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TRILEPIDEA

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NEW ZEALAND

PLANT OF THE MONTH, p. 2

Jovellana repens. Photo: Rowan Hindmarsh-Walls.

Hidden in Plain sight—a new species of lichen *Strigula oleistrata* (Strigulaceae) from New Zealand.

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New Zealand has a surprising diversity of *Strigula*. 25 species of the genus are found here out of the c.70 species recognised; representing over a third of the known species (Galloway 2007, Lücking 2008, Hyde et al. 2013). Most of these species are foliicolous, meaning that they live on the surfaces of leaves. However, a few species do colonise rocks and bark (Galloway 2007).

Between 2016 and 2017 the senior author undertook a third year, level 7 School of Environmental & Animal Sciences self-directed paper studying *Strigula novae-zelandiae* at the Unitec Institute of Technology Herbarium (UNITEC). *Strigula novae-zelandiae* is a foliicolous species that is sometimes known as 'silver paint lichen', because when dead the thallus imparts a silvery patterning on the leaves it has colonised. *Strigula novae-zelandiae* is assumed to be an endemic to New Zealand where it is thus far known only from the northern North Island within the range of its key phorophyte 'host' taraire (*Beilschmiedia tarairi*, Fig. 1) (Sérusiaux 1998; Galloway 2007; Ford et al. 2019). At the time that study was initiated *Strigula novae-zelandiae* was known from very few collections, and a preliminary study by one of us (DJB) to resolve its conservation status suggested that it was morphologically variable. This variation needed further study before a satisfactory conservation status could be determined. In particular, it was noted that there seemed to be two morphotypes he designated 'A' and 'B', which may have been part of the ontogenetic development of *Strigula novae-zelandiae* or perhaps two different species. Morphotype 'A' has a rounded thallus which gets radially larger as the lichen grows while the other, Morphotype 'B' initiates as finger-like lobes which interlace and merge over time, ultimately producing a rounded thallus seemingly indistinguishable from Morphotype 'A'. Therefore, we used microscopy and DNA analyses (nr DNA ITS) to compare these entities. These analyses revealed that Morphotype 'A' and 'B' are indeed ontogenetic i.e. they

Figure 1. *Strigula* species growing on the phorophyte taraire (*Beilschmiedia tarairi*).

PLANT OF THE MONTH – *JOVELLANA REPENS*

Rowan Hindmarsh-Walls

The plant of the month for March is the small forest species, *Jovellana repens,* one of only two *Jovellana* species endemic to New Zealand. The species can be found from Mt Pirongia and Te Moehou, in the North Island, south to the southern South Island, becoming more abundant in the central part of its range. The herb is found in damp forest and scrub, from the lowlands up to the subalpine zone. It is most often near streams and seepages, in fresh silt and around rocks, and can tolerate deep shade. The plant is fairly distinct even without flowers. It has petiolate hairy leaves with serrated margins, and a creeping habit. The flowers are borne on small heads above the leaves and are very distinctive, like little foxglove flowers. They are furry and white, or occasionally pinkish with purple splotches on the inside of the throat.

Jovellana repens—(left) plant, (right) flower. Camp Creek, Inchbonnie, 18 March 2020. Photos: Rowan Hindmarsh-Walls.

In New Zealand the species is most similar in appearance to its close relative *Jovellana sinclairii*, which is much less common, is much larger, and has a shrubby growth habit rather than the creeping habit of *J. repens*. It can superficially look like both *Brachyglottis sciadophila*, and some species of *Brachyscome* and *Lagenophora*. It can be distinguished from *Brachyglottis sciadophila*, which is also a trailing species, by its rooting at the nodes, which is rare in the *Brachyglottis.* And *Brachyscome* and *Lagenophora* do not obviously creep across the ground like *Jovellana.* Another similar species is *Veronica jovellanoides* but this has orbicular, deltoid to spathulate, leaves and non-pouched flowers.

The species is currently listed as not threatened, as it has a wide distributional range, and is common within much of this area. It is does not appear to be at risk from browsing pressure, but could be easily out-competed by exotic weed species, especially grasses, and herbs.

The genus *Jovellana* is small and contains only six to eight species, the other, non-New Zealand species are found in Chile. The genus has recently been included in the family Calceolariaceae, along with the genus *Calceolaria,* of which the yellow flowered *Calceolaria tripartita* is naturalised in New Zealand. The genus is named after Gaspar Melchior de Jovellanos, an 18th century Peruvian botanist. The species epithet *repens* is from the latin *repere*- meaning 'to creep', referring to the species' habit.

You can view the NZPCN website factsheet for *Jovellana repens* at: http://www.nzpcn.org.nz/flora_details.aspx?ID=867.

represent different stages in the development of the thallus of *Strigula novae-zelandiae* (Fig 2.). However, during fieldwork a third morphotype 'C' was also identified. That morphotype is distinguished from the other two by possessing a rounded, almost circular, thalli and pycnidia are often clumped or scattered rather than present in lines radiating out from the thallus centre (Fig 3). Our nrDNA ITS results showed Morphotype 'C' nested in a separate clade to *Strigula novae-zelandiae* s.s. suggesting it was a different species. Therefore, on the basis of the molecular and morphological data we described morphotype 'C' as a new species, *Strigula oleistrata* (Ford et al., 2019). The morphological traits that separate *Strigula novae-zelandiae* and the newly named *Strigula oleistrata* include the thallus margin; *Strigula novae-zelandiae* has lobate margins with narrow lobes (Fig. 2) and *Strigula oleistrata* has undulate to slightly scalloped margins (Fig. 3). The pycnidia distribution on the thallus also differs; *Strigula novae-zelandiae* has pycnidia spreading outwards from the thallus centre in radial lines (Fig. 2) while *Strigula oleistrata* has them scattered over the thallus or in clusters (Fig. 3). Spore features also separate these species; *Strigula novae-zelandiae* has polarilocular macroconidia (Fig. 2) that are larger than the non-polarilocular macroconidia of *Strigula oleistrata* (Fig. 3). The epithet '*oleistrata*' meaning 'strewn with olives' was chosen as a reference to the black pycnidia of the species that are scattered in a haphazard pattern or in dense, often clumped, clusters rather than in radiating lines as seen in *Strigula novae-zelandiae*, such that the thallus of *S. oleistrata* resembles that of a pizza (Fig 3) furnished 'with generous helpings of olives thrown into the middle' (Ford et al. 2019). We are appreciative of Neville Walsh (Melbourne Herbarium) for his help with providing this epithet, a name choice which has been widely greeted with amusement by the world lichen community (C. Printzen *pers. comm*.).

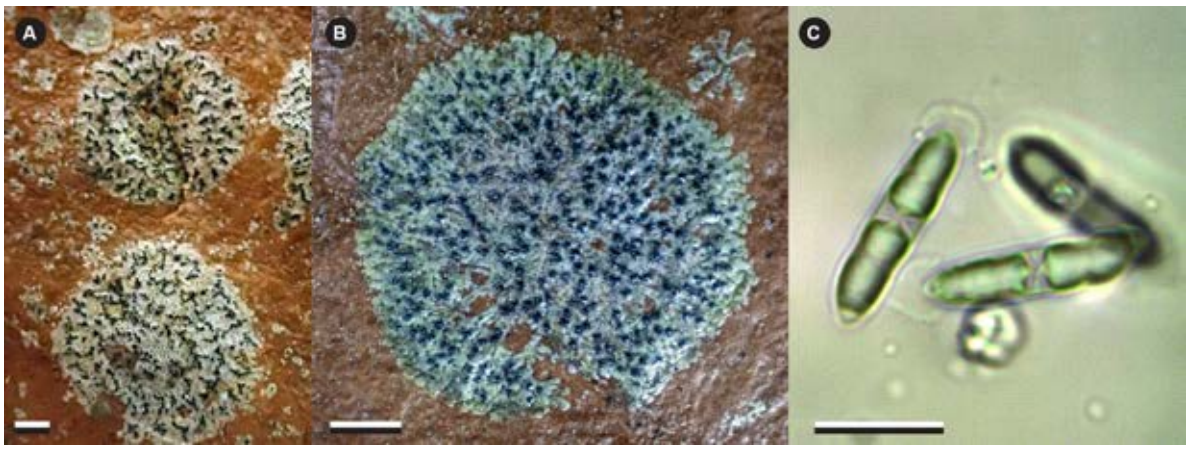

Figure 2. *Strigula novae-zelandiae*: (A) holotype, PDD 40205; (B) thallus showing the digitate margin; (C) polarilocular conidiospores. Scale bars: A, B = 1 mm; C = 10 µm. Photos: (A, B) Jeremy R. Rolfe; (C) Dan Blanchon.

With the recognition of *Strigula oleistrata*, Ford et al. (2019) also provide an updated key to the foliicolous species of *Strigula* in New Zealand.

Ecologically *Strigula oleistrata* seems to have the same range and phorophyte preferences as *S. novae-zelandiae*, with most observations made from taraire, though titoki (*Alectryon excelsus* subsp. *excelsus*) is also utilised. Other than *Strigula novae-zelandiae*, *S. oleistrata* frequently co-habits with *Strigula delicat*a, *S. nitidula*, *S. orbicularis* and *S. smaragdula*, *Byssoloma subdiscordans* and *Calopadia subcoerulescens*. All these foliicolous lichens can be considered 'short-lived' as they live only as long as their phorophyte host leaves do.

Before this study *Strigula novae-zelandiae* was known from only five locations, one near Kaitaia and the others within the broader Auckland Region (Galloway 2007). Over the course of this study we found this species at 23 locations ranging from Northland (near Kaitaia) to the northern Waikato, Coromandel Peninsula and East Cape. Both species can be hard to identify and are not always present where the main phorophyte, taraire is common, and, because of their elusive habitat preference for the canopy foliage of large forest trees both species can be easily overlooked. These make an accurate conservation assessment difficult. Nevertheless Ford et al. (2019) suggested that *Strigula oleistrata* be

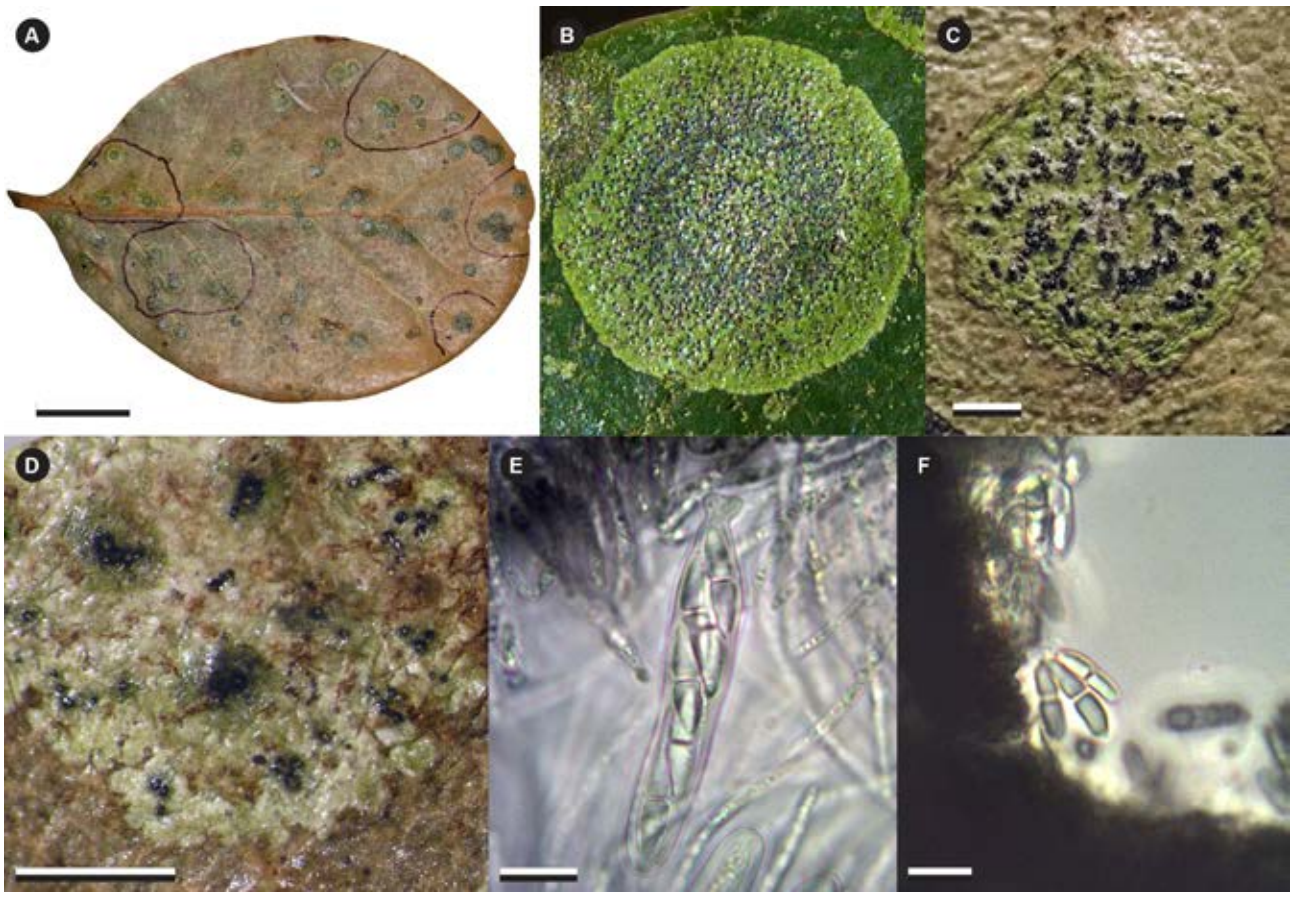

Figure 3. *Strigula oleistrata*: (A) thallus showing pycnidia densely aggregated in the centre; (B) perithecia; (C) ascus. (D) conidiospore. Scale bars: A = 20 mm; B, D = 1 mm; E, F = 10 µm. Images: (A) Peter de Lange, (B, C) Jeremy Rolfe, (D) Dan Blanchon.

given the status of 'At Risk—Naturally Uncommon' qualified 'DP' [Data Poor], 'RR' [Range Restricted] and 'Sp'[Sparse] using the New Zealand Threat Classification System (Townsend et al. 2008) because the population size and trend data are unknown, and the species is thus far believed to be naturally confined to and yet sparsely distributed on two phorophytes, taraire and titoki, species on which is it is not always present. This assessment is in accordance with that given to *Strigula novae-zelandiae* by de Lange et al. (2018) which has an identical range, population characteristics and almost the same phorophyte preferences.

Acknowledgements

We would like to acknowledge our colleagues, Andrew Veale, Jeremy Rolfe and Erin Doyle for assistance with this study. Neville Walsh for his inspired epithet suggestion and the subject editor for lichens in the journal Phytotaxa, Christian Printzen for his suggestions and handling of our paper.

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Why types need to be consulted—working out the real manuoea (*Kunzea ericoides*)

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Many of New Zealand's more common trees and shrubs, especially those found in coastal habitats, were amongst the first plants to be collected and described by European botanists. Initially these descriptions were based on specimens collected by expedition scientists, medical staff, officers or interested crew, on the ships that plied our waters during the early mapping of New Zealand by Europeans. Those specimens mostly ended up being described by botanists who bought them for their private collections or who were commissioned to describe them—the latter usually working from universities, or key museums and natural history collections in Europe.

This was the situation with manuoea (*Kunzea ericoides*), or by the te reo 'kanuka' name that it has come to be more widely, if not truly correctly, known (Orsman 1997; de Lange 2014; R.O. Gardner *pers. comm*.). That tree, placed in *Kunzea* by Joy Thompson (Thompson 1983), as *K. ericoides* was originally described as a species of *Leptospermum*, *L. ericoides*, by Achille Richard (1794–1852) in 1832. Richard was a Professor of Botany working out of what is now the Muséum National d'Histoire Naturelle (National Museum of Natural History, Paris). He was commissioned to describe the plants collected during the 1826–1829 voyage of Astrolabe. The type specimen of manuoea came from what is now the 'Astrolabe passage', Abel Tasman National Park, Tasman Bay, South Island. We actually don't know who collected the specimens. It may have been collected by Jules Sébastien César Dumont d'Urville (1790–1842) who commanded the expedition but it could also have been René Primevère Lesson (179–1849); Richard doesn't say, and the labels on the specimens he used don't give the collector(s) name(s) either. What we do know is that both d'Urville and Lesson collected plants. We also know that whoever collected the type was at considerable pains to record the te reo name 'manuoea' bequeathed the tree by local iwi and used in Richard's protologue (Richard 1832).

Richard's description of manuoea is as beautiful as it is botanically accurate. Richard (1832) notes that manuoea has '*ramulis glabris*' [hairless branchlets], '*folia parva aut subopposita, approximata, linearilanceolata, basi sensum angustata, coriacea, glabra*' [small, subopposite leaves that are linear-lanceolate, with narrowed bases, leathery texture and hairless]. '*calyx cum ovaries adhaerens glaberrismus*' [calyx and ovary fused, hairless] and finally '*capsula minima, turbinate, glabra*' [small fruits that are turbinate in shape and hairless]. In summary then Richard (1832) described a plant that has small linear-lanceolate leaves and tiny fruits, critically the plant he named *Leptospermum ericoides* was in his view 'hairless'. He also used the species name '*ericoides*' because he felt the general aspect and foliage of his new species had a superficial resemblance to *Erica arborea*, a species of *Erica*—which indeed it has.

These points are important because despite the clarity of his description, Richard's *Leptospermum ericoides* was subsequently misinterpreted by the English and majority of New Zealand-based botanists right up until 2014 when I published my revision of the New Zealand members of the *Kunzea ericoides* complex (de Lange 2014).

Critical to this faulty thinking was the historical difficulty of consulting Richard's type specimen. That collection was deposited in the Muséum National d'Histoire Naturelle (National Museum of Natural History) in Paris, a very long way from New Zealand. Indeed, until the advent of digital imaging of type material, examination of types often required complicated and risky interloaning of them between herbaria, or the expense of travelling overseas to see the specimen. In the case of Paris with the exception of Dr(s) Warwick Harris, Hellmut Toelken and I, I suspect the type had not been consulted by anyone else with an interest in *Leptospermum* or *Kunzea,* at least up until 1999 anyway. This includes the Australian Botanist Joy Thompson who shifted *Leptospermum ericoides* to *Kunzea*, as *K. ericoides* in 1983.

Consequently, from a New Zealand point of view our interpretation of manuoea relied solely on the word of Joseph Dalton Hooker (1817–1911) and those who followed him. Hooker's opinion (and this

despite his being based in Kew, London, England, so only a 'hop, skip and a jump' from Paris) was given in ignorance of the type, least ways I never found any evidence that Hooker actually looked at the type, yet his word resulted in the blind-acceptance of New Zealand botanists that his views of *Leptospermum ericoides* were correct. Hooker, as has been noted by others, preferred (see Gillbanks 2014) 'broad species concepts' so while he could see variation in New Zealand *Leptospermum ericoides* (i.e. *Kunzea ericoides*) he was not accepting of any ideas to segregate this variation into different taxonomic units. There were of course detractors to this view, most notably New Zealand based naturalist William Colenso (1811–1899) who tried to convince Hooker of two further species, for which he proposed the names "Leptospermum pahaoaense" and "L. pulchrum"[1] but Hooker was having none of that. Colenso was ignored. Granted, Colenso was an extreme botanical splitter; he is reputed to have even named a new fungus on the basis of a spider's web but in the case of this story it is important to remember he started out his New Zealand natural history career at the Bay of Islands. There he was very familiar with another *Kunzea* then attributed to *K. ericoides* and known to northern iwi as rawiri. That species, now referred to as *Kunzea linearis*, Colenso rightly noted looked very different to the *Kunzea* he saw around the Hawkes Bay/Wairarapa and Ruahine Range. However, Hooker would have none of it. Colenso was ignored and unusually for him he didn't bother trying again. Another detractor was Thomas Kirk (1828–1898) who went ahead and named what is now *Kunzea linearis* and *K. sinclairii* —he too butted heads with Hooker but unlike Colenso elected to ignore Hooker and 'go forth and publish'. Even so Kirk's *Leptospermum* (i.e. *Kunzea*) names were widely misunderstood in part because of his way of describing them but also because other contemporary New Zealand based botanists felt more comfortable following Hooker's views.

In 1999 I visited the Muséum National d'Histoire Naturelle whilst back packing around Europe. There I hoped to see the type of *Kunzea ericoides* in which I was fortunate. On viewing it I could see first-hand the brilliance of Richard's description. However, the branchlets, capsules and leaves of the type are not hairless like Richard had stated; there are hairs present but they are sparse and very small—you need a decent hand lens (20×) or microscope to see them, so you could be excused for describing the species as 'hairless'. These distinctions had also been noted by Dr Hellmut Toelken who was the first botanist to realise that *Kunzea ericoides* was not present in Australia but rather a New Zealand endemic. Unfortunately, Thompson (1983), who had adopted a broad view of the species, had by now stated that *Kunzea ericoides* was an Australasian species, with subsequent dire consequences for the species in New Zealand but that is another story—see de Lange et al. (2010) and de Lange (2014) for more on this if you wish. Hellmut also recognised that New Zealand *Kunzea ericoides* was divisible and that the species in the strict sense was a northern South Island endemic.

The subsequent treatment of the New Zealand *Kunzea ericoides* complex in de Lange (2014) accepts a narrow view of that species confining it to the northern South Island in locations north of the Buller and Wairau Rivers. Within that range *Kunzea ericoides* is most common in Nelson, particularly North Western Nelson where it ranges from the coast to the tree line. Within this range it cohabits with rawiritoa (*Kunzea amathicola*) around Puponga, and with rawirinui (*K. robusta*) and makahikatoa (*K serotina*) elsewhere. I remain perplexed as to why *Kunzea ericoides* has not crossed the Cook Strait. It would not surprise me if someone does find it somewhere in the south eastern North Island—keep looking—but for now at least I still have seen no specimens collected from wild stations outside the northern South Island.

Manuoea is easily recognised on account of its usually bright lime green, linear to linear-lanceolate, glabrescent leaves, and seemingly glabrous branchlets (Fig. 1, 2). As I noted above the hairs are present but these are usually sparse—they are best seen using a 20× hand lens on young branchlets. In this species the hairs are divergent (patent) rather than appressed so they stick out at right angles to the branchlet axis looking rather like patchy stubble. However, on account of their small size, to the naked eye manuoea does indeed appear to have, as first described by Richard (1832) glabrous leaves,

1 For the record these are now *Kunzea robusta* and *K. serotina* respectively.

Fig. 1. Foliage of manuoea (*Kunzea ericoides*). Riwaka–Kaiteriteri Road, Tasman Bay. Photo: P. J. de Lange.

Fig. 2. Young branchlet of manuoea (*Kunzea ericoides*). Note the seemingly hairless condition. Riwaka–Kaiteriteri Road, Tasman Bay. Photo: P. J. de Lange.

branchlets and capsules. In growth habit manuoea typically has pendulous branches (Fig. 3,4), more so than any other New Zealand arborescent *Kunzea* species, though pendulous branches can be seen in most of the other arborescent New Zealand species, especially some East Cape rawirinui populations.

Fig. 3. Mature manuoea (*Kunzea ericoides*) growing on roadside. Note pendulous branches. Riwaka–Kaiteriteri Road, Tasman Bay. Photo: P. J. de Lange.

Fig. 4. Pendulous branches of manuoea (*Kunzea ericoides*). Riwaka–Kaiteriteri Road, Tasman Bay. Photo: P. J. de Lange.

The flowers of *Kunzea ericoides* are produced in compact corymbiform inflorescences (Fig. 5, 6), which remain this way until the 'resting' vegetative bud located at the apex of inflorescence commences growth, after which the inflorescences often elongate into short racemes. However, from time to time, particularly in good flowering years the late season inflorescences may form elongated botyra.

Fig. 5. Flowering manuoea (*Kunzea ericoides*) showing corymbiform condition typical of newly opened inflorescences. Riwaka–Kaiteriteri Road, Tasman Bay. Photo: P. J. de Lange.

Fig. 6. Heavily flowering manuoea (*Kunzea ericoides*) branchlets—the typical flowering condition of *Kunzea* subgenus *Niviferae*. Riwaka–Kaiteriteri Road, Tasman Bay. Photo: P. J. de Lange.

The flowers themselves offer no useful diagnostic characters though as Richard (1832) noted the hypanthium is usually glabrous. As a rule, manuoea usually flowers very heavily, such that flowering trees have all the appearance of being heavily laden with snow—a factor that lead Hellmut Toelken and I to place this species and its Australian and New Zealand allies into a new subgenus *Niviferae*—the epithet meaning 'snowy' (de Lange et al. 2010). Truly these *Kunzea* are the real 'Christmas' trees of Aotearoa/New Zealand, in that they reach peak flowering during December, and when they do they certainly resemble snow-covered trees such as one might see in the northern Hemisphere during Christmas time.

Acknowledgements

This article was stimulated by Dan Blanchon's interest in manuoea specimens I had collected whilst visiting North West Nelson. Dan felt a little 'story' on this species history was warranted, and the March 26 four-week COVID-19 lockdown provided the stimulus to write (yes I am already bored). The original was published as a post in the Unitec Herbarium Facebook just before lock down began (March 25). This article somewhat expands and modifies that text. Of course none of this would have been possible without the PhD supervision of Dr Brian Murray now retired from the University of Auckland, and support of Dr(s) Hellmut Toelken and Warwick Harris. Of course it's my story, others may wish to tell it differently.

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The type locality

Ian St George

Long Island: *Thelymitra longifolia* J.R. & G. Forst and *Microtis unifolia* (Forst.f.) Reichb.f.

The discovery in 1773

Johann Reinhold Forster, the naturalist on Cook's second (*Resolution*) voyage, wrote in his diary, at Queen Charlotte's Sound, on 9 November 1773,

> *9^{br} y^{e} 13th In the Afternoon we brought our plants overside and drew and described the new ones. The next morning we went over to Long-Island & mounted the hill, where we found several fine plants. This & the day before were remarkably fine & warm. In the night the small diving Petrels retire to the hills, where they have some holes under ground like Rabbits, & there they all together make a great noise, like the croaking of Frogs at a Distance, & sometimes to the cackling of Hens. We returned to dinner, having found a new Orch & an other new plant nearly related to the Class of Orches, but of a very singular structure & making absolutely a new genus. Several more new plants were likewise discovered, besides them* [1]

Michael Hoare identified the first as *Ophrys unifolia* Forst.f. (*Microtis unifolia*) [2], and the second as *Thelymitra longifolia* J.R. & G. Forst. [3].

Daniel Solander (Fig. 1), of Cook's first (*Endeavour*) voyage, had a mixed collection, with *Thelymitra* plants from Tolaga Bay, Whitianga and northern Queensland, which he placed in the European genus *Serapius*, as *Serapius regularis*, in his manuscript [4]. He noted, "There are strong reasons for placing this plant in a separate genus—the regular, spreading, 6-tepalled corolla, etc". George Forster also used the name *Serapius regularis* in *Prodromus*.

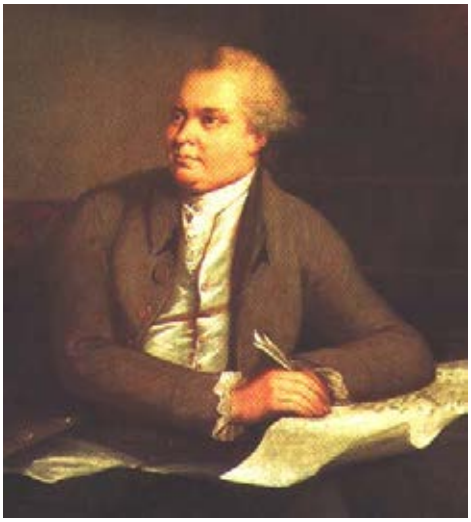

Fig. 1. Daniel Solander.

George Forster (Fig. 2) made a lithograph (Fig. 3) of *T. longifolia* for *Characteres,* and watercolour drawings of both plants, from which lithographs were made but never published. A set of 301 of his watercolour drawings was sold to Banks in 1776 for 400 guineas and now forms part of the Banksian collection housed at the British Museum (Natural History). The fully coloured illustrations of both these species are among them (Fig.3). It appears the other artist on the second voyage, William Hodges, made copies, and these are preserved in a small volume in the Alexander Turnbull Library [5].

Fig. 2. JR Forster holding a bird for G Forster to draw.

With the discovery of a number of taxa related to these two orchids—later-flowering *Microtis* with affinities to *M. unifolia*, and various *Thelymitra* with affinities to *T. longifolia*—it is important to know what the type specimens are.

Forster's lithograph of *T. longifolia* shows a column with an uncleft anterior lobe well above the cilia, but otherwise no discriminatory features; his description says only "cucullate" = hooded. The pollinia have dislodged and fallen onto the stigma.

No detailed illustrations of *M. unifolia* appear to have survived.

Fig.3: *Microtis unifolia* and *Thelymitra longifolia.* Watercolours by Georg Forster. Inset (bottom right): the column of *Thelymitra longifolia:* detail from lithograph by George Forster, 1776; from *Characteres generum plantarum*.

Descriptions

The original descriptions had no reason to emphasise the differences between these and what we now regard as related taxa, so they are brief and unhelpful. Some years ago the late Dan Hatch kindly translated Solander's (unpublished) and Forster's (published) descriptions from the Latin. Here are the Forsters'...

Thelymitra longifolia [3]

Name—from the Greek—a woman's mitra or head covering, since the female parts of the flower are hidden by the mitra.

Floral bract—lanceolate, acute, with a single flower.

Petals—6, [3 sepals, 3 petals], ovate-lanceolate, spreading, concave, the 3 sepals larger.

Column—a single structure, 2-lobed, the upper lobe truncate, very short, the lower lobe erect, 3-fid with jagged edges. Midlobe cucullate. Lateral lobes with spreading tufts of thin hairs at the tips.

Stamens—2, mounted on short filaments. *Anthers* ovate, hidden by the 2 lateral lobes of the column.

Ovary—inferior, stigma in the centre of the column, ovate, obtuse, short, with a nectar-filled hollow at the base.

Seed—very numerous, dust-like, adhering longitudinally to the wall of the ovary.

Serapius regularis [2]

Tubers ovate. *Leaf* keeled, with a fibrous sheath, the erect scape bearing a spike. *Corolla* 6-petalled. Forster. NZ. Name taken from the Ms of the late Dr Solander.

Ophrys unifolia [2]

Tuber ovate, *scape* terete, sheathing. *Leaf* single, terete, hollow throughout, emerging from a split in the middle of the scape, the leaf-lamina reflexed. Forster. NZ.

What is there now?

Both of these species are therefore November-flowering Marlborough plants (Forster's "9br" is November, not September).

My wife and I took the water taxi out from Endeavour Inlet on 12 November 2010, 237 years after the Forsters had left from Ship Cove. We were greatly helped by Bill Cash from the DoC base in the Sounds. He has recorded orchids from many of the Sounds islands; he sent us an aerial map showing the tracks, and advised us to land at the shingle fan on the SW of the island, bush bash up to the summit ridge, and follow the ridge track.

That is what we did. The island is of course no longer covered with the vegetation of Cook's day, but has been burned, grazed, and is now regenerating with secondary forest. It is surrounded by a marine reserve, and is close to Motuara island, a bird reserve. We saw bellbirds galore, saddlebacks, bush robins, pigeons.

And we saw orchids: *Pterostylis banksii*, *P. montana sensu* Moore, *P. graminea*, other *Pterostylis* sp., *Acianthus sinclairii, Corybas macranthus, Chiloglottis cornuta, Caladenia* sp. and, of course, *Microtis unifolia* and *Thelymitra longifolia* (Fig.4).

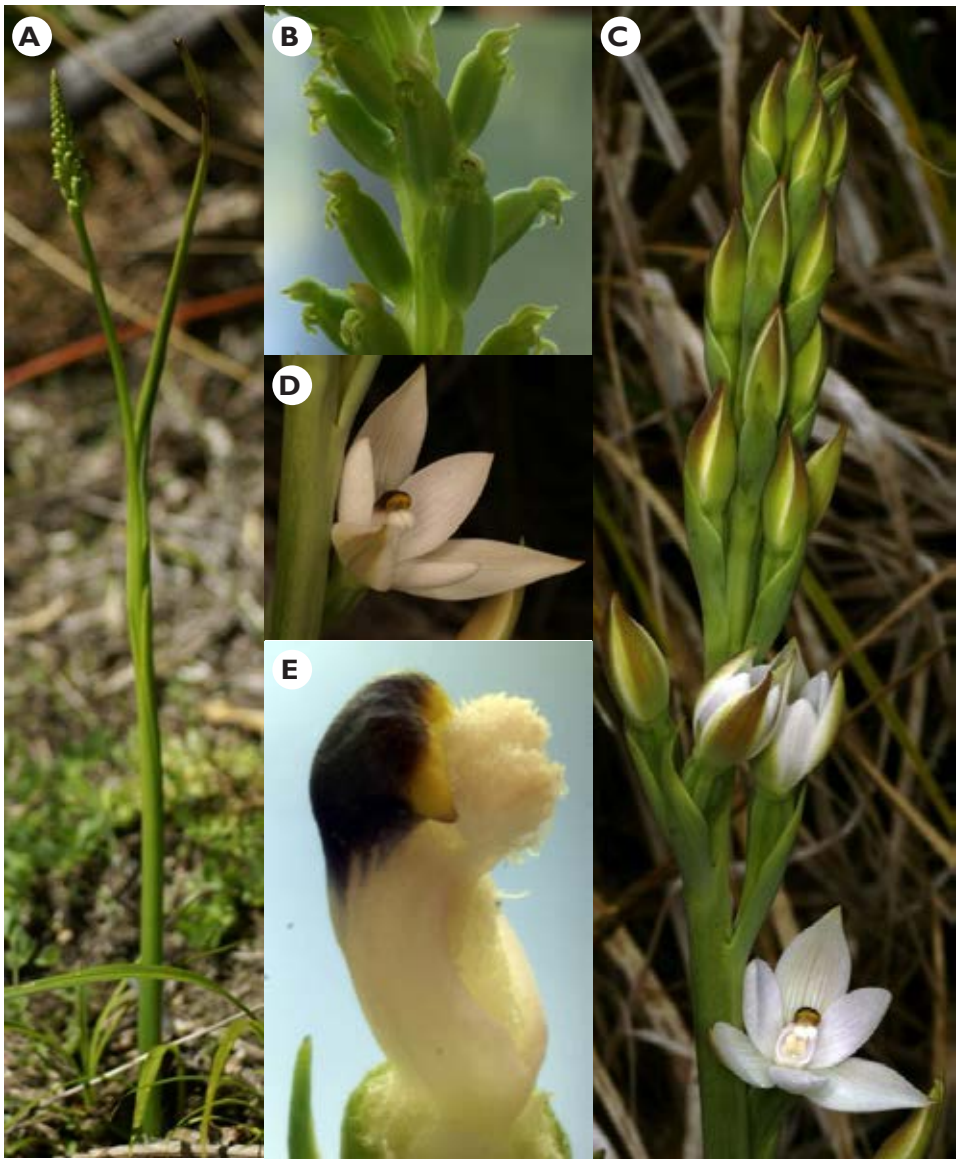

Fig. 4. On Long Island now. (A) *Microtis unifolia* plant, (B) *M. unifolia* flowers, (C) *Thleymitra longifolia* flowers, (D) *T. longifolia* flower, (E) *T. longifolia* column.

Thelymitra longifolia s.s. has a wide strap-like floppy ridged leaf, large stem leaves, flowers that open serially beginning from the lowest, and a post-anther lobe that is entire, or at most very shallowly emarginate. On the mainland I observed a couple of *T.* aff. *longifolia* taxa with narrow, arched, concave-upwards-in-cross-section leaves, and all had more notched post-anther lobes.

Microtis unifolia s.s. is a robust plant compared with other taxa: 10mm thick at the base of the stem in large specimens. In other words it is exactly as we have been led to believe.

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UPCOMING EVENTS

Most, if not all, Botanical Society meetings and field trips have been cancelled until further notice due to the COVID-19 lockdown. Please contact your local Botanical Society if you wish to ascertain the current status of their planned activities.