Preface

There are about 2,000 existing botanical gardens (arboreta) in the world, with about 100,000 species of higher plants collected and preserved. Of these species, about 15,000 are endangered plants. These gardens receive 200 million visitors annually, promoting the advancement of plant science and public knowledge services. Due to the lack of systematic review of the historical and current data of Chinese botanical gardens, the basic status of the number of botanical gardens, conservation capacity, and plant *ex situ* conservation are unclear, and the national strategy for *ex situ* conservation of plant diversity is difficult to clarify. After more than four years of questionnaire survey, literature research, and field visits, the team of *Ex Situ Cultivated Flora of China* in South China Botanical Gardens carried out a comprehensive survey of the national botanical gardens and their *ex situ* conservation, analyzed the development status and existing problems of the Chinese botanical gardens, and proposed relevant suggestions. They expected to promote the joint development of the national botanical gardens through the implementation of the "Construction and Evaluation of the National Standard System of Botanical Gardens" and the compilation and research of *Ex Situ Cultivated Flora of China*, and to play an active role in integrating the protection and utilization of plant resources.

Since the establishment of the Hong Kong Zoological and Botanical Gardens in Hong Kong by Westerners in 1871, the Chinese botanical gardens had experienced about 150 years. But before 1950, the botanical gardens and arboretums in China were mainly established by colonists, and secondly by the Chinese. The main purpose of the botanical gardens and arboretums established by the Chinese was to meet the needs of research of plant resources and teaching in China, and the period before 1950 was a difficult stage in the history of the construction of botanical gardens in China. Over the past hundred years, there are three stages in the large-scale construction of modern botanical gardens, namely the restoration and exploration stages from 1950 to 1964, the rapid development stage from 1980 to 1994, and the steady development stage since 1995. The main functions of the botanical garden change from the investigation of plant resources, introduction and domestication to the protection of rare and endangered plants and the protection of biodiversity. There are 161 botanical gardens and arboretums that cover the main climatic regions in China, such as the tropical humid regions, the subtropical regions, and temperate regions, but there is no botanical garden in the cold and temperate regions on the Qinghai-Xizang Plateau.

After the founding of the People's Republic of China, especially since 1980, the Chinese botanical gardens have made great progress in plant *ex situ* conservation and staff construction, and have become an important force in the international botanical gardens. At present, the total area of Chinese botanical gardens has reached 102,007.2 hm^2, of which the area of gardens for specific collections is 5,400 hm^2, and the area of natural vegetation is 76,171.7 hm^2. China has built *ex situ* conservation experimental facilities of a certain scale, of which the area of plant conservation or nursery is 1,014.9 hm^2, the area of micro-propagation facilities is 36,745 m^2, the area of seed banks or seed specimen banks with an area of 11,962 m^2, and the area of specimen arboreta is 30.4 hm^2. Chinese botanical gardens and arboreta have established a large-scale workforce. The

total number of employees is 11,227, including 2,876 scientific researchers, 2,937 landscaping and horticulture managers, 1,161 science popularization education personnel, more than 103 well-known botanical specialty experts, which have formed a certain influence in the field of international botanical gardens and plant *ex situ* conservation.

According to a sample survey of *ex situ* conservation plants in China, there are 396 families, 3,633 genera and 23,340 species. Among them, 288 families, 2,911 genera and 22,104 species are native plants, accounting for 91% of the family, 86% of the genera and 60% of the species in native higher plants, respectively. The living collections and cultivation in the Chinese botanical gardens and arboreta have formed the core and backbone of China plant *ex situ* conservation. About 40% of rare and endangered plants of the latest checklist of *China Plant Red Data Book* have been conserved *ex situ* in the Chinese botanical gardens. The Chinese botanical gardens and arboreta currently have 1,195 gardens of living collections. According to the preliminary analyses and statistics, 51 families with more than 100 species, 34 genera with more than 50 species, and 15,199 species of living plants have been collected and *ex situ* cultivated in these gardens, which have played a positive role in the conservation of native plants in China. Due to their institutional characteristics, the botanical gardens of Chinese Academy of Sciences (CAS) have long been engaged in the collection, research, discovery and utilization of specific genus and family, and some specialized plants. The botanical gardens of CAS have the characteristics of long history, rich accumulation, strong regional representation and strong systematic data accumulation, and play a significant leading role in the number of accessions, *ex situ* conservation species, nationally and locally endemic species, rare and endangered species. The 119 members of Chinese Union of Botanical Gardens have extensive coverage and regional representation. In the national botanical garden system, the top 50 botanical gardens in the number of *ex situ* conservation species, specialized living collection gardens, China and endemic species, and rare and endangered species have the botanical garden representativeness and the complete information of *ex situ* conservation, have an extensive representative of *ex situ* collection and play a central role in plant *ex situ* conservation in China.

China's huge resource platform for the introduction, *ex situ* cultivation and protection of plants at home and abroad in recent decades has played an important role in basic botanical studies, such as plant taxonomy, morphological anatomy, reproductive development, and genetic breeding. Based on living plant collection, the Chinese botanical gardens have made great progress in scientific research, and have played an extremely important role in the exploration and utilization of plant resources. The Chinese botanical gardens have become high-quality tourist scenic spots and important tourist destinations. A systematic service facility of public education and tourism has been established in order to facilitate and launch the public education courses for universities and middle and primary schools, and science popularization activities with unique features of botanical gardens. The number of tourists reached 160 million from 2012 to 2014, including 30 million young people, clearly suggests that the Chinese botanical gardens provided good social benefits.

However, the history of the Chinese modern botanical gardens is relatively short, and some problems exist in the botanical garden construction and management. For example, the Chinese botanical gardens lack the overall planning and deployment at the national level and the management norms of botanical garden construction. Pan park-based phenomenon exists in the management of botanical gardens. The collection of living plants and the management of *ex situ* conservation in the Chinese botanical gardens are insufficient. The management and information recording of living plants in the Chinese botanical gardens have not received sufficient attention. Scientific researches on the collection of living plants are deficient, and the applications of plant resources need to be strengthened. Public education and knowledge dissemination mostly stay at the

level of publicity, and it is urgent to construct and implement an educational curriculum system that is in line with international standards.

During the investigation and compilation of *The Chinese Botanical Gardens*, a large number of materials have been searched, sorted and summarized. Many colleagues in each botanical garden have participated in the collection and sorting of the data and the investigation of the botanical gardens. Some of them have been indicated in the book, but many contributors may still be omitted. Thanks for the supports from projects of Construction and Evaluation of National System of Botanical Garden Standards (KFJ-1 W-NO1 and KFJ-3 W-NO1-2), China-Compilation of *Ex Situ Cultivated Flora of Botanical Gardens* (NO. 2015FY210100), Key Laboratory of Plant Resource Conservation and Sustainable Utilization of Chinese Academy of Sciences, Guangdong Provincial Key Laboratory of Digital Botanical Garden, and Guangdong Provincial Key Laboratory of Applied Botany.

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