# Palms

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Who does not recognize the distinctive pattern of leaf scars on the trunk of *Phoenix canariensis*? It is one of the most widely cultivated ornamental palms in the world. See article by D.H.R. Spennemann, p. 185. Photo by S. Zona.

**FRONT COVER**

*Livistona australis*, Mt. Keira, Illawarra, New South Wales. September 2017. See article by J.L. Dowe & B.O. Schlumpberger, p. 167. Photo by J.L. Dowe.

**BACK COVER**

*Nypa fruticans* inflorescence with the central female head surrounded by fresh male spikes. See article by L. Noblick et al., p. 118.

# PALM NEWS


Rosemary Lovatt

We extend our hearty **congratulations to the Townsville Palmetum, which celebrated its thirtieth anniversary**. The Townsville City Council marked the milestone on September 23rd with a program of events, music, displays from local gardening clubs, healthy living cooking workshops, and short talks by local gardening gurus. Historical imagines of the garden sent locals on a trip down memory lane with many recalling fond memories of when the garden was grassland and they went swimming in the local creek. The Palmetum's magnificent savannah palms created a stunning backdrop for displays by local artists and craft groups. Parents relaxed under the leaves of the *Attalea* palms, whilst the children enjoyed a story time or climbed aboard the train to trek around the xerophyte gardens. For palm enthusiasts it was a day to reconnect with old friends and celebrate the contribution made by the late Robert Tucker. The event was supported by the Queensland Government and was truly about the community discovering one of Australia's most unique botanic gardens.

The island of **Hawaii is slowly recovering from the volcanic eruptions** earlier this year that devastated many palm-rich gardens and nurseries. Attendees of the Hawaiian Biennial in 2004 will remember the amazing collection of palms originally started by the legendary Pauleen Sullivan and later developed into an eco-resort by Mark Frost. That collection is now buried under lava. IPS member Kimberley Cyr, who lives and gardens in Leilani Estates, ground zero for much of the devastation, provided us with some first-hand perspective on what she calls the "New Normal." She wrote:


Bo-Göran Lundkvist

> It's an experience that tears you in two directions, with awe and wonder at the powerful force of the earth's interior, but sadness for homes lost, people displaced, and unique natural features consumed under 15 or more meters of solid, black lava rock.

Like all palm growers, Kim is an optimist. She ended her account on a hopeful note:

> Plants are amazingly resilient. Despite more than 100 days of exposure to sulfur dioxide and frequent acid rain, many palms and plants that escaped the flow itself remained quite healthy. Of course, some could not withstand the onslaught, rainforest palms and smaller palms, especially. But what a surprise to see *Mauritiella armata*, which grew within 200 meters of the main lava fissure and had become a dried husk, pushing out new, green leaves only one month after the flow halted."

# *Livistona australis* in 19th Century Europe, a Horticultural VIP

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**During the nineteenth century, the Australian Cabbage Palm, *Livistona australis* (R.Br.) Mart., became a feature in many gardens and collections in Europe. In colder regions, the palm thrived in glasshouses and conservatories, whilst it was grown outdoors in warmer locations around the Mediterranean. Its attraction was its cold-hardiness and as a symbol of the exotic. Nineteenth-century horticultural journals were examined for primary sources of information to illuminate the history of the species in Europe.**

By the early nineteenth century in Europe, an interest in the cultivation of tropical plants was firmly established. Palms were among the most sought-after plants, and assembling of palm collections was seen as evidence of horticultural excellence as well as expressing nationalistic achievement and pride. The collections ranged from a few species to many hundreds, depending on the personal interests of curators and directors, as well as the ability to acquire and then maintain the plants.

The development of tropical plant collections was made possible by technical advances in the design and construction of heated glasshouses. These enabled many tropical and warm climate plants to be cultivated in some of the coldest locations in Europe (Kohlmaier & Sartory 1991). Construction was primarily of iron and glass, and heating was provided by steam, generated by coal and coke, conducted through piping. Along with sophisticated shading systems and artificial humidification,

1 (left). *Livistona australis*, Broken River, Eungella Range, Queensland, near the northern limits of distribution. April 2008. 2 (right). *Livistona australis*, Cabbage Tree Creek Flora Reserve, Victoria, the most southern limits of distribution. January 2018. Photos by J.L. Dowe.

these constructions were able to maintain constant, warm temperatures throughout the year. The increasing use of cast iron facilitated the extension of spans and vertical heights, thus allowing large trees, including tall palms, to be grown to maturity. This paper investigates the Australian cabbage palm, *Livistona australis*, and how it was grown in the glasshouses and gardens of Europe during the nineteenth century.

*Livistona australis* occurs naturally in eastern Australia, from Paluma Range, Queensland (18.928° S) to near Orbost, Victoria (37.784° S), a distance of over 2500 km (Figs. 1 & 2). Despite the exceptionally broad geographical distribution, the species is morphologically uniform throughout its range. Although preferring coastal or near-coastal habitats, populations can extend inland to locations up to 1000 m above sea level in rainforest and other moist forests. The wide geographical and ecological range of the species has provided an apparent pre-adaptability to cultivation in a range of horticultural conditions.

## Cultivation of *Livistona australis* in Europe

The first recorded horticultural collection of *L. australis* occurred during the voyage of the *Investigator* under the command of Matthew Flinders, 1801–03. This voyage circumnavigated Australia and included the botanist Robert Brown amongst the scientific crew. Brown (1810) was later to establish the genus *Livistona* and describe *L. australis* (as *Corypha australis* R. Br.). The gardener assigned to the *Investigator* voyage was Peter Good of Kew Gardens. Good's only known collection of *L. australis* noted "the Cabbage Palm a species of *Corypha*," collected on 23 June 1802, at Hawkesbury River, New South Wales (Vallance et al. 2001). Although it can be assumed that seeds were returned to England, there were no records of subsequent activity with regards to germination and cultivation in England.

The first verifiable record of *L. australis* being received at Kew was in 1808, with seeds sent from Australia by the collector George Caley (Russell 1962). Subsequent documentation of the plant collections at Kew did not include



3 (left). *Livistona australis* Rob. Br. Plate 1789. Permission of Queensland Herbarium Library. 4 (right). *Livistona australis* Rob. Br. Plate 1790. Van Houtte, L. 1868. Flore des Serres et des Jardins de l'Europe 17. Both reproduced with permission of Queensland Herbarium Library.

any Australian palms so it can be concluded that the species was still not successfully cultivated as of 1813 (Aiton 1810–1813).

The first successful cultivation of *L. australis* at Kew was in 1824. It was reported that seeds were dispatched from Australia, not as propagating materials *per se*, but as drainage crocks in containers of other Australian plants, and, by coincidence, germinated during the voyage to England (Seemann 1856). The plants were dispatched under the direction of Allan Cunningham, who was then collecting Australian plants and herbarium specimens for Kew. Upon arrival of the potted plants at Kew, the germinated seeds of *L. australis* were found and cultivated by John Smith, then overseer of the hot houses, and in 1841, the first Curator at Kew.

In only a few years, the palm became commercially available in England and was listed in the 1830 catalogue of Loddiges Nursery as a "stove plant," i.e. one that requires a heated glasshouse (Conrad Loddiges & Sons 1830). There is no record of how Loddiges obtained the species, but the company was active in acquiring and propagating Australian plants (Cavanagh 1990).

Further dispatches of seeds from Australia were credited to the Austrian explorer John Lhotsky (in Australia 1832–38), who declared that the species was "of great value to the practical gardener or amateur collector" (Conductor 1834). Possibly the greatest disseminator of seeds was Baron Ferdinand von Mueller, Victorian Government Botanist, who sent large quantities to Mediterranean countries (Parkin 1996). Mueller was active in supplying seeds of Australian plants and provided "a box of seeds of *Seaforthia elegans* and *Livistona* (*Corypha*) *australis*, two of the most beautiful palms from Australia" to the Société d'Acclimatation de France (Raveret-Wattel 1874). The German horticulturist Eduard Ortgies (1869) reported that *L. australis*, by the

1860s, had been introduced by "a massive importation of seeds and seedlings" and that they were "now very inexpensive." The Belgian horticulturist Louis Van Houtte (1868) provided two of the first published illustrations of cultivated specimens (Figs. 3 & 4) and wrote that "it does not lack buyers who can afford to place it in a position of grandeur."

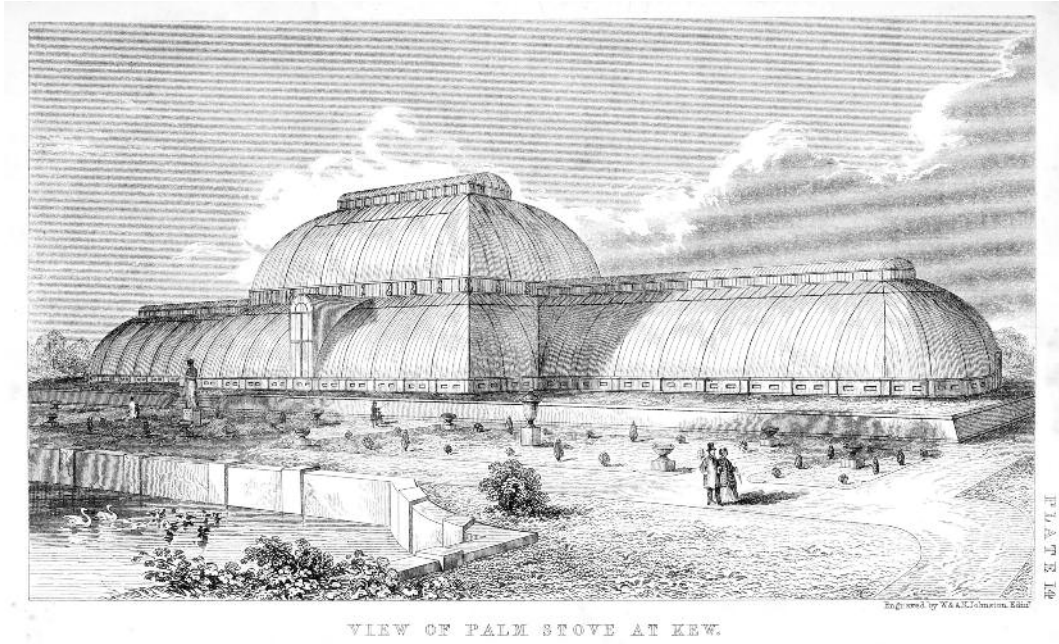
Once the horticultural potential and supply of *L. australis* were fully realized, the species was praised for its "magnificence," "noble proportions" and "desirability." It was promoted as one of the "choicest" palms for the home as a potted plant, in the conservatory as a feature plant and in the open air in warmer regions of southern Europe (Croucher 1872, Williams 1876, André 1879). The cold-hardiness and adaptability of the species for outdoor cultivation around the Mediterranean was soon recognized and described as "hardy to semi-hardy in regions where oranges are grown" (Naudin & Mueller 1887). A summary of individuals established in the late nineteenth century in Italy and France was provided by Roster (1913). These included specimens to 13 m tall at Palermo and others at Cannes that survived undamaged in temperatures as low as -7°C. Possibly the largest collection was at Naples Botanic Gardens, where 27 individuals from 2 m to 12 m tall were cultivated.

**The Kew Palm House**

One of the main attractions in the Royal Botanic Gardens Kew is the Palm House and its exceptional collection of tropical plants (Fig. 5). Completed in 1844 (Gosse 1857), it was to house one of the largest palm collections in Europe during the nineteenth century (Minter 1991). It was reported that the collection numbered "upward of 300 species" in 1878 (Hemsley 1878), 407 species in 1889 (Royal Gardens, Kew 1897) and more than 450 species in 1910 (Anon. 1910a).

One of the first published accounts of *L. australis* at Kew was provided by the German horticulturist Eduard Otto (1833), who wrote, after visiting Kew, that *L. australis* was the only Australian palm cultivated in European gardens. Subsequent reports indicated that by 1848, *L. australis* (by this time transplanted to the Palm House) had grown to "six feet [1.8 m] of trunk and more than 120 leaves" (Fischer 1848). By 1856, it was described as one of the "majestic" species amongst the palm collection (Flach 1856) and had reached a height of 9 m (Houlston 1856). However, the healthy and rapid growth of *L. australis* was to threaten its own existence and, when the crown was approaching the ceiling of the Palm House in 1876, it was cut down and replaced with *Phoenix dactylifera* (Hooker 1876). Prior to this, the renowned illustrator and lithographer

5. "View of Palm Stove at Kew," Plate 14 from McIntosh 1853. The Book of the Garden, Vol 1. William Blackwood and Sons, Edinburgh and London. Source BHL.



Walter Fitch completed an illustration that was published in Curtis's Botanical Magazine (Fig. 6). Hooker (1877), in the accompanying text, wrote that "this graceful palm was for many years one of the greatest ornaments of the Palm House" and that "it flowered annually at Kew, in the spring months, for many years." Eight years after the felling of *L. australis* in 1876, a second individual was reported to have flowered (Anon. 1884) and was described as "the tallest tree in the house, and distinctly shows its leaves in the uppermost dome or section of the building."

In 1891, several palms were removed from the Palm House and transplanted to the Temperate House (Watson 1891), amongst them *L. australis* and *L. inermis*. This was necessitated by the "crowded state of the former house" and those chosen for transplanting "would be likely to thrive in a temperature which, during summer, is the same as that outside in this country, and in winter is heated only sufficiently to keep out frost." There were continuing misapplied references to "*L. inermis*" [= *L. decora*] during the following years (Watson 1889), amongst which was a proposition that this name correctly applied to the Victorian population of *L. australis*, because of the apparent "pinnately-palmate leaves" (Hemsley 1892). This confusion was not satisfactorily resolved until Beccari's account of the Coryphoid palms (Beccari 1921).

And yet another individual named as *L. australis* was reported as flowering in the Palm House in 1904 (W.H. 1904). It was described as "35 feet (11 m) in height, and 1½ foot (0.4 m) in diameter at the base, and has a head of leaves some 14 feet (4.2 m) across," and with "large branched spikes of flowers measure about 3 feet (1 m) in length; the branches of the inflorescence are drooping, like the branches of the funeral *Cypress*; the flowers are creamy white. The plant is carrying six of these large inflorescences."

Other gardens in the United Kingdom that had plants of *L. australis* included Edinburgh Botanic Garden where, in the glasshouse, it was reported in 1858 to be a height of 7 m (Balfour 1860) and by 1883 had reached 12.5 m, with "a clear stem of 20 feet 4 inches [6 m], and 3 feet 3 inches [1 m] at the base" (Lindsay 1886). A specimen was grown in the Great Conservatory at Chatsworth, the estate of the Duke of Devonshire, where it was described as "magnificent" and "noteworthy" (Fintelmann 1882), and also in the Palm House at the Dangstein Estate, Sussex (Trotter 1988). Outdoor cultivation was reported on the Isles of Scilly (Meyer 1885), Guernsey (Carré 1887) and Torquay, Devon, where it flowered (Ramsey 1900).

**The Royal Gardens of Herrenhausen near Hannover**

Somewhat in competition with the palm collection at Kew, the collection at the Royal Gardens of Herrenhausen, Hannover, Germany, was the largest in Europe in the nineteenth century, surpassing Kew in the number of species, diversity and the eventual maturity of individual specimens (Minter 1991). The collection was first established by Court Gardener Heinrich Ludolph Wendland in the 1830s and later expanded by his son, Hermann Wendland, who assumed the role of Court Gardener upon the death of his father in 1869. Hermann Wendland was a very productive palm taxonomist, with more genera being established by him than any other botanist (Dowe 2018).

The original accession record for *L. australis* at Herrenhausen has not survived; however, published reports in a variety of horticultural and botanical journals allow a reasonable understanding of the history of its cultivation. It was reported by Hermann Wendland that the species was first obtained by his father Heinrich from Kew Gardens in 1827 as "a little 1.5 foot [0.47 m] high plant" (Wendland 1852). The palm was most likely grown in one of the glasshouses at Herrenhausen, possibly the one constructed in 1791, where the first palm collection was gathered (Rettich 2006). By 1847, *L. australis* was reported to be over 9 m tall (Otto 1847). The glasshouse was subsequently replaced by a much larger structure designed by German architect Georg Ludwig Friedrich Laves in 1849 and from that time became known as the Palm House. It was a timber beam construction, measuring 35 m long, 10 m deep and 13 m high (Kohlmaier & Sartory 1991). It can be ascertained that *L. australis* was moved into the Palm House in about 1849. It was maintained as a potted specimen at this time, a considerable horticultural feat for such a large palm. It was placed in a central position on a 1.5 m tall pedestal, with an overall height of 7.3 m and with 1.7 m of bare stem (Wendland 1850). It was to achieve rapid growth: two years later it was 7.6 m tall with 2.4 m of bare stem (Wendland 1852), and seven years was 12 m tall with 4.2 m of bare stem (Koch & Fintelmann 1859).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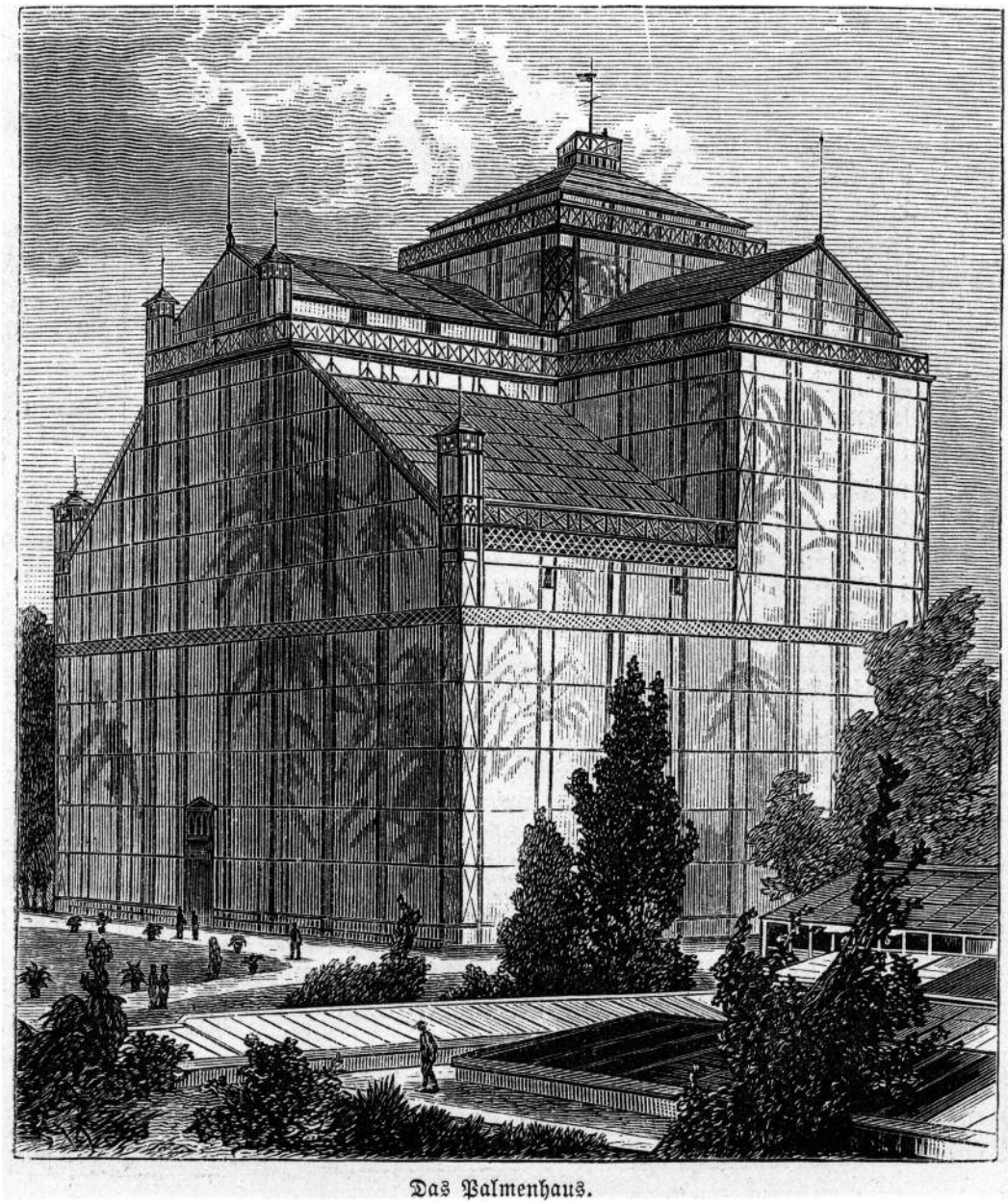
W.Fitch del. et lith.
Vincent Brooks Day & Son Imp.




7. Palm House, Herrenhausen Gardens, circa 1890, designed by Richard Auhagen (Woodcut from unknown source). With permission of Historisches Museum Hannover.

In 1875, an annotated list of the palms at Herrenhausen was published, including at least 435 palm species. At this time, *L. australis* had reached an overall height of 14.72 m and with 9.76 m of bare stem (Schaedtler 1875).

*opposite page:*

6. *Livistona australis*, drawn from a plant in the Palm House at Kew. Curtis's Botanical Magazine 33: Tab. 6274 (1877). (W. Fitch and Vincent Brook Day and Son). Permission of Queensland Herbarium Library.

During the late 1870s, the palm eventually reached the roof, so the pot was placed deeper in the ground. By this time, the Laves's Palm House was showing structural deterioration, and the expanding collection had become increasingly overcrowded. A new and much larger Palm House was designed and constructed by the Royal Building Overseer Richard Auhagen and completed in 1880. The large collection had been difficult to maintain in the smaller glasshouse, where individuals

8. "Vue intérieure de la Serre aus Palmiers a Herrenhausen," with *Livistona australis* the dominant tall palm. L'Illustration Horticole 29. 1882. (creator not known). Courtesy of Nicole Schuermans-Ceulemans, Belgium.

were all kept as potted specimens. The new glasshouse (Fig. 7) was a cast iron and glass structure with a length of 30.5 m, width of 28.5 m and a central height of 30.2 m, which made it then the tallest glasshouse in Europe (Auhagen 1882). The additional space, both horizontally and vertically, allowed many of the larger specimens to be planted directly into the soil, which was heated by a complex system of ducts, heaters and pumps. *Livistona australis* was moved to the new Palm House and planted directly into the ground in the prime central position (Preissel & Preissel 1993) (Fig. 8). According to Wendland (1882) the relocation prompted flowering for the first time, producing "12 decorative long flowering stems," and which was "probably initiated by an increase in the amount of light."

An inventory of the living plant collection in Herrenhausen in 1888 listed 85 palm species in the Palm House (Peters 2013). The remainder of the palm collection was held in auxiliary heated glasshouses. The display in the Palm House was supplemented by the potted collection, and only a small portion of the palm collection was on public display at any one time. There was an emphasis on a "natural" display rather than one including large numbers of plants in otherwise crowded "unnatural" arrangements (Stühring 2008).

*Livistona australis* continued its upward growth, and in 1898 was reported to be approaching the roof at a height of 23 m (Wittmack 1898). In 1912, at 32 m high, the crown reached the roof and was "threatening to destroy the glass" (Fischer 1912). However, it endured until 1920 when, at almost 100 years old, the palm was cut down with permission of the Duke of Cumberland (Rettich 2006). A 2.5 m length of stem, a cross-section and two leaves were preserved in the provincial museum, now the Niedersächsisches Landesmuseum in Hannover (Preissel & Preissel 1993). The museum accession entry recorded that the palm: "Had to be cut beginning of March 1920 because of too large size. Dimensions: stem size 26 m, leaf crown size 5 m, in total 31 m long. Stem diameter at the base 68 cm, at 26 m height 26 cm" (C. Schilling & A. Böhme, pers. comm.).

The Palm House survived well into the twentieth-century but was damaged during

9. *Livistona australis*, in the Jardin des Plantes, Paris. The Garden 26: 337. 1884. (creator not known). Source BHL.


Fig. 28.—Livistona australis.

10. *Livistona australis*, Villa Venetienne, Nice. The Gardeners' Chronicle, third series, 71, July 29: Fig. 28. 1922. (photographer not known). Source BHL.

bombing raids in World War II and demolished in the early 1950s (Schwerin 2013). The museum stem and leaf specimens have not survived and were most likely destroyed during World War II (C. Schilling & A. Böhme, pers. comm.).

A number of other German botanical gardens also had feature specimens of *L. australis*. In the Münich Botanic Garden it was reported as having been received in 1826 by Carl von Martius as a gift from William Aiton at Kew (Kolb 1867). By 1862, it had reached a height of 12.8 m, and was reputedly the tallest individual in Europe (Mulsant 1862). Specimens dated 1862/1864 in the Münich Herbarium include inflorescences and flowers, thus indicating that the Münich plant had flowered by that time. Carrière (1868) noted that the individual had flowered three times in six years since 1862. By 1877, it had reached a height of almost 20 m (Carrière 1877). Individuals were also grown in glasshouses in Berlin (Sauer 1834), Moabit (Otto & Dietrich 1854), Donaueschingen (Brandt 1885), Göttingen (Mönkemeyer 1890) and Frankfurt am Main (Anon. 1910b).

## Cultivation elsewhere in Europe

Other glasshouse specimens of *L. australis* in Europe were reported in France (Paris and Lyon) (Fischer 1847; Regel 1865) (Fig. 9), Belgium (Laeken, Bierbeek & Brussels) (Morren 1859, 1883; Koch 1862), Netherlands (Zwolle) (Witte 1859), Hungary (Alcsuth) (Schebanek 1878), Russia (Odessa, Nizhny Novgorod and St Petersburg) (Koch 1853, 1858; Dörr 1887) and Austria (Vienna-Schönbrunn) (Dechevalerie 1873).

In the warmer regions of Europe, *L. australis* was grown outdoors. For example in Monaco (Monte Carlo) (Anon. 1887); in France in Toulon (Naudin 1856), Hyères (Nardy 1874), Nice (Chabaud 1882), Cannes (André 1883, 1888) and the Riviera region (Becker 1901; Chabaud 1915) (Fig. 10); in Italy in Palmero (Sprenger 1884), Görz (Palm 1887), Naples (Regel 1891), Elba (Anon. 1904), Porto Ercole (Mt Argentario) (Kyburz 1989) and Genoa (Regel 1874, Brandt 1878, Wittmack 1883); in southern Russia (Sukhumi) (Saakov 1963); in Portugal (Lisbon) (Carmichael 1885); and in Spain (Menorca) (Rodriguez 1901).

## Conclusion

As a featured glasshouse palm, *L. australis* was eventually replaced by other palm species that were considered more exotic or otherwise of greater interest. Experience dictated that *L. australis* could reach great heights in a relatively short period and was ultimately unsuitable for even the tallest glasshouses. As an outdoor palm it has remained popular in Mediterranean countries (Pintaud 2002). Although its status as a feature palm extended throughout most of the nineteenth-century, it is now only rarely kept in European glasshouses – a "horticultural VIP," whose time came and went.

## Postscript

Although this current research has focused on the horticultural history of *L. australis*, we are aware of its susceptibility to the Red Palm Weevil, *Rhynchophorus ferrugineus*, which is presently infesting and killing many palms in southern Europe (Soroker & Colazza 2017). However, details of individual deaths and extent of damage for *L. australis* are presently not available. If Red Palm Weevil cannot be controlled, continuing cultivation of *L. australis* in southern Europe may be at risk.

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We would like to thank Christiane Schilling and Annina Böhme of the Niedersächsisches Landesmuseum for providing information and access to their archival records. Members of the European Palm Society are thanked for

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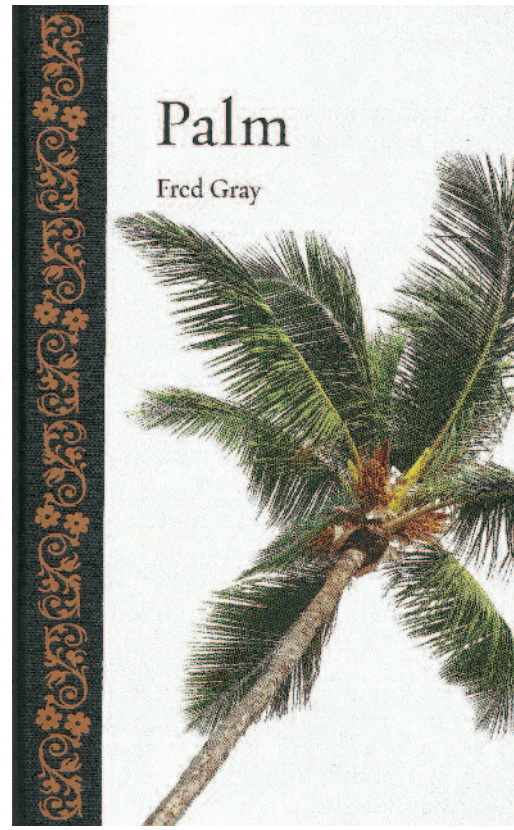
## PALM LITERATURE

### PALM – Fred Gray, Reaktion Books, London. 2018. Hardcover. ISBN: 978-1-78023-917-0. Price: £16. 228 pages, profusely illustrated




Reaktion Books is an independent publisher based in the UK specializing in books on art, culture, animals, food and more. *Palm* is the latest (20th) volume in its Botanical Series, "integrating horticultural and botanical writing with a broader account of the cultural and social impact of trees, plants and flowers." The series includes individual volumes devoted, for example, to apple, bamboo, cactus, cannabis, etc.

Fred Gray is Emeritus Professor of Continuing Education at the University of Sussex in UK and is particularly interested in the architecture and landscaping of the seaside. In not being a palm specialist he perhaps has a nicely detached view of his subject, where a palm scientist might have found difficulty in not becoming bogged down in endless detail about the amazing diversity of the family, agonizing over what palm to include, what to leave out.

In fact, the author mentions a mere 25 of the 2500 odd recognized species by name, and while the coconut, oil palm and date palms receive substantial treatment, other major economic palms such as the betel nut, sago palm, carnauba wax palm and raphia palms (apart from mentioning that *Raphia regalis* holds the longest-leaf record) receive no mention. Does this matter? Perhaps not when the main thrust of the book, the intertwining of palm botany, history, cultivation, trade, politics and ecological destruction are so well discussed using the very limited examples chosen.

There are nine chapters. The first two chapters, 1. The Prince of Plants and 2. Dissecting the Giant Herb, deal with the general morphology of the family, mentioning, of course,

superlatives of leaf and seed size, and stem length. Chapter 3, The Civilizing Date, discusses the crucial role that the date played in the foundation and development of civilization. Chapter 4, Western Discovery, Chapter 5. Empire and Utility, and Chapter 6, Of Tigers, Plantations and Instant Noodles, together deal overwhelmingly with the history and development of the oil palm as a plantation crop, linking to changing attitudes among colonial powers to slavery and plantations. Together they provide a well-balanced account of the oil palm in plantation culture, the increasing dependence of mankind on palm oil and its derivatives and the impossibility of living everyday lives without consuming some product derived from the oil palm. The ecological destruction associated with oil palm cultivation is fairly discussed. Chapter 7, The Ornamental Palm, discusses the role of palms in artificial landscapes and art while Chapter 8, Captive Performer, treats the development of the great glasshouses of private and public gardens. The final chapter, Abstractions and Fantasies, digresses into the world of palm symbolism and even the use of palms in pornography. I was in a way surprised that the author in discussing the palm-free landscapes described in Daniel Defoe's Robinson Crusoe did not take the opportunity to mention the wonderful *Juania australis*, a palm endemic to the Juan Fernandez Group that includes Robinson Crusoe Island, where Alexander Selkirk, the model for Robinson Crusoe, was marooned.

The book ends with references, further reading and associations and websites, including, of course, a reference to the International Palm Society (described as an American society!). The book closes with an unusual "timeline" from 100 million years ago until 2010 providing a selection of key moments in the history of palms.

There is one very unfortunate howler – the frontispiece to the chapter on Ornamental Palms is a fine, old photograph labelled "a fan palm," displaying the non-palm, *Ravenala madagascariensis*, that all readers of our journal know is not a palm but a member of Strelitziaceae. Perhaps this also highlights a weakness in the book – nowhere is the palm defined properly. Why are palms palms? As is well known there is a whole collection of arborescent monocots and some cycads that may be confused by the general public (presumably at whom the book is aimed) with the true palms. Indeed the Cornish and Devon Rivieras on the south coast of England are defined by the presence of ornamental palms, which happen for the most part not to be palms at all, but species of *Cordyline*. In a book of this sort, this is a strange absence.

This is a beautiful book. The hard-back binding is pleasing and the page layout and type face all carefully thought out and appropriate. Throughout it is illustrated with beautiful photographs or art reproductions, almost all in color. It is also an easy read, and there is much to stimulate. The links made between palms and literature are sometimes surprising and entertaining.

This is the sort of book that would sit well on the bedside table in a palm enthusiast's guest bedroom. Here is an easily read, palm-themed book, filled with entertaining anecdotes and serious political matter, to while away the time, gently informing the reader about selected aspects of this most magnificent of flowering plant families. It is not an exhaustive introduction to the palm family, but the reader may learn much about the interactions between palms and man, particularly in history, art, culture and trade. At £16, it is a steal.

JOHN DRANSFIELD

# *Nypa fruticans* in the Western Atlantic: Potential for Re-colonization?

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***Nypa fruticans*** **Wurmb, the mangrove palm (Fig. 1), belongs to one of the oldest palm subfamilies, Nypoideae, and at one time had a pantropical distribution with fossil pollen and fruits common in many parts of the world (Uhl & Dransfield 1987, Sunderland & Morakinyo 2002, Gomez-Navarro 2009) (Fig. 2). Its oldest fossils date back to the Upper Cretaceous, 65–70 million years ago (Gee 2001).** ***Nipadites*** **fossils, which closely resemble current day** ***Nypa fruticans*** **fruits, have been found throughout the world in North America, South America, Africa, Southern England, Poland and Belgium.**

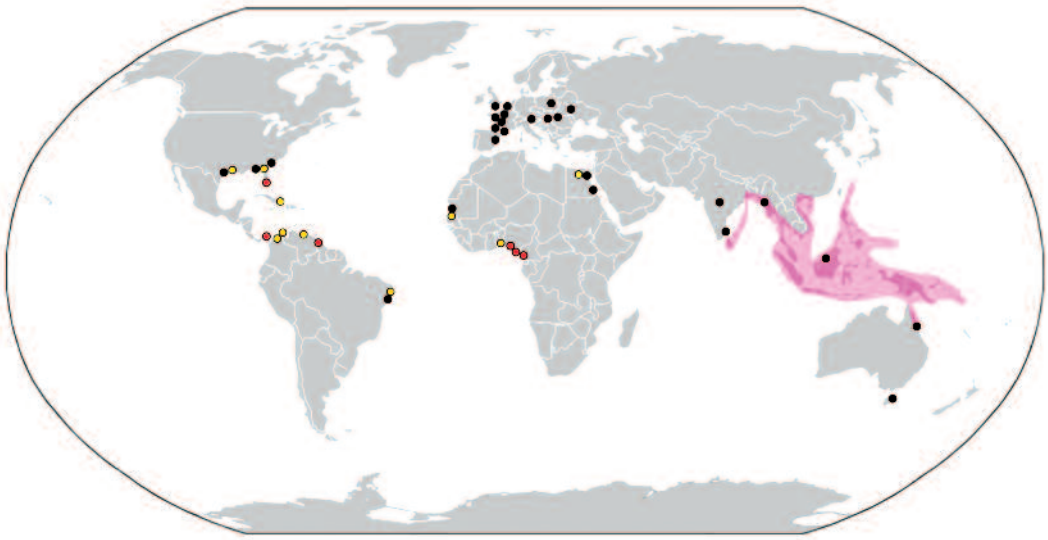
*Nypa* fruits are dispersed by water and float from one location to another, much like the coconut, facilitating the long-distance spread of the species. Eocene fruits (ca. 56–34 million years ago) discovered in southern England are about seven centimeters long and were found buried in the London Clay layer, for example on the isle of Sheppey at the mouth of the Thames River. It is thought that the Earth was suffering from a severe greenhouse warming event, since London was nowhere near the tropics at that time. During the Eocene, it was also common along Brazilian shorelines in the western tropical Atlantic. However, sometime during the Tertiary, as a result of climate and sea level changes, *Nypa* became extinct in the Neotropics before the start of the Pleistocene (Dolianiti 1955, Muller 1980, Bacon 2001).

### *Nypa*, the weed

In spite of its former pantropical distribution, *Nypa* has been absent from West Africa since the end of the Eocene (Gee 1989). *Nypa fruticans* was reintroduced to the West African

1. Outside (top) and inside (bottom) view of a natural *Nypa fruticans* forest in the Similajau National Park, Sarawak, Malaysia.

coast in the early twentieth century and has since become a serious weed (Sunderland & Morakinyo 2002). In 1906, a trial plantation was established in Old Calabar, Nigeria, with seeds from the Botanic Gardens of Singapore. Seeds produced from this first introduction were then used to establish a second plantation in Oron, Nigeria, at the Cross River Delta in 1912 (Holland 1922, Russell 1968). Later in 1946, over 6000 seeds from Malaysia were planted throughout the swamps of the Niger Delta (Zeven 1971). Since then *Nypa* has naturalized and rapidly colonized large areas of the West African coastline (Sunderland



2. World map of current natural distribution of *Nypa* (shaded area). Fossil fruits (black dots) and fossil pollen (yellow dots) reveal *Nypa*'s past pantropical distribution, and new and introduced populations (red dots) demonstrate its ability to recolonize.

2001), becoming established as far south as the Wouri Estuary near Douala, Cameroon and westwards to Lagos (Fig. 2).

The dense *Nypa* stands in Nigeria are outcompeting the indigenous mangroves. When the native mangroves are overharvested for wood for smoking fish, for commercial sale or degraded by other human activities like petrochemical installations, *Nypa* rapidly invades, forming dense stands that permanently displace the native species (Sunderland & Morakinyo 2002). Its capacity repeatedly to branch dichotomously at its shoot apices (Tomlinson 1971) enables a single plant to dominate a very large area. In addition, phytotoxic substances have been discovered in *Nypa fruticans* leaves, which inhibit both germination and seedling growth of other plant species including *Pennisetum polystachion, Euphorbia heterophylla, Phaseolus lathyroides* and *Centrosema pubescens* (Wongkaew & Techapinyawat 1996). However, not all plants are affected by this phytotoxin, since it shares its native habitat with ca. 105 other species in Malaysian mangrove forest (Japar 1994). Still, the displacement of the native mangroves in Africa is negatively affecting native fish populations that depend on these mangroves for breeding (Sunderland & Morakinyo 2002). The lower biodiversity of *Nypa* mangroves vs. native mangroves reduces the fish catch and shellfish harvest, hurting people's livelihoods (CABI 2018).

Not all the news about *Nypa* is bad. In Southeast Asia, it is one of the most utilized mangrove species. The leaves are used for roof thatching, making umbrellas, raincoats, hats, mats, brooms, baskets, cigarette wrappers, ropes, and as a source of fuel. The sap from the inflorescence stalk is used to make sugar, vinegar and a popular alcoholic beverage in Malaysia, India and Bangladesh. The gelatinous endosperm is edible and can be eaten raw, while the hardened endosperm from mature fruits is used as vegetable ivory for making buttons and jewelry (Burkill 1966). Parts of the palm are also used for medicinal remedies to treat headaches, toothaches and herpes (Burkill 1966). Although, it was originally introduced to West Africa for thatch and alcohol production, its use never quite caught on, and it still remains considerably underutilized in that region (Holland 1922, Sunderland & Morakinyo 2002).

### *Nypa*, a Central American introduction or relic?

In 1989, an isolated, well-established population of *Nypa* was discovered on the Caribbean coast of Panama. At the time it was the only known record of the palm in the Neotropics (Duke 1991). The population was considered quite small in extent, ranging about one kilometer along the Rio Majugual tidal stream with only two or three monotypic stands of 40–50 palms (Duke 1991). It was also found near a busy main road and in the city

of Colón, the Atlantic seaport of the Panama Canal. Initial investigations found about 100 adult specimens in 1991, but their numbers appeared to be increasing rapidly based on an abundance of immature individuals. Duke (1991) reported that the species was spreading downstream to the edge of the open estuary and is now poised to cast their progeny across the Caribbean. Dispersal throughout the region seems inevitable. As people become more knowledgeable about this palm and discover its many uses (Tomlinson 1986), it may spread even faster. Durable palm leaves are highly sought after for thatching, although there is no evidence that the current grove is being used in this manner. If *Nypa* was introduced to Panama, the size and extent of the mature stand suggest that the introduction occurred ca. 60 years ago (more than 30 years ago *fide* Duke in 1991). Since *Nypa*'s historical Neotropical distribution is well established, one could assume this is a relict population that dwindled during drier climatic conditions, survived, and is just now recovering. However that would mean *Nypa* has been present in Panama since the Eocene (based on fossils in Brazil), and how local people completely missed this useful palm all this time is hard to imagine. Evidence seems stronger that the original specimens of this Panamanian population, just like its Nigerian cousins, were introduced (Duke 1991).

### *Nypa* crossing the Atlantic

In 2001, Bacon wrote that germinated *Nypa* fruits were showing up on Manzanilla Beach in Trinidad. Bacon (2001) speculated that the Trinidad specimens arrived from West Africa via ocean currents and his photograph of germinated *Nypa* proves that the seed can survive being soaked for quite long periods in saltwater. Because of prevailing currents, it is unlikely that the fruits came from Panama. Inspired by Bacon's article, Johnson (2001) recalled seeing about 20 naturalized colonies of *Nypa fruticans* in western Guyana in 1994 down the Barima River, at a place called Blackwater. His boatman, having lived in the area all of his life, reported that *Nypa* first appeared even farther downstream around Mabaruma about 20–30 years earlier. Johnson speculated that *Nypa* propagules from Africa probably first established near the mouth of the river near Mabaruma and fruits from those colonies were carried farther upstream by the tidal currents. The location where Johnson first observed *Nypa* on the Barima River is 25 miles upstream, which suggests rapid colonization. Johnson (2001) wrote that he would not be surprised to find other unreported colonies elsewhere in the Guyanas, Venezuela and Colombia.

In 2013, *Nypa* arrived in eastern St. Lucia on ocean currents from Africa with some fruits already germinated and ready to establish themselves in their new home (see figure in Noblick & Graveson 2014). Some St. Lucia locals are concerned that it will invade the mangroves on the eastern side of the island, since it thrives in the estuarine mud at the mouth of rivers (Dransfield et al. 2008).

We can easily estimate that *Nypa* propagules have been dispersing across the Atlantic for over 100 years, since about 1912 and especially after 1946. However, Bacon (2001) reported that less than 10 percent of seed are viable upon arrival and suggested that it may take much longer before this species becomes established, as it often becomes trapped in unsuitable strand lines along Atlantic beaches. Nonetheless, according to Johnson (2001), populations have established in western Guyana and may already be established in other unreported areas along the northern coast of South America.

### *Nypa*'s propagation potential

*Nypa* in its native habitat can be exceptionally prolific. One collection made by the first author in Indonesia yielded 120 fruits from a single infructescence and several ripening infructescence heads were floating next to their mother plants. In addition to prolific fruit production, a single *Nypa* plant can occupy and dominate a huge area over time, as rhizomes of *N. fruticans* can spread laterally by repeated dichotomous branching from the original plant (Tomlinson 1971, 1986). Together, these two strategies make *Nypa* a prime candidate for expansion, given the right environmental conditions.

At Funaura Bay on Iriomote Island, Japan, *Nypa* occupies its current northernmost natural distribution in Southeast Asia (Sugai et al. 2015). This island population is located ca. 24°24′ N of the equator and has been designated as a Natural Monument. Yet from the time of its designation in 1960, the population, once estimated to be ca. 150 plants, progressively declined over time until only 28 were found in 1998 (Setoguchi et al. 1999). The initial high counts may be due to an initial misunderstanding of how *Nypa* rhizomes dichotomously branch and difficulty

3. Montgomery Botanical Center: (above and below left) Aerial views show rapid *Nypa* growth on an island in Duck Lake from 2005 to 2017. (right) Young *Nypa* palms on the island in 2001 with an American crocodile. *Nypa* palms and crocodiles both come from evolutionary lineages spanning millions of years. Crocodile photo by Mary Andrews.

distinguishing individual palms from multi-branching clones. In other words, what observers counted as multiple plants in 1960 may have been a single individual, dichotomously repropagating itself over and over again. Several studies have demonstrated very low genetic variation within populations and considerable spatial extension of old clones (Tommerup 2009, Jian et al. 2010, Sugai et al. 2015). In fact, of the currently recognized 28 individuals at Funaura Bay, 27 are genetically identical (Setoguchi et al. 1999).

4. Growth Comparison: (above) Duck Lake Island with four newly planted *Nypa* palms in 2000. (below) Duck Lake Island with same *Nypa* palms in 2018.

One logical explanation for this is that the population arose from a single introduction, which spread vegetatively, deceptively appearing as multiple individuals when in reality they were a single clone. Similarly, the genetic diversity of four *Nypa* populations from Southeast Asia was examined by microsatellite and ISSR markers (Jian et al. 2010), and researchers found no genetic variation within any of these populations from Hainan Island in China. Moreover, although 11 individuals from the Japanese Funaura population produced flowers in 1998, none of these individuals set fertile fruits (Setoguchi et al.

1999). This would lend credence to the supposition that *Nypa* individuals are self-incompatible, and that natural pollinators are absent from Japan.

Meanwhile, only 27 individuals were reported in 1978 (Nishihira 1980) from the Uchipanari *Nypa* population, which grows on a small neighboring island just west of Iriomote, but 65 individuals were counted in 1993 (Nakazato et al. 1996). Unlike the drastic decline of the Funaura population, the size of the Uchipanari population more than doubled in only 15 years, demonstrating *Nypa*'s propagation potential. Genetic testing of 135 adult *N. fruticans* ramets from Funaura and Uchipanari revealed only two multilocus genotypes (Sugai et al. 2016). The probability of a genotype re-occurring by sexual mating was extremely low in the Funaura population, although not as low in the Uchipanari population. Nonetheless, results indicated that all ramets sampled in both populations were most likely derived from vegetative propagation, since more than 100 of the Uchipanari ramets share the same multilocus genotype (Sugai et al. 2016). Geographic and genetic isolation are thought to minimize the advantages of sexual reproduction in marginal populations and to induce a shift toward asexual reproduction in clonal plants (Eckert 2002). This was not the case with the centrally located Philippine population of *N. fruticans*, where Sugai et al. (2016) found a much higher genetic diversity of 20 genets instead of two. The significantly reduced genetic diversity in marginal populations can be attributed to the consequence of founder effects, bottlenecks, a much smaller effective population size, genetic drift, inbreeding and/or high environmental stress at the distribution margins (Eckert et al. 2008). In spite of all of these barriers, *Nypa fruticans* continues moving into and establishing itself in new areas.

We can conclude from the studies in Japan and China that it only takes a single founding event, a single fruit, to start a new population of *Nypa* in marginal areas. This fact increases the probability of future *Nypa* recolonization elsewhere, especially during a period of overall global warming, as we are currently experiencing.

**Sex is best: *Nypa* pollen and the pollinators**

Biology books teach that sexual recombination via cross pollination is important for maintaining strong, healthy, viable plant populations (Campbell 1987, Raven et al. 2005). *Nypa* has been around for a long time as evidenced by its easily recognized pollen in the fossil record. *Nypa* pollen recorded in Cretaceous sediments (Muller 1981, Ellison et al. 1999, Gee 2001) is one of the oldest known identifiable angiosperm pollen grains that can be linked to a modern species. However, *Nypa* is currently restricted to Southeast Asia (Ellison et al. 1999), indicating that over time it succumbed to bottlenecks and lost a great amount of genetic diversity.

We presume that ocean currents dispersed floating *Nypa* fruits during or following the Ice Ages, which successfully germinated in new areas. These new populations could usually preserve only a few genotypes as we see in Japan (Sugai et al. 2016) and China and Vietnam (Jian et al. 2010). Bottlenecks caused by repeated Ice Ages and founder effects of new propagules settling in new areas during the interim warmer periods may explain the low genetic diversity of *N. fruticans* seen today, with the exception of places like Thailand and the Philippines (Jian et al. 2010, Sugai et al. 2016). The predominance of vegetative propagation (dichotomous branching) and limited gene flow between populations, likely also helps maintain the low genetic diversity of this species (Jian et al 2010). Jian et al. (2010) surmised that *Nypa* may be able to reproduce by selfing, which could also contribute to its high level of homozygosity, but evidence to prove this is unconvincing. While a brief overlap between female and male anthesis means that selfing is theoretically possible (Essig 1973), Mantequilla et al. (2016), working in the Philippines, argued that chances for self-pollination are slim. In their study, three of six bagged *Nypa* inflorescences produced no fruit, while three others did, but they attributed successful fruit set to loosening of the rope that was used to tie down the net bags with the inflorescences inside. The loosened ropes may have allowed the entry of creeping insects and arthropods that pollinated the inflorescences. This lack of development of viable fruits agrees with experiments conducted by Hoppe (2004), who also showed a complete lack of fruit set in three inflorescence heads that were bagged to exclude insects.

Several insect visitors to *N. fruticans* have been recorded including *Apis* bees, *Trigona* bees, staphylinid, curculionid and nitidulid beetles (Fong 1987, Duke 1991, Hoppe 2004, Mantequilla et al. 2016). Mantequilla et al. (2016) identified possible pollinators of *N.*

5. *Nypa* infructescence with at least two viable open-pollinated fruits in 2018.

*fruticans* to be beetles – two nitiluids (*Eupuraea* species), a staphylinid (Staphilinidae), fruit flies (two species of *Drosophila* [Drosophilidae] and a species of Agromyzidae), a stingless bee (*Tetragonula*) and a regular bee (*Apis cerana*). A more recent study (Straarup et al. 2018) focused on the role of beetles in the pollination of *N. fruticans* in Thailand and compared it with previous studies conducted at different localities in southern Thailand (Hoppe 2004) and the Philippines (Mantequilla et al. 2016). Interestingly and contrary to previous studies, Straarup et al. (2018) did not observe any *Drosophila* fly visitors on the inflorescences but explained their absence based on the site's garden location, edge effects and the use of pesticides. Straarup et al. (2018) provided a more comprehensive understanding of *Nypa* reproductive ecology and added insights into the alleged roles of incompatibility, wind pollination and thermogenesis for the interaction with potential beetle pollinators, especially nitidulid beetles. Another reason for low genetic diversity of *Nypa* populations located at its margins is the possible absence or scarcity of effective pollinators due to the change of weather conditions, such as temperature and seasonality that may differ substantially from the center of its distribution.

**South Florida**

In South Florida, we have also experienced aggressive expansion of *Nypa* similar to what was recorded in Uchipanari, Japan, where the population appeared to more than double in 15 years. At Montgomery Botanical Center (MBC), we witnessed a small *Nypa* planting, consisting of only four young *Nypa* plants, completely dominate an island and expand far into the shallow adjacent waters of the surrounding lake (Figs. 3 & 4), in fewer than 20 years. But, as observed in Funaura Bay, our inflorescences never produced any fruits without manual intervention (i.e., hand pollination).

In the Chinese and Japanese populations (Jian et al. 2010, Sugai et al. 2016), very little cross pollination occurred, as most of the ramets were genetically identical. The fact that 11 flowering individuals failed to produce fruit at Funaura Bay indicates self-incompatibility and/or lack of pollinators. In Florida, it is probably a lack of pollinators that prevented fruit set, since our plants are genetically diverse, collected from Malaysia in 1982 and Indonesia in 1998. MBC has a history of *Nypa* introductions and failures. Out of 47 Indonesian fruits collected by the first author, only eight survived as plants. No viable fruits were produced from our plants until 1996 when we attempted our first cross-pollination by hand between two different *Nypa* plantings from Malaysia.

Then in 2008, some of the first open-pollinated fruits began to mysteriously appear, but a major freeze in 2010 destroyed all of the young developing *Nypa* inflorescences, resulting in no flowers over the next several years. No hand pollinations have occurred since 2016; nevertheless, we continue to find viable, open-pollinated fruits (Fig. 5) in our lakes. An alleged mystery pollinator has taken up the task of cross pollinating the *Nypa* palms, since it is unlikely that they are now self-pollinating, having never done so in the past. Although some comments in the literature propose that *Nypa* can self-pollinate (Jiam et al. 2010), there is no irrefutable evidence for it. Even Mantequilla et al. (2016) failed to prove or

disprove it conclusively, although he settled on a "slim chance." Since *Nypa* pollen grains are sticky, an insect pollinator is the most likely candidate at MBC.

Does *Nypa fruticans* have the potential to recolonize the Western Atlantic? Our answer would be certainly. Evidence from China and Japan indicates that it takes only a single fruit to found a population with low genetic diversity in marginal populations. Viable fruits are currently being washed ashore in Trinidad (Bacon 2001) and St. Lucia (Noblick & Graveson 2014) and have been appearing there for a number of years. This trend will likely continue for many years to come based on prolific fruit production along the West African coastline. Evidence suggests that *Nypa* has the potential to invade and dominate degraded mangrove areas (Sunderland & Morakinyo 2002) or any brackish muddy flat, even in the absence of effective pollinators. This palm has the capacity to expand mainly because of its effective vegetative propagation. It can survive even in more northern latitudes (personal experience in Miami, Florida), and evidence exists that it has already gained a foothold in northwestern Guyana without any historical evidence of human intervention (Johnson 2001). As long as *Nypa* continues to find new pollinators (as in Miami) during its renewed circumnavigation of the globe, it has a shot at recolonizing and persisting in areas once occupied by its ancestors. It is no wonder that *Nypa* has persisted on the planet for millions of years.

At MBC, we are currently working to resolve unanswered questions regarding potential pollinators outside of the natural distribution of *Nypa* and to test for self-pollination.

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# Canary Island Date Palms (*Phoenix canariensis*) in Australia: Introduction and Early Dispersal

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**During the past 150 years, the Canary Island Date Palm (*Phoenix canariensis*) has found widespread use as an ornamental in public and private spaces across the globe. This paper traces the historic trajectory of the introduction and early dispersal of the palm into Australia, from its beginning as a prized ornamental plant in private and public greenhouses to the planting in botanic gardens and public parks. When the public embraced the plant as a highly decorative exotic ornamental, it found widespread use as a street tree, which after World War I became often associated with Australian War Memorials. The palm became well established in private gardens of the interwar period.**

During the second half of the nineteenth and the first half of the twentieth century, the Canary Date Palm (*Phoenix canariensis*) has seen widespread use in horticultural settings, first in Central and Mediterranean Europe and then in many parts of the USA, South America and Australia. The ease with which even established *P. canariensis* can be transplanted for immediate effect aided its acceptance as an ornamental plant.

*Phoenix canariensis* is a dioecious plant that is solely propagated by seed (Barrow 1998). The seed germinates after 85–100 days, and the plant has two pinnate leaves at about one year of age. It reaches reproductive maturity and first flowers after six or seven years. It seeds freely annually producing between 100 and 300 dates of limited flesh content. In its natural setting, the palm will grow to about 18–20 m in height, with a crown diameter of 10–12 m, made up of in excess of 200 arching, pinnate fronds. Unless affected by disease or pests, the plant can live for 200–300 years (Beech 2017). Fully mature palms weigh up to 10 tons in mass.

The plant is endemic to the Canary Islands, where it has been recorded on most islands (Lipnitz & Kretschmar 1994, Sosa et al. 2016). It was quickly and widely dispersed in the second half of the nineteenth century as a horticultural feature plant and street tree. Today it is distributed globally in warm temperate climates. Given its hardiness, *P. canariensis* can thrive on many soils and under many climatic conditions (as long as temperatures do not fall below -10°C). It is now considered naturalized in peninsular Spain, Portugal, Italy, Bermuda and parts of the United States, New Zealand (Beech 2017) and most of Australia (Spennemann & Pike in prep.). In Australia it is increasingly considered an invasive weed, as it is readily dispersed by a number of avian and other vertebrate vectors (Spennemann subm., Spennemann & Pike in prep.), as well as through water movement.

Compared with research into the dissemination of the true Mediterranean date palm (*Phoenix dactylifera*) (e.g. Johnson et al. 2013, Rivera et al. 2013), little work has been carried out on *P. canariensis*. The only surveys of historic sources are a paper by Zona (2008), which focused on Europe and the United States with a brief section on Australia, and Tournay's (2009) study of France. For the Australian setting, Zona's work was by necessity limited, as it was carried out from overseas and relied on secondary literature as well as personal communications. A systematic compilation of all plants listed in nursery catalogues in Victoria 1855–1889 includes only a single entry for *P. canariensis* (Brookes & Burley 2009, p. 133).

While these gaps in the history of palms in Australia are in part due to a lack of interest in the topic, they are primarily an artifact of the availability of data, as relevant primary sources were either absent or lost. Many local government/council files that may have addressed the rationale for planting such palms during the nineteenth century have long been destroyed or lost. Private archives of horticultural enthusiasts, if they ever existed, are virtually unknown. While there are small collections of nursery catalogues, they are incomplete, dispersed and often not readily accessible. Nineteenth and early twentieth century newspapers, the other primary source of information, were dispersed and, by and large, not indexed. The development of a digital archive of Australian newspapers (National Library of Australia 2018) has fundamentally changed this.

This paper originated from an exploration of the potential use of DNA to track some historic plantings of the 1920s and 1930s back to the original seed trees. It was surmised that the majority of seedlings used in public plantings in southeastern Australia would have been furnished by the botanic gardens of Melbourne and Sydney. To understand the patterns of dispersal and the usefulness of this hypothesis, background research into the history of *Phoenix canariensis* in Australia was required.

This paper will review the historic evidence for the introduction and dispersal of Canary Island Date Palms (*Phoenix canariensis*) on the Australian continent. It will draw, to the extent possible, on primary sources, in particular a systematic review of the reporting of *P. canariensis* in Australian newspapers during the colonial (1850–1900) and early Federation (1901–1915) and Inter-War period (1915–1939). The methodology is discussed elsewhere (Spennemann 2018a).

## Introduction of *Phoenix canariensis* to Australia

The first properly documented presence of *P. canariensis* in Australia dates to 1877 when the Royal Society of Tasmania acquired an unspecified number of *P. tenuis* for its gardens in Hobart (Abbott 1878, p. 30). Given the name, we can safely assume that the plant was supplied by Verschaffelt's successor company Jean Jules Linden (André 1873, Ducos 1875, Linden 1873). We can surmise that the plants in Hobart were grown in heated greenhouses. Nothing is known as to whether, or how long, these plants survived. Today the Royal Tasmanian Botanical Gardens possesses two *P. canariensis* which are deemed to date back to the late nineteenth century (Royal Tasmanian Botanical Gardens 2018).

1. *Phoenix canariensis* (center, back) in the greenhouse of the Adelaide Botanic Gardens in 1881.

We can infer an earlier introduction to Melbourne, possibly about 1872 or 1873. Sometime in the 1880s a Mr. W.R. Virgoe in Brighton (Victoria), described as an "ardent lover and indefatigable collector of plants" (Anon. 1874), had planted out two well-established, potted specimens of *P. canariensis* in his garden once they had become "too large to be accommodated in the glasshouses" (Anon. 1897c). Virgoe's garden formed the private extension of what was to become the Old Chatsworth Nursery. In 1897 the two plants were described as being "at least 25 years old," which suggests they were initially grown in the early 1870s.

Frederick Turner (1919) claimed in a piece contributed to the *Sydney Morning Herald* in September 1919, that Sir Joseph Dalton Hooker, then director of Kew Gardens, sent seeds of *P. canariensis* to Charles Moore, Director of the Botanic Gardens, Sydney. Turner asserted that "in due course they were sown, and seedlings raised from then. The most vigorous seedling was planted in the present group of palms in the Garden Palace Grounds at the time when I had charge of those gardens. That was the first specimen of *Phoenix canariensis* planted in Australia." Turner (1919) also asserted in the newspaper piece that he "recently published a very brief account of it in a scientific journal in London, and that information has since been verified by the authorities at Kew." At the time of writing this article has not been located.

Turner was recruited from Queensland and became foreman of the Garden Palace Grounds in 1880, a position that he held until 1881 when he became the superintendent of Hyde, Phillip and Cook Parks, Sydney (Anon. 1889). The first *P. canariensis* in the Garden Palace Grounds date to that period. This is broadly confirmed by a news item of 1916, that noted that "[i]n the Garden Palace grounds, Sydney, is a fine specimen of this palm. It is 36 ft high, has a trunk diameter of 3 ft at 3 ft from the ground, and the spread of the fronds is 30 ft. It is upwards of 30 years of age" (Anon. 1916).

Unlike the *Phoenix canariensis* which had arrived in Hobart in 1877 as potted specimens supplied by a nursery, the *P. canariensis* at Sydney were grown from seed supplied by another botanic garden.

2. *Phoenix canariensis* planted in ca. 1906 in the Botanic Gardens, Albury, NSW.

In addition to these two confirmed occurrences, there is anecdotal evidence for an early introduction to Queensland, now a 20 m tall *P. canariensis* in the gardens of the former Archerfield Homestead (Forest Lake near Brisbane). The palm, which is listed on the significant tree register of the National Trust of Australia, was reputedly planted ca. 1876 (National Trust 2014a). As this claim cannot be independently verified at the time of writing, this record needs to be taken *cum grano salis*.

In the mid-1880s, the Melbourne nursery Law, Somner and Co (1886) sold potted, one- or two-year old specimens which would have been grown from imported seed.

**The Pot and Greenhouse Period**

In Europe and the Americas, the primary use of *P. canariensis* was initially that of an indoor plant, as many nursery catalogue illustrations suggest (Spennemann 2018b). Not surprisingly, the early references to the Canary Island Date Palm in the Australian press highlight the use of the plant as an indoor ornamental. For example, in June 1891 the Melbourne-based weekly, *The Australasian*, reported on a survey originally carried out by the *Revue d'Horticulture Belge* and extracted from a report in the *Gardener's Chronicle*, that *P. canariensis* was the tenth most popular indoor plant in Europe (Anon. 1891c). The item was reprinted in the *Sydney Mail* (Anon. 1891a). By that time the palm had long been established as a feature plant in fashionable Victorian house interiors and in greenhouses, both private and public as in the case of the Geelong Botanic Gardens (Viator 1891).

The Australian press continually advocated *P. canariensis* as suitable as a pot plant for windows and verandahs (Anon. 1901, 1902, 1913c, 1913e), to be used "for the decoration of halls, balconies, &c." (Anon. 1909c) and for ferneries, including those with southern aspects (Anon. 1910d).

We know from ancillary evidence, that in Australia *P. canariensis* were widely grown as pot plants in the mid-1880s. For example, in 1899 a then approximately 14-year old *P. canariensis* was planted out in the Williamstown (Victoria) gardens (Anon. 1910e), which suggests that the plant was grown since ca. 1886.

**Production in Nurseries**

As noted earlier, during the mid-1880s, the Law, Somner and Co (1886) nursery, based in Richmond, Victoria, sold potted specimens of *P. canariensis* that by necessity would have been grown from imported seed. It can be surmised that the plants would have been at least one to two years old at the time of offering. We can further assume that the initial production would have been in greenhouses. By the mid-1890s, however, the palm had proved sufficiently hardy to thrive in the Melbourne climate. Consequently, Melbourne nurseries grew *P. canariensis* in the open, both for direct sale and as future seed sources, such as a large specimen in the Richmond nursery in 1894 (Anon. 1894). The Balaclava Nursery, for example, had large numbers of *P. canariensis* growing in open ground near their residence in 1895 (as *Phoenix tenuis*, Anon. 1895).

3. A mature *Phoenix canariensis* being transported on the outskirts of Adelaide, SA, ca. 1914. (Image courtesy State Library of South Australia PRG-280-1-12-251).


4. *Phoenix canariensis* in the Botanic Gardens, Melbourne, Victoria, ca. 1905.

As noted above, sometime in the 1880s W.R. Virgoe of Brighton had planted out two well-established, potted specimens of *P. canariensis* in his garden. By 1897 the two plants, a male and a female, had grown to 12 ft. high with a crown exceeding 20 ft. in diameter. The plants were manually pollinated by cutting off "the flower of the male plant and shake the pollen over the flower of the female" (Anon. 1897c). By 1897 the nursery "had thousands of the young palms in various stages of growth" (Anon. 1897c). These two mature specimens where transplanted in 1903 to the Melbourne Botanic Gardens (see below). At the time, they weighed eight tons each and were claimed to be about 30 years old (Anon. 1903b).

The demand for palms as an easy-to-maintain yet exotic decoration for living rooms and verandahs was quite substantial. Regular reports on the Melbourne nurseries during the closing years of the nineteenth century indicate that the Union Nursery in Brighton annually sold 10,000–12,000 palms of various varieties (Anon. 1896), while in 1898 the total Melbourne demand was estimated at about 30,000 palms annually, primarily *Howea belmoreana* and *H. forsteriana, Trachycarpus fortunei, Chamaerops humilis, Ptychosperma elegans, Latania loddigesii, Rhopalostylis baueri* and *Phoenix canariensis* (Anon. 1898). Ten years later the boom still showed no signs of abating: "[w]ith the exception perhaps of ferns there are more palms sold in Melbourne than any other class of pot plants" (Anon. 1908a).

The nurseries accommodated this. In 1903 the Cremorne Nursery Company, Richmond, had "a large stock, plants of all sizes, of this very hardy and valuable palm" (Anon. 1903c). At Richard Cheeseman's nursery on Hawthorn Road, Brighton,

> *"Phoenix canariensis* are raised in the open, as it is found by experience that hardier and better specimens can be produced in this way. No better example of the hardy character of the latter palms can be shown than the results attained at the Brighton Nurseries, where practical evidence is to be seen of their usefulness as garden ornaments." (Anon. 1904a).

The production of *P. canariensis* and other palms occurred on a large scale. In 1907, for example, the Union Nursery in Brighton operated a palm shed with 100,000 plants (Anon. 1907). Three years later, at Richard Cheeseman's nursery in Brighton "[t]here [was] one large shed full of palms of various sizes, and when we are told there are quite a quarter of a million of plants in it, the statement cannot be contradicted… only popular and serviceable kinds are propagated…." (Anon. 1910g).

By 1910, however, some nurseries seem to have had an oversupply of large palms and were


5. *Phoenix canariensis* at the lake in the Botanic Gardens, Melbourne, Victoria, ca. 1909.

forced to destroy the excess. It seems the foliage of "a batch of large plants, too big for transplanting, was being fed to the home cow, and the animal seemed to relish the dainty and uncommon diet" (Anon. 1910g).

While Melbourne's nurseries seemed to have been able to rely solely on word of mouth and the annual accounts in the newspapers, a Sydney nursery advertised the sale of *Phoenix canariensis* as "palms for lawns" in 1905 both in Sydney (Searl's 1905a) and Brisbane (Searl's 1905b), asking prospective buyers to request a catalogue.

Horticultural production from locally produced seed, however, remained relatively small, despite *P. canariensis* being on record in Victoria from at least 1897 for having produced ripe and viable fruit (Anon.1897c, 1900a), and even though palm fronds of *P. canariensis* with fruit were shown at the Mentone Flower Show of 1905 (Anon. 1905b). It appears that the only local commercial seed production had been at Virgoe's Chartsworth nursery, which ceased once the plants were transferred to Melbourne's Botanic Gardens – where Guilfoyle continued to harvest and propagate.

By 1908, the majority of Melbourne nursery specimens were apparently still grown from seed imported from the Canary Islands, with "only a small proportion from locally grown specimens" (Anon. 1908a).

This situation eventually changed as more and more mature *P. canariensis* came into production. Thus by 1911, Richard Cheeseman's Brighton Nursery had "a pair of fine specimens of this species growing alongside each other and fortunately they are of both sexes, so that the female plant is producing an abundance of fruit from which thousands of seedlings are raised" (Anon. 1911b). Formal horticultural processes were followed at Cheeseman's nursery in Brighton to ensure success: "A fine specimen of the female plant of *Phoenix canariensis* is in flower, and the pollen from a male plant has been scattered over the female blossoms, so that fertile fruits are assured" (Anon. 1913b).

Local seed production meant that the prices for *P. canariensis* could drop and the market could expand as Australian nurseries could now readily service any growth in demand. Thus *P. canariensis* moved from a special to a mainstream exotic also servicing the demands of the lower economic segment of society. And demand was to rise, not just as an indoor plant, but as a hardy feature plant in public and private gardens.

**Feature Trees in Botanical and Public Gardens**

While Australian nurseries and enthusiastic amateurs may have acquired *P. canariensis* directly from Belgian suppliers almost as soon

as they became available, it fell to the botanical gardens in the metropolitan and regional cities, as well as the public gardens of smaller towns, to familiarize the public with its characteristics and appearance. The role of botanic gardens as trend setters for urban gardens and public plantings must not be underestimated as they provided the public with a first-hand experience of the habit of plants they had read about in horticultural magazines and in the horticultural sections of weekly newspapers such as the *Australasian* (Melbourne, Vic) the *Australian Town and Country Journal* (Sydney, NSW), the *Queenslander* (Brisbane, Qld) or the *South Australian Chronicle* (Adelaide, SA).

*Phoenix canariensis* was grown both in the greenhouses and conservatories (Fig. 1) of botanic gardens and, where the climate allowed, also in the open (Figs. 2, 4–6). Extensive experiences with outdoor growing had been made, of course, in the Mediterranean with plantings in Vicomte Vigier's garden in Nice (André 1888), which suggested that Sydney and Brisbane should be two of the prime locations in Australia. Indeed, a *P. canariensis* was planted in Sydney's Domain as early as 1880, but it does not seem to have captured the public's imagination. One wonders to what extent the destruction of the Garden Palace in September 1882 and the subsequent temporary abandonment of the place played a role (Fitzgerald 1989). The palm would have been out of sight and mind for a period, and only re-entered public consciousness once the area had been redeveloped as Sydney's Botanic Gardens. In November 1903 J.H. Maiden noted that the Sydney Botanic Gardens sported a 'magnificent *Phoenix canariensis* [with] a circumference of foliage of about 90ft' (Anon. 1903f). This seems to refer to the palm that had been planted by Turner in 1880.

6. *Phoenix canariensis* in the Botanic Gardens, Melbourne, Victoria, July 1911.

As experiences with outdoor growing in Australian settings increased, the geographic range of out-door planted specimens expanded. One of the earliest documented plantings of a *P. canariensis* in Victoria occurred in 1890 in Malvern when a specimen of *P. canariensis* "was knocked out of a 4 inch pot" by William Pockett (Anon. 1897b), the then curator of the Malvern Shire Gardens. The performance of that plant was watched with interest, and it was reported that by 1897 the palm had attained a height of 14 feet (Anon. 1897b), while by 1909 it had reached 20 feet (Anon. 1909f). That fact that it could withstand low level frost in 1900 (Anon. 1900b) was of great interest as it proved that *P. canariensis* could be planted successfully in moderate Australian climates (see also Anon. 1897a, Neete 1906).

By early 1891 several specimens (labelled *Phoenix tenuis*) were growing in the Parliament House Gardens in Melbourne (Anon. 1891b, 1892). Other public gardens soon followed. As noted earlier, in 1899 the curator of the Williamstown (Victoria) gardens, Samuel Thake, planted out a then approximately 14-year old *P. canariensis* (Anon. 1910e).

In the Melbourne setting, *P. canariensis* were absent from the Botanic Gardens in 1883 (Guilfoyle 1883, p. 120). When Guilfoyle remodelled the gardens, he embraced the palms. As one writer put it in 1903,

> "The great success achieved with palms is one of the features of the garden. They grow so slowly that a long lime must pass before any effect could have been secured but Mr. Guilfoyle's plan was to obtain by gift, exchange, or purchase well-grown palms and transplant them." (Anon. 1903b).

Guilfoyle put this into effect in late 1899 or early 1900 when he acquired two mature trees:

> "Amongst the many improvements recently made in these gardens by Mr. Guilfoyle…are a pair of magnificent Canary Islands palms, which were obtained from the Old Chatsworth Nursery, at Brighton; these specimens weighed 7 and 8 tons each respectively, and are probably upwards of 30 years old…There are several fine specimens of this noble palm in the vicinity of the

7. *Phoenix canariensis* as a feature street planting in the 1930s. Western end of Dean Street, Albury, NSW.

> metropolis, the finest being in Mr. John Grice's garden at Toorak, but splendid plants are in the University gardens and elsewhere. Ere long this palm should be quite common, as it is seeding freely, and many thousands of young plants may be found in some of the nurseries" (Anon. 1900a).

The two palms, nicknamed "Adam and Eve" once they had been transplanted from Mr. Virgoe's garden at Brighton (Anon. 1903b), produced viable seed for propagation in and distribution by the Royal Botanic Garden in Melbourne.

At the turn of the twentieth century, palm seeds and palm seedlings were still gifts of value. For example, before the Australian opera star Nellie Melba returned to England from her Australian and New Zealand tour, she planted on 13 April 1903 a golden poplar on the central lawn of the Melbourne Botanic Gardens (Anon. 1903e). The following day, Guilfoyle sent her two packets of Australian and New Zealand seeds, as well as "two Canary Island date palms (one for you, the other for Miss Clarke) and I feel sure they will thrive splendidly on your cabins during the voyage home if you will give them light and moisture. As for the salt air, my experience has been, this palm does not mind it a bit, in fact likes it" (Guilfoyle 1903). While Guilfoyle may have procured the specimens from commercial suppliers, it is more probable that they came from the Melbourne Botanic Garden's own nursery at that time. *Phoenix canariensis* palms were then also used as memorial trees in the Melbourne gardens (see below).

The transplanting of *P. canariensis* is a comparatively easy affair as the palms tend to withstand a change of conditions fairly well (Fig. 3). As a reporter noted in 1900, when discussing the newly planted palms in the Melbourne Botanic Gardens,

> "These giants were moved with the greatest safety, and are an illustration of what can be accomplished in the removal of big specimens when undertaken by experienced men." (Anon. 1900a).

*Phoenix canariensis* were planted in the Fitzroy Gardens (Melbourne) on 10 July 1906 (Anon. 1906a). Intriguingly, they were found vandalized in mid-September 1910 (Anon. 1910f), after someone had snapped the leaves in half. By and large, however, the public certainly "took to" the exotic trees. Thus, when two palms had to be removed from the domain in Sydney in March 1911, members of


8. A row of *Washingtonia robusta* as street trees and a single *Phoenix canariensis* in the grounds of Rio Vista, Mildura in ca. 1909.

the public objected, forcing the Domain Overseer (1911) to respond publicly, asserting that not only had twelve new palms been planted that month, but that between 1908 and 1911 a total of 35 *P. canariensis* had been planted in the Domain.

Why did the palms become so popular? Clearly their hardiness was one reason, and their exotic nature another. However, that does not fully explain the palm craze that swept Australian towns at the end of the nineteenth century and the subsequent period before World War I. Lilleyman (2007) posited that it was influenced by the travelers who had come through the Suez Canal with a subsequent stopover in Colombo (Sri Lanka) who could not help but being exposed the picturesque nature of palms planted in the open, whereas previously the palms had been confined to Victorian greenhouses.

**Taking to the Streets**

Given the public interest in exotic trees, it is not surprising that *P. canariensis* soon made an appearance as street trees. The ornate nature of the tree, combined with the dense and (eventually) lofty canopy made the "graceful palm" eminently suited as a tree that would give a street or avenue a tropic flair, creating "picturesque and efficiently shaded boulevards" (Anon. 1917b). The reports on street tree plantings at the French Riviera had extolled that "*Phoenix canariensis* is one of the most commonly planted, and succeeds well. This and *Washingtonia filifera* are frequently planted in avenues, and then have a fine bold appearance" (Anon. 1904b). Underlined by reports from the USA which claimed that the Canary Island palm was "much esteemed for street planting" (Anon. 1905a), such sentiment influenced Australian urban planners. The directors of the various metropolitan botanic gardens, Guilfoyle (Melbourne), Schomburgh (Adelaide), as well as the government botanists such as Joseph H. Maiden (New South Wales), shaped much of the debate as they provided "expert" advice.

Plantings commenced in Sydney's Centennial Park in 1906, and dramatically expanded in 1909 when a total of 308 palms had been "planted on either side of one of the principal drives" (Anon. 1909d) of Gregory, Driver, and Macarthur Avenues, which form the approaches to the Sydney Cricket and Show Grounds, (Anon. 1910c). By 1918 there were "three miles of palms already planted…mostly the Canary Islands palm" (Anon. 1918b). In 1910 Maiden planted a row of *P. canariensis* along Macquarie Street, on the western boundary of the old Palace Garden Grounds and future Botanic Gardens (Anon. 1910b), adding to a number of single trees and smaller

9. The avenue at Yanco, NSW, ca 1914. (Image courtesy State Library of South Australia, PRG-280-1-14-317).

palm groups that had already been planted in 1909 (Morris 2002, Ruting 2015).

It was Maiden's stated aim for "Sydney to present a more semi-tropical aspect" and "the planting of palms will help this" (Maiden 1910).

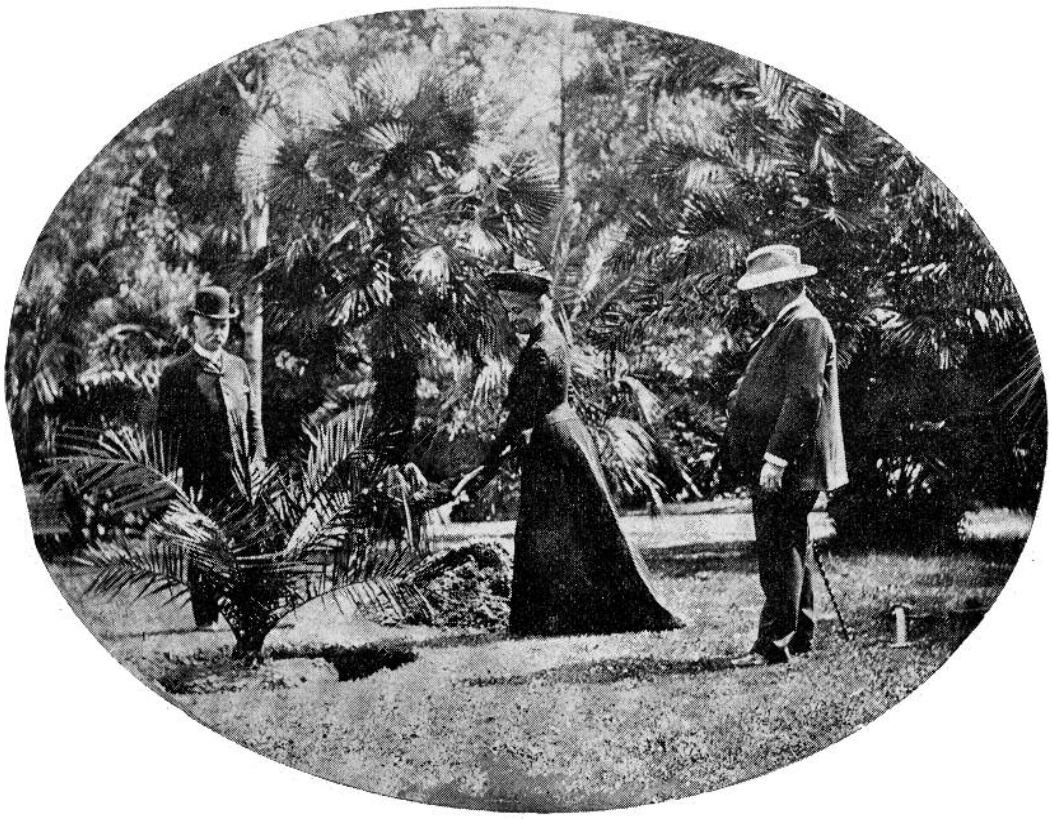
The various municipalities making up Sydney embraced *P. canariensis* to such a degree as a street tree and park tree (such as Daceyville, Anon. 1917b), that Melbourne's *Australasian* noted with some envy that "the city of Sydney will deserve the fancy name already given it, viz., the city of palms" (Anon. 1918b). *Phoenix canariensis* was also embraced by regional and rural communities in NSW and Victoria (Fig. 7).

In Mildura, a regional town in northern Victoria (Fig. 8), the decision was made to plant *P. canariensis* as street trees in 1906 (Anon. 1906b) and again in 1912 (Anon. 1913d, Heritage Council Victoria 1999b). The Canary Island date palm was widely recommended as ornamental street trees in drier areas, such as the goldfields and other towns of Western Australia (Chapman 1906 Anon. 1909b). Often specimens were supplied by the botanic gardens, such as in 1922 when Maiden recommended *P. canariensis* for planting in Parkes (New South Wales) (Anon. 1922a) and the Sydney Botanic Garden supplied the plants (Anon. 1922b).

Palms were also trialed on a larger scale in the newly developed irrigation areas (Anon. 1908b) and soon became integral to urban planning in the new towns (Fig. 9):

> "The main avenue from Yanco station to the new township, a distance of between three and four miles, will consist of two roadways, with a row of palms in the centre and sugar-gums on each of the outer sides…the palms, consisting of *Washingtonia*, *Phoenix canariensis*, and *Cocos plumosa* (*Syagrus romanzoffiana*), … are being raised from seed in the nursery established by the Government at Yanco" (Anon. 1912b).

The preference of many councils to plant exotics and in particular *P. canariensis* was driven by the hardiness of the plants once established, but it was not without its critics. Some argued that Australian towns should eschew the use of exotics and ought to plant natives (Anon. 1926), while others brought up more practical concerns about the use of *P. canariensis*, such as monotony and dense interlocking canopies blocking future views and vistas (Turner 1919). Such voices, however, were few and far between. Some councils engaged in large-scale planting of avenues. In 1928, for example, almost 70 trees were planted along Robe Terrace at Walkerville, South Australia (National Trust,2014c). In 1929



10. Lady Clarke planting a Canary Island Date Palm on 28 September 1903 (Anonymous 1903a).

an even more grandiose avenue of 143 *P. canariensis* was planted along the median strip of Mt Alexander Road, Essendon (Victoria) (Heritage Council Victoria 1999a). The appeal of palm-lined streets endured. In 1936, for example, the City of Port Adelaide planted 66 palms as part of a depression-era work scheme (McDougall & Vines 2014, p. 19, National Trust 2014b).

**Memorial Trees**

Since palms could be readily (trans-)planted as feature trees in lawns, they were well suited as trees to be planted to mark specific occasions. The first such event occurred in September 1903 when Lady Clarke, the wife of the Governor of Victoria, planted a *P. canariensis* in the Melbourne Botanic Gardens (Fig. 10) (Anon. 1903a, 1903d). Further specimens soon followed. In November 1909 the Victoria League Memorial Tree planted in the Melbourne Botanic Gardens (Anon. 1909a, 1909e). Lord Kitchener, "hero of the Boer War," likewise planted a Canary Island Date Palm on 12 February 1910 (Anon. 1910a, 1910h), adding to the memorial palm collection.

**Memorial Trees to WWI**

The Australian military campaigns during World War I in the Near East, from the troops preparing in Egypt to the landings at Gallipoli and the operations in the Palestine (Beersheba), exposed a broad range of citizens directly and indirectly (via newspaper reporting) to the nature of palms in the open. In particular, they created an emotional connection to a plant associated with the battle against the Turks. Just as the seeds of the Lone Pine at Gallipoli (a specimen of *Pinus brutia*) became known to signify that campaign, *P. canariensis* became the symbols of the Palestinian operations (ignoring the fact that the palms in the Palestine were of course the "real" date palms, *P. dactylifera*). Because of its ease of propagation, as well as its hardiness as a plant in diverse environments, *P. canariensis* was far more commonly planted as a commemorative tree than *Pinus brutia* (ALA, 2017).

As early as October 1917, even before the Battle of Beersheba, the City of Melbourne decided to plant a *P. canariensis* to line the projected ANZAC Parade. It noted that,

> "[s]urmounting the raised centre way will be rows of Canary Islands date palms. Lest it be thought that in the continuation of palms— reminders of the deserts of the Orient, where Australia's troops clashed with the Sultan's— there should be monotony. It is pointed out by the director that no two of these trees, produced from seed, are exactly alike." (Anon. 1917a).

Similar memorial avenues were planned for (but not implemented) in May 1918 for Perth (Western Australia) (Lilleyman 2007). They were established, however, *inter alia* in Williamstown (Victoria) (Birdwood Avenue, Anon. 1918a) and West Merbein (Anon. 1919). At the latter location 240 palms were to be planted, each with plaques bearing the names of fallen soldiers of the area (Anon. 1919). *P. canariensis*, planted singly or in pairs, decorate War Memorials in a number of places.

**Feature Trees in early Private Gardens**

Almost simultaneously with the planting of *P. canariensis* in the botanic gardens, we find references to planting in private outdoor spaces. The palm was lauded as an exotic and highly ornamental plant that could readily be raised from seed and as the Australian press noted, once planted out proved a fast grower (Anon. 1899) that had shown itself to be quite hardy (Anon. 1897b, 1909d) and could even resist light frosts (Anon. 1900b). Yet the palm did not thrive in areas with too much frost, as "even in the sheltered Botanic Gardens of Hobart such a beautiful palm as the *Phoenix canariensis* had severely suffered from frost" (Anon. 1913a). *Phoenix canariensis* was advocated as a feature tree in the center of a lawn (Allaway 1914, Caldwell 1895), as it gave the garden a tropical flair (Viburnum 1915).

**Feature Trees in Private Gardens of the Interwar Period**

The architecture of the inter-war period in Australia shifted away from Victorian British architecture and became heavily influenced by Californian designs, such as Californian Bungalows or Spanish Mission-style houses. Not only the architectural designs were imported, but also ideas of landscaping, of which palms formed an integral part (Fig.11).

Consequently, *P. canariensis* was advertised by a range of nurseries for example in Sydney (Symonds 1928, p. 76), throughout Queensland (Langbecker 1928, 1929, 1930, 1931a, 1931b, 1932, 1938a, 1938b) as well as Hobart (Davis 1938) and Launceston (Walker & Sons 1938).

**Conclusions**

Publicly planted palm trees were visual manifestations of exotic, and often romanticized, environments. The second half of the nineteenth century saw the final expansion of colonial empires. In Australian context, the South Pacific with its palm-fringed exotic islands created a public allure. Accounts of South Seas island trade, as well as Australia's own colonial aspirations in New Guinea, were prominent in the Australian press. While coconut palms (*Cocos nucifera*), the icon of the tropical Pacific did not thrive in temperate Australia, another pinnate-fronded palm did – *Phoenix canariensis*.

Initially confined to greenhouses as a tangible connection of the reach of governments (and powerful merchants) to their overseas possession and trading contacts, palms later became more commonplace, allowing the general public to partake in that dream (Manthorne 1984, Rodrigues 2017).

The lushness of its ample pinnate fronds and the decorative, evenly patterned trunk made *P. canariensis* the quintessential visual manifestation of an exotic palm. The species was eminently suited for public display, as its general hardiness, once the plant was established, allowed it to persist even in areas beyond its potential natural spread.

The early introduction of *P. canariensis* to Australia was a mixture of organized acquisitions by botanical gardens and acclimatization societies as well as an uncontrolled import by enthusiasts. The difficulties with the importation of live plants must not be underestimated, as during the 1870s a ship's voyage from Europe to the major ports of Melbourne and Sydney took three months. While plant importers had gained much experience by the 1870s, and mortalities were low, the system was far from perfect. It was much easier to ship seeds, but for the Belgian and German horticultural firms that meant forgoing a sizeable profit. Thus is not surprising that the early introductions were potted plants. Concomitantly, the significance of the supply of *P. canariensis* by Hooker to Moore must not be underestimated.

Once local seed production had commenced, both at Melbourne's and Sydney's nurseries as well as the respective botanic gardens, the propagation and planting of palms accelerated.

Eventually, *P. canariensis* became a prominent street tree.

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# Message from the President

Dear IPS member,

I want to thank you for supporting the International Palm Society and renewing your membership. With 2019 fast approaching and holiday activities getting started, simple things like renewing your membership can easily slip through the cracks and be forgotten. Please renew promptly so that your membership benefits will be uninterrupted. Members like you make the IPS and its mission of conservation, education and horti-culture a success.

In 2019, the IPS is making a concerted effort to grow our membership. We cannot achieve this goal without the efforts of faithful and valued members like you. Please reach out to other like-minded people in your network about joining the IPS. These individuals can range from good friends who enjoy palms as much as you do to the neighbor who is consumed by growing orchids. The love of plants is infectious, and it usually takes very little convincing to get someone to join. With the holiday season nearly upon us, what better gift than an IPS membership? Won't you please help us grow the IPS family in 2019?

Ray Hernandez,
*IPS President*
*Tampa, Florida, USA*

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