



深圳仙湖植物园 苏铁类植物迁地保护

EX-SITU CONSERVATION OF CYCADS
IN SHENZHEN FAIRY LAKE BOTANICAL GARDEN

主 编 陈谭清

副主编 李 楠

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目 录

1	导 言
3	深圳仙湖植物园苏铁类植物迁地保存概况
8	苏铁类植物的学术研究、交流和科普宣传
9	形形色色的苏铁类植物
9	波温铁属
10	角果泽米属
11	奇寡铁属
11	蕨铁属
12	苏铁属
25	双子铁属
26	非洲大苏铁属
28	鳞皮泽米属
29	大泽米属
30	泽米属
33	小苏铁属
34	仙湖植物园苏铁类植物名录

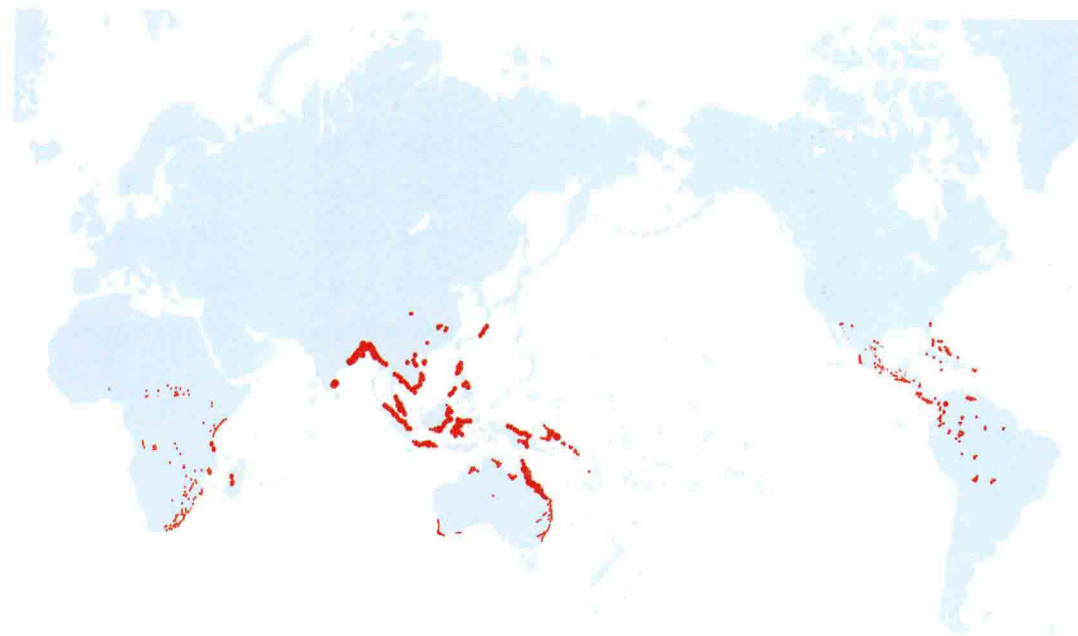
Contents

2	Introduction
4	A breif introduction to Ex Situ Conservation of Cycads in Shenzhen Fairy Lake Botanical Garden, China
8	Scientific Researches and Exchanges as well as Education of Cycads
9	Various Cycads in the World
9	<i>Bowenia</i>
10	<i>Ceratozamia</i>
11	<i>Chigua</i>
11	<i>Stangeria</i>
12	<i>Cycas</i>
25	<i>Dioon</i>
26	<i>Encephalartos</i>
28	<i>Lepidozamia</i>
29	<i>Macrozamia</i>
30	<i>Zamia</i>
33	<i>Microcycas</i>
34	Name List of Cycads conserved in Shenzhen Fairy Lake Botanical Garden

导 言

苏铁类植物是一群古老且濒临灭绝的“活化石”，是恐龙时代的植物。然而，在两亿多年的地质演变中，苏铁类植物没有和恐龙一同消失，而是奇迹般地生存了下来。如今，苏铁类植物仅存 3 科 11 属约 200 余种，分布于亚洲、非洲、美洲与大洋州的热带和亚热带地区。我国苏铁类植物仅 1 科 1 属，即苏铁属(*Cycas* L.)，约 20 余种。苏铁俗称“铁树”，由于气候的原因在寒温带地区栽培难得开花，因而有“千年铁树开了花”之说，其实在环境条件适宜的热带和亚热带地区，苏铁几乎每年都可以开花。苏铁树形奇特、庄重典雅、四季常青，具有独特的热带景观效果，是南方的古寺庙和园林绿地常见的景观植物。苏铁全株可入药，有收敛止血、解毒止痛、益肾固精、平肝降压、去风活络等功效；其茎干和种子含有丰富的淀粉，经碾磨和漂洗去毒后可供食用。

苏铁类植物的研究可为探讨古生态、古气候、古地理和植物区系的演变提供科学依据。鉴于其生存现状和重要的学术、经济价值，地球上现存的所有苏铁种类均被列入红皮书，作为重点对象加以保护。然而，这样一群极其珍贵、稀有的植物，其自然生境却遭到日益严重的破坏，种子或植株被盗时有发生，就地保护状况令人担忧。因此对苏铁进行迁地保育十分必要。



苏铁类植物在世界上的分布

Cycads in the world

Introduction

Cycads are regarded as a group of ancient, relic and endangered "living fossil". They are the plants of dinosaurian era. However, through the geological evolution of at least 250 million years, they have not disappeared together with dinosaurs, but still been alive miraculously so far. Today, living cycads consisting of more than 200 species in 11 genera and 3 families, are found in the tropical, subtropical and warm temperate regions in Asia, Africa, America and Australia. More than 20 species in genus of *Cycas* L. are found in China. "Iron tree", a popular name for cycads in China, is seldom in bloom in North China because of the climatic reason. Therefore, there is a popular Chinese saying "the iron tree of thousand years is in bloom" in term of miraculous thing has happened. In fact, cycads can be in bloom almost every year in their favorable environment in South China. With peculiar trunk, grave and noble figure, and evergreen fronds, cycads can be provided with unique tropical landscape effects. They are popular scenic plants in temples, gardens and landscape of South China. All parts of cycads can be used as medicines which have effects of astringent, antidote, anodyne, being beneficial to kidneys of human being, relieving hypertension and rheumatism etc.. The trunks and seeds of cycads are rich in starch which is edible through special processes of being crushed and rinsed to eliminate its toxins.

Studies on cycads may extend our knowledge on the evolution of paleoecology, paleoclimate, paleogeography and vegetation. In view of their surviving state and important scientific and economic values, every species of living cycads has been listed in Red Data Book so as to be protected as key plants. However, the present conditions of *in situ* conservation of cycads are not completely optimistic. Their natural habitats have been destroyed daily, seeds and individuals are stolen frequently. Therefore, the *ex situ* conservation of cycads is also extremely essential.

深圳仙湖植物园苏铁类植物迁地保存概况

仙湖植物园搜集、保存的苏铁类植物主要种植在三个区：苏铁园、古苏铁林和苏铁国际迁地保存中心，占地总面积约5公顷。其中“苏铁国际迁地保存中心”就占地约2.7公顷。中心内的分区主要依据每种苏铁类植物的地理分布种植，分为亚洲区、美洲区、非洲区、澳洲区；亚洲区分为国产区和东南亚区；国产区又划分为普通栽培苏铁小区、海南苏铁小区、攀枝花苏铁小区和叉叶苏铁小区等10余个小区。今年又增设了苗圃和古苏铁林。迄今，本中心已累积引入苏铁类植物9属，约130余种、变种或变型，万余植株。大部分种类生长良好，部分种类已开花结实。

地处南亚热带的仙湖，进行苏铁类植物的迁地保育研究，条件得天独厚！本中心地处梧桐山北麓偏西坡下，海拔100 - 130m，土壤母质为页岩、砂岩分化的黄壤，多石砾，偏酸性，经改良后的土壤肥沃、疏松，是苏铁类植物生长、繁育和保存的良好场所。自1989年至今，仙湖植物园先后多次对苏铁类植物进行了野外考察和引种工作，采集了大量的植物标本，同时开展了苏铁类植物的分类学、分子生物学、解剖学、孢粉学、同工酶，细胞染色体及繁殖栽培技术等方面的研究。

仙湖植物园主要气候因子指标

The main climatic factors in Shenzhen FairyLake Botanical Garden

年平均温度 (℃) Annual mean temperature	22
最高月份平均温度 (℃) Maximum monthly mean temperature	28.2
最低月份平均温度 (℃) Minimum monthly mean temperature	14.1
年最高温度 (℃) Annual maximum temperature	38.7
年最低温度 (℃) Annual minimum temperature	0.2
年降雨量(mm) Annual precipitation	1933.3
年相对湿度(%) Annual relative humidity	71-85

A breif introduction to Ex Situ Conservation of Cycads in Shenzhen Fairy Lake Botanical Garden, China

The Cycads Collection in Shenzhen Fairy Lake Botanical Garden includes three parts, covering an area of ca. 5 ha. They are Cycads Garden, Antique Cycads Forest, and The International *Ex Situ* Conservation Center of Cycads.

The International *Ex Situ* Conservation Center of Cycads is located at the north foothills of Wutong Mt., at 100–130 m altitude, covering an area about 2.7 ha.. The soil is loose and fertile, yellow or rocky, slightly acid, which is favorable to the growth, propagation, and conservation of cycads. So far, more than 130 species, varieties, or cultivated forms, belonging to 9 genera (*Bowenia*, *Ceratozamia*, *Cycas*, *Dioon*, *Encephalartos*, *Lepidozamia*, *Macrozamia*, *Stangeria*, *Zamia*), have been introduced to the center from Asia, Africa, America and Australia. Native species including almost every species of *Cycas* recorded in China are conserved here. Most of them grow well and some species have blossomed and fructified. The center is divided into different sections, subsections and units. The division is made mainly according to the geographical distribution of each species.

Up to now, many investigations have been performed about cycads. About 600 numbers and more than 6000 sheets of specimen were collected. The studies on reproduction and propagation of cycads, including the experiments of hybridization, germination, cutting and grafting, the researches on tissue culture, anatomy, palynology, allozyme, cytology, molecular systematics and taxonomy have been carried on.





地处梧桐山北麓偏西坡下的仙湖，属南亚热带气候，进行苏铁类植物的迁地保育研究，条件得天独厚
Shenzhen Fairy Lake Botanical Garden is situated at the eastern suburb of Shenzhen, China ($22^{\circ} 34' N$, $114^{\circ} 10' E$). The 590-hectare garden relies its eastside on the green and magnificent Wutong Mountain. With south subtropical climate, the garden possesses excellent natural conditions to the growth and conservation of Cycads.



宁静的苏铁园是人们休闲度假的好去处

The peaceful Cycads Garden is a good place for entertainment and holiday.



苏铁与鳞秕泽米群植景观 Landscape of *C. revoluta* and *Zamia furfuracea*.



苏铁是我国南方园林绿地常见的景观植物

C. revoluta is one of popular scenic plants in gardens and landscape in the south of China.



苏铁皇 *Cycad Emperor* (*C. elonga* (Leandri) D. Y. Wang)

苏铁类植物的学术研究、交流和科普宣传

Scientific Researches and Exchanges as well as Education of Cycads



第二届全国苏铁学术会议暨第二届中国植物学会苏铁分会会员代表大会于1998年12月在深圳仙湖植物园召开。

The Second Chinese Symposium of Cycads and the Second Meeting for the Deputies of Chinese Cycads Society were held in Shenzhen Fairy Lake Botanical Garden in December, 1998.



攀枝花苏铁小区：繁殖并保存了百余株攀枝花苏铁实生苗。

More than one hundred seedlings of *Cycas panzhihuaensis* reproduced by the center are conserved in Panzhihua Unit.



举办苏铁专题展览，进行苏铁科普宣传

Display of cycads is held for tourists education.



贵州苏铁和蕨铁羽叶扦插实验获得成功

The reproduction experiments by fronds cutting of *Cycas guizhouensis* and *Stangeria eriopus* were successful.



苏铁国际迁地保存中心

The International *Ex Situ*

Conservation Center of Cycads

形形色色的苏铁类植物

Various Cycads in the World

波温铁属 *Bowenia* Hook. ex Hook.f.

现存 2- 3 种，均分布于澳大利亚东北部沿海的昆士兰热带地区。本属植物具二回羽状叶，很易辨认。

The genus consists of two or three living species, all being restricted to tropical Queensland, Australia. Species of *Bowenia* are the only cycads to have bipinnate leaves.



美丽波温铁雄株及其珊瑚根

A male individual of *Bowenia spectabilis* with its coralloid roots.



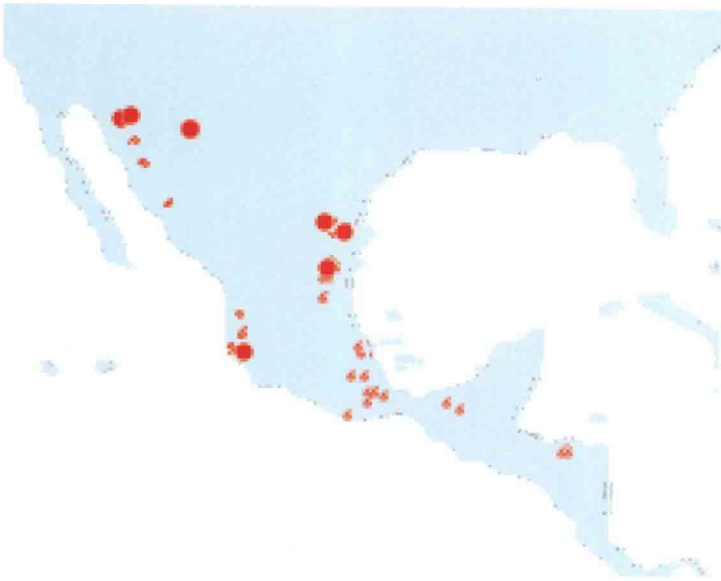
齿叶波温铁及其雌球果

An individual and female cone of *B. serrulata*

角果泽米属 *Ceratozamia* Breng.

现存约11种，分布于中美洲墨西哥等国家。本属植物的大孢子叶果期顶端有两个角状突起。

Consisting of 11 living species, which are mainly restricted to Mexico, with a couple of species extending into Belize and Guatemala. Species of *Ceratozamia* can be immediately distinguished by the paired, horn-like projections on the peltate sporophylls.



稀有濒危物种轮叶角果泽米

The rare and endangered species *C. hildae*



墨西哥角果泽米已开花 *C. mexicana* has been in bloom

奇寡铁属 *Chigua* D. Stevenson

2 种，南美洲哥伦比亚特有属。小叶具中脉和叉状分支的侧脉，边缘有锯齿；侧脉与中脉间呈锐角。

Consisting of two species, both endemic to Colombia in South America. The leaflets of *Chigua* have a prominent midrib and forked lateral veins arising at acute angle to midrib.



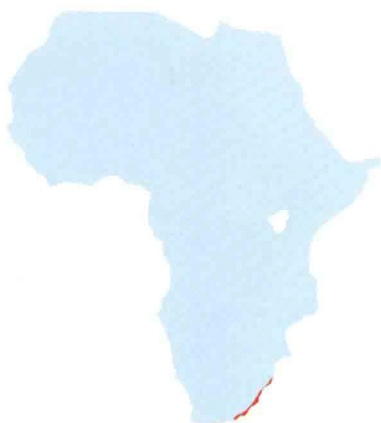
奇寡铁的叶和雄球果

Leaves and male cone of *C. restrepoi* D. Stevenson

蕨铁属 *Stangeria* T. Moore

单型属，南非特有。叶似蕨叶，具中脉和叉状分支的侧脉，边缘有锯齿；侧脉与中脉间呈直角分叉。

Monotypic genus, with the solitary species endemic to South Africa. This genus is readily recognized by its pinnate, fern-like leaves with a prominent midrib and forked lateral veins arising at right angles to midrib.



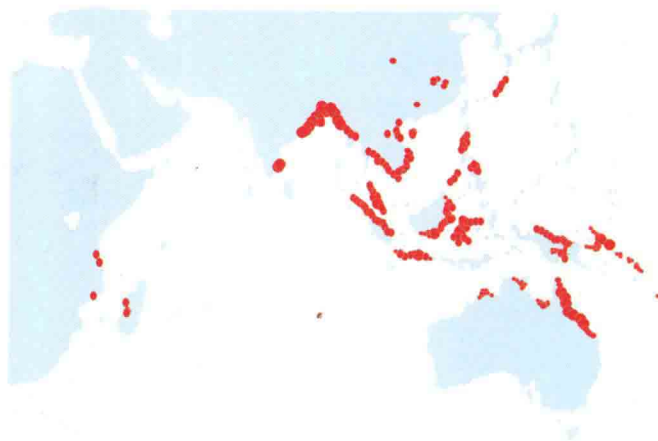
蕨铁植株及其雌雄球果

A young individual, male and female cones of *S. eriopus*.

苏铁属 *Cycas* L.

现存约40余种, 分布于亚洲、大洋洲和非洲。
本属植物小叶仅具中脉, 全缘。

Consisting of more than 40 living species, being found in Asia, Australia and South Africa. Species of *Cycas* are readily recognized by their entire leaflets which have a prominent midrib and lack any lateral veins.



这株仙湖苏铁, 是地道的“本地苏铁”, 据悉移自于梧桐山上 (中图为其雌、雄球果, 下图为雌株)。

C. fairylakae is a species native to Shenzhen. This individual is said to be transplanted from Wutong Mt. at the beginning when the garden was built (Middle: female and male cones; Bottom: a female individual).