

GROUP F: PALMS, CYCADS & PANDANS

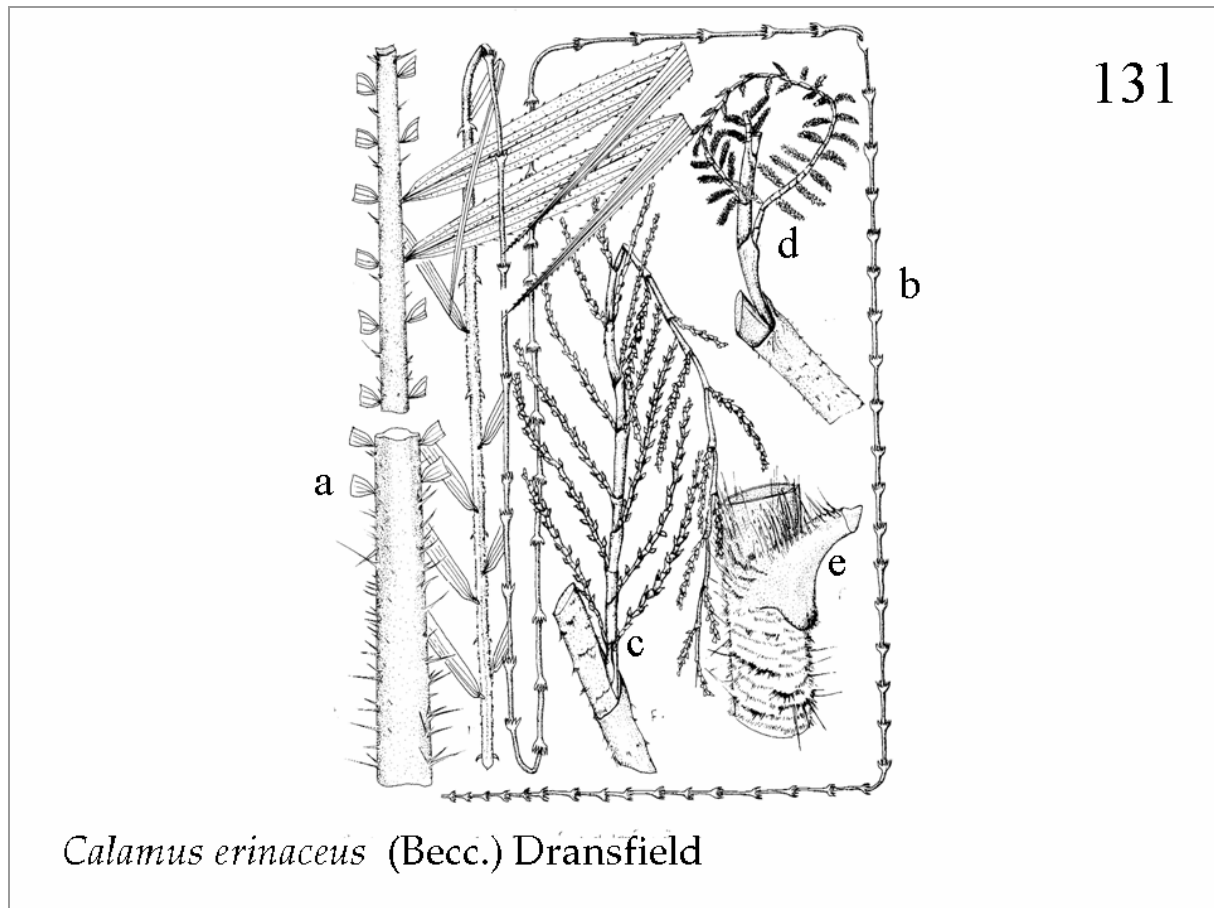


Fig. 131. *Calamus erinaceus* (Becc.) Dransfield. (a) Leaf axis, with two leaflets still attached, (b) whip-like, hooked leaf-tip, (c) female inflorescence, (d) male inflorescence, and (e) base of leaf (leaf sheath) , showing insertion of spines.

ARECACEAE

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Calamus erinaceus* (Becc.) Dransfield*Synonyms :** *Calamus aquatilis*, *Daemonorops erinaceus*, *Daemonorops leptopus***Vernacular name(s) :** Rotan Bakau (Mal., Ind.)

Description : A robust, multiple-stemmed climbing palm (rattan) with whip-like hooks at the tips of its leaves. The stems climb up to 15-30m (or more), are 2-3.5 cm in diameter, but may be up to 6 cm wide if the enclosing sheaths are included. The sheaths are orange to yellowish-green, and are very densely armed with horizontal or slanted greyish-brown spines that are 2-35 mm long. The spines and the sheath epidermis are densely covered with fine grey scales. The 5-9 spines around the mouth of the leaf sheath point upward and are up to 6 cm long. The leaves are about 4.5 m long with numerous greyish-green leaflets that measure 2 by 40 cm; the leaf stalk is 20 cm. These are very regular, closely grouped, and hang laxly. They are armed with short bristles along the margins and on the veins on the underside of the leaflet. The lower surface also has minute brown scales and a thin layer of pale wax. The leaf axis is extended into a thin, spiny, whip-like extension that is about 2 m long. The flower clusters are 75-150 cm long and consist of lateral panicles sprouting from the axils of the uppermost leaves. Fruits are round, about 1 cm in diameter and covered with about 12 vertical rows of triangular, straw-coloured scales. This species is referred to as *Daemonorops leptopus* in Watson (1928).

Ecology : A rattan, forming thickets on the landward margin of mangroves or on the landward side of coastal sandbars. The plant climbs by means of its hooks. Mangrove associate species.

Distribution : Southeast Asian species, recorded in Southern Thailand, the Philippines, Malaysia (Peninsular, Sarawak), Brunei, Singapore and Indonesia (Borneo, Java, Sumatra).

Abundance : Locally abundant (e.g. along the coast of Sabah) along the coast, but very rare in inland habitats.

Use(s) : The canes of this species have little commercial use, as they are too stiff and hard (Verheij & Coronel, 1992).

Source of illustration : Dransfield (1984)

Reference(s) : Watson (1928), Dransfield (1984), Tomlinson (1986), Leiden Herbarium, <http://www.nationaalherbarium.nl/>, http://www.arcbc.org/arcbcweb/climbing_palms/climbing_palmspage2.htm.

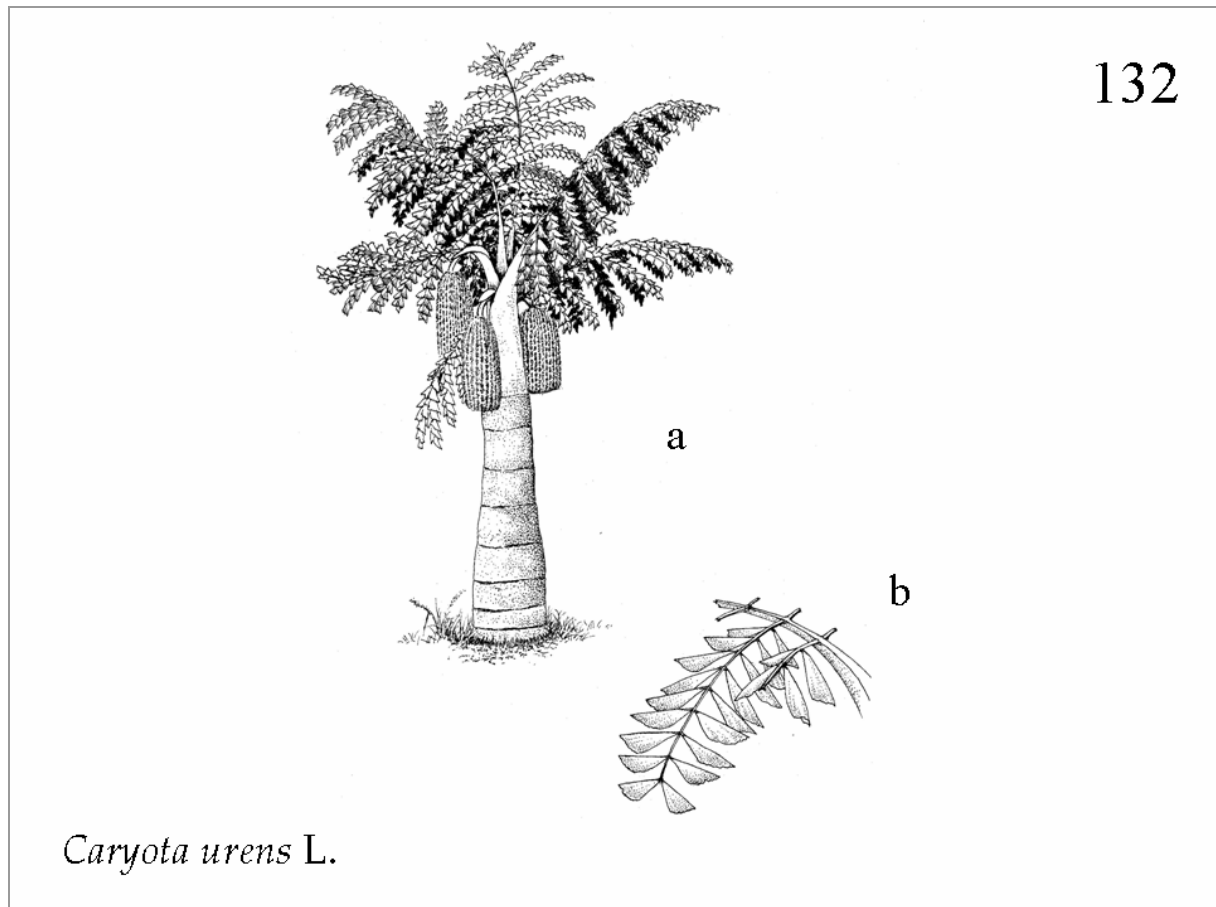


Fig. 132. *Caryota urens* L. (a) Habit of fruiting palm, and (b) detail of leaf, showing shape of leaflets.

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Caryota urens* L.*Synonyms :** Unknown.**Vernacular name(s) :** Solitary fishtail palm, Toddy palm, Jaggery palm, Kitul palm (E), Tao rang (Thai)**Description :** Tall palm exhibiting an erect single trunk, usually 10-12 m tall, but may be up to 30 m tall, bearing ringed scars left by fallen leaves. The trunk reaches its maximum height just before the plant begins blooming. Leaves are twice divided into leaflets, up 7 m long, but usually 3-5 m, bearing wedge-shaped, marginally toothed leaflets somewhat shaped like a fish tail, 10-20 cm by 9-10 cm, dark green. Flowers are either male or female, both borne on the same plant, alternating on branched flowering clusters, up to 2 m long, enveloped by 2 keeled, marginally fibrous leaflets. Fruits are round when ripe, reddish pink, 2-3.5 cm diameter with 1-3 smooth black seeds. Avoid contact with the red fruit produced by this palm: it contains oxalic acid which is toxic when ingested, and contact with skin may result in severe chemical burns.**Ecology :** Occurs in moist, flat lowlands to montane rainforest up to 1000. Common in lowland rainforest of varying soil types, including sandy, basaltic, granitic and alluvial, on a range of aspects from flat to steep slopes. Also occurs in semi-deciduous vine forests, broad-leaved swamp forests, (landward fringes of) mangroves and freshwater swamps. Occurs as infrequent to frequent scattered individuals or small to large groups, apparently never forming stands. Pollination is by insects, seed dispersal by flood, birds or mammals. Two closely related fishtail palm species – *Caryota mitis* and *Caryota obtusa* – occur in Malaysia and Indonesia. *Caryota urens* dies soon after flowering/fruitletting, which is usually after 20-25 years of growth. Mangrove associate species.**Distribution :** Found from India and Sri Lanka eastwards to Myanmar, Cambodia and Thailand.**Abundance :** Locally common.**Use(s) :** The sap of this palm is very rich in simple sugars. In India and other Asian countries, the palm is tapped for its syrup which is often fermented into an alcoholic beverage called toddy. The syrup is also processed into a granular sugar called “jaggery”. Planted as an ornamental in other Southeast Asian countries (e.g. Malaysia) and Australia.**Source of illustration :** Authorhttp://www.plantapalm.com/vpe/photos/Species/caryota_urens.htm<http://www.pacsoa.org.au/palms/Caryota/urens.html>**Reference(s) :** Whitmore (1979), Maung (2003)http://www.palmdoctor.com/Palm_Of_The_Month/Caryota_urens.htmhttp://gmr.landfood.unimelb.edu.au/Plantnames/Sorting/Palms_Thai_index.htmlhttp://www.panda.org/about_wwf/where_we_work/ecoregions/global200/pages/regions/region035.htm.

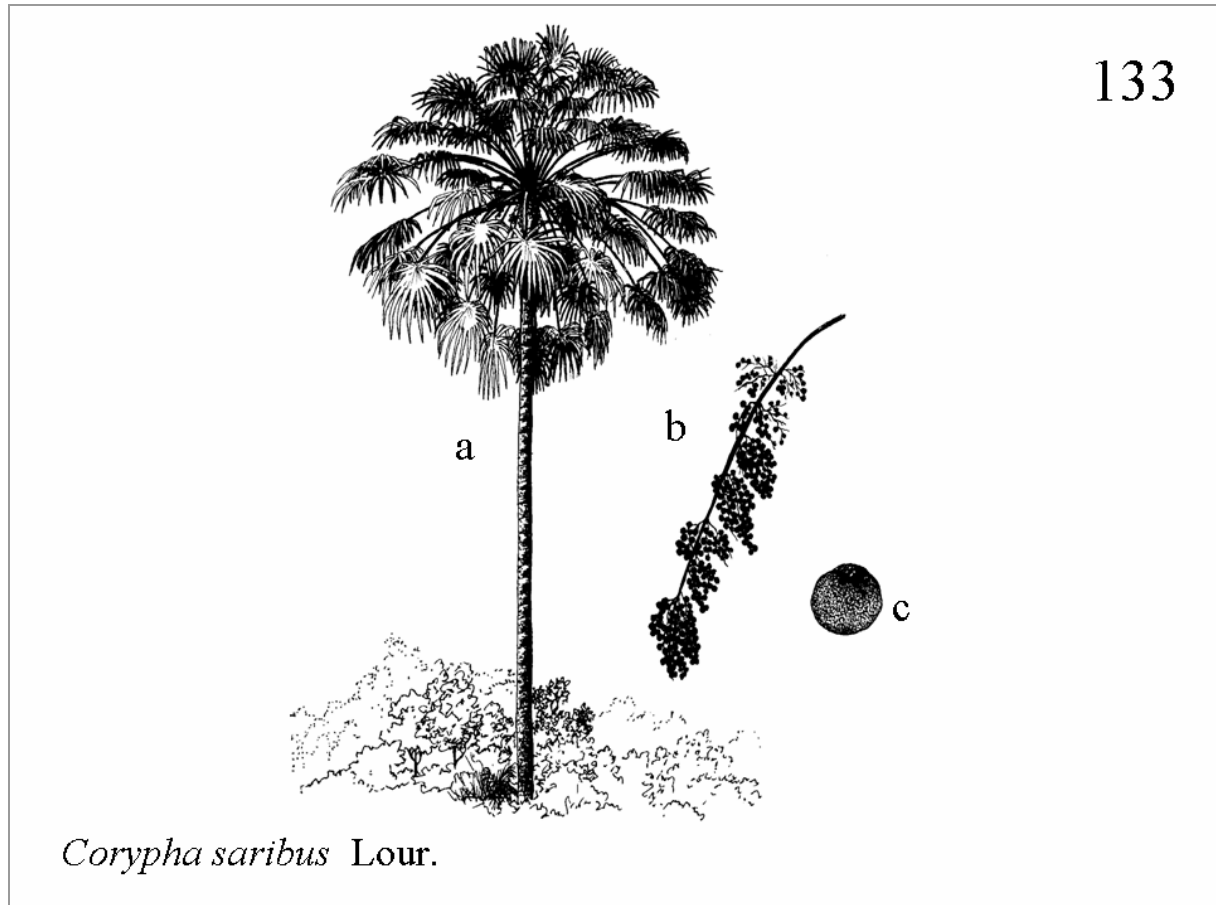


Fig. 133. *Corypha saribus* Lour. (a) Habit, (b) cluster of fruit, and (c) fruit.

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***Corypha saribus* Lour.**

Synonyms : *Livistona cochinchinensis*, *Livistona saribus* (Lour.) Merr. ex Chev.

Vernacular name(s) : Taraw palm (E), Serdang (Mal.), Sariboe, Serdang (Ind.), Rock (Thai.), Kè (Viet.)

Description : Palm tree, 12-30 m tall. Leaves are fan-shaped, about 1 m diameter, with many principal veins. Leaves are irregularly divided by shallow to deep splits, and the tips of the leaflets are sometimes pendulous. Leaf stalks are orange-yellow, 1.5-2.5 m long and with dark spines at the base. Leaf sheaths are dark, chocolate-brown and fibrous. Flowers are borne on stalked, branching clusters that emerge from between the leaf stalks. Fruits are round, 1.5-2 cm diameter, occasionally broader than long, with a thin, fleshy, blue-green skin that is green with white spots when unripe. It is immediately distinguishable from all other species of the related fan palm genera (*Corypha* and *Livistona*) by the combination of blue-green fruit with a leaf that is irregularly divided by shallow and deep splits. All other *Corypha* and *Livistona* species, apart from the minute *Livistona exigua* of Brunei, have leaves that are regularly divided. In most of the literature in the region it is known as *Livistona saribus*.

Ecology : A species of lowlands, especially lowland swamps on the landward side of mangroves. Forms extensive forests on coastal hills. Grows both in tall forests and in low shrub/grass vegetation, including seasonally swampy *Melaleuca* wooded grasslands. Mangrove associate species.

Distribution : Southeast Asian species, found in the Philippines, Cambodia, Thailand, Vietnam, Malaysia (Peninsular, Sabah) and Indonesia (W. Java, Borneo, Sumatra, Moluccas, Sulawesi).

Abundance : Locally abundant, but found only in low densities in mangroves.

Use(s) : The palm cabbage, fruits and seeds are edible. Timber used in construction. Stems are used as masts for sailing vessels (South Borneo).

Source of illustration : Whitmore (1973) and live material, Botanical Garden, Bogor.

Reference(s) : Whitmore (1973), Said (1990), Dransfield (pers. comm. 1994), Missouri Botanical Garden TROPICOS database (<http://mobot.mobot.org/>).

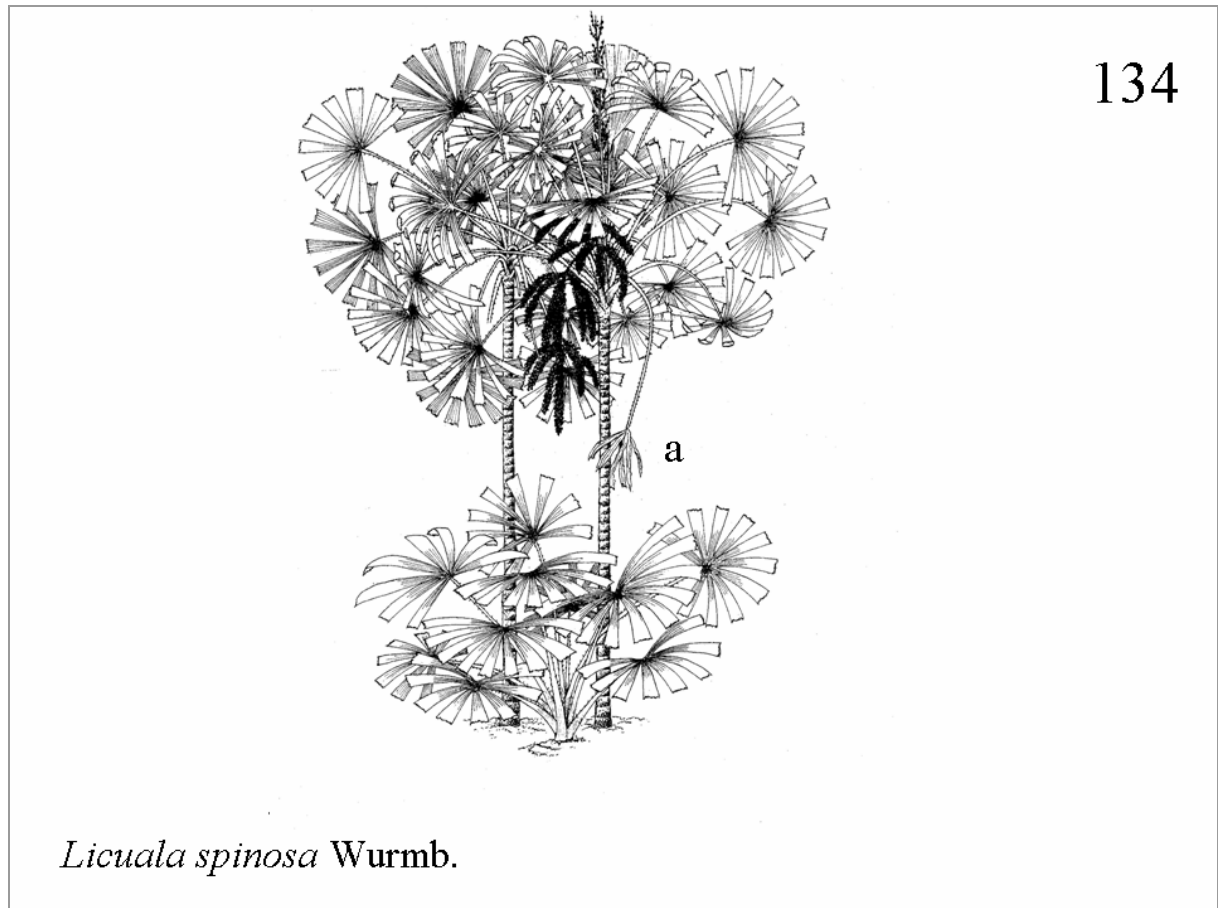


Fig. 134. *Licuala spinosa* Wurmbr. (a) Fruiting palm.

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***Licuala spinosa* Wurm.**

Synonyms : *Licuala horrida*, *Licuala spinosa* Poir., *Licuala spinosa* Thunb., *Licuala spinosa* var. *cochinchinensis* Becc.

Vernacular name(s) : Spiny licuala palm, Mangrove fan palm, Good luck palm (E), Palas, Palas duri (Mal.), Palas – *Palas duri* (Ind.), Kha pho (Thai)

Description : A medium-sized, coarse palm, forming dense, compact (to wide-spreading) clumps with several 7-8 cm thick stems to 4-5(-6) m. Leaves are hand-shaped and have a radius of 45-60 cm; leaflets about 7-8 cm wide, with squared-off ends. The leaf stalks are quite heavily armed with short spines. Flowering stalks occur arching out from the leaf base up to 3(-4) m, usually with 4-5 sprays of 15 cm long spikes. Fruits are round, 10-12 mm diameter, bright orange to reddish, and very showy.

Ecology : Occurs in open, swampy ground and river banks in coastal areas. In Peninsular Malaysia it is found in swampy depressions in open sandy country, especially along the east coast. Also occurs on landward margins of mangroves. Differs markedly from the typical *Licualas* in that it is cold tolerant, and prefers full sun. Mangrove associate species.

Distribution : Southeast Asian species, occurring in Myanmar, Cambodia, Vietnam, Thailand, the Philippines, Malaysia, Singapore, Brunei and Indonesia (Sumatra, Java, Borneo). Cultivated world-wide in the tropics, sub-tropics and temperate regions.

Abundance : Common.

Use(s) : Often cultivated in parks, worldwide. *Licuala* leaves are collected as food wrappers in Malaysia and Indonesia, and a royalty fee used to be paid for this to the Malaysian Forestry Department. The young leaves of *Licuala spinosa* are collected to make *ketupat* (square parcels of woven strips of palm leaf in which rice is boiled and served) for local use. Leaves are sold on local markets for the latter.

Source of illustration : <http://www.pacsoa.org.au/palms/Licuala/spinosa.html>

Reference(s) : Whitmore (1979), Afriastini (1988), Kiew (1989),
<http://www.pacsoa.org.au/palms/Licuala/spinosa.html>.

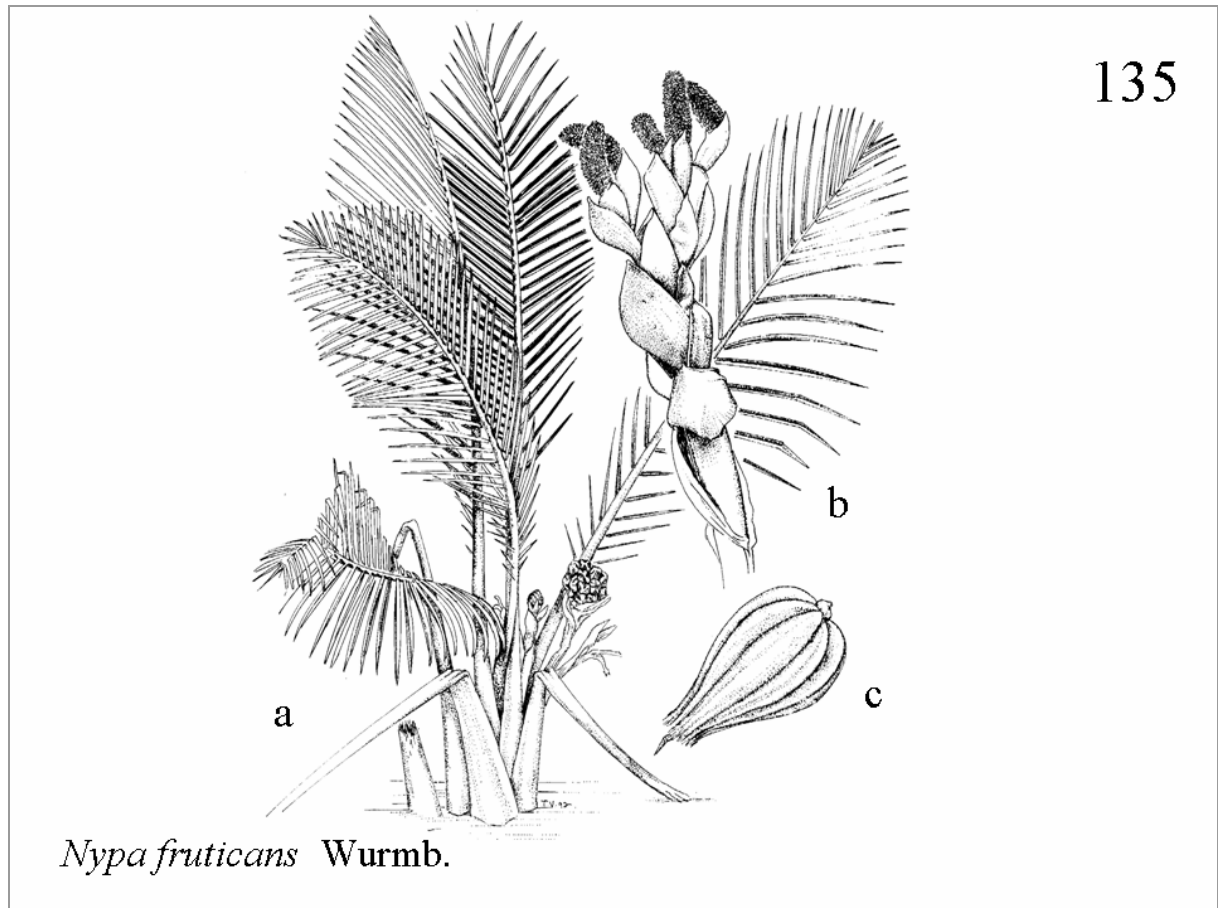


Fig. 135. *Nypa fruticans* Wurm. (a) Habit, with maturing fruit, (b) inflorescence, and (c) individual fruit.

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Nypa fruticans Wurm.

Synonyms : *Cocos nypa* Lour., *Nypa fruticans* Thunb.

Vernacular name(s) : Nypa (E), Nipah (Mal.), Nipah, Tangkal Daon, Buyuk, Bhunjok, Lipa (Ind.), Chaak (Thai.), Apung (Bru.), Nipa, Sapsap, Sasa (Phil.), Dúa nu'ó'c (Viet.), Chaak, Chak (Thai.), Chark (Camb.)

Description : Clump-forming, stemless palm with underground, robust, forking stems that root from the lower surface. The leaves are erect, slightly recurved, 4-9 m long. The stout leaf stalk is 1-1.4 m long and strongly flanged at the base. There are 100-120 leaflets per leaf, each 60-130 by 5-8 cm, with a shiny-green upper surface and a somewhat powdery lower surface. The midrib is regularly marked by linear, brown scales that are up to 2 cm long. The bisexual flower clusters sprout from near the top of the stem on a 1-2 m-long stalk. The female flowers form a spherical head, 25-30 cm in diameter. The bright yellow male flowers are catkins, located below the female head of flowers. The fruiting body is spherical, 45 cm in diameter; the individual brown fruits are obovate, angular and fibrous, 10-15 by 5-8 cm. There is one 4-5 cm white, egg-shaped seed per fruit. *Nypa* pollen has been found dating from the upper Cretaceous period, 65-70 million years ago. *Nypa* has been well represented in the Australian flora since the early Tertiary period. Monotypic genus.

Ecology : Occurs on soft, fine-grained substrates fringing the upper limits of tidal waterways. A perennial (high) input of freshwater is required. Rarely occurs beyond the littoral zone. It usually occurs in pure stands. *Nypa* has a massive, dense root system that is better adapted to resist swift running water than are most other mangrove species. Its pollen is sticky and pollination appears to occur via *Drosophila* flies. Fruits are fibrous and air cavities in the seed coat and fruit coat aid water dispersal, during which time the seedling sprouts. Occasionally the plant is viviparous. True mangrove species.

Distribution : Found from Sri Lanka and the Bay of Bengal eastwards to northeast Australia and the Western Pacific (Solomon Islands, Marianas). Found throughout Southeast Asia.

Abundance : Common, locally very common.

Use(s) : A sweet syrup can be extracted from the stem in large quantities if the flowers are removed at the proper time. It is used in the production of alcohol (including 'toddy'), sugar and vinegar, and is planted for this purpose (e.g. West Borneo). If well-managed, sugar production is higher than that of sugar cane or beet, and the sugar has a higher sucrose content. Fronds are used for thatch, umbrellas, hats, mats, baskets and cigarette papers. The seed is edible. After preparation, leaf steam fibres are used to produce rope, brooms and brushes.

Source of illustration : Adapted from photograph by Polunin (1988) and live material.

Reference(s) : Backer & Bakhuizen van den Brink (1963-8), Percival & Womersley (1975), Whitmore (1979), Wightman (1989), Aksornkoae (1993), Yao (2000), Marschke (2000) <http://www.fao.org/DOCREP/005/AB598E/AB598E23.htm>.

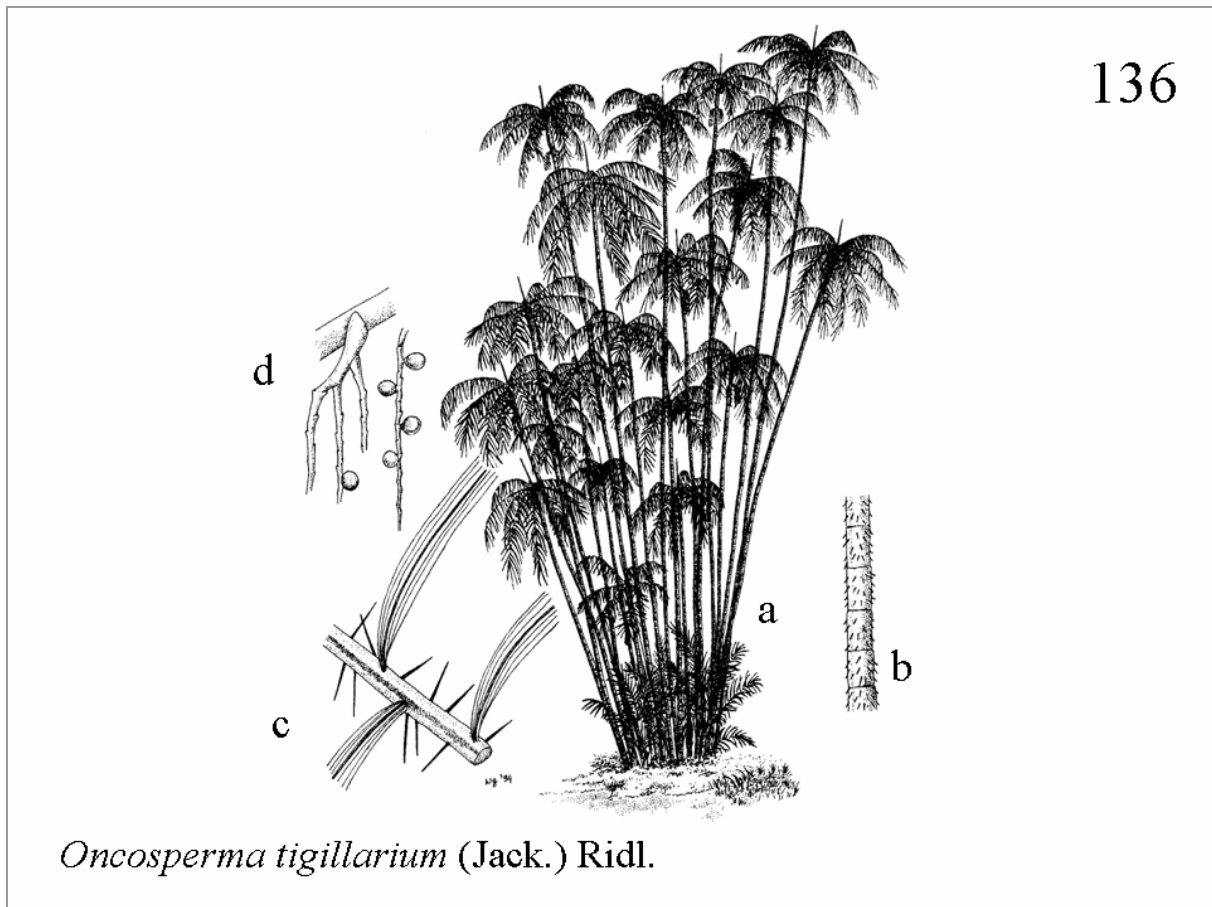


Fig. 136. *Oncosperma tigillarum* (Jack.) Ridl. (a) Small grove of palms, (b) detail of trunk, showing spines, (c) detail of spines and leaflets along leaf axis, and (d) inflorescence with fruit.

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***Oncosperma tigillarium* (Jack.) Ridl.**

Synonyms : *Areca tigillaria* Jack., *Oncosperma filamentosa* Blume, *Oncosperma filamentosum* Blume, *Oncospermum tigillaria* (Jack.) Ridl..

Vernacular name(s) : Nikong, Nibung (Mal.), Nibung, Libung, Nibong (Ind.), Lao cha own, Lao cha on (Thai), Nhum (Viet.)

Description : Erect, often several-stemmed, very spiny, 9-25 m tall palm forming clumps of up to 7 m across. Stem has 2.5-6.5 (or more) cm long, sharp thorns between the scars left by the leaf stalks. Stem 10-15(-25) cm diameter. The leaf stalk is brown-scaly and very thorny. The leaf blade is 180-360 cm long. Leaflets are initially densely covered with scales, and strongly drooping. They are pointed, many-nerved, measure 60-105 cm by 2-3 cm, and have a midrib that does not have spines. Flower clusters are bisexual and located below the leaf-crown, 30-60 cm long, and simply branched. The flower stalk is flattened and 11-22 cm long. The lower, lateral branchlets of the flower cluster bear 2-3 groups of flowers, the others bear one group of flowers each. Flower groups are up to 40 cm long, and the males are thicker and shorter than the females. Male flowers are yellow, with united calyx lobes that are about 3 mm long; individual lobes are ovate to heart-shaped, with a short point and a keel. Petals are free, oblong, pointed and about 8-10 mm long. There are 6 stamens, about 5 mm long. In female flowers, both petals and sepals are almost round, while the corolla is slightly larger than the calyx, measuring about 3-4 mm. Fruit is round, with a remnant of the style occurring on the middle. Fruit is at first dark green, later becoming very dark purple, about 1 cm in diameter. The slightly greyish leaves give the palm a silvery appearance.

Ecology : Occurs exclusively near the sea-shore, often on the landward margin of mangroves, in the transition zone between mangroves and freshwater swamp forest. Mangrove associate species. Hollow stems are often inhabited by small bat species. Mangrove associate species.

Distribution : Southeast Asian species, found in Cambodia, Thailand, Malaysia, Singapore, the Philippines, Brunei and Indonesia (Sumatra, Borneo, Java).

Abundance : Often locally abundant; occasionally (semi-)cultivated.

Use(s) : *Nibung* is an economically very important plant. The timber is hard and resistant to sea water, wood borers and termites. It is often in coastal construction, including the stakes of large traps (*bagan* in Indonesia and Malaysia) and the poles supporting stilted coastal villages (*kampung laut* in Indonesia and Malaysia). Split into strips it is used for flooring. The tall clumps of splaying trunks with their fine, feathery crowns make *Nibung* a desirable ornamental for a large park. Such clumps may be seen in the Botanical Garden (*Kebun Raya*) in Bogor. Occasionally cultivated.

Source of illustration : Whitmore (1973) and live specimens in the Bogor Botanical Garden

References : Backer & Bakhuizen van den Brink (1963-8), Whitmore (1973), Aksornkoae (1993), http://www.panda.org/about_wwf/where_we_work/ecoregions/global200/pages/regions/region035.htm.

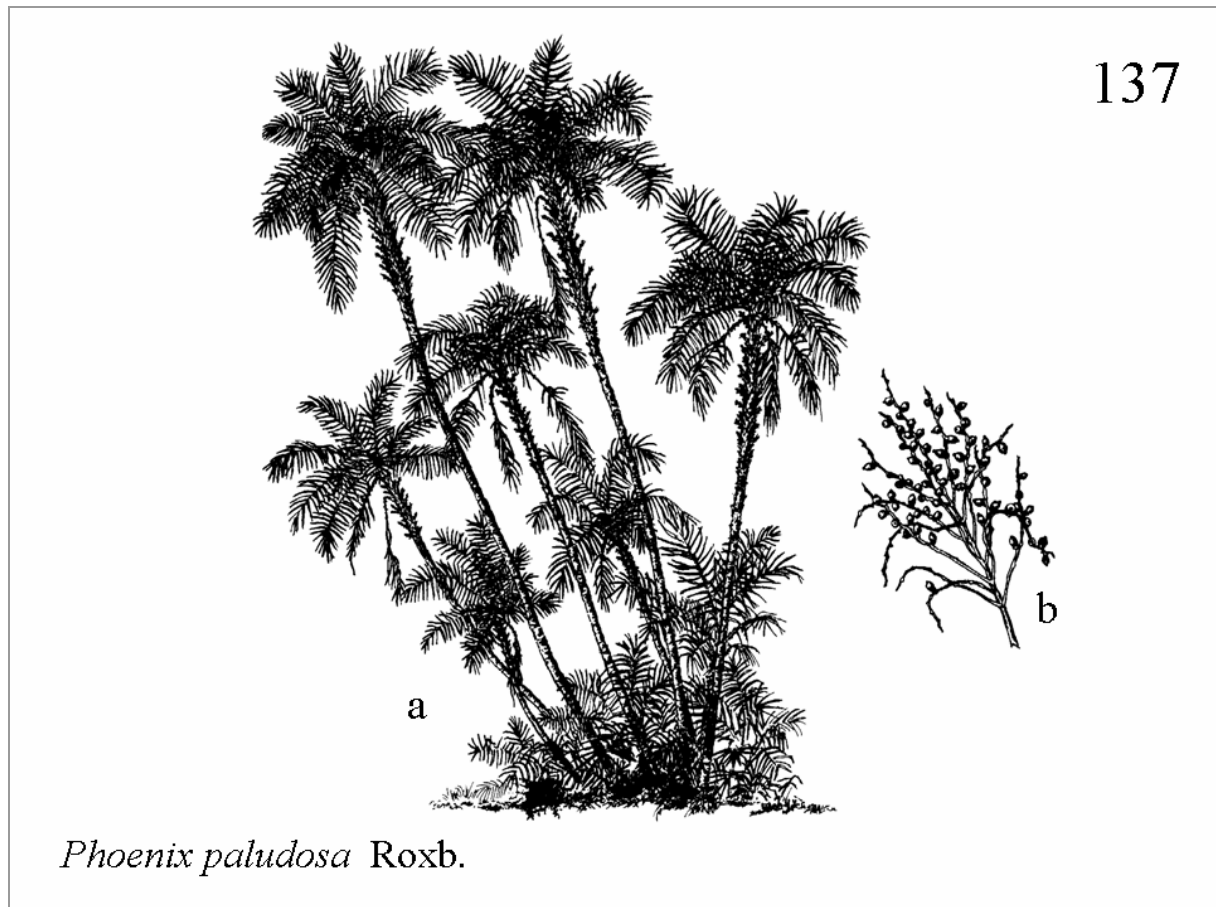


Fig. 137. *Phoenix paludosa* Roxb. (a) Small grove of palms, and (b) inflorescence with fruit.

ARECACEAE

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***Phoenix paludosa* Roxb.**

Synonyms : Unknown.

Vernacular name(s) : Mangrove Date Palm (E), Dangsa, Korma Paya (Mal.), Dangsa, Korma Rawa (Ind.), Peng, Peng tha le (Thai), Chà là (Viet.), Peng (Camb.)

Description : Palm, up to 6 m tall, but often much shorter. The slender, grey stems have persistent spiny leaf stalks, fibrous leaf sheaths and diamond-shaped leaf scars. The numerous bright green, sometimes yellowish leaves persist near the top of the stem and are pale grey underneath. The leaves curve slightly, are inserted on the trunk so that they point upward, and are rather short, measuring up to 150 by 45 cm. The stiff leaflets are directed towards the end of the leaf, but their tips droop. *Phoenix paludosa* is unisexual, i.e. each specimen has either male or female flowers. The unisexual flower cluster looks like a stiff brush, and is located between the leaves on an erect stalk of 60 cm. Numerous clustered, slender, straight groups of flowers occur; they are aimed upward at a slight angle. The orange berries are oval, and about 1 cm long. The seeds have a lateral embryo, unique in *Phoenix*.

Ecology : Occurs on the landward margin of mangroves, forming extensive, dense, leafy clumps with stems of all heights. Also growing as rosettes in open places. At first sight the mangrove is a surprising place to find a species of a genus normally associated with dry climates (e.g. Date Palm). However, the characteristics that the habitats have in common is that water is not freely available to plant roots. Mangrove associate species.

Distribution : East Africa (Zanzibar), India (Ganges delta), Andaman Islands, Myanmar, Vietnam, Cambodia, Thailand, Malaysia (Peninsular) and Indonesia (Sumatra).

Abundance : Locally common, but listed as rare in Indonesia (Mogea *et al.*, 2001).

Use(s) : Palm cabbage and fruits are eaten. Leaves are used for temporary fencing.

Source of illustration : Sastrapradja *et al.* (1978).

Reference(s) : Burkill (1935), Backer & Bakhuizen van den Brink (1963-8), Whitmore (1973), Tomlinson (1986), Said (1990), Aksornkoae (1993), Marschke (2000)
<http://www.forestry.gov.my/isu300.html>,
<http://gmr.landfood.unimelb.edu.au/Plantnames/Sorting/Phoenix.html>
http://www.wetlands.org/RDB/Ramsar_Dir/Cambodia/KH002D02.htm.

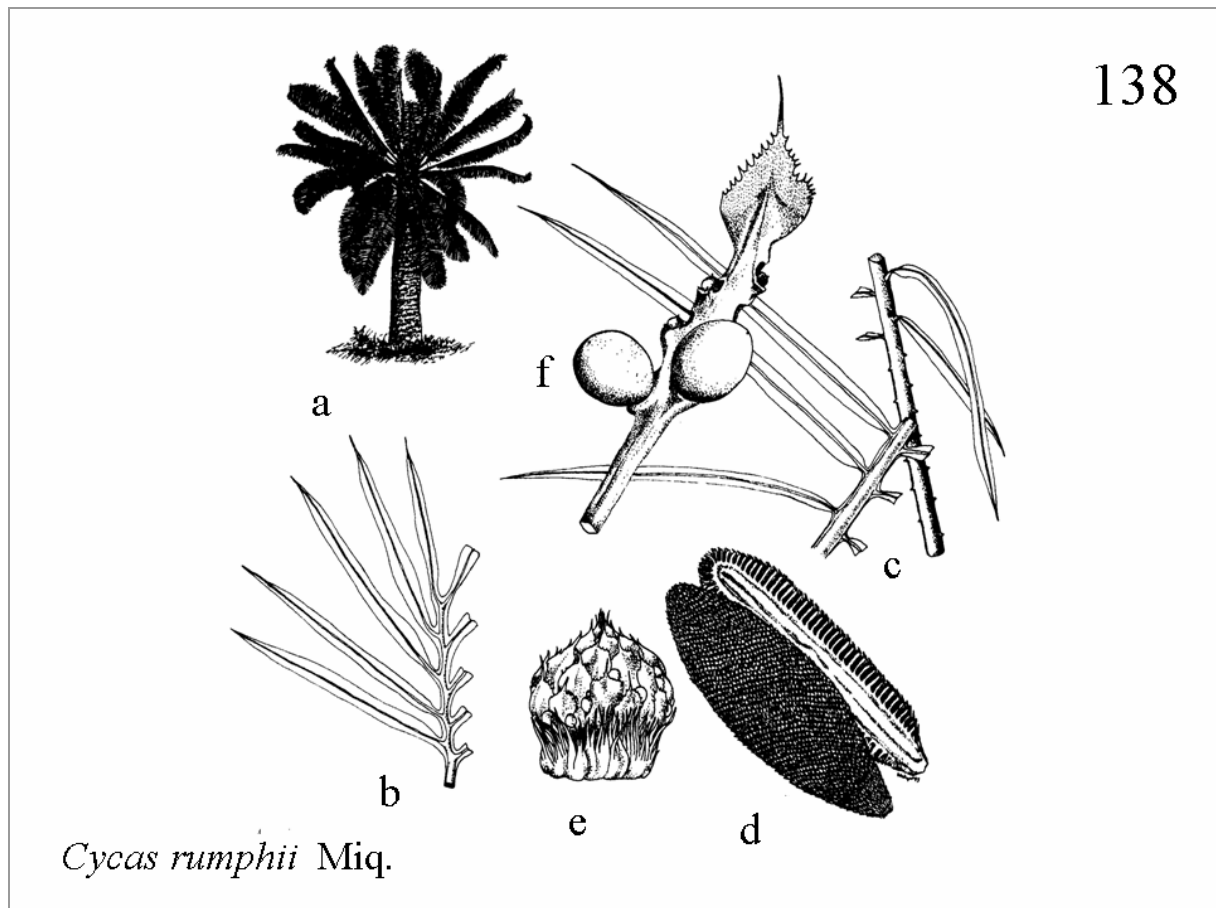


Fig. 138. *Cycas rumphii* Miq. (a) Habit, (b, c) detail of leaf, (d) male cone, (e) female cone, and (f) 2 fruit on stem.

CYCADACEAE

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Cycas rumphii Miq.

Synonyms : *Cycas celebica* Miq., *Cycas circinalis* L., *Cycas corsoniana* D. Don., *Cycas recurvata* Blume ex J. Schuster, *Cycas sundaica* Miq. ex J. Schuster, *Olus calappoides* Rumph., *Zamia corsoniana* G. Don.

Vernacular name(s) : Queen sago, Sea cycad, Bread palm (E), Paku laut, Paku gajah, Paku haji (Mal.), Pakis Haji, Pakis Laut, Pakis Gajah, Pakis Raja, Pakis Dongol, Patuku, Ukayu Datu, Papa Blung, Gogopoa, Siba-siba, Sayur Kelapa – *Paku haji* (Ind.), Pitogo, Bait, Sauang (Phil.), Mong-tain (Myan.), Prong, Prong-tha-le, Maphrao-sida (Thai.), Thien tue (Viet.)

Description : Gum-containing palm-like or tree fern-like tree, up to 6(-7) m tall. It has a well-developed, mostly not branching stem that is armed with the semi-persistent remains of the leaf stalks. The leathery leaves are once-divided into leaflets, developing in groups. Leaves are arranged in a dense terminal whorl, up to 2.5 m long, with 50-150 pairs of leaflets. The leaf bundles alternate with groups of scales. The leaf stalk is spiny, and middle leaflets are 20-35 cm long. The bright yellow, strongly smelling clusters of female flowers measure 30-70 by 12-17 cm, and are stemless, occurring on the end of the leafy stem. These female flowers have numerous large spore-bearers that are densely hairy and have 2-4 ovules. Normal leaves develop above the female flowers. Male flowers are cone-like. Seeds are borne on the edges of a flattened organ, and are ellipsoid, orange-brown, and measure 4-6 by 3-5 cm.

Ecology : Occurs on the landward margins of mangrove swamps, but also far inland on dry places in the hills, up to altitudes of 450 m, but usually below 100 m asl.. In the littoral forests it is often an inhabitant of rocky shores rather than mangrove. Flowering occurs all year round. The seeds float and are carried long distances by ocean currents. Mangrove associate species.

Distribution : From India and Sri Lanka through Southeast Asia to Micronesia. In Southeast Asian recorded from Myanmar, Vietnam (endangered), the Philippines, Thailand, Malaysia (Peninsular, Sarawak, Sabah), Indonesia (Sumatra, Java, Sulawesi, South Borneo, Moluccas, Papua, Lesser Sundas), East Timor and Papua New Guinea. Cultivated.

Abundance : Uncommon, but may be locally fairly common. Listed as threatened in parts of its range (e.g. Vietnam), due to over-exploitation (collection in wild) and habitat changes.

Use(s) : Ornamental tree in gardens and cemeteries. The seeds are edible, after a special treatment, as fresh seeds are poisonous. Young leaves are eaten as vegetable (*sayur lodeh* in Indonesia) or salad (*lalab*). A kind of sago can be prepared from the trunk. A poultice of seeds or bark is used to cure ulcers and other skin complaints. Latex of the leaf stalks was used in colonial times as a glue to repair pottery and glassware. Stem latex is used in the treatment of abscesses, and for detoxification.

Source of illustration : Ochse & Bakhuizen van den Brink (1977).

Reference(s) : Heyne (1950), Watson (1928), Backer & Bakhuizen van den Brink (1963-8), Sastrapradja *et al.* (1980), Afriastini (1988), Verheij & Coronel (1992), Aksornkoae (1993), <http://plantnet.rbgsyd.gov.au/cgi-bin/taxon.pl?name=Cycas+rumphii>; <http://ratree.psu.ac.th/~bnoparat/MANGROVE.html>.

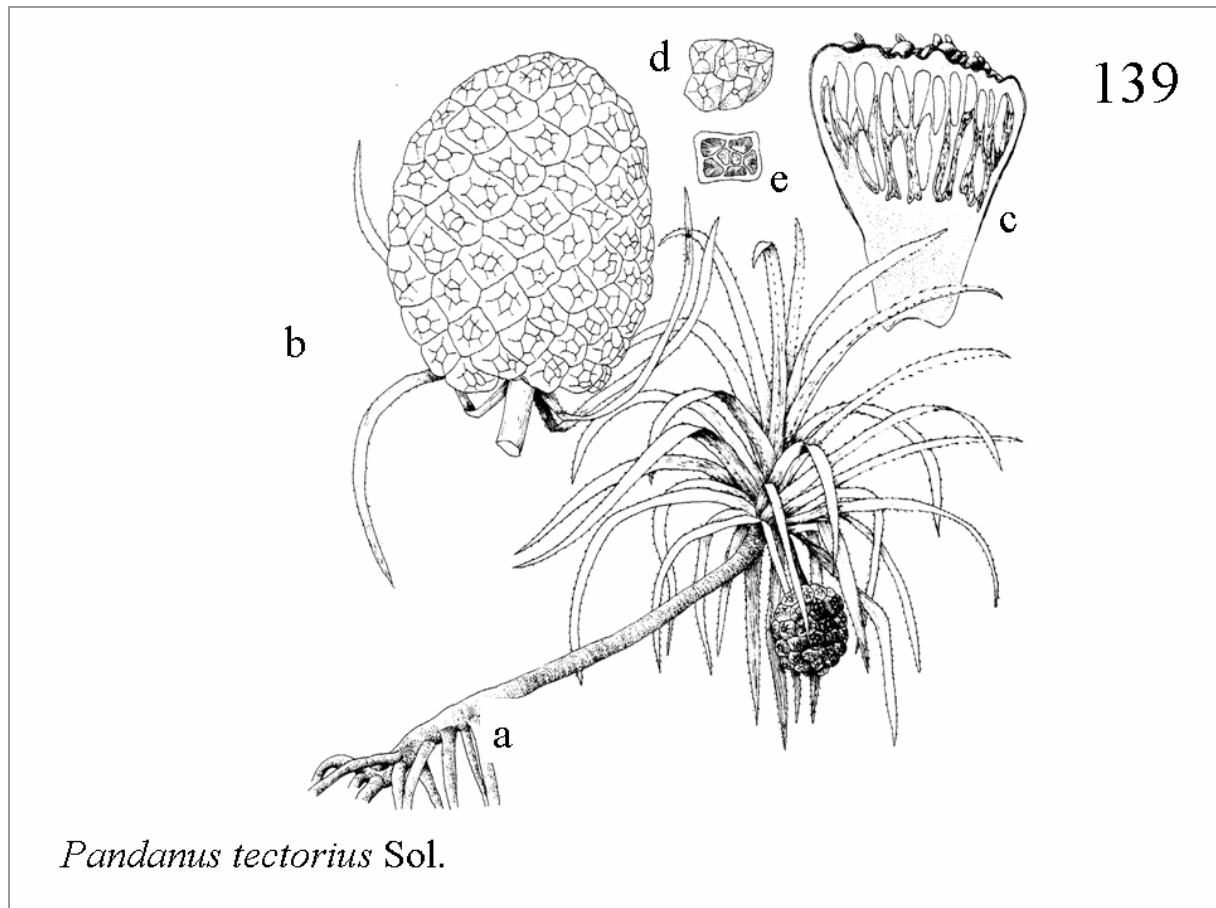


Fig. 139. *Pandanus tectorius* Sol. (a) Habit, (b) fruit cluster, (c) individual fruit (longitudinal section), (d) fruit, seen from above, and (e) cross-section of fruit.

PANDANACEAE

139

***Pandanus tectorius* Sol.**

Synonym(s) : *Pandanus fascicularis*, *Pandanus foetidus*, *Pandanus inermis* Reinw., *Pandanus laevis* Kunth., *Pandanus littoralis* Jungh., *Pandanus moschatus* Miq., *Pandanus odoratissimus* Park., *Pandanus odoratus* Salisb., *Pandanus odorifer* (Forssk.) Kuntze, *Pandanus versus*, *Marquartia leucacantha*

Vernacular name(s) : Common Sea-shore Screwpine (E), Pandan laut (Mal.), Pandan nipah, Mengkuang – *Pandan pudak* (Ind.), Rhumjeik-samot (Camb.), Toei thale (Thai)

Description : A gregarious shrub or small tree, widely branching, sometimes with several trunks, often with stilt roots around the stem, and aerial roots emerging from the branches; 3-7 m tall. Stilt roots with 'warts' and conspicuously large root 'caps'. Leaves long and strap-like, 70-250 cm by 3-9 cm, with a triangular, pointed tip, arranged in close spirals, spiny along the edges and midrib; usually bluish-green, occasionally pale green or variegated. Male flower heads arranged singularly, in a pendulous 'cone', 25-60 cm long, with 10-20 branched side-branches; stamens arranged in bunches on short side-branches; leaflets around the male flowers are linear-lanceolate, keeled, yellowish-white, and emit a pleasant odour. Female flower heads also singularly arranged, with 5-18 styles; fruit pendulous and rounded, each fruit egg-shaped, 4-7.5 by 2-6.5 cm, turning orange-yellow. As many as 28 varieties have been described (Heyne, 1950), some of the more common ones being *Pandanus tectorius* var. *littoralis*, var. *borneensis*, var. *javanicus*, var. *timorensis* and var. *sumbavensis*.

Ecology : Occurs along beaches and occasionally on margins of mangroves, but also inland, up to an altitude of 800 m. The latter is due to planting. Probably the most widespread *Pandanus* species. Mangrove associate species.

Distribution : Pantropical, found throughout Southeast Asia.

Abundance : Common.

Use(s) : Used for weaving mats, hats and baskets, often cultivated for this purpose. Fruit is edible. Leaves yield a strong fibre which is used for making rope. The tender leaves are eaten, raw or cooked. Scented water is prepared from the male flowers. Male flowers also used to scent clothes, and to prepare scented oils. Leaves used for weaving hats and mats. The sharp serrated leaves of the plant can cause lacerations. Male flowers may also be used to adorn the hair. The outer part of the flower and the blossoms yield an essential oil. The flowers and leaves can cause dermatitis to cooks and florists.

Source of illustration : Based on Backer (1920) and Polunin (1988).

<http://www.bogos.uni-osnabrueck.de/expo/alle/Pandanus%20tectorius.htm>

http://www.botany.hawaii.edu/faculty/carr/images/pan_tec_fr.jpg

Reference(s) : Backer (1920), Heyne (1950), van Steenis *et al.* (1951), Afristini (1984), Polunin (1988), Heywood (1993), Khan & Alam (1996),

<http://bodd.cf.ac.uk/BotDermFolder/BotDermP/PAND.html>

