

RHODODENDRONS

BEYOND JUST BEAUTIFUL FLOWERS

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The alarm went off, as always, at 4 a.m. The first thing I did was to head for the door to check out the day's weather so I could plan my schedule, which would inevitably be determined by the nature of the clouds. In Sikkim, a small region in the Eastern Himalaya, everyone's life had to be adjusted to unpredictable weather. In my case, I quickly discovered that at high-altitudes, a field researcher had to take advantage of every sunny day, particularly if she was studying plant-pollinator interaction involving *Rhododendrons*, possibly the most exquisite flowers on the planet.

I work in the Kyongnosla Alpine Sanctuary in Eastern Sikkim, in a tiny protected forest of 31 sq. km. located at an elevation ranging from 3,200 to 4,200 m. Despite its tiny size, Kyongnosla boasts a rich diversity of flora and fauna. My study area has mixed stands of conifers and *Rhododendron* trees and subalpine shrubs, with dwarf *Rhododendron* bushes and conifers in the upper alpine reaches.

Though wild rhododendrons are distributed in most parts of the Northern Hemisphere, the main focus of diversity is in the Himalaya from Uttarakhand, Nepal and Sikkim to western China and in Southeast Asia.

IN THE FIELD

On the first day, Sonam, my field assistant, and I started out from the field station located at 3,200 m. at 5 a.m. so as to reach the field site before the pollinators arrived at the blooms. Slowly, and with measured steps we ascended the snow-covered slopes. It was hard work, but the excitement of actually beginning fieldwork for my doctoral degree dissertation filled me with purpose. After a 45-minute walk, we had ascended to around 3,500 m, and Sonam gestured silently to point out a musk deer and a Himalayan Monal just 15 m. away from us. I was smitten. Both creatures looked stunning contrasted against the whiteness of the snow, and seeing them together was indescribable. I observed the pheasant scratching with its long beak and claws at the snow-covered ground in search of tubers

of the beautiful, purple-coloured Iris flowers. The Iris plant is a food source for many birds and insects that rely on the tubers and nectar during the monsoons in preparation for the harsh winter ahead.

The long hike offered me stunning landscapes and views of spectacular Himalayan species including musk deer, Himalayan Monals, and Blood Pheasants. These animals are more active early in the morning and through my study period I was often lucky to see them walking through their forests, or drinking water from mountain streams. When we reached the first research plot, I saw *Rhododendron thomsonii* trees laden with bright, blood-red flowers, an incredible picture postcard view against the backdrop of the snow! This is where Sonam and I took up our position, near a tree in full bloom.

Within a few minutes, the cold that had been kept at bay while walking began to creep up on us. My nose and fingertips went numb. Sonam began grumbling about how tough it was even to write down notes and I wondered if any wildlife would even visit the flowers. Just as our patience and tolerance began to run low, the first sunrays made their appearance. With the welcome warmth enlivening us, we focussed on the flowers, and almost instantly saw a small, greenish bird with a long beak hovering near the tree. Before I could focus my binoculars to confirm its identity, a second bright-coloured bird flew into view. I could see instantly that it was a Fire-tailed Sunbird, with its characteristic and very spectacular long, red tail, pointed beak and multi-coloured body. I forgot the cold as I watched it flit from flower to flower, dipping in every once in a while for its nectar reward. Only later did I realise that the green-coloured bird was the female sunbird. They tend to move in pairs and are generally the first to visit the rhododendrons each day.

Rhododendron thomsonii is native to India, Bhutan, Nepal and the Xizang area in China. It is named by one of the greatest British botanists of the 19th century, Sir Joseph Dalton Hooker, after his close friend Dr. Thomas Thomson, who was his travelling companion in the Eastern Himalaya.



TOP When beak sizes are not conducive to the flower shapes, the birds steal nectar by punching small holes at the base of the flower. This Gold-naped Finch *Pyrrhoplectes epauletta* is robbing nectar from *Rhododendron thomsonii*.

MIDDLE Insects, such as this bumble bee on a *Rhododendron cinnabarinum* flower, are nectar seekers too. Some species eliminate the effort of moving between petals and short-circuit the process by using powerful jaws to chew a hole and suck out the nectar using their short tongues.

ABOVE The author saw tiny warblers such as this Lemon-rumped Leaf-warbler *Phylloscopus chloronotus*, arrive in singles and across an elevation range of 3,200 to 4,200 m. The bird in this image has already visited the flower as the cream-coloured pollen are clearly seen on its forehead, stripe and mandibles.

A PERFECT BIRDING MORNING

The day whizzed by as I recorded bird after bird species at the flowers. The thrushes, decidedly larger than the sunbirds, came in a party of five or six and spent more time on the flowers. They give out four to five different calls as they mimic other birds. When the tiny warblers arrived, I saw them appear in singles and across an elevation range of 3,200 to 4,200 m.

Studies have revealed that birds are attracted to crimson-coloured flowers and over the course of my study, I saw a similar pattern. There were other rhododendron species that were flowering simultaneously such as *R. campanulatum* (purple flowers) and *R. hodgsonii* (pink flowers), but these were secondary choices for the birds. Of course, all birds are opportunistic feeders and they would move to less-preferred flowers once the red blooms began to wilt. The shifts in the timing of flowering from lower to higher altitudes helped the birds by distributing the availability of resources. All these birds visited a few specific tree species through the day, and repeatedly visited similar trees at intervals. Key factors that governed the choice of flowering species and quantum of nectar obtained were the beaks and body sizes. And when beak sizes were not conducive to the flower shapes, the birds stole nectar by punching small holes at the base of the flower, after which, of course the flowers would wither and die. It was interesting to observe how some birds easily and 'legitimately' obtained nectar from certain flowers, and acted as nectar robbers with other species. The active robbers were largely finches and tits.

POLLINATORS COME IN ALL SHAPES AND SIZES

Apart from birds, insects including bumblebees, flies and moths were clearly the most important rhododendron pollinators in my field site. They creep over the stamens and stigma to get to the base of the blossom. The insect is brushed with pollen, which it then transfers to the stigmas of flowers. Interestingly some rhododendrons are also blessed with long stamens that project above the stigma and enable self-pollination.



After a harsh winter, when food sources in forests dwindle, Rhododendrons are the first tree species to bloom. Understandably a myriad life forms make a bee-line for these flowers. Rhododendrons also provide fringe benefits – the understory shrubs provide good habitat for the Blood Pheasant *Ithaginis cruentus* (left) and the Himalayan Monal *Lophophorus impejanus* (right) that usually feed on tubers found under the ground.

During the course of my field study, I also observed beetles, wasps and ants on the flowers.

The process of pollination is different in various rhododendron species. In those with tubular flowers, the nectar lies in the bottom, or corolla tube, and can be reached only by visitors with long proboscises. In other species the long stamens and pistils curve upwards so they can easily come in contact with the pollinator. In yet others, coloured dots and blotches on the corolla lobes act as nectar-guides. Research suggests that most hymenopterans follow these dots to reach the nectar.

After a harsh winter, when forests offer virtually no food resource, *Rhododendrons* are the first tree species to bloom. Understandably they therefore support myriad life forms. I have even recorded pikas feeding on fallen petals of *R. campanulatum*. Much later in June, I came across several nests with juveniles of different birds on the trees – this actually coincided with the peak *Rhododendron* flowering. This floral species is without doubt one of the most important food sources that help to maintain and sustain the biodiversity of this Himalayan region. But it's a fair exchange. The birds and insects act as pollen vectors and in



return are fed by these flowers. Nature is filled with such examples of win-win strategies, perfectly crafted as mutualistic relationships.

Wild species and humans living around rhododendron habitats have always understood the value of this incredible plant, but of late the government too seems to have woken up to the significance of the flowers and has actually instituted a

Rhododendron Festival in honour of the trees.

There is, however, still a yawning gap in our understanding of the ecology of *Rhododendrons* and now is when we must have rules, regulations and laws that prevent over-exploitation. After all, we surely must not allow life-giving rhododendrons to be loved to death... for this would seriously impact wild species up and down the food chain. 🌿



June is flowering season in the forests of the subalpine region. Mixed patches of *Rhododendron* with red, purple and yellow flowers paint the forest in their colourful hues.