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Cover: Hunter Valley garden at sunset. Photographer Heather Miles

Australian Plants

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Editorial

Merle Thompson OAM

Once again we have seen devastation wrought on our native plants in extreme weather events. There have been bushfires, floods, storms and cyclones across most states, even simultaneously throughout the summer. What will autumn and winter deliver? Plus, of course, there are challenges relating to the human experience and how to juggle economic, social and environmental factors.

How is our environment faring and what can we do to understand what is happening to our native plants and how can we help to conserve them? These are ideas which are constantly in my mind but in this issue of *Australian Plants* we have opted for a different focus.

We have a special article from Dan Clarke explaining to us the proposed revision of the genus *Leptospermum*. I suspect some readers will think that it is too technical for them. Others will exclaim “not more name changes”. We have included this article to help general readers to realise why changes are made and what is the science behind them.

The remaining articles have a more horticultural focus. Mark Abell's follow up article on plants to use in and around ponds has some great practical advice. His previous article on designing a pond was in *Australian Plants* Vol 32 Issue 255, Autumn 2023.

We feature two articles about public developments – the entire campus of Wollongong University and the *Terra Australis* garden in Canberra which has largely been funded and designed by ANPSA member societies and members. It never occurred to me that overseas students sending home photos of native fauna on campus would be a drawback for others.

The final article arose from a fun conversation when a friend was telling me of the experience of driving with a bag of banksia cones and the curious sound when they all suddenly exploded open and shed their seeds. It tickled my sense of humour and I thought I would share the story. But is there some interesting science involved?

We have a very diverse readership and subscriber base. We encourage you to let us know your areas of interest so that we can try to cover them in future issues. Are you prepared to provide an article yourself? Please contact us if you are.

The Development of the Landscape of the University of Wollongong

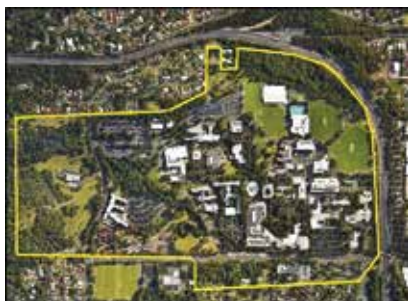
Anthony Wardle, with acknowledgement to the late Dr Keith Tognetti

Anthony has worked for the University of Wollongong Landscape Department for the past 31 years. He has extensive knowledge of the history, flora and fauna of Wollongong's main campus.

When newcomers visit the University of Wollongong, it's common for them to think that the campus was cut out of the local natural forest, with buildings nestled amongst mature trees and shrubby green spaces. But looking at the aerial photo of the site from the 1950's, it shows a completely cleared dairy farm with corn fields and only a few remnant trees along the creek lines. A recent image of the same area shows a stark contrast, with a mix of tall trees, reedy water features, shrubby green spaces, and a healthy canopy. Almost all the vegetation on campus has been purposely planted and regenerated to form the green, biodiverse environment that it is today.



1950



2017

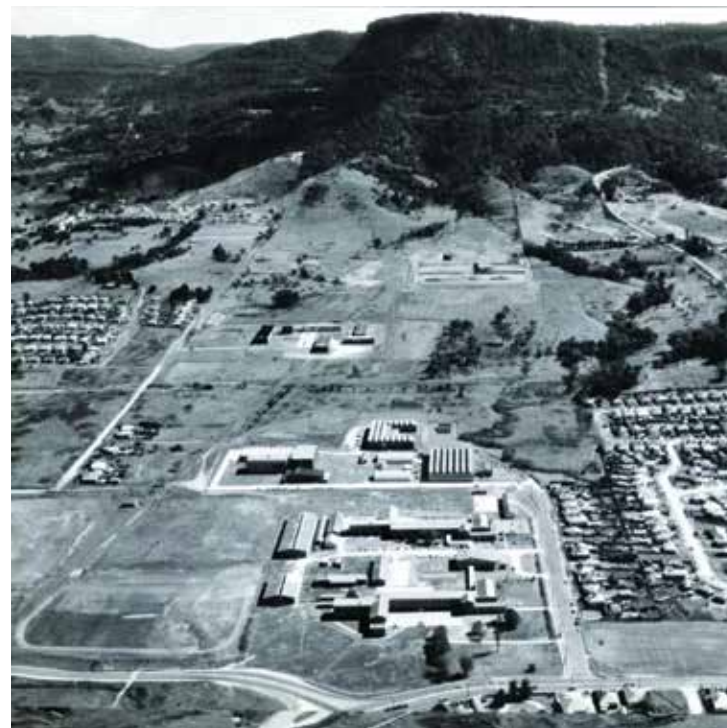
Source: 1955 Adastra Imagery. Accessed online <https://wollongong.maps.arcgis.com/apps/MapSeries/index.html?appid=ad9b467e8da342f190428fcde0e7ae4c>

The University of Wollongong sits on 86 hectares at the foot of the Illawarra Escarpment, with 95 buildings, 2,000 staff, and around 17,000 people on campus on any given day. The management of the outdoor areas, with sports fields, ponds, bushland areas and many mature trees, is certainly a large undertaking. The Tree Management Program has over 5,000 trees assessed and tagged, with an estimated 18,000 trees on the whole site.

Before European arrival more than 200 years ago, the area on which the University stands, would have been a mix of pristine coastal plain and escarpment foothills plant communities. Coastal Plain Melaleuca Forest and Dry Rainforest on the lowlands, Forest Redgum Grasslands

on the foothills, Eucalypt/Turpentine Forest on escarpment spurs, and Sub-tropical Rainforest in the gullies and creek lines.

In 1962, a Teacher's College was built on the old, cleared farm site and 1969 saw the arrival of the University. As more buildings were constructed, the land was levelled and filled with slag and coal wash from local heavy industries. It was a bleak, dusty, shadeless, windswept, inhospitable space, with the only vegetation being roses, camellias, pines and maples, around the Teacher's College. In these early days, there was no real thought for the environment of the site.



1963 Source: University of Wollongong archives Flickr

In the early 1970's a great change would take place. The University's first Head Gardener, Charlie House, and Head of Physics, Ken Ausburn teamed up to start planting native trees and plants with great tenacity against the management, who loved their 'coal wash and roses'.

1973 saw the arrival of the first Vice Chancellor, Michael Birt, and a Buildings Site Committee was formed. Michael was an open-minded man with a great feeling for the environment and the beautification of the University Campus began. The race was on, to plant quick-growing

natives and large tree species for shade, screening and softening buildings, and mass plantings to hide unsightly roads and car parks.

The mid 70's saw the arrival of Leon Fuller, the first Landscape Superintendent, who took up the planting policy with gusto, adding thousands of native plants and trees. Leon pushed for local area natives to be used, as they were suited to local conditions and required the least maintenance. He carried out his own research on propagation of local species for planting, due to the scarcity of commercially available stock. His work extended outside into the community, by pushing the Green Corridor concept, which involved bringing fingers of native escarpment



bushland down through urban areas to join the sea, creating wildlife corridors. When Leon left for greener pastures, David Walker, Head Landscaper, continued the good work and vision as the University was transforming from a coal wash desert into a landscape of distinction. In the late 70's the Enlightened Building Policy was formed which dealt with building heights, placement and working with the landscape to create a unique setting.

In the 1980's and 90's, Martin Bramston, Landscape Supervisor, continued the good work. He had a love for design and water features, overseeing the construction of ponds and running stream waterways to further enhance the campus environment. As more buildings sprung up and the campus community grew, the Landscape Department became more involved in the design and consultation process on landscaping and plantings around new constructions.



Bush regeneration is also an important part of greening of the university grounds. Weed reduction and regeneration of the creek lines and the bush escarpment on the west side of campus is ongoing and ensures wild areas are managed to promote biodiversity. In more recent times, there have been efforts to plant specifically for an increase in habitat



and biodiversity. Simply planting natives and building suitable areas of habitat sees the creatures arrive. An amazing number of native animals can be seen on campus and are an asset for the university with students photographing the grounds and the unique critters that live there. Insects, frogs, reptiles, possums, bats, echidnas, and many types of birds, including powerful owl, lorikeets, honeyeaters, ducks, and waterfowl live on campus, all because of natural native plantings.

From 2013 to 2019, Landscape Supervisor Mark Spence pushed his passion for the environment, with more green space creation. Frog ponds and natural teaching areas were constructed and after a complete assessment of the waterways, mass plantings of native aquatic species around ponds and water courses took place, resulting in natural barriers for safety, improved water quality, erosion control and increased biodiversity.



Current Supervisor, Mark Haining, continues the landscape development, evolution and management of the outdoor spaces with a modern Australian design feel, focusing on mature tree management, rainforest plantings, impacts of festivals and events, and guiding the department into the future.

The Landscape Department also liaises with various faculties at the University to help with student education and studies by creating spaces



and specific learning and teaching areas, like frog ponds, insect, aquatic and bird habitats, so students don't have to go off site for practical studies. We have unique and beautiful fauna and flora in Australia, and for the many international students that come to the campus to study in a place that is alive with native plants and animals, it is a real drawcard. These students are taking photos and footage of the local colourful plants, birds and wildlife to send back home to the rest of the world.

So why do this? Why have a university covered with local native trees, gardens, and animals?

The large trees and green vegetation spaces on campus gives a pleasant learning and working experience, providing wind breaks, shade, thermal regulation of buildings and open areas.

- Large buildings are softened or hidden by plantings, giving a forested parkland atmosphere, with great outlooks from offices and venues.
- It is healthier and more enjoyable to be in a natural environment; surrounded by greenery and grounded to nature, in a campus that is biodiverse, green and full of life.
- A beautiful campus, alive with native plants and animals, is a valuable drawcard for students, employees and the surrounding community.



- Onsite learning and study areas are an asset for students, preventing the need to travel to other locations.
- With the impact of post European settlement on Australia's east coast ecosystems there is a sense of obligation to create and maintain a biodiverse environment.

The University of Wollongong grounds are a fantastic example of how our decisions can impact the health and well-being of our natural spaces and how, with time and commitment, positive transformations can occur.





Substantial changes to the *Leptospermum* genus *sensu lato*

Dan Clarke

Dan Clarke is a botanical consultant in NSW and the Conservation Officer for Australian Plants Society NSW.

This article aims to inform and educate all members regarding another upheaval to our current grasp of botanical names. Yes, it has happened again, and I do sympathise with all interested and concerned.

In 2023, The *Leptospermum* genus (Tea-trees) was “split” with all species now falling into 5 genera. Herein, I will aim to do my level best to communicate the changes and the reasoning behind them in layperson’s terms. As you will read below, these changes comprise a lot to digest but I feel it is also a case of “history repeating itself” when all the historic major study on this group is considered.

The published paper accounting for these most recent changes is referenced as: **Wilson, P. G. and Heslewood, M.M (2023). Revised taxonomy of the tribe Leptospermeae (Myrtaceae) based on morphological and DNA data. *Taxon*: 72 (3): 550–571.**

Please note at this time: the National Herbarium of NSW has adopted the changes. However, some other herbaria have not, and, at the time of writing, it has not yet been added to the Australian Plant Census.

Unfortunately, the above-named paper is not free and is hidden behind a “paywall” – a common condition that causes many gripes amongst ecologists, botanists and other plant lovers who want to best digest the study and implications. For the purposes of this article (and I am not meaning to seek any brownie points here), I paid \$10 (US dollars I later discovered) for 48 hours of access so I could understand what was required. I will not do justice, in this article, to the complicated interpretation of Bayesian analyses regarding phylogenetic trees along with discussions and conclusions reached. However, I have done my best to relay the main points from the research and conclusions.

Background

As a starting point, getting to grips with the complicated former *Leptospermum* genus, i.e., *sensu lato*, can be done by downloading the comprehensive and in-depth studies of the late Joy Thompson (1923–2018). Joy spent most of her career at the National Herbarium of NSW, naming about 90 species of pea (legume) genera, *Tetratheca*

and *Leptospermum* amongst others. Joy's paper is referenced as **Thompson. J (1989). A revision of the genus *Leptospermum* (Myrtaceae). *Telopea* 3(3): 301–449.** This one can be downloaded, for free, here:

plantnet.rbgsyd.nsw.gov.au/Telopea/results.php?Where=ArtParentRef=%273%27+and+ArtVolume=%273%27+and+ArtIssue=%273%27

This publication followed earlier work by Thompson completed in 1983 that defined the generic limits of *Leptospermum*. This comprised evidence that was sorely needed as it was thought that the genus was in a state of chaos up until this point, since the initial work of George Bentham in the 1860s. Thompson (1983), also published in *Telopea*, can be downloaded here:

plantnet.rbgsyd.nsw.gov.au/Telopea/results.php?Where=ArtParentRef=%273%27+and+ArtVolume=%272%27+and+ArtIssue=%274%27

Readers likely know that *Leptospermum* translates from the Greek words *leptos* (λεπτός) meaning “thin”, “fine” or “slender” and *sperma* (σπέρμα) meaning “seeds”, referring to the thin brown seeds of the genus. In general, the *Leptospermum* genus is characterised by having simple leaves with a spiral to alternate leaf arrangement; flowers are 5-numerous with 5 sepals and petals (often in a recognisable rotate formation) and with stamens in 5 bundles; each bundle sitting opposite a petal, and with stamens either shorter or just longer than the petals. The base of the flower has a hypanthium, a cup-like structure which covers the ovary and on the rim of which sit the sepals, petals and stamens. There is one carpel in the middle of the stamens. Flowers are generally white but sometimes pink to red. The fruits are capsules and are also usually distinctive; dry, usually woody and can persist on some species for several years or fall off quickly on other species.

The two relatively recent publications of Joy Thompson (when considering the lengthy time of historic botanic study and naming of Australian plants) reflects the complexity of the *Leptospermum* genus. Species in the genus show much variation in leaf, flower and fruit characteristics. Many species have histories of having different names and some were placed in different genera to start with. There are also some instances of some species appearing very similar to that of *Kunzea* and other closely related genera. There is at least one example of a *Leptospermum* species hybridising with a *Kunzea* species in New Zealand (*K. sinclairii* x *L. scoparium*).

Thompson (1983) pulled many species out of *Leptospermum* and placed them into the genera of *Kunzea*, *Neofabricia*, *Pericalymma* and

Homalospermum. These were all considered to be part of the tribe **Leptospermeae**. Hence, if we were all back in 1983, we would be dealing with this upheaval in a very similar fashion to today.

In Thompson (1989), 79 species of *Leptospermum* were recognised, which accounted for 27 new species and 15 either renamed species or re-described species. A total of eight new subspecies were also recognised. The 79 species were spread from New Zealand to eastern and Western Australia, New Guinea, the Cooks Islands and South-East Asia. In eastern Australia, species are found from southern Tasmania to Cape York. One species, *Leptospermum mandidum* (Weeping Teatree) extends into the tropics of the Northern Territory and the north of WA. There is now one species endemic to New Guinea. Two species occur in South-East Asia (one endemic to Borneo). Western Australia has about 17 species in the south-west region. And of course, some species have become weeds outside of their natural range, such as *Leptospermum laevigatum* (Coast Teatree).

Thompson (1989) suggested that these species could be divided into two natural groups:

- Group 1: sepals persistent into the fruiting stage with the capsules lacking woody valves and the seed generally ovate with a reticulate surface (“fruits not woody” group)
- Group 2: sepals deciduous or sometimes persistent, with capsule-valves woody and with seed linear and with striate (longitudinal) patterns on the surface (“fruits woody” group).

Additional subgroups were also recognised within these groups. These subgroups might even be considered to be separate genera in time. However, the two overarching groups were not completely concrete and the condition of whether sepals be persistent or deciduous (or maybe sometimes persistent); is considered unhelpful. Thompson also recognised that some species did not sit comfortably in the two groups.

Post the publications of Thompson, further work was completed, over the last 25 years or so, with Leptospermeae found to comprise nine genera. These are the five stated above, in addition to, *Asteromyrtus*, *Agonis*, *Taxandria* and *Paragonis*. Much of this work is based on nucleotide sequencing, as well as analyses of flower-ovary and seed characteristics. This reflects the continuing exploration of botanists and taxonomists in understanding which species belong to the same common and related evolutionary groups, and which belong to different, albeit closely related, groups. In other words, study revolves around the concepts of monophyletic and paraphyletic groups.

Most taxonomists prefer the idea of only describing monophyletic groups. Hence, if a “group” be something definitive such as *Leptospermum*, then it should contain **all** the species that have descended from a common ancestor and **only** those species. In other words, they have all arisen from the same point of origin in evolution terms. Any other species that do not fit the bill need to be renamed (sometimes termed “sunk” or “dropped”) into another genus or a new genus.

The follow up studies alluded to above, found through nucleotide sequencing (O'Brien *et al.*, 2000) that all of Thompson's species fell in four separate groups, with some strong support for Group 2. To cut a long story short, there were also some problems with the analyses when all of Thompson's established genera from 1983 were included, with evidence showing that *Leptospermum* was not a monophyletic group as currently recognised. In a nutshell, this evidence suggested that some species of *Leptospermum*, were more closely related to other species in the other eight genera in tribe Leptospermeae, than to other species of *Leptospermum* (Binks *et al.* 2022a) – a taxonomic wrongness at best and a nightmare for some at worst.

Additional issues revolve around ovule orientation in flowers within the tribe, as well as differences in seed appearance. Evidence suggested that tribe Leptospermeae was sound, but the species within, once again, needed a bit of a jiggle.

Findings

Wilson and Heslewood (2023) decided to clarify the issues with the discrepancies demonstrated by all the evidence. A combination of seed-morphological study, along with DNA-sequencing and analysis was undertaken. At this point, a total of 88 species of *Leptospermum* were recognised with three informal taxa awaiting publication. A total of 62 of these taxa (45 from the “non woody-fruited” group and 17 from “woody fruits” were scrutinised. An additional 36 species of tribe Leptospermeae were also sampled. In these studies, taxa from “outgroups” must also be used to demonstrate that the resulting data forms a logical picture in terms of relationships. The outgroups form an anchor for the resulting phylogeny and also show an evolution of established traits in the taxa being analysed. A total of 11 species were selected from here from genera such as *Tristaniopsis*, *Callistemon* and *Melaleuca*.

To briefly summarise seed results: it is reported that seeds in genera such as *Homalospermum* are disc-shaped with a continuous marginal wing whereas seeds in *Agonis* and *Asteromyrtus* are narrowly-ellipsoid to obovoid. The seeds in these genera arise from ovules described as

hemitropous, meaning they are orientated at right angles to the stalk of the ovary. Wilson and Heslewood (2023) concluded that the hemitropous ovules in *Homalospermum* is a result of convergent evolution when genetic data are compared with *Agonis* and *Asteromyrtus*. The ovaries of *Leptospermum sensu lato*, are anatropous meaning they align adjacently with the ovary stalk. The seeds of Thompson's Group 1 are obovoid to broadly cuneiform or oblong with seed coats having a reticulate pattern. In Group 2, seeds are predominantly linear-striate and this was broadly confirmed in this study.

I will not do complete justice to the implications here. However, the resulting phylogenetic trees from the nucleotide-sequence data shows species of *Leptospermum* splitting generally into five groups. In one analysis, a group of four clades or clusters is nested next to *Kunzea* spp. whilst the last cluster is well separated and is nested between *Asteromyrtus* and *Homalospermum*. In a second set of nucleotide data, the species of the five clusters nest closer together but are still intermingled with those of other genera. However, in both analyses, the same *Leptospermum* species nest together in their respective clusters. Generally, the “woody” and “non-woody”-fruited taxa are well separated. The four clusters referred to above generally comprise the species of Group 1 of Thompson (1989). Generally, Group 2 is supported as a monophyletic group and these species require no name changes. Some of Thompson's subgroups in Group 2 are supported with these latest data, reflecting her skills and insights as a botanist. The resulting phylogenies also mostly reflect the natural geographic distribution of species.

As with all of these studies, the data has to be interpreted and conclusions made. However, it has been agreed that the four separate clades warrant separation into new and resurrected genera.

The following is an account of the new combinations. The seeds, as well as woody vs non-woody fruits are still important. It is worth noting that no individual species have been “lumped” or “split” – just renamed.



Above: Some common *Leptospermum* species subject to the changes –
 Left: *Leptospermum laevigatum* (now *Gaudium laevigatum*) (Image: Alan Fairley)
 Right: *Leptospermum trinervium* (now *Gaudium trinervium*) (Image: Dan Clarke)
 (see Findings pp 223–224)



Above: Some common species that will not change names –
 Left: *Leptospermum polygalifolium* (Image: Heather Miles)
 Right: *Leptospermum macrocarpum* (Image: Jill Dark)

New Genera and combinations

The key of Wilson and Heslewood (2023) is copied verbatim here as follows:

- 1 Fruit persistent; fruiting hypanthium and valves woody; seeds linear, striate, sepals deciduous or persistent (eastern Australia, New Zealand, the Cooks Islands and Malesia)...***Leptospermum***

Fruit mostly deciduous; fruiting hypanthium and valves predominantly non-woody (if woody and persistent, fruit c. 20 mm diameter); seeds ovate with a reticulate or narrow-reticulate surface; sepals persistent

- 2 Fruit with valves exserted above the fruiting hypanthium at dehiscence (all Western Australian species)...***Apectospermum***

Fruit valves not exserted at dehiscence 3

- 3 Flower usually solitary, bracteoles broad and scarious or papery; fruits 3-5(-11)-locular 4

Flowers usually 3 or more on condensed axillary shoots, bracteoles not scarious; fruits consistently 3-locular...***Aggreflorum***

- 4 Seeds with usually several rows of loose cells, sometimes expanded into a narrow wing; fruiting hypanthium often somewhat succulent...***Gaudium***

Seeds lacking rows of loose cells; fruiting hypanthium never succulent (all Western Australian species)...***Leptospermopsis***

Genera

As far as I can ascertain, all of the former *Leptospermum* species epithets have been retained under the new genus names with the following exception of *Leptospermum madidum* (now *Aggreflorum longifolium*).

The Latin gender is also the same in most cases. Hence, no spelling changes for species epithets, with the only exception seen in *Leptospermopsis* species which requires a Latin-gender change from, for example, *sericeum* to *sericea* (for all species ending in “um”). This does make our job a little easier in understanding “where species have gone”.

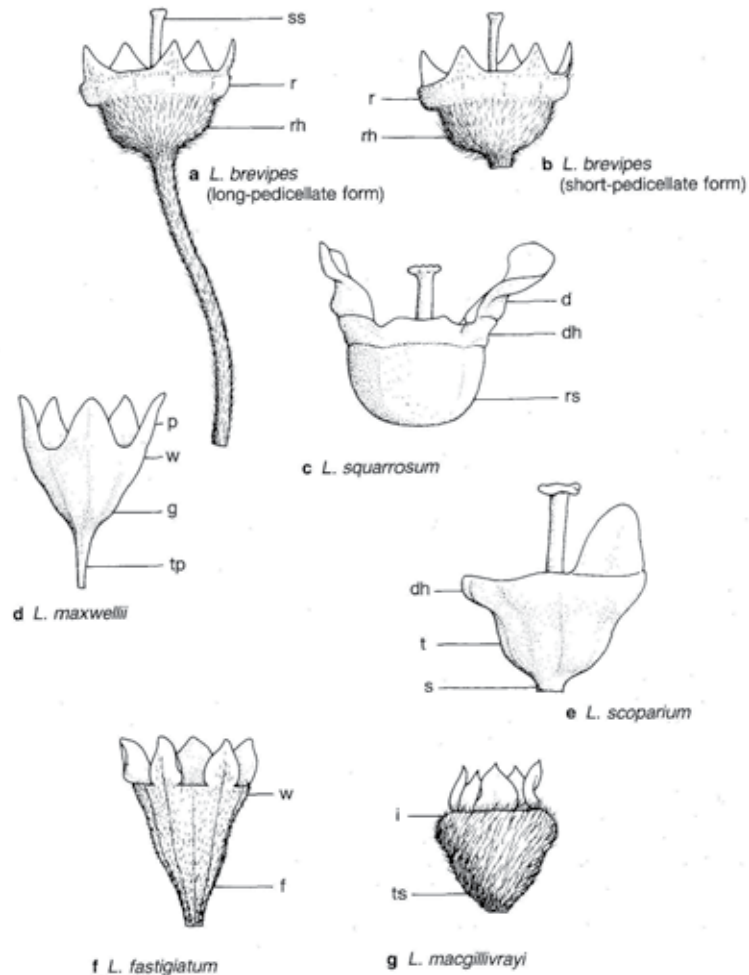


Fig. 4. Lateral view of young fruits. (See text for discussion.) a = dehiscent sepal; dh = somewhat widened and differentiated upper part of hypanthium; f = tapered fluted hypanthium developing a pedicel; g = gradually tapered hypanthium; i = incurved upper part of hypanthium; p = persistent sepal; r = upper part of hypanthium forming a rim; rh = rounded hypanthium-base with sudden taper to a scarcely tapered pedicel; rs = rounded sessile hypanthium; s = tapered hypanthium with short broad pedicel; ss = stigma and style; t = tapered hypanthium; tp = tapered pedicel; ts = tapered sessile hypanthium; w = widened upper part of hypanthium.

Figure 1. Figure 4 from Thompson (1989) showing variation in early developing fruit (capsules) of several *Leptospermum* species

Apectospermum

Starting with our new contenders, *Apectospermum* now holds four species. These are: *A. macgillivrayi*, *A. exsertum*, *A. spinescens* and *A. subtenue*. All four species are endemic to Western Australia, generally occurring in the south-west region.

Apectospermum is from the Greek *Apektos* (απεκτος) – reported to mean “unkempt” or “uncombed” and also possibly meaning “deprived” and is a reference to the shaggy testa (seed coat) which comes from the loose testa cells in the fruit of *A. spinescens*.



Apectospermum spinescens Syn *Leptospermum spinescens*. Photos Thomas Mesaglio

Aggregflorum

A genus of ten species and two subspecies, with a tropical to temperate distribution in Australia from the north-west of Western Australia, through the Northern Territory and down the east coast with one species endemic to New Guinea.

Aggregflorum is derived from Latin *aggrego* meaning “to add to” and *-florus* “flowered” – a reference to the multi-flowered inflorescence of these species.

The species are:

- *A. anfractum* – endemic to Queensland between Mackay and Cooktown;
- *A. benwellii* – endemic to New South Wales, occurring only in Nymboida National Park (west of Grafton);
- *A. brachyandrum* – occurring from northern New South Wales, from north of Port Macquarie, through to Cairns in Queensland;

- *A. ellipticum* – occurring very close to the coast, from Coffs Harbour in New South Wales, north to about Maryborough in Queensland;
- *A. longifolium* subsp. *longifolium* and *A. longifolium* subsp. *sativum* – previously *L. madidum* with subsp. *madidum* and subsp. *sativum* recognised. Subspecies *longifolium* is endemic to the Cape York Peninsula in Queensland. Subspecies *sativum* occurs in the north-west of the Northern Territory and extends into northern Western Australia;
- *A. luehmannii* – endemic to Queensland from the Glass House Mountains and Numinbah Valley;
- *A. pallidum* – endemic to central Queensland – generally west of Townsville; *A. parviflorum* – endemic to New Guinea;
- *A. purpurascens* – endemic to far north Queensland;
- *A. speciosum* – another coastal New South Wales/Queensland species occurring between Yamba and Fraser Island;
- *A. parviflorum* – endemic to New Guinea.



Aggreflorum luehmannii Syn *Leptospermum luehmannii*. Photo: Lawrie Smith

Gaudium

Another new genus comprising 22 species – containing the majority of eastern Australia species with one Western Australian species.

Gaudium means “joy” in Latin and is in honour of Joy Thompson and a tribute to her extensive work on the *Leptospermum* genus.

- *G. blakelyi* – a species endemic to NSW with a limited distribution – near Lithgow in New South Wales;
- *G. brevipes* – growing across large parts of eastern New South Wales, into SE Qld and eastern Victoria;
- *G. confertum* – the one species endemic to Western Australia – occurring along the south coast in Fitzgerald National Park;
- *G. coriaceum* – occurring in the west of New South Wales, Victoria and South Australia;
- *G. deanei* – a threatened species confined to the Sydney region around Lane Cove, New South Wales;
- *G. divaricatum* – endemic to inland central New South Wales.
- *G. glaucescens* – a species with a strong coastal distribution occurring from south of Lismore, New South Wales to north of Bundaberg in Queensland;
- *Gaudium jingera* – endemic to Victoria, in the Snowy Range.
- *G. laevigatum* – a well known tea-tree found on beach dunes in New South Wales, Victoria and Tasmania. It is also a weed in South Australia and Western Australia;
- *G. lamellatum* – widespread across the south-east of Queensland and into the northern central areas of the State;
- *G. microcarpum* – from north of Coffs harbour in NSW, extending into the tablelands regions, up to around Gympie in Queensland;
- *G. multicaule* – growing from south of Dubbo, New South Wales, through the ACT, into northern Victoria;
- *G. myrsinoides* – growing from Eden on the far south coast of New South Wales, through Victoria and into South Australia;
- *G. namadgiense* – restricted to the ACT-NSW border areas – occurring in Namagdi National Park and a few other locations;
- *G. neglectum* – endemic to Queensland- between Herberton and Bundaberg;
- *G. parvifolium* – north from around Nowra in New South Wales,

extending out to Dubbo and northwards through the tablelands and slopes, just into Queensland;

- *G. polyanthum* – endemic to New South Wales – between Bowral and Dorrigo;
- *G. semibaccatum* – growing between Forster in New South Wales, to Bundaberg in Queensland, very close to the coast;
- *G. sericatum* – endemic to Queensland – in the Leichhardt district – west of Bundaberg and Gladstone;
- *G. subglabratum* – endemic to south-eastern New South Wales, growing in the Budawang region;
- *G. trinervium* – another well-known species in Sydney bushland, growing from Ulladulla, NSW north to around Yeppoon in Queensland;
- *G. venustum* – endemic to Queensland and a rare-threatened species – occurring in one patch, near and west of Eidsvold.



Gaudium blakelyi Syn *Leptospermum blakelyi* Photo: Julie Favell

Leptospermopsis – this is a resurrected genus of eight species, most of which are hard to differentiate morphologically. The genus was first described in 1920 by Spencer Moore.

Leptospermopsis means “resembling *Leptospermum*”. The species are:

L. erubescens, *L. incana*, *L. maxwelli*, *L. nitens*, *L. oligandra*, *L. roei*, and *L. sericea* – all endemic to the south-west of Western Australia;

L. fastigata – occurs in south-western Western Australia and the west of South Australia.



Leptospermopsis incana
Syn *Leptospermum incanum*
Photo: Chris Jonkers

Leptospermum sensu stricto

Our old familiar friend is still here but is now substantially reduced to 44 species. These are found in eastern Australia, New Zealand, the Cook Islands and Malesia (Indonesia, Malaysia and the Philippines). Space will not permit the listing of these, but it will include many of your old favourites; for instance *L. scoparium*. So, it would seem that about 50% of the species have been removed.



Leptospermum scoparium Image: Heather Miles

I encourage you to take your time absorbing the changes. Whilst it is always challenging, we are reminded again of the continuing exploration and revised understanding of our unique flora. I, for one, am always interested as to how long it takes (as well as how painful it is) for the horticultural industry to create and implement the required plant labels for the customers! In any event, tea-trees remain beautiful plants to cultivate and can put on a great show in any garden.



Leptospermum squarrosum – another which retains its name. Photo: Dan Clarke

References

- Binks, R.M., Heslewood, M., Wilson, P.G. & Byrne, M. (2022). Phylogenomic analysis confirms polyphyly of *Leptospermum* and delineates five major clades that warrant generic recognition. *Taxon* 71: 348–359.
- O'Brien M.M., Quinn, C. J., Wilson, P.G. (2000). Molecular systematics of the *Leptospermum* suballiance (Myrtaceae). *Australian Journal of Botany* 48(5) 621–628.
- Thompson, J.A. (1989). A revision of the genus *Leptospermum* (Myrtaceae). *Telopea* 3(3): 301–449.
- Thompson, J.A. (1983). Redefinitions and nomenclatural changes within the *Leptospermum* suballiance of Myrtaceae. *Telopea* 2(4): 379–383.
- Wilson, P. G. and Heslewood, M.M (2023). Revised taxonomy of the tribe Leptospermeae (Myrtaceae) based on morphological and DNA data. *Taxon*: 72 (3): 550–571.

Native plants for ponds and watergardens

Mark Abell

In the Winter 2023 issue of 'Australian Plants' Vol 32, No. 255) there was an article by Mark on creating a pond. As indicated at that time, Mark has prepared this follow-up article to provide information on plants to be included in your pond.

There is a wide range of native aquatic and wetland plants that can be used when planting out your ponds and water gardens. For the purposes of this article “pond” will be used to refer to an outdoor aquatic environment for growing plants.

Plants in ponds not only look good, they help in a number of other ways. Rather than just relying on filters, plants can improve the water quality by absorbing nutrients from the water. By reducing nutrients in the water column, plants help to control and reduce algae levels in ponds.

Plants also provide habitat for a range of aquatic life and many other animals that use the pond.

The article will focus on the various types of plants that are more suitable for urban garden ponds, this will leave out some of the larger plants that are more suitable for larger water features including farm dams.



A garden pond with *Myriophyllum*, *Marsilea mutica*, *Nymphoides* and *Eleocharis*.

Whilst it is preferable to use local plants (particularly if you are near any natural watercourses), it should be noted that many aquatic plants have very wide distributions, often extending to other countries. This can make it difficult to accurately determine what is local to a given area. A good local nursery that sells aquatic plants should be able to assist in recommending plants that are local to your area.

One way to think of your pond is as either a water garden, or as a small ecosystem, rather than “just a pond”.

There is a large variety of various plant types that can be used successfully in different parts of the pond. Just like garden plants are often classified and grouped (ground covers, rockery plants, shrubs, climbers and trees), aquatic plants can also be put into some broad groups. These groupings can help in understanding where to best use the plants in a water garden.

The main plant groupings and uses are –

- Fully Aquatic Plants – best in the deeper water near the centre of the pond
- Marginal & Emergent plants – placed around the edges and shallower areas
- Riparian Plants – planted in the area around the outside of the pond.

Fully Aquatic Plants

These are found in areas where the water can get deeper and are capable of either floating or growing fully submerged.

This group can be further organised into –

Floating Plants – these plants are free floating on the surface of the water. They prefer still conditions and may need regular thinning to keep them from completely covering the water surface. With no roots in the substrate, they take their nutrients directly from the water and thus can be good at removing nutrients from the water column.

Some examples that can be used are –

- Duckweeds – *Lemna* & *Spirodela*
- *Azolla filiculoides* & *A. pinnata* – floating aquatic ferns
- *Riccia* – aquatic liverwort
- *Ricciocarpus natans* – Bearded Liverwort
- *Ceratophyllum demersum* – Hornwort



Ricciocarpus natans



Spirodella punctata



Azolla filiculoides



Azolla pinnata (goes red in full sun)

Fully Submerged Plants – these plants grow fully underwater and make good habitat for any fish and aquatic animals in the pond. In growing underwater, they can grow more slowly than plants with leaves on or above the water surface. From time to time, they will need to be thinned out to maintain some open space in the water. These plants can also do well in aquaria.

Some examples of these are –

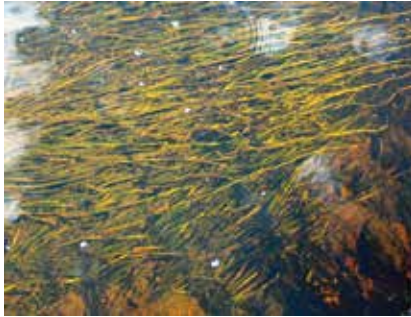
- *Vallisneria* – ribbonweeds
- *Chara* & *Nitella* – Stoneworts – Macro Algae
- *Cycnogeton procerum* – Water Ribbons
- *Aponogeton* – Lace Plants
- *Blyxa aubertii*
- *Hydrilla verticillata* – Water Thyme
- *Najas tenuifolia* – Waternymph
- *Ottelia alismoides*
- *Potamogeton* – Pondweeds



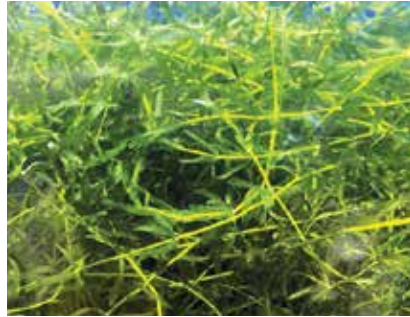
Najas tenuifolia



Chara sp.



Valisneria nana



Hydrilla verticillata

Plants with Floating Attached Leaves – these plants have roots in the substrate and leaves on long petioles that float on the surface of the water (think waterlilies). With the leaves exposed to more light and CO² they can grow faster than fully aquatic plants. They tend to prefer still water and do best in the deeper parts of the pond.

Some examples are –

- *Nymphoides* – marshworts
- *Nymphoides indica* – Water snowflake
- *Nymphaea violacea* and *N. gigantea* – Water Lily
- *Marsilea mutica* – Rainbow Nardoo
- *Brasenia schreberi* – Watershield
- *Ottelia ovalifolia* – Swamp Lily



Nymphoides montana



Marsilea mutica



Ottelia ovalifolia (lower left, darker leaves) and *Nymphoides indica*.

Plants with Submerged and Emergent Leaves – these plants grow both under and out of the water. Many of these plants have two different types of leaves, one for when they are underwater and a different type of leaf for above the water. In many cases these plants are from ephemeral water bodies that, depending on the time of year and rainfall, can be either fully submerged or just growing on damp ground. These plants can be kept trimmed to be a fully underwater plant, or used near the edges as a marginal plant.

Some examples are –

- *Myriophyllum* – Milfoils
- *Ceratopteris thalictroides* – Water Sprite – an aquatic fern
- *Rotala mexicana*
- *Monochoria australasica*
- *Hygrophila angustifolia* – Willow hygro
- *Limnophila brownii* – Ambulia



Ceratopteris thalictroides



Myriophyllum variifolium – showing different leaf forms.

Marginal / Emergent Plants

These are found around the edges of the water bodies and can survive underwater as well as being able to grow in damp conditions out of the water. The water bodies in which they are found naturally often have water levels that vary depending on the rainfall and seasonal conditions. These plants make good habitat for frogs and other animals that live around water.

Some of the smaller marginal plants are –

- *Elatine gratioloides* – Waterwort
- *Lilaeopsis polyantha* & *L. brisbanica* – Grasswort
- *Hydrocotyle tripartita* – Pennywort
- *Glossostigma elatinoides* – Mud Mat
- *Lobelia anceps* – Angled Lobelia
- *Bacopa monnieri* – water hyssop
- *Selliera radicans*
- *Ranunculus inundatus* – River Buttercup
- *Marsilea drummondii* – Nardoo



Lilaeopsis brisbanica



Lilaeopsis polyantha



Bacopa monnieri



Elatine gratioloides

Some larger marginal plants include –

- *Philydrum lanuginosum* – Frogsmouth
- *Persicaria* – knotweeds
- *Ficinia nodosa* – club rush
- *Juncus* – rushes
- *Eleocharis* – Spike rushes



Philydrum lanuginosum



Ficinia nodosa

Riparian Plants

These naturally occur around the margins of water bodies, normally outside of where there is permanent water. They can take occasional periods of inundation and don't usually mind moister conditions. Whilst not planted in the pond, the appropriate selection of riparian plants, for around the pond, can help to make a more balanced and natural looking pond. They also provide habitat for animals that make use of the pond.

Some riparian plants that can work well around ponds include –

- *Lomandra fluviatilis* and *L. hystrix*
- *Baloskion tetraphyllum* – Tassel-cord Rush
- Various ferns
- *Crinum pedunculatum* – Swamp Lily
- *Banksia robur* – Swamp Banksia
- *Callistemon* – Bottlebrushes – many are found near water



Lomandra fluviatilis



Baloskion tetraphyllum

Amongst the various aquatic plants are some that are unusual and different from normal plants. With water availability not a problem in an aquatic environment there are many plants that do not need roots and can take in nutrients from the water column. As they do not have to worry about water loss, they can also have fine and feathery leaf structures. There are many plants that obtain additional nutrients by trapping and consuming small aquatic organisms. Also, there are many primitive plants to be found in aquatic environments.

Some of these plants include –

- *Wolffia*- Tiny Duckweeds – includes the smallest flowering plants in the world
- *Aldrovanda vesiculosa* – waterwheel plant – in the family *Droseraceae* it has small underwater traps similar to those of the related Venus Flytrap.
- *Utricularia* – bladderworts – these are aquatic carnivorous plants that capture small organisms with bladder like traps, they can also have attractive flowers that they present above the water surface.
- Aquatic sponges – there are also a number of native species of freshwater sponges
- *Riccia* – a primitive aquatic liverwort with a simple binary branching structure and no roots



Wolffia globosa growing amongst *Ricciocarpus*.



Wolffia globosa

Utricularia australis –
Yellow Bladderwort

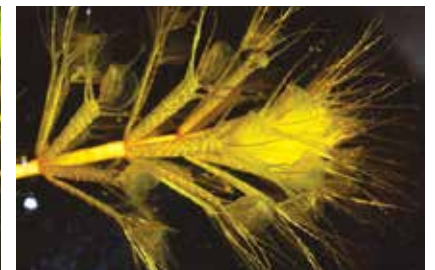
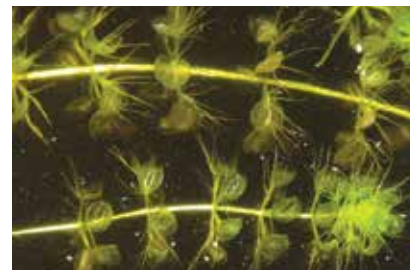


***Aldrovanda vesiculosa* – Waterwheel Plant**

Aldrovanda is an interesting and unusual carnivorous aquatic plant. It is closely related to the Venus Flytrap and it has a similar method of trapping small aquatic animals.

It has a very wide distribution, being found in parts of Western Australia, the Northern Territory, Queensland and New South Wales. Across the world it can be found across Europe, Tropical Africa, India and Japan.

Aldrovanda grows just below the water surface in shallow acidic water. It is only 1–2cm wide and as one end grows the other dies off, so the individual plants are rarely more than 10–15cm long. In areas with colder winters, it forms a vegetative bud called a 'turion' which sinks to the bottom of the water till conditions are warmer.



Plants to Avoid

Whilst there are many great and suitable native plants for your pond, there are many for one reason or another that are not suitable.

It is important to keep in mind the size of your pond as well as the eventual size of the plants that are being added. There are many plants that will be too big for the pond that you are planning. e.g. *Typha* (Bullrushes), many reeds and rushes. These are best for dams and larger water bodies.

Often sold for ponds are many non-native plants. Whilst they can be attractive, they are not really suitable for a native garden pond. Also, over time they may become the next set of problem weeds.

This includes most of the water lilies that are sold. Native waterlilies only naturally occur in the sub-tropical & tropical parts of Northern Australia. The ones most commonly seen in farm dams and still water in the southern half of Australia are the introduced *Nymphaea caerulea* (Blue Waterlily) or *Nymphaea mexicana* (Yellow Waterlily). For the non tropical parts of Australia it is worth considering the smaller but similar looking *Nymphoides* genus of plants.



Nymphaea mexicana forming a dense carpet over the water

Another plant that used to be widely available as a water plant is “elodea” (*Egeria densa*). It is now considered a weed in NSW and QLD and a much better alternative is the related native *Hydrilla verticillata* (Water Thyme).

There are a number of major weeds that were originally introduced as pond plants. Widespread pond planting followed by high rainfall and flood events have helped to spread these rapidly along waterways. With few native animals to eat them, they rapidly outcompete the native vegetation. These should never be planted or kept.

Some of the worst weeds are –

- *Cabomba caroliniana* – Fanwort
- *Myriophyllum aquaticum* – Parrots Feather
- *Salvinia molesta*
- *Eichhornia crassipes* – Water Hyacinth



Salvinia molesta



Myriophyllum aquaticum

Some Recommended Reading

There are many books on the flora of specific areas which have sections on aquatic plants. These are a good starting guide to what can be found in that area. An example is *Field Guide to the Native Plants of Sydney* – Les Robinson

Aquatic & Wetland Plants – Nick Romanowski

Waterplants in Australia – Sainty & Jacobs

Aquatic Plants of Australia – Helen Aston

www.aquagreen.com.au/catalog.html – has some detailed notes on many plants, including cultural notes.



Potamogeton crispus – Curly Pondweed



Nymphoides indica and *Vallisneria nana*



Potamogeton perfoliatus



Vallisneria gigantea



Myriophyllum crispatum



Cyanogeton procerum – Water Ribbons



Schoenoplectus mucronatus



Persicaria depehensis – Spotted Knotweed



Crinum pedunculatum



Hydrocotyl tripartita



Terra Australis Garden at the National Arboretum, Canberra

Words by Ros Walcott, photos by Ben Walcott

Ros and Ben are Life Members of ANPS Canberra and are involved in the implementation of the TA garden at the Arboretum.

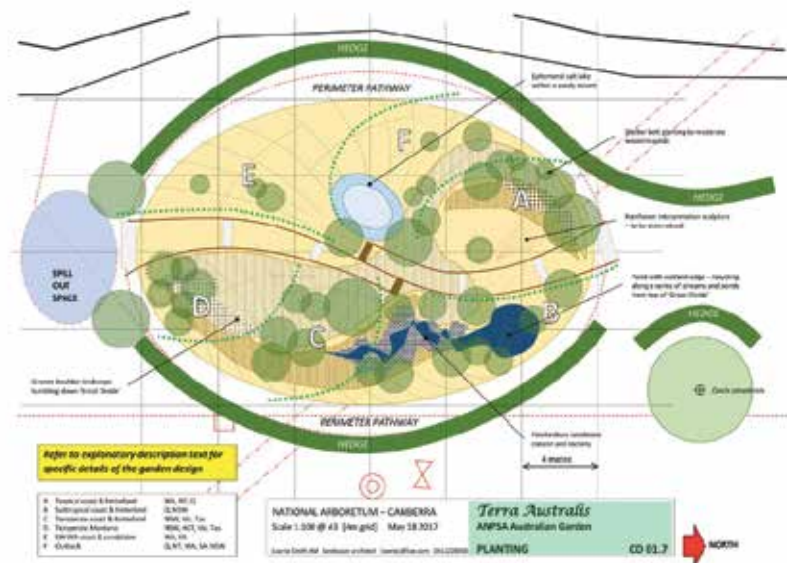
More photos of TA garden on walcottgarden.com

The National Arboretum in Canberra, opened in 2013, features 100 forests of rare, endangered and symbolic trees from around Australia and the world. The Arboretum has become a national tourist destination with approaching 1 million visitors last year, even though many of the trees are still young. However two of the forests are nearly one hundred years old, the Cork Oaks, *Quercus suber*, and the Monterey Pine, *Pinus radiata*. The Arboretum was voted Canberra's Best Tourist Attraction, 2019, 2021 and 2022. More than 44,000 trees from over 100 countries are growing across the 250-hectare (618 acre) site, making it one of the world's largest living collections of rare, endangered and significant trees.



Sculpture of the handwritten title to the poem 'My Country'
by Dorothea Mackellar

The National Arboretum has created a chain of seven gardens spread along a hillside from the main Visitors Centre called the 'Gallery of Gardens'. The Australian Native Plants Society (Australia) (ANPSA) secured one of these gardens, the Terra Australis Garden, to be developed as a wholly native plant garden featuring attractive modern cultivars, species and hybrids of Australian native plants. Rather than only growing species plants, it is important to use this garden to engage the public with the continuing research and development of Australian native plants. New selections and cultivars are regularly released commercially and this garden provides an ideal opportunity to establish and promote some of these 'new plants' – at least those that are likely to be successful in this location.



Lawrie Smith's design of the garden.



Left: the garden in October 2019 and right the same in February 2024.

The design for the garden is an oval shape 30m x 20m, surrounded by a hedge, on a level area made by removing considerable soil from the hill behind the garden. The site is very exposed with no tree cover and has only moderate drainage, so the elevation has been raised.

Lawrie Smith, who designed the Roma Street Parklands among many other botanic gardens, led the design team. The Terra Australis Garden, opened in December 2019 by Angus Stewart and Tara Cheyne, MLA,, was developed by ANPSA as a stylised representation of the Australian geography and its diverse flora. The garden celebrates the varying Australian landscape through landform, rock form, and plant species, to showcase a more formal garden using native plants. Rectangular steel panels across the pathway incorporate lines from the poem:

'My Country' by Dorothea Mackellar

*I love a sunburnt country,
A land of sweeping plains,
Of ragged mountain ranges,
Of droughts and flooding rains.
I love her far horizons,
I love her jewel-sea,
Her beauty and her terror –
The wide brown land for me!*



Left: the plaque at the entrance.
Above: side view in February 2024.

After four years the TA Garden is growing bushy, in some cases almost too bushy! As you can see from these recent photos, taken September and November 2023 and February 2024, the garden is packed with plants in flower and is looking mature. I am somewhat chagrined that my careful measurements of plant spacing seem to have been ignored by the plants themselves in their exuberance.

The wattles bloomed magnificently in 2023, *Acacia acinacea*, Gold Dust Wattle, *A. covenyi*, Bluebush, *A. fimbriata*, Fringed Wattle, *A. howittii* 'Canberry Honey Bun' and *A. verniciflua*, Varnish Wattle. The two *Myoporum floribundum* have grown and flowered, despite being stepped on, crushed by a stone and blown horizontal by the wind. New



Acacia acinacea, Gold Dust Wattle, *Allocasuarina duncanii*, Duncan's She-oak, *Eucalyptus neglecta*, Omeo Gum, *Leptospermum* 'Copper Glow', *Leptospermum* 'Mesmer Eyes'



View of the water feature in February 2024



Basalt ridge, northwest representation.

plantings of *Eremophila maculata* 'Passionate Lady', *Calothamnus quadrifidus* Pencil Form and *Callistemon subulatus* 'Brogo Overflow' have been established and are in flower.

The maintenance staff at the Arboretum are doing a sterling job of pruning, watering and fertilizing the garden. They also have some strategic plans to limit children climbing on the water feature and disturbing the rocks.



Callistemon 'White Anzac' and flowering *Myoporum floribundum*



Southern entrance to the garden.

They have planted *Kunzea ambigua*, Tick Bush, between the water feature and the path. These bushes will grow up to 3m high with aromatic leaves and honey-scented white flowers to form an impenetrable barrier (we hope). The guide ropes installed by the Arboretum staff are also helpful in keeping the public off the water feature and out of the gardens.



Top of water feature.



View of southeast with *Allocasuarina dunconii* and *Leptospermum*.



TA garden on the right 2019 (photo courtesy the Arboretum).

We are most gratified by the support ANPSA, many APS societies, nurseries and individuals have given to promote the establishment and growth of this special native garden in such a prestigious location.

The case of the exploding Banksia cones

Merle Thompson, Co-editor with Alexandra Tuson

Alexandra and Rod Tuson own a property on the central tablelands of New South Wales. Some years ago they had an interesting experience which we wish to share with you in this light-hearted article.

The Tuson property is an interesting one from each of geological, botanical and social perspectives. There is a U-shaped lava flow, the base of which is virtually a million-year-old compost heap. After wet weather or frost this area “drums” when you stamp on it. The area was used by the Gundungarra Aboriginal people of the area as a corroboree ground and there is archaeological evidence of their use of the area. Botanical interest includes masses of ground orchids in spring and summer, the presence of *Bursaria spinosa ssp lasiophylla*, which is the sole food of the purple copper butterfly, as described in the article in Australian Plants Vol 31, No. 253, Summer 2022/23 P. 370 and P. 393, and the occurrence of an unusual form of *Banksia marginata*. It is the Banksia which is the topic of this article.



The Banksia grow on the western side of the property, on a steep slope descending to a permanent creek, in a rich basalt derived clay and stoney soil.

There is no lignotuber. It is thought they do not need one as the plants have no evidence of fire, and the soil is free draining and has never been cultivated. The trees are large. At chest height one cannot give a closed hug. Of the newer trees, which they have encouraged to grow, the flowers are borne on three year old wood.

They have lost a couple to drought over the past twenty years, and have planted at least a dozen, now maturing nicely. Some neighbours have planted

Banksia marginata. The form on the Tuson property.

the seeds and have had good results. The only other place that they have seen these growing naturally is along Magpie Hollow Road, Lithgow, heading toward Sodwalls, after Lake Lyell.

When aiming to collect cones for the seed distribution and propagation of new trees it has been frustrating to plan the gathering and find all the cones have opened after a thunderstorm the previous afternoon. Some years the cones have not formed, which is attributed to a very wet and snowy winter when the flowers were not pollinated at the right time.



Alexandra hoped to propagate the Banksia from seed but despite all the usual treatments, such as putting the cones in the oven, and (with tongs) holding a cone over a gas flame to singe the cone, she could not open the follicles and extract any seed. In fact, Rod facetiously accused her of trying to burn the house down.



Each summer Rod and Alexandra were involved in running a residential musical activity for amateur musicians in Wollongong. The University of Wollongong, which by accidental coincidence is featured in an earlier article in this issue, was one of the venues involved. They, particularly Alexandra, relieved the stress of the demands of such a taxing undertaking by wandering in the neighbouring Wollongong Botanic Gardens. In doing so, they became friendly with the late Anders Boefeldt.

As a side issue, discussing the Banksia story opened up some interesting correspondence about this fascinating man. 'He was a great amateur botanist for the Wollongong area. He was reportedly excellent on rainforest identification and study.' 'He was an amazing man. Anders Boefeldt is remembered for his passion and incredible knowledge of local plants. He was a Senior Horticulturalist with Wollongong Council, he shared his knowledge with all, collected seeds for propagation and study, for the Wollongong Botanic Garden, and re-discovered many historical sightings of plants thought to be extinct in the Illawarra. His passing was a sad loss to nature.' 'He was sacked by the council every few weeks his mates recall, but they could not be without him, as his instincts were so finely attuned to plants, propagation, and finding forgotten botanical treasures.' 'Anders was a bit of a dreamer and I think his "sacking" was for forgetting meetings when he was busy in the field. I think he was only sacked for a day or so at a time. Everyone knew his great worth to the gardens.'

Alexandra's discussions with Anders covered topics such as the pollination of orchids, and the difficulty of getting some native seeds to germinate. In the course of these discussions the problem of extracting seed from their Banksia was raised.

In February 2002 Rod and Alexandra were driving to Orange. Alexandra had with her a bag of *Banksia marginata* cones to mail to Anders. She wrote: 'It was hot, humid, and a huge thunderstorm was about to happen. Wind gusts, lightning aloft and just about to pour and WW3 started in the bag of Banksia cones. The barometric pressure had suddenly dropped and the cones were opening and seed was being ejected.'

This information was then relayed to Anders, along with more Banksia cones. He sent some to the Navy base at Jervis Bay where there is the barometric chamber used to treat divers with 'the bends'. The aim was to see what would happen if the cones were subjected to a sudden drop in pressure. Sure enough, the cones behaved as Alexandra had described.

It appears that humidity and sudden drop in barometric pressure, close to good rain are ideal for the cones to open. 'Very satisfactory. Clever adaptations these Banksias!'



Is this just an interesting tale or is there an important lesson to be learnt? Have others experienced a similar situation where barometric pressure appears to be involved in opening seed capsules of any kind? Are we just having fun with the idea of exploding cones or are we on to a discovery which could be of value to others? Maybe it's not as momentous as the discovery of the role of smoke in germination but the revelation of a phenomenon within the science of seed dispersal. Someone suggested that we go to Bunnings and buy a pressure vessel and experiment. Or can you muck up your kitchen trying to cause a drop in pressure with cones taking the place of vegetables in your pressure cooker?

We would love some feedback.



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