TRILEPIDEA

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Deadline for next issue: Friday 15 May 2020

SUBMIT AN ARTICLE TO THE NEWSLETTER

Contributions are welcome to the newsletter at any time. The closing date for articles for each issue is approximately the 15th of each month.

Articles may be edited and used in the newsletter and/or on the website news page.

The Network will publish almost any article about plants and plant conservation with a particular focus on the plant life of New Zealand and Oceania.

Please send news items or event information to **events@nzpcn.org.nz**

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NEW ZEALAND

PLANT OF THE MONTH, p. 2

Ruppia megacarpa. Photo: Rowan Hindmarsh-Walls.

2019 ASBS-NZPCN Conference Charity Auction: The Round Up!!!

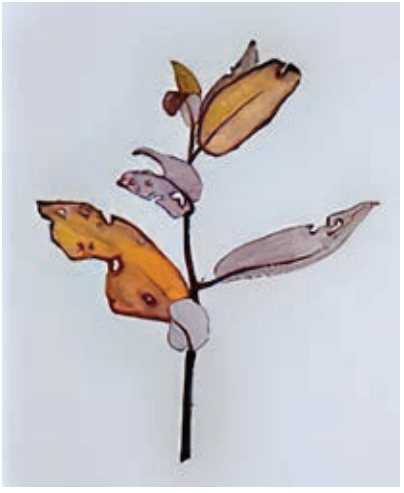
Matt Ward, NZPCN Secretary – mattdavidward@gmail.com

It seems like an age ago and, in all honesty, it was five months ago, so, yes, better late than never. If you were not able to attend the awesome conference run at Wellington's Te Papa Museum, in late November 2019, you missed a very professional, entertaining and informative event. Co-hosting the conference with the Australasian Systematic Botany Society (ASBS) made for a fantastic collection of attendees and presentations, which made you really think about what was being communicated. Of course, there were orchid presentations too, which were awesome.

Aside from the excellent talks, another charity auction was run to raise funds for both societies various causes. The funds raised from the auction would be split 50/50 between our two societies. The NZPCN split its share of the funds raised between the 'David Given Scholarship' and the 'John Sawyer Plant Conservation Fund' [https://www.nzpcn.org.nz/nzpcn/awards/david-given-scholarship/]. The ASBS would use the funds raised to bolster its Scientific Research Awards, which currently include the 'Hansjörg Eichler Scientific Research Fund' and the 'Marlies Eichler Postdoctoral Fellowship'.

The auction was extremely well supported donations wise. In total there were 101 items up for grabs, including amazing books, local experience vouchers, handcrafted uniqueness, merchandise and fantastic artworks. The items donated had a combined reserve of $4,300.00, so fingers were crossed that we would be able to generate a good amount for our causes. An amazing hand-crafted display board with 150 insets of native New Zealand timbers generated the most, going for $300.00. Most items went for $20.00–$70.00, and all managed reserve or just over, so well done by all who bought, bargained and bid on the items, you are fantastic!!! In total we raised an amazing sum of $5,183.20 towards the various funds mentioned above.

I would like to thank personally all the kind item donors from across the globe. Without your kindness an auction result like this would not have been possible. Rewi Elliott, Heidi Meudt, John Clarkson and Bill Barker did an awesome job rounding up items from both sides of the ditch, managing to get them to arrive on time for kick off. A special thanks to June Parnell too, she manned the auction during most of the conference and did a tireless job of keeping everything in check, including me. An incredibly special thank you, to the very generous efforts of Paula Warren, for donating 25 items to the auction, all of which were handmade and well received, generating almost $700.00! The remaining kind folks and organisations who donated items include Wayne



Horopito. Painting by Paula Warren.

PLANT OF THE MONTH – *RUPPIA MEGACARPA*

Rowan Hindmarsh-Walls

The plant of the month for April is the insignificant *Ruppia megacarpa,* or horse's mane weed, one of two *Ruppia* species found in New Zealand. The species is found across the North, South and Chatham Islands. It is fully aquatic and is found mostly in brackish water, usually tidal lagoons and creeks, but also ditches and ponds. The plant can grow in up to two metres of water and forms thick beds in suitable conditions, with plants of over one metre in height in the water column. It is looks fairly indistinct, when viewed from above the water surface, but has some interesting features when viewed underwater. From a slender creeping rhizome arise much branched stems, which are often obviously zig-zagged. The leaves are very narrow and long, up to 20cm, with bidentate or truncate tips. The flowers, which lack a perianth or bract, are borne on long white flowering stems at the water surface. Once pollinated the flowering stems coil up and retract back down toward the leafy part of the plant as the achenes mature.

Ruppia megacarpa – Gladstone, Greymouth, 10 April 2020; (left) growth habit, (right) leaves. Photos: Rowan Hindmarsh-Walls.

Ruppia megacarpa is similar looking to the one other *Ruppia* species found in New Zealand, *Ruppia polycarpa*. *R. megacarpa* is distinguished by its distinctive zig-zag branching pattern, by the leaves having truncate or bidentate ends, and by only having four carpels per flowering stem. *R. polycarpa* has congested, non-zig-zag branches, leaves with obtuse ends and eight carpels per flowering stem. Both *Ruppia* species could be mistaken for another aquatic species, *Stuckenia pectinata,* which often grows in the same habitats, but this species has a prominent ligule at the top of the leaf sheath, unlike *Ruppia.*

The species is native to New Zealand, but is also found in Australia and up into Asia. It has a threat ranking in New Zealand of 'At Risk-Naturally Uncommon' as it is only found in coastal habitats, and does not occur far inland. There is no mention of specific threats to the species in the literature but it has disappeared from many Canterbury lagoons and estuaries, which is possibly linked to nutrient enrichment.

The genus *Ruppia* is cosmopolitan but very small with only eleven known species. Two of the other species are found in Australia and Papua New Guinea. The genus is named after Heinrich Bernardt Rupp (1688-1719), a German botanist and author of the Flora of Jena. The species epithet *megacarpa*, is from the greek 'megas' meaning great, and 'karpos' or fruit, presumably referring to the large fruit of the species.

You can view the NZPCN website factsheets for *Ruppia megacarpa* at: https://www.nzpcn.org.nz/flora/species/ruppia-megacarpa/

Reference

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Bennett, Biotopia Designs, Kate Brown, Joe Buchanan from Diatom Print, Kevin Burns, Eleanor Burton, Ian Clarke, Julian Fitter, Jane Gosden, Peter Jobson, Prashant Joshi, Ivan Lin, Landcare Research, Kate Miller from Zealandia, New Zealand Plant Conservation Network, Tanya Scharaschkin, Roy Slack, Philip Smith, James at Tumbleweed, Te Papa Press, Wellington Gardens, Matt Ward and Lydia White.

And, last but not least, another massive thank you to you all, for bidding on the items and providing so much entertainment to all of us involved, WELL DONE!!! Stay home, stay safe KIA KAHA!!!

Peperomia leptostachya (Piperaceae) on Raoul Island, Kermadec Islands—a name reinstated

Peter J. de Lange (pdelange@unitec.ac.nz), School of Environmental & Animal Sciences, Unitec Institute of Technology, Auckland

Dave Havell, Chauncy Ardell and I struggled up through dense swathes of the fern *Parablechnum novae-zelandiae*. We were nearing the apex of Ravine 8, Raoul Island, Kermadec Islands group. The day was 9 May 2009 and I was near the end of my first visit to the island, a two-day epic that left me feeling rather short-changed. I had been waiting nineteen years for the privilege of going, and my long promised 10-day trip was suddenly cut short due to the threat of an incoming cyclone. So, I was being given a rapid botanical tour of the highlights of the island. Ravine 8 is one of several imaginatively named gulches that drain the north-western ridgeline of Raoul. This one is reached by traversing the air strip west of the Accommodation Houses, and then heading up the first ravine mouth you encounter. On that particularly day it was raining, initially a light drizzle, but drizzle that, as the day grew older, turned to steady rain, which proved rather unpleasant when climbing a near vertical ephemeral water course, where a slip could result in serious injury—the rocks were getting awfully slippery. The object of our clamber though was to see *Hebe* (*Veronica*) *breviracemosa*, the so called 'Kermadec koromiko'—a shrub that had been believed extinct (Given 1981), only to be rediscovered by then goat hunter Ray Scrimgeour who in 1983 was chasing one of the last feral goats (*Capra hircus*) to be seen during the final phases of a decades long goat eradication attempt on the island (de Lange 1999; de Lange & Stanley 1999; de Lange & Havell 2009).

As we neared the ravine head, the ascent flattened out into a mass of chaotic slump material lying at the base of the escarpment that gives rise to Ravine 8. There growing on pumiceous loose material with *Hebe breviracemosa*, *Parablechnum novae-zelandiae*, *Plagiochila pacifica* and seedlings of *Melicytus ramiflorus* subsp. *ramiflorus* I was shown a rather undistinguished *Peperomia* Ruiz et Pav. (Figures 1–3).

Figure 1 (left). Habitat of *Peperomia leptostachya*, Ravine 8, Raoul Island, May 2009. *Peperomia leptostachya* can be seen as the small delicate plant growing on the shaded tuffaceous rock forming the head of Ravine 8, plants are growing in association with *Hebe* (*Veronica*) *breviracemosa* and *Parablechnum novae-zelandiae*.
Figure 2 (centre). *Peperomia leptostachya* plants growing with *Plagiochila pacifica* on tuffaceous rock face at head of Ravine 8, Raoul Island, May 2009.
Figure 3 (right). Fruiting plant *Peperomia leptostachya* plant, head of Ravine 8, Raoul Island, May 2009.

Peperomia is a genus of c.1000 species within the Piperaceae (Mabberly 2017). They are often called 'radiator plants', evidently because they need 'warm air and sunlight to flourish'[1], so if you grow them inside you grow them near your heaters. Popular in cultivation, the genus has spawned a mass of cultivars and hybrids of just about every form, shape, colour and hue. It is also a taxonomic nightmare because, being a succulent, *Peperomia* don't make good herbarium specimens (Fig. 4). Unless they are treated with extreme care, and even when carefully pressed they usually end up as a wizened black / brown 'shape' from which it can be very hard to reconstruct anything taxonomically sensible. So, working out species from types that are 100 or more years old can be very tricky. For that reason, many of the descriptions of species described over the last 180 years or so are often associated with exquisite line drawings or water colours of the plant in life (Fig. 5), and it is these illustrations more than the types themselves that have until recently been the key to resolving disputes about their taxonomy. Now though, with the advent of digital camera technology, *Peperomia* are again being revisited by taxonomists who can now improve their descriptions with *in-situ* habitat images and close up images showing key diagnostic characters, as well as using DNA sequence data to make better sense of *Peperomia* herbarium material.

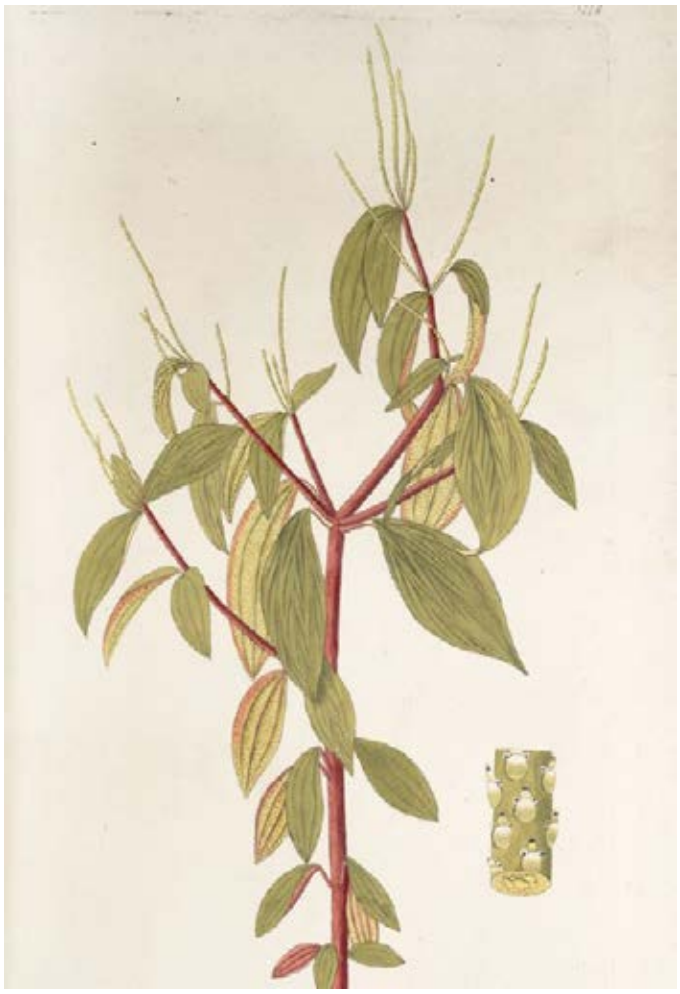

Figure 4 (left). Lectotype of *Peperomia leptostachya* (top two pieces), Beechy Expedition, Oahu, Hawaiian Islands. Image courtesy of Kew Herbarium.
Figure 5 (right). *Peperomia blanda*. Colour copper engraving from Jacquin (1793: tab. 218). Image courtesy of Bibliothèque des Conservatoire et Jardin botaniques, Genève.

From a New Zealand point of view *Peperomia* is not so bad. We only have two species (Allan 1961), that are morphologically well marked: *Peperomia tetraphylla* Hook. et Arn. (Fig. 6) and *P. urvilleana* A.Rich. (Fig. 7). Of the two, *P. urvilleana* is the more common. It ranges through the North Island and northern South Island (Marlborough Sounds, through Golden Bay and thence south along the

1 See https://www.southernliving.com/garden/plants/peperomia-radiator-plants (accessed: 30 March 2020)


Figure 6 (left). *Peperomia tetraphylla* growing epiphytically on puriri (*Vitex lucens*), Onepoto, Hicks Bay, April 1995.
Figure 7 (right). *Peperomia urvilleana* growing on andesite rock Maungaraho Rock, Tokatoka, Kaipara, December 2015.

coastline of the Heaphy. *Peperomia tetraphylla* in New Zealand is confined to the northern North Island, where it is probably most common in the northern portion of East Cape, though it is also present in the Bay of Plenty, and very sporadically in Northland. Both species extend outside New Zealand. *Peperomia tetraphylla* is also present in eastern Australia and some Pacific Islands—though notably not the Kermadec Islands, and *P. urvilleana* is known from the Kermadec, Lord Howe and Norfolk Island groups.

The Kermadec Islands are included within the concept of the New Zealand Botanical Region advocated by Allan (1961). However, despite a flora overwhelmingly derived from New Zealand sources, and some shared animal life, they are a truly oceanic island group that many feel is better treated as their own distinct unit rather than 'shoe-horned' into the New Zealand Archipelago, located some 1000 km southwest of them (see discussion in Trnski & de Lange 2015). The vascular plant flora of the Kermadec Islands last received a comprehensive treatment by the late Bill Sykes who, on the basis of several visits between the 1960s and early 1970s, prepared a bulletin outlining the vegetation associations and vascular plant flora of the island, with cameos on the bryophytes and lichenized mycobiota (Sykes 1977). Although out of date, that account and a partial update (Sykes & West 1996), along with a detailed account of the island group's mosses (de Lange & Beever 2015) remain the 'go-to' accounts of the vegetation and flora of the Kermadecs[2].

From the Kermadec Islands, Sykes (1977) reported two *Peperomia*, *P. urvilleana* and *P. leptostachya*, both of which he noted as present only on Raoul Island, which at 2943 ha and 530 m a.s.l. is both the largest and highest of the group. Neither species was considered common and, unusually in comparison to New Zealand, *Peperomia urvilleana* is primarily an epiphytic species on Raoul Island (Sykes 1977). I have yet to see it there growing on rock. Of Raoul Island *P. leptostachya* occurrences, Sykes (1977) merely noted that it was extremely uncommon. Later Sykes & West (1996) referred Raoul Island *Peperomia leptostachya* to *P. blanda* var. *floribunda* following decisions taken by Forster (1993), and as a result this became the name that was subsequently widely used by New Zealand botanists.

Peperomia leptostachya was described in 1832 by William Jackson Hooker and George Arnott Walker from specimens collected from Oahu (Fig. 4), one of the Hawaiian Islands, during an expedition lead by Captain Frederick William Beechy (1796–1856). In the sense of the describing authors,

2 Other accounts of the Kermadec Hornwort, Liverwort and Lichenized fungi based on my field work there, my specimens and those collected by others are in preparation and I hope that one day soon these will be published.

that species is wide ranging throughout the Paleotropics, a floristic kingdom proposed by Ronald Good and Armen Takhtajan that comprises the tropical areas of Africa, Asia and Oceania (excluding Australia and New Zealand) (see Takhtajan 1986). Indeed, I know *P. leptostachya* well from Rarotonga (Fig. 8), Cook Islands, where it is locally common on the walls of ravines and cliff faces in the slope forest. *Peperomia leptostachya* has much larger, elliptic-obovate to elliptic, or elliptic-ovate, distinctly, palmately 3–5-nerved uniformly pubescent leaves and stems, (Figures 9–12) than *P. urvilleana*.

Figure 8 (left). *Peperomia leptostachya* plants growing on basalt rock forming the walls of Papua Waterfall, Rarotonga, Cook Islands, July 2008.
Figure 9 (middle). *Peperomia leptostachya* in cultivation, Mt Albert showing the distinctive foliage—note prominent veins and dull greenish-brown colour caused by leaf indumentum, January 2009.
Figure 10 (right). *Peperomia leptostachya* in cultivation, Mt Albert leaf—note prominent veins and dull greenish-brown colour caused by leaf indumentum, January 2009.

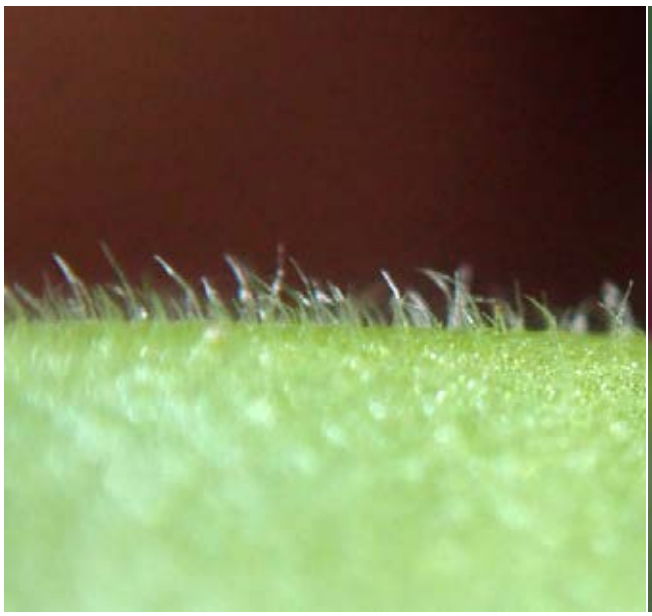

Figure 11. *Peperomia leptostachya* in cultivation, Mt Albert—leaf indumentum, January 2009.
Figure 12. *Peperomia leptostachya* in cultivation, Mt Albert—the puberulent stems that also distinguish this species from *P. urvilleana*, January 2009.

The name *Peperomia leptostachya* was used in New Zealand until 1996, when Sykes & West (1996) following Forster (1993) used the name *P. blanda* var. *floribunda* for the Raoul Island plant. *Peperomia blanda*, was initially described as a species of *Piper*, *P. blandum* by Jacquin (1793) from specimens collected from Venezuela. This species differs from *Peperomia leptostachya* by having distinctly

dimorphic leaves; those from the base are small and elliptic and they become gradually larger toward the stem apex, where they are lanceolate with long acuminate apices (Fig. 5). By way of contrast, the leaf apices of *P. leptostachya* are shortly acute, obtuse or have rounded leaf apices.

Despite these differences, *Peperomia leptostachya* was merged into *P. blanda*, as *P. blanda* var. *leptostachya* (Hook. et Arn.) Düll by Düll (1973) on the basis of its strong resemblance to *P. blanda* (Düll 1973; Mathieu 2020). Later, Hüber (1998) made a new combination for *Peperomia arabica* var. *floribunda* Miq. in *P. blanda* as *P. blanda* var. *floribunda* (Miq.) Hüber, in the process citing as a synonym *P. blanda* var. *leptostachya*, thus inadvertently rendering *P. blanda* var. *floribunda* nomenclaturally superfluous (Mathieu 2020). Nevertheless, this fact went unrecognised and as such the name *P. blanda* var. *floribunda* came to be widely used for *P. leptostachya* until Mathieu (2020) recognised the problem and resolved the matter. So, the Raoul Island plant is again referred to *P. leptostachya*.

On Raoul Island, although *Peperomia leptostachya* remains an uncommon plant, there are indications that it is increasing its range. This suggests that it may have been a recent arrival to the island or, that when that island was ravaged by goats, it had declined and now populations are recovering. We are not sure; all we can do is speculate. In this respect, it is interesting that the species was not recognised when Oliver published a comprehensive account of the vegetation and the flora of the islands (Oliver 1912). It may well have been present; it is after all superficially similar to *P. urvilleana*. Sykes (1977) was the first person to record it from Raoul, and he described it as an uncommon plant of shaded sites near ravine heads and as a low epiphyte (W.R. Sykes *in litt.*); these are the same habitats it occupies now. When feral goats were widespread on the island, these habitats were still present, though the vegetation within them was less dense, so perhaps less suitable for this plant. So, the *Peperomia* may have been there well before Sykes noted it—these cliff and ravine habitats are difficult to safely access after all. Remember that Sykes (1977) also thought that *Hebe* (*Veronica*) *breviracemosa* was likely extinct, yet it was rediscovered in these habitats by Ray Scrimgeour and subsequent Department of Conservation (DOC) weeding teams, and that is a much larger plant than *Peperomia leptostachya*. Long standing presence or recent arrival issues aside though, what we do know now is that, as a result of the collective interests of these weeding teams and renewed botanical curiosity, *Peperomia leptostachya* is locally common in some parts of Raoul. In fact, in 2011, when I last visited that island, it was more common there than *P. urvilleana*.

Back in New Zealand, *Peperomia leptostachya* of Raoul Island origin is occasionally seen in cultivation. During 2004 when I worked for DOC, I acquired a plant from Raoul-based staff from which to count the chromosomes, that plant had $2n = 66$ chromosomes, whereas the other two New Zealand species *P. tetraphylla* and *P. urvilleana* have $2n = 44$ chromosomes respectively (Murray & de Lange 2013). Having finished with the plant it was decided to grow it on, and portions of that plant were distributed to various people, botanic gardens and native plant nurseries. It is from these initial distributions of that plant that I assume the plantings of it that I now see from time around Auckland are derived. In New Zealand, *Peperomia leptostachya* is easily grown but rather cold-sensitive. Like others of its genus, it makes an ideal house plant (Fig. 13); it is relatively disease free, and extremely

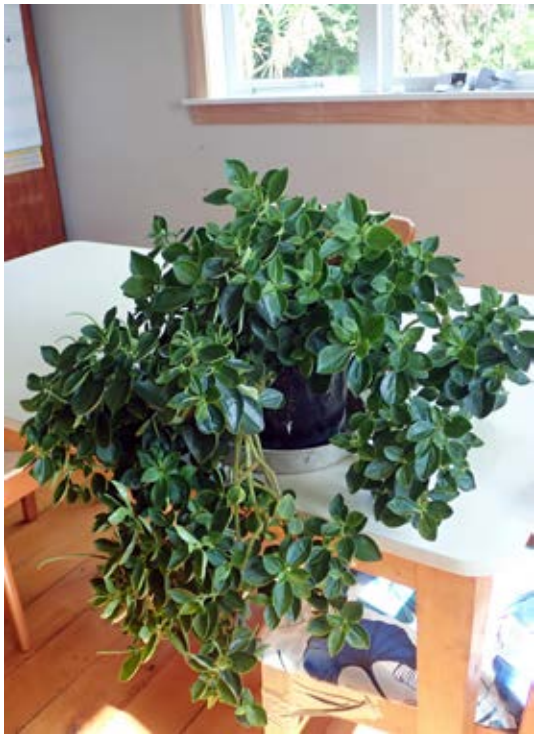

Figure 13. *Peperomia leptostachya* in cultivation, Jesmond Terrace, Mt Albert, Auckland. This plant is descended from the original chromosome voucher sent from Raoul Island in 2004. March 2020.

forgiving of a range of conditions but does best in partial shade, in a free draining, moist soil. It is an ideal subject for a hanging basket, and I have seen it used to good effect on wall gardens in cafes around Parnell, Auckland (Fig. 14).

Figure 14. *Peperomia leptostachya* in cultivation, Italia Square, Parnell Rise, Auckland. This plant was one of a number growing on a raised basalt block garden fringing the inner courtyard of a café. At this location plants also festooned a wall garden. June 2015.

Acknowledgements

I would like to thank Dr Guido Mathieu for drawing to my attention last January the problem over the usage of the name *Peperomia blanda* var. *floribunda*, its relationship to *P. blanda* var. *leptostachya*, and the reasoning for reviving usage of *P. leptostachya*. His paper is an excellent summary of the problem and the nomenclatural resolution thereof. I also thank Dr Paul Forster of the Queensland Herbarium (BRI) for useful discussion on the problem. The late Bill (W.R.) Sykes (1927–2018) is also acknowledged for his willingness to share his unpublished information on the Kermadec Islands prior to my visits to the islands in 2009 and 2011, and for discussion thereafter on matters botanical and otherwise. Lastly, I thank David Havell (Department of Conservation), Bec Stanley (formerly of the Department of Conservation) and Chauncy Ardell (former 'Raoulie') for assistance in the field on Raoul and/or furnishing material of *Peperomia blanda*. Jeremy Rolfe cast a critical eye over a draft of this article.

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A new southern limit for *Microlaena carsei*

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As I unclip after abseiling down another of Atuatumoe's waterfalls and scramble out of another of its chilling pools, I am almost not surprised to see *Microlaena carsei*, a grass unfamiliar to most, growing on a vertical moss-covered rock face (Fig 1). This Nationally Endangered species only standing out to me because I had recently met it in the mossy hollows of the Waima ranges (Fig 2) (de Lange, 2018). Coromandel's valley of the sleeping god (Atuatumoe) (37°03'51.0"S 175°40'35.2"E) becomes the new southern limit of the endemic *Microlaena carsei*. Previously this endemic grass was known from Te Paki south to Kerikeri and Waipoua until in 2006 Peter de Lange found this species growing on Great Barrier Island, which was a major range extension. With Coromandel not being too far away and having similar vegetation types it is not unbelievable that this species was found here – it is more believable that no one has looked.

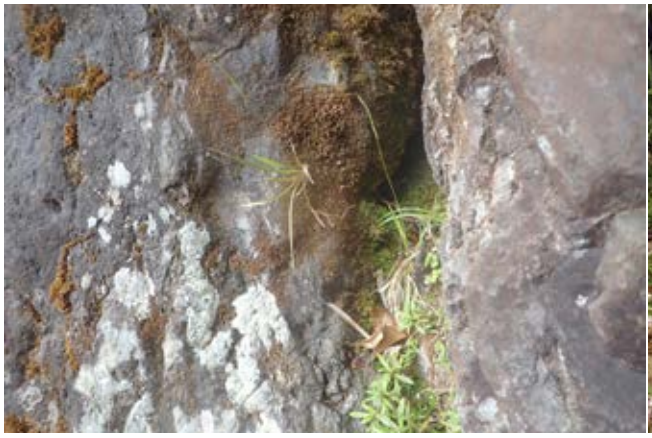

Figure 1 (left). *Microlaena carsei* hanging on to the vertical moss-covered rock face of Atuatumoe Stream, Coromandel, 29 February 2020.
Figure 2 (right). *Microlaena carsei* locally common in bryophyte beds under the swamp maire (*Syzygium maire*) forests in the Waima Ranges, Tutamoe, 9 January 2020. Photos: Marley Ford.

It has been suggested that this grass is 'seemingly endemic to kauri (*Agathis australis*) dominated forest' (de Lange, 2020). Which in this case rings true, even though there is rarely a large kauri seen down the Atuatumoe valley. The species is represented by stunted trees clinging to the rock faces and some rather large kauri logs deeply wedged into the stony creek bed (Fig 3), from the once-great kauri forest before logging in the 1890s. (Standfield, 2016). However, this association does not always seem obvious. Populations that I have seen in the Waima Ranges grow on the cold tops where kauri is not found but there is potential that kauri once grew there. *Microlaena carsei* could be used as an indicator species for past kauri distribution. Over its habitat this species is found in association with old-growth forests, usually damp shaded hollows or shaded sites on margins of fast-flowing streams or riverbanks (de Lange, 2020).

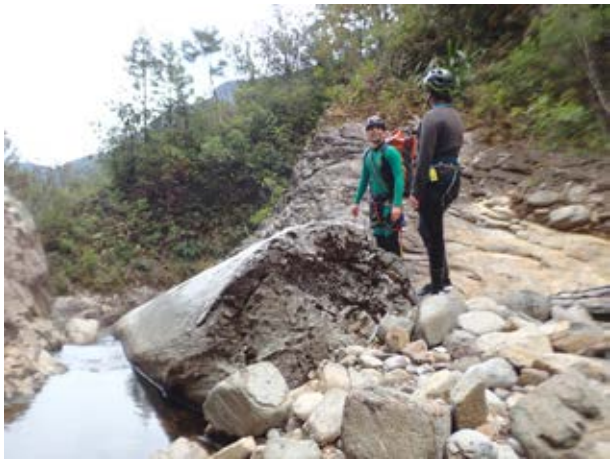

Figure 3. Greg and Tayla giving scale to the large Kauri log, a reminder of the logging in Atuatumoe stream, Coromandel, 29 February 2020. Photo: Marley Ford.

Microlaena is a near endemic genus represented by four species in New Zealand, two endemics and two natives. *M. carsei* being one of the former species is named after Harry Carse (1857–1930), a schoolteacher and plant collector (Taylor, 2002). Long ago known as a variety of *M. avenacea* it is very similar to this species which it is often sympatric with. It differs by its shortly rhizomatous habit, narrower leaves and panicles, shorter lemma, and fine elongate, long internodes (Edgar & Connor, 2000).

With the threat status of Threatened – Nationally Endangered, threats to its existence include the risk from frequent flooding depositing silt on plants and also spreading weeds such as *Tradescantia fluminensis* and *Selaginella kraussiana* (de Lange, 2020). These weeds grow rapidly with the potential to smother this grass and other indigenous riparian species. Habitat destruction from the loss of 90 per cent of New Zealand's wetlands and also forest logging would have played a large part in the fragmentation of this species (Belliss et al., 2015). The exact distribution of this species is still unknown but most populations that are known seem secure and are well protected within forest reserves (de Lange, 2020):

With the loss of our kauri forest ever increasing due to disequilibrium caused by the disease, kauri dieback (*Phytophthora agathidicida*), it becomes important now, more than ever, to understand the relationships of these keystone species. There are still many species, such as the so often overlooked *M. carsei,* about which little is known about their relationship to kauri. While the kauri forests still stand, we have time to investigate the ecology of these species and begin to understand their relationship before they disappear.

Acknowledgements

I would like to thank Rhys Gardner for his suggestions.

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Wellington Region assessment of threatened plants and forest environments

The Environment Team at Wellington Regional Council has put out some very helpful documents to help identify which plant species and which forest environments are considered threatened within the region.

Just recently they published the Conservation status of indigenous vascular plant species in the Wellington region (https://www.gw.govt.nz/assets/Environment-Management/Conservation-status-of-indigenous-vascular-plant-species-in-the-Wellington-region.pdf).

Candidate plant species were assessed by a collaborative group comprising representatives from the Department of Conservation, regional councils, a local authority, and local experts. The resulting regional threat listing is similar to that used for the New Zealand Threat Classification System, but applies a species population threshold adjusted to the regional land area under consideration for the species. The regional statuses are Regionally Critical, Regionally Endangered, Regionally Vulnerable, Regionally Declining, Regionally Relict, Regionally Naturally Uncommon, Regionally Data Deficient, and Regionally Extirpated. The assigned regional threat status cannot be lower than that of the national threat status, but can be higher, e.g. a Nationally Vulnerable species could be assessed as being Regionally Critical. The regional threat listing process also included identifying populations that are national strongholds (e.g. *Leptinella nana* is only known from Wellington Region) and the use of regional qualifiers, such as natural or historic range limits (Crisp 2020).

The report on Forest Ecosystems of the Wellington Region was released in 2018 and the PDF can be found here http://www.gw.govt.nz/assets/Our-Environment/Environmental-monitoring/Environmental-Reporting/Forest-ecosytems-of-the-Wellington-region-reduced.pdf. This document describes the ecosystems predicted to have occurred in the Wellington Region prior to the arrival of humans based on the work by Singers and Rogers (2014). The Greater Wellington Region has a diverse range of ecosystem types because of the diverse geography that creates differences in temperature, a variable west - east moisture gradient, and a variety of land forms and soil types. The guide is focussed on describing the forest ecosystem types, of which there are 21 different types, but brief descriptions of the other ecosystem types in the region are also provided in an Appendix and include 7 wetland, 1 cliff, 6 coastal, 4 alpine and 1 braided river ecosystem types. The report describes each of the forest ecosystems in more detail, including location maps and assigns a Regional Threat Status based on how much of each forest ecosystem type can still be found today in the region. The Threat Statuses are: Critically endangered, Endangered, Vulnerable, and Not threatened.

Crisp P. 2020. Conservation status of indigenous vascular plant species in the Wellington Region. Wellington Regional Council, Wellington, **No. GW/ESCI-G-20/20.** 33 p.

Singers N., Crisp P., Spearpoint O. 2018. Forest ecosystems of the Wellington Region. Greater Wellington Regional Council, Wellington, **No. GW/ESCI-G-18-164:** 58 p.

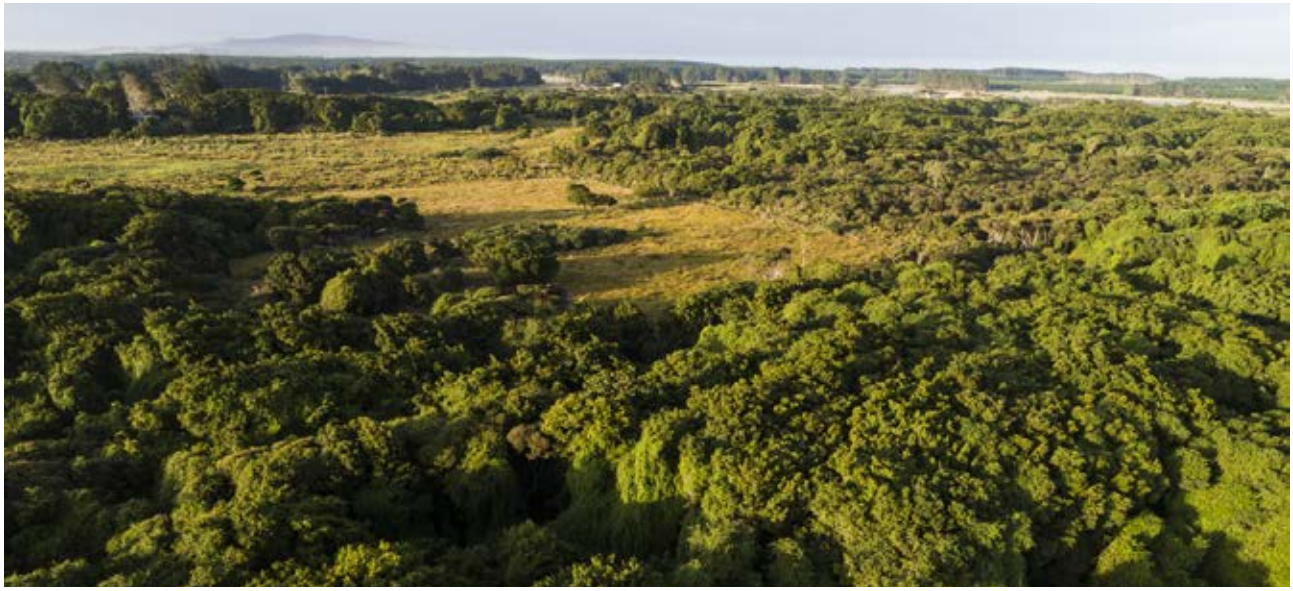
Singers N.J.D., Rogers G.M. 2014. A classification of New Zealand's terrestrial ecosystems. Department of Conservation, Wellington, *Science for Conservation* **No. 325:** 87 p.

The Native Forest Restoration Trust Urgently Needs Your Help to Buy a Nationally Significant Dune Forest

Sandy Crichton, Trust Manager, NFRT

We are a charitable trust and we recognise the financial pressure many of you may be experiencing during lockdown. Protecting our people is absolutely our first priority at this time, and I appreciate the measures that have been put in place to be able to do this. I also know that our connection to the land is something very precious to us, and I think our natural environment helps give us strength in challenging times like these. We look forward to the good things we enjoyed returning, not least our freedom to wander in New Zealand's great outdoors.

For 40 years the Native Forest Restoration Trust (NFRT) has been campaigning and purchasing land to protect native habitats throughout New Zealand. We were recently contacted by members of Otatara Landcare Group about an 80-hectare property in Otatara, just west of Invercargill. It borders the Oreti river and has been identified as one of the most important natural areas in Southland that is not already protected.



Otatatara Dune Forest. Photo: Jason Hosking.

The area has largely been cleared of native forest, and the property itself has been farmed for many years. However, there are fragmented remnants of nationally important ecosystems still in place, and the property presents a fantastic opportunity for restoration.

The most valuable part of the property, from a conservation perspective, is an area of tōtara forest on sand dunes. This type of ecosystem is naturally rare and most of it has already been cleared. Only around 10 per cent of what existed before humans arrived now survives in this area, and it has been classified as nationally endangered. The property also contains localised areas of mataī-pokaka-kahikatea forest.

Tōtara forest on sand dunes. Photo: Jason Hosking.

Patches of this kind of ecosystem in the Otatara area are considered the best example of the sand dune tōtara and tōtara-mataī sequence in New Zealand. This property has been identified as probably the largest remaining unprotected site of its type in Otatara, and possibly even across the whole country.

It's an area of considerable ecological importance, and is of national significance. It has remnant native forest, and the potential to regenerate naturally with careful management. It's exactly the type of area that the Native Forest Restoration Trust was founded to protect and the opportunity to save it is one that we just couldn't let pass by.

The $1.5 million price is a lot for us to pay and we are seeking help from people like you with an interest in native plants and native habitats. Unfortunately, the timeline for the sale is incredibly short and we have to raise the funds by Monday 20th May in order to save this important habitat forever. So far, we have raised around $750,000, which is extraordinary in these uncertain times.

We will do everything we can to raise the necessary funds in time. With such a huge target and such limited time, we know that unfortunately we also have to have a contingency plan. Every dollar we raise will go directly to purchasing part of this important habitat and the more we can raise the more we can save, but if we have a shortfall, we may need to on-sell a small portion of the land to recover some of the costs.

I can't stress enough how much of a difference you can make by making a donation. Raising a further $750,000 in such a short space of time would be a tremendous task at the best of times. At the moment it seems almost impossible, but we still hold out hope of saving as much of the 80 hectares as possible to allow the areas that have been farmed to regenerate.

Every square metre that we can protect is a huge win for the conservation of our native species. The clock is ticking. It's awful timing, but if you are able to help us save as much of this ecologically significant area as we can, that would be amazing. You can make a donation on our website to help make this possible: https://www.nfrt.org.nz/otatara-reserve-appeal/ Thank you.

Trilepidea taonga found in the Field Museum Herbarium

Peter J. de Lange (pdelange@unitec.ac.nz), School of Environmental & Animal Sciences, Unitec Institute of Technology, Auckland

Adams's mistletoe, *Trilepidea adamsii* a hemiparasitic plant (Fig. 1) is the sole representative of the endemic New Zealand, North Island genus *Trilepidea*. It was last reported from the wild in 1954 when Audrey Eagle was shown a flowering plant by Hamilton Boys High School Headmaster and amateur botanist Michael Gudex. That plant, seen near Maungakawa (Sanatorium Hill) Pakaroa Range (Fig. 2) just north-east of Cambridge, was growing on mapou (*Myrsine australis*) (Given 1981; Norton 1991; de Lange & Norton 1997). At the time no one had any idea that this plant was probably the last specimen of this species, and when they did, some 20 years later, dedicated searching of the Pakaroa Range by Audrey Eagle, Athol Caldwell, Reg Bell, and Fred Corlett failed to find any more plants. As far as we know *Trilepidea adamsii* is now extinct (de Lange et al. 2010). Consequently, herbarium specimens of this species are of immense value—clearly one can't get any more.

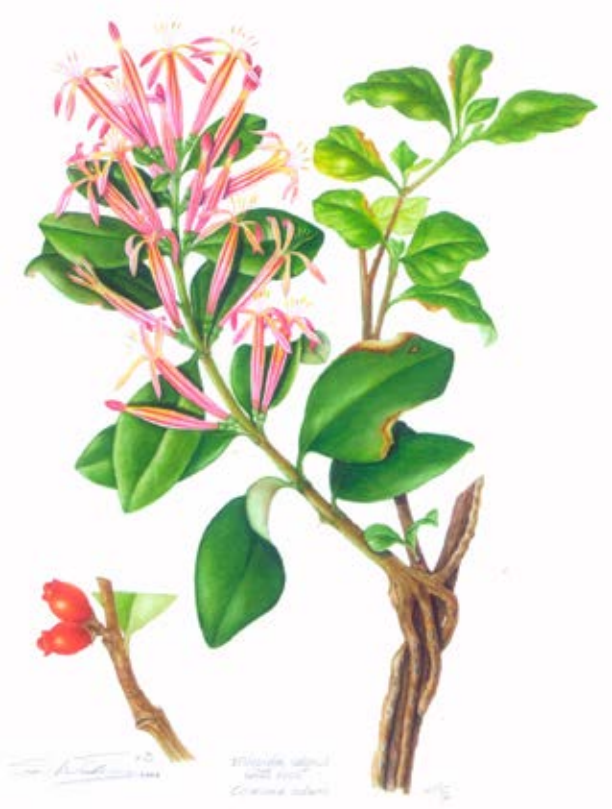


Figure 1. A reconstruction of *Trilepidea adamsii* painted by Sue Wickison for the New Zealand Plant Conservation Network. Sue and I worked on herbarium specimens held at the Auckland Museum Herbarium (AK), paintings, drawings and accounts I had gathered from people who had seen this plant alive (see https://www.suewickison.com/blog/article_2007.htm).

One of my hobbies when visiting other countries is to look into their herbaria to see what New Zealand plant specimens I may find. During November 2012 I was able to check the holdings of the Field Museum, Chicago. Illinois, USA. I was over there to participate in a *Frullania* workshop run by Dr Matt von Konrat who was then in charge of the bryophyte collections held there and who also happens to be one of the world experts on that liverwort genus. On a 'down day' I thought I'd see what I could find in the vascular plant collections. I was well rewarded.

Figure 2. The approximate location where the last known specimen of *Trilepidea adamsii* was seen by Audrey Eagle and Mike Wilcox in 1954, Maungakawa (Sanatorium Hill).

In one of the cabinets I found a fruiting specimen of *Trilepidea adamsii* (Fig. 3). That collection came from 'Hape Creek' the type locality for the species (Cheeseman 1881—who described this species as *Loranthus adamsii*). Although the collection bears a formal Kirk printed label and is also labelled in Kirk's hand I strongly suspect it was a specimen gifted to him by Thomas Cheeseman. Kirk routinely traded specimens with botanical contemporaries both within New Zealand and overseas (de Lange

2016). I have found that in the process he also relabelled specimens gifted to him or that were formally described by him, in the process often omitting the actual collector (de Lange & Gardner 2002; de Lange 2014). In the case of the specimen I found I suspect this is also the case.

The real value of this specimen, beyond the obvious that it represents another collection of the presumed extinct *Trilepidea,* is that it is fruiting. The only other fruiting specimen that I know of is lodged in the Auckland Museum Herbarium (AK), and this was collected from Onetangi, Waiheke Island, in the 1930s.

The lack of fruiting herbarium specimens of *Trilepidea* is not in itself surprising. At the time it was extant people tended to collect it when it was flowering because it was more obvious and also rather beautiful (Fig. 1). More ecologically informative and morphologically useful specimens were, ironically, only collected for this species when it was already extremely uncommon, e.g., the Waiheke Island suite (see comments in de Lange 1997).

Figure 3. Field Museum herbarium specimen of fruiting *Trilepidea adamsii.* Photo: Christine Niezgoda.

As an aside, because of this chance discovery the Field Museum staff undertook a detailed search for Kirk specimens, finding over 800 specimens in the process (C. Niezgoda *pers. comm.*).

Acknowledgements

I'd like to thank Dr Matt von Konrat, Head of Botanical Collections, Field Museum, for funding my travel to Chicago to attend the *Frullania* workshop and for providing me with free accommodation—always a bonus when travelling in the USA. I also thank Christine Niezgoda, Collections Manager, Flowering Plants for taking the image of the fruiting *Trilepidea* specimen and her ongoing interest in the Kirk holdings in their herbarium. Thanks also to Audrey Eagle for sharing her correspondence about, and her experiences of, seeing and searching for *Trilepidia adamsii* and Mike Wilcox for his recollection of seeing it with Audrey Eagle and Michael Gudex.

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Reflecting on the NZPCN website – 2003 and beyond

Jesse Bythell – NZPCN Webmaster

As NZPCN launches its website on a new platform it is worth reflecting on how far we have come since our beginnings in April 2003. When NZPCN first formed one of the key goals was to communicate to conservation practitioners and members of the public which of our native plants were threatened, because this information was relatively hard to come by at the time for those outside of academia or the Department of Conservation. Initially, a simple list was formed and published online, and in time this morphed into something much more complex. Today our website supports a rich content of information about native plants including threats, conservation practices and further research needs.

At present our website contains 7,713 flora pages, 270 pages of information about New Zealand flora and plant conservation, over 30,000 images, and 1,774 documents, as well as a glossary of botanical terms, a book-making tool, species name etymologies, plant lists and a quiz! Work is ongoing to complete the vascular flora pages and currently 76 per cent of native species and 22 per cent of exotics have been completed. We are continuing to improve how we deliver images to our users and are pleased to note only 5.6 per cent of native vascular plant pages lack an image. As our volunteers learn the ropes of the new system, we will be able to continue the work of improving the site, so keep your eyes open for new content and other changes.

In addition, we run a sister website to host journals from New Zealand Botanical Societies (bts.nzpcn.org.nz), which holds 321 journal issues containing 3,040 articles with more to come. Since we changed to the new platform, we have been able to make a start at working more closely with iNaturalist NZ and recognise there are greater opportunities to work together.

The work to prepare this information is no small feat and is largely undertaken with volunteer power. We are privileged to benefit from the expertise of a range of people who have supported our website by either editing content, preparing and writing species information, providing images and contributing in many other ways. I am proud to work with such a passionate group of people and I know as cheesy as it sounds 'teamwork truly does make the dream work'. Without this diverse range of people adding their time and talent our website would not be as in depth and well-used as it is. We still have more work to do and are confident with our new website platform we can continue to enhance the quality and breadth of information we offer.

There is danger in singling out particular people for their efforts as this can mean others are inadvertently overlooked, particularly because I have not been with NZPCN from the beginning and am not familiar with all the people who have contributed from the start.

However, here are the people I know of who have been a key part of creating and enhancing the website over the years: John Sawyer, Jeremy Rolfe, Peter de Lange, Colin Ogle, John Barkla, Cathy Jones, Simon Walls, Nick Singers, Mike Thorsen, Paul Champion, Deborah Hofstra, Eric Mackenzie, Peter Buchanan, Matt Ward, Michael Bayley, Alison Kellow, Rowan Hindmarsh-Walls and Bill Campbell. We also wish to acknowledge the multitude of photographers (current tally 333) who have allowed us to use their images on our website.

Of course, the website could not exist without the efforts of our NZPCN committee members over the years who have helped run the organisation, nor would we get very far without the technical support from our website developers Anthony Archer (Propel) and Robin Sallis. And last but certainly not least we would not be what we are today without our incredible membership and sponsors whose interest and support is fundamental.

We at NZPCN are thinking of you all right now as you stay home and we collectively attempt to turn the Covid-19 tide. We look forward to a time when we can get back out there into wild places, gardens, laboratories, classrooms and our research and restoration project sites to carry on learning about and protecting our native flora.

Kia kaha and thank you.

UPCOMING EVENTS

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

Please Note: Due to the uncertainty surrounding when group activities will be allowed under the COVID-19 lockdown rules, it is recommended that you contact your local Botanical Society if you wish to ascertain when they are likely to recommence having meetings and field trips.

In the meantime, we will not publish meeting and field trip notices until these activities are permitted again by the government. Hopefully, that will be by the time of the next issue of this newsletter.