expedition (1939–1940; Fig. 1). Cycad pictures from these three expeditions included photographs taken at botanic gardens, gardens of scientific institutions, nurseries and in the wild. All of these photos with the exception of three are dated. All but three of them were taken by David Fairchild, the rest by members of his expeditions. To our surprise we found that most of the cultivated plants that were photographed decades ago in overseas gardens remain alive today. Fairchild, in three of his books, also documented photos and brief accounts of cycads that he encountered in the wild or cultivated in gardens in Italy, Indonesia and the United States (Miami, Florida). We found that from 1898 through 1935, the time period when Fairchild was officially affiliated with the United

States Department of Agriculture (USDA), the agency received only 22 accessions of cycads, none of which were collected in any of Fairchild's expeditions.

## Keywords

Botanical history; germplasm; USDA; gymnosperms; plant exploration

## Introduction

Fairchild Tropical Botanic Garden (FTBG; Coral Gables, Miami), named for David Fairchild (1869–1954), was the first botanical garden established in Miami celebrating the legacy and achievements of one of the most renowned plant collectors of the nation. It was founded in 1938 by a group of distinguished citizens under the leadership of Colonel Robert H. Montgomery (1872–1953), who became its first director (Zuckerman 1988, p. 19, 1997, pp. 15–19) until his death. Later in 1959 his widow Eleanor “Nell” Montgomery Jennings (1905–1990) established The Montgomery Foundation, a non-profit organization in Coral Gables that aimed to honor the unparalleled contributions made by Robert Montgomery to tropical botany by creating a living plant collection parallel to FTBG to support research and conservation of palms and cycads. This institution, located on the original site where Nell and Robert Montgomery had their home and estate one mile south of FTBG, was the largest property (48.5 ha) devoted to tropical plants in South Florida (Zuckerman 1997, pp. 54–56). It was later renamed Montgomery Botanical Center (MBC) to further highlight

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Figure 1. Map of localities where Fairchild or his travelling companions recorded cycads.

its core mission in plant exploration and the rigorous stewardship of living collections for research and educational purposes.

Since their establishment, these two gardens have developed extensive collections of cycads, long-lived gymnosperms that superficially resemble palms but are actually among the most primitive living seed plants (Brenner et al. 2003) with an ancient evolutionary history dating back at least 270–280 million years (Gao and Thomas 1989). This shared focus on cycads was surely influenced by Colonel Montgomery, who assembled an impressive cycad collection at his estate, then known as the Coconut Grove Palmetum. It was then that he had a vision of creating a botanic garden in Miami that not only provided a unique location in the continental United States to grow tropical plants but also would honor the achievements of David Fairchild, one of the pioneers of plant genetic resource initiatives

in America. As director and founder of the first germplasm federal unit of the nation (USDA Section of Foreign Seed and Plant Introduction, created in 1898), Fairchild was above all a plant explorer. By the 1930s he already had received international recognition for his accomplishments in bringing thousands of germplasm collections to the United States and for his vision in organizing international plant collecting expeditions that reached all continents. Fairchild was a pivotal figure in the introduction of new plants of agricultural and horticultural interest into the United States. The career of Fairchild can be divided into four main periods: (1) 1896–1903: Establishing the USDA Section of Foreign Seed and Plant Introduction and performing plant collection expeditions sponsored by Barbour Lathrop; (2) 1904–1924: Solidifying the USDA germplasm introduction program; (3) 1925–1933: Conducting expeditions on the

research vessel *Utowana* sponsored by Allison Armour; and (4) 1934–1954: Concluding his work at the USDA and starting an association with Fairchild Tropical Botanic Garden.

In previous studies we have shown that during his endeavors Fairchild targeted a wide array of plants including those used for food and others with gardening and ornamental value (e.g., Camas et al. 2020; Francisco-Ortega et al. 2020). Clearly, cycads have played a central role in the history of these two neighboring botanic gardens, both of which are world-renowned for their extensive holdings of this highly threatened plant group. As David Fairchild was a key figure in the botanical history of South Florida and had a solid friendship with Colonel Montgomery, in this contribution we sought to explore the extent to which David Fairchild may have influenced the development of these collections or the popularization of these plants in ornamental horticulture in the United States through his endeavors as a plant collector and coordinator of the USDA program for germplasm introduction. Our research was based on the study of: (1) published works by David Fairchild; (2) plant inventory books providing information on plant material introduced by the USDA. This publication is currently titled *Plant Inventory, United States Department of Agriculture* but was known by other titles prior to 1937 (available at: <https://www.ars.usda.gov/northeast-area/beltsville-md-barc/beltsville-agricultural-research-center/national-germplasm-resources-laboratory/docs/plant-inventory-books/>); and (3) photographs (see inventory pertinent to David Fairchild and his encounters with cycads in Tab. 1) and documents of David Fairchild, which are housed in the Archive and Library of FTBG.

A map summarizing the locations where our research shows Fairchild encountered cycads is presented in Figure 1.

### **Lathrop Expeditions (1896–1903): Early worldwide germplasm collections for USDA and cycad records from South Africa and Japan**

Barbour Lathrop (1847–1927), a wealthy businessman from Virginia was one of the most important and influential figures in Fairchild's career in plant genetic resources (Harris 2015, pp. 15–68). In 1893 they met on the steamship *Fulda*, a passenger vessel cruising from North America to the Mediterranean (Fairchild 1938, pp. 30–37). Lathrop was not a botanist, but he strongly believed in the importance of plant introductions to diversify the arrays of foods available in America and expand agricultural crops that could be raised in South Florida (Douglas 1973, pp. 12–13). This initial meeting on board the *Fulda* eventually resulted in a solid friendship that led them to embark on four major plant collecting trips together. These germplasm enterprises were extensively described in Fairchild's (1938, pp. 82–103, 119–166, 210–225, 248–262, 267–285) autobiography. These expeditions took place between 1896 and 1903 and reached Africa, Asia, Europe, the Caribbean Islands and South and Central America. At the Archive and Library of FTBG there is a 56-page, unpublished document that has details of the sites that were explored and the material that was obtained in the last three trips (between 1888–1903). Over 482 plant accessions were collected during these three germplasm collection enterprises, and surprisingly none of them was for a single cycad species.

However, a study of Fairchild's photographic record yielded two interesting images that were made during these expeditions. The earliest cycad photograph located was taken in Japan in December 1901, and it shows specimens of *Cycas revoluta* Thunb. growing in pots at the Yokohama Nursery Company in Yokohama (Fig. 2). This species, currently restricted to the Ryukyu Islands in Japan

Table 1. Photographs accessioned in the Archive and Library of Fairchild Tropical Botanic Garden taken by David Fairchild or members of his expeditions that are pertinent to cycads

Photo description	Date	Photo number / Figure number
Helene Muller Pancoast (one of David Fairchild's grandchildren) in cycad collection at The Kampong	11 May 1941	00740 / —
Helene Muller Pancoast (one of David Fairchild's grandchildren) in cycad collection at The Kampong	11 May 1941	00741 / —
Helene Muller Pancoast (one of David Fairchild's grandchildren) and her mother in cycad collection at The Kampong	11 May 1941	00743 / Fig. 11
<i>Cycas rumphii</i> Miq. on the little island of Mandioli, Batjan, Moluccas, Indonesia. Photo by Edward Beckwith	26 May 1940	01139 <sup>1</sup> / —
<i>Cycas rumphii</i> Miq. on the little island of Mandioli, Batjan, Moluccas, Indonesia. Photo by Edward Beckwith	26 May 1940	01205 / —
<i>Cycas revoluta</i> Thunb. and other plant species growing in L'Orto Botanico dell'Università di Palermo, Sicily, Italy	Unknown	01859 / —
Karl Dahlberg, garden superintendent of Fairchild Tropical Botanic Garden, standing near the newly planted Cycad Circle of this garden, including <i>Cycas revoluta</i>	14 May 1938	01875-b / Fig. 13, <i>top</i>
<i>Cycas wadei</i> Merr., Bureau of Science Building, Manila, Philippines	1940	02227 <sup>1</sup> , 03822 <sup>1</sup> / Fig. 9
Unknown person with <i>Cycas revoluta</i> Thunb., likely at Fairchild Tropical Botanic Garden	May 1941	02480 <sup>2</sup> / —
Mrs. Anne Archbold beside a great specimen of <i>Cycas edentata</i> de Laub. on the strand at El Templo Island, Philippines	1940	03503 <sup>1</sup> / Fig. 8
<i>Cycas rumphii</i> Miq. on tiny island in Straits of Lembeh, Sulawesi, Indonesia	10 January 1940	03639 <sup>1</sup> / —
<i>Cycas rumphii</i> Miq. on islet of Batjan, Moluccas, Indonesia	23 May 1940	03710 <sup>1</sup> / —
<i>Cycas wadei</i> Merr. growing in Manila, Philippines	1940	03823 <sup>1</sup> / —
<i>Cycas wadei</i> Merr. growing in Manila, Philippines	1940	03824 <sup>1</sup> / —
<i>Cycas wadei</i> Merr. growing in Manila, Philippines	1940	03825 <sup>1</sup> / —
Close up of <i>Cycas wadei</i> Merr. in Manila, Philippines	1940	03826 <sup>1</sup> / —
<i>Cycas</i> aff. <i>rumphii</i> Miq., Fairchild Tropical Botanic Garden	ca.1941	04736 / —
General view across the Cycad Circle, Fairchild Tropical Botanic Garden	7 May 1941	04737 / Fig. 13, <i>bottom</i>
Dr. Louis Charles Trabut standing beside large <i>Encephalartos longifolius</i> (Jacq.) Lehm. under a specimen of <i>Howea forsteriana</i> (F.Muell.) Becc. in Jardin D'Essai du Hamma, Algeria	February 1925	05027 <sup>3</sup> / Fig. 4
Immense <i>Encephalartos laurentianus</i> De Wild. in Jardín de Aclimatación de La Orotava, Canary Islands, Spain. Photo by Graham Fairchild	July 1925	05586 <sup>3</sup> / Fig. 5, <i>left</i>
<i>Right to left</i> : Prof. Otto Penzig, his daughter, and David Fairchild on tile floor of the Istituto di Botanica di Genoa, Italy	3 November 1925	05715 <sup>3</sup> /



Photo description	Date	Photo number / Figure number
<i>Cycas revoluta</i> Thunb. growing in sphagnum moss on tile floor of terrace of the Istituto di Botanica di Genoa, Italy	9 November 1925	05722 <sup>3,4</sup> / Fig. 6
<i>Cycas rumphii</i> Miq. on tiny island in Straits of Lembeh, Sulawesi, Indonesia	February 1940	09279 <sup>1</sup> / —
<i>Cycas rumphii</i> Miq. on tiny island in Straits of Lembeh, Sulawesi, Indonesia	February 1940	09280 <sup>1</sup> / Fig. 7
<i>Zamia integrifolia</i> L.f. at Fairchild Tropical Botanic Garden	11 May 1941	09318, 09412
Colonel Robert H. Montgomery gazes at a <i>Cycas revoluta</i> Thunb. at Montgomery Botanical Center	Unknown	10840 <sup>5</sup> / —
General view across the Cycad Circle, Fairchild Tropical Botanic Garden	8 May 1941	10894 / —
Pots of <i>Cycas revoluta</i> Thunb. at Yokohama Nursery Company, Japan	November–December 1901	11425 <sup>6</sup> / Fig. 2
Medley Wood, curator of Durban Botanic Garden, posing with <i>Encephalartos longifolius</i> , (Jacq.) Lehm., Durban Botanic Garden, Durban, South Africa	January–February 1903	11569 <sup>6</sup> / Fig. 3
<i>Cycas revoluta</i> Thunb. with <i>Strelitzia nicolai</i> Regel & Körn. at L'Orto Botanico dell'Università di Palermo, Sicily, Italy	Unknown	11947 / Fig. 10, top

<sup>1</sup>Photo taken during the Cheng Ho Expedition (1939–1940) to Indonesia and the Philippines.

<sup>2</sup>We are not certain if this photo was taken by David Fairchild.

<sup>3</sup>Photo taken during the Allison Armour Expedition (1925–1927) to the Old World.

<sup>4</sup>Photo was reproduced in Fairchild (1930a, p. 262).

<sup>5</sup>Photo was reproduced in Fairchild (1947, p. 168).

<sup>6</sup>Photo taken during the Lathrop Expedition (1898–1903) to the Old and New World.

(Kyoda and Setoguchi 2010), is the most widely cultivated species of cycad in the world and, as evidenced by this photograph, was already vigorously commercialized by nurseries at the beginning of the 20th century.

The second relevant photo was taken in February 1903 when Fairchild visited Durban Botanic Gardens (then Natal Botanic Gardens) in the city of Durban, KwaZulu-Natal, South Africa. Established in 1849, Durban Botanic Garden is Africa's oldest surviving botanic garden (Glen and Higginson-Keath 2014). At the time of Fairchild's visit, the garden was slightly over half a century old and had several well-established, large specimens of the African cycad genus *Encephalartos* Lehm. in cultivation. Fairchild photographed a large individual of the South African endemic *E. longifolius* (Jacq.) Lehm., which had two

to three feet of trunk (Fig. 3). Photographed next to the cycad was none other than John Medley Wood (1827–1915), curator of this garden (1882–1913) and widely considered the “Father of Natal” botany (Strey 1977). The magnificent plant photographed by Fairchild is alive today with a stem about eight feet tall. *Encephalartos woodii* Sander ex J.M.Wood, a species that is now extinct in the wild, was dedicated to this distinguished South African botanist who first reported the species. Only a single male plant of this species was ever located in the wild. As cycads are dioecious, both male and female plants are required to produce seeds. Therefore, all existing plants of this species in cultivation are clones of this plant that slowly have been propagated vegetatively by the removal and establishment of offsets. Consequently, this species is





Figure 2. Left, *Cycas revoluta* plants for sale at Yokohama Nursery Company in Yokohama, Japan. Courtesy of the Archive and Library of Fairchild Tropical Botanic Garden.

Figure 3. Above, *Encephalartos longifolius* at Durban Botanic Gardens in South Africa, with Medley Wood, known as the father of Natal botany. Courtesy of the Archive and Library of Fairchild Tropical Botanic Garden.

regarded as a paradigm for cycad conservation (Osborne 1986).

During these early stages of the USDA Section of Foreign Seed and Plant Introduction only six cycad collections were received (Tab. 2). Four of them belonged to the Old

World genus *Cycas* L. and were sent from France between 1898 and 1901 (Cook 1899, pp. 8–9; Smith 1900, p. 52; Pieters 1905, p. 149). Three of these accessions were collected by USDA plant explorer Walter T. Swingle (1871–1952), whilst the fourth

Table 2. Plant germplasm of cycads received by the USDA Section of Foreign Seed and Plant Introduction (1898–1935)<sup>1</sup>

Species	Biogeography	Provenance / Arrival year to USDA	Collector	USDA reference
<i>Bouenia spectabilis</i> Hook.f.	Australia	Queensland, Australia / 1922	C. T. White	Fairchild 1924b
<i>Ceratozamia mexicana</i> Brongn.	Mexico	Veracruz, Mexico / 1923	C. A. Purpus	McKee 1926
<i>Ceratozamia mexicana</i> Brongn.	Mexico	Veracruz, Mexico / 1933	C. A. Purpus	Morrison 1934
<i>Cycas circinalis</i> L.	Old World	France / 1898	W. T. Swingle	Cook 1899
<i>Cycas normanbyana</i> F.Muell. [ <i>C. media</i> R.Br.]	Australia	France / 1898	W. T. Swingle	Cook 1899
<i>Cycas normanbyana</i> F.Muell. [ <i>C. media</i> R.Br.]	Australia	Paris, France / 1901	Vilmorin Andrieux & Co.	Pieters 1905
<i>Cycas neo-caledonica</i> <sup>3</sup> [ <i>C. seemannii</i> A.Braun]	Fiji, New Caledonia, Tonga, Vanuatu	France / 1899	W. T. Swingle	Smith 1900
<i>Cycas pectinata</i> Buch.-Ham.	Bangladesh, Bhutan, China, India, Laos, Myanmar, Nepal, Thailand, Vietnam	India / 1931	Chandra Nursery	Ryerson 1932
<i>Cycas siamensis</i> Miq.	Cambodia, Laos, Myanmar, Thailand	Botanic Garden, Bangkok, Thailand / 1933	A. Kerr	Morrison 1934
<i>Cycas siamensis</i> Miq.	Cambodia, Laos, Myanmar, Thailand	Myanmar / 1935	W. V. Palmer	Morrison 1940a
<i>Cycas</i> sp.	Old World	Honolulu, Hawaiian Islands / 1921	H. L. Lyon	Fairchild 1923
<i>Cycas</i> sp.	Old World	Kobe, Japan / 1927	H. H. Bartlett	Ryerson 1930
<i>Dioon</i> sp.	Honduras, Mexico	Veracruz, Mexico / 1935	C. A. Purpus	Morrison 1940b
<i>Dioon edule</i> Lindl.	Mexico	Veracruz, Mexico / 1930	C. A. Purpus	Ryerson 1931b
<i>Encephalartos lehmanni</i> Lehm.	South Africa	Botanic Garden, La Mortola, Italy / 1929	S. W. McLeod B.	Ryerson 1931a
<i>Encephalartos lemarincianus</i> De Wild. & T.Durand [ <i>E. poggei</i> Asch.]	Angola, Eswatini, Democratic Republic of Congo	Botanic Garden, d'Eala, Democratic Republic of Congo / 1931	A. Corbisier-Baland	Ryerson 1933a
<i>Encephalartos</i> sp.	Africa	Botanic Garden, Loureno Marques, Mozambique / 1934	T. Barbour	Morrison 1937
<i>Encephalartos villosus</i> Lem.	Eswatini, South Africa	Botanic Garden, La Mortola, Italy / 1932	S. W. McLeod B.	Ryerson 1934a

Species <sup>a</sup>	Biogeography	Provenance / Arrival year to USDA	Collector	USDA reference
<i>Macrozamia macdonnellii</i> (Miq.) A.D.C.	Australia	Botanic Garden, Adelaide, Australia / 1918	J. F. Bailey	Fairchild 1922b
<i>Stangeria paradoxa</i> T. Moore [ <i>Stangeria eriopus</i> (Kunze) Baill.]	South Africa	London, Great Britain / 1901	W. Bull	Pieters 1905
<i>Zamia integrifolia</i> L.f.	Bahamas, Cayman Islands, Cuba, USA	Soledad Garden, Cienfuegos, Cuba / 1932	R. M. Grey	Ryerson 1934b
<i>Zamia floridana</i> A.D.C. [ <i>Z. integrifolia</i> L.f.]	Florida (USA)	Subtropical Laboratory, USDA, Miami, Florida / ca.1902	P. H. Rolfs	Pieters 1905
<i>Zamia kirkxii</i> Miq. [ <i>Z. pygmaea</i> Sims]	Cuba	Soledad Garden, Cienfuegos, Cuba / 1933	R. M. Grey	Morrison 1936
<i>Zamia portoricensis</i> Urb.	Puerto Rico	Agricultural Experiment Station, San Juan, Puerto Rico / 1932	H. C. Henrickesen	Ryerson 1934a
<i>Zamia portoricensis</i> Urb.	Puerto Rico	Agricultural Experiment Station, Mayaguez, Puerto Rico / 1933	T. B. McClelland	Morrison 1934
<i>Zamia pumila</i> L.	Cuba, Puerto Rico, Dominican Republic	Soledad Garden, Cienfuegos, Cuba / 1931	F. G. Walsingham	Ryerson 1932
<i>Zamia pumila</i> L. [ <i>Z. integrifolia</i> L.f.]	Florida (USA)	Everglades Experimental Station, Florida / 1934	R. N. Lobdell	Russell 1950
<i>Zamia</i> sp.	New World	Cali, Colombia / 1932	M. J. Rivero	Ryerson 1933b

<sup>1</sup>David Fairchild was officially affiliated with this federal agency during this period.<sup>2</sup>Name is given as stated in USDA report, accepted name is indicated inside brackets. Taxonomy and biogeography follows Calonje et al. (2020).<sup>3</sup>*Nomen nudum*



one was a gift from a private company. A sample of the monotypic South African genus *Stangeria* T.Moore sent from England (London through William Bull) in 1900 was the fifth cycad that reached the USDA germplasm program during this period (Pieters 1905, p. 138). The sixth cycad collection that was received by this federal agency came from Miami (through Prof. P. H. Rolfs, USDA Subtropical Laboratory) in 1902, and it was for the native *Zamia floridana* A.DC., with the current accepted name being *Z. integrifolia* L.f. (Pieters 1905, p. 204).

### **Solidifying the USDA germplasm introduction program (1904–1924): Cycad collections**

Fairchild settled in Washington, DC, after the last of Lathrop's expeditions, and between 1904 and 1924 his plant hunting trips were reduced significantly as he mostly coordinated other expeditions and the processing of many of the germplasm accessions that were shipped to the United States during this time. In 1904 he explored California; in 1907 and 1909 he travelled to Europe; and in 1915 he went to Canada (Fairchild 1915; Lawrence 1964, pp. 84–85). Furthermore, he visited South Florida often. During this period, his only trip to the tropics took place in 1921 when he and his son, the famous Tropical entomologist Graham Bell Fairchild (1906–1994), explored Panama. At this time David Fairchild was involved in the establishment of the Barro Colorado Island Laboratory and the Summit Gardens, both in the Canal Zone (Fairchild 1921, 1922a, 1924a). With 17 species of *Zamia* L., Panama is one of the main centers of diversity for the genus. It hosts the greatest concentration of species richness per unit area, including *Z. pseudoparasitica* J.Yates, the only epiphytic member of the Cycadales (Dressler 1975). However, in none of Fairchild's

accounts for this country is there any reference to this genus. Even so, the Costa Rican and Panamanian species *Z. fairchildiana* L.D.Gómez was named in honor of David Fairchild (Luis Diego Gómez, pers. comm., Dec. 2004). Although no *Zamia* species are found within Barro Colorado (Croat 1978), the species *Z. stevensonii* A.S.Taylor & Holzman occurs in the Panama Canal Zone; however, there is no record of this species being encountered or collected by Fairchild during his visit to Panama.

During the 1904–1924 period the USDA Section of Foreign Seed and Plant Introduction only received four cycad collections (Tab. 2). Two of them were for the Australian genera *Bowenia* Hook. (this collection had an unknown provenance and was presented by government botanist C. T. White) and *Macrozamia* Miq. (Fairchild 1922b, p. 9, 1924b, p. 10), and they reached the USDA in 1922 and 1918, respectively. The *Macrozamia* sample was collected at the Botanic Garden of Adelaide, and apparently it was the only one that was sourced from a botanical institution during this period. There was one accession of *Cycas* that was sent from Honolulu in 1921 (Fairchild 1923, p. 22; this collection had an unknown provenance but was presented by Harold L. Lyon, who was a botanist from the Experiment Station of the Hawaiian Sugar Planters' Association). The fourth collection was of the Mexican genus *Ceratozamia* Brongn., and it was received from Veracruz in 1923 (McKee 1926, p. 16, this collection had an unknown provenance but was presented by C. A. Purpus).

### **USDA Allison V. Armour Expeditions (1925–1933) in the Old World: The Canaries, Italy, and Algeria Gardens**

From 1925 to 1933 Fairchild undertook extensive fieldwork on board the research

vessel *Utowana*. These expeditions were funded by wealthy Chicago businessman Allison V. Armour (1863–1941), who was also the owner of this yacht. During these nine years USDA participants visited the Canary Islands, Portugal, Tropical West Africa, Indonesia, Malaysia, Singapore, Sri Lanka, the Western Mediterranean, the Caribbean Islands, Central America, Mexico and the Guianas. It is worth mentioning that the Asian portion of these voyages was undertaken on commercial passenger boats as during that time the *Utowana* needed engine repairs. Based on these expeditions Fairchild wrote four works. Three of them covered the Old World enterprises (Fairchild 1928, 1930a, 1930b) whilst the fourth one concerned the trip made to the Caribbean Islands and the Guianas (Fairchild 1934).

During the *Utowana* expeditions Fairchild did not collect any germplasm of cycads; however, he encountered and photographed several interesting individuals in some of the botanic gardens that he visited. In February 1925 Fairchild stayed in the Jardin D'Essai du Hamma in Algiers, Algeria. This garden is the oldest botanic garden of the country, and it was founded in 1832 (Ghanem and Sofiane 2014). There Fairchild photographed (Fig. 4) a large specimen of the South African endemic *Encephalartos longifolius* next to Louis C. Trabut (1853–1929), a French botanist who worked extensively on the flora of Algeria and Tunisia (Maire 1929). This magnificent specimen survives at this garden today. That same year Fairchild visited the Jardín de Aclimatación de La Orotava in the town of Puerto de La Cruz on the island of Tenerife, Canary Islands. Officially established in 1791 (Cioranescu 2010, pp. 150–151), this is the second oldest botanic garden of Spain and the oldest of the Atlantic Islands. There Fairchild's son, Graham, took one photo of a specimen of *E. laurentianus* De Wild. (Fig. 5, left), the

largest species in the genus, which in the wild is restricted to Angola and the Democratic Republic of Congo. This plant still grows at the garden and is now quite massive with over four meters of trunk (Fig. 5, right).

On 9 November 1925, while in Italy, Fairchild visited the Instituto Botanico di Genova (also known as Orto Botanico dell'Università di Genova), where he took two photographs of an individual of *Cycas revoluta* (Fig. 6) that had been growing for 30 years directly on sphagnum moss without any soil. This botanic garden was established in 1802 (Peccenini 2008), and there Fairchild met with Albert Julius Otto Penzig (1856–1929). One of the two pictures that we found shows this German mycologist and professor of botany at the University of Genoa (Mariotti 2017), his daughter and Fairchild sitting under the shade of this specimen (Photo 05715). The other photo (Fig. 6) was published in Fairchild's book *Exploring for Plants* (1930a, p. 262). This *C. revoluta* plant survives today, although it was transplanted to another site in this Italian garden in 2006.

During the 1925–1933 period the USDA germplasm repositories received a total of 13 accessions of cycads with representatives from four genera, *Cycas*, *Dioon* Lindl., *Encephalartos* and *Zamia* (Tab. 2). Nine of these collections came from botanic gardens or agricultural research stations. Only one sample of *Dioon* reached the USDA, and it was shipped from Veracruz, Mexico. The three accessions of *Cycas* came from Asia (India, Japan and Thailand). Three collections of *Encephalartos* were also sent, and they came from botanic gardens located in Italy or in the Democratic Republic of Congo. The majority of the samples (six) belonged to the New World genus *Zamia*, and the vast majority of them (five) were shipped from Cuba or Puerto Rico, whilst only one accession of this genus was sent from Colombia.



Figure 4. *Encephalartos longifolius* at Jardin d'Essai du Hamma, with Dr. L. Trabut, French botanist who worked extensively on the flora of Algeria and Tunisia. Courtesy of the Archive and Library of Fairchild Tropical Botanic Garden.

**Cheng Ho Expedition (1939–1940):  
Indonesia and the Philippines**

In 1935, two years after his last *Utowana* expedition, Fairchild retired from the USDA (Harris 2015, p. 247). Three years after his retirement, in 1938, he joined FTBG as its most distinguished botanist and plant collector.

During his tenure in this garden David Fairchild made four plant hunting expeditions targeting Colombia, Guatemala, Indonesia, Panama, Philippines and Venezuela. These endeavors took place between 1939 and 1949 (Korber et al. 2016, p. 172).

Relevant to this contribution was the trip that he made to Asia between November 1939





Figure 5. *Left*, *Encephalartos laurentianus* at Jardín de Aclimatación de La Orotava in Tenerife, Spain, photograph taken by David Fairchild's son (Graham Fairchild) in 1925, Courtesy of the Archive and Library of Fairchild Tropical Botanic Garden, and, *right*, photograph taken by Alfredo Reyes in January 2020.

and August 1940 because this was the only one in which cycads were collected and reported during his association with FTBG. The voyage was undertaken on a custom-built research junk named the *Cheng Ho*. This expedition was financed by Anne Archbold (1873–1968), daughter of a co-founder of Standard Oil, and was the first official plant exploration expedition organized by this botanic garden (Degener 1943; Zuckerman 1988, pp. 55–57). This expedition was documented extensively by Fairchild (1943) in one of the last books he published.

Twelve photos of cycads were taken during this voyage. Fairchild encountered wild populations of the Indonesian-New Guinea endemic *Cycas rumphii* Miq. growing on three different Indonesian islands of the Moluccas

(four pictures from Batjan and Mandioli islands were located) and Sulawesi (three photos from an islet on Strait of Lembeh, Fig. 7). Two of these photographs were taken by expedition member Edward Beckwith. On Mandioli Island he made two collections of *C. rumphii* (under Fairchild's collection numbers 360 and 361) and sent one of them to the USDA (Fairchild's number 360 that received USDA accession number PI-139357) and to Colonel Montgomery. Unfortunately, these plants do not survive to this date. According to the records of the Horticulture Department of FTBG, none of these collections made it to the living collections of this garden. However, we are certain that the same collection that was shipped to USDA also reached Colonel Montgomery's garden (today





Figure 6. *Left*, *Cycas revoluta* growing directly on sphagnum moss at the Istituto di Botanica di Genoa, Italy. Courtesy of the Archive and Library of Fairchild Tropical Botanic Garden.

Figure 7. *Above*, Population of *Cycas rumphii* growing on an islet on Strait of Lembeh, Sulawesi. Courtesy of the Archive and Library of Fairchild Tropical Botanic Garden.

MBC) and was listed under number RM-225 7. Unfortunately, it seems that this individual was dead by the time MBC's plant records were digitized in 1994. The expedition team also encountered a population of *C. edentata*

de Laub. growing on El Templo Island (now known as Ambulong Island) in the Philippines. Fairchild photographed a great specimen of this species next to Anne Archbold (Fig. 8). On the same trip he also took five photographs





Figure 8. Anne Archbold, funder and participant of the Cheng Ho Expedition, next to *Cycas edentata* on El Templo Island in the Philippines. Courtesy of the Archive and Library of Fairchild Tropical Botanic Garden.

of several specimens of *C. wadei* Merr. planted around the Bureau of Science in Manila (Philippines) and other unidentified places of this city (Fig. 9). The species, endemic to Culion Island in the Philippines, was described by the famous American botanist Elmer D. Merrill (1876–1956), who joined the Bureau of Science as botanist first in 1906

and later as its director between 1919 and 1923 (Robbins 1958). The building complex where the Bureau of Science was located, now part of the University of the Philippines, was severely bombed during World War II (Anonymous 1945), but apparently the plants survived in the area until the 1980s after which they disappeared when the grounds were



Figure 9. *Cycas wadei* at the Bureau of Science in Manila, Philippines. Courtesy of the Archive and Library of Fairchild Tropical Botanic Garden.

re-landscaped (Esperanza Maribel Agoo and Domingo Madulid, pers. comm.).

This unique collection of cycad photographs from Old World countries also includes two images of individuals of *Cycas revoluta* from the L'Orto Botanico dell'Università di Palermo, Sicily, Italy (Fig. 10, top). This garden has its roots in 1779 when the Regia Accademia degli

Studi di Palermo was founded and a piece of land was allocated to establish a small botanic garden (Di Paola 2012; garden's Web site, <http://www.ortobotanico.unipa.it/storia.html>). We are not certain when these two undated photos of cycads were taken as Fairchild visited this Italian island both during the Lathrop (year 1902) and Allison V. Armour (year 1926)





Figure 10. *Top*, *Cycas revoluta* in L'Orto Botanico dell'Università di Palermo, Sicily, Italy, undated historic photograph taken by David Fairchild, Courtesy of the Archive and Library of Fairchild Tropical Botanic Garden, and, *bottom*, photograph taken by Dr. Manlio Speciale in January 2020.



Figure 11. Diverse collection of cycads at The Kampong (now The Kampong, National Tropical Botanic Garden), David Fairchild's estate in Coconut Grove, Miami, Florida. Helene Muller Pancoast (one of David Fairchild's grandchildren) and her mother (Barbara Lathrop Fairchild) are also depicted. Photo taken in May 1941. Courtesy of the Archive and Library of Fairchild Tropical Botanic Garden.

expeditions. The depicted individuals are still growing in the same spots where Fairchild took these photos (Fig. 10, *bottom*).

### Cycads cultivated in Miami

Fairchild's fondness for cycads is evidenced by the fact that he maintained a diverse collection of cycads at The Kampong, including at least *Cycas revoluta*, *C. aff. rumphii* and a species of *Macrozamia* (Fig. 11). These plants were depicted along with some of Fairchild's family members in three different pictures found in the Archive and Library of FTBG. As indicated above, we are certain that Robert Montgomery also had an extensive collection of cycads at his estate. Fairchild photographed him with a male specimen of *C. revoluta* (Fig. 12) and included this image in the last of his books (Fairchild 1947, p. 168).

This plant, along with two others of similar age, were over two meters tall when acquired by Robert Montgomery in August of 1932. Two of these plants, identified with accession numbers RM311★A and RM311★C, persist in the living collections of MBC.

Finally, Fairchild also made photos of several cycads at FTBG, including a large specimen of *C. revoluta*, which he photographed next to a person whom we have been unable to identify. Fairchild also took one picture of an individual of *Zamia integrifolia* (coontie), which is native to the grounds. In 1938, in the early stages of FTBG, Fairchild photographed its first superintendent, Karl Dahlberg standing among several newly planted collections, including a specimen of *C. revoluta* (Fig. 13, *top*). In 1941 Fairchild also took an additional photograph of the same area of this garden, which is known as the Cycad Circle (Fig. 13, *bottom*).



Figure 12. *Above*, Colonel Robert Montgomery posing with *Cycas revoluta* at his Coral Gables, Florida estate (now Montgomery Botanical Center). Courtesy of the Archive and Library of Fairchild Tropical Botanic Garden.

Figure 13. *Right, top*, Karl Dahlberg (Fairchild Tropical Botanic Garden's first superintendent) standing among several newly planted collections of the Cycad Circle in 1938, including an individual of *C. revoluta*, and, *bottom*, The Cycad Circle in 1941. Courtesy of the Archive and Library of Fairchild Tropical Botanic Garden.

## Conclusions

David Fairchild's appreciation for cycads is evidenced by the multitude of photographs he took of them in the wild and in gardens throughout the world and by his cultivation of several species at his home in Miami. It is interesting to note that due to cycads being very long-lived plants, several of the plants Fairchild photographed as far back as the beginning of the 20th century remain alive and healthy at botanical gardens to this day. Fairchild's appreciation for cycads is further evidenced by mentioning them in at least three of his books: *Exploring for Plants* (Genoa, Italy; p. 262), *The World Grows Round My Door* (Montgomery Botanical Center, Miami;

p. 168) and *Garden Islands of the Great East* (Sulawesi and Moluccas, Indonesia; pp. 107 and 202, respectively). However, it appears that Fairchild considered cycads to be of limited economic importance as potential plant introductions into the United States since he made very few collections of cycad germplasm during his decades-long career of exploration and germplasm introductions and did not feature any cycad species during his editorship of two serial magazines focused heavily on plant introductions of economic importance. The first of them was a USDA bulletin titled *Plant Immigrants*, which was published between 1908 and 1924 and included a total of 219





volumes, and the second one, titled *Occasional Papers of Fairchild Tropical Garden*, was published by FTBG between 1938 and 1950 and had as one of its main aims to inform South Florida horticulturists on new plant introductions with potential utilization in the farms and gardens of the region.

### Acknowledgments

Janet Gates (Durban Botanic Gardens, South Africa), M. Clement (Durban Botanic Gardens, South Africa), D. McCracken (University of KwaZulu-Natal, South Africa), K. Benmenni (Jardin D'Essai du Hamma, Algeria), A. Reyes (Jardín de Aclimatación de La Orotava, Tenerife, Spain), M. Speciale (L'Orto Botanico dell'Università di Palermo, Sicily, Italy) and E. M. Agoo (De La Salle University, Manila, Philippines) provided historical context about the cycads observed by Fairchild.

### References

- Anonymous. 1945. Destruction of scientific institutes in the Philippines. *Nature* 155: 784.
- Brenner, E. D., D. W. Stevenson and R. W. Twigg. 2003. Cycads: Evolutionary innovations and the role of plant-derived neurotoxins. *Trends Pl. Sci.* 8: 446–452.
- Calonje, M., D. W. Stevenson and R. Osborne. 2020. The world list of cycads. *Cycads* 5(1): 77–119.
- Camas, M., C. M. S. Carrington, S. Saint-Aime and J. Francisco-Ortega. 2020. David Fairchild's plant hunting expedition in the Lesser Antilles: Year 1932. *Selbyana* 33: 43–62.
- Cioranescu, A. 2010. Historia del Jardín de Aclimatación de La Orotava. Instituto Canario de Investigaciones Agrarias, Gobierno de Canarias.
- Cook, O. F. 1899. Numbers 1901–2700. *Invent. Sect. Seed Intro. U.S.D.A.* 5: 1–62.
- Croat, T. B. 1978. *Flora of Barro Colorado Island*. Stanford, California: Stanford University Press.
- Degener, O. 1943. The last cruise of the "Cheng-Ho." *J. New York Bot. Gard.* 44: 197–213.
- Di Paola, F. 2012. L'Orto Botanico di Palermo II Gymnasium. *Agathón* 2010: 41–44.
- Douglas, M. S. 1973. *Adventures in a Green World: The Story of David Fairchild and Barbour Lathrop*. Miami, Florida: Field Research Projects.
- Dressler, R. L. 1975. It grows up in the trees; really, it does. *Bull. Marie Selby Bot. Gard.* 2: 22–23.
- Fairchild, D. 1915. Trip across Canada, down the Pacific Coast, and Return through the Central United States. September 8 to November 13, 1915. Unpublished report. Depository: The Archive and Library of Fairchild Tropical Botanic Garden, Coral Gables, Miami, Florida.
- Fairchild, D. 1921. Panama Trip. August 17th to September 29th, 1921. Unpublished report. Depository: The Archive and Library of Fairchild Tropical Botanic Garden, Coral Gables, Miami, Florida.
- Fairchild, D. 1922a. The jungles of Panama. *Natl. Geogr. Mag.* 41: 131–146.
- Fairchild, D. 1922b. Inventory of seeds and plants imported by the Office of Foreign Seed and Plant Introduction during the period from April 1 to June 30, 1918 (nos. 45972–46302). *Invent. Seeds U.S.D.A. Bur. Pl. Industr.* 55: 1–48.
- Fairchild, D. 1923. Inventory of seeds and plants imported by the Office of Foreign Seed and Plant Introduction during the period from January, 1 to March 31, 1921 (nos. 52306–52854). *Invent. Seeds U.S.D.A. Bur. Pl. Industr.* 66: 1–91.
- Fairchild, D. 1924a. Barro Colorado Island laboratory. *J. Heredity* 15: 99–112.
- Fairchild, D. 1924b. Inventory of seeds and plants imported by the Office of Foreign Seed and Plant Introduction during the period from July 1 to September 30, 1922 (nos. 55569–55813). *Invent. Seeds U.S.D.A. Bur. Pl. Industr.* 72: 1–42.
- Fairchild, D. 1928. Two expeditions after living plants: The Allison V. Armour expeditions of 1925–27, including two voyages in the especially equipped yacht *Utowana*. *Sci. Monthly* 26(2): 97–127.
- Fairchild, D. 1930a. Exploring for Plants: From Notes of the Allison Vincent Armour Expeditions for the United States Department of Agriculture, 1925, 1926, and 1927. New York: Charles Scribner's Sons.
- Fairchild, D. 1930b. Exploring for plants in Ceylon. *Asia* 30: 400–405, 451–454.
- Fairchild, D. 1934. Hunting for useful plants in the Caribbean. *Natl. Geogr. Mag.* 66: 705–737.
- Fairchild, D. 1938. *The World Was My Garden: Travels of a Plant Explorer*. New York: Charles Scribner's Sons.
- Fairchild, D. 1943. Garden Islands of the Great East: Collecting Seeds from the Philippines and Netherlands India in the Junk "Cheng Ho." New York: Charles Scribner's Sons.
- Fairchild, D. 1947. *The World Grows Round My Door: The History of The Kampong, a Home on the Edge of the Tropics*. New York: Charles Scribner's Sons.
- Fairchild, D. n.d. List of Inventory Numbers of Section of Seed and Plant Introduction Which Refers to Seeds and Plants Secured by Lathrop and

- Fairchild. Unpublished report. Depository: The Archive and Library of Fairchild Tropical Botanic Garden, Coral Gables, Miami, Florida.
- Francisco-Ortega, J., M. Swan, B. C. Bennett and B. Jestrow. 2020. Early use of motion pictures in economic botany (1924, 1926): China, Indonesia, and Sri Lanka. *Econ. Bot.* 74: 363–371.
- Gao, Z. F., and B. A. Thomas. 1989. Occurrence of earliest cycads in the Permian of China and its bearing on their evolution. *Chin. Sci. Bull.* 34: 766–769.
- Ghanem, L. and H. Sofiane. 2014. Le Jardin d'essai du Hamma: histoire d'un jardin colonial. In: A. Bouchène, ed. 2014. *Histoire de l'Algérie à la période coloniale, 1830–1962*. Paris: La Découverte. Pp. 120–123.
- Glen, H. and D. Higginson-Keath. 2014. Information reconstruction of the historic plantings in Durban Botanic Garden. *Acta Hort.* 1035: 105–109.
- Harris, A. 2015. *Fruits of Eden: David Fairchild and America's Plant Hunters*. Gainesville: University Press of Florida.
- Korber, N., J. M. Nassar, J. Mosely, B. Jestrow, C. Lewis and J. Francisco-Ortega. 2016. The last plant hunting expedition of David Fairchild: Venezuela and Colombia (March–April 1948). *Brittonia* 68: 170–186.
- Kyoda, S. and H. Setoguchi. 2010. Phylogeography of *Cycas revoluta* Thunb. (Cycadaceae) on the Ryukyu Islands: Very low genetic diversity and geographical structure. *Pl. Syst. Evol.* 288: 177–189.
- Lawrence, G. H. M. 1964. A bibliography of the writings of David Fairchild. *Huntia* 1: 79–102.
- Maire, R. 1929. Luis Trabut. *Rev. Bot. Appl. Agric. Trop.* 98: 613–620.
- Mariotti, M. 2017. The contribution of some German personalities to botanical culture in Liguria (NW-Italy) between 19th and 20th centuries. *Bolletino Museo Istituto Biologia Università Genova* 79: 136–165.
- McKee, R. 1926. Seeds and plants imported by the Office of Foreign Plant Introduction, Bureau of Plant Industry, during the period from October 1 to December 31, 1923 (S.P.I. nos. 58024–58454). *Invent. U.S.D.A.* 77: 1–20.
- Morrison, B. Y. 1934. Plant material introduced by the Division of Plant Exploration and Introduction, Bureau of Plant Industry, January 1 to March 31, 1933 (nos. 101585–102377). *Invent. U.S.D.A.* 114: 1–38.
- Morrison, B. Y. 1936. Plant material introduced by the Division of Plant Exploration and Introduction, Bureau of Plant Industry, October 1 to December 31, 1933 (nos. 103777–103988). *Invent. U.S.D.A.* 117: 1–14.
- Morrison, B. Y. 1937. Plant material introduced by the Division of Plant Exploration and Introduction, Bureau of Plant Industry, July 1 to September 30, 1934 (nos. 105933–106560). *Invent. U.S.D.A.* 120: 1–26.
- Morrison, B. Y. 1940a. Plant material introduced by the Division of Plant Exploration and Introduction, Bureau of Plant Industry, April 1 to June 30, 1935 (nos. 110198–111857). *Invent. U.S.D.A.* 123: 1–63.
- Morrison, B. Y. 1940b. Plant material introduced by the Division of Plant Exploration and Introduction, Bureau of Plant Industry, July 1 to September 30, 1935 (nos. 111858–112306). *Invent. U.S.D.A.* 124: 1–22.
- Osborne, R. 1986. Focus on *Encephalartos woodii*. *Encephalartos* 5: 4–10.
- Peccenini, S. 2008. Le collezioni botaniche dell'Università di Genova: storia del Museo e dell'Orto Botanico. *Museologia Scientifica Memorie* 2: 156–160.
- Pieters, A. J. 1905. Seeds and plants imported during the period from September, 1900, to December, 1903 (nos. 5501–9896). *Invent. Seeds U.S.D.A. Bur. Pl. Industr.* 10: 1–333.
- Robbins, W. J. 1958. Elmer Drew Merrill, 1876–1956: Biographical Memoir. Washington DC: National Academy of Sciences.
- Russell, P. G. 1950. Plant material introduced by the Division of Plant Exploration and Introduction, Bureau of Plant Industry, April 1 to June 30, 1939 (nos. 132271–133381). *Pl. Invent. U.S.D.A.* 139: 1–75.
- Ryerson, K. A. 1930. Plant material introduced by the Office of Foreign Plant Introduction, Bureau of Plant Industry, July 1 to September 30, 1928 (nos. 77261–77595). *Invent. U.S.D.A.* 96: 1–20.
- Ryerson, K. A. 1931a. Plant material introduced by the Office of Foreign Plant Introduction, Bureau of Plant Industry, July 1 to September 30, 1929 (nos. 80811–81619). *Invent. U.S.D.A.* 100: 1–44.
- Ryerson, K. A. 1931b. Plant material introduced by the Division of Foreign Plant Introduction, Bureau of Plant Industry, January 1 to March 31, 1930 (nos. 82600–86755). *Invent. U.S.D.A.* 102: 1–111.
- Ryerson, K. A. 1932. Plant material introduced by the Office of Foreign Plant Introduction, Bureau of Plant Industry, January 1 to March 31, 1931 (nos. 90837–92336). *Invent. U.S.D.A.* 106: 1–67.
- Ryerson, K. A. 1933a. Plant material introduced by the Division of Foreign Plant Introduction, Bureau of Plant Industry, April 1 to June 30, 1931 (nos. 92337–93748). *Invent. U.S.D.A.* 107: 1–58.

- Ryerson, K. A. 1933b. Plant material introduced by the Division of Foreign Plant Introduction, Bureau of Plant Industry, January 1 to March 31, 1932 (nos. 95552–98256). *Invent. U.S.D.A.* 110: 1–96.
- Ryerson, K. A. 1934a. Plant material introduced by the Division of Foreign Plant Introduction, Bureau of Plant Industry, April 1 to June 30, 1932 (nos. 98257–100467). *United States Department of Agriculture Inventory* 111: 1–93.
- Ryerson, K. A. 1934b. Plant material introduced by the Office of Foreign Plant Introduction, Bureau of Plant Industry, October 1 to December 31, 1932 (nos. 101158–101584). *Invent. U.S.D.A.* 113: 1–24.
- Smith, J. G. 1900. Numbers 2701–3400. *Invent. Sect. Seeds Intro. U.S.D.A.* 7: 1–86.
- Strey, R. G. 1977. The Father of Natal Botany, John Medley Wood. *Natalia* 7: 43–45.
- Zuckerman, B. 1988. *The Dream Lives On: A History of the Fairchild Tropical Garden, 1938–1988*. Coral Gables, Miami, Florida: Fairchild Tropical Garden.
- Zuckerman, B. 1997. *The Montgomery Story*. Coral Gables, Miami, Florida: The Montgomery Foundation.