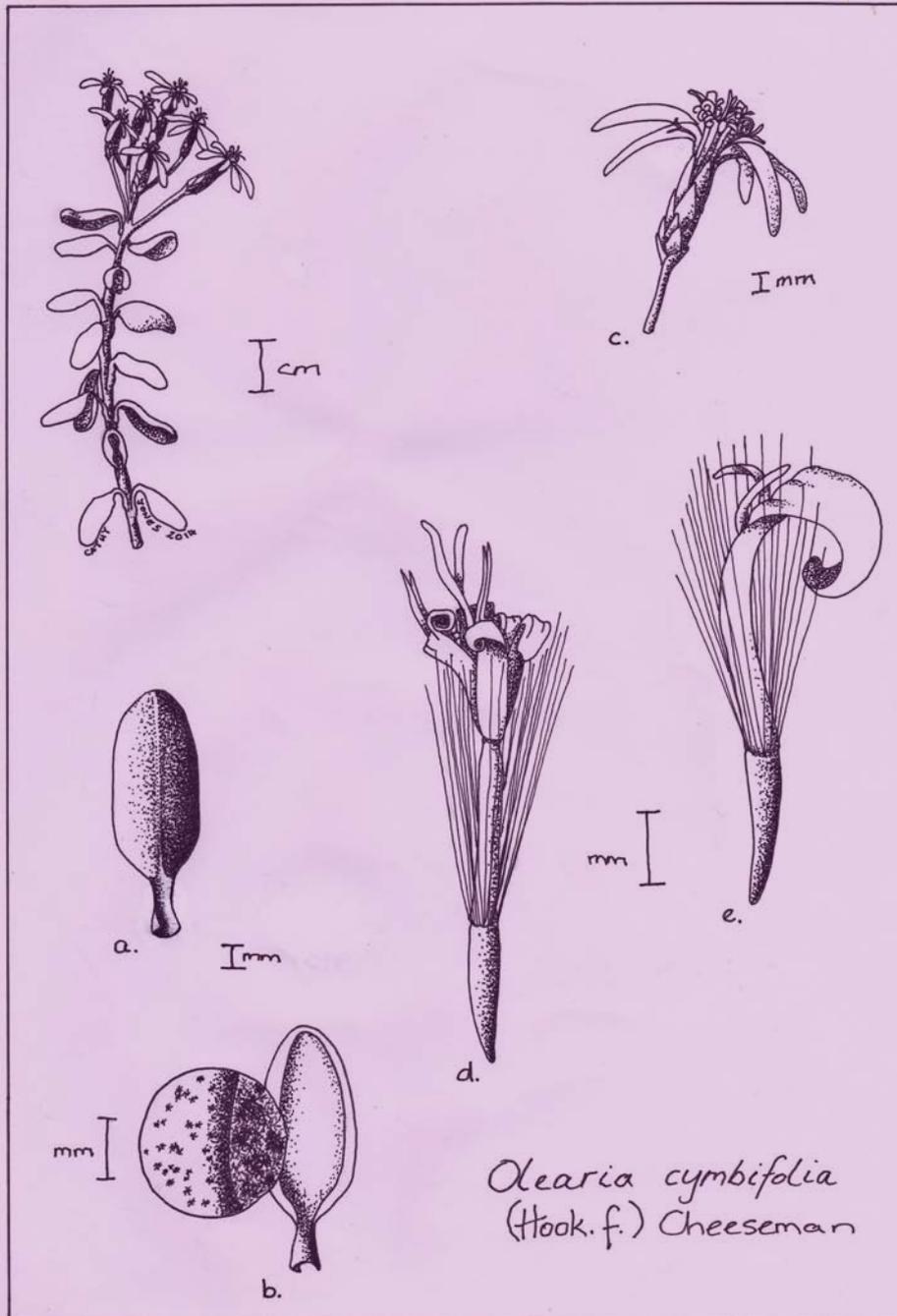


NEW ZEALAND BOTANICAL SOCIETY

# NEWSLETTER

NUMBER 117

September 2014



## New Zealand Botanical Society

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### Subscriptions

The 2014 ordinary and institutional subscriptions are \$25 (reduced to \$18 if paid by the due date on the subscription invoice). The 2014 student subscription, available to full-time students, is \$12 (reduced to \$9 if paid by the due date on the subscription invoice).

Back issues of the *Newsletter* are available at \$7.00 each. Since 1986 the Newsletter has appeared quarterly in March, June, September and December.

New subscriptions are always welcome and these, together with back issue orders, should be sent to the Secretary/Treasurer (address above).

Subscriptions are due by 28 February each year for that calendar year. Existing subscribers are sent an invoice with the December *Newsletter* for the next years subscription which offers a reduction if this is paid by the due date. If you are in arrears with your subscription a reminder notice comes attached to each issue of the *Newsletter*.

### Deadline for next issue

The deadline for the December 2014 issue is 25 November 2014.

Please post contributions to:  
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Museum of New Zealand Te Papa Tongarewa  
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Wellington 6021

Send email contributions to [editor@nzbotanicalsociety.org.nz](mailto:editor@nzbotanicalsociety.org.nz). Files are preferably in MS Word, as an open text document (Open Office document with suffix ".odt") or saved as RTF or ASCII. Macintosh files can also be accepted. Graphics can be sent as TIF JPG, or BMP files; please do not embed images into documents. Alternatively photos or line drawings can be posted and will be returned if required. Drawings and photos make an article more readable so please include them if possible.

### Cover Illustration.

*Olearia cymbifolia* drawn by Cathy Jones from a specimen collected on the Lake Chalice track, Richmond Forest Park, on 16 February 2014. a.leaf adaxial surface, b.leaf abaxial surface with magnification showing arrangement of stellate hairs on adaxial and abaxial surfaces, c.capitulum, d.disc floret, e.ray floret.

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### New Zealand Botanical Society News

#### ■ Allan Mere Award 2014

The NZBS Committee is pleased to announce that this year's award of the Allan Mere is to Dr Brian P J Molloy, member of the Canterbury Botanical Society, Royal Society representative on the Riccarton Bush Trust and Director of the QEII National Trust.

Brian was proposed by Peter de Lange, Peter Heenan and Brian's late son, Michael Molloy, and his nomination seconded by three other botanical societies (Auckland, Nelson and Canterbury), Riccarton Bush Trust, QEII National Trust, National Biodiversity Network Trust (UK), Landcare Research (Christchurch and Dunedin), Department of Conservation, NZ Plant Conservation Network and two individuals (Joshua Salter and Ian St George).

The proposers wrote: "Brian has been an important mentor and advisor in our two careers, provided sage advice, insights into conservation and ecology, and helped format our views on the complexities of the biological world. However, we are not the only ones to have benefitted from his wisdom, humour and unequalled company in the field. Brian is, if ever there was a claim for such a title, a 'living legend'. As a conservationist Brian has settled many a battle by using his favoured weapon, 'a cuppa', often brewed haphazardly on the roadside to the amused consternation of an aggrieved landowner or distraught botanist. Few would know that he was the driver behind the late David Given's switch from taxonomy to plant conservation, and that he provided the impetus within QEII to change covenanting styles from haphazard choices or personal whims to ones setting aside key landscapes, ecosystems and threatened plant and animal habitats. Throughout his career, Brian has followed the safe advice of his colleague and friend, the late Eric Godley, who simply asked that people do 'Good Botany'. This he has done, and this he has strongly encouraged others to do".

A selection of comments below from his supporters indicate the breadth of admiration for Brian throughout the botanical community of New Zealand:

"As a biosystematist Brian has a well practised eye, and has, we have estimated, recognised in the vicinity of 80 potentially new taxa, many discovered after his official retirement in 1995".

"Brian has had a long and distinguished career in the botanical sciences and for over 50 years has made important contributions in many areas, including ecology of South Island grasslands, reserve identification and conservation, Riccarton Bush, taxonomy and QEII. His contributions to taxonomy are especially important for New Zealand botany and include describing a new genus of conifer (*Manoao*), new species of daisies (in the genera *Leucogenes*, *Olearia* and *Pachystegia*), orchids, grasses, and a range of other species (eg *Melicytus* and *Chaerophyllum*)."

"Brian is a remarkable and wonderful man and a truly exceptional botanist who has probably done more than anyone alive in New Zealand to support and promote botanical study and plant conservation".

Brian is the fifteenth recipient of the Allan Mere since the NZBS was asked to administer the award in 1999.

Congratulations Brian! On behalf of the Society, I will present the Allan Mere to Brian at the monthly Canterbury Botanical Society meeting on 7 November 2014.

**Anthony Wright**, President, New Zealand Botanical Society

## ■ Call for Nominations

Nominations are called for the following positions of Officers and Committee of the New Zealand Botanical Society for 2015:

- President
- Secretary/Treasurer
- 3 Committee Members

Nominations for all positions opened 1 September 2014 and close on 19 November 2014. Nominations shall be made in writing to the Secretary, c/o Canterbury Museum, Rolleston Avenue, Christchurch 8013, and shall be signed by the Proposer, the Seconder, and by the Nominee to indicate their acceptance of nomination. If necessary, ballot papers for a postal election will be circulated with your December *Newsletter*.

## Regional Botanical Society News

### ■ Auckland Botanical Society

#### June Meeting

The meeting began with an auction of botanical books, then Bec Stanley spoke on her surveys of the “wild west forget-me-not”, *Myosotis petiolata* var. *pansa*. In 2000 Bec surveyed the national extent of this species from north Taranaki to Te Henga, then in 2009 she repeated the Auckland section to determine the state of the population. Like all our native herbs, the forget-me-not is subject to being over-whelmed by taller exotics, so has a toe-hold on precarious sites. This made the survey rather hair-raising in parts. The other refuge, track margins, is where most of us get to see this attractive little white-flowered herb.

#### June Field Trip

A large party of 37 members met at the historic Mataia Homestead on SH 16 at Glorit, on the edge of the Kaipara Harbour. After a welcoming morning tea including Devonshire scones, we car pooled across the farm and parked at a sand quarry on a hilltop. All the natural areas on the property have been fenced and have had intensive pest control since 2008. This has been such a success that kiwi have been released there. Riparian planting is being undertaken along the stream edges, but apart from that natural regeneration is the order of the day. The health of the vegetation, particularly pohutukawa that had almost been killed by possum browse, is remarkable, and filled the hearts of the botanists with delight. A drop downhill through gumland scrub to the harbour's edge gave a view over an estuary, and led to the path around Tautau Point and Mataia Point. From there a boardwalk took us through a QE II covenanted patch with kauri and tanekaha. A rather muddy path back to the homestead had us walking through swathes of the Nationally Endangered *Centipeda minima*.

#### July Meeting

After the Plant of the Month talk on *Pimelea longifolia*, Mark Large began his talk by promising to tell us a story: and what a story it was, taking us from Triassic extinctions, acidified seas, Greenland's fossil flora, the separation of Pangaea, and tsunamis in Japan. Some botany was introduced when he pointed out that leaves have fewer stomata when carbon levels and temperatures are high. The state of today's atmosphere is illustrated by the fact that the karaka leaves collected from Tolaga Bay by Banks and Solander in 1769, have considerably more stomata than karaka leaves collected there recently.

#### July Field Trip

A dry-footed suburban walk to view rock forests attracted a record 68 people, despite the day being as cold as Auckland gets. We visited Government House grounds, where the head gardener guided our steps, and Eden Gardens, where the café proved to be popular. After lunch Withiel Thomas Reserve and Almorah Road Reserve completed the walk to view the best remnants of Auckland's isthmus rock forests.

### August Meeting

A variety of talks made this a busy evening. Warren Brewer kicked off with Plant of the Month – *Pseudopanax arboreus*. Warren included his particular interest in etymology. Jane Sparkes and Nick Waipara from Auckland Council explained the work of the Weedspotters' Network and illustrated the fungal pathogen, Myrtle rust, with a plea that Bot Soc members keep an eye open in case it reaches New Zealand. Geoff Davidson completed the evening's talks by explaining the NZ Native Forest Restoration Trust's seven year effort to reserve an area on the Chatham Islands containing over 100 plants of special interest.

### August Field Trip

The steep sides of an eroded river gully protected what is now the Harker Reserve, Tuakau, from being converted to pasture in days gone by. A disused road makes access easy through the regenerating vegetation, and finally leads to an impressive waterfall. Local enthusiasts have done some weeding and considerable planting along the track. The main interest is the number of pukatea and large swamp maire trees growing in wet hollows. Considerable effort was made on the day in putting together a species list, as none is known to exist.

### Forthcoming Activities

20 September South Piha  
1 October "Subantarctic Islands ecosystems", Sean Cooper  
18 October Oruawharo River, Kaipara Harbour  
18-25 October Lord Howe Island  
5 November "Kunzea, and then there were 10", Peter de Lange  
15 November Rakino Island

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### ■ **Rotorua Botanical Society**

#### June Field Trip - Wairere Falls

Although it was a combined trip with Waikato Botanical Society, the turnout was only nine. Several people were keen to concentrate on ferns so we set out with these as the day's targets. Initially, the canopy was mostly totara with kanuka and some titoki, mahoe and pigeonwood, typical of a recent forest. We encountered great carpets of filmy ferns amongst the rocks in the outwash fan of the stream close to the track start. *Hymenophyllum scabrum* with its distinctive hairy stipe enveloped most of the large rocks along with *H. sanguinolentum*. Other filmy ferns included *H. dilatatum*, *H. flexuosum*, kidney fern and *H. frankliniae*. *Arthropteris tenella* was also locally common nearer the first bridge along with *Asplenium lamprophyllum* climbing on the rocks and at the bases of trees.

Near the bridge the forest was well developed with kohekohe, puriri, titoki and the odd *Mida salicifolia* and *Raukaua edgerleyi* amongst dominant tawa. Here the main groundcover was *H. demissum* or bush rice grass. For a brief section the track was close to pasture with weeds such as blackberry and Himalayan honeysuckle and two new records, *Coprosma areolata* and *Dodonaea viscosa*, both clearly recent arrivals as they were abundant only as saplings. As the gorge became tighter the main trees were rewarewa, tawa and pigeonwood with masses of kiekie and supplejack. Kanuka, *Dicksonia squarrosa* and silver fern dominated where the track veered away from the gorge to gain height on the ridge the forest.

At the edge of the plateau the forest changed to tawa, kamahi, tawari and the odd rimu. At the top of the falls *Hymenophyllum frankliniae* was common on tree ferns along with *Trichomanes venosum*. *Blechnum nigrum* was in the darkest, dampest places along the track. In more open areas were *B. fraseri* and *Lycopodium deuterodensum*. After viewing the top of the falls we headed upriver in search of *Hymenophyllum lyallii* only to find *H. minimum* instead and a huge pendulous *Phlegmariurus varius*. From there we retreated to the vehicles, on the way noting *Trichomanes elongatum* and *H. atrovirens* in different dark holes in the bank. It was a great day for ferns.

#### July Field Trip - Lindemans Road loop

The first hundred metres or so provided a good view of several lowland species not seen later,

including puriri and kohekohe. The area had been logged a long time ago (as evidenced by the kauri dams) but the lower slopes had only recently been allowed to return to forest resulting in considerable areas of tree ferns, especially wheki, much karamu, mahoe and the odd young rimu. Interesting finds included *Brachyglottis kirkii*, a common sight along the fringes of this side of the Kaimai Ranges and, *Melicytus micranthus*.

The steep track meant we had plenty of time to seek out interesting plants, including *Adiantum cunninghamii*, *A. hispidulum*, and *A. fulvum*. Saplings of *Pittosporum cornifolium* were, unusually, found on the ground under a pole kauri. Other kauri forest associates included a canopy often dominated by toru, *Coprosma spathulata*, and the odd hard beech. Common epiphytes here included *Winika cunninghamii*, *Drymoanthus adversus* and the pygmy orchid, *Bulbophyllum tuberosum*. On the ground, patches of *Pterostylis trullifolia*, *Corybas trilobus* *C. oblongus* and *C. acuminatus* were just coming into bud. Further on the heavily perfumed flowers of *Alseuosmia macrophylla* were just beginning to open. A special find was a solitary large *Libocedrus plumosa*. In a short section of tawa-dominated forest with abundant pigeonwood, supplejack and tawari there was *Mida salicifolia*.

As the ridge flattened out (briefly), we lunched under kauri, amongst *Corokia buddleioides* in fruit. *Hydrocotyle dissecta* formed mats on the ground, with patches of *Gonocarpus incanus*, *G. micranthus* (in a wet spot) and *Nertera dichondraefolia*. After lunch, where the track finally flattened off, the forest was mainly tawari, with large old kauri and *Dracophyllum latifolium*. Just over the summit *Pittosporum kirkii*, was noted hanging from a *Collospermum hastatum* amongst the now abundant kiekie. Along this flattish section *Blechnum fraserii*, *B. nigrum* and filmy ferns, including *Hymenophyllum scabrum*, *H. frankliniae* and *H. flexuosum*, were especially common. A brief climb brought us to *Pseudopanax laetus* and *Raukaua anomalus* a pair to our earlier *Melicytus micranthus*. Several sedges including *Macheriana tenax* and *Schoenus maschalinus* were noted in the old pond bed of the second dam.

#### August Field Trip - Maketu Spit

The Kaituna River comes to the sea at a sand bar. To speed its flow in flood a cut was made in 1957, near one of its former outlets, breaking the farmland into several islands linked by causeways. The main spit had been retired from grazing but remained weedy until about 4 years ago when a care group took over its management. As a result weeds such as pampas, lupin and pines have been largely removed and plantings made. Marram is largely absent so spinifex dominates much of the area along with *Muehlenbeckia complexa* and patches of *Carex testacea*. Wind grass (*Lachnagrostis billardieri*) is also common. From the cut to the tip the spit becomes barer so the spinifex becomes more dominant and sparse and scattered *Senecio skirrhodon* and straggly pingao appear.

We started at the cut and first traversed the oceanward edge and returned via the estuary side, so for the outward journey we traversed mainly *Muehlenbeckia* and spinifex. Many adventives were only present close to the car park at the cut and because we were near mid winter many of the herbs were present only as seedlings. The *Muehlenbeckia* hid many herbs including *Calystegia soldanella*, *Oxalis rubens* and introduced weeds, especially *Stellaria media* *Silene gallica* and *Cerastium fontanum*. Other plants here included *Carex pumila* and *Poa pusilla*. In the bare areas cats ear was especially abundant and the grass *Lagarus ovatus*, was just starting to appear. *Senecio elegans* was a target weed species scattered throughout and often evident above the sward. Towards the middle of the spit *Senecio biserratus* was quite evident and common and easily confused with the *S. elegans*.

At the tip of the spit plants were very lush as seabird roosting on the high tide regularly fertilised the area. Here, and along much of the inside of the spit, introduced plants were much more common and varied. Back towards the car park large areas were dominated by *Ficinia nodosa* with patches of sand grass, *Zoysia pauciflora*. Prominent adventives included *Osteospermum fruticosum*, *Cakile maritima* and wild radish. Several of the early plantings were already seeding including *Coprosma repens* and *Melicytus novaezelandiae*. A species list from 10 years earlier during the summer showed some adventive plants gone, but many missed because of the different seasons. Several sedges seem to have been lost because the upper estuary had previously been saline but became fresh when a causeway had been cut then re-dammed.

#### FUTURE EVENTS

October 11	Lake Maraetai, Waikato River
October 31- Sat 2 November (Sunday 3 November optional)	East Cape revisited #8

November 6- 7 December

Lake Surprise, Tongariro National Park

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#### ■ Wanganui Museum Botanical Group

##### FUTURE EVENTS

7 October	Plants in the UK. Colin and Robyn Ogle.
1/2 November.	Bush across Mangawhero River from Aberfeldy School.
4 November	Workshop on the family Solanaceae. Colin Ogle.
29/30 November.	Taihape – Les & Kiwi Rowlands' farm.

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#### ■ Wellington Botanical Society

##### 15 February 2014: Muritai Park Track – Mackenzie Track

Fifteen of us started the track, marked by a large old tītoki. A tall, probably planted, whau, overhung the steep, barren slopes, while underneath was a varied community of commonly-occurring native Wellington ferns, sedges and herbaceous plants. Among them, were occasional tufts of the dainty *Arthropodium candidum* in flower. Noted also, were two huge, overhanging holly trees. We climbed steadily, enjoying lush tangles of kiekie in the gullies, and further up, the opportunity to study *Libertia edgariae* in flower, this park being a stronghold for the species. Also prominent here were the bright pink flowers of the insectivorous native sundew, *Drosera auriculata*, wahu. An unexpected highlight was a 6m narrow-leaved maire spotted below the track. Both black maire and white maire were also present. Dry spur-crests with black beech and hard beech, over a typical shrub understorey of prickly mingimingi (*Leptecophylla juniperina*, and big mingimingi (*Leucopogon fasciculatus*), and coprosma species, offered us yet another type of plant community to botanise. On the Mackenzie Track, Pat Enright made the find of the day, the Nationally Critical *Rorippa divaricata*.

##### 8 March 2014: Fitzroy Bay side of Baring Head / Orua Pouanui

Thanks to GWRC Ranger Mark McAlpine providing us with a gate key, our party of ten was able to take 4WD vehicles over the Wainuiomata River bridge to Fitzroy Bay, giving us more time to botanise. We botanised the raised beach adding the ferns *Asplenium flabellifolium* and *Polystichum oculatum* to the plant list. Later, at the Baring Head climbing rocks, we saw *Coprosma repens* prostrated against them by the wind, *Pimelea prostrata* subsp. *prostrata*, *Crassula mataikona* and *Craspedia uniflora* var. *grandis*. We saw an abundance of ripe fruit on *Coprosma propinqua* var. *propinqua*, *Melicytus crassifolius* and *Muehlenbeckia complexa*. Many copper butterflies fed on abundant *Ozothamnus leptophyllus* flowers. Also *Spinifex sericeus* and *Poa billardiarei* (= *Austrofestuca littoralis*) on the beach are growing well, no longer being trampled by cattle, and sand dunes are forming.

##### 5 April 2014: Wi Tako Scenic Reserve, Upper Hutt

Our group of seventeen climbed Rangi's Track through Forest and Bird's Ecclesfield Reserve (5 ha) and on to Wi Tako Ngatata Scenic Reserve, (60 ha), to start botanising. We used a new track skirting around the base of a regenerating hillside, crossing several wet gullies. Highlights we added to the list were *Collospermum hastatum* and *Cyathea smithii*. We saw a lot of *Gahnia pauciflora* and *G. setifolia*. There is also the uncommon *G. rigida* near where we walked, but we were unable to find it. We also found the weedy *Pseudopanax lessonii* hybrids, *Cotoneaster franchetii*, *Erica arborea* / tree heath and a white-flowered jasmine. We lunched in a grove of black beech beside a stream with two small *Syzygium maire* / swamp maire on its banks.

##### 3 May 2014: Pūriri Track and Broad Gully Track

These short tracks above Wainuiomata, initially under kānuka, and then through beech forest, produced some unexpected botanical surprises. First, masses of tiny beech seedlings, the product of

a beech mast year, looking like tiny green butterflies on the forest floor. Second, the start of the orchid-flowering season with at least two tiny orchids already in flower. *Pterostylis alobula* and *Corybas cheesemani*. Colourful fungi, small and large, in the leaf litter and on wood, added further interest. Findings of the orchid *Drymoanthus adversus* are always celebrated. Both hard beech and black beech are present. Pest control appears to have been successful with palatable plants such as five-finger and patē showing several years' growth. Other seedlings in evidence included miro and pukatea. Another trip in a year or two would be worthwhile, to check on the survival and progress of those beech seedlings.

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## ■ Nelson Botanical Society

### May Fieldtrip: Fern Covenant, Delaware Bay

Eighteen members explored the Fern family covenant in Maori Pa Road. The property is regenerating well following extensive weed and pest control by the family over many years. Near the coast is 2 ha of mature forest with some tall *Alectryon excelsus*, *Beilschmiedia tawa* and *Laurelia novae-zelandiae* trees with associated epiphytes and vines including *Astelia solandri*, *Freycinetia banksii* and *Griselinia lucida*. The understory had many seedlings of *Streblus heterophyllus* and *Rhopalostylis sapida*. We were pleased to find a single juvenile *Dysoxylum spectabile* as this is at its southern limit. Climbing up trees were *Microsorium scandens* and *Blechnum filiforme* and on the ground *Lastreopsis glabella* and *L. velutina*. The rest of the covenant is regenerating *Kunzea ericoides* with an understorey of mainly *Coprosma rhamnoides* and *Meliclytus ramiflorus*.

### May Evening Meeting: "Tien Shan Mountains, Kazakhstan". Uta Purcell.

They travelled by train, bus, four wheel drive, horses and foot for 18 days often up round 3,000 m. Almaty was the centre point and they travelled south to Small Almaty Gorge, then east to Charyn National Park, the lower parts of the Dzhungarian Mountains and deserts of Aktau and eventually back along the vast Kapchagai Lake, then west by train and bus to a village at the foot of the Tien. A highlight was a stay at Mountain House in the Aksu-Dzhabagly Scientific Reserve where 800 square kilometres have been protected for 75 years. This was stunning mountain country with Bugulator at 4,244 m as backdrop, brown bear, ibex, juniper forest and alpine meadows. This was obviously a perfect time of year with the snow having just gone. Tulips were plentiful with not much leaf and delicate petals. Gentians of the wonderful bright blues we see in Europe. There were delphiniums, euphrasias, white hollyhocks, fritillarias, euphorbias, *Myosotis*, silver birch and many more.

### June Fieldtrip: Pelorus Fungi and Flora

Ten members drove to Pelorus Scenic Reserve to explore for fungi on an off-track route. We were fortunate to see the elusive *Geoglossum fallax*, protruding from the leaf litter. Close by we saw the parasitic fungus, *Cordyceps robertsii*. *Akanthomyces araneorum*, another parasitic fungus, was seen with its white frost-like stalks appearing on small branches. Several clumps of green *Gliophorus viridis* fungi were growing at the base of *Cyathea dealbata*. Several wax-gills distinguished by their translucent waxy texture and their bright colours were sighted on dead wood and in the leaf litter. Large cup fungi, *Cookeina colensoi*, were common on fallen tree trunks. The brown earth stars, *Geastrum saccatum*, were found nestled in the leaf litter. White translucent jelly fungi, *Tremella fuciformis*, were growing under damp branchlets. Both club and small clumps of coral fungi were evident on the forest floor displaying their bright colourful fingers.

### June Evening meeting: Flying, Fungi and Flora, Rebecca Bowater.

Rebecca captivated our members with a selection of audio-visuals, the first being the white herons at their only New Zealand breeding colony in Waitangiroti Reserve. These amazing birds were going about their daily routines of preening, feeding their young and social interaction, with Rebecca photographing their elegance and grace. The second viewing portrayed our alpine flora with a musical background, which enhanced the crisp images of these flowering plants. The final powerpoint slides presented a range of fungi found in the Nelson Region.

### July Fieldtrip: Tinline Nature Walk, Abel Tasman National Park

Eight of us enjoyed this trip into the National Park. The predominant podocarp is rimu and the overall predominant trees are beech – black, silver and hard. We saw *Metrosideros fulgens* in flower and two *Raukaua edgerleyi*. Of the many tree ferns present, some were possibly *Cyathea cunninghamii*. The filmy ferns we found were *Hymenophyllum bivalve*, *H. demissum*, *H. sanguinolentum*, *H. revolutum*, *H. scabrum*, *H. villosum* as well as *Cardiomanes reniforme*.

### July Evening Meeting: “Spider orchids and fungus gnats; a story about deception, sex and death in the New Zealand forest.” Carlos Lehnebach

Carlos briefly explained the structure of orchid flowers and the diversity of orchids in New Zealand before touching on their pollination systems. Spider orchids produce no nectar and have long been known to be visited by fungus gnats. It was also suspected that they resemble fungi visually and in their odour. Eight species of *Nematoceras* are currently recognised in New Zealand with at least nine tag-named forms in the *Nematoceras trilobum* aggregate. Using DNA sequencing and by scoring 14 morphological characters for 150 populations, four possible new species were segregated. The pollinators of these forms were determined using DNA to identify the fungus gnats, eggs and larvae found in the flowers. They found that each of the spider orchid “species” was visited by different species of fungus gnat of the genus *Mycetophila*. Video footage of male fungus gnats sitting on the flowers and flicking their wings to attract females was a highlight. Photos of fungus gnats with orchid pollinia stuck on their thorax confirmed their role in pollination. Another aspect of this study showed that each species produced a different odour imitating a different fungus. They have distinguished four new orchid species in the aggregate and demonstrated that they use a deceptive pollination system, which is a mix of brood-site and mating-rendezvous-site for the fungus gnats.

### FUTURE EVENTS

September 21	Inches’ Wairoa Valley (Threatened Plant weeding): Shannel Courtney 03 546 9922
September 22	Talk by Cathy Jones “Alpine Plants”
October 19	Jimmy Lee Creek, Richmond: Susan Cook 03 544 6175
October 24-27	Labour Weekend Camp, Matakītaki, Murchison: Cathy Jones 03 546 9499
November 16	Waireka Rd Covenant, Tophouse: Helen Lindsay 03 5284020
December 12-14	Cobb, Peel + Magnesite area camp: Shannel Courtney 03 5469922
December 21	Mount Robert, Nelson Lakes National Park: Sue Hallas 03 545 0294

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### ■ **Canterbury Botanical Society**

#### July Fieldtrip: Plant Pleasures and Puzzles and in the Botanic gardens Native Garden

Eleven members (4 under 30 please note) turned up to test their plant ID skills in the Botanical Gardens native section, and Cockayne garden. This collection is gathered from around NZ so we were not able to rely on superficial glances or the likely species for an area or habitat to decide on a plant’s name. A plant’s provenance, possible hybridism, and cultivars added to the challenge.

First up was a shrubby totara (6m main stem) planted at the entry to the Native section in honour of Christchurch botanist Arnold Wall – our identification of Westland totara (*Podocarpus acutifolia*) was confirmed by the plant label. This is one species of an international collection of trees and shrubs in the genus *Podocarpus*.

Most of the common trees of Canterbury are grown here but we were attracted to the trees with a natural distribution limit north of Kaikoura and we managed to name black maire (*Nestegis cunninghamii*), wharangi (*Melicope ternata*), parataniwha (*Elatostema rugosum*), toru (*Toronia toru*), and pukatea (*Laurelia novae-zelandiae*) sporting a few fluffy seeds. The several species of *Pomaderris* had us consulting Eagles Trees and Shrubs but I am not game to put names into the newsletter beyond the familiar local small-leaved *P. phyllifolia*.

The shelter of the beech, kahikatea, broadleaf and totara canopy trees has enabled the survival of

a suite of frost-tender self-sown saplings that do not naturally grow south of Banks Peninsula – karaka, kawakawa, raukaua (*Raukaua edgerleyi*), pigeonwood, titoki - and species of higher rainfall areas to the west – kanono (*Coprosma grandifolia*), toro (*Myrsine salicina*), and the forest cabbage tree (*Cordyline banksii*).

The new hebe/veronica garden of the naturally occurring species put Alistair's knowledge to the test especially as the plant labels are yet to come. One unmistakable species is *Hebe townsonii* (= *Veronica townsonii*) with the domatia along the leaf edges. Later we were caught out by the Kermadec Island species *Myrsine kermadecensis* and *Pseudopanax kermadecensis*.

David helped us identify wheki-ponga (*Dicksonia fibrosa*) from scruffy wheki (*D. squarrosa*), ponga/silver fern (*Cyathea dealbata*) from katote (*C. smithii*) with its skirt of dead mid-ribs. The spleenworts were mainly *Asplenium xlucrosum*, the fast-growing hybrid of hen and chicken fern (*A. bulbiferum*). It was great to see the hanging spleenwort *A. flaccidum* perched in a broadleaf.

The Native section is a great place to view threatened species such as the sub-alpine tree Pitpat (*Pittosporum patulum*), Cobb Valley *P. dallii*, the frost-flat shrub *P. obcordatum*, kakabeak in flower (*Clianthus maxima*), and the exceedingly rare button daisy *Leptinella nana*. There was some surprise that the city weed Wind grass (*Anemanthele lessoniana*), is a nationally threatened species; an example of how our city and gardens can provide surrogate habitat for plants threatened by loss of their natural habitats.

The garden's staff clear the native section of superfluous self-seeding trees. Dean mentioned that makomako/wineberry is on the list as it had made a nuisance of itself by spreading throughout the gardens with the help of its bird-dispersed fruit and hybridises with shrubby wineberry (*Aristotelia fruticosa*). Some of the older *Hoheria* had died of old age, which helped reduce the work of clearing out the lacebark hybrids. Funnily enough karo doesn't spread in the Gardens. Whether we were looking at *Pittosporum crassifolium* or *P. ralphii* was not resolved. The most numerous self-sown trees were five-fingers (*Pseudopanax* species) in a morphological muddle of hybrid forms. I would have liked to see the native inkberry *Dianella nigra* within the native section used instead of the current fashion for Australian cultivars.

Dean showed us the recent addition to the NZ flora *Parahebe jovellanooides*, a species only likely to be admired by a botanical society as story of its discovery and Nationally Critical status is not matched by its stature or presence. *Jovellana repens* at least made it to ankle height. The Cook Strait kowhai *Sophora molloyii* (the popular Dragons Gold cultivar) was in flower as well as a *S. microphylla* tree sourced from the Waimakariri plains. It was confusing to see the South American *Sophora* in the native section and I felt it best left in the dedicated *Sophora* collection. Unlike the Auckland and Wellington Botanic gardens the use of wiggwig *Muehlenbeckia astonii* has been restrained but it is sure to feature in the planned Canterbury dryland garden.

It was such an enjoyable way to spend a winter's morning that we plan to return next July to test our plant knowledge in the rest of the native section and view the *Phormium* collection. We left with a huge appreciation of the collectors and gardeners who have built up and tended the collection over the past 75 years.

#### August: Fieldtrip: West Melton Grasslands and Water Race

We chose to visit a dryland site for our August trip, not just because it provides an easier option during the often colder and less reliably dry winter months but also because these ecosystems are amongst the most highly threatened in New Zealand. They occupy areas that were historically the easiest to clear and convert to pasture. This loss has accelerated recently as a result of the lure of higher returns from dairy production and large-scale irrigation. Fortunately the sites we visited are owned by Ecan. However, they are still used for grazing under a lease arrangement. The first site we looked at was the water race at the end of Thompsons Rd and while a number debated the statutory obligations of territorial authorities the rest of us examined the mostly herbaceous flora of this tiny site. I have visited the site a number of times and thought I had located those species that made the site so special, including *Mentha cunninghamii* (now ranked as a species At Risk – Declining), *Gonocarpus micranthus*, *Plantago triandra* and no less than seven species of *Carex*. Despite my confidence that I had located all that was important prior to this trip Miles Giller's ever acute eyesight picked up another gem – *Gunnera dentata*. There are a few risks to the site

including over enthusiastic mechanical drain cleaning that had flattened a large native broom (*Carmichaelia australis*) and unsympathetic gorse control.

We had lunch on the river side of the stopbank at the edge of a borrow pit that was created in the making of the aforementioned stopbank and had a quick look at a number of kowhai that were burnt in a grass fire a year and a half ago. While most of them have recovered, there was some significant damage to the bark of at least one. Time will reveal the resilience of these old-timers in the face of these unfortunately all too common fires. Following lunch a few of us pulled a number of wilding pines that were invading the moss field that has colonised the floor of the borrow pit.

The afternoon saw us occupying the paddocks on the east side of the road and these paddocks hold a quite different appeal. There is one very healthy *Olearia adenocarpa*, (the Nationally critical shrub daisy only found on the Waimakariri and Rakaia flood plains) with a scattering of *Carmichaelia corrugata* and *Raoulia monroi* (At Risk-Declining) on the fence line that signposts the site while inside the paddock the indigenous vegetation is very sparse. Our meandering brought us to no less than 10 more *Olearia adenocarpa*. This shrub ranged in health from the first specimen mentioned above to those that were barely more than a stump. Rabbits and hares are responsible for much of its parlous state. These plants would benefit greatly from some protection and as one of the patches contained 7 individuals in a quite confined area it might even be considered cost effective. The native species were sparse but included many that would once have been much more common across the Canterbury Plains, such as *Geranium retrorsum* (Nationally vulnerable), *Raoulia australis* and *Scleranthus uniflorus*. A couple of small terraces contained a mix of exotic grasses, *Poa cita*, *Festuca novae-zelandiae* and matagouri (some killed by herbicide targeted at gorse). The greatest threat to the site at present is the large swathe of gorse that will relentlessly overtake all of the native species that have clung on at this site since it was a channel of the Waimakariri.

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#### ■ Botanical Society of Otago

##### FUTURE EVENTS

September 10 Annual Geoff Baylis Lecture – ‘Long leaves and fat roots’ Peter Johnson.

September 13 Moss, liverwort and lichen walks and workshops. Contact Alison Knight, ph 4878265.

October 4 Fieldtrip to Waianakarua Arboretum. Contact John Steel, ph 021 2133170.

October 15 Department of Botany Colloquium speakers.

November 1 Fieldtrip to Macraes Flat. Contact Marcia Dale, ph 4546706.

##### Botanical Society of Otago

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#### ■ Other Botanical Society Contacts

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##### Manawatu Botanical Society

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##### Wakatipu Botanical Group

**Chairman:** Neill Simpson (03) 442 2035  
**Secretary:** Lyn Clendon (03) 442 3153

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## ANNOUNCEMENTS

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▪ **Request for James Beever's Dictionary of Maori Plant Names (1991)**

Does anyone have a spare copy of this dictionary please - required for a Maori studies course?  
If yes please contact: Emma Sandford mobile 021 125 8817, emma@netsmart.net.nz

▪ **Orchid Council of New Zealand Annual Weekend**

**Iwitahi Heritage Protection Area**

Iwitahi HPA, administered by the Orchid Council of New Zealand, is one of the last areas of *P. nigra* left in the North Island. Native orchids thrive under the trees due to the needle drop creating an environment where the orchids can grow unhindered by undergrowth. The Orchid Council of New Zealand will be holding its annual weekend, which is open to any interested person, here on the weekend of 6<sup>th</sup> -7<sup>th</sup> December 2014. At this time of the year most of the orchids will be in flower.

**Directions to Sika Lodge**

The reserve is 27km east of Taupo turn right off state high way 5 (Napier-Taupo Highway) into Taharua Rd and follow for 9.5km then turn right into Clements Mill Road.

**Accommodation**

Sika Lodge can accommodate about 32 people. Bunks, sheets, pillow and a light duvet are supplied. It does pay to bring extra blankets. The units are:- 3 X 8 bunk with a heater in each room; 4 X 2 bunks , lounge, kitchen and shower and toilet blocks. Bring warm clothing, as it can get very cold in this area at this time of the year, also wet weather clothing and a pair of gardening gloves.

**Food** (If you want beer or wine with meals bring your own)

Catered Friday: Dinner

Saturday: Breakfast, Lunch, Dinner

Sunday: Breakfast, Lunch

**Program**

Friday Night - Welcome Introductions, catch up

Sat morning - Visit to reserve guided tour; afternoon - Further explore the area and working bee to tidy up area, Evening discussion and presentations.

Sun morning - Working Bee; afternoon - Depart for home

**Cost:** \$90 (may reduce depending on the final numbers)

To book contact Bill Liddy 06 836 6735 or email [wflid@xtra.co.nz](mailto:wflid@xtra.co.nz)

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## NOTES AND REPORTS

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▪ **New Zealand's natives as weeds abroad**

**Murray Dawson**, Landcare Research, PO Box 69040, Lincoln 7640, New Zealand;  
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New Zealanders love their native plants and in equal measure despise exotic weed invaders. However, few non-botanists may realise that several New Zealand native plants have escaped cultivation to become weedy in other regions of the world. This article profiles a diverse range of these New Zealand native rogues abroad. It provides a somewhat abridged version of a recent article by the author (Dawson, 2014) and both expand upon articles by the late Graham Harris (1998, 2002).

### ***Acaena novae-zelandiae* (bidibid, piripiri, red bidibid)**

*Acaena* is a genus of about 100 southern hemisphere species in the Rosaceae family. They are mat-forming herbaceous plants with pinnate leaves. Their fruit form a dense ball containing numerous seeds, and in some species the seed-heads form a burr which attaches to animal fur, feathers, clothing and shoes for dispersal – to the annoyance of many a hiker. Some weedy bidibids can be a serious problem in the wool of sheep, and naturalisations in the early 1900s were through contaminants in fleeces exported from Australia and/or New Zealand.

New Zealand is well represented with 18 indigenous species (of which 14 are endemic) – *Acaena anserinifolia* (hutiwai), *A. buchananii*, *A. caesiiglauca* (the glaucous bidibid), *A. dumicola*, *A. emittens*, *A. fissistipula*, *A. glabra*, *A. inermis* (the spineless bidibid), *A. juvenca*, *A. magellanica*, *A. microphylla* (2 varieties), *A. minor* (also 2 varieties), *A. novae-zelandiae* (red bidibid), *A. pallida* (sand bidibid, sand piripiri), *A. profundeincisa*, *A. rorida*, *A. saccaticupula* and *A. tesca*. A few of the indigenous species and cultivars are grown as groundcovers, including *A. caesiiglauca*, *A. inermis* ‘Purpurea’, and several selections of *A. microphylla* and *A. saccaticupula*.

Despite the species name ‘novae-zelandiae’, red bidibid is probably native to both New Zealand and Australia (although some botanists believe it to be an early Australian import). *Acaena novae-zelandiae* is considered a native weed of unimproved pasture land and waste places in both countries.

*Acaena novae-zelandiae* is the most common naturalised bidibid in Britain and Ireland, where it can displace native vegetation and become abundant on sparsely vegetated and moderately disturbed lowland sites and coastal sand dunes. Feathers of ground-nesting birds have been found so clogged with red bidibid seed-heads that the birds have starved. This species was possibly introduced to Great Britain in about 1796 as a garden plant or, more likely, it established accidentally from imported wool. The first British record of it as a weed is in 1901, from Devon.

Red bidibid has also naturalised in coastal areas in California and is present in several other States including Hawai‘i.

### ***Austroderia richardii* (toetoe)**

Toetoos are tall growing grasses (Poaceae/Graminae) with long and attractive flower spikes. Recently, all five New Zealand native species were transferred from the related genus *Cortaderia* to *Austroderia* – *A. fulvida*, *A. richardii*, *A. splendens*, *A. toetoe* and the Chatham Island endemic *A. turbaria* (Linder et al., 2010).

One of our native toetoos is weedy abroad. *Austroderia richardii*, an endemic of the South Island of New Zealand, is regarded as an environmental weed in Tasmania where it has locally naturalised in western regions. This toetoe is also considered a potential environmental weed in New South Wales, Victoria and South Australia.

### ***Avicennia marina* subsp. *australasica* (mānawa, mangrove)**

*Avicennia* is a mangrove genus of up to eight species assigned to the family Acanthaceae (formerly in the Verbenaceae or Avicenniaceae).

*Avicennia marina* occurs in both northern and southern hemispheres, with three subspecies recognised. However, *A. marina* subsp. *australasica* (mānawa) is New Zealand’s only mangrove – and the most southerly mangrove in the world – naturally occurring in the North Island (from Parengarenga Harbour south to Kawhia and Ohiwa Harbours). This subspecies is shared with the east coast of Australia (Queensland, New South Wales and Victoria) and Lord Howe Island.

Dr R.L. Bieleski (2009) recounts the unfortunate story of how propagules of *A. marina* subsp. *australasica* were collected in 1964 at Meola Creek, Auckland, exported, and planted in a salt marsh in Mission Bay of San Diego for research purposes. From there it subsequently spread to become a serious weed that has defied attempts at its eradication.

### ***Carex* species (New Zealand sedges)**

*Carex* is an extensive genus of the true sedges comprising nearly 2000 species in the Cyperaceae

family. They are widespread in cold and temperate regions of the world, or in mountains of the tropics. *Carex* are perennial rhizomatous herbs, usually with 3-angled solid stems.

New Zealand is well represented with 79 indigenous species (of which 68 spp. are endemic) and 26 exotic species (of which 23 are fully naturalised).

*Carex* are popular for landscaping with species and cultivars suited to a wide range of environmental conditions, from wetland planting to dry areas, and from shade to full sunlight. Ornamental New Zealand native *Carex* include the reddish-brown and upright form of *C. buchananii*, red and green cultivars of *C. comans* (e.g., *C.* 'Frosted Curls') and *C. flagellifera*, the orange-red and weeping form of *C. testacea*, and other cultivated species including *C. dissita*, *C. secta*, *C. tenuiculmis* and *C. virgata*.

Four New Zealand endemic species are declared weeds under the Tasmanian Weed Management Act 1999 – *Carex albula* (where it is called New Zealand hair sedge, or white sedge as it is known in New Zealand, after the bleached white tips of the leaves), *C. buchananii* (Buchanan's sedge), *C. flagellifera* (shining sedge) and *C. testacea* (speckled sedge). In the past, these four were extensively planted on roadsides in Tasmania for soil binding and beautification, and also sold widely throughout Australia as ornamentals. However, because of their weedy potential, the importation, sale and distribution of all New Zealand native sedges are prohibited in Tasmania.

### ***Coprosma repens* (mirror plant, taupata) and *C. robusta* (karamū)**

*Coprosma* is a genus of 100 species in the Rubiaceae (coffee) family. *Coprosma* species occur naturally in New Zealand, Australia, Borneo, Java, New Guinea, the Hawaiian Islands, the Juan Fernández Islands and other islands of the Pacific Ocean. Coprosmas have diverse growth habits, ranging from prostrate plants and divaricating shrubs with small leaves, to small trees with relatively large leaves. They are dioecious and female plants produce berries that are orange, red or blue.

New Zealand is very well represented with 54 indigenous species of which 50 spp. are endemic. They are extensively cultivated as ornamental plants and more than 140 cultivars have been selected. Two New Zealand species have become weedy within our own shores and also in other countries.

In Australia, *Coprosma repens* (taupata) is widely naturalised in southern and central New South Wales, in many parts of Victoria, in the coastal districts of south-eastern and southern South Australia, in Tasmania, and in the coastal districts of south-western Australia. Further afield, this species is also naturalised in Norfolk Island, Hawai'i, California and South Africa.

*Coprosma robusta* (karamū) is an environmental weed in southern Victoria and Tasmania, and is possibly also naturalised in New South Wales.

### ***Cordyline australis* (cabbage tree, tī kōuka)**

*Cordyline* is a genus of 15–20 species of woody monocotyledons. Botanists have puzzled over the correct placement of *Cordyline* which has consequently bounced between a host of families including the Agavaceae (now Agavoideae), Asteliaceae, Dracaenaceae, Laxmanniaceae and Lomandraceae. Based on molecular evidence, *Cordyline* is commonly now accepted in Asparagaceae (subfamily Lomandroideae), although to the non-expert it may seem incredulous that cabbage trees belong in the same family as the defining genus *Asparagus*.

Like some other genera mentioned in this article, New Zealand is well represented by *Cordyline*, with five indigenous species (of which four are endemic) – *C. australis* (cabbage tree), *C. banksii* (Bank's cabbage tree), *C. indivisa* (mountain cabbage tree), *C. obtecta* (Three Kings cabbage tree) and *C. pumilio* (dwarf cabbage tree). A further two species, *C. fruticosa* (Pacific Island cabbage tree) and *C. rubra*, are exotic.

However, it is the New Zealand endemic cabbage tree (tī kōuka and other common and Māori names), *Cordyline australis*, that is the best known and has the widest natural distribution throughout the North, South and Stewart Islands.

The iconic cabbage tree is one of the most widely cultivated New Zealand plants in Europe, Britain and the USA. They are hardy and tolerant of a wide range of conditions, and can be grown in

containers or out in the open to provide a palm-like tropical effect in temperate regions of the world. More than 30 cultivars have been named, including those with purple or red coloured leaves and green, cream, or yellow striped variegation.

*Cordyline australis* is such a familiar part of the planted landscape in the south of England they have become known as Torquay palms, named after the seaside town in Devon. Some trees are growing as far north as Scotland, along the western coast where the Gulf Stream tempers the climate. The seaside village of Plockton features an esplanade of these tropical-looking 'palms' (Fig.1).



**Fig. 1** An avenue of *Cordyline australis* (cabbage trees) planted at the seaside village of Plockton in Scotland. Photo: 'Wojsyl', via Wikimedia Commons and reproduced under the Creative Commons Attribution-Share Alike 2.5 Generic license.

Despite being so widely grown, there are relatively few places in the world where cabbage trees have become weedy. In Australia, *C. australis* has naturalised in southern Victoria, south-eastern South Australia, and has sparingly naturalised in New South Wales. It has also naturalised at Salt Point State Park in Northern California where the California Exotic Pest Plant Council listed it as a "wildland weed of secondary importance."

#### ***Corynocarpus laevigatus* (karaka, kopi)**

*Corynocarpus* is the sole member of its own family, the Corynocarpaceae. There are only five named species of these evergreen trees found naturally in the south-west Pacific: *C. laevigatus* (karaka) of New Zealand, *C. cribbianus* of New Guinea and north-eastern Queensland, two subspecies of *C. rupestris* known only from a few localities in eastern Australia, *C. dissimilis* endemic to New Caledonia, and *C. similis*, the most widely distributed species, found in Vanuatu, the Solomon Islands, New Britain, New Ireland and the Bismarck Archipelago.

Few New Zealanders would realise that karaka is a serious weed in the Hawaiian Islands where it is an aggressive coloniser that forms dense shade which excludes other species, including some endangered native plants. Karaka was originally planted on the island of Kaua'i in 1891 and became naturalised by 1912. It is most common at Kōke'e in the northwest of Kaua'i, where it was aerially seeded for reforestation in 1929. Along with several other invasive plant species, karaka threatens the survival of one of Hawai'i's most endangered plants, the heau (*Exocarpus luteolus*, of the Santalaceae family) which is endemic to Kaua'i. Karaka also occurs on other islands of the Hawaiian archipelago including Hawai'i (Big Island), Moloka'i and O'ahu. The orange fruit is eaten by birds and feral pigs that disperse the seeds.

#### ***Cotula australis* (soldier's button) and *C. coronopifolia* (bachelor's button)**

*Cotula* is a genus of 50–80 species generally known as buttonweeds or water buttons in the daisy family (Asteraceae/Compositae).

*Cotula australis* (soldier's button) is a low growing annual with rosettes of feathery leaves and small, pale yellow, button-like flower-heads. It is indigenous to New Zealand and Australia and is also a weed of both countries, where it is widespread in suburban and disturbed areas, coastal sites, gardens, lawns and waste places. Soldier's button is now a widespread weed in temperate parts of the Old and New Worlds.

Another promiscuous and weedy buttonweed, *Cotula coronopifolia* (bachelor's button) is also

indigenous to New Zealand and Australia, as well as southern Africa. It has larger flower-heads than *C. australis* and these are bright yellow. *Cotula coronopifolia* is salt tolerant and occurs on coastal sites, especially in shallow water, and also inland in wet and waste places. Its dispersal is aided by the corky wings of the outer seed achenes which float in water.

Bachelor's button is a cosmopolitan weed. It is widely naturalised in coastal areas of the USA (Alaska, Washington, Oregon, California, Nevada and Arizona), in Canada (British Columbia, Quebec, Nova Scotia, New Brunswick and Prince Edward Island), and many other countries.

### ***Crassula helmsii* (Helms crassula, New Zealand pygmyweed)**

*Crassula* is a diverse and widely distributed genus of about 200 species of succulent plants in the Crassulaceae family. New Zealand has 11 indigenous species (of which seven are endemic) and 20 exotic species (of which six are fully naturalised).

New Zealand has contributed one of its native crassulas as a serious weed in other countries. *Crassula helmsii* (Helms crassula) is a perennial, decumbent and mat forming herb, found in shallow pools of fresh water or in damp usually shaded places. It has often been treated as indigenous to both New Zealand and Australia. As stated on the NZPCN website, it may instead be endemic only to New Zealand because representatives there are apparently smaller and more delicate than Australian material. DNA and chromosome evidence also suggest that Australian plants might be a separate species.

It would appear that it is the New Zealand plant which has naturalised in the UK. *C. helmsii* was first introduced there in 1927, was recorded as naturalised in 1956, and became fully established from 1970. It is now regarded as a serious weed in the UK, and is one of five introduced aquatic plants banned from sale there from April 2014. This is the first ban of its kind in that country. *C. helmsii* has also naturalised in western Europe and south-eastern USA (Florida, North Carolina and Washington).

*Crassula helmsii* was originally grown as an oxygenating plant for ponds and aquariums. It can regenerate from small pieces, which are easily spread by birds, boats or fishing gear, and can form dense mats that out-compete native aquatic plants.

Ironically, in New Zealand *C. helmsii* appears to be rather uncommon with a patchy distribution throughout its natural range. It is known only from the West Coast of the South Island between Karamea to just south of Haast.

### ***Dichondra repens* (Mercury Bay weed)**

*Dichondra* is a genus of perhaps nine species of prostrate, perennial, herbaceous plants, with creeping stems in the Convolvulaceae family.

Two species (*Dichondra brevifolia* and *D. repens*) are indigenous (non-endemic) to New Zealand, and one (*D. micrantha*) is fully naturalised.

*Dichondra repens* is indigenous to New Zealand (Three Kings, North, South and Chatham Islands), many parts of Australia (Queensland, New South Wales, Victoria, Australian National Territory, Tasmania, South Australia and Western Australia) and probably Norfolk Island. It is commonly known as Mercury Bay weed in New Zealand and kidney weed (after its kidney shaped leaves) in Australia.

Mercury Bay weed is found in grassland, lawns, scrub, crops, forest clearings and margins. It may have been deliberately planted as low maintenance ground cover to replace grass lawns or it can establish spontaneously in lawns as a weed.

Mercury Bay weed has probably naturalised in many countries including China, Japan, South Africa and the USA, although the synonym *Dichondra repens* var. *micrantha* for *D. micrantha* confuses exactly what species occurs where. In California, *D. repens* has escaped gardens to become a localised weed throughout the state.

### ***Dodonaea viscosa* (akeake, hopbush)**

*Dodonaea* is a genus of about 70 species in the Sapindaceae family. They have a cosmopolitan distribution in tropical, subtropical and warm temperate regions of Africa, the Americas, southern Asia

and Australasia. By far the highest species diversity is in Australia.

*Dodonaea viscosa* is New Zealand's sole native species in the genus and, including seven subspecies and much variability, it is also indigenous to Australia and throughout the tropics and subtropics.

In horticulture, akeake is a hardy fast growing shrub or small tree that thrives in windy, dry and full sun conditions. The purple foliated cultivar, *Dodonaea viscosa* 'Purpurea', is very widely grown. As reported by Metcalf (1987), this cultivar was discovered in New Zealand in the early 1890s, from a wild plant growing on the bank of the Wairau River, Marlborough.

Although this purple-leaved cultivar is of New Zealand provenance, it was widely (but incorrectly) sold as a native selection in Australia. In Western Australia, it has escaped cultivation and is invading areas of native bush.

### ***Epilobium brunnescens* and *E. nummulariifolium* (creeping willow-herbs)**

There are 160–200 species of *Epilobium* of the Onagraceae family. They are erect or creeping herbs or subshrubs that have a worldwide distribution, favouring temperate climates.

New Zealand has 39 indigenous species (of which 31 are endemic) and five exotic, fully naturalised species.

Two New Zealand endemic creeping willow-herbs, *Epilobium brunnescens* subsp. *brunnescens* and *E. nummulariifolium*, are frequent weeds of potted plants and were carried abroad unnoticed in this manner.

*Epilobium brunnescens* subsp. *brunnescens* was first recorded in the British Isles in 1904, from Craigmillar, Edinburgh, and started its main spread from the 1930s. It has now invaded much of northern and western Britain – throughout all the hills of northern England, Scotland, Wales, Cornwall, and much of Ireland excluding the central flat lands. It is common as a garden weed on damp walls, steps and gravel paths, and in the wild in drainage ditch sides, besides streams and ascending to high altitudes in the mountains. Like other willow-herbs this low growing species produces abundant seed that can be dispersed by the wind over long distances. It has been named among the 20 worst introduced weeds in Britain where it is known as 'New Zealand willow-herb'.

### ***Hoheria populnea* (houhere, lacebark, ribbonwood)**

*Hoheria* is a genus of only six species of trees or large shrubs (*H. angustifolia*, *H. equitum*, *H. glabrata*, *H. lyallii*, *H. populnea* and *H. sexstylosa*) in the Malvaceae family, and all are endemic to New Zealand.

All species bear large, white, five-petalled flowers in profusion and (with the exception of the recently described *H. equitum* of the Poor Knights and Hen and Chicken Islands) are widely cultivated throughout New Zealand. *Hoheria glabrata*, *H. lyallii* and *H. sexstylosa* have reasonable cold tolerance and are therefore grown in Great Britain.

In California *H. populnea* is considered to be a potentially invasive weed, and most of the mature trees that were growing at the then Strybing Arboretum in San Francisco (now known as the San Francisco Botanical Garden) were removed (sometime prior to being reported by Harris, 1998), along with their prolific seedlings. Californian authorities have noted that this had been a fortunate escape for the region, as the lacebark's weedy tendencies were caught before it was widely available to the public.

### ***Hydrocotyle moschata* (hairy pennywort)**

*Hydrocotyle* or water pennyworts as they are sometimes called, is a genus of 75–100 species found in temperate and tropical regions worldwide. They were formerly placed in the Apiaceae family, but are now in the Araliaceae. All species are prostrate perennials with long creeping stems. They are typically found in damp and shady environments.

New Zealand has 10 indigenous species (of which nine are endemic) and five exotic species (of which three are fully naturalised). Overseas, the New Zealand endemic *Hydrocotyle moschata* is an

uncommon turf weed in the south coast of California.

### ***Leptospermum scoparium* (mānuka, tea-tree)**

There are 87 species of *Leptospermum* (family Myrtaceae), a genus centred in Australia, where most are endemic. *Leptospermum scoparium* (mānuka or tea-tree) is the sole New Zealand indigenous species and is shared with mainland Australia and Tasmania where it is less variable. More than 150 garden cultivars have been named from New Zealand mānuka and have been selected for white, pink and red coloured flowers that are single or double and a range of dwarf, prostrate and upright statures. These ornamental cultivars are widely grown in many countries including New Zealand, Australia, South Africa, the UK and the USA.

In Hawai'i, *L. scoparium* and the Australian species *L. laevigatum* were both planted on Lana'i during forestry efforts to stabilise eroding soils. After a number of years, both species began to spread, with *L. scoparium* becoming the more aggressive of the two, forming monotypic thickets that crowd out other plants. The first collection of it naturalising there was made in 1927. It is now found naturalised on Lana'i, Kaua'i, O'ahu (Starr et al., 2003) and East Maui (Starr et al., 2004). Mānuka is still widely cultivated as an ornamental shrub in Maui but listed as one of Hawai'i's most invasive horticultural plants ([www.hear.org/hortweeds](http://www.hear.org/hortweeds)).

### ***Metrosideros excelsa* (pōhutukawa, New Zealand Christmas tree) and *M. kermadecensis* (Kermadec pōhutukawa)**

Like *Leptospermum*, *Metrosideros* is another member of the Myrtaceae that produces vast quantities of fine seeds that are readily dispersed by the wind. There are some 53 species of *Metrosideros*, with a natural distribution across New Zealand, New Caledonia, Hawai'i, Papua New Guinea, elsewhere across small islands of the Pacific, and with one outlier species native to South Africa.

New Zealand has 12 endemic species, and *Metrosideros excelsa* (pōhutukawa) is the most widely cultivated with more than 30 named cultivars. Overseas, pōhutukawa is cultivated in countries with mild climates and in some places it has naturalised. Most notably, *M. excelsa* has escaped from cultivation in the Western Cape province of South Africa and has become a serious weed of the coastal fynbos (a major ecosystem renowned for its diversity of native plant species), where it is commonly called 'New Zealand bottlebrush'.

The closely related *M. kermadecensis* (the Kermadec pōhutukawa) has recently naturalised on Maui on the Hawaiian Islands, and is considered a pest species. Both New Zealand *Metrosideros* species are cultivated on Norfolk Island, where *M. kermadecensis* has naturalised and *M. excelsa* may be starting to naturalise.

### ***Muehlenbeckia complexa* (small-leaved pohuehue, wire vine)**

*Muehlenbeckia* is a genus of about 23 species belonging to the Polygonaceae family. They are native to the southern hemisphere, especially South America, Papua New Guinea, Australia and New Zealand.

New Zealand has two endemic species (*M. astonii* and *M. ephedroides*) and three indigenous (non-endemic) spp. (*M. australis*, *M. axillaris* and *M. complexa*). *Muehlenbeckia complexa* (small-leaved pohuehue, wire vine) has naturalised in Western Australia and possibly also escaped from cultivation in Canberra. Similarly, it is cultivated as an ornamental plant in California (and other States) and occasionally escapes from cultivation. It is considered invasive at the Golden Gate National Recreation Area, San Francisco.

### ***Myoporum laetum* (ngaio)**

There are about 32 species of *Myoporum* in the Scrophulariaceae (formerly the genus was placed in its own family, the Myoporaceae). They are evergreen shrubs to small trees, with glabrous (hairless) vegetative parts and leaves often dotted with glands. Flowers are bell-shaped and the fruit is a berrylike succulent drupe, generally white to purple coloured, and often spread by birds. Species are naturally found in New Zealand, Australia, Pacific islands including Hawai'i, Mauritius and China.

New Zealand has four indigenous species – the widespread endemic *Myoporum laetum*, the Kermadec ngaio *M. rapense* subsp. *kermadecense*, the recently described *M. semotum* of the Chatham Islands, and *M. obscurum*, indigenous to Raoul Island and Australia.

New Zealand ngaio (*M. laetum*) has been introduced to several countries including Spain, Portugal, Chile and the United States. It has become a serious invasive weed in coastal southern California and part of Mexico's Baja California peninsula, forming dense thickets that out-compete native plants. It is on the California noxious weeds list as 'a most invasive wildland pest plant' and there are programmes for its control. *Myoporum laetum* is also invasive on Robinson Crusoe Island (formerly Isla Más a Tierra, the second largest island of the Juan Fernández Islands off the coast of Chile).

### ***Phormium tenax* (New Zealand flax, harakeke)**

Like *Cordyline*, *Phormium* has also been assigned to a range of monocotyledonous plant families, including the Agavaceae (Agavoideae), their own family the Phormiaceae, the Hemerocallidaceae and most recently, the Xanthorrhoeaceae.

*Phormium* is a remarkable genus of only two species, *P. cookianum* (mountain flax, wharariki) and *P. tenax* (New Zealand flax, harakeke). Both subspecies of *P. cookianum* (subsp. *cookianum* and subsp. *hookeri*) are endemic to New Zealand.

*Phormium tenax* (harakeke) has often been considered indigenous to both New Zealand and Norfolk Island because it was abundant when discovered on Norfolk Island by Cook's expedition in 1774<sup>1</sup>. However, its historical absence from adjacent Phillip Island, the lack of fossilised *Phormium* pollen grains on Norfolk Island<sup>2</sup>, and the knowledge that Polynesians had visited before the British provides evidence that harakeke may have instead been introduced to Norfolk Island by earlier Polynesian settlers (Coyne, 2009).

Harakeke has long been used by Māori for textiles, cordage and nets. There are probably around 50 distinctive named weaving varieties, and more than 220 cultivars selected, with green, yellow, red, purple and variegated leaves on plants of various stature. The ornamental cultivars are grown in many countries around the world.

In the 19th century and up the mid-20th century, harakeke was the basis of a large fibre industry in New Zealand, providing rope, fabric, matting and other fibre products. During that time it was planted on islands such as St Helena and Tristan da Cunha in the South Atlantic, and the Isle of Man in the Irish Sea with an aim to establish similar industries there.

On St Helena, the economy of the island became heavily dependent on harakeke fibre until the industry collapsed in the 1960s, when harakeke fibre could no longer compete with the new synthetic fibres. The last flax mill closed on St Helena in 1966<sup>3</sup> but harakeke



**Fig. 2** *Phormium tenax* (harakeke) growing as dense weeds near Diana's Peak, St Helena Island. Photo: Michelle Heyes, [www.kevinandmichelle.co.uk](http://www.kevinandmichelle.co.uk).

<sup>1</sup> William Wales, the ship's astronomer, wrote: "Near the shore the ground is covered so thick with the New Zealand Flax Plant that it is scarce possible to get through it." The potential value of harakeke was directly responsible for the island's inclusion as an auxiliary settlement in the British Government's plan for the colonisation of New South Wales; Norfolk Island was colonised in March 1788.

<sup>2</sup> Although *Phormium* pollen grains are often underrepresented and hence difficult to detect in peat samples.

<sup>3</sup> There is an excellent account of the history of flax milling on St Helena at <http://jcgimshaw.blogspot.co.nz/2011/06/flax.html>.

continued to grow wild (it was first recorded as naturalising by 1852) and became extremely widespread and troublesome (Fig. 2), damaging the island's ecosystem, and threatening a unique flora of 43–49 endemic species of flowering plants and 13–16 endemic ferns.

On Tristan da Cunha, 2430 kilometres south of St Helena and also in the middle of the South Atlantic, harakeke was traditionally used for roof thatching where other materials were in short supply. Thatching was typical until 1961 but continued to some degree until the late 1980s before being fully replaced by zinc roofs. On 19th December 2012, the island opened the Tristan Traditional Thatched House Museum using harakeke once again as roof thatch and following the traditional quarried stone construction techniques for the walls of the building. Harakeke is also considered an invasive weed on the island.



**Fig. 3** *Phormium tenax* (harakeke) used to construct the traditional Tristan Thatched House, 7 November 2012. Photos courtesy Tourism Department Tristan da Cunha.

Elsewhere in the world, harakeke has also naturalised in Australia (Tasmania, south-eastern South Australia, eastern New South Wales, and possibly southern Victoria), Hawai'i (Big Island, Kaua'i Island and Moloka'i Island), Robinson Crusoe Island (Juan Fernández Islands), and probably elsewhere such as Chile, Spain and South Africa.

***Pittosporum crassifolium* (karo), *P. eugenioides* (lemonwood, tarata) and *P. tenuifolium* (black matipo, kōhūhū)**

*Pittosporum* is a genus of about 200 species of trees and evergreen shrubs in the Pittosporaceae family. Their natural range extends from New Zealand, Australia, Oceania, eastern Asia and some parts of Africa.

New Zealand has 23 endemic species and one fully naturalised species, *Pittosporum undulatum* (sweet pittosporum, also called Australian cheesewood and Victorian box).

Pittosporums are popular garden subjects for their low maintenance and glossy evergreen foliage. There are more than 60 named cultivars derived mainly from three New Zealand endemic species: *Pittosporum crassifolium*, *P. eugenioides* and *P. tenuifolium*. Although not as troublesome as the Australian *P. undulatum*, these three New Zealand species have occasionally escaped cultivation in other countries to become weedy.

*Pittosporum crassifolium* (karo) has naturalised in south-eastern Australia (southern Victoria and the coastal districts of central New South Wales), Norfolk Island, Hawai'i and the Isles of Scilly in Britain. In California plants were considered to be 'weeds in cultivation' but they may now have also escaped into the wild.

*Pittosporum eugenioides* (lemonwood) has occasionally naturalised in south-eastern Australia, where it is regarded as an environmental weed in Victoria and a minor or potential environmental weed in New South Wales. Lemonwood is invasive on Robinson Crusoe Island (Juan Fernández Islands) where it has also escaped from cultivation.

*Pittosporum tenuifolium* (kōhūhū) is the third New Zealand endemic pittosporum to have become weedy abroad. Like the others, kōhūhū has also naturalised in temperate south-eastern Australia (southern Victoria and sub-coastal districts of central New South Wales) and possibly also Tasmania. It is also said to have naturalised in California and Robinson Crusoe Island.

### ***Solanum aviculare* and *S. laciniatum* (pōroporo)**

*Solanum* (of its namesake family Solanaceae) is a diverse genus of trees, shrubs and herbs that include crop plants such as tomatoes (previously species of *Lycopersicon*) and potatoes, as well as ornamental plants cultivated for their flowers and fruit, and weeds such as nightshades. Current estimates consider the number of *Solanum* species to be between 1500 and 2000.

New Zealand has three indigenous species (the closely related pōroporos, *S. aviculare* and *S. laciniatum*, and the small flowered nightshade *S. nodiflorum*; none of which are endemic), as well as 27 exotic species (of which 20 are fully naturalised and 7 are casual escapes).

*Solanum aviculare* is indigenous to New Zealand (where it is called pōroporo), eastern Australia (commonly known there as kangaroo apple), Lord Howe Island, Norfolk Island (where it is possibly extinct), and also the West Papua Province of Indonesia and Papua New Guinea.

*Solanum aviculare* (or possibly *S. laciniatum* as the distinction between these two are not always clear in overseas references) has also naturalised in New Caledonia, Hawai'i (Lana'i), in western USA (California and Oregon) and probably elsewhere.

The leaves and unripe fruit of both *S. aviculare* and *S. laciniatum* contain the toxic alkaloid solasodine, which can be extracted and used as a precursor for producing contraceptive pills and other steroidal compounds. Both species are commercially cultivated for this purpose in China, eastern Europe and Russia and have probably naturalised in these countries as well.

### ***Tetragonia tetragonioides* (kōkihi, New Zealand spinach)**

*Tetragonia* is a genus of about 57 species in the family Aizoaceae, native to temperate and subtropical regions mostly of the southern hemisphere (New Zealand, Australia, southern Africa and South America).

New Zealand has two species, *Tetragonia implexicoma* and *T. tetragonioides*, both indigenous and non-endemic.

Of all *Tetragonia* species, the best known is *T. tetragonioides* which is used as a leafy food crop. Among other common names, it is known as New Zealand spinach, but this belies the fact that it is also indigenous to Australia, Japan, Chile and Argentina.

It has become naturalised in many parts of the world. For example, in the USA, it is weedy in many States (including California, Connecticut, Florida, Georgia, Massachusetts, North Carolina, North Dakota, New York, Ohio, Pennsylvania, Washington, Wisconsin, West Virginia), the Hawaiian Islands and Porto Rico.

## Summary

Many of the affected regions – such as in southern Australia, Tasmania, mild regions of the UK and the USA including especially California, and oceanic islands such as Hawai'i and the Juan Fernández Islands – have similar climates or conditions to the native New Zealand habitats where the plant species are originally from.

Some of the native species listed here are also indigenous to Australia and other countries, so their weedy distributions are not always a result of spread from New Zealand. Nevertheless, others are endemic to New Zealand and were originally confined to these shores before their escape abroad.

## Final comments

Many of the New Zealand native plants mentioned in this article have been traditionally, culturally, aesthetically, horticulturally and at times economically important – the very reasons why they were first cultivated and distributed so widely. People continue to enjoy these positive qualities in environments where the plants are not out of place and troublesome. After all, one person's weed is another's treasure!

## Acknowledgements

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### ■ Biographical Sketch – Philibert Commerson (1727-1773) & Ouris

**Val Smith**, 80 Mill Road, New Plymouth 4310.

Philibert Commerson (or Commerçon) was born on 18 November 1727 at Châtillon-sur-Chalaronne, a small town north of Lyon, France, where his father Georges-Marie was the town lawyer. His parents were from families of farm workers and traders who had acquired wealth and social standing through hard work and strategic marriages. Philibert, the eldest of their seven children, was assured a good education. He was first taught by a local priest, and at the age of thirteen sent to the Jesuit College at Bourge-en-Bresse, 30 kilometres away, where field trips with Father Garnier endeared him to botany. He began medical studies (which included botany) at Montpellier University, but spent most of his time at the botanical garden, graduating in 1754 – with a reputation as a compulsive collector!

Instead of setting up in practice, he botanised in France and Switzerland, and made himself known to other botanists. He also established botanical gardens in Châtillon and elsewhere. Eventually, on 17 October 1760, he married 40 year-old Antoinette Beau, a lawyer's daughter, and agreed to settle down as a doctor in Toulon-sur-Arroux. Three days after the birth of their son on 16 April 1762, Antoinette died. Jeanne Baret, already employed as a servant, became Commerson's full-time housekeeper and the infant's nurse. Twenty-one years old, the daughter of day labourers, Jeanne

had learned to read and write, and as a herb woman was interested in Commerson's botanical work; she sorted his papers and plants and became indispensable.

In 1764 they left for Paris and rented an apartment near the *Jardin du Roi*. When pleurisy kept Commerson in bed, Jeanne nursed him, and during recovery he read, wrote, and maintained his scientific contacts. Two years later he was appointed doctor and botanist on Bougainville's voyage of circumnavigation, and Jeanne, disguised as a boy, accompanied him as his valet. They collected copiously, and Commerson paid his willing and capable workhorse tribute by naming a shrub genus *Baretia* after her. He commemorated family, friends and even himself in his plant names, notably the showy *Bougainvillea* from the environs of Rio de Janeiro. Landfall was also made in the Strait of Magellan and the South Pacific, but the French were unwelcome in the Dutch East Indies and unable to obtain the spice and other plants of economic value they sought. Leaving the expedition at the Île de France (Mauritius), Commerson botanised there and in Madagascar until his final illness and death at Flacq on 13 March 1773, aged 45.



*Ourisia macrophylla* subsp. *macrophylla*



*Ourisia macrophylla* subsp. *macrophylla*

Most of his notes and specimens made it to France, and many new genera, including *Ourisia*, were published by Antoine-Laurent de Jussieu in *Genera Plantarum* (1789). Commerson's label for *Ourisia Miltopsis* indicates it was collected on an island in the Strait of Magellan in October 1767 and named after Oury or Ouris, a retired official of the Malouines (Falkland Islands) with an interest in natural history. Rene-Andre Oury was clerk/secretary of the company set up by Bougainville to finance and organise the French settlement, and when the colony was handed over to the Spanish he left the Falklands for South America. He joined Bougainville's expedition, but stayed behind with Commerson and others at Mauritius on the final leg of the journey. Jean-Francois Oury, an aid-pilot and engineer on Bougainville's voyage, had also worked for the colony in the Malouines and stayed on to assist the authorities at Mauritius. *Ourisia* may have been named after either, neither or both of them.

## ***Ourisia macrophylla* subsp. *macrophylla***

Plantaginaceae

The genus *Ourisia* contains 28 species of herbaceous or slightly woody plants that occur in South America, Tasmania and New Zealand in a wide range of habitats from sea level to 5000m. They have five fused corolla lobes in a diverse range of shapes and colours from white to pink, lilac or red, but species in Australasia are white only. Hui-o-Raukatauri or mountain foxglove, *O. macrophylla* subsp. *macrophylla* ('large-leaved'), previously considered a Mt Egmont/Taranaki endemic, has lost this status, having been found on the Herangi Range 120 km to the north.

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Canterbury Botanical Society Newsletter 2014: 7 Upcoming meetings and trips, meeting report on St Helena Island endemic gumwood tree daisy conservation.

Canterbury Botanical Society Newsletter 2014: 8 Upcoming meetings and trips, meeting report on the flora of Mt Diablo, California and trip report on the Botanical Garden's native garden.

Canterbury Botanical Society Newsletter 2014: 9 Upcoming meetings and trips, trip report on West Melton grasslands, re-discovery of adult *Teuclidium* leaf minor moth in Christchurch Botanic Gardens.

Botanical Society of Otago 72, May 2014: Upcoming meeting and trips, plants from sub-fossil sites, ANZAC poppies, rare Otago Peninsula plants, meeting and trip reports.

The New Zealand Native Orchid Journal 133, August 2014: *Orthoceras novae-zeelandiae*, *Pterostylis* identification markers, NZ orchids distribution list 2014, *Paracaleana minor* pollination, *Prasophyllum*.

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