

## The Bogor Botanic Garden and Its Rich Collection of Palms

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Bogor Botanic Garden, located about 60 km from Jakarta, the capital city of Indonesia, is situated on the lower slopes of Mt. Salak. Even though Bogor is only 260 m above sea level, it enjoys a cool climate throughout the year, the average mean temperature being 25° C. Bogor receives the nation's highest rainfall (about 4,000 mm/year) with the fantastic average of 322 cloud bursts per annum. The heavy rains, which usually greet Bogor in the evenings, help make the soil rich and support luxuriant plant growth. No wonder the country's, perhaps the world's, foremost tropical botanical garden is founded at this health-resort; it is visited by thousands of people every week.

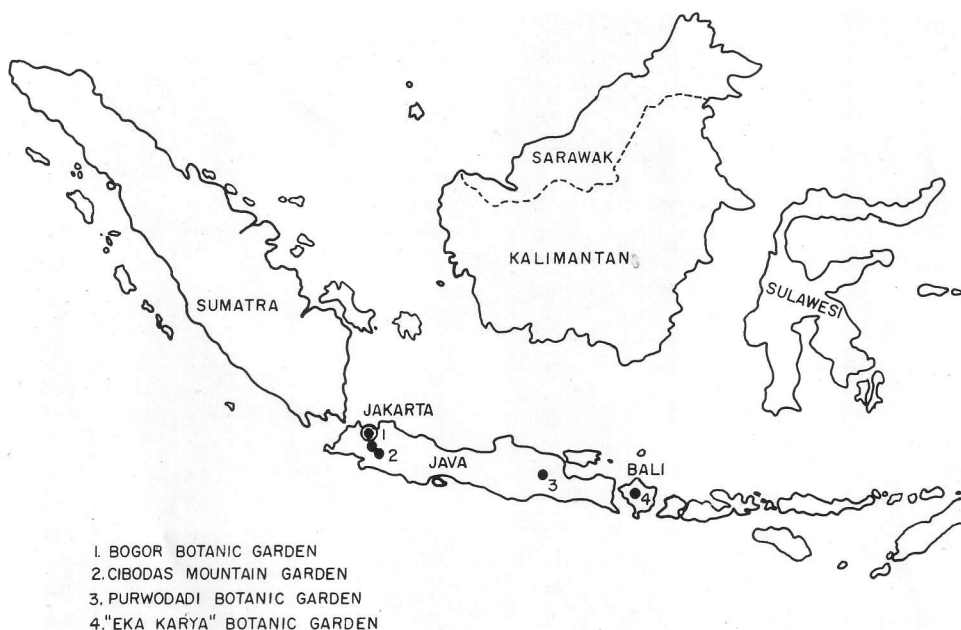
Bogor is linked with Jakarta by a super highway (Jagorawi) and two busy roads. At present the Bogor Botanic Garden is proud of having approximately 5,000 species of indigenous and exotic trees within its securely protected iron fence. The most beautiful among the trees are the 300 odd species of palms that adorn practically all the 25 blocks of the garden. In this paper a brief history of the Gardens and a list of palms grown at the Bogor Botanic Garden are given.

### **Brief History of Bogor Botanic Garden**

The Hortus Botanicus Bogoriensis was founded on May 18, 1817 by C. G. C. Reinwardt (just at the period when the British Administration had come to a close), and established by the Dutch Government behind the present Presidential

Summer Palace which used to be the residential hill-resort of the Dutch Governor-General, Buitenzorg. The garden was expanded to the east and south of the palace in 1892 and 1927, and now covers an area of 87 ha which excludes the Palace Grounds.

J. E. Teysmann, the first Curator of the Gardens, collected 1,912 species of plants during its first five years. Many economic plants as well as a majority of widespread ornamental plants were imported by the gardens, the most important being oil palm, quinine, cocoa, tea, vanilla, cassava, gutta-percha, ironwood, bougainvillea, and allamanda. The number of species increased considerably during the management of Teysmann. The garden expanded further and became multi-locational in 1880 when the capable Professor Melchior Treub became Director. A garden mainly for subtropical plants was established on 80 ha of land at Cibodas in West Java at an altitude of 1,450 m. Professor Treub served until 1905 and brought fame to the garden by attracting eminent botanists and biologists from all over the world. Thus the Bogor Botanic Garden became a world center in the tropics for biological and agricultural research. In 1884 a laboratory, now known as the Treub Laboratory, was set up in the garden to serve visiting scientists who wished to do research on tropical flora and fauna. Another very important contribution of Prof. Treub was the establishment in 1905 of the Agricultural Department of the Garden. This institution has grown into the Ministry of



1. Map of Indonesia showing position of Bogor and other botanic gardens.

Agriculture of Indonesia. The various regional gardens of the Bogor Botanic Garden are given below together with the years of their founding (Table 1, see also map, Fig. 1).

### Functions of the Gardens

The gardens serve several purposes:

1. To explore indigenous plant species having economic potential or botanical interest. The potential of such germ-

plasm could be exploited in plant breeding;

2. to conduct horticultural and botanical research;
3. to introduce useful plants from abroad and from inside the country for multiplication and/or breeding purposes;
4. to provide guidance and facilities for education; and
5. to make the gardens available for the public as places of recreation.

Indirectly the plant communities in the

Table 1. Government Botanic Gardens of Indonesia

Location	Year of Founding	Area
Bogor, West Java	1817	110 ha <sup>a</sup>
Cibodas, West Java	1862	80 ha <sup>b</sup>
Sibolangit, North Sumatra	1914	20 ha <sup>c</sup>
Malang, East Java	1941	85 ha
Setia Mulia, West Sumatra	1955	60 ha <sup>c</sup>
Eka Karya, Bali	1959	129 ha

<sup>a</sup> At present the area of the Botanic Garden is 87 ha (minus the Palace Ground).

<sup>b</sup> At present the area has increased to 100 ha.

<sup>c</sup> These gardens do not function actively and are administered by the Ministry of Agriculture.

gardens provide habitats for animal species which increase opportunities for zoological research and education. To the Bogor Botanic Garden is attached an excellent zoological museum with many research scientists working with living species of animals. The Deer Park where herds of beautiful white-spotted deer can be seen grazing undisturbed in the grounds of the Summer Palace is attached to the garden.

### Research on Palms

A team of young scientists at the garden have initiated different aspects of research on several species of palms. Some of the ongoing studies include investigations on the morphology and utilization of *Arenga microcarpa* as an alternative source of edible sago, systematics and classification of the genera *Salacca* and *Arenga*, pollination biology of *Salacca*, rates of leaf-production and recording of the span of life of green leaves, morphology of palm spines, and floral biology and germination of seeds of many species of palms. Most of these investigators periodically make expeditions to the remote islands of the country to explore palms and expand the collection at Bogor.

### List of Palms of the Bogor Garden 1980

#### Acoelorrhaphe

wrightii (Griseb. & H. A. Wendl.) H. A. Wendl. ex Becc. .... W. Indies

#### Acrocomia

totai Mart. .... S. America

#### Actinorhynchis

calapparia (Bl.) H. A. Wendl. & Drude ex Scheff. .... Malesia  
pamau Becc. .... Solomon Is.

#### Aiphanes

caryotaefolia (H.B.K.) H. A. Wendl. .... Colombia  
erosa (Linden) Burr. .... Barbados Is.

#### Ancistrophyllum

acutiflorum Becc. .... Trop. W. Africa

#### Archontophoenix

alexandrae (F. Muell.) H. A. Wendl. & Drude .... Queensland

#### Areca

catechu L. (Fig. 2) ..... S.E. Asia  
var. alba Bl. .... S.E. Asia  
laosensis Becc. .... Thailand  
latiloba Ridl. .... Java, Sumatra  
macrocalyx Zipp. .... New Guinea  
oxycarpa Miq. ....  
..... N. Sulawesi; Minahassa  
triandra Roxb. .... S.E. Asia  
vestiaria Giseke .... Sulawesi  
spp. .... Irian Jaya, Sumatra, Ternate

#### Arenga

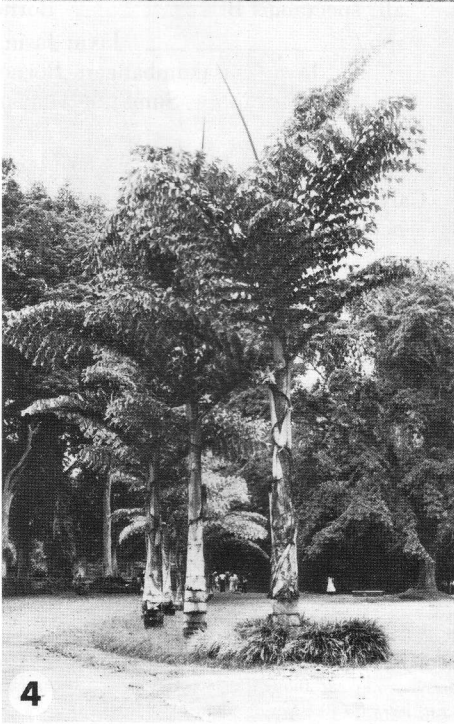
australasica (H. A. Wendl. & Drude) S. T. Blake ..... Australia  
borneensis (Becc.) Dransf. (Fig. 3) ..... Borneo  
caudata (Lour.) H. E. Moore ..... Thailand  
engleri Becc. .... Taiwan, Ryukyu Is.  
microcarpa Becc. ....  
..... New Guinea, Maluku: Kai  
obtusifolia Mart. ....  
..... Sumatra, Malay Pen., Java  
pinnata (Wurmb.) Merr. ....  
..... Java, Sulawesi  
porphyrocarpa (Mart.) H. E. Moore .....  
..... Java, Sumatra  
tremula (Blanco) Becc. .... Philippines  
undulatifolia Becc. .... Borneo  
spp. .... Java, Malay Pen.,  
..... New Guinea, Sulawesi:  
..... Gorontalo

#### Astrocaryum

aculeatum Meyer ..... Guiana

→

2. Two unusual specimens of *Areca catechu*, the betel palm, which bear cream-colored fruit. 3. *Arenga borneensis*, an elegant dwarf palm from Borneo; 4. *Caryota no*, an attractive non-clustered fishtail palm, native to Borneo; 5. *Ceratolobus glaucescens*, a very rare, endangered rattan of W. Java.







- Chamaedorea*  
*erumpens* H. E. Moore..... Honduras, Guatemala  
 ..... Honduras  
*geomiformis* H. A. Wendl..... Honduras  
 ..... Honduras  
*glaucofolia* H. A. Wendl..... Mexico  
*oblongata* Mart..... Mexico, Nicaragua  
*oreophila* Mart..... Mexico  
*tepejilote* Liebm..... C. America
- Chrysalidocarpus*  
*lutescens* (Bory) H. A. Wendl..... Madagascar  
 ..... Madagascar  
*madagascariensis* Becc.  
 var. *lucubensis* (Becc.) Jum. & Perr.  
 ..... Madagascar
- Coccothrinax*  
*dussiana* L. H. Bailey..... Barbados Is.
- Cocos*  
*nucifera* L..... Cult. Tropics  
 (Kelapa Aren Hijau)..... Cult. Java  
 (Kelapa Bali)..... Cult. Java  
 (Kelapa Bengkulu)..... Cult. Sumatra  
 (Kelapa Bol)..... Cult. Java  
 (Kelapa Deli)..... Cult. Java  
 (Kelapa Genjah)..... Cult. Java  
 (Kelapa Genjah Gading)..... Cult. Java  
 (Kelapa Genjah Hijau)..... Cult. Java  
 (Kelapa Genjah Manis)..... Cult. Java  
 (Kelapa Genjah Puyuh)..... Cult. Java  
 (Kelapa Hijau)..... Cult. Java  
 (Kelapa Jepun)..... Cult. Java  
 (Kelapa Jepun Besar)..... Cult. Java  
 (Kelapa Jeruk)..... Cult. Java  
 (Kelapa Matahari).....  
 ..... Cult. Maluku: Ambon  
 (Kelapa Merah)..... Cult. Java  
 (Kelapa Parang Hijau)..... Cult. Java  
 (Kelapa Parang Merah).....  
 ..... Cult. Maluku: Ambon  
 (Kelapa Pinang)..... Cult. Java  
 (Kelapa Tikeh)..... Cult. Java  
 (Kelapa Tikeh Merah)..... Cult. Java
- Corypha*  
*umbraculifera* L..... India, Sri Lanka  
*utan* Lam..... S.E. Asia  
 sp..... —
- Cryosophila*  
*warscewiczii* (H. A. Wendl.) H. H. Bart  
 ..... C. America
- Cyrtostachys*  
*elegans* Burr..... New Guinea  
*renda* Bl..... Sumatra, Borneo,  
 Malay Pen.  
 sp..... New Guinea
- Daemonorops*  
*angustifolia* (Griff.) Mart.. Malay Pen.  
*binnendijkii* Becc..... Sumatra  
*calicarpa* (Griff.) Mart..... Malay Pen.,  
 Sumatra  
*didymophylla* Becc..... Borneo,  
 Sumatra, Malay Pen.  
*fissa* Bl.  
 var. *cinnamomea* Becc..... Borneo  
 var. *minor* Becc..... Borneo  
*geniculata* (Griff.) Mart..... Sumatra  
*hygrophila* (Griff.) Mart... Malay Pen.  
*hystrix* (Griff.) Mart..... Malay Pen.,  
 Sumatra, Borneo  
*jenkinsiana* (Griff.) Mart..... India  
*longipes* (Griff.) Mart..... Sumatra  
*longispatha* Becc..... Borneo  
*melanochaetes* Bl..... S.E. Asia  
 var. *microcarpa* T. & B... S.E. Asia  
*oblonga* (Reinw.) Mart..... Java  
*palembanica* Bl. (Fig. 7)..... Sumatra  
*rubra* (Reinw. ex Mart.) Bl..... Java,  
 Sumatra  
*treubiana* Becc..... Cult.  
*trichroa* Miq..... Borneo, Sumatra  
*aff. hystrix* Bl..... N. Sumatra  
*spp.*..... Sulawesi,  
 Sumatra
- Deckenia*  
*nobilis* H. A. Wendl. ex Seem.....  
 ..... Seychelles Is.
- Desmoncus*  
*polyacanthos* Mart..... Kalimantan
- Dictyosperma*  
*album* (Bory) H. A. Wendl. & Drude ex  
 Scheff..... Mascarene Is.
- Drymophloeus*  
*pachycladus* (Burr.) H. E. Moore.....  
 ..... Solomon Is.
- Elaeis*  
*guineensis* Jacq. (Fig. 8).....  
 ..... Cult. W. Africa

10. The elegant wheel shaped leaves of *Licuala spinosa*.

- oleifera* (H.B.K.) Cortes  $\times$  *guineensis*  
 Jacq. .... Hybrid
- Eremospatha*  
*cuspidata* (G. Mann & H. A. Wendl.)  
 G. Mann & H. A. Wendl. ....  
 ..... Trop. Africa
- Eugeissona*  
*utilis* Becc. .... Borneo
- Euterpe*  
*oleracea* Mart. .... Brazil
- Gronophyllum*  
*microcarpum* Scheff. ....  
 ..... Maluku: Bacan I.
- Heterospatha*  
*elata* Scheff. .... Guam,  
 Maluku, New Guinea
- salomonensis* Becc. .... Solomon Is.
- Hydriastele*  
*rostrata* Burr. .... New Guinea  
 sp. .... New Guinea
- Hyophorbe*  
*lagenicaulis* (L. H. Bailey) H. E. Moore.  
 ..... Mascarene Is.
- Hyphaene*  
*coriacea* Gaertn. ....  
 ..... E. Africa, Madagascar
- petersiana* Klotz. .... Congo
- thebaica* (L.) Mart. .... N. Africa
- Iguanura*  
*macrostachya* Becc. ....  
 ..... S. & E. Kalimantan
- polymorpha* Becc. .... Perak
- wallichiana* (Hook. f.) Benth. & Hook.  
 f. .... Malay Pen.
- Korthalsia*  
*echinometra* Becc. .... Malay Pen.  
 Sumatra, Borneo
- ferox* Becc. .... Borneo
- junghuhnii* Miq. .... Java
- laciniosa* Griff. ex Mart. .... Java
- robusta* Bl. ....  
 ..... Sumatra, Borneo, Palawan
- rostrata* Bl. .... Borneo, Sumatra,  
 Malay Pen.
- sp. .... S. Kalimantan





11. A group of sagu palm (*Metroxylon sagu*) grows healthily on the bank of Ciliwung, the river that flows right through the middle of the garden.

#### Latania

- loddigesii* Mart. .... Mascarene Is.  
*lontaroides* (J. Gaertn.) H. E. Moore .....  
 ..... Mascarene Is.  
*verschaffeltii* Lem. .... Mascarene Is.  
 sp. .... —

#### Licuala

- gracilis* Bl. .... Java: Ujung Kulon  
*grandis* H. A. Wendl. .... New Hebrides  
*paludosa* Griff. ex Mart. ....  
 ..... Sumatra, Borneo, Malay Pen.  
*petiolulata* Becc. .... Borneo  
*pumila* Bl. .... Java  
*rumphii* Bl. .... Sulawesi: Manado  
*spinosa* Thunb. (Fig. 10) .... S.E. Asia  
 spp. .... Java: Peucang I.,  
 New Guinea

#### Linospadix

- sp. .... New Guinea

#### Livistona

- australis* (R. Br.) Mart. .... Australia  
*chinensis* (Jacq.) R. Br. ex Mart. (Fig. 9)  
 ..... S.E. Asia  
*drudei* H. A. Wendl. .... Australia

- hasseltii* Hassk. ex H. A. Wendl. ....

- ..... Borneo, Sumatra,  
 Java, Malay Pen.  
*inermis* R. Br. .... Australia  
*jenkinsiana* Griff. .... India  
*mariae* F. Muell. .... Australia  
*muelleri* F. M. Bailey ..... Australia  
*rotundifolia* (Lam.) Mart. (Fig. 9) .....  
 ..... S.E. Asia  
*saribus* (Lour.) Merr. ex A. Cheval. ....  
 ..... S.E. Asia  
*speciosa* Kurz ..... Burma, Malay Pen.  
 spp. .... New Guinea, Thailand

#### Lodoicea

- maldivica* (Gmel.) Pers. .... Seychelles Is.

#### Maxburretia

- furtadoana* Dransf. .... Thailand  
*rupicola* (Ridl.) Furtado .... Malay Pen.

#### Maximiliana

- maripa* (Correa) Drude .....  
 ..... Trinidad, S. America

#### Metroxylon

- sagu* Rottb. (Fig. 11) .....  
 ..... Cult. S.E. Asia, Malasia



12. Nipah (*Nypa fruticans*), commonly found in mangrove swamps. Its potential has not been fully exploited.



13. A vigorously growing specimen of *Oncosperma horridum*. It is widely distributed in S.E. Asia.

Nenga

- gajah Dransf. .... Sumatra
  - pumila (Mart.) H. A. Wendl. .... Java
- Nephrosperma
- vanhoutteanum (H. A. Wendl.) Balf.f. .... Seychelles Is.

Normanbya

- normanbyi (Hill) L. H. Bailey ..... Australia

Nypa

- fruticans Wurm. (Fig. 12) S.E. Asia

Oenocarpus

- bacaba Mart. .... Brazil
- panamanus L. H. Bailey ..... Panama

Oncosperma

- fasciculatum Thw. .... Sri Lanka
- horridum (Griff.) Scheff. (Fig. 13) ..... Malay Pen., Sumatra, Borneo

- tigillarum (Jack) Ridl. .... S.E. Asia
- Opsiantra
- maya O. F. Cook ..... Guatemala
- Orania
- aruensis Becc. .... Maluku: Aru Is.
  - regalis Bl. .... New Guinea
  - sylvicola (Griff.) H. E. Moore ..... Java, Sumatra, Malay Pen.
- Orbignya
- cohune (Mart.) Dahlgren ex Standl. .... Honduras
  - lydiae Drude ..... Brazil
  - martiana Barb. Rodr. .... Brazil
  - spectabilis (Mart.) Burr. .... Brazil
  - sp. .... Brazil
- Paralinospadix
- caudiculatus (Becc.) Burret ..... Irian Jaya
  - petrickianus Burr. .... Unknown



14. *Pigafetta filaris* grows abundantly in North Sulawesi where it is known as "wanga". The shiny slender stems are quite attractive. The palms illustrated were planted in 1974.

*Pelagodoxa*

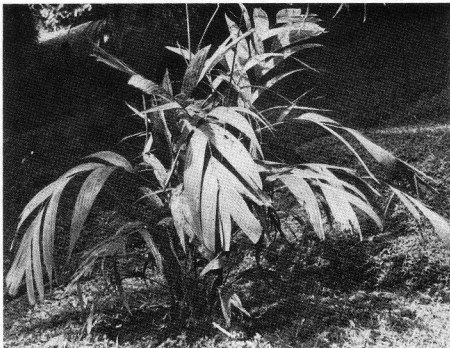
*henryana* Becc. ex Bois.....  
 ..... Marquesas Is.

*Phoenicophorium*

*borsigianum* (C. Koch) Stuntz.....  
 ..... Seychelles Is.

*Phoenix*

*canariensis* Hort. ex Chabaud.....  
 ..... Canary Is.



15. *Pinanga densiflora* has beautifully mottled leaves.

\* *dactylifera* L..... Cult. N. Africa  
*farinifera* Roxb..... India  
*loureirii* Kunth..... India to Vietnam  
 and Taiwan  
*pusilla* Gaertn..... Sri Lanka  
*reclinata* Jacq..... Madagascar  
 var. .... Senegal  
*roebelenii* O'Brien..... Laos  
*sylvestris* (L.) Roxb..... India  
 sp. .... Egypt, Germany,  
 India, Italy, Surinam

*Pholidocarpus*

*macrocarpus* Becc. .... Malay Pen.  
*mucronatus* Becc. .... Sumatra

*Phytelephas*

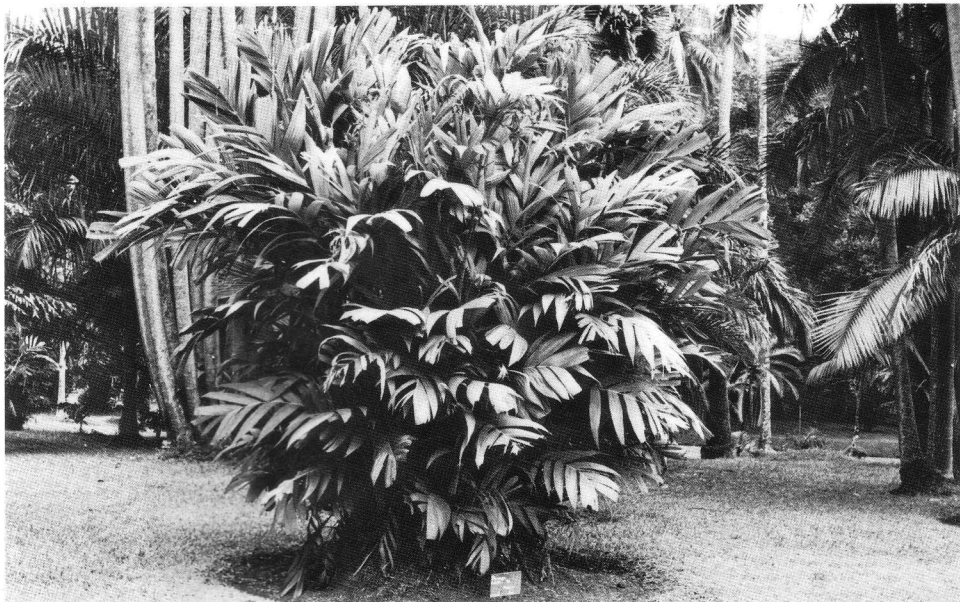
*macrocarpa* Ruiz & Pavon... Colombia

*Pigafetta*

*filaris* (Giseke) Becc. (Fig. 14).....  
 ..... Sulawesi, Maluku,  
 New Guinea

*Pinanga*

*coronata* Bl..... Java, Sumatra  
*densiflora* Becc. (Fig. 15) N. Sumatra



16. *Pinanga* (*Pinanga kuhlii*) a clump forming species, up to 7 m high. It is grown as an ornamental plant in many parts of the country.

- disticha* (Roxb.) Bl. ....  
 ..... Malay Pen., Sumatra  
*grandis* Burr. .... N. Sumatra  
*javana* B. .... Java  
*kuhlii* Bl. (Fig. 16) ..... Java, Sumatra  
 var. *sumatrana* Scheff. .... Sumatra  
*latisecta* Bl. .... Sumatra  
*patula* Bl. .... Sumatra  
 aff. *scortechinii* Becc. .... Malay Pen.  
 spp. .... Bali I, Sulawesi:  
 Minahassa, Sumatra:  
 Besitang, Borneo  
*Plectocomia*  
*elongata* Mart. ex Bl. ... Java, Sumatra  
*Pritchardia*  
*pacifica* Seem. & H. A. Wendl. ....  
 ..... Fiji Is.  
*Ptychococcus*  
*paradoxus* (Scheff.) Becc. ....  
 ..... New Guinea  
*Ptychosperma*  
*ambiguum* (Becc.) Becc. ... New Guinea  
*elegans* (R.Br.) Bl. .... Queensland  
*keiense* (Becc.) Becc. .... New Guinea  
*macarthurii* (H. A. Wendl.) Nichols. ....  
 ..... Maluku, New Guinea  
*propinquum* (Becc.) Becc. ....  
 ..... New Guinea  
*sanderanum* Ridley ..... New Guinea  
*Raphia*  
*farinifera* (Gaertn.) Hyland. ....  
 ..... Madagascar, Africa  
*gentiliana* De Wildem. .... Congo  
*hookeri* G. Mann. & H. A. Wendl. ....  
 ..... W. Africa  
*laurentii* De Wildem. .... Congo  
*Reinhardtia*  
*gracilis* (H. A. Wendl.) Drude ex Dam-  
 mer  
 var. *gracilior* (Burr.) H. E. Moore .....  
 ..... Honduras  
*Rhapis*  
*excelsa* (Thunb.) Henry ex Rehd. ....  
 ..... S. China, Japan  
 sp. .... Thailand  
*Rhopaloblaste*  
*augusta* (Kurz) H. E. Moore .....  
 ..... Nicobar Is.



17. *Verschaffeltia splendida* from Seychelles Islands. Notice the aerial roots which are continuously produced at the bottom of the stem.

- ceramica (Miq.) Burr. ....  
 ..... Maluku: Bacan I.  
*elegans* H. E. Moore..... Solomon Is.  
*singaporensis* (Becc.) J. D. Hooker .....  
 ..... Malay Pen.
- Roystonea  
*elata* (Bartr.) Harper..... Cuba, Florida  
*oleracea* (Jacq.) O. F. Cook.....  
 ..... W. Indies  
 sp. .... Brazil  
 sp. (hybrid)..... Cult. Philippines
- Sabal  
*domingensis* Becc..... San Domingo  
*mauritiiformis* (Karst.) Gris. & H. A.  
 Wendl. .... Colombia
- mexicana* Mart..... Guatemala, Mexico  
*minor* (Jacq.) Pers. .... S.E. U.S.A.  
*palmetto* (Walt.) Lodd. ex Schult. &  
 Schult.f. .... S.E. U.S.A.  
 sp. .... —
- Salacca  
*affinis* Griff..... Malay Pen.,  
 Sumatra, Kalimantan  
*dubia* Becc. .... Unknown  
*zalacca* (Gaertn.) Voss..... Java  
 sp. .... Java
- Scheelea  
*insignis* (Mart.) Karst. ....  
 ..... Brazil, Colombia  
*martiana* Burr. .... Brazil  
 sp. .... —
- Serenoa  
*repens* (Bartr.) Small. .... S.E. U.S.A.
- Socratea  
*durissima* (Oerst.) H. A. Wendl. ....  
 ..... C. America
- Syagrus  
*flexuosa* (Mart.) Becc. .... Brazil
- Synechanthus  
*fibrosus* (H. Wendl.) H. A. Wendl. ....  
 ..... Guatemala
- Thrinax  
*parviflora* Sw... Jamaica, San Domingo  
*radiata* Lodd. ex Schult. & Schult.f. ....  
 ..... C. America  
 sp. .... California, Jamaica
- Veitchia  
*merrillii* (Becc.) H. E. Moore.....  
 ..... Philippines  
*montgomeryana* H. E. Moore..... Cult.
- Verschaffeltia  
*splendida* H. A. Wendl. (Fig. 17).....  
 ..... Seychelles Is.
- Wallichia  
*densiflora* (Mart.) Mart. .... India  
*disticha* T. Anders. .... India
- Washingtonia  
*filifera* (Linden) H. A. Wendl. ....  
 ..... S. California