

Gesneriaceae of Thailand and Lao

Final report for the Davis Expedition Fund

Carmen Puglisi
Royal Botanic Garden Edinburgh, 20A Inverleith Row, EH3 5LR
cpuglisi@rbge.ac.uk

Background

Thailand is a hotspot for the biodiversity of the plant family Gesneriaceae. The latest data indicate that the country hosts c. 235 species in 30 genera. These numbers, however, are extremely likely to be underestimates, as new species and even genera are still being discovered (unpublished data). Most taxa are restricted to limestone substrates and are narrowly endemic. Endemicity, combined with the difficult access to the steep karst formations and the remoteness of many limestone sites, means that plant collection is still necessary in order to discover the plant diversity in Thailand and establish conservation priorities.

My current research focuses on the subtribe Loxocarpinae and on the genus *Microchirita* (C.B. Clarke) Yin Z. Wang. All the genera under investigation have their centre of biodiversity in Thailand, and the material available for taxonomic investigation suggested the north and the west of the country as the most interesting targets of this expedition.

During the late stages of field work planning in spring 2014, the political unrest in Thailand hit a critical point and a military coup took place. As a consequence, the counterparts from the Forest Herbarium (BKF) were no longer able to run any expedition and suggested that alternative plans to field work in Thailand should be made. With the help of the director of Pha Tad Ke Botanical Garden (Lao PDR), and Singapore Botanic Gardens, an expedition to the neighbouring Luang Prabang province in Lao PDR was organised. Luang Prabang is a poorly explored province characterised by fragmented limestone formations, therefore another very interesting area for the collection of Gesneriaceae. As the unrest in Thailand partly settled over the summer, it was finally decided to run two short expeditions in October, one in Lao PDR, and the other in western Thailand.

The expedition teams

Team Lao PDR: Keoudone Souvannakhoummane (Pha Tad Ke Botanical Garden), Michele Luigi Rodda (Singapore Botanic Garden), Carmen Puglisi (Royal Botanic Garden Edinburgh) and local gardeners.

Team Thailand: Somran Suddee, Preecha Karaket and Chandee Hemrat (Forest Herbarium, Bangkok), David J. Middleton (Singapore Botanic Gardens) and Carmen Puglisi (Royal Botanic Garden Edinburgh).

Visa and permits

Laos and Thailand grant tourist visa on entry. Plant collections were made under the terms and conditions of the permits granted by the Governments to my counterpart institutions, Pha Tad Ke Botanical Garden (Luang Prabang, Lao PDR) and the Thai Forest Herbarium (Bangkok, Thailand).

Collection methods

The collections made were general, therefore plants were collected without restrictions to specific taxa of interest, yet in compliance with the CITES and local regulations. Plants for herbarium collections were collected in sets of at least three duplicates whenever possible, in order to guarantee distribution to the herbarium of the host institution (PTK or BKF), E and SING, and potentially more. Collection data were recorded in the field and plants were pressed on return to the base camp in the evening. In Laos, the expedition team was equipped with electric fan heaters. An old camping tent was adapted to become a drying chamber for the pressed specimens and the silica gel (Figure 1). Fully dried specimens were subsequently stored in plastic bags and kept as insulated as possible from the atmospheric humidity. In Thailand, where the electric heaters were not available, we preserved the pressed specimens in alcohol. Once we returned to Bangkok at the end of the trip, the specimens were left open to let the alcohol evaporate and then dried at the facilities of BKF herbarium.

Associated with all the herbarium specimens are silica gel samples for DNA extraction, and for some selected Gesneriaceae of interest, spirit collections were made, too. Both the silica gel and the spirit collections were deposited at SING herbarium, in Singapore.



Figure 1. The plant drier used in Lao PDR. An old camping tent was strapped to a small fan heater at one end and to the plant press at the other. Inside the chamber, the silica gel was routinely dried overnight. Left: specimens ready to be pressed and dried. Right: the drier in use (also demonstrating its additional application as socks drier).

Itinerary

In Lao PDR, from Pha Tad Ke Botanical Garden we drove to Nong Khiaw and then sailed on the river Ou up to Muang Ngoi, which is where we set our base. From there, over eight days we explored the surrounding areas on daytrips. Back in Pha Tad Ke, we collected on the mountain within the botanic garden.

The expedition in Thailand followed an itinerary already predetermined with the Thai counterpart. From Bangkok, we drove to Uthai Thani and then Mae Sot. From Mae Sot we followed the Thai-Burmese border all the way to Mae Hong Son. Then we started our southwards journey and went to Chiang Mai, Sukhothai and finally Bangkok.

Outputs

The collecting trip to Lao PDR resulted in 288 collections, including 43 living accessions for cultivation in Pha Tad Ke Botanical Garden and Singapore Botanic Gardens. 245 accessions consist of herbarium specimens and associated samples in silica gel, which have been distributed to PTK, E and SING.

In Thailand, 165 collections for herbarium were made (Fig. 2). The primary set of specimen was deposited in BKF, the duplicates in E and SING. Again, all the collections have a matching sample in silica gel for DNA extraction, deposited in SING.

The Thai collection is particularly rich in Gesneriaceae and several new species have already been identified. An article describing four new species of *Microchirita* has been submitted already and two more articles are under way.



Figure 2. Thai plants collection in action. Top left: plant collecting. Top right: a plant of *Microchirita* is pressed in newspaper. Bottom left: leaf material was taken for desiccation in silica gel. Bottom right: one of the new species of *Microchirita* discovered in Thailand. All photos by Preecha Karaket.

Budget

The contribution of the Davis Expedition Fund (£2900) was used as follows: international flights (£927), excess baggage (£160), car hire in Thailand (£562) and Lao PDR (£150), boat hire in Muang

Ngoi, Lao PDR (£400), accommodation in Lao PDR (£105), Bangkok (£213) and elsewhere in Thailand (£180), and counterpart costs (£700, shared with staff from the Singapore Botanic Gardens).

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