

NEW ZEALAND NATIVE ORCHID JOURNAL



November 2024 Number 175

Contents

No 175 November 2024 ISSN 1177-4401



Cover: *Caladenia lyallii*, Arthur's Pass—Rebecca Bowater

Orchids in 3D: *Caladenia lyallii*, Iwitahi—Eric Scanlen

3 From the Chair: Gael Donaghy

Original Papers

6 Mycorrhizal relationships and germination of New Zealand *Corybas*

17 The Type Locality: *Calochilus*

Notes

12 Photographing Native Orchids

17 Wilding Conifer Survey

18 Upcoming Events

Back Cover: 2025 Membership subscriptions due



New Zealand Native Orchid Group

Chair: Gael Donaghy, GaelDonaghy@gmail.com.

Deputy Chair: Bill Campbell, jccampbell@xtra.co.nz.

Secretary & Treasurer: Pam Shearer, pam@insidettrack.co.nz.

Membership secretary: Graeme Jane, gtjane@kinect.co.nz.

Webmaster: Bill Campbell, jccampbell@xtra.co.nz.

Editor: Cara-Lisa Schloots, caralisa95@gmail.com.

The New Zealand Native Orchid Journal: Our main aim is to improve knowledge of NZ native orchids, so we allow others to republish material published here, provided the source and author are acknowledged. The editor and members may not share authors' views. Published quarterly from February—deadline first of the month preceding.

From the Chair: Gael Donaghy



Kia ora tatou

Spring has arrived and with it the usual unsettled weather. The orchids flowering more than makes up for it though, as long as you don't mind

getting wet. On a recent trip to the hills above Ōhope in the eastern Bay of Plenty we saw three *Corybas* in flower in a small 30 hectare private covenant, *C. vitreus*, *C. hypogaeus* and *C. trilobus* ss. It still surprises me what you can find in small remnants of native forest. On a trip in September to visit family in Australia it was interesting to find *Thelymitra* very like our *T. pauciflora* nearly in flower in the Snowy Mountain area of New South Wales. The area is quite high and we had frosts during our visit. My niece kept an eye on it and found it on 21 September. Does anyone know of *T. pauciflora* or similar flowering this early in New Zealand?

From the sublime to the ridiculous... NZNOG is required by new legislation, along with roughly 22,000 other Incorporated Societies, to have a new written constitution approved by 2025 or be wound up! There are many requirements not covered by our current Rules, and although there is a template available, it is extremely bureaucratic and time-consuming going from one page of straightforward rules to nearly

20 pages of formal legal wording. My thanks go to Alasdair Nicoll for doing the ground work and to Ian for casting his eye over it, and confirming my view of it as a mind-numbing piece of bureaucracy. I just have the job of renumbering all the paragraphs and checking all the internal references point to the right place. Part V 10.2.3 or Part V.10.b.iii anyone? The next iteration will go to the AGM on 30 November.

I'm continually being surprised by the demand for the Pocket Guide. The initial print run of 200 in 2021 was sold out mid 2023, a second print run of 75 sold out by July 2024, and of the third print run of 50 books I have sold about 10. They go all over New Zealand and some go overseas – to Australia, USA, Germany, UK, Switzerland, and recently there have been a couple of inquiries from South American countries. A couple of buyers have had their copies hand delivered by our members.

Thanks to David McConachie for taking one to Perth to hand over to an American lady attending the same conference as him, and to Alasdair Nicoll for handing over one to a student from Chile, newly arrived in New Zealand, and receiving and banking the money for it. We exploit all ways and means!

The inbox

Taeniophyllum fasciola



Brett Payne

July 2024 | Ara Metua, Vaima'anga district, Rarotonga (Takitimu Conservation Area)

The inbox

Taeniophyllum fasciola



Brett Payne

July 2024 | Ara Metua, Vaima'anga district, Rarotonga (Takitimu Conservation Area)

Mycorrhizal relationships and germination of New Zealand *Corybas*

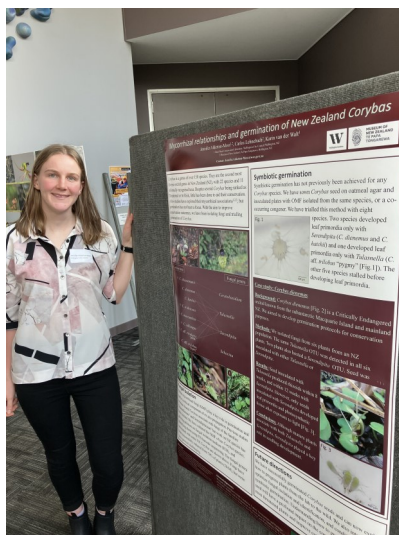
Jennifer Alderton-Moss^{1,2}, Carlos Lehnebach², Karin van der Walt¹

¹ Lions Ōtari Plant Conservation Laboratory, Wellington City Council, Wellington, NZ

² Museum of New Zealand | Te Papa Tongarewa, Wellington, NZ

Note: The following article shares some preliminary results from our work on *Corybas*, including the identification of mycorrhizal fungi and trials into symbiotic and asymbiotic germination. This article was adapted from a poster presented at the International Orchid Conservation Conference 8 (IOCC8), 3 – 6 September 2024, Perth, Australia (Figure 1).

Figure 1: Jennifer Alderton-Moss standing alongside her poster at the IOCC8 conference ►



Introduction:

Corybas is a genus of over 150 species. They are the second most diverse orchid genus in Aotearoa, with 22 species and 11 informally recognised taxa. Despite several native *Corybas* being ranked as Threatened or At Risk, little has been done to aid their conservation. A few studies have explored their mycorrhizal associations^{1,2,3,4}, but germination has not been a focus. With the aim to improve conservation outcomes, we have been isolating fungi and trialling germination of *Corybas*.

Fungal isolation

Orchid mycorrhizal fungi (OMF) play a key role in germination and can be a critical component of ex situ propagation. Previous studies overseas found *Corybas* associate with fungi of the families Tulasnellaceae¹ and Serendipitaceae², but work on Aotearoa's species has been limited^{3,4}. We have cultured the OMF of ten *Corybas* species, growing pelotons (coils of fungal hyphae hosted within orchid root cells) on fungal isolation medium (FIM), and identifying them using DNA sequencing.

The fungal genera associated with some Aotearoa *Corybas* are shown in Figure 2. We have been successful in culturing fungi from 74% of plants (50/68), but some have proved challenging. Cultured fungi can be used to inoculate orchid seed in vitro – if it's the right fungus a symbiosis is formed where the fungus provides the energy the seeds need to germinate. This process is known as symbiotic germination.

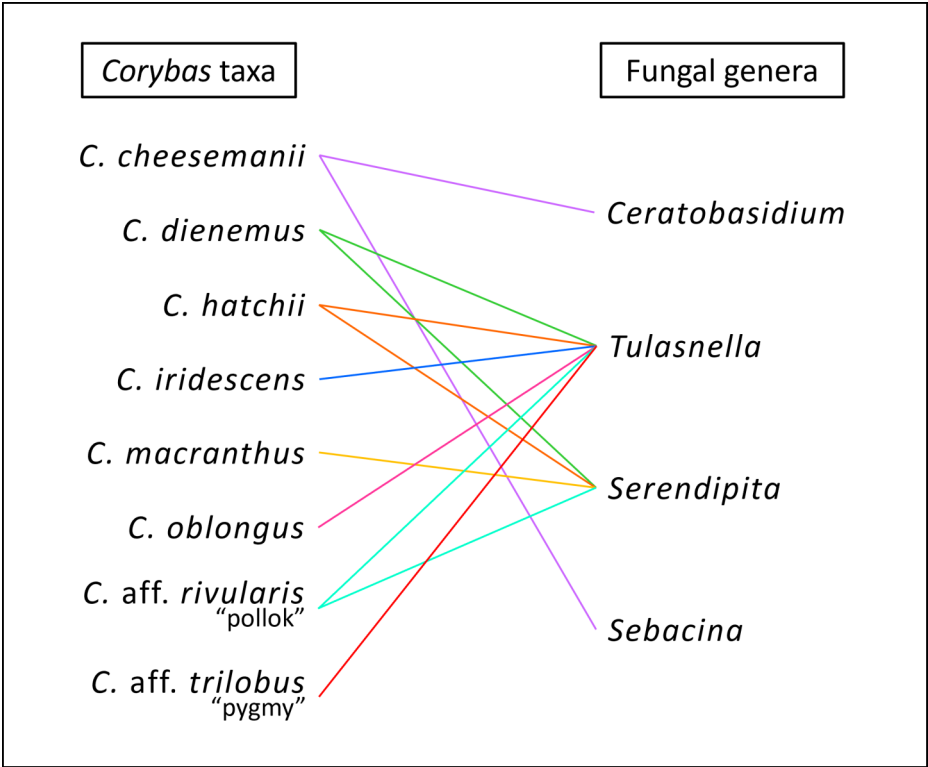


Figure 2: Summary of the fungal genera we isolated from selected *Corybas* species ▲

Symbiotic germination

To the best of our knowledge, symbiotic germination has not previously been reported for any *Corybas* species. To assess the ability of our cultured fungi to germinate seed and support seedling development we have sown *Corybas* seed on oatmeal agar and inoculated the plates with OMF isolated from the same species, or a co-occurring congener.

We have trialled this method with eight species. *Corybas dienemus* and *C. hatchii* have developed leaf primordia (a structure that over time will become the first leaf) only when inoculated with *Serendipita*. The entity known as *C. aff. trilobus* 'pygmy', on the other hand, has developed leaf primordia only when inoculated with *Tulasnella* (Figure 3).



▲ Figure 3: Symbiotically germinated seed of *C. aff. trilobus* “pygmy”. Leaf primordium is indicated by arrow

Development of the other five species stalled before developing leaf primordia - identifying how to continue the development of these species will now be a priority. When fungi cannot be cultured, or cultured fungi do not support germination, we can try an alternative approach known as asymbiotic germination.

Asymbiotic germination

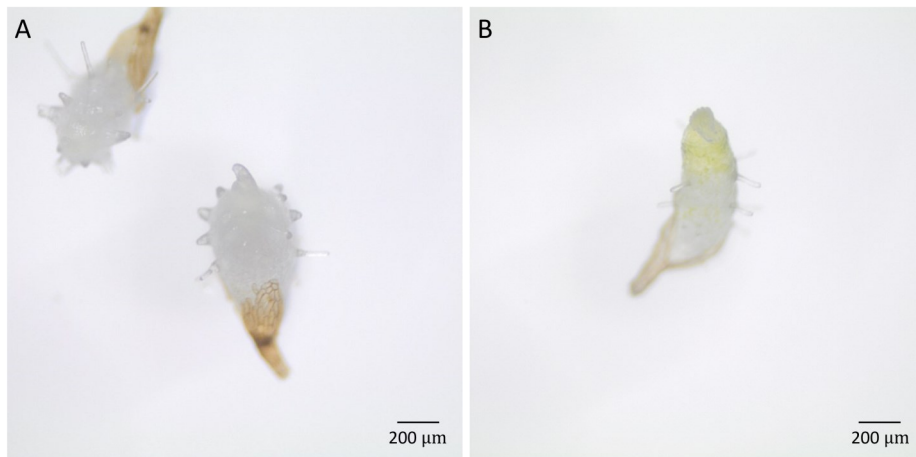
Asymbiotic germination utilises nutrient media which replicate the role of OMF and can be particularly important when fungi cannot be cultured.

We have tested germination of eight *Corybas* species on Knudson C medium (KC). *Corybas carsei*, *C. cheesemanii* and *C. oblongus* developed rhizoids (root-like projections from the developing seedling) within 24 weeks on KC; *C. hatchii*, *C. iridescens*, and *C. macranthus* progressed beyond rhizoids and developed leaf primordia.

However, there is often great variability between seed lots, and we suspect that seed dormancy may be an issue within *Corybas*. For example, 62.3% of seed from one *C. macranthus* capsule germinated on KC (Figure 4a), but no seed germinated from another capsule, despite being collected concurrently and processed in the same way. Furthermore, germination can

be slow – *C. carsei* seedlings only began to turn green after a year and a half on KC (Figure 4b).

For some species, we have begun trialling alternative media (e.g., BM1, Murashige and Skoog), and we will continue this to see if asymbiotic germination can be optimised.



▲ Figure 4: Asymbiotic germination of *C. macranthus* (a) and *C. carsei* (b) after 6 months and 8 months on Knudson C medium, respectively.

Case study: Fungal isolation and symbiotic germination of *Corybas dienemus*

Background: *Corybas dienemus* (Figure 5a) is a Critically Endangered orchid known from the subantarctic Macquarie Island and mainland Aotearoa. We aimed to develop germination protocols for conservation purposes.

Methods: We isolated fungi from six plants from a single North Island population. The same *Tulasnella* strain was detected in all six plants. Two plants also hosted a *Serendipita* strain. Seed was inoculated with either *Tulasnella* or *Serendipita*.

Results: Seed inoculated with *Tulasnella* produced rhizoids within 8 weeks, and within 12 weeks with *Serendipita*. However, only seeds inoculated with *Serendipita* developed leaf primordia and photosynthetic tissue after exposure to light (Figure 5b).

Conclusions: Although mature plants associate with different fungi, only one supported the development of seedlings under the conditions we tested.



▲ Figure 5: Flowering plant (a) and symbiotically germinated seedlings (b) of *C. dienemus*

Future directions for *Corybas*

We have successfully germinated *Corybas* seeds and can now explore how to progress plants from the lab to the wild. We also intend to optimize fungal isolation and identification, and conditions for symbiotic germination. Understanding how to grow *Corybas* from seed will have a profound impact on the conservation of some of Aotearoa's most threatened species and improve outcomes for the wider genus.

References

- 1 Lyon (2014). Molecular systematics, biogeography, and mycorrhizal association in the Acianthinae (Orchidaceae), with a focus on the genus *Corybas*. PhD Thesis.
- 2 Qin *et al.* (2024). Three helmet-orchid species share abundant fungi of Serendipitaceae regardless of altitude. Botany.
- 3 Alderton-Moss *et al.* (2023). Identification of fungal associates of the swamp helmet orchid (*Corybas carsei*), a threatened (nationally critical) species. N Z J Bot.
- 4 Watkins (2012). The biogeography, ecology and endophyte mycorrhiza of the New Zealand *Corybas* alliance (Orchidaceae): specifically, *Nematoceras iridescens* (Irwin et Molloy) Molloy, D.L.Jones & M.A.Clem. (species). PhD Thesis

Acknowledgements

We thank the Australian Orchid Foundation, Lottery Environment and Heritage (LEH-2022-184662) and the Department of Conservation for funding. JAM would also like to give her sincere thanks to the Ōtari Trust and Wellington City Council, for their support to attend IOCC8 and present this work. The NZ Native Orchid Group is gratefully acknowledged for their continued support towards New Zealand orchid conservation.

The inbox

Microtis unifolia



Lawrence Porter

A multi-headed *Microtis unifolia* grown in cultivation.

November 2024 | Upper Hutt

Photographing Native Orchids

Rebecca Bowater

When I am looking for an orchid to photograph, I look for a flower that is at its best, not a damaged one—if you have a choice.

I always use a tripod when I photograph orchids whether they are on the ground or on a bush, and I wait for the wind to stop to prevent movement. This will give you a sharply focused image. I do remove twigs or leaves that lie around or on the plant before I photograph it. I look at the background of the plant and choose the best angle that does not have a huge distraction from your subject.

As you know, most of our orchids are small so I use a macro lens, you may turn your settings to macro if you are using a camera or phone. If you are in a shady bush area and you are able to alter your ISO setting to a higher number for example 400 or 500, this will help. If your camera has an aperture priority feature put the F-stop up to F11, 14 or 16 to give a better depth of field. You need to sit on the ground or stand close to the flower, look for the best angle and take the photo without any movement and look at the result. Keep practicing till you see a great improvement in your photography skills.

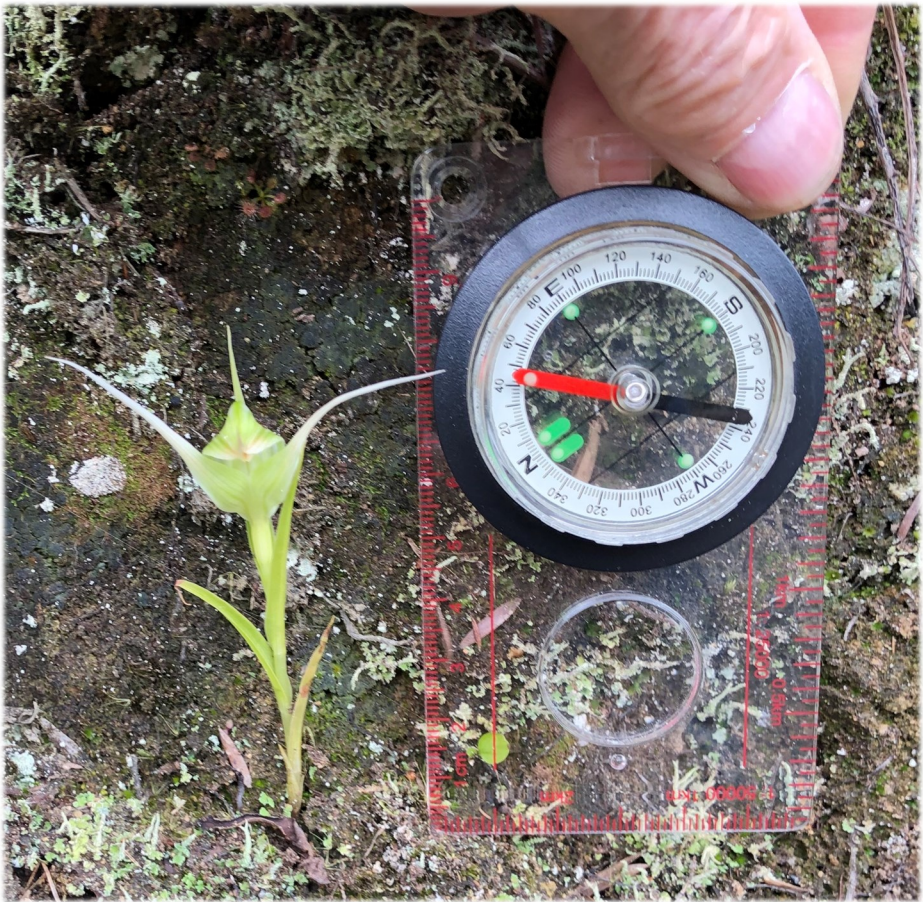
Good Luck!

If you have been wondering who has taken some of the excellent recent cover photos of the journal, it has been Rebecca (this journal and the May Journal 173). Rebecca is an award-winning photographer based in Nelson and received a Fellowship of the Photographic Society in New Zealand in 2006. She has a website showcasing her excellent photography (<https://www.flickr.com/photos/152088905@N05/albums/>), and has published two books, “[New Zealand Alpine Flora](#)” and “[New Zealand Funqi](#)” which is in its third edition [Ed.].



The inbox

Pterostylis banksii



Ian St George

A tiny hypochromic *Pterostylis banksii* on a roadside bank, 7 cm high.

September 2024 | Coromandel

Tips and tricks for finding New Zealand orchids with Mark Moorhouse

Stop and pull off the road when you find a likely spot and poke about in unexplored spots. It's how our knowledge of distribution grows. Share your knowledge with other members and ask their advice.

Notes

Revisiting the *Dendrobium kingianum* found in the Coromandel by Gael Donaghy and Graeme Jane in 2007 (NZNOG Journal No. 107), Ian St George asks “Is *Dendrobium kingianum* a vagrant New Zealand native orchid?”.

If you go to https://inaturalist.nz/observations?place_id=6803&subview=map&taxon_id=83578 you will see ten reports, with photographs, of the Australian “Pink rock orchid”, that appear to have been taken in the wild in New Zealand—from Northland (3 sites), Coromandel (2 sites), Manukau, Taranaki (2 sites) and Marlborough.

What does “native” mean in this context? It should mean “born here” so would be apt if plants had grown from seed.

The word “vagrant” might fit: as I understand it “vagrant species” arrive naturally at a site, but do not form long-term sustainable populations, though I have only seen the term

applied to Australian orchids that grow here from seed carried in the westerlies. If they did arrive on the wind, they would be our first epiphytic vagrant. It seems very unlikely to me.

Are they simply “garden escapes”, surviving when garden rubbish is dumped in the bush? If so, they could not be said to have arrived “naturally” so aren’t strictly “vagrant”. But if they have offspring from seed they might be “native”.

Neither “native” nor “vagrant” would be appropriate if the orchids had been planted out deliberately, of course, but I think we are nearing a point when we should be including *Dendrobium kingianum* in our orchid lists.

Forest And Bird—South Otago ventured out in hail and rain for an Orchid Hunt this September. They found five species although most were not yet in flower.

Iwitahi Working Bee & Native Orchid Weekend

Friday, December 6th -Sunday , December 8th
At the Iwitahi Reserve off SH5 (Napier -Taupo)



Starts Friday after 4pm
Ends Sunday Lunchtime-ish



Includes Meals and 2 Nights Accomodation at Sika Lodge
(bunk room style)

Light /Moderate Track Maintenance, weeding etc.
Orchid Identification, photography and discussions on site

\$120 +/-PP
[THE MORE THAT COME](#)
[THE CHEAPER IT GETS](#)

We would expect to see *Calochilus*, *Chiloglottis*, *Gastrodia*,
Thelymitra and *Pterostylis* species in flower

If you are unable to attend for the full weekend but would like to join us at the reserve or prefer to organise your own accommodation please let me know so we can keep an eye out for you

To register your interest email me - tobymarris@hotmail.com



The inbox

Pterostylis alobula



Lawrence Porter

August 2024 | Eastbourne, Wellington

The Type Locality

Calling *Calochilus* "campestris" in NZ

Ian St George



When George Bentham included Robert Brown's *Calochilus campestris* [1] in the *Flora Australiensis* in 1878 [2] he referred to a painting in Curtis's *Botanical Magazine* by Dr John Scott (left) [3].

John Buchanan was the first to record a *Calochilus* in New Zealand, *C. paludosus*, collected by HH Travers near Collingwood in December 1881 [4].

Thomas Kirk was the first to record *Calochilus campestris* in New Zealand. From Rotorua he had obtained specimens, "which, although differing in one or two points from the Australian plant, must be identified with *C. campestris* R.Br." He went on to compare the Rotorua plants with the engraving in JD Hooker's *Flora Tasmaniae*. Then he wrote, "Mr Fitzgerald's fine drawing in 'Australian Orchids' represents the habit and structure of the New Zealand plant exactly, but differs in the coloration, the calli and fringes in all the Rotorua specimens seen by me being of a deep

▲ *Calochilus campestris* by Dr John Scott, Curtis's *Botanical Magazine* t.3187.



WH Fitch's lithograph from W Archer's drawing of *C. campestris* in JD Hooker's *Flora Tasmaniae*, plate CVI.



AJ Stoops's lithograph from RD Fitzgerald's drawings labelled *C. campestris* in his *Australian orchids*, Vol.2, Part 4.

velvety red throughout, and showing no trace of blue or even purple.” TF Cheeseman concurred and in 1906 included *Calochilus campestris* in his *Manual* saying, “so far I have seen no specimens except from Rotorua. These exactly match the plate in Fitzgerald’s Australian Orchids, with the exception that the fimbriae on the lip never show any trace of blue, but are always red” [7].

Both Kirk and Cheeseman relied on the similarity of Rotorua plants to Fitzgerald’s drawing, to identify them as *Calochilus campestris*. The trouble was, Fitzgerald had got it wrong: the plant he labelled *Calochilus campestris* is actually a colour form of *C. robertsonii*. Nicholls pointed that out in 1941: “R.D. Fitzgerald’s interpretation of *C. campestris* is incorrect. He illustrates a widespread, pale flowered variety of *C. robertsonii*, which, in some localities at least, is fairly abundant” [8]. According to Hatch, HMR Rüpp made the same observation, independently, in 1943 [9].

Thus Dan Hatch, who was aware of Fitzgerald’s mistake, identified the Rotorua plants as *C. robertsonii* and could write that “*Calochilus campestris* Cheesem. not of R.Br.” was a synonym for *C. robertsonii*. They are still there, at the Rotorua racecourse.

But in the meantime another *Calochilus* had been found at Kaimaumau in the far north. HB Matthews first came across it in 1924 and described it in manuscript as “*Calochilus viridisanguineus*” [10].

Hatch included it as *Calochilus campestris* in his “New Zealand forms of *Calochilus* R.Br.” in the *Transactions* in 1948 [11]. Lucy Moore

agreed [12]. Then it was lost for years till Doug McCrae reported its rediscovery in 1987 [13].

We now know it as *Calochilus herbaceus*. Lindley had described *C. herbaceus* in 1840 [14] but Bentham had regarded it as a synonym of *C. campestris*—and so it remained, so Hatch and Moore (and McCrae) were right in their times.

Only later, in 1989 did Clements and Jones reinstate *C. herbaceus* [15].

In New Zealand it grows in scattered localities from the far north down to Albany and is considered Threatened - Nationally Critical”.

Furthermore, Peter de Lange writes, “New Zealand plants and some Australian populations differ slightly from *C. herbaceus* sens. str. and it is thought that they probably warrant separate taxonomic recognition (D.L. Jones *pers. comm.*)” [16]. The *Atlas of living Australia* repeats that thought [17].

To look at the range of flower colours and shapes in New Zealand, go to https://inaturalist.nz/taxa/411252-Calochilus-herbaceus/browse_photos.



↑ *Calochilus campestris* from New South Wales.
<https://retiredaussies.com/>



↑ *C. herbaceus* from Tasmania by Lachlan Copeland November 2012. *iNaturalist*.



↑ A hypochromic *C. herbaceus* flower from the far north by Mike Lusk. *iNaturalist*.



↑ *Calochilus herbaceus* from the far north. Bill Campbell. *iNaturalist*.

References

1. Brown R 1810. *Prodromus Fl. Nov. Holl.* 320.
2. Bentham G 1878. *Flora Australiensis* vi. 315.
3. Hooker WJ 1832. *Calochilus campestris*. Field *Calochilus*. *Curtis's Botanical Magazine* 3187.
4. Buchanan J 1882. Additions to the flora of New Zealand. *Trans. Proc. Roy. Soc. N.Z.* 15: 340.
5. Kirk T 1892. Notice of the occurrence of Australian orchids in New Zealand. *Trans. Proc. Roy. Soc. N.Z.* 24: 427.
6. Fitzgerald RD 1882. *Australian orchids*. V2, pt4.
7. Cheeseman TF 1906. *Manual of the NZ flora*. Govt Printer, Wellington, p686.
8. Nicholls WH 1941. *Victorian Naturalist* 58: 94.
9. Rüpp HMR 1943. *Orch. N.S.W.* 49.
10. See Scanlen E 2005. Matthews & Son on orchids. *NZNOG Historical Series* 14: 14.
11. Hatch ED 1948. The New Zealand forms of *Calochilus* R.Br. *Trans. Roy. Soc. N.Z.* 77 (2): 248.
12. Moore LB, Edgar E 1970. *Flora N.Z.* 2. Govt Printer, Wellington, p121.
13. McCrae D 1987. The rediscovery of *Calochilus campestris* in NZ. *Orchids in NZ* 13 (3): 69.
14. Lindley J 1840. *The genera and species of orchidaceous plants*. London, Ridgways, p459.
15. Australian Orchid Foundation 1989. *Australian orchid research, Catalogue of Australian Orchidaceae*. Reed Books, p35.
16. de Lange PJ 2024. *Calochilus herbaceus* Fact Sheet. New Zealand Plant Conservation Network. <https://www.nzpcn.org.nz/flora/species/calochilus-herbaceus/>
17. Atlas of living Australia. <https://bie.ala.org.au/species/https://id.biodiversity.org.au/taxon/apni/51400217>.



Dendrobium kingianum—Ian St George

Wilding Conifer Survey

Some of our native orchids have an interesting relationship with exotic conifer species. Areas such as Iwitahi (*Pinus nigra* plantation) are important locations for some rare species and have very high diversity. Various orchids are frequently found in plantation forestry, and even areas of wilding conifers can provide habitat for some of our native orchid species.

Although conifers can provide habitat for our native orchids, their spread can lead to large scale landscape and ecological changes, many of which are detrimental at an ecosystem level. This can impact plant and animal communities both in terms of composition and resilience to further environmental stressors such as climatic changes.

As a member of the NZNOG I am sure that you also have an interest in the conservation of our native orchids, and by extension, the native ecosystems of Aotearoa. As such you may be interested in sharing your opinion on wilding conifers in the below mentioned survey.

Scion and Manaaki Whenua-Landcare Research are conducting a survey to understand how perceptions of wilding conifers differ across regions of Aotearoa New Zealand, and between professions and stakeholders. We are also interested in understanding how these perceptions compare to how other biosecurity threats are perceived. 'Wilding conifers' is a term used to describe exotic coniferous trees that self-establish beyond their initial plantings.

This survey is open to anyone although you will only be able to complete the survey once. Please complete this survey using this link (https://scionresearchgroup.qualtrics.com/jfe/form/SV_cv7oeXYAcXMQ9ym)!

Your participation is entirely voluntary and the survey will be anonymous.

*This survey will take about 10 minutes to complete, please forward the survey link to anyone who you think might be interested in completing it too. This survey will remain open until **20 December 2024**. Please email wildingpine@gmail.com if you have any questions.*

As an appreciation for your participation in the survey, you will have the option to enter a draw to win one of five \$100 Prezzy vouchers.

Upcoming Events

30 November 2024

New Zealand Native Orchid Group

NZNOG Annual General Meeting and field days, Petone.

31 November-8 December 2024

New Zealand Native Orchid Group

NZNOG Tagalong, Tararua, Ruahine and Kaweka Ranges

6 December-8 December 2024

Orchid Council of New Zealand

Native Orchid Reserve Working Bee, Iwitihi

14 December 2024

Canterbury Botanical Society / New Zealand Native Orchid Group

Field Trip: Orchids of Arthur's Pass, a day trip led by the New Zealand Native Orchid Group.

13—16 December 2024

Nelson Botanical Society

Camp to Marlborough—Alpine

23—27 January 2025

Auckland Botanical Society

Summer Camp—Whangaroa, Northland

22 February 2025

Botanical Society of Otago

[Field Trip: Maukaatua track](#)

Do you know about an upcoming event that the NZNOG may be interested in? Let me know by email: caralisa95@gmail.com

Tips and tricks for finding New Zealand orchids with Mark Moorhouse

Check rocks in open scrubland for *Bulbophyllum*, *Earina*, and *Dendrobium*.

The inbox

Editor's top picks from recent *iNaturalist* observations

Sebastian Doak

September 2024 | Buller District | [iNaturalist](#)



▼ *Corybas rivularis*

Corybas species ▲



Indy Marshall

September 2024 | Coromandel | [iNaturalist](#)

2025 subscriptions due



Annual subscription rates

- New Zealand membership with four printed journals per year: **\$40**
- Overseas membership with four printed journals per year: **\$55**
- New Zealand student membership with four printed journals per year: **\$20**
- Electronic membership with four PDF journals emailed to you per year: **\$20**

Subscription runs from 1st October - 30th September.

Please use internet banking to transfer your subscription payment into the following bank account.

Bank: ANZ - Wellington Branch
Name: NZ Native Orchid Group
Account Number: 06-0909-0177836-000

SWIFT code: ANZBNZ22

Note: Please put your **name** in the Reference space and **Membership** in the Details space so we know the deposit was from you

Please follow this link if you would like to renew your membership online:

<https://www.nativeorchids.co.nz/join/>

