

Protecting Orchids in Nature Reserves: Research and Restoration Needs

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Abstract Will installment of a few fences and rangers be sufficient to secure the rich orchid floral in an economically challenged area under the current rapidly changing environments? What are the research and restoration needs? We convened the Guangxi International Orchid Conservation Symposium in May 2009 in Leye county, a remote, rural area in southwestern China that is rich in orchids, to address these questions. Symposium participants examined orchid conservation issues from various angles, as reflected in this volume. Although the biological factors in orchid conservation were emphasized, social factors (i.e. protected area - people relations) were also presented here. These reviews and analyses will inform conservation workers in China as well as around the world.

Keywords Biodiversity · Biological Conservation · Chinese Orchids · Endangered Species · Protected Area · Southwestern China

In 2004, a workshop sponsored by the IUCN Orchid Specialist Group Asian division was held in Yunnan province, southwestern China, to educate forest managers in southern China the importance of orchid conservation. Mr. Wu Tiangui, the director of the then Yachang State Forestry Station of Guangxi Zhuang Autonomous Region, was among the many trainees. After a long and difficult hike, the trainees were shown a very small patch of slipper orchids that were poached to near extinction. Not impressed by what he saw, Mr. Wu made a casual comment, “if this is orchid, I have a lot of them in my mountains”. Although not quite believing what he said, one of us (YBL), who was one of the teachers of the workshop, decided to check Yachang’s mountains out. That was the beginning of an astonishing discovery of what turned out to be a very large number of orchids (nearly 140 species and growing), in Yachang, a relatively small 220 km² state forestry reserve in a remote area of Guangxi province, southwestern China. The most extraordinary features about Yachang, just as Mr. Wu commented, are that populations of many of the terrestrial and lithophytic orchids are extremely

large. These are not just any orchids, but those in high demands in horticultural and herbal medicinal trades and collected to near extinction in other places. This discovery is a source of excitement for orchid conservationists in China and around the world. Orchids, as one of the most diverse group of plants, are also among the most threatened (Cribb et al., 2003; Koopowitz et al., 2003).

Realizing the specialness of the findings, the provincial government of Guangxi swiftly granted the area a nature reserve status, a decision later ego by the State Forestry Administration of China in 2009. However, will installment of a few fences and rangers sufficient to secure the future of these unique botanical resources in this economically challenged area under the current rapidly changing environments? The Guangxi provincial government decided to seek scientific advice from national and international orchid specialists and conservation biologists by sponsoring the Guangxi International Orchid Conservation Symposium near the Yachang Orchid Nature Reserve. Because the issues examined in the symposium also apply to other orchid-rich nature reserves around the world, we decided to publish the best analyses from this symposium in an international journal. This was the genesis of this special issue.

We begin the volume by examining why park-people matters to sustainable management of nature reserves around the world, especially in Asia, and ways to improve the relationship (Heinen, this volume). Cameron (this volume) looks at how plant systematics can help with orchid conservation. Factors relates to the projected climate change that are likely to threaten the long-term persistence of orchids were identified in southwestern China, and research needs to better understand and mitigate these threats were proposed (Liu et al., this volume). Seaton and colleagues (this volume) explore seed-banking as a complementary ex-situ measure to mitigate impacts of climate change. Two kinds of biotic interactions, pollination and mycorrhizae, play vital roles in orchid reproduction and survival, we therefore specifically look at the relationship between orchid pollination and conservation, using *Cypripedium* (Bernhardt and Meier, this volume) and the diverse orchids in the Mediterranean region (Vereecken et al., this volume), respectively, as example groups. In addition, Liu and colleagues (this volume) examine the nature and role of mycorrhizal fungi in promotion of seed germination and seedling growth of Chinese orchids. While recognizing the potential of symbiotic germination and seedlings in orchid restoration, Yam et al. (this volume) presents asymbiotic restoration methods undertaken in Singapore, which has generated admirable successes, not only in nature reserves, but also in urban parks and streets. Finally, the importance of seemingly unrelated organisms in sustaining orchid populations is illustrated by Pemberton (this volume) through recognition of the vital but little known, specialized, biotic interactions between orchid pollinators and non-orchid organisms. We believe that these reviews and discussions will not only inform conservation workers in China, but around the world.

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