

Petalochilus alatus (R.Br.) D.L.Jones et M.A.Clem. (At risk/Naturally uncommon) (Fig. 4)

Previously included in the *Caladenia carnea* complex, this species of orchid has only recently been recognised from New Zealand. It seems to be relatively common in the north, growing under a kanuka canopy, or on poor gumland soils. It flowers early, September being a good month to see it, and can be white, pink or mauve in colour, with a cerise striped labellum.

Linguella puberula (Hook.f.) D.L.Jones, M.A.Clem. et Molloy (Threatened/Nationally critical) (Fig. 5)

This greenhood orchid was formerly known as *Pterostylis nana*. The puberulent (clad in very small soft hairs) stem emerges from a rosette of yellow-green leaves. These plants, from a newly found site,

Acknowledgement

Kevin Matthews (K.G.M.) and Andrew Townsend (A.J.T.) for photographs.

were seen growing on poor soils in gaps in gumland vegetation, along with the greenhood, *Plumatichilos tasmanicum* (see next). The young plants of the two species have a similar appearance.

Plumatichilos tasmanicum (D.L.Jones) D.L.Szlach. (Threatened/Nationally endangered) (Fig. 6)

The basal leaves on the bearded (or plumed) greenhood have a less pronounced petiole than those of *L. puberula*, and the deeper green colour helps to distinguish the two before flowering. The distinctive labellum is clad in yellow cilia and is terminated by a brown knob-like callus. As well as in gumland vegetation, this orchid has also been seen growing in shattered rock in the serpentine quarry on the Surville Cliffs, an inhospitable site that no other plants could colonise.

The alder forests of the lower Waikato River

Mike Wilcox and Jan Butcher

European alder or black alder (*Alnus glutinosa*) is an abundant tree along the banks of the lower Waikato River. It can be seen in Hamilton, Taupiri, Huntly, Rangiriri, Meremere and Mercer, but the area we are describing here is the Waikato River from the Port Waikato-Tuakau Bridge downstream towards Port Waikato where alder forests occur here on both sides of river. This alluvial forest comprises mostly pure stands of alder in a band up to 500 m wide, in places with some admixture of kahikatea (*Dacrycarpus dacrydioides*). The largest tracts lie north of Te Kohanga and near Tauranganui.

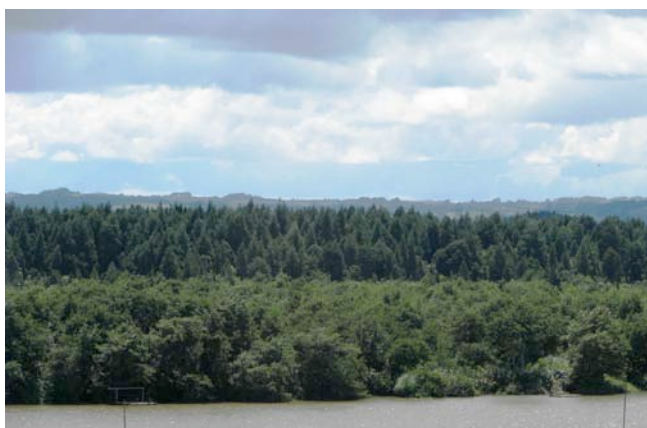


Fig. 1. Alder forest, backed by kahikatea forest, Tauranganui, 24 Feb 2009. Photo: M.D.Wilcox.

The alder canopy varies from 10 m to 20 m in height, and the trees range in diameter from 10 cm to 40 cm. Many are multi-stemmed. The subcanopy or understory is either absent or sparse, comprising scattered hybrid coprosma (*Coprosma × cunninghamii*), karamu (*Coprosma robusta*), swamp coprosma (*Coprosma tenuicaulis*), hangehange (*Geniostoma ligustrifolium*), putaputaweta

(*Carpodetus serratus*), mahoe (*Melicytus ramiflorus*), kawakawa (*Macropiper excelsum*), woolly nightshade (*Solanum mauritianum*) and Chinese privet (*Ligustrum sinense*). Cabbage trees (*Cordyline australis*), nikau palms (*Rhopalostylis sapida*), kiekie (*Freycinetia banksii*), and tree ferns (*Cyathea medullaris*, *C. dealbata*, *Dicksonia squarrosa*) are frequent and *Parsonsia heterophylla* commonly grows as a vine into the tops of alder trees. Small plants of native broom (*Carmichaelia australis*) can be found around the bases of alder trees.

On the northern bank of the Waikato River, kahikatea occurs in pure stands landward of the alder swamp forests (e.g. at the Piggott Wetland) and these additionally have some pukatea (*Laurelia novae-zelandiae*), *Coprosma propinqua*, *Melicytus micranthus*, *Streblus heterophylla*, *Gahnia xanthocarpa* and abundant Jerusalem cherry (*Solanum pseudocapsicum*). The kahikatea trees carry impressive epiphytic *Collospermum hastatum*.



Fig. 2. Alder forest, Waikato Heads Rd near Tauranganui, 24 Feb 2009. Photo: M.D.Wilcox.

Apart from the comparatively firm ground at the base of the trees, the floor of the alder forest is wet with pools of standing water and extensive boggy vegetation, and difficult to negotiate. The pervasive ground-cover plants are wandering jew (*Tradescantia fluminensis*), gypsywort (*Lycopus europaeus*), beggar's ticks (*Bidens frondosa*) and swamp willow weed (*Polygonum salicifolium*, syn. *Persicaria decipiens*). Several ground ferns gain a footing around the bases of alder trees, common of which are *Diplazium australe*, *Blechnum novae-zelandiae*, *Microsorium pustulatum*, *Pyrrhosia eleagnifolia*, *Histiopteris incisa* and *Asplenium oblongifolium*. Sedges are abundant and include *Carex geminata*, *Carex maorica*, *Carex secta*, *Carex virgata* and *Baumea articulata*. Some vigorous colonies of spoon lily (*Alocasia brisbanensis*) have become well established.



Fig. 3. Interior of alder forest near Tauranganui, 24 Feb 2009, M.D.Wilcox.

Open water in the form of drains or canals are usually abundantly fringed with reed sweetgrass (*Glyceria maxima*), with clumps of raupo (*Typha orientalis*), flax (*Phormium tenax*), yellow flag (*Iris pseudacorus*), Purua grass (*Bolboschoenus fluviatilis*), umbrella sedges (*Cyperus ustulatus*, *C. eragrostis*) and *Phalaris arundinaceus*. Drier margins support pampas grass (*Cortaderia jubata* and *C. selloana*), rushes (*Juncus*

effusus, *J. sarophorus*), sea aster (*Aster subulatus*), purple top (*Verbena bonariensis*) and broad-leaved fleabane (*Conyza sumatrensis*). The drains themselves have parrot's feather (*Myriophyllum aquaticum*), alligator weed (*Alternanthera philoxeroides*), water celery (*Apium nodiflorum*), marsh bedstraw (*Galium palustre*), and primrose willow (*Ludwigia peploides* subsp. *montividenis*).

Cheeseman (1913) observed that "Old trees of the alder have spontaneously appeared in not a few stations along the banks of the lower Waikato, from Huntly to within a few miles of the mouth of the river. Probably they have originated from seeds floated from Taupiri, where, I understand, it was planted by the missionaries prior to 1860. The willows which now form a continuous fringe along the banks of the river have doubtless originated from the same source".

The missionaries Cheeseman refers to could have been the Rev. Robert Maunsell who was active from 1838 to 1850 at Port Waikato and Te Kohanga, or the Rev Ashwell who was in charge at the Taupiri mission (Wily 1939).

Black alder occurs naturally throughout Europe, including the British Isles, and extends to the eastern Black Sea region of Turkey. It requires constant water around its roots as the foliage lacks any mechanism for controlling transpiration. It can rapidly colonise bare mineral soils such as riverbanks, and the roots have nitrogen-fixing nodules. It has the typical growth features of a pioneering species, the seeds germinating quickly and the seedlings growing rapidly in height for 7-10 years, and then slowing down considerably. The winged seeds are produced in abundance from an early age, and they readily disperse by wind or by floating downstream on water. In addition alder coppices profusely by suckers from the stump after felling.

Are the Waikato alder forests useful? They do provide a riparian buffer zone between the river and farmland, and the local farmers use the alder forests for cattle foraging (although the animals eat the ground-cover plants rather than the alder itself). The species has generally only been promoted in New Zealand for shelter and ditch bank stabilisation (Bullock 1986). The wood is comparatively light in weight and has the reputation of being durable under water (useful for jetty piles, perhaps), but there appears not to have been any serious attempt at utilising the wood of the Waikato alder resource. In places it has been felled and burnt, and the land drained and converted to pasture. It makes a fast-burning firewood.

References

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Botany of some of the islands in the eastern Bay of Islands, Northern New Zealand: an update

Maureen Young

In February 1973, Alan Esler (then botanist with the Botany Division, DSIR) visited the islands of Urupukapuka, Moturua and Okahu in the eastern Bay of Islands, and in January 1980 members of the Offshore Islands Research Group visited Urupukapuka, Okahu, Motuarohia, Waewaetorea and Motukiekie Islands. An account of these visits was published by Beever et al. (1984). In recent times Barbara Parris, with some input from the local community, has added records for Urupukapuka and Moturua to the species list published in *Tane*. For two weeks in March 2009 I joined a team of Department of Conservation (DoC) workers, consisting of Cinzia Vestena, Fiona Cameron and Andrew Townsend, and we set up several vegetation monitoring plots prior to the planned eradication of rats from the islands. This account gives an update on the state of the vegetation of Urupukapuka, Moturua and Okahu Islands, adds newly-found species to the list, and comments on some of the records. Brief visits were also paid to the small islands of Poroporo and Motungarara, and these are also commented on.

The Islands

Urupukapuka Island (208 ha)

Urupukapuka is the largest of the islands. It is a Recreational Reserve, and with a daily ferry service, is much visited. A 1959 aerial photograph was published by Beever et al. (1985), and this shows that the island, apart from a fringe of pohutukawa (*Metrosideros excelsa*), was then largely in pasture. In the intervening 50 years, c. half the area of the island has naturally regenerated – mostly with a cover of tall kanuka (*Kunzea ericoides*), but with a more diverse vegetation spreading upwards from the coast and the wetter gullies. Young pohutukawa are common wherever a light gap has allowed them to establish. It is intended that some of the island will remain in pasture, both for the convenience of visitors and for protection of archaeological sites.

DoC is coming under pressure from the local community and from tourism operators, to “hurry up” the natural regeneration by planting on the island, to make it more quickly available as a place to liberate native fauna. When one sees what has happened in 50 years without any interference, and presuming that the regeneration will speed up in the next 50 years, it would be a very great pity if that happens. One of our monitoring sites at Indico (sometimes called Entico) Bay, was under a large pohutukawa

tree, with a sub-canopy of tall *Coprosma macrocarpa*, a ground cover of five species of *Carex* and flax (*Phormium tenax*), and a few metres away, a good population of *Ranunculus urvilleanus* – a situation that could never be emulated by planting, especially in view of the thick covering of kikuyu grass (*Pennisetum clandestinum*) growing on the grassed areas.

As planting on neighbouring Waewaetorea Island is showing, there is a danger that canopy species will be included in the revegetation, thus influencing the resulting forest type. Included on Waewaetorea are species not native to the eastern Bay of Islands, not native to Waewaetorea, or if native to the island then probably not sourced from the island (Barbara Parris pers. comm.). If the go-ahead is given for planting on Urupukapuka, then DoC must keep very close control to make sure that best practice restoration takes place.

Moturua Island (150 ha)

In the 1959 photograph, Moturua Island Scenic Reserve was also largely in pasture, though with some gullies and coastal slopes under natural vegetation. This has given the island a head start in the regeneration stakes, and it now has a complete covering, apart from grassy areas around the sheltered bays. Again the main cover is of kanuka, with much less manuka (*Leptospermum scoparium*), and abundant cutty grass (*Gahnia lacera*) as ground cover. However, coastal forest is established along stream edges and in gullies, and seedlings, saplings and trees of kohekohe (*Dysoxylum spectabile*) and karaka (*Corynocarpus laevigatus*) are a hopeful sign for the future. Near the track from Otupoho Bay to Waipao Bay is an interesting area where the understorey over quite a large area is composed of plentiful Kirk's daisy (*Brachyglottis kirkii* var. *angustior*). We came across slopes covered extensively with the lycophytes, *Lycopodium deuterodensum* and *L. volubile*. A couple of shrubs of *Dracophyllum lessonianum* grew there; the newly described *Dianella latissima* was present in numbers, and also one seedling of tanekaha (*Phyllocladus trichomanoides*). Gymnosperms are rare on these islands, so this latter, and also a small rimu (*Dacrydium cupressinum*), were welcome sights. However, the many saplings of kauri (*Agathis australis*) that have been planted near this track should be removed. Wattles and pines are well established, with black wattle (*Acacia mearnsii*), brush