

DAVIS EXPEDITION FUND

REPORT ON EXPEDITION / PROJECT

Expedition/Project Title: BRD (Nepal) 2014

Travel Dates: 15th of August to the 15th of September 2014

Location: Baglung, Rukum and Dolpa Districts, Mid Western Region Nepal

Group Members: Dr. Patrick Kuss & Alan Elliott

Aims: Patrick – To collect *Pedicularis* specimens for morphological and phylogenetic work as part of the revision for the Flora of Nepal

Alan - To collect *Clematis* specimens for DNA and floristic work as part of my PhD project. Gain fieldwork experience from working in Nepal

Outcome (not less than 300 words):-

Baglung, Rukum, Dolpa (BRD) Expedition 2014

15 August to 15 September 2014



Royal
Botanic Garden
Edinburgh

ROYAL BOTANIC GARDEN EDINBURGH

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DEPARTMENT OF PLANT RESOURCES

MINISTRY OF FORESTS AND SOIL CONSERVATION

GOVERNMENT OF NEPAL

INTRODUCTION

The expedition to Baglung, Rukum and Dolpa Districts was led by the Royal Botanic Garden Edinburgh (RBGE) and jointly conducted with Nepal's Department of Plant Resources (DPR).

The main purpose of the expedition was to collect herbarium specimens and silica gel dried samples from three districts of Mid Western Nepal. These three had been identified as under collected and some of the least visited Districts in Nepal, and it was hoped that a programme of wide scale plant collecting would likely yield many species not previously recorded in the area. The specimens and information gathered on the expedition will directly benefit the work of the Flora of Nepal Project, a priority within the *Nepal Biodiversity Strategy 2002* and the *Nepal Biodiversity Strategy Implementation Plan 2006*.

EXPEDITION PARTICIPANTS

Dr Colin A. Pendry (Leader), RBGE

Dr Patrick Kuss, University of Zurich and a current Sibbald Fellow at RBGE

Mr. Alan Elliott, University of Edinburgh and RBGE

Mr Ganga Datt Bhatt, National Herbarium and Plant Laboratory of Godawari, Department of Plant Resources, Kathmandu

Mr Subhash Khatri, Department of Plant Resources, Kathmandu

EXPEDITION ITINERARY

The initial proposed timetable for the expedition had to be revised due to resurfacing work at Juphal airstrip so our itinerary was cut short by 4 days to allow us to fly back to Kathmandu. Following discussion with the bus company we began the expedition a day earlier than schedule to compensate for delays caused by landslides which had blocked the road beyond Pokhara. This resulted in a 26-hour bus journey, with 3 changes of bus and a jeep to reach where we would begin

the trek, each time unloading the bus, carrying the equipment across the landslide and reloading on to the new vehicle.

Once on the ground the route set out in the proposal was modified as we went along to suit conditions, finding campsites and incorporating rest days when members of the group had medical problems. We had hoped to spend several days collecting at Phoksundo Tal but unfortunately we were only able to spend a few hours there due to the revisions in the itinerary.

The expedition visited the following localities.

Day	Date	Details
1 -5	15 th - 19 th August	Kathmandu - Trek Preparations.
5-6	19 th - 20 th August	Bus journey. Departed Kathmandu 6pm on 19 th arrived Bhimgithe 8pm 20 th (350km).
7	21 st August	Bhimgithe (1200m) to Suprang (2300m) - Walk - short jeep ride - walking thereafter.
8	22 nd August	Suprang (2300) to Uttarganga (2800m)
9-10	23 rd -24 th August	Uttarganga (2800m) to South of Phalgune Dhuri (3800m)
11	25 th August	South of Phalgune Dhuri (3800m) to Phalgune Dhuri (4100m) to Thankur (3200m)
12	26 th August	Thankur (3200m) to Kayam (2700m)
13	27 th August	Kayam (2700m) to Guibang (2890m)
14	28 th August	Guibang (2890m) to Sen Khola Camp (3710m)
15	29 th August	Rest day at Sen Khol
16	30 th August	Sen Khola to to Upper Pani Dhal Khola - High Camp (4300m)
17	31 st August	Upper Pani Dhal Khola (High camp (4300m) to Lower Camp (4000m) - Jangla Bhanjang (4500m) - to Lower Camp (4000m).
17	1 st September	Upper Pani Dhal Khola (4000m) - Jangla Bhanjang (4500m)- Beluwa (2334m)
18	2 nd September	Beluwa (2334m) - Dunai (2063m).
19	3 rd September	Dunai (2063m) to Shyanta (2403m)
20	4 th September	Shyangta to Phkosumdo Khola
21	5 th September	Phoksumdo Khola (3100m) to (3803m) to Phoksumdo Tal (3600m) to Phoksumdo Khola (3100m)
22	6 th September	Phoksumdo Khola (3100m) to Kageni (2250m)
23	7 th September	Kageni (2250m) to Juphal (2480m).
24	8 th September	Juphal to Kathmandu
25	9 th September	Sorting the 451 collections in to the duplicate sets
26	10 th September	Sorting the 451 collections in to the duplicate sets
27	11 th September	All day at National Herbarium working on <i>Pedicularis</i> (Patrick) & <i>Clematis</i> (Alan) collections.
28	12 th September	Morning at National Herbarium working with <i>Pedicularis</i> (Patrick) & <i>Clematis</i> (Alan) collections. Afternoon: Post Trek seminar at DPR with staff and students from TU.
29	13 th September	Packing away gear into the store in Kathmandu
30	14 th September	Securing export permits for the collections
31	15 th September	Depart Kathmandu

METHODS

Vascular plants, including ferns, were collected if found to be in suitable fertile condition, with flowers or fruits, to be made into herbarium specimens. We split into two teams collecting different plant families/groups with the result that comprehensive and non-overlapping collections were made. Ideally five duplicates of each collection were made, so that specimens could be distributed to the herbaria at Godavari (KATH), University of Tokyo (TI), the Royal Botanic Garden Edinburgh (E), Tribhuvan University (TU), with a spare set available to be sent to the appropriate specialist for identification. A minimum of four duplicates were made of each collection so that each partner on the expedition would receive a specimen. Exception were made for Orchidaceae, whose transfer is restricted under CITES, and only two duplicate collections of each of these were made, both of which remained in Nepal. For *Pedicularis* seven duplicate collections were made with the additional specimens going to the National Herbarium of Bhutan and the herbarium of the Chinese Academy of Sciences in Beijing (PE) due to Patrick's collaborative work on the Flora of the Pan-Himalaya.

At the end of each day the specimens were processed and dried over kerosene stoves. Silica gel dried leaf samples were taken from each collection for use in phylogenetic studies, and each partner received one set. Field data was entered to the Flora of Nepal Padme dataset during the trip

RESULTS

454 herbarium specimen collections, each with associated leaf collections dried and stored in silica for future DNA extraction.

All field collected specimen data including preliminary identifications are available online through the Flora of Nepal portal www.floraofnepal.org. The process carrying out formal identification of the specimens and attaching the field images to the specimen records to appear online have also begun.

ALAN

I was part of the group collecting Ranunculaceae which allowed me to collect *Clematis* samples, the main focus of my PhD project. In total 12 collections of *Clematis* were made. Two target species specifically being looked *Clematis phlebantha* and *Clematis graveolens*, and unexpectedly *Clematis roylei*. Before the trip no material of these three species was available for the phylogenetic work in my study. In addition a morphologically distinct, undescribed species of *Clematis* was collected in Rukum District.

PATRICK

My emphasis during the field work was to collect *Pedicularis* specimens, sample roots for herb chronological dating, georeference additional populations and quantify morphological and colour variation of species within and among populations. In total, 16 species of *Pedicularis* were encountered along the trek, most of them repeatedly. Over 100 additional locations were GPS located. Overall, the majority of my working hypotheses for closely related or isolated endemic taxa could be studied during the expedition. Some examples: *P. megalantha* and *P. hoffmeisteri* were thought to have no range overlap and to be habitat vicariants in their respective range. In terms of floral colour they are distinct, less so in corolla size. New data shows parapatric growth in adjacent but distinct habitats, a trend to altitudinal vicariance and approaching (intermediate) floral colour and size in the area of range overlap. The endemic *P. dendrothauma*, so far only known from the Annapurna region, was found in two additional large populations. It turned out that this epiphytic

species is nothing but the Western colour variant of *P. scullyana*. The encountered individuals occurred either epiphytically in thick moss cushions on at least five different host trees of the cloud forest, or were found in vertical grass-dominated mesic to wet cliffs and along mesic rivulets. Lastly, the morphologically closely related *P. gracilis* and *P. brunoniana* had clear altitudinal preferences with a rather narrow band of approaching growth form on floral morphology. Preliminary root dating indicates that the two species are well distinct in terms of life span, i.e. annual vs. perennial. In addition to the work on *Pedicularis*, my team of two Nepali assistants helped sampling any species belonging to gymnosperms, to monocot families, Orobanchaceae, Scrophulariaceae, Fabaceae or had a climbing life form. Of these around 135 specimens were processed into herbarium and silica dried tissue material for distribution among the partner institutions.

OBSERVATIONS

***Impatiens glandulifera* (Himalayan Balsam)**

This species is native to the western Himalayas but is well known as an invasive weed in Europe where it colonises wet waste ground and riverbanks and outcompetes native flora creating a dense monoculture. In Nepal it is considered to have a questionable status as a native (Polunin 1984).

We initially saw this species growing in the ground flora in an orchard in Nabi, west of Dorpatan, Baglung District. We then observed the plant growing along the trail, particularly in areas of heavy trampling where it formed a climax vegetation type with *Rumex nepalensis* and on disturbed ground on the banks of the Phaguni Khola and its tributaries.

Dr Colin Pendry commented that in his 10 years of field experience in Nepal he had not encountered this plant. It became obvious that the plant was confined to the trail and in areas of human disturbance. We believe that it is behaving exactly the same way it does in Europe and is probably therefore not native to Nepal or at least this area in Nepal.

We informed the Department of Resources in Nepal once back in Kathmandu about this and they seemed genuinely surprised to be told that they may well have the beginnings of an invasive weed problem with this species.

Clematis

The genus is an infrequent component of the forest flora in Baglung & Rukum Districts. Plants occurred sporadically as individuals or in small populations of 2 or 3 plants. A new species was discovered in Rukum District and it will be described from the material collected on this expedition.

Once into the dry inner valleys of Dolpa *Clematis* becomes a dominant shrub the xeric scrub. Along the Thuli Bheri Nadi *Clematis grata* were very frequently abundant, *Clematis graveolens* were abundant and *Clematis tibetana* subsp. *brevipes* occasional.

Clematis phlebantha, which is endemic to the area, was very locally abundant on dry south facing slopes around the southern end of Phoksumdo Tal. Around the town of Ringmo *Clematis tibetana* subsp. *brevipes* was a very frequently abundant/dominant shrub.

Pedicularis

Species of *Pedicularis* were encountered frequently along the trek. Often three to six species occurred sympatrically or parapatrically. A notable exception was the driest and hottest part of the inner valleys where only one species grew scattered along irrigation channels. Our work was restricted to altitudes between 2100 and 4500 m. It is very likely that many more species could have been found in the higher alpine to nival zones where there are species that flower in June or early July.

As in many other places of the world, livestock avoids *Pedicularis* due to its bitter and toxic compounds. Over-grazing in the subalpine and alpine zones has often led to near monodominance of some, mostly annual, *Pedicularis* species. It is known from the Chinese Tien-Shan Mountains that pasture quality is difficult to regain once *Pedicularis* dominance is established.

References

Polunin, O. (1984) *Flowers of the Himalaya*. Oxford University Press, Oxford