



TRILEPIDEA

Newsletter of the New Zealand Plant Conservation Network

No. 238

March 2024

Deadline for next issue:
Friday 19 April 2024

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



Drymoanthus flavus.
Photo: Bill Campbell.

NZPCN 2024 conference

Taylor Davies-Colley, Bill Campbell, Marley Ford

The New Zealand Plant Conservation Network conference being held from 6-9 October 2024 at Forum North in Whangārei is only just over six months away now. **Early bird registrations close on 31 March** (this Sunday), so you need to act fast to make the most of the discounted registration fees if you haven't already registered.

Our conference theme is "Ka mua, ka muri – walking backwards into the future". With this we will also be able to celebrate 21 years of NZPCN with a special event.

The conference will run from Sunday to Wednesday, with workshops and a welcome event on Sunday, symposia on Monday and Tuesday, and field trips on Wednesday. Our field trips and workshops will make the most of the incredible flora of Whangārei, with the city also being the gateway to wider Te Tai Tokerau/Northland and all the amazing botanising it presents.

A reminder to students that there are still a couple of places for free student registration available. Students who wish to make a presentation at the conference can receive free registration to facilitate their attendance. Spots for free student registration are limited so get in touch if you are interested in attending the conference and presenting at it.

Register for the conference [here](#), and keep an eye out for updates here and on social media. If you or your business would like to support the conference, we are looking for conference sponsors, as well as donations to our auction raising funds towards the David Given Threatened Plant Scholarship and the John Sawyer Threatened Plant Endowment Fund. Please get in touch with conference organising committee lead Taylor Davies-Colley at nzpcnconference@gmail.com any enquiries or offers of support.

We look forward to seeing you in Whangārei in October.

Mystery *Corybas* at Arthur's Pass

Bill Campbell (billcampbell@xtra.co.nz) (Original article published in the NZ Native Orchid Group Journal 172 in March 2024 and is reprinted here in an amended form with permission.)

While returning to Christchurch from Westport after the 2023 New Zealand Native Orchid Group tagalong tour, Max Hill and I decided to stop at the Bealey River Track at Arthur's Pass for a bit of a wander to stretch the legs. We crossed the river and walked a reasonable distance up the track on the other side, with a few orchids to be seen along the way. *Corybas vitreus* in full flower and *Pterostylis venosa* just finishing flowering were the highlights at that stage.

The return trip proved more productive, as we came across *Pterostylis venosa* in full flower just after re-crossing the river. This is a species I hadn't previously encountered in flower, so the camera was put to work. Soon after, and not long before hitting the

PLANT OF THE MONTH – *DRYMOANTHUS FLAVUS*

Bill Campbell (billcampbell@xtra.co.nz)

The plant of the month for March is *Drymoanthus flavus*, a relatively small and uncommon epiphytic orchid found from about the King Country region of the North Island southwards, although it is sparsely distributed in the upper and central regions of the South Island. This endemic species is also found on Rakiura/Stewart Island.

Drymoanthus flavus is a lowland to montane forest species, where it can be found in suitable habitat on the trunks and limbs of host tree species. Plants are often only 2–3 metres above ground level and, in the Wellington region at least, sometimes grow in association with the more common *Drymoanthus adversus*. Occasionally, plants may be found growing on rock outcrops and cliff faces but not to the same extent as other epiphytic species.



Drymoanthus flavus: (left) flowering plant on beech, Wainuiomata, 31 October 2016; (right) plant on *Olearia rani*, Wainuiomata, 18 September 2019. Photos: Bill Campbell.

The plants form tufts of several leaves and are characterised by the many white to brownish cord-like roots spreading out across the host species. The distinctive leaves are green to yellowish-green and are purple blotched, distinguishing them from those of *D. adversus*. Flowering occurs in October/November and the yellow flowers are borne in racemes of usually 2–6 flowers. The seed capsules are purple blotched like the leaves and this is another distinguishing feature.

The only similar species with which *D. flavus* is likely to be confused is *D. adversus*. However, *D. adversus* lacks the purple blotching of *D. flavus* and has yellow flowers, rather than green or greenish-white flowers with red, maroon or purple flecks.

This species has a current conservation status of At Risk – Declining. It was thought that over-collection by unscrupulous plant collectors was largely responsible for the decline of this species but recent studies suggest other factors may be at play.

The genus name *Drymoanthus* is derived from the Greek words *drymos* (forest) and *anthos* (flower). The species epithet *flavus* means pale yellow, presumably referring to the flower colour.

You can view the NZPCN website factsheet for *Drymoanthus flavus* at <https://www.nzpcn.org.nz/flora/species/drymoanthus-flavus/>

roadside carpark, we came across a small flowered *Corybas* under beech on the trackside. This was unlike anything I had seen before and the ball-shaped flower most closely resembled images I had in my mind of *Corybas sulcatus*. A number of photos were taken for further reference.

Following my return home I sent a photo to Carlos Lehnebach at the Museum of New Zealand Te Papa Tongarewa to get his opinion on what we had observed. Carlos responded by saying that it was not *Corybas sulcatus* but something similar to an entity he had previous seen west of Arthur's Pass.

A search of iNaturalist NZ turned up a couple of similar looking observations, one from Otago and one from Canterbury. Both of these had been identified on iNaturalist as *C. sulcatus*, presumably because of the flower shape and general appearance.



Two views of the apparently undescribed *Corybas* sp., Bealey River Track, Arthur's Pass 20 November 2023. Photos: Bill Campbell.

At this stage it would appear that this is an undescribed entity, possibly restricted to the mid and lower South Island on the eastern side of the Southern Alps, although the observation made by Carlos Lehnebach was slightly west of the Alps. More observations and more information is needed to pin this one down, so I would encourage you to watch out for anything similar in mid to late November. Information regarding future observations of similar plants can be circulated via this newsletter and details should also be passed on to Carlos for his records.

My summer with onion orchids (*Microtis*) in Wellington – new populations and seed germination

Benjamin Carson^{a,b,c}, Jennifer Alderton-Moss^a, Karin van der Walt (Karin.VanderWalt@wcc.govt.nz)^a, and Carlos A. Lehnebach^b

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From late spring to summer, we are probably more likely to encounter onion orchids – belonging to the genus *Microtis* – than any other native orchid. First described by Robert Brown in 1810, *Microtis* (derived from Greek for “small ear”, referring to the shape of the flowers) includes 23 recognised species distributed from East Asia through to the Pacific (Govaerts, 2023). Often weedy, green, and clonal, these plants have been the subject of taxonomic dispute partly on account of their small, highly variable flowers that do not preserve well in collections (Bates, 1984). In New Zealand, *Microtis* species

flower and fruit from around November to February. Once their seed capsules split, their above-ground parts die off and disappear until the next growing season.

Aotearoa New Zealand has three accepted representatives of the genus (Fig. 1): the endemic small onion orchid *M. oligantha*, slender onion orchid *M. parviflora*, and common onion orchid *Microtis unifolia* (Allan Herbarium, 2023). A more uncommon fourth species, *M. arenaria*, is also recorded (New Zealand Native Orchid Group, 2024).



Figure 1. Three *Microtis* species found in New Zealand: *Microtis oligantha* (left), *M. parviflora* (centre) and *M. unifolia* (right). Photos: Ben Carson (left, right) and Bill Campbell (centre).

M. oligantha and *M. unifolia*—the species I focused on—enjoy a distribution across New Zealand, although *M. unifolia* is particularly abundant and found in a range of environments (Fig. 2). *M. oligantha* appears to prefer montane grassland habitat; it was first described by Lucy Moore in 1968 when she studied specimens that were originally designated as an ‘alpine form’ of *Microtis* (Moore, 1968).

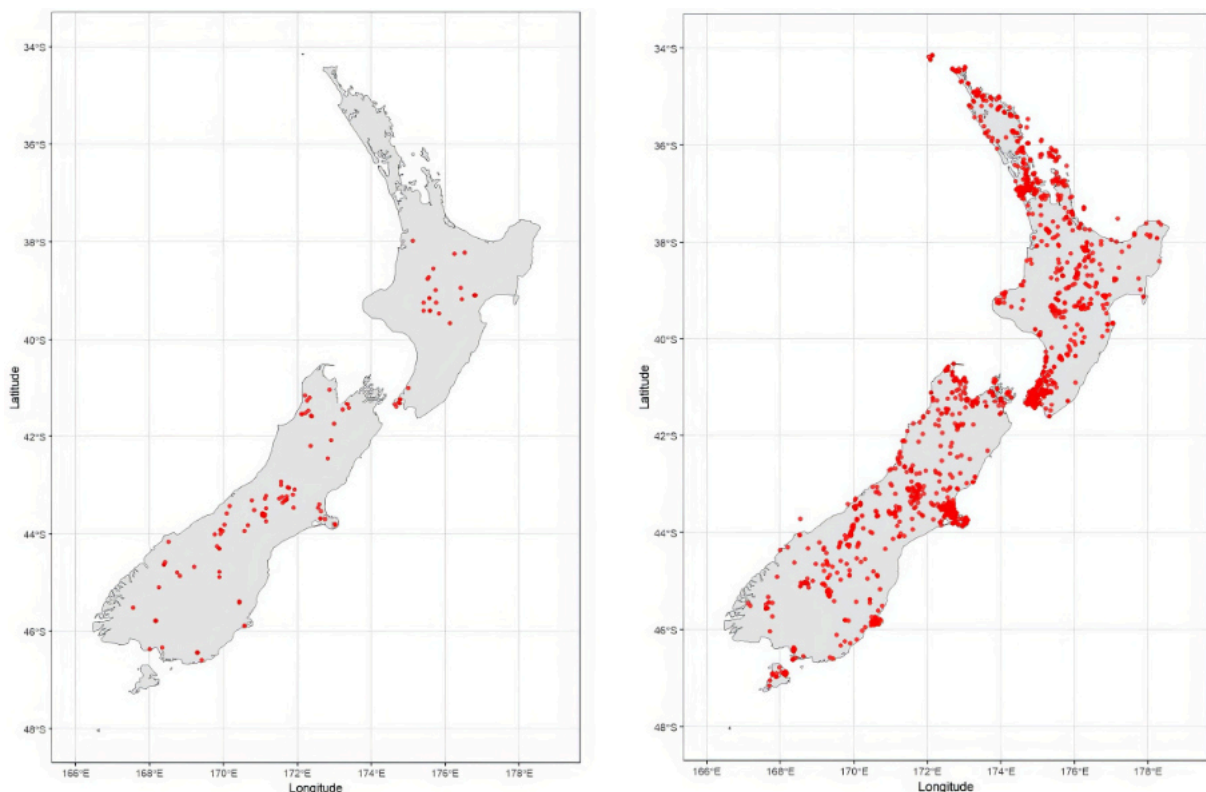


Figure 2. Distribution maps showing recorded observations and collections of *Microtis oligantha* (left) and *Microtis unifolia* (right) from mainland New Zealand. Dataset compiled using GBIF and AVH.

In the Greater Wellington region, *M. oligantha* was previously reported from only one population at Tarikākā/Mt Kaukau (Crisp, 2020). Used for recreation and grazing, the habitat includes many grasses and lower-stature plants surrounded by gorse and Darwin’s barberry (Fig. 3). Although this population was deemed stable, its confinement warranted a Regionally Endangered threat status. Its conservation is therefore of regional importance.



Figure 3. *Microtis oligantha* habitat (left) and flowers in bud (right) at Tarikākā/Mt Kaukau, 7 December 2023. Photos: Jennifer Alderton-Moss.

What do we want to know?

Thanks to a Te Tahua Taiao Ngā Taonga (Lottery Environment and Heritage) grant, a three-year project led by Ōtari and Te Papa has enabled breakthroughs in the conservation of threatened native orchids. The project aims to identify ideal methods to produce and propagate resilient seedlings, which can be deployed to bolster existing populations or establish new populations. Orchid seeds, referred to as ‘dust seeds’ because of their tiny size (Fig. 4), have few energy reserves and often perform best with ‘*Rhizoctonia*-like’ mycorrhizal fungi. Identifying mycorrhizal fungi and growing orchids in conjunction with them is essential for orchid conservation.

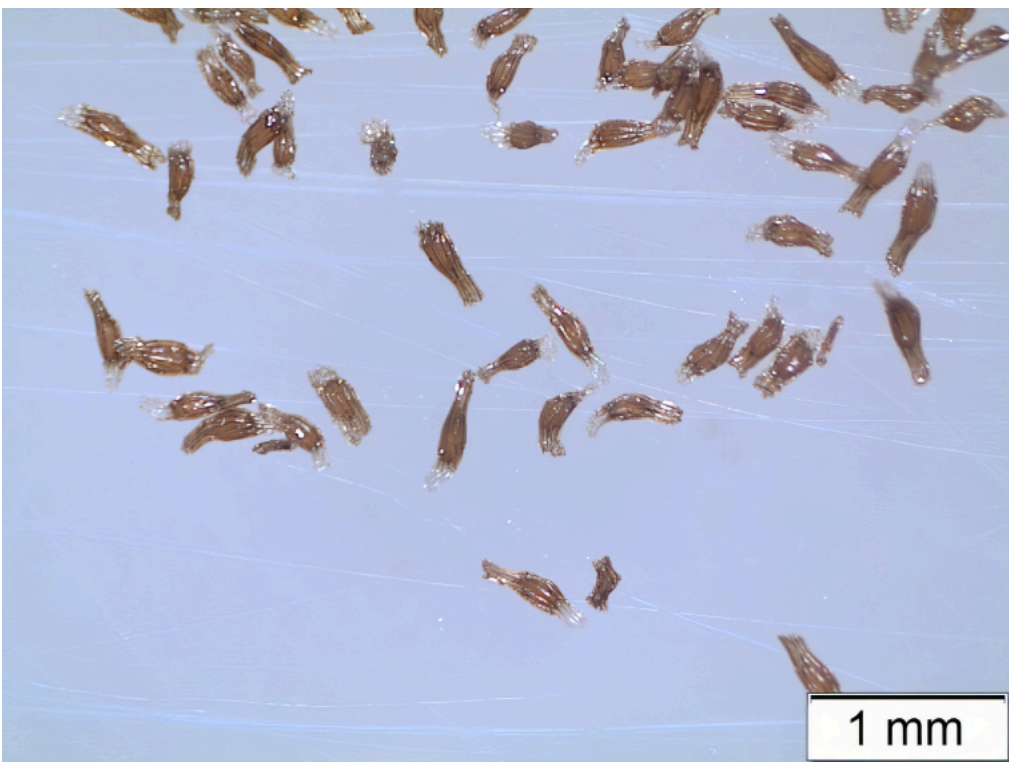


Figure 4: Tiny seeds of *M. unifolia* viewed under the microscope. Photo: Ben Carson.

Complementing this work, the Deane Endowment Trust provided funding for Ōtari to offer Te Herenga Waka Victoria University of Wellington summer research scholarships in both 2022/23 and 2023/24, the latter of which I was awarded. I was tasked with gathering baseline data on the nutrients and fungal partners needed to germinate the abundant *M. unifolia*, informing methods to be used for *M. oligantha*. I also set out to survey populations of *M. oligantha* and compile observation and specimen records. The life cycle of *Microtis* has made it ideal to study over the summer period, while its fast germination time compared with other native genera has meant that I have seen exciting results already!

A new population – new considerations for management?

It soon became clear that *M. oligantha* was not as rare in the Wellington region as had been reported. In addition to the Tarikākā population, I looked around and found a very small population of ~30 plants along the summit track of Rangituhi/Colonial Knob in Porirua. The site was less exposed to the wind than surrounding pasture hillslopes on which *M. unifolia* was growing. Further searches in the area did not yield any more *M. oligantha*, suggesting that this population is highly fragmented.

M. oligantha had been observed during the 2007 BioBlitz at Ōtari-Wilton's Bush (Lewington & West, 2008). Prompted by this mention, I found a large population (~4,000 plants) in a grassy clearing within the reserve (Fig. 5). Here too, *M. oligantha* occurs alongside *M. unifolia*. Interestingly, this population barely exceeds 100 m elevation, throwing into question the perceived montane nature of *M. oligantha*. It is also worth noting that while *M. oligantha* rarely surpasses 15 cm in height, the less exposed, more crowded examples at Ōtari had taller flowering stalks ranging from 20-25 cm.



Figure 5: Habitat for *M. oligantha* at Ōtari-Wilton's Bush (left); a plant growing among the long grass (right). Photos: Ben Carson

Finding these new populations has generated further questions: what conditions does *M. oligantha* need in the wild, what management regime is needed to sustain populations across varied sites, and where else might they be found? While the Tarikākā and Rangituhi populations are subject to occasional grazing, the Ōtari site is periodically mown. Perhaps the elimination of taller competition is key to the survival of *M. oligantha* at these sites? To investigate this, orchids could be counted in mown and unmown plots over subsequent seasons. Given that *M. oligantha* is not confined to one population in Wellington, I suggest that its regional conservation status could be downgraded to Naturally Uncommon in lieu of further observations.

Does *Microtis* know what's good for itself?

Other *Microtis* species including *M. arenaria*, *M. media*, and *M. parviflora* in Australia have been reported to germinate faster and with a broader range of mycorrhizal fungi than other orchids (Bonnardeaux et al., 2007; Brundrett et al., 2003; De Long et al., 2013; Dowling & Jusaitis, 2012; Perkins et al., 1995)—but would *M. oligantha* and *M. unifolia* germinate similarly?

Due to its ubiquity, I first trialled germination methods for *M. unifolia* seeds using a wide range of nutrient media types: Knudson C, Modified Knudson C, Orchid Basal Medium (OBM), and OBM with added Murashige and Skoog medium (Fig. 6). Initially – and strangely – the plants did not seem to respond particularly well to any of these except for the water agar control, which lacks additional nutrients and carbon! On agar, almost all seeds began to germinate, producing tuber-like protocorms with rhizoids (simple hair-like ‘roots’). However, after six weeks, it was clear that while the rhizoids were growing, the protocorms were getting no bigger, suggesting that water agar fails to support the development of advanced seedlings. Some seedlings on agar were moved into the light and although they turned green, they did not grow any further.

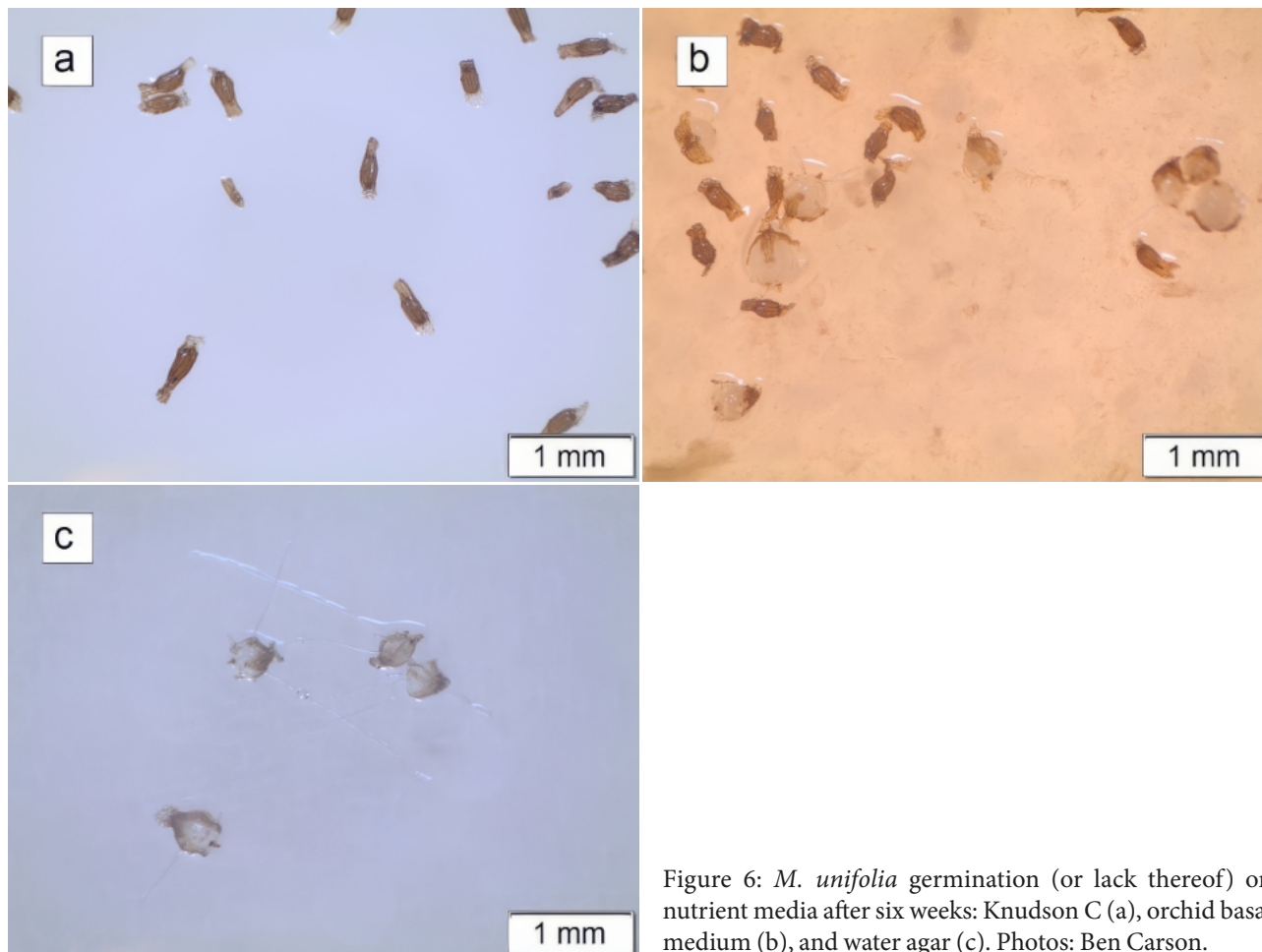


Figure 6: *M. unifolia* germination (or lack thereof) on nutrient media after six weeks: Knudson C (a), orchid basal medium (b), and water agar (c). Photos: Ben Carson.

Do fungal partners make fast starters?

Perhaps I would have more luck growing the plants with fungi? I started by trialling *M. unifolia* seed with fungi obtained from other native orchids, belonging to the ‘big three’ *Rhizoctonia*-like genera: *Ceratobasidium*, *Tulasnella*, and *Sebacina*. This was done by placing seeds and a block of fungal inoculant on oatmeal agar, which provides carbon and mineral nutrients to the fungus. I hoped that this would provide clues as to what type of fungi would best support germination and seedling development. After nine weeks, it was clear that the *Sebacina* strains tested produced the largest, most advanced seedlings with leaves beginning to form (Fig. 7). *Ceratobasidium* and *Tulasnella* appeared no better than the control at facilitating germination.

But what fungi do *Microtis* naturally associate with?

To answer this question, I first collected roots from both *M. oligantha* and *M. unifolia* plants at Tarikākā and Ōtari. In *Microtis*, small coils of mycorrhizal fungi (called pelotons) are found in the lateral roots; to isolate them, pelotons were teased out from the roots, rinsed, and placed on media. Once fungi had grown sufficiently, DNA sequencing was used to identify them. This indicated that

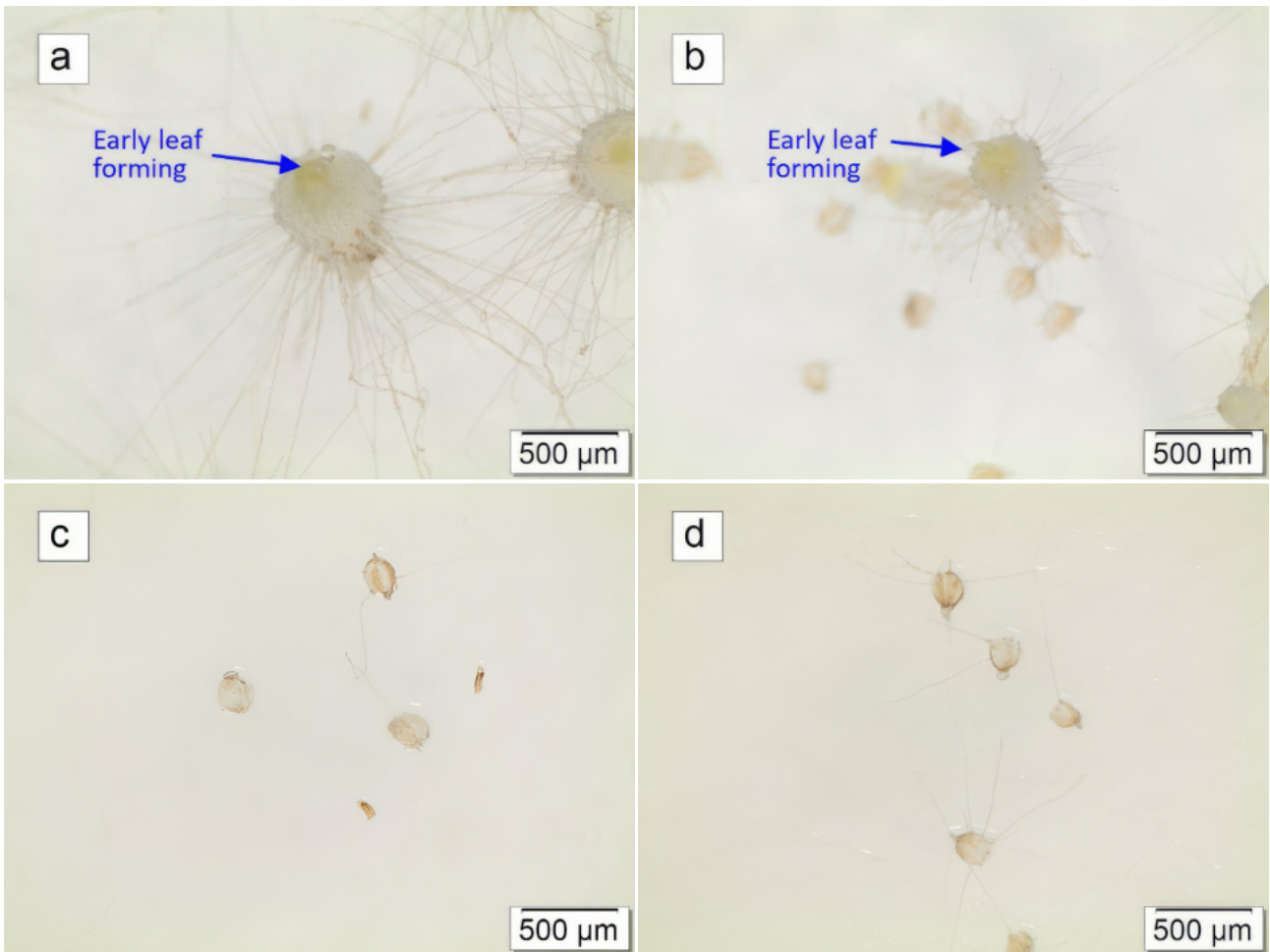


Figure 7: *M. unifolia* seedlings germinated on oatmeal agar in association with fungi after 12 weeks. Protocorms were producing leaf tissue in association with two *Sebacina* strains (a, b), whereas those in association with *Tulasnella* (c) and *Ceratobasidium* (d) did not reach this stage. Photos: Ben Carson

fungi isolated from *M. oligantha* at Tarikākā and Ōtari, as well as *M. unifolia* at Ōtari, belonged to the genus *Tulasnella*. Fungi from *M. unifolia* at Tarikākā were identified as *Sebacina*.

To see whether *Sebacina* and *Tulasnella* from *Microtis* aid seedling development, I then germinated *M. unifolia* seed with these fungi. After only three weeks, both fungal strains had produced enlarged protocorms with rhizoids, showing that co-habiting endophytes are indeed helpful (Fig. 8). However, as with my initial experiment, *Sebacina* has proven to be the stellar fungal partner – it has already supported the formation of early leaves in some seedlings!

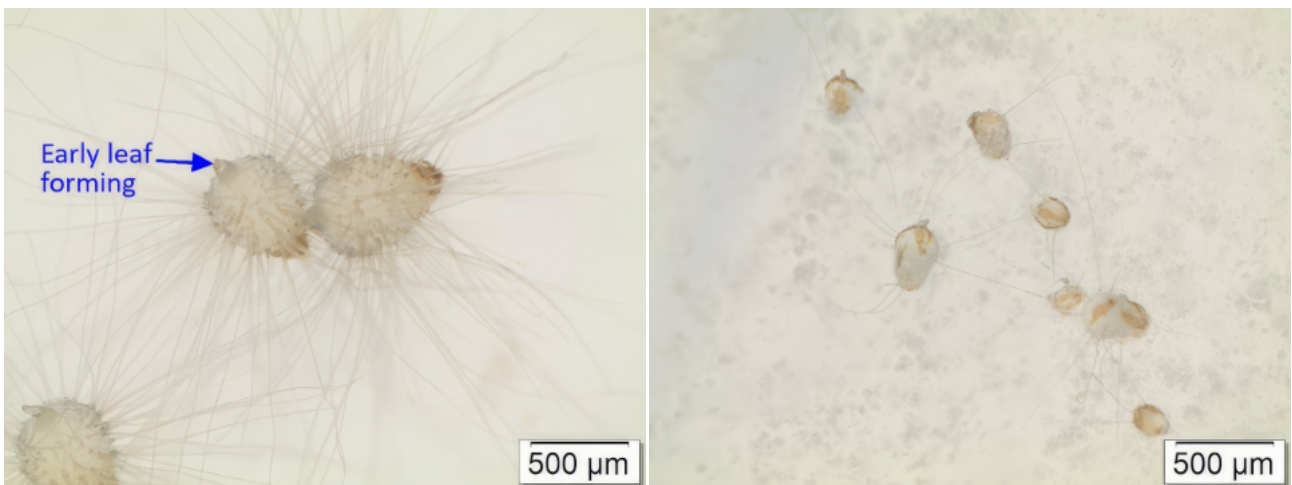


Figure 8: *M. unifolia* seedlings germinated in association with *Sebacina* isolated from *M. unifolia* (left, with leaf primordia) and *Tulasnella* isolated from *M. oligantha* (right) after six weeks. Photos: Ben Carson

These findings already hint at methods that can successfully grow New Zealand *Microtis* from seed – now, it is just a matter of finding suitable fungal partners for *M. oligantha*.

Where to from here?

Orchid time is very different to human time—within a month, *M. oligantha* proceeds from a green shoot in bud to a dried husk sans seed. By February, many of the plants around Wellington had already dispersed their seed, prompting a mission to collect seeds and place them in storage. Long-term seed storage is an essential component of plant conservation; however, it is complicated by varying preferences and tolerances of seeds to storage conditions. After defined time intervals, I will retrieve desiccated *Microtis* seed from storage at 5°C (fridge), -18°C (freezer), and -196°C (liquid nitrogen), and determine if the storage methods impact seed viability. This will inform the best methodology to preserve seed in case species become critically rare or extinct in the wild.

I am so grateful to have had the opportunity to learn about these fascinating plants! From finding new populations of *M. oligantha* to germinating healthy seedlings, I am delighted to contribute to the knowledge base for native *Microtis*; while there is so much more to unearth, I hope we now have a good start.

A huge thanks to the Deane Endowment Trust for funding my scholarship, and to Karin van der Walt (Ōtari-Wilton's Bush), Carlos Lehnebach (Te Papa Tongarewa – Museum of New Zealand), and Peter Ritchie (Te Herenga Waka – Victoria University of Wellington) for supervising me. Also, a massive thank you to Jennifer Alderton-Moss and Sally Paine for help in the lab.

References

- Allan Herbarium, (2023). Checklist of the New Zealand Flora – Seed Plants. Lincoln, Manaaki Whenua Landcare Research. <https://doi.org/10.26065/4cnn-tg41>
- Bates, R., (1984). The genus *Microtis* R. Br. (Orchidaceae): a taxonomic revision with notes on biology. *Journal of the Adelaide Botanic Gardens* 7(1): 45–89.
- Bonnardeaux, Y., Brundrett, M., Batty, A., Dixon, K., Koch, J., & Sivasithamparam, K., (2007). Diversity of mycorrhizal fungi of terrestrial orchids: compatibility webs, brief encounters, lasting relationships and alien invasions. *Mycological Research* 111(1): 51–61. <https://doi.org/10.1016/j.mycres.2006.11.006>
- Brundrett, M. C., Scade, A., Batty, A. L., Dixon, K. W., & Sivasithamparam, K., (2003). Development of *in situ* and *ex situ* seed baiting techniques to detect mycorrhizal fungi from terrestrial orchid habitats. *Mycological Research* 107(10): 1210–1220. <https://doi.org/10.1017/S0953756203008463>
- Crisp, P., (2020). Conservation status of indigenous vascular plant species in the Wellington region. Greater Wellington Regional Council Publication No. GW/ESCI-G-20/20 Wellington.
- De Long, J. R., Swarts, N. D., Dixon, K. W., & Egerton-Warburton, L. M., (2013). Mycorrhizal preference promotes habitat invasion by a native Australian orchid: *Microtis media*. *Annals of Botany* 111(3): 409–418. <https://doi.org/10.1093/aob/mcs294>
- Dowling, N., & Jusaitis, M., (2012). Asymbiotic *in vitro* germination and seed quality assessment of Australian terrestrial orchids. *Australian Journal of Botany* 60(7): 592–601. <https://doi.org/10.1071/BT12133>
- Govaerts, R., (2023). The World Checklist of Vascular Plants (WCVP). Royal Botanic Gardens, Kew. Checklist dataset <https://doi.org/10.15468/6h8ucr> accessed via GBIF.org on 2024-02-15.
- Lewington, R. J., & West, C. J., (2008). Otari BioBlitz: detailing vascular plants, mosses and liverworts. *Wellington Botanical Society Bulletin* 51: 5–23.
- Moore, L. B., (1968). Taxonomic notes on New Zealand monocotyledons. *New Zealand Journal of Botany* 6(4): 473–492. <https://doi.org/10.1080/0028825X.1968.10428586>
- New Zealand Native Orchid Group, (2024). *Microtis arenaria* – Notched Onion Orchid. Accessed 20 March 2024, <<https://www.nativeorchids.co.nz/orchids/microtis-arenaria/>>
- Perkins, A. J., Masuhara, G., & McGee, P. A., (1995). Specificity of the associations between *Microtis parviflora* (Orchidaceae) and its mycorrhizal fungi. *Australian Journal of Botany* 43(1): 85–91. <https://doi.org/10.1071/BT9950085>

A surprise find of *Pterostylis paludosa* near Charleston on the West Coast

Bill Campbell (billcampbell@xtra.co.nz) (Original article published in the NZ Native Orchid Group Journal 172 in March 2024 and is reprinted here in an amended form with permission.)

While participating in the NZ Native Orchid Group 2023 tagalong tour I decided to revisit a pakihi site that Mike Lusk and I had been to during our South Island trip the previous year. On that trip we had observed a couple of plants of *Calochilus paludosus* at the site and I was hopeful that we might find it flowering there this time, even though we were a week and a half earlier.

Max Hill, who I was travelling with, and I stopped at the site while travelling towards Charleston on Saturday 18 November. A single plant of *C. paludosus* was located almost immediately near the road, very close to where one of the plants had been observed in 2022. Unfortunately, this plant was still a few days off being in full flower.

Max and I continued searching in the area, with me following a track out towards a power pylon, where the other plant of *C. paludosus* was observed by Mike Lusk and me. With no further sign of any *Calochilus* I decided eventually to go cross country for the return trip. Initially, all I saw were leaves and buds of *Thelymitra* species, most likely *T. cyanea* and *T. pulchella*.

Just when I was beginning to think my cross country excursion was going to be fruitless I spied a lone, very yellowish, *Pterostylis* flower and leaves poking up out of a clump of the wire rush *Empodisma minus*. It was quite unlike anything I had seen before in relation to both colour and shape, so *Pterostylis paludosa* immediately sprang to mind. However, not having seen this species previously I wasn't about to jump to any hasty conclusions. I called Max over, took some photos and then carried on. It wasn't long before more plants began to appear and further photo taking confirmed that they were indeed *P. paludosa*.

The plants became more numerous as we progressed and the final estimation was that there were more than 80 plants at the site, with the majority of these being in full flower. Thankfully, we were able to catch up with the rest of the tour group at lunch time and guide them back to the site for photo opportunities. For nearly all, this was their first encounter with this rarely observed species.

A subsequent search of iNaturalist NZ ascertained that *Pterostylis paludosa* had not been recorded on iNaturalist previously. This is a fair indication that we were very fortunate to observe and photograph what is obviously an extremely elusive orchid.



Pterostylis paludosa in flower near Charleston: (top) 18 November 2023; (bottom) 20 November 2023. Photos: Bill Campbell.



Pterostylis paludosa in flower near Charleston, 20 November 2023. Photo: Bill Campbell.

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.

National Wetland Symposia 2024

Dates: 10–11 April, with optional field trip 12 April.

Venue: Copthorne Hotel and Resort, Waitangi.

This is an event for community groups, landowners, iwi, scientists, wetland managers and students who are interested in sharing and learning about wetlands.

Details of the speakers, field trips and training, along with tickets, can be found via the following link: <https://www.wetlandtrust.org.nz/what-we-do/symposia/>

Auckland Botanical Society

Meeting: Tuesday 9 April. Topic: Lucy Cranwell Lecture – The Flora of the Chatham Islands. **Speaker:** Dr Peter de Lange.

Venue: Auckland War Memorial Museum.

Field Trip: Saturday 20 April. See website <https://sites.google.com/site/aucklandbotanicalsociety/> for further details.

Waikato Botanical Society

Meeting: Monday 15 April at 6.00pm. **Topic:** Wildflowers of Western Australia. **Speaker:** Nigel McCarter.

Venue: The Link Centre, Corner of Te Aroha Street and River Road, Hamilton East.

Rotorua Botanical Society

Field Trip: Saturday 6 April for Landcare Okareka Mistletoe Restoration Project Weed Control/Plant Releasing Work Day. **Meet:** Corner of Summit and Loop Roads, Okareka (lake end) at 8.45am.

Leader: Paul Cashmore, email pcashmore@doc.govt.nz, ph. 07 349 7432 (wk) or 027 650 7264.

Field Trip: Saturday 13 April to Moutohora (Whale Island) combined with Eastern Bay Forest and Bird. **Meet:** White Island Rendezvous Carpark – time to be confirmed.

Leader: Jo Bonner, email coastlandspn@xtra.co.nz, ph. 027 715 684. Cost \$120.00 and numbers limited, so please register with Jo by 31 March at the latest.

Wellington Botanical Society

Field Trip: Saturday 6 April to Nga Manu Nature Reserve wetlands, Waikanae. **Meet:** Nga Manu carpark at 10.00am.

Co-Leaders: Andy McKay, ph. 027 555 653 and Kate Jordan, email kateljordan@gmail.com, ph.027 899 0018.

Meeting: Monday 15 April at 7.30pm. **Topic:** Ecosourcing for resilience in a changing environment. **Speaker:** Peter Heenan, Senior Researcher - Botanist, Systematics, Manaaki Whenua – Landcare Research.

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

Field Trips/Meetings: Please refer to the website: <https://canterburybotanicalsociety.org.nz/canterbury-botanical-meetings-field-trips> for current details.

Botanical Society of Otago

Meeting: Wednesday 10 April at 5.20pm. Topic: An introduction to the Natural History of Chatham Island. **Speaker:** On Lee Lau. **Venue:** Zoology Benham Building, 346 Great King Road, Dunedin. Go to main entrance and proceed to Benham Seminar Room 215 on second floor.

Contact: Gretchen Brownstein, email brownsteing@landcareresearch.co.nz, ph. 021 065 8497.

Field Trip: Saturday 13 April to Manuka Gorge Lichen and Bryophyte walk. **Meet:** Botany Department carpark at 9.00am.

Contact: Jo Sinclair, email josinclair6@gmail.com.
