TRILEPIDEA

Newsletter of the New Zealand Plant Conservation Network

No. 231

July 2023

Deadline for next issue:
Friday 18 August 2023

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 info@nzpcn.org.nz

Postal address:
PO Box 147
Mangonui 0442
NEW ZEALAND

PLANT OF THE MONTH, p. 2

Pterostylis puberula.
Photo: Bill Campbell.

Final week to apply for the 2023 David Given Threatened Plant Scholarship

Alex Fergus (fergusa@landcareresearch.co.nz)

The NZPCN administers a fund which honours the contribution of the late David Given to New Zealand plant conservation. The scholarship funds research into the biosystematics, autecology and conservation management of New Zealand's indigenous threatened plants, fungi and their communities. Applications for the 2023 funding round are currently open.

One scholarship is awarded every two years and will provide up to $8000 towards the cost of a research project. The scholarship is granted for research that assists practical and/or technical understanding of the taxonomy and ecology of New Zealand's threatened plant taxa or supports the protection and recovery of threatened plant taxa and their communities.

Applicants must be New Zealand residents or citizens, but the work could involve overseas researchers who collaborate with the principal researcher. Threatened species and communities can be either nationally or regionally threatened. Plant species include vascular and non-vascular plants. Fungi are also covered by this scholarship.

For this funding round we have sharpened up the description of the scholarship and implemented an application form. We encourage potential applicants to focus on describing the conservation issues associated with their target taxa and describe the impact of your potential project, please include explicit examples of how you believe your research will contribute to better conservation of the threatened taxa or community. All potential applicants should contact the DGTPS committee chair (Alex Fergus) if they have any queries about the relevance of their project or about the application process (fergusa@landcareresearch.co.nz).

The DGTPS selection committee comprises the President and at least two other members of the current NZPCN Council. The selection committee may refrain from making an award if, in their opinion, there is no application of sufficient merit. The most recent project funded by the DGTPS is a great example of the sort of research that we are aiming to support, this was Debra Wotton's research focusing on understanding the remaining genetic diversity of the threatened – nationally vulnerable dryland shrub *Veronica* (*Hebe*) *armstrongii*. More about Debra's research can be found here:

https://www.nzpcn.org.nz/publications/documents/trilepidea-e-newsletter-for-september-2021/

Scholarship details and forms are available from:
https://www.nzpcn.org.nz/nzpcn/awards/david-given-scholarship/

Applicants must complete and sign the application form and submit written or electronic applications to: NZPCN, PO Box 147 Mangonui 0442 or info@nzpcn.co.nz. For

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PLANT OF THE MONTH – *PTEROSTYLIS PUBERULA*

Bill Campbell (billcampbell@xtra.co.nz)

The plant of the month for July is *Pterostylis puberula,* one of New Zealand's 30 described greenhood orchids. At present this species is considered to be a New Zealand endemic, pending further study of its relationship to the Australian *Pterostylis nana*. It has a limited distribution, only being found now at scattered sites in the Far North, on the Coromandel Peninsula and in North-west Nelson.

Pterostylis puberula is usually found in gumland or other nutrient poor sites amongst low growing scrub and sedges. Colonies don't usually persist for many years and appear to be transient, often reappearing some distance away.

The species is a slender greenhood, that can be very cryptic, growing to a maximum of 200mm in height. Juvenile plants appear as tiny rosettes with trowel shaped leaves and mature plants have one or more distinctive sheathing leaves up the finely hairy stem. The flower has a blunt tipped dorsal sepal, most similar to *P. foliata* in appearance. It is unlikely to be confused with any other New Zealand greenhood, although juvenile plants in their early stage possibly could be mistaken for those of *P. tasmanica*. Both species are often found growing in close proximity to one another.

Pterostylis puberula has a current threat ranking of Threatened – Nationally Vulnerable. Most populations are on secure sites, with fire and browsing animals being the biggest threats.to the ongong survival of this species in New Zealand. Natural succession resulting in habitat loss is likely to be an issue also.

The genus name *Pterostylis* means 'winged column' and the species epithet *puberula* means 'with tiny hairs', referring to the fine hairs on the stem.

You can view the NZPCN website factsheet for *Pterostylis puberula* at https://www.nzpcn.org.nz/flora/species/pterostylis-puberula/

Pterostylis puberula. (top left) Flower, Whatuwhiwhi, 17 October 2018; (top right) flowering plant, Whatuwhiwhi, 17 October 2018; (bottom) habitat at Tahanga Road, Lake Ohia, 30 August 2015. Photos: Bill Campbell.

email applications please include the subject "David Given Scholarship". Applicants must nominate two referees who can attest to their experience and their ability to complete the project within a two-year period. Applicants are also responsible for ensuring their referees complete the referee forms before the funding round closes. Applications for the current funding round close on Monday 31 July 2023.

The DGTPS committee will deliberate during August and notify the applicant by Thursday 31 August 2023, permitting time to undertake relevant project logistics for the 2023/2024 field season. The name of the successful applicant will be announced on the NZPCN website shortly after they have confirmed their acceptance of the scholarship.

Scholarship deliverables include brief 6-monthly progress updates, and a short report summarising the results upon completion of the research. Successful applicants are also expected to assist the NZPCN in preparing a short article about the research for our newsletter *Trilepidea* at the beginning of the project and upon its completion.

Under our nose, a second record of the bristle fern *Abrodictyum caudatum* for mainland New Zealand

Marley Ford, Private Consultant (mfecobotany@gmail.com)

A second mainland population of the small bristle fern *Abrodictyum caudatum* (Brack.) Ebihara & K.Iwats has been found in West Auckland, an area of New Zealand so well botanised (Figure 1). Previously this 'Threatened – Nationally Critical' fern (de Lange et al. 2018) was only known on the New Zealand mainland from near Kerikeri but is also known from the Kermadec Islands. Beyond New Zealand it is present in Australia, New Caledonia, Fiji, Samoa, Cook Islands and the Society Islands (Breitwieser et al., 2023).

A member of the fern family Hymenophyllaceae Mart., this fern has been previously called *Trichomanes caudatum* Brack. and still is treated as so by the New Zealand Flora (Breitwieser et al., 2023). Recent revision, however, better places the plant as *Abrodictyum caudatum* (Ebihara et al. 2006). The epithet 'caudatus' refers to the tail-like point the pinnae taper to (Breitwieser et al., 2023). From other mainland bristle ferns (*Abrodictyum* C.Presl and *Polyphlebium* Copel Subfamily Trichomanoideae) *Abrodictyum caudatum* is distinguished by its campanulate indusia, deltoid fronds and single unbranched veins (Figure 2). These characters separate the similar species from ferns in similar habitats such as *Polyphlebium endlicherianum* (C.Presl) Ebihara et K.Iwats. and *Polyphlebium venosum* (R.Br.) Copel.

Figure 1 (left). Mass of *Abrodictyum caudatum* as epiphyte on *Dicksonia squarrosa*.
Figure 2 (right). Campanulate sori on frond of *Abrodictyum caudatum*.

In April 2020 an iNaturalist observation of *Trichomanes* was posted by Danielle Munster from private property in Glen Eden, Auckland, originally identified as *Trichomanes endlicherianum* (https://inatur-

alist.nz/observations/42946972). The plant did not fit this species and eventually the conclusion was arrived at that this plant was the rare fern *Abrodictyum caudatum*. The site was visited by the author on 22 July 2023 (https://inaturalist.nz/observations/42946972) to confirm this identification. This population was confirmed, although only one tree fern *Dicksonia squarrosa* was found with this filmy fern as an epiphyte. On this plant it was abundant, from the ground up to 2 m high. The *Dicksonia squarrosa* was on a riparian stream and the bristle fern grew with *Hymenodon pilifer*, *Tmesipteris tannensis*, *Lepraria ulrikii* and other bryophytes (Figure 3). The host tree fern grew under a canopy of *Kunzea robusta* with an understorey of *Pseudopanax arboreus* and *Alsophila dealbata* and was surrounded by sparse *Geniostoma ligustrifolium* var. *ligustrifolium* seedlings and occasional patches of *Diploblechnum fraseri* on the ground (Figure 4). Only one other plant of *Dicksonia squarrosa* was seen in the vicinity and without the rare bristle fern.

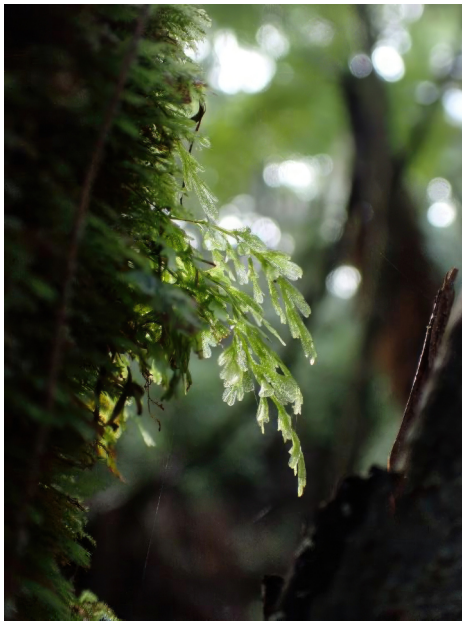

Figure 3 (left). Habit of *Abrodictyum caudatum*.
Figure 4 (right). Riparian habitat of the *Abrodictyum caudatum* host *Dicksonia squarrosa*.

Seemingly, this tree fern is the preferred substrate, being the same host as for the Kerikeri population. The nearby tree ferns *Alsophila dealbata* and *Sphaeropteris medullaris* at the Auckland site lacked the fern. Superficially the mainland sites seem to share a similar humidity and altitude (Auckland 72 m, Kerikeri 10–20 m). The Auckland population is in younger early successional vegetation than the Kerikeri one but further down the gully there is more intact older vegetation with a tanekaha (*Phyllocladus trichomanoides*) canopy and scattered kauri (*Agathis australis*).

The Auckland population is threatened by slips along the stream, with the clay soil being prone to slipping. A few slips are obvious along the stream arising from recent heavy rainfall events. To work towards increasing the Auckland population of *Abrodictyum caudatum* more plants of its preferred host, the tree fern *Dicksonia squarrosa,* should be planted around the original population, working towards its insurance.

There remains some uncertainty about the taxonomic status of mainland *Abrodictyum caudatum*, with the Kerikeri population previously referred to as *Abrodictyum* aff. *caudatum* (de Lange et al., 2013). Morphologically it differs from the Kermadec plants by the downward growth against its substrate, with the Kermadec plants being slightly more erect (Breitwieser et al., 2023). Further, the indusia are more flared in the Kerikeri plants, with the few present in the Kermadec material appearing to be more truncate (Breitwieser et al., 2023). Because of this it is uncertain whether the two populations belong to the same species. This new Auckland population matches the Kerikeri population with the downward growth, flattened indusia and similar habitat. Genetic sequencing by Perrie et al. in unpublished data indicated that the Kerikeri plants group with those of Fiji, French Polynesia, and Australia. However, it

also indicates that New Caledonian material of *A. caudatum* is different to that in Fiji, French Polynesia, and Australia. This suggests that more than one species may be present in the Pacific region. Specimens of the Auckland population have been sent for sequencing. It is hypothesised that the difference in morphology of the mainland New Zealand population of the species is because it is on the very southern edge of its distribution and the plants could be poorly developed compared to those in tropical regions (Breitwieser et al., 2023). Ultimately, further research is needed to fully understand the taxonomic status of *Abrodictyum caudatum* in New Zealand.

The discovery of this fern in Auckland is a surprise, as it is thought to be one of the most well botanised areas of New Zealand. The occurrence of the one colony of *Abrodictyum caudatum* suggests it could be more widespread but not in abundance. It should be looked for in likely places between Kerikeri and Auckland and probably wider. This find also highlights the importance of the online social network iNaturalist and the potential it has to identify new locations of threatened plants by connecting citizens with experts.

Acknowledgements

I would like to give a massive thanks to Oscar Grant for bringing the original observation to my attention and reminding me of it, Danielle Munster for originally finding this plant and facilitating contact with landowners, Amanda Mellick for allowing me to visit her property and survey the fern, Barbara Parris for her comments on this species and Bill Campbell for reviewing the draft.

References

de Lange, P. J., Rolfe, J. R., Champion, P. D., Courtney, S. P., Heenan, P. B., Barkla, J. W., Cameron, E. K., Norton, D. A., & Hitchmough, R. A. (2013). Conservation status of New Zealand indigenous vascular plants, 2012. *New Zealand Threat Classification Series 3*. Department of Conservation, Wellington.

de Lange, P. J., Rolfe, J.R., Barkla J. W., Courtney, S. P., Champion, P. D., Perrie, L. R., Beadel, S. N., Ford, K. A., Breitwieser, I., Schönberger, I., Hindmarsh-Walls, R., Heenan, P. B. & Ladley, K. (2018). Conservation status of New Zealand indigenous vascular plants, 2017. *New Zealand Threat Classification Series. No. 22*.

Ebihara, A., Dubuisson, J.-Y., Iwatsuki, K., Hennequin, S., & Ito, M. (2006). A taxonomic revision of Hymenophyllaceae. *Blumea 51*: 221–280.

Breitwieser I., Brownsey P.J., Nelson W.A., Smissen R., & Wilton A.D. eds. (2023) *Flora of New Zealand Online – Taxon Profile – Trichomanes caudatum* (Brownsey P. J., & Perrie L. R. 2014). Accessed at https://www.nzflora.info/factsheet/taxon/Trichomanes-caudatum.html#d85a1564-d4fe-42ff-a323-ac4351863c46 <23/07/2023>

Last chance to submit restoration stories for our Queenstown Lakes District restoration pathways project.

Alex Fergus, Jesse Bythell, Jo Smith, Ben Teele

The NPZCN and Queenstown Lakes District Council (QLDC) held a restoration pathways workshop in Arrowtown on 15 May. The concept for the workshop emerged during the planning for our conference, Hauropi whakahou ki Aotearoa – Restoration Ecology in New Zealand, which ran in December 2022 in Tāhuna – Queenstown. As an organisation, NZPCN wanted to give something useful back to the community after the conference. Because there is such a wide range of experience and so many restoration projects happening in the region, we decided to focus on producing a synthesis of what has been shown to work and not work for local restoration, to share learnings and bring everyone along together. The focus of the workshop was to capture as many local examples as we could of restoration projects, using templates to structure the data collected.

In August and September, the project team will work on digitising the restoration stories, breaking them down into steps that can be used to weight state and transition diagrams, highlighting what parts of the process are essential for success in the region, and equally importantly, what has been shown not to work. We will undertake this process at a general level for all stories, but where we have enough replicates, we will generate diagrams for specific target habitats as well.

This is a last chance call for anyone wanting to submit a QLD relevant restoration story to do so before the end of the July. The workshop template can be found on our website here:
https://www.nzpcn.org.nz/publications/documents/restoration-pathways-workshop-2023-v2/

Our state and transition diagrams will be combined with the locally finessed technical cheat sheets and brought together in a synthesis document that has the broader goal of guiding future restoration work in the region. A draft of this document we will be circulated to all restoration story contributors for comment, and anyone who is interested will be welcomed as co-authors on the final document which will be published in *Trilepidea* or as a standalone document that will be available to download for free from the NZPCN website.

Serendipitous discovery of Castle Hill forget-me-not population

Debra Wotton[1,2] and Jane Gosden[2]
[1]Moa's Ark Research and [2]Biological Sciences, University of Canterbury

On a botanising trip to Castle Hill Basin, Canterbury, in November 2022, we made the exciting and unexpected discovery of a previously unknown population of the Nationally Critical Castle Hill forget-me-not, *Myosotis colensoi*. This beautiful limestone endemic plant is restricted to just a handful of sites in Marlborough (Ben More and Chalk Range; Druce & Williams 1989) and Canterbury (Castle Hill Basin).

Nationally Critical Castle Hill forget-me-not (*Myosotis colensoi*) in flower at Waterfall Bluff, Craigieburn Forest Park, Castle Hill Basin, Canterbury. Photo: Jane Gosden.

We set out on the Hogs Back Track in Craigieburn Forest Park, where Jane was hoping to find the Nationally Critical *Epilobium pictum*. Early on we noticed limestone rocks along the track, and so briefly searched (unsuccessfully) for limestone plants along Hogs Back. Back on the track, we spied a promising limestone bluff with talus slopes below, a couple of kilometres walk from our viewpoint. It was already late afternoon, but the lure of a possible new limestone discovery was too tempting. Abandoning the *Epilobium* search, we headed to the limestone bluff.

Upon reaching the site, we searched the steep, blocky talus slope below the bluff but, disappointingly, found only weeds. However, within minutes of commencing our search of the bluff itself, we were rewarded with the exciting discovery of several *M. colensoi* plants! With the light fading, we called it a day. We returned the next morning to search the entire bluff system and ridgeline, recording more than 100 *M. colensoi* plants—all confined to the main bluff. The plants were mostly flowering and appeared healthy, but the site is threatened by weeds (especially chewings fescue, *Festuca rubra*, and tussock hawkweed, *Hieracium lepidulum*). The limestone bluff is unnamed, so we have called it "Waterfall Bluff" after the creek that runs below.

The main limestone formation at Waterfall Bluff, Castle Hill Basin, Canterbury, with a steep talus slope below. Photo: Debra Wotton.

Beyond the main bluff, the limestone formation extends along the ridgeline, with mostly small rocks above the surface and another large chunky talus slope below a second bluff part way along. This second talus slope has a fascinating and diverse stand of gnarly native shrubs with huge trunks—suggesting they are unusually old. Unfortunately, we couldn't spend much time here, but it would be well worth further exploration—most limestone ecosystems have lost their native woody vegetation. We found no *M. colensoi* plants or other limestone endemics along the ridge, which has dense swards of non-native grasses. However, there were many other native plant species, especially among the rocks. *Myosotis colensoi* was probably more widespread in this area in the past (prior to weed invasion), and other limestone endemics may also have occurred here.

Obviously, this is an important find for the conservation of a critically endangered plant, and even more so because it is on Public Conservation Land. It is surprising that this population has not been discovered before, given its proximity to a walking track and the profusion of botanists in Canterbury. It just goes to show that exciting discoveries can still be made in relatively accessible areas – even when you're looking for something else!

To our knowledge, *M. colensoi* has not been sighted previously on Waterfall Bluff. There is one historic record of *M. colensoi* in this general area, collected by Walter Brockie "at head of Hogs Back Creek" (Allan Herbarium, CHR 73467). This specimen has no collection date but was probably collected sometime between 1928 and 1947, when Brockie was working at the Christchurch Botanic Gardens (McCaskill 1982). The location described by Brockie suggests that the plant he found was more likely to be on nearby Hogs Back than on Waterfall Bluff.

Critically endangered *Myosotis colensoi* (Castle Hill forget-me-not) in flower at Waterfall Bluff, Castle Hill Basin, Canterbury in November 2022, with Craigieburn Range in the background. Forget-me-not plants are threatened by invading weeds: chewings fescue (*Festuca rubra*), tussock hawkweed (*Hieracium lepidulum*) and field chickweed (*Cerastium arvense*) can all be seen in this image. Photo: Debra Wotton.

View of Waterfall Bluff from Hogs Back track. The main bluff is at the far left of the ridge, and the shrubland is in the open talus area on the steep slope on the right below another bluff. Photo: Jane Gosden.

References

Druce, A. and P. Williams. 1989. Vegetation and flora of the Ben More—Chalk Range area of southern Marlborough South Island. New Zealand Journal of Botany 27:167–199.

McCaskill, L. W. 1982. The Castle Hill buttercup (*Ranunculus paucifolius*): a story of preservation. Tussock Grasslands & Mountain Lands Institute, Lincoln College, Lincoln. Pp. 11.

Notes of general interest

Some of the items below, with appropriate links, may be of interest to readers.

Biodiversity Credit System (BCS)—calling for public submissions:

https://consult.environment.govt.nz/biodiversity/nz-biodiversity-credit-system/#:~:text=biocredits%40mfe.govt.nz%20Overview%20The%20Government%20is%20exploring%20whether%20a,restoration%20of%20native%20wildlife%20in%20Aotearoa%20New%20Zealand

The National Policy Statement on Indigenous Biodiversity gazetted on 7 July—details here:

https://environment.govt.nz/acts-and-regulations/national-policy-statements/national-policy-statement-for-indigenous-biodiversity/#:~:text=The%20National%20Policy%20Statement%20for,least%20no%20further%20reduction%20nationally.

Following the recent review, amendments have been made to the National Environmental Standards for Production Forestry—details here:

https://www.mpi.govt.nz/forestry/national-environmental-standards-plantation-forestry/

Working paper on reforming the Wildlife Act by the Environmental Defence Society:

https://eds.org.nz/resources/documents/report-library/

UPCOMING EVENTS

If you have events or news that you would like publicised via this newsletter please email the Network (info@nzpcn.org.nz), prior to the published copy deadline, with details of meetings, field trips or other events taking place during the following month or later. The deadline for copy for the following month's *Trilepidea* is at the top of the front page of each issue.

If you intend to participate in one of the advertised botanical society meetings or field trips please check with the relevant society beforehand to confirm that the published details still stand.

Auckland Botanical Society

Meeting: Wednesday 2 August at 7.30pm. **Speaker:** Dr Matt Renner. **Topic:** Bryophytes.	**Venue:** Unitec, School of Natural Sciences, 139 Carrington Road, Mt. Albert (Gate 4, Building 115, Room 1028).
Field Trip: Saturday 19 August to private property at Piha.	**Leader:** Viviane Robinson.

Waikato Botanical Society

Meeting: Monday 21 August at 6.00pm. **Speaker:** Paul Cashmore, Rotorua Botanical Society.	**Venue:** The Link Centre, corner Te Aroha Street and River Road, Hamilton East.

Rotorua Botanical Society

Field Trip: Saturday 5 August to Tutaeheke, Highlands Station, south of Rotorua. **Meet:** At the Rotorua carpark at 8.30am or at the intersection of SH5 and Highlands Road, south of Rotorua, at 8.45am. **Grade:** Moderate.	**Leader:** Martin Pearce, email mpearce21@xtra.co.nz, ph. 07 349 1929.

Wellington Botanical Society

Field Trip: Saturday 5 August to Birchville Dam, Upper Hutt. **Meet:** Carpark alongside Akatarawa Road, opposite its junction with Birch Terrace, at 9.30am.	**Co-Leaders:** Leon Perrie, email leon.perrie@tepapa.govt.nz, ph. 027 419 1378; Lara Shepherd, email lara.shepherd@tepapa.govt.nz, ph. 027 363 5854.
Meeting: AGM on Monday 14 August at 7.30pm. **Speaker:** Dr Allison Knight. **Topic:** The trail from Tony Druce to the power of Lichens.	**Venue:** Victoria University, Wellington, Lecture Theatre M101.

Nelson Botanical Society

Field Trip/Meeting: Please refer to the website: https://www.nelsonbotanicalsociety.org/trips-meetings.

Canterbury Botanical Society

Meeting: Monday 7 August at 7.30pm. **Speakers:** Callum Nicholls and Kelvin McPherson. **Topic:** *Haastia* Taxonomy**.**	**Venue:** St Albans Community Centre,1049 Colombo Street, Christchurch.

Botanical Society of Otago

Meeting: Wednesday 16 August at 5.20pm. **Speaker:** Cathy Rufaut. **Topic**: Advancing the inland saline ecosystem.	**Venue:** Main seminar room, Manaaki Whenua Landcare Research, 764 Cumberland Street, Dunedin.
Field Trip: Saturday 19 August to inland salines of the Maniototo .**Meet:** TBA.	**Leader:** Cathy Rufaut.