Newsletter

Australasian Systematic Botany Society

No. 202 June 2025

Previous issue No. 201 published: 24 January 2025 (print), 16 January 2025 (digital)

In this issue

From the President

Katharina Nargar

Preparations for the next ASBS conference 'Next Generation Botany' are in full swing. The conference will be held from 2–6 November at the University of New England in Armidale, NSW. The key events for the conference have been finalised and consist of a pre-conference workshop 'Wiki for Botanists', three days of scientific program including the 2024 and 2025 Nancy T. Burbidge lectures, the conference dinner, and a post-conference field trip. The 2025 Conference web page will soon go live, and members will be able to register and submit abstracts online. We are using Humanitix to manage the ticketing for this conference, so we didn't have to purchase an expensive plug in or develop further inhouse functionality for the website, which would have been expensive. Their pricing was very competitive as we qualify as a charity and our fees were reduced significantly, also 100% of profits from the booking fees go to charity. Please refer to the ASBS website for more information. Many thanks to Andrew Thornhill and team for organising this year's ASBS conference.

The ASBS Annual General Meeting (AGM) will be held in conjunction with the conference on the 5th of November, as a dual event to allow attendance in person and online. Council will provide more details on the AGM closer to the date.

As in previous years, the Student and Early Career Researcher (SECR) subcommittee will be organising a suite of activities for students and ECRs in conjunction with the ASBS conference to foster new connections and networking. If you are interested to get involved, please contact Patrick, Tim and Paulo via ecr.asbs@gmail.com. Please note that the SECR subcommittee are still inviting self-nominations for joining the subcommittee to achieve broader diversity.

Congratulations to the two successful recipients of this round of Hansjörg Eichler research grants, Luke Vaughan (University of Melbourne) and Andrew McDougall (University of Adelaide). I wish you all the best for your research projects on the systematics of *Peziza* (Acomycota) and taxon delimitation in the *Caladenia reticulata* complex (Orchidaceae) respectively.

I also wish to extend my heartfelt congratulations to our dear colleague and friend Ilse Breitwieser, Nancy Burbidge Medallist 2018, on her recent retirement which was celebrated at the Allan Herbarium recently. Among Ilse's manifold career achievements and contributions to the Society, Ilse has been instrumental in fostering closer relationships between Australian and New Zealand plant systematists, which found its manifestation in the name change of our Society from 'Australian' to 'Australasian' Systematic Botany Society in 2011. A big thank you to Ilse and best wishes for your future adventures!

Last but not least a big thank you to Helen and all contributors to this newsletter for another well-rounded edition.

All the best,

Katharina

ASBS 2025 Next Generation Botany Conference

Conference web page to launch soon!

More info at https://asbs.org.au/

2–6 November 2025, University of New England, Armidale, New South Wales, Australia.

Sunday 2 November	**Workshop**: Wiki for Botanists (9 am–4.30 pm) (max 25 participants, registration required) **Registration mixer** at Welder's Dog Brewery (around 5pm).
Monday 3 November	**Conference sessions day 1** **Opening keynote talk:** Dr Hervé Sauquet, Head of Plant Discovery and Evolution Research, National Herbarium of NSW, Botanic Gardens of Sydney Student and ECR mixer (6–9 pm) details TBA.
Tuesday 4 November	**Conference sessions day 2** 2024 Nancy Burbidge Lecture (Dr Karen Wilson) **Keynote speaker:** Dr Francis Nge, Systematic Botanist, National Herbarium of NSW, Botanic Gardens of Sydney **Conference dinner** at New England Regional Art Museum (6 pm).
Wednesday 5 November	**Conference sessions day 3** 2025 Nancy Burbidge Lecture (TBA) **Keynote speaker**: Dr Helen Kennedy, Identifications and Living Collections Botanist, Australian National Herbarium, CSIRO ASBS Annual General Meeting (4 pm)
Thursday 6 November	**Field trip** (8 am–approx. 5 pm) Dorrigo National Park Crystal Showers Walk, details TBA

From the Editor

Helen Kennedy

Welcome to Issue 202!

If it feels like it's been a little longer than usual between issues—you're not imagining things. Earlier this year, I proposed to the ASBS Council that we reduce the number of newsletters from four to three per year. The council were supportive, noting that if circumstances change, we can always return to a quarterly schedule.

Here's why we made the change:

Sustainability: Producing three issues per year is simply more manageable. I want to commit to delivering the newsletter consistently for the next five years, and this schedule makes that possible.

Reflecting Reality: In three of the past five years, we've only published three issues anyway.

Evolving Role: The newsletter serves a different purpose today than it did 20 or more years ago. Back then, it was the primary vehicle for sharing information with members. Now, with so many ways to communicate, the newsletter's role has shifted to one of storytelling, engagement, celebration, and record-keeping. Its value lies more in quality than frequency.

If this issue is anything to go by, the focus on quality over quantity is paying off. My goal is for each issue to feel like an event—something worth waiting for—and the contributors to this edition have truly delivered!

Continuing the theme of change, this is our first issue published exclusively online at the ASBS website. I've kept the format familiar and ensured it works well on both screens and printed pages. Still, I welcome any feedback—this is an area I'd love to keep improving.

I thoroughly enjoyed reading the contributions in this issue. A standout for me was Heidi Meudt's tribute to Ilse Breitwieser as she retires, highlighting her remarkable career. One quote particularly stuck with me:

"[Ilse] firmly believed that plant systematists need to stick together to continue advocating for our research, together."

To me, that perfectly captures the spirit of ASBS. A community newsletter running strong for over 50 years? That's some mighty powerful glue.

Enjoy the read!

From Buzz Hoot Roar

Dr Roger Charles Carolin (1929–2025)

Peter Weston, Janice Hughes, Karen Wilson, Barbara Briggs, Betty Jacobs, Belinda Pellow and David Keith

Dr Roger Charles Carolin, former Associate Professor in the School of Biological Sciences at the University of Sydney, died on 3 February 2025 at his home 'Oak Park' near Berry on the South Coast of New South Wales. Roger (Ruari to some of his closest friends) was a giant of Australian systematic botany in the late 20th century, contributing significantly to our knowledge of plant taxonomy, plant phylogeny, floristics, biogeography and ecology, as well as to botanical collections, systematic methodology and, perhaps most importantly, botanical education.

Roger was born in London on 15 October 1929. He grew up in Kingston-on-Thames, hoping to become a farmer and discovered that a career in botany was about as close as a London boy could approach such an occupation in Britain. In 1952 Roger completed a Bachelor of Science degree with Honours at the Imperial College of Science and Technology, University of London, then enrolled in a PhD, also at the same university, based at the Royal Botanic Gardens Kew.

By 1952 the 'new systematics', focussing on microevolutionary processes, population genetics and experimental studies of reproductive biology had become highly influential, especially in universities, and Roger shared that movement's explicit aim of improving the scientific rigour of plant taxonomy. The subject of Roger's PhD project was the systematics of the genus *Dianthus* (Caryophyllaceae), using diverse sources of evidence including experimental studies of hybridisation, cytogenetics and anatomy.

When he was close to finishing his thesis Roger was offered a job as a lecturer in botany at the University of Sydney. The University of London's rules specified that every PhD candidate must defend their thesis in-person but Roger sailed for Sydney on a new adventure without doing this. Undeterred by the set-back of leaving the U.K. unrewarded after three years' work, Roger enrolled in a PhD at the University of Sydney on the floral morphology of the Campanulales and finished it successfully.

As you can see from the accompanying list of Roger's publications, he went on to publish, as sole author or co-author, 36 papers on the morphology, anatomy and systematics of the families Geraniaceae, Goodeniaceae, Stylidiaceae, Campanulaceae, Poaceae, Plantaginaceae, Chenopodiaceae, Cyperaceae, Rutaceae and Portulacaceae; five papers on the ecology and phytogeography of coastal heath in eastern Australia; two papers on botanical history; numerous taxonomic treatments for regional Floras; five editions of the *Flora of the Sydney Region*; two books and various articles popularising knowledge of the Australian flora. In particular, he left his mark on Goodeniaceae, which he wrote up for the *Flora of Australia,* describing more than 60 previously unrecognised species of *Goodenia* and 16 of *Scaevola* as well as the genera *Coopernookia* and *Nigromnia* (the latter now included in *Scaevola* – Shepherd

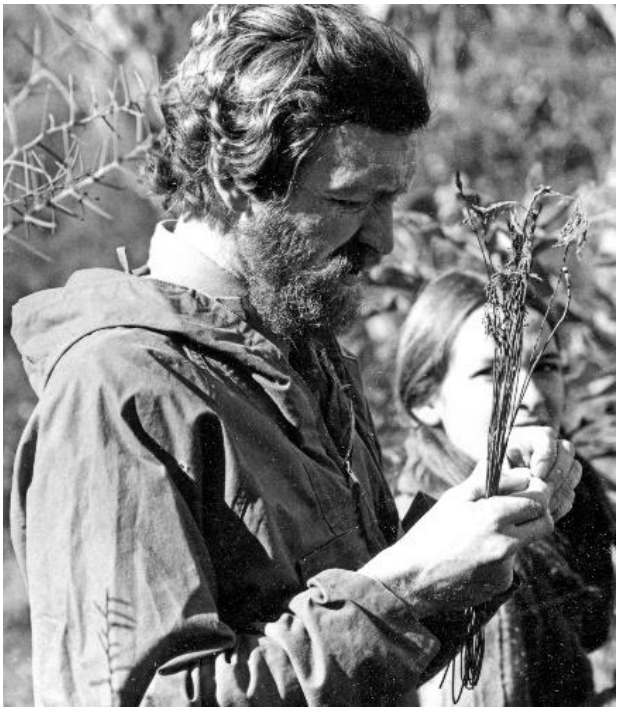
et al. 2020). He investigated the morphology of the inflorescences, flowers and fruit and contributed to the familial and generic classification, recognizing that *Brunonia* (then separated as Brunoniaceae) was deeply embedded. His cladistic analysis of the family was the first such analysis by an Australian botanist—another research technique of which he was an early adopter.

There is no need to replicate David Morrison's excellent assessment of Roger's contribution to science (Morrison 1989) but we do feel it is appropriate to emphasise that Roger's greatest contribution to the progress of Australian plant systematics has been through his teaching and influence on former students. Roger was determined from the outset to treat plant systematics as a branch of biological science, in which hypotheses of relationships are rigorously tested using empirical evidence: observations (in the field and laboratory), analytical inference and, where necessary, experiments. He was always ready to use new techniques in his research, as reflected in his comment to David Morrison: 'If you stop being willing to accept new ideas then, as a scientist, you're dead.' At the same time, Roger was keenly aware of the importance of field knowledge of plants, both in systematics and ecology. He organised many local excursions for his B.Sc. students in collaboration with other Botany Department staff. For his own research, he travelled more widely. Trips were often with his research students: notably with Surrey Jacobs in tropical and central Australia, with Peter Clarke in NSW coastal habitats, central Australia with Charlie Carter, and the Snowy Mountains with Barbara Briggs and Jim Peacock. In 1970, soon after a new plant ecologist, Peter Myerscough, arrived at Sydney University from England, Roger and Surrey took him on an epic trip through western Queensland to the Kimberley and Pilbara and back through central Australia. All three recalled that trip as foundational to their careers and understanding the character of Australia. The Myall Lakes area north of Port Stephens, NSW, was the focus for ecological research by Roger, Peter Myerscough and several students including David Keith and Anne Clements. Roger was a natural philosopher who loved good ideas. His philosophical interests were broad, ranging in the history and philosophy of science from Karl Popper's critical rationalism and Paul Feyerabend's methodological anarchism to Thomas Kuhn's paradigms. However, his philosophical investigations went much further than that, to ethics, comparative religion and panpsychism. His eclectic interests, extraordinary memory for detail and ability to blend knowledge and anecdotes across history, the classics, science and his own experiences made him an exceptionally creative thinker, a disciplinary trail blazer, a peerless teacher and an intriguing conversationalist.

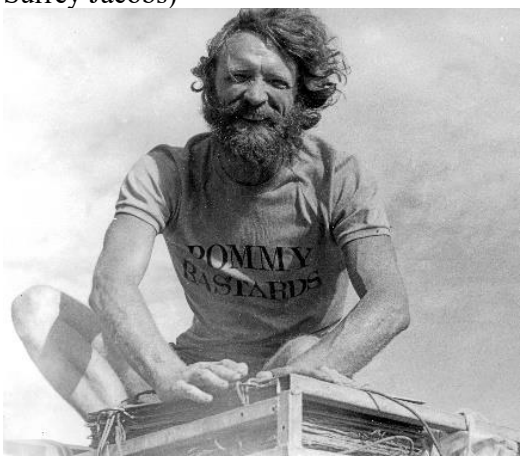
Roger drying specimens near Broome. Consideration of occupational health and safety was limited in 1970! (Photo: Surrey Jacobs)

Roger with Janet Carolin (left) and Marie Burton (right) at the USYD Botany Department Christmas party, 1970. (Photo: Surrey Jacobs)

David Curtis, Roger and John Ford in the John Ray Herbarium (SYD) *c.* 1970. (Photo: Surrey Jacobs)



Roger identifying a restiad, with Judy Hufton (later West) in background, on a Sydney class excursion, *c.* 1970. (Photo: Surrey Jacobs)



Roger tying down a plant press on top of the vehicle, near Borroloola, May 1974. (Photo: Surrey Jacobs)

His students were infected with his enthusiastic intellectualism. We also remember times with him that were great fun, among them dancing Strip-the-willow up and down Sydney University's Science Road to the sound of Roger's accordion and, later, the Botany Bush Band. We dispersed widely from Sydney, collectively infiltrating many Australian herbaria and universities, some of us coming to occupy senior positions in them, and some to scientific institutions beyond Australia's borders. Many others went on to encourage others in botany and scientific methods in the education sector as teachers or field guides and in government organisations such as national park services.

Roger played an active role in ASBS in its early days, as a founding member, President (1976–1979), Vice-president (1979–1981) and as co-convener of the Sydney chapter in the 1970s. He was awarded the Nancy Burbidge Medal in 1990. His involvement in other societies and advisory committees are detailed in Morrison (1989).

Roger and David Keith at Tea Gardens wharf on the way to Myall Lakes, 1981. (Photo: Belinda Pellow)

Roger with Billarr Billarr Callistemon at home after winning Reserve Champion Female Red Poll at Sydney's Royal Easter Show 2002. (Photo: Janice Hughes)

In 1981, Roger had a mid-life crisis, during which he split up with his first wife, Janet, taught himself to ride a motorbike (he was an enthusiastic autodidact) and shot through to Bali for a motorcycle holiday there. This proved to be an unfortunate misadventure because, a couple of days before he was due to return to Sydney, he was confronted with an oncoming vehicle while avoiding people walking on the road edge. The head-on collision left him with multiple fractures between his right knee and his right shoulder. He was partly patched up by a local doctor and put onto a Garuda plane by forklift and tied down to the floor for the flight home (Qantas had earlier refused to honour his return ticket). More hospitalisation and a long convalescence followed.

In 1982 Roger married Diana Macnamara and they happily lived together at Woids Avenue, Hurstville, just around the corner from his former student and 'virtual brother'

Surrey Jacobs. Sadly, Diana and Janet were both diagnosed with breast cancer in 1987, which proved fatal for both of them.

From 1987 to 1992 Roger was President of the Australian Flora Foundation, on the committee of which he met Janice Hughes in 1988. Romance soon blossomed between them and Roger moved in with Janice, starting a 37 year relationship. After Roger retired in 1989, they moved to Berry to breed Red Poll cows, eventually buying a 150 acre property, 'Oak Park', at Jaspers Brush. Red Polls are a dual purpose breed that originated in England. Roger remembered them from the farm where he worked during WW2 as a teenager. He learned artificial insemination and used selective breeding and genetics to improve his herd, all animals bearing names of Australian plants. At local agricultural shows and the Sydney Royal Easter Show the commentators often had difficulty pronouncing names of the cows he entered. Roger's interest in genetics extended to breeding chooks. He and Surrey Jacobs shared an interest in Old English Game and Speckled Sussex breeds, and he showed and judged at many poultry shows. Some other passions included vegetable gardening, knitting and beekeeping, and in the 1970s he built his own spinning wheel. This was pre-internet so many phone calls and visits to the Jacobs family provided the research and experimentation required for these hobbies. We are reliably informed that he happily knitted jumpers on the train going to work at the height of that passion, ignoring the bemused stares of fellow passengers.

Karen Wilson, Roger and Janice Hughes at a Jacobs' sheep-roast near Bungonia, 2002. Roger wears one of his hand-knitted jumpers. (Photo Surrey Jacobs)

In his later years, Roger continued to subscribe to many online journals and never ceased researching varied topics including evolution, history, climate change, politics, quantum theory and the universe's consciousness. YouTube became a stimulus for him as he discovered lectures and programs expanding his idea of the Theory of Everything. He never stopped being a volunteer reader, editing pages for Project Gutenberg, which offers free online editions of out-of-print books. This often took him off on a tangent, researching a topic he had just discovered.

Janice Hughes, Betty and Surrey Jacobs and Roger on holiday at Gerringong, 2005. (Photo Betty Jacobs)

Roger was not interested in being celebrated at a funeral but loved a party, so he was delighted when his former Technical Officer Belinda Pellow, and former student, David Keith, organised three 'pre-mortem wakes' during the last ten years of his life, the last one six months before his death. When he died he was happy to 'become part of the Universe's consciousness'.

Roger is survived by Janice and his children, Ian, Lydia and Michael, his stepson Lachlan, three grandchildren, two step grandchildren and two great grandchildren. His botanical legacy lives on through his publications and his many students.

The 'Banksia Institute' started in 1981 as a social group consisting of students of Roger and Peter Myerscough. This photo shows a Banksia Institute planting at 'Oak Park' in 2015. Roger, Janice Hughes and Peter are sitting on the bench. Others (from left) Sue Weston, Tony Auld, Belinda Pellow, Euan Auld, Judy Scott, Nichola Auld, Andrew Denham, David Keith, Charles Morris, Ross Bradstock and partner, Peter Weston, Elenore Denham, Lisa Metcalfe. Dogs: Reggie and Stella. (Photo: Janice Hughes)

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Hansjörg Eichler Scientific Research Fund

Council is pleased to announce the following successful applicants from the most recent round of grant applications.

Luke Vaughan, a Master of Science student from the University of Melbourne for his project proposal:

'Systematics of the genus *Peziza sensu lato* (Pezizaceae, Ascomycota) in Australia'

Luke plans to build on existing ITS and LSU based phylogenetic analyses by performing genomic sequencing, and subsequent genome skimming of selected Australian taxa within the Pezizaceae to test species and generic delimitation for phylogenetic taxa and establish placement and support for Australian lineages within Pezizaceae. Luke was awarded AU $5,000.

Successful grant applicant Luke Vaughan.

Andrew McDougall, a PhD student from the University of Adelaide for his project proposal:

'A population level investigation into the genetic distinctiveness within the *Caladenia reticulata* Fitzg. species complex in South Australia.'

Andrew's research focuses on resolving species boundaries within the *Caladenia patersonii* R.Br. and *C. reticulata* Fitzg. species complexes in South Australia. He will use the awarded AU$4872 to fund a population level analysis using SNP genotyping.

Successful grant applicant Andrew McDougall.

News from the west

Juliet Wege, Western Australian Herbarium

Paulo Baleeiro Souza has recently joined the team at the WA Herbarium (PERTH) having completed his PhD on the Systematics of *Eriocaulon* at The University of Queensland as well as a stint at the Queensland Herbarium studying *Nymphoides* (Menyanthaceae) and curating assorted plant groups. His position is supported by Fortescue and will focus on resolving taxonomic issues in the Pilbara region and adjacent arid zone, including describing species of conservation concern and building taxonomic expertise in neglected groups. Paulo is on the lookout for research synergies and collaborations, so if you're conducting taxonomic research in the Pilbara or working on groups extending into Western Australia's arid zone, then please get in touch with him to let him know what you're up to.

Leah Seabourne has settled into her new role as Herbarium Botanist at Kings Park and Botanic Garden (KPBG). Established in 1962 and situated in a tiny building in the nursery, this small but significant collection includes vouchers for seeds and plants collected from across Western Australia for horticultural and conservation activities within the botanic gardens. To date, 21,578 collections have been databased, with a dataset of 18,053 records having been made available through the Atlas of Living Australia. Data capture is ongoing, with the collection thought to comprise more than 30,000 specimens (some of which are duplicated at PERTH). In addition to managing and curating this collection, Leah provides botanical training to staff, volunteers and the public, and assists garden staff with plant identification including within the gardens and bushland at Kings Park and Bold Park. She has been proactive in building connections with the team at the WA Herbarium and is looking to be an active member of ASBS.

Paulo Baleeiro Souza at PERTH. Photo: Juliet Wege.

Leah Seabourne at KPBG. Photo: Kirsty Chisholm.

Islands in the desert

The enigma behind the distribution of *Eriocaulon* in the isolated springs of the Great Artesian Basin

Hansjörg Eichler Scientific Fund report

***Paulo Baleeiro Souza**. Research Scientist. The Department of Biodiversity, Conservation and Attraction of Western Australia.*

Twelve Springs, Lake Frome supergroup, South Australia

Eriocaulon L. is a pantropical genus within the family Eriocaulaceae, which exhibits its highest diversity in South America, Africa and the Indian subcontinent (Giulietti *et al.* 2012; Leach 2017; POWO 2025). Among the various regions that have contributed to the diversification of this fascinating group, the Great Artesian Basin (GAB) stands out as particularly intriguing—at least for me.

Globally, *Eriocaulon* comprises nearly 500 species (POWO 2025), with 35 recorded in Australia (Leach 2017; Baleeiro *et al.* 2023). Most of them are endemic to the Monsoon Tropics; however, three species are confined to the artesian springs of Australia's arid and semi-arid zones. These springs, fed by the GAB, span a vast area from tropical and semi-arid Queensland to the arid interior of South Australia and New South Wales (Fig. 1). One of these species, *Eriocaulon carsonii* (Fig. 2A), is divided into three subspecies (subsp. *carsonii*, subsp. *orientale*, subsp. *euloense*), while the other two, *E aloefolium* (Fig.2B) and *E giganticum* (Fig. 2C) are microendemics to single springs (Fig. 1) at Edgbaston spring complex (Davies *et al.* 2007; Leach 2017).

The GAB is one of the world's largest artesian groundwaters systems, supporting hundreds of spring vents that vary widely in size and habitat type. These springs are ecological refugia, often exhibiting high levels of endemism and microendemism (Rossini *et al.* 2018). In this context, I draw a metaphorical comparison: the artesian springs are like *'islands in the desert'*, reflecting their ecological isolation and role as refugia for endemic species (Figs. 1 & 3).

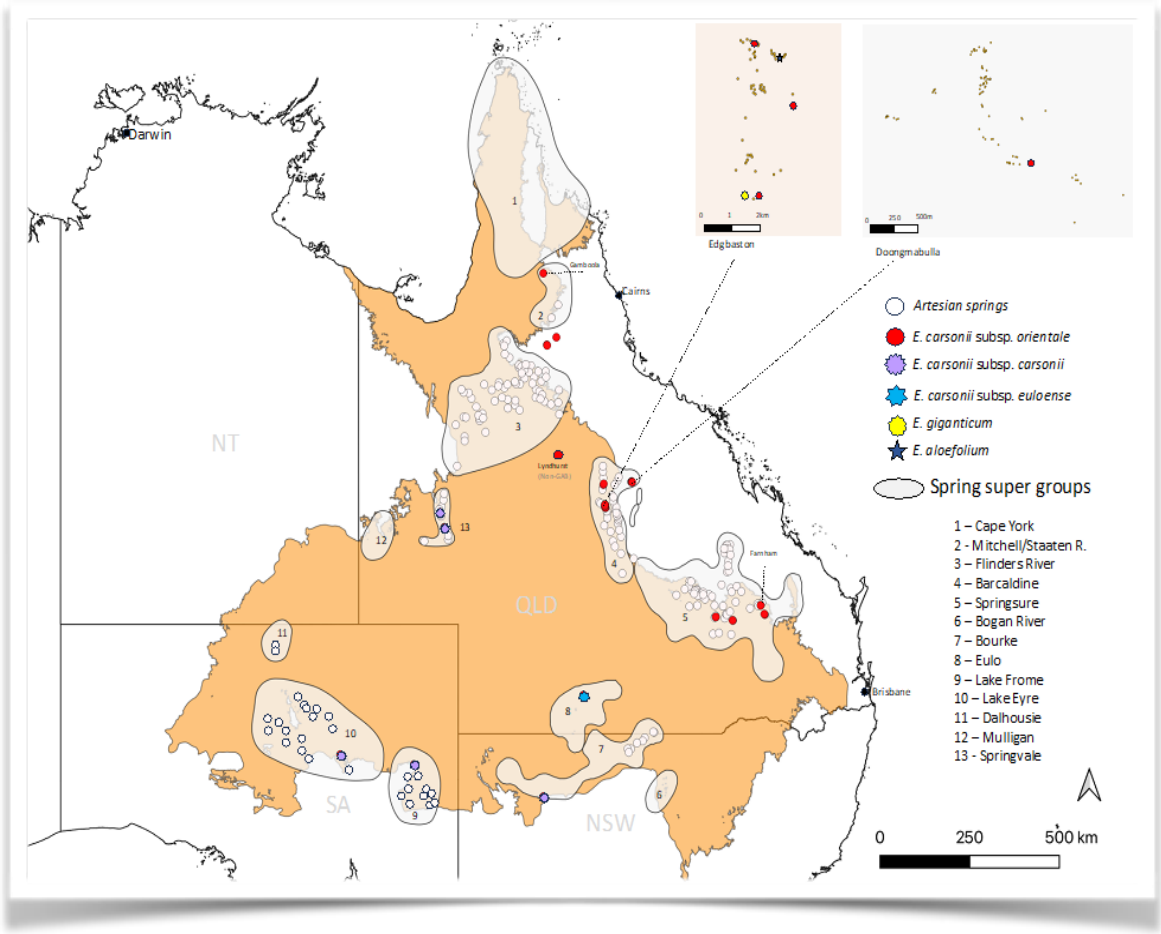

Figure 1. Map of the Great Artesian Basin. Spring complexes are clustered into 13 spring supergroups. Note that Edgbaston and Doongmabullla are one of the largest complexes with around 60 springs as shown in the smaller maps top right.

There have been numerous studies on the endemic biota of the GAB, with much of the research focused on the Lake Eyre region in South Australia (Ponder *et al.* 1995; Perez *et al.* 2005; Worthington-Wilmer & Wilcox 2007; Worthington-Wilmer *et al.* 2008, 2011; Guzik *et al.* 2012, 2019; Murphy *et al.* 2010, 2012, 2015; Clarke *et al.* 2013; DeBoo *et al.* 2019). From this research two main hypotheses have emerged to explain the origins of this biota:

- Miocene Relict Hypothesis: Suggests that the GAB's endemic species are paleo-endemics, remnants of a mesic Miocene landscape (~5.3–23 MYA) that once supported rainforests and permanent wetlands (Mishler *et al.* 2014; Murphy *et al.* 2015; Fensham *et al.* 2023).

- Pleistocene Neo-Endemism Hypothesis: Proposes that endemic species are more recent, having evolved during the Pleistocene through dispersal from coastal mesic habitats during wetter interglacial periods (Toon *et al.* 2018; Fensham *et al.* 2023).

Methods

This study forms part of my PhD thesis at the University of Queensland, titled "Systematics of *Eriocaulon* L. (Eriocaulaceae Martinov) in Australasia: Phylogenomics, Historical Biogeography, and Landscape Genomics." Prior to this work, I employed

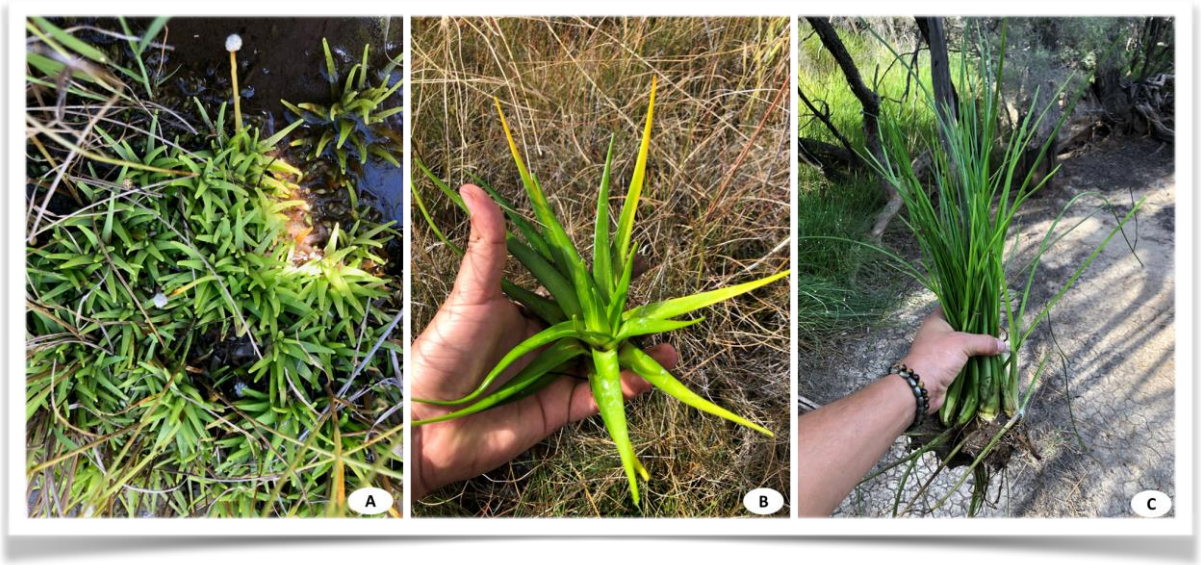

Figure 2. Rosettes of **A**. *Eriocaulon carsonii* subsp. *orientale*, **B**. *E. oreophilum*, **C**. *E. giganticum*

Sanger sequencing (Baleeiro *et al.* accepted, 2025) in an attempt to critically test species boundaries and relationships, and complement the study of Larridon *et al.* (2019), which focused primarily on species from Asia and Africa. However, due to the poor resolution of some subclades, we concluded that the Angiosperms353 sequence capture would offer a more robust solution.

Following that, I integrated population genomics techniques to assess genetic diversity, population structure, and gene flow within and among *Eriocaulon carsonii* populations confined to and outside (one population) the GAB springs. I selected specimens from plants growing at least 2 metres apart, resulting in sample sizes from 1–15 specimens per population, depending on population size. The first sequencing plate included 99 specimens from eight populations of *E. carsonii* subsp. *orientale*, *E. giganticum*, and *E. aloefolium*. Below are results from this initial analysis. The

Figure 3. Vents at Bourke Spring super group New South Wales

Hansjörg Eichler Scientific Fund award allowed us to run two further plates including specimens of *E. carsonii* subsp. *carsonii* and subsp. *euloense*. Analysis for these plates is still ongoing and the results for these two plates are not shown in the below preliminary summary.

For genotyping, I used double-digest Restriction-Site Associated DNA Sequencing (ddRADSeq), selected for its cost-effectiveness and ability to generate a high number of Single Nucleotide Polymorphisms (SNPs). Library preparation was conducted in-house at the Cook Lab, University of Queensland.

Results

The analysis of *Eriocaulon* based on the Angiosperms353 target capture dataset revealed strong support for the monophyly of nearly all sampled taxa. This finding aligns well with traditional taxonomic classifications. The final dataset included 214 nuclear genes, with aligned sequence lengths ranging from 70,122 to 846,476 base pairs. Phylogenetic relationships were inferred using a concatenated supermatrix approach, and the resulting topology was supported by high bootstrap values, and variation in support for gene and site concordance factors.

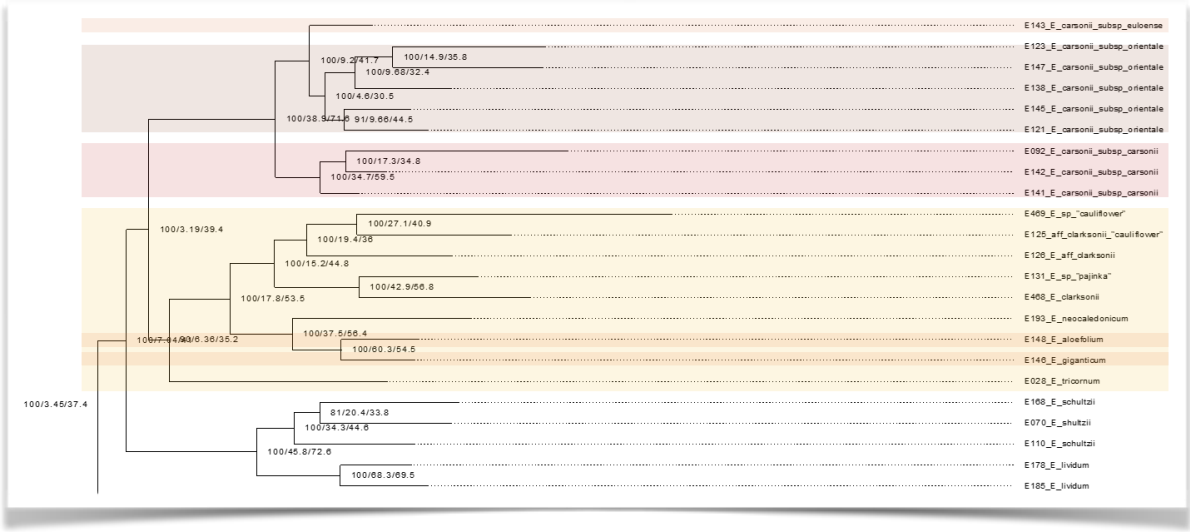

Figure 4. Branch extracted from Baleeiro *et al.* in prep.

Within *Eriocaulon carsonii*, the three recognised subspecies—subsp. *orientale*, subsp. *euloense*, and subsp. *carsonii*—formed a well-supported clade (Fig. 4). The phylogeny indicates that subsp. *orientale* is sister to subsp. *euloense*, and together they are sister to subsp. *carsonii*, confirming their close evolutionary relationships and supporting their current taxonomic delineation. The two microendemic species, *E. giganticum* and *E. aloefolium*, which are each restricted to individual spring complexes within Edgbaston Spring complex (Fig. 1), also formed a distinct and well-supported clade. Interestingly, this clade was recovered as sister to *E. neocaledonicum*, a species endemic to New Caledonia. Together, these three taxa were sister to *E. clarksonii*, a species restricted to Cape York peninsula.

The broader clade containing these taxa was found to be sister to a group comprising *E. schultzii* endemic to the Darwin region and *E. lividum* from Kakadu National Park (Northern Territory) and the Kimberley region of Western Australia. This grouping

suggests a biogeographic connection between the arid zone endemics of central Australia and the Monsoon Tropics and landmass exchange.

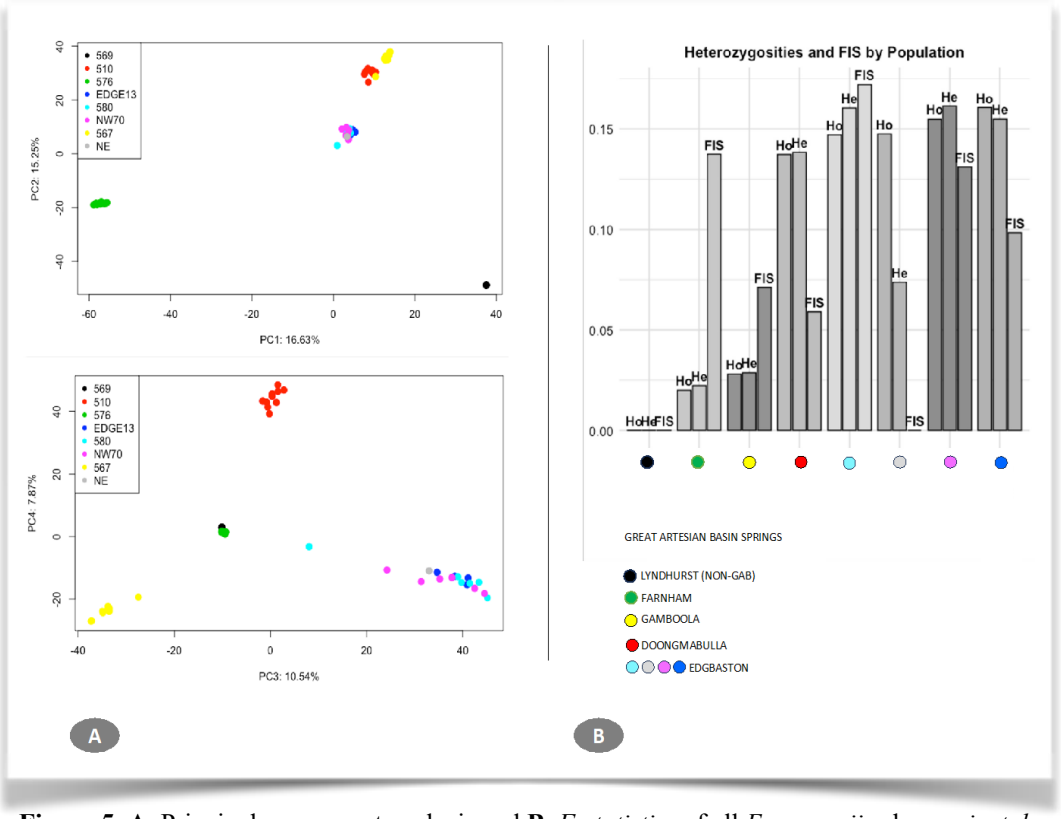

Figure 5. A. Principal component analysis and **B.** *F-statistics* of all *E. carsonii* subsp. *orientale* samples.

Population Genomics Results

The population genomic analysis of *Eriocaulon carsonii* subsp. *orientale*, based on ddRADseq data, included 63 individuals and identified 3,481 polymorphic single nucleotide polymorphisms (SNPs).

Principal Component Analysis (PCA) (Fig. 5 A) showed clear genetic structuring among populations from different spring complexes, with each forming distinct clusters. Notably, all specimens from the non-GAB spring at Lyndhurst (represented by black dots) overlapped exhibiting zero heterozygosity and significant inbreeding, suggesting a highly uniform genetic makeup (Fig. 5 A, B). However, a separate analysis with only the Lyndhurst population showed high heterozygosity and negative inbreeding. Therefore, a more in-depth analysis has been conducted. In contrast to the large spring complexes such as Edgbaston and Doongmabulla, smaller and more

isolated populations such as Farnham and Gamboola displayed low heterozygosity and high inbreeding coefficients, indicative of genetic bottlenecks or prolonged isolation. Most populations from Edgbaston showed higher heterozygosity and lower inbreeding, except for one outlier. Overall, the dataset revealed moderate levels of genetic diversity, with an observed heterozygosity (Ho) of approximately 0.15 (Fig. 5B).

Complex	Doongmabula	Farnham	Edgbaston		
Population	510	576	EDGE13	580	NW70
576	0.699				
EDGE13	0.293	0.727			
580	0.293	0.69	0.083		
NW70	0.283	0.679	0.077	0.079	
Gamboola (567)	0.52	0.904	0.667	0.631	0.6

Table 1. Fixation index (Fst)

Pairwise fixation index (Fst) values (Table 1) further supported significant genetic differentiation among populations, particularly between Gamboola and Farnham. These results suggest long-distance isolation, which limits gene flow and promotes genetic divergence over time. The dating analysis (in prep) could perhaps support that these populations date back to the Pliocene (5.3-2.5 MYA), when the retraction of mesic habitats may have fragmented ancestral populations. However, the possibility of intermittent gene flow—facilitated by aquatic birds or extreme flood events—cannot be ruled out, especially in regions where mesic corridors may have once

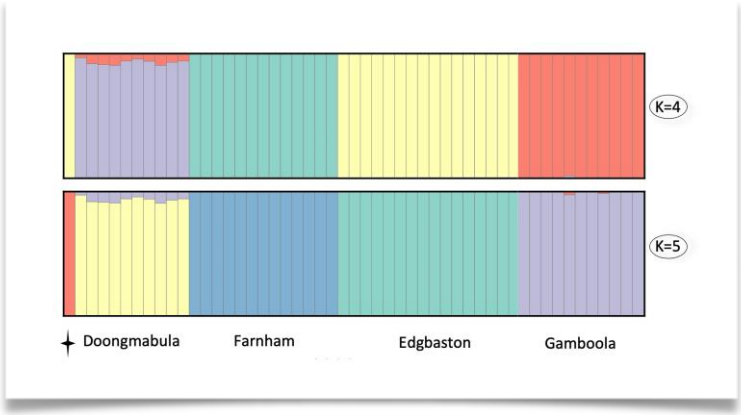

Figure 6. Structure analysis of all populations of *Eriocaulon carsonii* subsp. *orientale* with a singleton from Lyndhurst (star)

bridged the GAB's periphery. The Structure analysis shows almost no admixture among populations from different spring complexes (Fig. 6).

The genetic distinctiveness of *E. carsonii* spp. *orientale* populations highlights the need to preserve their habitats in the complex system of the the Great Artesian Basin springs. It is also important to note that the extra sequencing plates, which includes samples from the other two subspecies (subsp. *carsonii* and subsp. *euloense*), are currently being analyzed and will provide further insights into the genetic structure and evolutionary history of the broader *E. carsonii* group.

Acknowledgements

I gratefully acknowledge the support of the **Hansjörg Eichler Scientific Fund**, whose funding enabled the expansion of the molecular component of this research. I also extend my sincere thanks to Richard Jobson, Rod Fensham and Boris Laffineur during field trips and the University of Queensland and Cook lab members for their guidance and resources throughout this study.

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Ilse Breitwieser Retires

Heidi M. Meudt, *Te Papa (WELT Herbarium)*
heidim@tepapa.govt.nz

With additional contributions from Phil J. Garnock-Jones, Wendy Nelson, Ines Schönberger, and Kerry Ford

On Friday 4 April 2025, a large turnout of botanists, colleagues and friends from throughout New Zealand came together to celebrate Dr Ilse Breitwieser's remarkable career and retirement. Those who attended were treated to not one but two celebrations. In the morning, a formal retirement tribute and morning tea (with *Craspedia* cake! Figs 1 & 2) was held at Ilse's workplace, the Allan Herbarium (CHR) Manaaki Whenua – Landcare Research (hereafter, Allan Herbarium), Lincoln, followed by an informal gathering later that afternoon with drinks and nibbles at Ilse's home in Christchurch.

Speakers at the morning celebration included several of Ilse's close colleagues: Ines Schönberger, researcher botanist at the Allan Herbarium, who organised the event and acted as emcee (Fig. 3); Heidi Meudt, plant systematist and Botany Curator at Te Papa; Phil Garnock-Jones, plant taxonomist and Professor Emeritus at Te Herenga Waka Victoria University of Wellington (VUW); Peter Buchanan, mycologist and systematist at Manaaki Whenua – Landcare Research; and Wendy Nelson, phycologist and Senior Research Fellow Auckland Museum Tāmaki Paenga Hira (Fig. 4). Taken together, their speeches paid tribute to Ilse and the twin themes of her plant systematics research in Asteraceae and her science leadership that formed the strong core of an outstanding career that has had a huge positive impact on researchers and the science sector in New

Zealand, Australia and beyond. Ilse herself also gave a heartfelt talk about her life and career (Fig. 5), and in turn paid tribute to her colleagues and friends, many of whom were in the audience.

Fig. 1. Ilse speaking at her retirement celebration as guests look on. Photo: Peter Buchanan.

Fig. 2. A *Craspedia* cake for morning tea! Photo: Peter Buchanan.

The following is a summary of Ilse's career based on the words spoken at her retirement celebration as well as additional personal recollections.

Fig. 3. Ines Schönberger presents Ilse with flowers at her retirement. Photo: Karen Scott.

From Germany to New Zealand

Ilse was born and raised in Germany and moved to New Zealand in the late 1980s to pursue a PhD in taxonomic botany at the University of Canterbury, which she achieved in 1991. She then went on to a postdoctoral fellowship at VUW, where she met several long-term colleagues and friends. She went back to Germany to become a department head at the Botanical Garden and Botanical Museum Berlin-Dahlem, returning to New Zealand just a few years later in 1995 to start employment at the Allan Herbarium in Lincoln, where she has worked for the last 30 years.

Contributions at the Allan Herbarium (CHR), Manaaki Whenua – Landcare Research

Ilse has made invaluable contributions to taxonomy and systematics in New Zealand whilst simultaneously having a profound

impact on research priorities, partnerships, and the preservation of critical capabilities at the Allan Herbarium (CHR) as she took up different roles at Manaaki Whenua – Landcare Research. After her first role as programme leader for plant systematics, she then moved to science leader of the Defining New Zealand Land Biota Outcome Based Investment (OBI), [1] followed by science leader of the Characterising Land Biota portfolio and capability leader of the plant systematists. In addition, Ilse was Director of Herbarium at CHR for over 15 years and chief editor of the online eFlora of New Zealand for 8 years.

Fig. 4. Speakers at Ilse's retirement, three of whom are also Nancy T. Burbidge medal recipients. Left to right, Phil Garnock-Jones, Ilse Breitwieser, Heidi Meudt and Wendy Nelson. Photo: Peter Heenan.

Her leadership during a challenging period of declining funding ensured the sustainability of taxonomic capability, the development of significant plant informatics services such as the eFlora, and the delivery of research shaped by both scientific excellence and stakeholder needs.

Ilse has, over many years, seen a large part of New Zealand through numerous collecting trips with colleagues searching for gnaphalioid daisies. Kerry Ford's field trips with Ilse have mainly been to collect *Craspedia* (Fig. 6). This has taken them to many remote mountainous areas particularly in the South Island (Fig. 7). With Ilse's administrative and leadership roles, her fieldwork tended to be overlooked but although these roles have slowed her taxonomic research, she has been able to keep things ticking along and continued yearly field collecting and maintaining an impressive, cultivated collection of *Craspedia* at the Allan Herbarium Experimental Gardens. There have been many glorious trips to the hotspot areas of *Craspedia* diversity, the Central Otago mountains and the mountains of Nelson and Marlborough. Kerry estimates that they have done about 40 field trips together over 30 years (and counting) and would like to emphasise that part of retirement is not to slow down, but to speed up!

[1] Unrecorded New Zealand now being catalogued. https://m.scoop.co.nz/stories/SC0809/S00087/unrecorded-new-zealand-now-being-catalogued.htm

Fig. 5. Ilse speaking at her retirement celebration with one of Phil Garnock-Jones' images of *Raoulia grandiflora* behind her on the big screen. Photo: Heidi Meudt.

Science leadership and contributions to the science sector

Ilse's professionalism, leadership, and dedication to the field are exemplary, and they go way beyond the walls of the CHR herbarium. She has contributed to our understanding of the New Zealand land flora, supported biosystematics widely throughout the country, and made many contributions to the broader science community nationally and internationally.

Ilse has tirelessly, consistently and persistently supported, sought funding for, promoted and advocated for plant systematics research and the people doing that research, throughout her career. Her various leadership roles are so important and yet often are "invisible" or behind the scenes. She is largely responsible for keeping plant systematics research (and staff!) alive and well over the many years that she was in her various leadership roles. She firmly believed that plant systematists need to stick together to continue advocating for our research.

Ilse is committed to mentoring future systematists, having co-supervised 12 postgraduate students, half from the nearby University of Canterbury and half from other New Zealand and international universities.

Her advocacy for the biosystematics workforce has been strong throughout her career, where she tirelessly campaigned and engaged with others outside her institution who were involved in similar advocacy. This involved dealings in the late 1990s and early 2000s with New Zealand government agency MoRST and the crown entity FoRST i.e. the Ministry and the Foundation of Research Science and Technology, as well as bidding for the OBIs in the mid-2000s, and collaborating with others in similar positions at other institutions on collective approaches to these portfolios. During many meetings to strategise, plan, submit proposals, and write reports, Ilse formed many strong relationships with others in similar positions at other institutions, such as Wendy Nelson (then at NIWA Taihoro Nukurangi). These relationships proved essential for providing mutual support especially for navigating multiple changes

and restructures throughout the New Zealand science system over the decades.

In all her advocacy work, Ilse has shown a strong commitment to engaging with iwi, local and regional government, the Department of Conservation, Ministry of Agriculture and Forestry Biosecurity NZ, among others, setting up advisory groups to connect the work of the biosystematics teams with these end users and stakeholders. This meant that there was a responsiveness to national need and a basis for decisions in her portfolio about how funding was to be allocated, always making sure to demonstrate the impact and value of biosystematics research to New Zealand.

Ilse was one of the team of people involved in the 2015 Royal Society Te Apārangi report on taxonomic collections and databases [2] which contained clear recommendations that had been endorsed by 13 CEOs of all the major natural collection-holding institutions in New Zealand including Manaaki Whenua – Landcare Research. This report articulates key principles and is still a useful resource for researchers and institutions to navigate our collective future; it also led to the establishment of Species Aotearoa.[3] She also helped develop *Discovering Biodiversity: A decadal plan for taxonomy and biosystematics in Australia and New Zealand 2018–2027*.[4]

Ilse has earned international recognition for her leadership contributions as member of the Executive of the Council of Heads of Australasian Herbaria and the New Zealand National Herbarium Network (including Chair), and Council member of the International Association of Plant Taxonomy and the Australasian Systematic Botany Society. She was also involved in several advisory boards, including the Steering Committees of the New Zealand Organisms Register, Biodiversity Services Stack, Electronic Flora of Australasia; the Governing Body of the New Zealand Virtual Herbarium; and the Research Advisory Panel of Museum of New Zealand Te Papa Tongarewa, among others.

Ilse has definitely been a trendsetter and an instrument of change in the Australasian botany world! In 2011, Ilse became the first non-Australian to join the council of the *Australian* Systematic Botany Society, which that very year changed its name to the *Australasian* Systematic Botany Society. Of course, Ilse – working closely with John Clarkson and other Australian colleagues – was instrumental in making this change happen, to strengthen our regional network. She stayed on the ASBS Council for 3 years, and since then, Council has always had at least one New Zealander on it. Six other New Zealanders have followed her lead to

[2] National taxonomic collections in New Zealand. https://www.royalsociety.org.nz/what-we-do/our-expert-advice/all-expert-advice-papers/national-taxonomic-collections-in-new-zealand/

[3] Species Aotearoa. https://www.speciesaotearoa.nz/

[4] Our plan for a decade of discovery. https://www.taxonomyaustralia.org.au/decadal-plan

volunteer for these roles.

During Ilse's tenure, she initiated, cultivated and managed strong collaborative, funding and research links between different institutions nationally and internationally. The foundation of these institutional collaborations was often her strong working relationship with one or more colleagues at those institutions. One example was the close collaboration of Ilse at the Allan Herbarium and Manaaki Whenua – Landcare Research with Wendy Nelson at NIWA and Patrick Brownsey at Te Papa, and their respective systematics and collection teams.

The friendship between Ilse and Patrick Brownsey (who sadly passed away in 2023) dates from 1990 when Ilse was a postdoctoral researcher at VUW, and Pat was Botany Curator at Te Papa. Soon after Ilse came back to New Zealand in 1995, in what was to be a common theme over the course of their unique collaboration, Pat and Ilse teamed up, schemed about what kind of plant systematics research to focus on, wrote up a successful proposal, and strategically and brilliantly managed the resulting research programme including the Te Papa subcontracts.

This formal collaboration and subcontracts had a big impact on plant systematics research and researchers at Te Papa, which continues to this day. It's important to note that Ilse's legacy also extends to Te Papa, especially through two large multi-year projects, the revision of *Veronica* (a genus of over 120 native species in New Zealand) and eFlora treatments of all New Zealand ferns (about 200 native species in 30 families).

For *Veronica,* the subcontract funding led directly to the salaries and research of Mike Bayly and Alison Kellow from 1996–2005 who produced multiple papers and *An Illustrated Guide to New Zealand Hebes*.[5] Over the years it has also supported Heidi Meudt (to research snow hebes) and Phil Garnock-Jones (to complete a monograph of what was then *Parahebe* and, later, the eFlora treatment of *Veronica*, which was published in 2023 with Ilse as the main handling editor). Heidi and fellow Botany Curator, Carlos Lehnebach, both benefitted from additional subcontract salary and research funding on *Plantago* and *Myosotis,* and *Uncinia,* respectively.

For the eFlora fern treatments, the subcontract funding came to directly support the salary of Patrick Brownsey and the research he did together with co-author Leon Perrie. They completed all 30 family treatments[6] and published many related scientific papers between 2012–2022, again with Ilse the main handling editor, finishing the project just before Patrick passed away in 2023. The subcontract also funded technicians Julia Wilson-Davey and Bridget Hatton – who are now collection managers at Te Papa – multiple days per week to curate

[5] An Illustrated Guide to New Zealand Hebes. https://www.tepapa.govt.nz/about/te-papa-press/illustrated-guide-new-zealand-hebes

[6] Ferns and Lycophytes. https://www.nzflora.info/publications.html#ferns-lycophytes

and manage the 24,000 fern specimens at WELT herbarium as the eFlora work progressed.

Research and scholarship

Alongside all her leadership responsibilities and achievements, Ilse has achieved an impressive research profile. Ilse's main research interests are systematics of New Zealand seed plants, especially Asteraceae (Compositae). In between her first paper, published in 1986, which is a detailed taxonomic revision of *Centaurea* sect. *Willkommia* in North Africa,[7] and her most recent one on a new species of *Craspedia*,[8] she's co-authored about 70 peer-reviewed research papers. Almost all of Ilse's papers are collaborative, with 2-5 (or more) co-authors, with her main collaborators being Josephine Ward (21 papers), Rob Smissen (16), Steven Wagstaff (9) and Kerry Ford (6).

Ilse's PhD at Canterbury University with Josephine Ward and her postdoctoral fellowship at VUW with Bruce Sampson set the foundation for her research career, which has concentrated on the daisy tribe Gnaphalieae, on which she is a world expert, as well as forays into tribes Astereae and Senecioneae. She is a valued international collaborator, having worked alongside other world experts on at least three major papers on the global classification and evolution of the family. Ilse collaborated with Vicky Funk (late American botanist at the Smithsonian herbarium, US) and others on establishing The International Compositae Alliance (TICA) and obtained, together with Jerry Cooper (mycologist and systematist at Manaaki Whenua – Landcare Research), GBIF seed funding for the development of the Global Compositae Checklist. She's also contributed to improving and refining the International Code of Nomenclature.

Fig. 6. Ilse in the field with *Craspedia incana* in Gorilla Stream, Mt Cook National Park, 2007. Photo: Kerry Ford.

[7] Breitwieser I. and Podlech D. 1986. Die Gattung *Centaurea* L. Sekt. *Willkommia* G. Blanca in Nord-Afrika. Mitteilungen der Botanischen Staatssammlung München 22: 21–96.

[8] Breitwieser I, Courtney SP. 2024. *Craspedia blepharia* (Compositae/Asteraceae, Gnaphalieae), a new species from Garibaldi Ridge in Nelson/Tasman, South Island of New Zealand. New Zealand Journal of Botany https://doi.org/10.1080/0028825X.2024.2418004

Ilse has described nine species new to science (mostly in *Craspedia*) and two new genera (*Argyrotegium* and *Rachelia*) as well as making many other new combinations.[9] Her work also focuses on clarifying and testing species boundaries, redefining generic circumscriptions, and improving higher level classification of New Zealand daisies with reference to their overseas relatives using multiple lines of evidence including phylogeny, anatomy, morphology, population genetics and chemistry. Her persistent, time-consuming and meticulous research in these areas has provided the essential data to help put the molecular findings properly in context and provide independent evidence in support of new classifications. Collaborative research projects on *Raoulia* and *Haastia* are cases in point. Ilse's research contributions will surely stand the test of time, as good taxonomy should.

Ilse has won several awards in recognition of her botany research achievements, including the Allan Mere award in 2018,[10] the Nancy Burbidge Medal in 2018,[11] and the Senior Bledisloe Trophy in 2023. She was also elected as a Fellow of the Linnean Society of London in 2019.

She has collaborated to compile and publish essential checklists of native and naturalised plants and made significant contributions to plant conservation assessments. Under her leadership, she has led the Allan Herbarium to maintain its status as the leading centre for plant taxonomic expertise in New Zealand, producing practical databases and tools that can be continuously kept up to date and which others rely on daily in their own research. This includes a much overdue update of the previous *Flora of New Zealand* series – the eFlora - that was made possible by Ilse's vision and leadership and is a freely available, authoritative, multi-author online Flora.

Conclusions

Ilse is an unequalled role model for many, in that she has managed to successfully combine research and leadership in her plant systematics career, to the benefit of all New Zealand scientists and science. She is also an extremely kind and generous human being, and there is integrity in all that she does.

Ilse is extremely supportive of and committed to the people behind the science. Many consider her to be an instrumental mentor who has truly shaped their careers through her continued patience, guidance, advice, support, and friendship. She advocates for learning and applying new skills to become better scientists, and she also challenges others to get involved in the

[9] Breitwieser, Ilse (fl. 1986). https://ipni.org/a/16506-1

[10] Allan Mere Award for 2018: Ilse Breitwieser. https://www.nzbotanicalsociety.org.nz/pages/Allan_Mere_Award-2018.html

[11] Introducing the 2018 Nancy Burbidge Medallist – Ilse Breitwieser. https://asbs.org.au/wp-content/uploads/2023/08/18-dec-177.pdf#page=5

broader New Zealand science environment as researchers and as future leaders.

Congratulations to Ilse Breitwieser on her retirement from an incredible career as scientist and science leader, and her achievements, leadership, collegiality, generosity, care for others, and friendship. It may not be easy to find a balance between retirement and continuing her taxonomic research on *Craspedia* as a research associate at Manaaki Whenua, but there is little doubt she will be up to the task.

Fig. 7. Ilse in the field in Havelock/Eric Stream confluence, Canterbury, 2007. Photo: Kerry Ford.

New ASBS Chapter in Palaeobotany & Palynology: Palaeo Plants for the Planet

Dr Anne-Marie Tosolini The University of Melbourne

We are pleased to announce a new ASBS Chapter in Palaeobotany & Palynology and thank the ASBS Council for accepting our proposal. Palaeobotany in Australia has a rich history, beginning in the early 19th century and evolving through significant contributions from various researchers and institutions. This is not the first time that fossil flora researchers have formed an Association. In 1980, a committee, led by Dr John Rigby and Dr Noel de Jersey, ratified a Plenary meeting in Wellington, New Zealand. The aims of the original Palynological and Palaeobotanical Association of Australasia (PPAA) were to promote the study of palynology and palaeobotany in the Australasian and contiguous regions, to act as a Regional Society affiliated with both the International Commission for Palynology (ICP), and the International Organisation of Palaeobotany (IOP) and to co-operate with other Regional Societies having similar aims. The PPAA constitution was redrawn in the mid to late 1980s, led by Professor Bob Hill, when it was subsumed as a specialist group within the (then) Australian Systematic Botany Society. However, it has not been very active since the 2000s and was dissolved.

Early Developments (19th Century to 1940s)

The study of fossil plants in Australia commenced early in the 19th Century, with the identification of Permian *Glossopteris* flora by Adolphe Brongniart in 1828 (Brongniart, 1828). Subsequent researchers like Frederick McCoy and William Branwhite Clarke advanced the field by examining plant macrofossils in Victoria and New South Wales, respectively. Prominent figures such as Feistmantel, Tenison-Woods, Johnston, and Von Ettingshausen focused on Palaeozoic, Mesozoic, and Tertiary floras. From 1915, Arthur B. Walkom's work, particularly in Queensland and New South

Wales, significantly influenced Australian palaeobotany. The description of the Devonian-aged *Baragwanathia* flora by Lang and Cookson added to the understanding of early vascular plants.

Emergence of Palynology (Post-1945)

Professor Isabel Cookson pioneered palynological research in Australia. Around 1945, the focus shifted towards the study of microfossils like spores and pollen, with Cookson's research on Tertiary and Mesozoic palynology. Other notable contributors included Virkki, Dulhunty, Balme, and Hennelly, who expanded the knowledge of Permian microfloras. Researchers like Evans, Dettmann and Playford, who furthered studies on Mesozoic microfloras, while De Jersey and colleagues focused on Palaeozoic and Mesozoic microfloras in Queensland.

Institutional Contributions

Research in palaeobotany and palynology has been conducted across various Australian universities and institutions, predominantly in capital cities. These studies have often been organised based on state divisions but also include collaborative efforts spanning multiple regions and even involving New Zealand. Over the decades, many researchers in palaeobotany collaborated on studies on Australian Cenozoic floras that flourished across institutions in the north (e.g. Queensland Museum, University of Queensland and QUT), southeast (The University of Melbourne, Monash University, Australian National University, Universities of Adelaide & Tasmania and Botanic Gardens in all states) and west (University of Western Australia & Curtin University). Research has focussed on ferns and fern allies (e.g. Nagalingum et al., 2002); Southern Conifer families (e.g. Hill, 2004) and key angiosperm families, such as Nothofagaceae, Lauraceae, Myrtaceae and Proteaceae, summarised in the "History of the Australian Vegetation" (Hill, 1994). Biogeographical research on these key Gondwanan families has changed our understanding of their gateways into Australia and evolution of arid adapted floras (e.g. Byrne et al., 2011; Weston et al., 2017, Peyrot et al., 2019, etc.) Continuing the Cookson tradition started at The University of Melbourne, research in palaeobotany and palynology is strong and ongoing across Australia.

Significance of Australian Palaeobotany

The study of fossil plants in Australia has been instrumental in understanding the evolution of the continent's unique flora, influenced by factors such as climate change, continental drift, and interactions with evolving fauna. Palaeobotanical research provides insights into past environments, including ancient rainforests and vegetation distribution, and aids in stratigraphic studies to determine the age and sequence of rock layers. Moreover, it helps trace the evolution of critical plant taxa and their relationships with other organisms.

Recent Discoveries

Recent findings, such as those at McGraths Flat in New South Wales and Hindon Maar in New Zealand, have uncovered exceptionally preserved Cenozoic fossils, offering a window into ancient rainforest ecosystems. Additionally, studies have highlighted the

significance of Australian rainforests, emphasizing their taxonomic, ecological and biogeographic importance. These advancements underscore Australia's pivotal role in unravelling the history of plant evolution and environmental change. Palaeozoic to Mesozoic research has highlighted the evolution of key characters in seed plants and Darwin's "abominable mystery" of the rapid diversification of angiosperms, including new advances in early angiosperms, eudicots and monocots. Palynological research on pre-Quaternary floras has been revived across Australia, following in the footsteps of Cookson & Dettmann.

In summary, Australia's palaeobotanical research has evolved from early macrofossil studies to advanced palynological investigations, significantly contributing to our understanding of plant evolution, past climates, and ecological dynamics.

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Nuts and bolts of the New Zealand Science Restructure

Kerry Ford, Allan Herbarium (CHR), Christchurch, New Zealand

New Zealand public science is amalgamating as of 1st July 2025. The former seven Crown Research Organisations (CRIs) will now be three Public Research Organisations (PROs).

The Plant Herbarium (CHR), Fungal Herbarium (PDD), Microorganisms (ICMP), NZ Flax and Living Plant Collection, and Arthropods and Nematode Collection, all currently with Manaaki Whenua Landcare Research will move to the NZ Institute for Bioeconomy Science (NZBSI). The National Forest Herbarium (FRI) currently with Scion will also move to NZBSI.

The stated rationale of this merger is to avoid unnecessary duplication and costs and increase focus on commercialisation and

entrepreneurship. This in large part reverses the splitting up of the DSIR (Department of Scientific and Industrial Research) into the CRIs 30 years ago, although the merger retains the commercial/corporate model introduced with that restructuring.

A summary of changes made to the structure of New Zealand public science.

The old CRIs **(+ the Met Service)**	**The new PROs**
AgResearch Manaaki Whenua Landcare Research NZ Forest Research Institute (Scion) Plant and Food Research	**NZ Institute for Bioeconomy Science**
National Institute of Geological and Nuclear Sciences (GNS) NZ Meteorological Service National Institute of Water & Atmosphere Research (NIWA)	**NZ Institute for Earth Science**
Institute of Environmental Science and Research	**NZ Institute for Public Health and Forensic Science**

Student and ECR Subcommittee Report

Patrick Fahey on behalf of SECR representatives Paulo Baleerio Souza and Timothy Hammer (incoming)

At the end of 2024 a call was put out for nominations to fill the two open positions on the SECR subcommittee, and thus our first order of business is to formally introduce and welcome our new representative, Timothy Hammer (University of Adelaide and South Australian Botanic Gardens and State Herbarium, Adelaide). Tim is an early career systematic botanist whose research has focussed on *Ptilotus* (Amaranthaceae) and *Hibbertia* (Dilleniaceae). He joined the subcommittee at the beginning of 2025, and we are very glad to have him on the team. Additionally, both Patrick (Queensland Herbarium and Biodiversity Sciences, Brisbane) and Paulo (Western Australian Herbarium, Perth) have changed jobs and states in the last year, meaning all Australian time zones are represented at our regular catchups.

Unfortunately, as no other nominations were received a seat on the subcommittee remains vacant. We therefore continue to invite self-nominations, particularly in light of the fact that all three subcommittee members are currently early career researchers and thus there is no representation of the student perspective of the ASBS membership.

Planning has already begun for the ASBS 2025 Conference on the 2nd – 6th November

2025, and a survey was run in April to gain an understanding of the events SECR's would like to take part in alongside the conference. Based on the feedback provided, the subcommittee is planning a buddy initiative for newer members of the Society, the traditional SECR mixer night and other exciting initiatives that will be revealed closer to the date. We hope to see many of you, both our SECR and non-SECR friends, in Armidale.

With the new website going live, a key initiative for the SECR subcommittee moving into 2025 is to better understand what proportion of the Society membership consider themselves SECRs (defined in the subcommittees terms of reference as current students and those less than 10 years post their studies). Members of the Society are thus encouraged to check they have specified their career stage and nominated to join the SECR register on their profile on the Society's website.

As always, feedback and collaboration are very welcome.

CANBR Volunteer Botanical Training Program 2025

Jessica Colussi and VBTP students

In January, The Centre for Australian National Biodiversity Research (CANBR) opened its doors to twelve enthusiastic participants for the annual Volunteer Botanical Training Program (VBTP). For five-and-a-half weeks, this program took students and professionals alike on a learning journey filled with enriching knowledge of plant sciences and herbarium work. Participants came from as far afield as Far North Queensland and as close to home as the Australian National Botanic Gardens, next door.

The VBTP began online and ran for two-and-a-half weeks before shifting to in-person learning for the final three weeks in Canberra. The initial online component was a fabulously collaborative space, where we all embarked on a group training experiences together. When we came together in person, we were welcomed warmly by a group of staff members and supervisors. Amongst participants there was an eagerness and excitement to embark on this experience together, and without hesitation we leapt into it from day one.

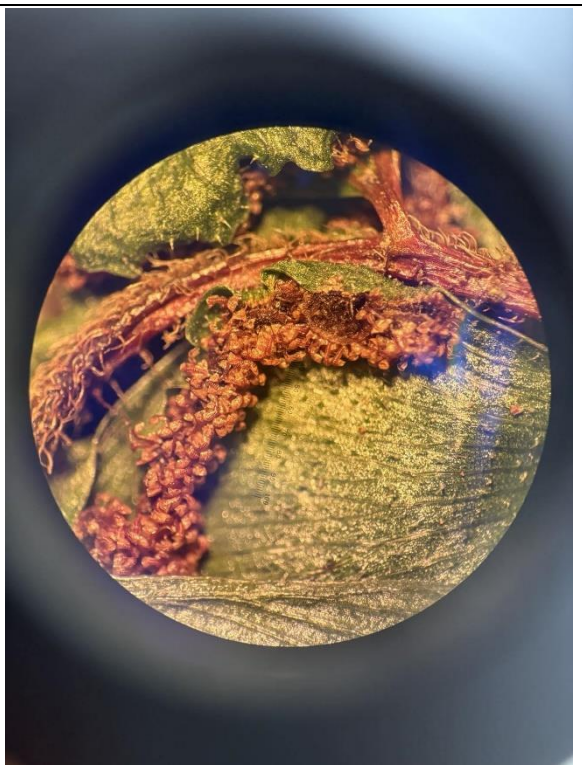
Over the course of the program, we were able to contribute meaningfully to scientific research and a variety of herbarium work. The training program offered a dynamic blend of coursework, presentations and hands-on learning experiences.

Learning to mount specimens

For the online component, we started by attending lectures and talks presented by CANBR staff across the field of botany. Following this, we participated in a variety of online analytical and research tasks. These experiences provided both theoretical and practical insights into an array of topics ranging from plant identification to ecological discussions.

Close-up of daisy pappus bristles observed during identification training.

For the second in-person component, participants came together at the Australian National Herbarium building at CSIRO Canberra on Ngunnawal Country. Here we undertook an array of hands-on, practical tasks and were taught about various fields of research that went on within and around CANBR. These experiences were academically enriching, practically empowering and fostered a sense of confidence in our abilities as trainees.



Close- up of sori observed on a fern during identification training

While at the Australian National Herbarium we worked alongside professionals on various tasks such as mounting of collected plant specimens, incorporation of mounted specimens into the herbarium collection, databasing specimens, and processing specimen loans. These experiences were excellent opportunities to harness practical, hands-on skills and reinforce what we had learnt through presentations as they allowed us to engage directly with botanical specimens. We also had the opportunity to assist staff members with a variety of other exciting projects such as the incorporation of orchid specimens, assisting with the identification of unidentified plant specimens, and extracting specimen information to be used in AI recognition software.

In addition to participating in ongoing work within the Australian National Herbarium building, we had the opportunity to tour other facilities and learn about their operations. These included visiting the Australian National Herbarium Cryptogam collection, the Australian National Botanic Gardens nurseries and seedbank and the CSIRO Tree Seed Centre. These experiences allowed us to observe firsthand the meticulous work involved in preserving and studying plant specimens in a variety of spaces, as well as the importance of conserving plant biodiversity for future generations. We were highly impressed by the cutting-edge research and conservation efforts that these facilities undertook, as well as their devoted staff members.

VBTP students looking for aquatic plants at Back Creek Travelling Stock Reserve

We were also taken on field trips and excursions where we had a chance to learn about living plant specimens. We were lucky enough to embark on a day-field trip into NSW where we explored various landscapes to learn about in-field plant identification, field-tasks and how to undertake plant collections. We went on a local excursion to Black Mountain where we engaged in plant identification, ecological discussions and had animal encounters along the way. The field trip discussions were not only informative but also allowed us to connect the theoretical knowledge we had gained in class with real-world applications. These outdoor experiences also provided valuable opportunities to engage with fellow participants in important cultural and ecological discussions, where we shared knowledge and various perspectives with one another.

Helen Kennedy demonstrating how to press a plant.

The final event of the program was a warm and bittersweet goodbye lunch, where everyone was able to reflect on our experiences and share our thoughts with fellow participants and mentors. The sense of camaraderie and shared learning was palpable, and it was clear that we had all been deeply impacted by the program in our own ways.

We would like to express our heartfelt gratitude to everyone involved in the VBTP. Thank you to the CANBR staff, supervisors and our peers for graciously contributing your expertise and time to this program. Your eagerness to share knowledge and create a safe and inviting learning environment was truly inspiring, and something we will never forget.

We would also like to thank the Friends of the Australian National Botanic Gardens for their invaluable contributions. They provided unwavering encouragement and shared incredibly insightful knowledge.

This program has broadened our understanding of the world of botany, deepened our appreciation for the importance of plant conservation, and introduced us to a network of passionate professionals dedicated to conserving Australia's unique flora. We look forward to applying the knowledge and skills we have gained into our own future pursuits within the botanical community.

Botanists in the Wikiverse

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As Australasian Systematic Botany Society (ASBS) members, many of us are incredibly active in contributing to biodiversity knowledge and to open science communities. We know that such actions have multiple benefits, and can also be undertaken in diverse ways, both in the physical world and in the digital (online) world. Our research and outreach efforts increase accessibility, efficiency, use/reuse and impact of biodiversity data and images, improving visibility of and collaboration among researchers, and enhancing our understanding and conservation of organisms and ecosystems. In addition, making these contributions can be rewarding, interesting and fun.

In an article we recently published entitled "Ten online contributions you can make right now to the biodiversity and open science communities, from easy to advanced" (Meudt & Leachman 2025), we outline some of the many ways people can contribute to biodiversity knowledge in the digital world. This includes engaging with iNaturalist, Wikipedia, Wikimedia Commons, Wikidata, Bionomia, and ORCiD, amongst others. As experienced Wikipedians, we are keen to assist those who are interested to learn, upskill and gain confidence in making such digital contributions. As an example take the Wiki work being undertaken at Te Papa by Heidi and Lucy Schrader, Digital Channels Outreach Manager, outlined in two blog posts "Planting our forget-me-nots in Wikipedia" and "Museology, Myosotis, and metadata oh my! Sharing sustainably in Wikipedia".

Free hands-on "Wiki for Botanists" workshop at ASBS 2025 on 2 November

At the upcoming ASBS Conference in Armidale in November 2025, we will be providing conference attendees with an opportunity to improve their digital outreach and communication skills by learning how to enrich Wikipedia, Wikidata and Wikimedia Commons. This will be a fantastic opportunity to assist attendees in increasing the impact of their research and biodiversity work while at the same time harnessing attendee expertise to enrich the world's most comprehensive open knowledge platform. Attendees will be guided by the two of us experienced Wikipedians–Te Papa Botany Curator Heidi Meudt and independent researcher Siobhan Leachman–with the generous financial support of Wikimedia Aotearoa New Zealand, to improve Australasian botanical content in the Wikiverse, and enhance the visibility of Australasian botanists as well as Oceania's unique native flora. In doing so participants will help unlock the wonders of our biodiversity and collaborate with fellow botanists and the Wiki community alike. For those that can attend, this is an opportunity to boost access to and increase the impact of

your work, as well as that of your colleagues and institution.

In the full day pre-conference workshop we are aiming to teach attendees to edit articles in Wikipedia on plant taxa and botanists, to add scholarly publications as references, to create and edit Wikidata taxa, botanist and scholarly article items, and to reuse botanist Wikidata Q identifiers in Bionomia.

We want to highlight the reuse of Wikipedia articles and Wikidata identifiers, including in third party sites such as iNaturalist, Atlas of Living Australia and GBIF, teach how to add participant-created images into Wikimedia Commons and reuse them in Wikipedia articles and Wikidata items, and how to add images to Wikimedia Commons from iNaturalist using Wiki tools.

The workshop will be held on Sunday 2nd of November from 9am until 5pm at the Armidale City Bowling Club, 92-96 Dumaresq St, Armidale (just behind the venue for the conference mixer, which will be held directly afterwards). The workshop is **free** and includes morning tea, lunch and afternoon tea. This workshop is open and relevant to anyone attending the ASBS conference (including scientists, researchers, students, curators, collection managers, affiliated staff, retirees, biodiversity enthusiasts…) However registration is required, so get in quick as the workshop is limited to 25 attendees.

Register for the in-person workshop on 2 November as part of the conference registration process on the ASBS Conference website.

Free virtual introductory wiki session on 14 October

As part of our efforts to engage with as wide an audience as possible, prior to the ASBS conference, we will also be offering a **free** virtual one hour introductory workshop giving a brief introduction to Wikipedia, Wikidata and Wikimedia Commons. Our aim will be to convince attendees how impactful engagement with the Wikiverse is. Our focus will be on topics relevant to plant biodiversity, especially botanists, collectors, taxa, specimens, scientific publications, and research, but the online introductory workshop will be open and relevant to all scientists, researchers, students, retirees and biodiversity enthusiasts, so please spread the word to your networks. During this session, we will also assist those who do not yet have Wikipedia usernames to create them.

Those who have registered for the in-person workshop are highly encouraged to attend this Zoom meeting, however it is open to all who are interested, so you do NOT need to be attending the in-person workshop to attend this introduction.

The virtual online introductory workshop will be held on **Tuesday 14th of October 3pm NZST** (i.e. 10am Perth, 12pm Papua New Guinea and 1pm Sydney)

Register now for the virtual online introductory workshop on 14 October: https://tepapa.zoom.us/meeting/register/_g4sKy2KTYGMIhtNIAxGeA_

Resources

If you are keen to get started in the Wikiverse before our workshops, here are some resources for you:

First, watch this Youtube video to help you create a Wikipedia account: https://www.youtube.com/watch?v=1lYEZhUCJVA&pp=0gcJCdgAo7VqN5tD

Then you can get tips on how to edit in the three main Wikimedia platforms here:

- Wikipedia: https://en.wikipedia.org/wiki/Help:Editing
- Wikidata: https://www.wikidata.org/wiki/Wikidata:Tours
- Wikimedia Commons: https://commons.wikimedia.org/wiki/Commons:First_steps

There are numerous other resources, tutorials, videos and slide decks available online to help you further your editing skills, some of which we will share at the workshops.

References

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Wikimedians editing species articles in Wikipedia, Wikidata items and adding images to Wikimedia Commons. Photo: Heidi Meudt, CC BY 4.0, via Wikimedia Commons

https://commons.wikimedia.org/wiki/File:New_Zealand_Species_Editathon_Oct_2024_04.jpg

Herbarium Miscellany: WA Government Printer labels 1898–1985

Neil Gibson, Albany, Western Australia
Previously: Science Division, WA Department of Biodiversity, Conservation & Attractions

Recent work on the early plant collections originating from the Western Australian Museum (now housed at PERTH) revealed substantial variation in specimen labels which often include printer codes in the lower corners. These turned out to be printer codes of the Western Australian Government Printer and were commonly found on a variety of Government publications including Government Gazettes and their indices, Mines Department publications[12], Royal Commission Reports[13], maps[14] , year books[15], etc.

A review of approximately 400 Diels & Pritzel specimens at PERTH and ~1,500 digital images of PERTH types on *Global Plants* identified at least 52 distinct label types produced by the Government Printer between ~1898 and 1974 (Table 1). Additionally, specimens originally from three other WA institutions have labels that date from 1950 to 1985 which are also attributable to the Government Printer (Table 2).

Established in 1870, the Government Printer met official printing needs until technological shifts and policy changes led to its closure in 1995[16].

The printer codes on labels vary in format and were deciphered with help from members of the Government Printing Office of Western Australia Facebook group. These codes may include two or more of the following components [17]:

- Internal job number
- Date requested (either year or month/year)
- Quantity printed (M – roman numeral for 1000; 2M = 2000)
- File reference for small plates for future reprints

[12] https://catalogue.nla.gov.au/catalog/237867

[13]https://www.parliament.wa.gov.au/intranet/libpages.nsf/WebFiles/Royal+Commission+mining+industry+1925/$FILE/898025.pdf

[14] https://nla.gov.au/nla.obj-1743514109

[15]https://www.ausstats.abs.gov.au/ausstats/free.nsf/0/4D8F3C956916B0BBCA257B020012F2EC/$File/13005%20-WA%20YrBook%201920-21.pdf

[16]https://www.wa.gov.au/government/publications/state-law-publisher-history

[17]https://www.facebook.com/govtprint/

Early labels included only a job number and year. Between 1946 and 1966, labels listed the job number, month/year, and print quantity. Later labels added a file reference. Two labels lack printer codes but are stylistically consistent with others from the Government Printer.

The 52 label types fall into six groups reflecting the history of the collections. Please note that collection location information has been removed on the labels reproduced in the following figures for species of conservation concern.

Group 1: 1898–1906

These labels are titled "HERBARIUM OF THE DEPARTMENT OF AGRICULTURE, WA", lack printer codes. A number of the labels are in Alexander Morrison's hand and others in W.V. Fitzgerald's. Morrison, the first Government-employed botanist, worked in the Agriculture Department from 1898 until his dismissal in 1906 and was not replaced until 1911.[18]. Fitzgerald left the State in March 1907[19]. As Morrison likely did not commission new labels after 1906, these were probably printed between 1898 and 1906. Morrison's personal label from this period closely resembles the departmental version, suggesting he designed it (Fig. 1).

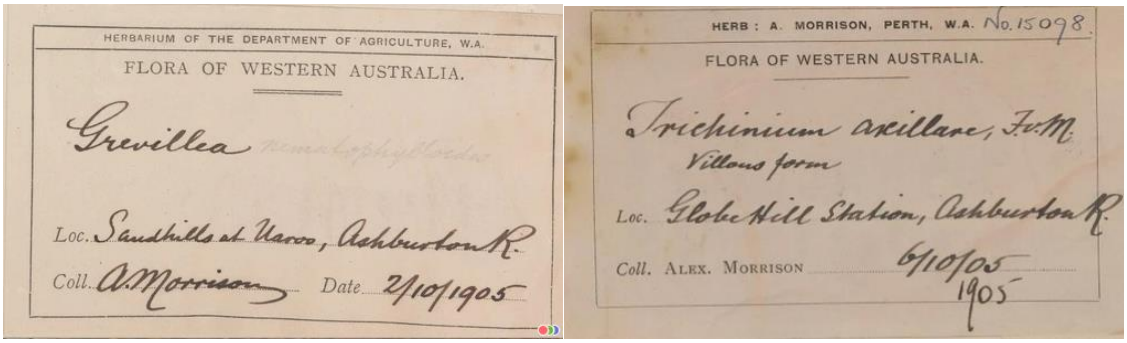


Figure 1. Morrison labels in his own hand from 1905. Left label is from Department of Agriculture, the right label is from his personal herbarium.

Group 2: 1921–1923

The second group of labels is represented by three print runs and is titled "HERBARIUM OF THE FORESTS DEPARTMENT". The job number and year appear on lower left of the label (Fig. 2). This group of labels coincides with Charles Gardner's tenure at the Forests Department from 1920 to 1924, with the design of the labels closely reflecting those used by Morrison and Fitzgerald.

Group 3: 1924–1927

The third group coincide with Gardner's move to the Department of Agriculture in 1924 in the period before the amalgamations of the Forestry and Agriculture Departments' herbaria in 1929. Two print runs have been found. The first is very similar in design to

[18] https://www.cpbr.gov.au/biography/stoward-frederick.html

[19] http://nla.gov.au/nla.news-article77614960

earlier Forests and Agriculture Department labels. The later 1927 label used a larger font in bold and a slight rewording of the title (Fig. 3).

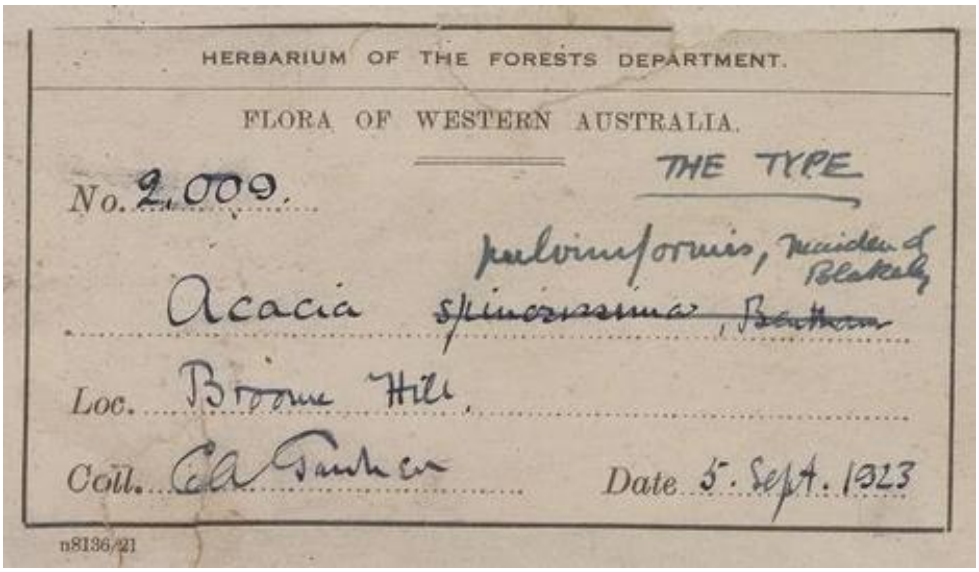


Figure 2. Example of the group 2 labels used by the Forest Department in the early 1920s in Gardner's hand. Note printer code (lower left) with job number and year (1921) job was requested.

Group 4: 1931–1960

The fourth group covers some thirty years following the amalgamation of the Agriculture and Forest Departments herbaria in 1929 when Gardner was appointed as Government Botanist to the newly created State Herbarium of Western Australia. Initially four print runs between 1931 and 1936 produced a label using striking serif font (Group 4A; Figure 4).

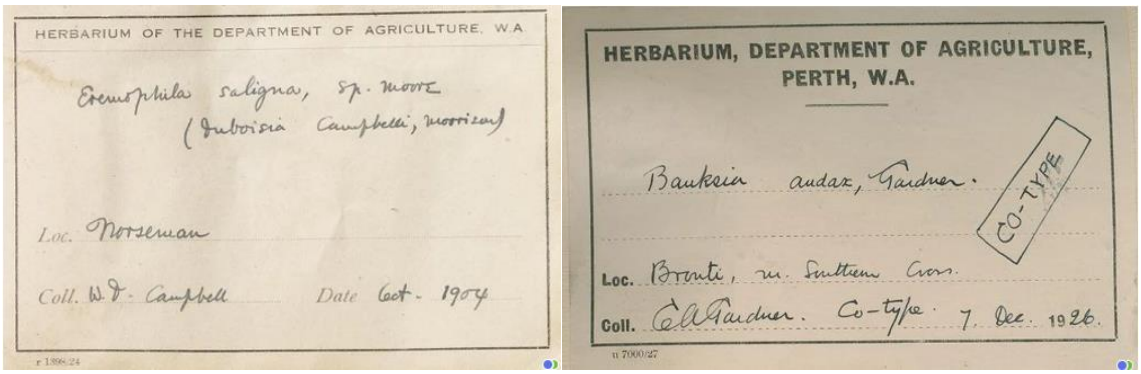


Figure 3. Example of the third group of labels used by the Department of Agriculture before the amalgamation of the herbaria. The design of the later label (1926) shows a significant departure from the previous labels (1904).

In the following years this was changed to a sans serif font and, in the main, remained little changed over the next twenty years (Group 4B; Figure 4). Several variants of this labels have been found, 13 print runs included a collector on the label (Gardner (seven different print

runs), Royce (four), George and Aplin (one each)). Multiple orders were made on various occasions for plain labels as well as labels with collectors given as in 1951 (types 21–23) and 1952 (types 25–27, Table 1). Type 15 labels also appear to fall in this group (Table 1). They are typologically very similar to labels produced from 1941 to 1944, but lack a printer's code. Gardner is given as the collector on these labels.

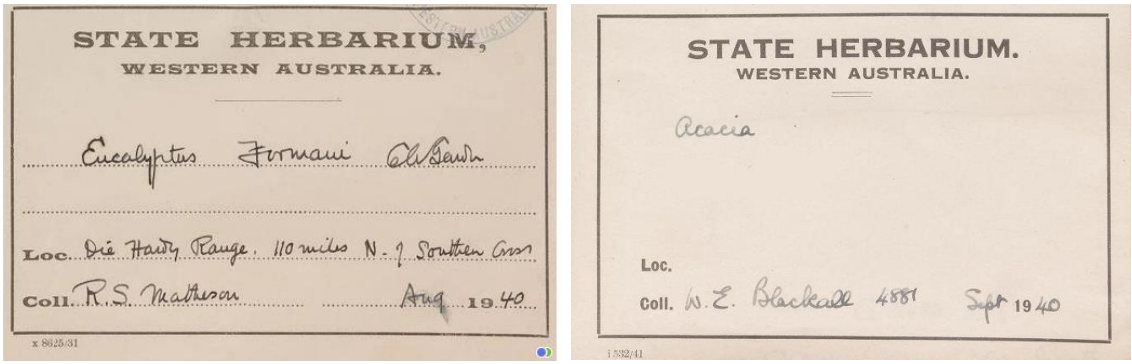


Figure 4. Group 4A was the first label used by the State Herbarium of Western Australia and used a striking serif font (left) while the later labels used a more sedate sans serif font (right, Group 4B). This change is first seen in 1941.

A third subgroup (Group 4C) stands out by its unusual wavy border with one type (type 16) denoting a donation from B.T. Goadby and the other with Gardner given as collector (type 17; Figure 5 & Table 1).

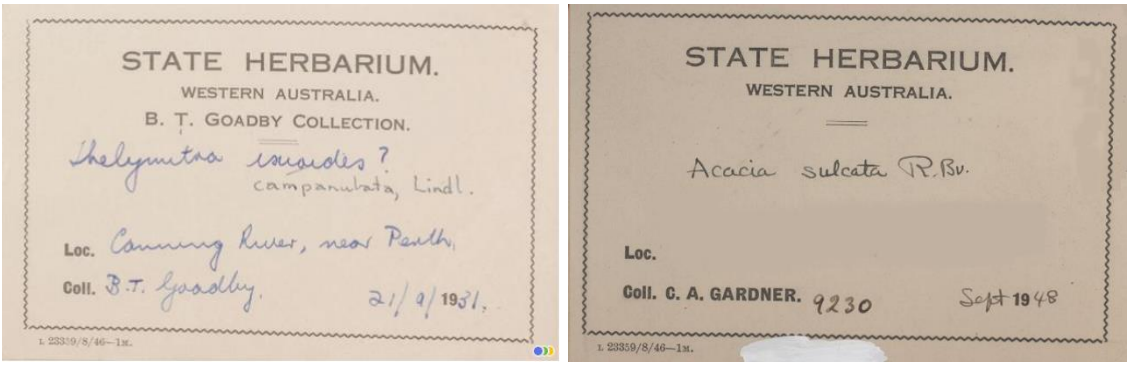


Figure 5. Labels in group 4C show unusual wavy borders with one indicating the donation of B.T. Goadby (left) and the other giving Gardner as collector. One thousand of each label was ordered in August 1946, according to the printer's code.

Group 5: 1962–1970

This period marks the renaming of the State Herbarium of Western Australia to the Western Australian Herbarium, ending in 1970 with the move to a purpose-built facility in South Perth. From 1967 onward, most labels included a file reference in the printer's code—new to this period (Table 1). These plates were reusable, as seen in types 45, 46, and 49 (file reference B386), used between 1967 and 1969. Types 45 and 49 note that specimens came from the W.E. Blackall Herbarium, while type 46 omits this line, suggesting individual print

lines could be added or removed as needed (Fig. 6). Four label types also featured pre-printed collector names: George (twice), Wilson, Bennett, and Maslin (Table 1).

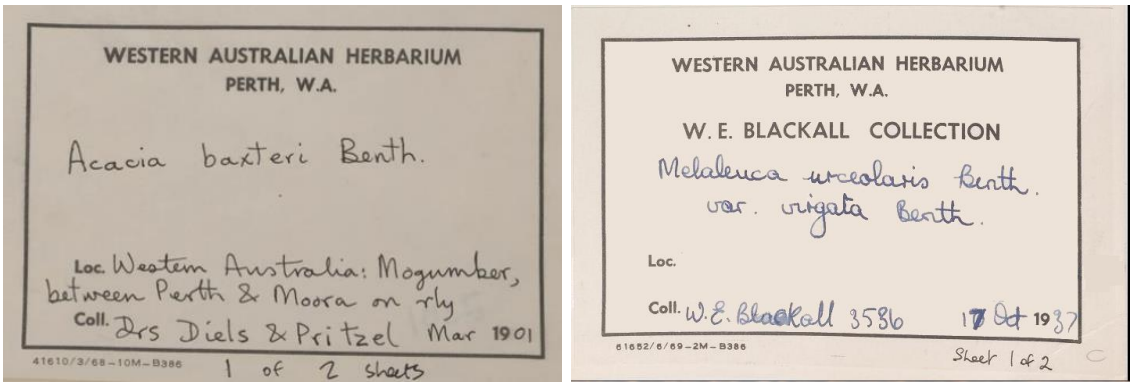


Figure 6. Labels in group 5 reflect the renaming of the State Herbarium of Western Australia to the Western Australian Herbarium Perth, WA. Printer's codes indicate 10,000 labels were ordered in March 1968 (left), and in 1969 2,000 labels were ordered (right). Both orders were made from the same plate with one line of print being removed (file reference B386).

Group 6: 1971–1974

This final group covers the early years at the South Perth location and the transition from hot metal printing to in-house label production. Two label types are known. Both use the title "WESTERN AUSTRALIAN HERBARIUM, PERTH" in one line of uppercase text. Type 51 includes the subheading "Flora of Western Australia" in sentence case (Fig. 7).

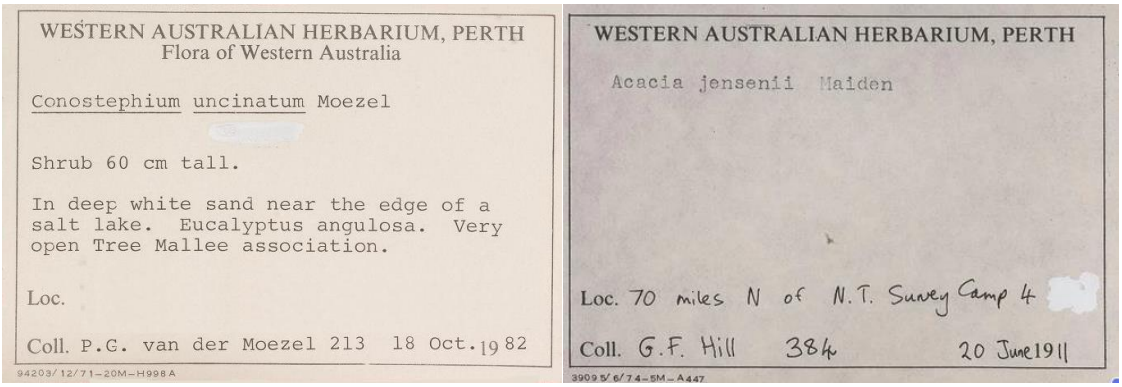


Figure 7. Group 6 labels demonstrating the change in title, the label on the left has a subheading; "Flora of Western Australia" Twenty thousand labels of this type were ordered in December 1971. The label on the right was the last type of label found printed by the Government Printer for the Western Australian Herbarium in June 1974, it had a much more modest run of 5,000 labels.

There is no evidence that the Western Australian Museum used labels printed by the Government Printer, rather their accession process was to transcribe information straight onto the sheet[20]. Many of these sheets had later labels attached as institutional name

[20] https://www.biodiversitylibrary.org/page/60016739

changes were implemented. The Museum collections passed to PERTH in 1957 and a transfer label has been attached to most transferred sheets. Five thousand of these labels were ordered in November 1959 (Fig. 8).

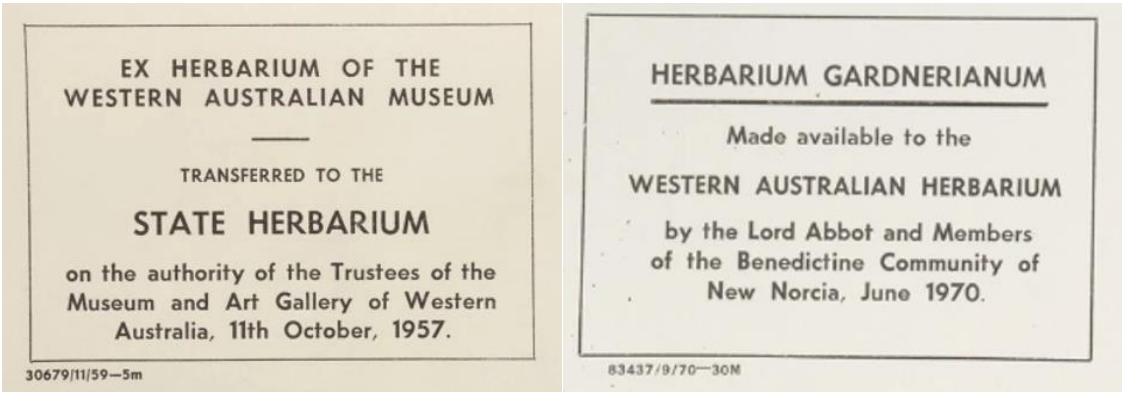


Figure 8. Two transfer labels as seen on sheets in PERTH. The herbarium of the Western Australian Museum were transferred in 1957 (left) and Gardner's private herbarium was transferred on permanent loan from the Benedictine Community of New Norcia in 1970.

A transfer label was also applied to specimens from Gardner's private herbarium, provided to PERTH by the Benedictine Community at New Norcia. These were loaned permanently to PERTH in 1970, with 30,000 labels ordered in September of that year (Fig. 8).

A plot of label orders over time (Fig. 9) shows a steady rate from the mid-1940s to the late 1950s. Orders spiked in 1960, followed by sustained growth from 1963 to 1971. The decline from 1971 to 1974 and the eventual cessation reflect the transition to in-house label printing. However, this shift was gradual, with 1970s labels still in use into the 1980s.

In addition to the labels printed for PERTH and its direct antecedents, the Government Printer also provided labels for University of Western Australia, Kings Park and Botanic Gardens and the Wildlife Research Centre—examples of which can be found in PERTH (Table 2, Figure 10). [21]

UWA had labels printed in 1950 and 1951; later labels lacked Government printer codes (Table 2). The UWA herbarium collections were transferred to PERTH in 1987[22]. Kings Park and Botanic Gardens had three runs of labels printed between 1967 and 1982 (Table 2). These were produced in book form with labels handwritten and processed along with the collection. Some duplicate and type material has subsequently been transferred to PERTH. The Wildlife Research Centre (WRC) ordered 200 books in 1985, in the same style as Kings Park (Table 2). The WRC was part of the then Department of Conservation and Land Management with which the Western Australian Herbarium was amalgamated in 1988.

[21] https://plants.jstor.org/stable/viewer/10.5555/al.ap.specimen.perth01036246

[22] https://plants.jstor.org/stable/viewer/10.5555/al.ap.specimen.perth01524240

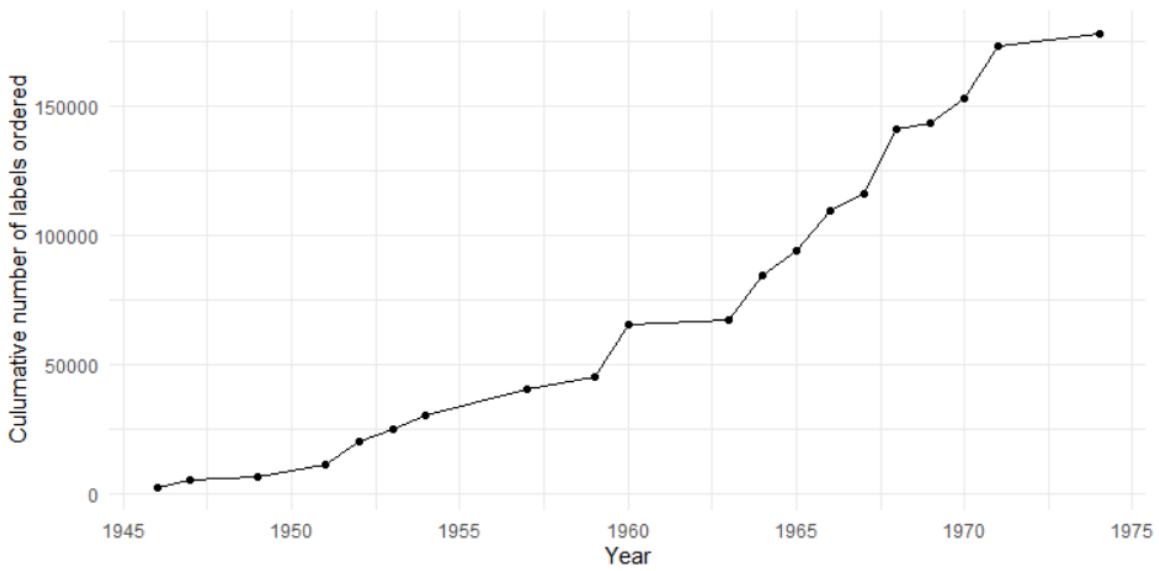


Figure 9. Number of labels ordered from 1946 to 1974 (for which data is available). A significant increase in orders is seen from 1963 onwards.

Labels produced by the Government Printer are just one source of the collection labels at PERTH, but they offer valuable insight into the herbarium's history and activities. As only a small portion of sheets has been examined, additional Government Printer label types are likely to emerge. Nonetheless, the overall pattern is clear, and all identified printer codes align with the system described above

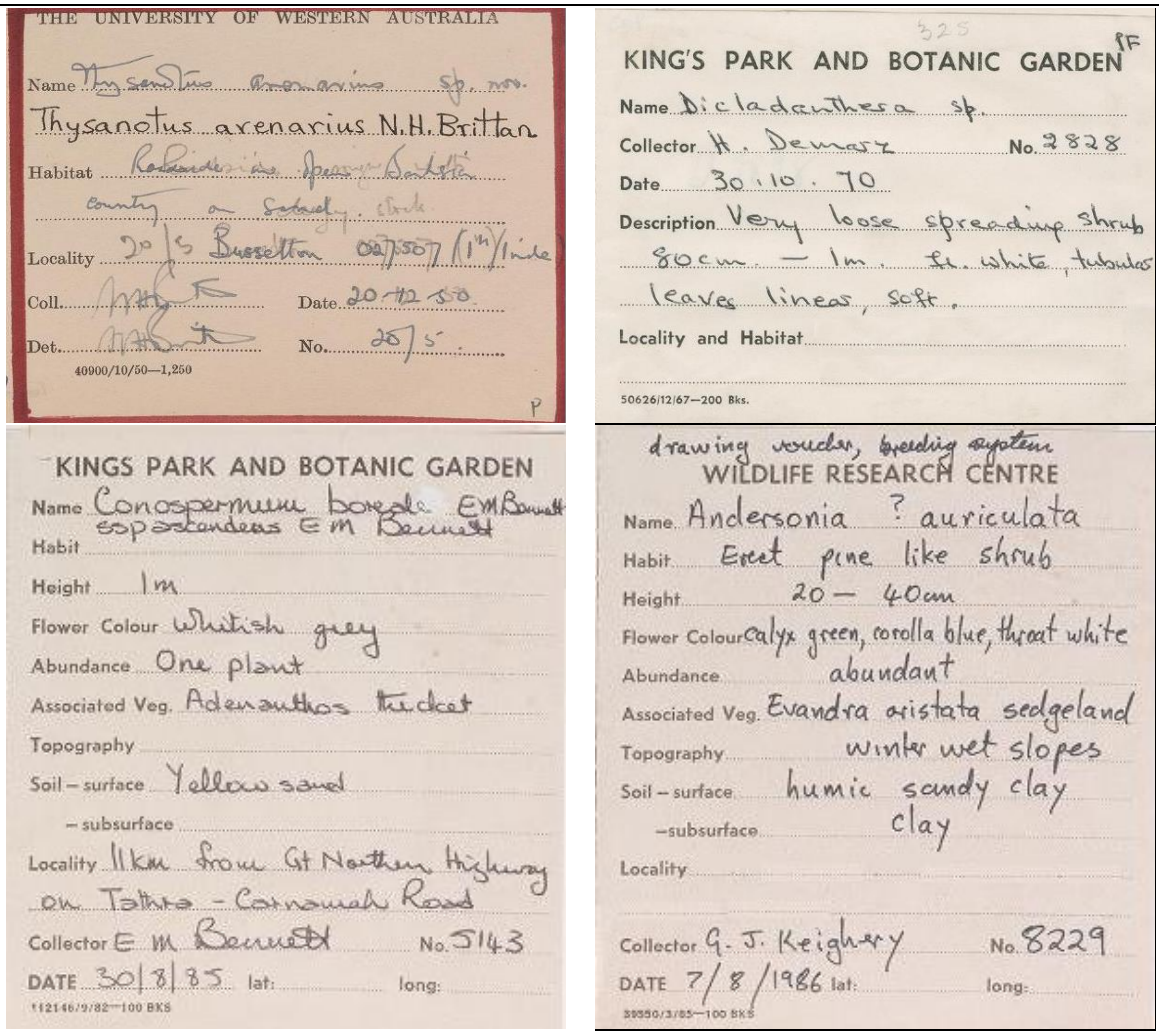


Figure 10. Labels produced for other institutions by the Government Printer from 1950 to 1985. Top left is a UWA label, this run was ordered in 1950 for a run of 1250. Top right and lower left are two styles of labels produced for Kings Park and Botanic Gardens. These labels were printed as collection books. Lower right is a WRC label ordered in 1985, this is the latest date found for orders to Government Printer.

Acknowledgements

Thanks to Alex George for his comments on an earlier draft, the staff of PERTH who facilitate my continued access to these fascinating collections and members of the Government Printing Office of Western Australia Facebook group with help in deciphering the meaning of the codes.

Table 1

Fifty two types of herbarium labels, in six major groups printed for PERTH and its antecedents by the WA Government Printer between ca. 1900 to 1974.

Type	Group	Printers code	Example	Year	Quantity	Institution	Variation
1	1	-	PERTH 02071967			Herbarium Department of Agriculture	
2	2	n8136/21	PERTH 00765864	1921		Herbarium of the Forests Department	
3	2	o10584/22	PERTH 00765317	1922		Herbarium of the Forests Department	
4	2	q5187/23	PERTH 01106376	1923		Herbarium of the Forests Department	
5	3	r1398/24	PERTH 09059458	1924		Herbarium Department of Agriculture	
6	3	u7000/27	PERTH 01000225	1927		Herbarium Department of Agriculture	
7	4A	x8625/31	PERTH 01150995	1931		State Herbarium WA	
8	4A	c8352/32	PERTH 01066145	1932		State Herbarium WA	
9	4A	c8352/35	PERTH 02812142	1935		State Herbarium WA	
10	4A	d6718/36	PERTH 02812215	1936		State Herbarium WA	
11	4B	i532/41	PERTH 00106941	1941		State Herbarium WA	
12	4B	i9772/42	PERTH 00577928	1942		State Herbarium WA	printers code on lower RHS

13	4B	i9772/42	PERTH 08890994	1942		State Herbarium WA	C.A. Gardner collector; printers code on lower RHS
14	4B	L1600/44	PERTH 05201314	1944		State Herbarium WA	
15	4B	-	PERTH 00747378			State Herbarium WA	C.A. Gardner collector
16	4C	L23359/8/46-1m	PERTH 00289558	1946	1000	State Herbarium WA	B.T. Goadby Collection subheading
17	4C	L23359/8/46-1m	PERTH 01019481	1946	1000	State Herbarium WA	C.A. Gardner collector
18	4B	9442/7/47-2m	PERTH 05899141	1947	2000	State Herbarium WA	R.D. Royce collector; printers code on lower RHS
19	4B	11261/9/47-1m	PERTH 01062603	1947	1000	State Herbarium WA	C.A. Gardner collector; printers code on lower RHS
20	4B	30289/8/49-1m	PERTH 04139194	1949	1000	State Herbarium WA	C.A. Gardner collector; printers code on lower RHS
21	4B	42878/1/51-1m	PERTH 01008137	1951	1000	State Herbarium WA	
22	4B	42878/1/51-1m	PERTH 01505971	1951	1000	State Herbarium WA	R.D. Royce collector
23	4B	42878/1/51-1m	PERTH 01182986	1951	1000	State Herbarium WA	C.A. Gardner collector
24	4B	48188/7/51-2m	PERTH 01178210	1951	2000	State Herbarium WA	including variant with W.E. Blackall Collection added (PERTH 01180894)
25	4B	55509/5/52-3m	PERTH 03264750	1952	3000	State Herbarium WA	

26	4B	55509/5/52-3m	PERTH 01626191	1952	3000	State Herbarium WA	C.A. Gardner collector
27	4B	55509/5/52-3m	PERTH 01224565	1952	3000	State Herbarium WA	R.D. Royce collector
28	4B	64014/3/53-5m	PERTH 02855682	1953	5000	State Herbarium WA	
29	4B	79072/9/54-5m	PERTH 01639382	1954	5000	State Herbarium WA	
30	4B	5857/5/57-5m	PERTH 00233528	1957	5000	State Herbarium WA	
31	4B	10816/12/57-5m	PERTH 01588559	1957	5000	State Herbarium WA	R.D. Royce collector
32	4B	26718/6/59-5m	PERTH 02832259	1959	5000	State Herbarium WA	
33	4B	34330/3/60-5m	PERTH 02742160	1960	5000	State Herbarium WA	
34	4B	40061/9/60-5m	PERTH 01571281	1960	5000	State Herbarium WA	
35	4B	40061/9/60-5m	PERTH 05194059	1960	5000	State Herbarium WA	A.S. George collector
36	4B	40061/9/60-5m	PERTH 01636146	1960	5000	State Herbarium WA	T.E.H. Aplin collector
37	5	74085/7/63-2m	PERTH 01143093	1963	2000	WA Herbarium Perth, WA	
38	5	79564/1/64-5m	PERTH 01639285	1964	5000	WA Herbarium Perth, WA	A.S. George collector
39	5	80732/2/64-2m	PERTH 04115325	1964	2000	WA Herbarium Perth, WA	A.S. George collector
40	5	80731/2/64-5m	PERTH 01558722	1964	5000	WA Herbarium Perth, WA	

41	5	92366/12/64-5m	K 000701354	1964	5000	WA Herbarium Perth, WA	Ex WA Herbarium Perth, WA heading
42	5	93331/1/65-10m	PERTH 03391795	1965	10000	WA Herbarium Perth, WA	
43	5	26175/3/66-10m	PERTH 01063685	1966	10000	WA Herbarium Perth, WA	
44	5	26175/3/66-5m	PERTH 00148466	1966	5000	WA Herbarium Perth, WA	P.G. Wilson collector
45	5	33086/2/67-7m-B386	PERTH 02812290	1967	7000	WA Herbarium Perth, WA	W.E. Blackall Collection subheading
46	5	41610/3/68-10m-B386	PERTH 0707783	1968	10000	WA Herbarium Perth, WA	
47	5	42511/4/68-10m	K 000717246	1968	10000	WA Herbarium Perth, WA	Ex WA Herbarium Perth, WA heading
48	5	44354/6/68-5m	K 000327727	1968	5000	WA Herbarium Perth, WA	E.M. Bennett collector
49	5	61652/6/69-2m-B386	PERTH 01602853	1969	2000	WA Herbarium Perth, WA	W.E. Blackall Collection subheading
50	5	69543/4/70-10m-H497	PERTH 00724254	1970	10000	WA Herbarium Perth, WA	B.R. Maslin collector
51	6	94203/12/71-20m-H998A	PERTH 01018094	1971	20000	WA Herbarium Perth - Flora of Western Australia	including variants with W.E. Blackall Collection added (PERTH 01009257) & Flora of Queensland added (PERTH 01599747)
52	6	39095/6/74-5m-A447	PERTH 00962864	1974	5000	WA Herbarium Perth	

Table 2

Six types of herbarium labels variously printed for the University of Western Australia, Kings Park and Botanic Gardens and the Wildlife Research Centre by the WA Government Printer between ca. 1950 to 1985. It is not known how many labels were in each collection book.

Printers code	Example	Year	Quantity	Institution
40900/10/50-1250	PERTH 01220993	1950	1250	University of Western Australia
52386/12/51-2500	PERTH 01224123	1951	2500	University of Western Australia
50626/12/67-200bks	PERTH 01625195	1967	200 books	King's Park and Botanic Garden
23550/10/73-200bks	PERTH 01223658	1973	200 books	King's Park and Botanic Garden
112146/9/82-100bks	PERTH 01813692	1982	100 books	Kings Park and Botanic Garden
39550/3/85	PERTH 01026046	1985	100 books	Wildlife Research Centre

Citrus and Human History

Book review by Stephen D. Hopper, The University of Western Australia, Albany

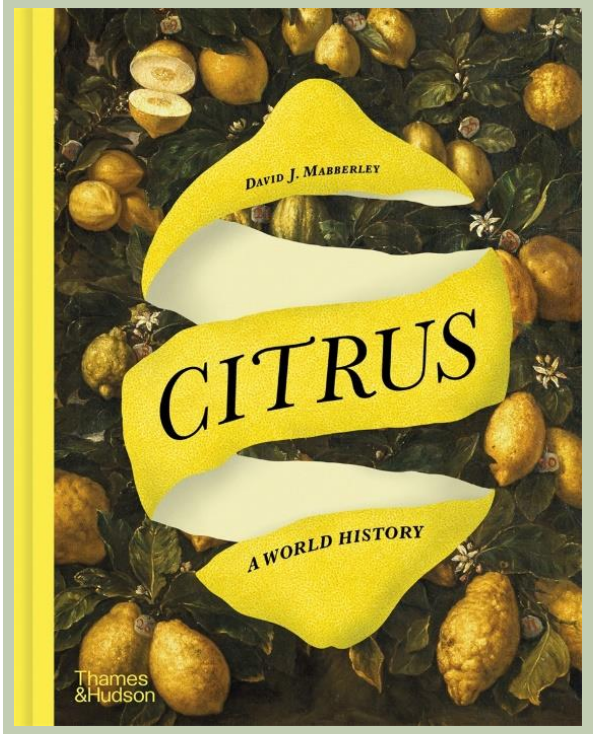
Citrus: A World History.

David J. Mabberley

ISBN: 978-0-500-02636-6, (hardback),
213 x 270 mm

Thames & Hudson Ltd, London, 2024,
pp. 288

RRP A$69.99



This book from the masterful pen of David Mabberley is well written, scholarly, and beautifully produced, as well as meticulously edited. I detected no spelling or grammatical mistakes in the work. I also learnt much about *Citrus*.

The text is copiously complemented with artwork, botanical and classical. After a succinct introduction, Mabberley takes a chronological approach, with the five chapters covering the ancient world, herbals to Hesperides, the House of Orange, Empire, exports and vitamin C, and a concluding account of progress and perils.

ASBS members will find much of interest and intrigue in the book. Despite consuming an orange each breakfast for decades, I was unaware, for example, of Mabberley's surmise that:

"There is no such thing as a wild orange, a wild lemon or a wild lime … these are all derived from hybridisations between truly wild species, the hybrid lines then fixed by apomixis. … The truly wild species underpinning the modern industry are: the mandarin (*Citrus reticulata*) and the pomelo (*Citrus maxima*) from China; the citron (*Citrus medica*), likely from north-eastern India; and the makrut lime (*Citrus hystrix*), from the Malay Archipelago." (p. 30)

Australia has six native species of *Citrus*, treated for the first time in any depth by Mabberley. They occur in tropical rainforests to semi-arid grasslands. Perhaps the finger lime (*Citrus australasica*) is best known because of its edible elongate fruits. China is the second major centre of wild *Citrus* species diversity. It is from the latter region that "the most significant and most intimate relations with human beings–leading to modern citrus crops" are to be found (p. 28).

The broad sweep of Eurasian history is covered from this Chinese base. We learn of the progressive dispersal westwards of *Citrus* facilitated by Alexander the Great and early scientific discourse of Theophrastus among the ancient Greeks. A lemon tree in the House of the Orchard, Pompei is featured on a fresco dating from around the birth of Christ. The Crusades and Islamic scholarship feature *Citrus.* Lemon houses and early orangeries are part of medieval Mediterranean horticulture. Royal European interest emerged at the time of William of Orange (1533–1584). Rumphius celebrated the Rutaceae and south-east Asian *Citrus* in his Herbarium Amboinense.

The age of Empire was inhibited by scurvy which ultimately was managed by fresh *Citrus* administered on long maritime voyages, pioneered by James Cook. The explosive cultivation of Central Valley orange orchards in California and in Florida made incredible fortunes for a time. Orange juice for breakfast has become a North American staple. Modern hybridisation led by USA citrologist Walter Swingle (1871–1952) helped this flourishing industry. However, Mabberley concludes the book with sobering reading about devastating diseases now afflicting plantation *Citrus*, much of which is established from a low genetic base. Will we continue to enjoy *Citrus* as a mainstream crop? Mabberley points to the Australasian species, long neglected, as potentially contributing to DNA and disease resistance that might ensure a brighter future than currently forecast.

I commend this book to all with an interest in *Citrus* and human history. David Mabberley has compiled an engaging work, rich in historical and botanical insight, and stunningly illustrated.

Ferns from afar

Book review by Peter Bostock, Brisbane

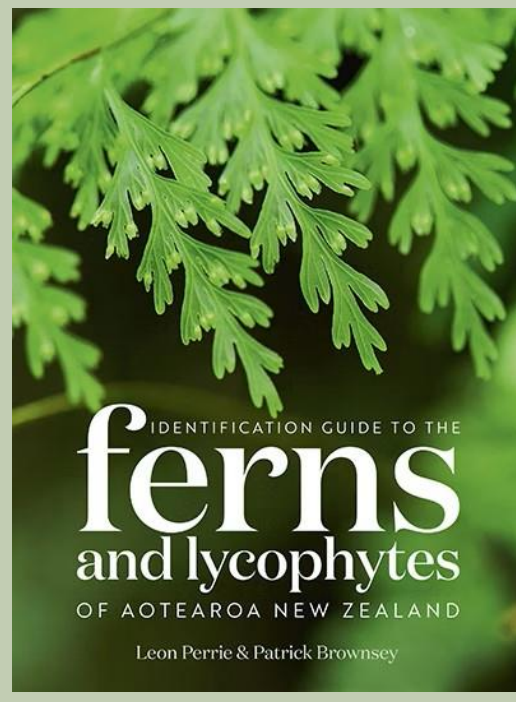
Identification Guide to the Ferns and Lycophytes of Aotearoa New Zealand

Leon Perrie & Patrick Brownsey

ISBN 978-1-99-116555-8
(paperback, flexibind with jacket),
235 x 175 mm

Te Papa Press, Wellington, New Zealand, 2024, pp 279

RRP NZ$50.



I feel very privileged to own many of the late 20th and early 21st century publications dedicated to Aotearoa New Zealand ferns, most of which post-date my late-blooming interest in the ferns (summer of 1978, to be more or less precise). To be asked to review this current book is just icing on the cake. I must add that my field experience of New Zealand ferns is based on a single visit, during joint Heads of Herbaria and related information systems meetings in Lincoln in 2004. We were taken on a full day excursion to Banks Peninsula, walking the Hinewai Reserve, guided by the legendary Hugh Wilson, and in the company of a rowdy crowd of experienced botanists! I photographed 29 ferns and lycophytes that day, but very likely missed a few. Of these, 13 are considered indigenous to Australia and New Zealand and one species is naturalised in New Zealand. Of the 29, I was more or less confident in my own identification of about 11 of them. I could not identify any of the 7 or so species of *Blechnum* nor about one-third of the *Asplenium* species, so I know that this guide would have been invaluable on the day!

Both Australia and New Zealand have proud histories for fern and lycophyte floras and identification guides, with enthusiasts and/or learned botanists (often combining the two traits!) abounding in both countries at various times in their modern history. However, it seems to me that field guides, at least those that truly earn that title by being portable, with appropriate illustrations and suitable for a wide ranging audience, are relatively rare. New Zealand arguably has a better track record for this, but both Australia and New Zealand have their floras that date from the 18th to the 21st century, and both have adopted internet based flora treatments, with associated advances in imaging and other aids. Both have adopted technology that aids identification as it became available, whether from coloured wood-prints, paintings, line drawings, blueprints (Dobbie 1880, 1880a, 1880b, 1921; Craig 1888, 1892) and lithograms (Bailey 1892), or monotone and colour photography (Brownsey & Smith-Dodsworth 1994, Crowe 2004). As modern taxonomy has shone a more detailed light on fern families, genera and species, so the floras and field guides have adopted diagnostic features that work to separate the taxa at these various levels.

A good field guide must clearly provide means to distinguish taxa that can be confused, and should offer one or more diagnostic tests to help resolve that problem. I'll call these confusing taxa "species pairs" for want of a better term, and the precision at which a species pair can be resolved to one or other species clearly depends on the technology available. A true field guide will clearly state the limits of its resolving power, which in this Guide, as in many, perhaps most, is restricted to the field of view of a 10× hand lens. Another important aspect of field identification is that it often must be carried out without major or even any noticeable damage to the plants themselves, which further restricts the characters that can be employed. This particularly applies to sporangia and spores, which sometimes are important in resolving species pair identity. I'll defer further discussion on identification until after my summary of the book's structure.

The Guide

This Guide is organised into 4 major sections: Illustrated glossary, Guide to genera, Species scan, and Species profiles, plus the all-important Introduction and four Appendices. The introduction ends with a helpful chart for the neophyte: Steps to identifying a fern or lycophyte. The Appendices are important too—particularly Appendix 2, which cites 24 indigenous and endemic taxa which are not included in the Species profiles, with a brief guide to their local distribution and abundance in Aotearoa New Zealand. Most are either uncommon or very uncommon, or confined to off-shore islands. Appendix 3 provides similar information for excluded naturalised species. Readers are advised to refer to the publications web site for eFloraNZ (undated) for more information regarding species in both appendices.

Illustrated Glossary

The glossary, arranged nominally under some broad alphabetic headings, makes extensive use of stylised diagrams of rhizome/frond arrangement, degrees of lamina dissection, and mono- and dimorphism of fronds. It avoids much of the botanical jargon associated with fern fronds, particularly terms such as pinnatifid vs pinnate etc. This simplification of language into terms like 'divided 1-3 times' or 'fronds divided twice' are sufficient for identification purposes. Some technical terms are employed and described, however, including stipe, rachis, costae, and pinnae, the latter two qualified by their place in the frond, as in 'primary', 'secondary' etc. Venation is simplified to terms such as midvein, free veins and netted veins. Two pages of small images are devoted to describing various arrangements of sporangia, sori and their indusia if present, under the major heading of Reproductive structures. The final page describes the sporophylls of lycophytes, Psilotaceae and Equisetaceae, including the modified sporophylls of *Equisetum* and lycophyte cones. Two final terms, which seem a little like afterthoughts, are Bulbils (illustrated by two images) and Stolons (no image). This is a reminder that every page needs to be thoroughly studied!

Guide to Genera

This section uses small images of diagnostic features, one per genus, in a set of seven categories defined by the position of sori (short or elongated, on margin or away from it), or where sori are not borne directly on the lamina, type of, or absence of, pinnule or lycophyll venation. Each group of taxa is indicated by a small (c. 15 mm diam.) green circle or icon, marked to show soral type and position or lamina venation. This icon is repeated in each species profile. It is actually a test for those who did not initially read the Introduction fully but instead dived directly into the profiles. Disclosure: I failed the test! Fortunately it is described in full in the Introduction on page 13. There are seven icons and their associated headings. The first one, for example, is "Sori elongated on lamina margin", and encompasses 10 genera, including *Adiantum*, *Pteris*, *Asplenium* and *Blechnum*.

Species Scan

This section provides a single image per species, of a frond or two or a whole plant or part thereof, arranged under major headings of Lycophytes and Ferns, and subsequently

in each category, organised in a sequence intended to group similar frond or plant morphologies together. I remember my early days as a fern enthusiast, before I migrated to keys, scanning books such as Jones and Clemesha (1977), trying to match their line drawings to the plant I was identifying. The human mind seems to pattern-match very easily, and an arrangement where similarities are grouped and differences separated is as good as any.

Species Profiles

These are one-page profiles covering 201 species, each with three or four colour images targetting whole plant appearance, habitat preferences, and appropriate distinguishing features, with descriptions always aimed at diagnosis, other notes to aid identification, a small map of Aotearoa NZ showing recorded distribution, a comment regarding local status (indigenous, naturalised etc) with extra-NZ distribution noted where applicable. The photography is excellent, with macrophotography for small features such as abaxial pinnules and sori, and the reproduction quality is superb. There are limitations, of course, with such photographs, but on balance, I think the authors provide as much information as is possible for this format. Finally there is a small comment at the end of each profile, reporting the length of fronds as a range e.g. *Asplenium polyodon* is given as 115–1640 mm, and the previously mentioned icon (here a circle about 1 cm in diameter) for soral position or leaf venation. In addition to the currently accepted name in New Zealand, synonyms, and vernacular and te reo Māori names where appropriate, are supplied.

This guide has an amazing wealth of information, and I won't attempt a detailed critique of accuracy or usefulness in identification. When I first opened the guide, I gravitated immediately to some species pairs and problem genera, that I know from long association with inexperienced fernies, can be difficult to identify. These include: species of *Adiantum* (e.g. *A. diaphanum* and *A. hispidulum*; dark erect hairs vs pale lax hairs); *Pellaea* (pretty much any and all of them, fortunately restricted to 2 species in New Zealand; stipe and rachis scales spreading vs appressed); *Grammitis sens. lat.* (in New Zealand, confined to the genus *Notogrammitis*); species of *Blechnum sens. lat.* and also *Hymenophyllum* species. These last three examples often involve knowledge of a very broad range of characters from rhizome to sorus, not forgetting hairs, glands, and/or scales. One species I always target: *Cyclosorus interruptus*, as the small scales on the abaxial pinna midribs are a very useful guide to confirm initial identification. In this Guide, the authors illustrate these scales in a clearly labelled image, although they are not specifically mentioned in the description. I am pleased to report that subject to the resolving power of this guide, the authors have satisfied my concerns about confusing species pairs (sometimes triplets or quadruplets!). Perhaps the most challenging will be *Hymenophyllum*, with 23 species covered. Habitat, habit, rhizome and stipe, lamina wings, position and shape of sori and indusial flap all play a part. I am more or less familiar with the seven species that occur in both Australia and New Zealand, and in the Guide, for example, *H. peltatum* (A, NZ) is to be compared with *H. cupressiforme* (A, NZ) and *H. revolutum* (NZ); by my reckoning, the parallel descriptions of

indusial flap margins, position of rachis wings and placement of secondary lamina segments easily separate these three.

What haven't I mentioned? The robust dust cover with centimetre ruler, matched by another ruler on the outer edge of the book's front and back covers; twin quite robust ribbons as place holders – one green and one orange; weight: 810 g; size: nominal 24 × 18 cm (h × w). Not a pocket book, but easily held in vehicle glovebox or in a backpack. I heartily recommend this book, and look forward to discovering more about New Zealand ferns from it, even if only from the comfort of my study!

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What books should the well-read botanist have?

Book review by Alex George, Kardinya

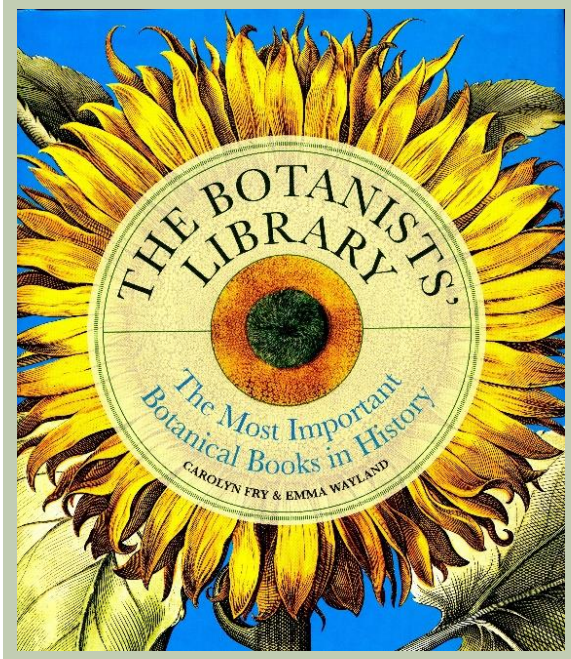
The Botanists' Library: The Most Important Botanical Books in History

Carolyn Fry and Emma Wayland

ISBN: 978-0-71129-494-3, (casebound with dust jacket), 200 × 235 mm

Ivy Press, London, 2024, pp. 272

RRP £28; A$60 (my copy from a local bookshop)



This is a delightful book with something for all, on the history not only of botany but of art, printing, social attitudes. Here, we find 'the usual suspects' but also (for me) works that I have been unaware of because they are not relevant to my work but are for others. As the title indicates, it's mainly about books, although a few journals such as *Curtis's Botanical Magazine* are included.

The first question is, who are the botanists of the title, though in the Introduction the authors pose the question: 'What books should be included in the discerning botanist's library?' Botany is defined 'loosely as the study of plants (allied to that of fungi)' but 'discerning' is not explained further. They acknowledge that it's a difficult question to answer due to the diversity of the subject, the global scope, and historical development. From the start, it soon becomes clear, from the works included, that such a (theoretical) botanist would have to be (very) wealthy. By the end, you realise that no single 'discerning botanist' or even an existing library can own all these works, rather 'The Botanists' Library' is a collective of what it might be.

Their question and response are those of two people with an interest in the philosophy of science (especially botanical), exploration, horticulture and the environment. While many of these works choose themselves, in moving away from the core, almost everyone would select different additions according to interest and kind of botany.

There are six chapters covering the periods

> Ancient times–1450, emerging knowledge: e.g. Theophrastus (*Historia plantarum*), Dioscorides (*De materia*

medica), the Hebrew Bible, the Carrara Herbal

1450–1600, the coming of printed books: e.g. Brunfels (*Herbarium viva eicones*), Schöffer (*Ortus sanitatis*), Fuchs (*De historia stirpium*), de l'Obel (*Stirpium adversaria nova*)

1600–1750, striving to know and classify: e.g. Besler (*Horus Eystettensis*), Parkinson (*Paradisi in Sole Paradisus*), van Rheede (*Hortus Malabaricus*), Grew (*Anatomy of plants*), Linnaeus (early works)

1750–1830, the 'global and local': e.g. Linnaeus (later works), Sibthorp & Franz Bauer (*Flora Graeca*), Curtis (*Botanical Magazine* founded), P.-J. Redouté (*Les Roses*), Wallich (*Plantae Asiaticae rariores*), Alph. De Candolle (*Prodromus systematis naturalis* founded)

1830–1950, botany becomes a science: e.g. Tsunemasa (*Honzö zufu*), Bentham (Floras), Bentham & Hooker (*Genera plantarum*), Jane Loudon (*Ladies flower garden*), Mendel (*Principles of heredity*), Bonnier (*Flore complète illustrée de France …*), *Index Kewensis* (from 1885)

1950–the present day: e.g. *Flora Europaea*, *Flora of the People's Republic of China*, Keble Martin (*Concise British Flora*), Kew's *State of the World's Plants etc.*

Within each period, important works are described, discussed and illustrated with images of covers, title pages, authors, plates. There is an emphasis on illustrated works of the Northern Hemisphere, especially Europe but also North America and Asia including China and Japan. Only a couple of South American works make the list, and few from Australia—Celia Rosser's *The Banksias* makes it (with a reference to the argument over the position of *Dryandra*) while D. McAlpine and W.D. Francis are mentioned in passing. Mueller, Bailey, Maiden, Black, Willis, Burbidge, Johnson & co. don't make the cut. The *Flora of Australia* is mentioned but not illustrated. Sydney's *Florilegium* is featured on p. 250 as a celebration of plants being grown in the Royal Botanic Gardens – a beautiful book but arguably not one of the 'most important' in botanical history.

Some textbooks make the list, e.g. Esau's *Plant Anatomy* and Taiz & Zeiger's *Plant Physiology and Development*. Conservation works begin to appear from the late 19th century.

Some works appear to have been included because they appealed to the authors artistically rather than being among the 'most important' books. An example is *The Alcatraz Florilegium* of 2016, about a garden developed during its prison years, later abandoned but then resurrected. It has an Australian connection, however: *Albizia distachya* (now known as *Paraserianthes lophantha*) is one of the plants that survived.

While Ferdinand Bauer is mentioned as travelling with Flinders, there is no mention that Robert Brown was on the voyage. Brown is noted for his discovery of the nucleus but the title of his paper is not, nor is there any mention of his other important botanical contributions. Most (all?) Australian taxonomists would rate his

Prodromus as one of our most important books.

The role of herbaria scarcely rates a mention but then, while their collections are cited in innumerable works, there are few books about them in particular, though many accounts of botanic gardens include them. The only guide to herbarium practices, Bridson and Forman's *The Herbarium Handbook*, is not mentioned.

For some works, more than one illustration is reproduced when one would have sufficed for this purpose, e.g. three from George Brookshaw's *Pomona Britannica*. A photo of American nuclear scientist Ernest Lawrence to show his lab as a model for research laboratories is not typical of a botanical one.

A nice juxtaposition is photos of Armen Takhtajan and Arthur Cronquist on facing pages with images of their most important books.

Many captions give only the common name of the plants figured. There are no captions for the plates on pp. 133 and 259 but they are presumably associated with those on facing pages. The type could have been larger in the captions and index, and the latter on white, not grey shaded, paper. While it would break up the text a little, I would like to have seen references to figures in the text, especially for those that appear on a different page. Some reproductions could also have been larger, in particular those title pages of early works that have much text besides the titles themselves.

The authors have done a great job in interpreting works in languages other than English, from the ancients to those of eastern Asia such as China, Japan and India.

The plants shown in illustrations are not indexed, nor are there entries for subjects such as taxonomy/systematics etc. Some book titles are, but many are under their authors so you have to know, for example, that Matsumura wrote *Nippon Shokubutsumeii* before you can look it up.

The colour plate on the back cover is not captioned but reading the book you eventually find it also reproduced on p. 200: it's *Meconopsis simplicifolia*, plate VIII from Joseph Hooker's *Illustrations of Himalayan Plants*, drawn by John Cathcart. Likewise, there is no caption to the frontispiece (with care you can make out the name on the plate, *Asphodelus ramosus*) but then you find it again on p. 159—from the *Flora Graeca*; interestingly, the quality of the reproduction of the two is different.

A couple of small historical errors appear. Kew is mentioned in the early 19th century as the 'Royal Botanic Gardens' (p. 140)—it did not become formally so until William Hooker assumed the Directorship in March 1841. Banks did not travel with the Forsters on Cook's 2nd voyage (p. 147).

The authors have answered their own question, what to include, very well. In such a wide field, every person would compile a different list according to their particular interests and location, but the choice here is excellent for the reader both new and experienced. The text is well written and easy to read.

The Redoubtable Redoutés

Book review by Alex George, Kardinya

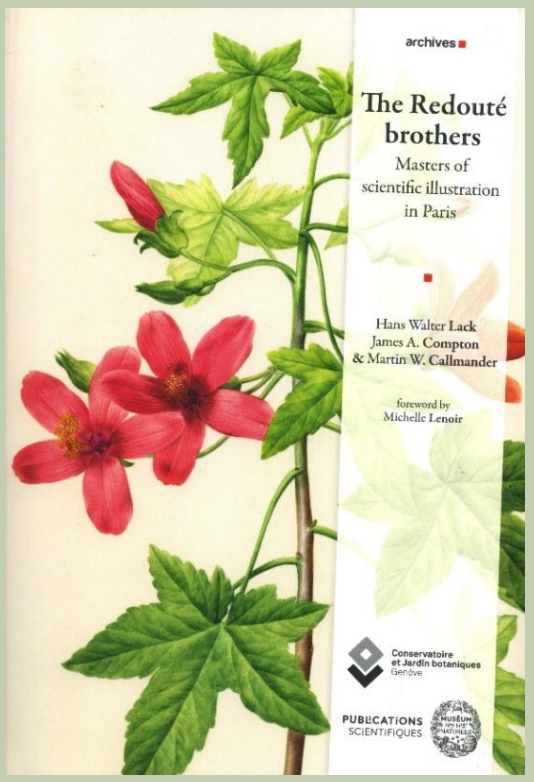
The Redouté brothers: Masters of scientific illustration in Paris

Hans Walter Lack, James A. Compton & Martin W. Callmander

ISSN 1281-7139, ISBN 978-2-38327-020-1, flexibound with French flaps, 240 × 168 mm

Conservatoire et Jardin botaniques de Genève & Muséum national d'Histoire naturelle, Paris, November 2024, pp. 822

RRP €49



A masterpiece. But, as a review is usually more than two words long, and especially one of a book of 822 pages, I should elaborate.

A preface by Hans Walter Lack explains 'why this book had to be written' – combining 'the first comprehensive biography of the three Redouté brothers in English', 'a historical panorama of the state of plant and fungal taxonomy' of the period, 'the organisms depicted and their importance for science', all while focusing as far as possible on the original, not published, artworks.

The book is an account of the brothers Antoine-Ferdinand, Pierre-Joseph and Henri-Joseph Redouté whose lives spanned the years 1756 to 1852 (even their parents had hyphenated given names).

The contents are given briefly on pp. 7–8 and in more detail on pp. 817–822. The book is presented in seven parts: 1, The formative years; 2, A multitude of projects; 3, The great works; 4, Henri-Joseph and the *Description de l'Égypte*; 5, Josephine's garden at Malmaison, *Les Roses* and other projects; 6, Pierre-Joseph, a Paris celebrity; and 7, Pierre-Joseph and Henri-Joseph as seen in a larger context. There are six appendices, then catalogues raisonnés of the works by Pierre-Joseph and Henri-Joseph. Unpublished text sources are listed, followed by the references, a list of the illustrations reproduced in the book, and finally five indices (general, books etc., persons, place names, plant and other biological names).

In general, the book takes us chronologically through the brothers' lives, with some chapters focused on their major works. There are many discussions on published works, their texts, plates, who drew these, the sources of the materials, the fate of the originals – the present location of many is unknown. A precise source is given for each reproduced plate. We are taken on a tour of places, events and people of the period, with detours into the history of other times. There are diversions into botanical (and other) matters essential for understanding some plates, e.g. the life history of the stem rust *Puccinia graminis* (pp. 558–560).

Everything is set in the political context of the time, much of it of course being the years of the French Revolution, the Napoleonic Wars and other upheavals, which all the brothers negotiated successfully. And through it all, Paris was virtually the centre of the scientific world, especially botanical, and we meet all the important players of the period in Europe (listed in a Dramatis personae on pp. 22–23) and some from elsewhere, e.g. Joseph Banks and James Edward Smith in London. There is much discussion about the people who commissioned art from the brothers.

Pierre-Joseph is by far the dominant figure in the story, due to his productivity and popularity, followed by Henri-Joseph and then Antoine-Ferdinand, but their relationship and comparisons are part of it.

For a number of works, especially those that appeared in parts over many years, there were other contributing artists and we are given comprehensive accounts of them and their work.

An interesting contrast with two other prominent brother artists of the period, Franz and Ferdinand Bauer, is that the latter used a microscope to study and draw plants, especially their finer features, whereas there is only one instance of Pierre-Joseph doing so, the moss *Tortula subulata*, and it's even possible that he copied another drawing of this.

Throughout the book, there is a fine selection of reproductions, each with its full provenance given in the caption. One point not given is the size of the originals. With two exceptions, I have not seen any original plates so cannot compare the reproductions with them but, assuming them to be faithful, as is often the case with watercolourists, the intensity of colour does not reflect the living plants. The cardinal flower, *Lobelia cardinalis* (p. 178) is perhaps an exception but even there the greens of the leaves seem too pale. Of interest in this respect, too, is Pierre-Joseph's plate of the red kangaroo paw, *Anigozanthos rufus*. As pointed out in the text, the flowers in herbarium specimens almost never retain their colour but this species is an exception. I saw Labillardière's specimen at FI in 1968 and was immediately impressed at how the flowers had kept their colour, and how realistic is Pierre-Joseph's painting of a single flower. I stress that my comments on colour refer to original paintings, not the plates in the book which I am sure are faithful reproductions.

Three other Australian plants are illustrated – *Acacia terminalis*, *Eucalyptus obliqua* and *Thysanotus patersonii* – and others are discussed in the text.

The research behind the book is mind-boggling – seeking historical data about

people, places and events in published and unpublished sources, tracking down plates original and published, interpreting the plates botanically and artistically, and incorporating all into a cohesive narrative. In the course of their research the authors have uncovered a number of plates that have lain in collections unnoticed by other researchers, and corrected errors made by previous authors. This volume must be the *sine qua non* about the Redouté brothers.

This is very much a book for botanists and artists. All scientific names are given in full, with their authors and family. The materials on which artists drew and painted are discussed. Developments in printing, to which Pierre-Joseph sometimes contributed, are discussed. The final assessment of Pierre-Joseph sums him up: that he gained 'applause, success and fame on a global scale' that no other plant illustrator has achieved.

All quotes from other languages are given in English translation, with the original text in footnotes.

A comprehensive list of references runs to 34 pages. There is a brief Contents at the start, listing the Parts, and a detailed Tables of contents at the back with a breakdown of the chapters.

Despite the huge amount of research, a number of matters still await further study, outlined in the chapter Further Research. Two hundred years on, there is still plenty of scope for the inquisitive Redoutéan, in particular the garden historian.

One point of format could have been presented better for the reader. There are many cross-references within the text, given as e.g. 'see first chapter of Part three'. Since the parts and chapters are not numbered in the text, this requires consulting the back contents, where the parts are numbered but not the chapters, and then a scan of the text. Citing a page number or range would have been better.

It's very apposite that, as I write this review, I have flowering in my garden both white- and yellow- flowering *Rosa banksiae*, discussed and illustrated in the chapter on *Les Roses*.

Which brings me back to the start of my review: A masterpiece.

Endeavour Champion

Book review by: David Mabberley, Sydney and Oxford

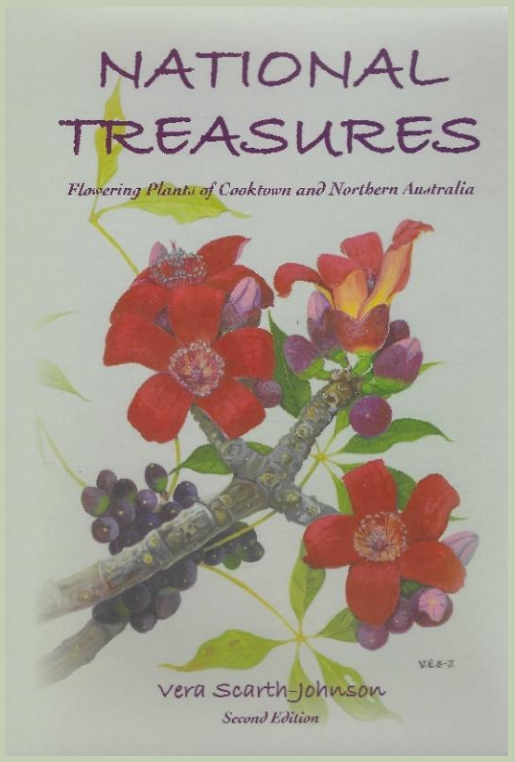
National Treasures: flowering plants of Cooktown and Northern Australia

By Vera Scarth-Johnson

ISBN: 978-0-646-70134-9, (paperback,) 230 x 165 mm

Vera Scarth-Johnson Gallery Association Inc., Cooktown, Queensland, Second edition, 2024, pp. xviii + 174

RRP A$35 00



According to one of the opening sections of this book (and reprinted almost *verbatim* in Wikipedia), Vera Scarth-Johnson (1912–99), 'tall, slim, distinguished, and very beautiful, was a feisty, larger-than-life character, who enjoyed friendships, a glass or two of claret and good conversation. There was no beating around the bush .... she made her straightforward views known to all, from high-profile scientists and politicians, to farmers, fishermen and children'.

Born Vera Elizabeth Johnson, daughter of a musician, Herbert Johnson, and his wife Grace (née Scarth, from a rich industrial family in northern England), and later styled Scarth-Johnson, she migrated to Australia in 1947, finally settling in Cooktown, north Queensland in 1972.

Although a cane farmer earlier in life, Scarth-Johnson became a conservation activist, focusing on developments she perceived to be detrimental to the Endeavour River - which she referred to as 'my river'. Her agitation is said to have been important in the establishment of the Endeavour River National Park in 1975 (gazetted 2006). Before this, she had got some 93.5 hectares of heathland about 17 km southeast of Bundaberg recognised as a wildlife reserve: in 2006 that was formally named The Vera Scarth-Johnson Wildflower Reserve.

Captivated by (or obsessed with?) the collections made by Joseph Banks's team at Endeavour River in 1771, Scarth-Johnson set about illustrating in watercolour many of the species they had found, though only 'the

most interesting or beautiful plants' (but strangely including the naturalised *Vachellia farnesiana*), as she wrote. Not only that, she collected herbarium specimens, among the 1700 of hers now held at BRI (though the type of the eponymous *Argophyllum verae* is not one of those), and worked with indigenous people recording uses of, and ecological information about, the plants. Indeed, one of the introductory tributes to her in this book is by a senior member of the Gamay Clan, of which she was made an honorary member.

Only 160 of Scarth-Johnson's planned 200 drawings of Cape York plants (some with pollinating insects) had been finished before failing eyesight and the onset of Parkinson's disease made her stop[23] (Clarkson 1997). In 1990 she gave the drawings to the people of Cooktown, and they are housed today in the Botanic Gardens there, in a purpose-built structure known as Nature's Powerhouse—a name she reportedly chose herself, with the idea that the collection would encourage local people to, in her own words, 'appreciate and protect our natural environment'. The building now also houses her desk and easel from her laundry-studio, besides her paints and brushes. However, in December 2023 the *Cape York Weekly* could report that the storage conditions for the collection were far from ideal, the room for it ('the bunker') 'doubling as a hallway' with some pictures damaged and at least one already affected by mould. Measures have been (and continue to be) taken to address these shortcomings (John Clarkson, pers. comm. 23 January 2025).

The first edition of this book was issued in 2000 to coincide with opening of that building, a year after Scarth-Johnson's death. Her original manuscript is lost and the printers have gone out of business, so, for this new edition, Tony Roberts stoically retyped the text and updated the botanical information. The 145 drawings reproduced here were re-photographed by Tess Buhmann and Michael Marzik. Moreover, the opportunity has been taken to add images of habitats, provided by yet others, to illustrate some of Scarth-Johnson's original arrangement by habitats or life-forms, which quirkily ends with 'Oddities'.

Beneath the images are the Latin and English names (rather quaintly capitalised) and local vernaculars if known, family and Scarth-Johnson's notes on local uses, propagation etc. – and if Banks's team had also collected the plant. There is a brief glossary, index of names and a bibliography. The book, as a whole, has a fresh look to it and its production is a credit to the Association and its volunteers.

This was not Scarth-Johnson's first venture in this field, however, because she collected and painted plants in many parts of Australia (besides on Tofua [Tonga]) and published, in Brisbane, *Wildflowers of the Warm East Coast* (1967) and *Wildflowers of New South Wales* (1968).

As a young woman, Scarth-Johnson had attended art courses in two colleges in

[23] Clarkson, J. 1997. Vera Scarth-Johnson. In J. McKay (compiler), *Brilliant Careers: Women collectors and illustrators in Queensland*. Queensland Museum

England, but she did not have any formal training in botanical illustration–and this shows in the images presented in this book. Some have floral dissections of varying quality, many do not. Indeed, the selection overall is uneven in quality, as pointed out in the introductory sections. Had she dated her work, it might have been possible to attribute the poorest ones to Scarth-Johnson's declining powers, but, as it is, the difference between the best and worst is jarring. One, a waterlily (p. 47), cannot even be identified to species.

Scarth-Johnson's work therefore cannot be compared with the watercolours made from the sketches drawn by her hero, Sydney Parkinson, working in Banks's team in 1771, nor indeed with contemporary Australian artists such as Beverly Allen, Susannah Blaxill or Celia Rosser, for example. Painted on paper of different hues, her work often more approaches 'flower-painting', as opposed to botanical illustration, and some of her best watercolours, e.g. *Barringtonia calyptrata*, are perhaps redolent of the work of Ellis Rowan.

Some of the images have the subject set in its habitat, e.g. *Amomum* (now *Meistera*) *dallachyi*, and therefore recall the oils made by Marianne North in Australia, while some of Scarth-Johnson's orchids, such as the Cooktown orchid, *Dendrobium bigibbum*, bear some comparison in style and quality with the Brazilian work of Margaret Mee (1909–1988), though both perhaps begin to approach the high camp of Robert Thornton's *Temple of Flora* (1799–1807).

As far as the text is concerned, some of Scarth-Johnson's eclectic notes raise a smile, such as the suggestion that *Acanthus ilicifolius* would make a good hedge to 'keep out trespassers', though more worrying, perhaps, is *Pseuderanthemum variabile* described as 'Good plant for the rockery' when, for most, it is a pestilential weed in subtropical gardens and nurseries.

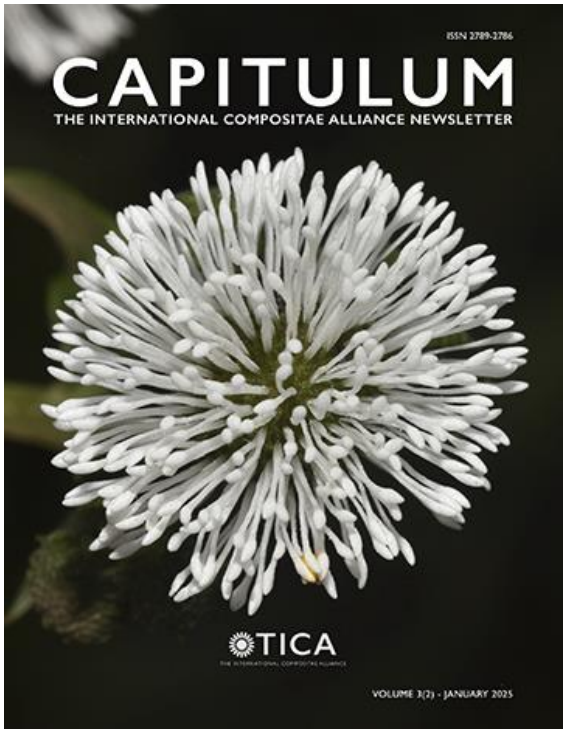
Readers of this *Newsletter* might note that, such is botanical progress, the nomenclature used is already outdated for a number of the plants depicted: besides the *Meistera* noted above, *Afrohybanthus enneaspermus* and *Hybanthus monopetalus* are now referred to *Pigea* while *Typhonium angustilobum* is now in *Lazarum*. There are very few errors in the notes, though slips include *Deplanchea* said to be named for its double anthers when it commemorates Émile Deplanche (1824–74), while the derivation of *Nauclea* is not that accepted today. Noteworthy, is the vexed use of the word *endemic*, as here under *Capparis lucida* and *Dillenia alata* which are indeed found in Cape York (endemic in layman's—and Scarth-Johnson's—terms, as with diseases) but not restricted (endemic in botanists' terms). In other places in this book 'limited' is used for the latter and, indeed, it would be less confusing for everyone if botanists adopted such unambiguous usage.

In 2018 a selection of Scarth-Johnson's Endeavour work was exhibited in the Cairns Regional Gallery and, two years later, other of her drawings were in a show, 'Finding Vera', in Bundaberg Regional Art Gallery. It is to be hoped that the best examples of her work in Cooktown could be exhibited elsewhere in Australia with a view, not only to respecting her wish to inspire Australians to 'appreciate and protect our natural environment', but also to mark her contributions to conservation in this country.

In the news

Please send to the Newsletter Editor anything that you think is of interest for the ASBS community.

CAPITULUM- a new name for the Compositae Newsletter



CAPITULUM is the new version of what was until 2021, known as Compositae Newsletter. The Compositae Newsletter was started by Tod Stuessy and Robert M. King in 1975 and had several headquarters throughout the years. Tod Stuessy, then based at the Ohio State University, served as editor to the first five issues and then Charles Jeffrey from The Royal Botanic Gardens at Kew edited the journal through to issue twelve in 1982. The torch passed then to Jette Baagøe from Denmark who would edit issue thirteen, which would turn out the last of that period as the newsletter was discontinued for six years. Then in 1988 Bertil Nordenstam from the Swedish Museum of Natural History took on the editorship of the newsletter for a stretch of 25 years until issue 50 in 2012. In this new form to which we affixed the name of the morphological structure classically associated with the family, the spirit remains the same as that of the original newsletter, that is, to be a venue for all things Compositae and welcome all kinds of diversity in both its contributions and contributors. [Text reproduced with modification from https://www.compositae.org/capitulum.html]

Vale Robert F. Parsons, published a historical summary of research on the genus *Taraxacum* in Australia in *Capitulum* earlier this year.

ISSN 2789-2786

Read the paper: Parsons (2025) *Taraxacum* F.H.Wigg. (Cichorieae) in Australia: The story of systematic research on the island continent in the last four decade. https://www.compositae.org/capitulum.html

Eucalyptus was not the problem

Taxonomic history in the making. Read the latest instalment in the debate.

Read the paper: Cook *et al.* (2025) *Eucalyptus* was not the problem: A response to "The genus problem – *Eucalyptus* as a model system for minimising taxonomic disruption" by Nicolle & al. **https://doi.org/10.1002/tax.13357**

The Genomics for Australian Plants Framework Initiative

Many of us have benefitted from—and contributed to—this landmark collaboration. Take a moment to reflect on the step-change the GAP Initiative has brought to the study of Australian plant diversity.

Read the paper: Simpson *et al.* (2025) The Genomics for Australian Plants (GAP) framework initiative – developing genomic resources for understanding the evolution and conservation of the Australian flora https://www.publish.csiro.au/sb/pdf/SB24022

The Rehearsal

Has anyone else been swept up in the hype surrounding TV show The Rehearsal? It would seem Nathan Fielder is not the only one rehearsing for success and this application—lab safety—is pertinent to many of us.

Link to story: **Want to enhance lab safety? Try a little role playing first**

Fungi to the front

Perhaps it's not the publicity mycologists would choose, but the media attention surrounding the Erin Patterson murder trial has spiked public interest in mushroom identification.

Link to related story: **Erin Patterson murder trial hears death cap mushrooms are 'challenging' to identify - ABC News**

Putricia and friends

Big, hot, stinky… and totally mesmerising. I was lucky enough to spend time with one of the *Amorphophallus titanum* that flowered at some south-eastern Australian botanical gardens earlier this year. What a spectacle!

Link to related story: **Big, stinky corpse flower Putricia blooms in Sydney, watched on by thousands via livestream - ABC News**

Amorphophallus titanum at the Australian National Botanic Gardens with Helen Kennedy—height 1.78 m—for scale (photo Megan Kennedy)

Botanists in the spotlight

My Garden Path | Gerry Turpin

Join ethnobotanist Gerry Turpin as he records and protects cultural plant knowledge.

Link to video: **My Garden Path | Gerry Turpin - Gardening Australia**

The Newsletter

The ASBS Newsletter keeps members informed of society events and news, and provides a platform for debate and discussion. The newsletter is published three times a year on the ASBS website. Original articles, notes and letters are encouraged for submission by ASBS members.

Have an article or an idea for the Newsletter?

Send it to Helen Kennedy at
editor.asbsnews@gmail.com

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The society

The Australasian Systematic Botany Society is an incorporated association of over 300 people with professional or amateur interest in botany. The aim of the society is to promote the study of plant systematics.

Membership is open to all interested in plant systematics. Members are entitled to attend general and chapter meetings, and to receive the ASBS Newsletter. Any person may apply for membership at any time by filling in a membership application form available at http://www.asbs.org.au/membership/. Subscriptions become due on 1 January each year.

The ASBS annual membership subscription is AUD $45, and a concessional rate of AUD $25 is offered to full-time students, retirees and unemployed people. Payment may be by direct credit, credit card or by cheque made out to Australasian Systematic Botany Society Inc. Members can update their contact details online at https://asbs.org.au/login/.

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ISSN 2204-910X

Cover Image: *Dendrobium canaliculatum* R.Br. by Ashley Field