THE UNIVERSITY OF MELBOURNE

The Botany Foundation

Annual Report 2022

Contents

Cover image: *Corymbia gummifera* (red bloodwood) flowers Mallacoota

Botany Foundation

The University of Melbourne Botany Foundation supports the discipline of Botany – the study of plants and plant processes.

The Foundation supports excellence in education and research in the School of BioSciences through: student awards and scholarships, early career postdoctoral awards and fellowships, a Professorial Chair, seed grants, and a partnership with the Royal Botanic Gardens Victoria. Plant science contributes to Australia's national science and research priorities and capacity building in the areas of biosecurity, agriculture and food production, the environment, biodiversity classification and conservation, and health.

Image: *Corymbia* (bloodwood) tessellated bark

Image: *Corymbia ficifolia* (flowering gum, pink form), Western Australia

— BOTANY FOUNDATION

The Botany Foundation and its endowed sub-trusts are managed by a Board, some of whom (*) have been members since the establishment of the Foundation. The first meeting of the Board was held in 1996 when a fund-raising appeal was launched.

Membership of the Board is specified in the University Trust Regulation governing the Foundation.

Board Members 2022

Dr Tony Gregson AM,
External Chairman

Professor Pauline Ladiges* AO,
Deputy Chairman

Ms Sally Browne* AM,
External Member

Professor Adrienne Clarke* AC,
External Member

Professor Moira O'Bryan,
Dean Faculty of Science

Associate Professor Alex Johnson,
School of BioSciences

Associate Professor John King* AM,
External Member

Professor Margie Mayfield,
Head School of BioSciences

Ms Kia Matley,
Postgraduate Student

Associate Professor Ed Newbigin,
School of BioSciences

Supported by Ms Penny Fairbank, Advancement,
Faculty of Science

Image: *Eucalyptus sideroxylon* (ironbark) flowers

Report from the Botany Foundation's Board Chairman

The Foundation continues to provide significant support to botany students and researchers, through our named scholarships and prizes, fellowships and grants. This year we were able to support 15 botany students. Four of the postgraduate students report on their research projects on pages 10-13, highlighting their contributions to plant biodiversity conservation at the species and ecological community level, understanding the mechanisms that pathogenic fungi use to overcome crop resistance causing yield losses, and applying biotechnology to improve bread wheat grain quality.

We are delighted to report on the success of Professor Michelle Watts, who holds the Adrienne Clarke Chair of Botany that we fund jointly with the School of BioSciences. Michelle is part of a new and exciting ARC-funded Research Centre of Excellence "Plants for Space", with key partner organisations including the Space Agencies of the USA, Germany and Australia (see pages 14-15).

This report also highlights the achievements of the Pauline Ladiges Plant Systematics Research Fellow whom we co-fund with the Royal Botanic Gardens Victoria; Dr Todd McLay's research (see pages 18-19) is advancing the application of genomics to understand the genetic diversity and evolution of Australian plants, and the conservation and management of vulnerable species and their populations. The Foundation is also contributing funds towards a salary for a postdoctoral fellow in plant ecology, and is supporting the research costs of a project on the diversity of microalgae associated with corals and which are essential for the health of coral reefs (see pages 16-17). The Protist Research Fund continues to grow with the support of a generous donor.

2022 was a challenging year globally and the Botany Foundation's capital was impacted by market downturn. However, the previous year delivered high investment returns and on balance the current total value of our two Trusts remains significant at $9.92m (see page 22).

I thank the Board members for their continued contributions and oversight of the Foundation. In particular, we welcomed the new Head of the School of BioSciences, Professor Margie Mayfield as a Board member. Professor Mayfield is a plant community ecologist interested in how environmental changes affect plant and insect community structure and function.

Thank you to all of our donors for enabling us to be in a position to help our young postgraduate students and research scientists, who continue to deliver excellence in plant science.

Dr Tony Gregson AM FTSE
Chairman, Botany Foundation

— SUPPORTING STUDENTS

2022 Student Scholarships and Awards

Since the Foundation was established in 1996, nearly 400 botany students have been supported through endowed awards and scholarships. This year the Foundation allocated a total of $32,100 to students, including 3 undergraduate students and 12 postgraduate students (MSc and PhD) whose research projects are listed below; four research projects are highlighted in the following pages. Students may use the funds for personal support or towards their research.

Molly Bloomfield, crimson berries

Botany Prize – Top 3rd Year Botany Student

Rebecca Carra

Bruce Knox Prize – Top 4th Year (Honours) Botany Student

Tessa Doherty
Shrub reproductive trajectories in the years following fire at Black mountain Nature reserve.

Kingsley Rowan Marine Botany Prize – Top 3rd Year Marine Botany Student

Alice Jenner

David Ashton Travel Award *(shared)*

Molly Bloomfield
Genetic variation, conservation and phylogeography of crimson berries (*Leptecophylla*, Ericaceae). MSc

Declan Blackburn
Reconstruction the phylogeny of the monocot family Asteliaceae to understand species boundaries and evolution in different biomes and changing climatic conditions. MSc

David H Ashton Scholarship

Andhika Putra
Understanding the past, present, and future of the allergenic invasive weed *Ambrosia artemisiifolia* in Australia. PhD

Griffin Srednick
Structural complexity and spatial heterogeneity mediate herbivory and influence asynchrony in algal metacommunities. PhD

Sophie Ducker Posgraduate Scholarship

Harvey Orel
Systematics and evolution of the Australasian plant family Rutaceae. PhD

Megan Klemm Postgraduate Research Award *(shared)*

Oscar Fung
Biotechnological strategies to improve plant growth and grain quality of bread wheat (*Triticum aestivum* L.). PhD

Riyad Hossen
Insight into diterpenoid biosynthesis in Bryopsidales algae: biochemical profiling to molecular pathway study. PhD

Ethel McLennan Award

Liu Wang
Understanding the role of the protein COMPANION of the enzyme CELLULOSE SYNTHASE 1 (CC1) in maintaining plant cellulose synthesis under salt stress. PhD

G.A.M. Scott Research Award *(shared)*

Lisa Buche
How positive interactions improve predictions of plant community diversity. PhD

Jose Manuel Sevenello Montagner
How do cross-trophic interactions influence plant species coexistence in patchy environments? PhD

John S. Turner Postgraduate Scholarship

Nicole Thompson
The LEUNIG Regulatory Complex: characterising interactions promoted by this protein complex in early embryo development of *Arabidopsis thaliana*. PhD

Gretna Weste Plant Pathology and Mycology Scholarship

Nicholas Chong
Role of transposable elements in the blackleg fungus in its ability to overcome canola cultivar resistance and to develop fungicide resistance. PhD

— STUDENT RESEARCH

Genetic variation, conservation and phylogeography of crimson berries (*Leptecophylla*, Ericaceae)

— By Molly Bloomfield, who shared the David Ashton Travel Award

The genus *Leptecophylla* is a member of the heath plant family Ericaceae, and includes 12 species from Papua New Guinea, Australia, New Zealand and various Pacific islands. My research is focussed on assessing the genetic variation, phylogeography and distinctiveness of one of those species -- the Crimson Berry, *Leptecophylla oxycedrus*, a shrub that occurs in isolated, small populations in Victoria and Tasmania. I will also test the validity of the recent taxonomic split that recognised *L. oxycedrus* as a species separate from *L. juniperina*, now considered to be restricted and endemic to New Zealand.

Determining the extent of genetic variation among isolated populations and the taxonomy and geographic limits of the species, will inform conservation management of Crimson Berry. In particular, my results will contribute to the management of plants at Victoria's Phillip Island Nature Parks by assisting in the selection of appropriate plants for revegetation or future breeding programs. My research may even allow the selection of plants from outside Phillip Island for this purpose, which is expected to optimise the genetic diversity of the species and assist in the resilience and survival of *Leptecophylla oxycedrus* on Phillip Island.

I am using next-generation DNA sequencing to evaluate the distinctiveness of plants and populations. Fieldwork is essential to my project because DNA markers are best sequenced from freshly collected plant material in this species and sampling of a number of individuals per population is required. I am using the funds from the David Ashton Travel Award for field work to collect plants in Tasmania, including some remote locations.

Molly Bloomfield on field work

Working in plant science brings me professional fulfilment as it challenges my problem-solving skills through data analysis and allows me to contribute to plant conservation. It also brings personal fulfilment through fieldwork.

Molly is completing her MSc and is supervised by Assoc. Prof. Mike Bayly and Adjunct Assoc. Prof. Dan Murphy (Royal Botanic Gardens Victoria).

How do cross-trophic interactions influence plant species coexistence in patchy environments?

— By PhD student Manuel Sevenello, who shared the G.A.M. Scott Research Award

Ecosystems around the world are being fragmented and altered by agricultural practices. Habitat fragmentation is one of the main threats to biodiversity and can affect important relationships between species, such as interactions between plants and insect pollinators. Understanding the factors impacting on insect pollinators and their relationship with plants is key to understanding the success and failure of plant populations.

The aim of my research is to gain a deeper knowledge of the biological consequences of landscape fragmentation on native plant population success. This will be done by exploring the impacts of environmental variation, including habitat loss and invasion of pest and weed species, on pollination and resulting plant reproductive success. The three aims of my PhD project are to: (a) explore how pollinators mediate species interactions and plant coexistence in natural plant communities, (b) analyse which landscape elements are important for pollen provision and reproduction of wildflowers, and (c) evaluate the reproductive evolutionary response of native plant species to intensive agricultural pressure and habitat fragmentation.

My study is conducted in the York Gum-Jam woodlands of southwest Western Australia. This ecosystem is a unique floristic region and a global biodiversity hotspot. This ecosystem is of high economic and ecologic importance, but more than 90% of its vegetation has been removed due to intensive agriculture. We have little understanding of how the annual wildflower species are responding to the effects of fragmentation, such as population isolation, pollinator collapse and competition with exotic species. This information is critical for the protection and conservation of the highly endangered flora of this region.

This project involved several months of intensive fieldwork throughout the Wheatbelt in Western Australia. The G.A.M. Scott Award supported this fieldwork with funding allowing for the project to include additional plant species and increasing the number of natural reserves studied. This has allowed the study to gain a deeper understanding of the factors influencing pollinators and wildflowers in highly fragmented landscapes.

Manuel is supervised by Prof. Margie Mayfield

Manuel Sevenello working in the York Gum-Jam woodlands of Western Australia

— STUDENT RESEARCH

Gene editing of bread wheat to improve plant growth and grain nutrition

— By Oscar Fung, who shared the Megan Klemm Postgraduate Research Award

Oscar with wild-type bread wheat plants in a John Innes Centre glasshouse, UK

Current estimates indicate that half of the human population suffer from micronutrient deficiencies and that nutritional disorders will only be exacerbated by future climate change and supply chain issues. The nutritional enhancement of staple crops such as bread wheat (*Triticum aestivum* L.), a process commonly referred to as biofortification, is an effective and practical strategy for combatting human micronutrient deficiencies. My PhD aims to apply CRISPR-Cas9 technology to edit genes within the bread wheat genome in order to improve plant growth and grain nutrition.

Research in the University of Melbourne's Plant Nutrition Lab has uncovered several gene families that play roles in iron and vitamin C nutrition and are promising targets for crop improvement via gene editing. The *HRZ* gene family functions to lower the amount of iron taken up into the plant and loaded into the grain. For example in rice, reducing the activity of *HRZ* genes resulted in a 3.8-fold higher concentration of iron within the grain relative to control lines. I aim to disrupt various combinations of the six *TaHRZ* genes in the bread wheat genome, allowing me to determine the function of these genes and ultimately generate bread wheat lines with high grain iron concentrations. Another gene family, *GGP*, is essential for vitamin C biosynthesis and the activity of *GGP* genes is controlled by a small upstream regulatory sequence (uORF). I therefore will utilise CRISPR-Cas9 to disrupt the *TaGGP*-uORF sequences, with an aim to increase *GGP* expression and vitamin C biosynthesis in bread wheat, and assess the resulting effect on grain nutrition and plant stress tolerance.

Editing genes within the bread wheat genome *via* CRISPR-Cas9 is notoriously difficult relative to other crops such as rice (*Oryza sativa* L.) and barley (*Hordeum vulgare* L.) due to the complex bread wheat genome and low regeneration efficiency of wheat from tissue culture. The John Innes Centre (JIC) in the UK is a leading institution in plant biology and crop improvement and houses a world-class bread wheat transformation platform (BRACT).

The Megan Klemm Botany Foundation award has enabled me to visit JIC and work with Professor Cristobal Uauy, a world-renowned expert in the use of biotechnological strategies for bread wheat improvement. The five-month research visit has enabled me to learn all aspects of gene-editing in bread wheat and generate the edited *TaHRZ* and *TaGGP*-uORF bread wheat lines that are essential for my PhD project. Furthermore, the protocols and tools of Professor Uauy's research group are open access, which will enable effective knowledge transfer once back in Australia and strengthen the collaboration between the University of Melbourne and JIC.

Oscar Fung is supervised by Assoc. Prof. Alex Johnson

The role of transposable elements in the blackleg fungus of canola in their ability to overcome disease control measures

— By PhD student, Nicholas Chong who was awarded the Gretna Weste Plant Pathology and Mycology Scholarship

Plant diseases are a serious threat to agriculture and food security worldwide. A major challenge for agricultural industries is how pathogens, such as fungi, adapt to overcome the resistance that has been laboriously bred into crop cultivars or become resistant to the chemicals used as fungicides.

In the case of blackleg disease of canola, caused by the fungus *Leptosphaeria maculans*, research has discovered that one way the fungus evolves rapidly to become genetically resistant is due to repetitive sequences in its DNA, which are more prone to mutation. Avirulence genes, which are related to pathogenicity and have corresponding resistance present in canola plants, are often found next to these repetitive elements, and so also mutate, leading to 'breakdown' of canola cultivar resistance in the field.

Until recently, it was thought that all of the repetitive DNA sequences in *L. maculans* were mutated, i.e. inactive, transposable elements. 'Transposons' or 'jumping genes' were first discovered in maize in Nobel prize-winning research by Barbara McClintock, and subsequently found across all domains of life. These are pieces of DNA that move (or 'jump') around in an organism's DNA. However, my supervisors discovered that an unknown number of these supposedly 'dead' transposons are able to move in the genome to change gene function such as causing resistance to fungicides. The aim of my PhD research is therefore to understand more how these DNA elements move in the genome of the blackleg fungus, and how that results in developing fungicide resistance. The insights I gain may contribute to finding ways of avoiding the emergence of issues like fungicide resistance.

I will use my award towards travel to the European Fungal Genetics Conference in Innsbruck, Austria, in 2023 to present my results and interact with and learn from the international research community performing related research.

Nicholas Chong is supervised by Assoc. Prof. Alexander Idnurm and Dr Angela Van de Wouw

Left: Nicholas Chong inspects disease on a canola crop early in the growing season when canola is most susceptible.

Right: Typical lesions caused by the blackleg fungus on canola, with the production of the spore forming structures (black dots) within the white dead tissue.

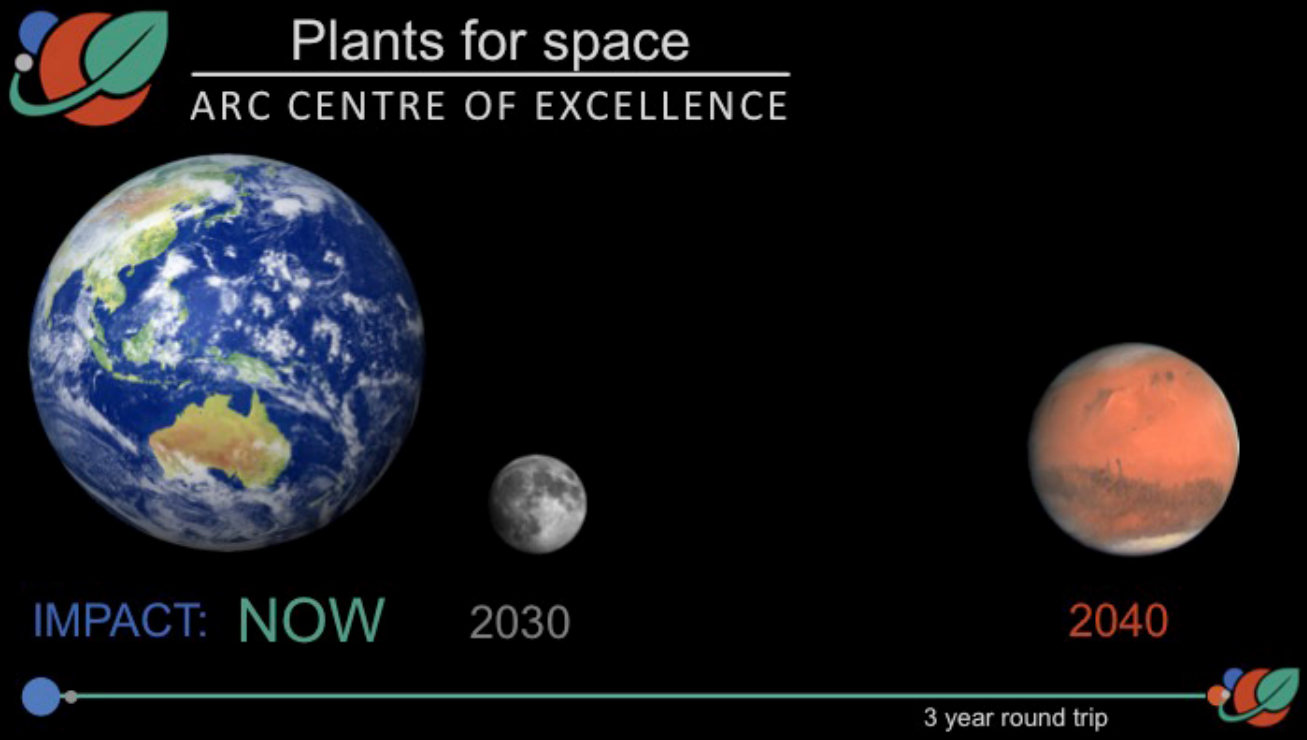
— FOUNDATION RESEARCH FUNDS

Plants for Space

— By Professor Michelle Watt

"People are fascinated by the idea of plants being the ideal all-round companions to humans in space".

The Adrienne Clarke Chair of Botany Professor Michelle Watt, who is supported through the Botany Foundation, is part of a newly funded Australian Research Council Centre of Excellence in "Plants for Space". The Australian Government is providing $35 million for this new research centre over seven years.



For more information:

https://www.adelaide.edu.au/newsroom/news/list/2022/11/03/research-centre-to-grow-space-food-expertise

https://research.unimelb.edu.au/research-updates/melbourne-joins-new-global-research-centre-to-investigate-using-plants-for-food-and-medicine-in-space

The central aim of the Centre is to design and create plant systems that supply calories, nutrients, pharmaceuticals and materials to humans living in Space. The plants must be robust to extreme and dynamic physical conditions, regenerate and reproduce without pollinators, and productive to ensure humans survive and thrive long term. Critically as the only other higher living forms with humans initially in space, the plants must foster well documented but poorly understood psychological benefits to humans through visual, smell, tactile and other sensory cues.

The traits discovered in the Centre for Space plants are expected to also enhance plants on Earth, to meet the challenges of food and water security and resource efficiencies in agriculture today. New traits include a harvest index of 1- meaning that 100% of the plant including the root systems is harvestable and edible, 100% use of recycled waste water, indefinite regeneration of tissues for continuous harvesting for “pick and eat” fresh, and ability to be stored long term while preserving a complete complement of nutrients for humans. These space traits are highly desirable and transferrable to sustainable agriculture on earth.

Four programs make up the Centre: Plants, Products, Processes and People. Physiology, biochemistry and molecular biology skills make up the Plant program to design and create plants that are “zero-waste” and provide a complete nutrient profile to astronauts. We will draw on the wide diversity of plants on Earth, as well as using synthetic biology tools to create completely new plant tissues. The Products program focuses on the products from the plants and their qualities for calories, nutrition, health and storage. Processes program involves the engineering systems to grow and harvest and process plants; to model and build closed loop systems that recycle water, waste and gases within the confines of spaceships and moon and mars habitats. The People program delivers the discoveries of the Plants, Products and Processes programs to agricultural and manufacturing industries, the education sectors, and to the public.

The Centre is led from the University of Adelaide, by Waite Director Matthew Gilliham. The University of Melbourne is one of five partner Australian Universities. Michelle Watt is the node leader for the University of Melbourne, and will work with Sigfredo Fuentes-Jara, also from the Faculty of Science, and Sally Gras, one of the Deputy Directors and from the Faculty of Engineering and Information Technology.

Key partner organisations include NASA, DLR (German Space Agency) and the ASA (Australian Space Agency). Over 15 international research partners include the German Juelich Research Centre, who have provided two PhD students and where Michelle was a previous Director. Together with Australian and international partners, the ARC Plants for Space CoE would be the largest single investment and organisation focusing on plants for space habitation, globally. At the moment, The University of Melbourne Botany Foundation is the only philanthropic organisation providing funding.

— FOUNDATION RESEARCH FUNDS

Microalgae of coral reefs exhibit different photo-physiological responses to heat stress

— By Dr Pranali Deore, supported by the Protist Systematic Research Fund

I have been fascinated by microalgae (single-celled photosynthetic protists) and have largely explored their biotechnological and ecological relevance in the context of climate change. I began my research on microalgae about 9 years ago and initially focused on their biotechnological applications. While exploring the commercial potential of algae, I realised that each microalgal species behaves very differently under similar environmental conditions. I was intrigued and began studying a range of microalgal species, their interactions with other microbes and their physiological responses to a range of environmental conditions.

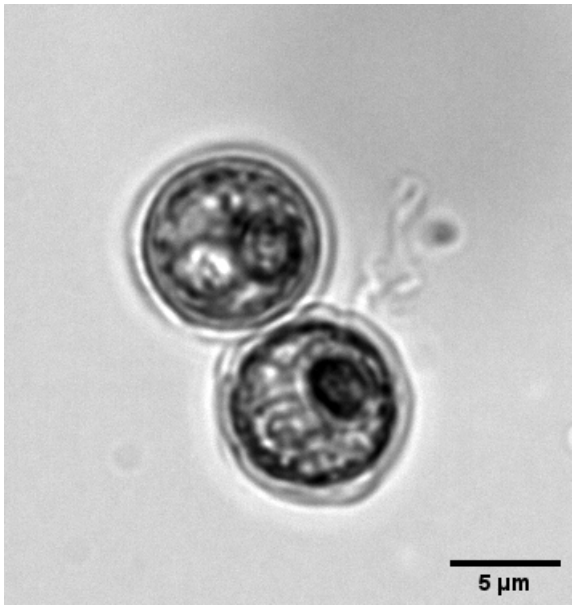
Currently, I am focusing on studying the photosynthetic behaviour of *Breviolum minutum*, which is a microalga of the taxonomic family Symbiodiniaceae. *Breviolum minutum* exists as free-living cells as well as residing inside invertebrate animals such as corals, sea anemones, hydroids, siphonophores, hydromedusae, sea pens and fans. The climate resilience of these animals depends on the abundance and diversity of *B. minutum* residing inside them. Taxonomic diversity of *B. minutum* can be studied using variations in many ribosomal, mitochondrial, and nuclear marker genes. The Internal Transcribed Spacer 2 (ITS2) region is commonly used for the identification of *B. minutum*, which harbours approximately 195 copies of this gene. Within-species diversity of *B. minutum* can be identified by the presence of different ITS2 type profiles within a cell population.

I have isolated a new ITS2 form of *B. minutum* (B1a-b1b-b1g), which is different from the commonly studied form of *B. minutum* (B1o-B1g-b1p). I isolated both of these ITS2 forms of *B. minutum* from the sea anemone, *Exapatisia diaphana*, collected from the Great Barrier Reef. Cells of these two forms have average diameters of 8.4 μm and 8.2 μm, respectively. Although morphologically alike, cultures of these cells differ in their photosynthetic behaviours under short-term cumulative heat-stress (26–42°C). Both cultures show similar levels of maximum photosynthetic yield, which is a measure of healthy functioning of photosystems participating in the chemical process of photosynthesis. However, they differ in their abilities to handle the release of excessively available energy that otherwise would damage proteins involved in photosynthesis.

Understanding the differences in photosynthetic behaviour of these two *B. minutum* ITS2 taxonomic forms under elevated temperatures is key to deducing their climate resilience potential and therefore, survival of their host organisms such as sea anemones or corals.

Above: Pranali Deore inspecting cultures of marine microalgae isolated from sea anemones collected from the Great Barrier Reef.

Right: Microalgal cells (ITS2 type profile B1-B1o-B1g-B1p) isolated from sea anemones collected from the Great Barrier Reef.



— FOUNDATION RESEARCH FUNDS

Exploring Australian plant biodiversity using genomics

— By Dr Todd McLay, who is the Pauline Ladiges Plant Systematics Research Fellow, jointly funded by the Botany Foundation and the Royal Botanic Gardens Victoria

I would like to begin by thanking the Botany Foundation and the Royal Botanic Gardens Victoria for providing the funding for this unique fellowship, which is allowing me to research significant taxonomic groups of native plants, contributing to knowledge of Australia's plant biodiversity, its evolutionary history, and long-term conservation.

I started my fellowship in 2020 but as the world responded to rising Covid case numbers, I was unable to do any molecular (DNA sequencing) lab work, fieldwork, or collections-based work during lockdowns. Nonetheless, working remotely I made good progress in a number of key projects, completed several legacy projects as publications, and developed other projects and collaborations. This year I am doing field work and back in the lab, applying genomics to significant iconic plants groups.

Evolution of northern eucalypts

This *Eucalyptus* Australia-funded project, led by Associate Professor Mike Bayly (University) and Professor David Cantrill (RBGV) is focused on the evolution, taxonomy, and biogeography of two clades of northern eucalypts that extend from the Kimberley to the Cape: *Eucalyptus* subgenus *Eudesmia*, and the paper-fruited bloodwoods, *Corymbia* subgenus *Blakella*. I contribute 50% of my time to this project, and have developed a method for sequencing large, multi-gene sections of eucalypt DNA – using a specifically designed target capture sequencing 'bait-kit'. I captured ~600 genes for 276 samples of eudesmids and bloodwoods. A phylogeny of the eudesmids is completed, and a manuscript drafted for publication. Additionally, 192 samples of *Corymbia terminalis* (tjuta or desert bloodwood) have been submitted for sequencing (using the method, DarTseq), to determine genetic geographic variation of this, the second-most widespread, species of eucalypt. The project is generating copious amounts of data, requiring significant bioinformatics analysis time, but will greatly contribute to our understanding of the geneic diversity and evolution of the eucalypt flora of northern Australia.

Genomics for Australian Plants

Genomics for Australian Plants (GAP) is a Bioplatforms-funded project that links scientists across Australian Herbaria and universities. GAP is split into three main streams: genomics, phylogenomics, and conservation genomics, and I have been involved in projects in all streams. As part of the GAP Genomics stream, I have led a team to assemble the first whole genome of *Acacia* (recently published), as well as being part of projects assembling the *Xanthorrhoea* (grass trees) and *Eremophila* (emu bushes) genomes. In the phylogenomics stream, I have been part of a bioinformatics working group that has developed two new pipelines for assembling target sequence capture data, and co-developed and presented a training workshop to students and early-career researchers in target capture data assembly. I have led the RBGV sampling effort to contribute to the Australian Angiosperm Tree of Life project.

The flexibility of my fellowship has allowed me also to contribute to several projects at both the RBGV and the University of Melbourne. This includes being part of the Bushfire Conservation Genomics program team, where we are investigating the impact of the 2019-2020 bushfire season on rare plant species in Victoria and south-eastern Australia.

Dr Todd McLay: Scrambling up a cliff to see Xanthorrhoea after three days of paddling down the Snowy River collecting seed and genetic material of rare bushfire-impacted plant species.

Image: *Corymbia ficifolia* flowers and bee

Foundation Gifts Received In 2022

Adrienne Clarke Chair of Botany

Johnson, Alex
Stone, Michael

Botany Foundation

— Unrestricted/Research

Anderson, John
Clarke AC, Adrienne
Friends of the University of Melbourne
Gregson AM, Tony
Harrison, John
King AM, John
Stone, Michael
Watt, Michelle

— Pollen Count

Anonymous
Connell, Mark
Cosgrove, Bradley
Sharp, Simon

David Ashton Travel Award

Stone, Michael

David H Ashton Scholarship

Hooley, Doug
Stone, Michael

Sophie Ducker Postgraduate Scholarship

Flesch, Juliet
Stone, Michael

Megan Klemm Research Award

Hallam Neil
Stone, Michael

The Bruce Knox Award

Stone, Michael

The Jeremy Pickett-Heaps Award

Andersen, Robert
Bennet, Dana
Harris-Wetherbee, Julie
The Musser Family Fund
Wetherbee, Richard

Pauline Ladiges Plant Systematics Research Fellowship

Costermans, Leon
Johnson, Alex
Moors AO, Philip
Nelson, Gareth
Richards AM, Max
Richards, Margaret
Stone, Michael

Ethel McLennan Award

Gaff, Donald
Stone, Michael

Plant Systematics Research Fund

Anonymous
Chambers AM, Carrick
Chambers, Margaret
Ladiges AO, Pauline
Playford, Mary
Stone, Michael

Protist Systematics Research Fund

Anonymous
Cowan, Roberta
Stone, Michael

John S Turner Postgraduate Scholarship

Gaff, Donald
Groves, Richard
Perkins, Lesley
Stone, Michael
Turner, Peter

Gretna Weste Plant Pathology and Mycology Scholarship

Idnurm, Alex
Stone, Michael

Fern Research Fund

Stone, Michael

The University of Melbourne Herbarium Fund

Gregson AM, Tony
Harrison, John
Ladiges AO, Pauline
Stone, Michael

The Women in Science of the Environment (WISE) Fellowship

Carrucan, Anna
Harrison, John
Morgan OAM, Susan
Regan, Margaret
Stone, Michael

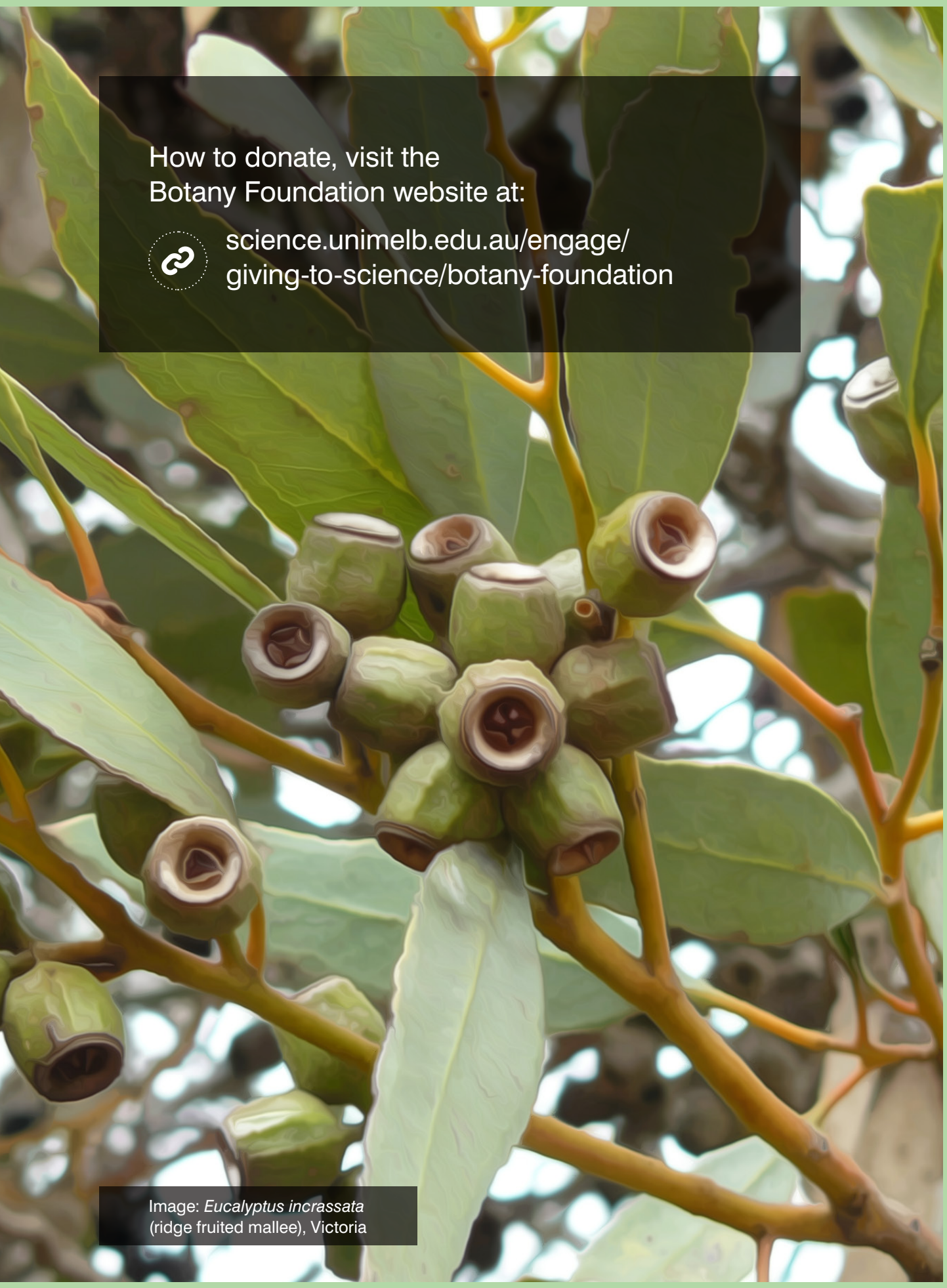
— FINANCIALS

Foundation Financial Summary in 2022

	Balance at 01.01.2022 ($)	Income[1] ($)	Awards & Expenses[2] ($)	Revaluation[3] ($)	Balance at 31.12.2022 ($)
Adrienne Clarke Chair of Botany Trust	**4,841,649**	**190,798**	**(143,866)**	**(309,138)**	**4,579,444**
Botany Foundation Trust					
Unrestricted Funds[4]	1,587,566	43,177	(54,367)	(95,750)	1,480,627
David Ashton Travel Award	56,222	2,196	(2,055)	(3,585)	52,778
David H Ashton Scholarship	158,039	7,235	(5,356)	(10,186)	149,732
Sophie Ducker Postgraduate Scholarship	94,470	3,761	(3,193)	(6,070)	88,968
Megan Klemm Research Award	137,164	5,587	(4,635)	(8,807)	129,309
Bruce Knox Prize	50,925	2,004	(1,750)	(3,278)	47,901
Pauline Ladiges Plant Systematics Research Fellowship	1,562,879	78,350	(59,236)	(99,994)	1,481,999
Ethel McLennan Award	72,087	2,983	(2,471)	(4,625)	67,974
Plant Systematics Research Fund	343,167	15,557	(12,338)	(22,013)	324,374
Protist Systematic Research Fund	97,524	14,162	(4,993)	(5,803)	100,891
Kingsley Rowan Marine Botany Prize	29,949	1,179	(1,029)	(1,924)	28,175
G.A.M. Scott Research Fund	161,540	6,335	(5,658)	(10,375)	151,842
John S. Turner Postgraduate Scholarship	107,719	5,915	(3,607)	(6,879)	103,149
Gretna Weste Plant Pathology and Mycology Scholarship	48,906	2,028	(1,648)	(3,153)	46,132
The Fern Research Fund	41,984	1,626	(2,041)	(2,654)	38,915
V Sarafis Research Fund	83,035	3,166	(5,184)	(5,178)	75,839
The University of Melbourne Herbarium Fund	812,962	39,579	(12,810)	(51,640)	788,091
Women in Science of the Environment (WISE) Fellowship	136,043	9,626	(6,735)	(8,519)	130,416
Jeremy Pickett-Heaps Award[5]		54,024	(30)	1,345	55,338
Botany Foundation Trust – Total	**5,582,182**	**298,490**	**(189,134)**	**(349,087)**	**5,342,450**
Total of the Two Trusts	**10,423,832**	**489,288**	**(333,000)**	**(658,226)**	**9,921,894**

Notes

1. Income includes donations (capitalised) and earnings on investments (for awarding)
2. Expenses include administration charges
3. Revaluation amounts represent the change in unit price of the capital units during 2022 of respective Trusts
4. Unrestricted Funds support research initiatives, the Pollen Count and events
5. A new fund with no award expenditure in 2022.



How to donate, visit the
Botany Foundation website at:

science.unimelb.edu.au/engage/
giving-to-science/botany-foundation

Image: *Eucalyptus incrassata*
(ridge fruited mallee), Victoria

For further enquiries

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Advancement Office
The University of Melbourne
Victoria 3010 Australia

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