The Phan Si Pan and Beyond!

In October 2014 **RICHARD A. BAINES**, Curator, Logan Botanic Garden organised a four week expedition to northwest Vietnam and writes about the different habitats and plants found.

The main focus of the expedition was the Hoang Lien mountain range and we had the privilege of having as partner Nguyen Van Du from the Institute of Ecology and Biological Resources in Hanoi. The trip was supported by three members of staff from Hanoi who arranged guides, provided logistical support and planned the itinerary.

The visiting team comprised horticulturists from Logan Botanic Garden, the Royal Botanic Gardens, Kew, the University of British Columbia, Vancouver and Longwood Gardens, U.S.A.

The primary aims of the trip were as follows;

- To collect, identify and examine species distribution of the genus *Magnolia* that are located in this area. In recent years a number of new species have been identified with many threatened in their native habitat.
- To collect specialist conifers for the Conifer Conservation Project including *Podocarpus, Calocedrus* and *Amentotaxus*.
- To collect living material principally in the form of seed. A great number of species native to this area are currently severely threatened by de-forestation and cultivation and many are present in small, fragile populations. The resulting offspring will be grown at Logan, Kew, Longwood and the David C. Lam Asian Garden at the University of British Columbia.

Topography and climate

The Phan Si Pan (or Fansipan), at 3,143 m is the highest peak in the Hoang Lien mountain range, often known as the rooftop of the Indochinese countries. It is located between two districts, Sa Pa in Lao Cai and Than Uyen in Lai Chau. This area covers the entire land of the Hoang Lien reserve of 29,831 hectares; the National Park received its protected status in 1986 from Vietnam's Prime Minister. It is 36 km from Lao Cai, the provincial town and 300 km north-west of Hanoi. The Hoang Lien mountain range is at the eastern extremity of the Himalayas and oriented along the Red River in roughly a north-west to south-east direction. The mountains have been formed from both gneiss and ancient granite rock. The lowest point of the reserve is 1,000 m asl in the valley between Phan Si Pan and Sapa town. The valley levels out in the southern part of the reserve and has been for the most part terraced for rice production and is populated by ethnic minorities.

The climate of the area is very humid with 76 to 96% humidity all year

View from summit of Phan Si Pan Mountain.

round and an average annual rainfall of 2,770 to 3,552 mm.

The heaviest rainfall occurs in July and August with an average temperature of 15 to 17 °C. Temperatures range from -3 to 29 °C with December and January the coldest months. Snow generally falls for between one to three days each year.

The natural vegetation is subtropical and temperate forest with extensive biodiversity, largely cleared by the immigrant ethnic groups. Today much of this area is under cultivation and only 10,000 ha of Virgin forest remain which is reducing every year.

The population of the area is approximately 10,000 which is composed of seven ethnic groups; Hmong, Dao, Kinh, Tay, Giay, Hoa and Xa Pho. They live mainly by cutting, burning and cultivating the forest slopes and by collecting and hunting for forest products such as tubers, roots, fruits, vegetables, birds and mammals.

The Sa Pa-Phan Si Pan area has recorded over 2,024 species belonging to 771 genera and 200 families. One of the interesting points is the high degree of endemism at nearly 18%. In Vietnam there are over 753 useful species, representing about 37% of the total species recorded. Of these, 428 are used for medicinal purposes, 123 for timber, 92 are edible plants, 51 for ornamental plants, 16 for oil, nine for dye, five for fibres and 10 for other uses. The area contains 126 threatened species including 34 critically endangered species including *Fokienia hodginsii, Abies fansipanensis* and *Taxus chinensis*.

Steep slope towards the summit of Phan Si Pan.

Sa Pa, our base camp, was established as a hill station by the French in 1922 and is a booming tourist town accommodating trekkers and backpackers. On clear days amazing views are visible of the mountains towering above on all sides and plunging valleys cascaded with intensive rice terraces. This epic scenery is regularly obscured by thick mist rolling across the peaks. The streets are filled with colour early each morning as local hill-tribes populate the streets with their vibrant costumes.

The Phan Si Pan can only be reached by foot due to rough, steep terrain and is treacherous during adverse weather conditions. Ladders, ropes and a high fitness level are required to reach the peak (a three day return trip). En route one sees a 100 m high silver waterfall 12 km from Sa Pa.

Whilst planning the trip I liaised with many people who had previously undertaken plant exploration trips to this area. This enabled us to locate plant species using GPS and pin point precise locations where species had recently been observed.

Within its natural area of 29,845 ha, there are 21,894 ha of forest which include 14,678 ha (67%) of natural forest that has only seen slight impact from human activity. As a result of the height and climate the vegetation of the Hoang Lien National Park has a range of vegetation zones:

1. Tropical rain forest on land below 700 m This type of forest is found on the south east boundary of the National Park in places such as Ban Ho. This forest

has been greatly affected by exploitation, cultivation, cattle raising and forest fires. It is very fragmented within the low lying areas. Structurally, the forest has a timber layer at about 5 to 10 m composed of species such as *Castanopsis* sp., *Quercus* sp., *Litsea* sp., *Schima wallichii* and *Magnolia* (*Michelia*) *mediocris.*

2. Sub-tropical rain forest in lower mountain layer, 700–1,700 m This forest often lies in mid-level in the high mountains or on the side of a ridge of the high mountains. With its year round cool climate and high moisture levels this vegetation contains many plants that are indigenous to Northern Vietnam or Southern China. This area contains a diverse range of trees and shrubs including *Fokienia hodginsii, Magnolia* (*Michelia*) sp., and *Alnus nepalensis.*

3. Sub-tropical rain forest in upper mountain layer, 1,700–2,400 m This area is temperate, cool, steep sided and mostly found amongst the peak areas of the Hoang Lien Son Range. A growing problem in this area is the vigorous bamboo forest composed of *Sinoarundinaria griffithiana* which occupies space and prevents sunlight from reaching newly emerging seedlings.

4. Temperate evergreen rain forest, above 2,400 m This area is concentrated around the Phan Si Pan peaks. The mountain tops are affected by cold weather, thin soil and cloud cover. The flora is mainly composed of the following families; Ericaceae, Lauraceae, Fagaceae and Magnoliaceae. Many of the trees act as host for a range of epiphytes such as *Rhododendron emarginatum* and orchids such as *Pleione* sp.

The expedition

All overseas members of the expedition arrived in Hanoi on 28 October and spent the evening planning the finer details of the forthcoming trip. Each member of the expedition fulfilled a specific role including seed collecting, pressing specimens, collecting DNA samples, photography, supplying GPS data, porters transporting materials and guides.

The following day, with supplies and equipment assembled, we travelled to the mountainous region of Vietnam along a newly constructed carriageway. The vegetation started off as intensive small scale cultivation, soon changing to rugged mountainous terrain shrouded in dense mists.

On Thursday 30 October we started exploring the dense vegetation in San Sa Ho, Lao Cai District with its deep ravines full of dense sub-tropical vegetation. Numerous species of *Schefflera* were observed including the truly impressive *Schefflera macrophylla* with its enormous compound pinnate leaves—the biggest of the genus!

At Logan we grow *Polyspora speciosa,* a very showy member of *Theaceae* which survives at -8 °C without damage so I was delighted to see *Polyspora longicarpa*. This species has large white camellia-like flowers with a cluster

of golden-yellow anthers. Another glowing attribute of this genus is the attractive glossy green lanceolate leaves.

A number of interesting members of Hydrangaceae were recorded including *Schizophragma* and *Dichroa* with its showy, large cobalt blue fruits. Several *Rhododendron* species were observed including *R. excellens, R. irroratum* and epiphytic species *R. sororium* and *R. emarginatum*. Other interesting flora included two species of *Daphniphyllum* probably *D. chartaceum* and *D. longeracemosum*, both trees to 10 m with fleshy green berries 1 cm across and glossy green handsome foliage.

After negotiating fairly steep terrain along narrow paths that doubled up as streams we finished the day with 60 collections and made our way back to Sa Pa.

The following day we travelled to Ton Station for a three day hike to the summit of the Phan Si Pan. Initially collecting through mixed forest at an altitude of 1,900 m the topography was fairly undulating with many interesting tree genera such as *Castanopsis, Magnolia, Acer* and *Huonodendron* with its attractive two tone burgundy and chocolate coloured bark.

The under-canopy contained a number of *Rhododendron* species in the Maddenia subsection notorious for their showy flowers and delightful scent. We came across our first specimens of *Rehderodendron macrocarpum* with its large nut like seeds. Firstly observed in Mount Emei and rarely observed growing outdoors in Britain this tree is one of the showiest members of the *Styrax* family. In mid-May white flowers with conspicuous yellow anthers are produced in axillary racemes along with the leaves. Another stunning find was a *Camellia* species that was in full bloom with large white wavy petals, 10 cm across with a cluster of butter-yellow stamens.

It was evident that recent storms had resulted in many large trees being blown over and much damage was evident. The topography became steeper with increasing altitude. We reached basecamp at 2,147 m at sunset spending the evening in a tarpaulin-covered tent supported by wooden poles. On a camp fire we cooked up a tasty meal of noodles, yams, pork and fresh greens all washed down by a healthy dressing of local vodka! Little sleep was achieved as many people were packed in like sardines and exiting the tent involved walking over many bodies. In the morning I had the ideal tonic to perk up one's spirit with a 3-in-1 coffee!

On Saturday 1 November we hiked from the base camp to the second camp, a shorter distance but much steeper than the previous day. To assist us several ladders had been fitted to steep rock faces and concrete bamboo rails improved safety along steep ravines. Travelling through deep gorges we observed many spectacular specimens of *Rhododendron sinofalconeri* along with a giant fluorescent worm!

During our journey we passed many fine stands of *Magnolia sapaensis* in the 2,200 to 2,400 m zone covered in pink seed pods that were starting to

Collecting camellia seeds.

disperse. This species has been flourishing in recent years at Tregrehan and has readily produced flowers in early summer. This magnolia would be ideally suited to Logan, with a similar climate to Cornwall.

That evening we stayed in a recently constructed wooden cabin. Our arrival was greeted by torrential rain but the stunning scenery was well worth the arduous journey! The cabin was divided into separate apartments with raised wooden floors. We ate sardines, chicken, greens and rice—washed down with a generous helping of vodka warmly toasted at every serving! A crisis was narrowly avoided when my water bottle was filled with vodka by accident! Sleep was cramped—with six people per floor and the building had a strong, unknown unpleasant odour!

A *Camellia* species with 10 cm flowers.

Amazingly, cans of soft drinks were being sold by local tribes at the summit for 30 dong (£1),

photograph © Richard Baines

View of drumlins in Ha Giang province.

an amazing bargain! Porters are paid $10 per day to transport goods up the mountain, a miserly figure when you consider the energy required to do this.

Seed collecting was going incredibly well with 181 collections made in just three days. Large areas of dead bamboo forest, *Sinoarundinaria griffithiana* were observed just below the summit where the bamboos had recently died

photograph © Richard Baines

Hardwood veneers are stacked along the roadside.

and been flattened by snowfalls.

On Sunday 2 November we made our final ascent to the summit, a two mile steep climb through mud and rough terrain. The stunning views and clear blue skies that greeted our arrival were breathtaking. We only made a few collections but collected seed from the highest growing plants in Indochina namely *Rhododendron crenulatum, R. huidongense,* and *R. sinofalconeri.*

A new cable car was being constructed at the summit with a proposed completion date of 2015. All work is done manually by workers who live on site and, sadly, it is unlikely that the surrounding vegetation will survive unscathed by the works.

On the long walk back we suffered torrential rain and raging streams that had appeared from nowhere! Thoroughly soaked and exhausted we returned to Sa Pa and enjoyed a well-deserved shower. That night we treated ourselves by ordering western food including pizzas and burgers. Our taste buds must have thought that Christmas had come early! We then met Dan Hinkley who was also in Vietnam carrying out fieldwork.

On 3 November we travelled to Bhang Koang village where we collected in a mainly deciduous forest. A recently constructed road allowed us to botanise in a very remote area rarely visited before.

During our lunch we observed a dead snake with similar colours to that of a coral snake but still enjoyed our rice, dried chicken and pepperami surrounded by heavy rain and mist. The find of the day had to be *Aesculus wangii*, only discovered approximately 12 years ago. We collected six enormous chestnuts located in dense vegetation by our eagle-eyed guide. Fantastically, the two seeds that came to Logan have already resulted in plants nearly 1.5 m tall.

That night we ate a traditional Vietnamese hotpot that was our guide Du's favourite dish. We purchased an additional bag for the seed collections along with a pair of shoes as my boots were permanently wet!

The following day started early with our usual bowl of noodles, then we travelled to Bat Dai Son in Ha Giang Province. Great swathes of recent deforestation were observed on the hillsides, and local sawmills were full to capacity with recently harvested timber.

On 5 November we met with the Head of Forestry in their local office. Our collecting permits were without an essential signature but Du quickly resolved this enabling field work to recommence. Much time was spent sorting and cleaning seeds, getting field notes up to date and packaging up DNA specimens.

After a brief meeting with the Head of Forestry the following day all documentation was confirmed as acceptable, after which we hiked up the Bat Dai Son Mountain to a height of 1,200 m through conditions resembling a Turkish bath!

During the ascent we observed isolated specimens of *Calocedrus macrolepis, Colocasia esculenta* and plentiful showy specimens of *Callicarpa longifolia*. Towards the summit the terrain was very steep with loose stones

underfoot so extra care had to be taken to avoid serious injury.

Magnolia and conifer conservation programmes had been initiated with plants of each being grown in a nursery at the rear of the Forestry Station. The station has been involved in the production of a new booklet titled *Selected Threatened* Magnolia *Species of Ha Giang Province, Vietnam*.

After an early start on Friday we hiked up the mountain behind the Forestry Station in Bat Dai Son. At the summit, specimens of *Trachycarpus geminisectus* and *Taxus wallichiana* were observed with the former only discovered in the last decade. It is easily distinguishable from other *Trachycarpus* by its dual folded leaves. Numerous *Calocedrus macrolepis* had also been planted out at approximately 800 m as part of the conifer conservation programme.

Later, we travelled back to our hotel in Ha Giang, a typical hotel that would not suffer from a top to bottom clean! A truly scary journey with wild driving and crazy moped operators!

On Sunday we travelled to the base of Tay Con Linh mountain, Vietnam's second highest mountain. The 23 km ride on the back of a motorbike to the summit was a breathtaking and exhilarating three hours! Towards the summit a conifer conservation project was firmly established with numerous plantings of *Cunninghamia konishii*, *Fokienia hodginsii* and *Calocedrus macrolepis* that were approximately 20 years old. Many of the *Cunninghamia* had been destroyed by a large scale forest fire several years ago.

Landslides were a common sight in the area with total devastation being the result. A virgin rhododendron forest was observed just below the summit bordering a bamboo forest some 15 m high. In the forestry hut a worker had lived there alone since 1989 with no electricity 23 km from nowhere! Plant of the day was *Schefflera macrophylla* with enormous leaves up to 1.5 m across which dwarfed every other *Schefflera* that I have ever seen!

On 12 November we travelled to Tam Dao Mountain in Vinh Phuc Province watching water buffalo in twos and threes grazing along the roadside with bells around their necks. From dawn, women also carried out manual labour in the paddy fields. We also observed thousands of hardwood veneers stacked and drying at the side of road together with manioc plantations.

Tam Dao hillside resort has been developed for people to escape the summer heat. Several species of *Magnolia* form part of a tree canopy with a few rhododendrons at the peak, including a possible new species in the Maddenia subsection. At the peak we walked through an extensive bamboo forest and observed an amazing landscape with the lower summits shrouded in mist and cloud. We botanised the base of the mountain at approximately 1,000 m. Today's highlights included *Illicium*, *Castanopsis* and several *Magnolia* species.

We travelled on to Hanoi where we met the Faculty Head at the Institute of Ecology and Biological Resources. He was pleased to cement our collaboration with an M.O.U. to further develop a three-year partnership programme.

Above, *left*, the compound leaf of *Schefflera macrophylla*, and *right*, *Trachycarpus geminisectus*.

In total, 482 plant collections were recorded including 450 seed collections, 475 DNA collections, 470 herbarium specimens, 4,500 photographs and 31 living collections.

The trip highlighted the gulf between our lifestyle and that of local tribes in this part of Vietnam. Locals rely on the forests for almost everything and in future years if the forests disappear what will they do? Observing children scavenging in local rubbish tips trying to locate items of worth highlighted the poverty levels experienced. The impact of deforestation on the area and the necessary urgency in mapping the flora of the region was another key issue.

We were very grateful for the work carried out by our colleagues from the Hanoi Institute and the support from Forestry Headquarters, to whom we are greatly indebted.

The trip has allowed many new species to be introduced to Logan that are threatened in the wild and will also allow further research to be carried out to support the study of plants in Vietnam.

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