

### Vegetation of the arid region

The Marsiandi Valley runs parallel to the Annapurna Range on its northern side and the main or central part of it is very dry with much more open vegetation than is seen on the southern side of the mountains. The flora there is mostly comprised of different genera let alone different species. Here the Fabaceae, legumes, are often as dominant as they are through much of southern Tibet. Amongst the several genera involved are species of *Caragana* that are often much in evidence with their spiny mounds somewhat reminiscent of gorse. That huge genus *Astragalus* is also represented here and I must mention *Sophora moorcroftiana* of course. This is also a spiny shrub but has blue flowers instead of the orange, reds or yellows of the other legumes, but like them it is much used for firewood in this almost treeless landscape. It is rather local although common where it does occur, this including the barren upper Kali Gandaki Valley in southern Mustang where the cold and dry up valley wind blows nearly every afternoon and evening throughout the year. Composites are present as in most places in Nepal and Tibet and the main genus of these dry zones is *Artemisia*, wormwoods. On the other hand the Chenopodiaceae is mainly a family of drier areas and species of genera like *Krascheninnikovia* with their grey, semi-succulent leaves are more indicative of the Central Asian steppe flora.

Along the middle Marsiandi Valley four very different plants deserve a brief mention for different reasons. Firstly *Dicranostigma lactucooides* is a member of the Papaveraceae and replaces *Meconopsis* in these dry areas. It looks superficially like the *Glaucium flavum*,

yellow horned poppy, that grows on the coast from Hawke's Bay to Otago. Secondly, although often common, *Thymus linearis* was a bit surprising to see, but I later saw this representative of a mainly Europe and West Asian genus growing even further east in Tibet. It is a typical creeping thyme such as people grow in their gardens here. *Myricaria rosea* is a small glaucous shrub with terminal spikes of rosy flowers in the Tamaricaceae. The species has the usual tiny scale leaves of tamarisks. Like some other genera mentioned here *Myricaria* is a characteristic genus of the Central and West Asian steppes but this species also sometimes grows in sand amongst rocks that are besides cold fast-flowing rivers in the Solu Khumbu district south of Mt Everest. Finally, what I think is my favourite plant of this dry region, *Stellera chamaejasme*. This is a clump-forming herb with a woody rootstock and slender shoots that have terminal umbels that cover their ends with fragrant white flowers that are crimson in bud. It belongs to the Thymelaeaceae and like species of *Daphne* is still sometimes used for making paper, at least in Tibet. But unlike this genus *Stellera* has no woody stems and therefore the only woody part are the roots below the surface. But where it grows there are no *Daphne* species.

The above plants comprise only a very small fraction of the beautiful and interesting alpine plants that grow in this high central region, and if I have given too much emphasis on the species of drier areas I have to offer the excuse that the northern side of the Himalaya is less well-known because it is more inaccessible.

## Lucy Cranwell Grant Recipient– Decisions mothers make: Food availability and the maternal investment of hihi (*Notiomystis cincta*)

Rose Thorogood

Hihi are an endangered member of the honeyeater family (Meliphagidae) of birds. Aside from Little Barrier Island, the conservation of this species relies on introduced, managed populations on offshore islands. All populations other than the one remaining natural population on Little Barrier Island require food supplementation for the continued survival of the birds. However, the relationship between food source, habitat, and breeding success is one of the key areas that is still not understood, and is vital for the successful conservation of this species. Importantly, birds and forest do not exist in isolation; both require each other. For New Zealand's unique floral diversity to remain, an understanding of its relationship with pollinators is crucial. Therefore, to improve conservation of hihi and their environment, this research aimed to understand the relationship between maternal investment (and breeding

productivity) and food availability using both a supplementary feeding experiment, and an assessment of the natural food supply and vegetation.

Tiritiri Matangi is an important restoration project, and is composed of a mix of remnant mature bush (kohekohe/taraire/pohutukawa) and replanted areas (puriri/*Cordyline*/mahoe). Hihi were introduced to Tiritiri in 1995 and 1996, and now occupy almost all catchments across the island. To understand the relationship between hihi and their environment, the vegetation composition of the territories occupied by hihi were characterized. Each territory within the four main catchments (Bush 1, 2, 21, and 22) was surveyed with ten random 5 x 5m plots. Vegetation was characterized by percentage cover, and by tier:

Groundcover (0 – 0.5m)

Shrub layer (0.5 – 2m)

Sub-canopy (2 – 5m)

Canopy (5m+)

Using ordination analysis (PC-Ord), no large-scale differences in vegetation composition or structure were identified between territories. However, hihi territories within Bush 2 had decreased species diversity than other territories, with a decreased cover within the subcanopy and shrub layers. Hangehange (*Geniostoma ligustrifolium*), an important source of nectar and fruit for hihi, was reduced in availability in these territories. Likewise, the experimental addition of supplementary food into hihi territories had little effect on any breeding success and maternal investment parameters measured.

Importantly, however, hihi were observed to predominantly feed on insects during the breeding season, indicating that nectar and fruit may not be as important as assumed during this period. Therefore the fieldwork conducted with support from the Lucy Cranwell field grant, and the Auckland Botanical Society, has led to further research concerning the relationship between hihi and their floristic environment. Research into the differences in pollen

loads, and location of pollen loads between the three honeyeater species (tui, *Prosthemadera novaeseelandiae*, and bellbird, *Anthornis melanura*) on Tiritiri and Little Barrier Island is currently being conducted and analysed. Comparisons of vegetation composition will also be made with that collected on Kapiti Island (the second managed hihi population), and Little Barrier Island. In addition, the vegetation composition data collected during this study is contributing towards other thesis research being conducted on Tiritiri by University of Auckland students.

Neither New Zealand's flora, nor fauna exist in isolation (although it is becoming increasingly so). Therefore, to increase our understanding of either we must attempt to determine the dynamics between them. The fieldwork supported by the Lucy Cranwell Field grant has contributed to the further understanding of the relationships between hihi and their environment, and has allowed me to develop and understand and appreciate of the importance of both hihi for the forest, and forest for hihi.

## Field Trip: Lichens recorded at the Court property, Waitoki. 19/04/03

Carol Lockett

Lichens collected during the visit to Sandra and Robin Court's bush at Waitoki (Haines & Lockett 2004) on 19 April 2003 have been further studied. This is the updated list, the numbers referring to voucher specimens held in the herbarium at UNITEC. Identifications were carried out under the supervision of Dr Dan Blanchon, with nomenclature based on Galloway (1985) and Malcolm & Galloway (1997).

*Cladonia chlorophaea* (Florke ex Sommerf.) Spreng. - #001183

*Heterodermia leucomelos* ssp. *boryi* (Fee) Swinscow & Krog - #001146

*Hypogymnia lugubris* (Pers.) Krog - #001151

*Menegazzia* sp. - #001157

*Parmotrema chinense* (Osbeck) Hale & Ahti - #001145

*Megalospora* sp. - #001147

*Pseudocyphellaria carpoloma* (Delise) Vain. - #001153

*Pseudocyphellaria multifida* (Nyl.) D.J. Galloway & P. James - #001160

*Punctelia* sp. - #001144

*Ramalina celastri* (Spreng.) Krog & Swinscow - #001142

*Rimelia cetrata* (Ach.) Vale & A. Fletcher - #001158

*Rimelia reticulata* (Taylor) Hale & A. Fletcher - #001150

*Sticta* sp. - #001154

*Teloschistes xanthoroides* J.S. Murray - #001143

*Usnea rubicunda* Stirt. - #001156

*Usnea* sp. - #001148

As yet unidentified crustose type - # 001163

### References

Galloway, D. J. 1985. *Flora of New Zealand Lichens*. Government Printer, Wellington

Haines, L.; Lockett, C. 2004. Field trip: Waitoki, property of Sandra and Robin Court, Horseshoe Bush Rd. 19/04/03. *Auckland Botanical Society Journal* 59(1): 10-11.

Malcolm, W. M.; Galloway, D. J. 1997. *New Zealand lichens. Checklist, key, and glossary*. Museum of New Zealand, Wellington..

## Field Trip: Lake Ohau Central Otago, 3-10/01/04

Kerry Bodmin (editor)

Authors: Chris Ashton, Paul Asquith, Enid Asquith, Ewen Cameron, Gael Donaghy, Leslie Haines, Cathy Jones, Steve McCraith, Julie McLintock, Margaret

Peart, Juliet Richmond, Betty Seddan, Sally Warren, Alison Wesley and Maureen Young.