Alpine Habitats and Cultivation in North-West Yunnan©

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In 2005, the author spent 3 weeks (August to September) studying alpine plants in the Lijiang and Zhongdian areas of Yunnan, China, both in the wild and in a local nursery. This helped in the understanding of how these plants grow in relation to soil, climate, aspect, and associated flora. The author also gained an insight into Chinese horticulture and was able to share experiences of alpine plant cultivation with Chinese students and nurserymen.

INTRODUCTION

As propagator for Kevock Garden Plants (Kevock), a nursery that specialises in unusual alpines, I have been responsible for the cultivation of a wide range of Chinese origin plants since July 2003. In August 2005, an opportunity arose for me to participate in a joint expedition to northwest Yunnan with the University of Edinburgh and the Kunming Institute of Botany. Although the main aim of their expedition was to study *Rhododendron* growing on limestone and its fungal associations, this would take them into the alpine zone where I could study the growing conditions of the plants I cultivate.

In particular, I wanted to focus on ten key genera: *Arisaema, Codonopsis, Cyananthus, Daphne, Gentiana, Meconopsis, Pedicularis, Primula, Rhododendron,* and *Saxifraga.* I also sought to gain an understanding of how a local nursery, Yunnan Gesang Flower Company Limited (Gesang), grows its alpines.

Yunnan is a huge and geographically diverse province ranging from the eastern fringes of the Tibetan Plateau to semi-tropical rainforests on the Vietnamese border. The northwest corner is dominated by the massive Hengduan Mountain Range, which is dissected north-south by the upper reaches of three mighty rivers: the Salween, the Mekong, and the Yangtze.

The range contains a huge variety of plant habitats between the river at or face on 1,500 m above sea level and the snow-capped peaks above 5,000 m. The prevailing wind brings warm wet monsoons from India, creating lush temperate vegetation on western slopes and progressively drier, Mediterranean landscapes to the east.

LIJIANG AREA

We explored the Yu Long Shan, a predominately limestone mountain separated from the rest of the range by the Lijiang Plain and bends in the Yangtze River. Our daily explorations clearly demonstrated how the vegetation changed: from damp meadows of *Primula, Gentiana*, and *Pedicularis* to forests of *Rhododendron* — the species mix reflecting the levels of moisture, altitude, aspect, and soil. The Gang Ho Ba glacial moraine was particularly exciting because species of *Rhododendron, Primula, Gentiana,* and *Daphne* were growing in virtually pure limestone.

We also saw people harvesting wild plants as traditional medicine, and inevitably the more valuable species are becoming rarer. The Royal Botanic Garden

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Edinburgh is encouraging some of the local people to cultivate medicinal plants in addition to their traditional crops in return for their support for the Nature Reserve and a new Botanic Garden on Yu Long Shan.

ZHONGDIAN AREA

Although we failed to reach the upper screes of Shika Shan, we did see alpine meadows and a wide range of woodland plants. We also gained an insight into what the early plant explorers endured as we tried to fight a way through dense *Rhododendron* forest.

At Hong Shan and Bai Ma Shan we were able to drive up to the alpine zone, finding gems such as *Primula bella* or carpets of *Gentiana hexaphylla* within a metre of the roadside. It was amazing to see the different mechanisms used by plants to survive on the exposed scree and rocky outcrops: deep tap roots or tubers, the frost protecting hairs, and the vivid blue and pink flowers to attract pollinators.

At Tianchi Lake, at 3,800 m, the habitat was more acidic *Rhododendron* woodland and damp meadows of *Gentiana sino-ornata*. Although winters can be severe here, the upper canopies of the woodland and forests protect the under-storey vegetation, which includes members of genera such as *Arisaema*, which in the U.K. may not be fully hardy.

At Napa Hai we found *Rhododendron* growing on the edge of a limestone quarry.

YUNNAN GESANG FLOWER COMPANY

After the official expedition I stayed on to visit Gesang, particularly the areas of alpine and lily production. I discussed propagation and cultivation techniques with the nursery manager.

The nursery sourced most of its alpines from the wild as seed or as a few plants that were then grown in the alpine research unit where growth could be monitored and stock accumulated. I saw cultivated *Meconopsis* seed being dried and cleaned in large round wicker trays. All seed was sown in small plastic crates and seedlings were generally left for a year before planting out in beds, some of which were covered by shade netting. Cuttings were simply placed in pots of sand and peat moss, since there were no mist units or systems for supplying bottom heat. There have been trials at Gesang with micropropagated *Cypripedium,* but these appeared to be in "shock" following transfer to a peat-based medium.

The lily production area was more sophisticated, reflecting the considerable assistance that Gesang has received from a Dutch bulb specialist company. Facilities included 30 sealed polytunnels, bulb grading and counting machines, cold storage areas, and a micropropagation unit. The breeding programme is based on crossing imported oriental lilies with local native species. The company also has a range of satellite farms for the production of early forcing tulips and other lilies to maximise the flowering period.

Gesang is able to produce large quantities of high quality cut flowers for the markets in Kunming, Shanghai, and Beijing. Production of alpines is, by comparison, a low priority, presumably because there is not yet a significant market for them within China.

CONCLUSION

Horticulture in China is inevitably benefiting from the dynamic economy. Gesang's success shows that disposable income is already being spent on cut flowers. The pace of urban development, which includes the provision of parks, street planting, and a proliferation of private gardens, must be stimulating horticulture more generally. The commercial cultivation of alpines in China may be in its infancy, but it could help to save the wild plants as well as generate planting material for new alpine gardens.

Other companies are likely to follow the Gesang approach and bring in foreign advisors and technology, which can then be adapted to local circumstances. However, according to the students on the expedition, horticulture is still seen as part of agriculture and there is little by way of training for amenity horticulture. I left wondering where the new gardeners and landscapers are going to come from and sorry that I did not have more time to discover and explore other nurseries.

I learned a lot about planning and participating in an expedition to look at plants in the wild. It is vital to have a good guide with reliable local knowledge of the plants, their whereabouts and accessibility.

Overall, I believe I had a very successful trip to China and left with a better understanding of how alpines grow in relation to soil, climate, aspect, and associated flora. Nurseries will only be able to provide appropriate growing conditions for alpines if the provenance is understood. However, there will still need to be a degree of trial and error, as we will never be able to create a complete match, especially on a commercial scale. In any case, if the plant is too tricky to grow, the customer may not be interested.

But, I only saw the tip of the iceberg — not only is there still much to be learned from the known areas of interest, such as the Yu Long Shan, but there are so many alpine areas of China that have yet to be explored by horticulturalists and conservationists.

Acknowledgements. I would like to thank the GB&I Region of IPPS and all those who have made donations to the Mary Helliar Travel Scholarship for their generous support of my trip. I am also grateful for the sponsorship that I additionally received from the Royal Horticultural Society, the Scottish Rock Garden Club, and the Merlin Trust.

A full report of Jane Armstrong's findings is available to sponsors of the Mary Helliar Travel Scholarship.