

SIKKIM

Following in the footsteps of Sir J D Hooker



Fig 1. Kanchenjunga from Kalimpong.

Darren Minney

June 4th - 21st

2014

SIKKIM

Following in the footsteps of Sir J D Hooker

5th June

On arrival at Bagdogra, West Bengal, India, the mercury read 36 degrees celcius and the sun was shining through a hazy sky, it was hot. To get to the first port of call at Darjeeling, we had a drive north through the hot dry plains. The presence of *Delonix regia* approximately 15m tall in full bloom, looking like claret umbrellas from a distance, sporadically broke up the dusty dry roads. *Colocasia* sp. growing as weeds in ditches along with species of *Musa* and Bamboo (likely to be *Bambusa* or *Dendrocalamus*).

It was a relief to be leaving the now sun baked scorching plains behind as the vehicle slowly started winding up the foothills of the Himalayas towards Darjeeling. All the time the temperature falling and humidity rising, along with the presence of cloud and mist lingering in the valleys and gorges covered in *Cryptomeria japonica* trees.

Following a slight delay because of a split tyre and leaking gear oil we picked up our guide Alister who would be with us for the duration of the trip. We passed small cascades and



Fig 2. Darjeeling in the cloud.

continued into thicker cloud and forest until we arrived at Darjeeling at 2050m above sea level. Darjeeling was somewhat cooler than the plains, although it remained warm and I could feel humidity in the air. It was bustling with Indian tourists escaping the hot lowlands. Darjeeling has a population of 132,000 and lies in the Mahabharat Range or Lesser Himalayas.

6th June

Firstly our guide took us to where it was believed Joseph Hooker spent much of his time whilst in Darjeeling. Within the grounds of a famous Indian School named St Pauls is the area where it is thought Brian Hodgson lived. Brian Hodgson (A Naturalist and British Civil Servant working in Nepal) allowed Hooker to use his house as a headquarters in which to explore the Himalayas in 1848. Using old drawings made by Hooker we tried to compare the landscape and vegetation to when he was in India. This was difficult to ascertain exactly, although some of the terrain appeared similar. Within close proximity were *Magnolia cambellii*, *Rhododendron arboreum* standing approx 6m tall. Unfortunately the time of year meant that clouds were ever-present as the monsoon was on its way, therefore we did not have clear views. There was a large *Cryptomeria japonica* within the grounds, believed to be over 200 years old and one of the oldest trees in Darjeeling. Still this gave inspiration for the journey ahead. The next stop was Lloyds Botanic Garden. It appears that the botanic garden runs on very little money, and it has little revenue because it is free entry. It was very rough with barbed wire fences spoiling aesthetics. There were some interesting large trees, and some interesting orchids.



Fig 3. Staff in Lloyd Botanic Garden, Darjeeling. Hand weeding and using a hand sickle to cut grass.

The comparison to our botanic gardens here in the United Kingdom could not be any different. Staff have no power tools, no mowers, and very few staff. Ironically the population probably know more about their native species than we do as they are still regularly collected and in use by them for various ailments as they are free to use.

7th June

Today we left Darjeeling and travelled west towards the border with Nepal. We passed through plantations of *Crytomeria japonica*. This tree was introduced by the British for building and furniture. A strong weather and insect resistant wood. The forest species then started to change to more native species such as Oak, Magnolia and Rhododendron.

We entered the Singalila National Park, had our passes checked and drove up steep windy roads to Meghma at 2600m. We were welcomed into a local house where we had egg and onion noodles with tea. We sat inside with a slight chill in the air as clouds rolled through the open windows. We left Meghma and trekked 8km towards Tumling. This is where we learnt how adept leeches are at clinging onto clothes that come into contact with any surface. However, this trek is where we first started coming into contact with the reason we were here. The first wild flower I saw was this spectacular *Anemone rivularis*. This was 200m into our first trek and was situated on the side of the track, bringing beautiful vivid violet colours to a cloudy grey backdrop.

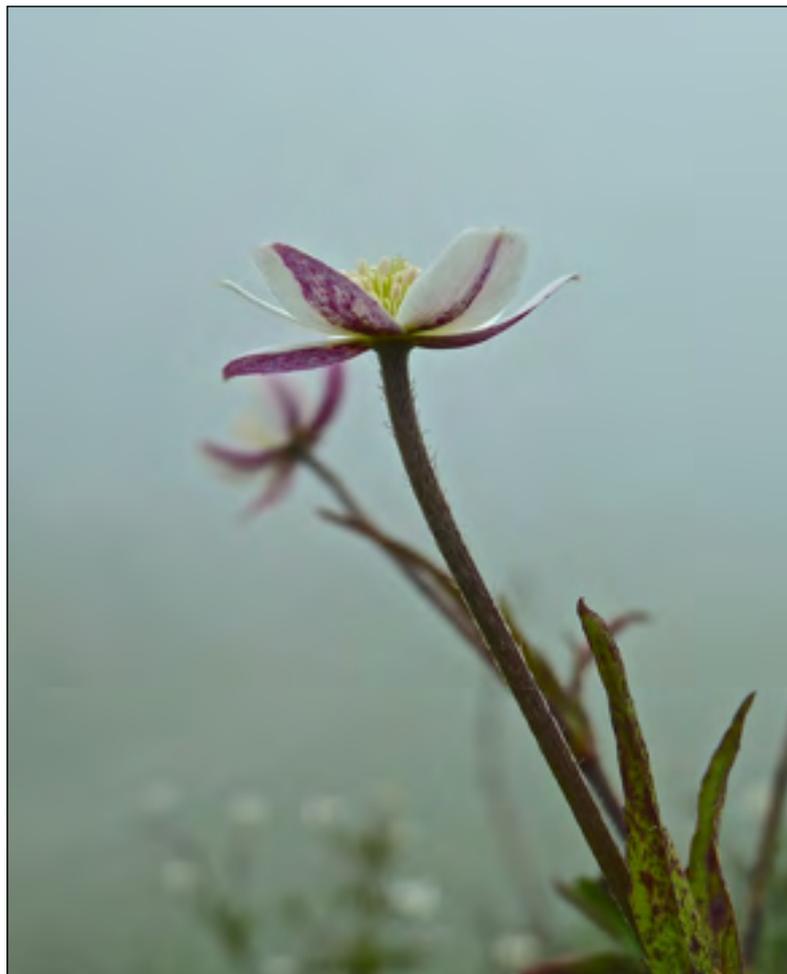


Fig 4. *Anemone rivularis*.

Other plants included *Fragaria nubicola* which covered the ground and verges like a blanket. It was impossible not to trample over them. Although fruiting, unfortunately they had lost their sweetness due to the amount of rainfall.

On route to Tumling we walked closely to the Indian border with Nepal. It was very interesting to contrast the two countries vegetation cover. In India, the forest has protection from the government and has been undergoing replanting for many years now.



Fig 5. Vegetation on the Indian/Nepal border. Looking North East towards Sikkim.



Fig 6. Nepali work party planting Rhododendrons.

In Nepal, there was stark difference with very few mature trees. Figure 6 shows a local work party seen planting Rhododendrons in an attempt to reinstate the forest. Due to relaxed regulations on felling by the government in Nepal, this has resulted in deforestation over many years for firewood and building resulting in this barren looking landscape.

As can be seen in Fig 7, some common plants in flower on route were *Rosa sericea* with white flowers consisting of 4 petals. *Spirea bella*, an erect shrub with clusters of delicate pale pink flowers, *Pleione hookeriana* with its mottled red brown lip and *Fragaria nubicola* which was also in fruit.



Fig 7. Top left clockwise; *Rosa sericea*, *Spirea bella*, *Fragaria nubicola* and *Pleione hookeriana*.

8th June

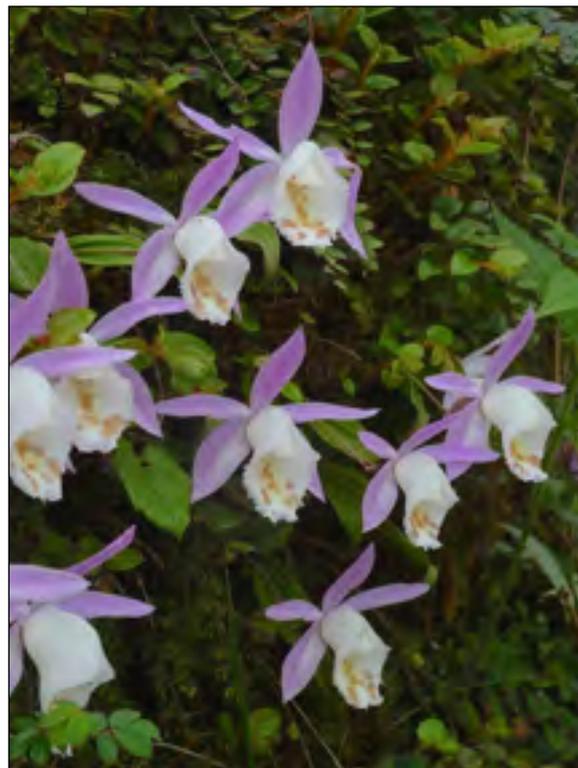
Our guide Alastair lead us on a round trip trek of 14km. We travelled on the western side of a ridge (India) which was cloaked in magnificent trees such as *Rhododendron arboreum*, *Lithocarpus elegans* and *Magnolia* species approximately 15-20 tall. The forest was constantly wet and covered by cloud with mist lingering in the valleys. As we gained elevation towards 3000m we came across more orchids. The most prevalent were *Pleione hookeriana* and its white variety *Alba*. They could be seen growing in moss on bark, moss in grass, on remnants of tree limbs laying in the forest and growing out of moss on vertical banks (Fig 8).



Fig 8. Top: Classic Pleione habitat, *Rhododendron arboreum* forest covered in moss.

Bottom left: *Pleione hookeriana* var. *Alba*.

Bottom right: *Pleione hookeriana*.



As we descended to a small hamlet called Gairibash and headed back eastwards on the other side of the ridge in Nepal, land was not covered in forest. It was drier, and there was a distinct lack of diversity. At the end of the trek we decided to walk up to a place called Tonglu, which promised stunning views of Kanchenjunga. Unfortunately we were not lucky and the cloud

lingered, but instead we were greeted with an amazing swathe of *Androsace sarmentosa*. The hill at Tumling was very peaceful and the sun managed to breakthrough the overcast sky momentarily to light up the pink flowers in Figure 9.

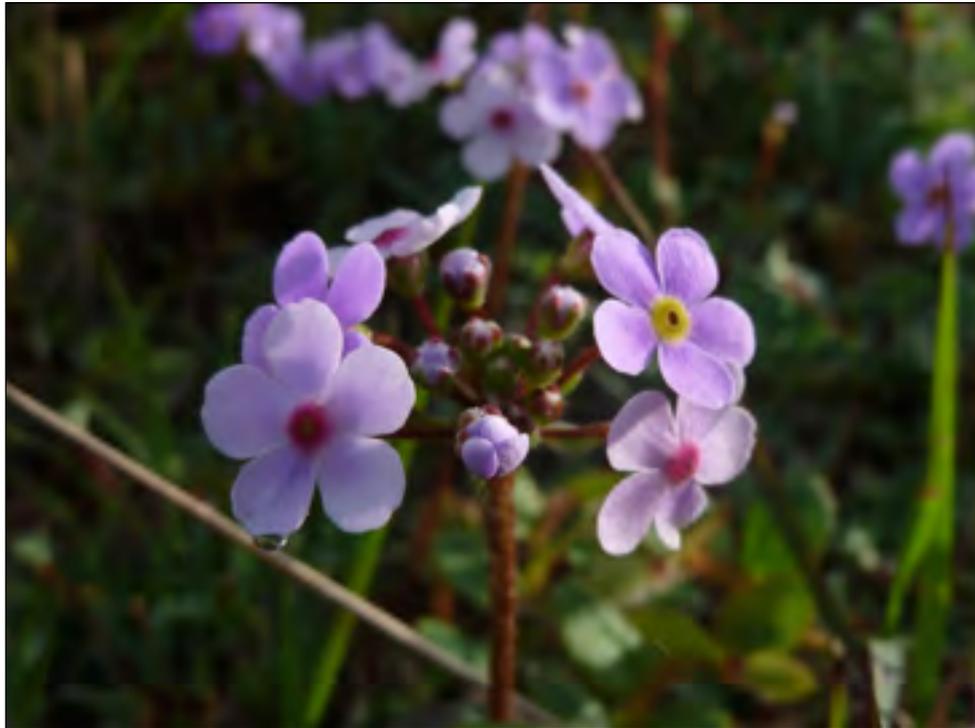


Fig 9. *Androsace sarmentosa*.

9th/10th June

Today we return trekked from Tumling to Meghma, followed by 5 hour drive towards the entry point to Sikkim at Rangpo. Decreasing in altitude as we went we ended up in tropical and sub-tropical zones and very different flora. The temperature at Rangpos elevation of 200m above sea level was above 30 degrees celcius. This is where we gained our in-line permit and entered Sikkim. On our travels we ventured through a *Tectona grandis* (Teak) plantaion which just oozes that luxurious tropical look, with deep bronze green colour leaves larger than your hands. There were occasionally *Delonix regia*, identifiable by their profusion of bright red flowers in the canopy.

At Gangtok botanic garden more emphasis on the presentation and the horticultural finish was evident. There is a small fee for the entrance to this garden, unlike Lloyds botanic



Fig 10. Gangtok botanic garden.

garden in Darjeeling. It appears that this garden also holds plant fairs and is possibly another source of income for the garden. Even after taking this into account, these gardens are not what I expected them to be having worked in a botanic garden in the UK. Clearly they still perform tasks such as consrvation as there are some species that are rare such as threatened conifer *Araucaria luxurians*, and there is also no doubt that these botanic gardens have potential for education and as a learning resource for local school children.

11th June

Today we had a 6 hour drive travelling from Gangtok to Lachung valley. From warm sub tropical forest through temperate deciduous forests to the alpine environment. The roads are undergoing construction and reinforcement at landslide prone areas. Colourful *Arundina graminifolia* and *Hoya acuminata* were seen on the roadside, along with hundreds of labourers earning a very low wage for creating road aggregates.



Fig. 11. Left, *Arundina graminifolia*. Right, *Hoya acuminata*.

The roads to Lachung are all currently under construction to make military movements quicker and easier to further North in Sikkim and to also facilitate large trucks and vehicles required in dam building which is required to supply electricity to the area. We arrived at Lachung (3,600m) after a very tiring, bumpy drive. This was to be the base from which we would travel up the Yumthang valley to Yume Samdong in search of alpine plants.

12th June

Today we travelled up the Yumthang valley with several stops on the way to botanize. We entered the Shingba Rhododendron sanctuary where unfortunately most of the Rhododendrons had finished their profuse flowering period. However, we did see magnificent examples of many Rhododendron species despite this. These included *Rhododendron cinnabarinum* with its deep orange waxy like flowers glowing like embers amongst an otherwise matt green background. *R. campylocarpum* with beautiful crimson marking inside the pale lemon nodding flowers and *R. glaucophyllum* with delicate glittery translucent looking pink flowers. All can be seen below in Figure 12.



Fig 12. *Rhododendron cinnabarinum*, *R. campylocarpum* and *R. glaucophyllum*.

On route it was clear how this high alpine environment is constantly being re-shaped by nature. Figure 13 shows the environmental and social devastation of snowmelt/landslide. Here large trees have been pushed over by the force of the debris, as has a house. On a positive note, our guide stated that the debris is often used as aggregate for road construction. Other plants flowering were *Magnolia globosa* with pure creamy white petals (Figure 14).



Fig 13. House and trees buried by landslide/flash flood debris.



Fig 14. *Magnolia globosa*.



Fig 15. *Clematis montana*.

Clematis montana was found sporadically climbing up larger *Rhododendrons* or rambling through lower growing shrubs. *Euphorbia wallichii* growing on open areas of rough meadow that appears to have been grazed. After reaching the valley of flowers, which I was very excited to see after reading about the amazing alpine meadows full of *Primulas* and other flowers, I was left a little dissatisfied. The landscape as with most of Sikkim was awe inspiring. Ice blue rivers in shallow meanders making their way through low lying valley meadows which lead up to *Picea*, *Larix* and *Abies* species Sub-alpine forests, which lead to crags, cliffs and further up to the snowline. There were several plants flowering on the meadows despite my slight dissatisfaction.



Fig 16. *Pedicularis siphonantha*.

Pedicularis siphonantha with its showy pink flowers and purple coloured corolla tube. Figure 16 above shows a rare solitary plant, the majority were found in clusters of between 4-10.

After suspecting that the *Primula* may have finished flowering in the area, we entered into and across a small meadow with slight protection from the elements in the form of a hedgeline. We were lucky enough to find a light covering of *Primula denticulata*. Figure 17 below shows that whilst the flowers were not at their best you could get an idea of what the meadows would look like when they would all be in bloom. Close by, nestled under shelter of large boulders were several *Mecanopsis simplicifolia*. These were a very similar colour flower to that of the *Primula denticulata*.



Fig 17. *Primula denticulata*.



Fig 18. *Mecanopsis simplicifolia*.

With the light fading and the mist turning to light rain we decided to head back to the vehicle. We crossed a wooden bridge and walked the opposite side of the river to get back to the car. This turned out to be a great decision. On the short trek back to the vehicle we found a great stand of *Mecanopsis paniculata* surrounded by clusters of *Pedicularis siphonantha* (Fig 19). *M.paniculata* were easily over 1 metre tall and smothered in bristly yellow hairs, which were now beading with water droplets as the rain set in for the evening. Beautiful nodding lemon coloured flowers were hanging their heads as if to shed the rain, but inside the flower a bright golden cluster of stamens hid (Fig 20). Finally we spotted a golden fungus (Fig 21) believed to be a species of *Calocera* possibly *viscosa*.



Fig 19. *Mecanopsis paniculata* with *Pedicularis siphonantha* foreground.



Fig 20. *Mecanopsis paniculata*.

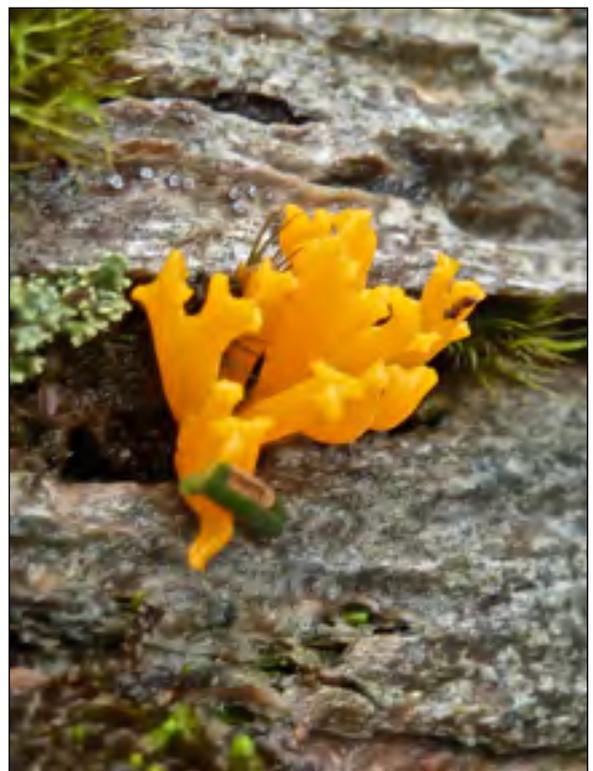


Fig 21. *Calocera* sp.

13th June

We started early as we were travelling the same route as yesterday but travelling much further up the Lachung valley to an elevation of 4,500m to explore Yume Samdong. As we travelled higher, I noticed the vegetation becoming compact and smaller in height. Soon we came across our first Rhododendron of the day, *Rhododendron setosum* (Fig 22), it was also very fragrant.



Figure 22. *Rhododendron setosum*.

Climbing higher still with the scree slopes and cloud base now clearly visible, we were met with *Rhododendron aeruginosum* as far as the eye could see. This can be seen in Figure 23 below, although unfortunately a photograph can not capture the sheer panorama and colour of this spectacular area. As we had increased our altitude, this meant that we hit a zone where

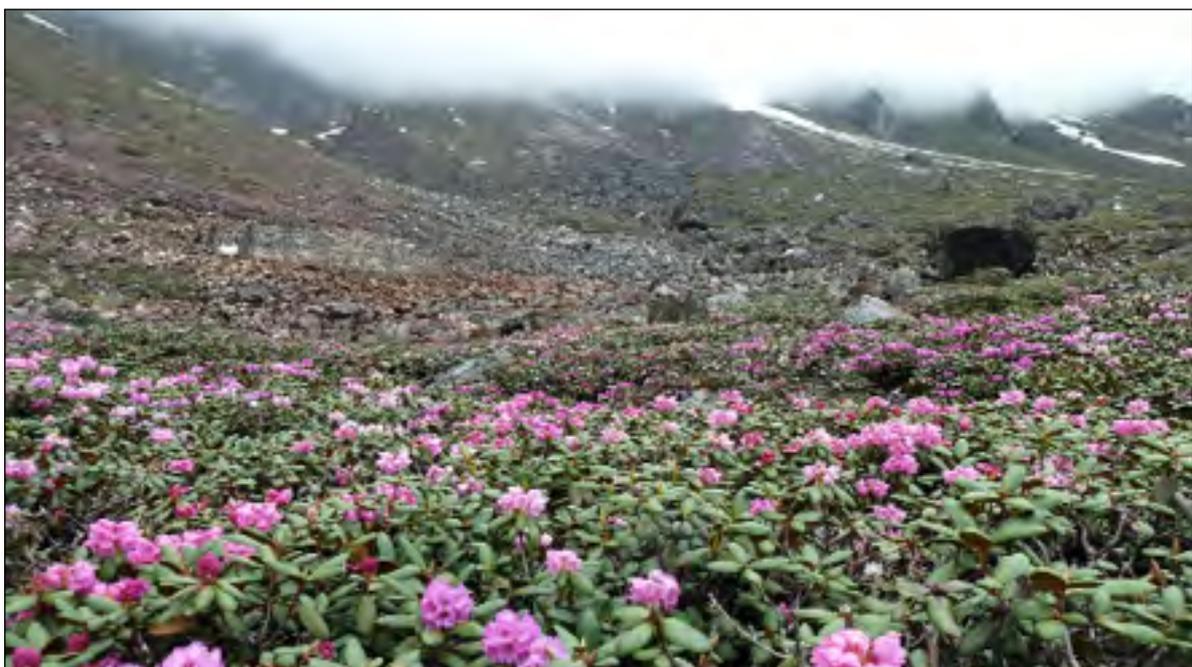


Figure 23. *Rhododendron aeruginosum*.

the Rhododendrons were flowering at their absolute best. Here we also came across Rhododendron anthopogon which has almost translucent crisp white flowers with a very slight hint of pink. Following the Rhododendron treat, the landscape opened up to a bare



Fig 24. *Primula calderiana*.

slope which had a lovely spray of deep purple across it. This turned out to be *Primula calderiana*. The different shades of purple was very variable as I walked amongst them. Over the brow of the next hairpin at approximately 4,400m, the scenery really changed to barren, rocky and scree slopes with a rushing icy river cutting through it. We were also now fully in the clouds and we finally spot our first yak. The only plant species to be growing slightly above the grass and moss is *Rhododendron anthopogon*. Because of the flower colour or lack of it, I have failed attempts at getting a good photograph of it in this location.



Fig 25. *Polygonatum hookeri*.



Fig 26. *Primula concinna*.

Plants at this high alpine zone are now very reduced in size. I am now plant hunting. My eyes darting over the surface in front of me for any splash of colour to investigate. The first plants I come across are the tiny *Primula concinna*, with minute foliage covered in light yellow farina (Fig 26 above), and dwarf Solomons Seal or *Polygonatum hookeri* (Fig 25 above).



Fig 27. Species above 4,500m. From top left clockwise; *Draba* sp, *Draba* sp, *Androsace* sp, *Rhododendron nivale* *Spongiocarpella purpurea*, *Draba* sp.

This was my first visit to see true alpine plants in the wild. I did not realise quite how small and insignificant that the plants appear within the landscape. I found this environment awe

inspiring, and these are some of the prettiest plants I have ever seen. Continuing to explore I was lucky enough to find *Rhododendron nivale*, ‘the smallest of all the Sikkim species of *Rhododendrons* occupying highest altitudinal zone between the tree-line and the perpetual snow,’ (Pradhan , 2010, p.36). Following a hike over scree and rock up to a height of 4830m (which is higher than Mont Blanc), the mild altitude headache we all had endured for a couple of hours started to irritate, so we started to head back down. We came across clumps of yak pruned *Ephedera gerardiana*, *Cassiope fastigiata* and a young *Rheum* species before heading to a natural hot spring and a well earned hot bath, with a backdrop of snow covered cliffs. The journey back that evening was a little hurried as light was fading quickly. The road was very rough, and I endured the most uncomfortable 3 1/2 hour car journey of my life, but it was worth it. This drew to a close our time in the Lachung Valley. Our guide Alister informed us that the monsoon rains were late appearing this year and he was expecting to find more plants in flower. Despite this, I was very pleased with what I had seen.

14th June

Two hour drive from Lachung to Lachen as Lachen was to be the base for two days to explore the Lachen valley. Today we had a break from altitude and walked some of the roads in and around Lachen to see what we could find on the roadsides. This included the carnivorous plant *Drosera peltata*, a climber *Aristolochia griffithii* and *Zanthoxylem armatum*.



Fig 28. left to right; *Drosera peltata*, *Aristolochia griffithii* and *Zanthoxylem armatum*.

Lachen is 2,750m above sea level which is 850m lower than Lachung, and therefore slightly warmer than the areas we have been to in the last few days. This may explain some of the more temperate species seen today.

15th June

Today we travelled approximately 25km north towards the Thangu valley which is where we did most of our exploring. The Lachen valley has steeper sides when compared to Lachung. Possibly one reason why it is less developed here as land is not as readily accessible. The valley contains fewer *Rhododendrons* and many more *Juniperus*. Then on the side of the road in a less than desirable mass of old landslide debris I see my first *Primula sikkimensis*, the ground was wet, which is its preferred habitat. We arrived at the start of our trek heading up a track again into the hills. Before long we came across more *Polygonatum hookeri* that we spotted much higher up in Yume Samdong (Fig 25), and *Daphne retusa* (Fig 29). A little higher still and *Cotoneaster microphyllus* covers large areas of ground and rock, with *Ephedera Gerardiana* intermittently poking through.

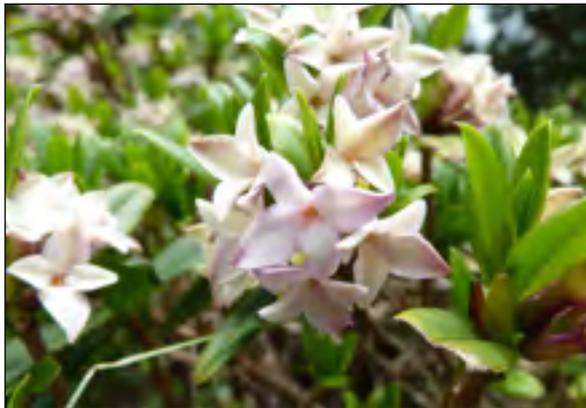
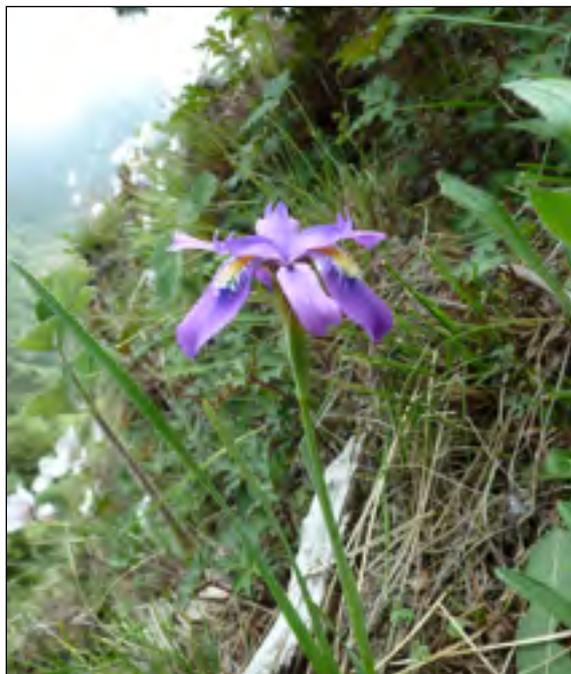


Fig 29. *Daphne retusa*.



Fig 30. *Fritillaria cirrhosa*.



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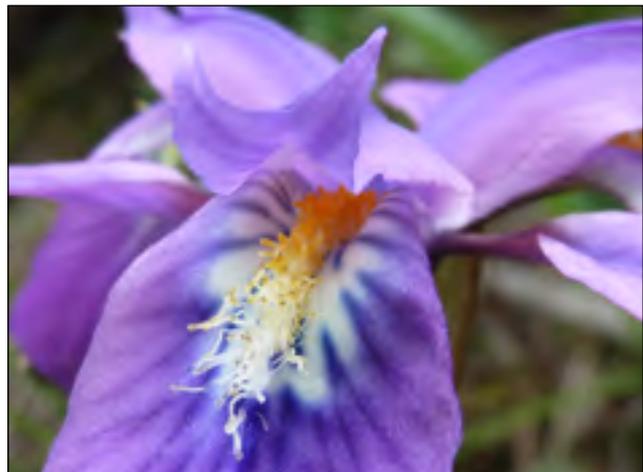


Fig 31. *Iris hookeriana*.

came across a stunning *Iris hookeriana*. The deep purple colouration on the falls compliment the orange and white beard perfectly with the dainty standard (top) recurved flicks.

A positive note for the steeper slopes which are harder to balance on, is that you dont have to stoop over, or get on your hands and knees every time you wish to take a closer look. And a closer look was definately required for the next plant our guide Alister spotted. The terrestrial orchid *Cypripedium himalaicum*. Why is it so interesting to look at? What does it look like? Does it really look like a lady's slipper? For me I think it looks like an old fashioned pram, just missing its wheels as it appears to be invisible suspended off of the ground in this picture.



Fig 32. *Cypripedium himalaicum*.

The raised veins and the specks of shiny glitter colouration, the sunlight shining through the lateral petals, all this makes for such an interesting and captivating thing to look at. Luckily we hit the correct time to see these flowers at their absolute best. We were also lucky to see *Cypripedium elegans* which was just as spectacular. These plants were abundant in this particular niche covering maybe one or two square metres. We did not see these plants anywhere else on the trip, it is obvious how important it is to preserve these areas. The construction of dams and the tourist industry could result in loss of habitat, not just for this species but for any species living in a niche environment under many external pressures, not



Fig 33. *Cypripedium elegans*.

to mention private collections. Both of these species are sadly on the IUCN redlist as endangered.

Returning to the theme of purple coloured flowers, the trek back down to our vehicle must have shown this plant in a different light because we must have walked straight past it on the way up. It is *Thermopsis barbata* and has an extremely hairy calyx to go with the deep purple

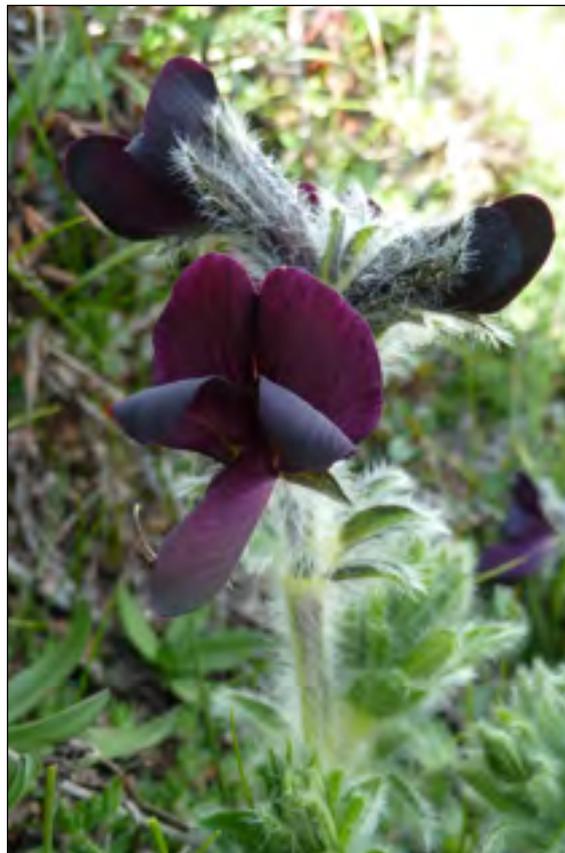


Fig 34. *Thermopsis barbata*

almost chocolate coloured flowers depending on which way the light falls. This ended our day in the Thangu valley.

16th June

We ascended the same route as yesterday but carried on further, gaining altitude as we went. We were to trek up to the Chopta valley, although first we carried on as far as the driver felt comfortable driving as this was a military sensitive area. We were so glad he went as far as he could, because we were greeted with some of the best Rhododendron flowers of the trip with clear views of rugged mountain tops to match.



Fig 35. *Rhododendron aeruginosum*.

And finally on our last day in the alpine areas I managed to get a picture of the delicate white and pink translucent flower of *Rhododendron anthopogon* (Fig 36) which I had struggled



Fig 36. *Rhododendron anthopogon*.

with. Our guide Alister tells us that the leaves of this species are mixed with Juniperous and used for incense in Monasteries. We followed the sinuous path from the road to the valley side and walked past several small flat areas. One was home to the top heavy flowers of *Lilium nanum* var. *flavidum* in Figure 37 below.

As we climbed up the valley sides we rose through a small area of forest. For the first time on the trip we could get closer to the trees. More recently planted trees such as *Abies spectabilis* in Figure 38 below were in good condition, compared to some of the older trees seen on the trip. We rose up into the Chopta valley and were greeted with the aroma and visual delights of knee high *Rhododendrons* blanketing the valley bottom with *Juniperus indica* and *Juniperus elegans* interspersed within this.

Over to the east we could see clouds, and the prevailing wind was blowing towards us. Within a minute we were surrounded by cloud, the wind picked up and it was raining lightly. Following some loud rumbles of thunder we decided to head back to the vehicle. Not a place to be in a thunder storm! On the return trek the weather eased and we took a diversion to have a look down by the river and came across one of my favourite plants of the trip. There



Fig 37. *Lilium nanum* var. *flavidum* .

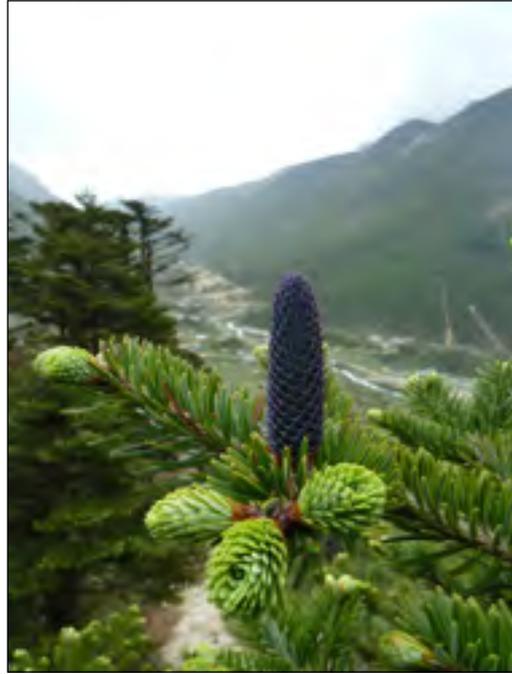


Fig 38. *Abies spectabilis*.

on a boulder in the middle of the river was the most stunning flash of electric blue, and one Genus that I really wanted to see in the wild.



Fig 39. *Corydalis cashmeriana*.

Growing in a clump of moss on a small boulder was this beautiful cluster of *Corydalis cashmeriana* with its surrounding splashing river keeping this plant constantly moist. Also in amongst the stream we discovered a cluster of five *Saussurea obvallata* buds. Such a shame that they were imminently going to flower as this would have been an amazing display. After a long day and a long drive home our guide organised us some millet beer, served in a tongba (large decorated traditional wooden tankard).

17th June - 20th June

These days were spent travelling from Lachen back to Gangtok, to Kalimpong and then back to the airport in Bagdogra on the 20th June. Although the driving took up the majority of time we did get to see a small plant nursery and orchid nursery. These, like the botanic



Fig 40. Buddhist Monastery.



Fig 41. Christian Church.

gardens were very low tech and working on a smaller scale when compared with nurseries back here in the United Kingdom. We also travelled to a small quaint Buddhist monastery and a Christian Church.

Unfortunately the time had come to leave India and the friends who had looked after us, and guided us around Sikkim. This diary gives just a small insight into a fraction of what we saw on the tour. It was incredibly tough to pick a handful of photos from the 2,800 that I took on my travels. Lots of pictures and plants have not made it into this report, not because they were not worthy, but I have tried to pick plants and scenarios that stick out as memorable to me so I can share them. It is difficult to quantify what I have seen and learnt on this short trip. To be able to spend days on end observing and researching plants in an amazing country I feel very privileged.

And at this point I thank both the Merlin Trust and the Alpine Garden Society for joint funding and subsequent possibility of me taking this trip.

I would also like to thank Paul Labous and Corinne Price who acted as references for my application to The Merlin Trust and Alpine Garden Society.

I would like to thank our guide Alister Adhikari and drivers Andrew and Sonam for keeping us safe and showing us the wealth of floral diversity and cultures of Sikkim.



Fig 42. Left to right; Darren Minney, Matthew Parker, Alister Adhikari and Andrew.

Lastly, thanks go to Matthew Parker who invited me to go with him, and whose contacts put us in touch with our guide.

My lasting memory can be seen in Figure 1. on the front page. In Kalimpong on the morning of departure I stood on the balcony of the hotel looking north graced with a tranquil first clear view of Kanchenjunga, the worlds 3rd highest mountain knowing Sikkim and all we had seen was inbetween.

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