

VOACANGA THOU.

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PHOT. 1. *Voacanga africana* (Leeuwenberg 8660, phot. T. BALTUSSEN).

INTRODUCTION

The present paper is a monographic revision of the genus *Voacanga*, and the study is based mainly on the examination of herbarium material. In addition, the author has had the opportunity of observing living plants belonging to 6 of the 12 species maintained here – 5 in the wild in Africa and one on Java.

It has been possible to trace almost all the type specimens of the names and synonyms discussed in the present revision. For practical reasons, two keys are provided – one for the species indigenous in Africa and the other for those found in Asia.

HISTORY OF THE GENUS

DU PETIT THOUARS (1806), who described the genus, named it from the Madagascan words *voa* (= fruit) and *acanga* (= guinea fowl) because of the spotted fruits. The first species, *V. thouarsii*, appeared in ROEMER & SCHULTES (1819).

The genus was described independently by BLUME (1826) as *Orchipeda*, on the basis of *O. foetida* from Java, by HOCHSTETTER (1841) as *Annularia*, with *A. natalensis* from Natal, by HARVEY (1842) as *Piptolaena*, with *P. dregei* from Natal as basis, by MIQUEL (1857) as *Pootia*, founded on *P. grandifolia* from Java. ENDLICHER (1842) added the illegitimate synonym *Cyclostigma* to HOCHSTETTER's *Annularia*. Subsequently, TEIJSMANN (1863) added a second species to *Pootia* which was transferred by MIQUEL (1864) to *Orchipeda*; finally, ROLFE (1883) reduced this last genus name to a synonym of *Voacanga*. Since 1883 all later taxa have been described directly as species of *Voacanga*.

GEOGRAPHICAL DISTRIBUTION

The genus *Voacanga* comprises 12 species, 7 in Africa and 5 in Asia. None of the species occurs in both continents. Of the African species, *V. thouarsii* is the most widely distributed, being found throughout tropical Africa in marshes and along creeks in deciduous forest and in not too dry savannas. The second one, *V. africana*, occurs almost as widely but is not found on Madagascar. It grows in secondary, bush-like vegetation and in open situations – in the coastal forests especially, often gregariously (West Africa); but it is also encountered in gallery forests in the savannas. *V. caudiflora* and *V. psilocalyx*, from west and east of the Dahomey gap, respectively, grow almost exclusively in the undergrowth of the humid forest. *V. bracteata*, whose area of distribution overlaps and is much greater than that of the previous two species together occurs in a comparable biotope but requires somewhat less humidity. *V. chalotiana*, present only in central Africa; probably has a preference for light shade (forest, secondary forest, gallery forest). *V. pachyceras* is only known from Zaïre and grows on river banks and in marshes.

All five of the Asian species are found within the region covered by the Flora Malesiana, but only on the islands. They occur in light forest or secondary vegetation, often along rivers. *V. grandifolia* is the most widely distributed and is known from Indonesia (except Sumatra and Kalimantan) and Papua-New Guinea; several more or less aberrant specimens come from Mindanao (Philippines). The areas of distribution of the other four species are much smaller. *V. globosa* and *V. megacarpa* are endemic in the Philippines. *V. foetida* is known from Sumatra and West-Java; there are also two collections from the south-eastern point of Borneo. *V. havilandii* has by far the smallest distribution of all the known *Voacanga* species and so far has only been collected in Sarawak.

RELATIONSHIPS WITH OTHER GENERA

Voacanga belongs to the tribe *Tabernaemontaneae* of the subfamily *Plumerioideae* (for the description and synonymy, see LEEUWENBERG, 1984). As is evident from the strikingly uniform habit and seeds, as well as the flowers and fruit, the genus is closely related to *Tabernaemontana*.

The two genera may be distinguished as follows:

Pistil head coherent with the anthers and therefore style and pistil head shed with the corolla; calyx also shed along with the corolla (Asian species and <i>V. pachyceras</i> and <i>V. thouarsii</i>) or some time after, at least before the fruit matures; in the latter case corolla tube up to 1.4 x as long as the calyx (exceptions to this last character: <i>V. bracteata</i> and <i>V. chilotiana</i>).	Voacanga
Pistil head not coherent with the anthers and therefore pistil still complete after the corolla has been shed; calyx persistent even under the fruit (probable exceptions: a few American species); corolla tube probably never less than 2 x as long as the calyx	Tabernaemontana

ECONOMIC INTEREST

For some years several hundred tonnes of the seeds of the African species *V. africana* and *V. thouarsii* have been collected for the industrial production of the alkaloid tabersonine, which is of considerable indirect medical importance (see the chapter on the phytochemistry of the genus).

In most African languages the two species just mentioned have the same vernacular name as the *Tabernaemontana* species that occur in the same biotope. Sometimes, *Tabernaemontana* is called the male and *Voacanga* the female. The seeds of *Tabernaemontana* are difficult to distinguish from those of *Voacanga*, but are usually larger. Like the two *Voacanga* species discussed above, the following *Tabernaemontana* species have a subglobose mericarp: *T. brachyantha*, *T. contorta*, *T. crassa*, *T. africana* (= *T. longiflora*), and *T. pachysiphon*; of these, *T. crassa* and *T. pachysiphon* have the widest distribution and the latter

has the greatest ecological similarity to *V. africana*. The foregoing *Tabernaemontana* and *Voacanga* species can be distinguished as follows:

- Mericarps with dark green and pale green spots, 3–10 cm in diameter, dehiscent; pericarp 5–15 cm thick; pulpy aril orange; corolla tube up to 1.1 x as long as calyx; style and stigma shed with corolla; calyx shed with corolla (*V. thourarsii*) or shortly after (*V. africana*); leaves herbaceous, pale green and acuminate (*V. africana*) or coriaceous, glaucous, and obtuse or rounded (*V. thourarsii*) the 2 **Voacanga** spp.
- Mericarps pale green or glaucous all over, mostly larger, up to 15 cm in diameter (orange and smaller in *T. africana*); pericarp mostly thicker (up to 4 cm in *T. pachysiphon*), dehiscent or not; pulpy aril white, cream, or nearly so; style and stigma not shed with the corolla; calyx persistent, even under the fruit; leaves coriaceous, mostly larger, dark green, and mostly acuminate the 5 **Tabernaemontana** spp.

INTERRELATIONSHIPS OF THE SPECIES

The morphology of the species suggests the relationships shown in the diagram below. The obvious feature of the scheme is that the most widely distributed species show more similarities with other species than do the less widely distributed ones.

Voacanga Thou., Gen. Nov. Madag. 10. 1806; Stapf in Fl. Trop. Afr. 4(1): 151. 1902; Pichon, Bull. Mus. Nat. Hist. Nat. Paris sér. 2. 19: 409. 1947; Mém. Mus. Nat. Hist. Nat. sér. 2. 27: 232. 1949; Codd in Fl. Southern Afr. 26: 273. 1963;

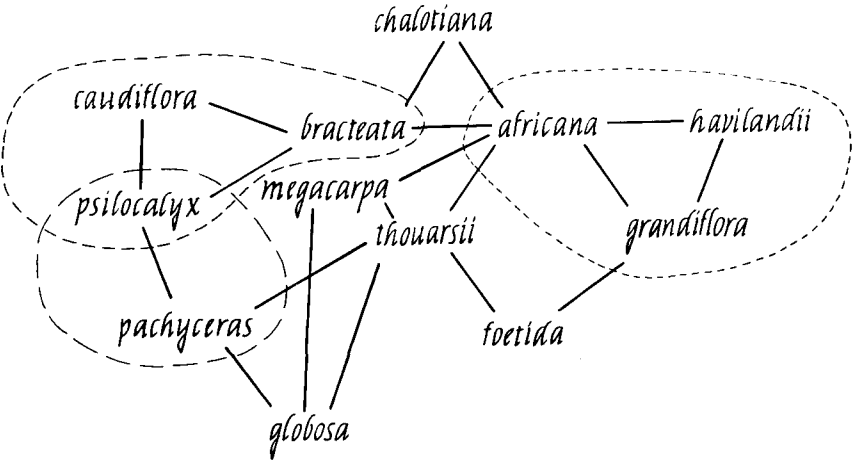


CHART. I. Relationship of the *Voacanga* species.

H. Huber in Fl. W.Trop.Afr. 2nd ed. 2: 66. 1963; Leeuwenberg in Fl. Zamb. 7(2): 434. 1985.

Type species: *V. thouarsii* Roem. & Schult.

Heterotypic synonyms: *Dicrus* Reinw. ex Bl., Cat. Gew. Buitenzorg 47. 1813, nomen (based on *D. foetidus* Reinw., nomen).

Orchipeda Bl., Bijdr. 1026. 1826; Miquel, Ann. Mus. Lgd.-Bat. 1: 316. 1864.

Type species: *O. foetida* Bl. (= *V. foetida* (Bl.) Rolfe).

Annularia Hochst., Flora 24: 670. 1841. Type species: *A. natalensis* Hochst. (= *V. thouarsii* Roem. & Schult.). Homotypic synonym: *Cyclostigma* Hochst. ex Endl., Gen. Pl. Suppl. 2: 56. 1842; Flora 27: 828. 1844.

Piptolaena Harv. in Hooker, Lond. Journ. Bot. 1: 25. 1842. Type species: *P. dregei* A.DC. (= *V. thouarsii* Roem. & Schult.).

Pootia Miq., Versl. en Med. Kon. Akad. Wetensch. 6: 192. 1857; in Fl. Ned. Indië 2: 417. 1857. Type species: *P. grandifolia* Miq. (= *V. grandifolia* (Miq.) Rolfe).

Shrubs or trees, repeatedly dichotomously branched and with 2 inflorescences in the forks when flowering. Bark usually with some white latex. Branchlets terete, mostly deeply sulcate when dry, with white latex. *Leaves* opposite, those of a pair equal or unequal, usually petiolate; petioles or leaf bases of a pair connate into a short ocrea, with a single row of colleters in the axils; blade elliptic or obovate or narrowly so, cuneate at the base or decurrent into the petiole. *Inflorescence* usually long-pedunculate, cymose, usually fairly lax. Bracts deciduous or less often more or less persistent, leaving conspicuous scars. *Flowers* actinomorphic, often fragrant. *Calyx* green, campanulate to cylindrical, usually shed with the corolla, inside with colleters; lobes subequal. *Corolla* mostly creamy or yellow; tube shorter or only slightly longer than the calyx, twisted, variously shaped; lobes in bud overlapping to the left, spreading or recurved. *Stamens* exerted or included; anthers sessile, narrowly triangular, acuminate at the sterile apex, sagittate at the base, glabrous, introrse. *Pistil* glabrous; ovary usually broadly ovoid; carpels free or connate at the base, rarely entirely fused, surrounded by a ring-shaped entire or lobed disk; disk adnate to abaxial sides of the carpels; style connecting the carpels at the apex, thickened at the apex; pistil head with a thin, recurved, undulate, entire, lobed, or fimbriate ring at the base, obovoid, with 5 short lateral lobes, coherent with the connectives of the anthers; stigmatic apex short. Style and stigma shed together with the corolla. *Fruit* two free or less often partly or completely united carpels; wall soft, carnosous, often thickish, creamy or yellow. *Seeds* surrounded by a yellow or orange pulpy aril, usually numerous, large, obliquely ellipsoid or less often reniform, rough, at the hilar side with one deep groove to half their width, less deeply grooved at the other sides, with a minutely tuberculate or honeycomb-like structure; endosperm copious, starchy, creamy to white, ruminant, surrounding the spatulate creamy to white embryo.

An Old World genus of 12 species, 7 of which in Africa and the others in 'Malesia' (= the Flora Malesiana area).

KEY TO THE AFRICAN SPECIES

1. Leaves obtuse or rounded at the apex, mostly narrowly obovate, thickly coriaceous and glaucous; inflorescence few-flowered; calyx closely clasping the corolla tube, shed with the corolla; corolla lobes wider than long, emarginate; carpels pale and dark green-spotted, subglobose. Swamps or river banks 7. **V. thouarsii**
 Leaves acuminate, – if obtuse – herbaceous to fairly thinly coriaceous and never glaucous; inflorescence many-flowered; calyx lobes mostly recurved; corolla lobes subacute to rounded; carpels spotted (*V. africana*) or not, subglobose or not 2
2. Calyx (when lobes erect) 5–7.5 mm long; lobes 1.5–2.5 x as long as the tube, 2.5–3.5 x as long as wide; carpels partly united; leaves long-petiolate, with a fishbone-like venation. Congo, Zaïre 4. **V. chaltiana**
 Calyx (when lobes erect) 7–22 mm long; lobes up to 1.2 x as long as the tube; in each calyx at least one lobe as long as wide or even wider than long; carpels free; leaves fairly shortly petiolate, with less regular venation 3
3. Carpels pale and dark green-spotted, subglobose; bracts deciduous when buds open; calyx lobes mostly recurved; corolla lobes 1.4–2.5 x as long as the tube; usually many flowers open at a time; common bush plant 1. **V. africana**
 Carpels not spotted, mostly yellow or orange, subglobose or not; bracts persistent at anthesis or not; calyx usually erect (recurved only in *V. bracteata*); corolla lobes – if more than 1.3 x as long as the tube – plant in forest understorey; usually 1–2 flowers open at a time in a single inflorescence 4
4. Corolla lobes 4–10 x as long as wide, 16–23 mm long, forming in bud a cylindrical head 3.5–6 x as long as wide; calyx much wider than the slender corolla tube; calyx lobes 0.2–0.3 x as long as the tube; bracts persistent at anthesis. Sierra Leone-Ghana 3. **V. caudiflora**
 Corolla lobes 0.8–1.2 x as long as wide and 2.5–7 x 3–8 mm or (only in plants from Nigeria eastwards) up to 4.4 x as long as wide and 7–18 mm long, forming in bud a conical or ovoid head; calyx lobes from 0.4 x as long as the tube; bracts often deciduous 5
5. Bracts persistent; corolla lobes 0.2–0.5 x as long as the tube, 0.8–1.2 x as long as wide, often turning dark brown at anthesis, forming a usually broadly ovoid head in bud 2. **V. bracteata**
 Bracts often deciduous; corolla lobes 0.5–1.8 x as long as the tube, 1.25–4.4 x as long as wide, white to pale yellow, not turning brown at anthesis, forming an almost conical head in bud 6
6. Stamens distinctly included; carpels almost cylindrical, parallel; calyx shed with the corolla. Zaïre 5. **V. pachyceras**
 Stamens exerted or barely included; carpels ovoid or nearly so, divergent; calyx deciduous after the corolla has been shed. Nigeria-Congo 6. **V. psilocalyx**

KEY TO THE ASIAN SPECIES

1. Sepals almost free, narrowly oblong. Philippines 12. **V. megacarpa**
 Sepals connate into a more or less cylindrical calyx with short lobes 2
2. Leaves pubescent beneath; corolla tube 7–11 mm long, lobes 2–3 x as long
 as wide. Sarawak 11. **V. havilandii**
 If leaves pubescent beneath, corolla tube 9–24 mm long and lobes 0.8–1.5
 x as long as wide 3
3. Calyx narrowly cylindrical, closely clasping the corolla tube, usually 3.5–7.5
 x as long as wide; corolla tube narrowly cylindrical, often much longer,
 lobes rhombic or nearly so, acute or obtuse. Philippines . 9. **V. globosa**
 Calyx amply cylindrical or campanulate, usually not clasping the corolla
 tube, 1–3 x as long as wide; corolla tube cylindrical or not; lobes obcordate
 or obovate, rounded to emarginate 4
4. Flowers large; calyx 22–37 mm long; corolla 65–100 mm long (lobes suber-
 ect), tube 28–42 mm long, infundibuliform; lobes 37–58 mm long. Suma-
 tra, Java, and S. Kalimantan 8. **V. foetida**
 Flowers much smaller; calyx 10–20 mm long; corolla (lobes spreading or re-
 curved) tube 9–25 mm long, cylindrical, bottle-shaped or conical; lobes
 9–30 (40) mm long 10. **V. grandifolia**

1. **Voacanga africana** Stapf, Journ. Linn. Soc. 30: 87. 1894; in Fl. Trop. Afr. 4(1): 157. 1902; H. Huber in Fl. W. Trop. Afr. 2nd ed. 2: 67. 1963; Leeuwenberg in Fl. Zamb. 7(2): 435, t. 100. 1985. **Fig. 1, p. 13; Map 1, p. 16**

Type: Sierra Leone: Bafodeya, Scott Elliot 5484 (BM, lectotype; isotype: K).

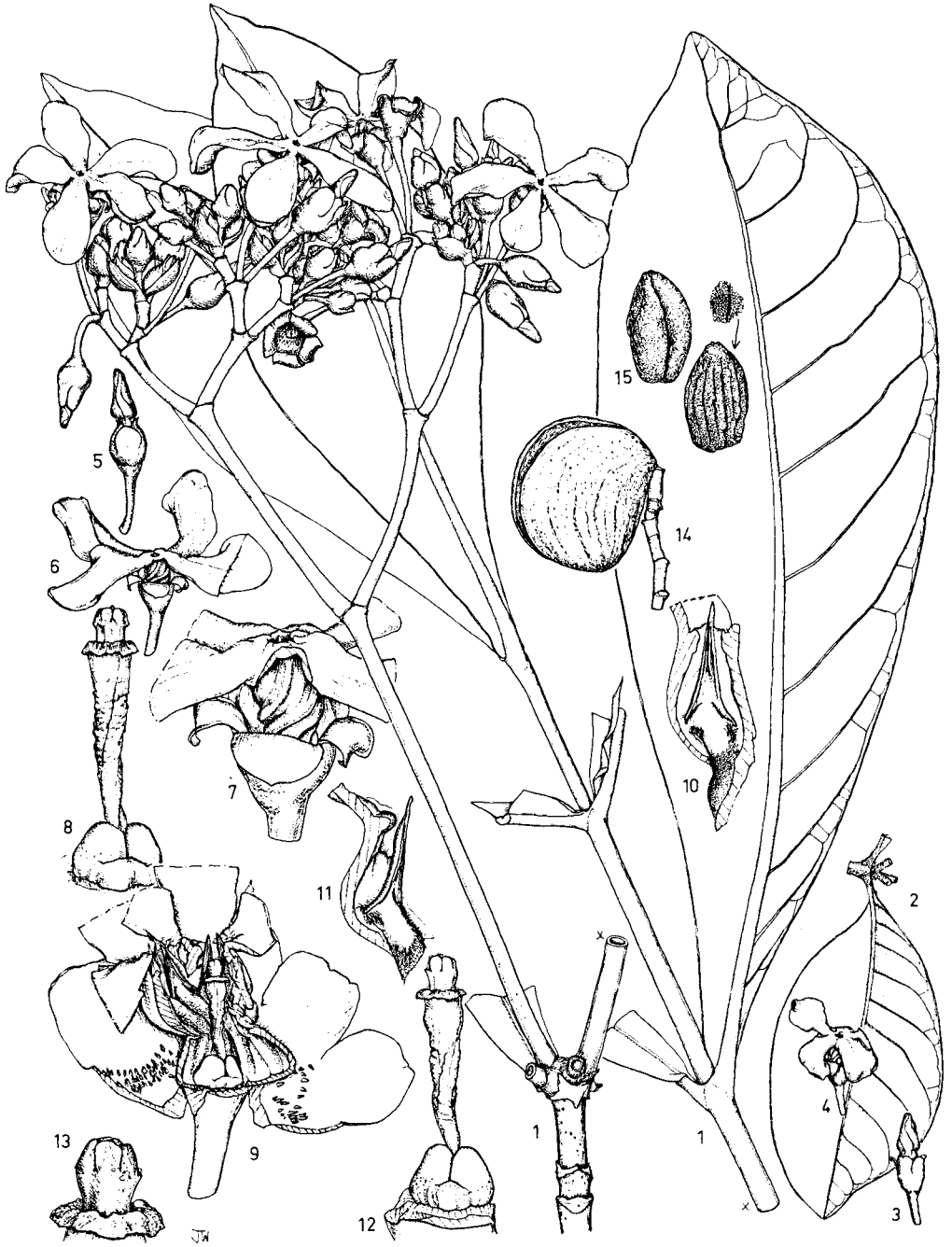
Heterotypic synonyms: *V. schweinfurthii* Stapf, Kew. Bull. 1894: 21. 1894; in Fl. Trop. Afr. 4(1): 155. 1902. Type: Zaïre: VII: Niamniam Land, Dungu, Turu R., Schweinfurth 3326 (holotype not seen, destroyed in B; lectotype: K; isotypes: K, P).

V. boehmii K. Schum. in Engler, Pflanzenw. Ost-Afr. C: 317. 1895; in Engler & Prantl, Nat. Pflanzenf. 4(2): 149. 1895; Stapf, tom. cit. 161. Type: Tanzania: T4: Kavenda R., Isimbira, Tabora, Böhm 37a (holotype not seen, destroyed in B; lectotype: K; isotype: Z).

V. angustifolia K. Schum., l.c. Type: Tanzania: T4: Kavenda, Boehm 60a (holotype not seen, destroyed in B; no isotype seen).

V. glabra K. Schum. in Engler & Prantl, Nat. Pflanzenf. 4(2): 149. 1895. Type: Cameroun: Mungo, Buchholz s.n. (holotype not seen, destroyed in B; lectotype: K). Homotypic synonym: *V. africana* var. *glabra* (K. Schum.) Pichon, Bull. Mus. Nat. Hist. Nat. Paris sér. 2. 19: 412. 1947.

FIG. 1. *Voacanga africana*. 1, flowering branch ($\times \frac{2}{3}$); 2, leaf ($\times \frac{2}{3}$); 3 and 5, flower buds ($\times \frac{2}{3}$); 4 and 6, flowers ($\times \frac{2}{3}$); 7, flower with incomplete corolla lobes ($\times 2$); 8 and 12, pistils ($\times 4$); 9, opened flower ($\times 2$); 10–11, stamens ($\times 4$); 13, pistil head ($\times 8$); 14, dehisced fruit ($\times \frac{2}{3}$); 15, seeds ($\times 2$) with more enlarged detail of testa. All from coll. Leeuwenberg: 1, 9–13 from 9485; 2–4 from 11927; 5–8 from 9256; 14–15 from 8660.



V. puberula K. Schum. in Engler & Prantl. loc. cit.; Stapf. tom. cit. 156. Type: Gabon: Estuaire: Loango, Chinchocho, Soyaux 41 (holotype not seen, destroyed in B; lectotype: K). Homotypic synonym: *V. schweinfurthii* var. *puberula* (K. Schum.) Pichon, tom. cit. 413, partly, excl. of syn. *V. diplochlamys*.

V. schweinfurthii var. *parviflora* K. Schum. in Engler, Bot. Jahrb. 23: 226. 1896. Type: Togo: Misahöhe, near Kununlu, Baumann 464 (holotype not seen, destroyed in B; lectotype: K; isotype: NH).

V. angolensis Stapf ex Hiern, Cat. Welw. Afr. Pl. 1: 668. 1898; Stapf, tom. cit. 154. Type: Angola: Cuanza Norte: Ambaca District, between Ngombe and Puri-Cacarombola, Welwitsch 5978 (BM, lectotype; isotypes: COI, K, LISU, MO). Homotypic synonym: *V. spectabilis* Stapf, tom. cit. 155. The holotype of this name is the lectotype of the preceding one.

V. lutescens Stapf, tom. cit. 157. Type: Mozambique: Manica e Sofala: between Lupata and Sena, Kirk 31 (K, lectotype). Homotypic synonym: *V. africana* var. *lutescens* (Stapf)Pichon, tom. cit. 412.

V. magnifolia Wernham in Cat. Talbot's Nigerian Pl. 62. 1913. Type: Nigeria: Cross River State: Oban, Talbot 1053 (BM, holotype; isotype: K).

V. eketensis Wernham, Journ. Bot. 52: 25. 1914. Type: Nigeria: Cross River State: Eket District, Talbot 3388 (BM, holotype; isotype: MO).

V. glaberrima Wernham, loc. cit. Type: Nigeria: Cross River State: Eket District, Talbot 3389 (BM, holotype).

V. bequaerti De Wild., Pl. Bequaert. 1: 402. 1922. Type: Zaïre: VI: between Walikale and Lubutu, Bequaert 6577 (BR, holotype).

V. lemosii Philipson in Exell, Cat. Vasc. Pl. S. Tomé 241. 1944. Type: São Tomé: between Paga-fogo and St. Catarina, Lemos s.n. (COI, holotype, not seen; isotype seen: K).

V. africana var. *auriculata* Pichon, loc. cit. Type: Tanzania: T4: Sagara, Sac-leux 2222 (P, holotype).

Shrub-like tree or shrub 1–10 (25) m high. Trunk terete, 2–30 (40) cm in diameter; bark pale grey-brown, smooth or near the base shallowly fissured, with some white latex. Branches lenticellate; branchlets glabrous, puberulous, or pubescent, with more latex than in the bark. *Leaves* shortly petiolate or sessile; petiole glabrous to pubescent, up to 2 cm long (ocrea not widened into intrapetiolar stipules); blade usually pale green when plant in flower, when in fruit usually darker, especially above, herbaceous when fresh, membranaceous to papery when dry, variable in shape and size, elliptic to narrowly elliptic, 1.5–3.5(4) x as long as wide, 7–41.5 x 3–20 cm (sometimes a little smaller), cuneate or decurrent into the petiole or base, not connate-perfoliate when sessile, acuminate with an often blunt apex or less often acute or obtuse in some leaves, glabrous on both surfaces to pubescent beneath all over and on the midrib above, with 8–22 secondary veins on each side; tertiary venation inconspicuous. *Inflorescences* usually long-pedunculate, 6–25 x 4–15 cm, usually many-flowered, fairly lax, 3.5–15.5 cm long incl. peduncle; peduncle pale green and glabrous to sparsely pubescent as branches and pedicels, usually slender; pedicels 3–20 mm long.

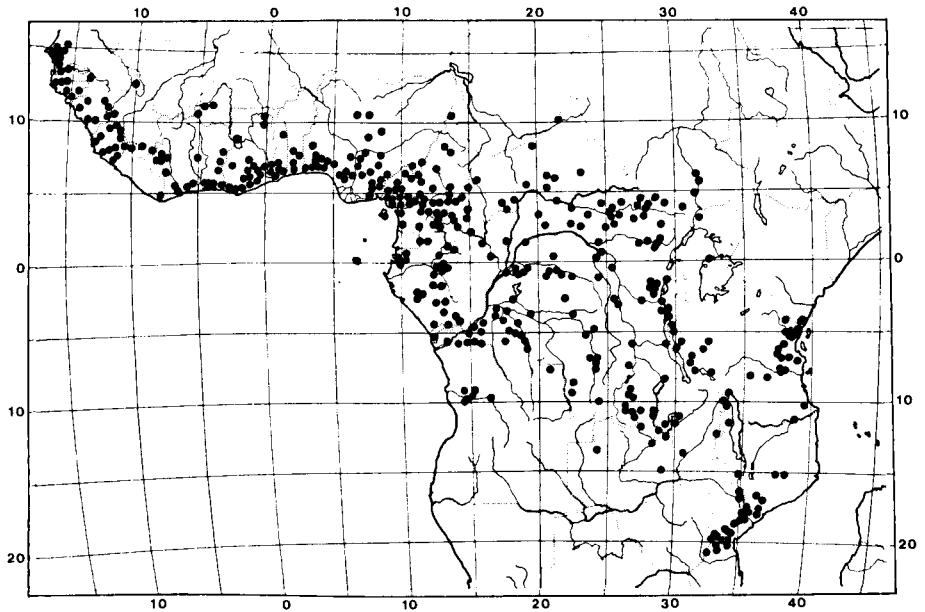
Bracts deciduous, usually all shed before the first bud reaches full size, about as long as the calyx, ovate, obtuse, with a few persistent colleters at the edges of the axils, upper bracts often narrower. *Flowers* malodorous. *Calyx* pale green (paler inside), 7–19 mm long (when lobes erect), deciduous after the corolla has been shed and before the fruit develops, glabrous or puberulous out- and inside, inside with a belt of colleters from 1–2 mm above the base of the tube to 1–2 mm below the base of the lobes, (the uppermost colleter near the edge of the base of the lobes and the remainder are arranged irregularly or in 1–3 rows above each other); tube cyathiform, 3.5–9 mm long; lobes 0.8–1.3 x as long as the tube, broadly ovate to oblong 0.7–1.3 (1.7) x as long as wide, 3.5–8 x 3.5–8 mm, obtuse, rounded, truncate, retuse, or emarginate at the apex, entire, imbricate in bud, usually partly recurved. *Corolla* creamy, greenish-creamy, yellow, or less often white, in the mature bud 17–31 mm long incl. the lobes (the lobes $\frac{1}{2}$ – $\frac{3}{4}$ of the bud length, being 8.5–19 mm, forming an almost conical head with a blunt apex), glabrous or less often minutely puberulous on both sides and inside often pubescent from about 5 mm above base to the insertion of the stamens, tube slightly shorter to slightly longer than the calyx (when the lobes erect), 7–15 mm long, almost cylindrical, twisted from 2–3 mm above the base, contracted at the base, in the middle, and at the mouth; lobes in bud twisted, obovate, narrowly obovate, or elliptic, 1.4–2.5 x as long as the tube, (1.1)1.5–2.2 x as long as wide, 12–37 x 7–16 mm, rounded or obtuse and usually with an upcurved margin at the apex, entire, spreading and often recurved later. *Stamens* exerted for 0.5–1.2 mm or occasionally just included, inserted 2–3 mm below the corolla mouth; anthers sessile, 4–5 x 1.3–2.5 mm, at the apex for about 0.5 mm sterile, glabrous, usually twisted with the corolla. *Pistil* 7–12.5 mm long (when style straightend out); ovary 1.6–2.5 x 1.7–3 x 1.2–2 mm, of two carpels; disk entire, ring-shaped, 0.8–1.2 mm high; style split at the base, narrowly obconical, 4–8 mm long, twisted and at the base curled, at the apex slightly narrower than the pistil head; pistil head 1–1.7 x 1–1.7 mm, with an undulate entire ring 1.7–3 mm in diameter. *Ovules* about 200 in each carpel. *Fruit* of two separate mericarps of which often only one developing; mericarps dark and very pale green-spotted, obliquely subglobose, often slightly wider than long and laterally compressed, 3–8 x 3–8 x 2.5–7 cm, 2-valved; wall 5–15 mm thick, creamy inside and on section; aril orange. *Seeds* many, dark brown, dull, obliquely ellipsoid, 7–10 x 3.5–5 x 3–4 mm, laterally with 4–5 grooves, rough, minutely tuberculate.

Distribution: Tropical Africa (continent and the isles in the Gulf of Guinea).

Ecology: Bush or light forest, in savanna areas in gallery forests. Common (in West Africa especially near the coast). Alt. 0–1100 m. Flowering mainly at the end of the dry season.

Vernacular names (If the language is not known, the locality is indicated with 'near').

Mali: Kombrocina (near Fangala Kouta).



MAP 1. *Voacanga africana*.

Sierra Leone: Boni (Mende, also used for other *Voacanga* spp.) Mokboto, Namanti (Tunkia).

Ivory Coast: Piegba (near Guiglo).

Ghana: Kakapempe (Ashanti, in Western, see also *V. bract.*), Abwamu, Ofruma, Ofuruma, Kwahu (Ashanti), Foba nzima (Atwabo-Anawan), Papaku, Obonawa, Sukuzia (Twi, Nyu (in Eastern, near Aketebwo), Aduflangobo (Peki).

Benin: Leti (Fon).

Nigeria: Dodo, Giwini, Wangwa (Yoruba), Ibu (Benin, also used for *Tabernaemontana pachysiphon*, but difference seen), Oturo (Isoko).

Cameroun: Nepu mbi (Bamenda), Dongo (Douala), Obaetoan (Yaoundé, Bulu), Esekié (Yaoundé), Etonli, Ebatonli, Ebatonli Poum (Bobili).

Central African Republic: Mololo (Issongo, Lissongo).

Sudan: Barimbakaru (Zande), Kuligny (Bari).

Gabon: Epanda, Ependê (Bakota).

São Tomé: Gata-grande (Crioulo).

Zaire: II: Mbundu (Congolese), Kintsongati (near Luki). III: Munkodia-kodia, Nkodia-kodia (Kikongo, see also *V. chal.* en *V. thou.*), Nkori nkori (near Ndemba), Nkolo nkolo, Nkolu nkolu (near Kimvula, Madimba and Popokabaka). V: Luchia, Luchia des bois (Baluba, see also *V. thou.*), Kitombo (Baluba), Luvula, Numba (Kiluba). VI: Bonkéka moké, Bonkéka, Nkéka (Lokundu, Mongo), Nsambi, Nsambi Elobambo (near Tumba Lake), Mpunja (near

Ingende), Angwe kedudu, Ebekulu, Gbondo, Liho, Lirangu, Yoma (near Man-
kaza, Bomongo Distr., coll. de Giorgi), Mbulu kale (Ngwaka), Aboliboto, Guya
(near Likimi), Lomponu mobali (near Boende), Bolelemo (near Monkoto),
Ebangabanga (Turumbu, also used for *V. bract.* and *Tabernaemontana crassa*),
Inaolo a Ebangabanga (= related to Enbangabanga), Ebanga lo Kikereke (Tur-
umbu), Ebanga lo Tokembe, Inaolo a Okuka Lo Fufow, Ekwalanganka Lo
Fufow, Inaolo a Ikukasa (Turumbu, see also *V. chal.*), Ikusasa i fofow (Turum-
bu), Ikowolo (Kikusi), Kalenge, Kantonko (Kirega, both names also used for
V. bract., see also next language), Kalenge (Kitembo, also used for *V. bract.*).
Kalenge (Kinyanga). VII: Gimba (Azandé, see also *V. thou.*), Tomedali, Dan-
dakala, Ndakaboli (Zandé), Bangbakalé, Kondakabali (Azandé), Gbo (Mong-
wandi), Senenango (near Poko), Balimbakaru (near Doruma). IX: Mankoban-
koba (Kifulero). XI: Lusisi (near Ganzu), Vuba (Kisa), Kilimbwe, Mobimbi
(Kibemba), Mutalala (near Kalemie).

Burundi: Umdwedwe (near Bururi, also used for *V. thou.*).

Angola: Bêta (near Lohanda R.), Muluanda (near Malanje).

Tanzania: T3: Mbowe, Mlambe (Kikondei, Mbelewele (near Makuyuni),
Mbere mbere (near Usambara Mts.). T4: Ikoliyoko, Luliyolwakape (Kitongwe),
Nachankana (Chifipa), Munamba (Mambwe). T6: Mtengolengo (Luguru),
Mboke (Vidunda). T7: Mandungulembe (Nyaky).

Zambia: Chipolo (Wemba), Mn-papal (Lunda).

Mozambique: Zambesia: Iragaraga (near Mocuba). Manica e Sofala:
Mcaucau (near Inhamitanga, also used for *Tabernaemontana elegans*). Muchen-
ga (Chindao, Chixanga), Phonda (Chindao), Ntchinga, Nienza (Cafre).

Malawi: Cinyimbire (Tonga).

A selection of the ca. 920 specimens examined:

Senegal: Rufisque (fl. May) Adam 1263 (MO, P); Mbissel, Fatick (fl. Apr.) Adam 13456 (MO);
Casamance, Heudelot 568 (G, P); Sédhiou, Berhaut 6121 (P).

Gambia: near Albrede (fl. June) Heudelot 89 (BM, FI-W, G, K, P); Abuko Nat. Res. (fl. July)
Starin 77 (K).

Mali: Fangala Kouta (fl., fr. Nov.) R. Dubois 24 (P).

Guinea Bissau: Xime, Bafata (fl. Mar.) Espirito Santo 496 (LISJC); Bissau, Stoetzel 19 (HBG),
21 (HBG); Caxamba, Bedanda (fl. Jan.) Alves Pereira 2716 (K); Cacine (bud Apr.) Roberty 17565
(G).

Guinea Conakry: Conakry (fl. Apr.) Debeaux 320 (BM, K, LE, LISU, P); Ditinn (fl. Apr.)
Chevalier 13464bis (P); Boké, Paroisse 50 (P); Konkoré R. (fl. Sept.) Pobéguin K 16 (K, P); Mt.
Gangan (fl. May) Roberty 17786 (G); Timbo (fl. Mar.) Chevalier 12521 (BR, K, P); Mamou (bud
Feb.) Cochet 28 (P); Macenta, Ziama Mts. (fl. Apr.) Adam 4294 (MO); Lola (fl. Mar.) Chevalier
20974 (P).

Sierra Leone: Lungi Peninsula (fl. Apr.) Morton SL 1231 (FHI, GC, K, WAG); Bafodeya
(fl. Apr.) Scott Elliot 5484 (BM, K, lectotype); Ninia Talla (fl. Feb.) Scott Elliot 4903 (K, paratype);
Koyema, Tingi Mts. (fl. Apr.) Morton & Gledhill SL 1814 (FHI, GC, K, WAG); Bweddu, Kisi
country (fl. Apr.) Deighton 3195 (K); Kambui Res. (fl. Apr.) Lane Poole 251 (K); Juring (fl. Dec.)
Deighton 303 (K).

Liberia: W Prov.: Kolahun, Karmadhun (imm. fr. Nov.) Baldwin 10193 (K); E Prov.: Diebla,
Webo (fr. July) Baldwin 6342 (K).

Ivory Coast: Nouba Mt., Nuon R. source (fl. Apr.) Fleury in Chevalier 21106 (P); Kpangouin
(fl. Jan.) Bamps 1889 (BR, UCJ); near Guiglo, Aubréville 2021 (P); 5 km W of Soubré (imm. fr.

May) Leeuwenberg 12134 (WAG); Monogaga (fl. Apr.) Geerling & Bokdam 2391 (BR, K, LD, MO, PRE, WAG); 3 km S of Niambézaria (fl. Mar.) Leeuwenberg 12076 (UCJ, WAG); km 9 Divo-Gagnoa Rd. (fl. Mar.) Leeuwenberg 12033 (UCJ, WAG); 2 km SE of Youhouli, along road to Dabou (fl. Mar.) Leeuwenberg 12078 (UCJ, WAG); near Brafouédi (fl. Apr.) Leeuwenberg 3333 (UC, WAG); km 12 Bouaké-Yamoussoukro Rd., Leeuwenberg 12243 (WAG); Banco For. Res. (fl. Jan.) De Wit 9065 (WAG); km 10 Aboisso-Maféré Rd. (fl. Mar.) Leeuwenberg 12022 (UCJ, WAG); E of Bingerville (fl. Apr.) Leeuwenberg 3166 (BR, COI, K, L, UC, WAG); km 6 Abengourou-Akoupé Rd., Leeuwenberg 12269 (WAG); km 7 Tankassé-Agnibilekrou Rd., Leeuwenberg 12267 (WAG); km 16 Bondoukou-Gouméré Rd., Leeuwenberg 12263 (WAG).

Upper Volta: Sindou (fl. June) Leeuwenberg 4324 (B, BR, K, MO, P, WAG); near Bobo-Dioulasso (fl. Oct.) Koechlin 7000 (P).

Ghana: Northern: Gambaga (fl. Apr.) Morton GC 9021 (GC, K); Naburinu (fl. May) Kitson 737 (K); Bole Distr. (fl. May) Kambonga 38 (KUM). Brong-Ahafo: Asukese F.R., Enti GC 39948 (GC). Ashanti: 2 km SW of Ejura (bud Mar.) Leeuwenberg 11987 (GC, WAG); Kumasi (fl. Apr.) Vigne 1087 (BM, FHO, K, KUM, US); Eyan (fl. Apr.) Vigne 1122 (A, FHO, KUM); Amentia (fl. Dec.) Vigne 1494 (K, KUM, P). Western: Jewi Wharf (fl., few fr., Mar.) Leeuwenberg 11142 (GC, WAG); Essiama (fl. Feb.) Irvine 2351 (E, GC, K, MO, P); 8 km from Sekondi on road to Accra (fl. Mar.) Morton GC 6629 (GC, K, WAG). Central: Birim Res. (fl. Apr.) Vigne 2886 (FHO, GC, KUM); Cape Coast (fl. Mar.) Apprey Ogoe 184 (CCG); W of Sukrong (Sukunu), along Nswawam-Asamankese Road (fl. Mar.) Leeuwenberg 12003 (GC, WAG). Eastern: between Pepease and Nkwantanang (fl. Apr.) Morton A 790 (GC); Akropong, Akwapim (fl., fr., Aug.) Irvine 773 (FHO, GC); Osenasi (fl. Feb.) Deakin 90 (GC); N of Mankesim on road to Swedru (fl. Feb.) Leeuwenberg 11049 (GC, WAG); Aburi (fl. Apr.) Hall & Benson GC 46153 (MO, US, WAG). Volta: Kpandu (fl. Mar.) Leeuwenberg 11186 (GC, WAG); Peki (fl. Nov.) W.H. Johnson 814 (GC, K); Dzodze (imm. fr. July) Akpabla 56 (GC).

Togo: Misahöhe, near Kununlu, Baumann 464 (K, NH, lectotype of *V. schweinfurthii* var. *parviflora*); Adétikopé, 20 km N of Lomé (fl. Mar.) Ern 3295 (WAG); Aledjo Mts., Kersting 75 (A).

Benin: Cabolé, cercle de Savalou (fl. May) Chevalier 23782 (P); Boguila, near Abomey (fl. Feb.) Chevalier 23201 (P); E. of Agoué, 3 km E of frontier with Togo (fl. Feb.) Leeuwenberg 11924 (WAG); 2 km N of Sakété (fl. Feb.) Leeuwenberg 11927 (WAG).

Nigeria: Kaduna State: Kan Gimi (fl. May) Keay FHI 22940 (FHI, FHO, K); Birnin Gwari (fl. Apr.) Meikle 1376 (BR, K, P); Nimbria F.R. (fl. Apr.) Latilo FHI 47416 (FHI, K, P). Niger State: Cece stream, Lapai Distr. (fl. Apr.) Abiai FHI 7043 (FHI, FHO, K). Kwara State: Lokoja, Patti Ridge (fl. Apr.) W.R. Elliot 48 (FHI, K). Oyo State: Shabe Rock (fl. Apr.) Hambler 1065 (BM, BR); Ogun R., on the Oyo-Iseyin Rd. (fl. Mar.) Onochie FHI 31548 (FHI, FHO, K, P); 24 km S of Ilesha (fr. Sept.) Akpaba FHI 18461 (FHI); Amo (fl. Apr.) Wimbush 15 in FHI 39624 (FHI, K); S of Ibadan Univ. Campus (fl. Apr.) Van Meer 690 (FHI, WAG). Ogun State: Abeokuta, Barter 3376 (K); km 4 Ilaro-Papalanto Rd. (fl. Apr.) Leeuwenberg 11334 (FHI, WAG); km 3 Ipokia-Ijofin Rd. (fl., fr. Apr.) Leeuwenberg 11346 (FHI, WAG). Lagos State: Lagos (fl. May) Dalziel 1001 (BM, K, MO, NY); Epe (fr. Aug.) J.B. Gillett 15274 (K). Ondo State: Idanre (fl. Jan.) Brenan 8712 (FHI, FHO, K, P). Bendel State: Iguobazuwa (fl. May) Eimunjeze & Oguntayo FHI 70170 (FHI, K, MO, P); Ekenwan (fl. Mar.) R. Ross 177 (BM, MO, S); Ehor (fl. Mar.) Leeuwenberg 11255 (FHI, WAG); Asaba (fl. May) Ainslie 293 (FHO). Benue State: Idah (fl. Mar.) F. White 8664 (FHO); between Gudi and Keffi (fl. Apr.) Keay & Jones FHI 37642 (FHI, K); Nupe, Barter 1327 (K, P); between Angmekka and Odeafa (fl. Apr.) Dundas 1933/1A (BM, FHO, PR[†]); 15 km N of Makurdi (fl. Mar.) J.A.D. Jackson 389 in FHI 57240 (FHI, FHO, K). Anambra State: Onitsha, Kennedy 2505 (FHO); Enugu (fl. Mar.) Lowe FHI 50256 (BR, FHI). Imo State: Afikpo (fl. Apr.) Jones 1402 (FHI); Arochukwu (fl. Jan.) Okafur & Latilo FHI 57641 (FHI). Rivers State: Degema, Talbot 3835 (BM, K). Cross River State: Eket Distr., Talbot 3247 (BM), 3388 (BM, MO, type of *V. eketensis*), 3389 (BM, type of *V. glaberrima*); km 10 Gron-Uyo Rd. (fl. Apr.) Van Meer 1202 (FHI, WAG); Oban, Talbot 1053 (BM, K, type of *V. magnifolia*); km 120 Calabar-Mamfé Rd. (fl. Apr.) Van Meer 1342 (FHI, WAG). Gongola State: Abong, Div. of Mambilla L.A. (fl. May) Chapman 3114 (FHI, K); Gashaka-Gangumi F.R. (fl. May) Chapman 4931 (K).

Cameroon: Sud-Ouest: between 3 Corners and Otu, Mamfé Distr. (fl. Mar.) Latilo & Oguntayo FHI 67766 (FHI, K, WAG); Ntali Mts., 30 km SE of Mamfé (fr. June) Villiers 1455 (WAG);

Johann-Albrechtshöhe, Staudt 859 (BM, FHO); Mungo, Buchholz s.n. (K, type of *V. glabra*); Victoria (fl. Feb.) Maitland 422 (B, FHI, K); Bibundi (fl. Mar.) Jungner 90 (BR, FI, LD, S, UPS); Mt. Koupé (fl. Jan.) Leeuwenberg 9256 (WAG). Nord-Ouest: Fang, Bamenda (fl. Mar.) Johnstone 168/31 (FHI, FHO). Littoral: near Douala (imm. fr. June) Fleury in Chevalier 33287 (P, WAG); Manengouba Mts. (fr. Nov.) Leeuwenberg 8660 (WAG), (fr. Sept.) 10329 (WAG, YA); 3 km NE of Baré (fl. Jan.) Leeuwenberg 9323 (WAG); 5 km N of Dibombé, a village on km 11 Loum-Yabassi Rd. (fl. Mar.) Leeuwenberg 9485 (WAG); Solé-Koum path, 20 km NW of Yabassi (fl. Mar.) Letouzey 14427 (P, YA); km 9 Masok-Kopongo Rd. (fl. Apr.) Leeuwenberg 5309 (BR, K, MO, P, WAG, YA). Nord: Ngomo, 25 km NNE of Nkambe (fl., fr. Nov.) Satabie 71 (P, WAG); km 20 of Bankim-Foumban Rd. (imm. fr. July) Leeuwenberg 10155 (WAG); near Boubala Lakes (fr. Dec.) Letouzey 2564 (P, YA); Geri, 40 km SSE of Poli (fl. Apr.) Fotius 2651 (P, WAG); Buffle Noir, Benoué Nat. Park (fl. May) Geerling & Néné 4723 (WAG); *ibid.* (fr. Oct.) P. Wit & M. Stark 2942 (WAG); near Mogodé, Letouzey 7004 (P, YA). Centre-Sud: km 2 Kribi-Yaoundé Rd. (fl. Nov.) Endengle 81 (P, YA); Golep Mt., 38 km N of Bafia (fl. Apr.) Ngameni Kamga 17 (P, WAG); Ebat Hill, 40 km SSW of Bafia (bud Dec.) Letouzey 9693 (P); Nkolbisson (fl. Mar.) Breteler 2630 (BR, K, LISC, P, WAG, YA); Yaoundé, Zenker & Staudt 121 (BM, K, LE); Nkoemvone, km 12 Ebolowa-Ambam Rd. (fl. Mar.) J. de Wilde 8105 (WAG); Bitye R., Bates 836 (BM, MO), 1059A (BM, MO); Ayos (fl. Dec.) De Wit 8271 (WAG); 18 km E of Djoum (bud Jan.) Beentje 1591 (WAG); Bamelap Rock (fl. Apr.) Letouzey 1655 (P, YA); km 34 Yoko-Tibati Rd. (bud Feb.) Leeuwenberg 9400 (WAG); km 34 Ntui-Yoko Rd., S of Nguila (fl. Feb.) Leeuwenberg 9387 (WAG). Est: near Nguelémendouka (fl. Apr.) Letouzey 1632 (P, YA); Asia (fl. Apr.) Letouzey 3894 (P, YA); Dengdeng (fl. May) Nana Pierre 76 (P, YA), near Lom-Djerem Rs. junction (fl. Feb.) Mildbraed 8104 (K), 8112 (HBG), 8127 (K); Bertoua (fl. Mar.) Breteler 1189 (BR, K, LISC, P, WAG); km 10 Doumé-Bertoua (fl. Dec.) Leeuwenberg 7362 (P, WAG); Batouri (fl. Mar.) Mildbraed 4820 (HBG); 3 km N of Lomié (fr. Sept.) Leeuwenberg 6596 (BR, P, WAG); Ngoila (fl. Feb.) Letouzey 12044 (K, P, WAG); near Moloundou (fl. Mar.) Mildbraed 4649 (HBG), 4779 (HBG); Mbatika-Melen, km 20 Moloundou-Yokadouma Rd. (fl. Apr.) Mezili 176 (K, P, YA).

Central African Republic: Boukoko (fl. Mar.) Tisserant 773 (BM, G, K, LISC, P); Lobaye For., Bagandou (imm. fr. May-July) Barbier 409 (MPU, WAG), 578 (MPU), 768 (MPU); 35 km SE of Boda (fl., fr. June) Badré 97 (P, WAG); Bangui Region, km 25 of Bodingbé Rd. (bud Mar.) Descouings 10018 (P); Ndongué, 100 km SW of Bouar (fl. Feb.-Apr.) Haxaire 1321 (P), 1418 (P), 1477 (P); Lubido Rocks, 12 km N of Wadda (fl. Feb.) Le Testu 3795 (BM, P); Boyketté, Audru-Boudet 2291 (P); Baguirimi, Baro, Chevalier 9830 (P); Ndouka (fl. May) Chevalier 8239 (G, L, P, WAG); Mbiyo R. source, 60 km N of Bambari (fl. Apr.) Tisserant 1490 (BM, BR, P); near Badé, 12 km S of Ippy (fl. Apr.) Tisserant 1867 (P); Yalinga (fl. May) Le Testu 4730 (BM, G, P, WAG), 4748 (BM, BR, P, WAG).

Sudan: Ghazal: Dervish Dini, Bor Region, de Vilmorin 148 (BR). Jonglei: S of Bor (fl. May) Lock 82/28(K). Equatoria: Yambio (fl. Mar.) Hoyle 742 (A, FHO, M); Yei R., Lado (fl. Oct.) Sillitoe 348 (K, UPS); Luri R., just N of Juba (fl. Feb.) J.G. Meyers 8635 (K); Bari, White Nile R. (fl.) Peney June 1861 (P).

Gabon: Estuaire: near Libreville, Klaine 1244 (BR, K, P); Chinchoco, Loango, Soyaux 41 (K, type of *V. puberula*); Agonzozorek, Upper Komo R. (fl. Oct.) Chevalier 26981 (BR, P); Atakama R. (fl. May) Bates 461 (BM, G, K, L, P, US); Mbé R., 22 km NE of Asok, (fl. Aug.) Breteler & De Wilde 249/78 (WAG). Woleu-Ntem: Etebéla (fl. Oct.) Le Testu 8930 (BM, G, P); Oyem (fl. Feb.) Le Testu 8990 (BM, P, WAG). Ogooué-Ivindo: Ipasa, 10 km S of Makokou (fl. Mar.) Hladik 2690A (P); Bélinga (fl. Oct.) N. Hallé 2854 (BR, P); km 20 Mékambo-Makokou Rd. (fl. July) Florence 1741 (P, WAG). Ogooué-Lolo: Likolo (fl. May) Le Testu 8096 (BM, BR, K, P); Miçoungangui, near Lastoursville (fl. May) Le Testu 8070 (BM, P, WAG); Mahounda (fl. July) Le Testu 8202 (BM, P). Ngounié: near Ndendé (fl. Dec.) Le Testu 5153 (BM, BR, P); km 6 Moanda-Bakoumba Rd. (fl. Oct.) Breteler 6755 (WAG); Issala (fl. Oct.) Le Testu 1651 (BM, BR, G, P).

Equatorial Guinea: Fernando Po: (fl. Jan.) Maññ 243 (K, P).

São Tomé: Lemos s.n. (BM, K); Capela (fl. Oct.) Espirito Santo 4767 (LISC, LISJC); Juliana de Sousa (fl., fr. Jan.) J. de Wilde et al. 264/80 (WAG); Porto Alegre (fl. Aug.-Sept.) Chevalier 13768 (P), 14177 (P), 14265 (P); Isla das Rolas (fl. Dec.) Quintas 954 (LISU).

Congo: Mvouti-Les Bandas Rd. (fr. June) Sita 3131 (P); km 8 Sibiti-Komono Rd. (fl. Sept.), de Néré 1863 (P); Bouéza For. (bud Nov.) Bouquet 756 (P); Vinza (bud Jan.) de Néré 842 (P); Gonaka-Antangui path (fl. Jan.) Bouquet 1145 (P); Mayombe For. (fl. Nov.) Thollon 1243 (K, P); Sanga R., Pobéguin 69 (P); Pikounda-Matéle Rd. (fl. Aug.) Bouquet 1714 (P); Dongou, Bouquet 2084 (P).

Zaire: II: Kizu (fl. Oct.) Vanderyst 26812 (BR); Luki (fl. Oct.) Donis 2031 (BR, MO); Gomelo Sumbi (fl. Oct.) Comte de Briey 2065 (BR); Kangu (fr. Oct.) Vanderyst 26996 (BR, MO). III: Matadi (fl. Nov.) Dacremont 318 (BR, C, MO, P, WAG); Kizulu (imm. fr. Dec.) Compère 986 (BR, SRGH); Mvuazi (fl. Sept.) Devred 742 (BR, K); Kinshasa (fl.) Laurent 13 Mar. 1896 (BR); Kikimi (fl. Sept.) Pauwels 5957 (BR, WAG); km 2 Bita-Kingankati Rd. (fl. Nov.) Breyné 949 (BR); Kisantu (fl. Sept.) Vanderyst 25788 (BR); Lemfu (fr. Mar.) Germain 2028 (BR); Kimvula (fl. Oct.) Pauwels 330 (BR). IV: Mushie (fl. Dec.) Lebrun 6710 (BR, WAG); Kasai R. (fl.) Laurent 11-XI-1903 (BR); Wombali (fl. Oct.) Vanderyst 2270 (BR); Kwango, Yongussi R. source (fl. July) Germain 2444 (BR); Kutu (fl.) Laurent 31-X-1903 (BR); Lukombé (fl.) Sapin Oct. 1910 (BR); Kimbau (fl. Sept.) Vanderyst 15336 (BR); Kikwit (fl. Oct.) Vanderyst 8251 (BR); Kwango, Kiyaka For. (fl. Sept.) Devred 2662 (BR, WAG); Bondo (imm. fr.) Sapin Sept. 1907 (BR); Bolinda, Oshwe Terr. (fl. Sept.) Gilbert 14823 (BR, WAG); Kapanga (fl. Aug.) Overlaet 572 (BR); Katola (imm. fr.) Sapin Apr. 1902 (BR), Apr. 1908 (BR); Sangaie (fl. Oct.) Gillardin 463 (BR). V: Kambaye (fl. Sept.) Quarré 2044 (BR); Mpoi-Gandayika (fl. Aug.) Risopoulos 636 (BR); Pastorale, Section Luulu (fl. Nov.) Quarré 2765 (BR, MO); Kaniama (fl., fr. Sept.) Mullenders 1063 (BR, K); Kabulo, Kongolo Terr. (fl. Sept.) Luxen 81 (BR, MO, WAG); Kiala, Thiébaud 323 (BR). VI: Gombe (fl. June) Vermoesen 2381 (BR); between Selenge and Lukolela (fl. July) Goosens 4968 (BR); Eala (fl. May) Corbisier Baland 1747 (BR, K); Wendji, Mbandaka (fl. Nov.) Staner 1397 (BR); Bokoma (fl., fr. Mar.) Hulstaert 95 (BR); Boteke (fl. Sept.) J. Louis 85 (BR, P, S, U, UC, US); Kombo (fl. Dec.) L. Dubois 246 (BR, K, MO, P); Ngondo, Ngiri, Bomongo Terr. (fl. Mar.) Evrard 5877 (BR, K); Djoa, Bolomba Terr. (fl. Oct.) Evrard 5005 (BR); Bangala, Nouvelle Anvers (= Makanza) (fl. Mar.) de Giorgi 384 (BR); Boyazube, Kangada R. (fl. Mar.) Evrard 579 (BR); Likimi (fl. Apr.) Malchair 265 (BR); Befale, Mangania (fl. Jan.) Evrard 3337 (BR, K); Boende (fl. Sept.) Goosens 4956 (BR); Wendji-Ikongo Rd., (fl. Oct.) Evrard 2608 (BR, K); km 30 Boende-Monkoto Rd. (imm. fr. June) Evrard 2292 (BR); Entongoto (fl. Mar.) Gorbatoff 81 (BR); lower Uele R., 130 km NW of Likati, Bongbeto (bud Jan.) Lisowski 47627 (POZG); Dundusana (fl. Dec.) Mortehean 972 (BR); Bokone, Bokungu Terr. (fl. Jan.) Evrard 5575 (BR, K); S of Booke, Monkoto Terr. (fl. May) R. Robin 57 (BR); Kole (fl. Oct.) Lebrun 6347 (BR, WAG); Bondo (fl. Mar.) Lebrun 2444 (BR); La Kulu (fl. May) Van den Brande 578 (BR, GENT); Mobwasa (fl. June) Lemaire 299 (BR); Mayoko, Opala (fl. Nov.) Lisowski 43332 (BR); Molima, Yambuya (fl. Dec.) Bequart 1360 (BR); Yangambi (fl. Apr.) J. Louis 8849 (BR, C, K, MO, P, UPS, WAG); Yalibwa (bud Feb.) J. Louis 1262 (BR, MO); Bambesa (fl. Nov.) Gérard 5419 (BR, WAG); Titule (fl. Apr.) Lebrun 2736 (BR, WAG); Madabu, Zobia (fl. Apr.) Gérard 2804 (BR); near Kisangani (fl. Apr.) Lisowski 45045 (BR); Bamanga (fl. Apr.) Hulstaert 1669 (BR); Lokadu, Claessens 584 (BR); Kindu (fl. Oct.) Gaille 34 (BR); Mongalula, near Avakubi (bud Dec.) Bequaert 1667 (BR); Walikale-Lubutu (fl. Jan.) Bequaert 6577 (BR, type of *V. bequarti*); Urega (fl. July) Lebrun 5648 (BR, K); Ituri, near Nduye (bud Apr.) Lisowski 45183 (BR); Abarangu, Mildbraed 3132 (K); Kembe, Walikale Terr. (bud, fr. Feb.) A. Léonard 1559 (BR); Mutongo (fl. Jan.) A. Léonard 2584 (BR, MO, P, WAG); Masingu (fl. Feb.) A. Léonard 1683 (BR); Irangi, Kalehe Terr. (fl. July) Christiaensen 552 (BR, NY, WAG); Turole, near Bunyakiri (fl. Sept.) Gutzwiller 2052 (BR, WAG); Luamba (= Rwamba), Shabunda Terr. (fl. Apr.) A. Léonard 3894 (BR, WAG). VII: Mokwange, Libenge Terr. (fl. Mar.) Thonner 265 (BR); near Bosobolo (fl. Apr.) Evrard 617 (BR); Pambwa (imm. fr. May) Evrard 965 (BR); Bosobolo-Banzville (= Mobayi) Rd. (fl. Apr.) Germain 8531 (BR); Mobayi (fl. Jan.) Lebrun 2097 (BR); near Yakoma, Léontovitch 148 (BR); Monga (fl. Feb.) Lebrun 2288 (BR); Bili (fl., imm. fr. May) Lebrun 2814 (BR, K, MO, WAG); Bigba-Ango Rd. (fr. Nov.) Gérard 5660 (BR); Tukpwo, Ango Terr. (fr. Oct.) Gérard 3185 (BR, L, M); Gwane-Zemio Region (imm. fr. July) Boutique 161 (BR); Nangu (bud June) Claessens 826 (BR); Zara, Poko Terr. (fl. Mar.) Nannan 553 (BR); Mande, Niangara Terr. (fl. Apr.) Nannan 326 (BR); between Amadi and Doruma (fl. June) Lebrun 3141 (BR, C, K); Mbunga (fl. May) de Graer 909 (BR); Niarniam Land, Turu R. (fl. Mar.) Schweinfurth 3326 (K, P, type of *V. schweinfurthii*); Garamba Nat. Park, near Bagbele (fl. Mar.) Noirfalise 30 (BR, K); Alimani (fl. Apr.) Seret

548 (BR). IX: Rutshuru (fr. Nov.) Lebrun 8339 (BR); between Masisi and Walikale (fl. Mar.) Lebrun 5162 (BR, WAG); Sange-Ruzizi Rs. junction (fr. Mar.) Germain 6352 (BR, P); Ruzizi R. valley, between Luvungi and Uvira (fl. June) Robyns 2523 (BR, K, MO). XI: Albertville (= Kalemie) (fl. Aug.) de Giorgi 28 (BR); Lunkinda R. (imm. fr. May) Brédo 4868 (BR); Sokele, Desenfans 90 (BR); Upemba Nat. Park, Mitwaba Terr. (fl. Aug.) de Witte 4125 (BR, K); Kapiri, Pande R. (fl.) Ad. Hock Oct. 1911 (BR); Kiubo (fl. Sept.) Schmitz 5686 (BR); Katanga, Luafi R. (bud Oct.) Lisowski 60082 (BR); 8 km W of Lubumbashi (bud Jan.) Lisowski 60083 (POZG); near Lukafa (fl. Aug.) Verdick 46 (BR); near Kasenga (fl., fr. Apr.) Robyns 1927 (A, BR, G, K, P); Johnston Falls, Luapula R. (imm. fr. Dec.) Lisowski 60080 (POZG); Luapula-Luombwa Rs. junction (fl. Oct.) de Witte 26 (BR).

Burundi: Randa, Bubanza Terr. (fl. Oct.) Lewalle 4797 (BR, K, LISC); Minago, Bururi (fl. Sept.) Auquier 4097 (BR); Kigewa, Bururi Prov. (fl. Oct.) Reekmans 5460 (BR, C, GENT, K, MO, UPS, WAG).

Angola: Cabinda: Bucu Zau (fl. Oct.) Gossweiler 6802 (BM, COI, LISJC, LISU); *ibid.*, Chiaca Res. (fl. Sept.) Monteiro et al. 313 (BM, COI, LISC, LISU). Cuanza Norte: Golungo Alto Distr., Mts. of Alto Queta (fl. May) Welwitsch 5931 (BM, LISU, paratype of *V. angolensis*); same distr., Quilombo (fl., fr. Nov.) Welwitsch 5979 (BM, COI, G, K, LISU, P, paratype of *V. angolensis*); same distr., Quibine Mt. (fl. Nov.-Dec.) Welwitsch 5980 (BM, COI, G, K, LISU, MO, P); Ambaca distr., between Ngombe and Puri-Cacarambola (fl. Oct.) Welwitsch 5978 (BM, COI, K, LISU, MO, lectotype of *V. angolensis*); Dalatanda-Cazengo (fl. May) Gossweiler 10194 (BM, COI); Salazar-Zavula (fl., fr. Jan.) Manuel da Silva 2258 (LISC); near Cuso (fr. Mar.) Dechamps et al. 1540 (BR, LISC); Cazengo, Granja de S. Luis (fl. Jan.) Gossweiler 4711 (BM, C, COI, K, LISJC, S), (fl. Nov.) 5641 (BM, COI, LISJC, LISU). Malanje: Quissol, near Angury (fr. July) Gossweiler 1138 (BM); Malanje, Marques 57 (COI). Lunda: Dundo, near Luachimo R. (fl. Oct.) Gossweiler 13705 (BM, K).

Uganda: U1: Laropi, W. Madi (fl. Mar.) Eggeling 1792 (BM, K); Entebbe, Mahon I (K).

Kenya: K7: Vanga (fl. Nov.) Graham 2210 (= Gardner 2210) (BR, FHO, K, P, Z); Ramisi R. bridge in Gazi-Shimoni Rd., Drummond & Hemsely 3902 (BR, K).

Tanzania: T3: Kisiwani, Pare Distr. (fl. Dec.) Hedberg et al. TPM 283 (K); near Mombo (fl. Jan.) Peter 58111 (B, WAG); km 8 Mombo-Korogwe Rd. (bud Nov.) Leeuwenberg 10824 (EA, WAG); Magemga Estate, Korogwe Distr. (fl., fr. Apr.) Faulkner 959 (B, BR, K, S); Amani (fl. Jan.) Verdcourt 32 (BR, K, M, PRE); Kigoma-Machazo, Peter 36997 (B); Kapapa, Tabora Distr. (fl. Sept.) Richards 25924 (K, M); Mahali Mts. (fl. Sept.) Jefford et al. 2606 (B, BR, K, MO, WAG); Bulimba, Kigoma Distr. (fl. May) Kahurananga et al. 2791 (BR, K, M); Lake Kativi Shore (fl. Oct.) Richards 20538 (BR, K); Kisi-Katisunga (fl. Jan.) Bullock 2264 (B, BR, K, S); Kalumbaleza (fl.) Silungwe 4 Oct. 1949 (K); Kavenda, Isimbira (fl. Nov.) Böhm 37a (K, Z, type of *V. Boehmii*); Lake Rukwa (fl. Oct.) Michelmore 1097 (K); T6: Turiani, Morogoro Distr. (fl. Nov.) Semsei 1930 (FHO, K); Kilosa (bud Sept.) Mwasumbi & Mwakalasi DSM 936 (BR, K); between Morogoro and Nzumbi (fl. Dec.) Eggeling 6775 (FHO, K, PRE); Msanga Mts. base, km 152 Morogoro-Iringa Rd. (fl. Nov.) Leeuwenberg 10839 (EA, WAG); Kidodi (fl. Nov.) Semsei 1037 (FHO, K); Ruvu R. valley, Uluguru Mts. (fl. Nov.) Pócs 6277/B (EA); km 5 Chazi-Morogoro Rd. (fl. Dec.) Harris 1312 (EA); Lukula, Selous Game Res. (fl. Nov.) Vollesen MRC 4127 (C, WAG); Ukutu (Khutu), Goetze 127 (K, paratype of *V. lutescens*); Ifakara (fl., fr. Aug.) Haerdi 54 (BR, G, K, WAG, Z). T7: Matema, Rungwe Distr. (fl. May) Richards 9860 (K); 7 km S of Great Ruaha-Yovi Rs. junction (fr. Sept.) Thulin & Mhoro 894 (K, UPS). T8: Seliman Mamba, Lindi Distr., Busse 2677 (BR, HBG, P).

Zambia: W Prov.: Ndola, Rogers 8361 (K, SAM, Z); Kabompe R. (fl. Nov.) Holmes 1010 (FHO, K, SRGH). N Prov.: Cassawa Sands, Abercorn Distr. (fl., fr. Feb.) Richards 10927 (K); Kawambwa (fl. Nov.) Fanshawe 3899 (BR, K, SRGH); Samfya Mission, Lake Bagweulu (fr. Aug.) F. White 3094 (BM, BR, FHO, K, MO); Chirui Island (fl. Oct.) R. E. Fries 1034 (UPS); Chembe Ferry, Luapula R. (fl., fr. Oct.) F. White 3517 (FHO, K); Kapalala, R. G. Miller 209 (FHO). E Prov.: Lundazi (fl. Oct.) Grout 265 (FHO).

Mozambique: sin. loc., Stewart anno 1863 (BM, paratype of *V. lutescens*); Niassa: Malema (fl. Dec.) Gomes e Sousa 839 (LISC); Ribáuê (imm. fr. Jan.) Torre & Paiva 10077 (LISC). Zambezia: Milange-Mocuba Rd. (fl. Nov.) Faulkner 489 (BR, K, S); Mocuba, Namagoa (fl. Dec.)

Faulkner 69 (K, PRE); km 50 Mopoeia Velha-Quelimane Rd. (fl. Dec.) Müller & Pope 1952 (K, LD, LISC, SRGH); Cundine (fl. Nov.) Le Testu 523 (BM, BR, G, P); Quelimane (fl. Jan.) Stuhlmann 710 (HBG). Manica e Sofala: between Lupata and Sena, lower Zambesi R., Kirk 31 (K, lectotype of *V. lutescens*); Chitengo (fl. Oct.) Balsinhas 1008 (COI, LMU); Inhansato, Inhaminga Region (imm.fr. Mar.) Gomes e Sousa 4297 (COI, K, M, PRE, SRGH); Cheringoma, Inhemitanga For. (bud Oct.) Simão 150 (LISC, LMA); Chupanga (fl.) Kirk Dec. 1862 (K, paratype of *V. lutescens*); Gondola (imm.fr. Feb.) Garcia 203 (LISC); Mávita (fl. Nov.) Mendonça 3796 (LISC); Gorongosa (fl. Oct.) Torre & Pereira 12383 (LISC); Dondo, 29 km from Beira (fl. Jan.) Sheppard 306 (K); Durúndi (fl. May) Barbosa 1683 (LISC); Beira (fl. Apr.) Torre 4021 (LISC); Dombe (fl. Nov.) Pereira & Marques 727 (LMU, MO, WAG); Busi R. below Spungabera (fl. Jan.) Goldsmith 5/62 (K, LISC, MO, SRGH); Chibabava, Lower Busi R. (fl. Dec.) Swynnerton 559 (BM, K, SRGH, Z); Pungoé R. (fl. Sept.) Vasse 254 (P).

Malawi: N Prov.: Kaseye R. (fl. Dec.) Pawek 13468 (K); Kaporo (fl. Jan.) Pawek 7730 (K, SRGH, UC); Sanga, 16 km S of junction with Mzuzu-NB Rd. (fl. Dec.) Pawek 6110 (K, UC). S Prov.: Blantyre, Shire Highlands (fl. July) Buchanan 9 (E, K, paratype of *V. lutescens*); Chiromo (fl. Jan.) Scott Elliot 1806 (BM, K); 95 km up the Shire R. (fl.) Kirk Jan. 1859 (K, paratype of *V. lutescens*).

Cult.: Netherlands, Wageningen, Bos 7385 (WAG, seedlings of herb. Leeuwenberg 8660). Jamaica (fl. May) Hope Gardens 103 (K). U.S.A.: Florida, Coconut Grove Intr.Gard. (fl. Aug.) Fennell PI 60394 (NA). Dominica: Roseau Bot. Gard. (fl. May) W.H.Hodge 3917 (GH, NY). Sri Lanka: Peradeniya Gardens, HGP 764 (K).

2. ***Voacanga bracteata*** Stapf, Kew Bull. 1894: 22. 1894; in Fl. Trop. Afr. 4(1): 160. 1902; H. Huber in Fl. W. Trop. Afr. 2nd ed. 2: 67. 1963, partly (excl. of Baldwin 6276). **Fig. 2, p. 23; Map 2, p. 25**

Type: Sierra Leone: Bagru R., Mann 858 (K, lectotype).

Heterotypic synonyms: *V. diplochlamys* K. Schum. in Engler & Prantl, Nat. Pflanzenf. 4(2): 149. 1895; Stapf in Fl. Trop. Afr. 4(1): 160. 1902; H. Huber, l.c., syn. nov. Type: Cameroun: Barombi, Preuss 14 (holotype not seen, destroyed in B; lectotype K!).

V. bracteata var. *lanceolata* Stapf, tom. cit. 161. Type: Cameroun: Yaoundé, Zenker 694b (K, lectotype; isotypes: S, WU).

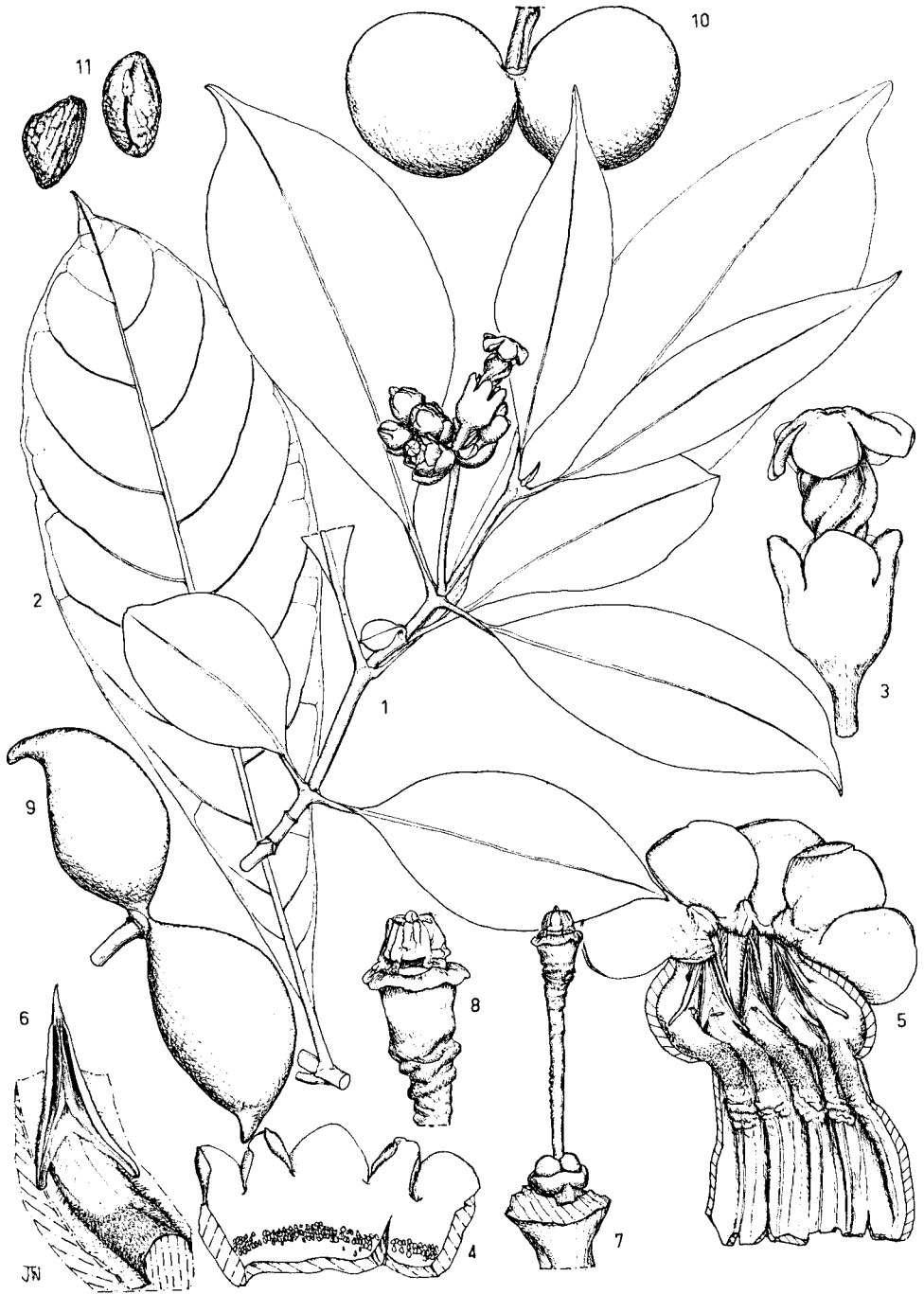
V. talbotii Wernham in Cat. Talbot's Nigerian Fl. 63. 1913. Type: Nigeria: Cross River State: Oban, Talbot 1624 (BM, holotype).

V. micrantha Pichon, Bull. Mus. Hist. Nat. Paris sér. 2. 19: 410. 1948, syn. nov. Type: Gabon: Nyanga, Le Testu 1370 (P, holotype; isotype: BM).

Missapplied name: *V. obanensis* Wernham, tom. cit. 62. Type: Nigeria: Cross River State, Oban, Talbot 2071, partly (BM, holotype, being *V. psilocalyx*; the K and Z sheets being *V. bracteata*).

Shrub or small tree, 1–6 m high. Trunk terete, 2–20 cm in diameter; bark pale grey, smooth, without latex, lenticellate. Branches lenticellate, with white latex; branchlets glabrous or sometimes minutely pubescent at the apex. Leaves petiolate; petiole glabrous or sometimes minutely pubescent, 2–30 mm long (oc-

FIG. 2. *Voacanga bracteata*. 1, flowering branch ($\times \frac{1}{3}$); 2, leaf ($\times \frac{1}{3}$); 3, flower ($\times 2$); 4, opened calyx ($\times 2$); 5, opened corolla ($\times 3$); 6, stamen ($\times 6$); 7, pistil ($\times 3$); 8, pistil head ($\times 6$); 9–10, fruits ($\times \frac{1}{3}$); 11, seeds ($\times 2$). 1, 3–8, 10–11 from Breteler & de Wilde 753/78; 2 from Bos 2283; 9 from de Koning 1610.



rea not or slightly widened into intrapetiolar stipules); blade often thinly coriaceous when fresh, membranaceous to papery when dry, elliptic or narrowly elliptic, variable in shape and size, 2–4 x as long as wide, 5–22 x 1.5–9 cm or sometimes some smaller, acuminate to almost caudate at the apex, glabrous on both surfaces or sometimes minutely pubescent beneath, especially on the costa, with 5–14 secondary veins on either side; tertiary venation inconspicuous. *Inflorescence* mostly long-pedunculate, 4–12 x 2–5 cm, drooping, few- to rather many-flowered, with first ramifications sometimes rather lax and other more congested. Peduncle slender, 1.7–10 cm long, pale green and glabrous or pubescent as branches and pedicels; pedicels 2–10 mm long. Bracts persistent or only lower deciduous, about as long as the calyx, ovate, concave, obtuse, glabrous or minutely pubescent outside, with a few colleters in the axils. *Flowers* with a faint odour. *Calyx* pale green, campanulate or nearly so, 8–12 (17) mm long (when lobes erect), persistent, often even under the fruit, outside glabrous or minutely pubescent, inside with a narrow belt of many crowded colleters in about 2–3 rows, being 1–2.5 mm wide and situated 0–1 mm above the base or sometimes with a 3 mm wide zone of more or less scattered colleters 1–4 mm above the base; tube cup-shaped, 4–6.5 (9.5) mm long; lobes 0.8–1.2 x as long as the tube, suborbicular or often some oblong, 0.9–1.5 x as long as wide, 7–7.5 x 3–7.5 mm, obtuse or rounded at the apex, imbricate in bud, erect or spreading to recurved. *Corolla* white or pale yellow, often with a brown centre, or entirely medium brown, often starting white or yellow and turning brown at anthesis, in the mature bud 12–22 mm long incl. the lobes (the lobes 1/5–1/3 of the bud length, forming an ovoid or broadly ovoid head, 1–1.5 x as long as wide, 3–5 x 2.5–4 mm, with a blunt apex), glabrous outside, inside with a pubescent belt from 5–9 mm above the base, being at or near the second constriction, to the insertion of the stamens and usually with some minute hairs near the base of the lobes; tube 0.8–2 x as long as the calyx (when the lobes erect), 10–17 mm long, more or less bottle-shaped, twisted from slightly above the middle to about 2 mm below the mouth, contracted at the base, about in the middle, and at the mouth, at the base 2–4 mm, above 3–5 mm, at the second constriction (being 5–9 mm above the base) 2–3 mm, above 3–6 mm, and at the mouth 1.5–2 mm wide; lobes (= free parts of limb) twisted, obovate or broadly obovate, 0.2–0.5 x as long as the tube, 0.8–1.2 x as long as wide, 2.5–8 x 3–7 mm, rounded to retuse, recurved. *Stamens* barely included or barely exerted, inserted 2.5–4 mm from the corolla mouth; anthers 4–5.5 x 1.5–2 mm, at the apex for 0.5–0.7 mm sterile, glabrous, usually twisted with the corolla. *Pistil* 9–13 mm long (when style straightened out); ovary of two carpels 1–1.8 x 0.9–2 x 0.5–1.2 mm; disk entire or slightly sinuate, 0.3–1 mm high; style occasionally split at the base for 0.3 mm, narrowly obconical, 7–10 mm long, twisted and sometimes curled at the base, at the base about 0.5 mm wide, at the apex slightly narrower than the pistil head; pistil head 1.5–3 x 1.5–3 mm, with an entire or slightly sinuate ring 1.5–3 mm in diameter. Ovules 50–70 in each carpel. *Fruit* of two separate mericarps usually both developing; mericarps yellow or less often white or orange, not spotted, obliquely subglobose to ovoid, or half-moon-shaped, 1–2.7

x as long as wide and 1–2.7 x as long as thick, as wide as thick or slightly wider, 26–60 x 15–35 x 15–30 mm, rounded to acute at the apex (when dry usually acuminate), smooth (when dry bumpy by the seeds), 2-valved (but not seen open); wall 2–6 mm thick; aril orange. *Seeds* many, dark brown to black, 7–10 x 4–4.5 x 3.5–4 mm, with a more or less honeycomb-like structure; embryo straight, 5 mm long; cotyledons orbicular, 2 mm long; rootlet 0.5–0.6 mm in diameter.

Distribution: Tropical West and Central Africa.

Ecology: Understorey of moist forests. Alt 0–1100 m. Probably continuously flowering and fruiting.

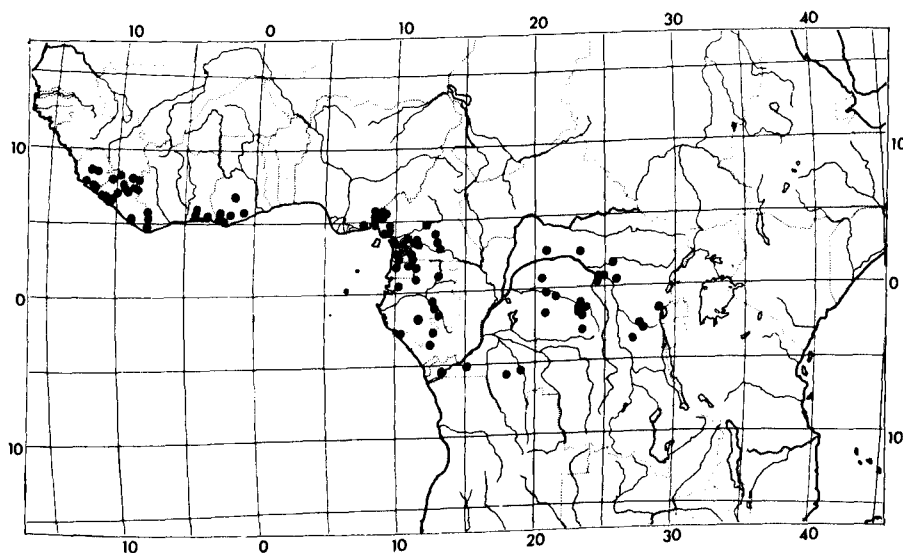
Vernacular names

Sierra Leone: Akbapoto (Tunkia), Boni (Mende, also used for other *Voacanga* spp.).

Ghana: Tweandema (Nzima), Kakapempe (Western, see also *V.afr.*).

Cameroon: Obaetoan (Yaoundé, also used for *V.afr.*).

Zaire: VI: Bekapu, Langure (near Likimi), Boke an Kiki (Bakutu), Kwankuma (near Mobwasa), Ebangabanga (Turumbu, also used for *V.afr.* and *Tabernaemontana crassa*), Inaolo a Ebangabanga (see *V.afr.*), Ebangabanga Lo Lowe (Turumbu), Kalenge (Kirega, also used for *V.afr.* and *V.thou.*), Kantonko (Kirega, also used for *V.afr.*), Muinya (Kirega), Kalenge (Kitembo, also used for *V.afr.*), Kantongo (Kitembe), Kalenge Kamume (Kinyanga; means male Kalenge), Buanga (Kinyanga).



MAP 2. *Voacanga bracteata*.

A selection of the ca. 210 specimens examined:

Guinea Conakry: Nimba Mts., Schnell 3744 (P); Nzérékoré, Adam 3867 (MO).

Sierra Leone: near Magburaka, Deighton 4948 (K, P); Bagru R., Mann 858 (K, lectotype); Pujahun, N.W.Thomas 8091 (K, WAG); Mesima, Deighton 5295 (K).

Liberia: Yuelliton Rd., Nimba Mts., Adames 670 (K, P); Saniquellie, Adam 16647 (MO); Vonjama, Baldwin 10035 (K); N of Zorzor, Bos 2575 (WAG); Kolubanu, Linder 1123 (A); Banga, Linder 1188 (A, K, LE); Ganta, Baldwin 9316 (K, MO, NY, US, WAG); about 8 km E of Robertsport, de Gier & Goll 146 (WAG); Bendu Rd., Lake Piso, J.W.A.Jansen 2248 (WAG); Duport, Bos 1848 (BR, K, WAG), 2283 (WAG); Firestone Plantation, Div. 18, Stoop v.d. Kastele 308 (WAG); Sinoe, A.Whyte anno 1904 (BM, K); Cavally R., E of Harper, J.W.A.Jansen 2437 (WAG).

Ivory Coast: km 25 Tai-Tabou Rd., W. de Wilde 1068 (BR, K, P, UC, WAG, Z); Agnéby R. valley, Voguè, Chevalier 17182 (P); Banco F.R., J. de Wilde 3201 (A, K, P, WAG); *ibid.*, de Koning 1610 (WAG); Yapo, Bègué 3118 (P); km 44 Abidjan- Adzopé Rd., Leeuwenberg 7960 (WAG); Toumangué For., km 28 Aboiso-Grand Bassam Rd., Bamps 2040 (BR, K, P, UCJ).

Ghana: Western: Kwaben, Vigne 1299 (FHO); Awiabo, Vigne 1465 (K); Axim, Irvine 2358 (E, GC, K); Opon Mansi F.R., Akpabla 924 (GC). Ashanti: Obomeng, South Scarp F.R., Adams 5167 (GC, K). Eastern: Esen Epam F.R., Enti Sp.445 (MO).

Benin: *sin. loc.*, Spire 91 (P).

Nigeria: Cross River State: between Old and New Ajasso, Ikom Distr., Latilo & Oguntayo FHI 67676 (FHI, K, WAG); Nyaja, Ikpai Distr., Latilo FHI 67779 (FHI, K, WAG); Oban Distr., Talbot 1290 (K), 1330 (K), 1624 (BM, type of *V. talbotii*), 2071 partly (K, Z); Oban F.R., Okafur FHI 36371 (FHI, FHO, K); Old Calabar, Thompson 39 (E, K, paratype); *ibid.*, Adiabo, Holland 108 (K); Eket distr., Talbot s.n. (BM, K).

Cameroun: Nord-Ouest: 5 km NE of Mamfé, Letouzey 14162 (P, WAG); between Mbiofong and Abakpa, Letouzey 13612 (BR, K, P, WAG); Abonando, Rudatis 14 (K, W, Z); Eyang, Tamajong FHI 22133 (FHI, K). Sud-Ouest: Lake Ejaghan F.R., F.White 8582 (FHO); Johann-Albrechts-höhe (= Kumba), Staudt 819 (FHO, GH); Barombi, Preuss 14 (K, type of *V. diplochlamys*); Mbalange N.A. For.Res., S Bakandu, Binuyo & Daramola FHI 35051 (FHI, FHO, GC, K, P); Cameroun Mt., above Buea, Morton GC 6751 (GC, K). Littoral: km 13 Nkongosamba-Douala Rd., Bamps 1493 (BR, WAG, YA). Centre-Sud: Mbango, near Lolodorf, Zenker Mar. 1911 (F); Kribi, Winkler 798 (Z); Bipindi, Zenker 38 ('pencil number', B, BOL, BR, C, FI, G, GH, LD, U, UC, US, WAG), 870 partly (HBG, K, L, M, NY, P, WAG, WU and the next partly: BR, E, GOET, see also *V. psilocalyx*), 944 (BM, E, K, LE, WU), 4163 (BM, E, G, K, LE, WU), 4278 (BR, E, G, GOET, HBG, K, L, LE, M, MO, P, S, W, WU), 4436 (BM, BR, E, G, GOET, HBG, K, L, LE, M, MO, P, S, W, WU), May 1898 (F, LD, MEL, UC); Kélé R. left bank, 29 km N of Eséka, Leeuwenberg 6020 (BR, K, LISC, MO, P, WAG, YA); *ibid.*, W. de Wilde 1496 (B, BR, FHI, GENT, K, MO, P, PRE, WAG, Z); near Songbong, S of Nyong R., 49 km SW of Eséka, Leeuwenberg 5058 (B, BR, C, FHI, K, LISC, MO, P, WAG, YA); Makak, Jacques-Félix 2260 (P); Bipindi-Ebolawa, Mildbraed 7620 (K); Ebianemeyong, 60 km E of Campo, Letouzey 9302 (P); near Ngom, 40 km SSE of Ebolowa, Letouzey 9968 (BR, K, P, WAG, YA); 5 km S of Mbalmayo, W. de Wilde 1801 (B, BR, K, MO, P, WAG, Z); Yaoundé, Zenker 694 (COI, G, NY, P, Z); 694b (K, S, WU); *ibid.*, Zenker & Staudt 187 (BM, COI, K, LE); Etun Hills, 10 km NW of Yaoundé, Mildbraed 7987 (HBG); Ngolebang, 42 km SE of Mbalmayo, Asonganyi 6 (P, WAG); km 35 Yaoundé-Ayos Rd., Leeuwenberg 5779 (WAG); Bissombo For., 59 km SE of Akonolinga, Asonganyi 280 (WAG); near Bongo, Letouzey 1730 (P, YA); Mbomba, Letouzey 1784 (P). Est: near Lom and Dj-rem Rs. junction, Mildbraed 8161 (K); between Mase and Anpel, Letouzey 4004 (P, YA).

Gabon: Estuaire: km 3 Asok-Hydroelectric powerstation in Tchimbélé R., Breteler & de Wilde 14/78 (WAG). Woleu-Ntem: Oyem, Le Testu 9379 (BM, P, WAG). Ogooué-Ivindo: Bélinga, N.Hallé 3190 (P), 3480 (P). Nyanga: Nyanga, Le Testu 1370 (BM, P, type of *V. micrantha*). Ngounié: km 20 Mimongo-Mbigou Rd., A.M. Louis et al. 489 (WAG). Ogooué-Lolo: Lastoursville, Le Testu 7333 (BM, BR, P), 7587 (BM, P, WAG); km 16 Lastoursville-Moanda Rd., Breteler & de Wilde 753/78 (WAG). Haut-Ogooué: km 11 Moanda-Franceville Rd., Breteler 6805 (WAG).

Equatorial Guinea: Rio Muni: Bebai, S of Campo, Tessmann 601 (K); Nkolentangan, Tessmann 315 (K).

Congo: Mayombe For., Makany 2046 (P); Maboukou, Moukoudi Region, Sita 3931 (P).

Zaire: III: Bufwakwanzi, Claessens 328 (BR, K); Bundi, Claessens 462bis (BR); Madimba, Nsi-mundele 332 (BR). VI: Mpole, Bikoro Terr., G. Gilbert 14684 (BR); Flandria-Makako Rd., Ingende Terr., Evrard 6056 (BR, K); near Businga, Lebrun 2031 (BR, MO, WAG); near Likimi, Malchair 330 (BR), 448 (BR); Mange, Befale Terr., Evrard 4969 (BR); Boende, Evrard 3948 (BR, K); Isongo, Gorbatoff 326 (BR); near Mobwasa, Reygaert 1406 (BR); Tohanga, Germain 7569 (BR, K, P); Yangambi, J. Louis 8637 (BR, K, SRGH, WAG); Yanongé, Ayobangira Samvura 126 (K); km 50 Yangambi-Bengami Rd., J. Louis 1604 (BOL, BR); 80 km E of Kisangani, Lisowski 17045 (BR); Urega, Lebrun 5590 (BR, K); Nyangoma, Shabunda Terr., A. Léonard 5137 (BR); Mesa Kama, Allard 302 (BR); Kembe, km 153 Sake-Walikale Rd., Pierlot 2105 (BR, WAG); Kalambairo, Mutongo, Gutzwiller 3203 (BR); Irangi, Troupin 4362 (BR, K), 4370 (BR, K, WAG), 4440 (BR), 4521 (BR, K); *ibid.*, Van der Veken 9743 (GENT); Kabunga, A. Léonard 1764 (BR, C, K, MO, WAG); Eke R., Michelson 183 (BR); Bunyakiri, Gutzwiller 2334 (BR). VIII: Ituri, near Nduye, Lisowski 44979 (POZG).

Cult.: Ivory Coast: Adiopodoumé, Leeuwenberg 12171 (WAG).

Notes. Specimens of *V. bracteata* in (young) bud or without corollas may be confused with *V. caudiflora* and *V. psilocalyx*. In the case of such incomplete specimens the arrangement of the colleters may be conclusive – they form a 1–2.5 mm wide belt comprising 2–3 dense rows situated 0–1 mm above the base, while in the other two species they are clearly separated from each other and are scattered over a wider zone (see figs. 2, 3 and 6).

3. *Voacanga caudiflora* Stapf in Fl. Trop. Afr. 4(1): 603. 1904; H. Huber in Fl. W. Trop. Afr. 2nd ed. 2: 67. 1963.

Fig. 3, p. 28; Map 3, p. 29

Type: Liberia, about 30 km from Karka Town, A. Whyte s.n. (K, holotype).

Shrub or treelet 1–6 m high, trunk 2–5 cm in diameter; bark fairly smooth, pale grey-brown. Branches lenticellate; branchlets glabrous. Leaves shortly petiolate; petiole glabrous, 3–20 mm long (ocrea not widened into intrapetiolar stipules); blade thinly or softly coriaceous when fresh, membranaceous or papery when dry, variable in size, narrowly elliptic or narrowly obovate, (2.5)3–6.5 x as long as wide, (4.5)10–28 x 1.5–8 cm, long-acuminate at the apex, glabrous on both surfaces; with 5–12 secondary veins on either side; tertiary venation inconspicuous. Inflorescences mostly long-pedunculate, 8–20 x 3–8 cm, drooping, few-flowered, lax. Peduncle slender, 2.5–15 cm long, pale green and glabrous; pedicels slender, glabrous, 10–28 mm long. Bracts persistent or deciduous, broadly ovate, concave, about as long as the calyx, rounded. Flowers: Calyx pale green or greenish-white, campanulate, much wider than the corolla tube, 11–19 x 5–9 mm, deciduous after the corolla has been shed, and before the fruit develops, outside glabrous, inside with a belt of scattered colleters in basal 2–4 mm; tube campanulate (2–4 x as long as the lobes) 8–13 mm long; lobes 0.2–0.3 x as long as the tube, broadly ovate to oblong, even in a single flower, 0.7–2 x as long as wide, 3–6 x 2.5–5.5 mm, rounded, erect. Corolla white, creamy or yellow, in the mature bud 16–30 mm long incl. the lobes (the lobes 0.4–0.55 of the bud length, forming an almost cylindrical head, 3.5–6 x as long as wide, 9–12 x 1.5–3 mm, with a blunt apex), glabrous outside, inside with a 1 mm wide pubescent belt just below the insertion of the stamens; tube 1.1–1.4

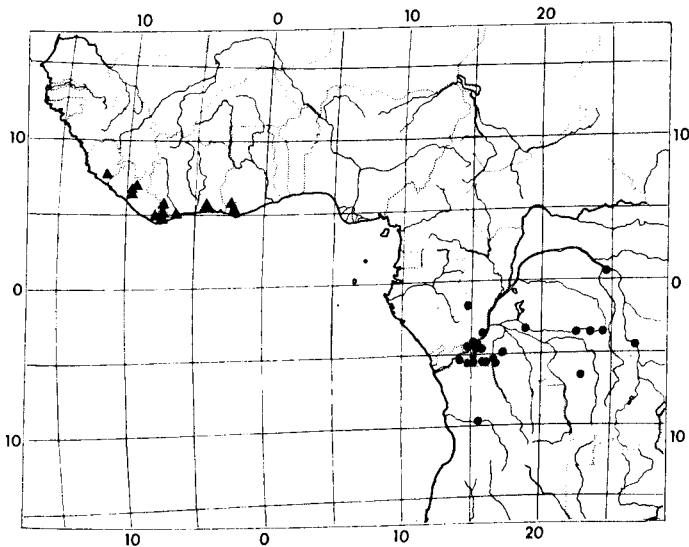


FIG. 3. *Voacanga caudiflora*. 1, flowering branch ($\times \frac{1}{3}$); 2-5, opened calyces ($\times 1$); 6, calyx segment inside ($\times 3$); 7, opened corolla ($\times 2$); 8, stamen ($\times 6$); 9-10, pistils ($\times 3$); 11, fruits ($\times \frac{1}{3}$); 12, seed ($\times 2$) with more enlarged detail of testa. 1, 5 from Bos 1957; 2, 10 from Ake Assi 3203; 3 from Stoop-v. d. Kastelee 299; 6 from Vigne 3160; 4, 7-9 from Jansen 2238; 11-12 from Leeuwenberg 12279.

x as long as the calyx (when the lobes erect), 16–24 mm long, almost cylindrical, contracted just below the insertion of the stamens (being 5–14 mm above the base or at 0.3–0.6 of the length of the tube), at the base 2–4 mm, at the constriction 1.5–2.5 mm, just above 2.5–3.5 mm, and at the throat 2–2.5 mm wide, slightly twisted for the entire length; lobes twisted, narrowly elliptic to strap-shaped, 0.9–1.3 x as long as the tube, 4–10 x as long as wide, 16–23 x 2.5–4 mm, obtuse, spreading to recurved. *Stamens* distinctly included (apex of anther 3–6 mm below the corolla mouth), inserted 7–10 mm below the mouth; anthers 6 x 1.2–1.5 mm, at the apex for 1 mm sterile, glabrous, not twisted. *Pistil* 7–21 mm long; ovary of two carpels, 1.5–2 x 0.8–1.5 x 0.8 mm; disk annular, slightly sinuate, 0.4–0.5 mm high; style not split at the base, almost cylindrical, slightly widened just below the pistil-head, 4.5–18 mm long, not bumpy, not twisted, at the base about 0.5 mm thick; pistil head 1–1.5 x 0.6–1.5 mm, with a shortly lobed ring, 1.3–2.5 mm in diameter. *Ovules* 30–50 in each carpel. *Fruit* of two separate mericarps; mericarps yellow or orange, narrowly ellipsoid, 2–4.5 x as long as wide, 4–6 x 1.2–2 x 1.2–2 cm, acuminate at both ends, with an obscure line of dehiscence, several-to many-seeded. *Seed* dark brown, 9 x 5 x 4.5 mm, with a minute honeycomb-like structure; embryo straight, 5.5 mm long; cotyledons orbicular, 2 mm long; rootlet 0.6 mm in diameter.

Distribution: Sierra Leone, Liberia, Ivory Coast, Ghana.

Ecology: Understory of moist forest or bush in the moist forest area. Alt. 0–150 m. Probably continuously flowering and fruiting. Mainly collected from September to February.



MAP 3. ▲ *Voacanga caudiflora* and ● *V. chaltotiana*.

Vernacular name

Liberia: Vu-fohn (near Monrovia).

Specimens examined:

Sierra Leone: near Blama, Deighton 315 (K).

Liberia: Nyaake, Webo, Baldwin 6098 partly (K, MO; the US sheet being a *Flacourtiaceae*); Jabroke Webo, Baldwin 6276 (K), 6452 (K); Gola For., Bos 1957 (WAG); *ibid.*, Bunting 4 Apr. 1910 (BM, MO); Bomi Hills, J.W.A.Jansen 2238 (WAG); N of Monrovia, within 32 km of Karka Town, A. Whyte s.n. (K, type); Mecca, Baldwin 10403 (K, MO); Suen, Linder 1406 (A, K); Firestone Plantations, Div.33, Stoop v.d. Kastele 263 (WAG), 299 (WAG); *ibid.*, Harbel, Lemckert 1 (WAG); Dukwia R., Cooper 219 (BM, F, K).

Ivory Coast: between Taté and Tabou, Chevalier 19831 (P); between Kago and Guraubané-Tabou, Guillaumet 524 (ABI); Grabo Rd., Tabou, Tehe Henri 11 Nov. 1964 (ABI); between Bredou and Dogbo-Tabou, 70 km NNW of Tabou, Guillaumet 851 (ABI); between Olodio and Grabo, Ake Assi 9430 (UJC); *ibid.*, km 7, Leeuwenberg 12306 (UCJ, WAG); 7 km S of Tai, J. de Wilde & Leeuwenberg 3574 (WAG); Tai For., Ake Assi 6809 (UCJ, WAG); *ibid.*, 20 km SE of Tai, Leeuwenberg 12340 (WAG); Baléko For., Ake Assi 3203 (P, UCJ); Kouta For., Ake Assi 2318 (ABI); Yapo For., Ake Assi 15746 (UJC); *ibid.*, Leeuwenberg 12279 (UCJ, WAG); *sin. loc.*, Aubréville 2806 (P, WAG).

Ghana: Western: Simpa, Vigne 2778 (FHO); Benzo, Tarkwa Distr., Duah FH 7046 (FHO, K). Northern: Jema, Vigne 3160 (A, FHO, GC, NY, US).

4. *Voacanga chalotiana* Pierre ex Stapf in Fl. Trop. Afr. 4(1): 158. 1902.

Fig. 4, p. 31; Map 3, p. 29

Type: Congo: Brazzaville, Chalot 5 (P, holotype; isotype: K).

Tree 6–30(35) m high, entirely glabrous except for inner side of the corolla tube. Trunk 10–80 cm in diameter; bark pale grey-brown, shallowly fissured, 0.8–1.8 cm thick, with stony orange-brown inclusions, with few white latex; inner bark yellow. Branches with some large lenticels; branchlets glabrous. *Leaves* long-petiolate; petiole 10–30 mm long (ocrea narrow); blade chartaceous when dry, narrowly elliptic, 2.8–4 x as long as wide, 5.5–21 x 1.5–6.5 cm, acuminate at the apex, glabrous on both surfaces, with 10–25 fish-bone-like secondary veins on either side; tertiary venation rather conspicuous, reticulate. *Inflorescences* long-pedunculate, 10–17 x 6–15 cm, lax. Peduncle 2.5–8.5 cm long; pedicels 6–15 mm long. Bracts deciduous, ovate to obovate, acuminate or nearly so, with a single row of large colleters in the axils; lower up to 7 x 5 mm, other smaller. *Flowers*: *Calyx* green(?), 5–7.5 mm long (when lobes erect), inside barely above the base with 4 or 5 large colleters in a single row opposite the lobes (all 20 to 25 colleters together shape an almost uninterrupted ring); tube cup-shaped, 2–3 mm long; lobes 1.5–2.5 x as long as the tube, narrowly triangular to almost oblong, 2.5–3.5 x as long as wide, 3–6 x 1.3–2 mm obtuse, recurved. *Corolla* (in bud pale yellow), white or creamy, often(?) with an ochraceous throat, in the mature bud 13–18 mm long incl. the lobes (the lobes 0.55–0.66 of the bud length, being 7.5–12 mm, forming an almost conical head with a blunt apex), glabrous outside, inside in tube appressed-pubescent with hairs directed downwards at the edges and bases of the filament ridges starting at 1.5–2 mm from the base and in between; tube inflated, 2–3.2 x as long as the calyx tube, 5–7

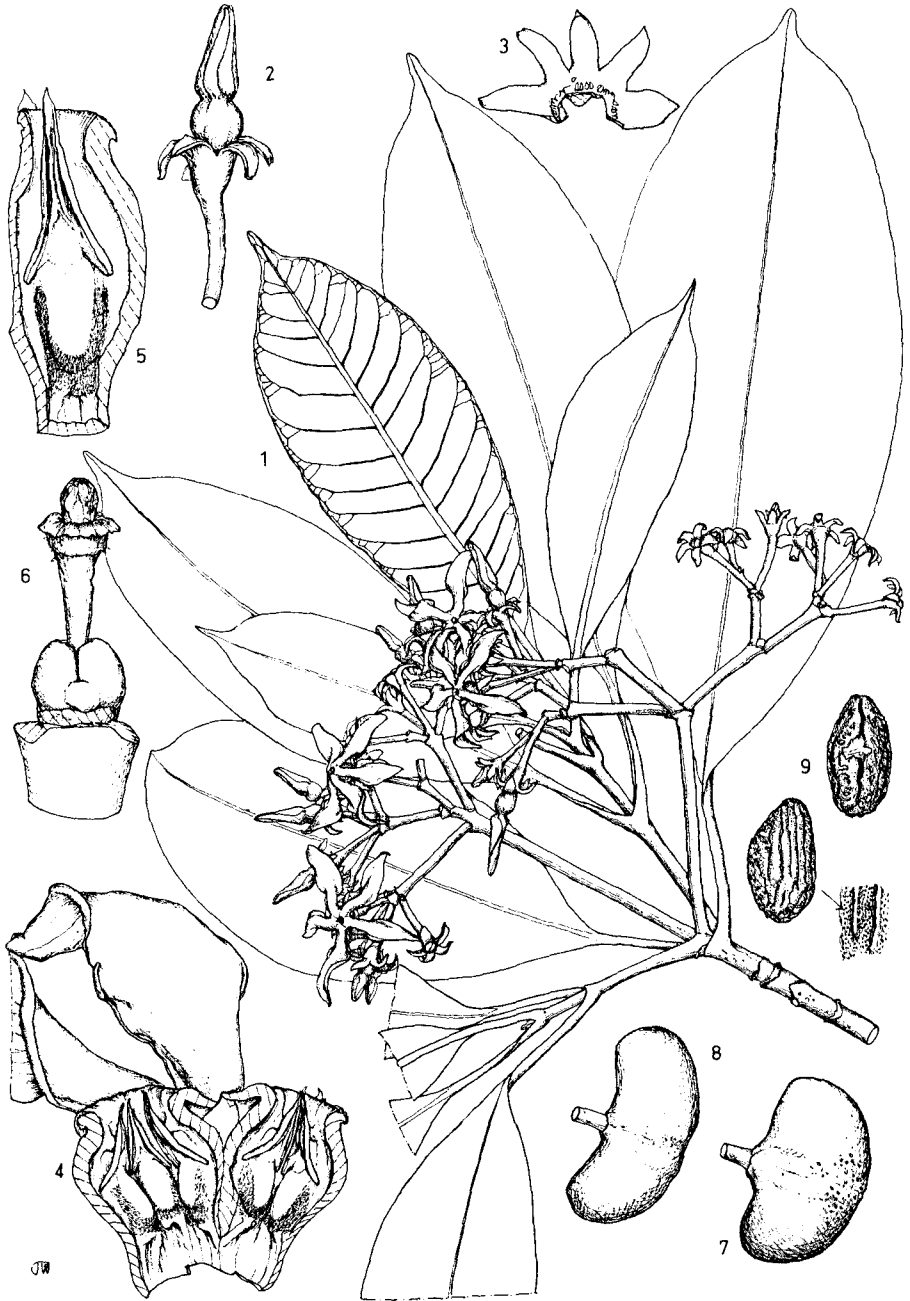


FIG. 4. *Voacanga chalottiana*. 1, flowering branch ($\times \frac{1}{3}$); 2, flower bud ($\times 2$); 3, opened calyx ($\times 2$); 4, opened corolla ($\times 4$); 5, stamen ($\times 8$); 6, pistil ($\times 6$); 7-8, fruits ($\times \frac{1}{3}$); 9, seeds ($\times 3$) with more enlarged detail of testa. 1 from J. Louis 3488; 2-6 from Bamps 610; 7 from Evrard 2278; 8-9 from J. Louis 4314.

mm long, with basal narrow part (partially in calyx) at base 2–3 mm wide, at widest point 3.5–4.5 mm wide, contracted again at the mouth; lobes not twisted, and at the base ventricose, obliquely oblong, 1.9–3 x as long as the tube, 2.4–3 x as long as wide, 11–18 x 4–6 mm, subacute or obtuse, spreading and soon afterwards recurved. *Stamens* exerted for 0.7–1.2 mm, inserted 2 mm below the corolla mouth; anthers 3–3.8 x 1.4–1.6 mm, at the apex for 0.6 mm sterile, glabrous. *Pistil* 5.1–6.1 mm long; ovary 1.7–2 x 1.5–1.7 x 1.2–1.5 mm, composed of 2 carpels being connate at the base for 0.4–0.8 mm; style not split at the base, 2.2–2.8 x 0.3 mm, slightly thickened at the apex; pistil head 0.6–0.8 x 0.6 x 0.8 mm, with a ring 1.2–1.5 x 0.5–0.8 mm. Ovules about 120–150 in each carpel. *Fruit* transversely broadly elliptic, immature often slightly bilobed, mature dark green or yellow and yellow-spotted at the apex and dark green at the base, not or barely lobed, 2.5–3 x 4.5–6.5 x 2–3 cm, with apices of carpels spreading or slightly recurved, transversely dehiscent; wall about 4 mm thick; aril bright yellow. *Seeds* dark brown, 6 x 3 x 2.5 mm, minutely tuberculate; embryo small, straight, 2.5 mm long; cotyledons orbicular, 0.8 mm long; rootlet 0.3 mm in diameter.

Distribution: Congo, Zaïre, Angola.

Ecology: Forests, often secondary, or gallery forests. Alt. up to 500 m. Probably flowering and fruiting the whole year.

Vernacular names

Zaïre: III: Nkolo nkolo, Nkolu nkolu (near Madimba and Popakabaka), Munkodia nkodia (Kibongo, see also *V.afr.* and *V.thou.*), Buenge (Tshiluba). IV: Nkosi nkosi (Kiyaka). V: Muyondwe (Kiluba). VI: Ikumuli, Inaolo a Okuka, Inaolo a Ikukasa (Turumbu, see also *V.afr.*).

A selection of the ca. 70 specimens examined:

Congo: Diele, J.de Brazza 14 (P); Plateaux Batéké, Koechlin 1145 (P); near Kinkala, Bouquet 2184 (P); Djoué R., Bouquet 889 (P); near Brazzaville, Sita 1930 (P), J. de Brazza 138 (P), Chalot 5 (K, P, type), Chevalier 4284 (BR, K, P), 11193 (P), 11216 (P).

Zaïre: III: Yombe, Compère 995 (BR, K); Mvuazi, Devred 621 (BR); Kimuenza, Mildbraed 3723 (HB); Kinshasa, Bequaert 7718 (BR); between Dembo and Koango, Butaye Oct. 1900 (BR); E of Nsele, Pauwels 4736 (BR, WAG); near Ntau, Callens 4440 (BR, NY); between Kinkosi and Kimvula, Hürlimann 12 Feb. 1957 (Z). IV: Dinga-Kwango, Devred 2518 (BR, MO); Kivwandaba, Popokabaka Terr., Pauwels 2021 (BR); Kwango, Yougussi R. source, Germain 2444 (BR, WAG); Buna, Flamigni 7129 (BR); Kamembele, Dibaya Terr., Liben 2274 (BR). V: Mutambo, Kasongo Terr., A.Léonard 5646 (BR); Kombe, Delvaux 867 (BR). VI: between Kole and Bekese, Lebrun 6394 (BR); Lodja, Lebrun 6245 (BR, K); Katakokombe, Lebrun 6120 (BR, K); Yangambi, Bamps 610 (BR, K), J.Louis 3488 (BR, FI), 4178 (BR, FHO, K, MO, P, SRGH, WAG), 4314 (B, BR, FHO, P, WAG), 6710 (BR, S, U, UC, US), 7381 (BR, C, FI, K, NY), 10191 (BR, K, MO, P, S).

Angola: Pungo Andongo, Welwitsch 5952 (LISU).

5. *Voacanga pachyceras* Leeuwenberg, *sp. nov.* **Fig. 5, p. 33; Map 4, p. 35**

Frutex vel arbor parva ramis lenticellatis bifurcatis. Folia anguste elliptica apice acuminata. Inflorescentia pauciflora. Bractee deciduae calice longitudine

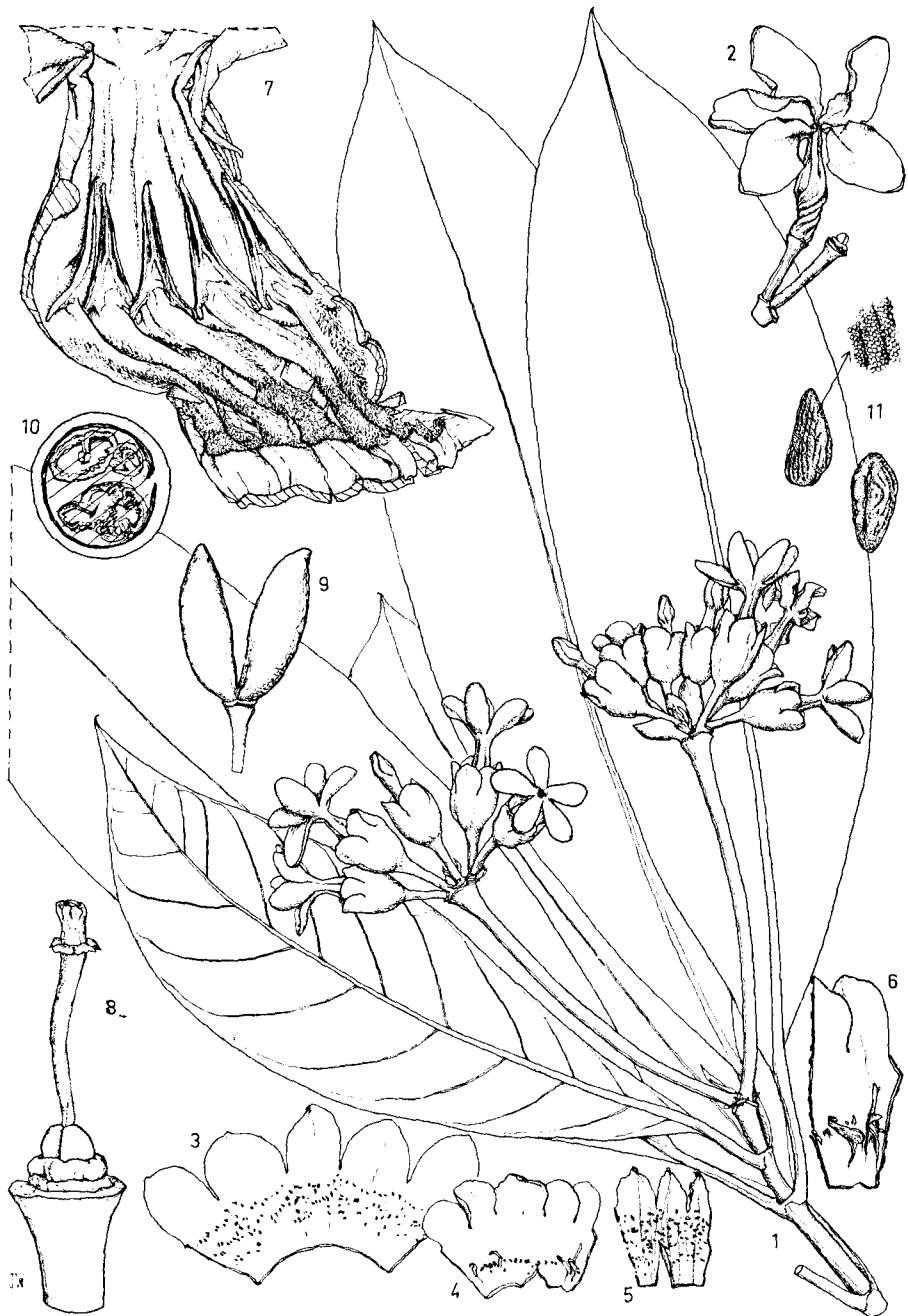


FIG. 5. *Voacanga pachyceras*. 1, flowering branch ($\times \frac{2}{3}$); 2, flower without calyx ($\times \frac{2}{3}$); 3-5, calyces inside ($\times 1$); 6, part of calyx inside ($\times 2$); 7, opened corolla ($\times 3$); 8, pistil ($\times 3$); 9, fruit ($\times \frac{2}{3}$); 10, transverse section of mericarp ($\times 2$); 11, seeds ($\times 2$) with more enlarged detail of testa. 1, 4 and 6 from Maudoux 325; 2-3, 8-11 from Léonard 1449; 5 from Evrard 5200.

circiter aequantes. Calyx tubo campanulato. Corolla alba tubo gracili lobis obovatis vel ellipticis. Stamina inclusa. Ovarium carpellis duabus inter se liberis compositum disco annulari circumdatum. Fructus folliculis duabus parallelibus erectis cornis crassis simillimis compositus.

Type: Zaïre: VI: Yandja Lake, near Isangi, J. Léonard 1449 (BR, holotype).

Shrub or small tree 1–5 m high. Trunk 2–3 cm in diam. (or more?). Branches lenticellate; branchlets glabrous or minutely pubescent at the apex. *Leaves* petioolate; petiole glabrous or with a few hairs, 4–20 mm long (ocrea slightly widened into intrapetiolar stipules); blade chartaceous to membranaceous when dry, narrowly elliptic, 3–4 x as long as wide, 3.5–24 x 1–6.5 cm, acuminate at the apex, glabrous above, pubescent or glabrous beneath; with 5–14 secondary veins on either side; tertiary venation inconspicuous. *Inflorescences* mostly long-pedunculate, erect, 7–12 x 3–7 cm, few-flowered. Peduncle fairly stout, 3–8 cm long, glabrous; pedicels glabrous, 7–18 mm long. Bracts deciduous, ovate, concave, acuminate, about as long as the calyx, glabrous outside. *Flowers*: *Calyx* pale green, campanulate or nearly so, 15–22 mm long (when lobes erect), shed with the corolla, outside glabrous or minutely papillose, inside with a (1)5–7 mm wide belt of small scattered colleters 2–3 mm above the base, not touching each other and never reaching the lobes; tube campanulate or nearly so, 7–13.5 mm long; lobes 0.4–0.9 x as long as the tube, broadly ovate to oblong even in a single flower, 0.7–1.4 x as long as wide, 6–8.5 x 6–11 mm, rounded or acute, erect. *Corolla* white, in the mature bud 20–37 mm long incl. the lobes (the lobes 0.35–0.45 of the bud length, forming an almost conical head 2–2.6 x as long as wide, 7–17 x 3–7 mm, with a blunt apex), glabrous outside, inside with a pubescent belt from 3–5 mm above the base to the insertion of the stamens; tube 1–1.25 x as long as the calyx (when the lobes erect), 17–24 mm long, more or less bottle-shaped, almost cylindrical at the basal third, then gradually widened towards the middle and from there less gradually narrowed to a narrow cylindrical part below the throat, at the base 3–4 mm, at the middle 5.5–8 mm, and at the throat 2–3 mm wide, twisted from the base to the middle; lobes twisted, obovate to elliptic, 0.5–1.1 x as long as the tube, 1.25–2(3) x as long as wide, 10–22 x 4–15 mm, rounded at the apex, spreading. *Stamens* included, apex of anther 4–6 mm below the corolla mouth, inserted 10–12 mm below the mouth; anthers 7–9 x 2–3 mm, at the apex for 1 mm sterile, glabrous, mostly twisted at the base with the corolla. *Pistil* 11–14.5 mm long; ovary of 2 carpels, 1.5–2 x 1.5–2 x 1 mm; disk annular, slightly sinuate, 0.5–0.6 mm high; style not split at the base, very narrowly obconical, 7.5–11.5 mm long, bumpy, twisted, at the base 0.5 mm thick, at the apex slightly narrower than the pistil head; pistil head 1.5–2 x 1.3–1.5 mm, with an undulate or shortly lobed ring, 2.2–3.2 mm in diameter. Ovules 70–100 in each carpel. *Fruit* of 2 separate mostly erect mericarps usually both developing; mericarps whitish, narrowly ellipsoid, 45 x 15 x 15 mm or perhaps smaller, acuminate at both ends, with an obscure line of dehiscence, several-to many-seeded. *Seed* dark brown, 9 x 3 x 3 mm, with a minute honeycomb-like structure.

Distribution: Only known from 12 collections made in Zaïre.

Ecology: Riverine or swamp forests. Alt. 0–500 m.

Vernacular names

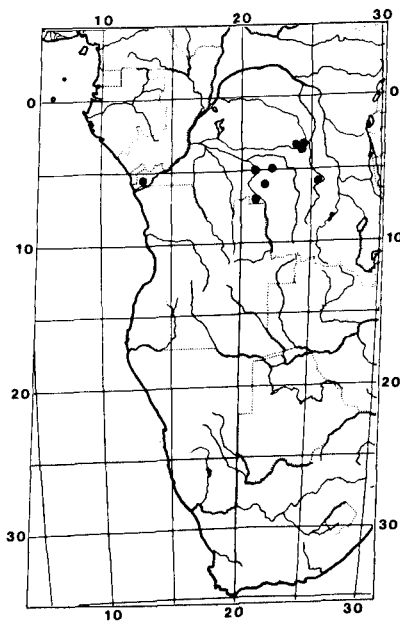
Zaïre: VI: Bokoleboliamba (Mongo; Ebanga Lo Kikereke (Turumbu, also used for *V. afr.*), Yeola i Bokaki (Turumbu).

Paratypes

Zaïre: II: Luki (fl. Sept.) Maudoux 325 (BR); *ibid.* (fl. Sept.) Wagemans 196 (BR, P). V: Lotoflo-den, Lualaba (fl. Oct.) Jensen 96 (C). VI: Mogandjo (fl. Mar.) Laurent 1000 (BR); near Yambuya, Solheid 76 (BR); Yafunga, near Isangi (fr. Sept.) J.Louis 11166 (BR); Yabahondo, Isangi Terr. (fl., fr. Oct.) Germain 8149 (BR, P); Yatolema, Opala Terr. (fr. Nov.) Lisowski 43347 (BR, POZG); Befori Ferry, Maringa R. (fl. Nov.) Evrard 5200 (BR); Bongoie, Boende Terr. (fr. Jan.) Evrard 3261 (BR); Bokote, Hulstaert 999a (BR); Itoko, Bokungu Terr. (bud, fr. Feb.) Evrard 5662 (BR, WAG); Emengeye, Monkoto-Booke path (fl. Nov.) Evrard 2779 (BR).

Etymology: Παχύς thick; κέρας, horn; the fruits resembling thick antelope horns.

V. pachyceras bears some slight resemblance to *V. globosa* and *V. thouarsii* in respect of the dehiscence (shedding) of the calyx. However, it differs from both of them, among other things, by having narrowly ellipsoid instead of subglobose carpels. In addition, in *V. pachyceras* the calyx is much wider than the corolla tube, while in the other two species it clasps the corolla tube.



MAP 4. *Voacanga pachyceras*.

On the other hand, *V. pachyceras* more nearly resembles *V. psilocalyx* through the flowers and to a lesser extent the leaves. The latter, however, has a calyx which persists for some time after the corolla has been shed; moreover, its stamens are barely or not, rather than distinctly, included. Likewise, the corolla tube differs to a greater or lesser extent depending on the insertion of the stamens. Finally, the carpels of *V. pachyceras* are erect or suberect, while those of *V. psilocalyx* are spreading.

6. **Voacanga psilocalyx** Pierre ex Stapf in Fl. Trop. Afr. 4(1): 159. 1902; H. Huber in Fl. W. Trop. Afr. 2nd ed. 2: 67. 1963. **Fig. 6, p. 37; Map 5, p. 39**

Type: Gabon: near Libreville, Klaine 1377 (P, lectotype; isotypes: A, BR, K).

Heterotypic synonyms: *V. zenkeri* Stapf, l.c., partly (as for lectotype; the paratype is *V. bracteata*). Type: Cameroun: Bipindi, Zenker 1807 (K, lectotype; isotypes: BM, E, G, GOET, HBG, L, LE, M, P, S, W, WU, Z). Homotypic synonym: *V. bracteata* var. *zenkeri* (Stapf) H. Huber, l.c. partly (excl. of Talbot 1290, Richards 5225, and Tamajong FHI 22133), syn. nov.

V. obanensis Wernham, Cat. Talbot's Nigerian Pl. 62. 1913. Type: Nigeria: Cross River State (BM, holotype; the K and Z sheets of this number are *V. bracteata*).

Shrub or treelet 0.80–3 m high. Trunk terete, 2–3 cm in diameter; bark pale brown, smooth, with white latex. Branches lenticellate; branchlets glabrous or sometimes minutely pubescent at the apex. *Leaves* petiolate; petiole glabrous or less often minutely pubescent, 2–30 mm long (ocrea slightly widened into intrapetiolar stipules); blade often coriaceous when fresh, membranaceous to papery when dry, elliptic, narrowly elliptic or oblong, variable in shape and size, 2–4.5 x as long as wide, 6–32 x 2–11 cm, acuminate to caudate at the apex, glabrous on both surfaces or less often minutely pubescent beneath, with 5–14 secondary veins on either side; tertiary venation inconspicuous. *Inflorescences* mostly long-pedunculate and often drooping, 6–20 x 3–8 cm, few- to fairly many-flowered; fairly lax at the base, higher up congested. Peduncle slender, 3–17 cm long, pale green and glabrous or less often minutely pubescent as branches and pedicels; pedicels 5–20 mm long. Bracts persistent at anthesis, later deciduous, ovate, concave, acute or obtuse, about as long as the sepals, glabrous or puberulous outside, with a few colleters in the axils. *Flowers* sweet-scented. *Calyx* pale green, campanulate or nearly so, 10–19 mm long (when lobes erect), deciduous after the corolla has been shed and before the fruit develops, outside glabrous or minutely pubescent, inside with a 1–5 mm wide belt of scattered small colleters not touching each other from 0–4 mm to 4–8 mm above the base,

FIG. 6. *Voacanga psilocalyx*: 1, flowering branch ($\times \frac{1}{3}$); 2–3, calyces inside ($\times 1$); 4, flower without calyx ($\times 1$); 5–7, corolla lobes ($\times 2$); 8, corolla inside ($\times 3$); 9, pistil ($\times 3$); 10, pistil head ($\times 6$); 11, fruit ($\times \frac{1}{3}$); 12, seed ($\times 2$) with more enlarged detail of testa; 13, section of seed showing embryo ($\times 2$). 1–2, 4–5 and 8–10 from van Meer 1265; 3, 7 from Bouquet 732; 6 from Leeuwenberg 5571; 11–13 from Breteler 5647.



JW

never reaching the lobes; none of the upper colleters close to the base of the edge of the lobes as the upper side of the belt is fairly straight; tube cup-shaped, 5.5–10 mm long; lobes 0.7–1 x as long as the tube, broadly ovate or often some oblong, 0.6–1 x as long as wide even in a single flower, 4–7.5 x 3.5–6 mm, obtuse or rounded, erect or apically slightly spreading. *Corolla* white, creamy, or pale yellow, in the mature bud 13–28 mm long incl. the lobes (the lobes 0.34–0.63 of the bud length, forming an almost conical to ovoid head, 1.3–2.8 x as long as wide, 5–14 x 3–9 mm, with a blunt apex), glabrous outside, inside with a pubescent belt from 4–7 mm above the base to the insertion of the stamens (being the part of the corolla partly incrassate below the insertion of the stamens); tube 1–1.3 x as long as the calyx (when the lobes erect), 11–20 mm long, more or less bottle-shaped, mostly contracted just below the middle and at 1–3 mm below the mouth, at the base 2–4.5 mm, above 3–5.5 mm, at the second constriction 2.5–4 mm, again above 4.5–7 mm, and at mouth 2–2.5 mm wide, twisted from barely below the second constriction to almost near the third (1–4 mm below the mouth); lobes twisted, elliptic, narrowly elliptic, or less often obovate (the latter only observed in large flowers), 0.6–1.8 x as long as the tube, 1.4–4.4 x as long as wide, 7–18 x 2.5–13 mm, obtuse or rounded, spreading and often later recurved. *Stamens* exerted for 0.5–1.5 mm, less often barely included, inserted 2–6 mm below the corolla mouth; anthers 4–7.5 x 1.5–3 mm, at the apex for 0.5–1 mm sterile, glabrous, mostly twisted with the corolla. *Pistil* 9–13 mm long; ovary of two carpels 1–2 x 1.5–2 x 0.7–1 mm; disk annular, slightly sinuate, 0.5–1 mm high; style not or hardly split at the base, narrowly to very narrowly obconical, bumpy, 6.5–10 mm long, twisted and often at the base curled, at the base about 0.5 mm in diameter and at the apex slightly narrower than the pistil head; pistil head 1–2 x 1–1.5 mm, with an undulate entire or lobed ring 1.8–3.2 mm in diameter. Ovules 35–100 in each carpel. Fruit of 2 separate mericarps usually both developing; mericarps yellow or orange(?), ellipsoid, 3–7.5 x 1.5–3 x 1.5–3 cm, recurved, often stipitate, acuminate at the apex or not, with an obscure line of dehiscence. *Seeds* many, dark brown, 8–9 x 4–5 x 3.5–4.5 mm, with a minute honeycomb-like structure.

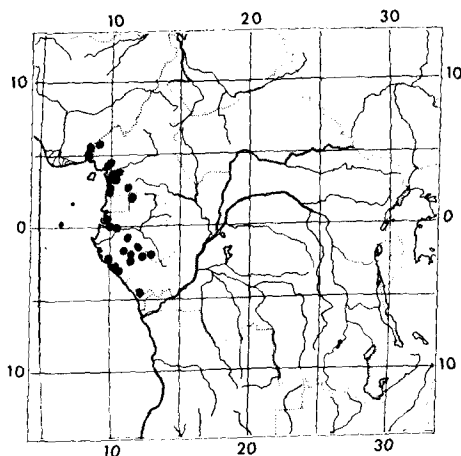
Distribution: Nigeria (Cross River State), Cameroun, Gabon, Congo.

Ecology: Forest understorey or gallery forest. Alt. 0–600 m. Probably flowering almost the whole year.

A selection of the ca. 75 specimens examined:

Nigeria: Cross River State: Ekinta R. For. Res., van Meer 1265 (FHI, WAG), 1380 (FHI, WAG), 1458 (WAG), 1590 (FHI, WAG); Oban, Talbot 290 (BM, K), 302 (BM, K), 2071 party (BM, type of *V. obanensis*); Eket Distr., Talbot s.n. (BM).

Cameroun: Nord-Ouest: Abonando, Rudatis 46 (G, K, W, Z). Littoral: km 24 Douala-Edea Rd. (route Razel), Leeuwenberg 6432 (P, WAG); SE of Tissongo Lake, 35 km SW of Edéa, Letouzey 12653 (YA); 3 km E of km 21 Yabassi-Douala Rd., Leeuwenberg 6407 (WAG). Centre-Sud: Mbango, Zenker June 1918 (F); Grand Batanga, Dinklage 673 (HBG), 929 (HBG), 1352 (HBG), 1406 (HBG); 7 km N of Kribi, Bos 5610 (WAG); 15 km ESE of Ebodje, 45 km S of Kribi, Letouzey 15325 (P); about 70 km SSW of Eséka, about 10 km SW of Nyong R. bridge, W. de Wilde 3840



MAP 5. *Voacanga psilocalyx*.

(BR, MO, P, WAG); 6 km E of km 58 Edéa-Kribi Rd., Leeuwenberg 5678 (B, BR, C, K, LISC, MO, P, PRE, WAG, YA); km 30 Edéa-Kribi Rd., near Nyong R. bridge, Leeuwenberg 5571 (B, BR, C, K, LISC, MO, P, PRE, WAG, Z); Bipindi, Zenker 92 partly (BM, COI, rest is *V. bracteata*), 870 partly (BM, G, LE, P, S, W, Z and the next partly: BR, E, GOET, see also *V. bracteata*), 3033b 1807 (BM, E, G, GOET, HBG, K, L, LE, M, P, S, W, WU, Z, lectotype of *V. zenkeri*), 3033b (B, BM, BR, E, G, GOET, HBG, K, L, M, P, S, W, WAG, WU, Z); 29 km NW of Eséka, Kcle R. bank, W. de Wilde 1480 (WAG); Ebea Falls, Dinklage 230 (HBG); Akonetye, S of Ebolowa, Koufani 60 (P, WAG), 142 (P, WAG).

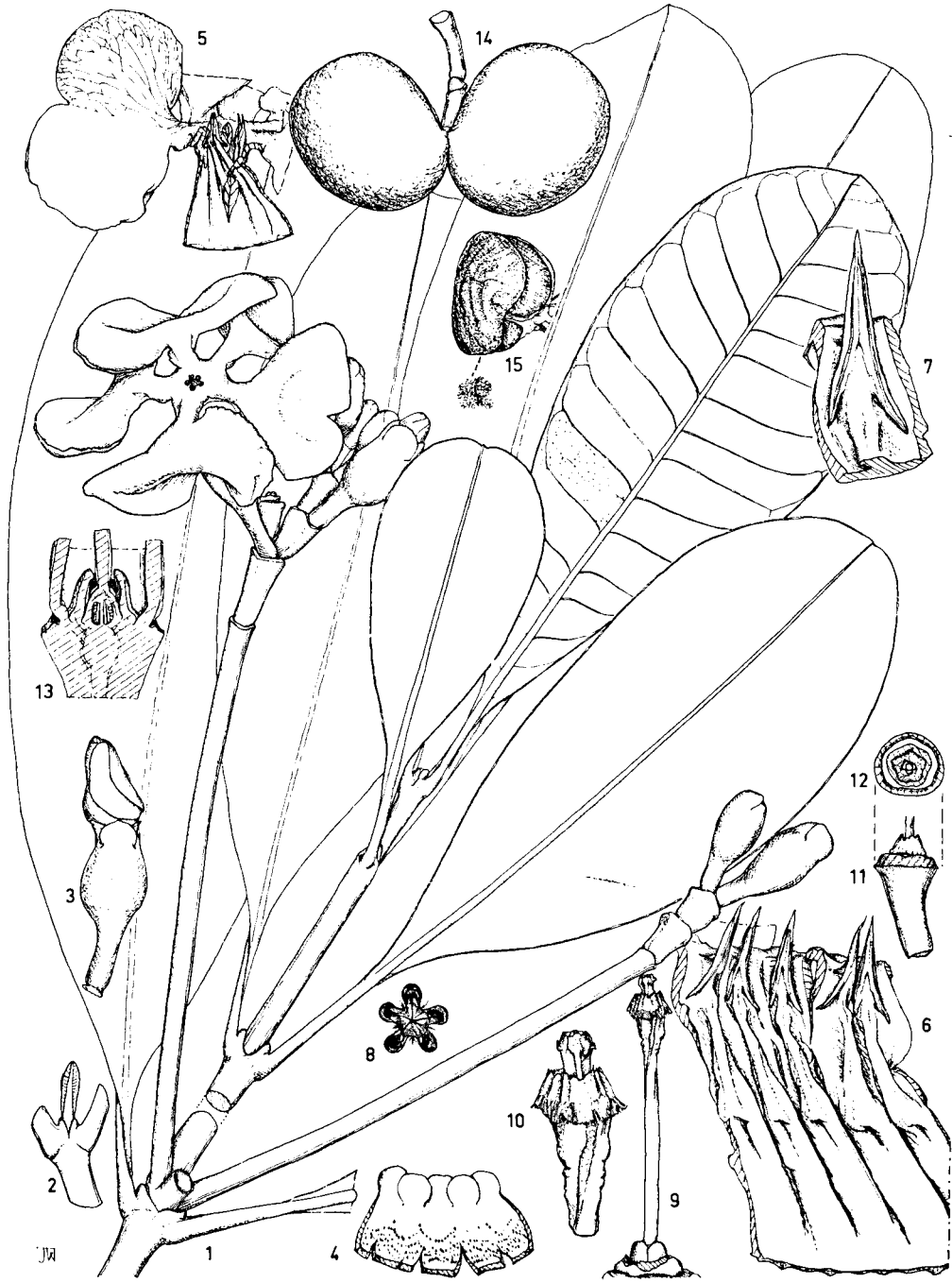
Gabon: Estuaire: near Libreville, Klaine 1377 (A, BR, K, P, type), 2280 (P), 2348 (P); Munda, Sibange Farm, Soyaux 20 (K, Z, paratype); Libreville-Cap Esterias Rd., A.M.Louis 176 (WAG); Cap Esterias, N.Hallé & Villiers 5485 (P), 5501 (P); near Nkogo, Fleury in Chevalier 26349 (P); Mondah For., 18 km N of Mondah, Gilles 444 (P); Nkoulounga, N.Hallé 721 (P, WAG); Bokoué, N.Hallé 785 (P), 797 (P). Woleu-Ntem: Bitam, Le Testu 9016 (BM); Oyem, Le Testu 9522 (BM); Mitzic, Pomeroy 281 (K, P). Maritime: Setté Kama, Dybowski 9 (P). Ngounié: Nzeck, Le Testu 9385 (BM, BR, P, WAG); Benzé Le Testu 5031 (BM); Ngomo Boulongo, Le Testu 6373 (BM); Iméno, Le Testu 6371 (BM, BR, LISC, P). Ogooué-Lolo: Modoumou, Le Testu 5599 (BM, BR, P). Haut-Ogooué: 60 km SSW of Moanda, Breteler 6860 (WAG). Nyanga: Gamba, Breteler & van Raalte 5647 (WAG); Panga, Le Testu 1801 (BM, P).

Congo: Mayombe, Lecomte E 88 (P); Moabi R., Bouquet 732 (P).

Note. *V. psilocalyx* may be confused with *V. bracteata* and *V. pachyceras*, q.v.

7. *Voacanga thouarsii* Roem. & Schult., Syst. 4: 439. 1819; Stapf in Fl. Trop. Afr. 4(1): 154. 1902; Codd in Fl. Southern Afr. 26: 273. 1963; H. Huber in Fl. W. Trop. Afr. 2nd ed. 2: 67. 1963, partly, excl. of Thomas 2929, Chevalier 23201 and Wimbush FHI 39624; Markgraf, Apocynaceae, Fl. Madag. 169: 219, pl. 35 (partly, excl. of leaves and fruit). 1976; Leeuwenberg in Fl. Zamb. 7(2): 437. 1985.

Fig. 7, p. 40; Map 6, p. 43



Type: Madagascar: sin. loc., Herb. Du Petit-Touars s.n. (P, holotype).

Homotypic synonyms: *Orchippeda thouarsii* (Roem. & Schult.) Baron, *Revue Madag.* 10 Mar. 1905 (year 7): 249; *Tabernaemontana thouarsii* (Roem. & Schult.) Palacky, *Cat. Pl. Madag.* 3: 30. 1907.

Heterotypic synonyms: *Voacanga dregei* E.Mey., *Comm. Pl. Afr. Austr.* 189. 1838. Type: South Africa: Natal: between Umtentu and Umzimkulu Rs., Drège anno 1837 (K, lectotype; isotypes: MEL, OXF, S). Homotypic synonyms: *Piptolaena dregei* (E.Mey.) A.DC., *Prodr.* 8: 358. 1844; *Voacanga thouarsii* var. *dregei* (E.Mey.) Pichon, *Bull. Mus. Nat. Hist. Nat. Paris sér.2.* 19: 415. 1947.

Annularia natalensis Hochst., *Flora* 24: 670. 1841. Type: South Africa: Natal: near Umlazi R., Krauss 27 (holotype not seen, destroyed in B; lectotype: BM, other isotypes seen: FI-W, G, K, M, MO, TCD, W). Homotypic synonym (illegitimate): *Cyclostigma natalense* (Hochst.) Hochst. ex Endl., *Gen. Pl. Suppl.* 2: 56. 1842; *Flora* 27: 828. 1844.

Voacanga obtusa K.Schum. in Engler & Prantl. *Nat. Pflanzenf.* 4 (2): 149. 1895; Stapf. *tom. cit.* 153. Type: Zaïre: VII: Niamniam Land, Mbruoale R., Schweinfurth 3741 (holotype not seen, destroyed in B; lectotype: K; other isotypes seen: P, S). Homotypic synonym: *V. thouarsii* var. *obtusata* (K.Schum.) Pichon, *loc. cit.*

Usually small tree, 2–15 (20) m high. Trunk terete, 4–40 (80) cm in diameter; bark pale grey-brown, smooth, with small lenticels, with some white latex. Branches with or without large lenticels; branchlets glabrous or minutely puberulous, with much latex. *Leaves* shortly petiolate; petiole 8–25 mm long, glabrous or minutely puberulous at the base (ocrea widened into intrapetiolar stipules); blade often slightly glaucous with the costa often pale, often thickly coriaceous (also when fresh), narrowly obovate or less often narrowly elliptic, 2–4 x as long as wide, 6–25 x 2–9 cm, obtuse or rounded, glabrous and mostly with numerous minute pits on both surfaces; secondary veins 12–20 on each side, inconspicuous in fresh leaves; tertiary venation inconspicuous. *Inflorescences* long-pedunculate, fairly lax, without peduncle 4–7 x 4–7 cm, few-flowered, monochasial or nearly so. Peduncle 5–14 cm long, stout, glabrous; pedicels 8–15 mm long except for the thickened 2–5 mm long apex, often minutely puberulous above. Bracts deciduous, ovate, rounded at the apex, with a single row of large colleters in the axils; lower up to 10 x 7 mm, others smaller. *Flowers* sweet-scented. *Calyx* pale to dark green, with hyaline margin, fleshy, clasping the corolla tube and shed together with the corolla, from abscission layer 13–25 mm long, 7–13 mm wide, outside minutely papillose except for the glabrous apices

FIG. 7. *Voacanga thouarsii*. 1, flowering branch ($\times \frac{2}{3}$); apex of branchlet ($\times \frac{2}{3}$); 3, flower bud ($\times \frac{2}{3}$); 4, calyx inside ($\times \frac{2}{3}$); 5–6, opened corollas ($\times \frac{2}{3}$); 7, stamen ($\times 4$); 8, corolla mouth showing anther apices ($\times 2$); 9, pistil ($\times 2$); 10, pistil head ($\times 4$); 11, pistil base with high disk ($\times 1$); 12 as 11, but above ($\times 1$); 13, longitudinal section of flower base without calyx ($\times 2$); 14, fruit ($\times \frac{2}{3}$); 15, seed ($\times 2$) with more enlarged detail of testa. All from coll. Leeuwenberg: 1, 5 from 11904; 2 from 11206; 3–4 and 6–13 from 9371; 14–15 from 10726.

of the lobes, inside with several irregular rows of colleters in the lower half of the tube; tube tun-shaped to cylindrical, 2.5–4 x as long as the lobes, 10–16 mm long; lobes usually broadly ovate, 3–10 x 4–10 mm, rounded, erect. *Corolla* pale yellow with the tube often pale green, creamy, or white, carnose, in the mature bud 29–33 mm long incl. the lobes (the lobes 0.4–0.6 of the bud length being 13–19 x 10–13 mm, forming an almost conical head with a blunt apex), glabrous on both sides; tube as long as the calyx or slightly longer, almost cylindrical, 17–23 mm long, twisted, widest around the ovary and there 5–8 mm wide, contracted above, narrowest just below the insertion of the stamens and there 4–6 mm wide, widened and thickened at the insertion of the stamens, inside with 5 small incassations in the mouth (touching the connectives); lobes not twisted, broadly obcordate, 1.1–1.3 x as long as the tube, 1.2–1.5 x as wide as long, 19–30 x 28–43 mm, with basal portion about 3–5 x 3–5 mm, abruptly widened from there, at the apex emarginate, spreading to recurved. *Stamens* exerted for 2–3 mm (seemingly more in dried specimens), inserted 3–4 mm below the mouth of the corolla; anthers 6–7 x 3 mm, at the apex sterile for 0.5–1 mm, glabrous. *Pistil* about as long as the corolla tube, 17–23 mm long; ovary of 2, separate carpels 2–3 x 2–3.5 x 1–1.7 mm; disk annular, lower or higher than the ovary, 2–4.5 mm high, shallowly to deeply 5-lobed; style not split at the base, 12–19 x 1 mm, more or less gradually thickened at the apex; pistil head capitate, 1–1.6 x 1–1.6 mm, with a ring 1.5–2 x 3–4 mm, long fimbriate at the base. Ovules about 80 in each carpel. *Fruit* of two free subglobose mericarps; mericarps slightly longer than wide and about as thick as wide, 4–10 cm diameter, pale and dark green-spotted, also when mature; wall creamy inside and on section, 5–15 mm thick; aril orange. *Seeds* dark brown, obliquely ovoid or ellipsoid, 8–9.5 x 6–6.5 x 4–5 mm, densely papillose and shallowly grooved all over.

Distribution: Tropical Africa inclusive of Madagascar.

Ecology: Moist places, swamps or creek banks in mostly semi-deciduous forest and not too dry savannas. Alt. 0–1600 m.

Vernacular names

Mali: Kompoure (near Kita).

Guinea: Yayé (near Kindia).

Sierra Leone: Boni, Gboni, Ngboni (Mende, see also other *Voacanga* spp.), Elankorotap, Empampoto, Gegbwema (Tunkia).

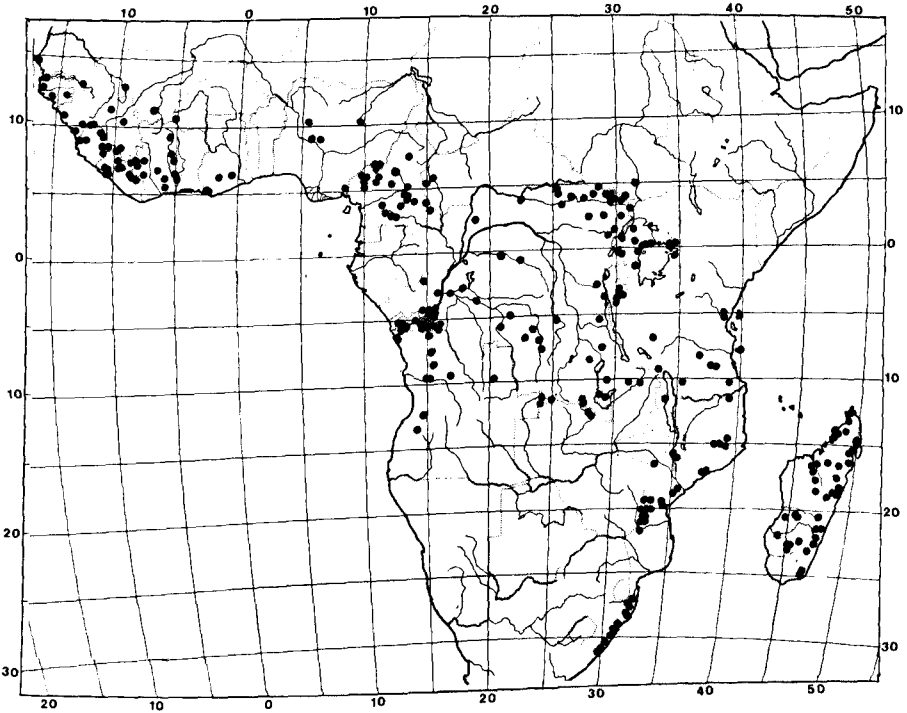
Liberia: Jerahkrehn (near Monrovia).

Ivory Coast: Piegba des marais (near Guiglo).

Cameroun: Pépekpen (Bamoun), Eba etoan osoe (Yaoundé), Papando (Bidjouki).

Sudan: Wangamba (Zande), Kulingyana (Bari).

Zaïre: III: Nkolu nkolu (near Kimvula, also used for *V.chal.*), Munkodia nkodia (Kitongo, see also *V.afr.* and *V.chal.*), Nteki (Kikongo), Nsanguti (Kiumbe). V: Luchia (Baluba, see also *V.afr.*), Kivubavuba (Kiluba), Lujiya



MAP 6. *Voacanga thouarsii*.

(Luwala), Lujia, Ndenga (Tsiluba, Dumba (near Gandajika), Tsitonga (near Kaniama). VI: Mobua tamba (Bebua), Kalenge (Kirega, also used for *V.afr.* and *V.bract.*), Wandja, Mandji (Kirega), Kizengue, Mabingu (Kibangubangu), Lathai (Kilendu), Gemba, Gamba, Gimba (Zandé, Azandé, see also *V.afr.*), Balim bakalo (Azandé), Logo (Keseseva). IX: Esse (Lugware). XI: Kitombo-Kitembwe (near Kisanga), Mabungo (Kitabwa).

Burundi: Umdwedwe (in Ruyigi Prov., als used for *V.afr.*), Umurungabare, Umwamunganda (Kirundi).

Angola: Muhanda (near Sombo, Lunda).

Uganda: Entoma (Langankok), Mabere ga Nkimi (Uganda), Chutengo (near Musozi).

Kenya: Adhiang, Okok, Odok (Luo; Adhiang also used for *Tabernaemontana ventricosa*; Odok means waxe-green).

Tanzania: T1: Kolimbi, Mtergo (Haya, Khaya). T6: Mulowolowo (Kimbanga). T8: Kiringoti (near Ruaha, Braun 1212).

Mozambique: Niassa: Chilengodi (Maconde). Manica e Sofala: Cauca cauca (Cheringoma). Gaza & Inhambane: Khahlu (Ronga). Maputo: Catchlo (Shizonga), Cachlo-tsoba, Incalhoane, Nkahlo wa tsovo (near Marra-cuene; means Nkahlo of the swamps), Delihulo (near Zitundo).

Malawi: Kakope (N, near Mulanje).
Madagascar: Kaboka, Angkangarano.

A selection of the ca. 570 specimens examined:

Senegal: Rufisque, near Dakar (fr. Mar.) Adam 853 (MO, P); Badi, Berhaut 872 (P); Boukitimgo, Lower Casamance (fl. Feb.) Berhaut 7011 (BR, P).

Gambia: sin. loc., Hayes 531 (K); Leprieur anno 1830 (P).

Mali: Sikasso, Finkolo F.R. (imm.fr. Dec.) Ake Assi 14570 (UCJ); between Niaradougou and Fousébougou (fl. Sept.) Diarra 265 (P); between Bougouni and Sikasso (fl. Dec.) Roberty 13313 (G); Sirakoro Ck., Kita (fr. May) R. Dubois 189 (HBG, P).

Guinea Bissau: Bissau, Bissalanca, Espirito Santo 1669 (LISC, WAG); Gabú (fl. June) Espirito Santo 2521 (K, LISC, LISJC, MO, P, WAG).

Guinea Conakry: Kindia (fl., fr. Mar.) Chevalier 13213 (P); Kaba R. (bud May) Chevalier 13118 (P); Sinéya (fl., fr. June) Pobéguin 804 (P); Kaloum (fl. May) Maclaud 4 (P); Laya (bud., imm.fr. Jan.) Scott Elliot 4481 (K); Kankan (fl. June) Lisowski 60079 (BR); E of Macenta (fl. May) Lisowski 60078 (POZG).

Sierra Leone: Roken, Rokupr-Mange Rd. (imm.fr. July) Jordan 59 (K); Gberia Timbako (fl. Nov.) D. Small 459 (K, P); near Masadugu (imm.fr. Aug.) Jaeger 893 (K); Gbinti (fl., imm.fr. July) Deighton 1970 (K); Sefadu (fl., imm.fr. July) Deighton 3744 (K); Yamadu (fl. May) Lane Poole 93 (K); Kenema (fl. May) D. Small 44 (K, P).

Liberia: km 11 Voinjama-Kolahun Rd. (fl., imm.fr. July) J.W.A. Jansen 1978 (WAG); W of Zorzor (fl., imm.fr. July) Bos 2251 (BR, K, WAG); Foquelle, Gbarnga (fl. Aug.) Daniel 446 (BR, COI, MO, P); E of Palala (fl. May) Blickenstaff 61 (BR, COI, GH, MICH, MO, NY, P, UPS); km 16 Ganta-Nbargna Rd., J.W.A. Jansen 1437 (WAG); Ganta (fl.) Harley May 1932 (K); Yepepa (fl. May) Adam 27617 (FHI, K, MO, UPS); Gola Nat. For. (fl. Dec.) Bunting 57 (BM); Dukwia R., Cooper 172 (A, GH, K, MICH, NY, US), 431 (A, BM, F, FHO, GH, K, NY, US); Duport, 11 km E of Monrovia (fl. May) Bos 1997 (WAG); near Tobli (fl. Jan.) Bos 2761 (K, WAG); km 36 Kanweake-Zwedru Rd. (fl. Feb.) van Meer 496 (MO, WAG).

Ivory Coast: km 30 Korhogo-Dikodougou Rd. (fl. July) Versteegh & Den Outer 510 (U, WAG); Between Buandougou and Marabadiassa (fl. July) Chevalier 21995 (P); Biaouéné (bud. Mar.) Aubréville 1126 (P); Danané (fl., imm. fr.) Ake Assi 3259 (ABI, UCJ); near Guiglo, Aubréville 2029 (P); Man-Biankouma, Yebegouen (fl. Jan.) Bamps 1916 (BR, K, UCJ); km 8 Daloa-Bouaflé Rd. (fl. Dec.) Leeuwenberg 10726 (WAG); km 5 Gagnoa-Sassandra Rd., Bégué 5 May 1949 (P); N of Niambézaría, Sassandra-Lakota Rd. (bud. Apr.) Leeuwenberg 12170 (WAG); Bouaké (fl., imm. fr. June) Leeuwenberg 4271 (B, BR, K, MO, P, UC, WAG); Toumodi (fl. Oct.) Pobéguin 254 (P); Lamto, Prévost 8 Aug. 1968 (ABI); Lamto Res., about 50 km S of Toumodi (fl. June) Bokdam 2749 (BR, LD, MO, PRE, WAG).

Upper Volta: Sindou (fl. Oct.) Geerling & Bokdam 1102 (BR, C, MO, WAG).

Ghana: Western: Axim (fl. Feb., Vigne 2826 (BM, FHO, GC, KUM), Amonsuri R. bridge (fl. Aug.) J.B. Hall 3365 (CGG). Ashanti: 12 km E of Obuasi, 1 km E of Nyankumasu (fl. Feb.) Leeuwenberg 11962 (CG, WAG). Eastern: 2 km E of Osino, along road to Kumasi (fl. Mar.) Leeuwenberg 11205 (GC, WAG); E of Abompe, 4 km N of Osino (fl. Mar.) Leeuwenberg 11206 (GC, WAG); near Anyiam (fl. Jan.) Leeuwenberg 11904 (GC, WAG).

Nigeria: Niger State: km 6 Kontagora-Ibeto Rd. (fl. Jan.) Meikle 1088 (K); Badeggi-Lapai, Ewan Stream (fl., fr. June) Onochie FHI 40211 (FHI, K, WAG); Wuya (fl. Feb.) Clayton 789 in FHI 39553 (FHI). Bauchi State: about 15 km E of Aliya, in the Big Ngeji (imm.fr. Oct.) Latilo FHI 64719 (FHI). Gongola State: Njawai and Mayo Daga (imm.fr. Nov.) Jackson et al. 2113 in FHI 33075 (FHI, K); Nguroje Kakara, Mambila Distr. (fr. Nov.) Latilo 128 in FHI 77417 (FHI); begin path Gembu-Warwar (fl. Feb.) Chapman 2685 (FHI, FHO, WAG). Cross River State: Oban, Talbot 295 (BM).

Cameroun: Nord-Ouest: Nkom-Wum F.R. (fl. June) Daramola FHI 41087 (FHI, K); Bali-Ngamba F.R. (fl. May) Ujor FHI 30337 (FHI, K). Ouest: Fouban (fl. Feb.) Jacques Félix 3048 (BR, LISC, P); km 12 Fouban-Foumbot Rd. (bud. imm.fr.) Leeuwenberg 8893 (WAG); km 4 Kekem-Bafang Rd. (fl. Feb.) Leeuwenberg 9371 (WAG). Nord: 17 km SE of Ngaoundéré (fr.

Dec.) W. de Wilde 4437 (BR, WAG); km 15 Tibati-Banyo Rd. (fl. Feb.) Leeuwenberg 9411 (WAG); Fouban-Banyo Rd. (fl. Feb.) Jacques Félix 3169 (BR, P). Centre-Sud: 3 km N of Npwé (fl. Feb.) Lowe 3085 (K); Yoko (fl. Apr.) Raynal 10945 (P); Etun, near Yaoundé (fl. Jan.) Mildbraed 7973 (HBG); Yaoundé (fl. Jan.) Breteler et al. 2486 (A, BR, K, LISC, M, P, UC, WAG); *ibid.*, Zenker & Staudt 130 (BM, K); between Kondebilong and Meyila, 53 km SE of Mbalmayo (bud May) Asonganyi 96 (P, WAG); Bitye, R., Bates 992 (B, MO, Z). Est: Dengdeng (fl. Apr.) Mildbraed 8890 (K); Bertoua (fl., fr. Nov.) Breteler 692 (A, BR, K, LISC, M, P, WAG, YA); km 10 Abong-Mbang to Lomié Rd. (fl. Aug.) Letouzey 507 (P, YA); Ziege, R., near Djemiong, 50 km SW of Batouri (fl. Apr.) Letouzey 4802 (BR, HBG, K, LISC, NY, P, WAG, YA); Batouri (fl. Apr.) Mildbraed 4875 (HBG); Doupello (fl. Apr.) Hedin 738 (LISC, P).

Central African Republic: Ndongué, 100 km SW of Bouar (imm.fr. June) Haxaire 1641 (P); *ibid.* (fl. Mar.) Roulon Monino 25 (P).

Sudan: Equatoria: Nabagoor R., Jambio Distr. (fr. May) Andrews 1567 (K); Mongalla (bud Feb.) Turner 150 (K); Khor Wanzi, Yei Distr. (fl. May) Andrews 1298 (K).

Congo: near Gamboma (fl. June) Descoings 6887 (P, WAG); between Pounou and Bouanga (fl. June) Descoings 6774 (P); Boko Region (fl. Aug.) de Néré 484 (P); km 23 Brazzaville-Plateau Batékés (fl. May) de Néré 1202 (MO, P, WAG).

Zaire: I: Moanda (fl. Sept.) Wagemans 621 (BR). III: km 15 Boma-Tshela Rd., Nsimundele 201 (BR); Reypens-Sanda Kizulu Rd. (fr. Sept.) Compère 274 (BR); Lukunga, Verschueren 577 (BR); Kisaka, Kolo, Thysville (= Mbanza Ngungu) Terr. (imm.fr. May) Davio 51 (BR, K, NY, WAG, Z); Lac Ngeenke, Maluku (fl. Feb.) Breyné 3202 (BR); Ndjili (bud, imm. fr. Mar.) Breyné 83 (BR); Kisantu (fl.) Vanderyst March 1911 (BR); Dila (fl. Oct.) Compère 703 (BR, K); Kimvula, Pauwels 2167 (BR); Lula-Lumene (fl. Feb.-Mar.) J. Gillet 3040 (BR). IV: Mushie (fl. Dec.) Lebrun 6685 (BR, K); Mongobe (fl., imm.fr. May) Flamigni 6084 (BR); Etiolo, Laurent 13 Oct. 1903 (BR); Sanga (fl. Sept.) De Bers 53 (BR); Bena Longo (bud Dec.) Dechamps 88 (BR, K) V: Kaulu, Dibaya Terr. (bud June) Liben 3179 (BR, MO, WAG); Katumanga (fl. Oct.) Liben 1809 (BR); Gandajika (fl., fr. Sept.) Risopoulos 451 (BR); Kaniama (bud Apr.) Herman 2225 (BR); Baluba (fl.) Sapin Nov. 1907 (BR); Mahila (bud Dec.) Delvaux 691 (BR). VI: Bomboma (fl. Apr.) Léontovitch 69 (BR); Boende (fl. Apr.) Evrard 4013 (BR, C, K); Lower Uele R. (fl. Oct.) Dewulf 153 (BR); Ngelewa-Imbow Rd. (bud Feb.) Evrard 5687 (BR, K); Bambesa, Gilbert DIFOR 280 (BR); Sarambila (fl. Apr.) Michelson 570 (BR); between Vube and Betongwe, J. Louis 4461 (BR, C, WAG); Source Duru, Garamba Nat. Park (fl. Apr.) De Saeger 388 (B, K, L, MO); Ome R. (bud June) Devillé 455 (BR). VII: km 15 Dula-Bagaembo Rd. (fl. July) Evrard 2425 (BR, L, MO); Tukpwo (fl. June) Gilbert 110 (BR); Dakwa, Ango (fr. Dec.) Germain 4465 (BR); Niamniam Land, Mbruole R. (fl. Apr.) Schweinfurth 3741 (K, P, S, type of *V. obtusa*); Gombari (fl. Feb.) Gilbert DIFOR 2151 (BR); Faradje (fl. July) Lebrun 3599 (BR, WAG); Yei (Sudan)-Aba Rd., Upper Uele R. (fl. Mar.) Hoyle 784 (BM, FHO). VIII: Irumu (fl. Mar.) Bequaert 2852 (BR). IX: Rutshuru (fl. Apr.) Ghesquière 4251 (A, BR, K, P); Kibondo, Mwenga Terr (bud June) A. Léonard 4757 (BR, MO, WAG); Bigna, Mont-Hawa (bud, imm.fr. Dec.) Smeyers 152 (BR, K). XI: Kalumengongo R., Upembe Nat. Park (fl. Nov.) J. de Wilde 762 (BR, K); Keyberg (= Kisanga) (fl. Mar.) Quarré 4846 (B, BR, MO, NY, P, US); Muhila, Musofwa R. (fl. Nov.) Lisowski 60084 (BR).

Burundi: km 4 Canguzo-Gitwenge Rd. (fl. Feb.) Reekmans 7589 (AAU, BR, K, WAG); Gisuru (= Kisoru) (fr. Dec.) Michel & Reed 818 bis (BR); Kiharo, Mosso (fl. Sept.) Reekmans 2701 (BR, MO); Kiofi, Michel & Reed 1357 (BR).

Angola: Congo: Sumba Peco (fl. Nov.) Gossweiler 8953 (BM, K, LISJC, US). Cuanza Norte: between Salazar and Lucala (imm.fr. Aug.) Manuel da Silva 2145 (LISC); Camabatela, Teixeira et al. 12058 (LISC). Ambaca: between Ngombe and Puri-Cacarambola (fl. Oct.) Weltsch 5977 (BM, COI, G, K, LISU). Malanje: Quela (fl., fr. Jan.) von Nolde 70 (BM); Lunda: Sombo, Tchiombe R. (bud Aug.) Mendes dos Santos 1538 (LISC); Uige Distr., between Zadi and Béu Rs., Raimundo et al. 476 (LISC); Saurino (= Vila Henrique de Carvalho), Young 1208 (BM); *ibid.*, Exell & Mendonça 591 (BM, COI, LISJC). Benguela: km 38 V. Norton de Matos and Chila Rd. (fl. Oct.) Raimundo & Matos 1439 (BM, BR, LISC, SRGH); Hanha (fl. Mar.) Gossweiler 4276 (BM, COI).

Uganda: U1: Maracha (fl. Feb.) Eggeling 1517 (FHO). U2: Hoima, Bunyoro (fl. Feb.) Bagshawe 1507 (BM); N of Kasyoha-Kitomi, Buhweju County (bud July) Synnott 374 (EA); Bungamgan,

Ankole Distr. (fl. July) Purselglove 846 (K); Toro, E. Brown 456 (K). U4: Musozi (fl. Jan.) Bagshawe 82 (BM), 131 (BM, K); Lake Kanyanja E bank, Masaka, Bukot County, Katende 1193 (EA); Mawokota Distr. (fl. Mar.) E. Brown 182 (K); Entebbe (fl., fr. Jan.) Egelling 151(363) (K); Kirerema (fl., fr. Aug.) Dümmer 90 (BM); Buvuma Island, Lake Victoria (fl. Sept.) Styles 243 (FHO).

Kenya: K5: Siaya, Odero 15 (K); Kakamega-Broderick Falls Rd. (fl., fr. Nov.) Faden & Evans 69/2061 (BR, K); Gem Yala-C. Nyanza (fl. Apr.) Kokwaro 132 (EA); Soso Kalanyo, Yala (fr. Sept.) Kokwaro 3155 (EA); S. Nyanza, 5 km S of Rondo (fr. Dec.) Vuyk 336 (WAG).

Tanzania: T1: Nyakoto (fl. Apr.) Gillman 257 (BR, EA, K); Maruku (fl. Feb.) Haarer 2501 (K). T3: Monga, Lushoto (fl.) Zimmermann 15 Feb. 1917 (BM, EA, FHO, K); Amani (fl. Mar.) Peter 58251 (B, WAG); between Sangerawe and Kwamkoro (fl. Mar.) Peter 58283 (B, WAG). T4: between Kibondo and Mabamba (fl. Nov.) Procter 592 (K). Pemba: Vaughan 2202 (FHO). T6: Kilosa (fl.) Lindblom July 1920 (S); Kikwawila, near Ifakara (fl. June) Haerdi 83 (K, Z); Mafia Island, Ngombeni SW (fl. Aug.) Schlieben 2655 (BM, BR, G, HBG, K, M, P, S, Z); 10 km S of Naula Camp, Selous Game Res. (fl. Nov.) Vollesen MRC 4136 (C). T7: Kyimbila, Stolz 477 (B, BM, C, G, K, L, MO, P, S SAM, U, UPS, W, Z); Chivanjee Tea Estate, Rungwe Distr. (fl. Feb.) Cribb et al. 10693 (K). T8: Ruaha-Mtua, Braun 1212 (B, EA); Rondo Plateau, Lindi Distr. (fl. Mar.) Schlieben 6147 (B, BR, HBG, K, LISC, MO, PRE, SRGH); 6 km E of Gumbiro, Songea Distr. (fl. Jan.) Milne-Redhead & Taylor 8427 (B, BR, K, LISC).

Zambia: W Prov.: Zambesi R., 6 km N of Kalene Hill mission, Edwards 799 (COI, FHO, K, SRGH); N of Dobeka Bridge, Mwinilunga Distr. (fl. Nov.) Milne-Redhead 3182 (B, BM, BR, K, PRE, S); km 135 Solwezi-Mwinilunga Rd. (bud Sept.) F. White 3289 (BR, FHO, K, WAG); Muliashi, Ndola Distr., Holmes 513 (FHO); Kitwe (fl. Nov.) Fanshawe 10438 (K). N Prov.: Distr. Fort Rosebery (= Mansa), Brenan & Greenway 8069 (BM, BR, FHO, K); 59 km W of Luwingu, R.G. Miller 215 (FHO); near Samfya Mission, Lake Bangweulu (fl. Aug.) E. White 3135 (BM, BR, FHO, K, MO, PRE); Kasama (fl. Feb.) Anton-Smith GHS 201.746 (SRGH); 40 km S of Shiwa Ngandu, Chinsali Distr. (fl. Dec.) Cottrell 12 (SRGH).

Mozambique: Niassa: km 5 Chomba-Negomano Rd. (fl. Apr.) Torre & Paiva 11890 (LISC); Ribáuê Mts. (fl. Feb.) Torre 1142 (COI, LISC); km 17 Mecuburi-Imala Rd. (fl., fr. Dec.) Macedo 2911 (WAG); Nampula (fl. Mar.) Torre 699 (COI, LISC). Zambesia: km 45 Maganja-Mocuba Rd. (fl., fr. Feb.) Torre & Correia 14506 (LISC); Maganja da Costa Region (fl. Apr.) Torre 5202A (LISC); Aringa (fl. Feb.) Le Testu 671 (BM, BR, G, MO, P, US, WAG). Manica e Sofala: near Gama, Beira Distr. (fl. Apr.) Gomes e Sousa 4364 (FHO, K); Serra Macuta, T. Müller & T. Gordon 1820 (LISC, SRGH); 70 km from Beira, Cheringoma Region (fl. Apr.) Torre 4002 (LISC); Pungwe Flats, Brewer SRGH 198.069 (SRGH). Gaza & Inhambane: Inhambane Bay (fr. July) Mogg 32611 (LISC); Chibuto, Alto Changane (fl. July) Torre 6771 (LISC, MO); Ave R. bridge in Inhambane-Jangamo Rd. (fl. Jan.) Gomes e Sousa 3297 (BR, COI, FI, LISC); Chibuto-Chégua (fl. Aug.) Pedro & Pedragão 1623 (LMU); Macia, Pedro & Pedragão 1477 (BR, K, LISJC); Chipenhe (fl. Apr.) J. de Koning 8175 (BR). Maputo: Manhiça (fl. May) Gomes e Sousa 3988 (COI, K, MO); Vila Luisa (= Marracuene) (fl., fr. Dec.) Mendonça 3414 (LISC); Delagoa Bay (= Baía de Maputo), Junod 365 (BR, LE, P, Z); Inhaca Island, 37 km E of Maputo City (fr. Dec.) Mogg 26777 (SRGH); km 15 Zitundo-Bela Vista Rd. (fr. July) Correia & Marques 2911 (K, LISC, LISU, LMU, M, SRGH, WAG); between Zitundo and Ponta do Ouro (fl. Dec.) Gomes e Sousa 3899 (BM, COI, K, LD, MO, PRE, S, SRGH); Nkuwazi F.R., 20 km S of Nkata Bay (fr. Sept.) T. Müller 1612 (SRGH).

Malawi: S Prov.: Shire Highlands, Geo Adamson 141 (K); Mulanje, Townsend 65 (FHO).

Zimbabwe: Melsetter (= Mandidzudzure) Distr., T. Müller & T. Gordon 1851 (K, LISC, SRGH).

South Africa: Cape Prov.: Mkambati, Lusikisiki Distr. (fr. Oct.) Marais 975 (K, PRE). Natal: Kosi Bay (fl., fr. May) Rodin 4704 (F, K, MO, NBG, PRE, S, UC, US); near Maputu, Ingwavuma Distr. (fr. Sept.) Edwards 2603 (K, PRE); Dukuduku, Hlabisa Distr. (fl. Jan.) Strey 5693 (PRE); St. Lucia Estuary (fl., fr. Aug.) Ward 3483 (BM, BR, K, M, MO, PRE, SRGH, W, Z); Ngoya, Mtunzini Distr. (fr. Feb.) Wells & Edwards 33 (K, M, PRE, SRGH); near Umlazi R., Krauss 27 (BM, FI-W, G, K, M, MO, TCD, W, type of *Annularia natalensis*); Umlhali R. mouth (fl. Feb.) J. Thode 4297 (STE); near Pinetown (fl. June) J.M. Wood 3841 (BOL, K, MEL, SAM); Durban, Gueinzus s.n. (K, TCD, W); between Umtentu and Umzimkulu Rs. (fl. Feb.) Drège anno 1837

(K, MEL, OXF, S, type of *V. dregei*).

Transkei: Pondoland, Bachmann 1056 (BO).

Madagascar: sin. loc., Baron 662 (P), 1629 (BM, K, P), 2682 (K), 4662 (K, P); herb. Du Petit-Thouars s.n. (P, type). Est: sin. loc., Chapelier s.n. (P); Humblot 3 (K, P); Antalaha, Andempona For., Roberson 13 June 1950 (P); Antalaha (bud May) SF 5052 (P); Antongil Bay, Richard s.n. (P); Ivoloïna, Dequaire 27636 (P); Andratamarina, Mananara, SF 1319 (P); Rés. Nat. I, Ambodiriana, Tamatave Distr., Rakotoniana SF 3667 (P); S of Tamatave (fl. Feb.) Croat 32433 (MO, WAG); Mananjary (fl. Mar.-Apr.) Geay 7278 (P), 7279 (P); Ifanadiana For. (fl. Dec.) SF 13820 (P); Tanala valleys, Baron 316 (K); near Vondrozo, Boiteau 2096 (P); Upper Mananara R., Farafangana Prov. (fl. Aug.) Decary 4921 (BM, P). Sambirano: Lokobe For., Nosy-Bé Distr. (fl. Sept.) Rakoto 4357 (P); Vavatobe (fl. Feb.) Hildebrandt 3311 (BM, GOET, K, KIEL phot. seen, L, LE, M, P, W); Beravina (fl. July) Hildebrandt 3077 (BM, K, KIEL phot. seen, P, W); Maromandia, Ankaramy (fl. Dec.) Decary 1327 (P). Centre: between Mandritsara and Andilamena, Humbert 18060 (P); Ambohijanahary, Homolle Y 3 (P); W of Analamanatrika, Ambohijanahary Canton (bud Jan.) Cours 2176 = Homolle 2176 (P); Ikopa R. valley, NW of Ankazobe (fl. Mar.) Decary 7569 (K, P); between Moramanga and Ambatondrazaka (fl. Jan.) Capuron SF 106 (P); Ambilona, Moramanga Distr., J.G. Abraham RN 110 (P); Filanjara, Mohabo (fr. Aug.) SF 10607 (P); East Imerina, d'Alleizette 1122 (P); Mandabe, Ranohira Canton (fl. Apr.) SF 19926 (P); Ilakaky R., Hazofotsy R. tributary (fl. Dec.) Humbert 19610 (P); Pic St. Louis, near Fort Dauphin (fl. July) Decary 10004 (P, US); Fort Dauphin, Scott Elliot 2401 (K). Ouest: Sahafazy For., Diégo-Suarez, SF 12746 (P); S of Ambilobé (fl. Aug.) Decary 14792 (P); Marivorahona Mts. (fl. Mar.) Humbert & Capuron 25608 (G, P); Ankarafantsika, km 30 Tsaramandroso-Majunga Rd. (fl. May) Gentry 11449 (P, WAG); Ambongo and Boïna, Perrier de la Bâthie 8843 (P); near Maevatanana (fl., fr. Apr.) Perrier de la Bâthie 544 (P); Andriba (fl. Jan.) Decary 17091 (P); W of Malaimbandy (bud Dec.) Aymonin-Keraudren & Aymonin 25827 (P); Janjina Mt. (fl. Nov.) Morat 3689 (P); Anatalato, Mahabo Distr. (fl. Mar.) SF 9523 (P); Maintirano (fl. Aug.) Decary 8245 (P); Hazoroa-Sakaraha (bud Feb.) SF 4998 (P); W of Isalo R., Ihosy-Tulear Rd. (fl. Nov.) Humbert 11589 (P). Sud: Anosyennes Mts., between Fort Dauphin and Ranamafona (fl. Feb.) Croat 31781 (MO).

8. *Voacanga foetida* (Bl.) Rolfe, Journ. Bot. London 21: 202. 1883.

Fig. 8, p. 48; Map 7, p. 50

Basionym: *Orchipeda foetida* Bl., Bijdr. 1027. 1826; Rumphia 4: 26, t. 179. f. 2, t. 180. 1849; Miquel, Fl. Ind. Bat. 2: 416. 1857.

(*Dicrus foetidus* Reinw. in Blume, Cat. Gew. Buitenz. 47. 1823, nomen).

Type: Indonesia: Java, sin. loc., Blume s.n. (L 898. 112-361, holotype; isotypes: MEL, P, U and perhaps also NY, W).

Shrub or small tree with a wide crown, 3-20 m high, with white latex; trunk 20-40 cm in diameter or less, terete or nearly so; bark smooth, pale grey. Branches pale grey-brown, lenticellate; branchlets glabrous. *Leaves* petiolate; petiole 5-15 mm long, glabrous (ocrea widened into intrapetiolar stipules); blade papery when dry, elliptic, narrowly elliptic or narrowly ovate, 1.9-3.5 x as long as wide, 7-34 x 3-11 cm, acuminate or apiculate at the apex (occasionally rounded), glabrous on both surfaces; secondary veins 7-17 on either side, gradually upcurved and forming an angle of 70-80° with the costa; tertiary venation not very conspicuous, reticulate. *Inflorescence* pedunculate, lax, 12-21 x 5-10 cm, few-flowered, cymose. Peduncle 5-11 cm long, fairly stout, glabrous; pedicels 10-30 mm long, glabrous. Bracts deciduous, oblong, rounded at the apex, about 0.4 x as long as the calyx. *Flowers* slightly malodorous. *Calyx* green, fleshy, campanulate, clasping the corolla tube and shed together with the corolla, from

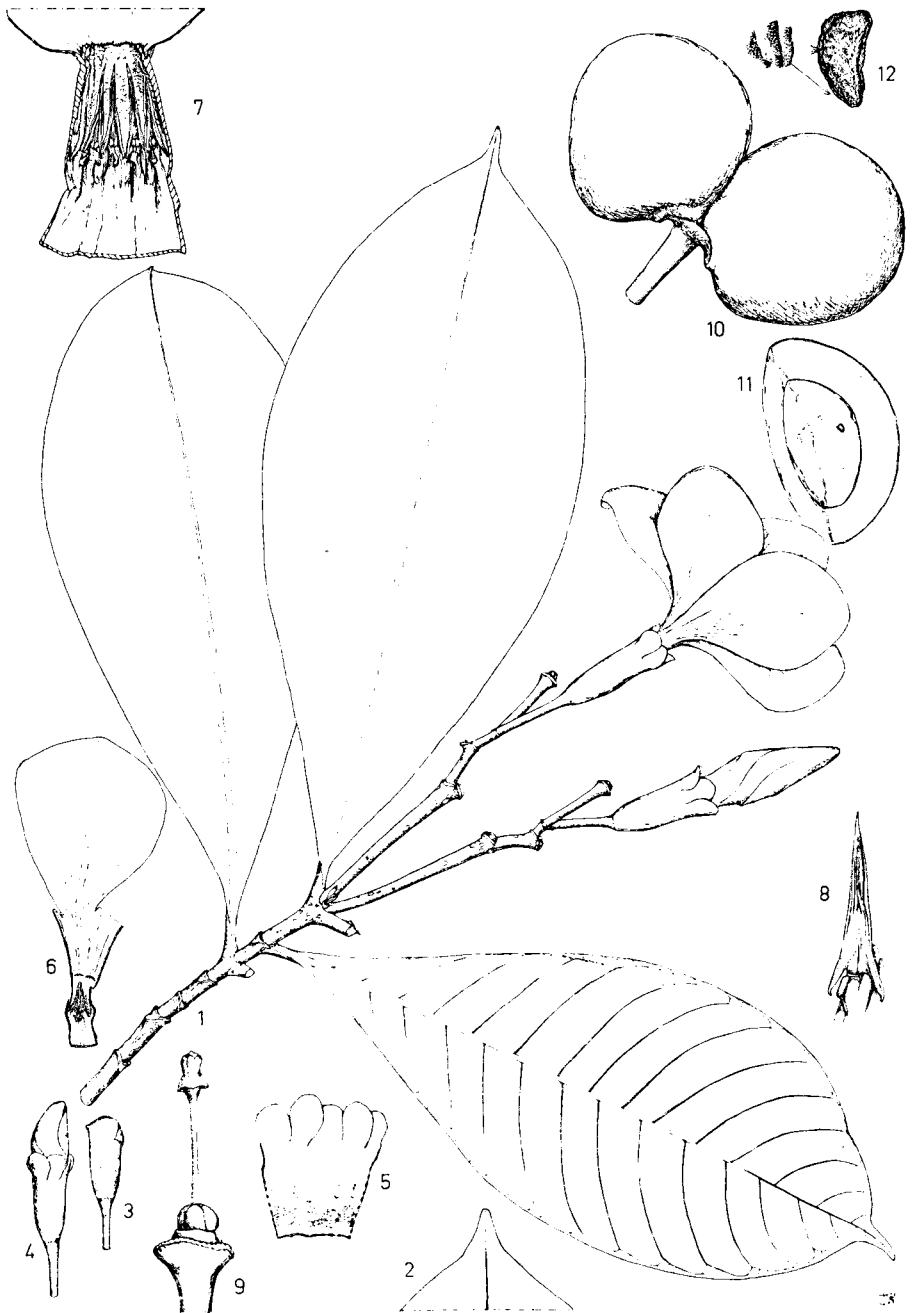


FIG. 8. *Voacanga foetida*. 1, flowering branch ($\times \frac{1}{2}$); 2, leaf apex ($\times \frac{1}{2}$); 3-4 flower buds ($\times \frac{1}{2}$); 5, calyx inside ($\times \frac{1}{2}$); 6, corolla segment inside ($\times \frac{1}{2}$); 7, corolla tube inside ($\times \frac{1}{2}$); 8, stamen ($\times 3$); 9, pistil ($\times 2$); 10, fruit ($\times \frac{1}{2}$); 11, section of mericarp ($\times \frac{1}{2}$); 12, seed ($\times 3$) with more enlarged detail of testa. 1 from Grasshoff 982; 2-8 from van Steenis 2377; 10-12 from spirit coll. Leiden 463/2470.

abscission layer 20–37 mm long, at the mouth 9–16 mm wide, at the base 6–9 mm wide, outside glabrous and minutely dotted, inside with an irregular 2–7 mm wide belt of scattered colleters 1–4 mm above the base; tube 2.9–4.5 x as long as the lobes, 15–28 mm long; lobes unequal, obovate, suborbicular or semi-circular, 0.4–2 x as long as wide, 5–12 x 5–11 mm, rounded, erect. *Corolla* white, creamy or sometimes pale yellow, 65–100 mm long, in the mature bud about twice as long as the calyx incl. the lobes (the lobes about half of the bud length, forming a conical head), glabrous on both sides; tube 0.9–1.2 x as long as the calyx, 28–42 mm long, infundibuliform, not twisted, at the base 5–7 mm wide, contracted just below the insertion of the stamens and there 3–5 mm wide, at the mouth 12–30 mm wide, inside with a faucal annulus 1–2 mm above the anthers and from there gradually widened to the mouth, and also with 5 oblong incrassations below the anthers; lobes slightly twisted, obovate, 1.2–1.8 x as long as the tube, 1.3–1.7 x as long as wide, 37–58 x 22–37 mm, rounded, entire, slightly spreading. *Stamens* deeply included, inserted 7–10 mm from the corolla base; anthers 7–8 x 2–3 mm, at the apex sterile for 0.5–1 mm, glabrous. *Pistil*: ovary of 2 separate carpels being about 2 x 2 x 1 mm; disk annular, about 0.5 mm high, entire; style not split at the base, thickened at the apex; pistil head capitate, about 1.7 x 1.2 mm, with a ring about 0.7 x 2 mm, being fimbriate at the base. *Fruit* of 2 free subglobose mericarps; mericarps slightly longer than wide and about as thick as wide, 6–11 cm in diameter, green with small grey warts; wall 10–15 mm thick; aril orange(?). *Seed* dark brown, 10–12 x 5–7 x 4–6.5 mm, densely papillose and shallowly grooved all over; embryo almost straight, 7.5 mm long; cotyledons orbicular, 4.5 mm long, rounded at the apex, deeply cordate at the base, palmately veined; rootlet 4 x 0.8 mm.

Distribution: Java, Sumatra and S. Kalimantan.

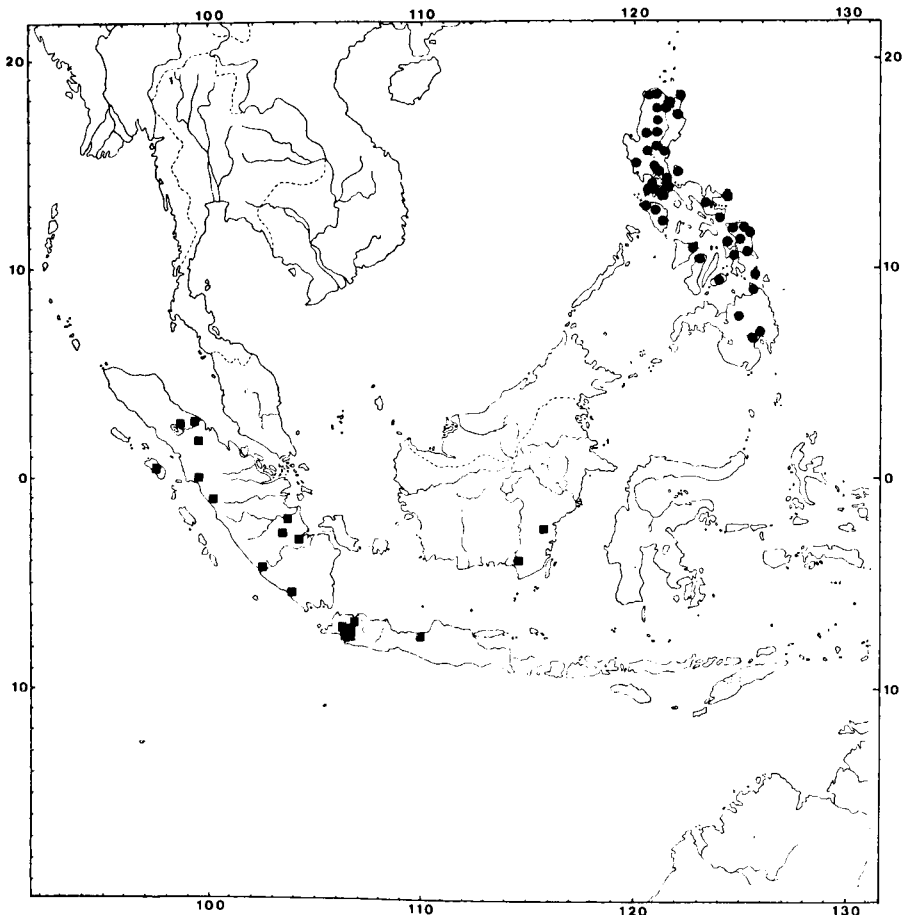
Ecology: Light forest. Alt. 0–600 m.

Vernacular names (new Indonesian spelling of 1972):

Sumatra: Rango-rango, Simbar badak hitam (Rawas); Campeko rimbu (near Djambi); Kayu tappar badak (near Padang). **Java:** Hamperu badak, Peler sampsi, Kiara gato (Sundanese). **Kalimantan:** Arasan landak (near Banjarmasin).

Most of the specimens examined:

Indonesia: Sumatra: sin. loc., Raffles s.n. (G); near Lumban Ria, Asahan (Feb.-Apr.) Rahmat Si Boeea 7535 (MICH, S, SING); near Prapat (fl. Nov.) Yates 2178 (BO, MICH, NY, P, S, UC); Sibolangit (fl. Apr.-June, fr. June) Lörzing 5065 (BO, L, U), 5179 (BO, L); *ibid.* (fl. May) Yates 1586 (BO, MICH, NY, P, UC); Upper Bila Plain (fl. Apr.) Lörzing 9660 (BO); Soliga, Nias (fl.) Batten Pool 1 Sept. 1939 (SING); Lubuk Landur, Ophir Distr. (fl. Apr.) Bünnemeijer 305 (BO); Div. Padang Si Dimpuan, subdiv. Padang Lawas (fl. Sept.) Rahmat Si Toroes 5399 (A, G, L, MICH, NY), 5477 (A, L, MICH, NY, UC, US), 5581 (A, L, MICH); Djambi (fl. Oct.) Posthumus 986 (BO, L, SING); Rawas (fl. Mar.) Grashoff 982 (BO, L); Lematang Ulu (fl. Oct.) Lambach 1234 (BO, L); Kepakiang, Bengkulu (fl. Dec.) de Voogd 1481 (BO, K, L); Ranau Danau (fl. Nov.) van Steenis 3948 (B, BO, L), Java: West: S of Jasinga (bud Sept.) Backer 26025 (BO, L, UC); Cileuksa, Jasinga Rd. (fl. Oct.) Schnepfer (Bosproefst. Ja) 2338 (BO, L); Bantam region, Forbes 221 (BM,



MAP 7. ■ *Voacanga foetida* and ● *V. globosa*.

BO, K); G. Lüang (fl. Oct.) van Steenis 2377 (BO, L); Depok (fl. June-Oct.) Beumée 6738 (BO, L), July 1923 (L, WAG), Backer July 1923 (L, MO, Z), den Berger 5 June 1917 (BO), Bakh.v.d.Brink 5326 (BO, L), Koorders 30936β (BO, L), 44071β (BO), 44148βb (BO); G. Ciapus, Salak (fl. Mar.) Bak.v.d.Brink 848 (BO, L, U); Cibeureum, Cijeruk (fl. Oct.) Boerlage 364 (L); Bogor (fl. Oct.) Hallier 110 (L); *ibid.*, Scheffer 6 Oct. 1870 (BO); Pelabuhanratu (fl. Nov.) Kostermans 23874 (A, AAU, BO, K, L); S of Leuweliang (fl. Aug.) Bakh.v.d.Brink 6844 (BO, L, WU); Ciletuh, Jampang Kulon (fr. July) Wiradinata 1957 (BO); Lengkong, Backer 17185 (BO, K, L); Sanggrawa, Koorders 125 (BO, K, L), 11859b (BO); near G. Prah, Bodja, Junghuhn s.n. (L 898.112-105); *sin. loc.*, Blume s.n. (L, MEL, NY, P, U, W, type). Kalimantan: South: Ambawang Lagoon, Martapura subdiv. (fl. Mar.) Dachlan 2149 (BO, L); Djaro Dam, 10 km NE of Muara Uja (fr. Nov.) de Vogel 704 (L).

9. *Voacanga globosa* (Blanco) Merrill, Philipp. Journ. Sci. 4: 319. 1909.

Fig. 9, p. 53; Map 7, p. 50

Basionym: *Tabernaemontana globosa* Blanco, Fl. Filip. ed. 1: 116. 1837; ed 2: 83. 1845; Miquel, Fl. Ind. Bat. 2: 424. 1857.

Type: Philippines: Luzon, Laguna Prov., Los Baños, comm. Gates & Catalan in Merrill, Pl. Blancoanae 462 (W, neotype (open flower); isoneotypes (buds): BM, BO, F, K, L, MO, NY, P, US).

Heterotypic synonyms: *V. cumingiana* Rolfe, Journ. Linn. Soc. 21: 313. 1884. Type: Philippines: Island of Negros, Cuming 1806 (K, holotype; isotypes: BM, W).

V. dolichocalyx Quisumbing & Merrill, Philip, Journ. Sci. 37: 192. 1928. Types: Philippines: Luzon, Tayabas Prov., Casiguran, Ramos & Edaña BS 45264 (NY, lectotype; isotypes: K, US); Luzon, Ilocos Norte Prov., Bangui, McGregor BS 43584 (HBG, paratype).

V. latifolia Quisumbing & Merrill, tom. cit. 193. Type: Philippines: Luzon, Isabela Prov., San Mariano, Ramos & Edaña BS 47070 (Holotype not seen, destroyed in PNH; lectotype: A; isotypes: NY, UC).

Shrub or small tree, 1–15 m high, with abundant white latex; trunk 1–20 cm in diameter; bark pale grey-brown, fairly smooth, lenticellate. Branches pale grey-brown, lenticellate; branchlets glabrous. *Leaves* petiolate; petiole 5–30 mm long, glabrous (ocrea widened into intrapetiolar stipules); blade subcoriaceous when fresh, papery when dry, narrowly elliptic or narrowly obovate, 2–4 x as long as wide, 4–25 x 1–9 cm, apiculate or acuminate at the apex, cuneate or decurrent into the petiole, glabrous on both surfaces; secondary veins 6–15 on either side; forming an angle of 70–80° with the costa and gradually upcurved; tertiary venation inconspicuous. *Inflorescence* pedunculate, lax, 6–17 x 5–10 cm, few-flowered, cymose, Peduncle 2–5 cm long, glabrous; pedicels 8–30 mm long, glabrous. Bracts deciduous, oblong, about 1 cm long, acute or acuminate. *Flowers* sweet-scented, very variable in size, even in a single inflorescence. *Calyx* green, fleshy, clasping the corolla tube and shed together with the corolla, (2)3.5–7.5 x as long as wide, from abscission layer 8–50 mm long, cylindrical or nearly so, 4–10 mm wide, glabrous outside, inside with 2–6 more or less wavy rows of colleters at the base; tube 5.5–12 x as long as the lobes, 7–45 mm long, usually partly torn at one side by the developing corolla; lobes variable in shape, suborbicular to semicircular, 1–3 x as wide as long, 1–6 x 2–6 mm, rounded, erect. *Corolla* white or creamy, in the mature bud about 30–65 mm long incl. the lobes (the lobes $\frac{1}{4}$ – $\frac{1}{2}$ of the bud length, being 12–25 x 4–11 mm, forming an ovoid head with a blunt apex), glabrous on both sides; tube 1–3 x as long as the calyx, almost cylindrical 24–50 mm long, not twisted, widest around the ovary and there 4–7 mm wide, slightly contracted just below the insertion of the stamens and there 3–5 mm wide, inside with 5 incrassations about 4 x 1.2 x 1 mm just below the stamens; lobes twisted, rhombic or almost elliptic, 0.6–1.4 x as long as the tube, 1.5–2.7 x as long as wide, 16–55 x 8–40 mm, obtuse or acute, spreading. *Stamens* included for 2–10 mm, inserted 9–15 mm below the mouth of the corolla; anthers 4–8 x 1.5–3 mm, at the apex sterile for 0.5–1.2 mm, glabrous. *Pistil*: ovary of 2 separate carpels 2–3 x 2–3 x 1–1.5

mm, rounded; disk annular, about 1 mm high, entire above, with 5 lateral lobes; style about 1 mm in diameter, thickened just below the pistil head; pistil head 1–1.5 x 0.8–1 mm, with a ring 1–2 x 1.5–2.5 mm, being long-fimbriate at the base. *Fruit* of 2 free subglobose mericarps; mericarps slightly longer than wide and about as thick as wide, 4–6 cm in diameter, green, plain, with a granular skin; wall about 3–5 mm thick; aril pale orange. *Seed* dark brown, 9–10 x 4–5 x 3–5 mm, with a minute honeycomb-like structure; embryo slightly curved, 7 mm long; cotyledons orbicular, cordate at the base, rounded at the apex, 3.5 mm long; rootlet 4 x 0.6 mm.

Distribution: Philippines.

Ecology: Forest or bush. Alt. 0–300 m.

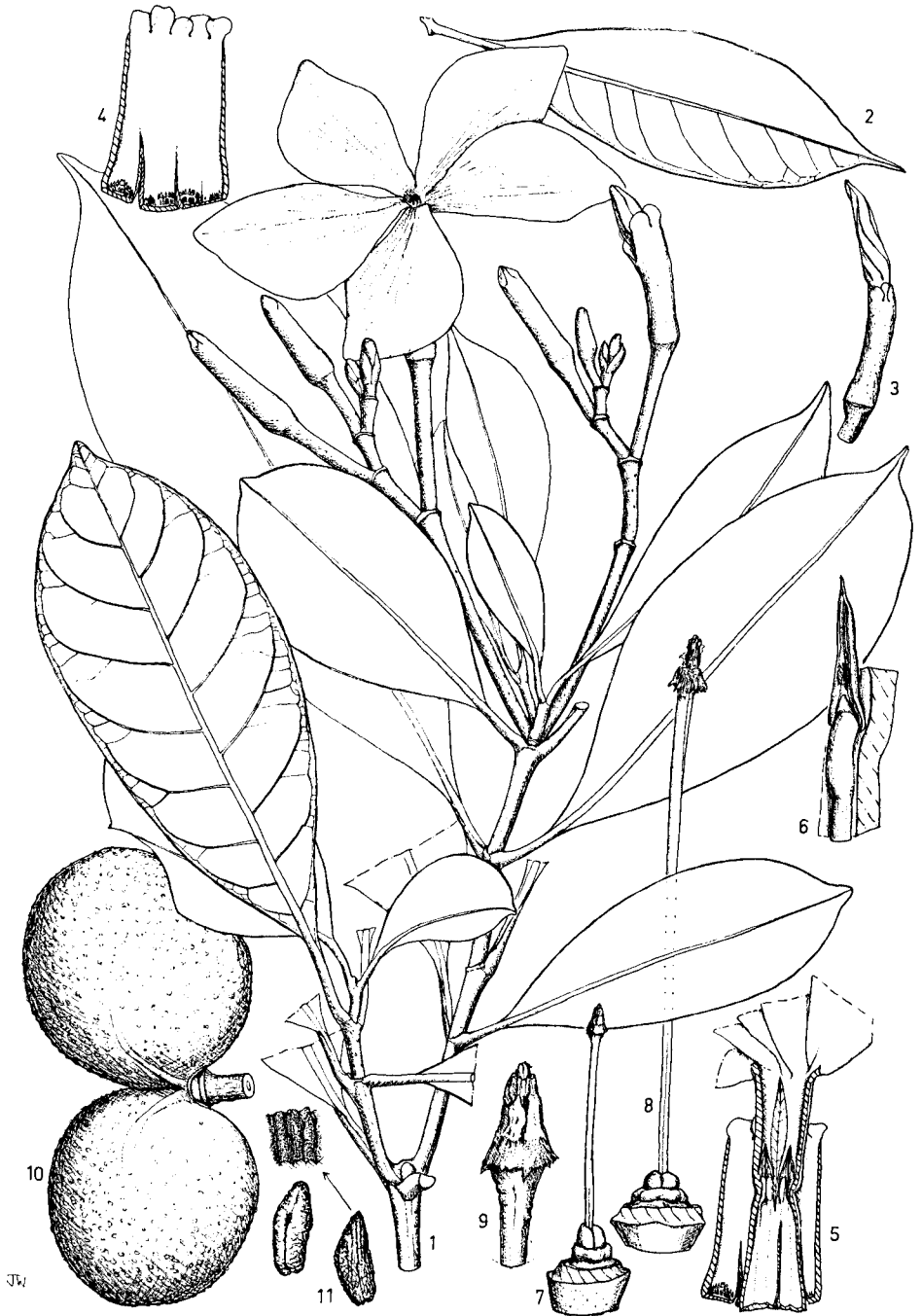
Vernacular names

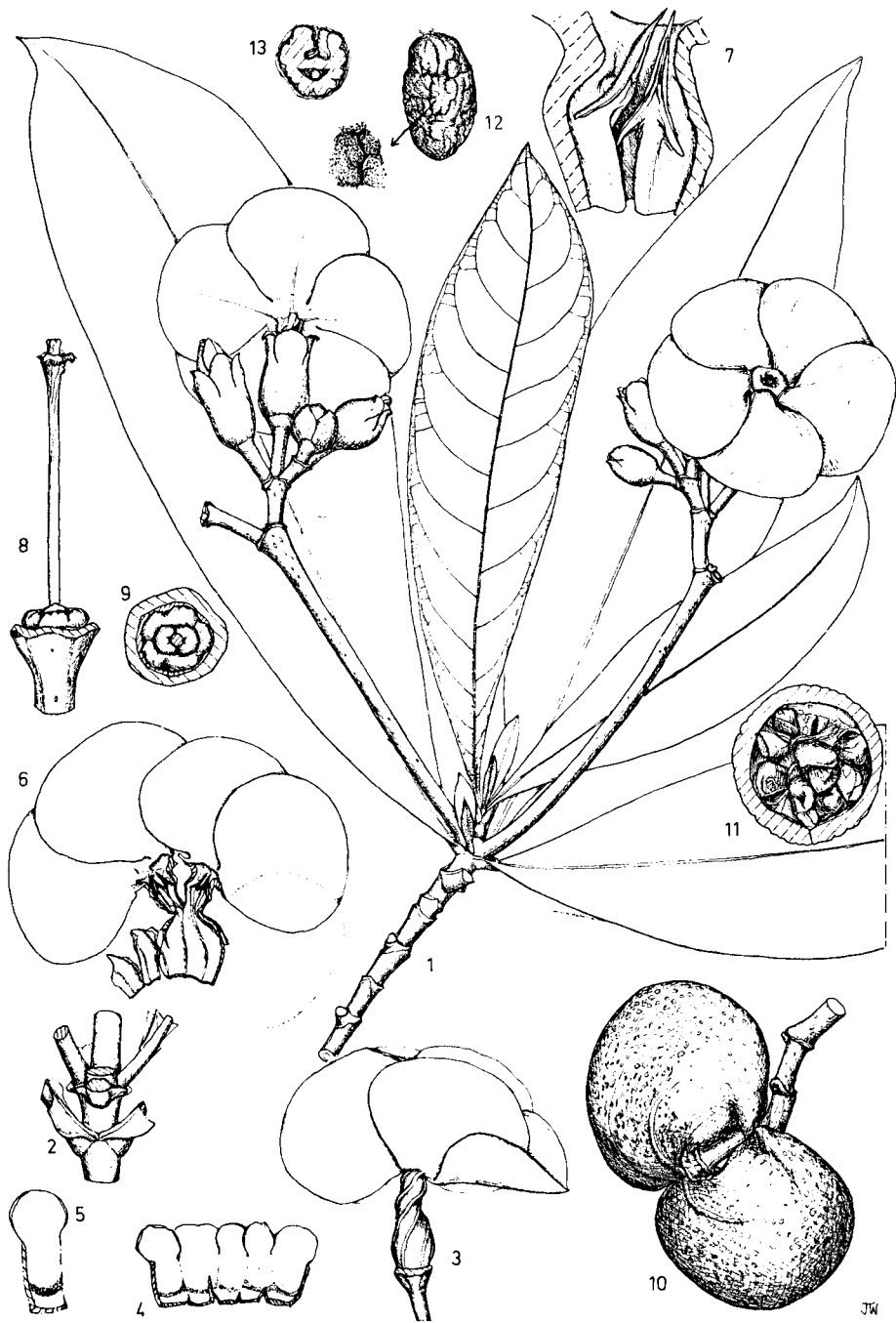
Bayag-Kambing, Bayag usa, Kalibutbut-tagabag, Kalibutbut-ya-tagalbag, Salibutbut.

A selection of the about 115 specimens examined:

Philippines: sin. loc., de Molland s.n. (WAG). Luzon: Cuming 476 (BM, C, K, LE, MEL, TCD, UPS, W); Ilocos Norte Prov., Bangui (fl. Nov.) McGregor BS 43584 (G, HBG, UC, paratype of *V. dolichocalyx*); Bangui to Claveria (fl. Aug.) Ramos BS 33125 (A, K, P); Isabela Prov., San Mariano (fl. Feb.) Ramos & Edaño BS 47070 (A, NY, UC, type of *V. latifolia*); Mt. Prov., Apayao (fl. Nov.) Vanoverbergh BS 17694 (UC), 17709 (UC); Canyan, Vidal 3274 (K); Cagayan Prov. (fl. Mar.) Curran FB 17146 (BO), (fr. Jan.) 17810 (F); Camalingan (imm. fr. Sept.) Aloba BS 29518 (LE, UC, W); Bayninan (bud July) Conklin & Buwaya PNH 80662 (K, L); Benguet Prov., Sablan (fl. Apr.) Elmer 6165 (G, K, NY, P); Nueva Vizcaya Prov. (fl. May) Darling FB 14847 (BM); Rizal Prov., Balacbac (fr.) Loher May 1916 (UC); Montalban (fr. Mar.) Loher 6490 (K), (fl. Oct.) 12637 (BM, P); Zambales Prov., Mt. Pinatubo-Villar (fl. June-July) Fox PNH 4696 (MICH), 4805 (MICH); Quezon Prov., Baler, Mt. Ditumabo (fl. Feb.) Quisumbing PNH 8045 (A); WSW of Baler (fl. Mar.) Jacobs 7961 (A, C, K, L, MO); Tarlac, Odonell, Loher 6495 (K, M); Mauban (fr. Oct.) Madulid DAM 4 (NA); Tayabas Prov., Mt. Banahao (fl. Oct.) Whitford 992 (K, NY, US); Gumaca (fl., fr. Sept.) Whitford 878 (K, P, US); Casiguran (fl. May) Ramos & Edaño BS 45264 (K, NY, UC, US, lectotype of *V. dolichocalyx*); Bulacan Prov., Angat (imm. fr. Dec.) Ramos BS 22305 (F, MO, US); Manila, Montalban (fl., fr. Feb.) Loher 4001 (K); Cavite Prov., Mendez-Nuñez (fl. Aug.) Mangubat BS 1356 (NY, US); km 75 Cavite-Batangas Rd. (fl. Dec.) Mendoza & Steiner PNH 41556 (BM, K, L, SING); Bataan Prov., Limay (fl. Nov.) McGregor BS 14514 (UC); Lamao R., Mt. Mariveles (fr. May) Borden FB 684 (BO, K, NY, US), (fl. Aug.) 1755 (K, NY, SING, US); Laguna Prov., Pagsanhan (fl. May) Merrill 2186 (K, MICH, NY, US); Paete (fl.) Bartolome Apr. 1910 (MICH); Los Baños, Mt. Maquiling (fl. June-July) Elmer 17614 (BM, BO, BP, C, F, FI, G, HBG, K, L, MO, NY, P, S, U, UC, US, Z), 18153 (BM, BO, BP, C, F, FI, G, HBG, K, L, MO, NY, P, S, U, UC, US, W, Z); *ibid.* (bud, fl., fr. May) Gates & Catalan in Merrill Pl. Blancoanae 462 (BM, BO, F, K, L, MO, NY, P, US, W, neotype); Batangas Prov. (fl. Aug.) Ramos 1836 (BM, BO, G, L, MO, P, SING); Camarines Prov., Mt. Iriga (fl. Dec.) Ramos BS 22209 (BM, L, US);

FIG. 9. *Voacanga globosa*. 1, flowering branch (x 3); 2, leaf (x 3); 3, flower bud (x 3); 4, opened calyx (x 1); 5, opened calyx and corolla, latter also torn above stamens (x 1); 6, stamen (x 4); 7–8, pistils (x 2); 9, pistil head (x 6); 10, fruit (x 3); 11, seeds (x 1) with more enlarged detail of testa. 1 from Sulit PNH 21647; 2–7, 9 from Jacobs 7961; 8 from de Mollans s.n.; 10–11 from Sulit PNH 14445.





Ponawa R. (fl. Dec.) Edaña BS 76406 (BO, G, NY, Z); Albay Prov., Mayon Volcano, Mendoza PNH 18440 (L, US); Sorsogon Prov., Irosin, Mt. Bulusan (fr. Oct.) Elmer 14730 (BM, BO, BP, C, F, FI, G, HBG, K, L, MO, NY, P, S, U, UC, US, W, Z). Polillo Island: (fl. May) Salvoza FB 29723 (MEL, UC), (fl., fr. Oct.-Nov.) McGregor BS 10358 (BO, BR, L); *ibid.*, Karlagan (fl. Nov.) Fox PNH 8998 (A). Catundunes: (fl. July-Sept.) Ramos & Edaña BS 75369 (SING, UC). Mindoro: Cuming 1500 (BM, FI-W, K, LE, TCD, W); Paluan (fl. Apr.) Ramos BS 39571 (A, BM, SING, UC); Mt. Halcon, Edaña PNH 3490 (BR); Bongabong R. (bud Apr.-May) Merritt FB 4075 (K); Mt. Yagaw (fl. June) Sulit & Conklin PNH 17629 (K, L). Panay: Capiz Prov., Jamin-dan (bud Apr.-May) Ramos & Edaña BS 31418 (BM, BO). Negros: Cadiz (fl. Feb.-Mar.) Celestino BS 7349 (BO, L); *ibid.*, Cornell (fl. Jan.) Dwight Pierce P 540 (US); *sin. loc.*, Cuming 1806 (BM, K, W, type of *V. cumingiana*). Bohol: Valencia (fl. Oct.) Ramos BS 42834 (UC). Leyte: (fl. Mar. and June) Wenzel 86 (A, BM, F, G, US), 1409 (BM, F, G, MO); Palo (fl. Jan.) Elmer 7103 (BO, BP, FI, G, K, NY). Biliran: Mt. Suiro (fl. May) Sulit PNH 21647 (K, L). Samar: Mt. Cansayao, Catarman (fr. Apr.) Sulit PNH 14445 (A, K, L); Catubig R., (fl. Feb.) Sablaya 54 (A, F, K, MO, P, US); Kadapnan Bo. Bantayan (imm. fr. May) Castro & Anonuevo PNH 5676 (A); Balangiga (fl. May) Madulid PNH 118277 (L); Loquilocon, Wright (fl., imm. fr. Apr.) Sulit PNH 6050 (A); Mt. Coniard (fl. May) Gutierrez PNH 117084 (L). Mindanao: Dinagat Island, Ramos & Convocar BS 83884 (A); Surigao (fl. June) Wenzel 3160 (BO, BR, UC); Bukidnon Prov., Mt. Katanglad (fr. Mar.) Sulit PNH 10014 (L); Davao Prov., Mati, Bitaragan R. (fr. May) Ramos & Edaña BS 49243 (BO, NY, UC); Santa Cruz (fr. June) Williams 2941, partly (K; F and NY sheets excl. leaves being Rubiaceous).

10. *Voacanga grandifolia* (Miq.) Rolfe, Journ. Bot. London 21: 202. 1883; Koorders, Exkursjonsfl. Java 3: 74. 1912 (superfluous comb.).

Fig. 10, p. 54; fig. 11, p. 56; fig. 12, p. 58; Phot. 3, p. 61; Map 8, p. 60

Basionym: *Pootia grandifolia* Miq., Versl. en Meded. Kon. Akad. Wetensch. 6: 193. 1857; Fl. Ind. Bat. 2: 417. 1857.

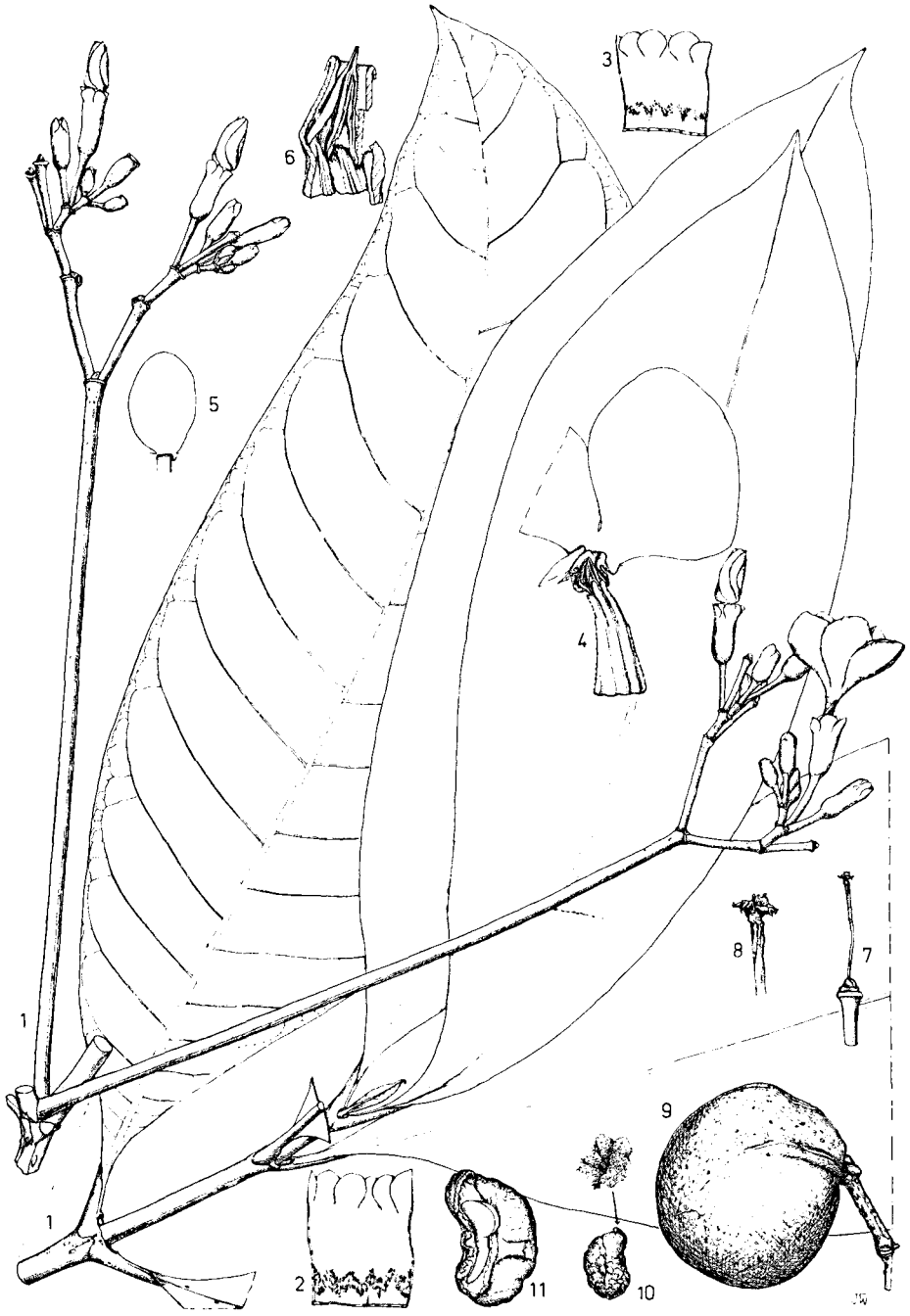
Type: Indonesia: Java, *sin. loc.*, Horsfield s.n. (K, holotype; isotypes: BM, U). Homotypic synonym: *Orchippeda grandifolia* (Miq.) Miq., Ann. Mus. Lugd. Bat. 1: 16, t. 10. 1864.

Heterotypic synonyms: *Pootia exauriculata* Teijsm. & Binnend., Natuurk. Tijdschr. Nederl. Ind. 25: 404. 1863. Type: Indonesia: Halmahera, Djailolo Prov., Teijsmann 5658 (BO, holotype; isotype: U). Homotypic synonyms: *Orchippeda gracipiles* Miq., Ann. Mus. Bot. Lugd. Bat. 1: 316. 1864. *Voacanga gracilipes* (Miq.) Mgf., Notizbl. Bot. Gart. Berlin 12: 548. 1935.

Tabernaemontana celebica Miq., Ann. Mus. Lugd. Bat. 4: 139. 1869, *syn. nov.* Type: Indonesia: Sulawesi, Menado, Riedel HB 5713 (L, holotype; isotype: U).

Orchippeda papuana F.v.Muell., Descr. Notes Papuan Pl. 7: 30. 1886. Type: Papua New Guinea: Fly R., d'Albertis, F. v. Mueller anno 1876 (MEL, holotype). Homotypic synonym: *Voacanga papuana* (F.v.Muell.) K.Schum. in Engler & Prantl, Nat. Pflanzenf. 4.2: 149. 1895; Boerlage, Handl. Fl. Ned. Ind. 2: 396. 1899 (superfluous comb.), *syn. nov.*

FIG. 10. *Voacanga grandifolia*. 1, flowering branch ($\times \frac{3}{2}$); 2, part of branch with leaf bases ($\times \frac{3}{2}$); 3, flower without calyx ($\times \frac{3}{2}$); 4, opened calyx ($\times \frac{3}{2}$); 5, calyx segment inside ($\times 1$); 6, opened corolla ($\times \frac{3}{2}$); 7, part corolla tube inside ($\times 4$); 8, pistil ($\times 2$); 9, ovary with disk above ($\times 2$); 10, fruit ($\times \frac{3}{2}$); 11, dried fruit on section ($\times \frac{3}{2}$); 12, seed ($\times 2$) with more enlarged detail of testa; 13, seed on section with rootlet in cavity for embryo and the deep groove ($\times 2$). 1, 10-13 from Colfs 105; 2-9 from Burck 396.



Voacanga versteegii Mgf., Nova Guinea 14: 287. 1927. Type: Indonesia: Irian Yaya, Merauke, Versteeg 1881 (L. holotype; isotype: BO), syn. nov.

V. grandifolia var. *glabrifolia* Bakh.f. in Backer, Bekn. Fl. Java 7, fam. 172: 22. 1948 (provisional ed., Dutch descr. only); Fl. Java 3: 229. 1965 (English descr. only), syn. nov. (nom.inval.). Type: Indonesia: Java, Rogodjampi District, Rogodjampi-Balak For., Koorders 126 (L. holotype; isotype: BO).

Shrub or small tree 2–15 m high. Trunk 10–20 cm in diameter (or more). Bark pale brown, smooth or slightly rough, with pustular lenticels, shallowly fissured, inner bark pale orange-brown or straw-coloured; sapwood and wood creamy. Branches lenticellate; branchlets glabrous. *Leaves* sessile and even connate-perfoliate to 50 mm long-petiolate; petiole glabrous or pubescent; blade herbaceous when fresh, papery or chartaceous when dry, elliptic, narrowly elliptic, or narrowly obovate, 2–4 x as long as wide, 8–40 x 2–14 cm, acuminate or acute at the apex, glabrous or sometimes sparsely pubescent above, glabrous or pubescent beneath; secondary veins 10–20 on either side; tertiary venation reticulate. *Inflorescence* long-pedunculate, few- to many-flowered, 8–30 x 5–20 cm, dichotomous in first branchings and further more or less monochasial. Peduncle 4–20 cm long, fairly stout, glabrous; pedicels 5–30 mm long, glabrous. Bracts deciduous, about as long as the calyx, ovate, rounded or acute. *Flowers* fragrant (sweet-scented or malodorous). *Calyx* green, nearly cylindrical, fleshy, not clasping the corolla tube and shed together with the corolla, from abscission layer 1–3 x as long as wide and 10–20 x 4–12(15) mm, outside glabrous, inside with a wavy 1–8 mm wide belt of scattered colleters 0–2 mm above the base; tube 1.5–5 x as long as the lobes, 7–14 mm long; lobes obovate, suborbicular or semi-circular, 0.5–1.7 x as long as wide, 2.5–6 x 2.5–8 mm, rounded, erect. *Corolla* white, creamy, or sometimes yellow, in the mature bud 20–45 mm long incl. the lobes (the lobes 0.45–0.6 of the bud length being 10–25 x 4–15 mm, forming an ovoid head with a blunt apex), glabrous on both sides; tube 0.7–2 x as long as the calyx, almost cylindrical to bottle-shaped, 9–24 mm long, twisted or sometimes not, 3–9 mm wide, contracted just below the insertion of the stamens and there 2–5 mm wide, inside with a faucal annulus; lobes slightly twisted, 0.8–2.2 x as long as the tube, elliptic or obovate, 0.8–1.5 x as long as wide, 9–40 x 10–37 mm, rounded, truncate, or emarginate at the apex, spreading to recurved. *Stamens* slightly (2 mm) exerted to barely included, inserted 2–7 mm below the mouth of the corolla; anthers 3–6 x 1.2–2.5 mm, at the apex sterile for 0.5–0.8 mm, glabrous. *Pistil* about as long as the corolla tube; ovary of two separate carpels 1–2 x 1.5–3 x 0.8–2 mm; disk annular, 5-lobed, 0.5–1 x as high

FIG. 11. *Voacanga grandifolia*. 1, flowering branch ($\times \frac{1}{2}$); 2–3, opened calyces ($\times 1$); 4, part of corolla inside ($\times 1$); 5, corolla lobe ($\times \frac{1}{2}$); 6, part of corolla tube inside ($\times 4$); 7, pistil ($\times 1$); 8, pistil head ($\times 3$); 9, fruit (only one mericarp developed); 10, seed ($\times 1$) with more enlarged detail of testa; 11, cleft seed with embryo and hilum ($\times 2$). 1, 9 from van Royen & Sleumer 5792; 2 from Brass 7735; 3–4 and 7–8 from Forbes 480; 5–6 from Womersley & Jones NGF 8806; 10–11 from Floyd NGF 7284.

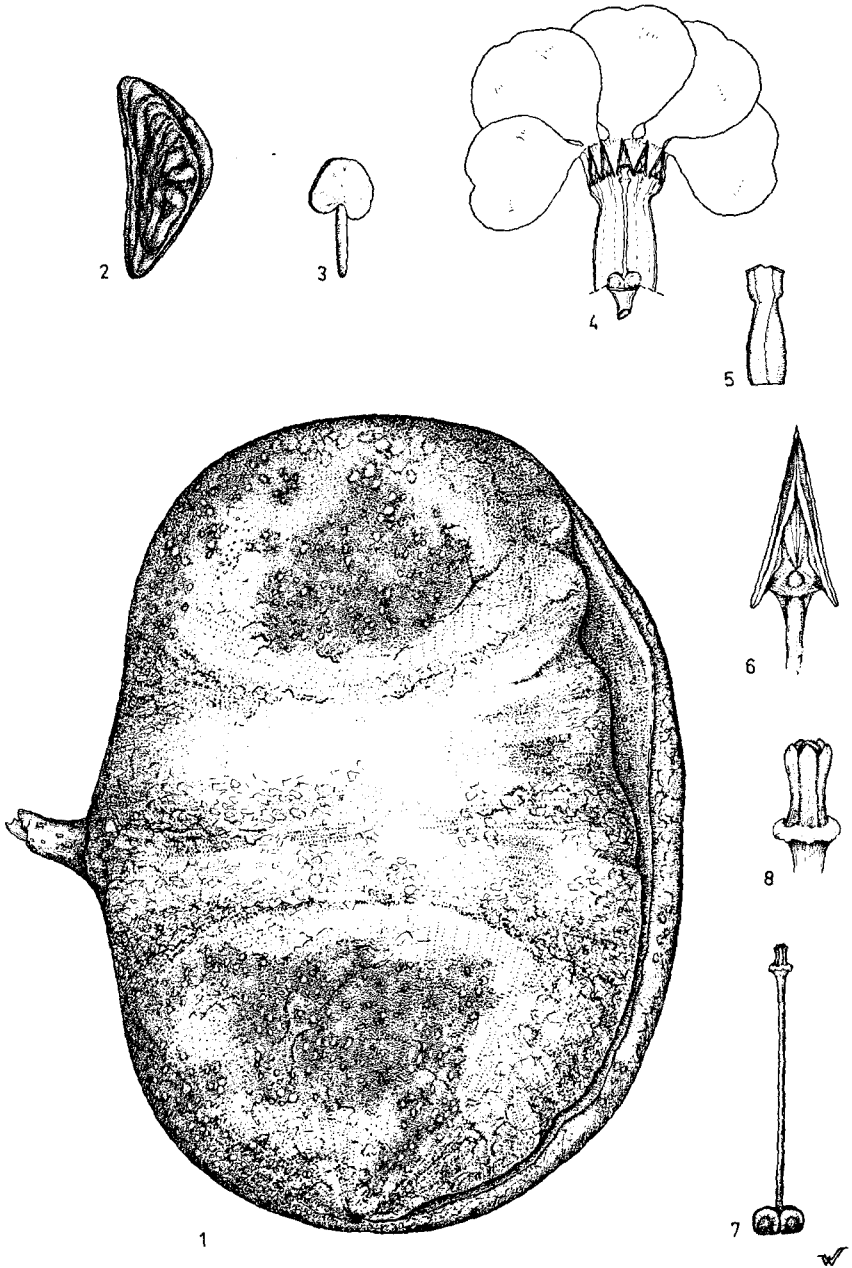


FIG. 12. *Voacanga grandifolia*. 1, fruit ($\times \frac{1}{3}$); 2, seed ($\times 2$); 3, embryo ($\times 2$); 4, opened corolla with pistil ($\times 1$); 5, corolla tube outside ($\times 1$); 6, stamen ($\times 6$); 7, pistil ($\times 3$); 8, pistil head ($\times 12$). 1-3 from van Balgooy et al. 2957; 4-8 from de Vogel 5181.

as the ovary; style not split at the base thickened at the apex; pistil head capitate, 0.6–1.5 x 0.6–1.2 mm, with a ring 0.5–1 x 1.5–2.5 mm, being fimbriate at the base. *Fruit* of two free, partly or completely united carpels (all observed on a single tree, Leeuwenberg 13121, cult. hedge in Bapakan, S of Yogyakarta), separate carpels subglobose, slightly longer than wide and about as thick as wide and 3–6 cm in diameter, fused carpels shaping a laterally compressed transversely elliptic fruit up to 12 x 15 x 10 cm; fruit outside pale yellow or dark green, with many small pale grey-brown warts; wall 5–25 mm thick; aril orange. *Seed* dark brown, 8–13 x 4–7 x 3–6 mm, densely papillose all over; embryo slightly curved, 6–7.5 mm long; cotyledons suborbicular, 2.7–4 x 2.7–4 mm, truncate at the apex, cordate at the base; rootlet 4 x 0.6–0.8 mm.

Distribution: Indonesia (from Central Java and Sulawesi East) and Papua New Guinea.

Ecology: Bush or light forest, often on heavy clay on river and creek banks. Alt. 0–1000 m. Probably flowering and fruiting the whole year.

Vernacular names

Philippines: Abubu (Lan.), Pangi, Tapadak (Maranao).

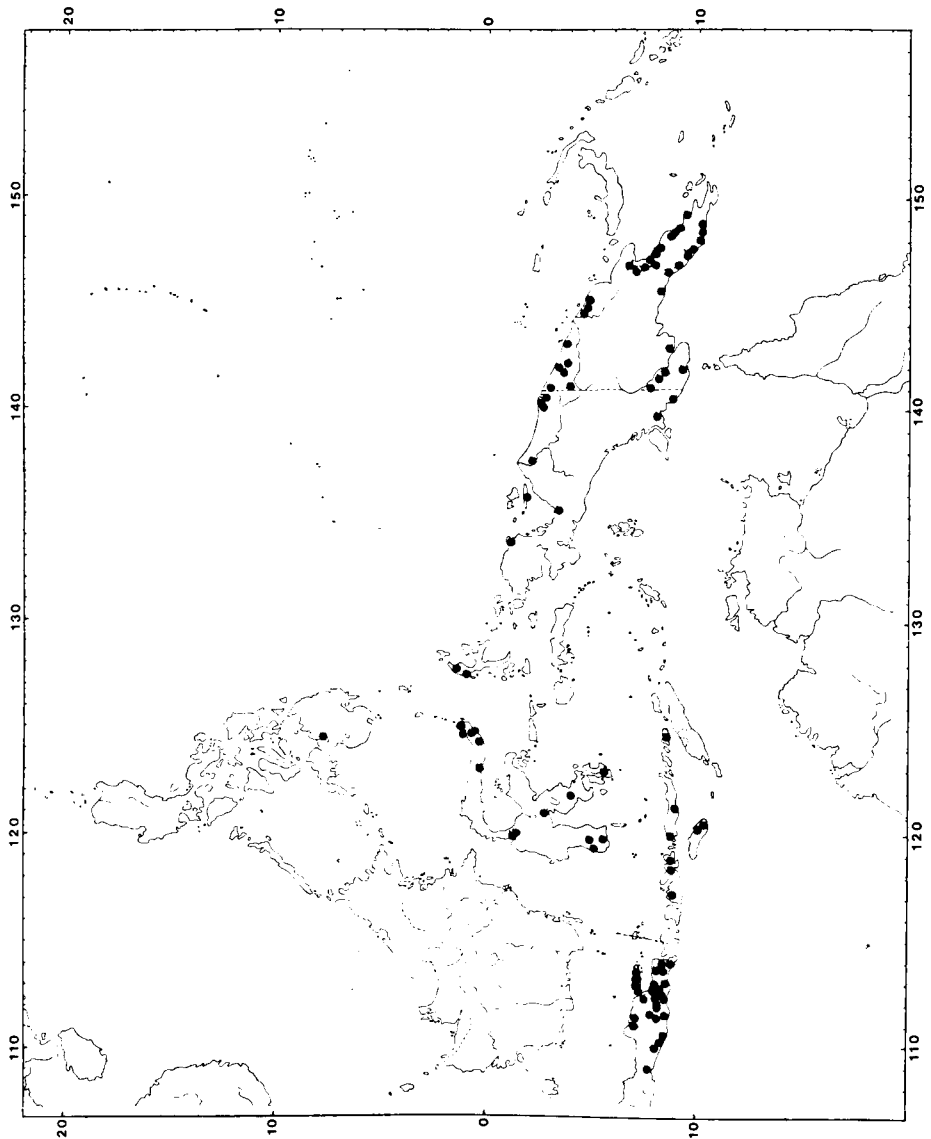
Indonesia: Java: Kalak kambing, Lakambing, Lekambing, Lokambing, Kalantong, Alakantong, Olak-ontong (Javanese), Pong-kapong (Madurese). Sulawesi: North: Mariango, Beta intolun, Mahang-kaliti, Saputan. South: Bunga yinai marawah, Lambuto (Makassarese). Sum b a w a: Piko, Peko odé, Toulawondonjaro. Flores: Menggé.

Papua New Guinea: Bahira, Baheira (Orokaiva, Mumuni), Boma latuata (near Veiya), Fegha (Korafe), Kaffekkaffef (Miniafia), Mampalo (Jal.), Pegatig (Gabensis).

A selection of the ca. 210 specimens examined:

Philippines: Mindanao: Lanao Prov., near Ramain, Zwickey 116 (A, MICH, MO, NY); *ibid.*, Liborio Ela Eballo 1138 (BO, MICH), 1170 (A, MICH). All three slightly aberrant, especially by the 5 longitudinal slits in the dried corolla tubes.

Indonesia: Java: Horsfield s.n. (BM, K, U, type). Central Java: Purwakerta, Koorders 29588 β (BO); Yogyakarta, Backer 2494 (BO), Junghuhn 224 (L); near Brosot, Kulon Progo Distr., Leeuwenberg 13123 (BO, L, WAG, herb.Fak.Kehutanan, Univ.Gadjah Mada, Yogyakarta); S of Yogyakarta, Teijsmann s.n. (BO); Rongkop, den Berger & Beumée 229 (BO); Ngoro Gunung, Rembang, Beumée 5592 (BO); G Lasem, van Steenis 17485 (BO, L). East: Gemarang For., Madiun, Beumée 1456 (BO); G Pandan, Koorders 84 (35) (BO); Kediri, Lörzing 796 (BO, L); Munung For., Kediri, de Voogd Dec. 1926 (BO); G Wilis, Grutterink 3009 (BO); Gadungan Pare, Sukaraja Distr., Koorders 22725 β (BO, L); Tulung Agung, Backer 12036 (BO); Wlingi Kesamben For., Beumée 2328 (BO); G Sahari, near Surabaya, Backer 26567 (BO); Malang, Wisse 286 (BO); Pasuruan, Backer 36044 (BO); Garutan, Tengger Plateau, Mousset 1096 (BO); Rejoso, between Pasuruan and Probolinggo, Backer 36043 (BO, L); Puger, Backer 17851 (BO, L), Koorders 20359 β (BO, L, P), 22615 β (BO, L); G Ringgit, Clason Y 2 (BO); Bondowoso, Backer 9520 (BO); Banyuwangi, near Kaligung, Koorders 28843 β (BO, L); Rogojampi For., Koorders 122 (BO, L), 123 β (BO, L), 124 β (BO, L), 126 (BO, L), Zollinger 2870 (BM, BP, FI-W, G, P, W); Grajagan, Booberg DTH 6612 (L). Madura: near Kamal, Hochreutinger 2817 (G, Z); Sampang, Backer 19574 (BO); Sumenep, Backer 20674 (BO, L); Nipah, Backer 21158 (BO). Sulawesi: North: Batu Angus Mt., Minahasa, de Vogel



MAP 8. *Voacanga grandifolia*.

2473 (L, Z); Mt. Klabat, Forman 235 (BO, K, L, SING); Menado, Riedel HB 5713 (BO, L, U, type of *Tabernaemontana celebica*), Teijsmann 5716 (BO, U), 5339 (BO, U); Lulumbulan For., Koorders 16064 β (BO, L); G Ambang, near Poopo, de Vogel 2629 (L, Z); Gurupahi, Kaudern 58 (AAU, L, NY, S). Central: between Palu and Parigi, Meyer 9375 (BO, L); SE of Lindu Lake, Meyer 9994 (L); Sopa Valley, about 80 km SSE of Palu, de Vogel 5181 (BO, L, WAG), van Balgooy et al. 2957 (BO, L), 3543 (BO, K, L). South: Porema, near Malili, Kjellberg 2692 (BO, S); NE of Makassar (= Ujungpadang), Meyer 10753 (BO), 10930 (BO); Maros, Teijsmann 12823 (BO); G Bontain, Posthumus 2766 (BO). Southeast: Bulu (= Mt.) Watuwila, Kjellberg 1055 (BO, S); Buton Island, Pasarwadjo, Elbert 2810 (K, L). Sumbawa: Sumbawa-Besar, Bloembergen 3084



PHOT. 2. *Tabernaemontana pachysiphon* (Leeuwenberg 11226, phot. LEEUWENBERG).



PHOT. 3. *Voacanga grandifolia* (Leeuwenberg & Rudjiman 13123, phot. LEEUWENBERG).

(BO, K, L); near Labuhansumbawa, Colfs 105 (L), 114 (L); Butu Dulang, Rensch 659 (BO); Dompu Valley, Elbert 3947 (L); 5 km S of Bima, Bloembergen 3158 (BO, L); Kinanta, Bima, Elbert 3578 (L); Sapet, Elbert 3821 (BO, L); Waworada Bay, Elbert 3920 (L). Flores: West-Nggoer, Schmutz 833 (L); West-Look, Schmutz 1897 (BO), 1897a (L); Mt. Ndeki, Kostermans & Wirawan 50 (L); Kekao, Schmutz 569 (L); Endeh, Verheijen 3697 (L). Sumba: Kabaniru, Teijsmann 8807 (BO); Rendi, Grevnstuk 224 (A, BO, L). Alor: Saumassi-Atimelang Rd., Jaag 1474a (L). Halmahera: Djailolo, Teijsmann 5658 (BO, L, U, type of *Pootia exauriculata*); Galalang, Mochtar 127 (K, L, SING), Irian Jaya: Maripi, near Manokwari, Versteegh & Vink BW 8256 (L); Serui, Japen Island, Neth. Ind. Serv. bb 30630 (MICH); Papaya, 20 km inward of Nabire, Kanehira & Hatusima 11844 (BO); Albatros Bivouac, Mamberamo R., Docters van Leeuwen 9648 (BO, L, U), 11311 (BO, K, L, U); between Ebeli and Dojo, near Hollandia (= Jayapura), Kalkman BW 3367 (L); near Sentani Lake, Kalkman BW 3608 (L); N of Jayapura, Meyer Drees 197 in Neth. Ind. For. Serv. bb 25077 partly (BO, L; fruits *Tabernaemontana aurantiaca*); Kemiri, Soehoed Sosridihardjo 6 (BO, K, L); Cycloop Mts., van Royen & Sleumer 5792 (BO, G, K, L, UC); Kiwalan, Anta exp. Wentholt 63 (BO, L); Merauke, Versteeg 1881 (BO, L, type of *V. versteegii*); Mopa airstrip, S of Merauke, van Royen 4818 (BR, FI, L).

Papua New Guinea: Ossima, Sepik Distr., Sayers NGF 13201 (BO, K, L, SING); near Hauser R., J.C.W. NGF 3787 (BO, K, L); Lumi-Nuku Rd., W Sepik Distr., Streimann & Martin LAE 52906 (BO, K, L); about 11 km ESE of Ataipe, L.S. Smith NGF 1247 (L); near Ambunti, Hoogland & Craven 10070 (K, L); Lake Daviumbu, Middle Fly R., Brass 7735 (A, L); Tarara, Brass 8540 (A, BO, L); Fly R., W. MacGregor anno 1891 (MEL); *ibid.*, D'Albertis, F. von Mueller anno 1876 (MEL, type of *V. papuana*); Karlo, F. von Mueller 282 (MEL); Nouea, F. von Mueller 307 (MEL); Mabadian, W Div., Brass 6483 (A, BM, BO, L); Oriomo Sawmill, W Distr., E. Grey & K.J. White NGF 10423 (BO, K, L, SING); Wayembange, E Sepik Distr., Benjamin LAE 67805 (L); Stephan-sort, Nyman 37 (UPS), 240bis (UPS), 248 (UPS); Kelel, Schlechter 16506 (C, G, K, S); Hatzfeldthafen, Madang Prov., (Bauerlein) Hollrung 415 (HBG, MEL, P); Aiome, Henty NGF 27490 (L); Constantinhafen (= Melamu), Hollrung 567 (BO, K, LE, MEL); near Ihu, Galore NGF 41105 (L); Markham Valley, Morobe Distr., Clemens 10694 (A, L, MICH, UC); Wampit, Kerenga et al. LAE 73810 (L); near Oomsis Ck., Floyd NGF 7284 (BO, K, L); *ibid.*, Womersley & Jones NGF 8806 (K, L); near Gabensis, 60 km SW of Lae, Fallen et al. 344 (L, MO); Lae-Garogos R. Rd., F. Hallé 1941 (BR); Labu, NGF 3230 (L); Lowe's Ford, Kassam Water Rice Rd., Brass 32312 (BO, K, L, NY, US); Old Anna village, Morobe Prov., Kerenga et al. LAE 73862 (L); Kubuna, Brass 5590 (A, BM, BO, NY); Veiya, Carr 11642 (A, BM, K, L, NY, SING), 11643 (A, BM, K, L, NY, SING); Manumu, Central Distr., Isles & Vinas NGF 32405 (K, L); Laloki, Pulsford UPNG 258 (L); Mageri, Sogeri Distr., Barrett 4268 (A, BO, K); Sogeri Region, Forbes 480 (BM, FI-Beccari 14031, K, L, LE, MEL, P), 599a (BM), 835 (BM); Oro Bay, Dekalb Russell 8 March 1943 (US); Soputa, Dekalb Russell 16 May 1943 (MICH, US); Killerton Rd., Popondetta Subdistr., A.N. Millar 1910 (L); near Jegarata, S of Popondetta, Hoogland 3364 (BM, L); Maopa Rd., Kwikila Distr., Vinas & Naoni UPGN 7627 (L); Mori R., Central Distr., Sayers NGF 19656 (K, L); between Wani-gala and Koreaf, Hoogland 4169 (K, L).

Cult. Indonesia, Bogor sub. XV J (A I) 6, Merrill Nov. 1902 (NY, US); sub. XVI I F II A, Bisset s.n. (Z), Burck 396 (L). Philippines, Luzon, Manilla, Clemens 18421 (UC), Guerrero BS 27 Aug. 1928 (UC). India, Travancore (= Kerala), Trivandrum, garden escape(?), Erlanson 5129 (MICH, NY).

Notes. *V. grandifolia* is not only the most widespread of the Asian species but it is also the most variable. The leaves can be sessile, as in many specimens from Java and a few from New Guinea, and there is considerable variation in size. Also the flowers exhibit great variation in size. Mostly, the fruits are composed of two separate mericarps, but they can also be united (Van Balgooy et al. 2957, fig. 12). Fruit with completely separate, partially separate, and completely united carpels have been observed on one and the same tree (Leeuwenberg 13121).

Dried specimens of *Tabernaemontana aurantiaca* Gaud. from New Guinea

are often confused with those of *V. grandifolia*, as their leaves are very similar and the two plants often grow side by side. However, the branches of the *Tabernaemontana* species are usually thinner and the two species differ considerably in flowers and fruits:

Calyx about 2 mm long, persistent; corolla tube much longer than the calyx; fruit bright orange, smooth, mostly subglobose or pear-shaped, indehiscent, with white spongy pulp not separable from the very thin wall; when dried, still more or less spongy **Tabernaemontana aurantiaca**

Calyx 10–20 mm long and shed with the corolla; corolla tube 0.7–2 x as long as the calyx; fruit pale yellow or dark green, with many small pale grey-brown warts, subglobose or nearly so, dehiscent; pulpy aril surrounding seeds easily separated from the thick fruit wall, never spongy **Voacanga grandifolia**

11. **Voacanga havilandii** Ridl., Kew Bull. 1926: 473. 1926.

Fig. 13, p. 64; Map 9, p. 65

Type: Malaysia: Sarawak: Kuching, Haviland 593 (K, holotype: isotype: SAR).

Heterotypic synonym: *V. borneënsis* Mgf., Mitt.Bot.Staatssamml.München 1: 28. 1950. Type: Malaysia: Sarawak, Kuching, Beccari 3601 (M, holotype; isotypes: FI (Beccari coll. no. 6431), K, LE; paratype of *V. havilandii*).

Small tree, 4–15 m high. Trunk 10–45 cm in diameter; bark lenticellate. Branches with white latex, pale grey-brown, with a few large lenticels; branchlets glabrous. *Leaves* petiolate; petiole 4–25 mm long, glabrous or with a few hairs beneath (ocrea widened into intrapetiolar stipules); blade thinly coriaceous when dry, elliptic, obovate, or narrowly so, 1.5–4 x as long as wide, 4–24 x 1.7–9.5 cm, acuminate or apiculate at the apex, glabrous and with indented (dry) more or less reticulate venation above, hirto-pubescent beneath; with 7–14 secondary veins on either side, with an almost straight angle on the midrib. *Inflorescence* several-flowered, with peduncle 10–30 x 10–20 cm, lax. Bracts deciduous (not seen), with a few persistent colleters in the axils. Peduncle slender, 4.5–16 cm long, glabrous or hirto-pubescent as its branches and the pedicels. Pedicels 1–2 cm long. *Calyx* green, campanulate or nearly so, 6–12 x 4–6 mm, shed with the corolla, outside glabrous or sparsely pubescent, inside with a wavy belt of the colleters in 2–4 irregular rows (dense or not) at the base, with the tops of the waves alternating with the calyx lobes; tube campanulate, 3–9.5 mm long; lobes 0.15–1.2 x as long as the tube, subequal to unequal, transversely elliptic to suborbicular, 0.6–1.2 x as long as wide, 1.5–4 x 2–5 mm, rounded or truncate, with a diaphanous margin, erect. *Corolla* white or creamy, in the mature bud 17–22 mm long incl. the lobes (the lobes 0.5–0.65 of the bud length, forming an ovoid or ellipsoid head, 2–2.2 x as long as wide, 10–14 x 5–6 mm, with a blunt apex), glabrous on both sides; tube 0.6–1.8 x as long as the calyx, 7–11 mm long, almost cylindrical, not or slightly twisted for the entire length, contracted at the base, just below the insertion of the stamens and at the mouth, where contracted 1.7–2

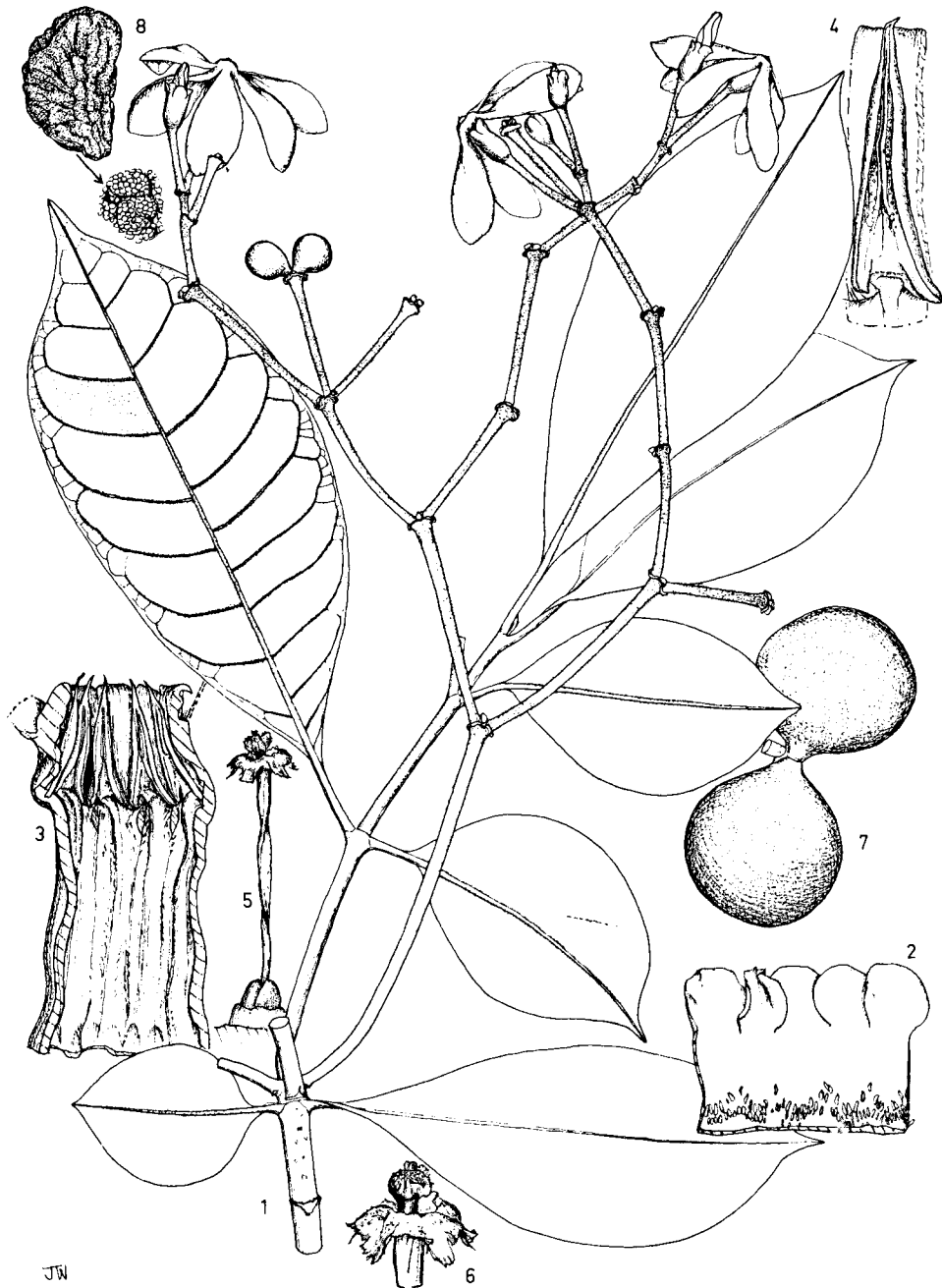
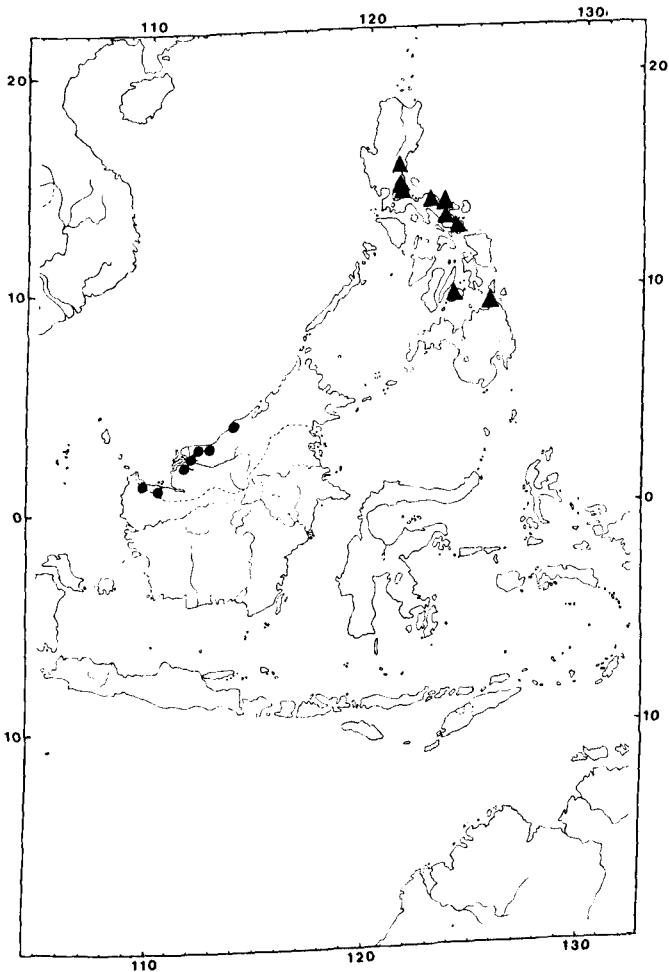


FIG. 13. *Voacanga havilandii*. 1, flowering branch ($\times \frac{1}{3}$); 2, calyx inside ($\times 3$); 3, corolla tube inside ($\times 6$); 4, stamen ($\times 12$); 5, pistil ($\times 6$); 6, pistil head ($\times 12$); 7, fruit ($\times \frac{1}{3}$); 8, seed ($\times 2$) with more enlarged detail of testa. 1-6 from Chai & Paie S 29303; 7 from Anderson S 25967; 8 from Rena George S 39934.

mm and around the anthers 2.5–3 mm wide; lobes slightly twisted, narrowly obovate or elliptic, 1.9–3 x as long as the tube, 2–3 x as long as wide, 15–24 x 7–11 mm, rounded, spreading and often later recurved. *Stamens* barely included to 2 mm exerted, inserted 2–3.5 mm below the corolla mouth; anthers 3.5 x 1.2–1.5 mm, at the apex for 0.5 mm sterile, glabrous, not twisted. *Pistil* glabrous, 7–12 mm long; ovary of two separate carpels, 1–2 x 1.5–2 x 1–1.5 mm; disk sinuate, 0.4–0.8 mm high; style not split at the base; almost cylindrical, 4.5–9 mm long, not twisted, at the base about 0.3 mm wide and at the apex slightly narrower than the pistil head; pistil head 0.7–1 x 0.7–1 mm, with an undulate entire ring 1.5–2 mm in diameter. *Fruit* of two separate mericarps; mericarps dark green, obliquely subglobose, about 3.5–5 cm in diameter; wall greenish; aril orange-red. *Seeds* many, dark brown, 9–10 x 6–6.5 x 3.5–5 mm,



MAP 9. ● *Voacanga havilandii* and ▲ *V. megacarpa*.

irregularly bumpy, minutely tuberculate; embryo slightly curved, creamy to white, 5 mm long; cotyledons orbicular, 2.5 mm long; rootlet 0.7 mm in diameter.

Distribution: only known from Sarawak.

Ecology: Bush or forest understorey, at low elevations, near rivers.

Vernacular names

Kayu susu (means milk wood = wood with latex, used for more Apocynaceae); Pelir kambing (Iban), Medang jong kong.

Specimens examined:

Malaysia: Sarawak: Mt. Gading, Lundu (fl. July) Paul Chai S 18456 (A, BO, K, L, SAR, SING), Chew Wee-Lek 574 (A, G, K, L, SING, UC); Lundu (fl., fr. Oct.) Clemens 22224 (K, NY, SAR); Kuching, Haviland 106 (SING), 593 (K, SAR, type), (fl. Jan.) 814 (GH); *ibid.* (fl. Dec.) Hewitt 2 (475) (K, SAR); *ibid.* (imm. fr. July) Wyatt-Smith KF 79308 (L, SAR); *ibid.* (fl. Mar.) Omar F.D. (= Foxworthy's collector) 396 (A, K, L, SAR, SING); *ibid.*, Setapok For. (fl. June) Jais bin Sijen 4774 (BO, K, L, SAR); km 14 Penrissen Rd. (fr. Aug.) Anderson S 25967 (K, L, SAR, WAG); Matang (fl. July) Beccari 3601 (FI, G, K, LE, M, paratype; type of *V. borneensis*); *ibid.* (fl.) Ridley Jan. 1915 (K); Semengoh (fl. July) P.Chai & I.Paie S 29303 (A, BO, K, L, MO, SAR, SING, UPS); Kalaka (fl. Apr.) Sarawak Mus. Ser. 229 (SAR); Pulau Bruit, Binatang Distr. (fl. Nov.) Sanusi bin Tahir 9261 (SING); Rejang, Sibu (fl. June) Haviland 2047 (BM, L, SAR, SING), 3047 (BM, BO, GH, K, paratype); Upper Mukah Hills (bud Feb.) Native Coll. Sarawak Mus. 5055 (NY); Begrih, Bawan, Balingian (fr. Oct.) Paul Chai S 19475 (BO, K, L, SAR, SING); Niah Caves, Niah Distr. (fl. June) Chew Wee-Lek 299 (G, K, L, SAR, SING); Niah Nat. Park (fr. May) Rena George S 39934 (L, SAR); *sin. loc.* Native coll. 98 (A), Beccari 1273 (FI).

12. *Voacanga megacarpa* Merrill, Philip. Journ. Sci. 7: 336. 1912.

Fig. 14, p. 67; Map 9, p. 65

Types: Philippines: Luzon, Tayabas Prov., Tununi R., Foxworthy BS 12343 (PNH, not seen, destroyed; no isotype seen). Luzon, Tayabas Prov., Binangonan, Whitford 829 (US, lectotype; isotype: P, was paratype). Luzon, Tayabas Prov., Baler, McGregor BS 10668 (US, paratype); Luzon, Camarines Prov., Tinambuc, Aguilar FB 14256 (BR, paratype).

Small tree 2–9 m high; trunk 6–30 cm in diameter. Branches lenticellate; branclets glabrous. *Leaves* shortly petiolate; petiole 15–30 mm long, glabrous (ocrea widened into intrapetiolar stipules); blade elliptic, obovate or narrowly so, 1.7–3.5 x as long as wide, (6)8–40 x (3)3.5–17 cm, apiculate or acuminate at the apex, cuneate or rounded at the base, thinly papery when dry, glabrous on both sides; secondary veins 12–18 on either side, rather straight, forming an angle of 60–70° with the costa; tertiary venation inconspicuous. *Inflorescence* long-pedunculate, lax, 13–40 x 10–25 cm, several-flowered, mostly several times dichotomously branched and further on more or less monochasial. Peduncle 8.5–19 cm long, stout, glabrous; pedicels 6–22 mm long, glabrous. Bracts deciduous and leaving conspicuous scars, sepal-like and of about the same size. *Flowers:* *Sepals* green(?), connate at the base for 1–2 mm, not covering each other in open flowers, narrowly oblong, 3–6 x as long as wide, 12–30 x 2.5–6



FIG. 14. *Voacanga megacarpa*. 1, flowering branch ($\times \frac{1}{2}$); 2, leaf apex ($\times \frac{1}{2}$); 3, flower without calyx ($\times \frac{1}{2}$); 4-6, calyces inside ($\times 1$); 7, partly torn corolla tube inside with incomplete lobe ($\times 1$); 8-9, stamens ($\times 3$); 10-11, pistils ($\times 1$); 12, seed ($\times 1$); 5, 9 and 12 from Elmer 15028; 1 from Mendoza PNH 18518; 2-4, 11 from Hallier 10 June 1903; 6-8 and 10 from Ramos & Edaño BS 45424.

mm, obtuse, acute or acuminate, inside with 1–3 dense rows of colleters at the extreme base, erect, entire. *Corolla* white, in the mature bud about twice as long as the sepals, incl. the lobes (lobes about 1/3 of the bud length, forming an ovoid head with a blunt apex), glabrous on both sides; tube 1.1–1.3 x as long as the sepals, almost cylindrical, 23–40 mm long, about 5–7 mm wide; not or only in upper part slightly twisted; lobes not twisted, obcordate, 0.5–1 x as long as the tube, about 1–1.5 x as wide as long, 16–37 x 19–37 mm, at the apex emarginate, entire, spreading to recurved. *Stamens* included for 4–7 mm, inserted 9–13 mm below the mouth of the corolla; anthers sessile, narrowly triangular, 5–8 x 2–2.5 mm, acuminate at the apex (sterile part 0.8–1 mm), glabrous. *Pistil* glabrous, 15–28 mm long; carpels 2, separate, about 2.5 x 2.5 x 1.5 mm; disk annular, about half as high as the ovary, entire; style cylindrical; pistil head 1–1.2 x 1–1.2 mm, with a 5-lobed ring 2 x 0.5 mm. *Fruit* of 2 free suglobose mericarps (being probably about 7 cm in diameter). *Seed* 9–10 x 4–5 x 3–4 mm, densely papillose and shallowly grooved all-over; embryo spatulate.

Distribution: only known from the Philippines.

Ecology: secondary forest at low elevation.

Vernacular names

Payat payat (Bio), Sapit-usa.

Specimens examined:

Philippines: Luzon: Tayabas Prov.: Baler (fl., fr. Aug.) McGregor BS 10668 (US, paratype); Infanta (fl. Sept.) Whitford 819 (P, US, lectotype); Casiguran (fl. May) Ramos & Edaña BS 45424 (B, NY, UC). Camarines Prov.: near Daët (fl.) Hallier 8-VI-1903 (HBG, NY), 10-VI-1903 (HBG); Tinambac (fl. Apr.) Aguilar FB 14256 (BR, paratype). Albay Prov.: Banao, Guinobatan (fl. June) Mendoza PNH 18518 (L, US); Castilla (fl. Mar.) comm. Seb. Vidal 3271 (K). Sorsogon Prov.: Irosin, Mt. Bulusan (fl., fr. Nov.) Elmer 15028 (BM, BO, F, FI, G, HBG, K, L, MICH, MO, NY, P, S, U, UC, US, W, Z); Irosin, Mt. Bangko (fl. May) Edaña & Gutierrez PNH 37826 (K, L, SING). Bohol: (Aug.–Oct.) Ramos BS 42822 (A, K, UC). Mindanao: Surigao (fl. Sept.) Wenzel 3184 (BO, BR, C, G, K, M, MO, NY, UC, Z).

EXCLUDED SPECIES

Orchipeda sumatrana Miq., Fl. Ind. Bat. Suppl. 553. 1862 = *Tabernaemontana macrocarpa* Jack.

Voacanga dichotoma K.Schum. in Engler, Pflanzenw. Ost-Afr. C: 317. 1895 = *Tabernaemontana pachysiphon* Stapf.

V. plumeriaefolia Elmer, Leaflets Philipp. Bot. 1: 333. 1908 = *Tabernaemontana plumeriaefolia* (Elmer) Merr., Enum. Phill. Fl. Pl. 3: 326. 1923 = *T. macrocarpa* Jack.

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REFERENCES (cited in text)

- BLUME, C.L. (1826). *Bijdragen tot de Flora van Nederlandsch Indië*. Batavia (= Jakarta): 1026.
- DU PETIT THOUARS, L.M.A. (1806). *Genera nova madagascariensia...* Paris.
- ENDLICHER, S.L. (1842). *Genera Plantarum*. Wien. Suppl. 2: 56.
- HARVEY, W.H. (1842). III Descriptions of several New Genera of S. African Plants. *London Journ. of Botany* 1: 18-29.
- HOCHSTETTER, C.F. (1841). *Nova genera Africae...* *Flora* 24: 657-672.
- LEEUEWENBERG, A.J.M. (1984) in T.A. VAN BEEK, R. VERPOORTE, A. BAERHEIM SVENDSEN, A.J.M. LEEUEWENBERG & N.G. BISSET, *Tabernaemontana* L. (Apocynaceae): A review of its taxonomy, phytochemistry, ethnobotany and pharmacology. *Journal of Ethnopharmacology* 10: 1-156.
- MIQUEL, F.A.G. (1857). *Nova Genera Apocynearum indicarum*. *Versl. en Meded. Kon. Akad. Wetensch.* 6: 191-194.
- ROEMER, J.J. & J.A. SCHULTES (1819). *Systema Vegetabilium*. Stuttgart 4: 439.
- ROLFE, R.A. (1883). Notes on *Carruthersia* and *Voacanga*. *Journ. of Botany* 21: 200-202.
- TEJDMANN, J.E. & S. BINNENDIJK (1863). *Plantae Novae in Horto Bogoriensi Cultae*. *Natuurkund. Tijdschr. Nederl. Indië* 25: 399-428.

INDEX OF EXSICCATAE

The numbers in parentheses correspond with the species-number of the revision. Only numbered collections have been listed.

If a collector gathered a part of his collection together with others using a single number series, only his name is cited in this list: e.g. Ramos & Edaño is cited as Ramos, and Torre & Correira as Torre.

- African species: 1. *V. africana*, 2. *V. bracteata*,
3. *V. caudiflora*, 4. *V. chalotiana*, 5. *V.*
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