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Cover: Aphid feeding on nectar of *Cyrtostylis rotundifolia*, Blenheim—Max Hill

Orchids in 3D: *Caladenia lyallii,* Arthur's Pass—Eric Scanlen.

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From the Chair: Gael Donaghy

Kia ora tatou

Welcome to this milestone journal – the first one that is under the control of Cara-Lisa. And what a bumper issue it is. From celebrating the life of Brian Molloy, one of NZ foremost orchid researchers, to historical research and classical teaching from Ian, to researcher Joe Dillon's project on the effect of climate change on distribution and flowering times of orchids, to members' field observations, and to opportunities for members to contribute to this research, I can see the purposes of NZNOG writ large.

I would like to take this opportunity to invite you to have a look at our new website (if you haven't already). If you are in the field, and want to look something up, you can use your smart phone – the website also works beautifully in the small screen format. The main difference is that the tabs along the top of the front page on the computer do not exist in the phone version – they are on a drop down menu under the three white horizontal bars at the top right of the screen. Our webmaster Bill has done a remarkable job, and with Robin Sallis, the website designer, has produced an extremely useful and user-friendly website. Bill is an administrator and can up-date the site as new information comes to hand.

The last 6 weeks have been extremely busy for me, with preparing and presenting a talk on native orchids at Orchids and More, which incorporated the 10th NZ Orchid Expo. Alasdair Nicoll, a committee member from the Waikato, put up a display and sold Pocket Guides, and talked to visitors about native orchids. I think between us we waved the NZNOG flag. I would also like a shout-out to Graeme who had to live through endless questions while I created the presentation.

The article about Native Orchids by the journalist from the NZ Gardener had some interesting follow-ups, when Stuff decided to run the article in their weekend magazines in the newspaper in Wellington and Christchurch. I even had one lady email me to ask me if I knew any Aussie orchid people because she was trying to track down a nephew who was involved in native orchids over there!

Being spring, there has been a run on Pocket Guides to post, and these sometimes lead to one of the best things about this job - people email me with orchids they find, and wonder what they are. Now it's full steam ahead with preparations for AGM and the tagalong – I wonder how people managed organising events like these with out email?

And although life is busy, it is never too busy to go bush and look for orchids! I have been out whenever the weather has been good and dry enough, finding some Corybas species in flower. *Corybas sanctigeorgianus* seems to be quite widespread in the Kaimai Ranges, and in the weekend, we found it up on the east side of the Coromandel Peninsula. I hope you are finding orchids in flower in your regions, and will volunteer to help Joe Dillon with his research on the impact of climate change on distribution and flowering times on our native orchids.

Obituary

Dr Brian Peter John Molloy

ONZM, CRSNZ, AHRIH

(12 August 1930 – 31 July 2022)

Obituary compiled by Murray Dawson—reprinted with permission, from the Royal New Zealand Institute of Horticulture journal

I've known Brian Molloy (Fig. 1, 2) my entire professional working life, spanning more than forty years.

He was one of a special cohort of professional botanists and ecologists who worked at the former Department of Scientific and Industrial Research's (DSIR) Botany Division, before the transition to Crown Research Institutes in the early 1990s.

His peers at the campus in Lincoln, Canterbury, included such notable achievers as Bill Sykes, Peter Wardle, Elizabeth Edgar, and former Directors Eric Godley and Henry Connor. All remained actively involved in research decades after their official retirements – a testament to their dedication and the nurturing work environment under the DSIR. Their contributions to New Zealand science, including Brian Molloy's, are immense.

Brian was among the last of these remarkable people, and a real survivor considering he had a major cancer scare and extensive surgery that could have easily taken him out well before time.

Brian differed from his contemporaries in being both an ecologist and a botanist, where most would specialise in only one of these disciplines. He was a true naturalist and conservationist with a profound love of and fascination for the New Zealand flora, and in uncovering, in his words "the stories they can tell" of their circumscription, evolution, and diversification. Brian described many new species and had several named in his honour (Fig. 3, 4, 6).

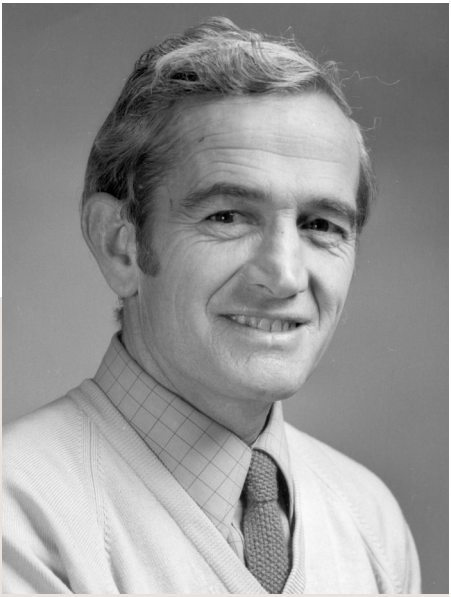

Fig. 1 Brian Molloy. DSIR Botany Division staff photograph, 1973 (photo: Jim Miles/ Bill Rennie).

A few of the many plant groups I remember Brian studying include native conifers, ferns, geraniums, Marlborough rock daisies (*Pachystegia*), *Brachyscome*, *Melicytus* (*Hymenanthera*), and especially orchids. I worked closely with Brian for several years, counting chromosomes of the native orchid species and co-publishing the results. Our work on the native sun orchids (*Thelymitra*) proved especially interesting as it revealed the hybrid origin of many species. Brian also worked on orchids in conjunction with members of the New Zealand Native Orchid Group, whom he held in high regard and respected their knowledge, not as amateurs, but unpaid professionals in their own right. Brian also collaborated with Canberra orchi-

dologists Mark Clements and David Jones, collecting DNA samples for a trans-Tasman study of genera.

I still remember the smell of formaldehyde emanating from Brian's room, which held jar after jar of preserved orchids and other species, arguably allowable in those days before modern Health and Safety practices. His office was well-equipped (Fig. 5), and I recall Brian spending many hours looking down a microscope identifying wood charcoals in soils, another of his many interests. This work revealed a widespread pattern of fires in determining the pre-European vegetation of the eastern South Island.

Fig. 2 Brian inspecting a New Zealand myrtle (rōhutu, Lophomyrtus obcordata) in flower outside the now demolished Godley Building, Lincoln, 2009 (photo: Murray Dawson).

When not in the office, herbarium, library, or plant nursery at Lincoln, Brian spent extensive time undertaking fieldwork (so much so, that he is missing from many of the staff photographs). He initiated surveys of the foothills and mountains of South Canterbury, including Peel Forest, and also conducted fieldwork on the Chatham Islands.

Brian was an outstanding communicator, freely sharing his knowledge and captivating audiences, be it explaining to a group in the field the differences between mānuka and kānuka or delivering a keynote speech at a conference. However, he was no academic elitist; Brian's common-sense and forthright manner (and without doubt his time as an All Black in 1957) were major assets when speaking to farmers about the potential for covenanting blocks of their land under the Queen Elizabeth II National Trust scheme. Brian is reported to have said that "Time spent around the kitchen table or looking at a wetland at the back of the farm results in much bigger gains for conservation than publications in scientific journals." He was a director of the QEII Trust from 1989 to 1998 and served as their high-country representative until 2012.

Brian served on the Riccarton Bush Trust Board for 44 years, managing this indigenous mixed podocarp forest remnant within Ōtautahi / Christchurch City, and the only remaining example of this forest type on the Canterbury Plains. He was instrumental in the installation of boardwalks and eliminating mowing to encourage regeneration of the bush, and in erecting a predator proof fence. Thanks to Brian's efforts, Riccarton Bush is now a much healthier ecosystem.

He served on many other boards and committees, including the North Canterbury Catchment Board, the South Canterbury Land Settlement Committee, and other parks and reserves committees.

In addition to being a leader, Brian was also an outstanding mentor, and very supportive of up-and-coming researchers and other professionals.

Brian had a remarkably varied and interesting life. As an example, he answered the call to be a horseman as an extra in the 'Lord of the Rings' movies. With his grizzled features being perfect for the part, I suspect that little make-up was required.

Brian openly shared his home life with his colleagues, unlike perhaps many of that generation. He was a proud and supportive family man. I know that it was very difficult to give up on their long-standing family home in Darvel Street (Riccarton, Ōtautahi / Christchurch) due to extensive damage from the 2010–2011 Canterbury earthquakes. This corresponded with a decline in health of his wife Barbara, and both events weighed heavily on Brian. He lost Barbara in 2016 and his son Michael in 2014; Brian is survived by daughters Sally, Jane, and Sue. Nevertheless, Brian adapted well and made the best of moving into Ngaio Marsh Retirement Village, which suited his gregarious nature.

He remained active in research right until the end, almost reaching the age of 92. Brian passed away during the COVID-19 pandemic,

Fig. 4 The spider orchid genus Molloybas, now treated as a synonym of Corybas cryptanthus (photo: © Ian St George).

Fig. 3 The potato orchid Gastrodia molloyi (photo: © John Barraclough, CC-BY-NC, via iNaturalist).

and it was this virus that he succumbed to. At the funeral, Brian was well remembered by eulogies delivered by Professor David Norton and Dr Peter Heenan covering his academic career, and his daughter Sally who spoke of family life and his time playing rugby for Canterbury and the All Blacks. Sue Molloy delivered the main eulogy. On display in the foyer were his numerous awards and recognition received from many organisations.

Recognition from the Royal New Zealand Institute of Horticulture (RNZIH) came in 2007, when Brian was awarded an Associate of Honour. Shortly before his death, Brian was proud to learn that his daughter, Sue Molloy, a botanical horticulturist at the Christchurch Botanic Gardens, was also recognised by the RNZIH in receiving a Fellowship.

Because he is so well known, obituaries have been published for Brian by several groups and organisations for which he had influence. Peter Heenan, David Norton, and Sue Molloy published a comprehensive remembrance for Brian in a 2022 edition of the *New Zealand Journal of Botany*.

A long life well lived, and to use his own, perhaps politically incorrect phraseology, Brian really was a "bloody good bugger."

Awards and Honours

1990: Loder Cup, Department of Conservation, New Zealand's premier conservation award, for work on native plants and conservation.

1992: Community Service Award, Christchurch City Council.

1995: Civic Award, Christchurch City Council, in recognition of civic and community services.

1995: Charles Fleming Award, Royal Society of New Zealand, for environmental achievement.

1997: Officer of the New Zealand Order of Merit (ONZM), for services to conservation.

2000: Federated Farmers Award, for contributions to the science, land and people of the high country.

2006: Lifetime Conservation Achievement Award, New Zealand Plant Conservation Network, for contributions to native plant conservation.

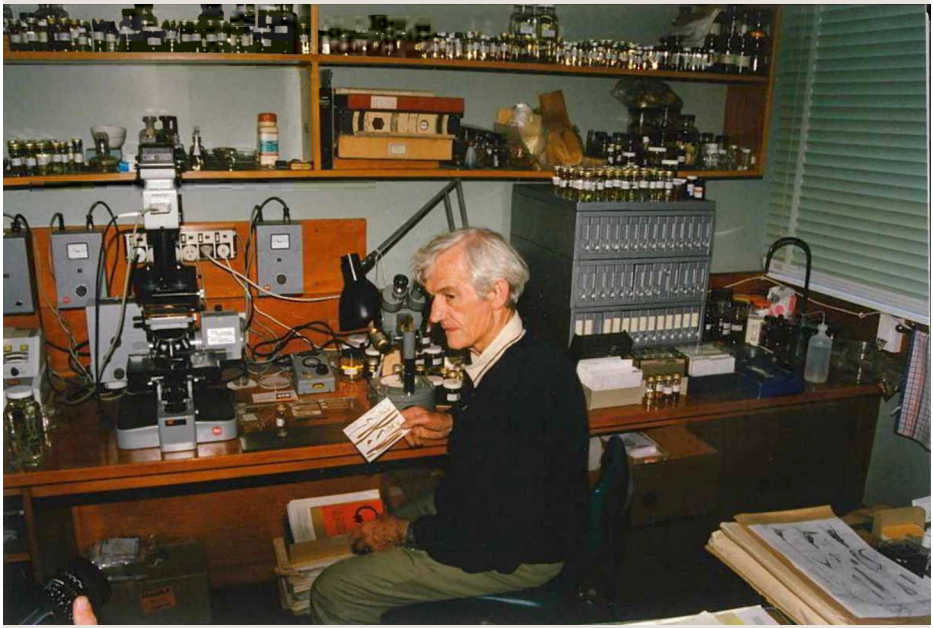

Fig. 5 Brian Molloy's office at DSIR Botany Division in the 1980s. On view are his 'tools of the trade', including compound microscope, microscope slide collection (in grey cabinet), herbarium specimens, and numerous vials and jars containing preserved plant parts. Photo: Jim Miles/Bill Rennie, © Manaaki Whenua – Landcare Research.

2007: Associate of Honour, Royal New Zealand Institute of Horticulture.

2010: Bledisloe Trophy, Canterbury Botanical Society, for contributions to New Zealand botany.

2011: Companion of the Royal Society of New Zealand, for the promotion and advancement of science and technology.

2011: Hatch Medal, New Zealand Native Orchid Group, for outstanding contribution to orchidology in New Zealand.

2014: Allan Mere, New Zealand Botanical Society.

2014: Civic Award, Christchurch City Council.

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Fig. 6 The Cook Strait kōwhai (Sophora molloyi Heenan & de Lange), named for Brian Molloy in 2001, and described by author Peter Heenan as being "as tough as old boots" and like its namesake, hardy in all extremes of weather (photo: P.B. Heenan, © Manaaki Whenua – Landcare Research).

Original Papers

What's in a name? the pink fingers orchid

Ian St George

Who called it that? I am no lover of rarely used "common" names but this may be a classical allusion – rather like *Corybas*, who in Greek mythology gave his name to the Corybantes, or dancing priests of Phrygia.
Dawn appears many times in Homer's *Iliad* and *Odyssey*, and the same line is repeated every time: *emos d'erigeneia phane rhododaktulos eos*: "when early-born rosy-fingered Dawn appeared" or "when Dawn touched the sky with pink fingers". Different things will happen every day, but Dawn always appears, always with pink fingers, always early. It is reliable: rhythmic for the orator and reassuring for the listeners. Similarly, the sea is always "wine-dark".

The pink fingers of the dawn goddess. Detail from Sebastiano Ricci (1659–1734), Aurora y Thyton [Aurora and Tithonus]. Museo Nacional de Bellas Artes, Buenos Aires, Argentina. Image via Wikimedia Commons.

The amorous goddess of the dawn, Eos, abducted the beautiful singer Tithonos to be her youthful lover—but she couldn't stop him from growing old, from losing his youth and beauty. Eos on the other hand was the ever-beautiful dancer, fired by the pink energy of the dawn's early light.
The seventeenth century Italian painter Sebastiano Ricci showed the delicately dancing fingers of the dawn goddess Eos, known in Latin as Aurora. Homer's epithet, rhododaktulos, is very apt: the divine Eos (with her rose) is pink fingered Dawn.
If indeed we have several taxa currently included in our small pink caladenias, I hope one will, one morning when the sky is touched with the pink fingers of Eos, be called "*Caladenia rhododactula*".

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On Behalf of Native Plants

Mike Lusk

Bill Campbell and I did a road trip from St Arnaud to Queenstown via Arthur's Pass and the Catlins, finding many orchids, with Mark Moorhouse's advice being of great help. One of the few downsides was seeing the widespread use of herbicides on track and roadside, both excellent orchid habitat.

It seems to me that while herbicides certainly have a place, their use is far too often ill-considered and profligate, perhaps because it is applied by contractors working to a protocol. Roadsides are arguably unsafe for orchid hunting especially when there are narrow verges but even then I think the risk is more theoretical than actual. It is arguable that spraying roadsides is the most efficient method of managing vegetation intrusion.

Tracks are shorter and safer. Many of the tracks we walked had been 'nuked' (an old DOC term for defoliating such places) even in sections where the vast majority of plants coping with the reduced light levels would have been natives including orchids. I don't blame contractors, who will not be paid if they don't meet the standards, but I do wish that DOC would work on less destructive ways of, as one DOC person said to me, 'giving the users a good experience'.

I should perhaps add that I am a great admirer of DOC which has limited funding, much of which seems not to get to the coal-face.

Pic 1. The lower part of a tree fern trunk

Pic 2. Distorted Pterostylis

Pic 3. Trackside Corybas, the lower part damaged by herbicide.

The inbox

Orchids were hard to find on the tracks leading up to the Queen Charlotte walkway from Lochmara Cove on 2 October. A form of *Pterostylis graminea* was just in flower, *Pp. cardiostigma, banksii* and aff. *montana* were not yet flowering and *P. alobula* was in seed: as was *Acianthus sinclairii.* The odd *Microtis* was above ground but not yet flowering. Then it rained. That was about it.

Ian St George

The inbox

▲ The Waimārama Brook Sanctuary once again showing off its fantastic orchid diversity with this *Pterostylis banksii* — *Rebecca Bowater, Nelson*

The inbox

Pterostylis trullifolia rosettes peeking through the leaf litter ►—
Laurence Porter, Wellington

We were all delighted, in 2019 in the Hollyford valley, to find good colonies of *Corybas acuminatus* ◄ ▼. What's interesting is that many of the flowers on the bigger leaves lacked the long filiform extension of the dorsal sepal. You can see it typically below: the left and rightmost plants are small and have filiform dorsals, the three larger central have merely acuminate dorsals. Why? - *Ian St George*

Original Papers

How is climate change affecting our orchids?

Joe Dillon—MSc student at Victoria University of Wellington
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Recent reports suggest that 2023 may shape up to be the hottest on record. In New Zealand, the average temperature has risen more than 1°C since 1850, a rate much faster than historical changes over thousands of years (Macara et al., 2020). Furthermore, recent decades have witnessed the hottest global temperature in 11,300 years (Marcott et al., 2013). What might this mean for our orchids, and what might we expect to see in the future? Exactly how climate change affects flora and fauna is an emerging field, but a lot of work has been undertaken since the 2000s. Here, I'll introduce the topic, focussing on orchids. Check out my article on ***page 26****, where I outline my MSc topic and extend a request for help to group members.*

Introduction

Overseas studies on climate change and plants have focussed on changes in two things:

1. Species Distributions: Climate change could reshape where our species occur. This is because every species exists within a 'climate envelope': the range of temperature and precipitation (among other variables) it can survive in. As the average global temperature increases, the locations where species can exist within their envelope is changing. On the warmer edges of distributions, plants will experience more stress, making populations more difficult to sustain, potentially causing them to decline. On the other hand, on colder edges conditions could become more favourable, causing population growth. As these two factors combine, the average distribution of most species will move closer to poles and higher in altitude. Many species have been observed shifting, with the majority moving in this expected direction (Parmesan & Hanley, 2015).

2. Flowering times: Climate change is making plants flower earlier. This is because plants use temperature to cue flowering. In most species, ambient temperature reaches a certain threshold, after which bud development occurs (Capovilla et al., 2015). Then, during development, further changes in ambient temperature continue to influence when flowers finally open (Capovilla et al., 2015).

Corybas cheesemanii

These responses may have evolved to restrict flower timing to roughly the same time every year. However, climate change is causing these temperature cues to occur earlier on average, advancing flowering times. In the past this has been demonstrated using changes in the first record of flowering every year (Parmesan & Hanley, 2015), but more recently the dates of herbarium records or even iNaturalist observations have been used (Williams et al., 2021).

New Zealand Orchids

How could these two changes affect *our* orchids? Based on overseas studies, we can expect to see changes in distribution (including expansion and declines) and mismatches with pollinators.

1. Expansion or decline: While the direction of distribution changes is relatively reliable, there are issues. Firstly, most distribution changes in terrestrial species occur slower than the changes in temperature that cause them (Doak & Morris, 2010). When this slow shift happens, or when geographical barriers or edges of habitats prevent or slow populations from shifting, they may become isolated in unsuitable habitat, causing declines. In New Zealand, alpine and Southern-distributed species could be particularly vulnerable to this, because their movement could be restricted by the tops of mountains or by the bottom of the South Island. On the other hand, species from Northern areas that are more suited to warm climates could see their ranges expanding South and upslope. The more we understand these changes, the better our opportunity is to appropriately manage populations to minimise population and species loss.

2. Pollinator mismatch: In some species, flowering advancement could make it hard for some orchids to find pollinators. This is because on top of changes in flower timing, climate change may be changing the timing of insect life-cycles, which may not always correspond with the plants they pollinate (Vitasse et al., 2021). If this timing becomes decoupled, plants could start to flower at times when their pollinators are not active. For most plants this is fairly low-risk, because most plants have multiple pollinator species (Gérard et al., 2020), but this is not the case for all orchids.

While many of our orchids can be pollinated by many insects (Lehnebach & Robertson, 2004) or are capable of self-pollinating (St George, 1994), others have highly specific pollinators and must receive pollen from another plant. Currently, this includes all investigated New Zealand *Pterostylis* species (Lehnebach et al., 2005; Thalwitzer, 2015; Bodley et al., 2016), many *Corybas* (Lehnebach et al., 2016), *Gastrodia molloyi* (MacDonald et al., 2015), and possibly other uninvestigated species. For these species, most are pollinated by one species of insect, which is a high-risk '*putting all of your eggs in one basket*' strategy. If their timing becomes out-of-sync with their pollinators, they may not be able to successfully produce fruit as often, reducing recruitment of new individuals into populations (Gérard et al., 2020). This could also make these species less equipped to move in response to changes in their habitat. Unlike distribution changes, phenological changes usually respond quickly to climate change because they are influenced by small changes within flower development (Capovilla et al., 2015).

*Check out **page 25** for details on my research, and how you can help.*

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The inbox

▲ The reward of multiple colonies of *Cyrtostylis oblonga* making the travel to Kuripapango worth it — *Cheryl Dawson, Hawkes Bay* ▼

Pterostylis porrecta appears to be expanding its range in the ▲ Porirua Scenic Reserve and at Waiorongomai. Pat notes that it seems to like being near mataī trees — *Pat Enright, Wellington*

The Type Locality

Caladenia lyallii from Otago's grassy hills

Dr David Lyall

Dr David Lyall had been a naturalist on the *Terror* when JD Hooker was on the *Erebus* during the Ross Antarctic expedition and they became lifelong friends. In 1895 Hooker would write Lyall's obituary [1].

After the *Terror*, Lyall served on the survey ship *Acheron* in NZ waters, "The *Acheron* left Wellington on her last expedition on the 28th November, 1850, since which period she has visited nearly every port on the S.E. and S.W. coasts of the Middle and Stewart's Islands" [2].

"Dr. Lyall, M.D., the Surgeon and Botanist, has made a large collection of birds, plants, and fossil remains; and large quantities have been sent home to the Lords of the Admiralty for the British Museum." [3].

Indeed so. Among the plants collected by Lyall in December 1850 was an entity Hooker would describe as *Caladenia lyallii* from no more specific a location than "grassy hills, Otago" [4]. The holotype is at Kew herbarium (next page). Hooker's description reads,

2. Caladenia *Lyallii*, Hook. fil.; radice tunicata, folio radicali anguste lineari, caule pilis patulis glanduloso medio 1-bracteato 1–2-floro, floribus bracteatis, sepalis lineari- v. obovato-oblongis acuminatis, labelli lobo intermedio brevi subulato recurvo.

Hab. Middle Island. Otago, *Lyall*.

A very much larger-flowered and stouter species than *C. minor*, with one to two flowers, each twice as large as in that species, and broad sepals, which are linear-oblong, or obovate and acuminate. (This is probably the *Caladenia* No. 4 of 'Flora Antarctica,' p. 70.)

It was Cheeseman who noted the "four rows of stipitate calli" on the labellar disc [5], a key feature in the recognition of the species ever since.

C. lyallii was regarded as endemic to New Zealand till Rüpp and Hatch wrote in 1946 [6] that *Caladenia alpina* (Rogers 1927 [7]) from Tasmania, Victoria and NSW was identical.

In 1996 Jones reinstated *C. alpina* and described a new, similar Australian species, *C. cracens* [8]. He noted that *C. lyallii* is generally more slender with smaller flowers and that "Florally *C. lyallii* can be distinguished from *C. alpina* by its squarer or more angular nearly oblong lateral lobes on the labellum, narrower sharply tapered labellum mid-lobe, sessile marginal calli and narrower (*c.* 2mm wide) non-tapered column. *Caladenia lyallii* can be distinguished from

C. cracens (also a slender plant) by its broader lamina calli on thicker stalks and sessile marginal calli on the labellum mid-lobe." Others have lumped all three back into *C. lyallii.*

Certainly there are, in the South Island at least, very robust plants with large flowers and "linear, somewhat irregular calli" on the lateral lobes of the labellum, that appear very like *C. alpina*.

North Island plants, on the other hand, are usually much more slender, and the flowers smaller. These differences deserve careful scrutiny—I think I can discern three forms: *C. lyallii* s.s., an even more robust South Island entity and the slender North Island plant. Or perhaps they are all the same, products of their habitat.

The *Acheron* left Wellington on 25 November 1850 for Port Cooper (Lyttelton), Akaroa and "Thence to Otago, where she lay about a month, our Christmas being passed in that settlement" [9].

▲ The Type specimen of "Caladenia Lyallii Hf. On grassy hills, Otago, N.Zld. December 1850. DL." at Kew.

Detail ►

One can assume with some confidence therefore that Lyall was in Dunedin in December 1850 and the "grassy hills, Otago" were those around Dunedin.

Indeed, every December those hills are still sprinkled with thousands of flowers of Lyall's caladenia. I have walked the Pineapple Track from Wakari up to Swampy Summit many times and it is especially well endowed.

References

1. Hooker JD 1895. David Lyall. *J. Bot.* 33: 209-211.
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3. *Wellington Independent* 5 April 1851 page 2.
4. Hooker JD 1853. *Flora Novae-Zelandiae 2* page 247.
5. Cheeseman TF 1906. *Manual NZ flora* page 688.
6. Hatch ED, Rüpp HMR 1946. *Proc. Linn. Soc. NSW* 70: 57.
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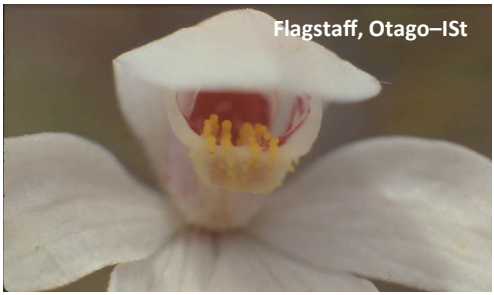
8. Jones D 1996. *Muelleria* 9: 41-50.
9. *Star* (Christchurch) 10 July 1926 page 20.


Shag Point Otago–ISt


Flagstaff, Otago–ISt


Flagstaff, Otago–ISt

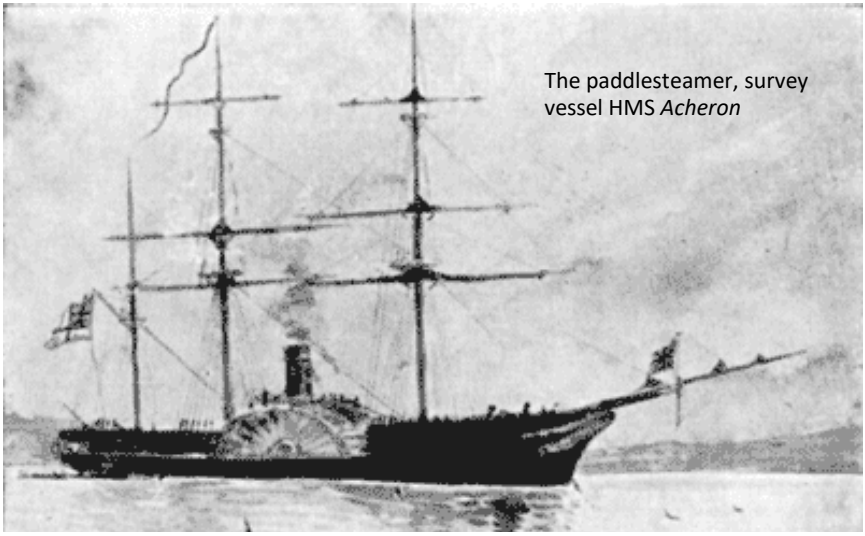

Iwitahi–Mike Lusk

Paul Maurice photographed this unusually coloured form on the Otira Valley track on 3 January 2015 and posted it later to *iNaturalist.*

In 1990 the Group published a photograph by Max Gibbs of two forms of *Caladenia lyallii,* clearly showing differences. —St George & McCrae 1990. *The NZ orchids….* Plate 6, Fig.20.

In the NZNOG *Newsletter* no.2 (June 1982), Lyn Young of Mosgiel wrote, "Specimens on Pineapple Track (last season) only half the size of the ones from Swampy. These areas are both on the same range of hills, only about 2km apart, but Swampy is about 400–600ft higher." Dorothy Cooper replied, "Specimens of this species in the Wellington area are also much smaller at lower altitudes."

For superb photographs of a Tasmanian version, CTRL-CLICK on
https://tasview.com/2021/10/21/white-orchids/



The paddlesteamer, survey vessel HMS *Acheron*

The inbox

◄ *Corybas cheesemanii* and ▼ *Corybas trilobus* agg. flowering in July near Ngāruawahia— *Hui Syn Chan, Waikato*

▼ *Corybas walliae* flowering in July near Ngāruawahia— *Hui Syn Chan, Waikato*

Original Papers

Climate change and New Zealand Orchids

Joe Dillon—MSc student at Victoria University of Wellington

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Next year, I'll be undertaking research on the potential impacts of climate change on our orchids (see ***page 14****, where I introduce this topic), as part of an MSc at Victoria University, supervised by Dr. Carlos Lehnebach and Dr. Peter Ritchie. I have attached a list of the species I am using in my study below this article. For this, I have tried to pick from diverse genera, with each species having many records on iNaturalist and in New Zealand herbaria, as well as having high taxonomic consensus. I have also included species with a variety of pollination strategies, including selfers and outcrossers, generalists and specialists.*

In my thesis, I will be investigating two main aspects of climate change impacts. These are changes in species distributions and flowering times.

1. Species Distribution: I will be investigating potential changes in the distributions of these 25 species by constructing Species Distribution Models (SDM). This is a model of the ideal habitat of a species, which I will derive from the collection locations of iNaturalist and herbarium records. Based on the ideal habitats in this model, I can predict a response under future climate change scenarios. This will provide valuable information for understanding where each species may be able to survive in the future, and what habitats are high priority for protection, and if needed, restoration.

2. Flowering times: To investigate changing flowering times, I will be using dates from iNaturalist and herbarium records to reconstruct a history of flowering dates of 25 species over the last 163 years. For some of this period, weather data is also available. Using these combined data, I will determine whether each species' flowering time has changed, and whether this change appears to be related to temperature. With this data, I will be testing changes using linear models, such as the one graphed on the following page (*Fig. 1*).

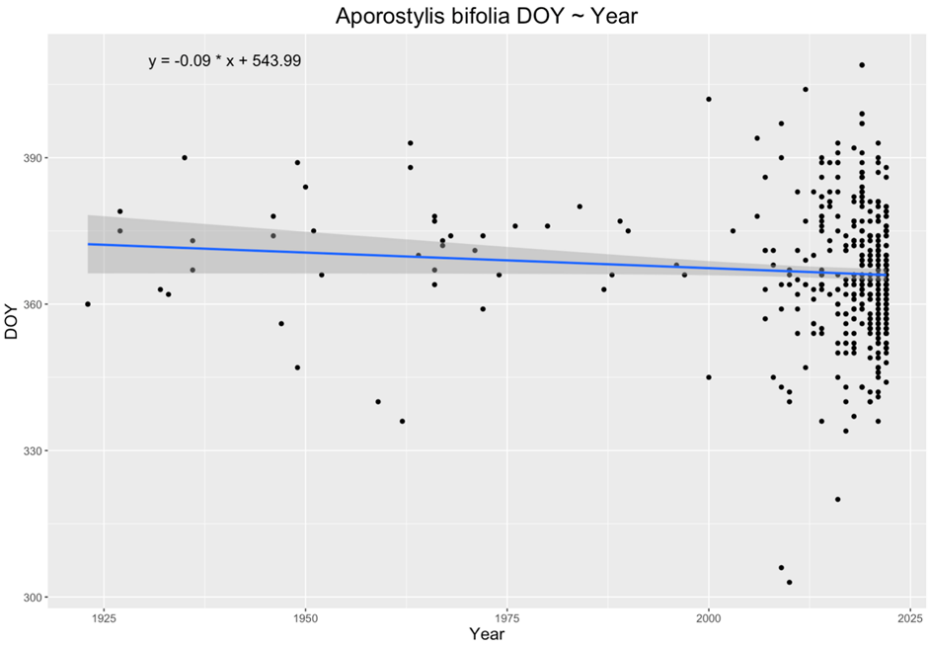

Fig. 1: A scatterplot, with Year of observation against the Day of Year (DOY). While this is a preliminary result, the regression line shows that flowering is occurring a mean of 9 days earlier than in 1923, a change of 0.09 days/year. Another analysis showed an increase in this rate since 2000, with an advancement of 6.21 days in 23 years, or 0.27 days/year.

Note: DOY is over 365 because the flowering season overlaps the New Year.

How you can help

For both analyses, I need lots of data. For the last ten years (particularly the last three) there is plenty, thanks to 1,800 iNaturalist users that have uploaded over 32,000 observations to the website. In addition, orchids are well-represented in our three main herbaria – WELT at Te Papa, CHR at Manaaki Whenua Landcare, and AK at the Auckland War Memorial Museum – giving me historical data dating as far back as Banks' and Solander's first collections in 1769. Currently data is aggregated, with many of the graphs that I have produced looking a lot like *Fig. 1*, with most data from after 2010.

I wish to extend a request of help to orchid group members for their records of orchids from the list at the bottom of his page*.** These can be contributed via photos, with matching exact dates and locations within five kilometre accuracy. For consistency's sake, these will need to be uploaded to iNaturalist. If you are not comfortable with locations being publicly available on iNaturalist, you can still contribute, while protecting locations. You can do this by selecting 'obscure location' on the observation upload page, which creates a random location within a large grid square each time the observation is viewed by someone else. Following this, you can give me access to these locations, ***by joining the project https://www.inaturalist.org/projects/climate-change-and-new-zealand-orchids and selecting 'trust'. By 'trusting' the project, you only allow me as the administrator to see the locations of the orchids, and only of the ones that I have selected to be part of the project (listed below). The location data I have access to is confidential. I understand that some members do not use iNaturalist. For these members I would be happy to help, ***you can email photos with dates and locations to*** wellyshungrybotanist@gmail.com, and I can upload them to iNaturalist for you.

In particular, I have substantial data gaps between 1980 and 2010. Any data, even outside of this time period, is very useful and will be gratefully accepted. For now, all records must have photo evidence, so that I can independently verify all records, and unfortunately I cannot use photos without dates or locations.

My focus orchids:

Acianthus sinclairii
Adenochilus gracilis
Aporostylis bifolia
Caladenia lyallii
Chiloglottis cornuta
Corybas acuminatus
Corybas cheesemanii
Corybas macranthus
Corybas oblongus
Dendrobium cunninghamii
Drymoanthus adversus
Earina autumnalis
Gastrodia cunninghamii
Gastrodia sesamoides
Orthoceras novae-zeelandiae
Pterostylis alobula
Pterostylis agathicola
Pterostylis brumalis
Pterostylis irsoniana
Pterostylis patens
Pterostylis trullifolia
Thelymitra carnea
Thelymitra cyanea
Thelymitra nervosa
Waireia stenopetala

J Dillon

The inbox

◄ *Corybas vitreus* from Aongatete, flowering in September— *Hui Syn Chan, Tauranga*

▼ *Corybas* sp. flowering near Rotorua— *Hui Syn Chan, Rotorua*

The Hatch Medal 2023

Gael Donaghy

I was delighted to award Bill Campbell the Hatch Medal for his outstanding contribution to The NZ Native Orchid Group. What do I know about Bill?

- He has been a member since .....
- I know he lives a life of service to others - whenever I contact him he is always busy with NZPCN, his church, his volunteer work, etc.

He is willing to put his hand up when something needs doing.
So our decision to award Bill the Hatch Medal is based on the following...

"Bill Campbell intruding into the personal space of the humble and noncontroversial Corybas trilobus"

1. As our Regional Contact person for Northland, he is always willing to show people the orchids that grow there. We have been recipients of his time when we visited the north, and I know other members have too. Bill's wider knowledge of the NZ flora enabled him to share some of the other special plants with people.

2. Bill organised and hosted the AGM and days in the field at Hauhora in 2020 where seventeen of us dined in style at the Big Game Fishing Club, and searched roadsides, swamps and bush for orchids. We found some of the Northland specialities in flower like *Cryptostylis subulata* and *Calochilus herbaceous.*

3. Bill adds to our knowledge of orchids, and is a loyal contributor to our Journal. An example of this is his recent article in Journal 169, South Island Orchid Odyssey, extending the range southwards of *Corybas obscurus.*

4. And to his latest contribution to NZNOG - a brand new website! I hope you have all had a look at it? Bill has spent a lot of time working on this, once the website developer Robin Sallis, had provided the design. As our webmaster he has had to devote many hours to getting the details right, and the photos uploaded. He is very responsive to feedback, and has taken on board the comments that have come since the site went live. This is such an advance for us, because no matter how good the old site was, we could not update it.

It is dedicated members like Bill, who put in countless hours in the service of NZNOG, who enable our group to fulfil its objectives of education and conservation, and to make information on orchids available. His role of webmaster with the NZ Plant Conservation Network also adds value to his work with NZNOG. The launch of the new website on Monday 25th September marks a milestone in the life of NZNOG. Our heartfelt thanks go out to Bill– he has done a superb job.

Upcoming Events

***SOON*—**Voting for New Zealand's favourite plant 2023.

***24 November 2023*—**Annual Red Bearded Orchid Survey (Department of Conservation), ROTORUA.

7 & 9 December 2023—WELLINGTON Botanical Society Field Trip, Rātā Walk, Lower Hutt.

9 December 2023—CANTERBURY Botanical Society field trip to Castle Hill (with the Nelson Botanical Society).

***1 January 2024*—**Registrations open for New Zealand Plant Conservation Network Conference (to be held in October).

20-27 January 2024—Wellington Botanical Society Summer Camp, RUAPEHU.

***31 January 2024*—**Deadline for NZNOG Journal (J172) submissions.

***2 February 2024*—**World Wetlands Day.

***3 March 2024*—**World Wildlife Day.

***22 May 2024*—**International Day for Biological Diversity.

6-9 October 2024—WHANGAREI, New Zealand Plant Conservation Network Conference.

A new article on Te Papa's blog, discussing progress in *Corybas carsei* conservation efforts. Check out the full article https://blog.tepapa.govt.nz/2023/08/09/our-swamp-helmet-orchid-is-a-step-closer-to-find-its-perfect-partner/?mc_cid=e6acb84a9f&cn-reloaded=1

Corybas carsei protocorm

The inbox

Editor's top picks from recent iNaturalist observations

▼ *Corybas papa*

Corybas acuminatus ▲

2024 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/

CLS