

WAGENINGEN AGRICULTURAL UNIVERSITY PAPERS
98-3 (1999)

Series of Revisions of Apocynaceae XLVII

The genus *Cerbera* L.

by

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Date of publication: 31 January 1999



The Netherlands 1999

952/90

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ISBN 90-5782-019-6

NUGI 823

ISSN 0169-345X

Distribution: Backhuys Publishers, P.O. Box 321, 2300 AH Leiden,
The Netherlands.

Telephone: +31-71-5170208

Fax: +31-71-5171856

E-mail: backhuys@euronet.nl

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Printed in The Netherlands

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The genus *Cerbera* L.

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Abstract

The genus *Cerbera* is monographed in this paper. It counts 6 species and can be found in Pemba, Tanzania, and Madagascar in the West to Pitcairn Island in the East, and from Okinawa Island, Japan, to Southern Queensland, Australia. *C. laeta* has been described as new to science, 3 names were reduced to synonymy and 30 binomials are listed as species or synonyms in other genera.

Introduction

The present publication is based on the study of herbarium material including the types of almost all names and synonyms, and living material of 2 of the 6 species maintained here. As it is not possible to recognize vegetative or fruiting material to the species, the author had to leave relatively many specimens unnamed, when more than one species is represented in a certain area. Flowering material is required to determine the plants with certainty. All species have beautiful flowers and are of horticultural interest. Cultivars have not yet been distinguished in *Cerbera*. As far as is known all species are highly poisonous.

Geographical distribution

Cerbera manghas is the most widespread species of the genus. It occurs from Pemba, an island belonging to Tanzania, and Madagascar in the West to Pitcairn Island in the East and from Okinawa Islands, Japan, to Southern Queensland, Australia, in the South.

The second is *C. odollam*, known from India and the Mariana Islands East to Sulawesi, Indonesia. The third, *C. floribunda*, occurs from Maluku, Indonesia, in the West to the Solomon Islands in the East. *C. inflata* is represented in the montane forests of Papua New Guinea and Queensland. *C. dunicola* inhabits dry vegetations of Southern Queensland. The last species, *C. laeta*, is a recent discovery from Papua New Guinea.

C. manghas and *C. odollam* occur along sea coasts, as well as inland. *C. manghas* has even been found at an altitude of 1100 m in Fiji, Viti Levu. *Cerbera* fruits have a strong fibrous mesocarp, which keeps them floating in the sea. Therefore the latter two species are known from many islands. Their area of distribution therefore must have been shaped by sea currents. *C. manghas* is found on the Palau (= Belau) Islands and south and east of it, as far as Pitcairn Island, while *C. odollam* is the only *Cerbera* species known from the relatively close Guam and Mariana Islands north of it.

Relationship to other genera

The genus *Cerbera* belongs to the tribe *Cerbereae* of the subfamily *Plumerioideae* of the Apocynaceae. It has drupaceous fruits and alternate leaves as most genera of this tribe. It has the strongest resemblance with *Cerberiopsis*, because of the narrowly obovate or elliptic leaves and the sepals which do not clasp the corolla base. However, *Cerberiopsis* has samaroid instead of ellipsoid drupes and persistent instead of deciduous sepals. Moreover, *Cerberiopsis* is hapaxanthic and *Cerbera* is surviving its flowering and fruiting periods.

C. manghas has lanate scales above the anthers exactly like those of *Thevetia*, as has been clearly figured by Gensel in his manuscript monograph of the genus. These scales occupy a perfectly similar position, as each scale covers an anther. Such scales do not exist in other *Cerbera* species.

Taxonomic part

Cerbera L., Sp. Pl. 208 (1753); Markgraf, Fl. Mad. fam. 169 — Apoc.: 156 (1976). — Type species: *C. manghas* L.

Homotypic synonyms: *Odollam* Adanson, Fam. Pl. 2: 171 (1763).
Odollamia Rafin., Sylva Tellur. 162 (1838). *Elcana* Blanco, Fl.
Filip. ed 2: 584 (1845).

Heterotypic synonym: *Tanghinia* Thou., Gen. Nov. Madag. 10
(1806). — Type species: *T. venenifera* Poir. (= *C. venenifera*
(Poir.) Steud. = *C. manghas* L.).

Shrubs or trees with much white latex in all parts, glabrous all over, except for the corolla inside; model of Leeuwenberg. Bark pale or dark grey, grey-brown or brown, thick; wood soft. Branches dark brown when dried, with many conspicuous leaf scars; branchlets terete. *Leaves* spirally arranged, often confined to the apices of the branchlets, petiolate; blade subcoriaceous or coriaceous when fresh, subcoriaceous or papery and often brittle when dried, narrowly or very narrowly obovate or elliptic, acuminate to retuse at the apex, cuneate at the base or decurrent into the petiole, with 8–30 pairs of rather straight or upcurved secondary veins forming an angle of 50–90° with the costa; tertiary venation reticulate, often inconspicuous. *Inflorescence* terminal or in the forks, rather large, pedunculate, congested when young, rather lax later and then mostly still more or less congested in last branchings. Peduncle rather long; pedicels usually short. Bracts like the sepals and about the same size or somewhat larger. *Flowers* fragrant, open during the day in most species, during the night in *C. floribunda*. *Sepals* mostly pale green, free or nearly so, imbricate, spreading or recurved, equal or unequal, ovate, elliptic or obovate, or narrowly to very narrowly so, acuminate to obtuse, without colleters. *Corolla* mostly essentially white, usually pink or less often yellow, orange or red at the throat (or entirely white), pubescent or puberulous at the mouth and often also at the base of the lobes, glabrous or hairy below; tube funnel-shaped or nearly so; lobes obliquely ovate to obovate and rounded at the apex or dolabriform and with an acuminate and a rounded apex or two rounded apices; 5 scales a short distance above the anthers in *C. manghas*. *Stamens* included; anthers sessile or nearly so (*C. laeta*), subglobose and laterally compressed, or elliptic or ovate, mostly cordate. *Pistil* with apex at the level of the anthers, glabrous; ovary subglobose, often laterally compressed, of 2 separate carpels each containing probably only 2 ovules, mostly abruptly narrowed into the style; pistil head like a cake or a scone, of 2–3 parts; basal part 5-ridged or absent, a ring-shaped veil or a ring and a blunt bilobed

cone. *Fruit* often red, purplish-red or blue when ripe, otherwise pale green, of 2 (or by abortion 1) mostly separate ellipsoid or subglobose drupaceous mericarps; mesocarp of strong fibres; endocarp hard. Seeds 1—2 in each mericarp, flat.

The genus is now considered to include 6 species from Pemba (Tanzania) and Madagascar in the West to Pitcairn Islands in the East, and from southern Japan, Ryukyu Islands, in the North to northern Australia, Queensland, in the South.

Key to the species

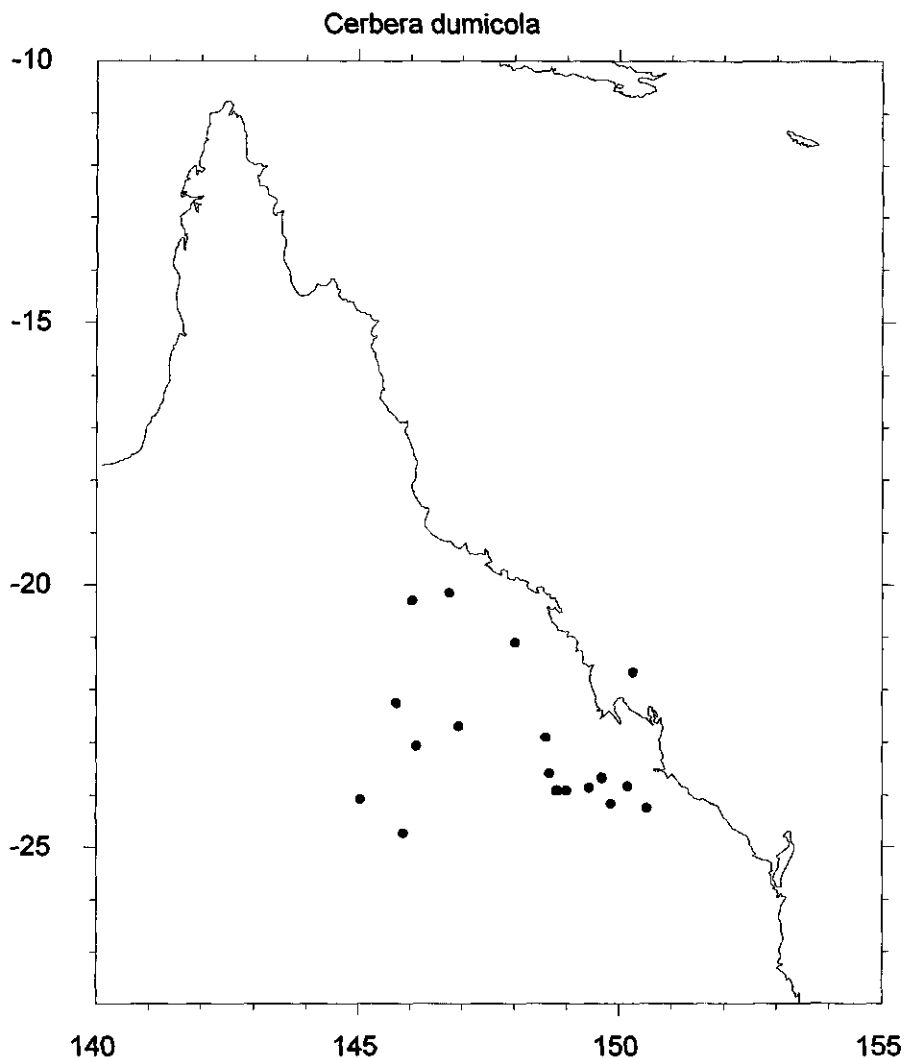
Open flowers, or else mature or almost mature buds are indispensable for determination. Fruiting specimens can only exceptionally be named. When only a single species is represented in an area fruiting specimens can be named. E.g. *C. odollam* is the only species known from India, Sri Lanka, Myanmar and the Mariana Islands including Guam. *C. manghas* the only species from Africa, Madagascar, China, Japan and the Pacific east of the Solomon Islands.

1. Corolla tube infundibuliform, not or slightly narrowed at the mouth; stamens with apex 0—2.5 mm below mouth of corolla tube2
 Corolla tube almost cylindrical, clearly narrowed at the throat; stamens with apex at least 3 mm below mouth of corolla tube4
2. Corolla tube densely hairy inside, 10—13 mm long; fruit ovoid to globose, 5.5 x 4 x 4 cm; leaves often sinuate or sinuately lobed. Southern Queensland1. ***C. dunicola***
 Corolla when at least 17 mm long densely hairy inside, otherwise glabrous, 12—55 mm long; fruit usually ellipsoid and more than 1.5 x as long as wide and more than 5.5 cm long; leaves entire....
 3
3. Corolla with 5 lanate scales at the mouth; sepals 1.2—12 x as long as wide, (4—)8—37 x 2—8 mm, usually acute or acuminate; corolla tube 17—55 mm long, narrowly infundibuliform, hairy inside in specimens collected in the area where *C. inflata* occurs***C. manghas***
 Corolla entirely glabrous inside; sepals 1.1—3 x as long as wide, 4—8 x 2—7 mm, rounded or obtuse; corolla tube 12—30 mm

- long, amply infundibuliform and slightly narrowed from the insertion of the stamens, glabrous inside. New Guinea and Queensland.....**3. C. inflata**
4. Stamens inserted 0.17–0.2 of the length of the corolla tube, which is 29–33 mm long and clearly widened just above the base; sepals 4 x 3 mm.....**4. C. laeta**
Stamens inserted 0.4–0.62 of the length of the corolla tube, which is 8–25 mm long and inflated 0.3–0.6 of the length from the base.....**5**
5. Corolla glabrous inside; tube 8–20 mm long; sepals 4–14 x 2–8 mm; inflorescence very many-flowered, several flowers open at a time and bracts usually not covering the sepals when flowers are almost open. Anthesis complete during the night. Micronesia and Eastern Maluku to Solomon Islands.....**2. C. floribunda**
Corolla puberulous inside at the mouth and often also on the base of the lobes; tube 15–25 mm long; sepals 6–19 x 2.5–5 mm; inflorescence few- to many-flowered, one flower open at a time and bracts often covering sepals when flowers are almost open. Anthesis complete during the day. India to Sulawesi and Mariana Islands, but not in China or Japan.....**6. C. odollam**

1. *Cerbera dunicola* P.I. Forster in *Austrobaileya* 3: 578, fig. 1 C, H, I (1992). — Type: Australia, Queensland, Port Curtis District, Howard Point, Middle Percy Island, 55 km NE of Arthur Point, Shoalwater Bay, *Batianoff et al.* 11705B (holotype BRI, not seen; isotype MEL). Map 1, p. 10

Shrub or small tree 1.50–5 m high. Bark light green, longitudinally fissured, later often somewhat scaly; sapwood and wood white. *Leaves*: petiole 5–15 mm long; blade narrowly elliptic, 2–6 x as long as wide, 5–17 x 1.5–6 cm, rounded to acuminate at the apex, cuneate at the base, entire, sinuate or sinuately lobed, with 15–50 pairs of rather straight secondary veins forming an angle of 45–90° with the costa; tertiary venation reticulate and conspicuous on both sides in dried leaves. *Inflorescence* 3–5 x 3–5 cm, c. 10-flowered, congested. Peduncle 5–50 mm long; pedicels 3–5 mm long. Bracts about the same size as the sepals. *Flowers* sweet-scented. *Sepals* pale green(?), equal or subequal, ovate



Map 1. *Cerbera dumicola*.

or elliptic, 2–2.5 x as long as wide, 8–9 x 3.5–6 mm, rounded at the apex. *Corolla* entirely white, about 15 mm long in the mature bud and forming a broadly ovoid head about one third of the bud length, with 5 lanate scales and lanate inside at the mouth, and with stiff hairs directed downwards from the insertion of the stamens to the base; tube 1–1.1 x as long as the sepals, 1.1–1.4 x as long as the lobes, 10–13 mm long, funnel-shaped, 1.8–2.2 mm wide at

the base, widened 0.7 of the length from the base which is at 7–9 mm, into a cone 5 mm wide just below the mouth and slightly contracted at the mouth; lobes obliquely ovate to obovate, 0.7–0.9 x as long as the tube, 1.5–1.6 x as long as wide, 8–9 x 4.5–6 mm, rounded. *Stamens* with apex 1 mm below mouth of corolla tube, inserted at 0.8 of the length of the corolla tube, at 8–11 mm from the base (= 2 mm below the mouth); anthers subglobose or ellipsoid, laterally compressed, 1–1.2 x 0.6–1 x 0.5 mm, with a 2 mm long mucro. *Pistil* with apex at the level of the anthers; ovary subglobose, 2 mm long; pistil head of 3 parts, a basal obconical part 0.9 x 2 mm, an undulate ring 0.1 x 2 mm and a stigmoid apex 1 x 2 mm. *Fruit*: mericarps subglobose to ovoid, 5.5 x 4 x 4 cm.

DISTRIBUTION: Australia (Southern Queensland).

ECOLOGY: Woodland or light forest with *Eucalyptus*. Alt. 0–450 m.

SPECIMENS EXAMINED:

Australia. Queensland: North Kennedy District, 8 km W of 'Windsor' Homestead, *Thompson & Sharpe* CHA 212 (BRI); 15 km SW of Ravenswood, *Thompson & Dillewaard* 488 (BRI). South Kennedy District, Gorge Creek, Redcliffe Tableland, *Fensham* 507 (BRI); 8 km N of Sringvale HS, *Thompson & Figg* GAL 178 (BRI); 5 km NE of Blairgowrie Homestead, *Thompson* JER 46 (BRI). Port Curtis District, West Bay, Middle Percy Island, *Battianoff et al.* 11627 (BISH, BRI); Howard Point, *Battianoff et al.* 11705 (MEL, type); 5 km N of Wowan, Banana Shire, *Gillespie* 4837 (BRI); 16 km NNE of Biloela, *Thompson & Price* BIL 233 (BRI). Leichardt District, Gogango Shire, Fleetwood Parish, *Heppell* 9 Dec. 1983 (BRI); German Creek, *Thompson* 6 Jan. 1993 (BRI); Duaringa, *Blake* 15360 (BRI); *ibid.*, *Murray* Oct. 1943 (BRI); *ibid.*, *C.T. White* 12460 (BRI); km 14 Cormet- Duaringa Road, *P.I. Forster & Bean* 15025 (BRI); 7 km W of Duaringa, *Anderson* 4859 (BRI); Blackwater, *Flowers* 24 June 1942 (BRI); South Blackwater Mine, Laleham, *Thompson* 18 Dec. 1985 (BRI); below Blackdown Tableland, *Williams* 10 Nov. 1975 (BRI); near Dingo, *Stephens & Dowling* DIN 48 (BRI); Baralaba, *Maclean* 18 Feb. 1943 (BRI) and 16 Nov. 1943 (BRI). Mitchell District, Blackall-Tambo Shire, *Roche* 19 July 1990 (BRI); Enskillen Range, *Beeston* 1430C (BRI); between Mt Dawson and Mackenzie, Anonym. MEL 1515808 (MEL). Not localized, near Stanwell, *O'Shanesy* 1829 (MEL).

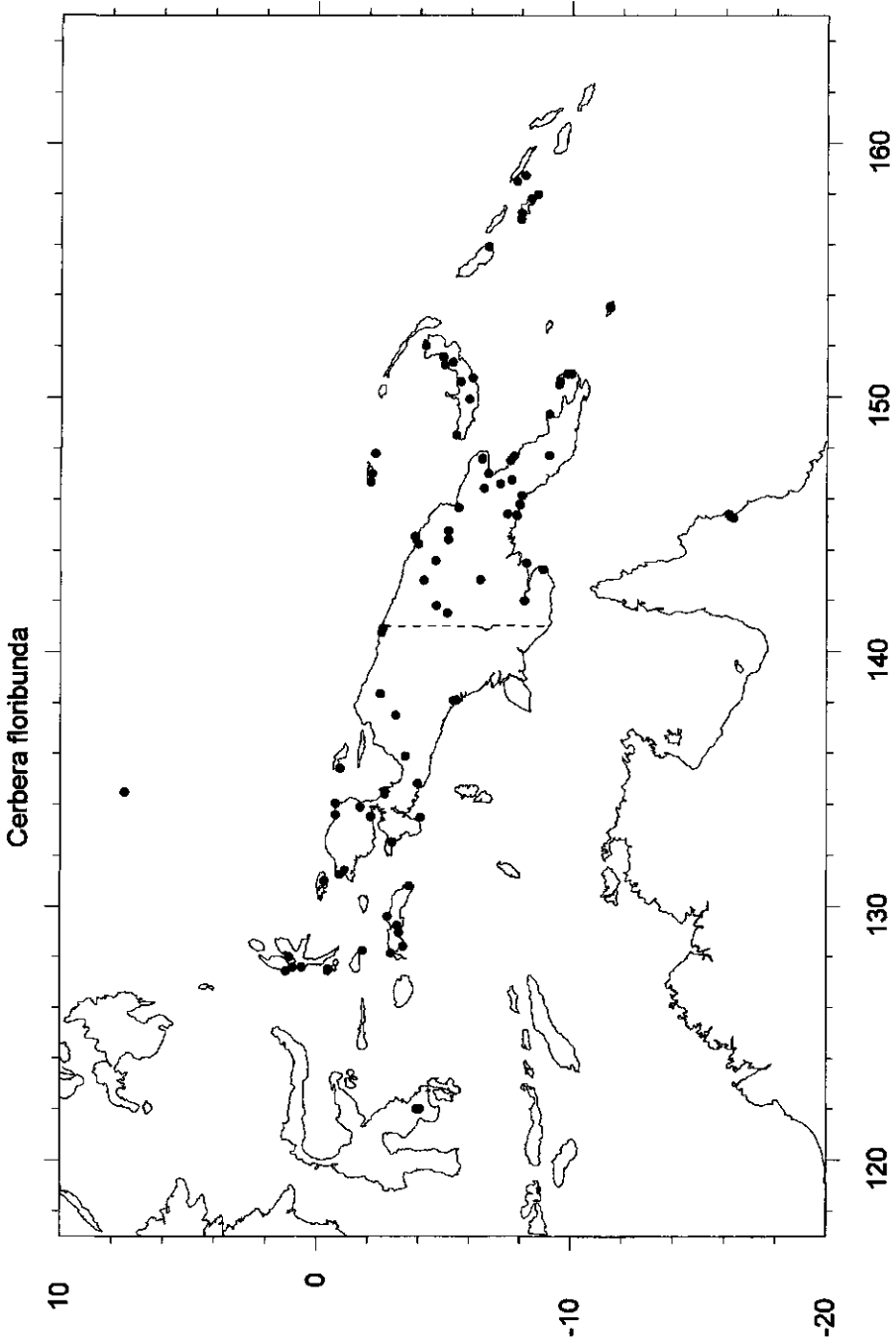
NOTE: *Cerbera dumicola* is only known from a few flowering, one fruiting and several more vegetative specimens. There is even not a single specimen with open flowers in a herbarium outside Australia. The description given here is taken from P.I. Forster (1992) and completed, also with information from collections made since his publication came out.

2. ***Cerbera floribunda*** K. Schum. in K. Schumann & Hollrung, Fl. Kais. Wilh. Land. 111 (1889); P.I. Forster in *Austrobaileya* 3: 570 (1992). — Type: Papua New Guinea, West Sepik Province, Augustafluss (= Sepik R.), *Hollrung* 849 (Lectotype K, designated by Forster; isolectotypes BO, L, MEL, P, UPS). Map 2, p. 13

Heterotypic synonyms:

- C. batjanica* Teijsm. & Binn., Cat. Hort. Bog. 385 (1866), nomen; ex Val. in Ann. Jard. Bot. Buitenzorg 12: 247, t. 26 (1895). — Type: Indonesia, cult. from seeds collected in Maluku, Batjan (= Bacan), SW of Halmahera, by *de Vriese*, Botanic Garden Bogor IV A 92 (Lectotype L 914.116-142, designated here).
- C. micrantha* Kanehira in Bot. Mag. Tokyo 45: 343 (1931). — Type: Caroline Islands, Palau, in a ravine Armatin, Babeldaob, *Kanehire* 470 (holotype TI, not seen; isotype BISH).

Tree 5–40 m high. Trunk 10–60 cm in diameter; bark grey, grey-brown or brown, rough, flaky, with pustulate lenticels; inner bark and sapwood cream or pale straw-coloured, soft. Branches dark brown when dried. *Leaves*: petiole 2–5 cm long; blade narrowly obovate or elliptic, 3–6 x as long as wide, (5–)7–30 x 1.5–8 cm, apiculate at the apex, with 8–20 pairs of upcurved secondary veins forming an angle of 50–90° with the costa; tertiary venation reticulate. *Inflorescence* 8–25 x 5–20 cm, many-flowered, rather lax, more so later. Peduncle robust, 4–12 cm long; branches long; pedicels slender, 10–40 mm long. Bracts about 1–1.5 x as long as the sepals, deciduous. *Flowers* sweet-scented, open during the night. *Sepals* pale green, equal or unequal, mostly shed before the corolla opens, free, spreading when not shed, ovate to obovate, 1.5–3.5 x as long as wide, 4–14 x 2–8 mm, rounded to acuminate. *Corolla* white, often pink, reddish or red outside and then often at the same time pale green at the base, 16–34 mm long in the mature bud and forming an ovoid, narrowly ovoid or ellipsoid head 0.4–0.5 of the bud length with a rounded apex, glabrous on both sides; tube 1–2.5 x as long as the longest sepal, 0.7–1.3 x as long as the lobes, 8–20 mm long, with a cylindrical basal part 0.3–0.4 of the tube length, 4–6 x 1–2 mm, rather abruptly widened into an ellipsoid, upper part about 3–4 mm wide and again narrowed at the throat; lobes 0.7–1.5 x as long as the tube, obovate or elliptic, 1.5–2.5 x as long as wide, 8–17 x 4–10 mm, rounded or acuminate at the apex. *Stamens* deeply



Map 2. *Cerbera floribunda*.

included, with apex 3—9.5 mm below mouth of corolla tube, inserted 0.42—0.6 of the length, (at 5—10.5 mm from the base); anthers ovate or nearly so, 2—2.5 x 1—1.5 mm, apiculate or nearly so at the apex. *Pistil* with apex about 0.5 mm below apices of anthers; ovary depressed-subglobose to cylindrical, 1—1.5 x 1.5 x 1.5 mm, abruptly narrowed into the thick cylindrical style; pistil head 3—3.5 mm long, of a basal ring 0.5—0.8 x 1—1.2 mm and a narrowly conical upper part 2.4—2.7 x 0.7—1 mm. *Fruit* blue or purple-blue; mericarps ellipsoid, 7.5—10.5 x 5—6.5 x 3—4 cm.

DISTRIBUTION: Caroline Islands, Micronesia (Belau), Palau, Indonesia (Maluku: Seram, Morotai, Halamhera; Irian Jaya), Papua New Guinea and the Solomon Islands.

ECOLOGY: Rain forests. Alt. 0—200 (—840) m.

GEOGRAPHICAL SELECTION OF THE APPROXIMATELY 140 SPECIMENS EXAMINED:

PALAU ISLANDS. Sin. loc., *Kanehira* 470 (BISH, type of *C. micrantha*), 2279 (K, P). Babeldaob Island, *Herbst et al.* 9496 (BISH).

INDONESIA. Sulawesi Tenggara: Wawotobi District, Palarahi, *Kjellberg* 907 (S); 5 km S of Polipolia, *Prawiroatmodjo & Soewoko* 1819 (L). Maluku: Morotai, Totodoku, *Kostermans* 691a (A, BO, K, L); Halmahera, Gunung Sahu, near Susupu, *de Vogel* 3287 (CANB, K, L); Loleba, Wasile District, *P.M. Taylor* 2213 (A, BISH); Akelamo, Oba, *de Vogel* 4425 (CANB, K, L); Ternate, *Beguïn* 2241 (BO, K, L); Bacan, *de Vriese* s.n. (L); Seram, W Uli, Kawa area, *Rutten* 1859 (BO); Kairatu, *Kuswata & Soepadmo* 6 (A, BM, BO, BZF, CANB, L, SING); between Wae Ruatan and Wae Toni, *Eyma* 3170 (A, BO, K, L); c 40 km E of Masohi, *Burley et al.* 4338 (A, BISH, F); Wae Mual, *Rutten* 175 (L); Kiandarat, *Buwalda* 5657 (BO, L). Irian Jaya: Waigeo Island, near Waifor, *van Royen* 5146 (A, CANB, K, L); E of Sorong, *Schram* BW 12461 (CANB, L); near Remu, *Pleyte* 467 (BO, L); Klamono, *Main* 578 (BO, L); N of Fak-Fak, *Vink* BW 12190 (B, K, L, Z); Sidai, *Koster* BW 6743 (A, CANB, L); Holtekang, *Schram* BW 1699 (A, CANB, K, L); km 1.5 Steenkool (=Bintun)-Tembuni Road, *van Royen* 3567 (A, CANB, K, L, P); Tafelberg, near Manokwari, *Mangold* 4 in BW 648 (A, CANB, L); Etnabay, *Koch* 51 (L); Wondiwoi Mts, *Koster* BW 13787 (CANB, L); near Wasior, *Widjaja* 4523 (BO); Manokwari, Momi, *Kostermans* 233 (A, K, L); Sawa, Sawaerma, Merauke District, *Widjaja et al.* EW 6266 (BO); Motorbivak, *Docters van Leeuwen* 11137 (A, BO, K, L, U); Lorentz R., *Von Römer* 12 (L); Noordrivier, *Versteeg* 1011 (BO, L); Memberamo, Albatros Bivak, *Docters van Leeuwen* 11277 (A, BO, K, L, U); Humboldt Bay, *Gjellerup* 980 (K, L, U); Tami, *Schram* BW 1626 (CANB, L).

PAPUA NEW GUINEA. near Frieda R., W Sepik District, *Henty & Foreman* NGF 42522 (A, BRI, CANB, K, L, SING); near Ambunti, Sepik District, *Hoogland & Craven* 10064 (K, L, P); Hak Valley, Telefomin District, *Frodin & Morren* 3474 (K); Mt Bosavi, *Jacobs* 9503 (BISH, L, Z); Lake Daviumbu, Middle Fly R., *Brass* 7905 (A); Sturt Island, Lower Fly R., *Brass* 8100 (A, L); Dagua, Oriomo R., *Brass* 5991 (A, BM); Amboin, Angoram Subdistrict,

Millar NGF 22999 (A, CANB, K, L); Sepik area, *Ledermann* 6646 (SING); Augustafluss (= Sepik R.), *Hollrung* 717 (HBG, K, MEL, paratype) & 849 (K, L, MEL, P, UPS, lectotype); Mt Hunstein, *Takeuchi* 5276 (BISH); Lae, Ramu R., *Womersley* NGF 24770 (A, CANB, K, L); Aupan, Madang District, *Katik* NGF 46652 (A, CANB, K, L); near Usino, Ramu valley, *Hoogland* 5016 (A, BM, K, L, MEL); Vailala and Lohiki Rs. junction, *Schodde* 4311 (A, K, L); Ihu Hill, *Schodde* 4232 (A, K, L); Cupola, Golf District, *Brass* 1217 (A, K); Malalaua R., *Schodde* 4536 (A, K, L); near Oomsis Creek, Morobe District, A. *White* NGF 11170 (A, K, L); Bulolo, *Gray* NGF 4082 (A, K, L, NSW, SING); Oomsis, Markham Valley, *Henty* NGF 10666 (A, K, L, SING); c 5 km S of Pindiu, *Hoogland* 8906 (A, BRI, K, L); Butibum R., *Hartley* 9889 (A, K, L); near Maiama, *Ridsdale* NGF 31684 (A, K, L, SING); near Garagos Creek, Bulolo Road, *Floyd* NGF 7235 (A, BM, K, L, SING); Kagi Gap area, Kokoda Trail, *Croft & Lelean* NGF 34727 (CANB, L); near Anara, Tufi Subdistrict, *Hoogland* 4603 (A, BM, BRI, K, L, MEL); Fergusson Island, Agamoia, *Brass* 27275 (A, L, S); and between Tutubea and Lake Lavu, *Croft et al.* LAE 68766 (E, K, L, M); Normanby Island, near Miadeba Airstrip, *Croft et al.* LAE 68858 (A, E, K, L, M); Normanby Isl., Waikaiuna, *Brass* 25247 (A, K, L, S); Sudest Island, Rambuso, *Brass* 28104 (A, K, L, S); Tagula Island, *Damas & Katik* LAE 74545 (A, CANB, K, L); 1 km SW of Kabuli, W Manus, *Sands et al.* 2753 (A, K, L); Wali R., near Derimbat, *Foreman* LAE 52414 (A, E, K, L); Rambutyo Island, *Kerenga & Croft* LAE 77382 (A, E, K, L). New Britain: Talasea, *Frodin* NGF 26615 (A, K, L, NSW, SING); Gasmata, *Frodin* NGF 26589 (A, BISH, L, NSW, SING); near Lavege, *Pajmans* 523 (CANB); Piriloma, *Sayers* NGF 21912 (A, L); W of Nantambu, *Islas & Vinas* NGF 32347 (A, E, K, L, M); Miller Mapping Point, Hoskins Subdistrict, *Stevens & Lelean* LAE 58543 (A, CANB, E, K, L); Nuau, *Lelean & Stevens* LAE 51297 (A, BISH, E, K, L, NSW); Keravat R., *Floyd* 6631 (A, K, L). Bougainville Island: Tonolei Harbour, *Coode et al.* NGF 40432 (K).

SOLOMON ISLANDS. SE Kolombangara, W of Vila R., *Gafui et al.* BSIP 8454 (K, L). New Georgia: Kibikibu R., *Cowmeadow's Collectors* BSIP 4822 (K, L, SING); Viru R., *Burn-Murdoch's Collectors* BSIP 6968 (K, L, SING). Vangunu Island, *Chapman* 428 (A, K, L, SING). Santa Ysabel: Allardyce Harbour, *Whitmore's Collectors* BSIP 3609 (K, L, SING); Bogotu Peninsula, *Whitmore* BSIP 4110 (K, L, SING).

AUSTRALIA. Queensland: Cook District, Oliver Creek, *Gray* 1095 (K, MEL); Daintree R., *Blake* 14992 (BRI, CANB); *ibid.*, *Kajewski* 1389 (A, B, K, NSW, S).

CULT. U. S. A.: Florida, Fairchild Tropical Garden, *Gillis* 9951 (A). Singapore: Singapore Botanic Gardens, *Furtado* SING 34828 (L). Indonesia: Bogor Botanic Garden, IV A 92 (L 914.116-142, lectotype of *C. batjanica*). Papua New Guinea: Lae Botanic Garden, *Millar* NGF 38460 (BRI, L).

NOTES: Open flowers are rare in herbarium specimens, so the author concluded that *Cerbera floribunda* flowers during the night. The latter has been confirmed by Dr. David Frodin (pers. com.), who could smell the strong scent of the flowers of the tree near the camp in the forest in Papua New Guinea. He also observed, that *C. manghas* is restricted to coastal vegetations in Papua New Guinea and that *C. floribunda* is found only inland.

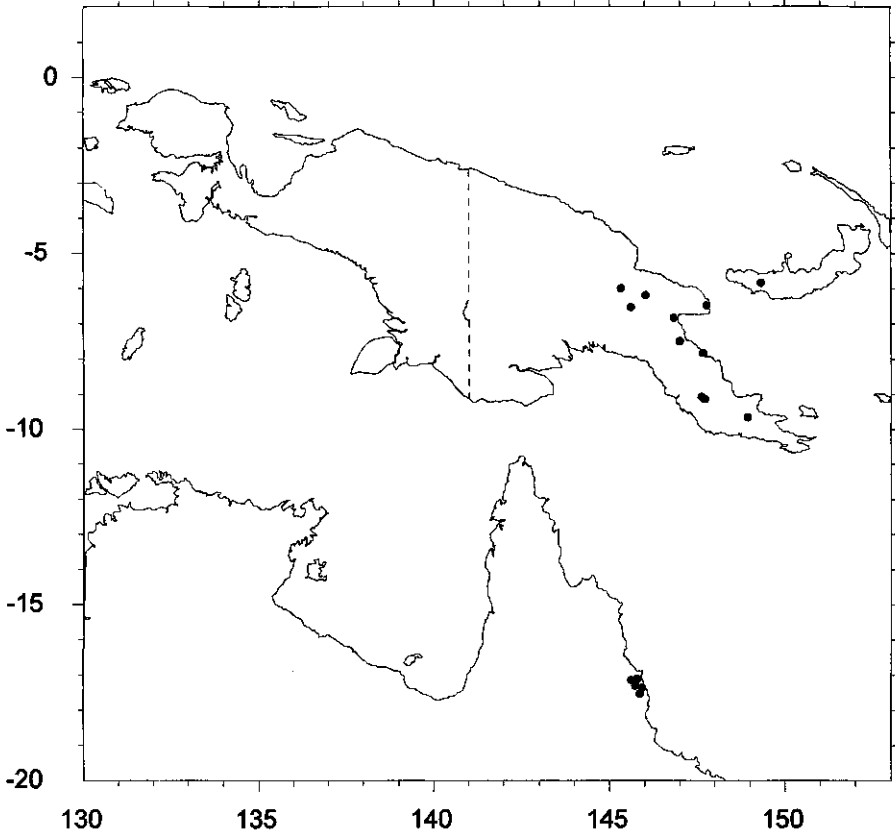
3. *Cerbera inflata* S.T. Blake in Proc. Roy. Soc. Queensland 70: 33 (1959); P.I. Forster in *Austrobaileya* 3: 572 (1992). — Type: Australia, Queensland, Cook District, near Goldsborough, upper Mulgrave R., *S.T. Blake* 15003 (holotype BRI, n.v.; isotypes CANB, K).
Map 3, p. 17

Basionym:

C. dilatata S.T. Blake in op. cit. 59: 161 (1948), not Markgraf (1927).

Tree 10–30 m high. Trunk up to 60 cm in diameter; bark grey, scaly, flaking with small square plates, lenticellate; inner bark cream or pale straw-coloured. Branches dark brown when dried. *Leaves*: petiole 1.5–5 cm long; blade coriaceous when fresh, coriaceous or papery when dried, narrowly to very narrowly obovate or elliptic, 3–5 x as long as wide, 7–22.5 x 2–8 cm, rounded, shortly apiculate or less often acuminate at the apex, decurrent into the petiole, with 10–30 pairs of rather straight to upcurved secondary veins forming an angle of 70–90° with the costa. *Inflorescence* 9–22 x 8–18 cm, many-flowered, rather lax. Peduncle robust, 2–8 cm long; pedicels robust, 10–30 mm long. Bracts about the same size as the sepals, deciduous. *Flowers*: *Sepals* medium green outside, light green inside, equal or unequal, not shed, broadly ovate to elliptic, 1.1–3 x as long as wide, 4–8 x 2–7 mm, rounded or obtuse. *Corolla* white or cream, tube cream and lobes suffused with pink, throat often greenish, 15–29 mm long in the mature bud and forming a broadly ovoid head 0.2–0.24 of the bud length, glabrous on both sides; tube 2–5 x as long as the longest sepal, 2.2–5 x as long as the lobes, 12–30 mm long, with an amply infundibuliform basal part 0.6–0.8 of the tube length, 2–4 mm wide at the base and 4–7.5 mm wide at the apex which is about the level of the insertion of the stamens, mostly slightly narrowed from there towards the mouth to 3.5–6.5 mm; lobes 0.22–0.45 x as long as the tube, ovate or broadly ovate, 1–1.5 x as long as wide, 5–9 x 5–6 mm, rounded at the apex; scales absent. *Stamens* with apex 0–2.5 mm below mouth of corolla tube, inserted 0.7–0.8 of the length, (at 9–16 mm from the base); anthers ovate or nearly so, 3–3.5 x 1.2–1.5 mm, apiculate at the apex. *Pistil* with apex 1 mm below apices of anthers; ovary subglobose, 1.5–2 x 1.5–2 x 1.5 mm, abruptly narrowed into the thick style; pistil head 2.7–4 mm long, of 2 parts, a basal ring

Cerbera inflata



Map 3. *Cerbera inflata*.

0.8–1 x 1–2 mm and a cone, 1.7–4 x 1.5–2 mm, shortly bilobed at the apex. *Fruit*: mericarps ellipsoid, 4.5–5 x 2.5–4 x 2.3 cm.

DISTRIBUTION: New Guinea and Queensland.

ECOLOGY: Rain forest. Alt. 120–2250 m.

GEOGRAPHICAL SELECTION OF THE 36 SPECIMENS EXAMINED:

PAPUA NEW GUINEA. E of Korn, Upper Waghji Valley, *Hoogland & Pullen* 6181 (A, BISH, BM, CANB, G, K, L, MEL); Chimbu Divide, Goroka Subdistrict, *Floyd et al.* 6264 (A, BRI, K, L); near Osaka, c 11 km S of Okapa,

Hartley 13120 (A, BRI, C, CANB, G, K); Kassam Pass, Kainantu Subdistrict, Henty & Vandenberg NGF 29313 (A, CANB, K, L); Wagau, Sayers NGF 21566 (BM, CANB, L, SING); Sattelberg, Ogeramang, Clemens 5108 (A, B); NW end of Lake Trist, Wau Subdistrict, Barker & Vinas LAE 67749 (A, E, K, L); Morobe, Bulang R., Clemens 5338A (A); Boridi, Carr 14217 (A, BM, CANB, K, L, SING) & 14887 (A, BM, C, K, L, SING); Kagi Gap Area, Kokoda Trail, Croft & Lelean NGF 34727 (A, CANB, E, K, M); Goropu Mts, Veldkamp & Stevens 5940 (BISH, CANB, HBG, L).

AUSTRALIA. Queensland: Cook District, near Goldsborough, Upper Mulgrave R., Blake 15033 (CANB, K, type); Danbulla, L.S. Smith 3734 (A, K, L); *ibid.*, Stocker 673 (A, BISH, K, L, NSW); Gadgarra Res., Atherton, Kajewski 1141 (A, K, P, S); Babinda, Blake 15024 (K, L); Barong L. A., Gray 1727 (BISH, K, MEL).

CULT. Papua New Guinea: Simbu Province, Gembogl, Sterly 80-342 (L). Australia: Queensland, Brisbane City Botanic Gardens, Hohnen May 1994 (BRI).

NOTES: *Cerbera floribunda* which flowers during the night is closely allied to *C. inflata*, which flowers during the day. Habit, fruits and the glabrous inner side of the corolla are quite similar. Both species can be distinguished as follows:

- * Corolla lobes 0.7–1.5 x as long as the tube, forming in the mature bud a usually ellipsoid head 0.4–0.5 of the bud length; stamens with apex 3–9.5 mm below mouth of corolla tube; corolla tube inflated around the stamens and much narrower below and above.....**C. floribunda**
- * Corolla lobes 0.22–0.45 x as long as the tube, forming in the mature bud a broadly ovoid head 0.2–0.24 of the bud length; stamens with apex 0–2.5 mm below mouth of corolla tube; corolla tube infundibuliform or nearly so.....**C. inflata**

4. *Cerbera laeta* Leeuwenberg, *sp. nov.*

Fig. 1, p. 19; Photos 1 & 2, p. 61

Arbor parva omnibus partibus corolla intus excepta glaberrima ramulis teretibus. Folia alterna longe petiolata laminis oblongis vel ellipticis apice apiculatis basi que cuneatis. Inflorescentia magna multiflora laxa pedunculis pedicellis que longis. Sepala minuta libera ovata obtusa vel rotundata patentia. Corolla alba extus roseo-suffusa tubo subcylindraco basi inflato lobis parvis. Stamina profunde inclusa filamentis crassis brevibus antherisque ovatis apice acuminatis basi cordatis glabris. Pistillum glabrum ovario depresso globoso styloque rugoso. Fructus mericarpiis duabus separatis caeruleis ellipsoideis.

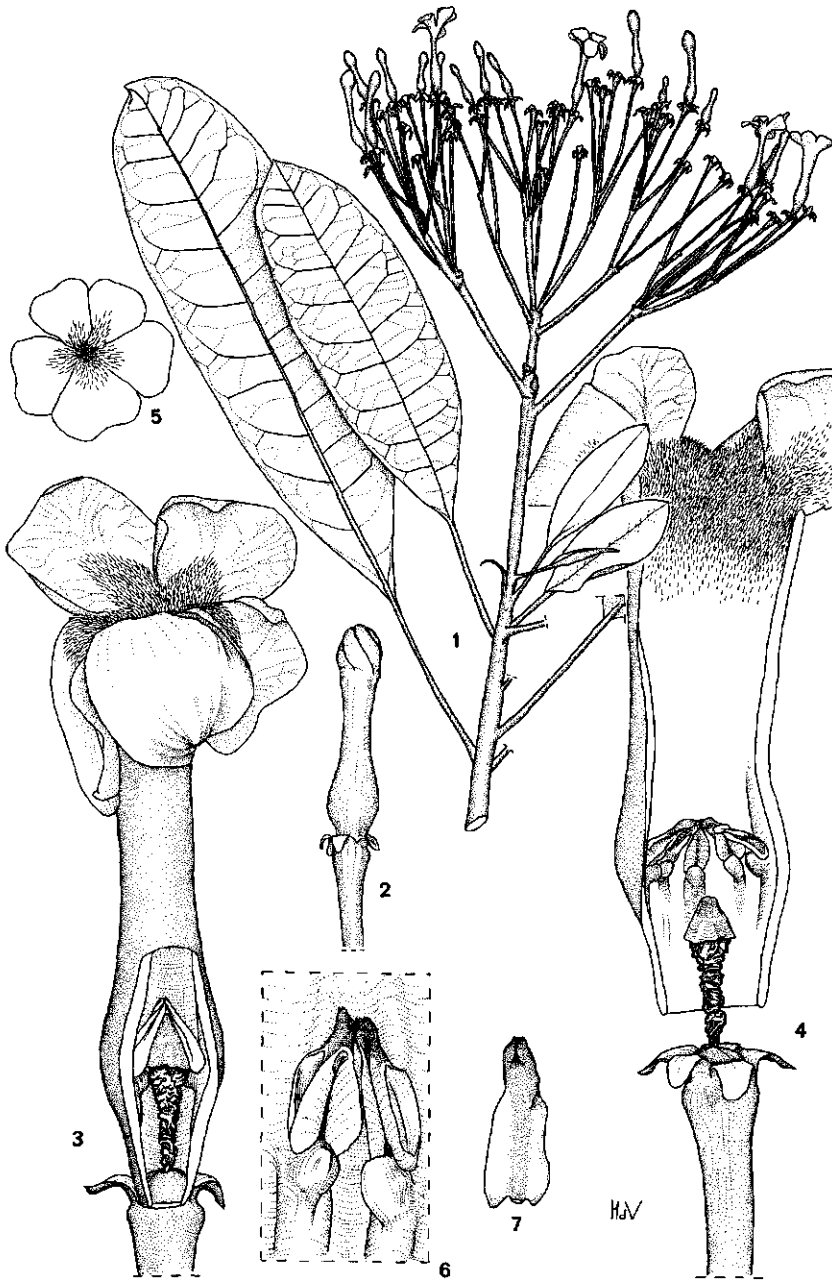


Fig. 1. *Cerbera laeta*. 1, habit (x 1/3); 2, bud (x 1); 3, flower (x 2); 4, opened flower (x 2); 5, flower above (x 2/3); 6, stamens (x 6); 7, anther outside (x 6). 1-7 from Staples 1139.

TYPUS: Cult. Hawai'i Islands, O'ahu, Ho'omaluhia Botanical Garden, Kaneohe, Accession 76.0961, from seeds collected by *Hodel* on 25 Aug. 1976 in Papua New Guinea, Rouna Falls, in forest along road to Varariato National Park, at 600 m alt., *Staples* 1139 (holotype WAG; isotype K).

Tree 5–6 m high. *Leaves* long-petiolate; petiole 2.5–8 cm long; blade oblong or elliptic, 2–3.5 x as long as wide, 10–28 x 5–9 cm or sometimes smaller, apiculate at the apex, cuneate at the base, with 8–14 pairs of upcurved secondary veins forming an angle of 80–90° with the costa; tertiary venation reticulate, not conspicuous. *Inflorescence* 15–25 x 15–20 cm, lax, many-flowered. Peduncle 5–10 cm long; pedicels 3–6 cm long. Bracts deciduous. *Flowers* sweet-scented. *Sepals* free, ovate, 4 x 3 mm, obtuse or rounded, spreading. *Corolla* white, faintly suffused with pink outside on lobes, 30–35 mm long in the mature bud and forming an ovoid head 6–7 x 5 mm, rounded at the apex; arachnoid-pubescent inside on lower half of lobes and in throat to 5 mm below mouth, otherwise glabrous; tube almost cylindrical, 29–33 mm long, slightly curved, 3 mm wide at the base, widened from 2–4 mm above which is around stamens and widest at 7–8 mm above the base and widened to 6 mm wide, narrowed above to 4 mm wide and there with 5 obscure indented lines alternating with the lobes; lobes subequal, suborbicular, 8–9 mm in diameter, rounded, truncate or retuse, spreading. *Stamens* deeply included, inserted 0.17–0.2 of the length of the corolla tube, at 5–7 mm from the base; filaments thick, 1 mm long; anthers ovate, 5 x 2 mm, acuminate at the apex, connivent into a cone over the pistil head. *Pistil*: ovary depressed-globose, 1.5 x 3 x 3 mm, abruptly narrowed into the rugose style; pistil head 3 x 3 mm, ovoid, of 2 parts, a basal veil, 1.5 x 3 mm and a 5-ridged and 2-lobed cone, stigmatic probably under the base of the veil. Two ovules at the edges of a large placenta in each carpel. *Fruit* deep blue; mericarps ellipsoid, 6 x 3 x 3 cm, rounded at both ends; exocarp about 1 mm thick; mesocarp fibrous.

PARATYPES:

Hawai'i: from the same tree, *Staples & Sands* 1047 (BISH, not seen, WAG) and *Lau* 3039 (BISH, not seen, WAG).

ETYMOLOGY: *laeta*, joyful. The tree is abundantly flowering with large lax inflorescences bearing large flowers and remarkable blue fruits.

5. *Cerbera manghas* L., Sp. Pl. 208 (1753), excl. of all synonyms which refer to *C. odollam*, description in italics covering lectotype; Leeuwenberg in *Taxon* 41: 560 (1992); Jarvis et al., *List Linnaean Gen. Names* 32 (1993), non Gaertn. (1791); P.I. Forster in *Austrobaileya* 3: 575 (1992). — Type: "East India", *Osbeck* s.n. (lectotype LINN 298.2, designated by Leeuwenberg after consultation with C.E. Jarvis).

Figs. 2–3, p. 22–23; Photos. 3–7, p. 62–64; Map 4, p. 24

Homotypic synonyms:

Tanghinia manghas (L.) G. Don, *Gen. Syst.* 4: 98 (1837); *C. forsteri* Seem., *Fl. Vit.* 157 (1866). (Seemann is referring to Murray, *Syst. Veg.* ed. 14: 251 (1784) which goes back to Linnaeus).

Heterotypic synonyms:

Tabernaemontana obtusifolia Lam., *Tableau Enc.* 2: 300 (1792); Poir. in Lamarck, *Enc. Suppl.* 5: 275 (1817). — Type: Madagascar, sin. loc., *Commerson* s.n. in herb. *Desfontaines* s.n. (holotype FI-W; isotypes G, P).

Elcana seminuda Blanco, *Fl. Filip.* ed. 2: 584 (1845). - Neotype: Philippines, Palawan, Taytay, *Merrill*, *Pl. Blancoanae* 318 (neotype L; isoneotypes BM, BO, F, GH, K, K, NSW, P, W).

C. odollam var. *mugfordii* Bailey in *Queensland Agric. Journ.* 3: 282 (1898), as *mugfordi*. *C. manghas* var. *mugfordii* (Bailey) Domin in *Biblioth. Bot.* 89: 522 (1928). - Type: Australia, Queensland, Mourilyan Harbour, *Mugford* s.n. (holotype BRI, not seen, but seen by P.I. Forster).

C. linnaei Montr. in *Mém. Acad. Sci. Lyon, Classe Sci.* II, 10: 233 (1860). — Type: New Caledonia, Île Art, *Montrousier* s.n. (holotype LY†). Neotype: New Caledonia, Nouméa, Southern end of Ouen Toro, *Stauffer* 5737 (neotype Z; isoneotypes A, BISH, G, K, L, P, UC, WAG).

C. manghas var. *samoensis* Hochr. in *Candollea* 5: 179 (1934). — Type: W. Samoa, Upolu, Falefa, 30 Mar. 1905, *Hochreutinger* 3439 (holotype G; isotypes L, UC, Z).

C. manghas var. *manghas* f. *luteola* Boiteau, *Fl. N. Caled.* 10: 219, pl. 37, 1–3 (1981), **syn. nov.** — Type: New Caledonia, Pouembout Valley, *MacKee* 33159 (holotype P).

C. manghas var. *acutisperma* Boiteau, l.c. and pl. 37, 4–8, **syn. nov.** — Type: New Caledonia, Pouembout, *MacKee* 26057 (holotype P; isotype L).

Tanghinia venenifera Poir., *Enc. Bot. Suppl.* 5: 283 (1817). *C.*



Fig. 2. *Cerbera manghas*. 1, habit (x 1/3); 2, flower seen from above (x 1/3). 1-2 from Rudjiman 357.

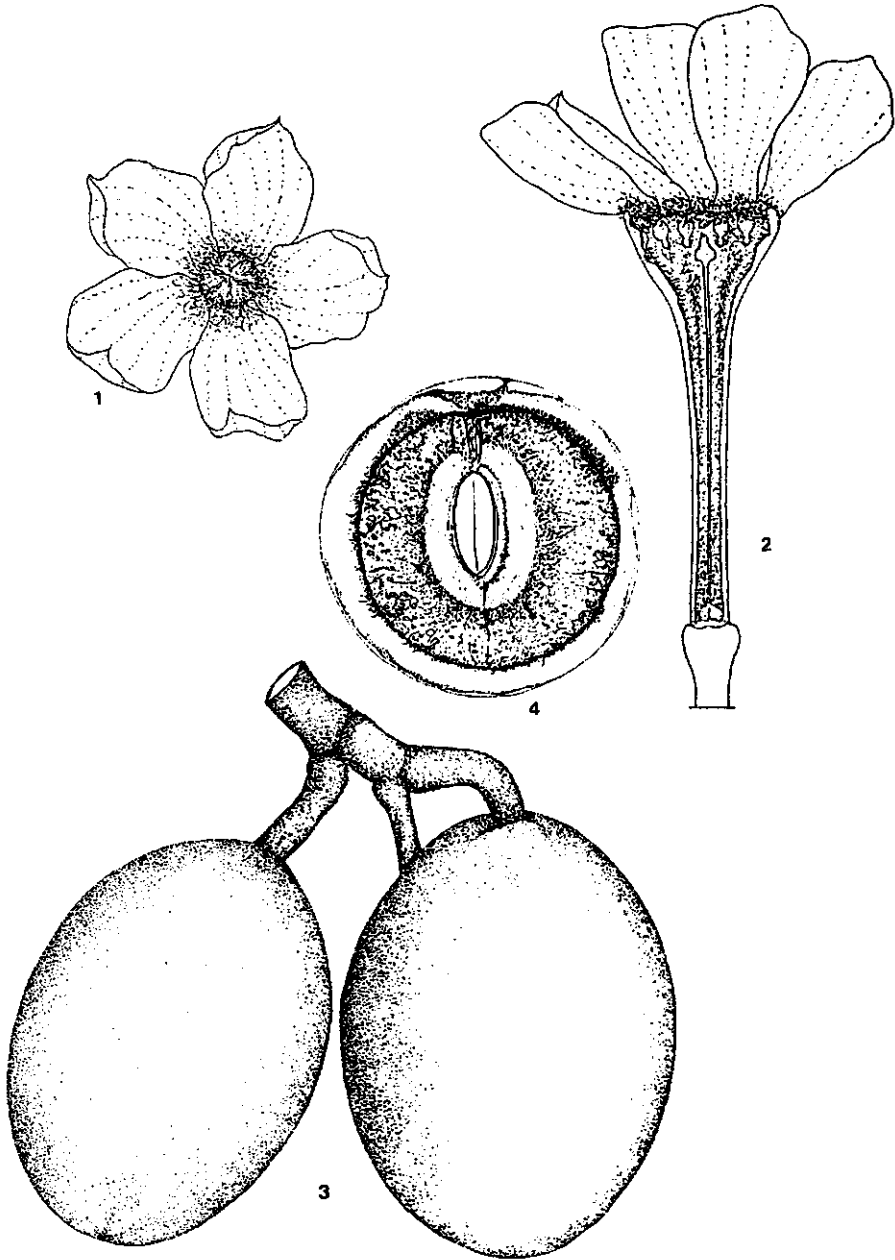
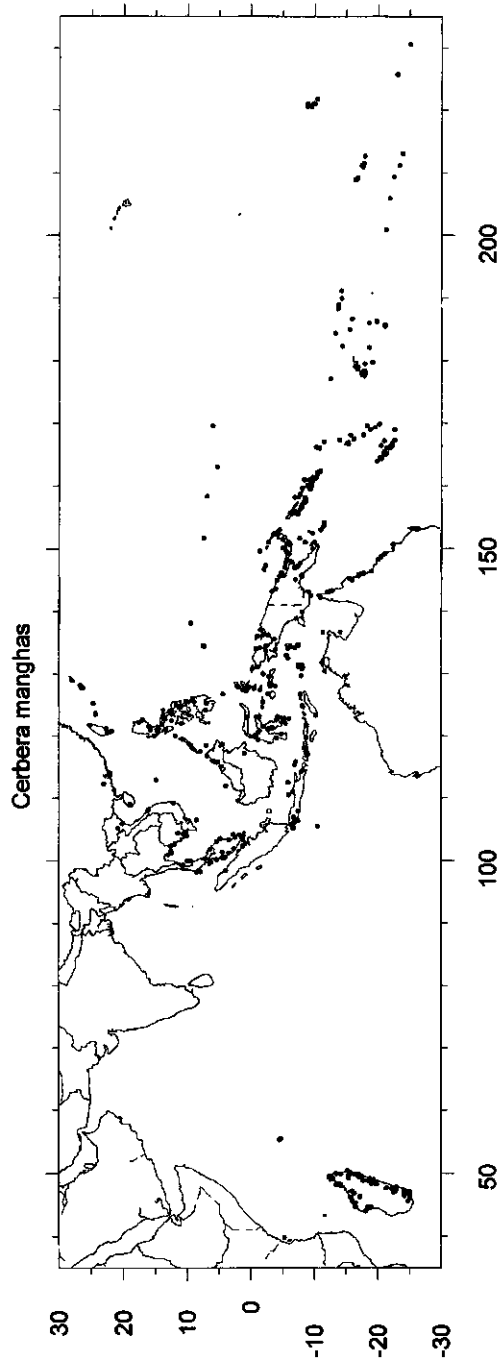


Fig. 3. *Cerbera manghas*. 1, flower seen from above (x 4/3); 2, opened flower (x 4/3); 3, fruits (x 2/3); transverse section of fruit (x 2/3). 1-2 from Rudjiman 357; 3-4 from Rudjiman 354.



Map 4. *Cerbera manghas*.

venenifera (Poir.) Steud., Nom. Bot. ed. 2, 1: 332 (1840); Markgraf, Fl. Madag. fam. 169: 157, pl 23 (1976), **syn. nov.** *C. tanghin* Hook in, Bot. Mag. 54: t. 2968 (1827), as *tanquin*. — Type: Madagascar, sin. loc., Du Petit-Thouars s. n. (holotype P).

Shrub or tree 1.50–25 m high. Trunk in trees 5–70 cm in diameter; bark pale to dark grey, grey-brown or dark brown, rough, peeling off usually in clumps, with large protruding lenticels, thick; inner bark cream or straw-coloured; wood soft, white. Branches dark or pale brown when dried, densely covered with conspicuous leaf scars. *Leaves*: petiole 1–4.5 cm long, glabrous; blade coriaceous when fresh, brittle when dried, narrowly to very narrowly obovate or less often elliptic, (1.7–)2.4–7 x as long as wide, 5–31 x 1–7(–8) cm, apiculate to acuminate at the apex, less often rounded or retuse, decurrent into the petiole, with 15–40 pairs of rather straight or upcurved secondary veins forming an angle of (50–)85–90° with the costa; tertiary venation inconspicuous. *Inflorescence* 5–25 x 3–15 cm, many-flowered, rather lax near the base, otherwise congested. Peduncle 1.5–12 cm long; pedicels 3–28 mm long. Bracts about the same size as the sepals or somewhat larger, deciduous. *Flowers* often sweet-scented, open usually one at a time in each inflorescence. *Sepals* very pale green, sometimes red (New Caledonia), equal or unequal, spreading and often recurved later, ovate to obovate, narrowly so to even very narrowly so, very variable in shape and size, 1.2–12 x as long as wide, (4–)8–37 x 2–8 mm, acute, acuminate or sometimes obtuse. *Corolla* tube often greenish or light green, lobes white, often partly pink outside, pink or less often pale yellow inside at the base (sometimes pale pink and with a darker pink base in some specimens found in Madagascar) or entirely white, with a white or pale yellow 5-lobed star with rounded lobes in the centre formed by 5 lanate scales, 20–50 mm long in the mature bud and forming an ovoid head 0.2–0.33 of the bud length with an obtuse apex, pubescent or puberulous or sometimes sparsely so at the mouth and often also on the base of the lobes and pubescent with straight hairs directed downwards from there to the base in stripes alternating with the filament ridges which are mostly narrower and less hairy to absent downwards (especially around the middle of the tube) and may unite into a more densely pubescent belt 7–20 mm wide at the base, or (only often as such in the Pacific area) entirely glabrous; tube

1.1–4(–6) x as long as the longest sepal, (1–)1.3–3 x as long as the lobes, 17–55 mm long, funnel-shaped, 1.5–4 mm wide at the base, widened 0.7–0.9 of the length from the base into a cone (4–)5–9 mm wide just below the mouth and slightly contracted at the mouth; lobes obliquely elliptic or obovate and rounded at the apex or dolabriform and with an acuminate and a rounded apex or with 2 rounded apices, 0.38–0.8(–1.7) x as long as the tube, 1.1–2.1 x as long as wide, (9–)14–30(–35) x (5–)9–18 (–35) mm, spreading and recurved later; 5 scales in the throat just below the mouth forming a 5-lobed white or pale yellow star with rounded lobes; scales triangular, 1.5–3 x 1–2 mm, caudate, with tails 0.5–1 x 0.5–1 mm, rounded, glabrous outside, lanate or sometimes almost glabrous inside. *Stamens* with apex 1–2 mm below mouth of corolla tube, each covered by one of the scales; anthers subglobose, laterally compressed or not, or elliptic, 1.5–3 x 1.2–2 x 1–2 mm, with an apical tail 0.5–1.5 x 0.3–0.5 mm, not included in the given sizes, glabrous. A broadly triangular glabrous excrescence 1–2 x 2–3 mm rounded or truncate at apex on each filament ridge 0–1 mm below insertion of stamens. *Pistil* with apex at the level of the anthers; ovary subglobose, laterally compressed or not, 1.2–2 x 1.2–2 x 1.2–2 mm, mostly abruptly narrowed into the filiform style; pistil head of 3 parts, a 5-ridged base 0.3–1 x 1–2 mm with rounded ridges, a veil 0.6–1.2 x 1.7–3 mm and a narrower or broader apex being a rounded or slightly bilobed cone 1–2 x 1–3 mm, with an apical hole. Ovules 2 in each carpel, ovoid. *Fruit* purplish-red or pale green and often suffused with wine-red, of 2 separate (rarely up to halfway fused) mericarps; mericarps ellipsoid, 5–12 x 3–7 x 3–5.5 cm, rounded at base and apex, rarely, especially when immature acuminate (seen from New Caledonia); mesocarp fibrous.

DISTRIBUTION: From Pemba and Madagascar in the West to Pitcairn Islands in the East and from the Ryukyu Islands in the North to Queensland in the South, but not in India, Sri Lanka nor Myanmar.

ECOLOGY: Mainly in coastal forest or thickets, sometimes among *Rhizophoraceae*, but also, although less often, inland; in Madagascar at about 150 m in Fiji, Viti Levu up to 1100 m, in New Caledonia up to 500 m and in Marquesas up to 900 m. Fruits with fibrous mesocarp floating and distributed by the sea.

GEOGRAPHICAL SELECTION OF THE APPROXIMATELY 1150 SPECIMENS EXAMINED:

TANZANIA. Pemba: Mikandani, *Greenway* 2722 (K); Jundana, *Vaughan* 367 (BM).

MADAGASCAR. Mahajanga: 12 km E of Ankiliromotsy, *Villiers et al.* 4912 (P); 3 km E of Bevitika, *Labat et al.* 2256 (K, P, TAN, WAG); Anatalabe Forest, Ambato-Boeny District, SF 19378 (P, TEF); Maintirano, *Perrier de la Bâthie* 8878 (P); Ankara, SF 6212 (P, TEF); Ankarafantsika Res., *Nicoll & Abraham* 416 (P, TAN, WAG); *ibid.*, Tsaramandroso, SF 31253 (TEF); Nemoroka Res., *B. Du Puy et al.* MB 395 (P, TAN); Ambonara, Sambaio R. basin, *Perrier de la Bâthie* 8909 (P); Antsaonjo, Namakia, SF 7374 (P, TEF); Mahajanga, *Perrier de la Bâthie* 13438 (P); Maromandia, SF 11092 (P, TEF); Manongarivo Res., Besinkara, *Gautier & Derleth* 2518 (K, P, WAG). Antsiranana: Ampondrabe, Ambanja, SF 7243 (P, TEF); Nosy Be, *Humblot* 195 (K, P, W); Ankarana Res., near Campement des Anglais, *Leeuwenberg et al.* 14352 (BR, K, P, TAN, WAG); ca 23 km S of Anivorano, 40 km N of Ambilobe, *Schatz et al.* 2413 (BR, K, P, TAN, WAG); Sahafary Forest, Diego-Suarez, SF 6278 (P, TEF); Rigny Bay, *Boivin* 2454 (P); Antsahatopy, Vohemar, SF 15503 (P, TEF); lower Androranga R. basin, Betsomanga Mts, *Humbert & Capuron* 24301 (P); Ampanavoana, *Ranjokiny* RN 10844 (P, WAG); Masoala Peninsula, Andronabe, *Zjhra & Hutcheon* 178 (P, TAN, WAG). Toamasina: Masoala Peninsula, S of Andranobe, *van Nek* 2027 (TAN, WAG), 2030 (TAN, WAG); Nosy Mangabe, *Leeuwenberg* 13926 (TAN, WAG); *ibid.*, *Schatz* 1623 (BR, P, TAN); Maroantsetra, SF 12077 (P, TEF, WAG); near Antanambe, *Morat et al.* 8535 (K, P, WAG); Soanierana-Ivongo, *Lam & Meeuse* 5544 (K, L, P); Île Ste Marie, *Boivin* 1781 (P); Tampolo, SF 16424 (P, TEF); Ambodimanga, *Botoalina* RN 7673 (P, WAG); km 49 Tamatave-Foulpointe, N of Antaratasy, *Leeuwenberg* 13743 (BR, K, L, P, TAN, WAG); Anosivola R., *Perrier de la Bâthie* 18138 (P); Ambila-Lemaitso, W of Canal d'Ampagalana, *Leeuwenberg & Ranaivojaona* 14588 (BR, K, TAN, WAG); Perinet, SF 1092 (P, TAN, TEF); near Vatomandry, *Perrier de la Bâthie* 14087 (P); Amparafana Forest, Mahanoro District, SF 17855 (TEF). Fianarantsoa: Androrangavola, Ifandiana, SF 14547 (P, TEF); Upper Iantara R. valley, *Humbert* 3414 (G, P); Matitanana R. basin, *Perrier de la Bâthie* 8927 (P); Iantara R. valley, Ivohibe, SF 1480 (P, TAN, TEF); Vondrozo, *Decary* 5091 (G, GB, P); Marangaty Forest, Farafangana, SF 16199 (P, TEF). Toliara: Mt Vohitrosy, middle Mandrare R. valley, *Humbert* 12735 (P); Imanobo, Fort-Dauphin, SF 1561 (P, TEF); Mandena F.R., *Gereau & Dumetz* 3278 (BR, K, P, TAN, TEF, WAG); *ibid.*, *Leeuwenberg* 14201 (BR, K, P, TAN, WAG); Fort-Dauphin, *Scott Elliot* 2441 (E), 2751 (BM, K); *ibid.*, *Bernardi* 11491 (BR, FT, G, L); Upper Mananara R. basin, between Imonty & Tsilotsilo Pass, *Leandri & Saboureaux* 4338 (BR, K, P, WAG); Sakamalio R. basin, *Humbert* 13404 (P); near Ambovombe, *Humbert & Swingle* 5633 (A, G, P, TAN, US); Amboasary, *Decary* 3178 (P); Andohahela Res., parcelle 2, *Malcomber* 2649 (P, WAG); *ibid.*, parcelle 3, *Leeuwenberg et al.* 14184 (BR, K, P, TAN, WAG). Sin. loc., *Baron* 195 (K), 1659 (BM, K, P); *Bojer* anno 1839 (G-DC); *Commerson* s.n. (FI-W, G, P, type of *Tabernaemontana obtusifolia*); *Du Petit-Thouars* 34 (P; type of *C. venenifera*).

MAURITIUS. Sin. loc., *Telfair* s.n. (K).

SEYCHELLES. Silhouette, Grance Françoise, *Jeffrey & Zelia* 1151 (K, L). Mahé: Grande Anse, *Robertson* 2472 (WAG); Sanssouci, *Schlieben* 11732 (B, HBG, K, M).

AMSTERDAM ISLAND. *Capt. Cook* anno 1775 (BM).

THAILAND. Koh Chang, *van Beusekom & Santisuk* 3185 (AAU, C, E,

K, L, P); between Chanthaburi and Trat, *Larsen et al.* 32408 (AAU, B); Rayong, *Ubolchalaket* 216 (AAU, P); Koh Samed, *Ryding* 885 (UPS); Sriracha, *Collins* 826 (AAU, K, P, US); Bang Son, *Put* 1481 (BM, K, P); Koh Tao, *Kerr* 12712 (BM, K); Koh Pennan (= Koh Phangan), *Robinson* 26 May 1913 (K); Koh Samui, *Kerr* 12593 (A, BM, K); Klong Bagatae, *Kloss* 6570 (K); Phuket, *Hansen & Smitinand* 12176 (C, K, Z); Hat Yai-Songhkla Road, *Soejarto et al.* 5997 (A, F, L); Terutao Island, *Congdon* 122 (A, AAU); Narathiwat, *Larsen* 4074 (K, L).

CAMBODIA. Kampot, *Hahn* 2 Oct. 1927 (P); Phnom Penh, *Bejaud* 154 (P).

VIETNAM. Cochinchina: sin. loc., *Thorel* 59 (BISH, F, HBG, P); île de Condor (= Con Son Island), *De Perry in Pierre* 4399, Aug. 1870 (A, B, C, NY, P); Phu Quoc Island, *Pierre* 4400, Feb. 1874 (B, F, K, P); near Hai-tien, *Godefroy* 798 (P). Annam: Nhatrang, *Poillane* 3310 (A, P); Tré Island, near Nhatrang, *Poillane* 3109 (A, P, UC); Tourane (= Da Nang), *Clemens* 3384 (A, BM, G, NY, P, U, UC, US, Z); Lang-Co, *Eberhardt* 2536 (F, P). Tonkin: Cho Ganh, *Petelot* 1048 (A, C, NY, P, UC, US); Ninh Binh Prov., Minh Tinh, *Bon* 1563 (P); Cay, *Bon* 5501 (P).

CHINA. Guangdong, Lamtao, *McClure* 1159 (UC) & 1194 (S, UC, W); Hainan, sin. loc., *Henry* 8205 (P); Naam Shan Leng, Ngai District, *Shan Mong Kwoh* 313 (UC). Macao, *Gaudichaud* 180 (P). Hong-Kong, Lantao Island, *Taam* 2193 (F, UC, US); Shatin, New Territory, *Chan* 1030 (A, P). Guangzhou: Guangdong, *Yip* 264 (L); Ng-Tung Shan, *Tsui* 212 (F, K, NY).

TAIWAN. Kelung (= Chilung), *Faurie* 256 (BM, G, LY, W); E of Keelung, *Boufford et al.* 25219 (A, NY); near Sokei, *Wilson* 10188 (A, BM, K, US); Shihyusan, *Ohasi* 24554 (A, E); Kenting Nat. Park, *Chih-Chia Wang* 501 (A); South Cape, *Henry* 2 Nov. 1889 (US).

JAPAN. Ruykyu Islands: Amami, *Kato & Miki* 365 (L); Oshima, *Faurie* 3992 (A, BM, P); Kunigami-mura, Mt Hedoishi, *Furuse* 18 (S); Kunigami, Taminato Ugan, *Walker et al.* 6104a (BISH, L, US); Gushikawa-mura, *Hatusima* 18108 (US); Kurema Jima, *Okuhara & Sunagawa* 120 (L, US); Ishigaki Shima, *Fosberg* 37308 (L, NY, US); Iriomote Island, *Walker & Tawada* 6562 (L, US).

PHILIPPINES. Polilo Island, *McGregor* BS 10332 (MEL). Luzon: E Cagayan, Bagui Point, *Allen* 116-81 (BISH); Isabela, Sierra Madre Mts, *Gutierrez* PNH 78285 (K, L); Aurora, Baler, *Stone et al.* PPI 5472 (L); Nueva Ecija, sin. loc., *Vidal* 3249c (A, MA); Zambales, sin. loc., *Ramos* BS 4986 (LY, NSW); Manila, *Cuning* 476 (P); Bataan, Lamao R., Mt Mariveles, *Borden* FB 2073 (F, K); Rizal, Montalban, *Loher* BS 13396 (M, UC); Batangas, Barrio Laiya, *Sulit* Mar. 1973 (WAG); Tayabas, Atimonan, *Whitford* 700 (F, K, P); Camarines Norte, near Daët, *Hallier* 8 June 1903 (HBG); Camarines Sur, Panagan R., *Edaño* BS 76464 (Z); Sorsogon, Irosin, *Elmer* 16773 (A, BM, BP, C, F, GH, HBG, K, L, NSW, P, S, UC, W, Z); Antique, Panay, *McGregor* BS 32565 (A, K, NSW, P, UC); Capiz, Sibuyan Island, *Elmer* 12173 (A, BISH, BM, E, HBG, K, L, LY, NSW, W, Z). Ticao Island: *Vidal* 3244 (K). Samar: Catbalongan, *Vidal* 3249bis (A, MA); Catubig R., *Ramos* BS 24335 (BISH, F, L); Capul, *Kondo & Edaño* PNH 36797 (BISH, L). Leyte: sin. loc., *Wenzel* 1386 (A, BM, F, GH); Calangaman Island, *Kondo & Edaño* PNH 36761 (BISH). Mindanao: Dinagat Island, *Ramos & Convocar* BS 83980 (A); Surigao del Norte, Surigao, *Bolster* 329 (UC); Surigao del Sur, Lanuza, *Rojo* 168 (L); Butuan, *Weber* 1133 (A, BM, F, GH, K, MEL, NSW, P, UC, Z); Maguindanao, Cotabato District, *Whitford* FB 14231 (E, L, LY); Davao del Sur, Mt Apo, *Elmer* 11997 (A, BISH, BM, BP, E, F, GH, HBG, K, L, LY, NSW, W, Z). Culion, *Herre* 1072 (A, UC). Palawan: Taytay, *Merrill* Pl. Blancoanae 318 (BM, BO, F, GH, K, L, NSW, P, W, neotype

of *Elcana seminuda*); Puerto Princesa, *Elmer* 12896 (BISH, BM, BP, GH, HBG, K, L, LY, NSW, U, W, Z); Panacan, Aborlan, *Sulit* PNH 12323 (A, BM); Ampaplot, Quezon, *Espiritu* PNH 91476 (K). Balabac: *Vidal* 3250 (K). Muligi, *Santos* 4689 (L).

SINGAPORE. Tanjung Gul, *Sinclair* 4945 (E, US); Labrador Nat. Res., *Maxwell* 82-176 (AAU, L).

MALAYSIA. Kedah: Lankawi Island, *Hanif & Nur* SING 7518 (BO, SING); *ibid.*, *Stone* 9117 (BISH, K). Pinang, *Delessert* anno 1835 (G). Perak: Pulau Lalang, *Seimund* 23 Nov. 1925 (SING); Pulau Rumbia, *Seimund* 10 Mar. 1926 (SING); Pankor, *Scortechini* 964 (K, P). Trengganu: Pulau Redang, *Kamarudins* FRI 31401 (L); 8 km S of Dungun, *T. & P.* 236 (K, L, SING). Pahang: Cameron Highlands, *Batten Pool* Nov. 1939-Jan. 1940 (SING); Pekan, *Ridley* anno 1893 (BM). Selangor: *sin. loc.*, *Kloss* s.n. (BM). Negri Sembilan: Port Dickson, *Purseglove* 4348 (A, K, L, SING). Johor: Pulau Tioman, *Stone* 12005 (L); Telok Gorek, Mersing, *Ng* FRI 5190 (A, K, L); Sedili Kecil, *Stone* 16069 (BISH); Pulau Pisang, *Henderson* SING 36273 (BO, K). Sarawak: Tg Jong Siang, Datu P. F., *Lee* S 14959 (K, L); Bako Nat. Park, *Wanner* 301 (U). Sabah: Kuala Membakut, *Amin & Haga* SAN 102929 (L); Fr. Binsulok, *Amin* SAN 102564 (E, K, L); Palau Balembangan, *Stone & Anderson* 4580 in SAN 86781 (A, UC); Melobong, Kudat, *Orolfa* FD 1830 (A, BRI, K, L); Semporna District, Pulau Timbun, *Singh et al.* SAN 49131 (K, L).

INDONESIA. Sumatra Utara: NW of Tanjungpura, *Iwatsuki et al.* S 285 (BO). Riau: Pulu Padang, *Docters van Leeuwen-Reijnvaan* 5548 (BO); Tebingtinggi, *Bruinier* 164 (BO), 206 (BO); P. Tukulai, near P. Bintan, *Bünnemeijer* 6299 (BO). Java Barat: Pulau Panaitan (= Prinseneiland), *van Borsum Waalkes* 514 (A, K, L); Udjung Kulon Res., *Soepadmo* 280 (A, K, L, P); 13 km N of Labuhan, *Leeuwenberg* 13211 (WAG); S Banten, near Malingping, *Adelbert* 405 (BO, K, L); Pelabuhanratu, *Koorders* 12260 (BO, K, L); 4 km W of Pelabuhanratu, *Leeuwenberg* 13284 (L, WAG); Bogor, Cibalagung, *Nedi & Idjan* 339 (BO); Udjung Genteng, *Backer* 17533 (BO); Banjarwangi, *Backer* 7030 (BO). Java Tengah: Semarang, Karimunjawa, *Karta* 266 (L, P); near Tayu, *Beumée* A 217 (BO). Java Timur: Bawean Island, *Buwalda* 3370 (L); near Rogojampie, *Zollinger* III 3932 (L, P, W). Kangean Island, *Dommers* 44 (BO). Kalimantan Timur: ca 20 km N of Samoja, *Ambriansyah & Arifin* 177 (K, L, WAN); *ibid.*, *Leeuwenberg* 14489 (L, WAG). Sulawesi: Talaud Islands, Karakelong Island, *Lam* 2486 (L). Sulawesi Utara: Gorontalo, *Riedel* s.n. (K, W). Sulawesi Tengah: SW of Donggala, *W. Meijer* 10049 (BO, L); 5 km N of Parigi, *Leeuwenberg et al.* 14566 (L, WAG); ca 20 km S of Tambarana, near Tiwa, *Leeuwenberg et al.* 14565 (L, WAG); Subdivision Poso, near Borone, *Eyma* 3722 (A, K, L, U); near Morowali, *Grimes* 1021 (BO, K). Sulawesi Tenggara: near Lelewawo, *Waturandang* E 36 (BO); Kendari, *Kjellberg* 1237 (BO, S); Wowoni Island, *Curran* 295 (A); Passar Wajo, *Elbert* 2803 (L); Muna Island, *Kjellberg* 45 (BO, S); Kabaëna Island, *Elbert* 3334 (A, L). Sulawesi Selatan: Pasankayu, *Rachmat* 178 (BO, L); Lampea, *Kjellberg* 2045 (BO, S); near Parepare, *Koorders* 16051 (BO, L); Kp. Mara, *Noerkas* 226 (BO, L). Kangean Islands: Kalisangka, *Backer* 26994 (BO, L); Sepanjang, *Backer* 28989 (BO). Nusa Tenggara: SW Sumbawa, *de Voogd* 1631 (A, BO, L); W Sumbawa, S of Sumbawa Besar, *Kostermans* 19204 (BO, C, K, L); Flores, Rinca, *Saakov* 140 (BO); Endeh, *Verheijen* 3637 (L); Alor, Likuatang-Taramana, *Jaag* 816 (L, ZT); Taramana-Pisigomo, *Jaag* 898 (BM, L, ZT). Pulau Semau, Timor, *de Voogd* 2321 (A, K, L). Aru Islands: Dobo, *Jensen* 240 (C, L). S Maluku: Wetar, *Bloembergen* 3707 (A, BO, CANB, K, L, P); Babar, *van Borsum Waalkes* 3100 (BO, L). Tanimbar Islands: Pulau Selaru, *van Borsum*

Waalkes 3168 (BO, L); S. Tanimbar, Arui Bab., *Purwaningsih* 46 (BO, K, L); P. Yamdena, Saumlakki-Olili Road, *Buwalda* 4025 (BO, K, L); Wai Ranarmoje, *Buwalda* 4678 (L). Kai Kecil, *Moseley* Sept. 1874 (K). Kai Besar: Elat, *Jensen* 148 (BISH, C, L). Sula Islands: Sula Mangole, *Bloembergen* 4734 (K, L). C Maluku: Buru, Waelanga, *van Balgooy* 4822 (L). Ambon: *Robinson* 72 (BM, GH, K, L, NSW, P); Hila, *Treub* anno 1893 (BO, L). Seram: Waylale Coast, Piru, *Maskuri* 965 (BO); Wae Selan, *Eyma* 2840 (A, BO, K, L); W of Pasahari, *Rutten* 180 (BO, L). N Maluku: Obi Island, Jikodolong, *de Vogel* 4251 (CANB, K, L). Ternate: Dao Lasi, *Beguín* 1078 (BO, L). Halmahera: Nucifera, Weda District, *de Haan* 1752 (BO, K, L, P); Taruba, *Nedi* 211 (A, K, L); Limau, *Yoshida* 2309 (L). Morotai: Wajabula, *Anang* 316 (BO). Irian Jaya: Misool Island, *Pleyte* 1163 (BO, K, L); Batanta Island, *van Royen* 3545 (A, CANB, K, L); Manokwari, *Versteegh & Vink* BW 8265 (BISH, CANB); Adi Island, *Moll* BW 9827 (BISH, CANB, L, WAG); Maswaar Island, *Kalkman* BW 3573 (CANB, L); Job Island, Wandammen Bay, *Schram* BW 15016 (L); Biak Island, *Feuilletau de Bruyn* 292 (L); Olifant Mt, Geelvink Bay, *A.B. Meyer* 7 (K); Yapen Island, *Aet & Idjan* 614 (K, L); Nabire, *Kanehira & Hatusima* 12856 (BO); Mamberano R., *Janowsky* 429 (BO, L); near Okaba, *Brandenhorst* 14 (BO, K, L).

PAPUA NEW GUINEA. Daru Island, *Brass* 6272 (A, BM, L); Dagua, *Pulsford & Floyd* 5431 (A, K, L); Cap Wom, ca 8 km NW of Wewak, *Wiakabu & Yelfe* LAE 70329 (A, E, K, L, M); Manam Island, Madang Province. *Demoulin & Smeets* 5871 (A, BR, K, L); Tukai, *Coode & Katik* NGF 32749 (CANB, L); near Bili Bili, *Hoogland* 4853 (A, CANB, K, L); Keuru, Gulf Division, *Brass* 1191 (K); Cupola, *H.E. Brown* 121 (A); near Salamaua, Morobe District, *A.E. White* NGF 11155 (A, K, L, NSW, SING); Bagabay Island, *Mann & Vandenberg* NGF 43407 (K, L); 6 km N of Matafuna, Long Island, *Millar & Vandenberg* NGF 48544 (A, L); Sisilia R. area, *Conn & Katik* LAE 66063 (K, L); Finschhafen, *Hollrung* 79 (BO, K, MEL); Busama, *L.S. Smith* 31 (CANB); Lasanga Island, *Streimann* NGF 44267 (K, L); Ulangawa Island, Morobe District, *Moi* 123 (A); near Tapio, Cape Vogel Peninsula, *Hoogland* 4332 (A, CANB, K, L); Kiriwina Island, *Frodin* UPNG 991 (K, L); Normanby Island, *Brass* 25463 (A, K, L, S); Woodlark Island, *Kairo* 170 (A, CBG, K, L); Joanna Island, Louisiades, *MacGregor* anno 1889 (MEL); Pig Island, *MacGillivray* 16 June 1849 (K); Sudest Island, Rambuso, *Brass* 28098 (A, L); Rossel Island, Abaleti, *Brass* 28288 (A, K, L); Pelikawa, Manus Island, *Stone & Streimann* 10488 in LAE 53788 (A, BISH, CANB, K, L); Lou Island, *Sands et al.* 3031 (A, K, L). New Ireland: near Lavongai, ca 42 km from Kavieng, *Coode et al.* NGF 29603 (A, BISH, BRI, E, K, L, SING); Danfu R. valley, *Sands* 777 (A, C, CANB, K, L); near the Timai, ca 1.5 km SW of Taron, *Sands et al.* 2018 (A, K, L). Mussau, *Køie & Sandermann Olsen* 1234 (C, Z). New Britain: W of Aisega, Cape Gloucester, *Frodin* NGF 26657 (BRI, L); Riebeck Bay, *Henty & Lelean* NGF 49469 (A, CANB, K, L, M, NSW); Pulie R., *Henty & Frodin* NGF 27211 (E, K, L, SING); Lake Dakataua, *Barker & Vinas* LAE 66541 (A, BISH, CANB, E, K, L, M, NSW); Schirlitz Penn., *Croft & Katik* NGF 15000 (A, BISH, CANB, E, K, L, M, NSW); near Massua, *Schlechter* 13725 (BO); Rapuri, near Cape Hoskins, *Floyd* 6451 (A, K, L); Gazelle Peninsula, *van Royen* 6620 (L). Bougainville Island: Kieta, *Kajewski* 1530 (A, BISH, BM, G, L, P); Buin, *Kajewski* 2239 (A, BISH, G).

SOLOMON ISLANDS. Ovau, *Mauriasi et al.* BSIP 13400 (A, K, L). Shortland: comm. *Comins* 313 (K). Treasury: *Mauriasi et al.* BSIP 14033 (K, L). Choiseul: Pokete Area, *Gafui et al.* BSIP 17448 (K, L); Mbirambira Area, *Gafui et al.* BSIP 18892 (K, L); N of Porokozo, *Gafui et al.* BSIP 18333 (L). New Georgia Group: Baga, *Whitmore's collectors* BSIP 2839 (K, L). SW Ranongga, *Mauriasi et*

al. BSIP 15636 (K, L). New Georgia: *sin. loc.*, *Waterhouse* 303 (A, C, K, L); Viru Harbour, *Kere* BSIP 5094 (K, L, SING). Kolombangara: Merusu Cove, *Whitmore* BSIP 1459 (K, L, SING). Rendova: *Whitmore* BSIP 1931 (K, L). Tetepari: *Mauriasi et al.* BSIP 15981 (K, L). Vangunu: *Whitmore* BSIP 883 (K, L, SING). Barora Fa: *Mauriasi et al.* BSIP 16545 (K, L); Santa Ysabel: Allardyce Harbour, *Sore et al.* BSIP 2641 (K, L); Tasia, *Brass* 3284 (A, BISH, L). Savo: Tonginakulu, *Gafui et al.* BSIP 12967 (K, L). Sandfly Island (= Mbokonimbeti), *Gafui et al.* BSIP 15178 (K, L). Guadalcanal: Mt Mambulu, *Kere* BSIP 4902 (K, L, SING); Mbokokimbo R., *P.I. Forster & Liddle* 8652 (BISH, K, MEL). Big Ngella: N of Haleta, *Gafui et al.* BSIP 15051 (K, L). Small Ngella: NW of Vuranimala, *Gafui et al.* BSIP 15424 (K, L). Malaita: Ata'a R., *Gafui et al.* BSIP 10689 (K, L); Su'u Area, *Mauriasi et al.* BSIP 13630 (K, L, SING); Rokera, *Gafui et al.* BSIP 10430 (K, L). Teruwo: Anuta, *Deyen* BSIP 19230 (BISH). San Cristobal: Onebia Area, *Gafui et al.* BSIP 12624 (K, L); Huni R. mouth, *Sore* RSS 2329 (A, K, L, P, SING). Santa Catalina: *Mauriasi et al.* BSIP 17831 (K, L). Santa Ana: near Gupuna, *Yen* BSIP 18113 (BISH, K). Reef Islands: Nanienubuli, *Inimua* BSIP 6526 (K, L, SING). Santa Cruz Islands: Masoko Area, *Mauriasi et al.* BSIP 16738 (K, L); Tomotu Noi, *Powell et al.* BSIP 19891 (BISH, L); Vanikoro, *Whitmore* BSIP 1770 (K, L, SING).

AUSTRALIA. Christmas Island: Rocky Point, *Andrews* 104 (BM, K); Waterfall Road, *Pearson* 86 (K). Northern Territory: Coburg Peninsula, Popham Bay, *Cowie* 1 3658 (K); Wessell Island, *Latz* 3500 (BRI). Queensland: Cook District, Dauan Island, *Lawrie* AQ 4029 (BRI); Cape York, *Clarkson* 5691 (BRI); *ibid.*, Muttee, *P.I. Forster* 6430 (K, MEL); Olive R., *Stirling* AIM 523 (BRI); Kennedy Hill Gorge, *P.I. Forster & Kenning* 5404 (BRI, MEL); Claudie R., *Hyland* 6207 (BRI, L); S of Cooktown, *Wrigley & Telford* NQ 1426 (CBG, K, L, MEL); Pilgrim Sands, *McKenze* Sept. 1980 (BRI); Abor. Res., *Hyland* 8520 (BRI, L); Edge Hill, via Cairns, *Dean* June 1906 (BRI); Mulgrave R., *Duke* AIM 1223 (BRI); near Innisfail, *Blake* 15256 (CANB, K); Bingle Bay, *L.S. Smith* 4913 (L); North Kennedy District, Balgal Beach, *Bean* 15 Nov. 1992 (BRI); Point Denison, *Fitzalan* s.n. (MEL 157317); Conway Nat. Park, *Batianoff* 9405210 (BRI); South Kennedy District, Repulse Bay, *Batianoff* 9406104 (BRI); N of Mackay, *McDonald* 4569 (BRI); Port Curtis District, Pearl Bay, *Sharpe* 5492 (BRI); Wide Bay District, S of Double Island Point, *Petrie* 157a (BRI); Freshwater Creek, *Everist* 7639 (BRI); Cooloo Nat. Park, *Miley* 28 Nov. 1989 (BRI).

PALAU (= BELAU) ISLANDS. Palau (= Belau): *Shearard* 97 (BISH). Malakal: *Fosberg* 47506 (P). Koror: *Fosberg* 32320 (L, P). Angaur: *Kanehira* 593 (A). Garudokku: *Takamatsu* 1215 (BISH).

CAROLINE ISLANDS. Yap: *C.C.Y. Wong* 327 (A, BISH). Kanif: *Takamatsu* 1917 (BISH). Amatyau: *Hosokawa* 8307 (BISH, US). Truk-Moen: *Fosberg* 60243 (L, P). Ponape: Patapan, *Ledermann* 13455 (B). Mutokolodsch, *Hallier* 14 Oct. 1903 (HBG). Kusaie: *Stone* 1925 (BISH). Lele: *Hallier* 3 Sept. 1903 (HBG).

MARSHALL ISLANDS. Jaluit: *Schnee* July 1901 (NSW).

LOYOTÉ ISLANDS. Lifou: *Whitmee* s.n. (BM). Ouvéa: *Däniker* 2091 (Z).

NEW CALEDONIA. Île Art, *Mackee* 19343 (P); Ouenga-Col d'Amos, *Bamps* 6154 (BM, BR, P); Ilot Hienga, *MacKee* 31741 (K, L, P); Pouembot, *MacKee* 26057 (K, L, P, type of *C. manghas* var. *acutisperma*), 33159 (P, type of *C. manghas* var. *manghas* f. *luteola*); Poindimié, *Bamps* 5900 (BR, P); Poya, *MacKee* 34126 (K, L, P); 7 km S of Thio, *Buchholz* 1025 (P); Kanala, *Vieillard* 962 (BM, P); Bouloupari, *MacKee* 32599 (K, L, P); near Nouméa, *Schlechter* 15090 (BM, BR, G, HBG, K, LY, P, W); Ouen Toro, *Stauffer* 5737 (A, BISH,

K, L, P, UC, WAG, Z, neotype of *C. linnaei*); Anse Vata, *Schodde* 5277 (CANB, L, P); Île des Pins, *MacKee* 13105 (K, L, P); Île Walpole, *Benoit in MacKee* 34396 (K, L, P).

VANUATU. Vanua Lava: *Wheatley* 467 (K). Santo: Kuplana, *Ludvigson* 16 (L). Pentecost: *Walsh* 143 (NSW). Malakula: *Gillison in N. Hallé* RSNH 6445 (K, P). Efaté: *Morrison* 25 Aug. 1896 (K). Port Vila: *Levat* 27 Nov. 1883 (P). Erromanga: *M.S. Johnson* 10 (A, P). Aniwa: *Curry* 1460 (K). Tanna, ca 9 km SE of Lenakel, *Green & Allan* RSNH 1215 (K, L, NSW, P). Aneityum (= Anelghowat): *Kajewski* 806 (A, BISH, K, P).

FIJI. Rotuma: *McClatchet* 847 (BISH). Vanua Levu: Bua, *Damanu in Berry* K 57 (CANB, K, L); Mathuata, *A.C. Smith* 1839 (B, BISH); between Valeni and Macuata, *Damanu in Berry* 15718 (K, L). Viti Levu: Lautoka, *Degener & Ordonez* 13978 (A, BISH, K, UC); Mba, *A.C. Smith* 6156 (A, BISH, K, L, P, S); Namosi, *A.C. Smith* 8524 (BISH, GH, K, L, P, S, UC); above Namalata and Ngaloa Bays, *A.C. Smith* 68 (B, BISH, K, P, S, UC). Ngau: *A.C. Smith* 7913 (BISH, GH, K, L, P, S, UC). Matuku: *Bryan* 252 (BISH). Ongea Levu: *Bryan* 440 (BISH).

WALLIS. Mt Lulu, *Morat* 7064 (P); Pointe Natalaa, *Hoff* 4246 (K, P).

FUTUNA ISLANDS. Futuna-Tuatafa: *Hoff* 3952 (P). Horne: *Yen X* 68 (BISH).

TONGA. Niuafouu: *Whistler* 6439 (BM). Niuatoputapu, *Whistler* 6119 (BM). Vavau: *Crosby* 109 (K). Foa: *O'Rourke George* 334 (GH). Lifuka: *Yuncker* 15730 (BISH, BM, GH, U). Uoleva: *Whistler* 6651 (BM, HBG). Eueiki: *Soakai* 995 (K). Tongatapu: *Yuncker* 15867 (BISH, BM, GH, U).

W. SAMOA. Savaii: *Christopherson & Hume* 2625 (A, BISH, P, UC). Upolu, Falefa, *Hochreutinger* 3439 (G, L, UC, Z, type of *C. manghas* var. *samoensis*).

AMERICAN SAMOA. Tutuila: Pago Pago, *Setchell* 92 (UC); between Aua and Afono, *Yuncker* 9427 (BISH, K). Tau: *Yuncker* 9134 (A, BISH).

COOK ISLANDS. Rarotonga, *Wilder* 857 (BISH).

AUSTRAL ISLANDS. Maïa: *St. John* 16968 (BISH). Rurutu: *Florence* 6121 (BISH, P, WAG). Tamatoa: *N. Hallé* 6642 (P). Raiavavae: *Florence* 5891 (P).

SOCIETY ISLANDS. Bora-Bora: *Lettou* anno 1825 (P). Raiatea: *J.W. Moore* 420 (BISH, L, U). Moorea: *H.W. Smith* 128 (A, BISH, UC). Tahiti: Punaauia, *Florence* 11480 (WAG); Ana Pua, *Grant* 4077 (A, BISH, K); Aiurua Valley, *Florence* 8101 (P). Mehetia: *St. John* 14225 (A, BISH, P).

MARQUESAS. Nukuhiva: *Decker* 200 (BISH, P, UC); *ibid.*, *Florence* 7287 (BISH, WAG). Uahuka: *Quayle* 1707 (BISH). Uapou: *F. Hallé* 2039 (CBG, P). Hiva Oa: *Schäfer & Oliver* 5283 (K). Tahuata: *Schäfer* 5137 (BISH, K). Fatuhiva: *Decker* 2612 (BISH, P).

GAMBIER ISLANDS. Puamau: *Schäfer* 5411 (K). Mangareva: *St. John* 14504 (BISH, K, L).

PITCAIRN ISLAND. *Chapin* 961 (A, BISH); *Cuming* 1379 (K).

CULT. Brazil: Bot. Garden, Rio de Janeiro, *Oakes Ames* Jan. 1916 (ECON). Trinidad: Bot. Garden, *Krug & Urban* 1378 (Z). Dominica: Bot. Garden, Roseau, *Hodge* 3886 (GH). Netherlands: Wageningen Bot. Garden, *van Setten* 591 (WAG). Germany: Berlin Bot. Garden, *Schwerdtfeger* 18232 (B); München Bot. Garden, *Martius* 8 Sept. 1832 (BR); *herb. Kummer* anno 1844 (M). India: Hort. Bot. Calcutta, *Griffith* anno 1843 (P). Vietnam: Saigon (= Ho Chi Minh) Bot. Garden, *Hiêp* 6 (P), 663 (P, WAG). Taiwan: Agr. College, Pintung, *Chin-en Chang* 9269 (A). Philippines: Pantar, *Zwickey* 320 (F). Indonesia: Bogor Bot. Garden, IV A 69, *Leeuwenberg* 13143 (WAG); IV A 90 A, *Leeuwenberg* 11863

(WAG); IV A 91, *Hallier* C 55 (G, L). Australia: Bot. Garden Darwin, *Allen* 532 (NSW); Cairns Bot. Garden, *Wrigley & Telford* NQ 1182 (CBG); Brisbane Bot. Garden, *C.T. White* 8777 (A, BRI); Sydney Bot. Gard., *Rodd* 10 Apr. 1970 (NSW). Hawai'i: Kaneohe, Ho'omaluhia Bot. Garden, *Staples & Sand* 1046 (WAG), 1048 (WAG), 1049 (WAG), 1051 (WAG). New Caledonia: Ouvea, *MacKee* 36070 (P, WAG). Tahiti Punaauia, *Florence* 11479 (WAG).

NOTES: The corolla tube of *C. manghas* is hairy inside in the western part of the area of distribution from Pemba and Madagascar east to Papua New Guinea, where it varies in length from 17 to 55 mm. In the Pacific part it may be glabrous inside, as is mostly the case in New Caledonia and often in Fiji and Samoa. The tube varies greatly in length; in Madagascar between 22 and 40 mm, in New Caledonia between 17 and 29 mm, in Fiji between 22 and 47 mm and in Samoa between 22 and 55 mm. Specimens with short corolla tubes collected in New Caledonia and the Pitcairn Islands sometimes erroneously had been named as *C. odollam*, but the insertion of the stamens shows that they belong here.

The description of *C. odollam* var. *mugfordii* Bailey contains the character red centre of corolla, a character only known of *C. manghas*. Therefore P.I. Forster's conclusion about this synonym is corroborated.

When the herbarium of Rev. Père Montrousier was brought to Lyon it got lost during transport some forty years ago (P. Morat, pers. comm.). Therefore a neotype is proposed for the synonym *C. linnaei*.

As has been mentioned with *C. floribunda* several species include a number of countries in their area of distribution, and as far as their area of distribution overlaps they have different biotopes. E.g. in New Guinea *C. manghas* occurs along the coast, and *C. floribunda* and *C. inflata* are found inland; *C. inflata* even at higher altitudes than *C. floribunda*. When only a single species occurs the various biotopes of all of them are occupied by that one species. Therefore *C. manghas* occurs in Madagascar and in Fiji not only along the coast as in Papua New Guinea, but also inland, in Fiji (Viti Levu) even as high as 1100 m. A comparable phenomenon has been observed by the author in Africa. From Benin eastwards two *Alstonia* species occur, *A. boonei* on dry spots and *A. congensis* in swamps. *A. boonei* is the only species west of the Dahomey Gap and in Ghana he found it in both biotopes.

6. *Cerbera odollam* Gaertn., Fruct. 2: 193 (1791). — Type: *Odallam* Rheed., Hort. Malab. 1: pl. 39 (1678).

Figs. 4–5, p. 35-36; Phot. 8, p. 64; Map 5, p. 37

Homotypic synonym:

Tanghinia odollam (Gaertn.) G. Don, Gen. Syst. 4: 98 (1837).

Heterotypic synonym:

C. lactaria Buch.-Ham ex Spreng., Syst. 1: 642 (1825).

C. manghas Gaertn., op. cit. 192, non L. — Type: Indonesia, Java, Semarang, *Horsfield* s.n. (holotype K; isotype BM).

C. dilatata Markgr. in Engler, Bot Jahrb. 61: 196, t. 10, f. 2H (1927) and 63: 285 (1930), non S.T. Blake (1948), partly, excl. of *Ledermann* 13455, which belongs to *C. manghas*. — Lectotype: Mariana Islands, sin. loc., *Gaudichaud* s.n. (Lectotype P, designated here).

Shrub or tree 2–15 m high. Trunk in trees 2–20 cm in diameter; bark grey, with large protruding lenticels, thick. Branches dark brown, with many conspicuous leaf scars. *Leaves*: petiole 1.8–4 cm long; blade subcoriaceous and brittle when dried, narrowly obovate, 2.5–5 x as long as wide, 9–23 x 2–5.5 cm, acuminate or apiculate at the apex, decurrent into the petiole, with 15–25 pairs of rather straight or upcurved secondary veins forming an angle of 60–90° with the costa; tertiary venation reticulate. *Inflorescence* 10–35 x 7–15 cm, many-flowered, congested when young, rather lax later near the base, otherwise congested. Peduncle 3–20 cm long; pedicels 5–25 mm long. Bracts the same size as the sepals or somewhat larger, deciduous. *Flowers*: *Sepals* very pale or light green, equal or unequal, spreading and recurved later, ovate, elliptic or narrowly to very narrowly so, 2–6 x as long as wide, 6–19 x 2.5–5 mm, acuminate or acute. *Corolla* white, yellow or orange in the throat or pure white, 22–35 mm long in the mature bud and forming an ovoid head one third to half of the bud length with an obtuse apex, puberulous on the mouth and often also on the base of the lobes, pubescent inside on the apex of trapezium-shaped excrescences 1.5–2 x 3–4 mm just above the insertion of the stamens, occasionally lanate (Guam, *Steere* 32) from the mouth to the insertion of the stamens or sparsely pubescent in stripes 4 mm long (Sabah, *Lejeune* Nov. 1990) alternating with the filaments from the middle of the anthers downwards, otherwise glabrous inside; tube 0.9–3 x as long as the calyx, 0.5–0.9 x as long as the lobes,

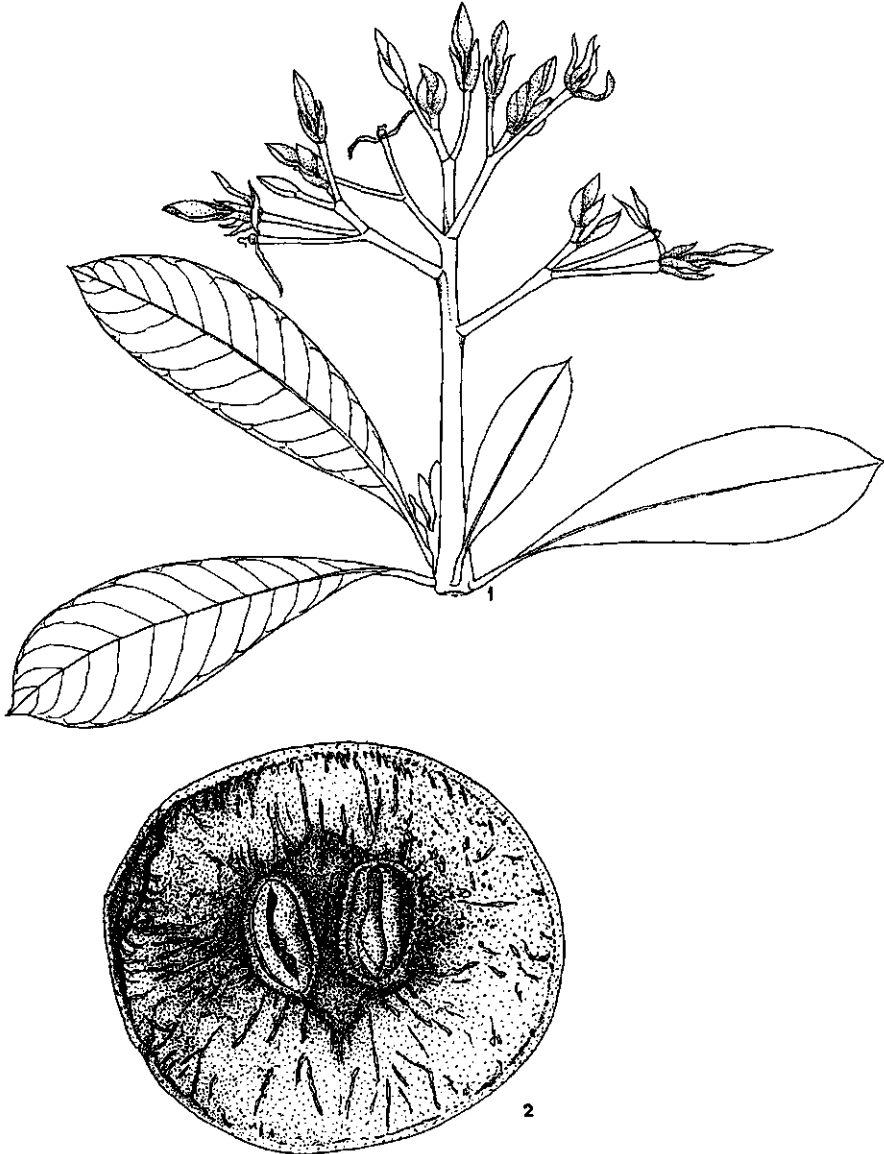


Fig.4. *Cerbera odollam*. 1, habit (x 2/5); 2, transverse section of fruit (x 1/4); 4, flower (x1/3). 1-2 from Rudjiman 350.

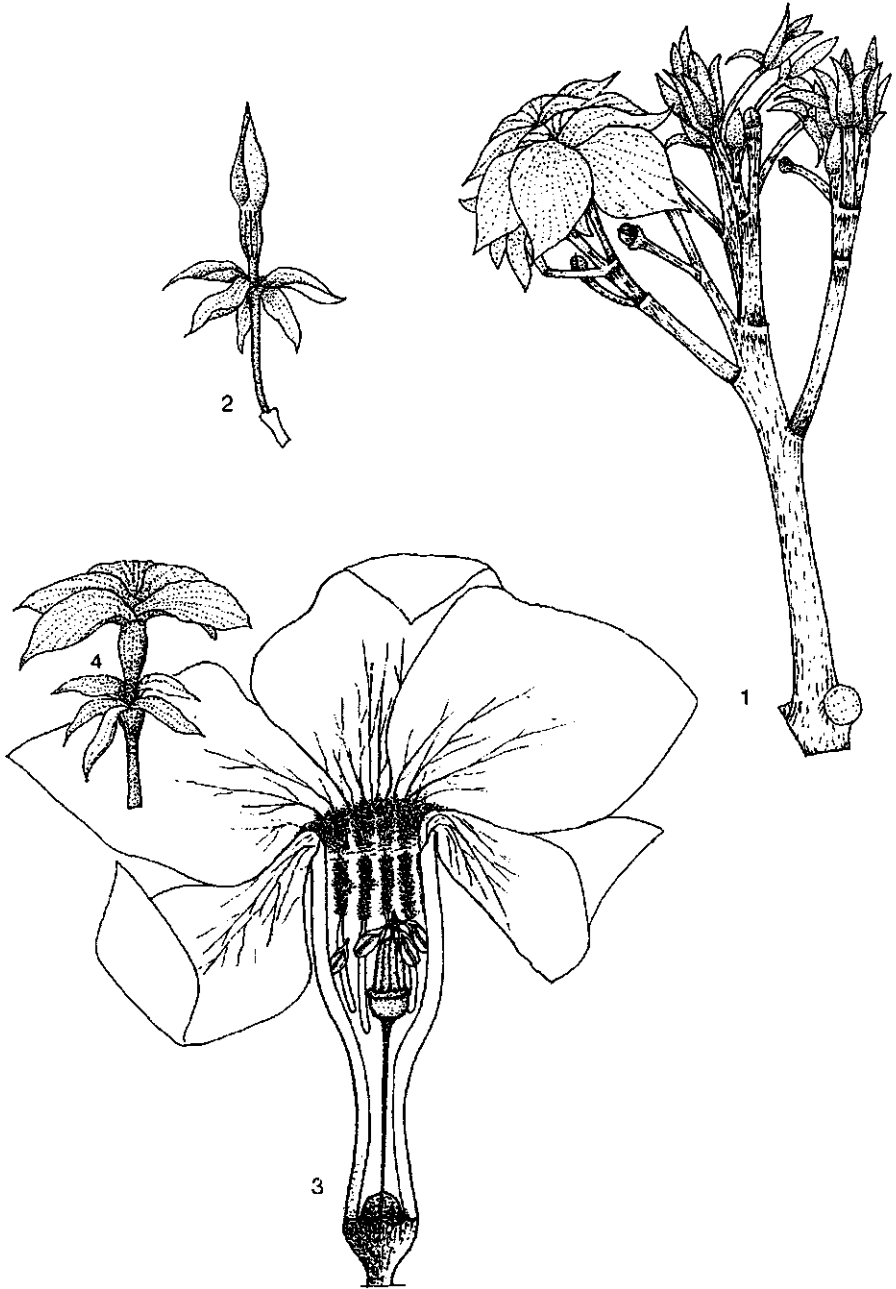
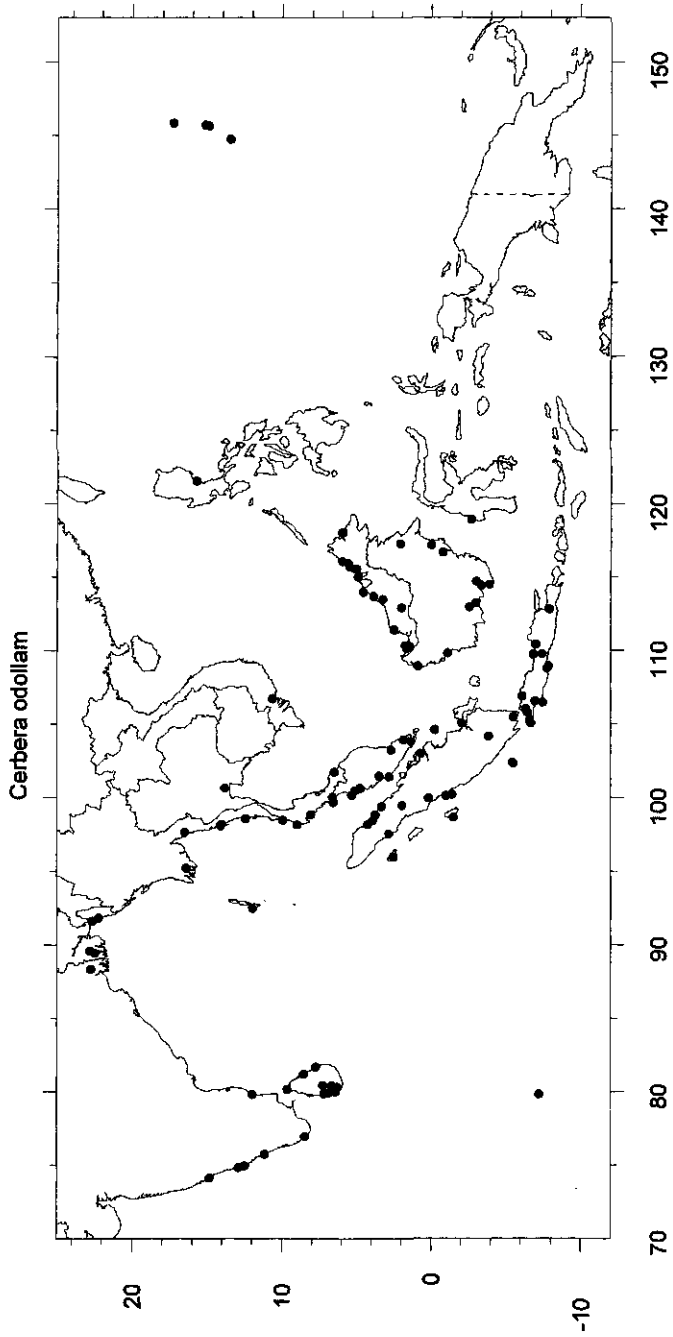


Fig. 5. *Cerbera odollam*. 1. inflorescence (x 2/3); 2. bud (x 2/3); 3. opened flower (x 3); 4. flower (x 2/3). 1-4 from Rudjiman 350.



Map 5. *Cerbera odollam*.

15–25 mm long, 2–4 mm wide just above the base, widened around the stamens at 0.3–0.5 of the length (at 6–10 mm from the base) to 4–7 mm wide and mostly contracted at the throat to 3–6 mm wide; lobes obliquely elliptic or obovate and acute or acuminate at the apex, or dolabriform and with an acuminate and a rounded apex, 1.1–2 x as long as the tube, 1.4–3 x as long as wide, 12–35 x 8–15 mm, spreading. *Stamens* with apex 5–7 mm below mouth of corolla tube, inserted 0.5–0.62 of the length of the corolla tube (at 9.5–12.5 mm from the base); anthers ovate, 1.7–2 x as long as wide, 2–4 x 1.2–2 mm, with an apical tail not enclosed in the given sizes, 0.5–1 x 0.3–0.5 mm. *Pistil* with apex at the level of the anthers; ovary subglobose, laterally compressed or not, 1.5–2 x 1.5–2 x 1.5–2 mm, abruptly narrowed into the filiform style; pistil head of 3 parts, the first of which is often absent, 0.5 x 1.5 mm, a ring-shaped veil 1–1.5 x 2–2.5 mm and a blunt cone 2.5–3 x 1.2–2 mm with an apical hole. *Fruit* pale yellow-green or red; mericarps subglobose to broadly ellipsoid, 8–11 x 7.5–11 x 6.5–10 cm, rounded at the apex, often(?) subcordate at the base.

DISTRIBUTION: South India, Sri Lanka, Myanmar, Thailand, Vietnam (Cochinchina), Malaysia (Malay Peninsula, Sarawak and Sabah), Indonesia (Sumatra, Java, Kalimantan, Sulawesi), Mariana Islands, Guam.

ECOLOGY: Coastal and riverine forest. Alt. 0–100(?) m.

GEOGRAPHICAL SELECTION OF THE APPROXIMATELY 250 SPECIMENS EXAMINED:

INDIA. West Bengal: Barrackpore Park, Calcutta, Lacaita Mar. 1913 (BM). Karnataka, near Karwar, *Fernandes* 121 (A); near Mangalore, *Hohenacker* 45 (G, K, M, MEL, NY, P, U, Z). Kerala: Kasaragod District, *Ansari* 64902 (K); Calicut, *Drew* anno 1857 (E); 5 km N of Trivandrum, *Erlanson* 5084 (A, NY, W). Tamil Nadu: Pondicherry, *Perrottet* anno 1835 (E, G, K, P). Andaman Islands: sin. loc., *C & P* 262 (K).

SRI LANKA. Jaffna, *herb. Rottler* 16 Jan. 1796 (C, K); Ganza, *Worthington* 4883 (BM, K); Batticaloa, *Fosberg et al.* 50992 (AAU, GH, K, L, NY, UC); between Mawanella and Udamulla, *H. Huber* 2 (BM, US); Negombo, *Leeuwenberg* 14784 (WAG); near Colombo, *Bernardi* 15399 (US, Z); W of Weddagala, Ratnapura District, *Fosberg* 56596 (E, K, NY, US); Alutgama, *H. Huber* 13 (BM, US); Aturuwella, *Trivengadam* 629 (K, P, US).

BANGLADESH. Sunderbans, *Heinig* 7 Feb. 1895 (A, HBG, MEL, P); ibid., Baniakhali, *Heinig & Gammie* 29 (U, UPS); Khulna, *Clarke* 33412 A (BM, C); Bhola, *Lace* 2623 (E); Chittagong, *Gamble* 7764 (K).

MYANMAR. Moulmeingyun, *Dickason* 6907 (A, E, L); Moulmein,

Dickason 7047 (A, E, L); Maungmagan, *Parker* 2153 (A); Tavoy, *Wallich* 1582.3 (K-W); Mergui, *Meebold* 14194 (BP).

THAILAND. Bangkok, *Kerr* 19558 (BM, E, K, P); *ibid.*, *Zimmermann* 129 (BM, BR, K, L, M, S, US, W); Ranong, *Shimizu et al.* 26375 (A, L, NSW), 26383 (A, AAU, L); Takuapa, *Geesink & Santisuk* 5224 (AAU, C, E, K, L, P); Krabi, *Kerr* 18598 (A, AAU, BM, E, K, L, P); Tarutao Nat. Park, *Congdon* 121 (A, AAU); Satun, *Kerr* 13926 (BM, K, P); Narathiwat, *Niyomdham* 1649 (AAU, C, E, K, L, NY, P).

VIETNAM. Cochinchina, *Thorel* 59 (P); *ibid.*, Saigon to Bien-hoa Road, *Lefèvre* 168 (P).

MALAYSIA: Penang, *Delessert Jan.* 1835 (G). Perak: Parit Buntar, *Agric. officer* SING 34902 (BO, K); Matang, *Wray* 2508 (MEL, SING). Selangor: km 42 Kelang-Morib Road, *T. & P.* 457 (K, L). Pahang: Gunung Lesong, *Lindong* KEP 80986 (A, K). Johor: Mawai, *Corner* 28 Mar. 1932 (SING). Sarawak: Lido Tanah, *Haviland* 106/21 (SING); Santubong, *Brooke* 8088 (BM, L); Kuching, *Hewit* 12 (K); Btg. Lassa, near Rumah Jimbau, *Mamit et al.* S 33601 (K, L); Kapit, Upper Rejang R., *Clemens* 21214 (A); Niah, *Lee* S 40189 (K, L); Labang, Bintulu, *Ashton* S 18153 (A, K, MEL); Baram R. mouth, *Hose* 57 (BM, E, K, P). Sabah: Merintaman F.R., Sipitang District, *Dewol & Karim* SAN 77677 (K, L); Beaufort District, Weston, *Mikil* SAN 34588 (K, L); Papar District, Bongawan F.R., *Dewol & Talib* SAN 80372 (K, L); Kota Kinabalu, *Saikeh Lantoh* SAN 67181 (K, L); Sandakan District, Gum Gum R., *Tarmiji Arsid* SAN 79630 (K, L, SING); Kulamba F.R., *Dewol Sundaling* SAN 55960 (A, K, L).

SINGAPORE. Merlimau, *Wilkinson* 18251 (SING); Tanjong Kling, *Sinclair* 5186 (E, US).

BRUNEL. Jerudong beach, *Ashton* BRUN 5174 (BO, K, L); Ulu Brunei, *Ashton* BRUN 5069 (A, BRI, K, L, SING).

PHILIPPINES. Luzon: Baler, *Merrill* 1051 (K).

INDONESIA. Sumatra: Aceh: Simaloer (= Simeulue), *Achmad* 316 (BO, L); Trumon, *Asdat* 120 (BO, L); Deli-Aceh border, *Bangham* 636 (A, K). Sumatra Utara: NW of Tanjungpura, *Iwatsuki* 5285 (L); Rantaupanjang, *Barends* BW 17 in bb 6758(BO), BW 18 in bb 6759 (A), 45 in bb 8904 (BO, WAG); Batu Bahu, *Yates* 2126 (BM, NSW, UC); Barus, Tapus, *de Haan* 943 in bb 31032 (BO). Riau: S Gansal, *Buwalda* 6801 (K, L). Sumatra Barat: Talu, *Bünnemeijer* 20 (BO); S of Padang, *W. Meijer* 5560 (L); NW of Painan, *van Borsum Waalkes* 1692 (L); Island of Siberut, Mentawai Islands, *Boden-Kloss* 14525 (BO, K); *ibid.*, near Siberut, *Iboet* 222 (BO, L). Bengkulu: Bengkulu, *Ajoeb* 67 (BO). Lampung: Terratas Coast, *Forbes* 1805 (BM, L); Enggano Island, *Lütjeharms* 4238 (BO, F, K, L, P), 5240 (F, K, L). Lingga Island, Panggak, *Bünnemeijer* 7022 (BO, K, L). Bangka: Mentok, *Bünnemeijer* 1519 (BO). Java Barat: near Ancol, *van Harreveld* 6631 (L); W of Tanjung Priok, *Backer* 33026 (BO, K); Bantan, Pandeglang, *Dali* 134 (A); N of Cibungur R., *van Steenis* 4705 (BO); Cigorodong, *Bisset* 769 (K, L); Prince's Island, NW of Ujung Kulon, *Banks & Solander annis* 1770-1771 (BM); Buniwangi, *Koorders* 12344 (BO, L); Balekambang, *Koorders* 106 (BO, L). Java Tengah: Cilacap, *Jeswiet* 1171 (WAG); Nusa Kambangan, *Coll. indig.* 7 June 1909 (BISH, MEL); Pekalongan, *Koorders* 14303 (BO, L); Prigi, *Backer* 11874 (L); Semarang, *Horsfield annis* 1802-1818 (BM, K, type of *C. lactaria*). Java Timur: Krallatan, *Docters van Leeuwen-Reijnvaan* 11779 (BO). Kalimantan Barat: Singkawang, *Hallier* 264 (BO); Kumbang Island, *Winkler* 3433 (BM, L). Kalimantan Tengah: Sampit, *Buwalda* 7939 (L); Mendawi, *van Wijk* 16 (BO, L); Banjarmasin, *Motley* 1287 (K); 5 km S of Belawang, Barito R., *Leeuwenberg & Rudjiman* 13366 (L, UGM, WAG). Kalimantan Selatan: ca. 20 km W of Pelaihari,

Murata et al. 4630 (L). Kalimantan Timur: W Kutai, near Jembayan, *Endert* 1426 (BO, L); ca. 20 km N of Samoja, *Ambriansyah & Arifin* AA175 (A, K, WAN); *ibid.*, *Leeuwenberg* 14488 (L, WAG, WAN); Berau, Segah R., *Kessler et al.* Berau 394 (L, WAN). Sulawesi Tengah: Mamuju, *Rachmat* 148 (BO, L, U).

GUAM. N of Merizo, *Bryan Jr.* 1239 (BISH, K, UC); between Pago and Ylig Rs., *Steere* 32 (A, US).

MARIANA ISLANDS. Sin. loc., *Gaudichaud* s.n. (P, lectotype of *C. dilatata* Markgr.). Tinian Island: Mt Lasso, *Hosaka* 2802 (L). Saipan Island: Pagan, *Hosokawa* 7969 (A, BISH). Agiguan (= Guguan ?), *Kondo* 2 June 1952 (BISH).

CULT. Netherlands, Bot. Garden, Wageningen, *van der Laan* 837 (WAG). Hawai'i, O'ahu, Foster Bot. Garden, *Lau* 1606 (WAG); Kaneohe, Ho'omaluhia Bot. Garden, *Staples & Sands* 1050 (WAG). India: Madras, Adyar Garden, *Bourne* 9 April 1896 (K); Lucknow Nat. Bot. Garden, *Balapore & Pandey* 72471 (A); Pondicherry Bot. Garden, *Perrotet* 317 (G, K). Sri Lanka: Royal Bot. Garden Peradeniya, *Jayaweera* 552 (A). Malaysia: Kuala Lumpur, Lake Gardens, *Stone* 6227 (L). Singapore: Singapore Bot. Garden, *Sidek bin Kiah* 57 (A, C, K); *ibid.*, *Leeuwenberg* 11881 (WAG), 11897 (WAG). Brunei: Seria, *van Niel* 3609 (L). Indonesia: Java, Bogor Bot. Garden XIX.M.22, *Djoemadi* 55 (BO, L).

Excluded species:

Cerbera ahouai L., Sp. Pl. 208 (1753) = *Thevetia ahouai* (L.) A. DC.
C. alliodora Willd. ex Roem. & Schult., Syst. 4: 798 (1819) =
Thevetia alliodora (Willd. ex Roem. & Schult.) Allorge in
Succulentas 1: 27 (1998) — Type: herb. B-WILLD 5112 =
vegetative non Apocynacea.

C. borbonica (J. F. Gmel.) Spreng., Syst. 1: 642 (1825) = *Ochrosia borbonica* J. F. Gmel.

C. chinensis Spreng., l.c. = *Rauvolfia verticillata* (Lour.) Baill.

C. cuneifolia H. B. K., Nov. Gen. 3: 224 (ed. quarto), 175 (ed. folio) (1819) = *Thevetia cuneifolia* (H. B. K.) A. DC. = *T. ovata* (Cav.) A. DC. Conclusion of W. Gensel in mss., confirmed here, both type specimens seen.

C. dichotoma Lodd., Bot. Cab. 16: t. 1516 (1829) = *Tabernaemontana dichotoma* Roxb. ex Wall.

C. fruticosa Ker in Bot. Reg. 5: t. 391 (1819) = *Kopsia fruticosa* (Ker) A. DC.

C. glomerata Bl., Mus. Bot. Lugd. Bat. 1: 158 (1850) in syn. = *Ochrosia glomerata* (Bl.) Val.

C. laurifolia Lodd., Bot. Cab. 10: t. 989 (1824). — Type: icon. cit. = *Tanghinia laurifolia* (Lodd.) G. Don, Gen. Syst. 4: 98 (1837) = *Vallesia macrocarpa* Hillebrand, Fl. Hawaiian Islands 297 (1888) = *Pteralyxia macrocarpa* (Hillebrand) K. Schum. in

- Engler & Prantl, Nat. Pflanzenf. 4, 2: 152 (1895). = **Pteralyxia laurifolia** (Lodd.) Leeuwenb., **comb. nov.**
- C. linearifolia* Stokes in Bot. Mag. Med. 1: 490 (1812) = *Thevetia peruviana* (Pers.) K. Schum.
- C. maculata* (Jacq.) Willd., Sp. Pl. 1: 1223 (1797) = *Tanghinia maculata* (Jacq.) G. Don, in Sweet, Hort. Brit. ed. 3: 461 (1839) = *Ochrosia borbonica* J.F. Gmel.
- C. muricata* Lam., Enc. 1: 62 (1783) = *Ochrosia oppositifolia* (Lam.) K. Schum.
- C. musculiformis* Lam., Enc. 1: 62 (1783) = *Banksia musculiformis* Gaertn. (*Proteaceae*).
- C. nereifolia* Zipp. in Bijdr. Nat. Wetensch. 5: 178 (1830) = *Podocarpus rumphii* Bl. (1847).
- C. nitida* H. B. K., Nov. Gen. 3: 225 (ed. quarto), 175 (ed. folio) (1819) = *Thevetia nitida* (H. B. K.) A. DC. = *T. ahouai* (L.) A. DC.
- C. obovata* Willd. ex Roem. & Schult., Syst. 4: 798 (1819). — Type: Sin. loc., Herb. B-WILLD. 5114 = *Craspidospermum verticillatum* Bojer ex A. DC.
- C. obtusifolia* V. Heurck & Muell. Arg. in van Heurck, Obs. Bot. 203 (1871). — Type: New Caledonia, Viellard 2979 (holotype AWH; isotypes A, P) = *Cerberiopsis obtusifolia* (V. Heurck & Muell. Arg.) Boiteau.
- C. oppositifolia* Lam., Enc. 1: 62 (1783) = *Ochrosia oppositifolia* (Lam.) K. Schum.
- C. ovata* Cav., Ic. 3: 35, t. 270 (1795). — Type: herb. Cavanilles (MA-CAV) = *Thevetia ovata* (Cav.) A. DC.
- C. parviflora* Forst., Insul. Austr. Prod. 19 (1786) = *Ochrosia oppositifolia* (Lam.) K. Schum.
- C. parviflora* Hook. & Arn., Bot. Beech. Voy. 90 (1832), citing Forster (see above) = *Ochrosia oppositifolia* (Lam.) K. Schum.
- C. parviflora* Forst. in Wall, Cat. 1584 = *Ochrosia oppositifolia* (Lam.) K. Schum.
- C. peruviana* Pers., Syn. 1: 267 (1806) = *Thevetia peruviana* (Pers.) K. Schum.
- C. platyspermos* Gaertn., Fruct. 2: 193, t. 124, f. 2 (1791) = *Ochrosia oppositifolia* (Lam.) K. Schum.
- C. quaternifolia* Roxb., Hort. Beng. 19 (1814, nomen = *Ochrosia oppositifolia* (Lam.) K. Schum.? Rumphius, Herb. Amb. 2: t. 363, cited by Roxburgh does not exist as also has been observed by Robinson in Philip. Journ. Sc. 7: 415 (1912). No

other plate could be traced in Rumphius's series of books, which could have been intended by Roxburgh.

- C. salutaris* Bl., Bijdr. 1033 (1826) = *Ochrosia oppositifolia* (Lam.) K. Schum.
C. thevetia L., Sp. Pl. 209 (1753) = *Thevetia peruviana* (Pers.) K. Schum.
C. thevetioides H. B. K., Nov. Gen. 3: 223 (ed quarto), 174 (ed. folio) (1819) = *Thevetia thevetioides* (H. B. K.) K. Schum.
C. triphylla Rudge, Pl. Gui. 4: 31, t. 48 (1806) = *Couma guianensis* Aubl.
C. undulata Andr., Bot. Rep. London 2: pl. 130 (1801) = *Ochrosia borbonica* J.F. Gmel.

Acknowledgements

The author is greatly indebted to the Directors and Curators of the following herbaria for putting material at his disposal: A, AAU, AWH, B, BISH, BM, BO, BP, BR, BRI, B-WILLD, C, CANB, CBG, E, F, FI-W, FT, G, GB, G-DC, GH, HBG, K, L, LY, M, MA, MA-CAV, MEL, MO, NSW, NY, P, S, SING, TAN, TEF, U, UC, UGM, UPS, US, W, WAG, WAN, Z, ZT.

Grateful thanks go to H. de Vries and Dr. Rudjiman (Gadjah Mada University, Yogyakarta), for the drawings they made, to Dr. G. Staples (BISH) for the supply of colour slides, to Prof. Dr. L. J. G. van der Maesen for correcting the English text and to Dr. P. van Welzen (L) for the efficient help to produce the distribution maps by computer.

For this paper a grant was given by the Landbouw-Export Bureau, Wageningen, in order to have it published with colour photographs.

Index of exsiccatae

Only numbered specimens are listed. *Cerbera dumicola* (d), *C. floribunda* (f), *C. inflata* (i), *C. manghas* (m), *C. odollam* (o).

- Achmad 316 (o).
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Adelbai, H., 8 (m).
Adelbert, A.G.L., 405 (m).
Aet & Idjan, 614 (m).
Agassiz, A., 118 (m).
Ah Wing, J., SAN 35487 (o).
Ahorn, G.P., 34, FB 1435 (m).
Ajoeb, 67 (o).
Allen, C.G.F., 532 (m).
Allen, M.S., 116-81 (m).
Allorge, L., 448 (m).
Alvarez, R.J., FB 21457 (m).
Alvis, R.J., 27 (m).
Ambriansyah, 175 (o), 177 (m).
Amin, Ag., SAN 102564 (m), 102929 (m & o), 104146, 114777, 115534, 126764 (o).
Anang 316 (m).
Anderson, E.R., 4859 (d).
Andrews, C.W., 104 (m).
Ansari, R., 64902 (o).
Apostel, I., 53 (o).
Arsid, T., SAN 79630 (o).
Asdat, 120 (o).
Ashton, P.S., BRUN 5069, 5174, S 18153 (o).
Atasrip, 66 (m).

Backer, C.A., 1508, 7030 (m), 11874, 17320 (o), 17533, 26992, 26994, 28989 (m), 33026, 33029, 33034 (o).
Bakhuizen van den Brink, R.C. Jr., 2358 (o).
Balajadia, FD 3279 (m).
Balakrishnan, N.P., 608 (o).
Balansa, B., 235, 235a (m).
Balapure, K.M., 72471 (o).
Balgooy, M. van, 4822, 4822A (m).
Bamps, P., 5790, 5900, 6154 (m).
Bangham, W.N., 636 (o).
Barclay, G.W., 3504 (m).
Barends, H.B., BW 17 in bb 6758, BW 18 in bb 6759, 45 in bb 8904 (o).
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Beccari, O., 3624 (m).

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 Bejaud, 154 (m).
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 Beumée, J.G.B., A 217 (m).
 Beusekom, C.F. van, 3185 (m).
 Bisset, N.G., 753 (m), 769 (o).
 Blake, S.T., 14992 (f), 15024, 15033, 15249 (i), 15256 (m), 15360 (d), 15479, 20244 (m).
 Blanchon, J.P., 833 (m).
 Bloembergen, S., 3218, 3707, 4734 (m).
 Boden-Kloss, C., 14525 (o).
 Bodinier, E., 1206 (m).
 Boerlage, J.G., 37, 520 (m).
 Boiteau, P., 2115 (m).
 Bolster, F.H., 329 (m).
 Bon, H., 395, 1563, 5501, 5692 (m).
 Boraule, J., BSIP 9078, 9318 (m).
 Borden, T.E., FB 2036, 2073 (m).
 Borsum-Waalke, J. van, 514 (m), 1692 (o), 3100, 3168 (m).
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 Bourdy, C., 203, 1060 (m).
 Brandenhorst, D.B., 14 (m).
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 Brown, E.S., 1048, W 184 (m).
 Brown, F., 175 (m).
 Brown, F.B.H., 402, 428 (m).
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 Burkill, H.M., 3975 (m).
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 Carles, W.R., 144 (m).
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 Chin-en Chang, 9269 (m).
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 Clarke, C.B., 6505, 33412A, 33412C (o).
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 Clemens, M.S., 5108, 5338A (i).
 Cockburn, P.F., FRI 7620 (m).
 Collins, D.J., 111, 826 (m).
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 Coode, M.J.E., NGF 29603 (m), 29937 (i), 32749 (m), 40432 (f).
 Corner, E.J.H., RSS 174 (m).
 Costenoble, L.W., 1151 (o).
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 Cox, P.A., 62, 95, 823 (m).
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 Croft, J.R., NGF 15000 (m), 34727 (i), LAE 68766, 68858 (f).
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 Curtis, C., 1651 (m).

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 Davidse, G., 8987 (o).
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 Descoings, B., 1351 (m).
 Dewol S., SAN 55960, 77677, 80372 (o).
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 Dickason, F.G., 6907, 7047, 8053 (o).
 Didrichsen, F., 3069 (m).
 Diefenderfer, P., 20 (m).
 Dissing, H., 1991, 2581 (m).
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Eames, A.J., 4 (m).
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 Edaño, G., BS 76464 (m).
 Elbert, J., 2803, 3334 (m).
 Elmer, A.D.E., 11997, 12163, 12173, 12896, 16773 (m).
 Endert, F.H., 827, 1426 (o).
 Erlanson, E.W., 5084 (o).
 Espiritu, R.A., PNH 91476 (m).
 Everist, S.L., 7639 (m).
 Evrard, C., 11260 (m).
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Fa'arodo, H., BSIP 12357 (m).
 Fagerlind, F., 4339 (o).
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 Forbes, H.O., 822 (f), 1805 (o).
 Foreman, D.B., LAE 52414 (f).
 Forman, L.L., 587 (o).
 Forster, P.I., 5404, 6430, 8652 (m), 15025 (d), 14344 (m).
 Fosberg, F.R., 11725 (m), 25217 (o), 32320, 37308 (m), 46301 (o), 47506 (m),
 50992, 56596, 59935 (o), 60243 (m).
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 Frodin, D. 3474, NGF 26589, 26615 (f), 26657 (m), UPNG 991 (m).
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 Gaerlan, F.M., PPI 2921 (m).
 Gafui, I.H., BSIP 8454 (f), 8658, 8872, 10165, 10329, 10430, 10689, 10825,
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 Grant, M.L., 4016, 4077 (m).
 Gray, B., 1095 (f), 1727 (i).
 Gray, E.C.G., NGF 4082 (f).
 Green, P.S., RSNH 1215 (m).
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 Herbst, D., 7115 (o), 9496 (f).
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 Prawiroatmodjo, S., 1819 (f).
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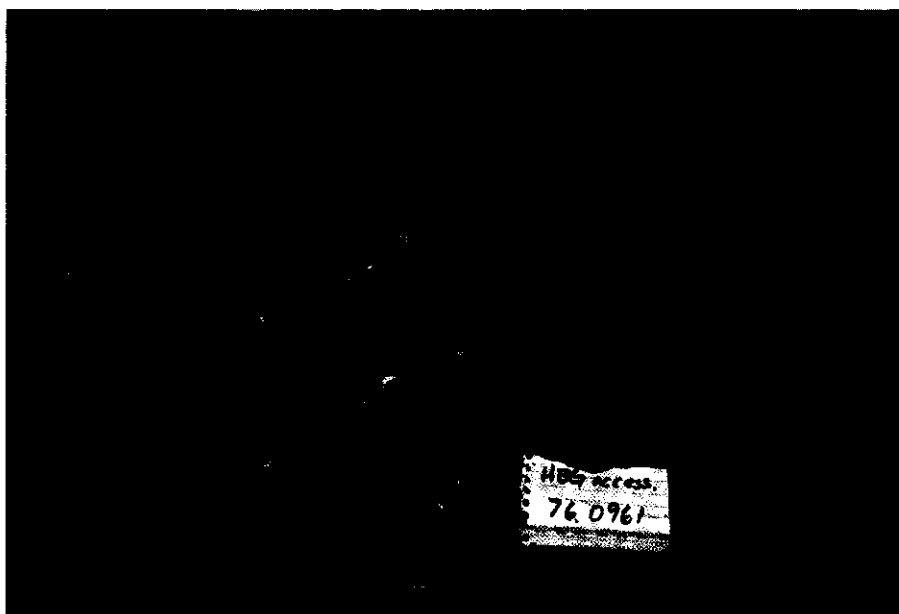
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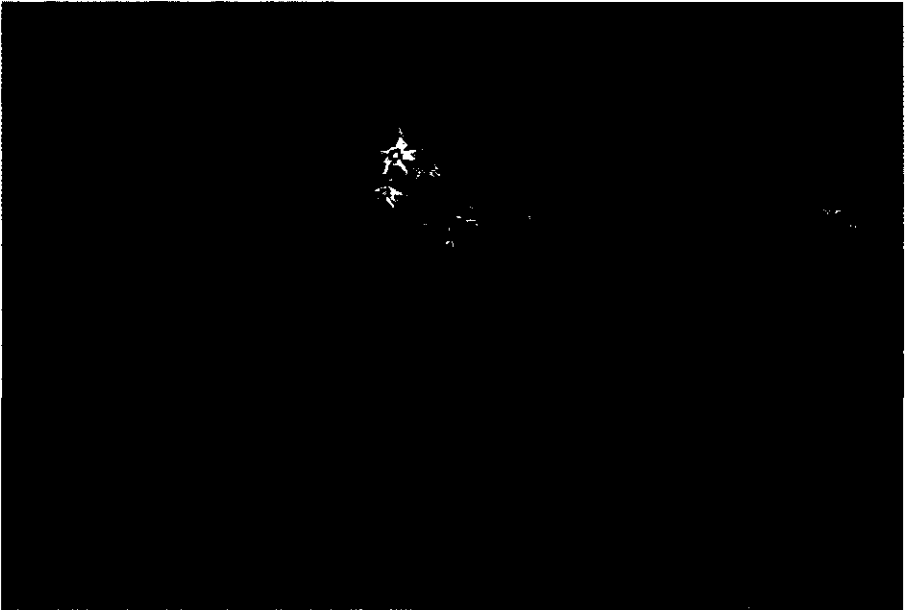
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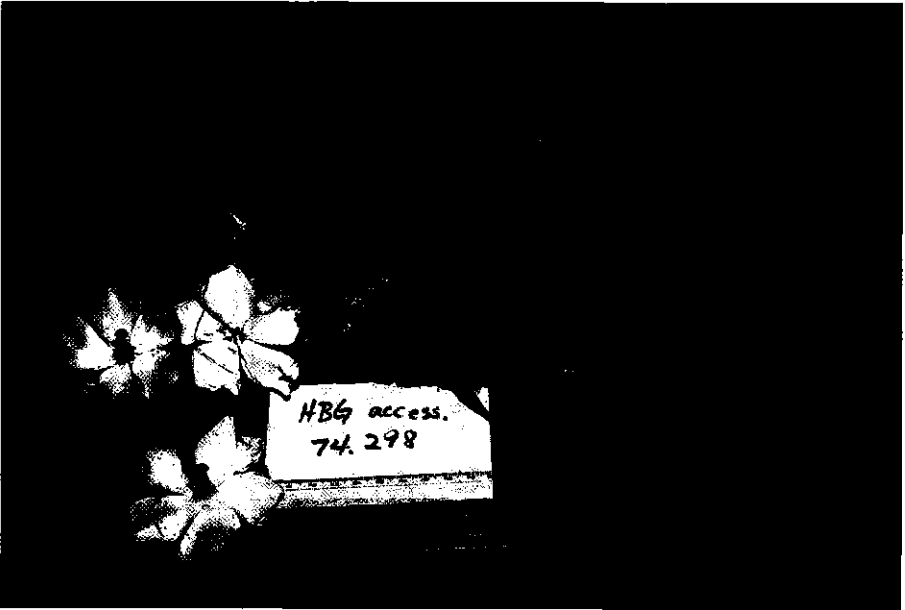
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