

Coffs Harbour Group NEWSLETTER No.143: October 2019



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APS Coffs Harbour Membership

We currently have 68 members.

APS Website

www.austplants.com.au

Keep up-to-date with news, program of outings and meetings via our pages:

www.austplants.com.au/Coffs-Harbour

~~~~~ *2019 Christmas Party*

Sunday, December 8: 1pm – 5pm

Hosts: Janice and Holger

39-41 Gale Street, Coramba – parking is limited, so look for a side street.

BYO: Plate of food to share, drinks

RSVP to jfitzpatrick@bigpond.com before Monday, Dec. 2

Please let Janice know what type of food (i.e. salad/main/dessert/savoury) you will bring.

(If you wish to cook on the BBQ, there is one available.)
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### Field Trip Memories: Jan Whittle



## MEETINGS

*Meetings are held monthly on Tuesdays in the Display Room, North Coast Regional Botanic Garden.  
Please bring a plate of food to share. Tea and coffee will be provided.*

**Tuesday, October 15: 7pm – 10pm**

**Guest Speaker: Dr. John Hunter, Adjunct Professor, Environmental & Rural Science, UNE**

**Topic:** *Subtropical grassland of the north coast bioregion*

John is a landscape ecologist and has done extensive study on the vegetation and diversity of the threatened *Themeda* grasslands, and also investigated the threatened *Zeria prostrata* on the sea-cliffs and coastal headlands of the north coast of NSW. He will be talking to the group about the sub-tropical grasslands of the North Coast bioregion.

**Tuesday, November 12: 10am – 1pm**

**Guest Speaker: Roger Bagley**

**Topic:** *Native water lilies and aquatic plants*

Roger is a member of the Coffs Harbour APS Group and has a long-term interest in Australian water lilies and other native aquatic plants. He is frequently seen looking after the aquatic plants in the North Coast Regional Botanic Garden.

## FIELD TRIP

**Saturday - Sunday OCTOBER 26 - 27:**

**Weekend visit to Lismore Rainforest Botanic Garden and Rocky Creek Dam**

**Leader/Organiser: Rob Watt (0266 550 043) *NB. further details will be sent out soon!***

The principal reason for this field trip is to visit the Lismore Rainforest Botanic Gardens. This relatively new garden is, like the NCRBG, built on reclaimed land. There has been a great deal of regeneration, and they have an impressive collection of rainforest plants from the region and southeast Queensland. They also have received a grant from the National Maritime Museum and are preparing for May 2020; again just like the NCRBG. They are looking forward to our visit and will meet us and give us a guided tour.

There is also another reason to explore the region: Faye Duncan, a long-time APS member lives just outside Lismore. She has maintained her membership of the Coffs Harbour Group but is now unable to make the trip to meetings or functions. While she can't come to us, we can honour her by visiting. Faye suggested our second venue of Rocky Creek Dam. There are a number of walks, including the Water Dragon Walk; Cedar Walk, Platypus Walk, Scrub Turkey Walk and Water Walk. Go online and there is a nice brochure.

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Mary Gibson: My Bunya Pine - from little things, big things grow

In 1984, I planted a seedling Bunya Pine;
35 years later, it is a magnificent tree.



Rob Watt: Fiona and Morrie Duggan's Tea Tree Enterprise and Garden

Photos: Jan Whittle & Morrie Duggan



Let us start with some history of tea tree oil. Distilled from the Australian native *Melaleuca alternifolia*, the oil possesses antibacterial, anti-inflammatory, antiviral, and antifungal properties but, of course, is not ingested. It has been used for many years for Australian health, including by the indigenous Bundjalung people of eastern Australia but also in the early years of white settlement. However, it was not until the 1920s and 1930s that its potential became clearer. The young economic chemist at the Technological Museum, Sydney, Arthur Penfold, who would go on to become a world authority for his phytochemical work, was working his way through the Australian flora and determining the economic uses of the volatile or 'essential' oils they contained. He was to produce the first reports of the antimicrobial properties of pure tea tree oil. However, it was not until the 1970s and 80s that production figures started to dramatically increase. In the 1970s, it started somewhat as a cottage industry with bush harvesting of native stands of *Melaleuca alternifolia*. With increased demand the industry began developing plantation-based production in the 1980s and also moved to source the best bush-sourced seeds in 1993 – the Tea Tree Breeding Program. Thus, it was relatively quickly determined that the trees from the coastal lowlands were better suited for oil production than those from the upland region both because of a higher prevalence of individuals with commercial oil quality and higher oil content.

Initially sourced from funds from the NSW Department of Primary Industry and CSIRO, it transitioned in 2017 from the NSW DPI to the Southern Cross University, where it will continue to build on the legacy of desirable traits identified and selected from the earlier breeding program. To this end "... five distinct genetic resource collections of tea trees representing more than 300 families from all parts of the species natural range have been established in the Northern Rivers of NSW as well as at West Wyalong and Wagga Wagga in southern NSW. These resource collections preserve the genetic diversity of the species and allow researchers to identify and infuse desirable traits into the main population through controlled pollination." *Tea Tree Oil Industry 25 years* (<https://www.agrifutures.com.au/wp-content/uploads/2018/10/18-022.pdf>).

Where does the *Melaleuca alternifolia* grow? It can be found in north east NSW, both on the coastal and on the adjacent ranges, and in south east Queensland north to Maryborough. It prefers well-drained, moist soils and full sun. It can cope with the occasional floods.



The Duggan's property, located at Braunstone, just south of Grafton and within flooding range of Maloneys Creek, has been given over to tea trees since the late 1990s. When we visited the bulk of the crop had already been harvested and Morrie had left a final run to demonstrate the process of harvesting, preparing the load for the steam infuser and the exciting distillation of the tea tree oil itself. Mechanical harvesting was somewhat of a surprise to me at least. The entire aerial growth is removed, the leaf and twigs finely cut and stored in a large bin attached to the harvester and then prepared by Morrie for the distillation process. Harvesting is every 12-18 months.

The distillation process is possibly the most exciting. Morrie creates a sealed unit around the biomass – as an alternative to placing the mass in a separate distiller – and then saturates the mass just harvested with steam where it is 'cooked' for up to 2 hours. Once the temperature rises to about 100°C the mixed oil and steam vapour begins to rise and after passing through a condenser, the temperature drops to between 55° and 35° C causing it to condense, forming the oil and water mix. It then passes into a separate chamber to separate the water from the now pure tea tree oil. The water and spent biomass are then recycled, the latter being now a valuable mulch which is in demand because the distillation process has effectively killed any weed seeds present in it. I think that all who watched this process were impressed with the hard work that Morrie puts into the enterprise and the iconic Aussie result.



The Duggan's garden and arboretum provide a wonderful native plant experience. For me there were a number of standouts: the mature grevilleas, particularly the 'Robyn Gordon' and 'Moonlight'; and a *Hakea francisciana* with its beautiful magenta tones in the flower. I was fascinated by a frost-damaged mature *Casuarina glauca* 'Cousin It'. I have this species in an area that gets quite cool but they don't appear so damaged. An explanation proffered by Morrie was that they get damage in their garden both frost and suffer on the same day with quite high temperatures. This could explain why the same degree of frost in one district, say Canberra, may not do as much damage as in another, like the upper region of the mid-north coast.

Finally, I thought that the arboretum created by the owners was a great success. It has provided shade under the original *E. grandis* for the successful propagation of many of the rainforest species that like that slight protection.



(L) *Hakea francisciana*; (M) *Grevillea* Moonlight; (R) Arboretum with *E. grandis*

Phil O'Shea: Australian Palms

Palms are the largest of the monocots and Australia has about 60 of the world's 3000 species. Palms hold a few records in the plant world including the largest leaf at up to 25 x 3 metres (*Raphia farinifera*), and largest seed at 16 kg (*Lodoicea maldivica*).

Palms have been divided into 5 subfamilies based upon their trunk, growth habit, leaf shape, inflorescence and flower form.

The **CALAMOIDEAE** are basically the climbing spikey palms. In NSW they are represented by a single species, the well known and best avoided Lawyer vine *Calamus muelleri* but there are 7 other species in Queensland. The **NYPOIDEAE** are branching palms adapted to a mangrove environment. This subfamily is represented by a single species in coastal northern Australia, *Nypa fruticans*.

The **CORYPHOIDEAE** are mostly fan palms, fishtail palms and feather palms. Their genera include *Livistona*, *Licula*, *Caryota*, *Arenga* and *Corypha*.

The *Livistona* include 21 species and are our most widespread genus ranging intermittently from eastern Victoria to the Fortescue of Western Australia. They can tolerate dry conditions and most have some adaptation to fire. Recent DNA analyses (Kondho et. al. 2012) suggests that the central Australian Palm, *Livistona mariae* has only been at its present location in Palm Valley NT for about 15,000 years and is not a remnant from an ancient, wetter climate.

The largest family are the **ARECOIDEAE**, which includes the *Archontophoenix*, *Lepidorrhachis* (Lord Howe Island) *Linospadix*, *Laccospadix*, *Howea*, *Ptychosperma*, *Carpentaria*, *Wodyetia*, *Normanbya*, *Rhopalostylis*, *Hedyscepe* and *Hydriastele* genera

Our rarest palm, *Ptychosperma bleeserii*, was first described in 1928 but subsequently thought to be extinct. It was rediscovered in isolated pockets of rainforest near Darwin. Although most of our palms occur in the tropics, we have four endemic species on Lord Howe Island and two on Norfolk Island.

References:

Dowe JL 2010 "Australian Palms Biogeography Ecology and Systematics" James Cook University.
Jones D 1993 "Palms in Australia".
Kondho et al 2012 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3350701/>



(L) *Archontophoenix purpurea*, Mt. Lewis Palm; (R) *Livistona nitida*, Carnarvon Gorge

Jan Whittle: Where there's Smoke there's ... Germination!

I was inside to escape the recent bushfire smoke when I read a timely e-article about the key role that smoke plays in the ability of plants to regenerate after a wild fire.

In 1989, South African botanist, Dr. Johannes de Lange, discovered that smoke germinated seed of a critically endangered wild flower that did not respond to heat or ash treatment. This led Western Australian scientist, Professor Kingsley Dixon (winner of the *2019 APS Professional Award*) to experiment with Australian native species. To date his 'smoke houses' have succeeded with over 400 species including acacia, anigozanthos, banksia, boronia, fringe-lily, grevillea, hakea, spinifex, and xanthorrhoea. A complete list of species is found at:

<https://www.bgpa.wa.gov.au/about-us/information/research/seed-conservation/smoke-to-sow-and-grow>

Of course, not any old smoke will work! Dixon's research team analysed 4000 chemicals in smoke and finally isolated (and patented) the 'magic' molecule, which they named Karrikinolide (derived from the WA Noongar word for smoke).

Karrikinolide is no shrinking violet of a molecule: just half a teaspoon is enough to germinate a hectare of bushland, which equates to 20 million seeds.

Want to try this at home? You will need to buy Karrikinolide in the form of smoke-water, smoke granules or smoke-impregnated discs.

For more information go to <https://theconversation.com/au> and find the article below:

Reference: 'The phoenix factor: what home gardeners can learn from nature's rebirth after fire' (K. Dixon, Curtin University, *The Conversation*, September 6, 2019).



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## Mary Gibson: An Italian Tale

On my recent trip to Italy, I visited an Information Office just on closing time. After my questions had been answered the gentleman behind the desk wanted to know where I was from ... "Oh Australia! I love Australia. The Finger Limes! I have one growing but is it ready to pick?" He indicated a finger length. I was so surprised I didn't ask how he got it and we were ushered out the door. I have visualised it growing in his back yard but there would be no back yards in the city of Palermo ... more likely in a pot on his balcony.

## National Herbarium of New South Wales seeks your help

The National Herbarium of New South Wales is imaging its 1.4 million specimens ahead of a move to the Australian Botanical Garden, Mt Annan in April 2021. See more at:

<https://www.rbgsyd.nsw.gov.au/Science/Herbarium-digitisation-relocation>

If you would like to help and gain valuable experience, please contact Melissa Wong on [melissa.wong@rbgsyd.nsw.gov.au](mailto:melissa.wong@rbgsyd.nsw.gov.au) with your availability and contact details.



**Rob Watt & Jan Whittle: You can grow *Viola betonicifolia* (Arrowhead violet) and help to save the critically endangered *Argynnis hyperbius* (Australian fritillary) butterfly**



Lindy Hills, an APS Committee member and President of the Friends of the North Coast Regional Botanic Garden, has been contacted by Irene Radcliffe about the need to propagate the Arrowhead violet (*Viola betonicifolia*) which is the **only food** of the critically endangered Australian fritillary butterfly (*Argynnis hyperbius*).

Irene has made available 700 *Viola betonicifolia* plants for people to grow in their gardens to help save the butterfly. If you are interested please call Irene on 66 543 476 for further information.

In 2002, the **NSW Scientific Committee** reported that

- the larval food plant of *Argyreus hyperbius* is *Viola betonicifolia* (Lambkin and Lambkin, 1977). Eggs are laid singly on a leaf of the larval food plant. Early instars remain on the foliage of the food plant, feeding by night. Later instars feed during the day and leave the plant at night to seek shelter. The larva pupates suspended from a branch or twig. Adults feed from flowers and fly during most months of the year.
- *Argyreus hyperbius* is restricted to a few widely separated localities of open swampy coastal habitat in eastern Australia, from south of Gympie, Queensland to north of Port Macquarie, New South Wales.
- *Argyreus hyperbius* habitat has been destroyed at many former sites: coastal swamps containing *Viola betonicifolia* have been largely destroyed by farming and urbanisation endangering *Argyreus hyperbius*. This butterfly is only known from a few widely separated localities through its range. The few remaining extant populations are threatened by weed invasion, which displaces the host plant as well as by swamp drainage and coastal development.
- *Argyreus hyperbius* is likely to become extinct in nature in New South Wales unless the circumstances and factors threatening its survival or evolutionary development cease to operate.

#### **Reference**

Lambkin, T. A. and Lambkin, K. J. (1977). Observations on the life history of *Argyreus hyperbius inconstans* Butler (Lepidoptera: Nymphalidea). *Australian Entomological Magazine* 17, 13-16.