

Cycad Biology and Conservation

The 9th International Conference on

Cycad Biology

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Front cover: *Cycas debaonensis*. Image by Greg Holzman.
Spine: Emergent leaf of *Cycas diannanensis*. Image by M. Patrick Griffith.
Back cover: Mature leaf of *Cycas multipinnata*. Image by M. Patrick Griffith.

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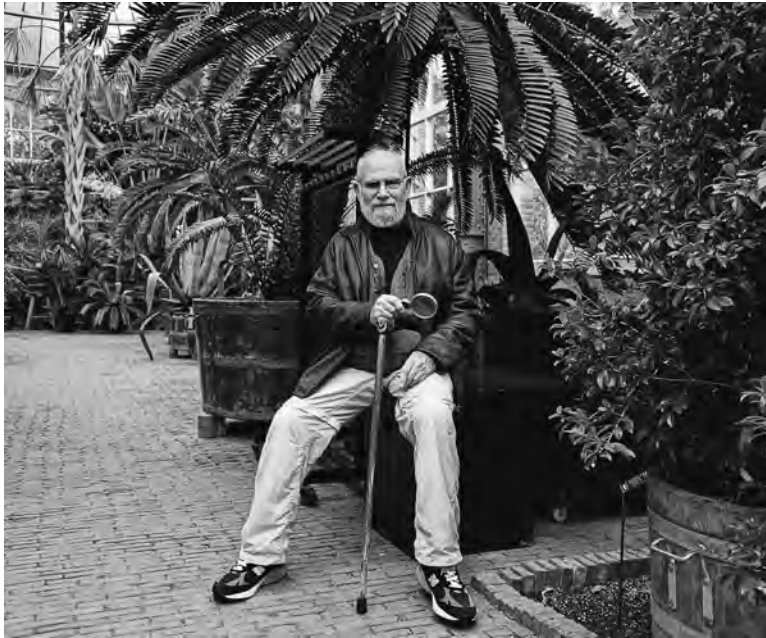
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In Memoriam: Oliver Sacks

8 July 1933–30 August 2015



Oliver Sacks under *Encephalartos altensteinii* in the conservatory of the Hortus Botanicus Amsterdam. Image: Bill Hayes.

In the passing of Dr. Oliver Sacks, we have lost not only a great neurologist and humanitarian but also a consummate botanist and Board Member of The New York Botanical Garden (NYBG). Interestingly, Oliver was mentored as a young man by Prof. Dr. Marie Stopes, the leading botanist of her day, who became a friend of his parents through her career as a leader in women's reproductive rights. Marie Stopes was an authority on both fossil and living plants with a specialty in cycads and ferns. Oliver often took trips with her to botanical gardens and continued his interest with regular Wednesday afternoon trips to NYBG. He became, as in all of his endeavors, an accomplished erudite botanist.

His lifelong interest and love of plants were, in his inimitable way, melded with his neurological interests, resulting in *Island of the Colorblind* dealing with his beloved cycads and Guam Dementia. Ferns were never far from his meandering through NYBG. Oliver was one of the most interesting members of the American Fern Society and particularly the New York Chapter, which meets at NYBG. It was here that he began the journey with the leading fern specialist, Dr. Robbin Moran, that resulted in *Oaxaca Journal*. Oliver was always in a most subtle way teaching all of us about the world around us—cephalopods for botanists—botany for geologists and any combination of interests that appealed to his eclectic nature and knowledge. He truly was a polymath. Oliver's appreciation of the plant world and understanding of the value of botanical gardens is demonstrated in *Awakenings*, in which he describes taking his patients to NYBG not just as a therapeutic exercise but also as an experience in serenity and awareness. All of our lives are better for having known him. Oliver Sacks will be missed by the botanical community in general and particularly by NYBG, where he so graciously and generously participated in its activities from serving as an enlightened board member to field trips and interaction with its horticulturalists and plant scientists. Clearly, humanity has improved by his presence and the world is a better place for his having been here.

Dennis Wm. Stevenson

The New York Botanical Garden

INTRODUCTION AND ACKNOWLEDGMENTS

*Cycad Biology and Conservation:
The 9th International Conference on
Cycad Biology*

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Over 100 delegates from 15 different countries, including 50 cycad experts from China, convened in Shenzhen, China for the 9th International Conference on Cycad Biology (*Cycad 2011*) Dec. 1–7, 2011 (Fig. 1-1).

Talks and posters were presented in eight main study areas: Genetics and Genomics, Conservation, Taxonomy and Phylogeny, Ecology, Horticulture, Toxicology, Economic Botany, and Information Management. Fifty-four talks and 22 posters were presented for a total of 76 presentations. A full list of presentations including full titles, abstracts, and authors is available in the Special Issue of the *Journal of Fairylake Botanical Garden* 2011, Vol. 10(3–4). The collected papers presented in this volume comprise the written proceedings of those presentations.

Continuing upon the very successful record of cycad conferences every three years, Cycad 2011 allowed cycad biologists from around the world to present new scientific discoveries, discuss future scientific directions, and build new collaborations for conservation. Central to the conference was the International Union for Conservation of Nature (IUCN)/Species Survival Commission (SSC)—Cycad Specialist Group, which met to update information on cycads on the Red List for 2011 with new data gained from recent research.



Figure 1-1. Delegates at the 9th International Conference on Cycad Biology at the Shenzhen International Garden and Flower Expo Park.

Cycad experts all over the world are rapidly improving our knowledge of these critically endangered plants at a time when this knowledge is especially crucial to their conservation. The need for a global forum for this expertise was clearly seen in the presentations and discussions. A clear path forward to future contributions was delineated in the concluding session, and plans were set forward for future conferences on the series.

Cycad 2011 was held at the Shenzhen International Garden and Flower Expo Park, a beautiful, comfortable, and welcoming venue. In addition to the important array of research and conservation material presented, conference participants were also treated to the very best in Chinese cultural experiences by the local organizing committee. The delegates also had the opportunity to explore cycads in the Shenzhen area. A field visit to the forest at the Meilin Reservoir afforded an opportunity to observe the endemic *Cycas fairylakea* in situ and discuss the conservation efforts for this population. In addition, participants enjoyed touring the very impressive National Cycad Germplasm Conservation Center, a major ex situ conservation collection located at Shenzhen Fairylake Botanic Garden. This living collection, with its associated research and conservation programs, sets a high standard for leadership in cycad conservation. Among other critically vital projects, the Center has established programs in conservation and reintroduction of the very unique Chinese endemic cycad, *Cycas debaoensis*.

Cycad 2011 Organizing Committee

Cycad 2011 was considered an immense success by the delegates, who are very grateful for the generosity and graciousness of the hosts in Shenzhen, China. The conference, sanctioned by the IUCN/SSC Cycad Specialist Group, was organized by Fairylake Botanical Garden (FBG), the Cycad Society of China, the Forestry Bureau of Guangxi Autonomous Region, The New York Botanical Garden, and Montgomery Botanical Center. The conference was co-organized by Shenzhen Urban Management Bureau, Department of National Reserves and Wildlife Conservation, the National Forestry Bureau, and the China Wild Plant Conservation Association. The Organizing Committee was chaired by Zhu Weihua of FBG, and Nan Li served as General Secretary of the Conference. The Academic Committee was chaired by Dennis Stevenson, Vice Chaired by Nan Li, and included Chen JiaRui, Huang Shong, and Patrick Griffith.

Proceedings Reviewers

The editors are very grateful for the expertise and effort provided by the reviewers of the included chapters: Esperanza Maribel Agoo, Octavio Aguilar, De Wet Bosenberg, Michael Calonje, Yu-Chung Chiang, James Clugston, Stephen Cousins[†], Boglarka Erdei, Cristina Lopez-Gallego, Yu-yuan Huang, Chad Husby, Domingo Madulid, Tracy Magellan, Thomas Marler, Alan Meerow, Philip Rousseau[‡], Terence Suinyuy, María Ydelia Sanchez-Tinoco, Lazaro Sanchez Velasco, Willie Tang, Irene Terry, Andrew Vovides, Phakamani Xaba, Wang Xinrong, Gong Yiqing, and Yong-Jiang Zhang.

[†]d. 16 June 2018

[‡]d. 29 November 2015