Palms of the San Francisco Botanical Garden

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Palms have achieved new significance at the San Francisco Botanical Garden (SFBG) since the 2015 registration of its high-elevation palm collection with the Plant Collections Network of the American Public Gardens Association. The developing collection represents species from cloud forest and other high-altitude areas of the tropics, as well as subtropical, mild-temperate, and Mediterranean-climate regions of the world.

First developed under former associate curator David Kruse-Pickler and curator emeritus Don Mahoney, the collection surprises and delights visitors. Ryan Guillou, the current curator, says, "Everyone thinks of palms as being from hot, steamy, tropical places. We are displaying groups of palms from a unique climatic niche that few other botanical gardens can grow well. We can be a refuge for them – it's important for conservation. And they are pretty plants."

Two Colombian wax palms (*Ceroxylon quindiuense*) (Fig. 1) planted in 1983 are exemplars of the SFBG's exceptional collection. They have thrived in the Garden's cool climate, their crowns 20 m (66 ft) high on white, wax-coated trunks, luminous in the Garden's swirling fogs. The enormous pinnate leaves of these still-immature palms stand in a shuttlecock form, showing off the satin texture of their abaxial surfaces. In the breeze, their silvery undersides alternate with glossy green adaxial surfaces. Behind the monumental pair grows a smaller, solitary *Ceroxylon vogelianum*, planted in the same year, its leaf scars canted at an eye-catching diagonal to the trunk axis. This planting is one of the very few displays of trunking wax palms in North America accessible to the public. It offers a rare glimpse of the glory of Colombia's national tree outside its habitat (a chief attraction on the 2018 International Palm Society Biennial tour to Colombia).

A new generation of two dozen young ceroxylons grows in the shade of the botanical garden's craggy Monterey cypress (*Cupressus macrocarpa*) and pine (*Pinus radiata*) trees and rustling blue gum eucalyptus (*Eucalyptus globulus*). In two or three decades these wax palms will turn their saxophone stems upward and rise as a gleaming grove of nine species – *Ceroxylon alpinum*, *C. amazonicum*, *C. ceriferum*, *C. echinulatum*, *C. parvifrons*, *C. parvum*, *C. quindiuense*, *C. ventricosum* and *C. vogelianum* – a sight easy to envision with the example of the three trunking ceroxylons already at hand.

The *Ceroxylon vogelianum* is now producing its fourth year of inflorescences amid its crown of plumose leaves, and is one of three specimens of this species to reach sexual maturity in the San Francisco Bay Area. The other two grow 24 km (15 mi) away in Oakland, at the Gardens at Lake Merritt's Lakeside Palmetum, established in 1982 by the Northern California Chapter of the International Palm Society and

open to the public; the Palmetum contains the Bay Area's other significant collection of trunking *Ceroxylon* species. These increasingly prominent trees at SFBG, like their contemporaries at the Palmetum, grew from seeds collected in Colombia and Ecuador in the 1970s and 1980s by the late Garrin Fullington, a key member of the Northern California Chapter of the International Palm Society and later the Hawai'i Island Chapter. Perhaps because of cooler temperatures, less competition, greater humidity or more irrigation, the SFBG plants of *Ceroxylon quindiuense* have grown taller than those planted at roughly the same time at the Palmetum.

Founded in 1937 and opened to the public in 1940, the San Francisco Botanical Garden at Strybing Arboretum occupies 22.3 ha (55 acres) in San Francisco's Golden Gate Park, 3.6 km (2 mi) from the Pacific Ocean. It is a city institution in partnership with the non-profit San Francisco Botanical Garden Society. It is known by botanists particularly for its *Magnolia* collection, ranked fourth in the world for conservation value, and is cherished by local residents for its beautiful gardens and extraordinary plants.

I have been a volunteer there since 1994, with much of my first two decades of work focused on propagating trees and palms and selling them to benefit the Garden. Many of the palms planted during the past two decades came from my propagation (and lobbying) efforts from seeds acquired from the International Palm Society Seed Bank, the late Inge Hoffmann (The Seed Lady), and Rare Palm Seeds. Volunteering at the Garden has significantly informed my new book from Timber Press, *Designing with Palms*, as well as my current work in horticulture at Flora Grubb Gardens and East West Trees.

The garden has a complete collection of *Parajubaea* and *Rhopalostylis* taxa, and aims for comprehensive collections of *Trachycarpus* and *Ceroxylon*. Collections in other genera focus on cool-growing species, often from mid- and high-altitude habitats, such as *Plectocomia himalayana* (Fig. 2), *Chamaedorea costaricana* (Fig. 3), *Caryota maxima* (the Himalayan strain) (Fig. 4) and *Arenga micrantha*. Genera with cool-growing species that the Garden has not yet collected include *Geonoma* and *Aiphanes*.

The site would not have appeared a likely home for a botanical garden at the time of the city's founding. The peninsula where the city of San Francisco exploded into being in the 1850s Gold Rush was once home to one of the largest coastal dune systems in California. Strewn on the Pacific Ocean side of the city and blown by prevailing winds 11 kilometers across the peninsula to San Francisco Bay, these sands were home to a dynamic dune scrub community, including well-known species first described from material collected here, like the California poppy (*Eschscholzia californica*). Groves of coast live oak (*Quercus agrifolia*), one of the city's handful of native tree species, dotted hills and stabilized-dune hollows, and willow thickets followed watercourses. Now these sands underlie much of the second-most densely populated large city in the United States, including its largest municipal park, Golden Gate Park, a sylvan 412 ha (1018 acres) of exotic trees and plants (with remnant native oak woodland).

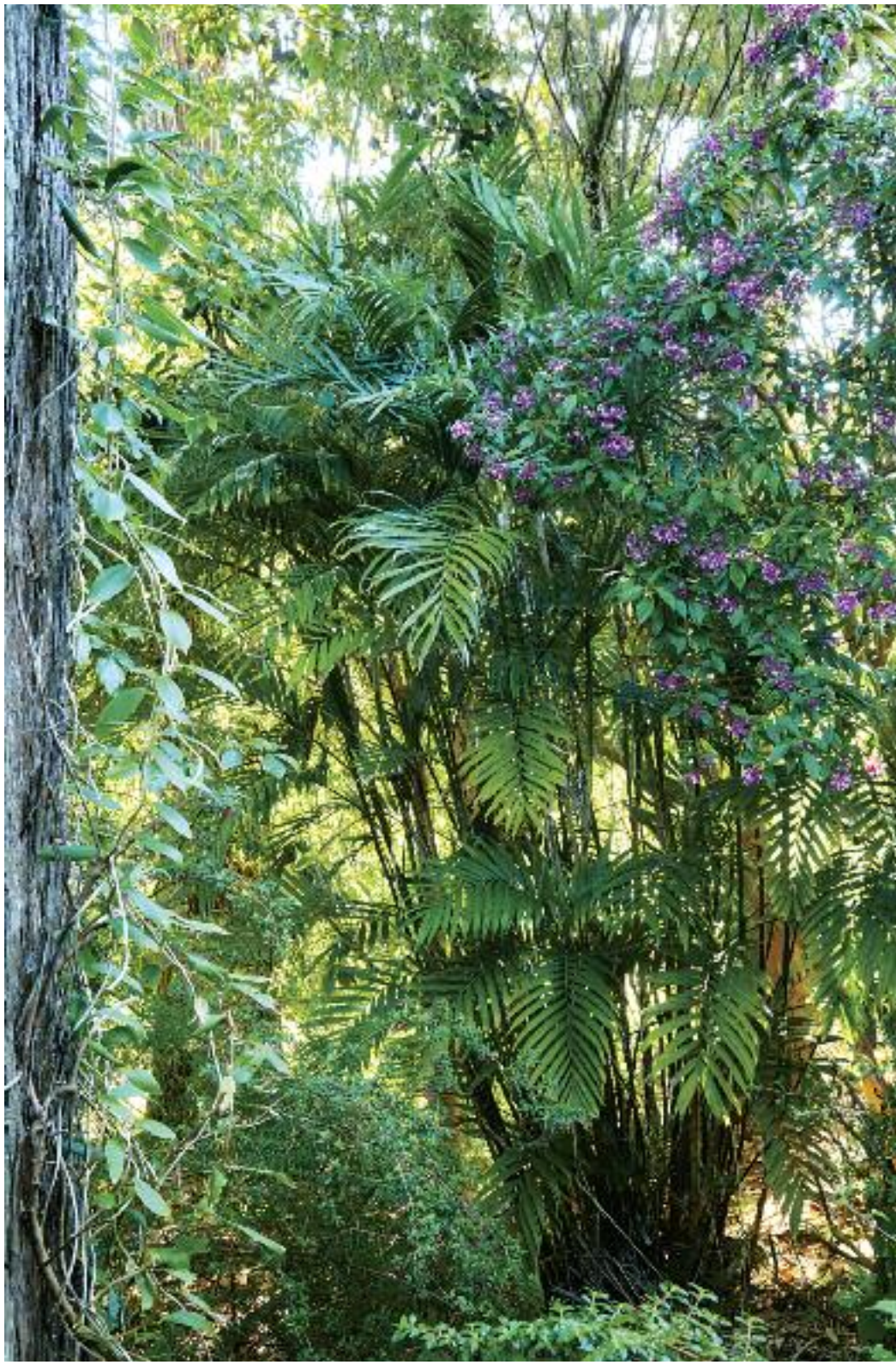
Bathed almost nightly in maritime low clouds and fog from May to September, the Botanical Garden – formerly known as Strybing Arboretum – sees average annual rainfall of around 635 mm (25 in), 80% of which falls between November and March. Average temperatures in July range from a high around 18ºC (64ºF) to a low around 12ºC (54ºF); in January daily highs average around 13ºC (55ºF) and lows around 7ºC (45ºF). Mostly, the weather is cool, humid, rainless and blustery (summer) or chilly, rainy, but mild (winter). The warmest months are September and October, when daily highs reach 20ºC (68ºF). Lows dipped below -7ºC (19ºF) in December, 1990, the extreme cold record for the Garden, itself the coldest place in San Francisco by far. Record high temperatures – fostered by brief outflows of dry, continental air – approach 38ºC (100ºF).

Hardly any other sizable cities share such climate conditions – perhaps Hobart, Australia, or Valparaiso, Chile, come close. Given the aquifer beneath the park tapped for irrigation, the mild climate, and neutral-pH, well-drained substrates, it is possible to cultivate an enormous range of plants here.

For such a young palm collection, a number of notable plants besides the older ceroxylons can be found in the Garden. Two immature, suckering specimens of *Plectocomia himalayana* (Fig. 2), the rattan occupying forests at 1500–2500 m (4921–8202 ft) above sea level scattered from Nepal and Bhutan to Thailand and Laos, clamber vigorously, even menacingly – thanks to their armature – high into large

1. Two immature *Ceroxylon quindiuense* planted ca. 1983 in the San Francisco Botanical Garden (SFBG) have developed spectacular white, wax-coated trunks now tall enough to be seen from outside the garden boundaries. In the background between them grows a flowering staminate specimen of *Ceroxylon vogelianum*. Immediately in front of them is a *Juania australis*, while in the foreground are several *Jubaea chilensis* in their rosette phase.

2. The Himalayan rattan palm *Plectocomia himalayana* grows next to and climbs on nearby *Photinia bodinieri* (trunk at left) and *Magnolia doltsopa* (foliage across the top). Inset: *Plectocomia himalayana* sheath detail.



3. *Chamaedorea costaricana* grows in the Mesoamerican Cloud Forest section of SFBG surrounded by other plants from Central America and Mexico like *Bomarea* sp. (left, on trunk), *Fuchsia paniculata* (upper right, lavender flowers), *Fuchsia thymifolia* (lower left, pink flowers), and *Begonia fuchsioides*.

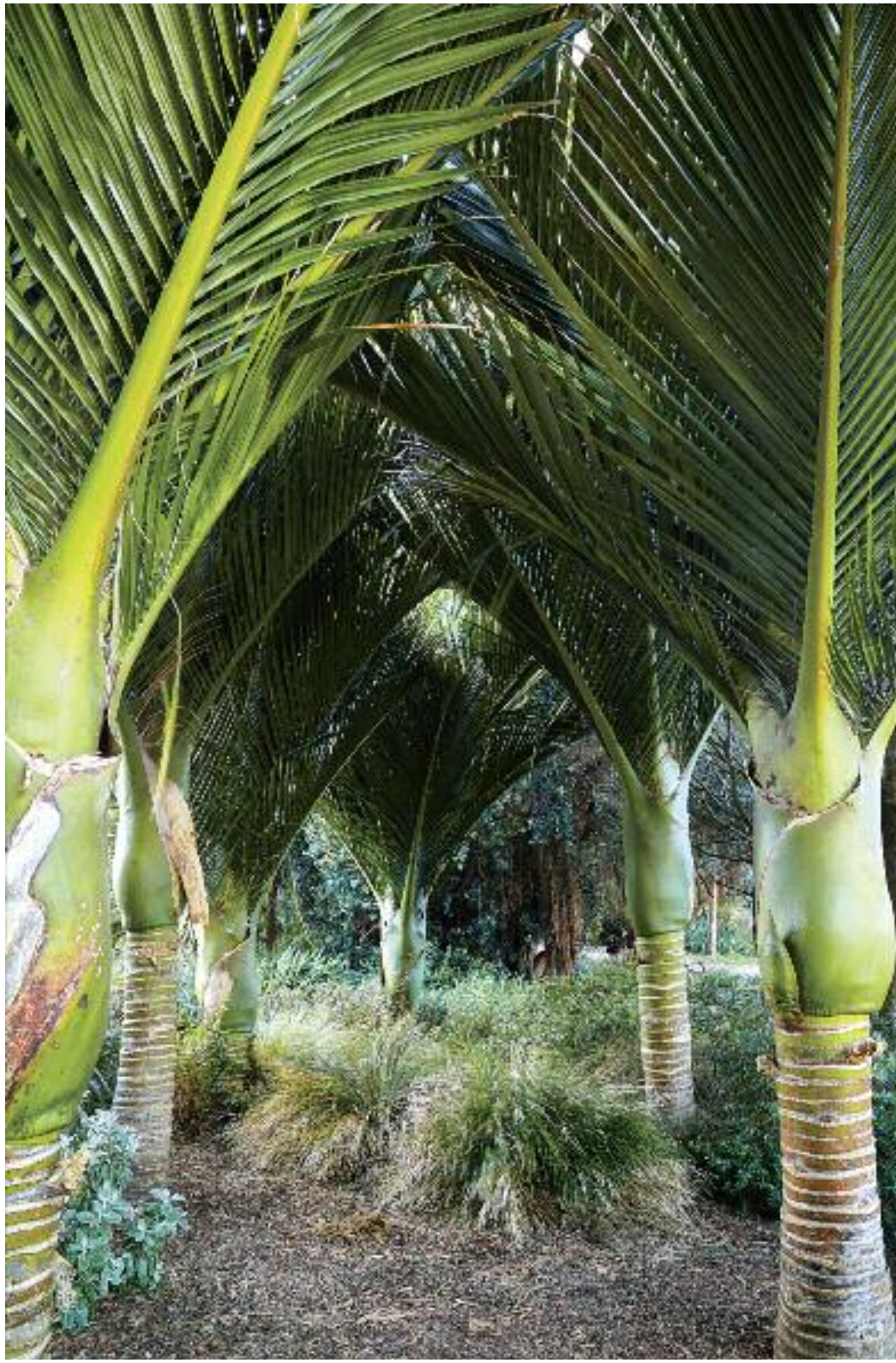
4. The Himalayan form of *Caryota maxima* has reached its terminal fruiting phase in a section of the SFBG now being planted with Southeast Asian cloud forest plants.

5. An immature *Juania australis* grows near two large *Ceroxylon quindiuense*. It is the sole survivor of a half-dozen specimens planted in hopes of developing a reproductively viable group of this notoriously difficult-to-cultivate species from a Mediterranean-climate cloud-bathed habitat on Masatierra in the Juan Fernandez Islands of Chile. Apart from constant mild leaf discoloration, this surviving plant appears healthy and grows steadily.

6. The waxy, bluish-green tones and regular pattern of leaf-blade splitting on young *Trachycarpus princeps* make it one of the most sought-after of frost-tolerant palms. It is threatened by hydroelectric projects along its Nu (Salween) River canyon habitat in Yunnan, China.

Magnolia doltsopa trees native to the same region (Fig. 2). Bulbils fork off the palms' aerial stems. An immature *Juania australis*, the very difficult-to-cultivate palm from Chile's Juan Fernandez Islands, represents the sole survivor of a planting of a half-dozen, its four-meter, apple-green ringed trunk setting it apart from its cousins nearby, the white-trunked ceroxylons (Fig. 5). Unusual species of *Trachycarpus* (Figs. 6 & Back Cover) also grow vigorously in the Garden, particularly *T. oreophilus*, *T. princeps*, *T. ukhrulensis* and *T. takil*, as well as *T. latisectus* and *T. martianus*. *Trachycarpus geminisectus* will likely be the next species planted out in the Garden.

A dense grove of *Rhopalostylis sapida* is growing into maturity and becoming a spectacle (Fig. 7) alongside a huge old *Pohutukawa* (*Metrosideros excelsa*) draped with aerial roots. Nearby, a dense planting of young *Jubaea chilensis* (Fig. 8) promises (in a century or so) to rival Ganna Walska Lotusland's renowned groves in Santa Barbara. Two *Brahea edulis* anchor opposite ends of a long, narrow bed edging the Garden's central lawn. To this bed dedicated entirely to plants from the five major Mediterranean-climate regions of the world the braheas contribute an accent of their native Baja California portion of the California Floristic Province, the Isla Guadalupe Biosphere Reserve, from which a number of other plants in the SFBG originate, like *Pinus radiata* var. *binata* and *Cupressus guadalupensis*. Curious visitors will discover many young palms in the



7. A grove of mature *Rhopalostylis sapida* planted at the initiative of former director Scot Medbury in the 1990s has become an attractive wandering place for visitors. Robust flowering specimens of *Rhopalostylis baueri* also grow in the SFBG.

8. More than a dozen *Jubaea chilensis* densely planted in the San Francisco Botanical Garden's Chilean section are on their way to becoming one of California's most significant public groves of this monumental, Mediterranean-climate species. Illuminated behind them is a Monterey cypress, one of a trio of tree species planted in the 19th century to help transform coastal dunes into Golden Gate Park, home to the botanical garden. In the foreground a bed contains terrestrial Chilean bromeliads in the genera *Fascicularia*, *Puya* and *Ochagavia*.

various geographic collections of the garden — the Mesoamerican Cloud Forest, the Andean Cloud Forest, the Southeast Asian Cloud Forest, Australia, New Zealand, East Asia, Chile, even the Mediterranean and Ancient Plants collections.

The Entry Garden, designed and installed in 1998 by Roger Raiche and Dave McCrory of Planet Horticulture, features plenty of palms – notably a pair of maturing *Parajubaea cocoides* (Front Cover) – amid other key plants representing the collections. Behind the cozy, densely shelved bookstore is a kiosk where visitors can shop from plants grown by volunteers in the Garden's nursery. Monthly plant sales from March through November, peaking in a big, festive May sale and auction, distribute some of the Bay Area's rarest and most interesting plants to gardeners and landscapers. Just off the Entry Garden, a serene courtyard leads to the Helen Crocker Russell Library of Horticulture, Northern California's preeminent reference collection of books and other printed material related to gardens and plants.

Trees are the largest living things that we humans can comprehend (i.e., their above-ground portions) as discrete organisms. The awe they inspire is at the heart of our love of plants and a profound motive for establishing arboreta and botanical gardens and the work done in research and conservation. At the SFBG, not only does the world's tallest (and now understood to be largest) conifer species, California's coast redwood, *Sequoia sempervirens* (to 115.6 m [379 ft]), grow, but so too do two of the world's tallest flowering trees, *Eucalyptus regnans* (mountain ash, 99.8 m [327 ft]), and *Ceroxylon quindiuense* (60 m [197 ft]), the tallest palm and monocot. I hope people visiting Golden Gate Park in San Francisco will be lured into the Garden by the sight of these beautiful palms, now but a third of their potential height, swaying in the near-constant breeze, their silvery-green cast a glinting, expressive complement to the foggy skies.

Acknowledgments

The author thanks Darold Petty and Richard Turner.

Palm species planted at the San Francisco Botanical Garden as of April 14, 2017.

Archontophoenix cunninghamiana 'Illawarra'
Archontophoenix purpurea (listed as "sp.")
Arenga engleri
Arenga micrantha
Brahea armata
Brahea calcarea
Brahea dulcis
Brahea edulis
Butia odorata (listed as *Butia capitata*)
Caryota obtusa
Caryota maxima "Himalayan"
Caryota "mystery"
Caryota "solitaire"
Caryota urens
Ceroxylon alpinum
Ceroxylon amazonicum
Ceroxylon ceriferum (listed as *Ceroxylon interruptum*)
Ceroxylon echinulatum
Ceroxylon parvifrons
Ceroxylon parvum (possibly *Ceroxylon pityrophyllum*)
Ceroxylon quindiuense
Ceroxylon sp.
Ceroxylon ventricosum
Ceroxylon vogelianum
Chamaedorea anemophila
Chamaedorea costaricana
Chamaedorea hooperiana
Chamaedorea sp. 'Horace Anderson'
Chamaedorea microspadix
Chamaedorea pochutlensis
Chamaedorea radicalis
Chamaedorea sp.
Chamaedorea sp. aff. *graminifolia*
Chamaedorea tepejilote
Chamaedorea woodsoniana
Chamaerops humilis
Chamaerops humilis var. *argentea*
Guihaia argyrata
Howea forsteriana
Juania australis
Jubaea chilensis
Linospadix monostachyos
Livistona australis
Livistona chinensis
Livistona jenkinsiana
Livistona lanuginosa
Livistona mariae
Syagrus hoehnei
Oraniopsis appendiculata
Parajubaea cocoides
Parajubaea sunkha
Parajubaea torallyi var. *torallyi*
Parajubaea torallyi var. *microcarpa*
Phoenix canariensis
Phoenix roebelenii
Phoenix sylvestris
Phoenix theophrasti
Plectocomia himalayana
Pritchardia minor
Rhapidophyllum hystrix
Rhapis excelsa
Rhapis multifida
Rhapis robusta
Rhopalostylis baueri
Rhopalostylis sapida
Rhopalostylis sapida (Chatham Islands)
Sabal minor
Syagrus romanzoffiana
Trachycarpus fortunei
Trachycarpus fortunei 'Wagnerianus'
Trachycarpus latisectus
Trachycarpus martianus
Trachycarpus oreophilus
Trachycarpus princeps
Trachycarpus takil
Trachycarpus ukhrulensis
Trithrinax acanthocoma
Trithrinax campestris
Wallichia oblongifolia
×*Jubautia splendens* (likely 'Dick Douglas')