

Conserving *Cypripedium macranthos*

PHILIP SEATON discovers first-hand that a project at Beijing Botanical Garden aims to re-introduce this threatened species



Cypripedium macranthos

Yu Zhang

IT WAS AN OFFER I COULD not refuse. 'Would you like to see some cypripediums tomorrow? It would take about two hours to drive up into the mountains to the nursery.' With buds like birds' eggs that gradually unfold to reveal flowers of an ephemeral and fragile beauty, cypripediums are top of my list of desirable orchid species. Although they are gradually creeping into cultivation, they are nevertheless still seen at orchid shows all too rarely, and the fact that they have a reputation for being temperamental in cultivation only adds to their mystique.

The offer was being made by Yu Zhang, who is in charge of the Orchid Living Collections at Beijing Botanical Garden, to myself and Yung-I Lee from Taiwan. We had just arrived in Beijing that morning after speaking at the 1st Guangxi International Orchid Conservation Symposium, held in Leye in Guangxi province. Our first visit, however, was to the Orchid Unit at the Botanical Garden. After a tour of the glasshouses we were taken to the laboratory complex, where we were greeted by Yu's colleague, Deng Lian. Here I was surprised to discover that not only were seeds of *Cypripedium macranthos* being germinated asymbiotically (using the following media successfully, Vacin & Went, Harvais, and Murashige & Skoog), but they were also being germinated symbiotically using a fungus isolated from cypripedium roots.

The use of fungal partners

This was the first time that I had encountered a fungus suitable for germinating cypripedium seeds. Not so for Yung. He explained excitedly that he had also isolated a suitable fungal partner for *C. formosanum* at the Botanical Garden of the National Museum of Natural Science, Taichung, Taiwan. Deng opened a refrigerator



A clump of *Cypripedium macranthos* in full bloom at the mountain nursery where the seedlings are grown on

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door, and proudly showed us their fungus collection grown on agar slopes and maintained at 4°C.

Unlike the seeds of tropical orchids that are routinely germinated in the light, the germination of terrestrial species is generally inhibited by illumination. Most will only germinate and complete their initial developmental stages in the dark. Thus our next visit was to a room

devoted to flasks containing anaemic ivory-coloured protocorms. The seedlings in flasks were hidden beneath sheets of newspaper, and could only be viewed beneath the eerie green of the room's 'safe lights'.

Growing plants on

As growers are aware, however, the survival rates of seedlings transferred from flask to compost tend to be low. And so it was that we found ourselves early the next morning driving north out of Beijing past a section of the Great Wall of China on our way to see the next stage in the process. After driving for about one and a half hours, we arrived at the base of a small mountain, which rose abruptly from the edge of the plain. We wound our way slowly upwards ➤

to the nursery at around 800 to 900m above sea level. Here the climate is cooler and more amenable to *Cypripedium* culture, with minimum temperatures of around -20°C in the winter, and generally staying below 30°C in the summer.

Even though past their peak, the rows of *C. macranthos* were a splendid sight, with blooms of various sizes in shades of pink. They were mostly being grown atop ridges running along the length of the large shade houses, with a few specimens cultivated in large pots sunk into the ground. Shelter from the summer sun was provided by 70 percent shade cloth. The nursery had previously been a vegetable garden, but now that the area had been assigned the status of a nature reserve the local people had been moved to alternative locations. The loamy soil had been enriched with additional humus, and the pH was a little below 7.

The climate in the Beijing area is (to me) surprisingly dry. During the six months of winter the shade cloth is removed and the plants are exposed to the elements. At this time, apart from the occasional covering of snow, there is very little precipitation, and plants are given no extra protection apart from a little extra covering of soil for the newly transplanted seedlings, which were being grown in pots surrounded by a polythene wall to offer further protection.

As well as *Cypripedium macranthos*, the nursery contained small numbers of *C. calceolus* and *C. shanxiense* from northern China as well as *C. tibeticum* and *C. flavum*. But apart from a few remaining flowers of *C. calceolus*, only *C. macranthos* was in full bloom.

Pests

As the plants were being grown essentially in the open, an obvious question to ask was if there were any serious pest problems. With such a



Above Deng Lian (left) and Yu Zhang (right) in the laboratory



Cypripedium macranthos has flowers in a range of pink shades

dry climate it appeared that slugs and snails, such a menace in the British climate, would not be a problem. Imagine my surprise however, when Ren Yan Dong began to dig into the soil and soon revealed a large pale grub several centimetres long. This evil-looking creature was apparently a major pest, causing severe damage by chewing through the bases of the shoots. Showing a photograph of the offending beast to Professor Youqing Luo at Beijing Forestry University later that day, revealed that it was the larva of a large scarabid beetle.

Re-introduction programme

As part of her role in charge of the Orchid Living Collection at the Beijing Botanical Garden, Yu is also responsible for orchid research projects. The long-term goal is to begin to re-introduce plants back into their previous natural habitats. Yu is hoping to get further facilities at the Garden to raise her seedlings and hence improve survival rates before transplanting them to grow on at the mountain nursery at the start of the short rainy season in early June.

Yu was the Eric Young Orchid

Student at RHS Garden Wisley from 2000–2001. She is now the General Secretary of the China Orchids Society, and in October 2009 she graduated from Beijing Forestry University. She has been awarded a Ph.D. for her project 'Research into germplasm resources and conservation biology of *Cypripedium macranthos* in China'.

Threats in the wild

Unfortunately, a large proportion of Chinese *Cypripedium* remain targets for plant collectors, and have been smuggled out of the country to destinations in Japan, Europe and North America. Originally collected by local people from the mountains to the northeast of Beijing, *C. macranthos* is under threat in its natural habitat, and its commercial sale is prohibited in China. For someone who has a particular interest in production and storage of orchid seed as part of an integrated conservation strategy it was, however, encouraging to see a large number of ripening seed capsules. The researchers are comparing the generation of seed through hand pollination with natural pollination by bumblebees. Indeed, it was a privilege to be treated to an all-too-brief insight into the work currently being undertaken on the conservation biology of *Cypripedium* in northern China. ■

PHILIP SEATON is Project Manager for Orchid Seed Stores for Sustainable Use (OSSSU), a Darwin Initiative project based at the Seed Conservation Department of the Royal Botanic Gardens, Kew, Wakehurst Place

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Pots of *Cypripedium macranthos* plants sunk into the ground at the mountain nursery

Philip Seaton