

3GBGC: Building a Sustainable Future-the Role of Botanic Gardens



Studies on the Relation between Current Global Botanic Gardens and Plant Diversity Conservation

Yu Yu-Hua, Liao Jing-Ping, Huang Hong-Wen✘, Ding Chao-Hua, Zheng Yong-Li

South China Botanical Garden, the Chinese Academy of Sciences, Guangzhou 510650, China

The Role of Botanic Gardens

Plant diversity is the foundation of Biological Diversity. Globally, botanic gardens are important scientific institutions and play a key role in plant diversity conservation. Botanic Gardens have very important roles to play in the dissemination of scientific knowledge and public education, of plant resources sustainable development and reasonable utilization.



The Current Status of Global Botanic Gardens

At present, about 2,400 botanic gardens have been set up in the world, around 100,000 species with more than 6,130,900 living plant and germplasm resources conserved in botanic gardens throughout the world, of which 8,823 species are on the IUCN red list of threatened plants. In China, there are over 160 botanic gardens, which cover an area of about 26,000hm², and conserve more than 18,000 plant species in all.



Of which 12 botanic gardens are affiliated to the Chinese Academy of Sciences, which has three key botanic gardens, that is, Wuhan botanical garden, South China Botanical Garden and Xishuangbanna Tropical Botanical Garden.



In recent years, the Chinese government and the Chinese Academy of Sciences (CAS) have paid great attention to conserving China's indigenous plant species. The CAS has drafted a 15-year master plan to guide the overall program of conserving them.



The first 5-year plan has five goals: i) to increase the number of Chinese species represented in the 12 CAS botanical gardens from $\sim 13,000$ species to $\sim 21,000$, which would be more than two thirds of China's indigenous species;



ii) to enhance or establish botanical garden collections for the $\sim 5,00$ plant species considered as rare and endangered; iii) to create five regional gardens to be maintained as complex communities mirroring neighbouring ecosystems,



to improve the chances of survival of additional species of plants; iv) to establish an information network among the gardens; and v) to improve horticultural and landscaping architecture of the gardens.



The significance of conserving plant diversity

The conservation of plant diversity around the world is of fundamental importance for the future of humankind, because of the significance of individual plant species and the communities and ecosystems they make up for the establishment of global stability.



Scientific achievements of China's Botanic Gardens in Plant Diversity Conservation

Xishuangbanna Tropical Botanical Garden monitored the flowers behaviour in nine species of *Alpinia* (*Zingiberaceae*) both native and introduced, in a tropical seasonal rainforest in Xishuangbanna, Yunnan, in southwest China.



This research showed that each species of *Alpinia* has two phenotypes that coexist in all populations which differ in the movement of the flower stigma .

This was a discovery of a new outcrossing mechanism; that is, a flexible style encourages



South China Botanical Garden
studied the pollination biology
of *Caulokaempferia coenobialis* (Hance) K. Larsen
in the Dinghushan and Nankunshan natural
reserves in Guangdong province in 2002, 2003
and 2004. Where a new self-pollination Mechanism
Was discovered called pollen sliding self-pollination.



In 2006, the South China Botanical Garden, Chinese Academy of Sciences analysed organic carbon in a 20-cm soil layer between 1979 and 2003; the results showed that old-growth forests in Dinghushan



Natural Reserve in southern China can accumulate carbon in soils. This phenomenon indicates the need for future research on the complex responses and adaptation to global environmental change belowground processes.



How to Conserve Plant Diversity

It is suggested studies on plant taxonomy and conservative biogeography be strengthened. In situ and ex situ conservation for plant diversity as well as reintroduction should also be enhanced.



Scientific researches on natural reserves should be further increased.

Conserving indigenous rare and endangered plant species; the native plants should be developed and utilized sustainably.



The dissemination of scientific knowledge and public education on the conservation of plant diversity needs to be further strengthened.

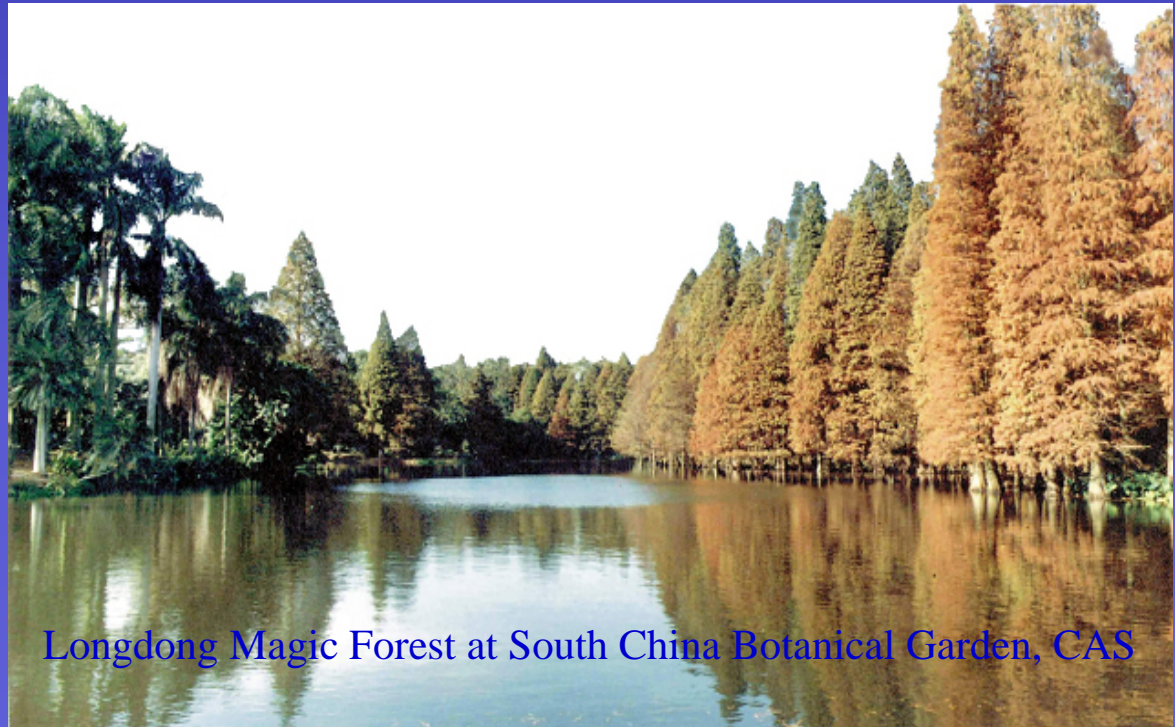


Perspective

Under the guide of Convention on Biological
Diversity Global Strategy for Plant
Conservation, the Gran Canaria declaration II
on Climate Change and Plant Conservation can
be well implemented by global botanic gardens,



the plant diversity will be conserved better, its sustainable and harmonious development must also be realized.



Longdong Magic Forest at South China Botanical Garden, CAS

