



TRILEPIDEA

NEWSLETTER OF THE NEW ZEALAND PLANT CONSERVATION NETWORK

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Guest Message from a Council Member

Ecosystems without many plant species: do they have any value besides occupying space?

My favourite places for botanising are ecosystems with many plant species: alpine herbfields of *Ranunculus*, *Bulbinella*, and *Celmisia* in bloom; West Coast forests where myriad bryophytes and ferns provide a feast of colours and shapes; coastal turfs where minute, interlaced plants are only revealed by getting on hands and knees with a hand lens. But, my first introduction to New Zealand botany was Craigieburn Forest Park. Mountain beech, mountain beech, more mountain beech: this was as boring an ecosystem as I had ever seen.

With time, I've learned to appreciate simple plant communities. Mountain beech forests are the simplest forests in the world. But lack of complexity can be a huge advantage in understanding forest dynamics and nutrient cycling, as the picture is blurred by many species. Mountain beech research was among the first to show species-poor plant communities can be more resistant than species-rich ones to exotic plant invasions. Although mountain beech forests have few vascular plant species, they have very high diversity of both lichens and mosses (90 species from 20 trees) and mushroom-forming fungi (198 species from 75 logs—one of the highest levels of diversity recorded).

Often simple ecosystems form where environments are so extreme few species can survive. As such extremes are rare, so are these ecosystems. Northland gumlands arose on soils once under kauri. Over millennia, acid kauri leaf litter leached nutrients from the soil, forming iron pans that impeded drainage. Now, only simple heaths of manuka, dracophyllum, and tangle fern grow there. Gumlands are important, however, for fernbirds, and scattered populations of threatened plants. Manuka honey from such highly acidic soils may have healthier properties.

Mt Titiroa, in Fiordland, and the Lookout Range in Northwest Nelson both have alpine granite sand plains. Sand plains form when steep rock ridges of Separation Granite combine with harsh, windy, but snowless alpine climates. Although they are not species-rich (12 species, on average, in 100 square metres), few species are shared between these remote locations, providing a unique opportunity to study convergence in plant form and function. Further, a sand plain moth species has the longest ovipositor relative to body size of any New Zealand moth. Could this be an adaptation for laying eggs in the sand? Or perhaps for hanging on in extreme winds!

I've grown to appreciate forests where a walk from valley to tree line reveals but a single species, the deep drifts of white sand on wind-buffed alpine ridges and the bleak gumlands of the Ahipara, where on a misty day, one might just hear the terrifying moan of the Hound of the Baskervilles...

Dr Susan Wisser

Landcare Research

PLANT OF THE MONTH – *OLEARIA ALLOMII*



Olearia allomii. Photo: Peter de Lange.

Plant of the Month for September is *Olearia allomii* (Great Barrier Tree Daisy). This small tree daisy is endemic to the central part of Great Barrier Island where it is found growing in open shrubland, on cliffs, and on rocky outcrops and crevices.

It's a stout shrub, growing to around 1 m tall, with tough but pliable leaves, green on the upper surface with silvery-white tomentum below. Small white flowers appear in late spring to early summer.

It propagates easily from seed and cuttings and grows best in a well drained infertile soil.

Try it in a pot out in the full sun where it can catch the breeze. *Olearia allomii* is not threatened but is naturally uncommon, found only on Great Barrier Island.

The Network fact sheet for *Olearia allomii* may be found at: www.nzpcn.org.nz/flora_details.asp?ID=605

Network conference update

The Network conference is still on despite the Canterbury earthquake. The conference venue at the Canterbury Horticultural Society rooms is still standing and our caterers are still operational. There is also plenty of good priced accommodation available around the city for the duration of the conference. Watch the Network website (www.nzpcn.org.nz) for more information about the conference or follow this link: [Conference 2010](#)

Phenology records reach 1000

The Network's national phenology recording system that began operation 2 months ago now has more than 1000 records for 329 different plant [taxa](#). Records have come in from all over the country providing information on flowering and fruiting of vascular plants. To record your observations follow this link:

- [Phenology recording system](#)

To view the results follow this link:

- [Phenology results](#)

Award winning gardener has died

Arnold Dench died at his home in Newlands on Sunday 29 August. He was a founder member of the NZ Plant Conservation Network and recipient of the 2008 Network award for plant conservation. He was a long time member of the Wellington Botanical Society and a superb propagator of native plants. He established and cared for one of the largest private [ex-situ](#) collections of native species at his garden in Wellington.



A new species of epiphytic orchid for New Zealand, near Whangarei

Sarah Beadel, Matt Renner, Ursula Brandes, Wildland Consultants (Sarah.Beadel@wildlands.co.nz)

We recently found a 'new' species of minute epiphytic orchid growing on gorse (*Ulex europaeus*) plants amongst secondary species of vegetation in northern New Zealand, on a hillside in the Waipu Ecological District, to the south-west of Whangarei. The initial collection was by UB, the initial identification was by MR, and SB and MR have subsequently revisited the site. The species is thought to be *Taeniophyllum norfolkianum*, previously known only from Norfolk Island, where it occurs on the undersides of Araucaria branches on the slopes of Mt Bates. Fewer than 1000 plants of *T. norfolkianum* are known to occur on Norfolk Island (Department of the Environment, Water, Heritage and the Arts 2007 and 2009), where it is threatened, classified as 'vulnerable', based on the IUCN red book classification system.

Taeniophyllum is a new genus for New Zealand, and *T. norfolkianum* is only the ninth indigenous epiphytic orchid species to be found in New Zealand: the other species are *Adelopetalum tuberculatum*, *Earina autumnalis*, *Earina mucronata*, *Earina aestivalis*, *Drymoanthus adversus*, *Drymoanthus flavus*, *Ichthyostomum pygmaeum* and *Winika cunninghamii*. The genus *Taeniophyllum* has over 170 species. The defining characteristic of the genus within the Orchidaceae is that the plants have no leaves, and the roots contain chlorophyll that performs photosynthesis. This group of orchids is highly specialised; Attenborough (1995) made the following observations:

"One orchid, Taeniophyllum, has roots that are even more versatile. Its scientific name means, rather unattractively, 'tapeworm leaf'. Its roots have not only developed into flat, tapeworm-like shapes several yards long that writhe statically all over the branch on which the plant sits, but they have also become green and manufacture the orchid's food. The true leaves, no longer needed, have been reduced to tiny scales on the minute stem that carries the flowers."

Taeniophyllum norfolkianum is a very small plant. The roots are only about 1 mm diameter; we observed plants with roots up to 25 mm long, radiating out to form patches 3–5 cm across. The flowers, 4–6 per cluster, are 7–10 mm long, tubular, and yellow-green.



We found about 140 *T. norfolkianum* plants growing on four gorse (*U. europaeus*) shrubs in a mosaic of mixed secondary indigenous forest and shrubland, and gorse scrub and shrubland. The open mixed scrub comprised tree ferns (mamaku, *Cyathea medullaris*) and silver fern (*Cyathea dealbata*), kanuka (*Kunzea* sp.), mahoe (*Melicytus ramiflorus* subsp. *ramiflorus*), gorse (*U. europaeus*) and pate (*Schefflera digitata*), with scattered mapou (*Myrsine australis*) and kahikatea (*Dacrydium dacrydioides*). The *T. norfolkianum* plants were growing on branches and stems in the gorse canopy open to the light. One plant was observed epiphytic on another gorse plant on a pasture margin, about 70 m from the main site. The plants were flowering and fruiting when observed in November 2009 and it appeared that some plants were at least two years old because we observed the remains of the previous year's flower stalks as well as 2009 flower stalks on some of the plants. The currently known population may not be the only occurrence of this species at this site because there are large amounts of suitable habitat and many host plants.

Taeniophyllum norfolkianum may have colonised recently from Norfolk Island. However, because this part of New Zealand is not well explored botanically, it could have been present, awaiting discovery, for quite some time. If it is a recent coloniser, then it joins the ranks of other orchids that have established naturally from other countries; mainly Australia. Some species have only ever been recorded from one or two sites, e.g., *Simpliglottis valida* and *Sullivania minor*, though others have become well-established following initial colonisation.

Until more is known, it is difficult to suggest what the threat status in New Zealand should be but, for now, it would definitely justify a ranking of 'Data Deficient', as per Townsend *et al.* (2008). There are still many unanswered questions about the distribution and natural hosts of this species, with large areas of suitable habitat (i.e., secondary indigenous species and gorse scrub and shrubland) in Waipu Ecological District, so further searches may locate more populations.

The other key question is: 'What is the natural host of this species in New Zealand?' Is it similar to *T. norfolkianum* on Norfolk Island or *T. muelleri* in Australia, occurring in the canopies of tall forest species? If so, it could easily have been overlooked, particularly if it is a "naturally uncommon" species.

This is an exciting record for New Zealand and we plan to return to the site to undertake further searches and learn more about the species in its only known New Zealand habitat.

Acknowledgement

This species was first collected while remeasuring a carbon and biodiversity monitoring permanent vegetation plot for New Zealand's Ministry for the Environment.

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Threatened Plant Survey of Rarotonga

P.J. de Lange, 16 Jesmond Terrace, Mt Albert, Auckland 1025

During July, I participated as a volunteer in an endemic plant survey of the Cloud Forest of Rarotonga. The work was organised through the Cook Islands Natural Heritage Trust and Wildland Consultants New Zealand and involved seven days of surveying the endemic plants of the mountainous interior of Rarotonga.

While on the island, I worked closely with Dr Tim Martin (Wildland Consultants New Zealand) and Mr Gerald McCormack (Cook Islands Natural Heritage Trust). Our survey focused on determining the status and trend for the Rarotonga endemic vascular plants—especially those endemic to the cloud forest. The data gathered are to be used to provide IUCN with Threat Listings in the hope that it will stimulate better funding for conservation programmes on the Cook Islands. Currently, plant conservation measures on the Cook Islands are non-existent and attempts to rectify this have been hampered by the lack of data to enable a global threat listing for their endemic flora. Although endemics were our focus we also spent some time looking for other scarce indigenous plants and, at the request of various specialists, collected bryophytes and lichens.

Our initial impression was that the indigenous flora of Rarotonga is in serious trouble. In 2005, five back-to-back cyclones virtually destroyed the last vestiges of lowland coastal forest (the few remaining remnants are now under serious threat from the ongoing expansion of the tourist industry, which requires ever more accommodation and restaurants) and these same storms toppled much of the lower slope forest on the island. Even worse though, was that the hurricane winds uplifted seed from a range of introduced, aggressive vines (mile-a-minute (*Mikania micrantha*), balloon vine (*Cardiospermum grandiflorum*), balsam pear (*Momordica charantia*), passion fruit (*Passiflora maliformis*, *P. rubra*), and merremia vines (*Merremia peltata*, *M. tuberosa*) are the worst of these) and spread these through the otherwise intact upper slope and cloud forest. It is these vines perhaps more than anything else that now threatens the entire forest structure of the island (Fig. 1).



Fig. 1. Introduced vines (mostly *Merremia peltata* and *M. tuberosa*) smothering forest, upper Papua Valley, Rarotonga.

On our first day we encountered the island's floral response to the 2005 cyclones—the dreaded 'au (*Hibiscus tiliaceus*) forest. New Zealand has supplejack (*Ripogonum scandens*) and leatherwood (*Olearia colensoi*) scrub, and Tasmania, horizontal (*Anodopetalum biglandulosum*). Well Rarotonga has something much worse: 'au forest (Fig. 2). This forest with its accompanying vines has grown up in sites damaged by the 2005 storms. It is horrid. The wood of 'au is very brittle and snaps —always rather inconveniently—with a razor-sharp jagged edge, usually when you are perched five or so metres up in the canopy. The resulting rapid descent accompanied by much



Fig. 2. 'Au (*Hibiscus tiliaceus*) forest in all its glory—lower Mangatea Bluff Track.

shredding of clothing, skin and blood loss is truly spectacular, whereas the alternative, open air caving under the mass of brittle branches, is hardly any better, especially when one encounters the spiny trunk of a venevene pāma (*Flacourtia jangomas*), which often grows amongst the 'au.

Past the 'au forest one still had to traverse the aptly named "disturbed forest" (see McCormack & Künzlé 1995), which, over much of the island, is given over to a mostly exotic flora canopy dominated by the canopy trees kō'i'i (*Spathodea campanulata*), i'i (*Inocarpus fagifer*), tuitui (*Aleurites*



Fig. 3. Mato (*Homalium acuminatum*) trunk and root system, Mangatea Bluff.

moluccana), Java plum (*Syzygium cumini*), venevene pāma, cecropia (*Cecropia pachystachya*) and rau'ava'ava (*Solanum mauritianum*) through which is threaded the ubiquitous balloon vine, merremia vines, balsam pear, mile-a-minute and passion fruit. The understory in these forests is as dull as it is depressing being dominated by the introduced shrubs ardisia (*Ardisia elliptica*), cestrum (*Cestrum nocturnum*), Surinam cherry (*Eugenia uniflora*) and, in places, coffee (*Coffea arabica*). Further upslope much of this vegetation gives way to dense stands of the endemic mato (*Homalium acuminatum*), an impressive tree that tends to flower only after cyclones have virtually stripped it bare of foliage. Mato is multi-trunked and has a stout root stock (Fig. 3), which along with pua (*Fagraea berteriana*) provided hand holds *par excellence* because even when dead the wood was iron hard and held fast. Few of the plants we were hunting for grew in these areas but we were able to confirm that the main slope forest endemics such as mato and the

spectacular orange-flowered neinei (*Fitchia speciosa*, Fig. 4) are thriving. Less common, perhaps worryingly so, was the Rarotongan coprosma (*Coprosma laevigata*), of which we saw fewer than 30 individuals during our survey and only one of these was flowering and fruiting. Its scarcity even came as some surprise to Gerald McCormack who had hitherto considered it common. More abundant, though still seen in pitifully low numbers, was the Cook Islands myrsine (*Myrsine cheesemaniae*), which though not endemic to Rarotonga, is known otherwise from the Cook Islands on Mangaia, Ma'uke and Miti'āro Islands. It was in these areas that we also occasionally saw two more endemics, the Rarotongan 'ange (*Geniostoma rarotongensis*) and Rarotongan psychotria (*Psychotria whistleri*).



Fig. 4. Neinei (*Fitchia speciosa*) in flower, Mangatea Bluff.



Fig. 5. Owee grass (*Cenchrus caliculatus*) on Motu Ta'akoka, Muri Lagoon, Rarotonga in July 2006. This grass has now gone extinct at this site.

In a few places on the basalt cliffs of Mangatea, we were pleased to see owee grass (*Cenchrus caliculatus*), which is now very uncommon on Rarotonga (Fig. 5). Owee grass takes its endearing vernacular from the vocal response given by those people ("Ow! Eeee!") silly enough to stand on or otherwise engage the barbed fruits and, on the islands, is a name used more freely for the much smaller, introduced *C. echinatus*, whose barbed seeds often embed themselves *deeply* into the bare-feet of those incautious enough not to watch where they are walking. However, unlike its smaller annoying cousin, *Cenchrus caliculatus* is declining throughout the Pacific (Whistler 1992) with perhaps the largest Pacific populations now known are those on Raoul Island. Owee grass aside, our venture on Mangatea failed to find *Pilea bisepala*, an urticaceous shrub that had last been recorded from this area in the 1920s. Though not endemic to the island, its extinction from Rarotonga is nevertheless a sad loss for that island's indigenous biodiversity.

The next day was spent on another traverse up and across the cliffs of Mangatea in the hope of finding a solitary Te Manga cyrtandra (*Cyrtandra lillianiae*) seen there by Gerald McCormack and Judith Künzle about 15 years ago. Having now cut a path through the dreaded 'au we made better progress and soon reached the tuanu'e (*Dicranopteris linearis*) fern slopes that are common on some of the steeper ridge lines of the island. From time to time, we admired the purple flowers of the fernland orchid (*Spathoglottis plicata*) and also occasional coral-pink flowering rata (*Metrosideros collina* agg.). Nevertheless, despite seeing a few specimens of the very uncommon indigenous vine *Cocculus orbiculatus*, the cyrtandra eluded us.



Fig. 6. Colin Rattle on the northern summit of Te Kou.

On day three, we climbed Te Kou. This time we were accompanied by local man Colin Rattle (Fig. 6). Colin is trying to save the Rarotongan bush foods and ancient crops that are fast disappearing through the onslaught of modern, faster growing food crops. He put us to shame, at 65, armed only with a sugar sack tied up with rope and the ubiquitous machete he climbed the 588 m of Te Kou barefooted ("I like to feel the earth on my feet") leaving us to cope as best we could with our packs, bottled water, cameras and plant presses. Colin's lunch, local bananas and two coconuts, was all that he would have beyond, that is, a long drink from the Te Kou spring in the summit "crater".

On Te Kou, we were searching for *Homolanthus nutans*, which we eventually found (Fig. 7).

Although not endemic to the island, this is a very uncommon

species on Rarotonga. We found five old trees, several of which showed evidence of regrowth through coppicing following the loss of the main trunk, caused perhaps by strong winds during cyclones. Several trees were fruiting and these bore evidence of rat predation. Indeed, while on Te Kou, we were alarmed to see rats (species not determined) scampering through the neinei forest canopy. Opinion on the island is divided as to whether rats are a problem in the forest, it being the view that ship rats probably are but kiore not as much. We let the silent forest speak for itself.



Fig. 7. *Homolanthus nutans*, Te Kou near southern summit.



Fig. 8. *Acrophorus raiatensis* sporangia, Te Kou "crater".

Associated with the *Homolanthus* we found our first specimens of another target species, *Hypolepis dicksonioides*, which, in Rarotonga, is confined to the cloud forest — quite a contrast to the disturbed lowland habitats it occupies in northern New Zealand and on Norfolk Island. Growing in association with the *Hypolepis* was another survey species and a new find for Te Kou, the fern *Acrophorus raiatensis* (Fig. 8). Previously, this fern had been known only from a small area on nearby Te Manga where we also saw it the next day. Near the *Hypolepis* we found *Nephrolepis flexuosa*, which was first recorded from the island in 2005 (see de Lange et al. 2005). It seems to be

genuinely scarce on Rarotonga. The trunks of kaiatea (*Weinmannia samoensis*) and tree ferns (*Cyathea parksiae* (endemic) and *C. affinis*) were also festooned in another cloud forest endemic,

Radiogrammitis cheesemanii (Fig. 9). Te Kou is this strap fern's type locality (Parris 1993) and it is certainly very common there (and also on nearby Te Manga and Te Atuakura). Near the small stream, we found a few plants of the Rarotongan coprosma and psychotria and saw plenty of orange, yellow and pink-flowering rata and white-flowered 'ua mōtukutuku (*Melastoma denticulatum*). It was only when back in New Zealand that I realised we'd also collected on Te Kou another scarce Rarotongan fern, *Monogramme paradoxum*, which grew amongst *Radiogrammitis* on the trunk of kaiatea. We ended our day with a tour of Colin's taro and banana gardens, followed by an excellent meal of boiled 'utū (*Musa troglodytarum*) served with coconut cream and a beer chaser.



Fig. 9. *Radiogrammitis cheesemanii* on *Cyathea affinis*, Te Kou "crater".



Fig. 10. Edwin Apera, Tim Martin, Gerald McCormack and "Ed Hillary" occupying the entire summit area of Te Manga.

The following day we set off up Te Manga with Edwin Apera from the local Ministry of Agriculture and Gerald McCormack. Te Manga (658 m) is the highest peak in Rarotonga and even by New Zealand standards it is a very tough climb. On this particular day, we hoped to find the ferns *Acrophorus raiatensis*, *Hypolepis dicksonioides* and *Microsorium powellii*, threatened grass *Garnotia stricta* (*G. cheesemanii*), Te Manga cyrtandra, and Rarotonga sclerotheca (*Sclerotheca viridiflora*). We intended to traverse from Te Manga summit to Te Atuakura. At the track start, we acquired a pair of local dogs that, despite Gerald's assurances that they wouldn't, followed us right to the summit (well one couldn't climb the last cliff so she provided us with a concerto of howling through the clouds (kept up until our descent), while her partner did reach the top where he earned half my lunch, water and the epithet "Ed Hillary" (Fig. 10)). Near the first summit of Te Manga, we rediscovered *Garnotia stricta*, an extremely

uncommon, innocuous little grass that had once been regarded as an island endemic (*G. cheesemanii*). Gerald had seen it in this area some 15 years before but had never seen it again despite searching. Luckily, some cliff and tree climbing located seven plants, all sadly at imminent risk of being overwhelmed by the exotic grass *Paspalum conjugatum*. Later, on the razor back between Te Manga's second peak and Te Atuakura, we started the real cliff work. Again, we thanked the Gods for neinei, whose stilt-like roots, even when dead formed a very reliable handhold on the otherwise treacherous water drenched basalt cliffs and rubble slopes that make up the habitat of *Cyrtandra lillianiae*. It was here, whilst in the clouds, that we found the first of the five Rarotongan sclerotheca specimens seen during our survey (Fig. 11), and—what luck—a flowering shrub as well! The flowers, as the name implies are a brilliant green, with the



Fig. 11. Rarotongan sclerotheca (*Sclerotheca viridiflora*) shrub, cliffs below ridge line leading from Te Manga to Te Atuakura.

central stigma and stamen maroon-black (Fig. 12). This species is genuinely scarce (W.A. Whistler, pers. comm.) and, by all accounts, we were lucky to find it. Sadly, we also found in the same area occasional ardisia and cestrum plants, which we assume have reached this ridgeline via myna birds crossing the island and even a few mile-a-minute. If these plants are not controlled in the long-term, they will displace the sclerotheca from its narrow ridge line and cliff face habitat. From here we dropped (literally) into a near vertical gully head where we finally found *Cyrtandra lillianiae*, sadly not in flower though we saw one amazing flower bud (60 mm long!) high up in the canopy (Fig. 13). This gesneriad is the bigger of the two endemic Rarotongan



Fig. 13. Flower bud of Te Manga cyrtandra (*Cyrtandra lillianiae*), cliffs below ridge line leading from Te Manga to Te Atuakura.

Cyrtandra. It has only ever been found in the gully heads, upper slopes and cliff scarps along the northern side of the island, with its stronghold on Te Manga. It can form a very large shrub (one we found measured 2 × 3 m). We soon found that the

fleshy stems snap readily making survey of plant numbers very tricky. We also noted that the stems frequently root from the nodes and we saw numerous layered branches. Seedlings were also found, which was very encouraging. Growing under the *Cyrtandra* we found examples of rough-leaved shrub (*Cypholophus macrocephalus*), several *Hypolepis dicksonioides* and, further upslope partly obscured by clouds, a large *Homolanthus*. The ridgeline back to Te Manga revealed further

plants of *Hypolepis* and two sclerotheca saplings. We also found what I regard as a second species of rata (*Metrosideros collina* agg.) on the island (there is supposed to be one).

My last two days with Tim were spent initially having a half day break—necessitated by the need to curate plant specimens in alcohol to meet New Zealand’s stringent biosecurity standards. Later in the afternoon of that day, we perplexed the locals happily swimming in the Papua Falls plunge pool by our dancing about for joy because we had successfully found a Rarotongan cyrtandra (*Cyrtandra rarotongensis*) growing above the plunge pool. We then surveyed for further plants (without success) in the Papua Stream Gorge above the falls. The next day we forgot about the solar eclipse due that morning—we were doing more important things after all—heading up the Avana River to try to find a Rarotongan cyrtandra plant Gerald had found in the Avana headwaters 20 years ago! As the sky got progressively darker we initially figured that the “mother of all” thunder storms was coming, but the myriads of people lining the roads cursing at the thick clouds obscuring the sun soon jogged our memories.

The Avana walk was, we were assured, a pleasant but wet river crossing day. It wasn’t! Gerald, sporting a detailed map “...turn left at the banana tree...walk right by the puraka...look for a rock that looks like a man’s head...climb up by the wild vanilla” made 20 years ago was countered by Tim with his modern GPS. This provided hours of entertainment as we made our way up the river, accompanied by arguments as to whose map or GPS unit was right. On the swampy river flats, we saw plenty of *Myrsine cheesemanii* (clearly the Avana is the stronghold for this species on Rarotonga) and, in places, quite commonly, the endemic orchid *Habenaria amplifolia*. We even saw a young kākērori (*Pomarea dimidiata*) an endangered endemic bird that followed us briefly through the trees.



Fig. 12. Flower of Rarotongan sclerotheca (*Sclerotheca viridiflora*), cliffs below ridge line leading from Te Manga to Te Atuakura.

Eventually, as per Gerald's map, we found an area of Tahitian vanilla (*Vanilla tahitensis*) (Fig. 14) and, near here, in one muddy area, sterile examples of the uncommon yellow malaxis orchid (*Malaxis reineckeana*). This orchid was growing alongside the much more common and, in this case,



Fig. 14. Tahitian vanilla (*Vanilla tahitensis*) wild in the upper Avana River.

flowering purple-black *Malaxis resupinata*. After much argument in which Tim's GPS was consulted and then completely ignored, we headed up the wrong stream system and ended up just below the summit of Te Atiakura hanging precariously on to a ridgeline razorback made up entirely of kiekie (*Freycinetia arborescens*) vines and pua trees. Wisely, we elected to drop into the next valley, a move which was soon rewarded by finding flowering specimens of another uncommon orchid, the white ground orchid (*Phaius terrestris*) (Fig. 15). Dropping into another stream, we clambered through masses of a strange *Blechnum filiforme* look-alike, which turned out to be the only known place on the island for *Lomagramma tahitensis* (Fig. 16)—one of the ferns on Gerald's map. So obviously back on Gerald's 20 year-old track we now



Fig. 15. White ground orchid (*Phaius terrestris*) upper Avana.

headed down stream. Finally, whilst trying to climb down a 10 m cliff face above the river, Tim spotted a flowering and fruiting Rarotongan cyrtandra—only our second for the entire survey (Fig. 17). The walk back to the road was filled with much discussion over the plight of the endemic flora it being agreed that *Cyrtandra rarotongensis* is now on the very verge of extinction. Our two plants are all that have been reliably reported from the island for the last 15 years.



Fig. 16. *Lomagramma tahitensis* and Gerald McCormack, upper Avana River.

The next day Tim nervously headed back to New Zealand with all our plant specimens and notes. I stayed on for another two weeks during which my only foray into the mountains was with my son Theo. We climbed Te Rua Manga (called "The Needle" for the tourist industry—"But it's not a needle Dad it's a pillar of rock," said Theo) from the southern side of the island greeting, along the way, several New Zealand Department of Conservation staff on holiday. On a rock



Fig. 17. Rarotongan cyrtandra (*Cyrtandra rarotongensis*) on cliff face, upper Avana River.

outcrop west of Te Rua Manga, Theo and I found what I am sure is *Plectranthus parviflorus* and a small amount of *Nephrolepis flexuosa*. Theo's eagle eyes also spotted two types of *Ophioglossum* along the banks of the Papua Stream.

In terms of new finds for the island, we are still working our way through the specimens. If I am right, the *Plectranthus* is new, while the *Ophioglossum* Theo found does not readily match what has been recorded from the island before (one seems to be very close to what we call here *O. petiolatum*). A filmy fern collected as “*Hymenophyllum sanguinolentum*” seems to be this and, if right, New Zealand has lost another endemic. Also, there is the possibility of a new *Metrosideros*. Threatened plant wise, we have plenty to write up but it’s clear that we are now seeing major declines in some cloud forest endemics and, if people don’t act now, the extinction of at least one more endemic—*Cyrtandra rarotongensis*. If the spread of exotic vines continues unabated, then there will be serious losses of indigenous biodiversity in the near future. The Cook Islands government needs our help. Wouldn’t it be great if our New Zealand biocontrol experts could find the time and the means to help them out free of charge? Perhaps as a conservation charity measure? Weed control is urgently needed there and it’s now beyond physical and chemical control (Reeves 2010).

Acknowledgements

I’d like to thank Tim Martin for asking if I’d come along on this field trip, for his tolerance of my night owl tendencies and for bravely taking most of the plant specimen collections past MAF. Thanks, too, to Gerald McCormack and Judith Künzlé for company in the field, food, wine and beer and most of all intelligent conversation. Special mention goes to Colin Rattle who never once raised an eyebrow at the numerous profanities raised on the long, steep, slippery, climb up Te Kou and down again, and for sharing with us a welcome feed of ‘utū, surely the king of all bananas. I hope that, when I am 65, I am climbing peaks barefooted too. Back in New Zealand, I’d like to mention Ewen Cameron for his patience in obtaining our vascular plant collections from MAF and his ongoing negotiations to get our bryophyte and lichen samples from ERMA; Rhys Gardner for confirming our *Garnotia* find; Bill Sykes for his interest and preliminary comments on specimens; and Art Whistler—a chance visitor to AK on my return—for his comments on the threat status of Rarotongan endemic plants.

References

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Solanum torvum, a risk organism

Solanum torvum Sw. (devil’s fig, Fig. 1) (synonyms: *Solanum ficifolium* Ortega, *Solanum ferrugineum* Jacq.), an exotic plant of the family Solanaceae, was recently reported to MAF Biosecurity New Zealand from a rural property in Taipa, Northland. A responsible landowner noticed that a plant had grown suspiciously quickly after it was planted out from a pot and notified the Department of Conservation, which, in turn, notified MAF Biosecurity New Zealand. The plant was confirmed as *S. torvum* by Auckland Museum. *Solanum torvum* is an “entry prohibited species” and should not be present in New Zealand.

Figure 1: *Solanum torvum*. Also known as devil’s fig, turkey berry, prickly solanum, shoo-shoo bush, wild eggplant, or the pea eggplant.



In response, MAF Biosecurity New Zealand investigators visited the affected property and removed all signs of the plant, including one mature specimen, 258 fruit and numerous seedlings (Fig. 2). The remaining stump was treated with herbicide gel to kill any remaining roots and all material was destroyed by the Northland Regional Council. Inspections were also conducted at neighbouring properties and no other devil's fig were found.



Figure 2: Seedling of *Solanum torvum* found in Northland.

Devil's fig is native to the West Indies and is now a weed in tropical areas of many countries. It is a slightly hairy but spiny, perennial plant whose leaves resemble those found on the eggplant/aubergine (*S. melongena*). Though generally adopting a shrubby growth habit and growing to 2–3 m high and 2 cm basal diameter, it may reach 5 m high and 8 cm basal diameter. Plants can grow 0.75–1.5 m per year, but the species is not long-lived and most plants live only about two years. It usually has a single stem at ground level, but may branch on the lower stem.

Flowers are produced in clusters (Fig. 3) and are shed soon after opening.



Figure 3: Flowers of *Solanum torvum*.

The flowers are tubular with five pointed lobes and are white, in contrast to yellow produced by tomato (*S. lycopersicum*) and violet by eggplant/aubergine. The stem bark is grey and nearly smooth with raised lenticels. The twigs are grey-green and covered with star shaped hairs. Short, slightly curved spines vary from thick throughout the plant, including the leaf midrib, to entirely absent. Leaves are opposite, or one per node, and are broadly oval with the border entire or deeply lobed. Petioles are 1–6 cm long. Blades, which range from 7 to 23 cm by 5 to 18 cm, are covered with short hairs.

Flowering and fruiting is continuous after the shrub reaches about 1–1.5 m high. Fruit grow in clusters of green, sphere shaped berries approximately 1 cm in diameter (Fig. 4). They become drab yellow when fully ripe (Fig. 5) and then dry black. They are thin-fleshed and contain numerous (>300) flat, round, yellow-brown seeds (Fig. 6) about 1.5–2 mm long. Seeds are spread by fruit eating birds, or by the movement of equipment and contaminated soil. It can spread rapidly as a weed in disturbed lands.

Devil's fig thrives in sunny, well-drained and fertile areas, is rather drought-tolerant and appears relatively free from pests and diseases in New Zealand. Though grubbing plants may control the shrub, lopping will not kill them. Translocated herbicides applied to leaves or the cut stumps are effective in killing the plant.

MAF Biosecurity New Zealand is interested to hear about any further occurrences of devil's fig. If you think you have seen this species anywhere, please call MAF Biosecurity New Zealand on **0800 80 99 66**.



Figure 4: Immature fruit cluster of *Solanum torvum*.



Figure 5: Mature fruit cluster of *Solanum torvum*.



Figure 6: Seeds inside a *Solanum torvum* fruit.

CURRENT FORUM THREAD

- What is the vulnerability of *Korthalsella salicornioides* to spray drift?

New Zealand Plant Conservation Network AGM:

The AGM of the NZ Plant Conservation Network will be held on Friday 8 October 2010. It will follow the first day of the Network conference (5.00–6.00 pm) and will be held at the Canterbury Horticultural Society Rooms (57 Riccarton Avenue, Christchurch). If you have items to put on the agenda or issues you wish to discuss please email them to the Network: info@nzpcn.org.nz. The draft agenda is below:

Agenda

Minutes of AGM 2009

Matters arising

President's report

Treasurer's report

Change to annual subscription fees

As per clause 6.1 of the NZPCN constitution, it is proposed that the membership fees for the 2010/2011 financial year be increased as follows:

- General member – change from \$35 to \$40
- Student/Unwaged member – change from \$10 to \$15
- NGO – change from \$50 to \$60
- Corporate (6 people on mailing list) – change from \$200 to \$250
- Corporate (25 people on mailing list) – no change

Election of Council members

General business

Close 6.00 pm

UPCOMING EVENTS

If you have important events or news that you would like publicised via this newsletter please email the Network (events@nzpcn.org.nz):

Plants in a human landscape – conservation outside nature reserves

NZPCN conference: 7–10 Oct 2010. Registration is now open via the Network website (credit card payment is required). Network members should log on as a member to receive discounted prices. Follow the website navigation (see left side of the home page for more details about speakers and symposia, social events and field trips to Quail Island, the 'Greening Waipara' project and Lincoln Dairy farm and Banks Peninsula.

Environment Institute of Australia and New Zealand

Annual Conference: Tuesday 26 October to Friday 29 October at Te Papa, Wellington. The title of the conference is "From Discovery to Delivery: Science, Policy, Leadership and Action". These are the four elements that, together, are essential for sound environmental management

Information:
www.confer.co.nz/eianz2010.

2010 Australian Systematic Botany Society Conference

Monday 29 November to Friday 3 December at Lincoln University. Theme: "Systematic botany across the ditch: links between Australia and New Zealand". Subject areas include palaeobotany, biogeography, phylogeny, algae, hybridisation, and biosecurity/weeds.

For more information see: www.landcareresearch.co.nz/news/conferences/asbs2010/index.asp or email: ASBS2010@landcareresearch.co.nz.

Auckland Botanical Society

Meeting: Wednesday 6 October at 7.30 p.m. a talk by Robin Atherton and Lara Shepherd titled 'Karakā and kowhai'. **Venue:** Unitec School of Health Sciences, Gate 4, Building 115. Room 2005.

Contact: Maureen Young, email: youngmaureen@xtra.co.nz.

Field trip: Saturday 16 October to Motuora Island, Kawau Bay.

Contact: Maureen Young, email: youngmaureen@xtra.co.nz.

Waikato Botanical Society

Field trip: Saturday 6 November a Threatened Plant Collection working bee. Please bring gloves, old clothes and boots for weeding, planting and propagating activities. **Meet:** 11.00 a.m. at Waikato University Gate 9, Hillcrest Rd, or down the hill at glasshouses compound.

Contact: Liz Overdyck, ph: 846 0965, email: eg3@waikato.ac.nz

Rotorua Botanical Society

Field trip: Saturday 2 October (Sunday 3 October optional) to East Cape, revisit no. 4. **Meet:** The car park at 7.30 a.m. or Opotiki DOC Office (cnr Elliot & St John Street) at 9.15 a.m. **Grade:** Medium. **Cost:** \$20 donation for accommodation for those staying Saturday night.

Leader : Tim Senior, ph: 0800 368 288 ext 6010 or 07 315 7371, email: tim.senior@envbop.govt.nz.

Wanganui Museum Botanical Group

Meeting: Tuesday 5 October at 7.30 p.m. a talk by Clive and Nicki Higgin titled 'Queensland'. **Venue:** Museum's Davis Lecture.

Contacts: Robyn and Colin Ogle, ph: 06 347 8547, email: robcol.ogle@xtra.co.nz.

Field trip: Saturday 9 October to Tennyson's Bush, Campbell Road, Brunsvick. **Meet:** at Police Station at 11.30 a.m.

Contacts: Robyn and Colin Ogle, ph: 06 347 8547, email: robcol.ogle@xtra.co.nz.

Wellington Botanical Society

Field Camp: Wednesday 29 December – Friday 7 January 2011 the summer camp in Northern Fiordland jointly with Botanical Society of Otago. **Accommodation:** indoors and camping at Boyds Creek Lodge, c. 40 km NE along SH94 from Te Anau.

Contact: Mick Parsons, ph: 04 972 1142, email: mtparsons@paradise.net.nz.

Nelson Botanical Society

Field trip: Sunday 17 October to Dun Mountain . **Meet:** at 8.00 a.m. in Selwyn St between the large gum tree and the Cathedral Steps.

Contact: Diana Pittham,
ph: 03 545 1985.

Field trip: 22–25 October, the Labour Weekend camp to Endeavour Inlet on Queen Charlotte Sound.

Further information: Shannel Courtney, ph: 03 546 9922.

Canterbury Botanical Society

Meeting: Friday 1 October at 7.30 p.m. a talk by Tara Schoenwetter titled Epiphytic lichen communities in a New Zealand forest. Indicators of environmental change.

Venue: room A5, Canterbury University.

Field trip: Saturday October 23 (note changed date) to two recent QEII covenants on Old West Coast Rd. **Meet:** roadside outside 658 Old West Coast Road at 10.00 a.m.

Contacts: Miles and Gillian Giller,
ph. 03 313 5315.

Field trip: Thursday 11 to Sunday 14 November (Canterbury Show Weekend), the spring camp to Hanmer Springs. **Venue:** Hanmer Springs Forest Camp.

Send non-refundable deposit of \$20 to: Trevor Blogg, Canterbury Botanical Society, PO Box 8212, Riccarton, Christchurch 8440.

Field trip: Tuesday 4 January to Tuesday 11 January, Summer Camp 2011 to the Cobb Valley Reservoir deposits are now due if you have booked a bed. Places still available; send a (non refundable) deposit of \$20 to Summer Camp – Cobb 2011, Treasurer, Canterbury Botanical Society, PO Box 8212, Riccarton, Christchurch, 8440.

Contact: Margaret Geerkens, ph: 03 352 7922; email: geerkensmr@xtra.co.nz.

University of Canterbury: Practical Taxonomy for Field Biologists BIOL 305

Summer course: This is an intensive, short summer course designed to meet the need for training in the collection, preparation, and identification of botanical specimens. **Venue:** Mountain Biological Field Station at Cass, Canterbury. **Dates:** Thursday 27 January to Friday 4 February 2011.

More information: visit: www.biol.canterbury.ac.nz/biol305 or contact Dr Pieter Pelsler, ph: 03 364 2987 ext 45605, email: pieter.pelsler@canterbury.ac.nz.

Botanical Society of Otago

Meeting: Wednesday 6 October at 12 noon, a talk by Dr Maikee Roleda, Marsden Post Doctoral Fellow, Department of Botany, University of Otago titled 'Physiological responses of macroalgae under high PAR, UVR and elevated temperature'. **Note special time and venue:** Union Street Lecture Theatre.

Contact: [Trish Fleming](mailto:Trish.Fleming@otago.ac.nz),
ph: 03 479 7577.

Meeting: Wednesday 20 October at 5.30 p.m. the winning Botany Colloquium talks. **Venue:** Zoology Benham Building, 346 Great King Street, behind the Zoology car park by the Captain Cook Hotel. Use the main entrance of the Benham Building to get in and go to the Benham Seminar Room, Rm. 215, 2nd floor. Please be prompt as we have to hold the door open.

Contact: [Allison Knight](mailto:Allison.Knight@otago.ac.nz),
ph: 03 479 7577.
