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THE VERBENACEÆ
OF THE
MALAYAN ARCHIPELAGO,

TOGETHER WITH THOSE FROM THE MALAYAN PENINSULA, THE PHILIPPINES, THE BISMARCK-ARCHIPELAGO, AND THE PALAU-, MARIANNE- AND CAROLINE-ISLANDS.

PROEFSCHRIFT TER VERKRIJGING VAN DEN GRAAD VAN DOCTOR IN DE PLANT- EN DIERKUNDE AAN DE RIJKS-UNIVERSITEIT TE UTRECHT, OP GEZAG VAN DEN RECTOR MAGNIFICUS Dr. G. W. KERNKAMP, HOOGLEERAAR IN DE FACULTEIT DER LETTEREN EN WIJSBEGEERTE, VOLGENS BESLUIT VAN DEN SENAAT DER UNIVERSITEIT TEGEN DE BEDENKINGEN VAN DE FACULTEIT DER WIS- EN NATUURKUNDE TE VERDEDIGEN OP MAANDAG 7 APRIL 1919, DES NAMIDDAGS TE 4 UUR, DOOR

HERMAN JOHANNES LAM,

GEBOREN TE VEENDAM. =

AAN DE NAGEDACHTENIS
VAN MIJN VADER.

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The world is so full of a number of things.
I'm sure we should all be as happy as kings.
(R. L. Stevenson, A Child's Garden
of Verses).

INTRODUCTION.

This enumeration of the Verbenaceæ of the Malayian Archipelago, together with those from Malacca, the Philippines and the western parts of Melanesia and Micronesia is based upon plant-materials from the Herbarium of the universities of Utrecht, Leiden and Berlin, and we avail ourself of the opportunity to tender our best thanks to their keepers for their kindness in supplying materials, necessary for the elaboration of this plant-family. We are sorry to say that we could, in consequence of the war, not obtain materials from the Kew- and Buitenzorg-herbaria. We chose the boundaries of these countries in this way, partly for their unity in phytogeographical respect (v.: „Phytogeographical Remarks”, p. 350), partly for the possibilities indicated by the materials extant.

About the arrangement and methods used we can say the following:

In general, we followed the rules, laid down by the Botanical Congress, Brussels 1910.

When specimina are mentioned by the number, under which they ressort in the herbaria of Utrecht, Leiden and Berlin, the latter are abbreviated respectively as H. A. R.—T., H. L.—B., and H. Ber.

H. B. or H. Bog. means: herbarium of the botanical gardens of Buitenzorg.

The tabulæ of determination are always arranged in this way that, whenever there could be any doubt in choosing one of two or more alternatives, the genus or species in question is to be found in following both or all the alternatives.

A bibliography on the subject is given, only containing those works, which are not mentioned in the text (p. 356).

Under: „doubtful species” only those species are given, which by no means could be mentioned in the tabulæ of determination. For we are in the opinion, that, if we gather in these tabulæ as much species as is possible without hurting their security, this gives a greater chance to find the species, or to discover new or synonymous ones.

For the subdivision of the family we used, generally spoken, Engler's System (Nat. Pfl. fam. IV. 3a, 1897).

Dimensions of inflorescences are always given including the length of the peduncles, if we did not indicate it otherwise.

In the matter of varieties we started from the principle, that they stand in reason to the species, as this does to the genus. Thus we eventually subdivided the species into var. α (often typicus, -a, -um), var. β , etc.

Also plants imported into or cultivated in the regions dealt with, are mentioned.

In: *Hallier f.*, Med. 's Rijks Herb. Leïd. no. 37, 32, the present publication by mistake is mentioned as edited in Utrecht.

VERBENACEÆ.

TABULATED STATEMENT OF THE GENERA AND SUBDIVISION
OF THE FAMILY ACCORDING TO THE AFFINITY.

A. Inflorescences spicate, botrytic, centripetal; ovules basal,
anatropical (except in *PETRÆÆ* and *CITHAREXYLEÆ*); seeds
exalbuminous Tribe I. VERBENOIDEÆ.

a. inflorescence a spike.

α. fruits with four 1-seeded cells.

or pyrenes (cocci) Subtribe A. EUVERBENEÆ.

1. *VERBENA*.

β. fruits with 2 (or by abortion 1)

pyrenes.

1. pyrenes 1-celled, 1-seeded

Subtribe B. LANTANEÆ.

I. fertile stamens 4.

†. fruits drupaceous with
fleshy exocarp and one
2-seeded (or two 1-seeded)

pyrenes 2. *LANTANA*.

††. fruits dry, capsular, with
thin, dry exocarp and
splitting up into 2 cocci 3. *LIPPIA*.

II. fertile stamens 2; fruits with

2 pyrenes 4. *STACHYTARPHETA*.

2. pyrenes 2-celled, 2-seeded

Subtribe C. PRIVEÆ.

5. *PRIVA*.

b. inflorescences paniculate or axillary.

α. fruits with two 1-celled, 1-seeded

pyrenes Subtribe D. *PETRÆÆ*.

6. *PETRÆA*.

- β . fruits with 2—4 two-celled two-seeded pyrenes . Subtribe E. CITHAREXYLEÆ.

7. DURANTA.

B. Inflorescences cymose, centrifugal, often composed.

- a. ovules laterally or nearly apically attached, hemianatropic; ovary perfectly or imperfectly 4—10-celled.

- α . fruits drupaceous, rarely an indehiscent capsule; seeds exalbuminous Tribe II. VITICOIDEÆ.

1. flowers actinomorphic; stamens 4(-7), equal.

- I. drupe with 4- ∞ pyrenes

Subtribe A. CALLICARPEÆ.

- †. style terminal; stigma with short, obtuse lobes.

- O. flowers 5—7-merous, or, if occasionally 4-merous, then always also alternating leaves next to the opposite ones 8. GEUNZIA.

- OO. flowers 4-merous, or, if occasionally 5-merous, then always all leaves opposite . . 9. CALLICARPA.

- ††. style sunk down between the only for $\frac{1}{2}$ of their length connated cells of the ovary, stigma with subulate lobes . . 10. SCHIZOPREMNA.

- II. Drupe with one 4-celled pyrene . . . Subtribe B. TECTONEÆ.

11. TECTONA.

2. flowers more or less zygomorphic; stamens 4—5, distinctly didynamous.

- I. fruit a 1-celled, 1-seeded, indehiscent capsule. Subtribe C. TEYSMANNIODENDREÆ.

- †. inflorescences composedly cymose, terminal; flowers very distinctly zygomorphous with rounded lobes; stamens 4 12. **TEYSMANNIODENDRON.**
- ††. inflorescences racemose, terminal, often brachiate near the base; flowers little zygomorphous, with narrow lobes; stamens 5 13. **XEROCARPA.**
- II. fruit a drupe with one 4-celled pyrene. Subtribe D. **VITICEÆ.**
- †. corolla-tube short, cylindrical.
- . corolla 4-lobed.
- . leaves simple.
- △. Shrubs at least $\frac{1}{2}$ M. high 14. **PREMNA.**
- △△: Undershrubs reaching only 15 cM. in height. 15. **PYGMÆOPREMNA.**
- . leaves digitately composed . . 16. **VITICIPREMNA.**
- . Corolla 5-lobed 17. **VITEX.**
- ††. Corolla-tube broadly funnel-shaped, widened towards the throat . 18. **GMELINA.**
- III. fruit a drupe with 1—4 one-seeded pyrenes
- Subtribe E. **CLERODENDREÆ.**
- †. calyx 2—3-lobed, when adult; corolla 4-lobed.
- . corolla-lobes subequal; pyrenes 3—4 . . 19. **FARADAYA.**
- . corolla 2-lipped with 3 obovate and 1 linear lobe; pyrenes 1—2
20. **HOSEA.**

- ††. calyx (3-)5-toothed or
-lobed, or nearly entire;
corolla 5-lobed.
○. calyx 3 or 5-toothed
or lobed, narrow, not
spreading . . . 21. **CLERODENDRON.**
○○. calyx indistinctly 5-
lobed or nearly entire,
widely spreading 22. **HOLMSKJÆLDIA.**
- β. fruit a 4-valvate capsule
Tribe III. **CARYOPTERIDOIDEÆ.**
1. calyx unaltered in fruit; leaves
pinnately composed . . . 23. **PERONEMA.**
2. calyx with enlarged, membra-
nous lobes in fruit; leaves one
or two times digitately com-
posed 24. **PETRÆOVITEX.**
- b. ovules apically attached, pendu-
lous, orthotropical.
α. ovary imperfectly 2-celled; fruits
dry, 1-seeded . . . Tribe IV. **SYMPHOREMOIDEÆ.**
1. involucre bracts 6.
I. flowers 6—18-merous . . . 25. **SYMPHOREMA.**
II. flowers 5-merous . . . 26. **SPHENODESME.**
2. involucre bracts 3—4 . . . 27. **CONGEA.**
- β. ovary imperfectly 4-celled; fruit
a 1-seeded, bivalvate capsule
Tribe V. **AVICENNIOIDEÆ.**
28. **AVICENNIA.**

TABULA FOR DETERMINING THE GENUS.

1. a. Fertile stamens 2 2.
b. Fertile stamens 4, or if 5, then all leaves opposite 3.
c. Fertile stamens 5 or more, or, if 4, then always some
alternate leaves between the pairs of opposite ones 27.
2. a. Leaves simple 4. **STACHYTARPHETA** p. 19.
b. Leaves pinnately composed, with winged rhachis
23. **PERONEMA** p. 321.

3. a. Inflorescence capitate, spicate or racemose. . . . 4.
 b. Inflorescence cymose or flowers solitary in the axils of the leaves 10.
4. a. Inflorescence racemose, axillary . . . 6. **PETRÆA** p. 25.
 b. Inflorescence spicate 5.
 c. Inflorescence capitate 9.
5. a. Spikes dense, short. 6.
 b. Spikes more or less elongated. 7.
6. a. Fruits drupaceous, with fleshy exocarp, and one 2-seeded or two 1-seeded pyrenes 2. **LANTANA** p. 10.
 b. Fruits capsular, with dry exocarp and splitting up into 2 one-seeded cocci. 3. **LIPPIA** p. 15.
7. a. Fruits capsular, bivalvate. . . . 28. **AVICENNIA** p. 339.
 b. Fruits drupaceous; pyrenes 2-seeded. 8.
 c. Fruits splitting up into four 1-seeded cocci 1. **VERBENA** p. 9.
8. a. Pyrenes 4 7. **DURANTA** p. 27.
 b. Pyrenes 2 5. **PRIVA** p. 23.
9. a. Heads with 3—4 involucre bracts 27. **CONGEA** p. 336.
 b. Heads without involucre bracts 28. **AVICENNIA** p. 339.
10. a. Inflorescences terminal, simple or composed and often paniced; the small inflorescences being sometimes attached at rather wide intervals (**Premna latifolia Roxb.**) . 11.
 b. Inflorescences axillary, simple, or flowers solitary in the axils of the leaves 22.
11. a. Flowers small, 0.5—1 cM. long; corolla-tube short, relatively rather broad, cylindrical or nearly so . 12.
 b. Flowers larger, 1.5—12 cM. long; corolla-tube long, relatively rather narrow, at least near the base, cylindrical or infundibuliform and very wide near the throat . 20.
12. a. Leaves composed 13.
 b. Leaves simple 16.
13. a. Calyx not enlarged in fruit 14.
 b. Calyx with enlarged, membranous lobes in fruit
 24. **PETRÆOVITEX** p. 323.
14. a. Corolla 4-merous 16. **VITICIPREMNA** p. 162.
 b. Corolla 5-merous 15.
15. a. Fruit capsular, indehiscent, 1-celled, 1-seeded
 12. **TEYSMANNIODENDRON** p. 97.

- b.* Fruit drupaceous with one 4-celled pyrene 17. **VITEX** p. 164.
16. *a.* Corolla 4-merous 17.
- b.* Corolla 5-merous 19.
17. *a.* Shrubs reaching at least $\frac{1}{2}$ M. in height 18.
- b.* Undershrubs reaching 15 cM. at the utmost
15. **PYGMÆOPREMNA** p. 160.
18. *a.* Style terminal 14. **PREMNA** p. 100.
- b.* Style sunk down between the only for $\frac{1}{2}$ of their length connated cells of ovary . 10. **SCHIZOPREMNA** p. 92.
19. *a.* Calyx unaltered in fruit 17. **VITEX** p. 164.
- b.* Calyx with enlarged, membranous lobes in fruit
Petræovitex bambusetorum.
20. *a.* Calyx closed at first, 2—3-lobed afterwards
19. **FARADAYA** p. 228.
- b.* Calyx 3—5-merous from the beginning. 21.
21. *a.* Corolla-tube relatively long; stamens indistinctly didynamous, usually long exsert; fruit drupaceous with 4 pyrenes. 21. **CLERODENDRON** p. 238.
- b.* Corolla-tube funnel-shaped, very wide across the throat; stamens very distinctly didynamous, little exserted or included; fruit drupaceous with one 1—4-celled pyrene
18. **GMELINA** p. 214.
22. *a.* Inflorescences axillary 23.
- b.* Flowers solitary in the axils of the leaves. **Gmelina uniflora.**
23. *a.* Calyx 2—3-lobed, when adult. 24.
- b.* Calyx small, regularly 4-toothed, very rarely 5-toothed (?) (**Callicarpa Horsfieldii Turcz**) 9. **CALLICARPA** p. 45.
- c.* Calyx indistinctly 5-lobed or undulate or nearly entire, spreading, coloured. 22. **HOLMSKJÆLDIA** p. 321.
- d.* Calyx regularly or irregularly 5-toothed 25.
24. *a.* Corolla-lobes subequal; pyrenes 3—4 19. **FARADAYA** p. 228.
- b.* Corolla-lobes unequal, 3 obovate, 1 linear; pyrenes 1—2
20. **HOSEA** p. 236.
25. *a.* Calyx unaltered in fruit 26.
- b.* Calyx with enlarged, membranous lobes in fruit
24. **PETRÆOVITEX** p. 323.
26. *a.* Corolla-tube short, 0.3—1.0 cM.; limb 2-lipped
17. **VITEX** p. 164.

- b.* Corolla-tube longer, cylindrical, slender, 0.5—12 cM.; limb subregularly 5-lobed . 21. **CLERODENDRON** p. 238.
27. *a.* Inflorescences capitate, with involucrel bracts . . . 28.
b. Inflorescences cymose or spicately racemose . . . 29.
28. *a.* Flowers 5-merous . . . 26. **SPHENODESME** p. 331.
b. Flowers 6—18-merous. . . 25. **SYMPHOREMA** p. 329.
29. *a.* Inflorescences terminal, composed. 30.
b. Inflorescences axillary 8. **GEUNZIA** p. 28.
30. *a.* Inflorescences cymose, paniced . 11. **TECTONA** p. 93.
b. Inflorescences racemose, subspicate, brachiate near the base 13. **XEROCARPA** p. 98.

Tribe I. VERBENOIDEÆ.

Subtribe A. EUVERBENEÆ.

I. **VERBENA** *L.* syst. veg. ed. I, (1737); *R. Brown*, Prodr. 514; *Benth.* and *v. Muell.*, Fl. Austr. V. 35; *Benth.* and *Hook.*, Gen. Pl. II, II, 1146; *Schauer*, DC. Prodr. XI, 535; *Engl.* u. *Prantl*, Nat. Pfl. fam. IV, 3a, 146; *Hook. f.*, Fl. Br. Ind., IV, 565; *Miquel*, Fl. Ind. bat. II, 908; *Hasskarl.* 2^e Cat. 's Lands Pl. tuin Btzg., 134 — Pubescent herbs or undershrubs; *leaves* opposite or ternately whorled, toothed or pinnatifid, simple; *inflorescences* spicate, terminal, simple or corymbose; flowers and bracts small; *calyx* tubular, membranous, shortly 5-toothed; *corolla* with cylindric tube, sometimes curved; limb \pm oblique, sub-2-lipped, 5-lobed, throat and insertion of stamens hairy; *stamens* 4, included, didynamous, inserted in the upper part of the corolla-tube; anthers glandular; *style* short; stigma unequally 2-fid, one lobe papilliferous, the other glabrous, horn-shaped; *ovary* supported by a short annular gynophore, at first 1-, but soon 4-celled, 4-ovuled; *fruit* capsular, with 4 one-seeded cocci.

Distribution: chiefly in tropical America, very few

species in the old world, one cosmopolitical for tropical-temperate regions.

1. *V. officinalis* L. Sp. pl. 29 (1753); *R. Brown*, Prodr. 514; *Benth.* and *v. Muell.*, Fl. austr., V, 35; *Schauer*, DC. Prodr. XI, 547; *Forbes* and *Hemsley*, Fl. Sin. II, 252; *Hook. f.*, Fl. Br. Ind., IV, 565; *Miquel*, Fl. Ind. bat., II, 908; *Backer*, Ann. Jard. bot. Btzg., Suppl. 3, I, 419; *Miquel*, Ann. Mus. bot. Lugd.—Bat. II, 97. — *V. macrostachya* *F. v. Muell.* Fragm. I, 60. — *V. menthæfolia* *Benth.*, Pl. Hartw., 21 (1839—1857) — *V. spuria* L. sp. pl. 29 (1753). — A herb 30—60 cM.; branchlets quadrangular, subglabrous, somewhat hirsute on the ribs; leaves oblong-lanceolate, base cuneate-attenuate, pinnatifid or coarsely toothed, (sub)sessile, glabrous or scabrid above, strigosely hairy beneath, especially on the nerves and along the variously lobed margins; 5—10 cM. long; spikes paniced, at first dense, ultimately interrupted below; bracts ovate, acuminate; the spikes in fruit $7\frac{1}{2}$ —25 cM.; calyx 0.15—0.2 cM., minutely 5-toothed; corolla blue, 0.6 cM.

Distribution: cosmopolitical for tropical, subtropical and temperate regions.

Subtribe B. LANTANÆ.

II. *LANTANA* L., Gen. pl. ed. I, 185 (1737); *Benth.* and *v. Muell.*, Fl. Austr. V, 34; *Benth.* and *Hook.* gen. Pl., II, II, 1142; *Schauer*, DC., Prodr. XI, 594; *Engl. u. Prantl*, Nat. Pfl. fam., IV, 3a, 150; *Hook. f.*, Fl. Br. Ind. IV, 562; *King* and *Gamble* Journ. As. Soc. Bengal, LXXIV, 4, 795; *Hasskarl.* 2e Cat. 's Lands Pl. tuin, Buitzg. 134; *Miquel*, Fl. Ind. bat. II, 904; *Roxb.* Fl. ind, III, 89. — Shrubs or undershrubs; branches usually acutely 4-ribbed, hirsute, sometimes spiny, glandular; leaves simple, opposite or ternate, rugose; inflorescences axillary, spicate or

capitate, peduncled, with ovate or lanceolate bracts; *calyx* membranous, with short tube, more or less distinctly two-lipped, 4—5-toothed, pubescent; *corolla* with long cylindrical tube; limb spreading, 4—5-lobed, more or less 2-lipped, oblique; *stamens* 4, didynamous, inserted in the middle or the upper part of the corolla-tube, included, with very short filaments; *style* short, with capitate stigma; *ovary* 2-celled, 2-ovuled; *drupe* with 1 two-celled, two-seeded pyrene, or with 2 one-celled, one-seeded pyrenes, exocarp fleshy; seeds without albumen.

Distribution: chiefly in tropical America, a few in Africa and Asia.

1. *a.* Leaves ternate or opposite; branchlets without spines; bracts with a long spiny acumen . 1. *L. trifolia* p. 11.

b. Leaves opposite; branchlets with or without spines; bracts without spiny acumen 2.

2. *a.* Branchlets often with spines; bracts as long as the half of the corolla-tube; calyx 2-lipped, lips 2-toothed; corolla golden-yellow, ultimately orange-coloured-red.

2. *L. aculeata* p. 12.

b. Branchlets without spines; bracts as long as the corolla-tube; calyx 2-lipped, lips entire; corolla white with yellow throat 3. *L. salvifolia* p. 13.

Doubtful species: 4. *L. triplinervia* p. 14.

1. *L. trifolia* *L.*, sp. pl. 626, (1753); *Backer*, Ann. J. bot. Buitzg. suppl. 3, I, 406; *Schauer*, DC. Prod. XI, 606; *Hook. f.*, Fl. Br. Ind. IV, 563; Bot. Mag. tab. 1022? or tab. 1449?!; *Hall. f.*, Meded. 's Rijks Herb. Leid. no. 37, 18; *Kuntze*, Rev. Gen. Pl. I, 504. — *L. albopurpurea* *Desf.* Cat. Hort. Par. ed. III, 392, (1829). — *L. achyranthifolia* *Desf.* l.c.; *Hall. f.* l.c., 17. — *L. annua* *L.* sp. pl. 627. — *L. dubia* *Royl.*, Illustr. Bot. Himal., 300, t. 73, (1839), pro parte. — *L. indica* *Wall.*, cat. no. 1823, (1828). — *L. pilosa* *H. B. et K.* Nov. Gen. et sp., II, 260, (1817). — *L. celtidifolia* *H. B. et K.*, Nov. Gen. et Spec. II, 259,

(1817). — An undershrub; branchlets, peduncles and petioles, hirsute-rugose; leaves ternate or opposite, membranous, ovate-lanceolate, both sides acute, base entire, margins dentate-serrate, above rugose with stiff hairs on papils, beneath rather densely hairy, glandular, hairs simple; 10 by $3\frac{1}{2}$ cM.; petioles 0.7—1 cM.; inflorescences axillary; spikes subcylindrical, $1\frac{1}{2}$ — $2\frac{1}{2}$ cM. long, 0.7—1 cM. wide, peduncles 9—10 cM.; bracts as long as or longer than the corolla, 5-nerved, with a long, slender acumen, 0.4—0.8 cM., lower surface pubescent and glandular; calyx irregularly and unequally 4-toothed, oblique, scarcely pubescent and glandular, 0.1 cM.; corolla softly hairy, glandular, 4-lobed, somewhat 2-lipped, lilac; ovary glabrous.

JAVA: *Denker* nos. 222 and 8, Purbolinggo, flow. on 27—V—1911—*Boerlage* nos. 44 (Buitenzorg) and 459 (Tjiomas) — *Zollinger* no. 1839 (*L. achyranthifolia*).

Distribution: tropical America, imported into tropical Asia (Ceylon, Brit. India, Java!, Sumatra).

2. *L. aculeata* L., sp. pl. 627, (1753); *Bot. Mag.* t. 96; *King and Gamble Journ. As. Soc. Bengal*, LXXIV, 4, 796; *Hall. f., Med. 's Rijks Herb. Leid.* no. 37, 17 — *L. camara* L. sp. pl. 627 (1753); *Benth. and v. Muell.*, *Fl. Austr.*, V, 34; *Backer, Ann. Jard. bot. Buitzg. suppl.* 3, I, 406; *Schauer, DC. Prodr.* XI, 598; *Elbert, Meded. 's Rijks Herb. Leid.* no. 12, 15; *Forbes and Hemsley, Fl. sin.* II, 251; *Koorders, Exk. fl. v. Java*, III, 132; *Kuntze, Rev. Gen. Pl.* I, 503; *Merrill., Bur. Gov. Lab. no. 27*, 67 and *Phil. Journ. Sci. Bot.* XI, 311; *Martius, Fl. Brasil.* IX, 255; *Merrill, Bur. Gov. Lab. no. 6*, 35. — *L. mutabilis* *Salisb.*, *Prodr.* 107, (1796) — *L. polycantha* *Schau.* *DC. Prodr.* XI, 597, (1847) — *L. scabrida* *Soland.* in *Ait. Hort. Kew* ed. I, II, 352, (1789) — *L. viburnoides* *Blco.*, *Fl. Philipp.*, ed. II, 345, (1845). A shrub; branches tetragonous, with or without down-

ward pointing spines on the ribs, hairy, as are petioles; *leaves* membranous, variable in form, from wide-lanceolate, acute both at the base and the apex, to ovate with subacute or subcordate base and acute or obtuse apex and to nearly rounded, with rounded apex and cordate base, the latter abruptly decurrent; margins crenate, entire towards the base; above rugose with stiff hairs on papils and simple soft hairs; beneath pubescent with simple hairs, glandular; pairs of nerves 5-7; $2\frac{1}{2}$ - $8\frac{1}{2}$ by $1\frac{1}{2}$ -4 cM.; petioles 0.4-2 cM.; *inflorescences* peduncled, capitulate or subspicate, with globose or ovoid spikes, 1- $1\frac{1}{2}$ cM. long, $1\frac{1}{2}$ -2 cM. wide, peduncles 1-7 cM. long, as long as or longer than the leaves; bracts 0.4-0.5 cM., lanceolate or ovate-acuminate, pubescent; *calyx* 0.2 cM., two-lipped, the lips acutely 2-toothed; whitish hairy, glandular; *corolla* 1.2 cM., softly pubescent, tube 0.8 cM., limb spreading, more or less 2-lipped, upper lip entire or somewhat 2-lobed, lower lip 3-lobed, the middle-lobe somewhat larger, gold-yellow, ultimately orange-red; *style* 0.4 cM.; *ovary* softly pubescent, somewhat glandular; *drupe* fleshy with one 2-seeded or two 1-seeded pyrenes.

JAVA: *Denker*, no. 35, Purbolinggo — *Boerlage*, in H. L.-B. sub nos. 908.353-393 (Buitenzorg) and 908.267-939 (Pelabuan Ratu) — *Elbert* nos. 466 (Kendeng Trinil) and 339 (Mt. Lawu), both localities in Madiun, the latter 1200-1400 M. in alt.

BANKA: in H. A. R.-T. sub no. 043916, in the garden Baturusak.

SALEYER-ISL.: *Docters van Leeuwen-Reijnvaan* no. 1674, 20 M. in alt., flow. on 20-V-1913; a shrub, 1 M. high.

PHILIPPINES: *Mc Gregor* in H. L.-B. sub no. 911.142-376, Luzon, Rizal, flow. in Nov. 1907.

Distribution: tropical America, imported into tropical Asia. \int . *L. salvifolia* *Jacquin*, Hort. Schoenbr., III, 18, t. 285, (1798); *King* and *Gamble*, Journ. As. Soc. Bengal. LXXIV,

4, 796. — *L. alba* Mill., ex Link Enum. pl. hort. berol., II, 126, (1821), (or Gard. Dict. ed. VIII, no. 8, (1768)¹⁾?); *Miquel*, Fl. Ind. bat. II. 904; *Schauer*, DC. Prodr. XI, 606. — *L. collina* Decne. in *Jaquem. Voy. Bot.*, 136, t. 141, (18..). — *L. dubia* Royle, Ill. Bot. Himal., 300, t. 73, 1839), — *L. dubia* Wall. ex Walp. Rep., IV, 63, (1842–8). — *L. Gogchana* Buch.—Ham ex Voigt, Hort. Suburb. Calc., 472, (1845). — *L. indica* Roxb. Fl. ind., III, 89, (1832); *Hook. f.*, Fl. Br. Ind. IV. 562; — *L. latifolia* Tausch, Flora XIX, 391, (1836) — *L. leucantha* Hort ex Schau., DC. Prodr. XI, 606, (1847) — *L. Wightiana* Wall. cat. no. 2655 (1828). — A shrub; branches without spines, tetragonous, hirsute; leaves elliptical-subrotundate or -ovate, both sides acuminate or base subcordate, coarsely dentate-serrate, strigosely hispid above, greyish-tomentose beneath; inflorescences spicate or subcapitulate, peduncled, shorter or longer than the leaves, bracts obovate-subrotundate or elliptical-ovate-acuminate, rugose on the backside, ciliate, as long as the corolla-tube; calyx hirsutely hairy, 2-lipped, lips entire, ciliate; corolla subhirsutely villous, white with yellow throat, tube 0.7 cM., limb 0.5 cM.; drupe dark-violet.

Distribution; chiefly in tropical America, less in tropical and southern Africa, rather common in Burma, Ceylon, India, Malayan Peninsula.

Doubtful Species:

4. *L. triplinervia* Turcz. in Bull. Soc. Nat. Mosc. XXXVI, II, 205, (1863). — A shrub; branchlets acutely quadrangular, scabrid on the ribs, and sometimes with short spines; leaves petioled, ovate-lanceolate; base attenuate, apex

¹⁾ In this case *L. alba* Mill. should have the priority. We cannot give a final decision in this matter, but think it is probable that the first given work contains the true description of *L. alba* Mill.

acuminate, margins crenate except near the base; base 3-nerved; upper side with short hairs, each on a small papil, lower side scabrid on the nerve-reticulation; heads on long axillary peduncles, which are hardly shorter than the leaves, spicate, with two linear involucreal bracts, afterwards elongated, oblong-conical; bracts lanceolate, acuminate, greyish, as long as the half or a third of the corolla-tube.

Distribution: Java.

We could not discover any mention of this plant in the bibliography of the systematical botany about the regions dealt with. Perhaps it is identical with *L. aculeata*.

III. *LIPPIA* L. Gen. pl. ed. I, 347 (1737); *Blume*, Bijdr. 821; *Benth.* and *Hook.* Gen. pl. II, II, 1142; *R. Brown*, Prodr. 514; *Benth.* and *v. Muell.* Fl. Austr. V, 34; *Schauer*, DC. Prodr. XI, 572; *Engl.* u. *Prantl.* Nat. Pfl. fam. IV, 3a, 151; *Hook. f.*, Fl. Br. Ind. IV. 563; *King* and *Gamble*, Journ. As. Soc. Bengal, LXXIV, 4, 797; *Miquel*, Fl. Ind. bat. II, 905; *Hasskarl*, 2^e Cat. 's L. Pl. tuin Buitzg., 134. — Shrubs, or undershrubs; branches tetragonous, usually hairy; leaves simple, opposite or verticillate, rarely alternate; inflorescences spicate or capitate, flowers small, in the axils of bracts; calyx membranous, tubular 2-lipped and more or less irregularly 4-lobed; corolla-tube cylindrical, somewhat funnel-shaped, limb spreading, oblique, 5-lobed, somewhat 2-lipped.; stamens 4, didynamous, included, with very short filaments, inserted in the upper part of the corolla-tube; style terminal, short; ovary 2-celled; cells 1-ovuled; fruit dry, splitting up into two 1-seeded cocci; albumen none.

Distribution: chiefly in tropical America; some species in Africa and some in Asia, one cosmopolitical in the tropics and subtropics.

The genus resembles much the genus **LANTANA**; the most striking difference is in its fruit, which has a dry (not a fleshy) exocarp, and splits up into two dry cocci.

1. a. Peduncles shorter than the leaves 2.
- b. Peduncles longer than the leaves, 5—11 cM.; leaves small, with rounded apex, subsessile, base attenuate, reaching 4 by 2 cM. 1. **L. nodiflora** p. 16.
2. a. Leaves ovate; bracts ovate, long cuspidate-acuminate, somewhat shorter than the corolla-tube; corolla pink.
 2. **L. geminata** p. 18.
- b. Leaves lanceolate; bracts rhomboid or nearly circular, abruptly acuminate or -apiculate, as long as the corolla-tube; corolla white. 3. **L. asperifolia** p. 18.
- Doubtful species: 4. **L. javanica** p. 19.

1. **L. nodiflora** *Rich.* (vel *Michx.* in *Rich.*?), *Fl. Bor. Am.* II, 15, (1803); *Blume*, *Bijdr.* 821; *R. Brown*, *Prodr.* 514; *Benth.* and *v. Muell.*, *Fl. Austr.* V, 34; *Williams*, *Bull. Herb. Boiss. sér. II, T. V*, 430; *Schauer*, *DC. Prodr.* XI, 585; *Forbes* and *Hemsley*, *Fl. Sin.* II, 251; *Forbes*, *Wander. Nat. f. Mal. Arch.* II, 226; *Pulle* in *Lorentz*, *Nova-Guinea*, VIII, 2, 401; *Hook. f.*, *Fl. Br. Ind.*, IV, 563; *King* and *Gamble*, *Journ. As. Soc. Beng.* LXXIV, 4, 797; *Koorders*, *Exk. fl. v. Java*, III, 133; *Hook.* *Comp. Bot. Mag.* I, 349; *Kuntze*, *Rev. Gen. Pl.*, I, 508; *Miquel*, *Fl. Ind. bat.* II, 905 and suppl. I, 244 and 570; *Merrill*, *Bur. Gov. Lab.* no. 27, 67 and *Phil. Journ. Sci. Bot.* XI, 310; *Martius*, *Fl. Brasil.* IX, 238; *Merrill*, *Phil. Journ. Sci. Bot.* III, 430; *Hall. f. Med.* 's *Rijks Herb. Leid.* no. 37, 19; *Hasskarl.* 2e *Cat.* 's *Lands Pl. tuin Buitzg.*, 134; *Schimper*, *Bot. Mitt. a. d. Tropen*, III, 129; *Valeton*, *Bull. Dépt. Agric. Ind. Néerl.* no. X, 53; *Zollinger* u. *Moritz*, *Syst. Verz.*, 52. — *Verbena nodiflora* *L.* *Sp. pl.* 20, (1753); *Burm.* *Fl. ind.* 12. t. 6. fig. 1; *Roxb.*, *Hort. Beng.* 4. — *Blairia nodiflora* *Gaertn.* *Fruct.* I, 266, t. 56, (1788). — *Zapania nodiflora* *Lam.* *Ill.* t. 17, (1793); *Wall. cat.* no. 1824. —

Phyla chinensis Lour., Fl. Cochinch. 66, (1790). — A creeping perennial herb or undershrub; branches tetragonous, appressedly pubescent; leaves chartaceous or subcoriaceous, sessile or subsessile, obovate or obovate-elongate with long-attenuate entire base and rounded serrate apex, both sides appressedly pubescent with simple hairs, pairs of nerves 2—6; $1\frac{1}{2}$ —5 cM. long; 0.3—2 cM. wide across the middle or above it; spikes 0.5—1.5 cM. long, 0.5—0.6 cM. wide, long-peduncled, solitary in the axils of the leaves; peduncles 5—11 cM.; bracts as long as the corolla-tube, ovate-rotundate with abrupt, subulate apex, or nearly wide-triangular, deltoid, with straight dentate apex, sometimes with a short acumen; calyx 0.06 cM., pubescent, 2-lipped, somewhat irregularly 4-toothed; corolla softly pubescent, 0.35 cM.; limb spreading, more or less 2-lipped, 4—5 lobed; stamens 4, didynamous, the short filaments inserted near the throat of the corolla; style very short, with capitate or subpeltate stigma, ovary glabrous 2-celled, 2-ovuled; fruit dry, with two 1-seeded cocci.

Var. α . *sarmentosa* Schauer, DC. Prodr. XI, 585, (1847). — *Lantana sarmentosa* Spr. Syst. II, 752, (1825—28). — *Lippia sarmentosa* Spr. l.c. — Leaves obovate, base entire to the middle, 3— $4\frac{1}{2}$ by $1\frac{1}{2}$ —2 cM.; pairs of nerves 4—6; bracts ovate-rotundate with long-acuminate, subulate apex, margins irregularly dentate, ciliate.

NEW-GUINEA: *Schlechter* no. 18101, near Kenegia-river, 150 M., flow. on Aug. 16th, 1908.

NEW-IRELAND (NEU-MECKLENBURG): *Peckel*, without no., Kawieng (Pakail), common, creeping, 50—150 cM. long, 20—40 cM. high.; flowers bluish white, flow. and fr. in Oct. 1911.

Var. β . *repens* Schauer l.c. 586. — *Lantana repens* Spr. l.c. — *Lippia repens* Spr. l.c. — Leaves elongate-obovate, base entire up to $\frac{3}{4}$ of the leaf, $1\frac{1}{2}$ —5 by

0.3—1 cM.; pairs of nerves 2—3; bracts deltoid with straight, dentate-ciliate apex, sometimes shortly, abruptly apiculate.

SUMATRA: in H. A. R.—T. sub no. 043912; P. Pontjang Kitjil in the bay of Tapanuli; flow. in Oct.

NEW-GUINEA: *Versteeg* no. 1845, flow. and fr. on 30—X—1907. — *Branderhorst* no. 58, fr. on 10—X—1907.

Distribution of the species: cosmopolitical in tropics and subtropics, especially in the neighbourhood of the sea-shore. (Sumatra!, Java!, Borneo!, Celebes!, Timor!, New-Guinea!, Luzon, Malacca, New-Ireland!)

2. *L. geminata* *Kunth*. in H. B. et K. Nov. Gen. et Spec. Pl., II, 266, (1817); *Benth.* and *v. Muell.*, Fl. Austr. V, 34; *Schauer*, DC. Prodr. XI, 582; *Hook. f.* Fl. Br. Ind., IV, 563; ? *Martius* Fl. Brasil. IX, 235. (*L. gem. Rich.*) — *L. asperifolia* *Poepp.* ex *Cham.* in *Linnæa* VII, 215, (1832). — *L. citrata* *Willd.* ex *Cham.* l.c., 214.

A shrub; branches subquadrangular, strigosely hispid; leaves opposite or ternate, ovate or ovate-oblong, base cuneate, decurrent, apex acute, margins serrate, pairs of nerves 3; above strigosely-hispid, beneath softly greyish hairy, 5—10 cM. long, lemon-flagrant; inflorescences capitulate, at first subglobose, 1.3 cM. long, ultimately subcylindrical, reaching 2.5 cM.; peduncles short, hardly as long as the petioles, solitary or two of them in the axils of the leaves; bracts ovate, cuspidate-acuminate, greyish-villous, ciliate, somewhat shorter than the corolla-tube; corolla violet.

Distribution: tropical America, imported into Bengal and Queensland.

We make mention of this species, finding it rather probable that it should occur in Malaya, since it is imported into Bengal and Australia.

3. *L. asperifolia* *Rich.* Cat. Hort. Med. Par., 67, (year?); *Schauer*, DC. Prodr. XI, 583; *Koorders*, Exk. fl. v. Java, III, 133; *Miquel*, Fl. Ind. bat. II, 906; *Martius*, Fl. Brasil. IX, 236. — *L. scabra* *Hochst.* Flora XXVIII,

68, (1845). — A shrub; branchlets hirsute, glandular; *leaves* opposite or ternate, shortly petioled, lanceolate or oblong-lanceolate, base attenuate, apex acute or obtuse, margins serrate, entire near base, above strigosely-hirsute, beneath, especially on the nerves greyish-pubescent; *inflorescences* capitulate, globose at first, ultimately cylindrical-ovoid, peduncles slender, shorter than the leaves, one or two of them in the axils of the leaves; bracts rhomboid-subrotundate, abruptly acuminate or acute, strigosely greyish-pubescent, as long as the corolla-tube.

Distribution: tropical America, South-Africa, Java.

Doubtful species:

4. *L. javanica* Spr. Syst. veg. II, 572 (or 752?), (1825—28); Schauer, DC. Prodr. XI, 593; Miq. Fl. Ind. bat. II, 906 (sub *L. asperifolia* as a doubtful synonyme). — An erect shrub; *leaves* oblong, subcrenulate; lower peduncles opposite, upper ones whorled, longer than the leaves; *heads* cylindrical; bracts acute.

Distribution: Java.

Probably this is the same as *L. asperifolia*.

IV. STACHYTARPHETA Vahl, Enum., I, 205, (1805); Benth. and Hook. Gen. Pl. II, II, 1145; Schauer, DC. Prodr. XI, 561; Engl. u. Prantl, IV, 3^a, 154; Hook. f. Fl. Br. Ind. IV, 564; King and Gamble, Journ. As. Soc. Beng. LXXIV, 4, 798; Miquel, Fl. Ind. bat. II, 907. — Herbs or shrubs with usually dichotomous branches; *leaves* usually opposite, simple, dentate or crenate, often rugose; *inflorescences* spicate, terminal, usually long and lax, the rhachis often angular and excavated beneath the by a bract supported flowers; flowers white, blue, red or pink; *calyx* membranous, narrowly cylindrical, 4—5-toothed, variously slit at a late stage; *corolla* with cylindrical, slender, often curved tube, limb spreading, 5-lobed, throat more or less villous;

stamens 2 fertile with anthers (the superior ones) and 2 sterile without anthers (the inferior ones), sometimes staminodes none; filaments short, included, inserted in the upper part of the corolla-tube, anther-cells vertically divaricate; *style* long, exsert, stigma capitate; *ovary* supported by a short annular disc, 2-celled, 2-ovuled; *fruit* capsular, separating into 2 one-seeded cocci; seeds exalbuminous.

Distribution: chiefly in tropical America, a few in Africa, imported into tropical Asia and run wild there.

1. a. Plant densely hairy; leaves $7\frac{1}{2}$ — $12\frac{1}{2}$ by 4— $6\frac{1}{2}$ cM.; petioles 2— $4\frac{1}{2}$ cM.; pairs of nerves 6—8; calyx 1—1.2 cM.; corolla $2\frac{1}{2}$ cM., pink . . . 1. **S. mutabilis** p. 20.
- b. Plant subglabrous; leaves 3—10 by 1—5 cM.; petioles $\frac{1}{2}$ — $3\frac{1}{2}$ cM.; calyx 0.6—0.75 cM.; corolla 0.7—1 cM., blue 2.
2. a. Crenatures of leaves mucronate; leaves 5— $7\frac{1}{2}$ cM. long. 2. **S. bogoriensis** p. 21.
- b. Crenatures of leaves entire; leaves 3—10 by 1—5 cM. 3.
3. a. Calyx 0.75 cM.; corolla-tube 0.75 cM.; leaves with acute or acuminate apex. . . . 3. **S. dichotoma** p. 21.
- b. Calyx 0.6 cM.; corolla-tube 0.7—1.2 cM.; leaves with obtuse or subrounded, sometimes subacute apex.

4. **S. jamaicensis** p. 22.

1. **S. mutabilis** (Jacq.) Vahl. Enum. I, 209, (1805); King and Gamble, Journ. As. Soc. Beng. LXXIV, 4, 799; Koorders, Exk. fl. v. Java III, 133; Bot. Mag. t. 976; Miquel, Fl. Ind. bat., II, 907; Merrill, Phil. Journ. Sci. Bot. XI, 309; Backer, Ann. jard. bot. Buitzg. Suppl. 3, I, 415; Hall. f., Med.'s Rijks Herb. Leid. no. 37, 22 — *Verbena mutabilis* Jacq. Coll. II, 334. — A herb, reaching 1 M.; branchlets quadrangular, with spikes and petioles densely tawny-pubescent; leaves opposite, ovate, base rounded and decurrent, apex acute, the upper three-fourths crenate, the crenatures mucronate, entire near the base, sparsely villous and scabrid above, softly grey-tomentose beneath, pairs of nerves 6—8, $7\frac{1}{2}$ — $12\frac{1}{2}$ by

4—6½ cM., petioles 2½—4 cM.; *spikes* stout, 15—45 cM. long, the flowers in excavations of the rhachis, bracts ovate-lanceolate, cuspidate-acuminate, strigosely hairy, 0.6—1.2 cM. long; *calyx* 1—1.2 cM., with 4 acute teeth, strigosely pubescent, the teeth on the outer side, the tube cleft on the inner; *corolla* pink, the tube curved, 2½ cM. long, limb spreading with 5 rounded lobes; *stamens* with villous filaments, anthers 0.12 cM.; staminodes subulate, villous, 0.35—0.5 cM.; *fruit* oblong, ovoid, or somewhat pyriform.

Distribution: from tropical America imported into the old world, and widely spread in Southern India, Java!, Ambon; also in Central Africa.

2. *S. bogoriensis* Zoll. et Mor., Syst. Verz., 52, (1846). — A perennial herb; branchlets glabrous; *leaves* obovate, obtuse, glabrous, base decurrent, margins serrate, the teeth mucronulate, together with the petioles reaching 5—7½ cM. in length; *spikes* 15—30 cM. long, bracts subulate shorter than the flowers, which are immersed in the hollows of the fleshy rhachis; *corolla* pale blue.

Distribution: only mentioned from Bogor (Buitenzorg, Java), Zollinger no. 849.

Perhaps it will appear that this species, which never, as far as we know, has been discovered for a second time, is identical with one of the other species.

3. *S. dichotoma* Vahl, Enum., I, 207, (1805); Schauer, DC., Prodr., XI, 561; Koorders, Exk. fl. v. Java, III, 133; Backer, Ann. Jard. bot. Buitzg. suppl. 3, I, 415; Martius, Fl. Brasil., IX, 199—? *S. cayennensis* Vahl l.c. 208; Hall. f., Med. 's Rijks Herb. Leid. no. 37, 20. — A herb?; branchlets dichotomous, quadrangular, sparsely pubescent, densier on the nodes; *leaves* ovate or ovate-oblong, base decurrent, apex acute or acuminate, margins coarsely dentate-serrate, strigosely hispid, glabrous on both sides, or sparsely rugose, membranous, 5—10 cM. long,

2—5 cM. wide; *spikes* 15—45 cM. long, bracts very narrow, subulate aristate, striate, margins ciliate; *calyx* compressed, 4-ribbed, 4-toothed, 0.75 cM.; *corolla* blue, tube as long as, or shorter than the calyx.

Distribution: from tropical America imported into Asia (Java).

4. *S. jamaicensis* Vahl. Enum. I, 206, (1805); Schauer, DC. Prodr., XI, 564; King and Gamble, Journ. As. Soc. Beng. LXXIV, 4, 798; Koorders, Exk. fl. v. Java, III, 133; Bot. Mag., t. 1860; Kuntze, Rev. Gen. Pl. I, 509; Merrill, Phil. Journ. Sci. Bot. XI, 310; id. ibid. IX, 136; Backer, Ann. Jard. bot. Buitzg., suppl. 3, I, 415. — *S. ciliata* Kunze, Del. Sem. Hort. Lips. 9 in adnot. — *S. indica* Vahl, l.c.; Hall. f., Med. 's Rijks Herb. Leid. no. 37, 20; Williams, Bull. Herb. Boiss. sér. II, T. V, 430; Schauer l.c.; Forbes and Hemsley, Fl. Sin. II, 251; Hook. f. Fl. Br. Ind., IV, 564; Koorders, Meded. 's Lands Pl. tuin no. XIX, 560; Miquel, Fl. Ind. bat., II, 907 and suppl. I, 244 and 570; Backer, l.c.; Hall. f., Med. 's Rijks Herb. Leid. no. 37, 20. — *S. marginata* Vahl, l.c. 207. — *S. pilosiuscula* H.B. et K., Nov. Gen. et Sp. II, 279 (1817) — *S. urticifolia* Dalz. et Gibs., Bomb. Fl. Suppl. 68, (1861) — *S. villosa* Turcz., Bull. Soc. Nat. Mosc. XXXVI, II, 197, (1863). — An annual, erect herb; branches dichotomous, obtusely quadrangular, the spikes and petioles sparsely pubescent; *leaves* opposite, thinly chartaceous or membranous, ovate or obovate, base decurrent, apex obtuse or subacute, margins coarsely serrate, ciliate, upper side glabrous, beneath with some hairs and scales or glabrate, pairs of nerves 4—6, 3—10 cM. long, 1—5 cM. broad, petioles $\frac{1}{2}$ — $3\frac{1}{2}$ cM. long, a narrow line of hairs between the petioles of each pair of leaves; *spikes* 10—30 cM. long, glabrescent, the flowers sessile in the excavations of the rachis, bracts subulate or lanceolate-acuminate, 0.5 cM.; *calyx* membranous, transparent,

glabrous, somewhat flattened, with 4 acuminate teeth on the outer side, cleft on the inner one, 5-ribbed, asymmetric, 0.6 cM. long, with some scales; *corolla* slightly curved, glabrous, tube 0.7—1.2 cM. long, limb spreading, 5-lobed, blue, upper half of the tube hairy within; *stamens* inserted about 0.6 cM. from the base of the corolla-tube, staminodes with capitate apex, often unequal in length; *style* 0.6 cM., with capitate stigma; *ovary* glabrous; *fruit* included in the calyx, somewhat curved, elongate-pyriform, 0.45 cM. long, shortly apiculate.

CAROLINE-ISLANDS: *Volkens* no. 300., Yap, along the roads, flow. on Jan. 4th, 1900, imported.

JAVA: *Went* in H. A. R—T. sub. no. 049898, Depok, flow. on 26—IV—1890.

BANKA: in H. A. R—T. sub. no. 043920, flow. in Sept. 1858.

Distribution: tropical America, Sandwich-isl., Samoa, New-Caledonia, Marianne-isl., Luzon, Java!, Sumatra, Malacca, Brit. India, Mauritius, Madagascar, tropical Africa. (*Hallier*, l.c.).

Subtribe C. PRIVEÆ.

V. **PRIVA** *Adans.* fam. II, 505 (year?); *Jussieu*, *Ann. Mus. Par.* VII, 75; *Benth.* and *Hook.* *Gen. Pl.* II, 2, 1145; *Schauer*, *DC. Prodr.* XI, 532; *Engler* u. *Prantl.* *Nat. Pfl.* fam. IV, 3a, 155; *Hook. f.*, *Fl. Br. Ind.* IV. 565. — Erect herbs; *leaves* opposite, membranous, petioled, serrate; *inflorescences* spicate, terminal or axillary, long and slender; flowers in the axils of small bracts; bracteoles none or very small; *calyx* nearly tubular at first, enlarged in fruit, including it, with 5-teeth and 5 ribs; *corolla* with cylindric, straight or curved tube; limb spreading, oblique, somewhat 2-lipped, 5-lobed; *stamens* 4, didynamous, inserted in the middle of the corolla-tube, included;

anthers with nearly parallel cells and fissures; *ovary* 4-celled, the cells 1-seeded, rising from two 2-celled carpels; *style* with partly club-shaped, partly toothlike stigma; *fruit* included, capsular, with two 2- (or by abortion 1-) seeded and 2- (or 1-)celled pyrenes.

Distribution: tropical America, some species in India and Africa, often escaped.

Capsule obovate, quadrangular; ribs acute with short, straight pricks, rugulose for the rest; commissures flat.

1. *P. echinata* p. 24.

Capsule obcordiform, with narrowed base, quadrangular; the ribs obtuse, softly aculeate; rugose for the rest; commissures excavated 2. *P. leptostachya* p. 24.

1. *P. echinata* Juss., Ann. Mus. Par. VII, 70, (1806); *Miq.* Fl. Ind. bat. II, 906; *Schauer*, DC. Prodr. XI, 534. — A herb; branchlets pubescent; *leaves* cordate-ovate, apex acute, base cordate with an abrupt triangle narrowing into the petiole; margins coarsely serrate; both sides strigosely rugose-pubescent; upper side shining, lower pale; *calyx* broadly ovate in fruit, coarctate at the apex, shortly rostrate with hispid hooked hairs; *corolla* reddish or dark-blue; *capsule* obovate, quadrangular, ribs acute with short, straight pricks, rugulose for the rest; commissures flat.

Distribution: tropical America and W.-India.

According to *Miquel* (l.c.) with soil from Dutch Guyana imported into the botanical gardens of Buitenzorg and escaped from there. *Blaauw* [De tropische natuur, ed. II, p. 13, (1916)] saw reddish- and dark-blue-flowered *Privæ* along the roads of W. Java. Probably it was this species.

2. *P. leptostachya* Juss., Ann. Mus. Par., VII, 70, (1806); *Schauer*, DC. Prodr. XI, 533; *Hook. f.* Fl. Br. Ind. IV, 565. — A herb with pubescent branchlets; *leaves* ovate, with acute apex and subcordate base, which is abruptly narrowed into the petiole with a deltoid narrowing; margins coarsely crenate-serrate; both sides more

or less softly rugose (according to *Roxburgh* ex *Hook. f.* l.c. with stiff hooked hairs), lower side pale; $4\frac{1}{2}$ cM. long, 0.6 cM. wide; petioles $2\frac{1}{2}$ cM.; *spikes* 15–30 cM. long; *calyx* more or less globose in fruit, shortly contort at apex, greyish pubescent, with hooked hairs; 0.6 cM. long; 0.2 cM. broad before or during flowering-time, 0.6 cM. in fruit; *corolla* white, 0.8 cM.; *capsule* obcordiform, with narrowed base, quadrangular; the ribs obtuse, softly aculeate; rugose for the rest, commissures excavated.

Distribution: Deccan Peninsula, Africa.

Though we did not find any indication in the bibliography about the occurring of the species in Malaya, it may occur in this regions. As *Blaauw* did not mention the species he saw in Java (see under *P. echinata*), it is possible it occurs there.

Subtribe D. PETRÆÆ.

VI. *PETRÆA* *Jacq.*, *Select. Am.*, 180, t. 114, (1763) — *Petræa B. Juss. ex Juss. Gen.* 108 (1789) [not *Petrea*, a name given by *Linnæus*, *Gen. pl. ed. I*, 347 (1737)] *Benth.* and *Hook. Gen. Pl.* II, 2, 1149; *Schauer, DC. Prodr.* XI, 616; *Engl. u. Prantl.*, *Nat. Pfl. fam. IV.* 3a, 158. — Shrubs or little trees; *leaves* simple, opposite, coriaceous; *inflorescences* paniculate, axillary, lax, elongated; flowers in the axils of caducous bracts, large; *calyx* with short tube, 5–15-ribbed, limb with 5 membranous, broad-linear, obtuse lobes, alternating with 5 deltoid inner teeth, the lobes enlarged in fruit; *corolla* with straight nearly cylindrical tube, limb spreading, subequally 5-lobed, or somewhat obliquely 2-lipped; throat villous; *stamens* 4, subequal, filaments short, inserted in the upper part of the corolla-tube, sometimes a rudiment of a fifth stamen present; *style* rather short, with increased and oblique apex; *ovary* on a solid disc, \pm imperfectly 2-celled, 2-ovuled; *fruit* included in the enlarged calyx-

tube, a dry indehiscent capsule, 2- or by abortion 1-celled and -seeded; seeds laterally attached, without albumen.

Distribution: tropical America, imported into Java! and Luzon (Merrill).

1. *P. volubilis* L. sp. pl. 626, (1753) not of *Jacquin* (1763); *Schauer*, DC. Prodr. XI, 618; *Jacquin*, Select. Stirp. Am. Hist., 180, t. 114; *Koorders*, Exk. fl. v. Java, III, 133; Bot. Mag. t. 628; *Martius*, Fl. Brasil. IX, 273; *Merrill*, Bur. Gov. Lab., no. 6, 36; *Hall. f.*, Med. 's Rijks Herb. Leid. no. 37, 22. — A scandent shrub; branchlets, inflorescences, and petioles minutely puberulous; leaves coriaceous, oblong-ovate or elliptical, base rounded, apex subacute, margins entire, glabrous above, somewhat hirsute-hairy on the midrib, glabrous beneath, eglandular; pairs of nerves 8—12, subwingedly prominent beneath, each nerve dichotomously branched before reaching the margin; 7—18 by $3\frac{1}{2}$ — $7\frac{1}{2}$ cM.; petioles 0.5—1 cM. long, 0.2 cM. thick; panicles 11—17 cM. long; calyx-tube 0.25—0.3 cM. long, 0.15—0.2 cM. wide, pubescent and with some glanduliferous hairs, rather solid \pm 10-ribbed, the 5 deltoid teeth ciliate, inner side glabrous; the 5 lobes in fruit membranous, 1.5—2.1 by 0.3—0.4 cM., both sides pubescent and glandular, with obtuse apex; corolla with glabrous tube, 10-lined, 0.4 cM.; throat villous; limb oblique, 5-lobed, lobes subequal, both sides pubescent and with glanduliferous hairs, 0.5 cM. long, 0.2 cM. broad; stamens 4, subequal, filaments 0.1 cM., anthers long-ellipsoid, 0.1 cM. with parallel cells; style 0.25 cM. with increased, papillose, oblique stigma; ovary glabrous, 0.17 cM. long, with gynophore (disc); fruit included in the calyx-tube, the inner 5 teeth being closed above it.

JAVA: *Ploem*, Preanger, in H. L.—B. sub no. 909.27—4; id. in H. L.—B. sub no. 908.337—73, near Buitenzorg, native name: hampelaas aroi.

Distribution: tropical America, imported into Java! and Luzon (Merrill).

Subtribe E. CITHAREXYLÆ.

VII. **DURANTA** L. Gen. Pl. ed. I, 367 (1737); *Bentham* and *Hooker*, Gen. Pl. II, 2, 1150; *Schauer*, DC. Prodr. XI, 615; *Engler* u. *Prantl.*, Nat. Pfl. Fam, IV, 3a, 159. — American shrubs, imported into Asia. *Leaves* small, simple, opposite or verticillate, entire or serrate-dentate; *inflorescences* spicate, axillary and terminal, forming a large terminal panicle; flowers apart; *calyx* regular, 5-ribbed, 5-toothed, persistent, including the fruit; *corolla* 2-lipped, upper lip 2-lobed, lower lip 3-lobed, middle-lobe longer; *stamens* 4, with short filaments, inserted above the middle of the cylindrical corolla-tube, \pm didynamous; *style* shorter than or as long as the corolla tube with club-shaped, sub-oblique stigma; *ovary* 8-celled; cells 1-ovuled; *fruit* a drupe with 4 pyrenes; pyrenes 2-seeded, 2-celled.

Distribution: tropical America, imported into and cultivated in tropical Asia, and there sometimes escaped.

1. **D. Plumieri** *Jacquin*, Select. Am., 186, t. 176, fig. 76, (1763); *Schauer*, DC. Prodr. XI, 615; *Elbert*, Meded. 's Rijks Herb. Leiden, no. 12, 15; *Gaertner* De Fruct. et Sem. Pl. I, 272; *Koorders*, Exk. fl. v. Java, III, 134; *Martius* in Flora Brasil. IX, 271; *Merrill*, Bur. Gov. Lab. no. 6, 35; Bot. Mag. tab. 1759. — A shrub; young parts softly scarcely hairy, glabrescent; *leaves* variable in form and dimensions, ovate, base cuneate, apex subacute or somewhat rounded, margins entire on more or less crenate towards the apex, opposite or subverticillate, pairs of nerves 4—5; upper side very sparsely hairy, lower side somewhat less sparsely, glandular, $2\frac{1}{2}$ —5 by 0.8—2 cM.; petioles 0.4—0.5 cM.; spikes lax, elongated, the lower axillary, one terminal, composing together a large terminal

inflorescence, 19 cM. long, 20 cM. wide; *calyx* with nearly cylindrical tube, 5-ribbed, with 5 subulate, abrupt teeth; softly hairy, glandular; tube 0.5 cM., teeth 0.1 cM.; inner side glabrous; *corolla* with cylindrical tube (0.7—0.8 cM.), 2-lipped; outer side softly hairy; lobes 0.35 cM., the larger 0.5 cM., lower side softly hairy, upper side moreover with long glanduliferous hairs; inner side of tube glabrous; *stamens* 4, short, included, subdidynamous; *style* shorter than the corolla-tube, with club-shaped stigma; *ovary* glabrous.

JAVA: in H. L.—B. sub no. 908.265—1195. — *Elbert* no. 338, Mount Lawu near Ploasan, Madiun, 800—1000 M., flow. in Oct.—Nov. 1907.

CAROLINE-ISLANDS: *Schnee*, Ponape, in H. Ber. without nr.

Distribution: tropical America; imported into and cultivated in tropical Asia, and sometimes escaped.

Tribe II. VITICOIDEÆ.

Subtribe A. CALLICARPEÆ.

VIII. **GEUNZIA** *Blume*, Cat. Gew. Buitzg. 11, 48, (1823) and Bijdr. 819 (1826); *Benth.* and *Hook.*, Genera Pl. II, 2, 1150; *Engl.* u. *Prantl.*, Nat. Pfl. fam. IV, 3a, 165; *Hook. f.* Fl. Br. Ind. IV, 566; *Koorders en Valetton*, Bijdr. Booms. Java, no. 7, 172; *King and Gamble*, Journ. As. Soc. Bengal, LXXIV, 4, 800; *Hasskarl*, 2^e Cat. 's Lands Pl. tuin Btz., 136; *Hall f.*, Med. 's Rijks Herb. Leid. no. 37, 23. — Shrubs or small trees; tomentum stellate or simple; *leaves* simple, entire or nearly so, opposite, always with alternate leaves between the often anisophyllous pairs

or pseudo-whorls, sometimes pseudo-ternate or even -quaternate; petioled, the petioles being joined by a line of hairs; *cymes* axillary, rather large, dichotomously branched; *calyx* 5—8-toothed, rarely 4-toothed; *corolla* 5—7-lobed, rarely 4-lobed: tube cylindrical or nearly so, glabrous within; *stamens* 5—7, exserted, rarely 4, inserted in the lower part of the tube; anthers generally glandular on both sides, denser on the backside, rather large, cells with, in the upper part widened, parallel fissures, by which it seems as if they were opening by a hole only; *style* elongated with capitate or subpeltate stigma, sometimes indistinctly lobed; *ovary* 4—5-, sometimes 3-celled; cells more or less perfectly 2-locellated, 2-ovuled; *fruit* drupaceous, with 6—12 (-14?) one-seeded pyrenes.

Distribution: Malacca, Malaya, Philippine Islands, New-Ireland (Neu-Mecklenburg).

This genus¹⁾ is closely allied to *Callicarpa*, and this is the cause, that so many authors have confounded the species of one genus with that of the other. Yet the two genera are, examining them exactly, very easily separable, though there are a number of features, which could confuse a superficial examiner. We have tried to separate distinctly the two genera, taking as a criterion the following characteristics, for

GEUNZIA.

1. Besides the opposite leaves, there are always alternate ones; this sometimes gives rise to the presence of (pseudo-) ternate or -quaternate leaves.

CALLICARPA.

1. only opposite leaves are present.

¹⁾ After we had written this explanation, *Hallier* published the 3rd part of his elaboration of the plants of Elbert's Sunda-expedition, in which is dealt with the Verbenaceæ. As regards the matter of *Callicarpa* and *Geunsia* he expressed, in general, the same opinion as given by us.

- | | |
|---|--|
| 2. The petioles of the opposite leaves are always joined by a characteristic interpetiolar margin of hairs. | 2. such a line is either absent, or not conspicuous. |
| 3. The anther-cells open by a typical widening of the upper part of the parallel fissures; (it is not a mere apical hole, as many authors pretend). | 3. The anther-cells open by a long fissure, from the apex to the base. |
| 4. The ovary is (3-)5-celled; the cells are 2 seeded. | 4. The ovary is 4-celled; the cells are 1-seeded. |

This, and some other, less easily definable features, determine the general habit, which is typical for each genus, and which enable us, to separate the two genera, even then, when, as occurs, we meet with specimina, which are 4-merous and 5-merous, and have the same habit. The latter characteristic, taken before as the criterion for separating the two genera, is not sufficient for this purpose, since we discovered 4-merous specimina, which without any doubt belong to *Geunsia*, and 5-merous ones, which belong to *Callicarpa*. Many species of *Geunsia* show a close affinity with certain species of *Callicarpa*. This may indicate the phylogenetic relation between them, and may give rise to the supposition that the *Callicarpa*-species are developing from the *Geunsia*-species, which may just be in a period of active mutation¹⁾. There are a number of facts, which give an indication into this direction. So may f. i.:

C. longifolia var. α be developed from *G. pentandra* or *G. acuminatissima*.

C. longifolia var. β be developed from *G. farinosa*.

C. lanata have the same origin as *G. hexandra*.

C. basilanensis be developed from *G. cumingiana* var. β ! etc.

The 6—7-merous *Geunsia*-species may be another branch of phylogenetic development, arisen from an original 5-merous form.

¹⁾ See: „Systematical Notes”.

1. a. Anthers short and broad, the proportion of length and breadth being ± 2 2.
- b. Anthers long and narrow, the proportion of length and breadth being $\pm 4-5$ 10.
2. a. Lower side of leaf adult subglabrous or sparsely puberulous; reticulation of nerves often very conspicuous. 3.
- b. Lower side of leaf adult densely yellow- or brown-tomentose 5.
3. a. Leaf with a $4\frac{1}{2}-6\frac{1}{2}$ cM. long, narrow acumen
 1. **G. acuminatissima** p. 32.
- b. Leaf with much shorter acumen 4.
4. a. Leaf 9—11 nerved, base abruptly attenuate; corolla-lobes glabrous or nearly so . . . 2. **G. pentandra** p. 33.
- b. Leaf 7—9-nerved, base gradually attenuate; corolla-lobes villous in the centre without. . . 3. **G. Pullei** p. 35.
5. a. Corolla-lobes and stamens 4—5 6.
- b. Corolla-lobes and stamens 6—7 7.
6. a. Leaves 14—18 by $5-7\frac{1}{2}$ cM.; petioles $2\frac{1}{2}-4$ cM.; usually sparsely puberulous beneath; base attenuate; corolla-lobes villous in the centre without
 3. **G. Pullei** p. 35.
- b. Leaves 16—28 by 7—14 cM.; petioles 1—3 cM.; lower surface densely tomentose; base often \pm cordate, corolla-lobes not or minutely puberulous
 4. **G. Cumingiana** p. 35.
7. a. Breadth of leaves $2\frac{1}{2}-5.2-7\frac{1}{2}$ cM. 8.
- b. Breadth of leaves 5—11 cM., length 11—24 cM.; calyx 0.3 cM.; corolla 0.7 cM., softly pubescent, 6—7-merous
 5. **G. hexandra** p. 37.
8. a. Leaves $4\frac{1}{2}-5\frac{1}{2}$ cM. broad, base subrotundate; petioles $1\frac{1}{2}-2$ cM.; corolla 5—6-merous; filaments glandular below; peduncles $2\frac{1}{2}$ cM. . 6. **G. grandiflora** p. 38.
- b. Leaves $2\frac{1}{2}-5$ cM. broad, base \pm obtuse or acute; petioles $1\frac{1}{2}-2\frac{1}{2}$ cM.; corolla 6—7-merous; filaments glabrous, peduncles 3—5 cM. 9.
9. a. Corolla 6-merous; lobes densely pubescent and glandular, except near the margin . . 7. **G. epiphytica** p. 38.
- b. Corolla 7-merous; lobes glandular 8. **G. flavida** p. 39.

10. *a.* Corolla 7-merous 8. *G. flavida* p. 39.
b. Corolla 5-6-merous 11.
11. *a.* Corolla 5-6-merous, leaves subternate, rusty-pubescent beneath, 11-17 by $4\frac{1}{2}$ - $7\frac{1}{2}$ cM.; petioles $1\frac{1}{2}$ -2 cM. long; corolla minutely rugose, hardly glandular, calyx 0.25 cM. 6. *G. grandiflora* p. 38.
b. Corolla 5-merous, leaves yellow- or ferruginous-tomentose beneath, 9-26 by 4-11 cM.; petioles 2- $3\frac{1}{2}$ cM. long (or if 1-2 cM. long, then leaves subquaternate) 12.
12. *a.* Plant with a ferruginous tomentum; calyx 0.3 cM., corolla-tube 0.4-0.5 cM., glandular 9. *G. cinnamomea* p. 40.
b. Plant with a yellow or yellowish brown tomentum, calyx 0.15-0.2 cM. 13.
13. *a.* Leaves subquaternate, 9-20 by 4- $10\frac{1}{2}$ cM., petioles 1-1.7 cM. 10. *G. quaternifolia* p. 41.
b. Leaves opposite, alternate, or subternate, $8\frac{1}{2}$ -22 (-26) by 4-8 (-12) cM., base narrower, more decurrent 14.
14. *a.* Corolla-tube 0.5-0.6 cM. long 11. *G. farinosa* p. 42.
b. Corolla-tube 0.3-0.35 cM. long 15.
15. *a.* Leaves serrulate towards the apex; ovary glandular 12. *G. serrulata* p. 43.
b. Leaves entire; ovary glabrous 13. *G. homiophylla* p. 44.

1. *G. acuminatissima* (*Teysm. et Binnendijk*) *H. J. Lam*, nov. comb. — *Callicarpa acuminatissima* *T. et B.* *Nat. Tijdschr. Ned. Ind.* XXV, 409 (1863). — A shrub or little tree; branchlets, nearly tetragonous, with cymes and petioles stellate-floccose, glabrescent; leaves membranous or subchartaceous, oblong-ovate or elliptical, base wide, abruptly decurrent, sometimes cuneate or unequal, apex very long acuminate, narrow, nearly subulate; margins entire; pairs of nerves 10-12; upper side, when young, sparsely stellate-hairy, with some glands, adult glabrous except on nerves, without glands; lower side sparsely stellate-hairy, when young, adult glabrous except on nerves, densely glandular, and with some scales; 20- $27\frac{1}{2}$ by $7\frac{1}{2}$ - $9\frac{1}{2}$ (-12) cM.; petioles 2.3-3.5 cM.; acumen

4½—6½ cM.; *cymes* 9½ cM. long, 4—5 cM. wide; peduncle 3½—6 cM.; pedicels 0.1—0.3 cM.; *calyx* 5—6-toothed, teeth deltoid; more or less densely stellate-hairy, glandular and with some scales, 0.1—0.15 cM.; *corolla* bright violet, glabrous, glandular on all parts of its outer side, 0.4—0.5 cM., 5—6-lobed. *stamens* 5—6, 1 cM. long; anthers twice as long as wide, both sides, especially the backside, glandular; *style* 0.8 cM. with capitate stigma; *ovary* conical, densely glandular, 4—5-celled; *fruit* red.

AMBOYNA: *Teymann* and *de Vriese*, in H. L.—B. sub no. 908.267—626. — *Teymann*, in H. A. R.—T. sub. no. 011532. — *Forsten*, in H. L.—B. sub nos. 908. 267—893 and 894.

CERAM: *Teymann* in H. L.—B. sub no. 908.266—853.

NEW-GUINEA: *Gjellerup* no. 917, Northern-Dutch-N.-G., 5 M. in alt., with flowers and young fruits on Nov. 24th, 1911.

King and *Gamble*, Journ. As. Soc. Bengal LXXIV, 4, 801, are in the opinion, that *Callicarpa acuminatissima* is identical with *Geunsia farinosa*. This is an error, as will be clear from our detailed descriptions.

2. *G. pentandra* *Merrill*, Phil. Journ. Sci. Bot. XI, 309, (1906). — *G. Hookeri* *Merrill*, Phil. Journ. Sci. Bot. VII, 342, (1912). — *Callicarpa pentandra* *Roxb.* (pro parte), Fl. ind. I, 395, (1832); *Schauer*, DC. Prodr. XI, 646; *Miquel*, Fl. Ind. bat. II, 885 and suppl. I, 243 and 569; *Oliver*, Journ. Linn. Soc. Bot. XV, 100. — *C. apoensis* *Elmer*, Leaflet. Phil. bot. III, 861, (1910). — A tree; branchlets, cymes and petioles more or less farinose; *leaves* elliptical-oblong, base subacute, apex rather long, usually gradually narrowing, margins entire, pairs of nerves 9—11: both sides, when young sparsely stellate-hairy, adult upper side glabrous, glandular, lower side glabrous or with very sparse stellate hairs, especially on the nerves; in sicco there is a typical minute reticulation

of little folds, on the lower side; 10—15 (—20) by 4—6 cM.; petioles 2—5 cM.; apex 1—3 cM.; *cymes* 6—10 cM. long, 8 cM. wide; peduncle 0—6 cM.; *calyx* hardly 5-toothed, glandular, somewhat hairy or nearly glabrous, 0.2 cM.; *corolla* glabrous, glandular, 0.5 cM., 5-lobed; *stamens* 5, 0.8 cM. long; anthers twice as long as wide, glandular on both sides.; *style* 0.6 cM., with capitate stigma.; *ovary* 5-ribbed, glandular, 5-celled, 10-seeded.

JAVA: Mount Salak; in H. L.—B. sub no. 908.266—905, with flowers and young fruits in June; native (sund.) name: hambirung (of the 2 specimina, 1 is *G. farinosa* and 1 *G. pentandra*); — in id. nos. 908.266—885, 884, 854, 856, 896, etc.; native (sund.) name: Kikú-ut, or Ki-hu-ut — Pl. Junghuhnianæ ined. no. 518.

SUMATRA: *Korthals*, in H. L.—B. sub nos. 908.266—844 and 894.

AMBOYNA: *Teysmann* and *de Vriese*, in H. L.—B. sub no. 908.267—328.

PHILIPPINE ISLANDS: *Cuming* no. 1773. — *Elmer* no. 11491, Todaya (Mount Apo), Davao, Mindanao, flowering in Aug. 1909. — Com. d. l. Fl. for. d. Fil. no. 1651, Laganoy.

The species has an affinity with *G. acuminatissima* from which it differs by the much shorter apex of its leaves, which have a glandular upper side, the typical reticulation of the lower one, and by its non-scaled calyx.

From *G. farinosa* it is distinguishable by the glabrous leaves, which are not abruptly, but gradually acuminate and its broad anthers, which are twice as long as wide.

Schauer, l.c., meant, that *Callicarpa pentandra* and *Geunslia farinosa* should be identical. This is certainly, perhaps partly, not exact. *Merrill*, l.c., in the opinion that *Callicarpa pentandra* is a *Geunslia*, described it, 1912, as *G. Hookeri*, which name he altered, in 1916, into *G. pentandra*, a species, which is undoubtedly quite different from *Blume's G. farinosa*. As *Schauer*, *King* and *Gamble* are in the opinion that *Callicarpa*

pentandra and *Geunslia farinosa* are identical. The error of this supposition will be clear from our definitions of the several species.

3. **G. Pullei** *H. J. Lam*, nov. spec. — Frutex, 3 M. alta; innovationes cum cymis petiolisque albido-brunneo-farinosae, glabrescentes; *folia* oblongo-lanceolata, basi acuta, longe decurrentia, apice longe acuminata, nova supra stellato-puberula, subtus stellato-tomentosa, adulta supra glabra vel, praecipue in nervis, singulis glandulis pilisque stellatis suffulta, subtus glabriuscula vel subtomentosa, eglandulosa reticulatione typica minute rugosiuscula; nervis secundariis utrinque 7—9; 14—18 cM. longa, 5—7½ cM. lata, petiolo 2½—4 cM. longo; *cymi* axillares, parvi, 2½—4½ cM. longi, 2—4 cM. diametro, pedunculo 2—2.7 cM. longo *calyx* dense stellato-puberulus, 5-dentatus; singulis glandulis squamisque vestitus, 0.2 cM. longus; *corolla* rubro-lilacinea, 0.5—0.6 cM. longa, tubo angusto, molliter pubescens, glandulis singulis aut nullis, lobis 5, extus pilis longis vestitis; *stamina* 5, longe exserta, 0.8 cM. longa; antheris ellipsoideis, sparse glandulosis, 0.1 cM. longis, 0.05 cM. latis; *stylus* 0.9 cM. longus, stigmatibus capitatus; *ovarium* glabrum eglandulosum, 5-loculare; loculi 2-ovulati; *fructus* ruber.

NEW-GUINEA: *Pulle* no. 261, near Kloofbivak, flow. on Oct. 31th, 1912. (Dutch N.-G.).

Our species has an affinity with *G. pentandra* with which it is conform, among other things, in the minute reticulation of the lower side of the leaves. Differences are the gradually, not abruptly decurrent base of its leaves, its less numerous nerves, its small cymes, its hairy corolla and its glabrous and eglandular ovary.

4. **G. Cumingiana** (*Schauer*) *Rolfe*, Journ. Linn. Soc., XXI, 315 (1884); *Koorders*, Meded. 's Lands Pl. tuin XIX, 559; *Merrill*, Phil. Journ. Sci. VII, 338 — *Callicarpa Cumingiana* *Schauer*, DC. Prodr. XI, 644, (1847);

Miquel, Fl. Ind. bat. II, 887. — A tree, 4—8 M. high, sometimes a large shrub, 2—3 M. high; branchlets, cymes and petioles densely floccose; *leaves* wide-oblong or ovate, entire or very minutely denticulated towards the apex, base cuneate, rounded or somewhat cordate, abruptly decurrent, apex subabruptly acuminate, pairs of nerves 7—9, upper side hirsute with dense intermixed simple and stellate hairs, with some scales and glands; nerves densely hairy, lower side densely stellate-tomentose or floccose, somewhat glandular, with some scales; 16—28 by 7—14 cM.; petioles 1—3 cM.; apex 1—3 cM.; *cymes* 8—13 cM.; peduncles 4½—6 cM.; bracts linear, 1 cM. long; *calyx* 4—5-toothed, hairy and glandular and with some scales, 0.1—0.2 cM.; *corolla* violet-blue, glabrous, as somewhat hairy on the lobes, 0.4—0.6 cM., 4—5-lobed; *stamens* 4—5, exerted, 0.9—1 cM., anthers twice as long as wide, glandular on both sides, especially on the backside; *style* 0.8—0.9 cM. with 4—5-lobed stigma; *ovary* conical, densely glandular; *fruits* red.

Var. α pentamera H. J. Lam, nov. var. — flores pentameri.

PHILIPPINE ISLANDS: Com. d.l. Fl. for. no. 844, Daraga.

NEW-GUINEA: *Gjellerup* no. 416a, 416b, 416c, Hollandia, 20 M. in alt., with flowers and young fruits on Dec. 31th, 1910; (in the same inflorescence 4- and 5-merous flowers: transition-form to var. β) — *Nyman* no. 52, Stephansort, flow. in Dec. 1898. — *Weinland*, A^o 1891, Kais.-Wilh.-land. in H. Ber. without nr.

Var. β tetramera H. J. Lam, nov. var. — flores tetramera.

PHILIPPINE ISLANDS: *Cuming* no. 1707. — *Robinson*, in H. L.—B. sub. no. 913.300—92, Basilan — *Elmer*, no. 13351, Cabadbaran (Mount Urdaneta), Agusan, Mindanao, flow. in July 1912.

NEW-GUINEA: *Ledermann* no. 12612a, Felsspitze, 1400 M., flow. on Aug. 4th, 1913; id. no. 9490, Etappenberg, 850 M.,

flow. on Oct. 24th, 1912. — *Wiesenthal* no. 12, Alexis-hafen, flow. on July 11th, 1912 (a large shrub). — *Schlechter* no. 16454, Kelel, 200 M. (a shrub). — *Gjellerup* no. 67^{a-e}, Hollandia, 10 M. in alt., flow. on April 28th, 1910. — *Lauterbach* no. 2027, Erima, flow. on May 6th, 1896; id. no. 3 (herb), flow. on May 1st, 1890; id. no. 972, Gogol-river, with flow. and young fruits in Nov. 1890; id. no. 1417, Finschhafen, fr. in Jan. 1891.

There are many specimens which form a transition-form between these two varieties, possessing 4- and 5-merous flowers on the same plant, branch, or even inflorescence. Such species among the *Geunsiæ* as this, might be that, which are especially in a period of active mutation, as mentioned on p. 30. As *Callicarpa pentandra* and *C. acuminatissima*, King and Gamble, Journ. As. Soc. Bengal LXXIV, 4, 801, suppose *C. Cumingiana* and *G. Cumingiana* to be identical with *G. farinosa*. It is evident that this is an error.

5. **G. hexandra** (*Teysmann et Binnendijk*) *Koorders*, Meded. 's Lands Pl. tuin XIX, 559 (1898); — *Callicarpa hexandra* *Teysmann et Binnendijk*, Ned. Tijdschr. Ned. Ind. XXV, 410 (1863). — A little tree; branchlets, cymes and petioles stellate-floccose, branchlets tetragonous; leaves oblong-ovate, base cuneate or obtuse-rotundate, very often unequal; upper side, adult, glabrous except on the nerves, lower side densely stellate-floccose-tomentose; subchartaceous; pairs of nerves 7—9; 11—22—24 by 5—11 cM.; petioles 1—3 cM.; apex 1—2 cM.; cymes 5½—10 cM. long, 4—7½ cM. wide; peduncles 3—5½ cM.; calyx 6—7-ribbed and -toothed; teeth abrupt, hairy and glandular; 0.3 cM.; corolla 6—7 lobed, softly pubescent, glandular, tube 0.6 cM., lobes 0.1 cM.; stamens (5—)6(—7), 1 cM.; anthers twice as long as wide, glandular on both sides, especially on the backside, 0.3 cM. long; style 1 cM. with capitate stigma; ovary glandular, 6-celled; cells 2-ovuled; fruit with 12 or—by abortion—less pyrenes.

CELEBES: *Reinwardt* no. 1528, Menado. — *Forsten*, in H. L.—B. sub nos. 908.267—731 and 732, near Likupang, flow. on Sept. 7th, 1840. — *Riedel* no. 5686.

6. **G. grandiflora**, *Hall f.* in *Med. 's Rijks Herb.* Leid. no. 37, 24. (1918) — A tree?; branchlets isophyllous, somewhat angular, with petioles and inflorescences densely stellate-ferruginous-pubescent; leaves alternate and subternate; ovate-lanceolate, long and gradually acutely acuminate at apex, base inequilateral, subrotundate, membranous; when adult glabrous above except on the rusty-villous midrib, minutely ferruginous-pubescent beneath, the indumentum being little distinct; 11—17 cM. long, $4\frac{1}{2}$ — $7\frac{1}{2}$ cM. broad; petioles, rather stout, $1\frac{1}{2}$ —2 cM.; cymes dichotomous; peduncles $2\frac{1}{2}$ cM.; bracts (1 — $1\frac{1}{2}$ cM. long) and bracteoles linear; calyx very shortly pedicelled, cup-shaped, 0.25 cM. long, with 5—6 small and acute teeth, densely ferruginous-tomentose without; corolla long-ovoid in bud, greyish and very minutely densely puberulous without, stellate-tomentose at tip, 0.5 cM.; lobes 5—6, obovate; stamens 5—6, few exerted; filaments minutely glandular below, anthers oblong, glandular on backside; style clavate, stigma capitate, lobed.

Distribution: S.-O.-Celebes.

7. **G. epiphytica** (*Elmer*) *H. J. Lam*, nov. comb. — *Callicarpa epiphytica* *Elmer*¹⁾, *Leaf. Phil. Bot.* VIII, 2871 (1915) — A shrub?; branchlets, cymes and petioles minutely brownish-stellate-tomentose; leaves oblong-lanceolate, oblong or sublanceolate, base cuneate or subacute sometimes truncate, apex acute or long-acuminate, char-

¹⁾ As some other, especially American and English authors use to do, *Elmer* is, in our opinion disapprovedly accustomed to use the English language for describing new species, instead of using Latin. According to the definitions of the botanical Congress, Brussels 1910, that all botanists should take for a rule, all those species, described in this way after 1912, properly should be declared not valid.

taceous or subcoriaceous: pairs of nerves 5—10; upper surface adult glabrous except on the midrib; lower surface densely minutely yellowish-brown-stellate-tomentose; 7—16½ by 2½—5½ cM.; petioles 1½—2½ cM.; apex 0—3½ cM.; *cymes* axillary, 7 cM. long, 5 cM. wide, peduncles 4—5 cM.; *calyx* with 6—8 minute teeth, densely stellate-tomentose, 0.3 cM. long and wide; *corolla* 6-lobed; tube 0.3 cM., lower part glabrous, upper part with the middle part of the lobes stellate-hairy and densely glandular; margins of lobes glabrous, imbricate; lobes 0.3 cM.; *stamens* 6, 0.9 cM. long; anthers twice as long as wide, glandular on both sides, denser on the backside; *style* 0.9 cM., with subpeltate stigma.; *ovary* narrowed towards the apex, glandular; *fruit* glandular.

Var. α typica H. J. Lam, nov. var. — *folia* oblonga, basi acuta vel truncata, apice acuta vel breviter acuminata, nervis secundariis utrinque 5—7; 7—13 cM. longa, 2½—5 cM. lata, petiolo 1½—2½ cM. longo, acumine 0—1½ cM. longo.

PHILIPPINE ISLANDS: *Elmer* no. 13822, Cabadbaran, (Mount Urdaneta), Agusan, Mindanao, flow. in Sept. 1912.

Var. β apiculata H. J. Lam, nov. var. — *folia* lanceolata vel lanceolato-oblonga, basi cuneata vel subtruncata, apice longe acuminata; nervis secundariis utrinque 7—10; 7½—16½ cM. longa, 2½—4.8 cM. lata; petiolo 1.7—2½ cM. longo; acumine 2—3½ cM. longo.

PHILIPPINE ISLANDS: *Elmer* no. 13861, same locality as var. α.

8. **G. flavida** (*Elmer*) H. J. Lam, nov. comb. — *Calli-carpa flavida* *Elmer*, Leaf. Phil. Bot. III, 863 (1910).

— A treelike shrub; branchlets somewhat tetragonus, with cymes and petioles minutely ferruginous-tomentose; *leaves* chartaceous or subcoriaceous, lanceolate-oblong, base cuneate, apex rather long acuminate; upper side, when young, stellate-hairy, adult glabrous except on the nerves,

which are ferruginously pubescent; lower side minutely ferruginous-tomentose; pairs of nerves 8—9; 8—17 $\frac{1}{2}$ by 3—5.2 cM.; petioles 1 $\frac{1}{2}$ —2 cM.; acumen 1 $\frac{1}{2}$ —3 $\frac{1}{2}$ cM.; *cymes* 5 $\frac{1}{2}$ —6 cM. long, 4 $\frac{1}{2}$ —5 $\frac{1}{2}$ cM. wide, peduncles 3—3 $\frac{1}{2}$ (—5) cM., bracts linear, 0.7 cM.; pedicels 0.2 cM.; *calyx* 0.25 cM., with 7 minute teeth, stellate-hairy, glandular; *corolla* blue, 0.5 cM., glandular, 7-lobed; *stamens* 7; *style* 0.7 cM. with capitate stigma; *ovary* glandular, stellate-hairy; *fruit* 0.5 cM. in diam., glandular, with some ferruginous, stellate hairs, red when ripe, with 7(?) pyrenes.

MINDANAO: *Elmer* no. 11851, Todaya (Mount Apo), Davao, fr. in Sept. 1909.

9. *G. cinnamomea* *Hall. f.* *Meded.* 's Rijk's Herb. Leiden no. 37, (1918). — A tree?; branchlets, petioles and cymes densely cinnamomeously stellate-farino-se; *leaves* in anisophyllous pairs and alternate, ovate or oblong-ovate, chartaceous or subcoriaceous; base subtruncate, apex usually abruptly acuminate, acumen narrow 1—1.5—3 cM. long; sometimes acute; margins entire; upper side brown stellate hairy when young, glabrous and dark when adult; lower side densely cinnamomeous or sometimes very dark-brown tomentose; pairs of nerves 6—8; 10 $\frac{1}{2}$ —20 cM. long, 4 $\frac{1}{2}$ —7 cM. broad; petioles 1—3 cM. long; *cymes* rather small, 4—5 cM. long, 3 $\frac{1}{2}$ —4 $\frac{1}{2}$ cM. in diam.; peduncles stout, 2—2 $\frac{1}{2}$ —3 $\frac{1}{2}$ cM. long; bracts linear, $\frac{1}{2}$ —1 cM. long; pedicels very short; *calyx* cup-shaped, densely yellowish or yellowy-ferruginously stellate-hairy, 5-toothed, 5-ribbed in the upper half, 0.25—0.3 cM. long, 0.2—0.25 cM. broad; *corolla*-tube 0.4—0.5 cM. long, with the lobes glandular-dotted, especially towards their ends, which usually bear some lax stellate hairs; lobes 5, 0.2 cM. long, 0.1 cM. wide; *stamens* 5, with long and narrow, 0.3 cM. long, on both sides glandular anthers, the filaments little exsert; *style* 0.8 cM., with capitate

stigma; ovary glabrous, with 5 lines of yellowish-white glands.

Distribution: S.-E.-Celebes (Kabaëna-isl.)!

This species shows a close resemblance with *G. flavida*, from which it is distinguishable by its 5-merous flowers and its glabrous ovary; also with *G. farinosa*, from which it differs by its dark tomentum, its somewhat smaller flowers and its always densely pubescent calyx.

10. *G. quaternifolia* Hall. f., Meded. 's Rijks Herb. Leiden, no. 37, 24, (1918). — A tree; branches plagiotropic, anisophyllous, the leaves pseudo-4-whorled, 3 leaves being equal and larger and 1 smaller; branchlets, cymes and petioles, minutely ferruginous- or brownish-puberulous, glabrescent; leaves membranous or chartaceous, broadly ovate; base broad, minutely and abruptly attenuate, apex shortly and abruptly acuminate; margins entire or minutely denticulate; pairs of nerves 10; upper surface glabrous, when adult, except on the nerves, lower one fulvous-tomentose; 8—20 cM. long, 4—10½ cM. broad, petioles 1—1.7 cM.; cymes 8—10 cM. in length, 7—7½ cM. in diam.; peduncles stout, 5—6 cM. long; bracts linear 0.5 cM.; pedicels hardly 0.1 cM.; calyx 5-denticulate, densely fulvous-stellate-tomentose, 0.15—0.2 cM. long; corolla-tube 0.4 cM. long, glabrous in the lower part, softly cinereous-puberulous in the upper part with the 5 lobes, which reach 0.1—0.15 cM. in length and in breadth; stamens 5, the filaments little exsert, anthers 0.35 cM. long, narrow, not glandular; style, rather as long as the stamens, 0.8 cM. with clavate stigma; ovary densely pubescent near the apex.

Distribution: E.—Borneo!

This species has an affinity with *G. homiophylla*, but differs from it by its broader leaves, its longer corolla-tube and its shorter lobes; also by its pubescent ovary; points of conformity are the softly pubescent corolla and the non-glandular anthers.

11. *G. farinosa* Blume, Cat. Gew. Buitzg., 48, (1823); id., Bijdr., 819; *Hooker, f.*, Fl. Br. Ind. IV, 566; *Hasskarl*, 2^e Cat. 's Lands Pl. tuin Btz., 136; *Koorders en Valetton*, Bijdr. Booms. Java no. 7, 173; iid., Atl. d. Baumart. Java II, 6, tab. 279. — *King and Gamble*, Journ. As. Soc. Bengal, LXXIV, 4, 800. — *Koorders*, Exk. fl. v. Java, III, 134; id., Plant. Jungh. ined., IV. Jungh. Gedenkb., 188; *Schumann u. Lauterbach*, Fl. D. Schutzgeb. Südsee, 521; *Schumann u. Hollrung*, Fl. Kais.-Wilh.-land, 119; *Stapf*, Transact. Linn. Soc. Bot. 2nd ser., IV, 215; *Warburg*, Engl. Jahrb., XII, 426. — A tree; branchlets, cymes and petioles brownish-stellate farinose; leaves ovate-oblong or oblong, often pseudo-ternate, especially towards the end of the branches, base acute, apex acute or subabruptly acuminate, chartaceous or subcoriaceous, margins entire or very minutely denticulate towards the apex, upper surface, when young, rather densely stellate-hairy, adult glabrous, eglandular, sometimes somewhat hairy on the nerves; lower surface densely and minutely brownish- or silvery white-stellate-tomentose, densely glandular; $12\frac{1}{2}$ —22 by 6—11 cM., petioles 2— $3\frac{1}{2}$ cM.; pairs of nerves 9—12; cymes 7—10 cM. long, 6—8 cM. wide, peduncles $2\frac{1}{2}$ —6 cM. long; calyx stellate-hairy, glandular, 5-toothed, 0.15 cM.; corolla violet, 5-lobed, glandular, glabrous, tube 0.5—0.6 cM.; lobes narrow, 0.15 cM.; stamens 5, 0.8 cM. long, anthers long and narrow, their length being five times their breadth, glandular on both sides, especially on the backside, 0.3 cM. long; style 1.1 cM., with capitate or somewhat 5-lobed stigma; ovary glandular, especially towards the top; fruit scarlet, somewhat glandular, with 10, or by abortion less, seeds.

Var. α typica H. J. Lam, nov. var. — *G. subternata* Hall. f., Med. 's Rijks Herb. Leiden no. 37, 25, (1918). — *Callicarpa affinis* Elmer Leaflet. Phil. Bot. III, 865 (1910) — *Callicarpa pentandra* Roxburgh, Fl. ind.

I, 395 (1832) pro parte; litt. see under *G. pentandra*—tomentum, foliorum subtus, ramulorum cymorumque luteo-brunneo-stellatum.

SUMATRA: *Forbes* no. 2769. Tandjong Ning, 200 M.

BORNEO: *Winkler* no. 2141. — *Korthals*, in H. L.—B. Sub no. 908.267—655, 908.265—1121, 1122 and 1123, etc., G. Sakumbang, Martapuro. — *Amdjah* no. 973, Sungei Oikung, 17—50 M. in alt. (*G. subternata* *Hall f.*), with fruits in Nov. 1912.

CELEBES: *Forsten* no. 12. — *Elbert* nos. 2690, Butonisl., Kambolosua, 0—100 M. in alt., flow. on 20-8-1909, and 2760, same isl., Lipumangan, 250—320 M., with buds on 22-8-1909; id. no. 3378, Kabaëna-isl., Eempuhu, Balo, 0—200 M., flow. on 26-10-1909.

PHILIPPINE ISLANDS: *Elmer* nos. 10856 and 11102 (*C. affinis*), Todaya (Mount Apo), Davao, Mindanao.

NEW-IRELAND (NEU-MECKLENBURG): *Peekel* no. 682; native name: tiptipinagut, flow. on Oct. 24th, 1910.

Var. β albida *H. J. Lam*, nov. var. — tomentum foliorum subtus, ramulorum cymorumque argenteo-albo-stellatum.

BORNEO: *Haviland* and *Hose*, no. 3553 E., Sarawak near Kuching, flow. in Nov. 1894.

Distribution of the species: Singapore, Malaya!, Philippine Islands!, New-Ireland!

We discovered specimina, which are a transition-form to *G. hexandra*, by their greater leaves and their somewhat hairy corolla. In connexion with our remarks on p. 30, it might be supposed, that *G. hexandra* is developing from *G. farinosa*. There are indications that 4-merous specimina occur, but we did not see such. They should form a *var. γ pentamera*.

12. *G. serrulata* *Hall. f.*, *Med. 's Rijks Herb. Leiden*, no. 37, 27, (1918). — *G. anisophylla* *Hall. f. l.c.*, 29. — A small tree; branchlets, petioles and inflorescences minutely yellowish farinose, glabrescent; leaves opposite and alternate, membranous or subchartaceous, ovate or ovate-

lanceolate, usually anisophyllous; base acute, apex shortly acuminate; margins entire in the basal part, usually irregularly serrulate or serrate in the apical one; upper side glabrous when adult, except on the nerves; lower one minutely yellowish-white or yellowish-brown tomentose; pairs of nerves 9—11; 9—16 $\frac{1}{2}$ by 4—9 cM.; petioles 2—2 $\frac{1}{2}$ cM. long; *cymes* 6—11 $\frac{1}{2}$ cM. long, 4—10 cM. in diam.; peduncles stout, 3 $\frac{1}{2}$ —6 cM. long; bracts small, linear; pedicels short; *calyx* obscurely 5-denticulate, always densely pubescent without (as the other parts of the plant with stellate hairs), 0.13—0.15 cM. long, cupuliform; *corolla* pulverulently puberulous and glandular without; tube 0.35 cM., lobes 5, 0.15 cM. long, 0.1 cM. broad; *stamens* 5; anthers long and narrow, 0.3 cM., glandular on both sides near the connective; *style* somewhat longer than the stamens, 0.8 cM.; stigma capitate; *ovary* glandular-dotted.

Distribution: W.-Borneo!

The species has an affinity with *G. farinosa*, but differs from it by its more distinctly serrulate leaves, its shorter corolla-tube, and its always densely pubescent calyx.

13. ***G. homiophylla*** Hall f., Med. 's Rijks Herb. Leiden. no. 37, 26, (1918). — A tree; branchlets, cymes and petioles, minutely yellowish farinose; *leaves* chartaceous, ovate or oblong-ovate; base broad, shortly and abruptly attenuate, apex acute or somewhat acuminate; margins entire; pairs of nerves 7—10; upper surface glabrous when adult, lower one rather laxly stellate-tomentose, subglabrate afterwards (as in *G. Pullei*); nerves pubescent on both sides; 8 $\frac{1}{2}$ —20 cM. long, 4—8 cM. broad; petioles 1 $\frac{1}{2}$ —3 cM. long; *cymes* rather small, 3—5 cM. long, 4—5 (—9) cM. in diam.; peduncles 1—2 $\frac{1}{2}$ —6 cM., usually longer than the petioles; bracts linear, 0.3—1.7 cM. long; pedicels 0.1—0.15 cM.; *calyx* cup-shaped, 0.15—0.2 cM. long, 0.15 cM. wide, obscurely

4-toothed, densely pubescent; *corolla*-tube 0.3—0.35 cM. long, glabrous in the lower part, softly pubescent in the upper one, especially on the midribs of the lobes; lobes 4, 0.2 cM. long, 0.1 cM. broad; *stamens* 4, with the long and narrow anthers (0.25—0.3 cM. long) 0.7—0.9 cM. long; anthers little or not glandular on their back-side; *style* 0.9 cM. with capitate or clavate stigma; *ovary* glabrous.

Distribution: W.-Borneo (Lombok—utan-isl.)!

It has a strong affinity with *G. Pullei*, from N.-Guinea, but is different in the shorter apex of the leaves, their abruptly attenuate (not acute) base, the 4-merous flowers, the shorter corolla-tube, the less hairy lobes, the long and narrow (not short and broad) anthers, which are 0.3 (not 0.1 cM.) long. It agrees with *G. Pullei* in the tomentum of the leaves, the pubescent corolla, and the glabrous ovary.

IX. CALLICARPA L. Gen. pl. n. 135 (1737); *Blume*, Bijdr. 817; *R. Brown*, Prodr. 513; *Benth.* and *v. Muell.*, Fl. Austr. V, 56; *Benth.* and *Hook.*, Gen. pl. II, 2, 1150; *Schauer*, DC., Prodr. XI, 640; *Engl.* u. *Prantl*, Nat. Pfl. fam. IV, 3a, 165; *Hook. f.*, Fl. Br. Ind. IV, 566; *Koord.* and *Val.* Bijdr. Booms. no. 7, 175; *King* and *Gamble*, Journ. As. Soc. Beng. LXXIV. 4, 802; *Miq.*, Fl. Ind. bat. II, 884; *Maxim.*, Bull. Ac. Imp. Sci. St. Pét., XXXI, 74; *Roxb.*, Fl. ind. I, 390. — Trees or shrubs, with a more or less dense stellate or simple tomentum; young parts and leaves often glandular-dotted beneath the tomentum; *leaves* opposite, never alternate, simple, petioled or sessile, margins usually crenate-serrate; *cymes* axillary, di- or trichotomous, shorter than the leaves; bracts small, linear; pedicels very short; flowers small; *calyx* campanulate, rarely tubular, truncate or minutely 4-, rarely 5-toothed, unaltered in fruit; *corolla* with short, nearly cylindrical tube, 4-, rarely

- b. Leaves $5\frac{1}{2}$ —8 by 2.2—4 cM.; petioles 0.5—1 cM.
6. C. Blancoi p. 58.
8. a. Proportion of length and breadth of the leaf = 2—3:1. 9.
 b. Proportion of length and breadth of the leaf = 4—7:1. 11.
9. a. Leaves longer than 15 cM. **28. C. lanata var β** p. 79.
 b. Leaves shorter than 10 cM. 10.
10. a. Leaves 2.3—6.5 by 0.8—2 cM.; petioles 0.2—0.5 cM.,
 more or less densely hairy above with simple hairs
7. C. micrantha p. 59.
 b. Leaves $5\frac{1}{2}$ — $9\frac{1}{2}$ by 2.2—4 cM.; petioles 0.7—1 cM.; with
 sparse simple hairs or glabrous above **6. C. Blancoi** p. 58.
11. a. Leaves 8—16 by 1.8—4.5 cM.; corolla 0.15—0.2 cM. 12.
 b. Leaves 15—30 by $2\frac{1}{2}$ —7 cM.; corolla 0.25—0.30 cM.
29. C. dolichophylla p. 82.
12. a. Leaves 1.8—5 cM. broad; petioles 0.3—1.5 cM.
8. C. caudata p. 59.
 b. Leaves 1—2 cM. broad; petioles 0.2—0.4 cM.
9. C. stenophylla p. 61.
13. a. Base of leaves cordate, rounded or obtuse. . . . 14.
 b. Base of leaves acute, cuneate or attenuate. . . . 21.
14. a. Corolla 0.5—0.6 cM. 15.
 b. Corolla 0.2—0.3 cM. 16.
15. a. Leaves entire, chartaceous, 5—9-nerved, $8\frac{1}{2}$ — $13\frac{1}{2}$ by
 4— $5\frac{1}{2}$ cM.; petioles 2— $2\frac{1}{2}$ cM.; elliptic, more or less
 long acuminate; corolla with simple hairs along 4 lines
10. C. subglandulosa p. 61.
 b. Leaves denticulate, subchartaceous-membranous, 12—14-
 nerved, 30 by 15—20 cM.; petioles 1— $3\frac{1}{2}$ cM.; broad-
 elliptic or rotundate; acumen short, abrupt; corolla
 pubescent on its whole surface, with simple hairs
11. C. ramiflora p. 62.
16. a. Margins of leaves entire or denticulate-serrulate or undu-
 late towards the apex only; leaves minutely, densely,
 stellately villous beneath, not floccose 17.
 b. Margins of leaves dentate-serrate, except near the base;
 leaves more or less densely stellately floccose beneath 18.
17. a. Corolla densely stellate-hairy without; lobes pubescent
 within **12. C. Maingayi** p. 63.

- b. Corolla glabrous without, lobes glabrous within
 13. *C. subalbida* p. 63.
18. a. Leaves 5—10 by 2.2—6 cM.; petioles 0.3—1 cM. . 19.
 b. Leaves 10—23 by 5—9 cM.; petioles 1—2½ cM. . 20.
19. a. } { 14. *C. ovata* p. 64.
 b. } { 6. *C. Blancoi* p. 58.
20. a. Proportion of length and breadth of the leaves =
 2½—3 : 1; leaves with 16—18 pairs of nerves
 15. *C. Reevesii* p. 65.
 b. Proportion of length and breadth of the leaves =
 1½—2 : 1; leaves with 5—6 pairs of nerves
 16. *C. denticulata* p. 65.
21. a. Leaves tomentose beneath, not, or indistinctly, floccose 22.
 b. Leaves glabrous or more or less floccose beneath 38.
22. a. Proportion of length and breadth of the leaves =
 4—6 : 1 23.
 b. Proportion of length and breadth of the leaves =
 1½—3 : 1 24.
23. a. } { 17. *C. angusta* p. 66.
 b. } { 18. *C. angustifolia* p. 66.
 c. } { 19. *C. rivularis* p. 67.
24. a. Corolla-lobes longer than the tube 20. *C. laciniata* p. 68.
 b. Corolla-lobes as long as or shorter than the tube . 25.
25. a. Corolla densely puberulous without 26.
 b. Corolla little puberulous or glabrous without . . . 30.
26. a. Peduncles ½—1 cM. 27.
 b. Peduncles 2½—8 cM. 28.
27. a. Leaves large, rotundate, 30 by 15—20 cM.; petioles
 1—3½ cM.; pairs of nerves 12—14; corolla puberulous
 on its whole surface 11. *C. ramiflora* p. 62.
 b. Leaves lanceolate or broadly oblong, 6½—18½ by
 3—10 cM.; petioles 1—2½ cM.; pairs of nerves 8—10;
 corolla with 4 lines of hairs
 21. *C. cana* var β and var ζ p. 68.
28. a. Corolla 0.2—0.3 cM. 29.
 b. Corolla 0.6—0.7 cM.; leaves 12—16 by 5—6 cM.;
 petioles 2—2½ cM.; flowers white
 22. *C. megalantha* p. 75.

29. a. Leaves entire, 5—10 by $2\frac{1}{2}$ —3.7 cM.; petioles 1.7—2.6 cM.; pairs of nerves 7—9; corolla with 4 lines of simple hairs; lobes glabrous within **23. C. longipetiolata** p. 75.
 b. Leaves entire or undulate, 15—30 by $7\frac{1}{2}$ —15 cM.; petioles 4—5 cM.; pairs of nerves 10—12; corolla with stellate hairs on its whole surface; lobes pubescent within
12. C. Maingayi p. 63.
30. a. Peduncles $\frac{1}{2}$ —2 cM. 31.
 b. Peduncles 2— $5\frac{1}{2}$ cM. 36.
31. a. Leaves 5-nerved, ovate or ovate-oblong, base and apex acute; margins crenulate except near the base
24. C. paucinervia p. 76.
 b. Leaves 7—10-nerved 32.
32. a. Leaves entire or serrulate towards the apex, minutely whitish tomentose beneath . **13. C. subalbida** p. 63.
 b. Leaves distinctly, sometimes coarsely dentate or serrate, except near base 33.
33. a. Leaves usually large, 9—26 by $3\frac{1}{2}$ —14 cM.; petioles 1— $3\frac{1}{2}$ cM.; coriaceous, usually more or less coarsely crenate or serrate; the whole plant rugosely ferruginous-woolly; leaves yellowy-brownish tomentose beneath
25. C. erioclona p. 76.
 b. Leaves smaller, or if as large, then membranous, never serrate, nor coarsely, but usually minutely denticulate-serrulate; the plant less rugose, not ferruginous . . 34.
34. a. Peduncles $\frac{1}{2}$ —1 cM.; leaves rather large, $7\frac{1}{2}$ —19 by $2\frac{1}{2}$ —11 cM.; petioles 0.3—1 cM.; the leaves never with simple hairs above
21. C. cana var. α , var. γ , var. δ p. 68.
 b. Peduncles 0.7—2 cM.; leaves smaller, $5\frac{1}{2}$ —10 by 1.2—6 cM.; petioles 0.3—1 cM.; sometimes with simple hairs above 35.
35. a. } **14. C. ovata** p. 64.
 b. } **6. C. Blancoi** p. 58.
36. a. Calyx truncate; leaves entire, coriaceous, with attenuate base **26. C. paloensis** p. 78.
 b. Calyx distinctly toothed; leaves denticulate, with acute or cuneate base 37.

37. a. Plant ferruginously pubescent; leaves 10—15 by 4—7 cM.; petioles 1 cM.; leaves ferruginous, pubescent beneath
27. *C. surigaensis* p. 79.
- b. Plant not ferruginously pubescent; leaves 16—34 by $6\frac{1}{2}$ —19 cM.; petioles 3—5 cM. 28. *C. lanata* p. 79.
38. a. Peduncles 3—8 cM. 39.
- b. Peduncles $1\frac{1}{2}$ —2 cM. 42.
39. a. Corolla glabrous without 40.
- b. Corolla pubescent without 41.
40. a. Leaves 18 by 6 cM.; petioles 2 cM.; pairs of nerves 9—11; plant hairy; calyx truncate, densely pubescent
26. *C. paloensis* p. 78.
- b. Leaves 15—30 by $2\frac{1}{2}$ —7 cM.; petioles 1— $2\frac{1}{2}$ cM.; pairs of nerves 13—16; plant subglabrous; calyx 4-toothed, subglabrous 29. *C. dolichophylla* p. 82.
41. a. Leaves with attenuate base, 12—16 by 5—6 cM.; petioles $2-2\frac{1}{2}$ cM.; colour of the lower side not determined by glands 22. *C. megalantha* p. 75.
- b. Leaves with more or less rounded base, $8\frac{1}{2}$ —15 by 4—7 cM.; petioles 2—3 cM.; colour of the lower side determined by numerous glands
10. *C. subglandulosa* p. 61.
42. a. Leaves entirely glabrous beneath 43.
- b. Leaves more or less pubescent beneath 49.
43. a. Peduncles $1\frac{1}{2}$ —2 cM.; cymes dichotomous; leaves $10\frac{1}{2}$ —17 by $4\frac{1}{2}$ —8 cM.; petioles $1\frac{1}{2}$ cM.
30. *C. glabra* p. 82.
- b. Peduncles 0— $1\frac{1}{2}$ cM.; cymes di- or trichotomous . 44.
44. a. Cymes sessile, cauliflorous; leaves 30—35 by 9—13 cM., petioles 1—2 cM.; pairs of nerves 14 31. *C. cauliflora* p. 83.
- b. Cymes peduncled, axillary; leaves reaching 18 cM. in length. 45.
45. a. Proportion of length and breadth of leaves = 4 : 1; plant entirely glabrous; leaves 4—6-nerved, 4—14 by $1-4\frac{1}{2}$ cM.; petioles 0.3—1 cM.; corolla 4-lobed down to the middle 32. *C. elegans* p. 83.
- b. Proportion of length and breadth of leaves = 2—3 : 1; corolla 4-lobed down to the middle or less deeply 46.

46. a. Leaves entire or rather coarsely crenate towards the apex; plant tomentose; corolla with 4 lines of hairs
 21. *C. cana* var. ζ , forma b p. 74.
 b. Leaves more or less coarsely dentate-serrate; plant scarcely pubescent or glabrous; corolla subglabrous . . . 47.
47. a. Proportion of length and breadth of leaves = 2 : 1; leaves rhomboid, entire near base, rather coarsely serrate for the rest, except along the abrupt apex; base rectangular; cymes often trichotomously branched
 33. *C. japonica* var. β p. 84.
 b. Proportion of length and breadth of leaves = 3 : 1; leaves lanceolate, with attenuate base 48.
48. a. Leaves $3\frac{1}{2}$ — $7\frac{1}{2}$ by 1.2—3 cM.; petioles 0.2—0.6 cM.; apex abrupt, entire; pairs of nerves 4—7; no scales on the lower side of the leaves . 34. *C. purpurea* p. 85.
 b. Leaves 7—18 by $2\frac{1}{2}$ — $6\frac{1}{2}$ cM.; petioles 0.7—2 cM.; apex acute; pairs of nerves 8—10; lower side of leaves with characteristic peltate scales
 35. *C. longifolia* var. α p. 86.
49. a. Calyx truncate or 4-toothed; ovary glabrous, often glandular 50.
 b. Calyx 5-toothed; ovary pubescent near the top
 36. *C. Horsfieldii* p. 91.
50. a. Proportion of length and breadth of leaves = 3 : 1 51.
 b. Proportion of length and breadth of leaves = 2 : 1 52.
51. a. Leaves $7\frac{1}{2}$ — $9\frac{1}{2}$ by 3— $3\frac{1}{2}$ cM.; petioles $\frac{1}{2}$ cM.; pairs of nerves 5—7; cymes 1.8 cM. long, 1.5 cM. in diam.; peduncles 0.3—1.2 cM. . . 37. *C. formosana* p. 91.
 b. Leaves 7—18 by $2\frac{1}{2}$ — $6\frac{1}{2}$ cM.; petioles 0.7—2 cM.; pairs of nerves 8—10; cymes $2\frac{1}{2}$ —4 cM. long, 5—7 cM. in diam.; peduncles 0.3—1.2 35. *C. longifolia* p. 86.
52. a. Leaves rotundate or subrotundate; base more or less abruptly attenuate 21. *C. cana* var. δ , var. ϵ , var. ζ p. 68.
 b. Leaves acute or obtuse at base and at apex; base never abruptly attenuate 53.
53. a. } } 14. *C. ovata* p. 64.
 b. } } 6. *C. Blancoi* p. 58.
- DOUBTFUL SPECIES: 38 *C. mollis* p. 92.

1. *C. Havilandii* (*King et Gamble*) *H. J. Lam*, nov. comb. — A tree?, branchlets, cymes and petioles densely tawny-stellate-pubescent; leaves opposite, chartaceous, ovate or ovate-oblong, base cuneate, entire, apex acuminate, margins denticulate, pairs of nerves 8–11, upper side, especially on the midrib densely rugose with simple hairs, lower side ferruginous-stellate-hairy, glandular, 6–15 cM. long, 4–6 cM. wide, petioles 1.0–1.7 cM.; cymes small, few-flowered, subsessile, $1\frac{1}{2}$ –2 cM. long, 3 cM. in diam., peduncles 0.3–0.5 cM.; calyx 4–5-toothed, teeth large, deltoid, densely stellate-hairy, glandular, 0.2 cM.; corolla glabrous, glandular, 4–5-lobed, 0.5 cM.; tube twice as long as the lobes; stamens 4–5, exserted, 0.6 cM.; anthers broad, on both sides, especially on the backside glandular; style 0.8 cM., with capitate or \pm 5-lobed stigma; ovary densely glandular, 4–5-lobed, 4–5-seeded, fruit with 4–5 one-seeded pyrenes.

Var. α tetramera *H. J. Lam*, nov. var. — flores tetrameri.

BORNEO: *Haviland* and *Hose* no. 3549 E., Sarawak near Kuching; with flow. and young fr. in Nov. 1894.

Var. β pentamera *H. J. Lam*, nov. var. — *Geunsia Havilandii* *King et Gamble*, *Kew Bull.* 1908, 105 and *Journ. As. Soc. Bengal LXXIV*, 4, 801 — ?*G. beccariana* *Briq.* nom. nud. in *Engl. u. Prantl.*, *Nat. Pfl. fam.* IV, 3a, 165 (1897); *King and Gamble*, l.c. 802. — flores pentameri.

BORNEO: *Haviland* no. 3549 K. and L., same locality. — *Beccari* no. 3240. — *Haviland* no. 889, near Kuching.

Without any doubt *King and Gamble's* species is a *Callicarpa* (only opposite leaves, leaves denticulate, cymes sessile, fruit with 4–5 (not 7–12) pyrenes). As in some other species of this genus there is a pentamerous form. (See observation at *Geunsia*, p. 30).

2. *C. basilanensis* *Merrill* in *Phil. Journ. Sci. Bot.* III. 263. (1908). — A little tree, 6 M.; young parts with

dense rust-coloured hairs; *leaves* opposite, oblong or ovate or elliptical-oblong, subcoriaceous, 25 cM. long, 12 cM. wide or less, petioles 1—2 cM., hairy, apex long caudate-acuminate, base rounded or acute, margins entire; upper side hirsute with simple hairs and papils, lower side rather densely stellate-tomentose; nerves on either side of the midrib 9—12; *cymes* densely stellate-tomentose, fasciculate, in the axils of fallen leaves, 2—2½ cM. long; *flowers* glabrous; *calyx* 0.3 cM. long, 0.25 cM. wide at the top, 4-toothed; *corolla* 0.7—0.8 cM. long with 4, sometimes 5 rounded lobes, each 0.3 cM. long; *stamens* 4, sometimes 5, filaments 0.5 cM., anthers 0.3—0.35 cM.; *stigma* ± 4-lobed; *fruit* globose, 0.5 cM. in diam. with 4 pyrenes.

Distribution: Basilan (Philippines).

This plant is nearly related to *Geunsia Cumingiana* var. β , e. g. by its sometimes 5-merous flowers.

3. *C. rubella* Lindley in Bot. Reg., t. 883, (1839)¹⁾; Schau., DC., Prodr. XI, 645; Elbert, Meded. 's Rijks-Herb. Leiden no. 12; Forbes et Hemsley, Fl. Sin. II, 254; Hook. f., Fl. Br. Ind. IV. 569; Kuntze Rev. Gen. Plant. I. 503; Maxim. Bull. d. l'Ac. Imp. d. Sc. de St. Pet. XXXI. 75; H. J. Lam in Hall. f., Med. 's Rijks Herb. no. 37, 34. — *C. sessilifolia* Wall. Cat. no. 1837 (1828). — *C. tenuiflora* Champ. ex Benth. in Hook. Kew Journ. V. 135 (1853). — ? *C. violacea* Korth. see: Korthals. Verband over de Natuurl. Gesch. der Ned. O. I. bezittingen 1839—'42. Botanie; nomen nudum? — An erect shrub or little tree; young parts and inflorescences with a thin woolly texture of stellate hairs; *leaves* with rather deeply cordate base, subsessile, from

¹⁾ We could not find the reason why *C. rubella* Lindl. should have the priority above *C. sessilifolia* Wall., but retained the first name, nevertheless, since we found that all authors use it.

the widest part near the base or, sometimes, near the middle of the leaf, gradually narrowing into the acuminate apex; margins minutely denticulate or serrulate; upper side hirsute with simple hairs, lower side stellate-tomentose; nerves, more densely hairy than the lamina, 10—12 on either side of the midrib; $6\frac{1}{2}$ — $18\frac{1}{2}$ by $1\frac{1}{2}$ —4.7 cM.; petioles 0.1—0.3 cM.; *cymes* globose, fasciculate, many-flowered, 1—3 cM. long and in diam.; peduncles 0.7—1.5 cM.; *calyx* 4-ribbed, 4-toothed, with long, simple hairs, glandular-dotted, 0.1 cM., pedicels 0.1 cM.; *corolla* softly hairy, especially on the outer side of the lobes, with little yellow glands, tube 0.2 cM., lobes 0.05 cM., rounded; *stamens* 4, exserted, 0.5 cM., anthers on both sides glandular; *style* 0.5 cM.; *stigma* \pm capitate; *ovary* with some glands; *fruit* globose, glabrous, 0.25—0.3 cM. in diam.

JAVA: *Elbert* no. 337. Resid. Madiun: Mt. Lawu, Sido Ramping, Gandang-Valley, 1300 M.; Nov. 1907 with fruits — *Junghuhn*, Ungarang, Medinie, north-slope, 1000—1600 M., native Java-name: Suren or Angro; in H. L.—B. sub nos. 908.267—1141; 908.267—1142; 908.267—1143.

SUMATRA: *Korthals* no. 5816.

BUTON-ISL. (CELEBES): *Elbert* no. 2814, Passar Wadjo, Coralreef, 0—100 M., 9 Nov. 1909 with fruits.

Distribution: British India, China.

Its affinity is, especially in regard with the flower, with *C. pedunculata*, but its leaves are always cordate, subsessile and narrower, whilst its cymes are smaller, fasciculate, not widely dichotomous as in *C. pedunculata*.

4. *C. lancifolia* *Merrill* in *Phil. Journ. Sc. Bot.* X, 70. (1915). — A shrub with stellate and sometimes plumose hairs on cymes and young branchlets; *leaves* lanceolate or narrowly oblong-lanceolate, chartaceous, base somewhat unequal, obtuse, apex long caudate-acuminate, 15—20 cM. long, 3—5 cM. wide; petioles 0.5—0.8 cM. long; margins

serrato-dentate with glands at the top of the teeth; upper surface with dispersed simple hairs, lower surface scarcely stellate-hairy, with some glands; pairs of nerves 10—11; cymes 2—4 cM.; flowers lilac, bracteoles linear; *calyx* with some simple hairs, hardly 4-toothed, 0.1 cM.; *corolla* glabrous, tube 0.2 cM., lobes 0.1 cM.; *stamens* little exerted, filaments 0.4 cM., anthers 0.05 cM.; *style* 0.55 cM., with thickened stigma.

Distribution; Mindoro (Phil. Isl.)

Its affinity is with *C. caudata*, from which it differs, however, by the obtuse base of the leaves, and in some other points.

5. *C. pedunculata* R. Brown, Prodr. 513, (1827); *Benth.* et v. *Muell.* Fl. Austr. V, 57; *Forbes*, Wander. eines Naturf. im Mal. Arch. II, 226; *Hook. f.*, Fl. Br. Ind. IV. 569; *King* and *Gamble*, Journ. As. Soc. Beng. LXXIV. 4, 807; *Koorders*, Exk. fl. von Java, III, 134; *K. Schum.* et *Lauterb.* Fl. d. Deutsch. Schutzgeb. i. d. Südsee, 522; *K. Schum.* et *Hollr.* Fl. v. Kais. Wilh.-land, 119; *Warb.* Engl. Jhrb. XIII. 426; *Hemsley*, Challenger Report. Botany. I. 110 and 176; *H. J. Lam.* in *Hall. f.*, Med. 's Rijks Herb. no. 37, 33. — *C. Cana* Wall. Cat. no. 1834, (1828), pro parte — *C. cuspidata* *Roxb.* Fl. ind. I. 394, (1832); *Hassk.* 2^o Cat. Buitenzorg, 136. — *C. dentata* *Roth.* Nov. Pl. sp. 81; (year?); *Blume*, Bijdr. 808; *Hassk.* l. c., 136 — *C. dentata* Wall. Cat. no. 6319 (1828) pro parte — *C. tiliaefolia* *Teysm.* et *Binnend.* ex *Clarke* in *Hook. f.*, Fl. Br. Ind. IV, 569, nomen nudum. — *C. lanata* *Vahl.* Symb. 3, 13. (1790—4); *Schauer*, DC. Prodr. XI, 644; *Miquel*, Fl. Ind. Bat. II, 886 and suppl. I, 243. — Shrubby, or sometimes a small tree. 2—6 M. high; innovations yellow-woolly with stellate hairs, as are cymes and petioles; *leaves* oblong-obovate, with rounded, truncate of somewhat cordate base and a rather long tapering apex; margins minutely serrate or somewhat crenate; membranous or subchartaceous;

upper side more or less hirsute with simple hairs; lower side more or less densely stellate-hairy, glandular-dotted; nerves, on both sides denser hairy, ± 10 on each side of the midrib; leaves $7\frac{1}{2}$ —17 cM. long, 3—6 cM. wide across the middle, petioles 0.5—0.7 (—1.4) cM. long, apex 2— $2\frac{1}{2}$ cM. long; *cymes* on slender peduncles, sometimes inserted a little above the leaf-axil, or 2 *cymes* in an axil; 4—5 cM. long, 3—6 cM. wide, peduncles 0.6—2.7 cM., generally 0.9—1.2 cM. long; flowers nearly sessile, light-violet; *calyx* with \pm dense prickly stellate hairs, and with glands or glanduliferous hairs, 4-toothed, 0.1 cM. long; *corolla* sparsely and softly hairy or almost glabrous, 0.2—0.25 cM.; *stamens* exerted; filaments 0.4 cM.; anthers glandular on both sides; *style* with capitate stigma, 0.5 cM.; *ovary* glabrous, except at the top, where it is somewhat hairy and glandular; *fruit* glabrous, 0.2—0.3 cM. in diam., light-violet or white.

JAVA: ex Herb. Hassk. in H. L.—B. sub no. 908.265—941, native name: Katumpang.

Var. α *typica* H. J. Lam, nov. var. — *folia* utrinque dense hirsuta; *calyx* dense pilis simplicibus tectus.

AMBOYNA: Karsten no. 3059, from Ambon imported into Buitenzorg and cultivated there sub signo XI. G. 48. — Forsten, in the woods, May 11th, 1842, with flow. and young fr., in H. L.—B. sub. nos. 908.266—1222 and 1223.

NEW-GUINEA: Gjellerup no. 1232, North-Dutch-New-Guinea, Arfak-mountains, Angimun, on deserted „ladang“¹⁾, on the shore of a lake, on stony soil, 1900 M., May 2nd, 1912 with flow. and young fr. — Lauterbach no. 2449, river A, camp II, 300 M., July 3rd, 1896, with flow. and young fr. — Rudolph no. 6. Simpsonhafen, at the border of the woods; also in alang-alang-fields; native name: a cibulit.

¹⁾ A „ladang“ is a place of primitive native cultivation.

NEW-BRITAIN (NEU-POMMERN): *Lauterbach* no. 207, Ralum; flow. in May — *Dahl*, Oct. 30th, 1896, flow.; Nord-tochter- and Uatom-islands.

NEW-IRELAND (NEU-MECKLENBURG): *Peekel* no. 61, Namatanai; native name: a tiptipinagut.

Var. β glandulosa H. J. Lam, nov. var. — *folia* angustiora, basi angustiori, latitudine majore supra medium, dentibus marginis minutioribus; *calyx* pilis longis glanduliferis vestitus.

CELEBES: *Forsten*, Tondano, May 1840, with buds, flow. and young fr., in H. L.—B. sub nos. 908.266—1226 and 1227.

NEW-GUINEA: *Hollrung* no. 210, Sattel-mountain near Finschhafen, July 1886, with flow. and young fr.

Var. γ glabriuscula H. J. Lam, nov. var. — *folia* supra pilis simplicibus sparsis, subtus pilis stellatis sparsis tecta, glandulosa; nervis utrinque densius pilosis; *calyce* minus dense pubescente.

JAVA: *Blume?* in H. L.—B. sub. no. 908.265—1115.

KEY-ISLANDS: *Hallier*, H. no. c. 121, from Key-Isl. imported into Buitenzorg and cultivated there sub signo XI. G. 49.

WETAR: *Elbert*, no. 4503. Mangowe, near Saiwerang, 600—800 M.; Febr. 19th, 1910, with fruits.

This variety has an affinity with *C. macrophylla*, with which some authors confound the species, by the form of its leaves, especially in regard with the base.

Var. δ psilocalyx H. J. Lam, nov. var. — *calyx* glaber vel margine singulis pilis suffultus, eglandulosus.

NEW-GUINEA: *Nyman* no. 580. Saedel-Mountain (= Sattel-Mountain?), 750 M. July 1899, flow. and young fr. — *Schultze* no. 194. (= *C. novoguineensis* Loes. ms. Augusta-river, Jan. 1913, flow.; also near Sepik-riv. Jan. 26th, 1910, flow. — *Schlechter* no. 16731, Hami-Mountains, in the woods, ± 800 M.; Oct. 27th, 1907, fr.

Distribution of the species: P. Penang, Malay Archipelago (Java!, Celebes!, Wetar!, Ambon!, Key-isl.!, Dutch-New-Guinea!, Kais.-W.-land), Bismarck-archipelago!, tropical Australia.

Its affinities are with *C. rubella*, *C. pilosissima* Max. (from Formosa), *C. caudata* and *C. macrophylla*. The leaves, however, never have a distinctly cordate base, as in *C. rubella*, are never as narrow as in *C. pilosissima* have never an acute or cuneate base as in *C. caudata*, nor are as long and wide as the leaves of *C. macrophylla*, which are coarsely dentate and have their greatest breadth near the base.

6. **C. Blancoi** Rolfe in Journ. Linn. Soc. XXI, 315, (1885); Elmer, Leaflet Philipp. Bot. III, 864; Merrill, Bur. of Gov. Lab. no. 27, 67 and Phil. Journ. Sc. Bot. I. suppl. I. 121. — *C. americana* Blco., Fl. Filip. ed. I, 517, (1837). — *C. bicolor* F.-Vill. in Blanco, Fl. Filip. ed. III. Nov. app. 158, (1845). — A shrub with tomentose texture on innovations, cymes and petioles; leaves opposite, membranous, ovate or oblong-ovate, base acute or somewhat rounded to truncate, margins more or less irregularly crenato-dentate; nerves, not very distinct, 7—9 pairs; $5\frac{1}{2}$ —9 cM. long, 2.2—5 cM. wide, petioles 0.5—1 cM.; texture varying on upper side, from stellate-hairy in youth, and glabrous when adult, to a covering with simple hairs, which are denser on the midrib and on lower side, from yellowy stellate-tomentose to almost glabrous; cymes on short peduncles, 1.3—2.5 cM. long and wide; peduncles 0.7—2 cM.; calyx 4-toothed, more or less stellate-hairy, glandular, 0.1 cM.; corolla glabrous with 4 short, glabrous or somewhat hairy, lobes, and 4 lines of little glands, 0.25—0.3 cM.; stamens exerted, anthers glandular on both sides, filaments 0.5 cM.; style 0.6 cM.; ovary glandular; fruits globose, 0.15—0.3 cM. in diam., glabrous.

? BANDA: *Teysman*, in H. L.—B. sub no. 908.265—307. (*C. angusta* det. Dr. Hasskarl).

LUZON: *Leonardo Lilles*; no. 42, near Lamao, Bataan. March, 1909, flow. — *C. B. Robinson*, no. 9695, Laguna, flow. just cast off on 2-II-1910.

MINDANAO: *Elmer* no. 10985, Todaya (Mt. Apo), Davao, June 1909, with fr. and flow.; id. no. 13441, Cabadbaran, Agusan, Aug. 1912, with fr. and flow.

Distrib.: Philippine Islands!, Banda. ?

The species has an affinity with *C. cana*, but the simple hairs sometimes present on the upper side of its leaves, and the peduncles, which are generally longer than the petioles, form differences, which, with the different form of the leaves, separate it from that species.

7. *C. micrantha* *Vid.* Phan. Cum. Phil., 187, (year?). — A shrub?; branchlets slender, round, with cymes and inflorescences stellately farinose or tomentose; *leaves* ovate-lanceolate or lanceolate, chartaceous; base acute, apex acutely acuminate, margins serrate, except close near the base; upper side more or less densely pubescent with simple hairs, lower one stellate-tomentose, glandular; pairs of nerves 6—8; 6 cM. long, 2 cM. wide; petioles 0.4 cM.; *cymes* small, 2 cM. long; peduncles $\frac{1}{2}$ —1 cM.; *calyx* somewhat stellate-pubescent, glandular; 0.1—0.15 cM. long; with 4 subacute, deltoid teeth; *corolla* with 4 lines of glands along the midrib of the lobes and on the tube, sparsely pubescent, 0.3 cM. long; lobes 0.1—0.15 cM.; *stamens* exsert, 0.4—0.45 cM.; anthers densely glandular on both sides, ellipsoid; *style* 0.55 cM., with capitate stigma; *ovary* densely glandular on upper half, the lower one glabrous.

? TIMOR: *Teysmann*, H. Bog. no. 8942, Tanini.

PHILIPPINES: *Cuming* in H. L.—B. sub no. 908.158—383, Luzon — Com. d. 1. fl. for. d. Fil. no. 1641, Abra.

The doubtful specimen: *Korthals* in H. L.—B. sub. no. 908.265—958, gives no locality.

8. *C. caudata* *Maximowicz.*, in Bull. de l'Acad. des Sc.

de St. Pét. XXXI, 76 (1887); *Elmer*. Leaf. Phil. Bot. III, 862; *Merrill and Merritt*, Phil. Journ. Sc. Bot. V. 380. — A shrub with whitish yellow floccose or tomentose texture on its young parts, cymes and petioles; leaves narrowly lanceolate, at both ends gradually narrowing, with acute base and a long tapering apex, membranous; margins minutely denticulate; pairs of not distinct nerves 8–9; $8\frac{1}{2}$ – $17\frac{1}{2}$ by 1.8–5 cM.; petioles 0.3–1.5 cM.; upper surface with more or less dense simple hairs; lower surface more or less densely stellate-hairy, sometimes with simple hairs; on both sides many reddish yellow glands, the hairs denser on the nerves; some little scales on the lower side; cymes globose, many-flowered, fasciculate, 2–5 cM. long, 1.2–6 cM. in diam.; peduncles 0.5–1.5 cM.; calyx with long simple hairs, many glanduliferous hairs and some large scales, sometimes glabrous; glandular-dotted, 4-toothed, 0.075 cM.; corolla with some simple hairs and some glands, 0.15 cM.; stamens little exerted; ovary with four broad lines of glands.

Var. α typica H. J. Lam, nov. var. — folia minora, 10 cM. longa, 1.8 cM. lata, petiolo 0.5 cM. longo; utrinque dense puberula, subtus stellato-tomentosa; cymi 1.2 cM. diam., pedunculo 0.5 cM. longo; calyx dense pilosus pilis simplicibus, pilis glanduliferis, squamis singulis.

Distribution: Philippines (*Max.*)

Var. β magna H. J. Lam, nov. var. — folia cum eis var. α conformia, sed dimensionibus differentia, $8\frac{1}{2}$ –16 cM. longa, $2\frac{1}{2}$ – $4\frac{1}{2}$ cM. lata, petiolo 0.3–0.7 cM. longo; cymis usque ad $3\frac{1}{2}$ cM. longi, pedunculis 0.5–1.5 cM. longis.

MINDANAO: *Elmer* no. 11333, Todaya (Mt. Apo), Davao. Aug. 1909, with fr.

LUZON: *Elmer* no. 8646, Baguio, Benguet, March 1907, with buds. — *Curran, Merritt and Zschokke*, no. 18127, Mt. Pulog, Benguet, Jan. 1909 — Com. d. l. Fl. for. d. Fil. no. 1643, Benguet; id. no. 1644, Lepanto.

Var. γ. glabriuscula H. J. Lam, nov. var. — *ramuli* glabriusculi; *folia* quam in var. *β* angustiora, 12—17½ cM. longa, 2.3—4(—5) cM. lata, petiolo ½—1½ cM. longo, supra interdum, subtus semper glabriuscula; utrinque glanduloso-punctata; *cymi* majores 3½—5 cM. longi, 4—6½ cM. diametro, pedunculo 1½ cM. longo; *calyx* glaber.

PHILIPPINE ISLANDS: Cuming no. 1330, Cagayan, Luzon.

Var. δ simplicipuberula H. J. Lam, nov. var. — *folia* vix denticulata, subtus pilis simplicibus vestita.

NEGROS: Merrill no. 10375, Dumaguete (Cuernos Mounts), Negros oriental, June 1908, with young fruits.

Distribution of the species: Philippine Islands!

9. *C. stenophylla* Merrill, Phil. Journ. Sci. Bot. V, 380, (1910). — A shrub, 3—4 M. high; branchlets, cymes and petioles densely stellate-tomentose; *leaves* narrow-lanceolate, membranous or chartaceous, base acute, apex gradually and long acuminate, margins denticulate; upper side subglabrous or with sparse, simple hairs, lower one densely stellate-hairy; pairs of nerves 9; 7—15 cM. long, 1—2 cM. broad; petioles 0.2—0.4 cM.; *cymes* 2 cM. long, 2—2½ cM. in diam.; pedicels very short; bracts subulate, 0.3 cM. long, bracteoles 0.1 cM.; *calyx* subglabrous, 0.1 cM., obscurely quadrangular, 4-toothed; *corolla* 0.2 cM., subequally 4-lobed; lobes rounded, 0.04 cM.; *filaments* 0.3 cM., exsert; anthers 0.03 cM.; *drupe* globose, 0.15 cM., pink.

Distribution: Luzon.

This species seems to have — according to the description, since we could not examine any specimen of it — a close affinity with our *γ*-variety of *C. caudata*, or even to be identical with it. According to Merrill it has, however, less hairy and narrower and longer leaves.

10. *C. subglandulosa* Elmer in Leaflet Phil. Bot. II, 513. (1908) — A tree, 6 M. high or more, with yellowy-

brown farinose texture on branchlets, petioles and cymes, glabrescent; *leaves* oblong or oblong-ovate, with subtruncate or subcuneate base, and a rather long, somewhat abruptly acuminate apex; margins entire; 8.5—13.5 cM. by 4—5½ cM.; petioles 2—2.5 cM.; apex 1.5 cM.; lamina chartaceous, upper side glabrous, or, when young, with some stellate hairs; with sparse glands, and stellate-pubescent midrib; lower side with dense masses of yellow glands, determining the colour of this side of the leaf; moreover with some stellate hairs and some scales; *cymes* large, 10—16(—20) cM. long, 7.5—10(—12) cM. wide, peduncles stout, 6—8 cM. long; *calyx* 4-ribbed, 4-toothed, glandular-dotted, sparsely, the ribs densely stellate-hairy with intermixed simple hairs, 0.15—0.2 cM. long; *corolla*-tube glabrous on lower part, upper one with the lobes, glandular-dotted and with 4 narrow lines of dense, simple hairs; tube 0.35—0.4, lobes 0.1 cM.; *stamens* exerted, filaments 0.8 cM., anthers glandular on both sides; *style* 1 cM. with capitate stigma; upper half of *ovary* glandular.

NEGROS: *Elmer* no. 9739; Dumaguete (Cuernos Mounts), Negros oriental; flow. April 1908.

After *Elmer's* description the calyx should have 0.3, the corolla 0.6 cM. The latter should be glabrous, moreover. This is, as we think, either a mistake or an inaccuracy or incompleteness.

11. **C. ramiflora** Merrill in Phil. Journ. Sci. Bot. III, 262, (1908) — A small tree, 5 M. high; branchlets, petioles and cymes ferruginous-floccose; *leaves* broadly ovate or rotundate, base rounded, apex somewhat abruptly acuminate; margins, except near the base, crenate-denticulate; pairs of nerves 12—14; lamina subchartaceous, upper side adult glabrous, nerves hairy, lower side more or less stellate-hairy; 30 cM. by 15—20 cM.; petioles 1—3½ cM., stout; *cymes* small, fasciculate, in the axils of branchlets or of fallen leaves, (pseudo-)cauliflorous, 1—1½ cM. long;

peduncles 0.3 cM.; *calyx* somewhat tubular, densely simple-hairy and glandular, and with some scales, 0.4 cM., 4-toothed; *corolla* white; tube glabrous in lower part, upper part with lobes densely simple-hairy and glandular, 0.5 cM.; *stamens* with glandular-dotted anthers; *style* 0.6 cM., with distinctly 4-lobed stigma.

LEYTE (PHIL. ISL.): *Ramos* no. 15278, Dagana, flow. in Aug. 1912.

Distribution: Mindanao.

12. **C. Maingayi** King et Gamble in Kew Bull. 1908, 106; *iid.*, Journ. As. Soc. Bengal, LXXIV, 4, 804. — A tree; young branches and cymes with a gold-yellow texture of little stellate hairs, obtusely quadrangular; *leaves* coriaceous, elliptic or elliptical-obovate, base rounded or subcuneate, unequal, apex rounded or shortly acuminate, margins subentire or subundulate; 15—30 by $7\frac{1}{2}$ —15 cM.; petioles 4—5 cM.; upper side glabrous except on the midrib; lower side with little gold-yellow hairs; pairs of nerves 10—12; *cymes* globose, many-flowered, stout, 8—9 cM. long by 15 cM. wide; peduncles 2.5—4 cM.; pedicels 0.1—0.25 cM.; *calyx* hemispherical, 4-denticulate, stellate-hairy; 0.1—0.15 cM.; *corolla*-tube 0.1—0.15 cM., lobes 0.1 cM.; outer side very densely stellate-tomentose, inner side of lobes villous; *stamens* with filaments 0.45 cM. long, anthers glandular on backside; *style* with capitate stigma; *ovary* hairy; *drupe* black, 0.15 cM. in diam.

Distribution: Malay Peninsula.

13. **C. subalbida** Elmer in Leaflet. Phil. Bot. I, 337, (1908). — A shrub; branchlets, petioles and cymes minutely grey-tomentose, *leaves* chartaceous, oblong or elliptical-oblong or broader and then ovate, base cuneate or somewhat rounded, apex long acuminate or acute, margins entire or somewhat denticulate towards the top; upper side glabrous, lower side with a silvery covering of minute, stellate hairs; 11—16 (—20) cM. long and 4.3—6.7 cM.

wide and then with 7—9 pairs of nerves, or 17—25 cM. long and 8—12 cM. wide and with 13 pairs of nerves; petioles 1—1.7, in the larger leaves 3—4 cM.; *cymes* 4 cM. long, 6 cM. in diam., in the axils of the upper leaves; peduncles 1 cM.; flowers in little woolly clusters, 3—5 together, with a indumentum of small, unequal bracts; *calyx* glandular-dotted, somewhat hairy, hardly 4-toothed, 0.1—0.2 cM.; *corolla* glabrous, tube only a little longer than the calyx, 0.2 cM.; lobes 0.1 cM.; outer side with little glands; *stamens* little exerted, 0.35 cM.; *style* 0.4 cM., with peltate stigma; *ovary* densely with yellow glands in upper half, lower half glabrous; *fruit* glabrous, 0.2 cM. in diam.

LUZON: *Elmer* no. 9184, Lucban, Tayabas; with flow. and young fr. in May 1907.

POLILLO: *McGregor* no. 10269, with buds in Oct.—Nov. 1909.

Distribution: Philippine Islands!

This species seems to have a close affinity with the γ -repana-variety of *C. erioclona*.

14. *C. ovata* *C. B. Robinson*, Phil. Journ. Sci. Bot. III, 215. (1908). — A shrub, 2 M. high; branchlets, cymes and petioles densely ferruginous stellate-tomentose, glabrescent; *leaves* opposite, membranous, ovate-elliptic; base subrotundate, apex acutely or obtusely acuminate; margins serrate except near the base; upper side little, lower one denser stellate-hairy; nerves 8—10; $5\frac{1}{2}$ —10 cM. long, 3—6 cM. broad; petioles 0.3—0.5 cM.; *cymes* $1\frac{1}{2}$ —2 cM.; peduncles 0.5—1.1 cM.; pedicels 0.2—0.4 cM.; bracts 0.7—0.8 cM.; *calyx* with 4 somewhat unequal lobes; 0.09—0.12 cM. long; *corolla* pink, 0.23—0.25 cM.; tube 0.12—0.16 cM.; lobes 4, 0.1 cM. broad; *stamens* 4, 0.27—0.3 cM. long; anthers 0.07 cM.; *style* 0.5—0.6 cM., with 4-lobed stigma; *ovary* globose, 0.05 cM.; *drupe* glabrous, 0.25 cM.

Distribution: Mindanao.

We did not see any specimen of this species, but the description gives rise to the supposition that it may be identical with *C. Blancoi*.

15. *C. Reevesii* Wall., Cat. no. 1830, (1828); *Hook. f.*, Fl. Br. Ind. IV, 568; *King and Gamble*, Journ. As. Soc. Bengal, LXXIV, 4, 805; *Maximowicz*, Bull. Ac. St. Pét. XXXI, 75; *Schauer, Dc.*, Prodr. XI, 641. — A shrub with grey-floccose texture on branchlets, cymes and petioles; leaves coriaceous (better chartaceous, in some cases even subchartaceous), oblong-lanceolate, base narrow but rounded or obtuse, entire, apex very long acuminate, margins of the upper half of the leaf minutely dentate-serrate; lamina, upper side glabrous, dark, nerves white with hairs, lower side yellow-white-hairy or stellate-tomentose; pairs of nerves 16—18; 10—23 cM. by 4—7½ cM.; petioles 0.8—2.5 cM.; cymes 7—13 cM. long, 6—7 cM. wide; peduncles longer than the petioles, 4—7 cM.; calyx very short, 0.13 cM., glabrous, glandular-dotted, somewhat 4-ribbed, hardly 4-toothed; corolla glabrous, with glands, 0.25 cM.; stamens long exserted, anthers with glandular-dotted connectives; ovary glandular; style very long, with peltate stigma.

SINGAPORE, cultivated. (*King and Gamble*).

Distribution: Tenerassim? and S.-China. (*Hook f.*).

Its affinity is with *C. pedunculata*, with the var. β of which its leaves are pretty much conform, but from which it is very different in the covering of the upper side of the leaves, the number of nerve-pairs, and other distinct points; also with *C. macrophylla*, *C. caudata* and *C. pilosissima*, from which species, however, it is distinctly different.

16. *C. denticulata* Merrill in Phil. Journ. Sci. Bot. III, 430, (1909). — A shrub or small tree, 2—3 M. high; branchlets and cymes densely stellate-hairy and plumose; leaves submembranous, ovate or broadly elliptical; base acute or rounded, sometimes somewhat cordate, apex

shortly acuminate, margins dentate; upper side of lamina adult glabrous or with some stellate-hairs on nerves, lower side stellate-hairy, densely glandular-dotted; pairs of nerves 5–6; 10–15 by 5–9 cM.; petioles densely stellate-hairy, adult glabrescent, 1–1½ cM.; *cymes* in the axils of the upper leaves, 5 cM. long or less; *calyx* hardly 4-toothed, with some stellate hairs and glands, 0.15 cM.; *corolla* sparsely hairy and glandular, 0.4 cM., lilac; *stamens* long exserted, 0.6 cM. with glandular anthers; *ovary* somewhat depressed; *style* 1 cM.; *fruit* globose, 0.3 cM. in diam.

Distribution: Batan, So Domingo de Basco, Camaguin.

Its habit reminds us that of a *Premna*.

17. **C. angusta** Schauer, DC., Prodr. XI, 642, (1847); Miquel, Fl. Ind. Bat. II, 889; Merrill, Phil. Journ. Sci. Bot., VII, 341. — A shrub?; branchlets, cymes and petioles white-stellate-tomentose; leaves membranous, lanceolate, base and apex acuminate, margins minutely denticulate; upper side, (when young?) somewhat farinose, (adult glabrous?) lower side stellate-tomentose; 7½–18 by 1.7–4 cM.; petioles 0.7–1.8 cM.; *cymes* lax, peduncles as long as petioles; *calyx* obscurely 4-toothed, 0.2 cM.; *corolla* hairy, 0.4 cM.; *stamens* and *style* long exserted.

Var. α *typica* H. J. Lam, nov. var. — *folia* minora, 7½–10 cM. longa, 1.8–2 cM. lata, petiolo 0.4–1 cM. longo.

? LUZON: Com. d. l. Fl. for. d. Fil. no. 425.

Var. β . *longifolia* H. J. Lam, nov. var. — *folia* majora, 9–18 cM. longa, 1.7–4 cM. lata, petiolo 0.8–1.8 cM. longo, nervis utrinque multis, obscuris.

PALAWAN: Foxworthy, no. 660, with fr. in March 1906.

Distribution of the species: Philippines.

18. **C. angustifolia** King et Gamble in Kew. Bull. 1908, 106; *ibid.*, Journ. As. Soc. Bengal LXXIV, 4, 804. — A shrub; branchlets, inflorescences and petioles with a

greyish or ferruginous, appressed tomentum of stellate hairs; branchlets obtusely quadrangular; *leaves* subcoriaceous, lanceolate, base long attenuate, apex acute-attenuate; upper side glabrous, lower one densely greyish tomentose; margins entire or very obscurely denticulate; pairs of nerves 9—15, irregular; 10—18 by 2—4 cM.; petioles 1.25—2 cM.; *cymes* few-flowered, 1.3—2 cM. long, 2 cM. in diam.; peduncles 0.6—0.8 cM., flowers bluish red; *calyx* campanulate, 0.2 cM.; mucronulate, densely stellate-tomentose without; *corolla* twice as long as the calyx, densely stellate-tomentose without; *stamens* hardly exerted; filaments 0.4 cM.; anthers oblong, glandular-dotted on both sides; *ovary* villous; stigma capitate; *drupe* glabrous, 0.25 cM. in diam.

Distribution: Malay Peninsula.

The species has a close affinity with *C. angusta* var. β , and perhaps it will appear that it is synonymous with it. But it seems to differ from it by the pubescent corolla and the hardly denticulate leaves.

19. *C. rivularis* Merr. Phil. Journ. Sci. Bot. VII, 340, (1912). — A shrub; branchlets slender, with inflorescences and petioles densely yellowy-white stellately tomentose; *leaves* lanceolate, chartaceous, acute at base and at apex; margins entire towards the base, serrate towards the top; upper surface glabrous, lower one densely whitish-tomentose; pairs of nerves 9; 10—18 cM. long, $1\frac{1}{2}$ — $3\frac{1}{2}$ cM. broad; petioles 1 cM.; *cymes* axillary, 3 cM. in diam.; peduncles as long as petioles; *calyx* 0.2 cM., 4-toothed, densely stellate-hairy without; *corolla* white, 0.3 cM., 4-lobed, somewhat puberulous without; *anthers* 0.13 cM., glandular on the backside; *drupe* glabrous, 0.3 cM.

Distribution: Palawan.

In the description we could not discover any point of difference with our β -variety of *C. angusta*, to which species it is related, according to Merrill, but different in the tomentum of

the lower surface of the leaves, the longer anthers, and the larger leaves. But as we did not examine any specimen, we could not give a final decision in the above-mentioned matter.

20. *C. laciniata* H. J. Lam, nov. spec. — Frutex? ramuli cum cymis luteo-griseo-tomentosi; folia membranacea vel subchartacea, ovata vel ovato-elliptica, basi abrupte in petiolum descendente, apice abrupte longeque acuminata, margine praeter basin grosse et irregulariter dentato-serrata, supra stellato-puberula, adulta praeter nervos glabra, subtus griseo-tomentella, 11—12 cM. longa, 6—7 cM. lata, petiolo $1\frac{1}{2}$ —2 cM. longo; cymi petiolum aequantes, hemisphaerici, 2 cM. diametro, pedunculo 0.5 cM. longo; calyx dense albo-tomentosus, distincte 4-dentatus, dentibus deltoideis; 0.2 cM. longus; corolla glabra, tubo brevi, 0.1 cM. longo, laciniis spathulatis, basi angustatis, 0.3 cM. longis; genitalia exserta.

TIMOR: ex. herb. mus. Paris from Decaisne? in H. L.-B. sub no. 908.265—1435.

This curious *Callicarpa* has in its habit a close affinity with *C. cana*, especially with the var. δ latifolia of that species. Its is, however, characterized by the exceptionnally long corolla-lobes, which is a unicum in *Callicarpa*. Perhaps it is a aberrant form of *C. cana*. We separate it from this species, however, as long as there is no indication that it is an abnormal form of it.

21. *C. cana* L. Mant. II, 198 (1767); Blume, Bijdr. 817; Benth. et v. Muell., Fl. Austr. V, 56; Williams, Bull. Herb. Boiss. sér. II, V, 430; Schauer, DC., Prodr. XI, 643; Decne., Nouv. Ann. Mus. Par. III, 401; Elbert, Med. 's Rijks Herb. Leid. no. 12, 15; Forbes et Hemsley, Fl. sin. II, 252; Forbes, Wand. Nat. f. Mal. Arch., II, 226; Hook. f., Fl. Br. Ind., IV, 568; King and Gamble, Journ. As. Soc. Beng. LXXIV, 4, 806; Koorders, Exk. fl. v. Java, III, 134; Bot. Mag. t. 2107 (certainly this is not var. α ; perhaps var. β ?; see Benth. et v. Muell. l.c.);

Hook., Comp. Bot. Mag. I, 349; *Miquel*, Fl. Ind. bat. II, 885 and suppl. I, 243 and 569; *H. J. Lam*, in *Hall. f.*, Med. 's Rijks Herb. Leid. no. 37, 32; *Roxb.* Fl. ind. I, 392; *K. Schum.* u. *Lauterb.*, Fl. D. Südsee, 522; *Spanoghe*, Linnæa XV, 330; *Warb.*, Engl. Jhrb. XIII, 426; *Hassk.*, 2e Cat. 's Lands Pl. tuin Buitenz., 136; *Hemsley*, Chall. Report, Bot. I, 110 and 176. — *C. adenantha* *R. Br.* Prodr., 513 (1827) — *C. americana* *Lour.* Fl. Cochinch. 70 (1790); Bot. Mag. t. 2107 — *C. bicolor* *Juss.*, Ann. Mus. Par. VII, 77 (1806); *Schau. DC.*, Prodr. XI, 642; *Koord. Med.* 's Lands Pl. tuin Btz. XIX, 558; *Miq.* Fl. Ind. bat., II, 889; *Merrill*, Phil. J. Sci. Bot. I, suppl. I, 121 — *C. dentata* *Roxb.* ex *Wall.* cat. no. 1834 (1828) — ? *C. macrocarpa* *Rænsch.*, Nom. ed. III, 37 (1797) — *C. Rheedii* *Kostel.* Allg. Med.-Pharm. Fl., III, 829 (1836) — *C. sinensis* *Hort.* ex *Steud.* Nom. ed. II, I, 217 (1841) — *C. tomentosa* *Lam.* Enc. I, 562 (1783) — A shrub; young parts white-yellow-brownish tomentose; leaves very variable in form, ovate-lanceolate or lanceolate or broadly oblong ovate-rotundate, often subsquarish, base long decurrent, entire, apex shortly acuminate, sometimes rounded; margins (sometimes coarsely and irregularly) serrate-dentate; when young, stellate-pubescent above, adult glabrous except on the nerves, yellowish or whitish, more or less densely stellate-tomentose (sometimes subglabrous) beneath, glandular beneath the tomentum; pairs of nerves 6—10; 7—19 by $2\frac{1}{2}$ —11 cM.; petioles 0.6—3 cM.; cymes (as are petioles) stellate-tomentose, globose, 2— $3\frac{1}{2}$ cM. long and in diam.; peduncles, always shorter than the petioles, 0.5—1 cM.; calyx with dense stellate hairs and glands, more or less distinctly 4-, very rarely 5-toothed, 0.15 cM.; corolla glabrous or lobes more or less hairy, always glandular (in four narrow lines along the lobes), 0.3 cM.; lobes 0.1 cM.; stamens with glandular anthers, 0.35—0.4 cM.; style 0.4—0.5 cM. with funnel-

shaped or shortly bifid stigma; *ovary* globose, glandular; *fruit* globose, 0.2 cM. in diam., glabrous.

Var. α typica H. J. Lam, nov. var. — *C. Heynii* Roth. Nov. Pl. sp. 82, (year?); *Blume*, Bijdr., 819; *Spanoghe*, Linnæa XV, 330; *Zollinger* u. *Moritz*, Syst. Verz., 53 — *C. latifolia* Zippel, partly (nomen nudum) — *folia* membranacea vel subchartacea, late ovata vel ovato-rotundata usque ad subtetragona, basi in petiolum decurrentia, apice breviter acuminata vel interdum obtusa, adulta supra glabra, subtus dense albido-stellato-tomentosa, basi integra, ceterum serrata, nervis secundariis utrinque circiter 10; 7—14 cM. longo, $4\frac{1}{2}$ —8 cM. lata, petiolo 0.6—2.8 cM. longo.

JAVA: *Elbert* no. 20467, Kendeng Trinil, Madiun — *Mousset* no. 1055, Klanrang, 600 M. — *Korthals* no. 580, Krawang. — *Ploem*, Preanger in H. L.-B. sub. no. 909.25—329. — *Forbes* no. 1252 — *Zollinger* no. 157 — *Junghuhn* no. 108, Weltevreden — *Waitz* in H. L.-B. sub. no. 908.266—1230: etc.

Native names: mamanirang (mal.), manieran (jav.), katum-pang.

NUSA KAMBANGAN: *Junghuhn* in H. L.-B. sub. no. 908.265—380 — *de Vriese* in H. L.-B. sub. no. 908.265—1459.

TIMOR: *Zippel*, in H. L.-B. sub. no. 908.265—1436.

LOMBOK: *Elbert*, no. 2409, Plambi, s.-w.-side, 200—400 M., in the woods, flow. on July 2nd, 1909.

SUMBAWA, BIMA: *Elbert*, no. 3534, Donggo-country, 250—500 M., flow. on Dec. 3rd, 1909; no. 3806, Rô-mountains, in the woods, 650—750 M., flow. on Dec. 14th, 1909; no. 3568, Kenanta, Donggo-country, 100—300 M., flow. on Dec. 3rd, 1909; no. 3636, w.-side of Kolo-mountains, 200—375 M.; no. 3897, Doro-kedo near Bima, 10—150 M., with flow. and young fr. on Dec. 16th, 1909.

SUMBAWA, DOMPU: *Elbert*, no. 3953, Dompuplain,

40—100 M., in the woods, with buds on Dec. 22nd, 1909.

SUMBAWA, SUMBAWA: *Elbert*, no. 4137, Olat Pussuk near Lapi, 100—300 M., with fr. on Jan. 3rd, 1910.

CELEBES: *Teysmann* and *de Vriese*, in H. L.-B. sub. nos. 908.267—1061 and 1062.

LUZON: *Cuming* no. 1283, Cagayan.

NEW-IRELAND (NEU-MECKLENBURG): *Peckel* no. 734, Namatanai, Rasirik, on the shore; flow. on Oct. 23rd, 1910, native name: tiptipinagut (cf. *C. erioclona* var. γ).

Var. β . *sumatrana* H. J. Lam, nov. var. — *C. albida* Bl. Bijdr. 818 (1826); *Zollinger* u. *Moritzi*, Syst. Verz. 53 — *C. sumatrana* Miq., Fl. Ind. Bat. II, 886, (1856); *Forbes*, Wander. Naturf. II, 226; *Miquel*, Fl. Ind. Bat. suppl. I, 243 and 569 — *folia* membranacea, vel sub-chartacea, lanceolato-ovata, basi attenuata, integra, apice acuminata, margine denticulata, adulta supra glabra, subtus dense albido-tomentosa, nervis utrinque 8—10; $6\frac{1}{2}$ —12(—18 $\frac{1}{2}$) cM. longa, 3—4 $\frac{1}{2}$ (-10) cM. lata; petiolo 1—2 $\frac{1}{2}$ cM. longo; corolla pilis densis in vittis 4 in lobis positis, tecta.

JAVA: *Junghuhn*, Sunda-countries, 1000—2000 M., in H. A. R.-T. sub. no. 049887 — *Zollinger* nos. 35 and 157.

BANKA: in H. A. R.-T. sub. no. 049888.

SUMATRA: *Korthals*, in H. L.-B. sub. no. 908.265—1092 and 1100 — Padang, Apenberg, in H. L.-B. sub. no. 908.265—1426, in H. Bog. sub. no. 3084, native name: tampa besi; in H. Bog. sub. no. 1159, Padang — *Korthals* in H. L.-B. sub. no. 908.265—367 (*C. albida* Bl.) —? a more glabrous form sub. no. 908.266—1268 in H. L.-B. collected by *Korthals*—*Junghuhn*, Padang, in H. L.-B. sub. no. 908.266—808.

P. PENANG: *Delessert* (*C. tomentosa* Lam.), in H. L.-B. sub. no. 908.265—1424.

MALACCA: *Griffith*, in H. L.-B. sub. no. 908.265—1440.

CELEBES: *Elbert*. no. 2538, Wandji-Wandji on Tukang-

Besi-islands, in the underwood, 0.60 M., flow. on July 22th, 1909.

Perhaps there is a more glabrous form, belonging to this variety; it seemed to us, however, not conspicuous enough, to base upon it a new forma. There are transition-forms to var. γ and δ . It is distinguishable from *C. longifolia*, with which it is nearly conform in regard to the leaves by the always tomentose, never laxely floccose texture of the lower side of the leaves, and its hairy corolla.

Var. γ . longifolia H. J. Lam, nov. var. — *folia* sub-chartacea, lanceolata, utrinque acuta, adulta supra glabra, subtus dense albido-stellato-tomentosa, saepe singulis glandulis parvis, in sicco atris prope nervum primarium suffulta; nervis secundariis utrinque 8; 7—15 $\frac{1}{2}$ cM. longa, 2 $\frac{1}{2}$ —5 cM. lata; petiolo 1.2—2.5 cM. longo; *corolla* glabra.

CELEBES: Gorontalo, in H. L.—B. sub. nos. 908.266—1231 and 1232, flow. on Oct. 18th, 1911.

LUZON: Reillo, no. 19265, Rizal, flow. on Dec. 12th — in Herb. Ins. Phil. in Acad. Lugd.—Bat. no. 492, Manila.

PALAU-ISLANDS: *Raymundus* no. 189, Korrör; native name: dub rschächel; the rubbed leaves are used for poisoning fishes in order to catch them. — *Ledermann* no. 14126, Korrör; native name: dub; in steppe-like grasformation, 20—40 M. in alt.; flow. and young fr. on Febr. 2nd, 1914.

As the var. β , it is distinguishable from *C. longifolia* by the always tomentose never floccose texture of the lower side of the leaves.

Var. δ . latifolia H. J. Lam, nov. var. — *folia* valde membranacea, late ovata, nunquam tetragona, basi attenuata, apice longiuscule acuminata, margine ut in var. α , vel crenata, vel bidentata, adulta supra glabra, subtus densiuscule stellato-tomentosa, nervis secundariis utrinque 8—10, 13—19 cM. longa, 6—11 cM. lata, petiolo 2—3 cM. longo.

forma a. typica H. J. Lam, nov. f. — *flores* tetra-

meri. — *C. latifolia* Zippel ex Spanoghe, Linnæa XV, 330, nom. nud.

SUMATRA: Lampongs, Tiga nemin, in H. Bog. sub. no. 4381;? native name: resepo.

LOMBOK: *Elbert*, no. 736, N.-side of Mount Rindjani, Bajan, 150—200 M., flow. on April 27th, 1909; no. 1992, S.-S.-E.-side of mount Rindjani, Swela near Pringabuja, 350—500 M., fr. on Febr. 8th, 1909.

TIMOR: *Decaisne*, in H. L.—B. sub. no. 908.265—299, near Cupang. — *Zippel* in H. L.—B. sub. nos. 908.265—937, 938 and 947.

NEGROS: *Merrill* no. 207, Cabancalan, flow. in April, 1910.

? YAP, CAROLINE-ISLANDS: *Volkens* no. 439, flow. in Febr. 1900; native name: gorruau (cf. *C. elegans*).

HERMIT-ISLANDS: *Kraemer* no. 51, Luf-isl. on the shore;? native name: caboxoud.

forma b pentamera *H. J. Lam*, nov. f. — flores pentameri.

2 specimina without name of collector or locality, in H. L.—B. sub. nos. 908.265—1108 and 1445. determined as *C. cana* (s. auct.) var. *latifolia* (s. auct.).

In some cases, like this, *Callicarpa* may be pentamerous, and in this point, form a transaction into *Geunsia*. The two genera may be distinguished, however, by the distribution of the leaves, which are in *Callicarpa* always opposite, and in *Geunsia* always opposite and alternate.

As there are 5-merous *Callicarpæ*, so there are also 4-merous *Geunsiaë*. Yet there are no doubtful cases, in regard of habit and distribution of the leaves.

Var. ϵ *dentata* *H. J. Lam*, nov. var. — *C. runcinata* Zippel, nomen nudum. — folia membranacea vel subchartacea, basi attenuata, acumine longiusculo, vel apice subtruncata, adulta supra glabra, subtus laxiuscule stellatomentosa, margine basi integra, ceterum grosse et irregulariter serrato-dentata, nervis secundariis utrinque 7—8,

7½—15 cM. longa, 3—7 cM. lata, petiolo 0.7—2 cM. longo.

1 specimen from *Zippel*, without locality (Timor?) in H. L.-B. sub no. 908.266—13.

SUMBAWA: *Elbert*, no. 3505, Bima, Donggo-country, 250—500 M., flow. on Dec. 3rd, 1909.

Var. ζ integrifolia H. J. Lam, nov. var. — *folia* membranacea vel subchartacea vel chartacea, basi apiceque attenuata, ovata vel obtuse subtetragona, margine integra, apicem versus crenulata vel subundulata vel subintegra, adulta supra glabra, opaca, subtus brunneo-luteo- vel -flavido-tomentosa vel glabriuscula; *corolla* pilis in vittis 4 in lobis positis vestita vel glabra.

forma a typica H. J. Lam, nov. f. — *folia* subtus dense tomentosa; *corolla* pilosa.

CAROLINE-ISLANDS: *Kraemer* no. 36, Truk-isl., Uman, on the shore; native name: drödol. — *Volkens* no. 210, Yap, Mount Bemeigsen, 250 M., flow. on Dec. 16th, 1899.

MARIANNE-ISLANDS: *Volkens* no. 14, Saipon, Garapan, on the shore in the brush-wood, flow. on Nov. 24th, 1899. — *Fritz*, Saipon, A^o 1903, in H. Ber. without nr. — *Schnee*, Tinian, A^o 1909, in H. Ber. without nr.; native name: hamlatt (cf. *C. glabra*).

HERMIT-ISLANDS: *Kraemer* no. 10, Luf-isl. Native name: cebochoud (ceboxoud?) (cf. var. *δ*.)

forma b glabriuscula H. J. Lam, nov. f. — *folia* subtus glabriuscula; *corolla* glabra.

SALEYER-ISLANDS: *Weber*, in H. L.-B. sub. no. 908.267—916.

CAROLINE-ISLANDS: *Ledermann*, no. 14019, Truk-archipelago, Eten I-Isl.; an undershrub on native cultivation-ground; flow. and young fr. on Jan. 23rd, 1914.

MARIANNE-ISLANDS: *Fritz*, Saipon, A^o 1903, in H. Ber. without nr.

Distribution of the species: Calcutta, Malacca!, Malaya (Sumatra!, Banka!, Java!, Timor!, Saleyer-isl.!, Minahassa!),

Philippines (Luzon!, Negros!), Bismarck-arch. (New-Ireland, Hermit-isl.), Palau-isl., Marianne-isl., Caroline-isl., Bourbon (*Hallier.*)

In our opinion, *C. cana* is a very polymorphous species, the varieties of which show an often uninterrupted series of transitory forms between each other. Though there are certain species, the affinity of which with *C. cana* is evident and even close, their general habit makes them distinctly different from the present species, the varieties of which are conform in habit, the length of cymes and peduncles, and the size of the leaves.

22. *C. megalantha* *Merrill*, Phil. Journ. Sc. Bot. X, 71 (1915). — A tree, 10 M. high; branchlets, cymes and petioles, brown or grey stellate-hairy, densely glandular; leaves oblong, or oblong-ovate, subcoriaceous, base acute, attenuate, apex acuminate, margins entire, upper side somewhat stellate-hairy when young, adult glabrous, lower side stellately pubescent, glandular; nerves densier hairy, 9 on each side of the midrib; 12—16 cM. long, 5—6 cM. wide, petioles 2—2½ cM.; cymes in the upper axils, 7—8 cM. in diam.; peduncles 8 cM.; flowers white, bracts oblanceolate or spatulate; calyx 0.3 cM., 4-toothed; corolla somewhat glandular, 0.6—0.7 cM., lobes 0.3—0.35 cM. with lines of stellate hairs; stamens 0.7—0.8 cM., with glandular anthers; ovary densely glandular.

Distribution: Luzon.

Its affinity is with *C. subglandulosa*; it has, however, leaves with an attenuate base, whilst *C. subglandulosa* has leaves with a somewhat rounded base.

23. *C. longipetiolata* *Merrill*, Phil. Gov. Lab. Bur. Bull. XXIX, 47 (1905). — A tree; branchlets subtetragonous, with cymes and petioles ferruginous-tomentose or -subtomentose; leaves coriaceous or thickly chartaceous, ovate or oblong-ovate, base somewhat rounded or subacute, or acute, apex acute or acuminate, entire, upper side, when young stellate-hairy, adult glabrous, lower side densely yellow-brown tomentose; nerves 7—9

on either side of the midrib, 5—10 cM. by $2\frac{1}{2}$ —3.7 cM.; petioles 1.7—2.6 cM.; *cymes* large, in the axils of the upper leaves, 7—10 cM. long, $5\frac{1}{2}$ —10 cM. wide; peduncles $4-5\frac{1}{2}$ cM.; *flowers* subsessile; *calyx* 4-toothed, densely stellate-hairy, glandular, 0.1 cM.; *corolla* glandular, 0.3 cM., with four lines of dense, simple (?) hairs; *stamens* 0.35—0.45 cM. with glandular anthers; *ovary* very small, upper half glandular and villous; *style* 0.4 cM., with capitate stigma.

Distribution: Luzon.

24. *C. paucinervia* Merrill, Phil. Journ. Sci. Bot. IX, 134, (1914). — A shrub?; branchlets with cymes and petioles densely yellowish stellate-hairy, glabrescent; *leaves* ovate or oblong-ovate, chartaceous or subcoriaceous, base abruptly attenuate, apex somewhat acuminate, margins crenulate, entire near base, upper side glabrous when adult, with stellate hairs on midrib, lower side densely yellow-brown tomentose, glandular; pairs of nerves 5; 9—11 cM. by $4-5\frac{1}{2}$ cM.; petioles 1—1.2 cM.; *cymes* small, 2 by 2 cM., peduncles 0.7 cM. or less. *calyx* densely stellate-hairy, truncate or 4-toothed, 0.15 cM.; *corolla* 0.3 cM., glabrous, lobes 0.13 cM.; *stamens* exerted, with glandular anthers; *fruit* 0.2 cM. in diam., glabrous.

Distribution; Guam (Marianne-Isl.).

This species has an affinity with *C. erioclona*, but the points of difference are the number of nerve-pairs, and the stellate, never plumose texture.

25. *C. erioclona* Schauer, DC., Prodr. XI, 643 (1847); Elmer, Leaf. Phil. Bot. III, 866; Miquel, Fl. Ind. Bat. II, 889; Merrill, Phil. Journ. Sc. Bot. I, suppl. I, 121; Scheffer, Ann. d. Jard. bot. Buitzg. I, 41. — Shrubby; branchlets, cymes, and petioles very hirsute, ferruginous-plumose; *leaves* membranous or subchartaceous, or chartaceous, lanceolate or oblong-lanceolate, both sides acuminate; or broader, broadly ovate or oblong-ovate, base cuneate

or subrotundate, abruptly attenuate, usually entire, apex subabruptly acuminate; margins more or less denticulate-serrulate, upper side dark, stellate hairy when young, glabrous when adult, lower side very densely white stellate-tomentose; nerves brownish-plumose, 7—12 pairs; 7—26 by $3\frac{1}{2}$ — $11\frac{1}{2}$ cM.; petioles 0.7—3.2 cM.; *cymes* small, $2\frac{1}{2}$ —5 cM. long, 4—9 cM. wide, sometimes greater, peduncles 0.7—2 cM.; *calyx* 4-toothed, 0.13 cM.; white stellate-tomentose and plumose, glandular; *corolla* white, tube 0.16 cM., lobes 0.04 cM.; glabrous, lobes with lines of yellow glands; *stamens* 0.3 cM. with densely glandular anthers; *style* 0.4 cM. with somewhat increased stigma; *ovary* villous, glandular.

Var. α. typica H. J. Lam, nov. var. — *C. fumata* Zippel, nomen nudum. — *folia* membranacea vel subchartacea lanceolata vel late lanceolata, utrinque acuminata, margine praeter basin, interdum irregulariter, denticulata; nervis secundariis utrinque 7—12; 9—26 cM. longa, $3\frac{1}{2}$ — $9\frac{1}{2}$ cM. lata; petiolo 1— $2\frac{1}{2}$ cM. longo; *cymi* $2\frac{1}{2}$ —4 cM. longi, $2\frac{1}{2}$ —4 cM. lati, pedunculo 0.7—1.5 cM. longo, interdum quam petiolo longiore.

CELEBES: *Forsten* in H. L.—B. sub. no. 908.266—1221, Amenrang, flow. and young fr. in Dec.

PHILIPPINES: *Elmer* no. 11190, Davao, Todaya (Mt. Apo), Mindanao, fr. in July 1909 — *Celestino* no. 7337, Cadiz, Negros, flow. in Febr.—March 1919 — Com. d. l. fl. for. d. Fil. no. 843, Sipocot—Cuming no. 911.

NEW-GUINEA: *Gjellerup* no. 698, Northern-Dutch-New-Guinea, Hollandia, 100 M., flowers white, anthers yellow-brown, fruit white.

NEW BRITAIN (NEU-POMMERN): *Parkinson* no. 191, A⁰. 1901.

3 specimina from Zippel, without locality, determined as *C. fumata* Zipp., and in H. L.—B. sub. nos. 908.265—1103, 1109 and 1450.

Var. β. latifolia H. J. Lam, nov. var. — *C. inæqualis*

Teijsmann et Binnendijk, nomen nudum — *folia* chartacea, ovata vel oblongo-ovata, basi cuneata, plerumque subrotundata, abrupte attenuata, apice acuminata, margine, praeter basin, grosse dentata, dentibus sinibus profundis, nervis utrinque 8, 7—17 cM. longa, $4\frac{1}{2}$ — $11\frac{1}{2}$ cM. lata, petiolo 0.7—3.2 cM. longo.

JAVA: *Forbes* no. 1355. — *de Vriese*, in H. L.—B. sub nos. 908.267—1091 and 1092. — 3 specimina in Herb. var. botan. in Acad. Lugd.-Bat., in H. L.—B. sub nos. 908.265—1104, 1110 and 1446 (*C. inæqualis* T. et B.).

Var. γ repanda H. J. Lam, nov. var.: — *C. repanda* K. Schumann et Warburg, Fl. Neu-Pomm. 144; K. Schum. u. Lauterb., Fl. D. Schutzgeb. Südsee, 522 — *C. cana* L. var. *repanda* Warburg, Engl. Jhrb. XIII, 426. (1891) — *folia* subchartacea, vel membranacea, late ovata, basi apiceque subabrupte acuminata, margine denticulata, nervis utrinque 10, 22—26 cM. longa, 12—14 cM. lata, petiolo 2— $3\frac{1}{2}$ cM. longo, crasso (0.4 cM.); *cymi* majores 5 cM. longi, 9 cM. lati, pedunculo $1\frac{1}{2}$ —2 cM. longo.

NEW-BRITAIN (NEU-POMMERN): *Dahl*, in the beginning of Aug., with fruits, Ralum; in H. ber. without nr.

NEW-IRELAND (NEU-MECKLENBURG): *Peekel* no. 63, Namatanai, flowers white, branchlets brown or black tomentose-plumose; native name: a-tiptipinagut (cf. *C. cana*, var. α).

Distribution of the species: Java!, Celebes!, Philippine Islands!, New-Guinea!, New-Britain!, New-Ireland!

The species is well characterised by its often plumose tomentum, and especially by the form of the leaves and the often denticulate or dentate margins. Its affinity is with *C. cana* and *C. paucinervia*.

26. *C. paloensis* *Elmer*, Leafl. Phil. Bot. I, 336 (1908). — A tree, 9 M. high; branchlets, petioles and cymes yellowy hairy; leaves „scattered along the branchlets”, coriaceous, broadly lanceolate, base and apex gradually acuminate,

margins entire, upper side when young, stellate-hairy, adult glabrous, lower side densely stellate-hairy, pairs of nerves 9—11; 18 by 6 cM.; petioles 2 cM.; *cymes* "terminal" (?) or \pm terminal or in the axils of the upper leaves, peduncles 3—5 cM.; *flowers* subsessile, lilac; *calyx* 0.1 cM., densely stellate-pubescent, truncate; *corolla* glabrous, 0.25 cM., 4-lobed, lobes 0.075 cM.; *stamens* 4, inserted in the throat of the constriction, little exerted; *style* little exerted; *ovary* somewhat hairy; *fruit* 4-celled, 4-seeded (one 4-seeded pyrene!), from 2 carpels, 0.2 cM. in diam., lilac.

Distribution: Leyte (Palo).

We did not see any specimen of this species, but we think it is a doubtful one; the leaves should be „scattered along the branchlets”; if this means: alternate, then the species could be a 4-merous *Geunsia*. The indication: „cymes terminal of \pm terminal or in the axils of the upper leaves” is not clear. If there are really true terminal inflorescences, it is evident, that this can not be a *Callicarpa*. So the terms: „stamens inserted upon the throat of the constriction”, and „fruit 4-celled, 4-seeded” indicate the same. Perhaps it is even not a *Verbenacea*.

27. *C. surigaensis* Merrill, Phil. Journ. Sci. Bot. III, 262 (1908). — A tree, 8 M. high; branchlets, cymes and petioles very hirsutely ferruginous-stellate-tomentose, or -plumose; *leaves* oblong-ovate or lanceolate-ovate, base acute, apex long caudate-acuminate, margins denticulate; subcoriaceous; upper side rather hirsute, especially on the nerves, lower side densely ferruginous-stellate-tomentose with plumose hairs on nerves; pairs of nerves 7; 10—15 by 4—7 cM.; petioles 1 cM.; *cymes* 4 cM. long; *flowers* red; *calyx* 0.3 cM., densely hairy, 4-toothed; *corolla* glabrous, 0.5 cM., 4-lobed, lobes 0.2 cM.; *stamens* 0.4 cM.; *ovary* glandular, *style* 0.7 with capitate stigma.

Distribution; Mindanao (Surigao).

28. *C. lanata*. L., Mant. II, 331 (1767); *Hook. f.*, Fl.

Br. Ind. IV, 567; *Roxburgh*, Fl. ind. I, 391; *Koorders en Valetton*, Bijdr. Booms. Java VII, 175. — *C. arborea Miquel* ex *C. B. Clarke* in *Hook. f. l.c.*, 567. — *C. arborea Roxburgh*, Fl. ind. I, 390, (1832); *Schauer*, DC. Prodr. XI, 642; *Pulle* in *Lorentz*, Nova-Guinea VIII, 4, 685; *Hook f. l.c.* 567; *King and Gamble*, Journ. As. Soc. Bengal LXXIV, 4, 803; *K. Schum. u. Lauterb.* Fl. D. Schutzgeb. Südsee, 521; *K. Schum. u. Holtrung*, Fl. Kais.-Wilh.-land, 119; — *C. cana Dalz. et Gibs.* Bomb. Fl. 200 (1861) — *C. farinosa Roxburgh* (ms.) *Clarke* in *Hook f.*, l.c. 567 — *C. magna Schauer*, DC., Prodr. XI, 641, (1847); *Miquel*, Fl. Ind. bat. II, 889 — *C. tecto-naefolia Wallich*, cat. no. 1827, (1828), — *C. tomentosa Murray* (*Willdenow?*), Syst. Veg. ed. XIII, 153, (1774); *Schauer* DC., Prodr. XI, 647; *Maximowicz*, Bull. Ac. Imp. Pét. XXXI, 75 — *C. Tomex Poir.* Encyc. Suppl. II, 32, (1811) — *C. villosa Roxb.* Hort. Beng. [10] (1814) — *C. Wallichiana Miq.*, nomen nudum — *C. Wallichiana Walpers*, Rep. IV. 125, (1848); *Schau., DC.* Prodr. XI, 641; *Miquel*, Fl. Ind. Bat. II, 889 and suppl. I, 243 and 569; — *Tomex tomentosa L.* sp. pl. 118, (1753).

A, sometimes rather large, tree, 6—12 M. high; branchlets, cymes and petioles, stellate-tomentose or -floccose; leaves oblong-lanceolate or broadly lanceolate, base acute, rarely subtruncate and abruptly attenuate, apex acute, sometimes subobtuse, or rather long acuminate, margins subentire or denticulate, entire near the base, chartaceous or subcoriaceous, sometimes membranous; pairs of nerves 7—11; upper side with stellate hairs when young, adult glabrous or with some simple hairs, lower side more or less densely white-tomentose, nerves on both sides pubescent, lamina somewhat glandular on both sides; 16—28(—34) by $6\frac{1}{2}$ —14(—19) cM.; petioles 3—5 cM. long, 0.2—0.5 cM. in diam.; cymes large, $3\frac{1}{2}$ —8(—14) cM. long, 4— $10\frac{1}{2}$ (—14)

cM. wide, peduncles stout, $1\frac{1}{2}$ — $5\frac{1}{2}$ cM. long; *calyx* 4-toothed, rarely subtruncate, teeth deltoid or minute; 0.1 cM., densely stellate-hairy, glandular or glabrous; *corolla* rather large, 0.4 cM. long, 0.05 cM. wide, glabrous or with some hairs, with 4 lines of glands along the lobes; lobes 0.1 cM.; *stamens* 0.65 cM., anthers glandular on both sides, 0.1 cM.; *ovary* hairy and glandular on upper side; *fruit* glabrous or somewhat hairy and glandular; *style* with capitate or subpeltate stigma.

Var. α typica H. J. Lam, nov. var. — *folia* subtus dense tomentosa, chartacea vel subcoriacea; *calyx* dense stellato-puberulus.

MALACCA: *Maingay* no. 1192. — Herb. *Wight* no. 2314. — *Griffith* no. 6037.

SUMATRA: *Korthals* in H. L.—B. sub. nos. 908.266—829 and 830. — *Junghuhn*, Tapanuli, 200—250 M. in H. L.—B. sub. no. 908.266—804; Padang, id. 908.265—948; etc.

JAVA: in H. L.—B. sub. no. 908.265—933.

TIMOR: ?*Decaisne*, in H. L.—B. sub. no. 908.265—1435.

CELEBES: *Teysmann* et *de Vriese*, in H. L.—B. sub. nos. 908.266—802 and 908.265—360.

LUZON: *Elmer*, no. 9125, Tayabas; Lucban, in H. L.—B. sub. no. 908.146—1998.

Var. β psilocalyx H. J. Lam, nov. var. — *folia* membranacea, subtus densiuscule tomentosa, vel subglabrata; *calyx* glaber vel nonnullis pilis vestitus.

LUZON: *Ramos*, nos. 395 and 15038, San Antonio, Laguna, with fruits on Oct. 11th. — *Cuming* no. 1266.

NEW-GUINEA: (KAISER-WILH.-LAND) *Schlechter* no. 16454. — *Nyman* no. 1053, Friedr. Wilh.hafen, flow. on Oct. 1st, 1899. — *Rodatz* et *Klank* no. 185, flow. on July 1st, 1899. — ?*Lauterbach* no. 1241 (and 1200?), Constantinhafen.

Distribution of the species: British India, Malay Peninsula! and Archipelago! Philippines!

In the bibliography about the subject we discover some indications, that some authors cannot find any difference between *C. arborea* Roxb. and *C. lanata* α . (e.g. *Miq. Fl. Ind. Bat. Suppl. I*, 243 and 569; also *Koorders en Valetton, Bijdr. Booms. Java. VII*, 175). We too, think so. So we have combined the two species under the name *C. lanata* α , finding no essential difference of any importance, that could separate them distinctly. Even if it should be shown that there are a treelike and a shrubby form, it would not be exact to consider them as more than two varieties of one single species. — It has a strong affinity with *Geunsia farinosa*, var. α , from which it is different, however, by its opposite leaves, 4-merous flowers and fissure opening of the anther-cells.

29. *C. dolichophylla* Merrill, *Phil. Journ. Sci. Bot. VII*, 339, (1912). — A shrub?; branchlets and cymes a little hairy (simple hairs); leaves chartaceous, lanceolate, base acute, apex acuminate, subentire or crenulate-denticulate; when young with simple hairs on both sides, adult glabrous; lower side denser hairy, and glandular, pairs of nerves 13—16; 15—30 by $2\frac{1}{2}$ —7 cM.; petioles 1— $2\frac{1}{2}$ cM.; cymes lax, 6 cM. long and in diam.; peduncles longer than petioles; flowers reddish; calyx 4-denticulate, 0.1—0.15 cM.; corolla 0.25—0.3 cM., glabrous.

Distribution: Luzon.

It has the habit of *C. longifolia*, but is essentially different by its simple hairs.

30. *C. glabra* H. J. Lam, nov. spec. — Frutex glabra, 2 M. alta; ramuli, cymi, petioli glabri vel glabriusculi; folia late lanceolata, basi integra, acuta, apice acuminata, margine praeter basin crenulata, utrinque glabra subtus glanduloso-punctata; nervis secundariis utrinque 4—5, subtus singulis pilis stellatis vestitis; membranacea, $10\frac{1}{2}$ —17 cM. longa, $4\frac{1}{2}$ —8 cM. lata; petiolo $1\frac{1}{2}$ cM. longo; cymi dichotomi, laxiusculi, pauciflori, 2— $3\frac{1}{2}$ cM. longi et lati; pedunculo $1\frac{1}{2}$ —2 cM. longo; calyx 4-dentatus glanduloso-punctatus, singulis pilis stellatis vestitus, 0.15 cM.; pedi-

cellis 0.1–0.2 cM. longis; *corolla* coerulea, glabra, vittis 4 glanduloso-punctata, tubo 0.3 cM. longo, lobis 0.1 cM.; *stamina* 0.6 cM., antheris glandulosis; *stylus* 0.8 cM.; *ovarium* glanduloso-punctatum.

MARIANNE-ISLANDS: Höfer no. 4: Fanaganam, Saipon, 30–100 M.; native name: hamlag (cf. *C. cana* var. ζ from the same locality), flow. on Nov. 2nd, 1912.

Our species has some affinity with *C. japonica* from which it differs in its dichotomous, never trichotomous cymes, larger leaves, longer petioles, etc.

31. *C. cauliflora* Merrill, Phil. Journ. Sc. Bot. VII, 338, (1912). — A shrub?; branchlets and cymes brownish-floccose, glandular; leaves chartaceous, oblong-elliptical, base attenuate, apex acuminate, margins entire or somewhat irregularly denticulate; upper side glabrous, lower side with some stellate hairs, densier on midrib, glandular; pairs of nerves 14; 30–35 by 9–13 cM.; petioles 1–2 cM.; cymes sessile, cauliflorous, hemispherical, crowded, 2–3 cM. in diam.; calyx 0.3 cM., 4-toothed; teeth 0.05 cM.; corolla dark-red, 0.7 cM., somewhat pubescent and glandular.

Distribution: Mindanao.

Its affinity is with *C. ramiflora*.

32. *C. elegans* Hayek in Fedde, Repert. Nov. Sp. II, 88 (1906); Merrill, Phil. Journ. Sci. Bot., VII, 338 — *C. serrulata* Zippel, ms. — Shrubby, 1–3 M. high; young parts with sparse stellate hairs, without glands; leaves chartaceous, lanceolate, base and apex acuminate, margins, except near base, serrulate, upper side glabrous, with some glands, lower side glabrous, glandular, with some stellate hairs on the midrib, and some larger glands near it; pairs of nerves 4–6; $4\frac{1}{2}$ –14 cM., by 1 – $4\frac{1}{2}$ cM.; petioles 0.3–1 cM.; cymes lax, few-flowered, nearly glabrous, 1–3 cM. long and wide; peduncles $\frac{1}{2}$ – $1\frac{1}{2}$ cM.; calyx, truncate or hardly 4-denticulate, glabrous, 0.1–0.15 cM., somewhat glandular; corolla blue or rose,

glabrous, tube 0.15 cM., lobes 0.15 cM., somewhat glandular; *stamens* 0.5 cM., anthers glandular on both sides, yellow; *ovary* glandular; *style* 0.4 cM.; *fruit* glabrous, without glands, 0.3 cM. in diam., globose, somewhat depressed.

PHILIPPINES: *Elmer* no. 12144, Sibuyan, Capiz, Magalanes, Mt. Giting-Giting, with fruits in April 1910. — *Ramos* in H. L.—B. sub no. 911.135—278, Luzon, Abra, with fruits in Febr. 1909.

PALAU-ISLANDS: *Ledermann* no. 14201, Korrör, 20—40 M. in alt., flow. in Febr. 1914; no. 14065, 10—100 M.; the leaves are chewed together with betle; no. 14257a, with flowers and young fruits in Febr. 1914. — *Raymundus* no. 129. — *Ledermann* no. 14358, Babelthaop, 200—300 M., flow. in Febr. 1914; native name: Haruei Gáruei, Gerucáu, Gerrucóu (cf. *C. cana* var δ , forma a).

Its affinity is with *C. purpurea*. Points of difference are the acuminate apex of the leaves, which is never abrupt, and always serrulate, upper side without any hairs and with some glands, and corolla-lobes as long as the tube.

33. **C. japonica** *Thunberg.*, Fl. jap. 60 (1760); *Forbes* et *Hemsley*, Fl. sin. II, 253; *Hasskarl*, 2^{de} Catal. 's Lands Pl. tuin Buitzg., 133; *Miquel*, Ann. Mus. bot. Lugd.-bat. II, 98; *Maximowicz*, Bull. Ac. Imp. Sci. St. Pét. XXXI, 77 — A shrub?; branchlets glabrous or glabrescent; *leaves* chartaceous, elliptical-lanceolate, or broadly elliptical, base acute or subacute, apex acute or acuminate; sometimes rhomboid, of rather different form; pairs of nerves 6—9, their upper side with some stellate hairs; rather coarsely dentate-serrate, base and apex entire; both sides glabrous, glandular, lower side often with scales, 4—15 by $4\frac{1}{2}$ — $6\frac{1}{2}$ cM.; *petioles* 0.2—0.5 (—1.5) cM.; *cymes* di-, generally trichotomous, glandular, often with scales, 1.3—1.5 cM. long and wide, with slender peduncles; *calyx* 4-ribbed, hardly 4-toothed, 0.38 cM.; *corolla* white, 0.33 cM., lobes 0.1 cM.; outer side papillose: *stamens* exerted,

anthers glandular; *style* with capitate stigma; *fruit* glabrous; red.

Var. α *typica* H. J. Lam, nov. var. — *folia* elliptica, acumine brevi, 10—15 cM. longa, $4\frac{1}{2}$ — $6\frac{1}{2}$ cM. lata; petiolis 0.25—0.5—(1.5) cM. longis; nervis secundariis utrinque 6.

Distribution: Japan.

Var. β *rhombifolia* H. J. Lam, nov. var. — *C. rhy-nchophylla* Miquel, Fl. Ind. bat. II, 888, (1856). — *folia* latiora, rhomboidea, basi late cuneata, margine usque ad dimidium folii integra, ceterum praeter acumen grosse serrato-dentata, apice abrupta acuminata, acumine 2 cM. longo, integro, obtusiusculo; nervis secundariis utrinque 7—9; 4 — 9 cM. longa, $5\frac{1}{2}$ cM. lata; petiolo 0.2—0.3 cM.; cymi trichotomi, pedunculo gracili, 0.7 cM. longo.

BORNEO: Korthals, in H. L.—B. sub. no. 908.263—29; in H. A. R.—T. sub. no. 049890.

Distribution of the species: Japan, Borneo!

In the opinion of Forbes and Hemsley, l.c., this species is synonymous with *C. longifolia*, var. α . Miquel, l.c. examined a large number of specimina, and found a considerable number of more or less important differences. We too, consider the species as a well-founded one, with an affinity with *C. longifolia*, var. α , from which it differs by its smaller leaves, which have an acumen, the often somewhat rhomboid form of its leaves, its coarsely dentate margins, relatively longer corolla-lobes, capitate stigma (in *C. longif.* bifid), and its red fruits (in *C. longif.* white).

Probably the form with „wider leaves, less acute base, often rhomboid, and with 9 nerves on each side of the midrib”, is identical with our var. β , which is also Miquel's *C. rhy-nchophylla*.

Its affinity is also with *C. purpurea*.

34. *C. purpurea* Jussieu, Ann. Mus. Par. VII, 67, (1806); Schauer, DC. Prodr. XI, 645; Forbes and Hemsley, Fl. sinensis II, 254; Miquel, Ann. Mus. bot. Lugd.—Bat. II, 98; Maximowicz, Bull. Ac. Imp. Sc. St. Pét. XXXI, 78; Roxburgh, Fl. ind. I, 395. — *C. Sieboldii* Zippel, ms. — A shrub?; branchlets, cymes, and petioles glabrous

or with some stellate hairs; leaves small, lanceolate, or lanceolate-obovate, base acuminate-attenuate, apex abruptly acuminate, subobtusate, margins crenate or crenulate, except from base up to $\frac{1}{3}$ or $\frac{1}{2}$ of the leaves, and at apex; both sides glabrous, lower side glandular; pairs of nerves 4-7; $3\frac{1}{2}$ -5- $7\frac{1}{2}$ cM. by 1.3- $2\frac{1}{2}$ -3 cM.; petioles 0.2-0.6 cM. (according to *Miquel*, l.c.: 1.3-4 cM.); cymes lax, di- or trichotomous, slender, 1- $1\frac{1}{2}$ cM. long, few-flowered; peduncles 0.4 cM. (according to *Miquel*: 1.3 cM.); calyx 4-toothed; teeth deltoid; glandular, glabrous or nearly so, 0.15 cM.; pedicels 0.1-0.2 cM.; corolla red, glabrous, glandular, 0.35 cM.; stamens little exerted, 0.4 cM., anthers glandular on both sides; style 0.45 cM., with capitate stigma; ovary somewhat glandular, somewhat 4-lobed.

3 specimina in H. L.-B.: *Zippel* sub. nos. 908.266-9 and 11; *Korthals* sub. no. 908.266-1; all of them without locality, but probably from Malaya.

Distribution: Cochin China, China, Japan.

35. *C. longifolia* Lamarck, Encyc. I, 563, (1783); *Blume*, Bijdr. 817; *Benth.* and *v. Muell.*, Fl. Austr. V, 57, *Williams*, Bull. Herb. Boiss. Sér. II, T. V, 430; *Schauer*, DC. Prodr. XI, 645; *Elbert*, Meded. 's Rijks-Herb. Leiden no. 12, 15; *Forbes* and *Hemsley*, Fl. sin. II, 253; *Hook f.* Fl. Ind. IV, 570; *Koorders* en *Valeton*, Bijdr. Booms. Java, no. 7, 176; *iid.* atl. d. Baumarten, II. 6. t. 275; *King* and *Gamble*, Journ. As. Soc. Bengal, LXXIV, 4, 807; *Koorders*, Exk. fl. v. Java, III, 134; *Kuntze*, Rev. Gen. Pl. I, 503; *Miquel*, Fl. Ind. bat. II, 887 and suppl. I, 243 and 569; *Maximowicz*, Bull. Ac. Imp. Sci. St. Pét. XXXI, 77; *Roxburgh*, Fl. ind. I, 394; *K. Schum.* u. *Lauterb.*, Fl. D. Südsee, 522; *K. Schum.* u. *Hollrung*, Fl. Kais.-Wilh.-land, 119; *Valeton*, Bull. Dépt. Agricult. Ind. Néerl. no. X, 51; *H. J. Lam.*, in *Hall f. Med.* 's Rijks Herb. Leid. no. 37, 33 — *C. cana* *Wallich*, cat. no.

1834 (1828), pro parte — *C. dentata* Wallich, cat. no. 6319, pro parte — *C. virens* Reinwardt, ms., pro parte. — A shrub or little tree; branchlets, cymes and petioles sparsely stellate-hairy, glabrescent; leaves, membranous, lanceolate or broadly-lanceolate, both sides acute, often the greatest breadth above the middle of the leaves; margins, except in lower half, denticulate-serrulate, sometimes subentire; nerves 8—10 on either side of the midrib, with many shorter nerves not reaching the margins between them; upper side when young, stellate-hairy, adult glabrous, glandular, nerves somewhat pubescent, lower side from rather densely floccose to nearly glabrous, densely glandular, with typical peltate scales (cf. *C. japonica*); 7—18 by $2\frac{1}{2}$ — $6\frac{1}{2}$ cM.; petioles 0.7—2 cM.; cymes small, globose, resembling those of *C. cana*, $2\frac{1}{2}$ —4 cM. long, 5—7 cM. wide; peduncles, shorter than petioles, 0.3—0.7—1.2 cM.; calyx subtruncate or 4-denticulate, somewhat 4-ribbed; sparsely stellate-hairy, with some glands, 0.8—0.13 cM.; pedicels 0—0.1 cM.; corolla white or rose, generally somewhat pubescent, sometimes nearly glabrous; sparsely glandular; lobes hemicircular, very short in regard to the length of the tube; tube 0.17—0.2 cM., lobes 0.03—0.05 cM.; stamens 0.3—0.4 cM., anthers glandular on both sides; style 0.5 cM., with bifid (!) stigma; ovary densely glandular and hairy; fruit glabrous or somewhat glandular, white.

Var. α subglabrata Schauer, DC. Prodr. XI, 645 (1847) — *C. attenuifolia* Elmer, Leafl. Phil. Bot. VIII, 2870, (1915) — *C. longifolia* var. β *uberius* Miquel, ms. — *C. Blumei* Zollinger et Moritzi, Syst. Verz. 53, (1846); Koorders, Exk. Fl. v. Java III, 134 — *C. javanica* Zippel, ms. — *C. lanceolaria* Roxb. Fl. ind. I. 395 (1832). — ?*C. longifolia* Lam. var. *lanceolaria* Clarke in Hook. f. Fl. Br. Ind. IV, 570 (1885). — leaves glabrous beneath or nearly so.

SUMBAWA: *Elbert* no. 4199, northern slope of Batu-Lantek-mountains, 1500—1700 M. with flow, and fr. on 20-I-'10; *id.* no. 4183, same locality, 500—1400 M. with fruits on 20-I-'09.

JAVA: *Zippel* no. 43 (*C. javanica* *Zipp.*) — *Forbes* no. 748. — *Zollinger* no. 156 (*C. Blumei* *Z. et M.*) — *Waitz* no. 28 — *Reinwardt* (*C. virens* *Rw.*) in H. L.—B. sub nos. 908.265—1490 and 1500 — *Pulle* no. 3119, with flow. and young fr. in June 1906, Preanger near Talun-plantation, 1700 M. — *Smith et Rant* no. 78, with fr. in May, 1911. — *Pl. Junghuhnianæ* ined. no. 523; *Junghuhn* no. 153, near Pangalengang, in the woods (Preanger), 1400 M.; native name: Katumpang (cf. *C. cana*, var. α), etc.

LOMBOK: *Elbert* no. 1864, S.-E.-side of mount Rindjani, Sapit-valley, mount Pussuk, 600—700 M. with flow. and fr. on 7-6-1909.

SUMATRA: *Elbert* no. 430, Lampongs, with flow. and young fr. in Febr.—March 1908; *id.*, Tandjong Karong, 75—100 M. in H. L.—B. sub no. 908.308—406; *id.*, Telok—Betong, Ranggal, 100—350 M. in H. L.—B. sub nos. 908.308—431 and 908.306—381. — *Diepenhorst*, Tampa barie, in H. bog. sub no. 1338, Priaman.

CELEBES: *Forsten* no. 93, Menado. — *Elbert* no. 3000, Rumbia, Liano, 25—150 M. with fruits on Sept. 12th, 1909; *id.* no. 3064, Rumbia, 50—300 M. with fruits on Sept. 15th 1909.

BORNEO: ? *Elbert* no. 553, Bukit-Uluh-Sebukuh with fruits an 8-9-1912; ? *id.* no. 619, Bukit-Tenampuk, 70 M., with fruits in Sept. 1912; ? *id.* no. 639, Bukit-Sungei-Tulit, 100 M., flow. in Sept. 1912. — *Rutten* no. 617, Bulongan nr. Sadjan-river, 10 M. in alt.: a tree, 6 M. high, flow. pink. on 25-X-1912, fr. white, anthers white; *id.* no. 571, same locality, flow. on 16-VI-1912; *id.* no. 459, westward of G. Runtu towards Bontang, fr. on 3/4-IX-1912; *id.* no. 263, same locality, flow. and fr. on 7-VI-1911.

PHILIPPINES: *Elmer* no. 13536 (*C. attenuifolia* *Elm.*), Cabadbaran (Mt. Urdaneta), Agusan, Mindanao, with buds in Aug. 1912.

NEW-GUINEA: *Ledermann* no. 6597, Camp Malu near Kais. Augusta-river, Bani-ravine with fruits on March, 13th, 1912; *id.* no. 6836, Malu, 50—100 M., with flow. and young fr. on March 30th, 1912; *id.* no. 11547a, Malu, with flow. and young fr. on March 3rd, 1913; *id.* no. 9226, Etappen-mount., 850 M., flow. on Oct. 12th, 1912. — *Schlechter* no. 14303, Torricelli-mountains, with flow. and young fr. in April 1903.

NEW-IRELAND (NEU-MECKLENBURG): *Kraemer*, Lama-sang, A^o 1909 in H. ber. without nr.; bloodstopping in menses; native name: Avóravi.

Var. β floccosa *Schauer*, DC. Prodr. XI, 645, (1847) — *C. acuminata* *Roxburgh*, Fl. ind. I, 394, (1832) — *C. attenuata* *Wallich*, Cat. no. 1835, (1828). — *C. longifolia* *Roxb.*, Fl. ind. I, 394, (1832) — *C. oblongifolia* *Hassk.* Cat. Hort. Bog. alt., 136, (1844). — *C. Roxburghiana* *Schult.* Mant III, 54, (1827). — leaves more or less densely floccose.

JAVA: *Elbert* no. 525, Pandan, Madiun, 400—900 M. — *Korthals*, in H. L.—B. sub no. 908.265—1491; *id.* Krawang in H. L.—B. sub nos. 908.267—758 and 759 — *Kuhl* et *v. Hasselt*, Tjikondé, flow. on Jan., 23th, in H. L.—B. sub no. 908.267—1208 — *Junghuhn*, Bantam, in H. L.—B. sub no. 908.266—1259; native name: Katumpang. (cf. *var. α* and *C. cana var. α*), or ki-katumpang, etc.

SUMATRA: *v. Daalen* no. 394, Gajoe- and Ajas-countries. — *Elbert*, Telok Betong, Ranggal, 100—350 M., in H. L.—B. sub no. 908.308—432 — *Beccari* no. 491, Padang, 360 M., etc.

BANKA: in H. A. R.—T. sub. no. 049889, Baturusak, flow. and fr. in June 1858.

TIMOR: *Forbes* no. 3601.

CELEBES: *Junghuhn*, near Sadeng; in H. L.—B. sub no. 908.267—1124.

BORNEO: *Korthals*, P. Sampe, in H. L.—B. sub nos. 908.265—1466, 1467 and 1468. — *Winkler* no. 2142, flow. on May 23th, 1908, Hayup — *Hallier* no. B. 309 (Hort. Bog.), P. Lemukutan, in a ladang (see note on p. 56), with fruits on Oct. 4th, 1893.

CERAM: *Teysmann et de Vriese*, in H. L.—B. sub no. 908.265—350; in H. A. R.—T. sub no. 011538.

AMBOYNA: *Zippel* in H. L.—B. sub no. 908.265—1464.

PHILIPPINES: *Merrill* no. 8057; Zamboanga, Mindanao.

NEW-GUINEA: *Schlechter* no. 16453., Kais.-Wilh.-land, nr. Wobbe., 200 M., with fruits on Sept. 1st, 1907; *id.* no. 13818. nr. Schumann-river, with flow. and young fr. in Dec. 1901. — *Wichmann* no. 44.

NEW-IRELAND (NEU-MECKLENBURG): *Peekel* no. 62, Namatanai.

var. γ areolata H. J. Lam, nov. *var.* — *folia* in sicco utrinque opaca (in *var. α* et *β* viridiuscula), adulta subtus glabrata eglandulosa, areolata, sine squamis; *calyx* subtruncatus; *stigma* 4-lobatum.

KALAO TOA-ISLAND: *Docters van Leeuwen—Reijnvaan* no. 1349, flow. on 5-V-1903.

Its leaves are somewhat larger than in the other varieties, reaching 17 cM. in length, 7 in breadth, with a petiole of 2.7 cM.

Distribution of the species: Eastern Bengal, Khasiah- and Chittagong-mountains, Malacca, Penang, Malaya (Sumatra!, Banka!, Java!, Nusa Cambangan!, Timor!, Borneo!, Celebes!, Sumbawa!, Ceram!, Amboyna!, Dutch-New-Guinea!, Kais.-W.-land!), New-Ireland!, Mindanao!, Manila.

The species has an affinity with *C. japonica* (q.v.) and with *C. cana*. From the latter it can be distinguished by considering that this species never has leaves of lanceolate form together with a floccose texture of the lower side of the leaves or with glabrous leaves. Further the corolla-lobes form a point of difference.

36. *C. Horsfieldii* Turczaninow, Bull. Soc. Nat. Mosc. XXXVI, II, 217. (1863); Koorders, Exk. Fl. v. Java, III, 134. — A shrub, branchlets, petioles and cymes densely hairy; branchlets tetragonous; leaves ovate-rhomboid, both sides long attenuate, upper half coarsely serrate, sparsely pubescent on both sides, glandular, densier on nerves; cymes small, as long as or somewhat longer than petioles; calyx 5-toothed; teeth deltoid, rather large; corolla-tube twice as long as the teeth of the calyx; stamens 4; ovary hairy at the top.

Distribution: Java.

This very imperfectly described species, of which we did not see any specimen, seems to be somewhat doubtful, as regards the 5-toothed calyx, of which the teeth are large-deltoid.

37. *C. formosana* Rolfe, Journ. Bot., XX, 358 (1882); Forbes et Hemsley, Fl. Sin. II, 252; Maximowicz, Bull. Ac. Imp. Sci. St. Pét. XXXI, 76; Merrill, Phil. Journ. Sci. Bot. I, Suppl. I, 121. — A shrub; branches glabrescent, but when young, as well as the lower side of the leaves, the cymes, pedicels, and calyx covered with a pale brown tomentum of stellate hairs; leaves elliptical, acute or shortly acuminate, serrulate or denticulate, base rounded; 5–8½ by 4–6 cM.; dark brown, sparingly pubescent above, slightly scabrid with age; nerves alternate, in about five pairs; petioles 0.8–1.2 cM.; cymes 5 times branched, dense-flowered, 4–5 times longer than the petioles; pedicels 0.4 cM.; calyx campanulate, scarcely 0.12 cM. long; segments minute; corolla 0.25 cM., lobes rounded, shorter than the tube; stamens exerted, 0.25 cM., anthers elliptical, notched at each end; style equalling stamens; stigma capitate; fruit globose, scarcely 0.25 cM. in diam.

Distribution: Formosa, Philippines (Merrill, l.c., Lamao Forest Reserve).

There were no specimens of this species within our reach, but from the descriptions we should say that it is identical with *C. Blancoi*.

DOUBTFUL SPECIES:

38. *C. mollis* Sieb. et Zucc., Fl. jap. fam. nat. 526 (1844); Forbes and Hemsley, Fl. Sin. II, 254; Koord. Med. 's Lands Pl. tuin Btz. XIX. 558; Miq. Ann. Mus. bot. Lugd.—Bat. II, 99; Maximowicz, Bull. Ac. Imp. Sci. St. Pét. XXXVI, 75. — A shrub?; branchlets glabrescent; leaves ovate or lanceolate, base cuneate, acute, subobtuse or sometimes somewhat cordate, apex with an acute or obtuse acumen; margins rather coarsely serrate, except near the base and the apex; teeth mucronulate; pairs of nerves 5—6, soon branching; upper surface scabrid-pubescent with simple hairs, lower one densely tomentose, both sides glandular under the tomentum; 5—7 by $2\frac{1}{2}$ — $9\frac{1}{2}$ cM., petioles 0.4—1.2 cM., (sometimes smaller, $4\frac{1}{2}$ by $1\frac{1}{2}$ cM., petioles 0.2 cM., perhaps a variety); cymes few-flowered, pubescent; peduncles about twice as long as the petioles; bracteoles linear, as long as the pedicels; flowers 4-, rarely 5-merous (*Miquel*); calyx tubular, densely floccose and glandular, 0.25—0.4 cM. long; segments lanceolate, about $\frac{1}{3}$ of the total length of the calyx; corolla-tube shortly exsert, villous and glandular along 4 lines, 0.3—0.45 cM., lobes obtuse, reflexed; anthers exsert, glandular on backside; drupe glandular at top.

Distribution: N.-Celebes? (*Koorders*), Japan.

X. **SCHIZOPREMNA** Baillon, Hist. d. Pl. XI, 119, (1892); Engl. u. Prantl, Nat. Pfl. fam. IV, 3a, 166. — Trees?; leaves opposite, simple; inflorescences cymose, terminal, composed; flowers 4-merous, somewhat zygomorphous; ovary 4-celled, 4-ovuled, formed from two 2-celled carpels; style terminal, sunk down between the only for $\frac{1}{2}$ of their length connated cells of the ovary; stigma bifid.

Distribution: Timor.

The genus differs from *Premna* only by the behaviour of the style (and of the ovary?)

1. *S. timorensis* Baill. l.c. 120; *Engl. u. Prantl*, l.c. — A tree?; branchlets glabrous; *leaves* broadly obovate, base attenuate; *cymes* terminal, paniculately composed; *calyx* coriaceous, 4-toothed, teeth subequal; *corolla* 4-lobed, lobes subequal, imbricate in the bud; *stamens* 4, short, included, anthers as long as the filaments, with parallel cells; *style* with shortly bifid stigma; *ovary* 4-celled, 4-seeded; *fruit* unknown.

Distribution: Timor.

Subtribe B. TECTONEÆ.

XI. TECTONA *L. f.* Suppl. 20, 151, (1781); *Blume*, Bijdr. 820; *Benth. and Hook.*, Gen. pl. II, II, 1152; *Schauer*, DC. Prodr. XI, 629; *Engl. u. Prantl*, Nat. Pfl. fam. IV, 3a, 167; *Hook f.*, Fl. Br. Ind. IV, 570; *Koorders en Valeton*, Bijdr. Booms. Java no. 7, 164; *King and Gamble*, Journ. As. Soc. Beng. LXXIV, 4, 808; *Miquel*, Fl. Ind. bat. II, 900; *Hasskarl*, 2e Cat. 's Lands Pl. tuin Buitzg., 135. — Large trees with a greyish stellate tomentum; *leaves* large, simple, opposite or verticillate; *panicles* terminal, usually large with many-flowered cymules; *calyx* campanulate, 5–6-toothed, enlarged in fruit; *corolla* small, white or bluish with short tube; lobes 5–6, imbricate in bud, subequal, spreading; throat sometimes villous; *stamens* 5–6, inserted in the inferior part of the corolla-tube, subequal, shortly exerted; *style* slender with shortly and acutely bifid stigma; *ovary* 4-celled, the cells 1-ovuled; *fruit* a drupe with 1 four-celled, four-seeded pyrene, included in the accrescent or inflat calyx; seeds exalbuminous.

Distribution: British India, Malay Peninsula! and Archipelago!, Philippines!

1. a. Leaves 23–55 by $12\frac{1}{2}$ –37 cM.; petioles 1.6–5 cM.;
tomentum floccose or \pm none 2.

- b. Leaves 8—15 by 3—6 cM.; petioles 0.5—0.7 cM.; tomentum minute 1. **T. philippinensis** p. 94.
2. a. Branchlets stellately floccose on all parts; leaves opposite, 23—55 by 22—37 cM.; petioles $2\frac{1}{2}$ —5 cM.; panicles 40 cM. long, 35 cM. in diam.; calyx-teeth obtuse; throat of corolla glabrous; corolla white 2. **T. grandis** p. 95.
- b. Branchlets subglabrous, nodes with dense globose masses of plumose or simple hairs; leaves 24 by $12\frac{1}{2}$ cM.; petioles 1.6 cM.; usually ternate; panicles 15—30 cM. long; calyx-teeth acute; throat of corolla villous; corolla blue
3. **T. Hamiltoniana** p. 96.

1. **T. philippinensis** Merrill Phil. Journ. Sci. Bot., V, 227, (1910) — *T. philippinensis* Bth. et Hook., Gen. Pl. II, II, 1152, nom. nud. — A tree, 15 M. high; leaves elliptical-ovate or ovate-lanceolate, acuminate, subcoriaceous, margins entire or minutely denticulate or undulate, above glabrous or densely white-verrucose, densely pale-stellate-hairy beneath; pairs of nerves 5—7; 8—15 cM. long, 3—6 cM. broad; petioles 0.5—0.7 cM.; panicles terminal, densely hairy; flowers 0.8 cM. long, 1 cM. wide; calyx densely pubescent, 0.5 cM. long, with 5 equal, deltoid, 0.2 cM. long teeth; corolla 5-lobed; inferior part of tube cylindrical; 0.1—0.15 cM. long, 0.5 cM. wide, the upper part suddenly widening; lobes 0.4 cM. long; throat villous; stamens 5, somewhat exsert, filaments 0.8 cM.; fruit 1.3 cM. long, 0.5—0.6 cM. in diam., glabrous or nearly so.

LUZON: Cuming no. 1432. Batanges.

Schauer, DC. Prodr. XI, 629, determined Cuming no. 1432, as *T. Hamiltoniana*. According to Merrill, l.c., this is a mistake: the specimen should belong to *T. philippinensis* Bth. et Hook., l.c., but as no description has been given, Merrill gives one. Differences from *T. Hamiltoniana* are in the dimensions the leaves and in the tomentum, which in *T. Hamiltoniana* is stellate-tomentose or-floccose, and in *T. philippinensis* minutely tomentose.

2. *T. grandis* L. f. Suppl. 151, (1781); *Blume*, Bijdr. 820; *Williams*, Bull. Herb. Boiss. Sér. II, T. V, 430; *Schauer*, DC. Prodr. XI, 629; *Decaisne*, Nouv. Ann. Mus. Nat. Par., III, 402; *Elbert*, Meded. 's Rijks Herb. Leiden, no. 12, 15; *Forbes*, Wander. Nat. f. Mal. Arch. II, 226; *Gaertner*, De Fruct. I, 275; *Hook. f.* Fl. Br. Ind., IV, 570; *Koorders en Valetton*, Bijdr. Booms. Java, no. 7, 165; *id.*, Atl. d. Baumart. II, 6, t. 255—272; *King and Gamble*, Journ. As. Soc. Beng. LXXIV, IV, 809; *Koorders*, Exk. fl. v. Java, III, 134; *Hook.* Comp. Bot. Mag. I, 349; *Kuntze*, Rev. Gen. Pl. I. 508; *Miquel*, Fl. Ind. bat., II, 901 and suppl. I, 244; *Hasskarl*, 2e cat. 's Lands Pl. tuin Buitzg., 135; *Merrill*, Bur. Gov. Lab. no. 27, 67; *Spanoghe*, Linnæa XV, 330; *Zollinger u. Moritzi*, Syst. Verz., 53; *Hall. f.*, Med. 's Rijks Herb. Leid. no. 37, 34 — *T. Theca* *Lour.* Fl. Cochinch., 137 (1790) — A large tree; branchlets obtusely quadrangular with inflorescences and petioles yellowy-brownish-stellate-tomentose; leaves thickly chartaceous or coriaceous, ovate-elliptic or obovate, sometimes subrotundate, base acute often decurrent, apex acuminate, margins entire; upper surface glabrous when adult, often densely verrucose, the midrib somewhat hairy; lower surface densely yellowish stellate-tomentose; pairs of nerves \pm 18; 23—60 cM. long, 22—37 cM. broad, petioles $2\frac{1}{2}$ —5 cM. long, 0.5 cM. in diam.; panicles large, 40 cM. long, 35 cM. wide, with opposite trichotomous cymes; bracts lanceolate-acuminate, 0.5—1.1 cM. long; flowers white; calyx 0.6 cM. wide campanulate, tube 0.3 cM., teeth 5, subobtusely, 0.1 cM.; outer side densely pubescent, teeth with dark-red glands; corolla-tube shorter than the calyx, glabrous within and without, lobes 5, rounded, 0.1 cM. exsert from the calyx, pubescent and with dark-red glands; stamens 5, inserted in the lower part of the corolla-tube, somewhat exserted; style short with shortly bifid stigma; ovary densely villous, conical;

drupe included in the enlarged, globose-urceolate, chartaceous, somewhat pubescent, $2\frac{1}{2}$ cM. long and wide calyx, with soft exocarp with dense felty stellate or branched hairs, endocarp thick, bony; pyrene 1 with 4 cells and 4 seeds, and a central cavity; *drupe* 1.2 cM. long, 1.2—1.5 cM. in diam.

JAVA: *Elbert* no. 470, Kendeng Trinil, Madiun — *Boerlage* in H. L.—B. sub nos. 908.267—957 and 958, Pelabuan Ratu.

SUMATRA: *Heyne* no. 273, Lubuk-alei, Ujung Gading, Ajer Bangis; native name: Kaju mandung.

PHILIPPINES: *Robinson et Ramos* no. 11885, Tanay, Rizal, Luzon, with fruits on Oct. 25th, 1910. — Com. d. l. Fl. for. no. 502, Igbarás, the leaves subglabrate beneath!

BORNEO: *Korthals*, Banjermassing, in H. L.—B. sub no. 908.266—588.

MALACCA: *Griffith*, in H. L.—B. sub. no. 908. 266—538.

MARIANNE-ISL.: Herb. Bur. of Sci. no. 253, Guam.

Distribution: British India, Malay Peninsula!, Burma, Sumatra!, Java!, Borneo!, Philippines!, Marianne-isl.!, Sumbawa, Bali, Kangean, Celebes (*Koord. et Val.*).

3. *T. Hamiltoniana* Wall. Pl. As. Rar., III, 68, t. 294, (1830—2), and cat. no. 773, (1828); *Schauer*, DC. Prodr. XI, 629; *Hook f.*, Fl. Br. Ind. IV, 571; *Miquel*, Fl. Ind. bat., II, 902; *Merrill*, Bur. Gov. Lab. no. 27, 68 — A tree, 10—13 M. high; branchlets round, or 6—8-angular, somewhat minutely hairy, the petioles and inflorescences usually tomentose; *leaves* ovate, base acute or rhomboid, apex acuminate, margins entire, usually ternate, sometimes opposite or quaternate, chartaceous, adult scabrid above, densely stellate hairy when young; densely stellate-tomentose beneath; pairs of nerves ± 7 ; 24 cM. long, $12\frac{1}{2}$ cM. wide, petioles 1.6 cM.; *panicles* terminal, stellate-woolly, the base with a dense, globoid cluster of long, branched hairs; 15—30 cM. long; *calyx*, densely stellate-

tomentose, glandular, 0.5 cM., tube 0.35 cM., teeth 5, acute, deltoïd; *corolla* glabrous, 0.5—0.8 cM., tube 0.3—0.5 cM., lobes 5, 0.2—0.3 cM. long; throat densely villous; *stamens* 5, inserted in the middle of the corolla-tube; *ovary* pubescent; *drupe* 0.3—0.6 cM. in diam., 4-celled without central cavity, glabrous or somewhat hairy.

MALAY PENINSULA: *Griffith*, in H. A. R.—T. sub no. 049901.

Distribution: Burma, Ava, Malacca (*Clarke* in *Hook. f.*).

Cuming's specimen no. 1432 (*Schauer*, l.c.), belongs to *T. philippinensis* (q. v.).

Subtribe C. TEYSMANNIODENDREÆ.

XII. **TEYSMANNIODENDRON** *Koorders*, Ann. Jard. bot. Buitzg., XIX, 19 (1904); *Engl. u. Prantl*, Nat. Pfl. fam. Nachtr. III, 307 — Trees; *leaves* opposite, digitately composed; *inflorescences* paniculate, terminal, with trichotomous cymes, bracts lanceolate, small; *calyx* persistent, somewhat enlarged in fruit, 5-toothed; *corolla* with short subcylindrical tube; limb oblique, 2-lipped, upper lip 2-lobed, sometimes subentire, lower lip 3-lobed, mid-lobe largest, with the throat villous within; *stamens* 4, distinctly didynamous, exerted, inserted in the middle or lower part of the corolla-tube; anthers glandular on the back-side; *style* terminal, slender, with shortly bifid stigma; *ovary* 2-carpelled, imperfectly 2-celled, cells 2-ovuled, imperfectly 2-locellated; ovules hemianatropical, attached laterally near the apex; *fruit* capsular, indehiscent, dry, by suppression 1-celled, 1-seeded; seeds pendulous, oblong, with membranous testa, exalbuminous.

Distribution: discovered growing in the botanical Gardens of Buitenzorg; Borneo!

1. **T. bogoriense** *Koorders*, Ann. Jard. bot. Buitzg. XIX, 19 (1904); *Engl. u. Prantl*, Nat. Pfl. fam. Nachtr. III, 308, (illustrated); *Hall. f.*, Med. 's Rijks Herb. Leid. no. 37, 55 — A tree, 16 M. high; branchlets obtusely

quadrangular, with inflorescences and petioles somewhat pubescent or subglabrous; *leaves* 3-foliolate, sometimes 2- or 4-foliolate with characteristic silicated epiderm-cells; leaflets lanceolate, acute at both ends, margins entire, coriaceous or chartaceous, glabrous on both sides; pairs of nerves 7—12; 10—29 by 4.7—9 cM., the terminal one larger; petiolules 0.7—2.5 cM.; petioles stout, 1.8—3.5 cM.; *panicles* lax, foliose beneath, 18—30 cM. long, 16—20 cM. wide; cymes opposite; *calyx* regular or somewhat 2-lipped, with 5 acute teeth; somewhat pubescent without, especially near the margin, 0.18—0.2 cM. long, 0.27—0.35 cM. wide; *corolla*-tube glabrous in the lower part, upper part with lobes pubescent without; the 4 smaller lobes pubescent within, the larger one with the throat (especially on the antical side), densely villous; tube 0.45—0.7 cM.; the smaller lobes 0.3—0.35 cM., the larger one 0.5—1.05 by 0.35—0.55 cM.; *stamens* 4, with stout, hairy filaments and divergent anther-cells, inserted in the middle of the corolla-tube, the longer ones 0.5 cM., the smaller ones 0.35 cM., exsert; *style* 0.4—0.5 cM. with acutely bifid stigma; *ovary* glabrous, apex densely hairy and glandular; *capsule* rather large, 4—5 cM. long, 3—4 cM. wide.

Distribution: discovered growing in the botanical Gardens of Buitenzorg. (e. g. in H. L.-B. sub nos. 914.196—88, 89, 90 and 91), W.-Borneo! (*Hallier.*)

XIII. XEROCARPA *H. J. Lam*, nov. gen. — Arbores; *folia* digitatim composita, 3-foliolata, petiolata, opposita, foliolis petiolulatis; *inflorescentia* terminalis, basi saepissime brachiata; paniculae spicatae vel spicae laxissimae elongatae; floribus brevissime pedicellatis, aut pedicellis nullis; *calyx* basi bracteolis 2 parvis suffultus, hypocraterimorphus, truncatus vel minute regulariterque 5-denticulatus; *corolla* subbilabiata, tubo brevi subcylindrico, lobis 5 angustis,

antico majore, fauce villosa; *stamina* 5 æqualia vel sub-æqualia, longiuscule exserta, lobis corollæ alternantia, antheris basi bilobis, dorsifixis; *stylus* filiformis, exsertus, stigmate breviter bifido, lobis acutis horizontalibus; *ovarium* 2-loculare, ex carpellis 2 conformatum; loculi 2-ovulati; ovula pendula, marginalia, hemianatropa, funiculis supra medium aut prope apicem ovarii insertis; *fructus* siccus, capsularis, indehiscens, abortu 1-locularis, 1-spermus, ovoideus; semen exalbuminosum.

Distribution: New-Guinea (Kais.-Wilh.-land).

Our genus is well characterized by its narrow corolla-lobes, 4 of which are nearly equal, its 5 stamens, and its typical lax spikes. It has an affinity with *Teysmanniodendron* by its capsular fruit and is without any doubt the 2nd genus belonging to Koorders' *Teysmanniodendreae*.

1. **X. avicenniæfoliola** H. J. Lam, nov. spec. — Arbor, 15—25 M. alta; ramuli tetragoni cum petiolis fulvo-tomentosi vel subglabri, cortice brunneo; *folia* petiolata, 3-foliolata, chartacea vel coriacea, in sicco utrinque fulvo-brunnea; foliola lanceolata utrinque acuta, integerrima, saepe cum nervo primario albo vel luteo curvata, viridia, utrinque glaberrima, eglandulosa, interdum singulis pilis glandulisque vestita, nervis secundariis paulo prominentibus; $5\frac{1}{2}$ —18 cM. longa, 1.1—6 cM. lata; petiolulo 0.5—2.3 cM., petiolo 1—4 $\frac{1}{2}$ cM. longo; *spicæ* vel paniculæ molliter ferrugineo-fulvo-pubescentes, 10—25 cM. longæ, tomento, ut in partibus novellis, variabiliusculæ; *calyx* truncatus vel regulariter 5-denticulatus vel dentatus, vel sinuato-undulatus, extus dense incano-fulvo-pubescentis, dein margine subglabratus, fructifer auctus, basi 2 bracteolis lanceolatis suffultus, 0.3—0.35 cM. longus, 0.25 cM. latus; *corolla* lutea v. luteo-coerulea v. griseo-lutea v. cæruleo-viridis, tubo brevī, glabro, 0.15—0.2 cM. longo; subbilabiata, labio superiore lobis 2 angustis, 0.5 cM. longis, 0.1 cM. latis, labio inferiore lobis lateralibus 2 angustis, lobo medio

majorē late spathulato, sæpe bilobo, 0.6 cM. longo, 0.15—0.3 cM. lato; lobis extus dense incano-fulvo-pubescentibus præter lobi majoris marginem, intus glabris; fauce longissime villosa; *stamina* 5, subæqualia, filamentis albis basi villosis, in tubi medio insertis, cum lobis corollæ alternantibus, 0.4 cM. longis, antheris cœruleis basi bilobis, thecis paulo divergentibus; *stylus* filiformis, cum ovario articulatus, glaber, stigmate breviter acuteque bifidus, lobis horizontaliter divergentibus; *ovarium* late pyriforme, breviter rostratum, glabrum, 2-loculatum; loculis 2-ovulatis; ovulis marginalibus pendulis prope apicem affixis; *capsula* nigra v. coccineo-nigra, glandiformis, nitida, glabra, pericarpio exocarpioque tenui, coriaceo, 2-vel sæpissime abortu 1-loculata, 1-sperma; 1—1.3 cM. longa, 0.5—0.7 cM. lata, calyce aucto 0.5 cM. longo insidens; semina exalbuminosa, pendula.

NEW-GUINEA: *Ledermann* no. 9510, Etappenberg, 850 M., with buds on 25-X-1912.; id. no. 9789, Camp 18, near April-river, 200—400 M., in the forest, buds on 20-XI-1912; id. no. 9792, same locality, buds on 21-XI-1912; id. no. 10427, Camp Malu, 40—70 M., flowers just cast off on 4-I-1913; id. no. 10828, same locality, 100—150 M., with fruits on 4-II-1913; id. no. 9667, near April-river, with buds and flowers on 14-XI-1912.

Subtribe D. VITICÆÆ.

XIV. **PREMNA** *L.* Mant. II. 154 (1771); *Blume*, Bijdr. 815; *R. Brown*, Prodr. 512; *Benth.* and *Hook.* Gen. Pl. II, II, 1152; *Blanco*, Fl. d. Filip. ed. I., 487; *Engl.* u. *Prantl.* Nat. Pfl. fam., IV, 3a, 170; *Hook. f.*, Fl. Br. Ind. IV, 571; *Koorders en Valetton*, Bijdr. Booms. Java, no. 7, 577; *King and Gamble*, Journ. As. Soc. Beng., LXXIV, IV, 810; *Miquel*, Fl. Ind. bat. II, 890; *Roxb.*, Fl. Ind. III, 75; *Hassk.*, 2^e Cat. 's Lands Pl. tuin Btz., 134; *Schauer*, DC., Prodr. XI, 630; *Hall. f.*, Med. 's Rijks

- b. Leaves usually serrate towards the apex; corymbs $5\frac{1}{2}$ —13 cM. long, 4—13 cM. wide 14.
13. a. Calyx 2-lipped, one lip entire or 2-toothed, the other entire; corolla pubescent without; leaves membranous
5. **P. sterculifolia** p. 113.
- b. Calyx 2-lipped, one lip entire or 3-toothed, the other 2-toothed; leaves chartaceous . . . 8. **P. Peekelii** p. 115.
14. a. Calyx 2-lipped, one lip 1-toothed, the other entire or 2-toothed; corolla-tube 0.2 cM. 9. **P. Curranii** p. 116.
- b. Calyx 2-lipped, one lip sometimes with 2 acute, usually with 2 obtuse teeth, the other sometimes entire, usually with 3 obtuse teeth; corolla-tube 0.4—0.5 cM.
48. **P. pubescens** p. 152.
15. a. Leaves $2\frac{1}{2}$ —12 by $1\frac{1}{2}$ —5.7 cM.; corymbs 6—13 cM. long, $2\frac{1}{2}$ —(5—8) cM. in diam.; peduncles 0.2—2.5(—8) cM. 16.
- b. Leaves $8\frac{1}{2}$ —22 by 4— $8\frac{1}{2}$ cM.; corymbs 10—15 cM. long, 7—20 cM. in diam., peduncles (0—) $2\frac{1}{2}$ — $7\frac{1}{2}$ cM. 22.
16. a. Leaves 3—4(—5) (in **P. integrifolia** sometimes more) -nerved; base subcordate, rounded or obtuse, sometimes subacute 17.
- b. Leaves 5—8-nerved, base cuneate, decurrent, sometimes subobtuse 20.
17. a. Leaves usually barbellate in the axils of the nerves beneath; pairs of nerves 4—6 18.
- b. Leaves not barbellate in the axils of the nerves beneath; pairs of nerves 3; corolla-lobes subequal
10. **P. corymbosa** p. 117.
18. a. Leaves entirely glabrous on both sides, also on nerves and in their axils beneath; teeth of the lower lip of the calyx small, close to one another, somewhat elevated above the rest of the calyx . 11. **P. borneensis** p. 117.
- b. Leaves usually pubescent on the nerves, always barbellate in their axils beneath; teeth of the lower lip of the calyx rather large and not close to one another . . 19.
19. a. Leaves $2\frac{1}{2}$ — $5\frac{1}{2}$ (—7) by 1.5—3.3(— $4\frac{1}{2}$) cM., entire, 4—5-nerved; corolla distinctly 2-lipped; upper lip sometimes 2-lobed 12. **P. congesta** p. 118.
- b. Leaves usually larger, often crenate towards the rounded

- or shortly acuminate apex; corolla subequally 4-lobed
42. P. integrifolia p. 140.
20. *a.* Teeth of the calyx broad and short, indistinct; base of the leaves decurrent; midlobe of the lower lip of the corolla broader than the lateral lobes
13. P. angustifolia p. 118.
- b.* Teeth of the calyx always large 21.
21. *a.* Base of the leaves subobtuse, narrow; midlobe of the lower lip of the corolla narrower than the lateral lobes
14. P. timoriana p. 119.
- b.* Base of the leaves cordate, truncate or subacute, usually broad; midlobe of the lower lip of the corolla broader than the lateral lobes . . . **42. P. integrifolia** p. 140.
22. *a.* Leaves 4—5-nerved, broadly elliptic, abruptly acuminate; base rounded or subcordate, 7—15 by 5¹/₂—9 cM.; petioles 2¹/₂—5 cM.; glandular beneath, glabrous in the axils of the nerves . . . } **15. P. ceramensis** p. 120.
 { **16. P. punctulata** p. 121.
- b.* Leaves 5—6 nerved, narrower, not abruptly acuminate; base acute or rounded; axils of the nerves usually barbellate beneath 23.
23. *a.* Leaves membranous, when young, chartaceous afterwards, elliptical or ovate, sometimes pubescent on both sides; corolla-tube pubescent without **17. P. divaricata** p. 121.
- b.* Leaves chartaceo-coriaceous; corolla-tube glabrous without 24.
24. *a.* Lower bracts leafy, upper ones lanceolate; nerves glabrous
18. P. perakensis p. 122.
- b.* All bracts linear; nerves generally pubescent . . . 25.
25. *a.* Branchlets, etc. with longitudinal lines of hairs which alternate at each node; corymbs often sympodiously branched; corolla-tube 0.4—0.5 cM. long
19. P. subglabra p. 123.
- b.* Branchlets, etc. with a continuous tomentum on all parts, or subglabrous; corymbs dichotomously branched; corolla-tube usually very short, 0.2 cM., sometimes reaching 0.3—0.4 cM. **42. P. integrifolia** p. 140.
26. *a.* Leaves coarsely crenate or serrate 27.

- 0.3 cM., lobes pubescent and glandular, tube glabrous without 4. **P. parasitica** p. 112.
- b. Leaves 8—17 by 3—12 cM.; petioles 1—3 cM.; calyx 4-toothed or subtruncate 37.
37. a. Calyx distinctly, acutely 4-toothed, not or indistinctly 4-ribbed, sparsely pubescent and glandular; leaves 10—17½ by 5—15½ cM.; petioles 1.5—2.3 cM.; style with shortly bifid stigma . . . 25. **P. thrichostoma** p. 128.
- b. Calyx often truncate or indistinctly 4-toothed, teeth obtuse; subglabrous, 4-ribbed; leaves 8—14 by 3—5 cM.; petioles 1—3 cM.; stigma long bifid, lobes 0.1 cM. 38.
38. a. Leaves areolate beneath . . . 21. **P. areolata** p. 124.
- b. Leaves not areolate beneath 26. **P. Williamsii** p. 129.
39. a. Calyx hardly 4-toothed or subtruncate; stigmatic lobes 0.1 cM. 38.
- b. Calyx with large teeth, which are 1/1 or 1/2 of the tube; stigmatic lobes shorter 41.
40. a. Calyx coriaceous, teeth 4, obtuse, ciliate
27. **P. oblongifolia** p. 129.
- b. Teeth of the calyx acute, sometimes subobtuse, not ciliate; one lip 2-toothed, the other 2-toothed or entire 41.
41. a. Calyx subquadrangular; leaves 4—7½ by 2—4 cM., 6—7-nerved; corymbs 4—12 cM. long; corolla with 4 subequal lobes 28. **P. Ridleyi** p. 130.
- b. Calyx not quadrangular; leaves 4—6-nerved and larger, or, if as large, then 4-nerved; corolla 2-lipped . . . 21.
42. a. Leaves 4—10 by 2—4 cM.; petioles 1—2½ cM.; ovate, base and apex acute. 29. **P. rufidula** p. 131.
- b. Leaves 9—24 by 6½—14 cM.; petioles 2—9 cM. 43.
43. a. Lobes of the corolla subequal, tube 0.1—0.3 cM. . 44.
- b. Corolla 2-lipped, tube 0.2 cM.; leaves long acuminate, often serrate towards the apex 9. **P. Curranii** p. 116.
44. a. Corolla-tube as long as or shorter than the calyx, 0.1 cM.; leaves obovate-oblong . 24. **P. oblongata** p. 127.
- b. Corolla-tube longer, 0.2 cM. or more; leaves broader 45.
45. a. Corolla-tube 0.2 cM.; calyx 0.1 cM.; stigmatic lobes short, capitate; ovary pubescent and glandular at the top
30. **P. regularis** p. 131.

- b. Corolla-tube 0.25—0.3 cM.; calyx 0.1—0.15 cM.; stigmatic lobes long, subulate 46.
46. a. Leaves membranous, $6\frac{1}{2}$ —15 by 5—12 cM.; teeth of the calyx subobtuse, often not alternating with the corolla-lobes **31. P. membranacea** p. 132.
- b. Leaves chartaceous or coriaceous, 12—26 by 7—9 cM.; teeth of the calyx acute, alternating with the corolla-lobes **32. P. rotundifolia** p. 132.
47. a. Leaves glabrous beneath, or pubescent only on the nerves or in their axils, or along the margin 48.
- b. Leaves pubescent beneath. 63.
48. a. Leaves crenate, serrate or undulate, except close near the base 49.
- b. Leaves entire or minutely denticulate, sometimes crenate, serrate or dentate towards the apex 51.
49. a. Leaves membranous, coarsely undulate-dentate, sessile, 10—14 by 5—8 cM.; corymbs 2—3 cM. long, $1\frac{1}{2}$ —2 cM. in diam. **33. P. sessilifolia** p. 133.
- b. Leaves chartaceous or coriaceous, petioled, corymbs larger 50.
50. a. Base of leaves decurrent, margins coarsely crenate; corolla-tube 0.45—0.55 cM. long, 0.1—0.15 cM. in diam.; teeth of calyx large, acute **34. P. angustiflora** p. 134.
- b. Base of leaves cordate or subcordate, margins dentate; calyx 2— $2\frac{1}{2}$ cM.(!?) **35. P. littoralis** p. 135.
51. a. Leaves 3—10 by $2\frac{1}{2}$ —5 cM.; petioles 1—4 cM. 52.
- b. Leaves 10—27 by 5—15 cM.; petioles $1\frac{1}{2}$ —8 cM. 55.
52. a. Corolla 0.3—0.4 cM. 53.
- b. Corolla 0.6—0.7 cM. 54.
53. a. Upper lip of corolla 2-lobed, lobes rounded; lower lip 3-lobed, midlobe rounded, lateral lobes subacute, deltoid **36. P. benguetensis** p. 136.
- b. Upper lip of corolla entire 21.
54. a. Upper lip of corolla entire or somewhat 2-lobed; leaves usually longer than 10 cM. **37. P. flavescens** p. 136.
- b. Upper lip of corolla deeply 2-lobed; leaves usually shorter than 10 cM. **38. P. membranifolia** p. 137.
55. a. Corymbs 5—8 cM. in diam. 56.

- b. Corymbs 10—24 cM. in diam. 59.
56. a. Corolla minutely pubescent without, 0.7 cM.; leaves 10—19 by 6—10 cM.; petioles 1.5—4 cM.; calyx 0.2 cM.
39. *P. nervosa* p. 138.
- b. Corolla glabrous without, 0.5—0.6 cM. 57.
57. a. Throat of corolla glabrous or nearly so; leaves 10—18 by 6—12 cM.; petioles 3—8 cM.
40. *P. paulobarbata* p. 138.
- b. Throat of corolla villous 58.
58. a. Leaves membranous; upper lip of corolla 2-lobed
38. *P. membranifolia* p. 137.
- b. Leaves chartaceous; upper lip of corolla entire
42. *P. integrifolia* p. 140.
59. a. Calyx deeply 2-lipped and -toothed 60.
b. Calyx hardly 2-lipped, subtruncate 62.
60. a. Calyx deeply or distinctly 2-lipped 61.
b. Calyx with 5 subequal large teeth, one sometimes larger
43. *P. flavida* p. 147.
61. a. Lower bracts leafy; base of leaves attenuate
41. *P. Wrayi* p. 139.
- b. All bracts linear; base of leaves broad, usually rounded or cordate 42. *P. integrifolia* p. 140.
62. a. Leaves 8—25½ by 6—14½ cM.; petioles 1—2 cM.; corymbs 8—26 cM. long, 11—24 cM. in diam.; peduncles 2½—11 cM.; stigmatic lobes capitate; drupe with large central cavity 44. *P. macrophylla* p. 148.
- b. Leaves 7—15 by 4½—6 cM.; petioles 1—4 cM.; corymbs 10—17½ cM. in diam.; stigmatic lobes subulate
37. *P. flavescens* p. 136.
63. a. Leaves 3—8 by 2—5 cM.; petioles ½—1½ cM. 64.
b. Leaves 10—35 by 7—20 cM.; petioles 3—10 cM. 70.
64. a. Leaves entire 65.
b. Leaves partly or totally crenate, serrate, or dentate 69.
65. a. Petioles ½—1½ cM. 66.
b. Petioles 1½—6 cM. 68.
66. a. Leaves 3—6 by 2—3½ cM., base cordate or rounded, apex acute; calyx 0.3 cM.; corolla pubescent without
45. *P. depauperata* p. 149.

- b. Leaves 5—15 by 2.7—5 cM., base acute or subrounded, apex obtusely acuminate or acute; calyx 0.1—0.15 cM.; corolla-tube glabrous, lobes somewhat pubescent without 67.
67. a. Leaves $6\frac{1}{2}$ —8 by 4—5 cM., relatively broad; corolla-lobes somewhat pubescent without
 46. P. leucostoma p. 149.
- b. Leaves 5—15 by 2.7—5 cM., relatively narrow; corolla-lobes glabrous without . **47. P. latifolia** var. δ p. 151.
68. a. Teeth of calyx acute, corolla glabrous without
 37. P. flavescens p. 136.
- b. Teeth of calyx obtuse, corolla more or less pubescent without **48. P. pubescens** p. 152.
69. a. Teeth of calyx acute; margins of leaves coarsely crenate; corolla-tube 0.45—0.55 cM. long, 0.1—0.15 cM. in diam.
 34. P. angustiflora p. 134.
- b. Teeth of calyx obtuse; margins of leaves serrate or denticulate towards the apex only **48. P. pubescens** p. 152.
70. a. Tomentum of the leaves beneath principally simple 71.
- b. Tomentum of the leaves beneath principally stellate 74.
71. a. Corolla-tube 0.4—0.55 cM., pubescent without; leaves often crenate or serrate 69.
- b. Corolla-tube 0.15—0.3 cM., glabrous without; leaves entire 72.
72. a. Base of leaves subobtuse, acute or attenuate; leaves 2.7—6 cM. broad; petioles $\frac{1}{2}$ — $1\frac{1}{2}$ cM.
 47. P. latifolia var. δ p. 151.
- b. Base of leaves rounded or cordate; leaves $4\frac{1}{2}$ —16 cM. broad, petioles 1—6 cM. 73.
73. a. Teeth of calyx usually acute; one lip with 2 large, the other with 3 smaller teeth. . **37. P. flavescens** p. 136.
- b. Teeth of calyx usually obtuse; one lip with 2 large teeth, the other often subentire . **8. P. Peekelii** p. 115.
74. a. Teeth of calyx small, $\frac{1}{4}$ or $\frac{1}{6}$ of the length of the calyx 75.
- b. Teeth of calyx large, $\frac{1}{2}$ of the length of the calyx or more 78.
75. a. Corolla glabrous without; lobes pubescent within; leaves

- with petioles reaching 15 cM.; corymbs shorter than the leaves 49. *P. Goeringii* p. 154.
- b. Corolla pubescent without; lobes glabrous within or nearly so 76.
76. a. Leaves abruptly acuminate, 4—6-nerved, 9—20 by 7—12 cM.; petioles $2\frac{1}{2}$ —6 cM. 50. *P. stellata* p. 154.
- b. Leaves gradually acuminate, 6—10-nerved, 10—35 by 7—20 cM.; petioles $2\frac{1}{2}$ —10 cM. 77.
77. a. Leaves eglandular above, 15—35 by $7\frac{1}{2}$ —20 cM., petioles $2\frac{1}{2}$ —10 cM.; calyx very shortly and irregularly 5-toothed, not or indistinctly 5-ribbed 51. *P. pyramidata* p. 155.
- b. Leaves usually densely glandular above, 10—28 by 7—14 cM.; petioles 3—10 cM.; calyx distinctly 5-toothed, 2-lipped, distinctly 5-ribbed . 52. *P. tomentosa* p. 156.
78. a. Corolla glabrous without, lobes pubescent within; leaves with petioles reaching 15 cM., corymbs shorter than the leaves 49. *P. Goeringii* p. 154.
- b. Corolla pubescent without, lobes glabrous within; leaves 11—30 by 8—20 cM.; petioles $1\frac{1}{2}$ —8 cM. 79.
79. a. Leaves gradually, subobtusely acuminate, often denticulate, sparsely pubescent or subglabrate beneath; calyx with 4 equal teeth and 1 larger one, not or indistinctly 2-lipped, 0.2 cM. 43. *P. flavida* p. 147.
- b. Leaves more or less abruptly and acutely acuminate, entire, stellate-tomentose beneath; calyx 2-lipped, 0.35 cM. 53. *P. Cumingiana* p. 157.
- DOUBTFUL SPECIES: 54. *P. Ledermanni* p. 159.
55. *P. nauseosa* p. 159.
56. *P. papuana* p. 160.
57. *P. populifolia* p. 160.

Section I Gumira Hassk.

1. *P. Derryana* King et Gamble, Kew Bull., 107 (1908); iid. Journ. As. Soc. Beng. LXXIV. 4, 813 — A climbing (?) shrub; branchlets smooth, with large lenticels; leaves membranous when dry, subsessile; elliptic or obovate, shortly and obtusely acuminate at apex, attenuate and

obscurely auricled at base; both surfaces shining, glabrous; margins entire; $12\frac{1}{2}$ —20 cM. long, 9—10 cM. broad; pairs of nerves 7—8; *cymes* in terminal panicles of 3—4 spikes, each spike with many interrupted glomerules of sessile flowers, the inflorescence 15—20 cM. long; main peduncles 5—6, secondary ones 2 — $2\frac{1}{2}$ cM. long; bracts lanceolate, 0.6 cM.; *calyx* deeply bilabiate, the upper lip entire as first, afterwards 2-lobed, 0.3 cM.; lower lip entire, 0.25 cM.; tube golden-pubescent without; *corolla*-tube rather longer than the calyx, glabrous without; throat sparsely white-villous; lips 2, upper lip emarginate, lower lip 3-lobed, the lobes obtuse, the midlobe longest; *stamens* 4, long exsert; filaments puberulous, twisted; anthers reniform, the cells opening by oblong pores; *ovary* glabrous, depressed; *style* as long as the stamens; stigma with 2 slender horizontal lobes.

Distribution: Malay Peninsula.

2. *P. Mariannarum* Schauer, DC. Prodr. XI, 632, (1847); Merrill, Phil. Journ. Sci. Bot., IX, 136 — A shrub?; branchlets, inflorescences and petioles minutely, apressedly pubescent; *leaves* ovate or subrotundate, base rotundate or slightly cordate, apex rounded and shortly acuminate, or obtuse; margins entire, adult glabrous on both sides, the nerves pubescent beneath; 5 cM. long; petioles 1.25 cM.; *inflorescences* corymbose, small; *calyx* 0.25 cM., 2-lipped, upper lip shortly truncate, lower one entire; *corolla* subequally 5-lobed; tube as long as the calyx; throat villous; *stamens* and *style* exserted.

Distribution: Marianne-Islands.

It has an affinity with *P. integrifolia*, but differs from it by its entire calyx-lips and its 5-lobed corolla. The latter characteristic, however, makes it rather doubtful, that the species really belongs to *Premna*.

3. *P. cordifolia* Roxb., Fl. ind. III, 78, (1832); Schauer, DC. Prodr. XI, 632, partly; Hook f., Fl. Br. Ind. IV,

572; *King and Gamble*, Journ. As. Soc. Beng. LXXIV. 4, 818; *Miquel*, Fl. Ind. bat. II, 895, partly; *Hunter ex Ridley*, Journ. As. Soc. Straits, LIII, 102 — *P. Doncaria Buch.-Ham. ex Wall.* Cat. no. 2147, (1828) — A shrub, 2½–4 M. high; branchlets, corymbs and upper side of petioles tawny-pubescent; *leaves* membranous; ovate or ovate-cordate, base rounded or cordate, apex acuminate; margins entire; upper side glabrous except on the nerves, bullate, lower side glabrous; 8–17 by 5–7½ cM.; petioles 1.2–2.5 cM.; pairs of nerves 5–6; *corymbs* many-flowered, dense, about 7½ cM. long and wide; flowers sessile, greyish-white; *calyx* 0.25–0.35 cM., 2-lipped, both lips entire or upper lip 2-lobed, glabrous or nearly so; *corolla*-tube 0.3–0.5 cM., 2-lipped, upper lip entire, lower lip 3-lobed; throat villous; *stamens* nearly included, as is the style; drupe obovoid.

Distribution: Malay Peninsula.

4. *P. parasitica* Bl. Bijdr. 816, (1826); *Schauer*, DC. Prodr. XI, 633; *Koord. en Val.* Bijdr. Booms. Java, no. 7, 185; *id.* Atl. d. Baumart. v. Java II, 6, t. 282; *Koord. Meded.*, 's Lands Pl. tuin Btzg., XIX, 560; *id.* Exk. fl. v. Java, III. 135; *id.* Pl. Junghuhn, ined. Ged. boek Fr. Jungh. 188; *Hooker*, W. J., Comp. Bot. Mag. I, 349; *Hall. f.*, Med. 's Rijks Herb. Leid. no. 37, 35; *Miquel*, Fl. Ind. bat. II, 896; *Hasskarl*, 2e Cat. 's Lands Pl. tuin Btzg., 135; *Spanoghe*, Linnaea, XV, 330. — *not P. thrichostoma* *Miq. ex Clarke* in *Hook f.*, Fl. Br. Ind. IV, 575 (see annotation at *P. thrichostoma* on p. 128) — A climbing shrub; branchlets, corymbs and petioles somewhat pubescent; *leaves* chartaceous, ovate or ovate-rotundate, sometimes obovate or obovate-oblong, base rounded or somewhat cordate, apex abruptly and shortly acuminate, sometimes acute; both surfaces glabrous or with some sparse hairs; puberulous on nerves; pairs of nerves 5–7, the lower pairs at a much greater angle with the midrib

than the upper ones; 10—30 by 5.1—20 $\frac{1}{2}$ cM., petioles 1.2—8.2 cM.; *corymbs* 11—24 cM. long, 5—27 cM. wide; peduncles 4—10 cM.; bracts caducous; *calyx* membranous, pubescent at first, glabrate afterwards, 2-lipped, each lip entire or more or less deeply 2-toothed; tube 0.15 cM.; lips 0.05 cM.; *corolla*-tube 0.3—0.37 cM., glabrous without, densely villous within nearly down to the base; lobes 4, subequal, pubescent and glandular without, 0.05 cM. long, rounded; *stamens* exsert, inserted in the throat; *stigma* rather long bifid, style 0.4—0.45 cM.; *ovary* glabrous; *drupe* oblong, 0.6 cM. long.

Koord. Pl. Jungh. ined. no. 519, with a large number of fruits which are deformed by the sting of an insect, having formed a curved, oblong, 2 cM. long gall-nut.

SUMBAWA: *Elbert* no. 3815, Bima, Rô-Mts., 650—750 M. in alt., with fr. on 14-XII-1909; id. no. 3952, Dompu, Dompu-plain, 40—100 M., flow. on 22-XII-1909.

Distribution: Java!, Sumbawa!, Timor (*Hooker, Spanoghe*), Celebes (*Hallier*).

5. *P. sterculifolia* *King et Gamble*, *Kew Bull.* 1908, 108; *iid.*, *Journ. As. Soc. Beng.* LXXIV, 4, 819. — A large climber; branchlets purple, scabridly puberulous; *leaves* membranous; ovate, base truncate or cordate, apex acuminate; upper side sparsely setulose and pubescent on the nerves, lower slightly puberulous, glandular-dotted; 10—22 $\frac{1}{2}$ by 7 $\frac{1}{2}$ —12 $\frac{1}{2}$ cM., petioles 5—10 cM. long; pairs of nerves 6, the 2 lowest pairs from close to the base spreading; *cymes* in large spreading, slightly puberulous, many-flowered panicate corymbs reaching 22 $\frac{1}{2}$ cM. in length and 20 cM. in breadth; peduncles stout, 7—10 cM.; ultimate cymules crowded; flowers pale green; *calyx* campanulate, obscurely 2-lipped; upper lip nearly entire or 2-lobed, the lower entire or obscurely toothed; tube 0.12 cM., glandular and puberulous, scaly without; *corolla*-tube puberulous, 0.3 cM., densely white-villous

within except at the base; 2-lipped, 4-lobed, lobes reflexed, obtuse, the midlobe of the lower lip 0.18 cM.; *stamens* exsert, filaments twisted; *style* 0.6 cM., stigma bifid with slender spreading lobes; *ovary* glabrous, depressed.

Var. α typica H. J. Lam, nov. var. — *foliorum* basis truncata vel subcordata; *calycis* labium superius subintegrum.

Var. β cordata King and Gamble l.c. — base of leaves more deeply cordate; branches of inflorescences more distant; upper lip of calyx 2-lobed.

Distribution of the species: Perak (Malay Peninsula).

6. **P. Ruttenii** H. J. Lam, nov. spec. — Arbor parva; ramuli, corymbi, petioli minutissime, sparse pubescentes; ramuli cylindrici cortice griseo; *folia* opposita, membranacea, integra, late ovata, basi leviter cordata vel truncata, apice subabrupte breviterque acute acuminata, adulta supra sparse pilis simplicibus vestita, eglandulosa, nervis subglabratis, haud prominentibus, utrinque 5; subtus glabra, glanduloso-punctata, nervis minute puberulis; 10—12½ cM. longo, 7—9.3 cM. lata, petiolo 4½—6 cM. longo; *corymbi* multiflori, 11 cM. longi, 13 cM. diametro; pedunculo 6 cM. longo; bracteis minutis; *calyx* bilabiatus, 0.3 cM. longus, labio utroque breviter acuteque bidentato; minute pubescens; margine ciliatus; *corolla* viridi-alba, novella extus tubo lobisque minute puberula, adulta tubo glabro, lobis puberulis; tubo intus parte superiore densissime profundeque villosa, 0.45 cM. longo; lobis 4, subæqualibus, 0.15 cM. longis, 0.1 cM. latis, oblongo-rotundis; *stamina* longe exserta, 0.45 cM. longo; *stylus* 0.9 cM. longus, stigmata brevissime bifido; *ovarium* glabrum.

BORNEO: *Rutten* no. 621, E.-Borneo, Bulongan, near Sadjan-river, 10 M. in alt., flow. on 25-X-1912.

This species shows a close relation to *P. parasitica*, but differs from it by its membranous leaves, which are puberulous above, its slender nerves, its smaller corymbis and larger flowers and its very shortly bifid stigma. Its affinity is also with *P. sterculifolia* and *P. cordifolia*.

7. *P. alba* H. J. Lam, nov. spec. — Frutex? glaberrima, epidermidi griseo-albo (non cera tecto); *folia* coriaceo-subchartacea, integra, late ovato vel ovato-rotundata, basi leviter late cordata, apice subabrupte breviterque acute acuminata, utrinque glaberrima, subtus in nervorum axillis barbellata, cum petiolo tota griseo-alba (in sicco), non cera tecta; nervis utrinque 6, 2 inferioribus imo a basi nascentibus; $10\frac{1}{2}$ –14 cM. longo, 8–11 cM. lata, petiolo $1\frac{1}{2}$ – $3\frac{1}{2}$ cM. longo; *corymbi* multiflori, 7 cM. longi, 4 cM. lati, pedunculo 3 cM. longo; brunneo-griseo-albida; bracteis minutis subulatis, 0.1–0.2 cM. longis; pedicellis brevissimis, 0.05–0.1 cM. longis; *calyx* cupuliformis, bilabiatus, labio inferiore 2 dentibus magnis subacutis, superiore integro vel irregulariter minuteque 3-denticulata, denticulis obtusis; 0.15 cM. longus, glaber, punctis albis stellatiformibus suffultus; *corolla* glabra, bilabiata, tubo 0.25–0.3 cM. longo, limbo obliquo, lobis 4, 0.1 cM. longis; tota vittis longitudinalibus punctorum alborum stellatiformium suffulta; fauce villosa, tubo 0.2 cM. diametro; *stamina* inclusa; filamentis vittis albis ut in stylo transversalibus suffultis; thecis poris ellipticis subparallelis; *stylus* brevis inclusus, stigmatate breviter bilobo; *ovarium* glabrum.

PALAU-ISLANDS: Without collector, number and locality in H. Ber.

Our species shows a close affinity with *P. integrifolia* in several characteristics, but differs from it by its typical white colour and the white stellate spots on its flowers.

8. *P. Peekelii* H. J. Lam, nov. spec. — Arbor parva 6 M. alta; ramuli, inflorescentiæ, petioli, minute molliterque pubescentes; *folia* ampla, chartacea, late ovate vel rotundata, basi leviter cordata, apice breviter acuminata, integerrima, adulta supra sparsis pilis simplicibus vestita, subtus densiuscule pubescentia; nervis utrinque densius puberula, vel nervis subtus subglabra, densiusque puberula prope nervos; nervi utrinque 5–6; 9–22 cM. longa, 6–16 cM.

lata, petiolo 1—6 cM. longo; *inflorescentia* corymbosa, ampla, bracteis parvis caducis, 10—15 cM. longa, 9—25 cM. lata, pedunculo brevi, 0—3 cM. longo; *calyx* 0.25 cM., pubescens, bilabiatus, labio inferiore 2 dentibus magnis acutis obtusisve, superiore integro vel undulato vel 3 dentibus obtusis suffulto; *corolla* glabra vel subglabra, bilabiata, 4-lobata, 0.35 cM. longa, tubo 0.3 cM. longo; *stamina* 4, inclusa, fauce villosa inserta; *stylus* stigmatate breviter bifidus; *ovarium* glabrum vel apice subpuberulum; *drupa* 0.4—0.6 cM. longa, globosa, glabra.

NEW-BRITAIN (NEU-POMMERN): *Peekel* no. 794, Vunapope, 3 M. in alt.; native name: a kua; with flow. and fr. on Aug. 1st, 1911.

9. *P. Curranii* H. J. Lam, nov. spec. — Frutex?; ramuli; *inflorescentia*, petioli pubescentes; *folia* oblonga vel ovata vel subquadrangulariter rotunda, basi leviter cordata, apice longe acuminata vel subabrupte vel abrupte acuminata, integerrima vel interdum apicem versus denticulato-serrulata; adulta utrinque molliter, in nervis densius, pubescentia; membranacea vel subchartacea; $11\frac{1}{2}$ —14 cM. longa, $6\frac{1}{2}$ —10 cM. lata; petiolo 3—5.2 cM. longo; *corymbus* parvus, $5\frac{1}{2}$ cM. longus, 4 cM. latus, pedunculo 1 cM. longo; *calyx* pubescens, sparse glandulosus, bilabiatus, 0.15 cM.; labio inferiore bidentato, superiore integro vel plus minus bidentato, dentibus obtusis; *corolla* 0.4 cM. longa; tubo extus puberulo 0.2 cM. longo, intus fauce dense barbato; bilabiata, labium superius integrum, 0.15 cM. longum, inferius 3-lobatum, 0.2 cM. longum, lobo medio majore, 0.1 cM. longo; *stamina* 4, exserta, fauce inserta; *stylus* 0.4 cM., stigmatate brevissime bifidus; *ovarium* glabrum; *drupam* non videmus.

MANILA: *Curran* no. 19022, flow. in May 1909.

Our species has an affinity with *P. pubescens* (as the specimen was erroneously determined), but differs from it very distinctly by its flowers.

10. *P. corymbosa* Rottl. et Willd. in Ges. Nat.f. Freunde, Neue Schr. IV, 187, 188, (1803); Forbes, Wand. Nat. f. Mal. Arch. II, 226; Hook. f., Fl. Br. Ind. IV, 573; Miq., Fl. Ind. bat., II, 894 and suppl. I, 243. — *P. densiflora* Wall., cat. no. 1773, (1828) — *P. cordifolia* Wight, Ic. t. 1483, (1850) — *P. truncata* Turcz. in Bull. Soc. Imp. Nat. Mosc. (1863), II, 215. — A shrub?, often spinous; branchlets, corymbs and petioles sparsely deciduously pubescent with simple hairs; leaves opposite, sometimes whorled, ovate, base cordate or rounded, apex obtusely acuminate or hardly apiculate, margins entire or somewhat crenate or undulate towards the apex; adult glabrous on both sides; coriaceous; pairs of nerves 3; 5–9 cM. long, 4½–5 cM. broad, petioles 2½ cM.; corymbs small, often very dense, brachiate; calyx 0.25 cM., 2-lipped, 1 lip entire or subentire, the other 2-toothed; corolla 0.5 cM., subequally 4-lobed, upper lip reflexed; throat villous; drupe obovoid, 0.5 cM.

Distribution: British India, China, Molucca-isl., Timor, Java? (*Miquel*), Sumatra? (*Miquel*).

11. *P. borneensis* H. J. Lam, nov. spec. — Arbor? ramuli cylindrici, glabri; folia coriacea, in sicco utrinque fusca, ovata, basi subcordata, apice acuta, utrinque glaberrima, supra nitida, subtus reticulata, nervis utrinque 5; 6½–8½ cM. longa, 4.2–5.7 cM. lata, petiolo 1.3–3 cM. longo, glabro; corymbi sparse minute pubescentes, 8–13 cM. longi, 7–8 cM. diametro; pedunculo 4–8 cM. longo; bracteis subulatis, caducis, 0.2–0.5 cM. longis; calyx viridis, cupuliformis, bilabiatus, labio superiore integro, inferiore producto bifido elongato suffulto, 0.15 cM. longus, membranaceus, utrinque glaber, extus glandulosus; corolla alba, extus glabra, tubo 0.3 cM. longo, intus fauce dense villosa, limbo bilabiato, 4-lobato, lobis 3 labii inferioris subequalibus, 0.08 cM. longis, quarto labii superioris integri 0.11

cM. longo; *stamina* 4, cum stylo apice bifido, 0.1 cM. exserta; *ovarium* glabrum.

W.-BORNEO: *Haviland* and *Hose* no. 3394 E, Sarawak nr. Kuching, flow. on Oct. 13th, 1894.

This species at first view, resembles very to *P. oblongifolia* Merr. from the Philippines, but is distinctly distinguishable by the longer petioles, the subcordate leaf-base and especially by the form of the calyx.

12. *P. congesta* Merr., Phil. Journ. Sci. Bot. I, suppl. 232, (1906). — A shrub or little tree; branchlets, corymbs and upper side of petioles sparsely pubescent; *leaves* subcoriaceous, ovate or elliptical-ovate; margins entire or somewhat crenate towards the apex; base rounded; apex acute or obtuse; glabrous above, or somewhat pubescent on the nerves, glabrous beneath, minutely glandular-dotted, often barbellate in the axils of the nerves; pairs of nerves 4—5; $2\frac{1}{2}$ —7 by 1.5— $4\frac{1}{2}$ cM.; petioles 1 cM. long or less; *corymbs* many-flowered, dense, 1.5—5 cM. in diam.; *calyx* glabrous, somewhat glandular; 0.2 cM., 2-lipped; lower lip 2-toothed, upper lip entire or minutely 2—3-denticulate; *corolla* red, 0.4—0.5 cM., more or less 2-lipped, 4-lobed, 1 lobe somewhat larger, 0.15 cM., tube 0.25—0.3 cM.; glabrous without; throat villous, upper lip sometimes shortly 2-lobed; *stamens* 4, didynamous; anthers 0.05 cM.; cells divergent, opening by an oblong or circular pore; *style* with shortly bifid stigma, 0.4 cM.; *ovary* glabrous.

PARAGUA (PALAWAN): Com. d. l. fl. for. no. 1639.

Distribution: Palawan!, Luzon (Phil. Isl.).

13. *P. angustifolia* H. J. Lam, nov. spec. — Arbor, 10—15 M. alta; ramuli, inflorescentiæque laxè minute pubescentes, glabrescentes, petioli glabri; *folia* membranacea vel subchartacea, ovata vel ovato-lanceolata, basi attenuata, apice acuminata, integra, utrinque glaberrima, nervis secundariis paulo prominentibus, utrinque 6—8; 3 — $11\frac{1}{2}$ cM.

longa, 1.8—5 cM. lata; petiolo 0.8—1.5 cM. longo, gracili; *corymbus* terminalis, 6—12 cM. longus, 4—5 cM. latus, flores parvi, subsessiles; *calyx* 0.15 cM. longus, glaber, subbilabiatus vel subtruncatus, labio inferiore obtuse 2-dentato, labio superiore integro vel subundulato; dentibus parvis, latis, obtusissimis vel subacutiusculis; *corolla* extus glabra, alba vel albo-viridis, 0.3 cM. longa, tubo 0.2 cM. longo, subbilabiata, labio superiore lato integro, inferiore profunde 3-lobo; fauce paulo angustaque villosa, ceteroquin intus glabra; *stamina* subinclusa, fauce inserta; *stylus* paulo exsertus, apice brevissime 2-fidus, 0.25 cM. longus; *ovarium* subcylindricum, depressum, glabrum; *drupam* non videmus.

NEW-GUINEA: *Ledermann*, no. 13017, Felsspitze in the mountain-woods, 1400—1500 M. in alt.; with flow. and buds on Aug. 20th, 1913; id. no. 9493, Etappenberg, 850 M.; with buds on 24-X-1912.

Our species has an affinity with *P. timoriana*, but differs very distinctly from it by the attenuate base of its entirely glabrous leaves, its hardly toothed calyx, its smaller flowers, and the broad midlobe of the lower lip of its corolla.

14. *P. timoriana* *Decne.* in *Nouv. Ann. Mus. Par.* III, 402, (1834); *Schauer, DC.*, *Prodr.* XI, 631; *Forbes, Wand. Nat. f. Mal. Arch.* II, 226; *Miq.*, *Fl. Ind. bat.* II, 893; *Hall. f.*, *Med. 's Rijks Herb. Leid.* no. 37, 35; *Spanoghe, Linnæa* XV, 330; *Schumann, Engl. Jhrb.* IX, 220; *Zoll. u. Mor.*, *Syst. Verz.* 52 — *P. tiliæfolia* *Zipp. ex Spanoghe l.c., ms.* — *P. syringæfolia* *Zipp. ex Spanoghe l.c., ms.* — A shrub?; branchlets, inflorescences and upper side of petioles minutely, sparsely pubescent, glabrescent; leaves ovate or ovate-lanceolate, base obtuse, narrow, apex acute or subobtuse, or subacuminate, adult glabrous above except on the midrib, glabrous beneath, often somewhat barbellate in the axils of the nerves; membranous; margins entire or coarsely dentate towards the apex; pairs of nerves 5—7, little prominent; 3—9 by

1.4–3.7 cM.; petioles 0.4–2.8 cM.; *corymbs* small, shorter than the leaves, many-flowered, dense, 1.5–2.8 cM. long, 2.6–3.8 cM. wide; peduncles 0.2–0.3 cM.; *calyx* somewhat pubescent at first, ultimately glabrous, 0.15–0.2 cM., 2-lipped, lower lip with 2 large, acute or obtuse teeth, the upper one entire, subentire or more or less acutely or obtusely 2–3-dentate; *corolla* glabrous without, 0.4–0.5 cM., 2-lipped, upper lip entire or somewhat 2-lobed, 0.15 cM., lower lip 3-lobed, the midlobe longer and narrower than the lateral ones; *stamens* exsert, inserted in the villous throat; *style* exsert, with bifid stigma; *ovary* glabrous.

PHILIPPINES: Cuming no. 1451!

Distribution: Timor (*Miq.*), Philippines! (Luzon, *Hallier.*) Gilberts-isl. (*Schumann.*)

The species seems not to be identical with *P. integrifolia*, as *Valeton* (Pl. pap. 52) thinks.

15. *P. ceramensis* *Miq.*, Fl. Ind. bat. II, 893, (1856). — A shrub?; branchlets, corymbs and petioles yellowish tomentose or velutinous; *leaves* chartaceous or subcoriaceous, broad-ovate, or suboblong-ovate, base rounded or somewhat cordate, apex shortly, subabruptly acuminate, margins entire or somewhat dentate towards the apex, glabrous on both sides, except on the nerves; lower side glandular; pairs of nerves 4–5; 7–15 by $5\frac{1}{2}$ – $8\frac{1}{2}$ cM.; petioles $2\frac{1}{2}$ –5 cM.; *corymbs* with foliaceous bracts or leaves below, many-flowered, 10 cM. long, 7 cM. in diam.; peduncles $2\frac{1}{2}$ cM.; *calyx* minutely pubescent, 0.15 cM., bilabiate, one lip obtusely 2-toothed, the other entire or with 2 minute teeth; *corolla* glabrous or subglabrous without, 4-lobed; lobes subequal, 2 somewhat larger and 2 smaller, throat densely villous; tube 0.25–0.3 cM., subinfundibuliform, the larger lobes 0.15 cM.; *stamens* 4, 0.1–0.15 cM. exserted from the throat, inserted in the upper part of the corolla-tube, at about $\frac{2}{3}$ from its base; *style* 0.5 cM.,

slender, with shortly bifid stigma; *ovary* sparsely glandular-dotted.

Distribution: Little-Ceram.

See annotation under *P. punctulata* Clarke.

16. *P. punctulata* Clarke in Hook. f., Fl. Br. Ind. IV 575 (1885); King and Gamble, Journ. As. Soc. Beng. LXXIV, 4, 817. — A shrub or small tree; branchlets dark brown; *leaves* chartaceous, broadly elliptic, suddenly shortly acuminate at apex, rounded or obtuse at base; margins entire; glabrous on both sides, punctulate beneath; pubescent on the nerves beneath; pairs of nerves 4–5; 10–15 cM. long, 5–7½ cM. broad; petioles 2½ cM.; the lowest pair of nerves very small, close to the base, the next pair a little above, the rest more distant; *corymbs* many-flowered, pubescent, 10–12½ cM. in diam.; lower bracts 1.2 cM., linear-oblong; flowers sessile or shortly pedicelled; *calyx* 0.15 cM., minutely grey-pubescent and glandular, 2-lipped, upper lip 2-toothed or subentire, lower one 2-toothed; *corolla* 0.25 cM., villous at throat within, lobes short, rounded; *stamens* included; filaments inserted in the middle of the corolla-tube, short; anthers reniform; cells slightly divergent; *ovary* glabrous; *style* rather short; stigmatic lobes slender, recurved; drupe not known.

Distribution: Malacca.

Perhaps this species belongs to *P. ceramensis* Miq. or is it a variety of it. Less important points of difference are the somewhat cordate leafbase and the exserted stamens of the latter species. We did not see any specimen and cannot give a final decision in the matter.

17. *P. divaricata* Wall. cat. no. 1781 (1828); Schauer, DC., Prodr. XI, 631; Hook. f., Fl. Br. Ind. IV, 575; King and Gamble, Journ. As. Soc. Beng. LXXIV, 4, 815. — *P. integrifolia* Willd. in Ges. Nat. f. Fr., Neue Schrift. IV, 187 (1803); Roxb. Fl. ind. III, 81. — *P. lucidula* Kurz, For. Fl. Brit. Burma, II, 263, (1877). — A shrub,

erect in the plains, climbing in the forest ¹⁾ (*Schauer*); branchlets and inflorescences subglabrous or slightly pubescent; *leaves* membranous when young, chartaceous when older; ovate or elliptic, base rounded or subcordate, sometimes attenuate, apex briefly acute or bluntly acuminate, both sides glabrous except on the nerves, sometimes somewhat pubescent, the lower one obscurely glandular-dotted, and sometimes barbellate in the axils of the 5—6 pairs of nerves; margins entire; $7\frac{1}{2}$ — $12\frac{1}{2}$ cM. long, 5—9 cM. broad; petioles $2\frac{1}{2}$ cM.; *corymbs* many-flowered, dense, divaricate, $7\frac{1}{2}$ — $12\frac{1}{2}$ cM. in diam., peduncles $2\frac{1}{2}$ —5 cM.; bracts 0.3 cM.; flowers subsessile; *calyx* small, 0.1—0.15 cM., 2-lipped, upper lip entire or shortly 3-toothed, lower one 2-toothed; teeth 0.07 cM., rounded or acute; *corolla* 0.25—0.3 cM., puberulous without, subbilabiate, subequally 4-lobed; *stamens* inserted in the densely villous throat, exsert; *style* as long exsert as the stamens; stigma very shortly bifid; *drupe* 0.5—0.6 cM. long and in diam.

Distribution: Malay Peninsula, Java.

18. *P. perakensis* *King et Gamble*, *Kew Bull.* 107, (1908); *iid.* *Journ. As. Soc. Beng.* LXXIV, 4, 816. — A climbing shrub; branchlets and petioles glabrous, corymbs tawny-pubescent; *leaves* chartaceous or coriaceous; elliptic-oblong or -lanceolate, sometimes -obovate, base narrowed or cuneate, apex shortly and bluntly acute, entirely glabrous on both sides, slightly rugose; margins entire; pairs of nerves 5—6; $7\frac{1}{2}$ — $12\frac{1}{2}$ cM. long, 4—6 cM. broad; petioles 1.3—2 cM.; corymbs spreading, reaching 15 cM. in length and in diam.; peduncles stout, 0— $7\frac{1}{2}$ cM. long; lower bracts leafy; flowers sessile, pale green with white stamens; *calyx* obscurely quadrangular, pubescent, nerved, the nerves prominent in fruiting, 0.15 cM.; 2-lipped; upper lip entire or obscurely 2-lobed, lower one 2-lobed (*K.* and

¹⁾ cf. *Clerodendron inerme*.

G.: „lower lip entire, upper one 2-lobed” is perhaps a mistake?); *corolla*-tube 0.3 cM., subequally 4-lobed, lobes ciliate; throat densely white villous; *stamens* long exsert, inserted in the throat: filaments somewhat flattened, anther-cells nearly globose, opening by circular pores; connectives glandular; *style* long exsert, stigma bifid; *ovary* glabrous; *drupe* pyriform, with only 1 fertile seed.

Distribution: Perak (Malay Peninsula).

The species has an affinity with *P. thrichostoma* Miq., but differs from it in several important points, such as the narrower, thicker leaves with glabrous nerves, the markedly nervose fruiting calyx, the large bracts and the circular openings of the anther-cells.

19. *P. subglabra* Merrill, Phil. Journ. Sci. Bot. I, suppl. 234, (1906); *id.* *ibid.* III, 431. — A tree; branchlets subquadragular, with 4 longitudinal lines of hairs along the ribs, alternating at each node; inflorescences and upper side of petioles pubescent; *leaves* opposite, sometimes somewhat alternate, the leaves of the same pair being attached at different height; chartaceous or subcoriaceous, ovate or oblong-ovate, base rounded or subcordate, sometimes acute, apex shortly acuminate, margins entire, glabrous on both sides; except on the nerves; beneath sometimes barbellate in the axils of the nerves; pairs of nerves 5—7; $9\frac{1}{2}$ — $13\frac{1}{2}$ by $5\frac{1}{2}$ — $8\frac{1}{2}$ cM.; petioles 2—7 cM.; *corymbs* many-flowered, brachiate, often in a sympodial manner, 9—14 cM. long, 10—20 cM. broad, peduncles 2 cM.; bracts linear, 0.5—0.8 cM. long; *calyx* somewhat pubescent at first, glabrate afterwards, 0.2 cM. long, 2-lipped, lower lip with 2 large obtuse or subacute teeth, upper one entire or obscurely 3-denticulate or undulate; *corolla* glabrous without or nearly so, 0.5—0.6 cM. long, green, 2-lipped, 4-lobed; tube 0.4—0.5 cM., throat densely villous especially before the midlobe of the lower lip; *stamens* 4, inserted in the throat; filaments hairy at base, nearly included;

style with shortly bifid stigma; *ovary* glabrous, globose; *drupe* pink, 0.35 cM. in diam. and in length.

LUZON: Curran no. 10678, Camarines, with flow. and young fr. in June 1908.

Distribution: Luzon.

20. *P. cauliflora* Stapf, Trans. Linn. Soc. ser. II, IV, 215, (1894). — A small tree; branchlets quadrangular, glabrous or nearly so; inflorescences appressedly stellate-hairy; *leaves* broadly oblanceolate, apex acuminate, margins crenate-denticulate, chartaceous; pairs of nerves 10—12; petioles 1.3 cM. long; *cymes* sessile at branchlets of the present or of the former year from the increased nodes, 1.3—2 cM. long; the upper leaves being fallen in the flowering-time; pedicels 1.5 cM.; *calyx* 0.25—0.3 cM., subtruncate or with 4 small teeth, somewhat stellate-hairy near the base; *corolla* white; tube 0.45—0.5 cM.; 4-lobed; lobes subequal, glandular without; throat glabrous (!); *stamens* 4, subequal; *style* somewhat longer than the *stamens*, shortly bifid at apex; *ovary* yellowy-glandular, 1 (? *H. J. L.*)-celled, 4-ovuled; ovules laterally attached; *drupe* ovoid or globose, sometimes somewhat quadrangular, 0.5 cM. long with 4 pyrenes (!? *H. J. L.*), and a central cavity.

Distribution: Penokok (Borneo).

This species, of which we did not see any specimen, is — if it is really a *Premna* — a very curious one by its inflorescences, its very long pedicels, its glabrous corolla-throat. The description seems to be a rather inaccurate and incomplete one; the „4-pyrened” fruit probably is a mistake for a fruit with one 4-seeded pyrene. It may be, that it is related to *Schizopremna*.

21. *P. areolata* Merr., Phil. Journ. Sci. Bot. X, 73, (1915). — A scandent shrub, 25—30 M. long; branchlets round, with the petioles glabrous; inflorescences ferruginous-pubescent; *leaves* membranous or subchartaceous, oblong, base rounded or acute, apex shortly and subabruptly acuminate or acute; glabrous on both sides, even

on the nerves; lower side areolate; areoles 0.1 cM. in diam., each included by the reticulation of the smallest nervules; pairs of nerves 5—9, usually 6; $7\frac{1}{2}$ —14 by 3—5 cM.; petioles 1—2 cM.; *corymbs* many-flowered, 10—12 cM. long, 7—10 cM. broad, peduncles 3—5 cM.; bracts narrow, 0.5 cM. or less; *calyx* sessile, glabrous, sparsely glandular, 0.2 cM.; 4-ribbed, quadrangular; truncate or slightly 2- or 4-toothed; teeth wide; *corolla* whitish, glabrous without; tube 0.3 cM., subinfundibuliform; lobes 4, subequal, the larger ones 0.15 cM.; throat densely villous with long, white, stiff, up- and downward pointing hairs; *stamens* 4, inserted in the throat, somewhat exserted; filaments glabrous; *style* longer than the stamens, 0.5 cM.; stigma divaricately bifid; lobes 0.075—0.1 cM.; *ovary* quadrangular, obscurely glandular-dotted at apex.

Distribution: Basilan.

It has a close affinity with *P. Williamsii*. Perhaps it would be better, to treat this species as a variety of the present one (both being described in the same paper and the latter beginning with an a).

22. *P. Kunstleri* King et Gamble, Kew Bull. 109, (1908); *id.*, Journ. As. Soc. Beng. LXXIV, 4, 821. — A large shrub or small tree, sometimes climbing; branchlets, petioles and *corymbs* glabrous or nearly so; *leaves* coriaceous, elliptic, sometimes elliptic-oblong or obovate, base rounded or subcordate, apex obtuse with a short blunt acumination; both surfaces glabrous; margins entire; pairs of nerves 5—7, the lowest 2 pairs close to the base, the rest more distant; 10— $17\frac{1}{2}$ cM. long, 6—10 cM. broad; petioles 1.8—3 cM. long; *corymbs* spreading, long-branched, 3-chotomous below, 2-chotomous above, reaching $17\frac{1}{2}$ cM. in length and $12\frac{1}{2}$ cM. in breadth; bracts linear or linear-lanceolate, the lower ones leafy; flowers subsessile; *calyx* 0.2 cM., truncate or very obscurely 2-lipped; *corolla* pale greenish-white, 0.25—0.3 cM., the

lower half glabrous, the upper shortly white-villous within; limb 2-lobed, upper lip and the lateral lobes of the lower lip equal, the midlobe larger; *stamens* shortly exsert, inserted just below the throat; pores of the anther-cells elliptic; *style* as long as the *stamens*; stigma very shortly bifid; *ovary* glabrous, depressed; *drupe* obovoid, 0.6 cM., waxy-white.

Distribution: Malayan Peninsula, Sumatra.

23. *P. adenosticta* Schauer, DC., Prodr. XI, 630, (1847); *Miq.*, Fl. Ind. bat. II, 892; *Merrill*, Phil. Journ. Sci. Bot. I, suppl. I, 230. — A shrub?; branchlets, petioles and inflorescences yellowy-tomentose or -farinose; *leaves* membranous, ovate, base rounded or acute, apex gradually and long attenuate-acuminate, margins entire, stellate-hairy when young, adult glabrous on both sides except on the nerves; glandular beneath; pairs of nerves 7—8; 9—17 by $3\frac{1}{2}$ — $8\frac{1}{2}$ cM.; petioles 2—6 cM.; *corymbs* 5—8 cM. long, 6—12 cM. in diam., lax, many-flowered; peduncles $1\frac{1}{2}$ —2 cM.; flowers polygamous (*Schauer*); *calyx* membranous, almost hyaline, pubescent on both sides, glandular without; 0.15—0.2 cM.; with four large, acute, deltoid teeth; one of them sometimes with a small teethlet at its margin; *corolla*-tube 0.25 cM., glabrous below, hyaline, very thin, upper half with outer side of lobes pubescent and glandular; sparsely villous within near the throat; lobes 4, subequal, 0.15 cM.; *stamens* 4, inserted in the throat; filaments rather stout, glabrous, exsert, 0.2 cM. long; anther-cells divaricate with elliptic pores; *style* short, subincluded, with very shortly bifid apex; *ovary* glandular in the upper half, smooth in the lower one; *fruit* for the lower half in the calyx, 0.3 cM. long, 0.25 cM. in diam.; apex slightly glandular; usually 2 of the seeds fertile.

LUZON: *Alvarez* no. 22424, flow. in Febr. 1911, prov. of Nueva Ecija. — Com. d. l. fl. for. d. Fil. no. 1645, Catbalongan.

Distribution: Luzon!

24. *P. oblongata* Miquel, Fl. Ind. bat. II, 893, (1856); *Koords. en Val.*, Bijdr. Booms. Java, no. 7, 183; *iid.* Atl. d. Baumart. Java, II, 6, t. 285; *Koorders*, Exk. fl. v. Java, III, 135. — A shrub or a small tree; branchlets somewhat quadrangular, with petioles and inflorescences slightly puberulous; leaves oblong, sometimes rotundate, often broadest across $\frac{1}{4}$ from the apex; base rounded or subcordate, apex abruptly short-acuminate; membranous, sometimes chartaceo-coriaceous; margins entire or obscurely denticulate; upper side sparsely pubescent or glabrous, lower side sparsely brownish tomentose with simple hairs or glabrous; pairs of nerves (4—)6; $8\frac{1}{2}$ —19 cM. long, 5—6(—9) cM. broad; petioles $1\frac{1}{2}$ —2(— $3\frac{1}{2}$) cM.; corymbs terminal with peduncles, which are from defoliate axils; calyx subglabrous or glabrous, somewhat glandular; membranous, very thin, 4-ribbed, 4-toothed; teeth usually large, obtuse or subacute; the whole calyx 0.1 cM., sometimes somewhat 2-lipped; corolla 0.2 cM. glabrous or very slightly pubescent; tube usually very short, as long as or somewhat longer than the calyx, sometimes longer; lobes 4, subequal; throat villous; stamens exsert; 0.1—0.15 cM., inserted in the throat; style reaching 0.35 cM., slender; stigma horizontally bifid; ovary obovoid; apex glandular; fruit obovoid, glabrous, 0.3—0.4 cM. long, 0.15—0.2 cM. in diam.

Var. α puberula H. J. Lam, nov. var. — *folia* utrinque, præsertim subtus, fulvo-subtomentosa, $8\frac{1}{2}$ —16 cM. longa, 5—6 cM. lata.

LUZON: *Elmer* no. 9388, Lucban, Tayabas, flow. in May 1907; determined as *Pr. odorata* Blco. and *Pr. pubescens* Bl.

Distribution; Java, Luzon!

Var. β subglabra H. J. Lam, nov. var. — *folia* utrinque glabra, nervis subpuberula, 10—19 cM. longa, $4\frac{1}{2}$ —9 cM. lata.

forma a typica *H. J. Lam*, nov. f. — corollæ tubus calycem æquans; calycis dentes mediocres, obtusæ.

JAVA: Tjiomas, in *H. L.—B.* sub. nos. 908.266—741 and 742. — Mount Salak, in *H. L.—B.* sub no. 908.266—932, etc.

BORNEO: *Korthals* in *H. L.—B.* sub no. 908.266—705, G. Pamattan.

forma β longituba *H. J. Lam*, nov. f. — corollæ tubus calycem duplo superans, angustus; calycis dentes longiores, obtusis, calyce bilabiato.

JAVA: *v. Hasselt* no. 241, Mount Salak, flow. in Sept. Distribution of the species; Java! Luzon! Borneo!

25. *P. thrichostoma*¹⁾ *Miquel*. *Fl. Ind. bat.* II, 892, (1856); *Koords. en Val.*, *Bijdr. Booms. Java.* no. 7, 184; *ibid.*, *Atl. d. Baumart.* II, 6. t. 286; *King and Gamble*, *Journ. As. Soc. Beng.* LXXIV, 4, 816; *Koorders*, *Exk. fl. v. Java*, III, 135. — *P. parasitica* *Clarke* in *Hook. f.*, *Fl. Br. Ind.* IV. 574, (1885), not of *Blume*. — A large climber, reaching a considerable height; branchlets with inflorescences and petioles sparsely pubescent; leaves chartaceous at first, afterwards subcoriaceous, very variable; ovate or obovate-elliptic or -oblong, sometimes rotundate, base rounded or subcordate or cuneate, apex shortly acuminate or acute; margins entire or somewhat undulate at apex; glabrous on both sides except on the nerves; pairs of nerves 5—6; 10—17 $\frac{1}{2}$ cM. long, 5—12 $\frac{1}{2}$ cM. broad; petioles 1 $\frac{1}{2}$ —2 $\frac{1}{2}$ cM.; corymbs rather lax, reaching 10 cM. in length and 9—12 $\frac{1}{2}$ cM. in diam.; peduncles 0—2 $\frac{1}{2}$ cM.; flowers sessile; calyx obscurely tetragonous, 0.1—0.17 cM., sparsely pubescent; 2-lipped, 1 lip 2-toothed, the other sub-entire or 2-toothed; teeth acute; corolla cream-coloured; tube 0.25 cM., with the 4 subequal lobes

¹⁾ We think the exact orthography of this word is with a *th* in the beginning, it being apparently derived from the Greek: $\theta\rho\iota\xi$ = hair, and $\sigma\tau\omicron\mu\alpha$ = mouth.

glabrous without; one lobe larger, 0.15 cM., the other ones 0.1 cM., rounded; *stamens* inserted in the densely villous throat; long exsert; anther-cells rounded or ovoid, opening by elliptic pores; *style* 0.5 cM., stigma divaricately 2-fid; *ovary* glabrous, somewhat glandular; *drupe* pyriform, containing only 1 fertile seed.

Distribution: Java, Malayan Peninsula, Borneo (*King and Gamble*).

26. *P. Williamsii* *Merrill*, Phil. Journ. Sci. Bot. X, 74, (1915). — A climbing shrub, branchlets and petioles glabrous; corymbs brownish-pubescent; *leaves* chartaceous, oblong; base acute, attenuate; apex acutely acuminate; margins entire; both sides glabrous; pairs of nerves 5; 8—14 by 3—5 cM., petioles reaching 3 cM. in length; *corymbs* many-flowered, reaching 8 cM. in length and in diam.; *calyx* subglabrous, somewhat 4-ribbed, subtruncate or broadly 4-toothed, 0.22 cM. long; *corolla* glabrous without; tube 0.3 cM., densely villous within in the upper part; lobes 4, subequal, 0.15 cM. long; *style* 0.5 cM. long; stigmatic lobes 0.1 cM.

Distribution: Mindanao.

Its affinity is with *P. areolata*, and except for the non-areolate leaves, we should conclude from the description, that the 2 species are identical. *Merrill* gives some other points of difference, such as the „somewhat longer petioles” and „the somewhat larger flowers” in *P. Williamsii*. We cannot decide, not having seen any specimen of the latter species, but the given differences do not seem very important, since we found also that in *P. areolata* the „areolæ” not always are very conspicuous.

27. *P. oblongifolia* *Merr.*, Phil. Gov. Lab. Bur. Bull., XXIX, 118, (1905); *id.*, Phil. Journ. Sci. Bot. I, suppl. I, 230. — A tree; branchlets and petioles glabrous; corymbs somewhat pubescent; *leaves* coriaceous, ovate or ovate-oblong; base rounded or cordate; sometimes cuneate; apex abruptly acuminate; margins entire; glabrous on both

sides, even on the nerves; pairs of nerves 6; $5\frac{1}{2}$ —10 cM. long, $2\frac{1}{2}$ —5(— $7\frac{1}{2}$ cM.) broad; petioles 1—1.7 cM.; *corymbs* 7— $10\frac{1}{2}$ cM. in length and 5.8 cM. in diam.; peduncles $2\frac{1}{2}$ —6 cM., bracts minute, subulate, 0.2 cM. long; *calyx* 0.15—0.2 cM. long, glabrous, sparsely glandular, coriaceous, subequally 4-toothed, teeth rounded, ciliate; *corolla* glabrous without; tube 0.2 cM., somewhat longer than the calyx; upper part very densely villous within; lobes 4, subequal, 0.2 cM. long, 0.1 cM. broad, reflexed; *stamens* exserted, 0.25—0.35 cM. long; anther-cells rounded, with shortly elliptical, slightly divaricate pores; filaments glabrous; *style* as long exsert as the stamens; stigma shortly bifid; *ovary* glabrous.

BORNEO: *v. Heutsz* no. 847; flow. on Febr. 22nd; native name: Kakandosago.

Distribution: Luzon, Borneo!

28. *P. Ridleyi* King et Gamble, Kew Bull., 109 (1908); *iid.* Journ. As. Soc. Beng. LXXIV, 4, 820. — A climbing shrub; *leaves* chartaceous, opposite or sometimes one of each pair rather higher than the other; ovate, ovate-oblong or slightly obovate; base often unequally rounded or attenuate, apex rounded or very shortly acuminate; glabrous on both sides, margins entire; 4— $7\frac{1}{2}$ by 1.8—4 cM.; petioles slender, 0.6—1.3 cM.; pairs of nerves 6—7; *corymbs* many-flowered, tawny-pubescent, 4— $12\frac{1}{2}$ cM. long, 5—10 cM. broad; peduncles 1.8—5 cM.; bracts linear-lanceolate, flowers subsessile or sessile; *calyx* subquadrangular, 2-lipped, each lip 2-lobed, with minute teeth; tube 0.12 cM., puberulous; *corolla*-tube slender; 0.25 cM., puberulous in the lower half within, long white-villous in the upper; lobes 4, equal, oblong, rounded at tip, 0.12—0.17 cM. long; *stamens* inserted, the 2 upper in the throat, the 2 lower ones lower down; filaments slightly flattened, long exsert; anther-cells round, somewhat divaricate; connectives glandular; *ovary* glabrous; *style* as

long as the stamens, 0.5 cM.; stigma bifid, the lobes 0.06 cM. long, usually recurved.

Distribution: Malayan Peninsula.

29. *P. rufidula* Miq., Fl. Ind. bat. III, Suppl. I, 243 and 569, (1860). — A shrub?; branchlets, petioles and corymbs slightly pubescent, glabrescent; leaves opposite, chartaceous, ovate, base subacute, apex acute or acuminate; margins entire; both sides pubescent, especially on the lower side and the nerves; pairs of nerves 4—6; 4—10 cM. long, 2—4 cM. broad; petioles 1—2½ cM.; corymbs trichotomously branched, 4—8 cM. long, 6—8 cM. in diam.; calyx pubescent, small, 4-toothed; teeth subequal; in fruit somewhat enlarged, nearly entire; corolla, etc. unknown.

SUMATRA: ? in H. L.—B. sub no. 908.266—836, Lampongs.

Distribution: Sumatra (Lampongs)!

30. *P. regularis* H. J. Lam, nov. spec. — Frutex scandens, 3 M. (*Gjellerup*) alta; ramuli teretes, cum petiolis corymbisque hirsuti; folia opposita, membranacea, late ovata vel subrotunda, basi cordata, apice truncata, breviter acuteque acuminata; utrinque pubescentia, præsertim subtus et in nervis pilis longiusculis; nervis secundariis utrinque 5; basi 5—nervia; 9—15 cM. longa, 9—14 cM. lata; petiolo 2—9 cM. longo; corymbi lati, multiflori, 13—15 cM. longi, 14 cM. lati; pedunculo 6—6½ cM. longo; bracteis linearibus, 0.2—0.8 cM. longis; floribus subsessilibus; calyx parvus, 0.1 cM. longus, 4-costatus, 4-dentatus, hirsute pubescens, præsertim in costis; dentibus majusculis, æqualibus, acutis; corolla albo-viridis glabra, fauce villosa, lobis 4, æqualibus, recurvis; tubo 0.2 cM. longo; lobis 0.1 cM. longis; stamina paulo exserta, filamentis gracilibus, fauce insertis, 0.1—0.15 cM. longis; stylus filiformis, 0.3 cM. longus, stigmatibus longiuscule bifido, lobis divaricatis, apice subcapitatis; ovarium subcylindricum, apice glandulosum, villosum, depressum; drupam non videmus.

NEW-GUINEA: *Gjellerup* no. 637, Sawia, Dutch N.-G., 100 M. in alt., with buds on Aug. 28th, 1911. — *Schlechter*, no. 18468, in the forests at the foot of the Bismarck-mountains, 150 M. in alt., flow. on Oct. 23rd, 1908; *id.* no. 18335, near Kenegia-river, 150 M., with buds on 5-X-1908.

31. *P. membranacea* *Merr.*, Phil. Gov. Lab. Bur. Bull., XXXV, 65, (1906); *id.*, Phil. Journ. Sci. Bot. I suppl. 230. — A shrub; branchlets, petioles and inflorescences brownish pubescent; *leaves* membranous, elliptic-ovate or -rotundate, sometimes -obovate, base rounded or cordate, apex shortly and abruptly acuminate; both sides pubescent, especially on the lower side and on the nerves; margins entire; pairs of nerves 5—7; base 5-nerved; $6\frac{1}{2}$ —20 cM. long, 5—14 cM. wide; petioles 1.2—7 cM.; *corymbs* 10—14 cM. long, (3—)6—14 cM. wide; bracts subulate, 0.5 cM.; *calyx* yellow, pubescent, glandular, 0.15—0.2 cM., with 4 more or less obtuse teeth; obtusely quadrangular; *corolla* glabrous without; tube 0.3 cM.; lobes 4, subequal, rounded, 0.15 cM. long, reflexed; upper half of the tube with the throat very densely villous with long, stiff, white hairs; *stamens* 4, long exsert, subdidynamous, 0.3—0.4 cM., often not alternating with the corolla-lobes, but inserted before them in the throat; *style* 0.4—0.5 cM., slender; stigma rather long bifid, lobes subulate, 0.07 cM. long; *ovary* glabrous.

MINDANAO: *Elmer* no. 10578, Todaya (Mt. Apo), Davao, flow. in May 1909.

LUZON: *Elmer* no. 8275, Lucban, Tayabas, flow. in May 1907.

Distribution: Philippines!

32. *P. rotundifolia* *Koord. et Val.*, Bijdr. Booms. Java, no. 7, 182, (1910); *iid.*, Atl. d. Baumart. Java, II, 6, t. 284; *Koorders*, Exk. fl. v. Java, III, 135. — *P. rotundifolia* *Korthals, ms.* — A shrub or a small tree, $1\frac{1}{2}$ M.

high; petioles and corymbs hirsutely pubescent; *leaves* opposite, sometimes one of each pair somewhat higher than the other; large elliptical-ovate, sometimes -subrotundate or -obovate; base rounded or subcordate, sometimes unequal; apex acute or cuneate, or very shortly, acutely acuminate; chartaceous; margins entire; both sides subhirsutely or hirsutely pubescent, especially beneath and on the nerves; pairs of nerves (4—)5—7, the 2 lower pairs close to the base; 12—26 $\frac{1}{2}$ cM. long, 7—19 cM. wide; petioles 2—5 $\frac{1}{2}$ cM.; *corymbs* wide, with opposite and alternate branchlets; 7 $\frac{1}{2}$ —15 cM. long, 7—20 cM. wide; peduncles 3—4 cM.; flowers subsessile; *calyx* subequally 4-toothed, somewhat 2-lipped; 4-ribbed; very hirsutely pubescent, obscurely glandular; 0.1 cM.; teeth acute, 0.03 cM.; *corolla*-tube slender, 0.25—0.35 cM., glabrous without, throat densely villous within; lobes 4, subequal, somewhat pubescent without, 0.1 cM. long; *stamens* long exserted; filaments slender, inserted in the throat; *style* slender; stigma long horizontally bifid; lobes subulate; *ovary* glabrous, apex with some white glands; *drupe* oblong, 0.4—0.5 cM. long, 0.15—0.2 cM. broad; glabrous, obscurely glandular-dotted.

JAVA: *Zollinger* no. 1503 (*P. rotundifolia* *Korthals*) — *Korthals* in H. L.—B. sub nos. 908.266—845, 1385, 1387, 1397, 1398. (all of them *P. rot. Kths.*); also in Sumatra?

Distribution: Java!, Sumatra?

Section II Premnos Hassk.

33. *P. sessilifolia* *H. J. Lam*, nov. spec. — Frutex?; innovationes glabræ vel subglabræ; *folia* opposita, sessilia, ramulorum apices versus conferta, ramulis crassiusculis; superiora paulo quam inferiora minora vel æqualia; membranacea, obovata, margine irregulariter remoto-sinuata,

sinubus latis, denticulis acutis vel subobtusis, ciliata; utrinque glaberrima; nervis secundariis, paulo vel non prominentibus, utrinque 4—6; $10\frac{1}{2}$ — $14\frac{1}{2}$ cM. longa, $5\frac{1}{2}$ —7.7 cM. lata; *corymbi* parvi, terminales, subpubescentes; 2—3 cM. longi, $1\frac{1}{2}$ —2 cM. lati; pedunculo 0.7—1.2 cM. longo; flores parvi; *calyx* bilabiatus, labio inferiore 2-, superiore 3-denticulato; 0.1 cM. longus, 0.2 cM. latus; extus sparse pubescens; margine ciliatus; *corolla* tubo subinfundibuliforme, 0.15 cM. longo, extus glabro in parte inferiore, cum lobis pubescente in parte superiore; bilabiata; lobis 4, majoribus 2, 0.15 cM. longis, minoribus 2, 0.1 cM. longis; fauce barbata; *stamina* 4, æqualia, filamentis brevissimis, 0.05 cM. longis, inclusis; antheris 0.05 cM. longis; *stylus* brevis, 0.07—0.1 cM. longus, stigmatate minutissime bifido; *ovarium* globosum, 0.07—0.1 cM. longum, glabrum, apice glanduloso-punctatum; drupam non videmus.

NEW-GUINEA: *Schlechter* no. 18303, near Kenegia-river, 150 M. in alt., flow. on 29-IX-1908.

A very remarkable species, distinguished by its sessile, sinuate leaves, which are entirely glabrous, its thin, non-prominent nerves, its small flowers and its very short, included stamens and style.

34. *P. angustiflora* H. J. Lam, nov. spec. — Frutex parva, 0.3—0.4 M. alta (*Ledermann*); ramuli, petioli, *corymbi* hirsute pubescentes pilis simplicibus; *folia* opposita, chartacea vel subcoriacea, ovato-rotundata, basi breviter attenuata, apice breviter acuminata, margine præter basin apicemque grosse crenata, interdum remoto-sinuata vel subintegra; utrinque pubescentia, præcipue subtus et in nervis; interdum subglabra, nervis pubescentia; nervis secundariis utrinque 5—7; basi 3—7—nervia; omnino variabilia forma tomentoque; 8—15 cM. longa, 4—11 cM. lata; petiolo 1.2 — $5\frac{1}{2}$ cM. longo; *corymbi* breves densi, terminales, 6 cM. longi, 7 cM. lati, pedunculo $1\frac{1}{2}$ cM. longo; bracteis deltoideis, 0.3 cM. longis; *calyx* hirtellus,

0.2—0.3 cM. longus, bilabiatus, variabilis, labio altero bidentato, interdum 1-dentato, acuto, altero 3- vel 2-dentato; dentibus magnis, acutissimis, majoribus 0.1 cM. longis; corolla alba, tubo angusto, 0.45—0.55 cM. longo, 0.1—0.15 cM. lato, extus puberulo; lobis 4 subæqualibus, 0.15 cM. longis, extus glabris; fauce villosa; *stamina* exserta, 0.25 cM. longa, filamentis filiformibus, thecis ovoideis, subdivaricatis, poris ellipticis; *stylus* 0.7—0.8 cM. longus, stigmatibus breviter bifidus; *ovarium* glabrum; *drupa* ignota.

PALAU-ISLANDS: *Ledermann* no. 14494, Babelthaop, 50—100 M. in alt., with flow. and fr. on March 6th, 1914.

A well-marked species, distinguishable by its relatively long and narrow corolla-tube, and its crenate leaves, the bases of which are typically 3—7-nerved.

35. *P. littoralis* King et Gamble, Kew Bull., 107, (1908); *iid.*, Journ. As. Soc. Beng. LXXIV, 4, 811. — A small tree; branchlets obscurely angled, with corymbs and petioles tawny-pubescent; leaves chartaceo-coriaceous, ovate or ovate-deltoid, base cordate, apex acuminate; both surfaces glabrous except on the nerves, which are puberulous; margins acutely crenate-dentate except near the base; pairs of nerves 7—9, the lowest 1—2 pairs starting from the base; 10—15 cM. long, 5—7½ cM. broad; petioles 2½—4 cM.; corymbs spreading, trichotomous, 10 cM. long, 15 cM. wide; peduncles 1.8—2.5 cM.; bracts linear, persistent, the lowest sometimes leaf-like; pedicels very short with a pair of minute bracteoles below the calyx; calyx 0.2 cM.—2½ cM. (mM.? H. J. L.), 2-lipped, upper lip shortly 3-lobed, lower one longer, 2-lobed; lobes rounded; tube pubescent without; corolla very pale green, 2-lipped, half as long again as the calyx; upper lip broad, bifid, lower one 3-lobed, the midlobe longest; all lobes rounded; tube glabrous without, also within except a belt of thick villous hairs just below the mouth; *stamens* (in bud) included, filaments short, thick; anthers reniform,

very shortly 1—2-mucronate; style thick, stigma very shortly bifid; *ovary* glabrous except for a few glandular scales; *drupe* glabrous.

Distribution: Perak, at the sea-coast.

The species — we did not see any specimen of it — seems remarkable by its large calyx. Perhaps, however, this is based upon a printing error, since we know of no other *Premna* with a calyx of this dimensions. The authors' remark: „stamens (in bud) included, style shört” seems rather superfluous, as it is very common that these parts grow rapidly after the opening of the flower.

36. *P. benguetensis* C. B. Rob., Phil. Journ. Sci. Bot. III, 215, (1908). — A shrub or small tree, 3.6 M. high; branchlets and corymbs densely ferruginous-pubescent; *leaves* opposite, elliptical-ovate, base rounded, apex acutely or obtusely acuminate; margins entire; glabrous on both sides, except on the nerves, which are, especially beneath, ferruginous-pubescent; pairs of nerves 5—7; $5\frac{1}{2}$ —7 cM. long, 2.3—3.2 cM. wide; petioles pubescent or subglabrous, 0.8—1.9 cM. long; *corymbs* leafy below; bracts 0.1—1 cM.; *calyx* 0.2—0.25 cM., somewhat 2-lipped; lower (upper: C. B. Rob.) lip with 2 large obtuse lobes, upper (lower: C. B. Rob.) one with 3 smaller subacute teeth; *corolla* greenish-white, 0.33 cM., 2-lipped down to the middle; upper lip with 2 round lobes, lower one 3-lobed, midlobe rounded, lateral lobes subacute, deltoid; glabrous without; throat villous; *stamens* didynamous; filaments 0.05—0.1 cM.; anthers 0.04 cM.; *style* 0.4 cM., stigma very short, bifid; *ovary* subglabrous or glabrous; 0.07 cM. in diam.; *drupe* globose, 0.4 cM. long, 0.35 cM. in diam.; pyrene with 2—4 seeds.

Distribution: Luzon.

37. *P. flavescens* Ham. ex Wall. Cat. no. 2649, (1828); Hook, f., Fl. Br. Ind. IV, 578; King and Gamble, Journ. As. Soc. Beng. LXXIV, 4, 812. — A shrub or a small tree;

branchlets, corymbs and petioles grey- or rusty-villous; *leaves* chartaceous, ovate or ovate-oblong, sometimes obovate, base obtuse or subcordate, sometimes subcuneate, apex acuminate; upper surface sparsely setulose, especially on the nerves, lower surface tawny-pubescent, or glabrate, minutely glandular; margins entire, pairs of nerves (4—)6—7; (7—)10—15 cM. long, ($4\frac{1}{2}$ —)5— $6\frac{1}{2}$ cM. wide; petioles (1.3—) $2\frac{1}{2}$ —4 cM.; *corymbs* 10— $17\frac{1}{2}$ cM. in diam., peduncles $2\frac{1}{2}$ —5 cM.; bracts small, linear, 0.6 cM.; *calyx* 0.15—0.25(—0.3) cM., pubescent without, 2-lipped, upper lip 3-, lower 2-toothed, teeth obtuse or subacute, 2 somewhat larger, or subequal, all teeth puberulous within; *corolla* greenish, tube 0.3—0.5 cM., glabrous without, throat densely villous; 2-lipped, upper lip entire or slightly 2-lobed, lower one 3-lobed, the midlobe larger, all lobes reflexed, 0.2 cM.; *stamens* exsert, inserted in the throat, 0.4 cM. long, subdidynamous; *style* slender, as long as the stamens; stigma with 2 horizontally spreading lobes; *ovary* glabrous; *drupe* globose, 0.4—0.5 cM. in diam., glandular.

Var. α typica H. J. Lam, nov. var. — *folia* subtus ferrugineo- vel fulvo-pubescentia. — E. Bengal. (Clarke in Hook. f.)

Var. β glabrior Clarke in Hook. f., l.c. — *leaves* sparsely pubescent or glabrate beneath. — Sikkim, Silhet (Clarke in Hook. f.)

Var. γ rubens Clarke, l.c. — *P. lucidula* Miq. (fide King and Gamble). Fl. Ind. bat. II, 898; Koord en Val., Bijdr. Booms. Java, no. 7, 188; Koord. Exk. fl. v. Java, III, 135. — *leaves* sparsely pubescent or glabrous beneath, dry usually reddish. — Burma, Malacca, Sumatra, Java. (King and Gamble).

Distribution of the species: E. Bengal, Sikkim, Silhet, Malacca, Sumatra, Java.

38. *P. membranifolia* Merr., Phil. Journ. Sci. Bot.

VIII, 388, (1913). — A climbing shrub; young parts somewhat grey-pubescent, glabrescent; *leaves* membranous, very thin, oblong, base rounded, apex acutely acuminate, both sides glabrous, pubescent on the nerves when young, glabrate afterwards; pairs of nerves 6; 8—10 cM. long, 4—5 cM. broad, petioles $2\frac{1}{2}$ —4 cM.; *corymbs* small, many-flowered, 6 cM. long and in diam.; pedicels rather long, 0.1—0.3 cM.; *calyx* puberulous, 2-lipped, upper lip with 3, lower one with 2 teeth, the teeth of the lower lip smallest; *corolla* glabrous without, 2-lipped; tube 0.4 cM.; throat villous; upper lip 2-lobed, lower one 3-lobed, the lobes of the upper lip and the midlobe of the lower one 0.2 cM. long and broad; the lateral lobes of the lower lip 0.15 cM.; *style* 0.6 cM.

Distribution: Leyte (Philippines).

39. *P. nervosa* Koord. et Val., Bijdr. Booms. Java, no. 7, 186, (1910); Koord. Exk. fl. v. Java, III, 135. — A climbing shrub; *leaves* oblong-elliptic or ovate, base obtuse, rarely cordate, apex acutely acuminate; margins entire or obscurely denticulate, membranous or subcoriaceous, glabrescent, subhirsutely pubescent on the nerves, especially beneath; pairs of nerves 6; the lowest 1 or 2 pairs very slender; 10—19 cM. long, 6.2—10 cM. wide; petioles 1.5—4 cM.; *corymbs* small, 5 cM. in diam., subglobose, shortly peduncled, somewhat pubescent, or glabrate; pedicels 0.05—0.1 cM.; *calyx* cup-shaped, 0.2 cM. long, pubescent, 2-lipped, 5-toothed, the 2 teeth of the lower lip largest, obtuse; *corolla* 0.7 cM., minutely pubescent without; *stamens* exsert; *style* slender with shortly bifid stigma.

Distribution: Java.

It has an affinity with *P. flavescens*, but differs from it in several points, such as the different tomentum of the leaves, which are less narrow, the smaller corymbs, and the somewhat pubescent corolla.

40. *P. paulobarbata* H. J. Lam, nov. spec. — Arbor; ramuli quadrangulares, glabrescentes cum petiolis corymbisque; *folia* subchartacea, ovato-oblonga, basi subcordata, apice longe acuminata, utrinque glabra, nervis interdum subsetulosa; nervorum axillis subtus barbellata; margine integra; nervis secundariis utrinque 6—7; 10—18 cM. longa, $6\frac{1}{2}$ — $12\frac{1}{2}$ cM. lata, petiolo 3—8 cM. longo; *corymbi* 7—11 cM. longi, 7—8 cM. diametro, pedunculo $4-4\frac{1}{2}$ cM. longo; bracteis infra foliaceis, supra subulatis parvis, 0.3 cM. longis; *calyx* subpuberulus, 0.2 cM. longus, nonnullis glandulis vestitus, bilabiatus, labio inferiore 2-superiore 3-dentato, dentibus acutis; *corolla* alba, bilabiata, labio superiore integro vel plus minus bilobo, labio inferiore 3-lobo; tubo 0.3 cM. longo, cum lobis extus glabro; fauce subglabra, labiorum basi subpuberula; *stamina* 4, exserta, fauce inserta, 0.2 cM. longa; *stylus* 0.45 cM. longus, stigmatе breviter bifidus; *ovarium* apice villosa, glanduloso; *drupa* nigra.

MARIANNE-ISLANDS: Höfer no. 27, Saipon; native name: Agan; flow. on Dec. 12th, 1903.

This species shows some affinity with *P. integrifolia*, especially in the leaves, but the flowers are very different.

41. *P. Wrayi* King et Gamble, Kew Bull. 109, (1908); *ibid.*, Journ. As. Soc. Beng. LXXIV, 4, 819. — A climbing, nearly glabrous shrub; branchlets obscurely quadrangular, smooth; *leaves* coriaceous; elliptic or elliptic-lanceolate, gradually acuminate at apex, attenuate at base, often unequal; shining and glabrous on both surfaces; axils of the nerves beneath barbellate; margins entire; pairs of nerves 6—8; 10—16 cM. by 5—10 cM.; petioles 1.2—5 cM.; *corymbs* dense and compact, about $10-12\frac{1}{2}$ cM. broad at top, glabrate or very minutely puberulous; lower branches 3-, upper 2-chotomous; peduncles about $2\frac{1}{2}$ cM., stout; bracts very small, linear, the lower ones leafy, pedicels 0.12 cM. long; *calyx* deeply 2-lipped; the lower

lip sharply 2-lobed, the upper 3-toothed; tube rugose; corolla not seen; drupe obovoid, 0.6 cM. long and in diam.; exocarp rugose, glandular-dotted; pyrene 4-celled and -seeded.

Distribution; Perak (Malay Peninsula).

The species shows a resemblance to *P. Kunstleri*, but differs in the more compact corymbs and the deeply lobed calyx.

42. *P. integrifolia* L. Mant. II 252, s.a. (1771); *Bl.*, Bijdr. 815; *Benth.* and *v. Muell.*, Fl. Austr. V. 59; *Williams*, Bull. Herb. Boiss. sér. II, T. V, 431; *Decaisne*, Nouv. Ann. Mus. Nat. Par. III, 402; *Forbes and Hemsl.*, Fl. sin., II, 255; *Pulle* in *Lorentz*, Nov. Guin. VIII, 2, 401 and VIII, 4, 685; *Hook. f.*, Fl. Br. Ind. IV, 574; *King and Gamble*, Journ. As. Soc. Beng. LXXIV. 4, 813; *Koord.*, Meded. 's Lands Pl. tuin Btzg., XIX, 560; *Hook.*, Comp. Bot. Mag, I, 349; *Miquel*, Fl. Ind. bat. II, 894; *Hall. f.*, Med. 's Rijks Herb. Leid. no. 37, 36; *Hassk.*, 2^e Cat. 's Lands Pl. tuin Btz. 135; *Hemsl.*, Chall. Rep. Bot. I, 110 and 177; *Merrill*, Phil. Journ. Sci. Bot. I, suppl. I, 233; *v. Muell.*, Descr. not. on pap. pl. I, 12; *Merrill*, l.c. III, 431; *Schum.* u. *Lauterb.*, Fl. D. Schutzgeb. Südsee, 523; *Schum.* u. *Holtrung*, Fl. Kais.-Wilh.-land, 119; *Spanoghe*, Linnæa XV, 330; *Schimper*, Ind.-Mal. Strandfl., Bot. Mitt. a. d. Tropen III, 129; *Valeton*, Pl. pap., Bull. Dépt. Agric. Ind. Néerl. X, 51; *Warb.*, Engl. Jahrb. XIII, 427; *Zoll.* u. *Mor.*, Syst. Verz. 52. — *P. abbreviata* *Miq.* Fl. Ind. bat. II, 892, (1856); *Koord. en Val.*, Bijdr. Booms. Java no. 7, 195; *iid.*, Atl. d. Baumart. II, 6, tab. 289; *Koord.*, Exk. fl. v. Java III, 135. — *P. cyclophylla* *Miq.*, l.c., 899; *Koord. en Val.*, l.c. (Bijdr.) 190; *iid.*, l.c. (Atl.) t. 288; *Koord.*, l.c. — *P. foetida* *Reinw. ex Blume*, Bijdr. 816, (1826); *Schau.*, DC., Prodr. XI, 630; *Elbert*, Meded. 's Rijks Herb. Leid. no. 12, 16; *Hall. f.*, l.c. 37; *Koord. en Val.*, l.c. (Bijdr.) 192; *iid.*, l.c. (Atl.) t. 291; *Koord.*, l.c. 136; *King and Gamble*, Journ. As.

Soc. Beng. LXXIV, 4, 814; *Hassk.*, 2^e Cat. 's Lands Pl. tuin Btzg., 135; *Miq.*, Fl. Ind. bat. II, 891, and suppl. I, 243. — *P. Gaudichaudii* *Schau.*, l.c. 631, (1847); *Merrill*, Phil. Journ. Sci. Bot. IX, 136; *Hall. f.*, l.c. 38. — *P. lævigata* *Miq.* l.c. 895 and suppl. I, 243. — *P. media* *R.Br.*, Prodr. 512, (1827). — *P. nitida* *K. Schum.* in *Schum. u. Holtr.*, Fl. Kais.-Wilh.-land 120, (1889); *Merrill*, Phil. Journ. Sci. Bot. I, suppl. I, 234; *Schum. u. Lauterb.*, Fl. D. Schutzgeb. Südsee, 523. — *P. opulifolia* *Miq.* l.c. 898. — *P. ovalifolia* *Wall.* cat. no. 1782, (1828). — *P. ovata* *R.Br.*, l.c. 512. — *P. sambucina* *Wall.* l.c. no. 1775; *Schau. DC.*, Prodr. XI, 631. — *P. scandens* *Boj.*, Hort. Maurit. 257, (1837). — *P. serratifolia* *Blco.*, Fl. Fil., ed. II, 342, (1845) — *P. serratifolia* *L. Mant.* 253, (1771); *Blume*, Bijdr. 815; *Schau.* l.c. 632; *Gaertn.*, Fruct. I, 269; *Roxb.*, Fl. ind. III, 77; *Hassk.*, 2^e Cat. 's Lands Pl. tuin, Btzg. 134. — *P. spinosa* *Roxb.* l.c. (1832). — *P. subcordata* *Turcz.* Bull. Soc. Nat. Mosc. XXXVI. II, 216, (1863). — *P. cuspidata* *Zipp. ms.* — *P. lasioneura* *Zipp. ms.* — A tree or shrub, sometimes climbing; branchlets subquadrangular, with corymbs and petioles above somewhat pubescent or subglabrate, glabrescent; leaves, as most other parts of the plant, very variable in form and size; ovate or elliptic often rotundate-ovate, base subcordate or truncate, rounded, rarely subacute, apex either shortly obtusely or acutely acuminate or rounded, or gradually acuminate; margins entire sometimes crenate towards the apex; pairs of nerves in the smaller leaves (see plate II) 4–5, in the larger ones 6–7; upper side glabrous, often pubescent on the midrib; lower one glabrous, often barbellate in the axils of the nerves; smaller, often nearly circular leaves $4\frac{1}{2}$ –7.2 by $4\frac{1}{2}$ –5.5 cM.; petioles 0.7 cM., the largest ones (with long acumen) reaching $16\frac{1}{2}$ cM. in length, 11.5 cM. in breadth, with a petiole of

2—6½ cM.; moreover all intermediate forms between these 2 extremes, forming a uninterrupted series; *corymbs* with minute bracts, 10—18 cM. long, 10—40 cM. in diam., on a peduncle of 2—5½ cM., being smaller (10—13 cM. long, 10—15 in diam.) in the forms with smaller leaves; the largest reaching 10—17 cM. long, 19—25—40 cM. in diam.; *calyx* very variable, 2-lipped, one lip 2-toothed or subtruncate, the other 2- or 3-toothed or entire or undulate; teeth obtuse or acute, sometimes subequal; 0.15—0.2 cM., usually sparsely pubescent and glandular; *corolla* white or greenish; tube either very short, as long as the calyx or a little longer, or rather long, reaching 0.3 cM.; more or less 2-lipped, 4-lobed; lobes sometimes subequal; somewhat minutely pubescent without, sometimes subglabrate; *stamens* inserted in the villous throat, somewhat exsert; anthers reniform; cells opening by elliptical pores; *style* as long as the stamens; stigma shortly bifid; *ovary* glabrous, sometimes somewhat glandular; *fruits* black.

Subspecies α *Truncatolabium* H. J. Lam, nov. subsp. — *folia* plerumque minora, rotundata sive ovato-rotundata sive elliptica, basi rotundata vel subcordata, interdum subacuta, apice rotundata vel abrupte acute obtuseve acuminata vel subacuta, sæpe crenata, ceteroquin integra, 4½—6½—13½ cM. longa, 3½—5½—11½ cM. lata, petiolo 0.7—1.7—4 cM. longo; *corymbi* 10—13 cM. longi, 10—15 cM. diam.; *calyx* plerumque 2-labiatus, labio superiore integro, rare 2—3-dentato vel undulato, inferiore 2-dentato, dentibus obtusis acutisve; rare truncatus; *corollæ* tubus plerumque calycem æquans, interdum superans (tab. II).

SUMATRA: *Diepenhorst* no. 2147 Hort. bog., Priaman, (= *P. lævigata* Miq. (partly)); *Teysmann*, Singkel, in H. L.-B. sub no. 908.266—986.

JAVA: *Blume*, in H. L.—B. sub no. 908.266—168 and 252, (*P. abbreviata* Miq.) — *Horsfield*, in H. A. R.—T. sub no. 049894 (*P. cyclophylla* Miq.) — *Blume*, in

H. L.—B. sub no. 908.266—971 (*P. foetida* Reinw. (partly); also no. 908.266—275. — *Korthals*, Santjang, in H. L.—B. sub no. 908.266—1349. — *Junghuhn*, in H. L.—B. sub no. 908.266—1335. — *Pulle*, in H. A. R.—T. sub nos. 049892 and 049911, Verlaten-Isl., flow. on 26—IV—1906.

LOMBOK: *Elbert* no. 2475. Mount Sapi, 0—300 M. in alt. flow. on 2-VII-1909.

KALAO-TOA-ISL.: *Docters van Leeuwen-Reijnvaan* no. 1540, with flow, and young fr. on 11-V-1913.

CELEBES: *Forsten*, near Likupang, fr. on Sept. 9th, 1840, in H. L.—B. sub no. 908.267—722.

BORNEO: *Amdjah* no. 35, in H. L.—B. sub no. 918.228—7, N. Borneo, Pladjah, with. fr. on 30—V — 1912.

AMBOYNA: in H. L.—B. sub no. 908.266—992 (*P. lasioneura* *Zippel ms.* (partly)).

LITTLE CERAM: *Forsten*. in H. L.—B. sub no. 908.267—724, Piru.

PHILIPPINES: *Elmer* no. 13348, Cabadbaran (Mt. Urdanata), Agusan, Mindanao, with fr. in July 1912; *id.* no. 12742, Puerto Princesa, Mt. Pulgar) Palawan, fr. in March 1911. — *Fénix* no. 15537, Palawan, flow. in July 1912.

NEW-GUINEA: *Branderhorst* no. 32, S.-Dutch-N.-G., fr. on 31-VIII-1907. — *Versteeg* no. 1129 and 1873 (transition-form to the „abbreviata“-type). — *Bamler* no. 21, Tami-isl. near Kais.-Wilh.-land, Kalimol. — *Holtrung* no. 13, Hatzfeldhafen. — *Moszkowski* no. 480, Dutch N.-G., Manokuari (*P. nitida* *Schum.* (partly?)). — *Gjellerup* no. 439, Kalo-Isl. W.-N.-G., with buds on 6-III-1911. — *Ledermann* no. 6512, Madang, Scheringsspitze, with buds on 20-II-1912. — *v. Römer* no. 129, with flow. and fr. on 7-IX-1909.

NEW-BRITAIN (NEU-POMMERN): *Dahl*, Ralum, Lowai, with buds on 3-II-1897.

NEW-IRELAND (NEU-MECKLENBURG): *Peekel* no. 342

(partly). Namatanai, Manmanbele, with buds on 25-II-1910; native name: Kuoskuos.

CAROLINE-ISL.: *Kraemer* no. 83, Truk-islands.

PALAU-ISL.: *Raymundus* no. 214, Korrör; native name: Chobengákl.

Subspecies β *Dentatolabium* *H. J. Lam*, nov. subsp. — *folia* plerumque majora, ovato-rotundata, basi cordata, interdum obtusa, apice plerumque longiuscule acuminata, interdum subacuta, integra, nunquam crenata vel serrata; $9\frac{1}{2}$ —12— $16\frac{1}{2}$ cM. longa, 6—8—10 cM. lata, petiolo $3\frac{1}{2}$ — $4\frac{1}{2}$ — $6\frac{1}{2}$ cM. longo; *corymbi* (9—)17—18 cM. longi, (7—)19—40 cM. diam.; *calyx* plerumque 2-labiatus, labio superiore 2—3-dentato, rare subintegro, inferiore 2-dentato, dentibus plerumque acutis; *corollæ* tubus plerumque calycem superans, interdum æquans (tab. II).

JAVA: *Horsfield*, in H. A. R.—T. sub no. 049891 — *Hasskarl* in H. L.—B. sub nos. 908.266—1333 and 935, and 908.345—208, W. Java: Tji-Lankakan; native name: Kitai. — *Junghuhn* in H. L.—B. sub no. 908.267—591, Pelabuan Ratu. — *Elbert* no. 468, Madiun, Kendeng, 100—300 M. in alt.; *id.* no. 467, same locality. — *Boerlage*, in H. L.—B. sub no. 908.266—751, Leiden-isl. nr. Batavia, flow. on 29-II-1888.

TIMOR: *Spanoghe* in H. L.—B. sub. no. 908.266—1321.

SUMBAWA: *Elbert* no. 3719, Bima, near Nanga Raba, flow. on 11-XII-1909.

CELEBES: *Elbert* no. 2804, Buton-isl., Passar-Wadjo, 0—100 M. in alt., fr. on 9-XI-1909; *id.* nos. 2884 and 2932, Muna-isl., Raha, 0—75 M. in alt., fr. on 3-VIII-1909 and 30-VII-1909; *id.* no. 2725, Buton-isl., Lipumangan, 250—320 M. in alt., flow. on 22-VIII-1909; *id.* no. 2624, Buton-isl., Bon-bon, 0—75 M. in alt.

BORNEO: *Haviland* no. 3054, Kalong-Sibu, Rejang, flow. in July 1893 — *Korthals*, in H. L.—B. sub no. 908.266—1348, Dussun; *id.* sub no. 908.267—706, Banjermassing. —

Hallier f. no. B. 197, W.-Borneo, Suka Lanting on Kapuasriver, fr. on 29-IX-1893; *id.* no. B. 273, Singkawan, fr. on 3-X-1893.

AMBOYNA: *de Vriese*, in H. L.—B. sub no. 908.351—73. — *Zippel* no. 235a (*P. lasioneura* *Zp. ms.* (partly).

BURU: *de Vriese*, in H. L.—B. sub no. 909.12—88.

PHILIPPINES: *Elmer* no. 12178, Magallanes (Mt. Giting—Giting) Capiz, Sibuyan, flow. in April 1910; *id.* no. 7808, Lucban, Tayabas, Luzon, flow. in May 1907; *id.* no. 13348, Cabadbaran (Mt. Urdaneta), Agusan, Mindanao, fr. in July 1912; *id.* no. 11115, Todaya (Mt. Apo), Davao, Mindanao, fr. in July 1909. — Com. d. l. Fl. for. d. Fil. no. 1638, Paragua; *id.* no. 498, Catbalongan. — *Alvarez* no. 22664, Camarines, Luzon, flow. in March 1912. — *Robinson* no. 6871, Polillo, fr. in Aug. 1909.

NEW-GUINEA: *Nyman* no. 32, Stepansort, with flow. and young fr. on 22-XII-1898. — *Hollrung* no. 679 (*P. nitida* *K. Schum.*), Augusta-station I and II, with buds in Aug. 1887. — *Ramu-exp.* no. 55, flow. on 1-VI-1898. — *Schlechter* no. 16512, Kelel, \pm 200 M. in alt., flow. on 7-IX-1907. — *Lauterbach* no. 2010, near Erima, 10 M. in alt., climbing, fr. on 6-V-1896; native name: Aga; *id.* no. 385, Finschhafen, shrub, fr. on 6-VII-1890. — *Ledermann* no. 6858, Malu-camp on Sepik-river, 20—40 M. in alt., treelike shrub 6—8 M., fr. on 2-IV-1912; *id.* no. 6730, same locality, climbing shrub, flow. and fr. on 22-III-1912. — *Koch*, Merauke, in H. L.—B. sub. no. 908.266—1331. — *Versteeg* nos. 1129 and 1873 (see. subsp. α .) — *Forbes* no. 165, Sogeri-region.

NEW-IRELAND (NEU-MECKLENBURG); *Peckel* no. 342 partly, see subsp. α); *id.* no. 341, Namatanai, flow. on 1-III-1910, native name: Kuas.

CAROLINE-ISL.: *Ledermann* no. 13140, Ponape, near Pailapilap, 10—20 M. in alt., large shrub, with flow. and fr. on 23-X-1913; *id.*, no. 13232a, Ponape, Patapat, 100—

200 M. in alt., flow. and fr. on 1-X-1913. — *K. Gibbon* no. 1197, Ponape, Pontopotop, 20 M. in alt., small tree, flow. and fr. on 19-IX-1913; native name: Tupuk — *Charley Gibbons* no. 1048, Ponape, Kamulait, 8 M. in alt., tree, fr. on 4-IX-1911, native name: Tchupuk. — (?) *Ledermann* no. 13546, Leperei? — *Volkens* no. 131, Yap, flow. and fr. on 9-XII-1899; id. no. 276, tree 10—12 M.

MARIANNE-ISL.: *Gaudichaud* (*P. Gaudichaudii Schau*). — Plants of Guam no. 449. — *Fritz*, without nr., Saipon. — *Haenke*, without nr.

PALAU-ISL.: *Ledermann* no. 14408, Ngarsul, Babelthaop, tree, 10—300 M. in alt., flow. and fr. on 24-II-1914; native name: Chosm. — *Raymundus* no. 85; native name: Chóschêm. — *Ledermann* no. 14074, Korrór, 10—100 M. in alt., flow. on 6-II-1914, native name: Gobngakl.

Distribution of the species: Madagascar, Mauritius (*Hallier*), British India from Bombay to Malacca and Siam (*Hallier*), Silhet, Ceylon, Andamans, Nicobars, Honkong (*Hall.*), Malaya!, Philippines!, Polynesia!, usually near the sea.

Schumann, Fl. Kais.-Wilh.-land, 120, observes already that *Schauer* and other authors before him maintained or founded a great number of species, which should really be combined¹⁾ with *P. integrifolia*, such as *P. sambucina* and *P. Gaudichaudii*. We agree in this opinion and should wish to extend this principle. For, examining a large number of specimina, we found, that several other species were unseparably united with one another by all possible intermediate forms and with *P. integrifolia*, such as *P. foetida Reinw.*, *P. lævigata Miq.*, *P. nitida Schum.*, *P. cyclophylla Miq.*, *P. abbreviata Miq.*, *P. opulifolia Miq.* So we thought to be justified to combine these species into one large and very polymorphous one, being called by the name of the eldest.

Probably it will appear that some more species belong to

¹⁾ cf. *Hallier f.*, Med. 's Rijk, Herb. Leid. no. 37, 38.

this polymorphous species, such as *P. obtusifolia* R.Br., which has already been mentioned by Schumann.

P. Mariannarum Schau. and *P. timoriana* Dec. (see Valeton, Pl. pap. 52) are probably related, but not identical.

Though there are many transition-forms, we think we can distinguish two more or less distinctly separable forms, an opinion laid down in the founding of the two subspecies. These are not distinctly separated (the former *P. Gaudichaudii* Schau. is a transition between them), and we may observe a certain parallelism between the alteration of the leaves from nearly circular and small to long acuminate and large, and that of the calyx from 2-lipped (1 lip 2-toothed, the other entire) to regularly 5-toothed, or somewhat 2-lipped. (see Plate II).

In this matter, we see how impossible it is — as several other authors did — to subdivide the species exclusively basing upon the form of the calyx, which, as in some other species, is often inconstant, and can give rise only to the keeping of Hasskarl's *Gumira* and *Premnos*, subgenera, which also are not distinctly separated.

This and some other polymorphous species in this family, as *Callicarpa cana* and especially *Avicennia officinalis*, may show once more, how wrong and unscientific it is to try to discover truths of any worth for the systematical Botany by the old method, by a mere examination of often individual morphological characteristics, and how necessary to apply the science of Genetics to the systematical branch of Botany. In this way we should find a new link between two branches of the sciences of nature; for to arrive at the understanding, based upon scientifically stipulated facts, that there is only one science of the things of Nature, we may consider as one of the highest ambitions of the man of science.

43. *P. flavida* Miq., Fl. Ind. bat. suppl. I, 570 and 243, (1860). — A shrub?; branchlets round, with corymbs and petioles stellate-tomentose, afterwards glabrescent; leaves large, opposite, sometimes in the same pair unequal in dimensions, the petioles also unequal; chartaceo-coriaceous, oblong-acuminate, from the middle gradually nar-

rowing into a long, obtuse acumen; base subcordate or rounded, sometimes cuneate; margins entire throughout or very minutely denticulate from $\frac{1}{3}$ from the base to the apex; when young, stellate-hairy on both sides, especially beneath, adult glabrate on both sides, or somewhat pubescent on the nerves, glandular; pairs of nerves (5—)7—9; 16—27 cM. long, 10—13 cM. wide; petioles 1.3—7 $\frac{1}{2}$ cM.; *corymbs* 16 cM. long, 13 cM. in diam.; *calyx* 0.2 cM. with 5 large, deltoid teeth, one of them larger, pubescent and with white glands without, more glabrous in fruit, 0.25 cM.; *corolla* pubescent and with white glands without, 2-lipped, upper lip entire, the lower 3-lobed, 0.3 cM. in bud; throat with a belt of curled white hairs; *stamens* inserted in the throat; *style* very shortly bifid at apex; *ovary* cubic, upper plane dotted with white glands; *drupe* glabrous, glandular.

SUMATRA: *Diepenhorst*, Priaman; H. bog. nos. 2107 and 2325; native name: Kayu Kunit. — *Teysmann*, in H. L.-B. sub no. 908.266—1323.

44. **P. macrophylla** H. J. Lam, nov. spec. — Frutex; ramuli cylindrici, cum petiolis corymbisque minutissime pubescentes; folia coriaceo-chartacea, forma variabilia, plerumque lato-ovata, basi lato-attenuato-cordata, apice abrupte breviterque acuminata; interdum oblonga vel oblongo-sublanceolata, basi rotundata vel subcuneata vel cordata, apice abrupte acuminata vel acuta vel subobtusata; margine integra; utrinque glabra, costa primaria supra, nervis subtus subpubescentia; nervis secundariis utrinque 5—8; 8—25 $\frac{1}{2}$ cM. longa, 6—14 $\frac{1}{2}$ cM. lata, petiolo 1—2 cM. longo; *corymbi* ampli; 8—26 cM. longi, 11—24 cM. diametro, pedunculo crasso 2 $\frac{1}{2}$ —11 cM. longo; *calyx* (in alabastro) 0.05—0.07 cM. longus, puberulus, glandulosus, subtruncatus vel undulatus vel subbilabiatus, labio inferiore 3-denticulato, superiore obscure 2-denticulato; *corolla* extus glabra basi tubi, marginibusque loborum; loborum basi,

tubi superiore parte pubescens; fauce anguste villosa, setis albis retrorsis; bilabiata, lobis 3 labii inferioris aequalibus, labio superiore majore, subbilobo; *stamina* fauce inserta; *stylus* apice longiuscule bifidus, lobis apice incrassato-subcapitatis; *ovarium* glabrum, subquadrangulare; *drupa* calyce insidens, 0.7 cM. longa, 0.5 cM. diametro, obovata, obpyriformis, basi saepe poro transverso; 4-sperma; cavitate centrale ampla, quadrangulare, endocarpio duro, tenui.

JAVA: in H. L.-B. sub nos. 908.266—834 and 908.267—763 (*v. Hasselt*, Buitenzorg).

SUMATRA: *Korthals* no. 963, Padang.

BORNEO: *Korthals*, Dussun, in H. L.-B. sub no. 908.267—743.

This species is conform with *P. regularis* in the characteristically capitate stigmatic lobes, and with *P. integrifolia* in the form of the fruits and the hole in their base.

45. *P. depauperata* Merrill, Phil. Journ. Sci. Bot. I, suppl. 231, (1906); *Hall. f.*, Med. 's Rijks Herb. Leid. no. 37, 39. — An undershrub; branchlets, petioles and corymbs densely rusty-villous; leaves coriaceous, oblong-ovate or elliptic-ovate, entire, sparsely pubescent above, villous beneath, glandular; base cordate or rotundate, apex acute; pairs of nerves 4—5; 3—6 cM. long, 2—3½ cM. wide; petioles 0.5 cM. or less; corymbs 4—5 cM. long and in diam.; calyx 0.3 cM. long, sparsely pubescent, subequally 5-toothed or somewhat 2-lipped; corolla 0.4 cM. long, pubescent without, subbilabiate; lobes 4, one of them larger; throat villous; stamens subincluded; style 0.35 cM. long; ovary glabrous; drupe glabrous, 0.4 cM. long.

Distribution: Culion (Philippines, Merrill), Tukan Besi and Kabaena-islands (*Hallier*).

46. *P. leucostoma* Miq., Fl. Ind. bat. II, 899, (1856); *Koord. en Val.*, Bijdr. Booms. Java no. 7, 193; *iid.*, Atl. d. Baumart. II, 6, t. 290; *Koord.*, Exk. fl. v. Java, III, 136. — A tree, reaching 13 M. in height (*Koorders*);

branchlets round or nearly so, with petioles and corymbs greyish-tawny-pubescent, woolly; *leaves* membranous, ovate or subrotundate, base cuneate or subtruncate, apex obtusely, shortly acuminate; margins entire; both sides pubescent, especially beneath and on the nerves, sparsely glandular; pairs of nerves 3—5; *corymbs* dense, many-flowered, 4 cM. long, 6 cM. in diam.; *calyx* 2-lipped, pubescent and glandular, 0.1 cM. long; upper lip with 3 small, acute or subobtuse, teeth, lower one larger, with 2 larger, acute teeth; *corolla*-tube short, glabrous without, 0.2 cM. long; lobes somewhat pubescent without, 2 larger ones, 0.2 cM. long, and 2 smaller, 0.1 cM. long; all of them with the throat more or less densely villous within; *stamens* inserted in the throat, connated with the tube and thus reaching its base; 0.3 cM. long, exerted; *style* 0.5 cM. long; stigma shortly bifid; *ovary* glabrous.

Distribution: Java.

This species has a close affinity with *P. latifolia*, var. δ , but the latter has among other points of difference, not so characteristically the barbate hairs on the inner side of the corolla-tube, which gives the name to the species, and the flower is more typically 2-lipped.

47. *P. latifolia* Roxb., Fl. ind. III, 76, (1832); Hook. f., Fl. Br. Ind. IV, 577. — A small tree; young parts hirsutely pubescent; *leaves* ovate or ovate-rotundate, base cordate and abruptly attenuate, or cuneate or rhomboid or obtuse, apex shortly acuminate; margins entire, rarely serrate, dusky pubescent, drying blackish above, cinereous beneath, mature usually pubescent, at least on the nerves; pairs of nerves 5—7; 5—10(—15) cM. long, 2.7—6(—7) cM. wide, often smaller; petioles 0.5—1.4 cM.; *corymbs* rather lax, terminal on main- and axillary branchlets, many-flowered, 5—7 $\frac{1}{2}$ cM. in diam.; bracts small, caducous; sometimes ferruginous-pubescent; *calyx* 0.15—0.2 cM. long, strigose or patently pubescent, in fruit enlarged to

0.3—0.6 cM. in diam.; somewhat 2-lipped; shortly 5-toothed; teeth acute or subobtuse; *corolla* 2-lipped, 0.3—0.4 cM. long; tube short, 0.2 cM. long; glabrous without; throat with the upper lip densely villous within, also the midlobe of the lower one; upper lip entire, lower one with one large and 2 small lobes; *stamens* exsert, inserted in the throat; *style* with shortly bifid apex; *ovary* glabrous except on the apex, which is sparsely pubescent and glandular; *drupe* glabrous, 0.4 cM. long and in diam., hardy, sometimes distinctly, verrucose.

Var. α typica H. J. Lam, nov. var. — *folia* basi cordata abrupte acuminata, pubescentia, 10 cM. longa, 6 cM. lata, vel minora; *calyx* strigosus — Coromandel coast and Bengal (*Hook. f.*).

Var. β cuneata C. B. Clarke in *Hook. f.* l.c. (1885), — *leaf-base* cuneate or rhomboid; *calyx* strigose. — Pegu, Burma (*Clarke*).

Var. γ mollisima C. B. Clarke, l.c. — *leaves* small, base obtuse or rhomboid; *corymbs* 4 cM. in diam. — Madras (*Clarke*).

Var. δ mucronata C. B. Clarke, l.c. — *P. mucronata* Roxb., *Fl. ind.* III, 80, (1832); *Schauer, DC.*, *Prodr.* XI, 635; *Miq.*, *Fl. Ind. bat.* II, 897. — *leaves* cuneate at both ends reaching 15 cM. in length, mature minutely pubescent on the midrib beneath; *corymbs* somewhat broad rusty-pubescent; *calyx* subpatently pubescent; *drupes* more verrucose and larger.

PHILIPPINES: Cuming no. 1367 — Com. d. l. fl. for. d. Fil. 1640, San Mateo — Ramos no. 8088, Isabela, Luzon, flow. in May 1909; *id.* no. 378, Antipolo, Rizal, Luzon, fr. in June 1910.

Distribution: N. India, Bengal (*Clarke*), Philippines!

Var. ε viburnoides C. B. Clarke l.c. — *leaves* ovate, base rhomboid glabrate, drying green, surfaces concolorous. — S. Deccan Peninsula (*Clarke*).

Distribution of the species: British India (*Clarke*), Philippines!

48. *P. pubescens* Bl., Bijdr. 816 (1826) s.a.; *Schauer*, DC., Prodr., XI, 634; *Koord. en Val.*, Bijdr. Booms, Java no. 7, 186; *iid.* Atl. d. Baumart. v. Java II, 6, t. 287; *Hall, f.*, Med. 's Rijk Herb. Leid. no. 37, 38; *Koorders*, Exk. fl. v. Java, III, 135; *Miquel*, Fl. Ind. bat. II, 897; *Zoll. und Mor.*, Syst. Verz., 52. — A climbing or suberect shrub or small tree (*Colfs* for var. α); branchlets, petioles and corymbs densely rufous-pubescent; hairs simple; leaves ovate or ovate-rotundate, sometimes ovate-lanceolate, base rounded or subcordate, sometimes subcuneate, apex cuspidate-acuminate or more or less shortly acuminate; upper half usually dentate-serrate; membranous or subchartaceous; both sides pubescent, especially beneath and on the nerves; sometimes glabrate except on the nerves; somewhat glandular beneath; all hairs simple; pairs of nerves 3–6; often the lowest 2 pairs starting from the base; $6\frac{1}{2}$ –16 cM. long, $4\frac{1}{2}$ –12 cM. broad, petioles 1–6 cM.; corymbs many-flowered; $5\frac{1}{2}$ –13 cM. long, 4–13 cM. in diam.; peduncles $1\frac{1}{2}$ –3 cM., bracts small, linear; flowers pedicelled; pedicels 0.1–0.25 cM.; calyx rather variable; usually 2-lipped, upper lip with 3, lower with 2, rather large, rounded lobes; sometimes lobes subacute, rarely upper lip subentire or entire; densely pubescent and glandular, 0.15–0.3 cM. long; corolla 2-lipped, upper half of the tube and lobes somewhat pubescent without, glandular; tube 0.25–0.4 cM. long, 0.25–0.35 cM. wide; upper lip entire, lower 3-lobed, midlobe larger; the lips 0.2–0.25 cM. long; throat densely villous with the upper half of the tube within; stamens long exsert, inserted in the throat, with the flower 0.6–0.8 cM. long; subdidynamous; style as long exsert as the stamens; stigma shortly bifid; ovary glabrous, or with

some scattered hairs and glands at the top; globose; *drupe* glabrous, sometimes somewhat verrucose.

Var. α subglabra H. J. Lam, nov. var. — *P. pubescens* Bl. l.c., s. s. — *P. populifolia* Zipp. ms. — *folia* plerumque ovato-lanceolata, basi cuneata, apicem versus serrata; utrinque subglabra, nervis pubescentia.

JAVA: *Zollinger* no. 645. — *Boerlage* no. 462, Tjiomas, Gunung Wangon, several specimina, flow. on Sept. 28th, 1888, and on Oct. 30th, 1888, — *van Hall?* no. 96.

SUMATRA: *Forbes* no. 2621.

TIMOR: *Zippel* no. 55. (*P. populifolia* Zipp.), in H. L.—B. sub nos. 908.266—1344, 1351, 1352, 1390 and 1399.

SUMBAWA: *Colfs* no. 144, Kailou Kesi.

Doubtful specimen: *Zollinger* no. 3813 (*P. cimicina* Zoll. et Mor. ms.).

Var. β odorata H. J. Lam, nov. var. — *P. odorata* Blco., Fl. Fil., ed. I, 489 (1837); *Schauer*, DC., Prodr. XI, 638; *Miquel*, Fl. Ind. bat. II, 900; *Hall*, f., Med. 's Rijks Herb. Leid. no. 37, 39; *Merrill*, Bur. Gov. Lab. no. 27, 68; *id.*, Phil. Journ. Sci. Bot. I, Suppl. I. 232; *id.*, *ibid.* III, 431; *id.* and *Merritt*, *ibid.* V, 380 — *P. fœtida* F.-Vill. Nov. App. 159 (1877) — *P. serratifolia* Blco., Fl. Fil. ed. II, 269 (1845) — *P. tomentosa* F.-Vill. Nov. App. 159 — *P. subscandens* Merr., Phil. Journ. Sci. Bot. I, Suppl. I. 230 (1906) — *P. vestita* *Schauer*, DC., Prodr. XI, 631 (1847); *Miq.*, Fl. Ind. bat. II, 892. — *folia* sæpe ovato-rotundata, basi truncata vel subcordata, interdum subcuneata, apicem versus serrata vel integra; utrinque, præsertim subtus et in nervis, molliter pubescentia.

JAVA: *Korthals*, Santjang, in H. L.—B. sub no. 908.266—690.

KABAENA-ISLAND (S. E.-ward of Celebes): *Elbert* no. 3366, Balo, Eempuhu, 0—200 M. in alt., with buds on 26-X-1909.

TUKANG-BESI-ISLANDS (S. E.-ward of Celebes): *Elbert* no. 2511, Wandji—Wandji, 0.60 cM. in alt., fr. on 22-VII-1909.

PHILIPPINES: *Ramos* no. 370 (*P. subscandens* Merr.), Antipolo, Rizal, Luzon, flow. in June 1910; *id.* no. 2641, Rizal, Luzon, flow. in May 1907 — *Elmer* no. 9940, Dumaguete (Cuernos Mounts), Negros, flow. in May 1908; *id.* no. 8667, Baguio, Benguet, Luzon, flow. and fruiting in March 1907 — *Vanoverbergh*, no. 159, Bontoc, Luzon, flow. on Febr. 1st., 1914 — *McGregor* no. 11280, Dupax, Nueva Vizcaya, Luzon, flow. in March—April 1912; *id.* no. 14160, same locality and date (*P. subscandens*) — *C. B. Robinson* no. 11569, Cotabato, Mindanao, flow. in June 1910 — *Merritt* no. 11450, Mindanao, flow. in April and May 1908. — Com. d. l. flor. for. d. Fil. nos. 1652, Manila; 846, Unisan (? = Unsang, Tau-i-Tau-i); 468, Batoan (? = Bato, Catanduanes); 847, Guinayangan, Luzon.

Distribution of the species: Malacca, Burma, Andamans (*Hallier*), western and central part of the Malayan Archipelago!, Philippines!

49. *P. Goeringii* Turcz., Bull. Soc. Nat. Mosc. XXXVI, II, 216 (1863). — A shrub? young parts tomentose; leaves large, base cordate, apex acuminate, glabrous above, except on the nerves, densely stellate-hairy beneath; margins entire; with petioles about 15 cM. long; corymbs shorter than the leaves; calyx equally and obtusely 5-toothed; corolla 2—3 times the length of the calyx, glabrous without; tube short; 2-lipped; upper lip entire, lower 3-lobed, both lips densely pubescent within; throat villous, stamens 4, didynamous, subincluded; drupe globose.

Distribution: Java? (or Japan).

50. *P. stellata* Merr., Phil. Journ. Sci. Bot. XI, 203, (1916). — A tree, 5—10 M. high; branchlets, petioles and inflorescences densely tawny-stellate-hairy, glabrescent; leaves chartaceous, ovate or oblong-ovate, base rotundate,

not cordate; margins entire; apex abruptly acuminate, acumen acute or obtuse. 1 cM. long; upper side shining, glabrous or somewhat stellate-hairy on the nerves, lower one sparsely stellate-hairy, denser on the nerves; pairs of nerves 4—6; 9—20 cM. long; 7—12 cM. broad; petioles $2\frac{1}{2}$ —6 cM.; *corymbs* reaching 11 cM. in diam., lower branchlets 4—6 cM. long; many-flowered; bracts small; bracteoles minute, linear, 0.1—0.2 cM.; pedicels 0.1—0.2 cM.; *calyx* 0.3 cM. long, stellate-grey-tomentose without, obscurely 2-lipped, subequally 5-toothed; teeth 0.05—0.08 cM.; *corolla* white, 0.5 cM. long, the upper part stellate-hairy without, eglandular; 2-lipped, upper lip entire, rounded, 0.2—0.25 cM. long, lower 3-lobed, the midlobe larger, 0.18 cM. long, elliptical-ovate; *stamens* glabrous; *ovary* hairy; *drupe* 0.4 cM. long, stellate-hairy when young, glabrate afterwards.

Distribution: Samar (Philippines).

This species is characterized by the stellate tomentum, and has an affinity with *P. tomentosa*, from which it differs by its smaller leaves which are abruptly acuminate and have a smaller number of nerve-pairs; also related to *P. pyramidata*.

51. *P. pyramidata* Wall., cat. no. 1779 (1827); Schauer, DC., Prodr. XI, 633; Hook. f., Fl. Br. Ind. IV, 576; King and Gamble, Journ. As. Soc. Beng. LXXIV, 4, 822; Miquel, Fl. Ind. bat. II, 897. — A small or medium-sized tree (a large tree, Wallich), 13—17 M. high; branchlets obscurely quadrangular, stellately tomentose with tawny tomentum, on the petioles and the corymbs; *leaves* chartaceous large-ovate or oblong, often ovate-rotundate, base rounded, subcordate or obtuse, sometimes attenuate, apex shortly acuminate; margins entire; upper surface glabrous except on the nerves, lower one stellate-tomentose, glabrescent afterwards; pairs of nerves 7—10, the lowest 2 pairs from near the base; 15—35 cM. long, $7\frac{1}{2}$ —20 cM. wide; petioles, upper side channelled, $2\frac{1}{2}$ —

10 cM. long; *corymbs* large, reaching 30 cM. in length and 15—22 cM. in diam.; peduncles $2\frac{1}{2}$ —8 cM.; bracts linear, 0.5—1.3 cM.; pedicels very short; flowers crowded at the ends of the branches; *calyx* 0.2—0.35 cM. long, stellately pubescent without, subequally 5-toothed, 3 teeth somewhat larger, 0.06 cM. long; *corolla* 2-lipped, 0.3—0.5 cM. long, stellate-pubescent without; tube with a ring of retrorse stiff hairs at the throat; upper lip entire, lower 3-lobed; *stamens* included; filaments stout; *style* thickened with very shortly bifid stigma; *ovary* glabrous, depressed; *drupe* 0.5—0.6 cM. in diam., glabrous.

Distribution: India (*Hook. f.*), Burma, Malay Peninsula, Java, Timor (*K. and G.*).

Its affinity is with *P. tomentosa* (see there).

52. *P. tomentosa* Willd., Spec. III, 314, (1797—1830); *Blume*, Bijdr. 816; *Schauer*, DC., Prodr. XI, 634; *Hook. f.*, Fl. Br. Ind., IV, 576; *Koords. en Val.*, Bijdr. Booms. Java, no. 7, 179; *iid.* Atl. d. Baumart. Java, II, 6, t. 283; *Koords.*, Exk. fl. v. Java, III, 135; *id.* Pl. Jungh. ined. Gedenk. Fr. Jungh. 188; *Hasskarl*, 2^e Cat. 's Lands Pl. tuin Btzg. 134; *Miquel*, Fl. Ind. bat. II, 896; *Roxb.* Fl. ind. III, 76; *Hall. f.*, Med. 's Rijks Herb. Leid. no. 37, 40. — A tree, reaching 16 M. in height (*Koorders*); branchlets obscurely quadrangular, with petioles and corymbs densely stellate-floccose; *leaves* ovate or ovate-rotundate sometimes oblong, base cordate or subtruncate sometimes subcuneate, usually abruptly attenuate, apex gradually, generally long acuminate, chartaceous; margins entire; upper surface glabrous, nerves, or midrib only, densely stellate pubescent; usually very densely, sometimes sparsely, yellow-glandular; lower surface more or less densely stellate tomentose, glandular; pairs of nerves 6—10; 10—28 cM. long. 7—14 $\frac{1}{2}$ cM. broad; petioles 3—10 cM. long; *corymbs* large, 9—22 cM. long, 8—16 cM. in diam.; peduncles 27 cM.; *calyx* campanulate, obscurely 2-lipped, 5-ribbed,

subequally 5-toothed; teeth subobtuse; 0.3 cM. long, 0.2 cM. wide; densely stellate hairy and glandular without; corolla 0.4—0.45 cM. long; tube 0.35 cM., lower part glabrous, upper part with the lobes densely stellately pubescent, and with white glands; upper lip entire, lower one 3-lobed; throat villous, sometimes subglabrous before the upper lip; *stamens* included, inserted in the throat; *style* very shortly bifid at apex; *ovary* densely glandular at apex.

JAVA: Pl. *Jungh.* ined. no. 517; native name: Ki-bombulang. — *Korthals*, Udjang Karang, in H. L.-B. sub no. 908.266—685; *id.* Krawang, in H. L.-B. sub. nos. 908.266—691 and 692. — In H. L.-B. sub no. 907.42—15. Lebak. — *Boerlage*, Tjiomas, in H. L.-B. sub nos. 908.339—302, 303, 304, flow. on 16-XI-1888; *id.* Buitenzorg, in H. L.-B. sub no. 908.352—1442, flow. on 7-XII-1888. — *Junghuhn*, Wijnkoopsbaai, 600—1300 M. in alt. in H. L.-B. sub. no. 908.266—1218. — *Zollinger* no. 1010.

SUMATRA: *Junghuhn*, Padang, in H. L.-B. sub no. 908.267—1214 and Upper-Angkola, 300—1000 M. in alt., in H. L.-B. sub no. 908.267—1203.

TIMOR: *Forbes* nos. 3892. and 4088.

Distribution: Deccan Peninsula, Ceylon (*Clarke in Hook f.*), Sumatra!, Java!, Timor!

We saw one specimen with 5 stamens, having 2 stamens inserted before the upper lip.

The species is very near *P. pyramidata* (cf. *King and Gamble*, Journ. As. Soc. Beng., LXXIV, 4, 822), but the latter has not the numerous glands on the upper surface of its somewhat larger leaves, and its calyx is not 5-ribbed as in *P. tomentosa*. Perhaps we had better treat them as varieties of the same species.

53. *P. Cumingiana* *Schauer, DC.*, Prodr. XI, 634, (1847); *Koorders*, Meded. 's Lands Pl. tuin Btzg. XIX, 559; *Miquel*, Fl. Ind. bat. II, 897; *Hall. f.*, Med. 's Rijks Herb. Leid. no. 37, 40; *Merrill*, Phil. Journ. Sci. Bot. I,

suppl. I, 230. — *P. cordata* Blco., Fl. Fil., ed. I, 489, (1837); Merr. Bur. Gov. Lab. no. 27, 68. — *P. tomentosa* Blco. l.c. ed. II, 342, (1845); ed. III, 269; F. Vill. Nov. App. 159. — *P. cardiophylla* Schau. l.c. 638; Miq., l.c. 900. — A tree?; branchlets somewhat quadrangular, with petioles and corymbs densely stellate-floccose, glabrescent; leaves chartaceo-coriaceous, large-ovate, or subrotundate, base cordate; apex acuminate; margins entire; pairs of nerves 5–6, the lowest 2 pairs from near the base; upper surface glabrous except on the nerves, lower stellate-tomentose, denser on the nerves; $10\frac{1}{2}$ –30 cM. long, 8–20 cM. broad; petioles 3–8 cM. long; corymbs reaching 10–17 cM. in length, 6–15 cM. in diam.; peduncles 3–6 cM.; bracts rather long; calyx 2-lipped, 0.35 cM., densely stellate-hairy and white-glandular without; upper lip with 3, lower with 2 large, acute teeth, as long as or longer than the tube; corolla 2-lipped, 0.6–0.7 cM. long; tube glabrous without, 0.4–0.5 cM.; upper lip entire, lower one undeeply 3-lobed, lobes somewhat undulate, larger than the upper lip; both lips softly pubescent and white-glandular without; throat with a ring of stiff, white, retrorse hairs; stamens included, inserted in the throat; style 0.6 cM. with shortly bifid apex; ovary pubescent and glandular at apex; drupe 0.5 cM. long and in diam., somewhat pubescent and glandular.

PHILIPPINES: *Elmer* no. 12604, Brooks Point (Addison Peak), Palawan, fr. in Febr. 1911; *id.* no. 10668, Todaya, (Mount Apo), Mindanao, with buds in May 1909. — *Ramos* no. 355, Antipolo, Rizal, Luzon, flow. in June 1910. — Com. d. l. fl. for. d. Fil. nos. 1744, Bosoboso; *id.* 845, Pampanga. — *Miranda* no. 18949, with flow. and fr. in Sept. 1912, Basilan. — *Cuming*, nos. 778 and 1280.

Distribution: Philippines! Celebes (*Merrill*, Phil Journ. l.c.).

DOUBTFUL SPECIES:

54. *P. Ledermanni* H. J. Lam, nov. spec. — Arbor, 10—12 M. alta; cortex griseus; ramuli graciles, glabri; *folia* valde membranacea, late ovata vel obovata, basi angulato-truncata, minute abrupteque attenuata, apice acuminata, margine integra, parte latiore supra medium, utrinque glaberrima, pilis nonnullis in costa insidentibus exceptis, 9—16 cM. longa, 4.8—9.6 cM. lata; petiolo glabro, apicem versus nonnullus pilis longis vestito, compresso, 1—5½ cM. longo; nervi utrinque 5—6, paullo prominentes, inferiores 2—3 proximi; *corymbi* terminales, minute puberuli, bracteis bracteolisque subulatis, 0.1—0.3 cM. longis; 8—10 cM. longi, 6—8 cM. diametro, pedunculo 2½—6 cM. longo; *flores* minutissimi adsunt alabastrorum ætate.

NEW-GUINEA: *Ledermann* no. 8661, April-river, Beach-camp, 40—100 M. in alt., with very young buds on 12—IX—1912. Our species is closely allied to *P. membranacea* Merr. from the Philippines, but differs in its leaves, which are entirely glabrous or have only some long hairs.

55. *Pr. nauseosa* Blco., Fl. Filip. ed. I, 489 (1837); *Schauer*; DC., Prodr. XI, 639; *Miquel*, Fl. Ind. bat. II, 900; *Merrill*, Phil. Journ. Sci. Bot. I, suppl. I, 233; *id.*, Bur. Gov. Lab. no. 27, 68. — *P. integrifolia* Blco., l.c. ed. II, 342; *Merrill*, Bur. Gov. Lab. no. 27, 68. — *P. leucostoma* Naves ex *F.-Vill.* in Blco., l.c. ed. III, Nov. App. 159 — *P. mucronata* *F.-Vill.* l.c. — A small tree, 4 M. high, dispersing a disagreeable odor from leaves and flowers; *leaves* hardly cordate, oblong, or elongateoblong, entire, glabrous or often somewhat pubescent; *calyx* 5-toothed.

Distribution: Philippines.

If it is true that *Cuming* no. 1367, as *Merrill*, l.c., indicates, belongs to this species, it should be a synonym of *P. mucronata* Roxb. = *P. latifolia* Roxb. var. δ . Perhaps *P. mucronata* Roxb. and its homonym *P. mucronata* *F.-Vill.* (not in Index kewensis) are confounded. We could find no better description of *P. nauseosa* and did not see any specimen of it; so we are not justified to decide in this matter, but we think, the supposition, that *Cuming* no. 1367 is *P. nauseosa* is a mistake, and this

specimen probably belongs to *P. mucronata* Roxb. (not of *F.-Villar*) only.

56. *P. papuana* Wernham, Trans. Linn. Soc. IX, I, 136 (1916). — A glabrous shrub; *leaves* oblong, subcoriaceous, base rotundate, apex acute, very shortly acuminate; pairs of nerves 6—9; $5\frac{1}{2}$ —7 by 2—2.8 cM.; petioles 1 cM.; *corymbs* rather lax, minutely rusty-hairy; 20 cM. long, 18 cM. wide; flowers rather large, glabrous; *calyx* subglobose, distantly dentate; *corolla* 0.4—0.5 cM., subequally 4-lobed; lobes obtuse; throat somewhat villous; *stamens* included; *ovary* glabrous.

Distribution: Dutch New-Guinea.

57. *P. populifolia* Miquel, Fl. Ind. bat. suppl. I, 570 and 243, (1860). — A shrub?; branchlets round, appressedly pubescent, glabrescent, with interpetiolar margins of hairs; *leaves* opposite, in the same pair often unequal in dimensions and in length of the petioles; chartaceous, oblong, or ovate-oblong, base rounded or truncate, sometimes oblique, apex acuminate; margins subirregularly serrate except near the base and the apex; upper side glabrous, somewhat pubescent on the midrib; lower side glabrous, somewhat barbellate in the axils of the nerves; $8\frac{1}{2}$ —13 by 4— $6\frac{1}{2}$ cM.; petioles 2—5 cM. long.

Distribution: Sumatra.

DOUBTFUL SPECIMEN:

v. Heutsz, no. 813, Borneo; a shrub, 3 M. high; 6 stamens (5! H. J. L.), flrs. green; native name: badindi; extract of leaves is a remedy for diseases of the skin.

XV. *PYGMÆOPREMNA* Merrill, Phil. Journ. Sci. Bot. V. 225 (1910) — *Engl. u. Prantl. Nat. Pfl. fam., Nachtr. IV, 266.* — Small undershrubs; branchlets somewhat hairy; *leaves* opposite, simple; *inflorescences* cymose, terminal, sometimes composed of axillary cymules; flowers small; *calyx* very small, 5-toothed, in fruit somewhat enlarged, 2-lipped; *corolla* with short, straight tube, limb 2-lipped, upper lip entire, lower lip 3-lobed; throat partly

villous; stamens 4, subequal, inserted in the lower part of the corolla-tube, included, or nearly so; *style* with very shortly bifid apex; *ovary* 2-celled, cells 2-ovuled; *drupe* small, included in the calyx, obovoid, with fleshy exocarp and thin, coriaceous endocarp, with 1 usually (by suppression) 1-celled, 1-seeded, sometimes 2-celled, 2-seeded pyrene; seeds oblong, compressed, exalbuminous.

Distribution: Luzon.

Without regard to characteristics of less consequence, the genus differs from *Premna* only by its extraordinarily small size; therefore perhaps we had better combine it with that genus, since in *Clerodendron* we met with an analogue case (*C. pumilum* Ridl. = *C. sarawakana* (Ridl.) H. J. Lam).

1. *P. humilis* Merrill, Phil. Journ. Sci. Bot. V, 225, (1910); Engl. u. Prantl. Nat. Pfl. fam., Nachtr. IV, 267. — A small undershrub, reaching only 15 cM., with few, if any branches; branchlets, cymes and petioles pubescent; leaves membranous or subchartaceous, obovate-oblong, apex acute or shortly acuminate, the widest part about $\frac{1}{3}$ from the apex, and from this point gradually narrowing to the acute base, margins entire, above glabrous with some hairs upon the nerves and along the margins, eglandular, beneath glabrous, sometimes somewhat puberulous on the nerves, with or without some glands; pairs of nerves 5—6; 3—12 by 1—5 cM., petioles 0.2—0.4 cM.; terminal cymes 1—2 cM. long and wide, peduncles 0.2—1 cM., pedicels 0.2 cM., with small bracteoles; calyx 0.15—0.2 cM., with 5 subequal teeth, in fruit somewhat enlarged, 2-lipped; corolla white or greenish-white, glabrous on the outer surface, 0.45 cM., 2-lipped, upper lip 0.2 cM. in diam., entire, lower lip 3-lobed, middle-lobe 0.16 cM. in diam., the lateral ones 0.1 by 0.15 cM., reflexed; throat scarcely villous; stamens 0.1 cM., anthers 0.06 cM. with parallel thecæ; style hardly 0.1 cM., very shortly bifid at apex; ovary glabrous; drupe 0.5 cM. long, 0.4 cM. in diam.

LUZON: *McGregor* no. 11458, Dupax, Nueva Vizcaya, flow. and young fr. in March—April 1912.

XVI. VITICIPREMNA. *H. J. Lam*, nov. gen. Arbores vel frutices; ramuli obtuse quadrangulares; *folia* digitatim composita; *inflorescentiæ* paniculatæ, terminales, cymis oppositis; *calyx* hypocraterimorphus, truncatus vel obsolete 4-5-denticulatus; *corolla* subbilabiata, labium superius integrum, interdum paulo bifidum, basi \pm villosum, inferius 3-lobatum, lobis subaequalibus, *stamina* 4, didynamia, medio tubo inserta, paulo exserta; *stylus* exsertus, filiformis, stigmatе breviter bifidus; *ovarium* novellum imperfecte, demum perfecte 4-loculatum, 4-ovulatum; *fructus* drupaceus, 1-pyrenus; pyrena 4-loculatum, 4-spermum,

Distribution: Philippine Islands!, New-Guinea!, New-Britain!, New-Ireland!

We based the present genus upon the 2-lobed corolla, which is a characteristic of *Premna*, and the digitate leaves, which are a feature of *Vitex*. Moreover, the throat of the corolla is villous before the upper instead of before the midlobe of the lower lip. Yet we conceive, that it may be a doubtful one, since the possibility exists that it may be either a hybrid of a *Premna* and a *Vitex*-species, or a variation of the latter genus.

a. Leaflets with acute base; tomentum ferruginous

1. *V. Turczaninowii* p. 162.

b. Leaflets with obtuse or rounded base; tomentum greyish-yellow 2. *V. Novæ-Pommeraniæ* p. 163.

1. *V. Turczaninowii* (*Merr.*) *H. J. Lam*, nov. comb. — *Vitex Turczaninowii* *Merrill*, Phil. Gov. Lab. Bur. Bull. XXXV, 77. (1905). — *Premna philippinensis* *Turcz.*, Bull. Soc. Nat. Mosc. XXXVI, II, 215, (1863). — A shrub?; branchlets quadrangular, with inflorescences and petioles minutely ferruginous—pubescent; *leaves* opposite, 3-foliolate (5-fol., *Merrill*); leaflets chartaceous,

lanceolate, base acute, apex obtusely acuminate, glabrous above or with some hairs and little scales, beneath glabrous, with reddish glands, sometimes somewhat hairy on the nerves; pairs of nerves 8—12; 8—17 by 4—6 cM., petiolules 1—2½ cM.; petioles 7—9½ (—11, *Merrill*) cM.; panicles large, leafed in the lower part, 18 cM. long, 24 cM. wide; calyx 0.25 cM., ferruginous-pubescent without, subtruncate or hardly, indistinctly 5-denticulate; corolla yellow (*Merrill*), with cylindric tube, lower part glabrous, upper part with lobes, except the margin of the larger lobe, pubescent, glandular, 0.5 cM.; lobes 4, the smaller ones 0.2 (lower lip), the larger one (upper lip) 0.25 cM. long; glabrous within; tube villous within near the insertion of the stamens; stamens 4, didynamous, 0.45 and 0.4 cM. long, inserted in the middle part of the corolla-tube, filaments villous at the base; style 0.6 cM., stigma shortly bifid; ovary broadly pyriform, glabrous, 2-celled, cells, when young imperfectly, ultimately perfectly 4-locellated, 2-ovuled, without central cavity.

LUZON: Ramos no. 382, Antipolo, Rizal, flow. in June 1910. — Cuming nos. 1172 and 1294 (*Premna philippinensis Turcz.*), auth. spec.

2. *V. Novæ-Pommeraniæ* (*Warb.*) *H. J. Lam*, nov. comb. — *Vitex Novæ-Pommeraniæ Warb.* Engl. Jhrb. XIII, 428 (1891) and XVIII, 208; *K. Schum.* u. *Lauterb.*, Fl. D. Südsee, 524. — A shrub (*Hellwig*) or large tree (*Dahl*); branchlets quadrangular, with petioles and inflorescences minutely greyish tomentose; leaves 3-5-foliolate, very rarely 6-foliolate; leaflets thinly chartaceous, ovate or obovate-oblong, margins entire, base often unequal, obtuse or subtruncate, apex acuminate; pairs of nerves 8—11; upper surface glabrous or with some hairs on the midrib, with minute scales, lower glabrous, glandular, on and near midrib pubescent; lowest leaflets, if present, 3½—8½ by 1½—4 cM., petiolules 0.2—0.8 cM.; lateral

ones 5—11 $\frac{1}{2}$ by 2—5 cM., petiolules 0.3—1.6 cM.; terminal ones 7—15 by 4—6 cM., petiolules 0.5—2 cM.; petioles 5—10 cM., *panicles* terminal, 14—18 cM. long, 6—16 cM. in diam.; cymes di- or trichotomous; pedicels short, 0.1—0.4 cM., *calyx* cup-shaped, truncate, softly pubescent and glandular without, glabrous inside, 0.3 cM. long and in diam.; *corolla* softly fulvous-pubescent and glandular without except on the lower part of the 0.4 cM. long tube and near the margin of the upper lip; glabrous within except at the insertion of the stamens and the base of the upper lip; lower lip 3 lobed, lobes subequal 0.2—0.3 cM. long, upper lip usually entire, sometimes more or less 2-lobed, villous at its base, 0.3 cM.; *stamens* didynamous, 0.6 cM., filaments glabrous, exerted, inserted in the upper part of the corolla-tube; *style* 1 cM., with shortly bifid apex; *ovary* glabrous; *drupe* 0.8 cM. long and in diam., glabrous.

NEW-GUINEA: *Hellwig* no. 390, Kais.-Wilh.-land, fr. on 8-III-1889; id. no. 463, same country, near Butaueng, flow. on 19-III-1889, a shrub.

NEW-BRITAIN (NEU-POMMERN): *Dahl* without nr. in H. Ber., Ralum, Lowoa, flow. on 2-II-1897; a large tree, corolla green-yellow, lip violet-veined.

NEW-IRELAND (NEU-MECKLENBURG): *Peekel* no. 311, Namatanai, Buniah; native name?: burugamata; flow. yellowish-green on Jan. 10th.

XVII. VITEX. *Tourn.* ex *L.*, syst. veg., ed. I, (1735); *Blume*, Bijdr., 812; *Benth.* and *v. Muell.*, Fl. Austr., V, 66; *Benth.* and *Hook.*, Gen. pl. II, 2, 1154; *Blanco*, Fl. Fil., ed. I. 513; *Schauer*, DC., Prodr. XI, 682; *Engl.* u. *Prantl.*, Nat. Pfl. fam. IV, 3a, 170; *Hook. f.*, Fl. Brit. Ind. IV, 583; *Koord. en Val.*, Bijdr. Booms. Java, no. 7, 198; *King* and *Gamble*, Journ. As. Soc. Beng. LXXIV,

4, 841; *Miquel*, Fl. ind. bat. II, 858; *Hassk.*, 2e Cat. 's Lands Pl. tuin, 134. — Shrubs and trees; *leaves* digitately composed, with 3—7 leaflets, rarely reduced to 2 or 1; *cymes* axillary, sessile or peduncled, short and crowded or larger and lax, sometimes subspicate often composed to a large, terminal panicle; bracts small; flowers white, blue, pink or yellowish; *calyx* cupuliform, rarely subcylindrical, 5-lobed or toothed, sometimes truncate; *corolla*-tube cylindrical, short, sometimes somewhat curved, widened towards the throat, often pubescent without, except the lower part; limb spreading, oblique, subbilabiate; upper lip 2-lobed, lower one 3-lobed, the middle lobe larger, entire or undulate, with the throat often villous within; *stamens* 4, didynamous, usually exsert; anthers with parallel or divergent fissures; *style* with shortly bifid apex; *ovary* 4-celled, 4-ovuled; ovules high-laterally attached; *fruit* not included, drupaceous, with one 4-celled and 4-seeded pyrene.

Distribution: in the tropics of both the Old and the New World, some species in the subtropics of Europe and Asia.

1. a. Calyx regularly 5-toothed, sometimes subtruncate or truncate (Section I *Agnus-Castus* (*Endl.*) *Briq.* (= *Euagnus Schau.*)) 2.
- b. Calyx 2-lipped, 1 lip entire or with 2 small teeth, the other 2-toothed (Section II, *Glossocalyx Clarke*).
34. V. *gamosepala* p. 209.
2. a. Cymes in large terminal panicles (sect. I, subsection 1 *Terminales Briq.*) 3.
- b. Cymes axillary, also in the axils of the lower leaves, sometimes composed to a long, interrupted, leafed, terminal panicle (sect. I, subsection 2 *Axillares Briq.*) 37.
3. a. Petioles winged 4.
- b. Petioles not winged 5.
4. a. } { 1. V. *pteropoda* p. 170.
- b. } { 2. V. *peralata* p. 171.

5. a. Leaves 1-, sometimes 2-foliolate 6.
 b. Leaves 3-5(-7-9) foliolate 13.
6. a. Leaflets 8-30 cM. long 7.
 b. Leaflets 1.7-6.5 cM. long, ovate or obovate, greyish tomentose beneath . . 11. **V. trifolia** var. β p. 182.
7. a. Calyx truncate or indistinctly 2-5-toothed.
 3. **V. cofassus** p. 172.
 b. Calyx distinctly 5-toothed 8.
8. a. Leaflets 3-4-nerved; 12-20 by 4-8 cM.; petioles 1-2 cM.; calyx sparsely glandular without and within.
 4. **V. smilacifolia** p. 175.
 b. Leaflets 6-20-nerved 9.
9. a. Leaflets 6-10-nerved 10.
 b. Leaflets 10-20-nerved 12.
10. a. Inflorescence a lax panicle. 5. **V. sarawakana** p. 175.
 b. Inflorescence subspicate 11.
11. a. Fruits 2-2.2 cM. in diam. . . 6. **V. holophylla** p. 176.
 b. Fruits 1.1 cM. in diam. . . 7. **V. subspicata** p. 177.
12. a. Midlobe of lower lip of corolla twice as long as the lateral lobes, undulate . . . 8. **V. Clarkeana** p. 178.
 b. Midlobe of lower lip of corolla five times as long as the lateral lobes, entire . . . 9. **V. Hollrungii** p. 179.
13. a. Leaflets distinctly pubescent on one or both sides 14.
 b. Leaflets glabrous on both sides, or pubescent only on the midrib 21.
14. a. Terminal leaflet sessile 15.
 b. Terminal leaflet petioluled. 17.
15. a. Leaflets 3-5 (sometimes 7 or 9), lanceolate; panicles interrupted, with subsessile, opposite, globose cymes; midlobe of lower lip of corolla little longer than the lateral lobes 10. **V. Agnus-castus** p. 180.
 b. Leaflets 1-3, or, if 5, then length only twice the breadth 16.
16. a. Leaflets 1-3, terminal one 2.6-9.2 by 1-3.7 cM.; petioles 0.7-3 cM.; calyx 5-denticulate, 0.3-0.4 cM.; teeth 0.05 cM. 11. **V. trifolia** var. α p. 182.
 b. Leaflets 5, terminal one 8-15 by $3\frac{1}{2}$ - $8\frac{1}{2}$ cM.; petioles 4-8 cM.; calyx 5-toothed, 0.6 cM.; teeth 0.2 cM.
 12. **V. pubescens** p. 183.

17. a. Calyx 0.2—0.3 cM.; corolla (together with midlobe of lower lip) 0.7—1.1 cM. 18.
 b. Calyx 0.6 cM.; corolla (together with midlobe of lower lip) 2 cM. 12. **V. pubescens** p. 183.
18. a. Corolla entirely glabrous within 19.
 b. Corolla more or less villous in the throat and near the insertion of the stamens 20.
19. a. Leaflets membranous, scabrid-punctate above, densely velutinous beneath; terminal ones 10—22 by $4\frac{1}{2}$ —10 cM.; petiolules 1—2 cM. 13. **V. velutina** p. 185.
 b. Leaflets chartaceous, glabrous above or nearly so, with small white scales, sparsely pubescent and glandular beneath; terminal one 9—14 by 4—7 cM.; petiolules $1\frac{1}{2}$ — $2\frac{1}{2}$ cM. 14. **V. sumatrana** p. 186.
20. a. Leaflets not or little pubescent beneath, glandular, nerves pubescent; calyx truncate or obscurely 5-toothed.
 15. **V. heterophylla** var. β p. 189.
 b. Leaflets whitish tomentose beneath; calyx with 5 distinct teeth, \pm 5-ribbed 16. **V. Negundo** p. 189.
21. a. Leaves 3-foliolate 22.
 b. Leaves 5-foliolate 33.
22. a. Calyx truncate or obscurely toothed 23.
 b. Calyx distinctly 5-toothed 24.
23. a. Upper lip and lateral lobes of lower lip of corolla tawny-pubescent within; inflorescence leafed below, 3 flowers together; leaves sometimes 5-foliolate.
 17. **V. nitida** p. 194.
 b. Upper lip and lateral lobes of lower lip of corolla glabrous within 18. **V. littoralis** p. 194.
24. a. Base of leaflets rounded, 6— $12\frac{1}{2}$ by 1.8—4.3 cM., petiolules 1— $1\frac{1}{2}$ cM.; 12—24-nerved, coriaceous
 19. **V. siamica** p. 197.
 b. Base of leaflets acute 25.
25. a. Proportion of length and breadth of terminal leaflet = 1—2 26.
 b. Proportion of length and breadth of terminal leaflet = 3—5 29.
26. a. Inflorescence with 2 peduncles from each node. 27.

- b. Inflorescence with 4–6 peduncles from each node
20. *V. flabelliflora* p. 198.
27. a. Calyx and corolla pubescent 28
b. Calyx and corolla glabrous. 21. *V. secundiflora* p. 198.
28. a. Leaflets extraordinarily densely glandular beneath, 3 or 5, pairs of nerves 8–11; bracts minute.
22. *V. luteo glandulosa* p. 199.
b. Leaflets rather sparsely glandular beneath, 3, pairs of nerves 6–8; bracts lanceolate, obtuse, 0.8–3.2 cM. long, 0.1–0.35 cM. broad . . . 23. *V. glandulosa* p. 199.
29. a. Calyx-lobes 0.1 cM.; filaments stout, glandular and villous; leaflets coriaceous . . . 24. *V. coriacea* p. 200.
b. Calyx-lobes 0.05 cM. or less 30.
30. a. Leaflets sessile; calyx and corolla glabrous
21. *V. secundiflora* p. 198.
b. Petiolules of terminal leaflet $\frac{1}{2}$ – $2\frac{1}{2}$ cM.; calyx and corolla pubescent 31.
31. a. Terminal leaflet 7– $17\frac{1}{2}$ by 2.8–7 cM., petiolule $\frac{1}{2}$ –1.7 cM.; calyx truncate or obscurely denticulate
18. *V. littoralis* p. 194.
b. Terminal leaflet $15\frac{1}{2}$ –25 by 4.8–7 cM., petiolule 1–2.7 cM. 32.
32. a. Calyx 0.1–0.15 cM., corolla-tube 0.3–0.4 cM.; leaflets not acuminate 25. *V. lasiantha* p. 201.
b. Calyx 0.2 cM.; corolla-tube 0.5–0.6 cM.; leaflets long acuminate 26. *V. longifolia* p. 201.
33. a. Calyx truncate or very obscurely denticulate
17. *V. nitida* p. 194.
b. Calyx distinctly 5-toothed 34.
34. a. Corolla-tube 0.4–0.5 cM., the 4 smaller lobes reaching $\frac{1}{2}$ – $\frac{1}{4}$ of its length 35.
b. Corolla-tube 0.8 cM., the 4 smaller lobes reaching $\frac{1}{6}$ of this length; calyx denticulate 15. *V. heterophylla* p. 187.
35. a. Corolla villous within, as are filaments 36.
b. Corolla within, and filaments, glabrous, sometimes a little villous on the base of the midlobe of the lower corolla-lip
14. *V. sumatrana* p. 186.
36. a. Leaflets eglandular beneath 21. *V. secundiflora* p. 198.

Section I *Agnus-castus* (Endl.) Briq.Subsection 1, *Terminales* Briq.

1. *V. pteropoda* Miq., Fl. Ind. bat. II, Suppl. I, 567 (1862); *King and Gamble*, Journ. As. Soc. Bengal, LXXIV, 4, 851. — A tree, reaching 13—20 M. in height; branchlets stout, glabrous, many-ribbed; leaves very large, 5—7-foliolate; petioles broadly winged, the wings broadest near the base, coriaceous, each 5—7 cM. broad, glabrous on both sides, irregularly reticulated with some indistinct nerves; leaflets oblong or oblong-ovate (-lanceolate, *King and Gamble*), base obtuse or acute, apex acuminate; coriaceous; pairs of nerves 10—13; glabrous on both sides, eglandular, 27—43 $\frac{1}{2}$ by 12—19 cM.; petiolules 0—2 cM.; petioles 14—25 cM.; cymes in long, subspicate, terminal panicles, glabrous, or minutely and sparsely pubescent, few-flowered; bracts 0.4 cM., linear, somewhat pubescent; length of panicle 17—30 cM.; calyx cupuliform, coriaceous, slightly 2-lipped, 0.15—0.2 cM. long, 0.2—0.25 cM. wide, upper lip with 3 small, acute teeth, lower one subentire or \pm 2-toothed and 2-angular; glabrous within, glandular and sparsely pubescent (especially near base) without; pedicels 0.05—0.3 cM., somewhat pubescent; corolla blue, tube 0.6 cM., glabrous in the lower part, both within and without, densely and softly pubescent for the rest outside, villous inside; upper lip 2-lobed, lobes oblong, 0.3 by 0.2 cM., lower one 3-lobed, lateral lobes as those of upper lip, midlobe 0.6 by $\frac{1}{2}$ cM.; stamens exerted, 0.8 cM. long, inserted in the throat; filaments villous; anthers reniform; style 1 cM. long, apex shortly bifid; ovary depressed, glabrous, except at apex, which is densely villous and glandular; drupe 1.8—2 $\frac{1}{2}$ cM. long, 1.2 cM. in diam., glabrous, seated on the much enlarged calyx.

SUMATRA: in H. Bog, sub. no. 1070, Siboga — in H. A.

R.—T. sub no. 044161. — *Teysmann* in H. L.—B. sub nos. 899.123—553 and 554, Palembang.

Distribution: Malacca (Perak, *Scortechini* in *King* and *Gamble*).

Except for the form and especially the dimensions of the leaflets we could not find any important point of difference with *V. peralata*, but since there were no specimina to be had, we could not combine the two species. *King* and *Gamble* too, have expressed their doubt in this matter, but they saw of the present species only one imperfect flower.

Miquel, in his original description, which is very imperfect, does not mention the breadth of the leaflets; *King* and *Gamble* accept this dimension as the most important point of difference between the two species, saying that the leaflets of *V. pteropoda* never should be broader than $7\frac{1}{2}$ cM.¹), those of *V. peralata*, however, should have a breadth of $7\frac{1}{2}$ —15 cM. All the above-mentioned specimina reach a breadth of 12—19 cM. So perhaps they rather belong to *V. peralata*. We must leave this matter to a later examiner, who may have within his reach the authentic specimens of both species, but we find it rather probable, that they should be identical.

2. *V. peralata* *King*, *ms.* in *Herb. Calc.*, *Kew. Bull.*, 112 (1908). — A large tree, reaching 27 M. in height; branchlets striate, angular, dark brown; leaves 5-7-foliolate; leaflets elliptic or elliptic-ovate, acute at apex, long-attenuate at base; both surfaces glabrous; margins entire, recurved; terminal one 15—50 cM. long, $7\frac{1}{2}$ —15 cM. in diam., the rest smaller in proportion; pairs of nerves 10—14, prominently raised beneath, petioles $7\frac{1}{2}$ —15 cM. long, the wings broad below and almost cordate, the breadth reaching 4—5 cM. on either side, curving upwards rather abruptly or gradually to the top, and veined like the leaflets; petiolules often 0, or scarcely reaching 0.6 cM. long; panicles terminal or sometimes axillary to the upper-

It may be, that here *V. alata* *Heyne* is meant: leaflets 3, 15 by 6 cM.; petioles 7 cM., wings narrower at base.

most leaves, sessile or peduncled, puberulous, reaching 60 cM. in length and about 30 cM. in diam.; rhachises angular, channelled; peduncles up to 20 cM. long; secondary peduncles of branches in whorls of 4 around the main rhachis; cymules many-flowered, 1.2 cM. long; bracts linear-lanceolate, 0.25—0.5 cM., persistent; pedicels 0 or very short; flowers blue with brown markings: *calyx* pink, shortly urceolate, tawny-pubescent, 0.25—0.4 cM.; teeth short, acute; *corolla*-tube campanulate, 0.62 cM. long, pubescent without, villous within around the point of insertion of the stamens and up to the midlobe of the lower lip; upper lip of 2 ovate, acute lobes, 0.25 cM. long, lower lip of 3 lobes, side lobes rounded, 0.4 cM., as the upper lip reflexed; midlobe 0.5 cM., obtuse, all lobes puberulous without; *stamens* exsert; filaments flattened at base, villous hairy; *style* slightly longer than the stamens; stigma shortly 2-fid; *ovary* rounded, depressed, glabrous below, villous at top; *drupe* ovoid-conoidal, smooth, longitudinally ribbed; 4 cM. long, $2\frac{1}{2}$ —3 cM. in diam.

PHILIPPINES: ? Cuming no. 1698.

Distribution: Malay Peninsula, ? Philippines.

3. *V. cofassus* Reinw. ex Bl., Bijdr. 8, 3 (1826); *Pulle* in *Lorentz*, Nova-Guinea VIII, 4, 685; *Hall. f.*, Med. 's Rijks Herb. Leid. no. 37, 47; *Miq.* Fl. Ind. bat. II, 863. — A large tree, reaching 12—30 M. in height; branchlets quadrangular, with inflorescences and petioles minutely and scarcely pubescent, ultimately subglabrous or glabrous; *leaves* 1-foliolate; leaflets oblong-lanceolate, base acute or subobtuse, apex long acuminate; margins entire; pairs of white nerves 8—18; chartaceous-subcoriaceous, in sicco usually greyish or greyish brown, (sub)sessile, with a distinct articulation with the petiole; 8—22 by $3\frac{1}{2}$ —9 cM.; petiolules 0—0.3 cM.; petioles 2—6 cM., in sicco black; upper side glabrous or with some hairs on the midrib or sparsely pubescent, densier on the nerves, lower one

glabrous or pubescent and glandular; *cymes* opposite, forming a terminal panicle, reaching 15 cM. in length; *calyx* truncate or with 2—5 very small teeth, cup-shaped, 0.2—0.25 cM. long, 0.25—0.3 cM. in diam., with 2 small, linear bracteoles at the base, sparsely pubescent and glandular without, glabrous or with some hairs within; *corolla* pale-blue within, reddish without or whitish, 2-lipped, 5-lobed; tube pubescent and glandular without, except in the lower part, glabrous within, except for the villous throat; 0.3—0.4 cM. long; smaller 4 lobes ovate, 0.1—0.15 cM. long, papillose within, pubescent and glandular without, the larger 5th 0.2—0.25 cM. long, villous inside; *stamens* little exerted, filaments stout, inserted in the throat, anthers reniform, dark-violet, with divergent fissures; style as long as the corolla 0.6 cM., apex shortly bifid; *ovary* depressed; glabrous, sparsely glandular; *fruit* seated on or half-enclosed in the slightly enlarged calyx, glabrous, 0.6 cM. long, 0.5 cM. in diam., dark-violet.

Var. α typica H. J. Lam nov. var. — *V. monophylla* K. Schum. in K. Schum. u. Hollr., Fl. Kais.-Wilh.-land, 121 (1889); K. Schum. u. Lauterb., Fl. D. Südsee, 524 — *V. punctata* Schau. DC. Prodr. XI, 687; Miq. Fl. Ind. bat. II, 863; Merrill, Phil. Journ. Sci. Bot. XI, 310 — *foliola* utrinque glaberrima vel in costa supra nonnullis pilis vestita.

MOLUCCA-ISL.: in H. L.—B. sub no. 908.353—297, Ternate; native name: govasa gabba gabba — de Vriese and Teysmann in H. L.—B. sub no. 908.267—273, Ceram — in H. A. R.—T. sub no. 011523, Halmaheira — Reinwardt no. 1465, Saparua.

CELEBES: Elbert no. 2732, Buton-isl., Lipumangan, 250—320 M. in alt., fr. on 22-VIII-1909 — Heyne no. 2821, Boni. —

NEW-GUINEA: *Weinland* no. 155, Kais.-Wilh.-land, Finschhafen; native name: matatakum, flow. in March.

1890. — *Gjellerup* nos. 406^{a-c}, Dutch N.-G., Hollandia, 10 M. in alt., flow. on 18-XII-1910; id. no. 35a (coll. Boschwezen), Dutch N.-G., Eti-river and upperstream of Tamoi-river, 85 M. in alt. — *Wiesenthal* no. 44, Kais.-Wilh.-land, Alexishafen, Admusin-isl., with flow. and fr. on 8-I-1913. — *Schlechter* no. 16042, Kais.-W.-land, near Bulu, flow. in April 1908; id. no. 14566, Kais.-W.-land, Torricelli-mts., 100 M. in alt., with buds in April 1902; id. no. 13832, Kais.-W.-land, Schumann-river, buds in Jan. 1902. — *Nyman* no. 83, Kais.-W.-land, Stephansort, flow. in Dec. 1898; id. no. 817, Kais.-Wilh.-land, Simbang, flow. in Dec. 1899. — *Ramu-exp.* no. 136, Kais.-W.-land, Ramu-river, fr. on 26-VII-1898. — *Ledermann* no. 7261, Kais.-W.-land, „Pionnier” camp, Sepik-river, fr. on 14-V-1912; id. no. 10723a, Kais.-Wilh.-land, Mt. Schrader, 2070 M. in alt., flow. on 28-V-1913.

NEW-IRELAND (NEU-MECKLENBURG): *Peekel* no. 310, Namatanai; native name: narása, flow. on 28-I-1910.

PALAU-ISL.: *Kraemer* in H. Ber. without nr.; native name: beokl or bars; flow. in May 1910. — *Raymundus* no. 98, Korrör. — *K. Gibbon* no. 1213 (= 1112), Korrör, 10 M. in alt., with white flowers on 3-I-1913.

MARIANNE- and CAROLINE-ISL.: *Kersting* no. 1213.

Var. β puberula H. J. Lam nov. var. — *foliola* utrinque, præsertim subtus, puberula.

NEW-GUINEA: *Ledermann* no. 10421, Kais.-W.-land, Malu-camp, Sepik-river, 30—40 M. in alt., flow. on 3-I-1913; id. no. 7147, same locality, flow. and fr. on 26-IV-1912; id. no. 6695, same locality, 60—80 M. in alt., flow. and fr. on 20-III-1912; id. no. 6911, „Schluchten”-camp, „Peilung” mt., 100—250 M. in alt., flow. on 5-IV-1912.

Distribution of the species: eastern parts of Malay Archipelago! and western parts of Polynesia!

We do not agree in *Hallier's* opinion, that the 3-foliate

V. littoralis Decne. should be a variety of the present species. Moreover its leaflets have far smaller dimensions.

4. *V. smilacifolia* H. H. W. Pearson, Kew. Bull. 59 (1907) — A shrub? branchlets, inflorescences and petioles glabrous, nodes increased, bark yellow or greyish-white; leaves 1-foliolate; leaflets sessile, elliptical-oblong, base rotundate, apex acute, acuminate or caudate-acuminate, coriaceous, entire, glabrous on both sides, with 3-4 nerves on either side of the midrib; 12—20 by 4—8 cM.; petioles stout, increased at both sides, 1—2 cM. long; cymes few flowered, opposite, in large, terminal panicles; panicles lax, more or less leafed below, reaching 25—30 cM in length, 20—23 cM. in diam., bracts small; pedicels very short; calyx campanulate, with 5 very small teeth, 0.15—0.2 cM. long, 0.2 cM. in diam., glandular on both sides; teeth ciliolated; fruiting calyx enlarged up to 0.6 cM; corolla-tube 0.4—0.6 cM., with peltate glands without, except in the lower part, glabrous within except for the villous throat; lobes glandular on both sides, the larger one 0.25—0.3 cM. broad; stamens hardly exerted, inserted below the middle of the corolla-tube; filaments villous at base; style 0.6 cM., bifid at apex; ovary globose, densely glandular-dotted; drupe (ripe?) black, glandular, 0.4 cM. long, 0.3 cM. in diam.

BORNEO: ?! Hallier f. no. B. 219, W.-Borneo, on Kapuas-river, upstream Suka Lanting; flowers bright-blue.

Distribution: Sarawak (N.-W.-Borneo).

5. *V. sarawakana* H. H. W. Pearson, Kew Bull., 60 (1907). — A shrub?; branchlets quadrangular, with petioles glabrous; nodes increased; bark cinereous, dissolved into thin lamels; leaves 1-foliolate; leaflets sessile, oblong or oblong-lanceolate, base rotundate or subcuneate, apex sub-acute or acuminate, thin-coriaceous, entire, bullate above, glabrous on both sides, with 6—10 nerves on either side of the midrib, 10—15 by 2—6 cM.; petioles increased

at apex and at base, sulcate above, 1—2 cM. long; *panicles* lax, glabrous or somewhat pubescent, terminal or the upper ones axillary, nodes with rather large intervals; pedicels short; cymes 3-flowered, with bracts, peduncled; *calyx* campanulate, shortly 5-toothed, 0.2—0.25 cM., minutely and appressedly pubescent without; teeth 0.05 cM.; *corolla-tube* $\frac{1}{2}$ cM., appressedly pubescent outside except in the lower part, villous inside; midlobe of lower lip flabelliform, 0.2 cM. broad, 0.25 cM. long, pubescent without, villous at base within, the 4 other lobes smaller, obtuse, pubescent; *stamens* hardly exerted, inserted below the middle of the corolla-tube, filaments villous; *style* 0.7—0.8 cM. with bifid apex; *ovary* globose, densely and minutely pubescent; *drupe* obconical-obovoid, seated on the somewhat enlarged calyx, 1 cM. long, 0.7 cM. in diam., minutely pubescent.

Distribution: W.-Borneo (Sarawak).

The species is clearly very nearly allied to *V. smilacifolia*, but differs considerably in the leaves, the ovary and the drupe.

6. *V. holophylla* Baker, Kew Bull., 25 (1896); King and Gamble, Journ. As. Soc. Bengal, LXXIV, 4, 844. — A small tree; branches with yellowish-white bark; branchlets also yellowish, shining, obtusely quadrangular; innovations tawny-tomentose; *leaves* opposite, 1-foliolate, coriaceous, ovate-lanceolate or ovate-oblong, acuminate at apex, rounded at base; both surfaces glabrous, upper olive-green, lower ferruginous; margins entire; 10—30 by 4—11 $\frac{1}{2}$ cM.; midrib stout, prominent, keeled above; main nerves 7—9 pairs at an angle of 70° with the midrib, curving upwards to meet in an intramarginal looped nerve, all slightly impressed above, raised beneath; secondary nerves many, irregular; reticulations prominent, netted; petioles 1.8—4 cM. long, puberulous when young, prominently jointed at both ends; *cymes* in terminal panicles of rather long glomerulate spikes reaching 15—17 $\frac{1}{2}$ cM.

long and $7\frac{1}{2}$ —10 cM. broad; densely tawny-tomentose when young, afterwards glabrate; bracts lanceolate, or elliptic-lanceolate, caducous, 0.25 — $\frac{1}{2}$ cM.; bracteoles 2, much smaller, flowers in each glomerule about 3 on each side, sessile; *calyx* campanulate, tawny-pubescent and glandular, 0.25 cM., with 5 equal, deltoid lobes; much accrescent in fruit, cup-shaped, truncate, 1.2 cM. in diam.; *corolla*-tube funnel-shaped, pubescent and glandular without, sparsely villous within; 2-lipped, upper lip shortly 2-lobed, the lobes rounded, reflexed, lower lip 3-lobed, midlobe long, very villous within; *stamens* exsert; filaments slightly villous; *ovary* rounded, villous at top; *drupe* globose or obovoid, 1.8 cM. in diam. depressed at apex.

Distribution: Sohore (Malacca), Borneo.

7. *V. subspicata* Hall. f., Med. 's Rijks Herb. Leid. no. 37, 52. — A small tree, 6—7 M. high; branchlets stout, cylindrical or obscurely quadrangular, pale-ochraceous; *leaves* 1-foliolate; leaflets sessile, distinctly articulated with the stout and glabrous, 1—3 cM. long petioles; ovate-lanceolate, base subacute, rounded or narrowly subcordate, apex caudate-acuminate; margins entire, recurved; chartaceous; pairs of nerves 7—10, at an angle of 70° — 80° with the midrib, meeting in a intramarginal nerve; glabrous on both sides; 8—25 by 3—10 cM.; *panicles* terminal, rarely axillary to the upper leaves, decussately ramose, subspicate, reaching 20—25 cM. in length; cymules sessile, opposite, few-flowered; bracts and bracteoles small, linear; pedicels short; *calyx* cyathimorphous, with 5 deltoid teeth, much accrescent in fruit, glabrous; 0.15 cM. when young, in fruit 0.7 cM. long, 1.7 cM. in diam.; *corolla* ochraceously pubescent without except in the lower part of the tube; lobes puberulous on both sides, the midlobe of the lower lip villous within; tube 0.4—0.45 cM., the larger lobe 0.2 cM. long; *stamens* exsert (2 cM.), filaments villous; *style* longer exsert than the stamens, bifid at apex; *drupe*

globose, for $\frac{2}{3}$ included in the enlarged, cup-shaped calyx, 1.3—1.7 cM. long and in diam.

Distribution: Sumatra, Borneo. (W.- and S.-E.-)

The species is closely allied to *V. Hollrungii*, but according to *Hallier*, it can be distinguished by the more increased articulation of its leaflets, the subbullate laminæ and the subspicate branchlets of the panicles.

8. *V. Clarkeana* King et Gamble, Journ. As. Soc. Bengal, LXXIV, 4, 845 (1909). — *V. simplicifolia* Clarke in Hook f., Fl. Br. Ind. IV, 586 (1885). — A small, shrubby tree, reaching about 5 M. in height; branchlets pale brown, round, glabrous or puberulous; leaves 1-foliolate; leaflets sessile, coriaceous, lanceolate or oblong-lanceolate, acuminate at apex, rounded at base, both surfaces glabrous, greyish when dry, the lower punctulate; margins entire, recurved; 15—30 by 5—7 $\frac{1}{2}$ cM.; midrib stout, very prominently raised beneath; pairs of nerves 12—20, slightly curving to near the margin, where they bend sharply parallel to it, all but the few lowest joining in an intramarginal looped nerve; petioles 1.2—1.8 cM., jointed at the base of the leaflet; panicles terminal, puberulous, 30—45 cM. long; peduncles 5—10 cM.; main branches usually 3, bearing distant, opposite, corymbose cymes of rather large flowers; cymes 2 $\frac{1}{2}$, rarely 5 cM. long; bracts small, caducous; bracteoles minute; pedicels 0.25— $\frac{1}{2}$ cM., much thickened in fruit; calyx campanulate, tawny-pubescent, 0.3—0.4 cM., much enlarged in fruit; lobes 5, irregular, short, acute; corolla-tube 0.6 cM., pubescent without and at the insertion of the stamens within, 2-lipped; pale blue, the midlobe of the lower lip darker, twice as long as the 4 recurved other lobes, crenate, villous within; stamens exsert; filaments villous at base, thickened; style as long as the stamens; stigma shortly 2-lobed; ovary globose, depressed, tawny-pubescent; drupe ovoid, tawny-pubescent, 0.8 cM. in diam. or more.

Distribution: Malacca, Borneo.

9. **V. Hollrungii** Warb., Engl. Jhrb. XVIII, 208, (1894); *Pulle* in *Lorentz*, Nova-Guinea, VIII, 2, 401 and VIII, 4, 685; *K. Schum.* u. *Lauterb.*, Fl. D. Südsee, 523; *Hall. f.*, Med. 's Rijks Herb. Leid. no. 37, 51. — A small tree, 3½ M. high (*Gjellerup*); branchlets round, with inflorescences densely and appressedly tawny-pubescent, glabrescent; leaves 1-foliolate; leaflets coriaceous, sessile, hardly articulated with the stout, glabrous, with transversal lamels supplied petioles; oblong, oblong-elliptic or oblong-lanceolate, base acute or cuneate, apex acuminate; margins entire; in sicco upper surface greyish, lower light-brown; both of them glabrous, the lower glandular; pairs of nerves 10—18; 11—30 by 4—13 cM., sometimes narrow (20 by 5 cM.) or broader (20 by 10 cM.); petioles 0.3 cM. in diam., 1.4—2½ cM. long; panicles terminal or axillary to the upper leaves, 12—28 cM. long; calyx campanulate, densely and appressedly tawny-pubescent without, glandular; ± 2-lipped; 5-toothed, 4(—5)-ribbed; teeth deltoid; 0.3(—0.4) cM., enlarged in fruit; corolla pubescent outside except in the lower part of the tube; the 4 smaller lobes subglabrous within, 0.1—0.15 cM. long, the larger lobe densely villous within, especially near the base, where there is a (honey-?) furrow, 0.5—0.8 cM. long, 0.2—0.4 cM. broad; tube 0.6 cM. long, densely villous in throat and near insertion of stamens; stamens exsert; filaments villous near their base; style 0.9 cM., bifid at apex; ovary densely pubescent and glandular, densier at apex; drupe globose, minutely pubescent at first, included in, ultimately seated on the accrescent calyx, 1.2—2 cM. long, 1.1—1.8 cM. in diam.; enlarged calyx 0.6—0.8 cM. long.

BURU: *Teysmann*, no. 1831 H. Bog., Oki.

NEW-GUINEA: *Gjellerup*, nos. 312a—d, Dutch N.-G., Hollandia, flow. and fr. on 21-VIII-1910; 10 M. in alt.; corolla yellowish, with blue lip; stamens yellow, anthers dark-brown, pollen yellowish white; stigma yellowish white;

fruit (not entirely ripe) bluish green; leaves bright green. — *Riggenbach*, no. 22, Kais.-Wilh.-land, Teba, on Mamberamo-river, near the shore; native name: bundo; flow. on 20-V-1910. — *Moszkowski* nos. 22 and 142, same locality (epiphytic!); flowers yellow, lip blue, with buds and flow. on 19-V-1910.

Distribution: Borneo (*Hall. f. l.c.*), Buru!, New-Guinea!

10. **V. *Agnus-castus* L.**, sp. pl. 890 (1753); *Schauer DC.*, Prodr. XI, 684; *Backer*, Ann. Jard. bot. Btz. suppl. 3, dl. I, 393; *Koord*, Exk. fl. v. Java, III, 136. — A shrub; tomentum appressed, whitish; leaves (3—)5(—7—9)-foliolate; leaflets lanceolate, acuminate at both ends, subsessile or shortly petioluled, entire or sometimes serrate, the lateral ones usually sessile; 4—5½ by 0.7—1 cM.; petioles 2—2½ cM.; panicles interrupted, terminal or axillary to the upper leaves; cymes globose, crowded, the lower ones in the axils of leafy bracts, 1—1½ cM. long and in diam.; peduncles 0.3—0.4 cM., long and in diam.; peduncles 0.3—0.4 cM., opposite or in whorls along the rhachis; calyx campanulate, acutely dentate, pubescent without; 0.15—0.2 cM.; bracteole 1, lanceolate, as long as the calyx; corolla-tube glabrous; 0.45—0.5 cM., pink, villous in throat; limb spreading, oblique, glabrous; lobes ovate, acute, the four smaller 0.15 cM., the larger one 0.2 cM. long; stamens and style exsert; stigma shortly bifid.

Distribution: a native of the countries around the Mediterranean sea; imported into W.-India and into Java (Batavia; *Backer, Koorders*).

11. **V. *trifolia* L.** sp. pl. II, 638 (1753); *Blume*, Bijdr. 812; *R. Brown*, Prodr. 511; *Benth.* et *v. Muell.*, Fl. Austral., V, 66; *Blanco*, Fl. d. Fil. ed. I, 513; *Schauer, DC.*, Prodr. XI, 683; *Hall. f.*, Med. 's Rijks Herb. Leid. no. 37, 40 — *Cham.*, Linnæa, VII, 107; *Decne.*, Nouv. Ann. Mus. Par. III, 400; *Elbert*, Med. 's Rijks Herb. Leid. no. 12, 16;

Forbes et Hemsley, Fl. sin. II, 258; *Forbes*, Wand. Nat. f. Mal. II, 226; *Hook. f.*, Fl. Br. Ind. IV, 583; *Koord. en Val.*, Bijdr. Booms. Java no. 7, 200, and Atl. d. Baumart., t. 292; *King and Gamble*, Journ. As. Soc. Bengal, LXXIV, 4, 842; *Koord.*, Exk. fl. v. Java, III, 136; *Bot. Mag.* t. 2187; *Hook.*, Comp. bot. mag. I, 349; *Kuntze*, Rev. gen., 510; *Miq.*, Fl. Ind. bat., II, 859 and suppl. I, 242; *Merrill*, Bur. Gov. Lab. no. 27, 68; *Miq.*, Ann. Mus. bot. L.—B., II, 99; *Maximowicz*, Bull. Ac. Imp. St. Pét. XXXI, 82; *v. Muell.* Descr. not. pap. pl. I, 11; *Merrill*, Phil. Journ. Sci. Bot. III, 432; *Roxb.*, Fl. ind. III, 69; *Schum. u. Lauterb.*, Fl. D. Südsee, 524; *Schum. u. Hollr.*, Fl. Kais.-W.-land, 121; *Spanoghe*, Linnæa XV, 330; *Schimper*, Bot. Mitt. a. d. Trop. III, 129; *Val.*, Pl. pap., 51; *Warb.*, Engl. Jhrb. XIII, 428; *Merrill*, Phil. Journ. Sci., Bot., VIII, 136; *Hassk.* 2e Cat. 's Lands Pl. tuin, 134; *Hemsley*, Chall. Report, 110 and 177 — *V. incisa* *Wall.*, Cat. no. 1746 (1827), pro parte; *Roxb.*, Fl. ind. III, 72 — *V. indica* *Mill.* Gard. Dict. ed. VIII (1768) — *V. integerrima* *Mill.* l. c. — *V. triphylla* *Royle*, Ill. Bot. Him., 299 (1839) — *V. variifolia* *Salisb.*, Prod. 107 (1790) — *V. repens* *Blco.*, Fl. Fil. ed. I, 513 (1837) (= var. β ?) — *V. rotundifolia* *L. f.* Suppl., 294 — A shrub or small tree; branchlets obscurely quadrangular, minutely grey-tomentose; leaves 1-2-3-foliolate, petioled; leaflets ovate or obovate-spathulate, sessile, base attenuately decurrent, apex acute-rounded; upper side glabrous (especially in the var. α), usually pubescent on the midrib, sometimes (in the var. β) minutely pubescent, lower side always with an appressed, greyish tomentum; pairs of very slight nerves in the lateral leaflets 6—7, in the terminal ones 6—13, in the var. β 4—6; leaflets $1\frac{1}{2}$ —9.2 by 0.7—3.7 cM.; petioles 0.15—3 cM., greyish pubescent; cymes opposite, 2—4 cM. long, in usually small, terminal, below leafed panicles, with a grey appres-

sed tomentum; panicles 4—13 cM. long, 2—5 cM. in diam.; bracts small, linear; *calyx* obscurely 2-lipped, with 5 small teeth, greyish tomentose and white-glandular without, glabrous within, 0.3—0.4 cM. long, 0.25—0.3 cM. wide, cup-shaped; pedicels none or very short; *corolla* blue or pink, tube 0.85 cM., nearly cylindrical, glabrous without in the lower, appressedly pubescent in the upper part, glabrous within except for the villous throat; lobes 5, pubescent without, glabrous within, the larger midlobe of the lower lip excepted, which has a somewhat villous base, and reaches 0.6 cM. in length and 0.35—0.4 cM. in breadth; *stamens* didynamous, inserted in the corolla-tube at about a half of its length, villous near the base; *style* 1 cM., shortly bifid at apex; *ovary* globose, depressed, glandular-dotted in the upper, glabrous in the lower part; *drupe* glandular, 0.6 cM. long and in diam., ruddy.

Var. α trifoliolata Schau. l.c. — *var. α trifoliolata* Cham., Linnæa VII, 107 (1832)¹⁾ — *Leaves* trifoliolate, sometimes reduced to 2 or even 1 leaflet; lateral leaflets 1.7—6¹/₂ cM. by 0.7—2.6 cM., 6—7-nerved, terminal ones 2.6—9.2 by 1—3.7 cM., 10—13-nerved; always glabrous above; midrib often pubescent; ovate, base attenuate, apex acute or subobtuse.

JAVA: *Buijsman* no. 252, Tengger near Nongki Djadjar, 1200 M. in alt., flow. on 1-IX-1907.

SALEYER-ISL.: *Docters van Leeuwen—Reijnvaan* no. 1710, 400 M. in alt. flow. on 21-V-1913.

NEW-GUINEA: *Neuhauss* no. 2. Sialum near King Wilhelm-Cape, flow. and fr. in Dec. 1909.

Var. β unifoliolata Schau., l.c. — *var. β simplicifolia* Cham. l.c.¹⁾ — *V. ovata* Thunb., Fl. Jap., 257; *Merr. Bur. Gov. Lab. no. 27, 68; id. Phil. Journ. Sci. Bot. III, 432;*

¹⁾ Properly speaking *Chamisso's* varieties have the priority, but we retain those of *Schauer*, the names being the most exact.

id. Bur. Gov. Lab. no. 6, 17. — Leaves 1-foliolate, rarely sub-2-foliolate, the leaflet being deeply 2-lobed; leaflets sessile, obovate, base attenuate, apex rounded; upper surface often pubescent, $1\frac{1}{2}$ — $4\frac{1}{2}$ by 0.9— $3\frac{1}{2}$ cM.; petioles 0.15—0.2 cM.; pairs of nerves 4—6.

JAVA: *Horsfield* in H. A. R.—T. sub no. 049902.

SALEYER-ISL.: *Docters van Leeuwen—Reijnvaan* no. 1863, partly an erect shrub, partly a characteristic, creeping shore-plant; fruits on 26-V-1913.

PHILIPPINES: *Elmer* no. 12135, Magallanes, Mt. Giting-giting, Capiz, Sibuyan, flow. in April 1910.

BONIN-ISL.: *Ari Kotara* in H. Ber. without nr., Chichigunu, Okasawara.

Distribution of the species: Mauritius, Réunion, Brit.-India, Ceylon (*Hallier*), Malacca! Siam, Hainan, S.-China, Korea, Andamans (*Hallier*), Malay archip.! Philippines!, Formosa, Liuchiu-isl., Japan, Polynesia. (*Hall.*).

12. **V. pubescens** *Vahl*, *Symb. bot.* III, 85 (1794); *Blume*, *Bijdr.* 812; *Schauer DC.*, *Prodr.* XI, 685; *Decne.* *Nouv. Ann. Mus. Nat. Par.* III, 401; *Elbert*, *Meded.*'s Rijks Herb. Leid. no. 12, 16; *Forbes*, *Wand. Nat. f. Mal. Arch.*, II, 226; *Hook. f.* *Fl. Br. Ind.* IV, 585; *Hall. f.* *Med.*'s Rijks Herb. Leid. no. 37, 44; *Koord. en Val.*, *Bijdr. Booms. Java*, no. 7, 202 and *Atl. d. Baumart.* t. 294 and 295; *King and Gamble*, *Journ. As. Soc. Beng.* LXXIV, 4, 848; *Koord.*, *Exk. fl. v. Java*, III, 136 and *Pl. Jungh. ined.* IV, 188; *Miq.*, *Fl. Ind. bat.* II, 861 and *suppl.* 242; *Merrill*, *Bur. Gov. Lab. Bull.*, no. 27, 68; *Spanoghe*, *Linnæa* XV, 330; *Schimper*, *Bot. Mitt. a. d. Trop.* III, 129; *Zoll. u. Mor.*, *Syst. Verz.* 53; *Hassk.* *2e Cat.*'s Lands Pl. tuin Btz., 134; *Hemsley*, *Chall. Rep. Bot.* I, 110 and 178. — *V. arborea* *Roxb.* *Fl. ind.* III, 73 (1832); *Jack*, *Descr. Mal. Pl.*, *Calc. Journ. Nat. Hist.* IV, no. XIII, 40. — *V. articulata* *Steud.* *Nom.*, ed. II, II, 777 (1841). — *V. bracteata* *Miq.* *l.c.* II, 862 (1856). —

V. digitata Wight ex Steud. l.c. — *V. heterophylla* Bl. (not of Roxb.) ex Miq. l.c. II, 862. — *V. inaequifolia* Turcz., Bull. Soc. Nat. Mosc. XXXVI, II, 223 (1863). — *V. latifolia* Blco., Fl. Fil. ed. I, 514 (1837). — *V. latifolia* Lam. Encycl. II, 613 (1786)¹; *Hall. f.*, Med. 's Rijks Herb. Leid. no. 37, 44. — *V. Negundo* Noronha (not of L.), Verh. Bat. Gen. V, ed. I. art. IV, 86 (1790). — A large tree, 20 M. high or more; branchlets acutely quadrangular, densely tawny-pubescent, as are petioles and panicles; leaves 3-5-foliolate; leaflets chartaceo-coriaceous, rarely membranous, ovate, base broadly cuneate, somewhat attenuate, apex obtuse, acutely or subobtusely acuminate; pairs of nerves in the terminal leaflets 11—13; upper surface sparsely pubescent or subglabrous, pubescent on the nerves; lower one pubescent, densier on the nerves; lowest leaflets, if present, 1½—5.2 by 0.7—2.3 cM., sessile; lateral ones 5½—15½ by 2½—7 cM., petiolules 0—0.2 cM.; terminal ones 8—22½ by 3½—9.2 cM.; petiolules 0—0.3 cM.; petioles 4—8 cM.; panicles large, the lower axillary to the upper leaves, the upper terminal, with leafy bracts to its rhachises; 8—25 cM. long, 6—18 cM. in diam.; bracts many, ovate, 0.7—1.2 by 0.2—0.7 cM.; calyx-tube campanulate, 0.4 cM., 0.7 cM. in diam.; teeth deltoid, 0.2 cM. long; densely pubescent without and on the teeth inside; corolla-tube glabrous on both sides in the lower part, pubescent without in the upper, glandular; throat glabrous except near the somewhat villous base of the midlobe of the lower lip and near the insertion of the stamens; lobes pubescent without, except near the margin of the lip, glabrous within; tube 1 cM.; smaller lobes 0.5 cM. long, 0.35 cM. broad; lip

¹) Really *Hallier* is right in giving the priority to this name. Yet we maintain the first given one, since all other authors use it. If we changed it, we should cause confusion.

1 by 0.5 cM.; *stamens* exsert, 1.1—1.3 cM. long, inserted about the middle of the corolla-tube, insertion densely villous; *style* as long exserted as the stamens, 1.5—1.8 cM., stigma bifid; *ovary* glabrous; *drupe* seated on the not enlarged calyx, 0.7 cM. long and in diam., glabrous.

JAVA: *Horsfield* in H. A. R.—T. sub no. 049899.

BORNEO: *Rutten* no. 406, Blukan, Sg. Berbar, near Bontang, E.-Borneo; corolla bluish white; drupe black; bark greyish; id. no. 38, Balikpapan-bay, P. Belang, E.-Borneo, a shrub (!) in the mangrove-formation (!); 4 corolla-lobes white, lip light-blue; bark grey; flow. on 6-IV-1910; id. no. 742, Bungalun-river, E.-Borneo, flow. on 23-XI-1912. — *v. Heutsz* no. 832, flowers green, on Febr. 22nd; native name: Alapan.

PHILIPPINES, PALAWAN: *Elmer* no. 12660, Brooks Point, Addison peak, flow. in Febr. 1911; id. no. 13004, Puerto Princesa (Mt. Pulgar). flow. in Febr. 1911. — *Foxworthy* no. 762, flow in March—Apr. 1906.

Distribution: India, Burma, Malay Archipelago!, Malacca, Palawan!, Indo-China.

13. *V. velutina* (*Koord. et Val.*) *Koord. Atl. d. Baumart.* II, 6, t. 297 (1914); *Koord. Exk. fl. v. Java* III, 137. — *V. heterophylla Roxb.*, var. *velutina* *Koord. et Val.*, *Bijdr. Booms. Java*, no. 7, 207 (1910). — A tree; branchlets quadrangular, with petioles and inflorescences velutinous; *leaves* 5-foliolate; leaflets elliptical-oblong, acute at base, shortly acuminate at apex, the lateral ones being twice as short as the terminal ones; membranous; scabrid-punctate above, velutinous beneath; terminal leaflets 10—22 by $4\frac{1}{2}$ —10 cM., petiolules 1—2 cM.; *panicles* leafed below; bracts linear; *calyx* 0.3 cM., sparsely pubescent outside; *corolla* 1 cM. long, sparsely pubescent without, entirely glabrous within; tube s-shaped; limb 2-lipped, 5-lobed.

Distribution: Java.

19. *V. sumatrana* Miq., Fl. Ind. bat., suppl. I, 567 (1860). — A tree; branchlets quadrangular, somewhat pubescent, glabrescent; leaves 3-5-foliolate: leaflets chartaceous, obovate, acute or cuneate at base, abruptly acuminate or subentire at apex; margins entire; pairs of nerves 6—10; upper surface glabrous or nearly so, with small white scales (glands, *Clarke*), pubescent on the nerves, lower glabrous or sparsely pubescent, glandular; lowest leaflets, if present, 7 by 3 cM., petiolules 0.5 cM.; lateral ones $4\frac{1}{2}$ —12 by $2\frac{1}{2}$ — $6\frac{1}{2}$ cM., petiolules 0.8—1—1.8 cM.; terminal ones $6\frac{1}{2}$ —14 by 4—7 cM., petiolules (0.5)— $1\frac{1}{2}$ —3 cM.; petioles glabrous, 5—8 cM.; panicles terminal, or the lower ones axillary to the upper leaves, minutely and sparsely ferruginous-pubescent, narrow, 8—12 cM. long, $1\frac{1}{2}$ — $2\frac{1}{2}$ cM. wide: calyx campanulate or urceolate, pubescent and glandular without, glabrous within; teeth 5, deltoid, small, more or less ribbed, often with a pimple below each tooth; calyx 0.3—0.4 cM. long, 0.2—0.25 cM. wide; corolla pubescent and glandular without, except in the lower part, entirely glabrous within or with some hairs at the base of the lip only; tube 0.4—0.7 cM.; lobes small, 0.1 cM., the lip 0.2 cM. long. all of them glabrous within; stamens little exerted, didynamous, inserted in the upper half of the corolla-tube; filaments stout, glabrous, red; anther-cells divaricate; style as long exert as the stamens, with shortly bifid apex; ovary pyriform, glabrous or somewhat glandular at tip; fruit globose, depressed, somewhat beaked at apex, glabrous, 1—1.2 cM. long, 0.9—1 cM. in diam. or more, seated on the enlarged (up to 1.3 cM. in diam.) calyx.

Var. α typica H. J. Lam, nov. var. — folia 3—5-foliolata; foliolorum acumina 0.9—1.2 cM. longa, sparse pubescentia subtus; calyx campanulatus, 0.3 cM. longus, 0.25 cM. diametro, dentibus basi bullatis; corollæ alabastrum recurvum, tubus 0.4 cM. longus; totæ 0.7 cM. longæ.

SUMATRA: *Teysmann* in H. L.—B. sub no. 908.267—471, Lampongs. — H. Bog. no. 4454, Natar, Lampongs, fr. on Dec. 29th; and no. 4333 (= 4302), same locality.

Var. β *urceolata* *King et Gamble*, Journ. As. Soc. Beng., LXXIV, 4, 849. — *V. heterophylla* *Schau.* (not of *Roxb.*) (partly), *DC.*, Prodr. XI, 686 (1847). — *V. Loureirii* *Wight ex C. B. Clarke* in *Hook. f.*, Fl. Br. Ind. IV, 585 (1885). — *V. urceolata* *C. B. Clarke* l.c.; *Forbes et Hemsley*, Fl. sin. II, 259. — leaves 3-foliolate; acumen of leaflets 0—0.3 cM., lower surface glabrous; calyx urceolate, 0.4 cM. long, 0.2—0.25 cM. wide, teeth ribbed; corolla 0.8—0.9 cM. long, tube 0.7 cM., not or little curved in bud.

MALAYAN PENINSULA: \dagger *Griffith* no. 6064. — *Maingay* no. 1205.

Distribution of the species: Malayan Peninsula!, Sumatra!
 15. *V. heterophylla* *Roxb.*, Fl. Ind. III, 75 (1832); *Schauer*, *DC.*, Prodr. XI, 686; *Forbes et Hemsley*, Fl. sin. II, 257; *Hook. f.*, Fl. Br. Ind. IV, 585; *Koord. en Val.*, Bijdr. Booms. Java, no. 7, 204 and Atl. d. Baumart. II, 6, t. 296; *Hall. f.*, Med. 's Rijks Herb. Leid. no. 37, 45; *King and Gamble*, Journ. As. Soc. Beng. LXXIV, 4, 848; *Koord.*, Exk. fl. v. Java, III, 137; *Miq.*, Fl. Ind. bat. II, 862 and suppl. I, 242 and 567; *Zoll. u. Mor.*, Syst. Verz., 53; *Hall. f.*, Med. 's Rijks Herb. Leid. no. 37, 45; *Williams*, Bull. Herb. Boiss. sér. II, T. V. 431. — *V. Babula* *Buch.-Ham. ex Wall.*, Cat. no. 1745 (1827). — *V. quinata* *Williams* l.c. (1905). — *V. undulata* *Wall.*, Cat. no. 1756 (1827). — A tree; branchlets obscurely quadrangular, somewhat pubescent or subglabrous, glabrescent; leaves 3—5-foliolate; leaflets lanceolate, sometimes ovate or broadly ovate, chartaceous, acute or cuneate at base, acuminate (sometimes obtusely) at apex, margins entire or undulate, entirely glabrous on both sides or pubescent on the nerves; pairs of nerves 4—7 in the

lateral, 9—12 in the terminal leaflets; petioles glabrous or puberulous, $3\frac{1}{2}$ —21 cM. long; lowest leaflets, if present, 4 — $4\frac{1}{2}$ by $1\frac{1}{2}$ — $2\frac{1}{2}$ cM., petiolules 0.2 — $\frac{1}{2}$ cM.; lateral ones 7—14 by 2.7—7 cM., petiolules 0.2 — $1\frac{1}{2}$ cM.; terminal ones 9— $18\frac{1}{2}$ by $3\frac{1}{2}$ —9 cM.; petiolules 0.8 — $2\frac{1}{2}$ cM.; sometimes with small white scales above; with red or yellow glands beneath; *panicles* terminal, large, minutely greyish tomentose; cymes 2—6-flowered; *calyx* cup-shaped, minutely greyish tomentose, nearly truncate, with 5 minute teeth, 0.25 cM. long and wide, glandular; with upwards pointing hairs within near the margin; *corolla* densely pubescent without; glandular; lowest part of tube glabrous; tube 0.8 cM. long, 0.25 cM. wide, glabrous within, a few hairs at the insertion of the stamens (halfway the tube) excepted; lobes glabrous within, 0.15 cM. long, subacute, deltoid, lip 0.25 cM. long; *stamens* included or nearly so; anther-cells little divaricate, sub-parallel, with some glands on the backside; filaments 0.7 cM., sparsely pubescent for the basal part; *style* 0.9 cM., with shortly bifid stigma; *ovary* glabrous, somewhat glandular; *fruit* 0.6 cM. long and in diam.

Var. α typica H. J. Lam, nov. var. — var. *undulata* Clarke in Hook. f. l.c.; Hall. f. l.c. — *foliolorum nervi glaberrimi*; ramuli glabri; foliola minora, lateralia 7—8 cM. longa, 2.7—3 cM. lata, petioluli 0.7—0.9 cM. longi; terminalia 9—10 cM. longa, $3\frac{1}{2}$ cM. lata, petioluli 1.3—1.7 cM. longi; petioli 3—10 cM. longi.

SUMATRA: H. Bog. no. 3783, Muara Duwa, Palembang. — Forbes no. 2612. — de Vriese no. 106, native name: madang giering.

JAVA: Reinwardt in H. L.—B. sub no. 908.267—548, Bantam. — Blume no. 2158. — Zollinger no. 603. — Ploem in H. L.—B. sub no. 909.25—478, Preanger. — Boerlage in H. L.—B. sub no. 908.352—1446, Buitenzorg, flow. and fr. on 15-XII-1888. — Junghuhn in H. L.—B.

sub no. 908.267—1136, Wijnkoops-bay; native name: Ki-Kambara. — *de Vriese* and *Teysmann* in H. L.—B. sub no. 908.267—358.

PHILIPPINES: *Elmer* no. 11602, Todaya (Mt. Apo), Davao, Mindanao, flow. in Sept. 1909. — *Cuming* nos. 1172 (Manilla) and 1294 (Luzon).

Var. β. puberula (Miq.) H. J. Lam. — Branchlets softly pubescent; leaves 3—5-foliolate; leaflets larger, the lateral ones 7—14 by 2.8—7 cM., petiolules 0.2—1½ cM.; terminal ones 9—18½ by 3½—9 cM., petiolules 0.8—2½ cM.; petioles 5—21 cM., with midrib beneath, minutely pubescent.

SUMATRA: *Korthals* in H. L.—B. sub no. 908.267—448.

JAVA: *Horsfield* in H. A. R-T. sub no. 049904. — *Buijsman* no. 250, Mt. Tengger, 400 M. in alt., flow. on 20-VIII-1907.

CELEBES: *de Vriese* and *Teysman* nos. 50, native name: Saraúwet, and 28, native name: Sao.

Distribution of the species: India (*King* and *Gamble*), Hongkong (*Hallier*), Formosa (*Matsumura* and *Hayata*) Malay Peninsula (*K.* and *G.*), Java!, Sumatra!, Celebes!, Philippines!

16. **V. Negundo** L., sp. pl., 638 (1753); *Williams*, Bull. Herb. Boiss. sér. II, T. V, 431; *Schauer*, DC., Prodr. XI, 684; *Cham.*, Linnæa VII, 400; *Forbes* and *Hemsley*, Fl. sin., II, 258; *Forbes*, Wand. Nat. f. Mal. Arch. II, 226; *Hook f.*, Fl. Brit. Ind., IV, 583; *Koord. et Val.* Bijdr. Booms. Java no. 7, 201 and Atl. d. Baumart. II, 6, t. 293; *Koord. Med.* 's Lands Pl. tuin XIX, 560 and Exk. fl. v. Java III, 136; *King* and *Gamble*, Journ. As. Soc. Beng. LXXIV, 4, 843; *Hall. f.*, Med. 's Rijks Herb. Leid. no. 37, 43; Bot. Mag., t. 364; *Hook.* Comp. Bot. Mag. I, 349; *Kuntze*, Rev. Gen. I, 513; *Miq.* Fl. Ind. bat. II, 860 and suppl. I, 242; *Maximowicz*, Bull. Ac. Imp. Sci. Pét. XXXI, 82; *Roxb.*, Fl. ind. III,

70; *Spanoghe*, Linnæa XV, 329; *Merrill*, Phil. Journ. Sci. Bot. IX, 136; *Hemsley*, Chall. Rep., Bot. I, 110 and 177; *Zoll. u. Mor.*, Syst. Verz., 53. — *V. arborea* *Desf.*, Cat. Hort. Par. ed. III, 391 (1829). — *V. gracilis* *Salisb.*, Prodr. 107 (1796). — *V. incisa* *Lam.*, Encycl. II, 612. (1786); *Schauer*, l.c. 684; *Maxim.* l.c. 82; *Hassk.*, 2e Cat. 's Lands Pl. tuin Btz., 134; *Schum. u. Lauterb.* Fl. D. Südsee, 524. — *V. laciniata* *Hort. ex. Schauer*, l.c., 684 (1847). — *V. leucoxyton* *Blco.*, Fl. Fil. ed. I, 516 (1837). — *V. paniculata* *Lam.* l.c., 612; *Roxb.*, Fl. ind. III, 71. — A large shrub or small tree: branchlets round, densely and minutely greyish or grey-brown tomentose; leaves 3-5-foliolate (when 2- or 1-foliolate probably an hybrid with *V. trifolia*; see note under), the terminal leaflets always petioluled, the other sessile or subsessile; leaflets ovate or ovate-lanceolate, thinly chartaceous; margins entire, sometimes coarsely and obtusely serrate in the middle of the leaflet; upper surface black in sicco, glabrous, lower minutely but densely grey or grey-brown tomentose; pairs of nerves 7-12-18, very indistinct; lowest leaflets, if present, 0.7-4½ by 0.4-2.2 cM., 7-8-nerved; lateral ones 1½-10 by 0.7-3.3 cM., petiolules 0-1 cM., nerves 8-10; terminal ones 2.3-10½ by 0.8-3½ cM., petiolules 1½-1.7 cM., pairs of nerves 10-18; panicles terminal or axillary to the upper leaves, grey or grey-brown tomentose, lax with long peduncled cymes or more crowded with sessile cymules; 4-24 cM. long, 3-13 cM. wide; bracts 0.2-0.6 cM.; calyx grey or grey-brown tomentose, 5-toothed, 5-ribbed, subbilabiate, 0.15-0.2 cM. long and wide; pedicels 0-½ cM.; corolla greyish pubescent without except in the lower part of the tube, 0.25-0.5 cM. villous within from the throat to the insertion of the stamens; 4 lobes subacute, deltoid, glabrous within, 0.1-0.15 cM., lip villous within, 0.15-0.3 cM.; the whole corolla 0.25-0.8 cM.; stamens 4,

exsert, 0.4 cM.; style 0.5–0.7 cM. with shortly bifid apex; ovary globose, white glandular at apex; fruit glabrous, seated on the somewhat enlarged, still 5-ribbed calyx, 0.4–0.6 cM. long, 0.5 cM. in diam.

Var. α typica H. J. Lam, nov. var. — var. *incisa* Clarke in Hook f. l.c. 584. — *V. incisa* Lam l.c. — *cymi* sessiles, glomerati, pauciflori; corolla 0.25–0.5 cM.

JAVA: *Boerlage* no. 483, Buitenzorg, Suka Sari, flow. on 24-IX-1888 — in H. L.-B. sub no. 908.267–40, native name: lagundi. — *Reinwardt* in H. L.-B. sub no. 908.267–265 and 59? — *Junghuhn* no. 46.

BORNEO: *Haviland* et *Hose* no. 3552 E., Sarawak near Kuching, with flow. and fr. on Oct. 26th, 1894; *iid.* no. 1645 E., same locality, flow. on 27-IV-1893.

BANDA: *Reinwardt* in H. L.-B. sub no. 908.137–466.

PHILIPPINES: Com. d. l. flor. for. d. Fil. no. 1648, Campanga. — *Ramos* no. 8292, Pangasinan, Luzon, flow. in May 1909. — *Darling* no. 16562, Abra, Luzon, buds in Febr. 1909. — *McGregor* no. 5259, Nueva Ecija, Luzon, flow. in Sept. 1908. — *Merrill* no. 3627, Concepcion, Tarlac, Luzon, flow. in Nov. 1903.

Var. β bicolor H. J. Lam, nov. var. — *V. bicolor* Willd., Enum. Hort. Berol., 606 (1809); *Schauer*, DC., Prodr. XI, 683; *Miq.* Fl. ind. bat. II, 860 and Suppl. I, 242 and 567; *Hall. f.*, Med. 's Rijks Herb. Leid. no. 37, 42 — *cymi* pedunculati, laxi, multiflori; corolla 0.5–0.8 cM.

MALAY PENINSULA: *Wight* in H. A. R.-T. sub no. 049906.

BANKA: in H. A. R.-T. sub nos. 044165 (nr. Mintok, flow. and fr. on 2-X-1858) and 044163 (same locality and time).

JAVA: *Pulle*, Edam-isl. in H. A. R.-T. sub no. 049907. — *Kuhl* et *v. Hasselt* in H. L.-B. sub no. 918.210–52, P. ajer, buds in April. — *Junghuhn* in H. L.-B. sub no. 918.210–53, Wijngoops-bay — in H. L.-B. sub no. 908.267–

566. — *Ploem* in H. L.-B. sub. 909.27—151. — *Blume* in H. L.-B. sub nos. 908.267—93 and 47. — *Waitz* in H.L.-B. sub no. 908.267—51, Djocjacarta — *de Vriese et Teysmann* in H. L.-B. sub no. 908.267—270 — *Hrb. Hassk.* in H. L.-B. sub no. 908.267—81, native (mal.) name: lagondi or daon lagondi.

SUMBAWA: *Elbert* no. 3729, Bima, 5—60 M. in alt., flow. and fr. on 10-XII-1909; id. no. 3927, Bima, Ui-ut, near Waworada-bay, 0—200 M., fr. on 13-XII-1909; id. no. 4118, Maba, 250—400 M. in alt., flow. and fr. on 2-I-1910.

TIMOR: *Zippel* in H. L.-B. sub no. 908.267—464.

FLORES: *Weber* in H. L.-B. sub no. 908.267—83, Bari-bay.

KALAO-TOA: *Docters van Leeuwen-Reijnvaan* no. 1513 flow. pink on 11-V-1913.

CELEBES: *Riedel* no. 5836, in H. A. R.-T. sub. no. 011558, Menado, native name: Kakawkaw. — *Elbert* no. 2986, Rumbia, Liano, flow. on 12-IX-1909, 25—150 M. in alt.; id. no. 2873, Muna-isl., Raka, 0—125 M. in alt.; id. no. 3337, Kabaëna-isl., Eempuhu, 0—200 M., flow. and fr. on 26-X-1909. — *Forsten* in H. L. B. sub nos. 908.267—718—720, Likupang; native name: Kaju labundèh, flow. and fr. on Sept. 8th.

BORNEO: *Rutten* no. 61, E.-Borneo, on a ladang; corolla pink; flow. and fr. on 5-V-1910.

MOLUCCA-ISL.: in H. L.-B. sub no. 908.267—474 (Banda). — *Reinwardt* in H. L.-B. sub. no. 908.267—863. — *Forsten* in H. L.-B. sub. no. 908.266—1214 (Ambon).

NEW-GUINEA: *Nyman* no. 210, Stephansort. — *Lewandowsky* no. 48, same locality, flow. on 15-VIII-1899, with one 1-foliolate leaf. — *Schlechter* no. 14253, Constantins-hafen. — *Hollrung* no. 486, same locality.

PHILIPPINES: *Elmer* no. 11999, Todaya (Mt. Apo), Davao, Mindanao, flow. and fr. in Sept. 1909. — *Tarrosa* no. 19553, Basilan, flow. and fr. on 7-VI-1911. — *Rosenbluth*

and *Tamesis* no. 12708, Laguna, Luzon, flow. in Sept. 1909.

NEW-BRITAIN (NEU-POMMERN): *Lauterbach* no. 166, Ralum. — *Dahl* no. 149, flow. and fr. in June 1896, Ralum.

PALAU-ISL.: *Kraemer* in H. Ber. without nr., native name: Klssegathui. — *Raymundus* no. 178, Korrör, native name: Klschochodüi. — *Ledermann* no. 14122, Korrör, native name: Klesechedui, flow. and fr. on 9-II-1914.

CAROLINE-ISL.: *Kraemer* in H. Ber. without nr. Truk-isl. — *Ledermann* no. 13631, Nompomal, Ponape, a tree, 8—10 M. high, flow. on 6-XII-1913.

MARIANNE-ISL.: Herb. *Hæenze* in H. Ber. without nr. — *Höfer* no. 25. Saipon. Ajuergan; native name Agalonte; a shrub, 3—4 M. high, flow. and fr. on 16-XI-1912.

The specimen: *Volkens* no. 425 from Yap, Caroline-isl., flow. and fr. on 8-II-1900, we consider as an hybrid between the β -variety of *V. Negundo* and the α -variety of *V. trifolia*. It has the habit of *V. trifolia*, also in the form of the often 1-foliolate leaves, but the terminal ones are usually petioluled and the corolla reaches 0.8—0.9 cM., the calyx 0.2—0.25 cM. It is a very remarkable intermediate form, and it may be said emphatically that it seems to be fertile.

Distribution of the species: E.-Africa. N.-Madagascar, Mauritius, Ceylon, India, Siam, S.-China, Hainan, Formosa, Japan (*Hallier*), Malay Peninsula! and Archipelago!, Philippines!, W.-Polynesia!

As there is still some confusion in distinguishing *V. Negundo* and *V. trifolia*, we enumerate here several distinct differences:

V. NEGUNDO.

1. Leaves 3—5-foliolate.
2. Leaflets ovate-lanceolate, often narrowly lanceolate; apex acuminate; margins sometimes crenate about the middle; upper side

V. TRIFOLIA.

1. Leaves 1—3 foliolate.
2. Leaflets ovate or broadly ovate, sometimes obovate, apex subacute-rounded; margins entire; upper side glabrous with pubescent

- | | |
|---|--|
| entirely glabrous; terminal leaflet distinctly petioluled, the other also or sessile. | midrib, sometimes pubescent; all leaflets sessile. |
| 3. Panicles 4–24 by 3–13 cM. | 3. Panicles 4–13 by 2–5 cM. |
| 4. Calyx 5-ribbed, 0.15–0.2 cM. long. | 4. Calyx not ribbed, 0.3–0.4 cM. long. |
| 5. Corolla with lip 0.5–0.8 cM.; tube 0.3–0.45 cM. | 5. Corolla with lip 1.4 cM.; tube 0.85 cM. |

17. *V. nitida* Merrill, Phil. Journ. Sci., Bot. VII, 343 (1912). — A tree, 5 M. high; branchlets somewhat quadrangular, more or less fulvous-pubescent, glabrescent; leaves 3–5-foliolate; leaflets elliptical-ovate, entire, acute or acuminate at base, obtuse or shortly and broadly acuminate at apex, glabrous or nearly so, the terminal ones 10 by 7 cM., the lateral ones 2–3½ cM. long, all of them petioluled; petioles 5–7 cM.; panicles terminal, composed by cymes, axillary to the upper leaves, subglabrous; peduncles 2–6 cM.; cymes dichotomous, rather lax and few-flowered; 3 flowers together, the lateral ones pedicelled, the terminal ones sessile, or nearly so; bracts deltoid, 0.15 cM., caducous; calyx 0.25 cM., appressedly pubescent, truncate or obscurely 5-toothed; corolla-tube 0.6 cM., densely villous within, densely tawny-tomentose without in the upper part; upper lip 2-lobed, lobes 0.35–0.4 cM., lower 3-lobed, the midlobe 0.5 cM. in diam., the lateral lobes 0.3 cM. long; all lobes densely tawny-pubescent on both sides; filaments densely villous below; style 1 cM. long.

Distribution: Mindanao.

This species belongs possibly to the subsection *Axillares*, for it is not clear from Merrill's description whether there are only axillary cymes forming together a terminal (pseudo-terminal) panicle, or if also a real terminal panicle is present.

18. *V. littoralis* Decne., Nouv. Ann. Mus. Par. III, 401 (1834); Merrill, Bur. Gov. Lab. Bull. no. 27, 68; Spanoghe, Linnæa XV, 330; Hallier f., Med. 's Rijks

Herb. Leiden, no. 37, 47. — *V. altissima* Naves ex Vill. in *Blco.*, Fl. Fil. ed. III, Nov. app. 130 (1877). — *V. glaberrima* Zipp. ex Span. in *Linnæa* XV, 330 (1841). — *V. timoriensis* Walp., Rep. IV, 84 (1848); Schauer, DC., Prodr. XI, 686; Forbes, Wand. Nat. f. Mal. Arch. II, 226; Miq., Fl. Ind. bat. II, 863. — *V. cofassi* Reinw. var. *timorensis* Hall. f. l.c., 47. — A tree; branchlets quadrangular, with petioles subglabrous or glabrous; leaves 3-foliolate, very rarely 2-1-foliolate, leaflets articulated; leaflets oblong-lanceolate or lanceolate, chartaceous, entire, in sicco dark-coloured, entirely glabrous on both sides, base acute or cuneate, apex acuminate; terminal leaflets $7\frac{1}{2}$ – $17\frac{1}{2}$ by 2.8–7 cM., petiolules 0.5–1.7 cM.; pairs of nerves rather variable, 7–9 or more up to 17–20; lateral ones 6–14 by 1.8–5 cM., petiolules 0.3–1.5 cM., often unequal and rounded at base; petioles 5–11 cM.; panicles terminal and axillary to the upper leaves, minutely grey-pubescent, pyramidate, 8–19 cM. long, 8–15 cM. wide; calyx densely pubescent to subglabrous, rather variable in tomentum and form, often 5-toothed in bud, the teeth bending together over the corolla, ultimately subtruncate, or truncate from the beginning, 0.1–0.15 cM. long, cup-shaped; corolla infundibuliform, densely and appressedly pubescent without, glandular with dense yellow glands; throat, insertion and base of stamens, and lip within villous; tube 0.3 cM. (young?), sometimes larger, 0.6 cM. (in *Decaisne's* specimina!); 4-lobes ovate, 0.1 cM. long and broad, or 0.3 cM. long and 0.2 cM. broad (*Decne.*); the lip undulate, 0.2 cM. long (young?) or 0.6 by 0.25 cM. (*Decne.*); the whole corolla 0.5 cM. (young?) or 1.1 cM. (*Decne.*); stamens inserted in the lower part of the corolla-tube, which is glabrous below their insertion; style, as stamens hardly exert, with shortly bifid stigma; ovary glabrous, glandular at tip and often also at base; drupe half-included in the

enlarged calyx, 0.3—0.6 cM. in diam., 0.4—0.5 cM. long, glabrous.

TIMOR: *Teysmann* nos. 8941 (Kupang) and 8944, native name: Kula or Daon Kula. — *de Vriese et Teysmann*, in H. L.—B. sub no. 908.267—936 to 938 (Kupang). — H. L.—B. no. 908.267—7. — H. Bog. no. 5165. — *Cunningham* no. 526, flow. in Nov. 1819. — *Zippel* in H. L.—B. sub no. 908.267—707 to 709. — *Spanoghe* in H. L.—B. sub no. 908.267—31 (corolla 1 cM., tube 0.6 cM.!) — *Decaisne* in H. L.—B. sub no. 908.267—21 (cor. as in prec.!).

KALAO-TOA: *Docters van Leeuwen-Reijnvaan* no. 1355, a tree, flow. pink on 5-V-1913, drupe black; native name: Katonding.

KAPE-ADI: *Docters van Leeuwen-Reijnvaan* no. 1309, a small tree, \pm 5 M. high, flow. reddish; fr. on 3-V-1913.

CELEBES: *Elbert* no. 2732, Buton-isl., Lipumangan, 250—320 M. in alt., fr. on 22-VIII-1909.

AMBOYNA: in H. L.—B. sub no. 908.267—18.

PHILIPPINES: *Elmer* no. 13440, Cabadbaran (Mt. Urdaneta), Agusan, Mindanao, flow. and fr. in Aug. 1912; *id.* no. 10995, Todaya (Mt. Apo), Davao, Mindanao, buds in June 1909; *id.* no. 11031, same locality and time, flow.; *id.* no. 10995 (? is this nr. right), Magallanes (Mt. Gitinggiting), Capiz, Sibuyan, flow. in May 1910. — *Whitford* and *Hutchinson* no. 9213, Zamboanga, Mindanao, flow. in Jan. 1908. — ? *Rosenbluth* no. 12165, Marinduque-isl. (leaflets membranous). — Com. d. l. fl. for. d. Fil. nos. 489 (Guinarás) and 849 (Unisan). — *Curran* and *Merritt* no. 12398, Mt. Limax, Bataan, Luzon, flow. in Aug. 1908. — *Reillo* no. 16463, Sa Maria, Zamboanga, Mindanao, flow. in Sept.—Oct. 1912. — *Curran* no. 17452, Negros, flow. and fruits in Sept. 1909. — *Cuming* no. 1365 (cor. 1 cM., tube 0.6 cM., cf. *Decaisne's* specimen from Timor).

Distribution: Timor!, Philippines! and some islands between them!

We are not sure that this is a uniform species, but we find, although it is rather polymorphous, no terms nor means to subdivide it into 2 or more species or varieties. The form with the larger corolla occurs in Timor (*Decne.*) as well as in the Philippines (*Cuming* no. 1365), and the localities in Kalao-Toa, Kape-adi, Celebes and also in Amboyna, may indicate that the plants from Timor are identical with those from the Philippines. An examiner having within his reach a more complete material than we had, will be able to give a final decision in this matter.

19. *V. siamica* *F. N. Williams*, Bull. Herb. Boiss., sér. II, T. V. 431 (1905); *King and Gamble*, Journ. As. Soc. Beng., LXXIV, 4, 847. — A tree, reaching 10–13 M. in height; branchlets with petioles glabrous; leaves 3-foliolate; leaflets coriaceous, glabrous, entire, ovate or ovate-lanceolate, acuminate, often bluntly at apex, rounded or cuneate at base, the lateral leaflets sometimes slightly asymmetric, the terminal ones 6–12 $\frac{1}{2}$ cM. long, 1.8–4.3 cM. broad, petiolules (also to lateral leaflets) about 1.2 cM.; petioles 2 $\frac{1}{2}$ –5 cM.; the lateral leaflets usually about $\frac{1}{3}$ smaller; pairs of nerves 12–24, only slightly curving to the margin; panicles terminal, with sometimes additional branches from the axils of the upper leaves, minutely puberulous, many-flowered, reaching sometimes 30 cM. in length; bracts many, persistent, linear-lanceolate, 0.6–1.8 cM.; bracteoles 2 to each pedicel; pedicels slender, sometimes 0; flowers small, blue or white; calyx-tube campanulate, pubescent and glandular without, 0.12 cM.; teeth 5, acute, 0.05 cM.; in fruit much enlarged, cup-shaped; corolla-tube 0.25 cM., pubescent on both sides except at the base, and with many yellow glands; upper lip with 2 short obtuse lobes; lower 3-lobed, the midlobe longer and villous inside; stamens included or nearly so; filaments thickened, villous; style rather thick, as long as stamens, with shortly bifid stigma; ovary depressed, spar-

sely glandular; *drupe* globose 0.35 cM. in diam., glandular, obscurely 4-lobed.

Distribution: Siam, Malay Peninsula.

20. **V. flabelliflora** Hall. f., Med. 's Rijks Herb. Leid., no. 37, 50 (1918). — A tree?; branchlets ochraceous-cinereous, glabrescent, with interpetiolar margins (without hairs); *leaves* 3-foliolate; leaflets broadly lanceolate, acute at base, sometimes unequal, acuminate at apex, chartaceous, glabrous on both sides; margins entire; pairs of nerves 7—9; 18—26 by $7\frac{1}{2}$ — $10\frac{1}{2}$ cM., petiolules 1.4—2.3 cM.; petioles glabrous, $2\frac{1}{2}$ — $6\frac{1}{2}$ cM.; *panicles* terminal, reaching 30 by 20 cM., minutely pubescent; panicles peduncled (2—)4—6(—7) from a node, the nodes at rather large intervals; cymules conspicuously peduncled, dense, subcapitate, dichotomous; bracts spatulate; *calyx* cyathimorphous, acutely 5-toothed, pubescent without, 0.15 cM.; *corolla* 0.7 cM., pubescent without, shortly villous within; lip villous within; *stamens* and *style* little exsert.

Distribution: E.-Borneo!

21. **V. secundiflora** Hall f., Med. 's Rijks Herb. Leid. no. 37, 49 (1918). — A tree, 10 M. high; branchlets quadrangular, with petioles glabrous; intrapetiolar margins (without hairs) present; *leaves* 3—5-foliolate; leaflets obovate, base narrowly obtuse, apex, sometimes obtusely acuminate; subsessile; margins entire; chartaceous; glabrous and reticulated on both sides; terminal leaflets 8—13 by $2\frac{1}{2}$ —5 cM., petiolules 0.1—0.2 cM.; petioles $3\frac{1}{2}$ —10 cM., the upper ones often winged, 0.5—0.6 cM. broad with the wings; *panicles* terminal, very minutely pubescent, 14—20 cM. long, 8—10 cM. in diam.; pedicels 0.1 cM.; *calyx* cyathimorphous, 0.2 cM., 5-toothed, glabrous, with peltate scales (glands, Hallier) near the margin; teeth ciliate; enlarged in fruit up to 0.3 cM. long and 0.5 cM. in diam.; *corolla*-tube glabrous with some scales (glands), 0.4—0.5 cM., infundibuliform; 4 lobes 0.2 cM. long and broad,

one 0.4–0.5 cM. long, 0.3 cM. broad, all lobes pubescent near the margin, the lip densely villous within, as is the throat; *stamens* 0.4 cM. exerted, filaments villous at their base; *style* 1 cM., with shortly bifid apex; *ovary* glabrous; *drupe* (ripe?) 0.4 cM. long.

Distribution S.E.-Borneo!

22. *V. luteoglandulosa* H. J. Lam, nov. spec. — Arbor; ramuli obscure quadrangulares, minute pubescentes et glandulosi, glabrescentes, sicut panicula; *folia* 3–5 foliolata; foliola ovata vel ovato-oblonga, chartacea; margine integra; supra subglabra, minutissime papillosa, subtus densissime glanduloso-punctata, nervis pubescentia; nervis utrinque 5–11; foliola inferiora 1–2½ cM. longa, ½–1.3 cM. lata, basi apiceque cuneata, nervis utrinque 5–6, petiolulo 0.1–0.2 cM. longo; lateralialia 6–10½ cM. longa, 3½–5 cM. lata, ut terminalialia basi attenuata, apice acuminata, petiolulo 0.3–0.6 cM. longo, nervis utrinque 6–10; terminalialia 4½–13 cM. longa, 4–5.6 cM. lata, nervis utrinque 8–11, petiolulo 1–2 cM. longo; petiolo subglabro, 4–8 cM. longo; *paniculæ* terminales, vel inferiores axillares, 14–20 cM. longæ, 11–12 cM. latæ; *calyx* cupuliformis, obtuse 5-dentatus, sparse pubescens glandulosusque, 0.25 cM. longus et diam.; *corolla* minute puberula glandulosaque, parte tubi inferiore et lobi medii inferioris labii margo exceptis; fauce dense villosa; lobis 4 intus glabris, lobo 1 majore intus villosus; tubo 0.4 cM. longo, lobis minoribus 0.1 cM. longis, obtusis, lobo majore 0.3 cM. longo; *stamina* inclusa, filamentis minute puberulis; *stylus* brevis; apice truncatus?; *ovarium* glabrum.

NEW-GUINEA: *Schlechter* no. 16593, Kais.-Wilh.-land, near Wabbe, 250 M. in alt., on 29-IX-1907.

A species well characterised by the very densely glandular lower surface of its leaflets.

23. *V. glandulosa* H. J. Lam, nov. spec. — Frutex?; ramuli, petioli, inflorescentiæ minute pubescentes, glabres-

centes; *folia* 3-foliolata; foliola late ovata, chartacea, margine integra, basi cuneata, apice subabrupte acuminata, supra glabra, scabrido-papillosa, sparse glandulosa, nervis dense pubescentia, subtus glabra, densiuscule glandulosa, nervis dense pubescentia; $4\frac{1}{2}$ —7 cM. longa, $2\frac{1}{2}$ —3 cM. lata, petiolulo 0.3—0.6 cM. longo; petiolo $1\frac{1}{2}$ — $2\frac{1}{2}$ cM. longo; *paniculæ* terminales, laxæ. 25 cM. longæ, 20 cM. latæ, bracteis lanceolatis obtusis, 0.8—3.2 cM. longis, 0.1—0.35 cM. latis; *calyx* cupuliformis, dense, præsertim subtus, pubescens, glanduloso-punctatus, intus glaber, in alabastro 0.15 cM. longus; *corollæ* alabastrum 0.3 cM. longum, dense pubescentis glandulosæque, parte inferiore tubi excepta; fauce, staminum insertione, lobi medii inferioris labii basi villosæ; *stylus* apice bifidus; *ovarium*, apice villosum et glandulosum.

LUZON: *Mangubat* no. 1361, Mendez Nunez, Cavite, buds in Aug. 1906.

This species is nearly allied to *V. luteoglandulosa*, but its leaves are far less glandular beneath, and it has large, lanceolate bracts.

24. *V. coriacea* C. B. Clarke in Hook. f., Fl. Br. Ind. IV, 586 (1885); King and Gamble, Journ. As. Soc. Beng. LXXIV, 4, 846. — A tree, reaching 20 M. or more in height; branchlets round, minutely puberulous; leaves 3-foliolate; leaflets lanceolate or oblanceolate, coriaceous; margins entire; base acute, apex obtuse or acute; glabrous on both surfaces, glandular below; petioles and petiolules minutely pubescent; pairs of nerves 6—7; 5 — $12\frac{1}{2}$ by 2—4 cM., petiolules 1—1.2 cM. in the terminal, 0.4—0.6 in the lateral leaflets; petioles $2\frac{1}{2}$ —5 cM.; *panicles* terminal, minutely pubescent, 11—20 cM. long, 8—10 cM. in diam., relatively few-flowered; bracts linear, 0.5 cM.; flowers in small, often distant clusters, violet or blue; *calyx* pubescent and glandular without, subinfundibuliform, enlarged and cup-shaped in fruit; tube 0.2—0.25 cM., teeth deltoid, 0.1—0.12 cM., acute (obtuse King and Gamble); *corolla* pubescent and glandular within and

without except on the inferior part of the tube; tube 0.4 cM., 4 lobes rounded, 0.2—0.3 cM. long, the lip larger, 0.5 cM. long, with the throat densely villous within, crenate; *stamens* exsert; filaments stout, glandular, villous below; anthers reniform; insertion in the throat; 0.4 cM. long; *style* 0.8 cM., stigma shortly bifid; *ovary* depressed, sparsely pubescent and glandular; *drupe* glabrous, 1.3—2 cM. in diam.

Distribution: Malay Peninsula!

25. *V. lasiantha* Hall. f., Med. 's Rijks Herb. Leid. no. 37, 50 (1918). — A tree, 23½ M. high; branchlets cinereous, with petioles subglabrous; *leaves* 3-foliolate, lanceolate or lanceolate-obovate, base acute or subattenuate, apex cuneate or subobtusate; margins entire; coriaceous, entirely glabrous on both sides; pairs of nerves 8—9; 15½—20 by 4.8—7 cM., petiolules 1.2—2.7 cM.; petioles 4—4½ cM.; *panicles* nearly as in *V. flabelliflora*, but never more than 2 peduncles from each node; reaching 20 cM. in length; bracteoles caducous; all parts minutely pubescent; cymules with peduncles 1 cM. long; *calyx* cup-shaped, densely tawny-pubescent, with 5 deltoid, rather large teeth, 0.1—0.15 cM. long, pedicels 0.1—0.3 cM.; *corolla* white, densely tawny-pubescent without except in the lower part of the tube; tube 0.3—0.4 cM., villous at throat; 4 lobes, 0.15 cM. long, pubescent on both sides, lip 0.3 cM. long, villous within; *filaments* 0.15 cM. exserted, slender, pubescent; *style* as long exsert as the stamens, with shortly bifid apex; *ovary* globose, glabrous, minutely villous at tip.

Distribution: S.-W.-New-Guinea!

26. *V. longifolia* Merrill, Phil. Journ. Sci. Bot. V, 227 (1910). — A tree; branchlets and petioles glabrous; *leaves* 3-foliolate; leaflets oblong-lanceolate to broadly ovate-lanceolate, subcoriaceous; margins entire, apex long acuminate; glabrous on both sides; pairs of nerves 10; terminal

leaflets 20—25 by 5—7 cM.; petiolules 1—2 cM.; petioles 5—9 cM.; *panicles* terminal, somewhat brownish-pubescent, reaching 25 cM. long, often with 4 peduncles from each node; main peduncle 15 cM.; flowers fasciculated; bracts 0.2 cM.; *calyx* pubescent without, with 5 small teeth, 0.2 cM. long and wide; *corolla* pink, pubescent within and without; tube 0.5—0.6 cM.; limb 2-lipped, upper lip 2-lobed, 0.5—0.6 cM., lobes narrow; lower one 3-lobed, lobes obtuse or acute, 0.3 cM.; *filaments* sometimes somewhat puberulous, didynamous, 0.6 and 0.8 cM.; fruit unknown.

Distribution: Mindanao.

Subsection 2 *Axillares* Briq.

27. *V. tetragona* Hall f., Med. 's Rijks Herb. Leid. no. 37, 53 (1918). — A tree?; branchlets very acutely tetragonous; *leaves* 1-foliolate; leaflets sessile, lanceolate, caudate-acuminate, acute at base, margins entire, recurved; chartaceous, distinctly articulated with the petioles, glabrous on both sides, with branchlets and petioles distinctly cinereous, especially beneath; pairs of nerves 8—12; 12—18 by 2.7—4.7 cM., acumen reaching 3 cM., petioles 1—2 cM.; *panicles* alternately axillary; cymes shortly peduncled, 3—7-flowered; pubescent; pedicels short, 0.1 cM.; panicles reaching 5 cM., cymes 1 cM.; *calyx* cyathimorphous, acutely 5-toothed, minutely and appressedly pubescent, 0.2 cM.; *corolla* with lip 0.8 cM., densely ochraceous-pubescent without, villous within as is the base of the lip; *stamens* and *style* exsert; *drupe* ellipsoid, for $\frac{2}{5}$ included in the cupuliform calyx, pubescent, 1 cM. long, 0.7 cM. in diam.

Distribution: E.-Borneo!

28. *V. longisepala* King et Gamble, Kew Bull., 112 (1908) and Journ. As. Soc. Beng., LXXIV, 4, 853. — A

small or moderate-sized tree; branchlets obscurely quadrangular, with petioles and inflorescences densely tawny pubescent; *leaves* 3-foliolate, membranous, the middle leaflet largest and petioluled, the side ones subsessile; ovate or elliptic-ovate, abruptly caudate-acuminate at apex, the terminal leaflets acuminate or cuneate at base, the lateral ones cordate or rounded, or acute and unequal; upper surface sparsely hispid and glandular, lower one tawny-pubescent and glandular; margins entire; 10—30 by 5—15 cM.; petiolule of the middle leaflet 0.6—2 cM.; petioles 5—15 cM.; pairs of nerves 8—15; cymes axillary, opposite, $2\frac{1}{3}$ —6.2 cM. long; main peduncles usually 2, vertically arranged, $2\frac{1}{2}$ —4 cM. long; branches 2- to 3-chotomous; bracts narrowly lanceolate, 0.6—1.8 cM., persistent; pedicels about $2\frac{1}{2}$ cM.; flowers primrose-yellow; *calyx* golden brown villous, campanulate, 0.85 cM.; lobes 5, oblong-lanceolate, 0.6 cM.; *corolla*-tube slender, funnel-shaped, 1—1.2 cM., yellow-glandular; 2-lipped, with a scanty ring of hairs within at the insertion of the stamens, 0.4 cM. above the base of; upper lip shortly 2-lobed, lobes rounded; lower lip 3-lobed, side lobes reflexed, middle lobe narrowed below, broadened above and fimbriate, twice as long as the side lobes; *stamens* exsert, filaments glabrous, slender; *style* with bifid stigma; *ovary* conoidal, densely yellow-glandular at top; *drupe* ovoid, black, smooth, glandular, 0.75 cM. long.

Distribution: Malay Peninsula.

29. *V. glabrata* R.Br., Prodr. 512, (1827); *Benth.* and *v. Muell.*, Fl. Austral., V, 31; *Schauer*, DC., Prodr. XI, 695; *Hook f.*, Fl. Br. Ind. IV, 588; *Koord. en Val.*, Bijdr. Booms. no. 7, 208 and Atl. d. Baumart. II, 6, t. 209; *King and Gamble*, Journ. As. Soc. LXXIV, 4, 852; *Koord. Exk. fl.*, III, 137; *K. Schum.* u. *Lauterb.* Fl. D. Südsee, 523; *K. Schum.* u. *Hollrung*, Fl. Kais.-Wilh.-land, 121; *Hall. f.*, Med. 's Rijks Herb. Leid. no. 37, 54. —

V. bombacifolia Wall., cat. no. 1749 (1828). — *V. Cunninghamii* Schau. DC., Prodr. XI, 691 (1847). — *V. helogiton* K. Schum. in K. Schum. u. Lauterb., Nachtr. Fl. D. Südsee, 362 (1905). — *V. leucoxyton* Schau. l.c. 692 (1847), (partly). — *V. pallida* Wall., cat. no. 1751 (1828). — *V. pentaphylla* Merr. Phil. Journ. Sci. Bot. IV, 320 (1909); Hall. f., l. c. 54. — A tree, reaching 10–20 M. (Merr.) or a large shrub; rather variable in tomentum and some other features; branchlets obtusely quadrangular, more or less fulvous-pubescent, glabrescent; leaves 3–5-foliolate; leaflets chartaceous or membranous, elliptical or elliptical-oblong or subobovate, sometimes subrotundate, sometimes lanceolate, base cuneate, sometimes broad, or long attenuate and narrow; apex obtusely or acutely acuminate; in sicco brown to nearly black; margins entire; pairs of nerves 6–15; upper side glabrous, minutely pubescent on the midrib, the nerves white-pubescent when young; lower one glabrous or very sparsely pubescent, midrib glabrous or somewhat pubescent, pubescent along it and \pm barbellate in the axils of the main nerves; lowest leaflets, if present, $2\frac{1}{2}$ –10 by 1– $5\frac{1}{2}$ cM., petiolules 0.2–0.3 cM., pairs of nerves 6–8; lateral ones 14–26 by 7–11 cM., petiolules 0.7–1.5 cM., pairs of nerves 10–12; terminal ones 15–31 by 8– $13\frac{1}{2}$ cM., petiolules 1–2 cM., pairs of nerves 12–17; petioles glabrous or somewhat pubescent, 7–17 cM. long, slender; *cymes* axillary, lax, slender, minutely pubescent, dichotomous, few-flowered, 7–14–22 cM. long, 8–7 cM. in diam., peduncles 2–7–10 cM., bracts small, caducous, 0.3 cM.; pedicels 0.1–0.3 cM., often with 2 minute often opposite bracteoles; *calyx* 0.15–0.4 cM. long, 0.25–0.3 cM. in diam., cupuliform, with 5 small teeth; minutely and appressedly pubescent; *corolla*-tube, yellowish white, pubescent over its whole length, 0.5–0.6 cM., glabrous within in the lower part, densely villous within in the

throat and up to the midlobe of the lower lip within; the smaller lobes — as the lip — pubescent without, 0.2—0.25 by 0.15—0.2 cM., the lip pink, reaching 0.5—0.8 by 0.25—0.4 cM., entire; *stamens* exsert, 0.6—0.7 cM., filaments villous in the lower half, glandular in the upper one, stout and broadened below; *style* 0.7—0.9 cM., exsert, with shortly bifid apex; *ovary* glabrous, minutely villous at tip; *drupe* obovoid, 0.8—1.3 cM. long.

JAVA: *Kuhl* et *v. Hasselt* in H. L.-B. sub no. 909.107—54. — *Korthals* in H. L.-B. sub no. 908.272—136, Krawang. — *Junghuhn* in H. L.-B. sub no. 908.267—1210, Tjiletù, native name: Ki bigchbul, a large tree and in H. L.-B. sub no. 908.267—1220, native name Ki Katjapi.

TIMOR: *Forbes* no. 3784 (very little barbellate in the axils of the nerves beneath).

NEW-GUINEA: *Hollrung* no. 672, Kais.-W.-land, flow. in Aug. 1887. — *Ledermann* no. 10474, Kais.-W.-land, Camp Malu on Sepik-river, 30—40 M. in alt., a small tree, 4—5 M. high; bark light-grey; fr. green-yellow on 4-I-1913. — *Hollrung* no. 708, Kais.-Wilh.-land, 2nd Augusta-station, flow. in Sept. 1887 (leaves membranous or thin-chartaceous, 10—19 by 4—7 cM.).

PHILIPPINES: *Merrill* no. 9330, Taytay, Palawan, flow. in May 1913.

Distribution: India, Burma, Siam, Cochin China, Malay Peninsula, Java!, Timor!, New-Guinea!, Palawan!, Mindanao (*Merrill*), N.-Australia, Queensland (see *Hallier*, l. c.).

30. *V. vestita* *Wall.*, Cat. no. 1750 (1828); *Schau.*, DC., Prodr. XI, 692; *Hook. f.*, Fl. Br. Ind. IV, 587; *King* and *Gamble*, Journ. As. Soc. Beng. LXXIV, 4, 854; *Miquel*, Fl. Ind. bat. II, 864 and suppl. I, 242 and 568; *Hall. f.*, Med. 's Rijks Herb. Leid. no. 37, 54. — *V. Finlaysoniana* *Wall.*, Cat. no. 6314 (1828). — A moderate-sized tree; branchlets round, with petioles and cymes softly grey-tawny-pubescent; *leaves* 3-foliolate; leaflets charta-

ceous, lanceolate, acuminate at both ends; margins entire; sparsely puberulous above, densier on the nerves, tomentose beneath and glandular; terminal leaflets $11\frac{1}{2}$ –19 by 5–10 cM., 8–10-nerved, petiolules $1\frac{1}{2}$ –6 cM.; lateral ones 8–16 by 4 – $6\frac{1}{2}$ cM., base often unequal, 5–7-nerved, petiolules $\frac{1}{2}$ –1 cM.; petioles $3\frac{1}{2}$ – $10\frac{1}{2}$ cM.; *cymes* axillary to the upper leaves, usually 2–4 vertically arranged in the axil, dichotomous, $2\frac{1}{2}$ –6 cM. long and in diam., peduncles 0.7 – $2\frac{1}{2}$ cM.; *calyx* subbilabiate, cupuliform or subcylindric, 0.3 cM. long, 0.2 cM. wide; teeth 5, small, deltoid; pubescent and glandular without, glabrous within; *corolla*-tube cylindric, slender, 0.8 cM. long, 0.1 cM. wide, except in the lower part densely glandular with rather large, yellow glands or glanduliferous hairs, as are the 5 subequal, 0.1–0.15 cM. long, ovate lobes, which have sometimes some hairs without, and are glabrous within as is the tube, except for a ring of stiff, upwards pointing hairs, about 0.25 cM. from the base; *stamens* subequal, included, glabrous, inserted at about 0.5 cM. from the base of the tube, 0.4 cM. long; *style* slender, 1 cM., with very shortly bifid stigma; *ovary* with glabrous, subcylindrical base, abruptly narrowing into a glandular-dotted beak; *drupe* globose, 0.6 cM. long and in diam., for the lower $\frac{1}{8}$ part included in the somewhat enlarged calyx.

JAVA: *Ploem* in H. L.–B. sub no. 909.27–27. — ? *Blume* in H. L.–B. sub no. 908.267–628.

SUMATRA: *Korthals* in H. L.–B. sub nos. 908.266–786 and 787, Mt. Tambang; *id.* in H. L.–B. sub nos. 908.266–755, Padang. — H. Bog. no. 1165, Lubuk-alung; *id.* no. 1158, Lubuk sikaping; *id.* no. 3671, Muara enim, Palembang.

Distribution: Burma, Malay Peninsula (and Penang), Java!, Sumatra!, W.-Borneo (*Hallier*).

31. **V. Aherniana** *Merrill*, Bur. Gov. Lab. Bull. no. 6, 18 (1903). — A tree; branchlets round, with petioles, petiolules and *cymes* minutely pubescent; *leaves* 3- (rarely

4-) foliolate; leaflets oblong or ovate-oblong, cuneate at base, acuminate at apex; chartaceous; margins entire; glabrous on both surfaces, somewhat pubescent on and near the nerves beneath; 10–24 by 6–10 cM., petiolules in all leaflets equal, 1–3 cM.; petioles $6\frac{1}{2}$ – $8\frac{1}{2}$ cM., incrassate at base and in the insertion of the petiolules; pairs of nerves 12–15; cymes axillary, peduncles 2 in the axils, 3–6 cM.; 9–12 cM. long, few-flowered; flowers relatively large; *calyx* funnel-shaped, with 2 minute bracteoles close to its base, sparsely pubescent and glandular without, glabrous within; obscurely 5-denticulate, 0.4 cM. long and wide; *corolla*-tube short, 0.35–0.4 cM., glabrous below, pubescent for the rest, as are the lobes, except for the margin of the large lip; throat and base of the lip densely villous; 4 lobes narrow, longer than the tube, 0.6 cM. long, 0.2 cM. broad, glabrous within; lip large, often somewhat 2-lobed, the lobes crenate- or sinuate-serrate; 1 cM. long; *stamens* little exsert, filaments villous below, inserted in the lower part of the throat; *style* as long exsert as the stamens, stigma shortly bifid; *ovary* glabrous, globose, \pm 4-furrowed.

PHILIPPINES: *Curran* no. 1143, Negros, flow. in April 1912; *id.* no. 10571, Albay, Luzon. — *Escritor* no. 20768, Guinayangan, Tayabas, Luzon, flow. in March–April 1913. — *Rosenbluth* no. 12236, Lubang-isl. flow. in March 1908.

32. *V. Curranii* H. J. Lam, nov. spec. — Arbor?; ramuli obscure quadrangulares, cum petiolis petiolulisque velutini, nodis incrassati; *folia* 5-foliolata; foliola elliptico-oblonga vel oblonga, apice basique acuminata, basi sæpe decurrentia, chartacea, vel subcoriacea, margine integra, longe petiolulata, 8-11-nervia, utrinque glabra, in costa media pubescentia; inferiora 11 cM. longa, 5 cM. lata, petiolulo 1.7 cM. longo; lateralialia 17 cM. longa, 6 cM. lata, petiolulo 3.3 cM. longo; terminalialia 20 cM. longa,

7 cM. lata, petiolulo 3.7 cM. longo; *paniculæ* spicatæ, longæ, axillares, pedunculis 3, verticaliter appositis; cymis minutis, breviter pedunculatis, 1-3-floris; flos illo *V. Ahernianæ* arcte affinis; *calyx* cupuliformis, 0.4 cM. longus et latus, absolute 5-denticulatus, dense aureo-fulvo-tomentosus; *corollæ* tubus calyce brevior, cum lobis 4 angustis 0.5 cM. longis, quinto 0.7—0.8 cM. longo, bilobo (lobis integris), extus dense aureo-fulvo-pubescent, parte inferiore excepta, intus dense villosus; *genitalia* inclusa; *ovarium* glabrum.

PHILIPPINES: *Curran* no. 17463, Negros, flow. in Oct. 1909.

This plant, in the specimen determined as *V. Aherniana*, is quite different from it — though in certain features undoubtedly related — by its 5-foliolate leaves, the densier indumentum of petioles, petiolules and flowers, and the presence of 3 (instead of 2) peduncles in the axils of the leaves.

33. *V. leucoxylon* *L. f.*, Suppl. 293 (1781); *Blume*, Bijdr. 813; *Blanco*, Fl. Fil. ed. I, 516; *Schau.*, DC., Prodr. XI, 692;? *Hook.* Comp. Bot. Mag. I, 349; *Miquel*, Fl. Ind. bat. II, 864 and suppl. I, 242; *Merrill*, Bur. Gov. Lab. Bull. no. 27, 68; *Roxb.* Fl. ind. III, 74. — A moderate-sized tree; branchlets ± quadrangular, with petioles, petiolules and cymes appressedly yellow- or brown-pubescent; *leaves* (3-)5-foliolate; leaflets long petioluled, oblong or elliptical-oblong, base acute, more or less attenuate, apex long acuminate; chartaceous; margins entire; glabrous above, pubescent on the nerves, beneath densely pubescent when young, sparsely when adult, densier near the nerves, eglandular; pairs of nerves 9—11, at an angle of almost 90° with the midrib; lowest leaflets, if present, as the lateral ones with often unequal base, 2½—5 by 1½—2½ cM., petiolules 0.6—0.9 cM.; lateral ones 5½—9½ by 3—4½ cM., petiolules 1—2 cM.; terminal ones 7—10 by 3—4½ cM., petiolules 1.4—2½ cM.; petioles

slender, 3—6 cM.; *cymes* axillary, lax, 12—17 cM. long and in diam., up to 6 times di- or subtrichotomous; peduncles $5\frac{1}{2}$ — $7\frac{1}{2}$ cM.; pedicels 0.05—0.2 cM.; *calyx* cupuliform, appressedly and sparsely pubescent without, glabrous within; teeth 5, equal, deltoid, 0.05 cM., the tube 0.2 cM.; *corolla* glabrous for the lowest 0.1 cM., appressedly pubescent; tube 0.45 cM., from the insertion of the stamens (about 0.1 cM. from the base) up to the throat and the lip within, densely villous; upper lip with 2 acute, 0.25 cM. long lobes, glabrous within, lower one 3-lobed, side lobes rounded, glabrous within, 0.25 cM., midlobe 0.35 cM., with sinuate margin; *stamens* little exsert; filaments thickened and villous towards the base, glabrous above; anther-cells divergent; *style* somewhat longer exsert than the stamens, with shortly bifid stigma; *ovary* globose, glabrous.

MALAY PENINSULA: *Griffith* no. 6062.

Distribution: Ceylon, India, Malay Peninsula!, Java. (*Miquel*).

Section II. *Glossocalyx* Clarke.

34. **V. gamosepala** *Griffith*, Notul. IV, 178 (1851); *Hook. f.*, Fl. Br. Ind. IV, 588; *King and Gamble*, Journ. As. Soc. Beng. LXXIV, 4, 855. — A moderate-sized tree; branchlets, petioles, petiolules and inflorescences minutely pubescent and glandular; branchlets \pm tetragonous; *leaves* 3-foljolate; leaflets chartaceous, ovate or ovate-lanceolate, base acute or attenuate, apex acuminate; margins entire; pairs of nerves 5—7; both surfaces glabrous, the lower one glandular, pubescent on the midrib; $5-17\frac{1}{2}$ by $2\frac{1}{2}-6\frac{1}{2}$ cM., petiolules 0.3— $2\frac{1}{2}$ cM., all dimensions smaller in the lateral leaflets; petioles $4\frac{1}{2}$ —10 cM.; *cymes* shortly peduncled, axillary, dichotomous, 1.3—4 cM. long and in diam., peduncles 0.2—1 cM.; *calyx* 2-lipped, upper lip entire or 2-lobed, lower one 2-toothed, the upper one

longer; glabrous, more or less densely yellow-glandular; corolla-tube slender, 0.8—1.2 cM., glabrous and more or less glandular without, except for the lower 0.1 cM.; glabrous within except for a ring of stiff, upwards pointing hairs in the middle; upper lip entire or 2-lobed, lower one 3-lobed; *stamens* inserted about the middle of the tube; anthers reniform; *ovary* glandular and pubescent; *drupe* 0.4 cM., glabrous.

Var. α typica H. J. Lam, nov. var. — *foliola* 9—17½ cM. longa, 4—6½ cM. lata, petiolulo 0.3—2½ cM. longo; *calycis* tubus 0.25—0.3 cM. longus, labium superius integrum, 0.4 cM. longum, inferius profunde bifidum, 0.2—0.25 cM. longum; calyx cum corolla densissime glanduloso-punctatum.

MALAY PENINSULA: Griffith no. 6065. — Maingay no. 1202.

Var. β Scortechinii King et Gamble, Journ. As. Soc. Beng. LXXIV. 4. 856 (1909) — *leaflets* as in the var. α; *calyx* 0.2 cM., upper lip 0.18 cM., lower one 0.065 cM., lobes acute; upper lip entire, lower one 2-toothed; with corolla less densely glandular; *corolla* somewhat pubescent.

SUMATRA: Forbes no. 3060.

Distr.: Malay Peninsula.

Var. γ Kunstleri King et Gamble, l.c. — *leaflets* 5—7½ (—13?) by 2½—4 cM., petiolules 1.3 cM. in the terminal, 0.6 in the lateral ones; petioles 2½—5 cM.; *cymes* 1.3 cM. long and in diam., peduncles 0.2 cM.; *calyx* 0.25 cM., sparsely glandular, somewhat pubescent; upper lip 0.18 cM., entire or 2-lobed, lower one 0.125 cM., 2-fid; *corolla-tube* densely glandular, 1.2 cM.; upper lip shortly 2-lobed.

SUMATRA: Forbes no. 2685, Batu-pantjeh, 100 M. in alt., a small tree, ± 4 M. high; flowers bright orange; *id.* no. 2771, Tandjong Ning, 200 M. in alt., a large tree; fruit brown, becoming black, flow. orange — Pl. Jungh.

ined. no. 520, Upper-Ankola, Tobing. — *Beccari* no. 768, Padang, Ajer mantjur, 120 M. in alt., fr. in Aug. 1878. — *Korthals* in H. L.—B. sub. no. 908.266—750.

BORNEO: *Winkler* no. 2433, S.-E.-Borneo, Hayup, flow. on. 13-VI-1908.

Distribution of the species: Malay Peninsula! Sumatra! Borneo!

IMPERFECTLY KNOWN OR DOUBTFUL SPECIES:

35. *V.?* ***bantamensis*** *Koord. et Val.*, Bull. Inst. Buitzg., II, 12 and Bijdr. Booms. Java no. 7, 210 (1910); *Koord.*, Exk. fl. v. Jav. III, 137. — A tree; branchlets appressedly pubescent, as are the cymes and the petioles; leaves 1-foliolate; leaflets obovate-elliptical, cuneate or acute at base, very shortly rotundate-acuminate at apex; membranous, glandular, adult subglabrous above, with dispersed hairs, nerves pubescent beneath; pairs of nerves ± 8 ; 7.2—14½ by 4.2—7.2 cM.; petioles 1½ cM.; corymbs axillary, one third shorter than the leaves, long peduncled; flowers unknown; drupe globose, partly puberulous, in the waxy calyx, which has 5 acute, deltoid, subcarinate segments; pedicels 0.2 cM., drupe (ripe?) 0.7 cM.; pyrene sub-4-celled, 2-seeded.

Distribution: W.-Java.

36. *V. celebica* *Koord.*, Med. 's Lands Pl. tuin XIX, 645 and 560 (1898). — A large tree, 45 M. high; bark cinereous; leaves 5-foliolate; leaflets elliptical-oblong, narrowed at base; margins entire; densely glandular beneath; inflorescence as in *V. heterophylla* *Roxb.*; calyx truncate or subtruncate.

Distribution: N.-Celebes.

37. *V. geniculata* *Blanco*, Fl. Fil. ed. I, 514 (1837); *Merrill*, Bur. Gov. Lab. Bull. no. 27, 68; *Schau.*, DC., Prodr. XI, 696. — A tree, 17 M. high; leaves 3—5-foliolate; leaflets lanceolate, somewhat pubescent at the margin and on the midrib; panicles verticillate; calyx small, campanulate, 3- or 4-toothed; corolla 2-lipped, campanulate; tube curved; upper lip 2-lobed, lower one 3-lobed, the midlobe largest, villous in throat; stamens didynamous, villous below; anthers reniform or semilunatic;

style as long exsert as the stamens, with bifid apex; *drupe* small, globose, pyrene as in the other species.

Distribution: Philippines.

Schauer, l. c.: an *Vitex*?

38. *V. macrophylla* *H. J. Lam*, prob. nov. spec. — Arbor parva, 6—8 M. alta, cortice griseo; ramuli obtuse quadrangulares, cum petiolis inflorescentiisque ferrugineo-pubescentes; internodia subclavata; *folia* 3-foliolata; foliola sessilia vel subsessilia, chartacea, margine integra, oblongo-lanceolata, utrinque acuta; densiuscula pubescentia in pagina superiore, densius in nervis, pilis simplicibus nonnullis stellatis intermixtis, subtus tomentella, subglandulosa; novella ferrugineo-puberula, lateralia 14—21 cM. longa, 8—9 cM. lata, petiolulo 0.—0.5 cM. longo, 11—15 nervia; terminalia 16—23 cM. longa, 11—12 cM. lata, petiolulo 0—0.8 cM. longo, 15—18-nervia; *paniculæ* axillares, angustissimæ, subspicatæ, in axillis foliorum solitariae; *flores* non videmus.

NEW-GUINEA: *Ledermann* no. 7972, Kais.-Wilh.land, camp Malu, 50—100 M. in alt., flowers greenish; leaflets greyish green with white midrib; very young buds on 18-VII-1912.

39. *V. Merrillii* *H. J. Lam*, prob. nov. spec. — *V. euphlebica* *Merrill*, ms.? — Arbor?; ramuli quadrangulares, glabri; *folia* probabiliter 3-foliolata; foliola chartacea, integra, lanceolata vel ovato-lanceolata, utrinque acuta, basi sæpe attenuata, in sicco supra grisea, subtus brunnea, utrinque glaberrima, eglandulosa; 7—10-nervia; 14—24 cM. longa, 8½—9½ cM. lata, petiolulo 1½—2 cM. longo; inflorescentia ignota; *calyx* 4-costatus, 4-angularis, subbilabiatus, 5-denticulatus; extus minute pubescens; 0.2 cM. longus, 0.15—0.2 cM. diametro; *corollæ* tubus glaber in parte inferiore, ceterum cum lobis 5 extus dense pubescens, intus glaber, staminum insertione sparse villosa excepta; 0.4 cM. longus; limbus bilabiatus; lobis 4, subæqualibus, 0.2 cM. longis, acutis, quinto, 0.3 cM. longo, rotundato; *stamina* tubi parte inferiore inserta, inclusa, filamentis totis villosis; *stylus* minutissime bifidus; *ovarium* depressum, abrupte minuteque apiculatum, glabrum, apice villosum; *drupe* calyce aucto dimidiatim inclusa, globosa, minute apiculata, apice villosa, 0.6 cM. longa, 0.8 cM. diametro.

PHILIPPINES: Fénix no. 15906, Bataan, Mindanao, flow. and fr. in Aug. 1912.

40. *V. Minahassæ* Koord., Med. 's Lands Pl. tuin Btz. XIX, 560 and 645 (1898). — A tree; *leaves* 5-foliolate; leaflets 23–27 cM. long, elliptical, glabrous and eglandular beneath; petioles 25 cM. long; inflorescences, flowers and fruits unknown.

Distribution: N.-Celebes.

41. *V. padangensis* Hall f., Med. 's Rijks Herb. Leid. no. 37, 46 (1918). — A tree?; branchlets with inflorescences ferruginous- or ochraceous-tomentose, glabrescent; branchlets quadrangular, *leaves* long petioled, 3–5-foliolate; leaflets lanceolate, cuspidate-acuminate, acute at base, the lower ones shorter petioluled and often unequal at base; coriaceous-membranous, glabrous and glandular on both sides except on the puberulous nerves, dark beneath and purple-violet, terminal ones 11–17 by 5–6 cM., petiolules 2–3 cM.; petioles 5–12 cM.; *panicles* terminal, thyrsoidal; with 2–6 decussate branches, 20–25 cM. long; *flowers* unknown; *drupe* ellipsoid, apiculate, black, glabrous, 2 cM. long, 1 cM. in diam.; fruiting calyx patelliform, shortly and irregularly 5-lobed, puberulous without, glabrous and violet within, 1.1 cM. in diam.

Distribution: W.-Sumatra.

42. *V. parviflora* A. Juss., Ann. Mus. Par. VII, 76 (1806); Miquel, Fl. Ind. bat. II, 865. — A shrub; branchlets round, very sparsely pubescent towards the top, glabrescent; *leaves* 3-foliolate; leaflets chartaceous, lanceolate or oblong-lanceolate, acute at apex, cuneate or subtruncate at base; margins entire; both surfaces glabrous, the lower one sparsely glandular; terminal ones 6–13 by $2\frac{1}{2}$ –5 cM., petiolules 0.8–1 cM., pairs of nerves 9–11; lateral ones 3– $10\frac{1}{2}$ by 1.4–4 cM., petiolules 0.6–0.7 cM., pairs of nerves 5–7; petioles, glabrous as are the petiolules, 2–8 cM. long; *panicles* terminal, extremely dense- and many-flowered (at least in the specimina extant), grey-tomentose, 14–22 cM. long, 12–34 cM. in diam.; *flowers* not present; *drupe* subglabrous, black, seated on or partly included in the persistent calyx, which is sparsely glandular and pubescent without.

PHILIPPINES: Elmer no. 14218, Mambajan, Camaguin-isl.,

Mindanao, Nov. 1912 — *Ramos* no. 16, Rizal, Luzon, Dec. 1909 — *Cenabre* no. 15251, Cebu, Dec. 1910.

All this specimina show a particular sterility. The flowers are not at all developed, but are replaced by great masses of tomentose bracts and bracteoles, whilst in the rudimentum of the minute buds we discovered small semilunatic, *Closterium*-like objects, which, examined by means of the microscope, showed light tips and a dark centre, these two being separated by planes concave towards the tips. They might be the eggs of any insect, by the sting of which the flowers were prevented from developing.

43. **V. philippinensis** *Merrill*, *Forest. Bur. Phil. Bull.*, I, 52.

This work was inaccessible to us.

Distribution: Philippines.

EXCLUDED SPECIES:

44. **V. premnoides** *Elmer*, *Leafl. Phil. Bot.* VIII, 2874 (1915); *Hall. f.*, *Med. 's Rijks Herb. Leid.* no. 37, 54 = *Mastixia premnoides* *Hall f.* (Cornaceæ), fide *Hallier*.

45. **V. curtifrutescens** *Elmer*, *Leafl. Phil. Bot.* VIII, 2873 (1915); *Hall. f.*; *Med. 's Rijks Herb. Leid.* no. 37, 54 = ? *Euphorbiacearum spec.*, fide *Hallier*.

46. **V. Novæ-Pommeraniæ** *Warb.*, *Engl. Jhrb.* XIII, 429 (1891) and XVIII, 208; *K. Schum. u. Lauterb.*, *Fl. D. Südsee*, 524 = *Viticipremna Novæ-Pommeraniæ* (*Warb.*) *H. J. Lam.*

DOUBTFUL SPECIMINA:

1^o. PALAU-ISL.: *Kræmer* in *H. Ber.* without nr., native name: bevór.

2^o. JAVA: ? *Horsfield* in *H. A. R.* — T. sub no. 049900 (is not *V. leucoxyton* *L.f.*: leaves glabrous beneath).

XVIII. **GMELINA** *L. Gen. Pl. ed. II, 526, (1742)¹*; *Blume, Bijdr.* 814; *Bentham and v. Mueller, Fl. Austr.*

¹) We could not find the reason, why this name (given before 1753) should be valid; we retained it, nevertheless, since it is universally used.

V, 64; *Benth.* and *Hook.*, Gen. Pl. II, 2, 1153; *Blanco*, Fl. de Fil. 492; *Schauer*, DC., Prodr. XI, 678; *Engler* u. *Prantl.* Nat. Pfl. fam. IV, 3a, 173; *Hook f.*, Fl. Br. Ind. IV, 581; *Koorders en Valeton*, Bijdr. Booms. Java no. 7, 196; *King and Gamble*, Journ. As. Soc. Bengal LXXIV, 4, 823; *Miquel*, Fl. Ind. Bat. II, 865; *Hasskarl*, 2e Cat. 's Lands Pl.tuin Btz. 135; *Roxburgh*, Fl. ind. III, 82; *Hall. f. Med.* 's Rijks Herb. Leid. no. 37, 55. — Trees or shrubs; branchlets often spinous; leaves opposite, rarely also alternate, simple, entire, usually with some large glands (extrafloral nectaries) near the base; *flowers* sometimes solitary in the axils of the leaves, usually on cymose inflorescences; *inflorescences* composed, terminal, paniculate; cymules short, decussate, few-flowered, axillary, especially the lower ones, in the axils of leaves or bracts; *calyx* persistent, truncate or 4–5-toothed, often somewhat irregular or oblique, generally with large glands, enlarged in fruit: *corolla* zygomorphous, tube narrow at base, funnel-shaped with wide throat, limb oblique, more or less 2-lipped; upper lip 2-lobed or entire, lower lip 3-lobed, midlobe largest; *stamens* 4, distinctly didynamous, inserted in the lower part of the corolla-tube, usually included, sometimes exerted; anthers with parallel fissures; *style* slender with unequally 2-lobed or subulate stigma; *ovary* (2–)4-celled and -seeded often with a central cavity; *fruit* with 1 four- or by abortion 3- or 2-seeded pyrene.

Distribution: Deccan Peninsula, Ceylon (*Trimen*), Malay Peninsula! and Archipelago!, S.-China (*Hallier*). Philippines!, Australia (*Benth.* and *v. Muell.*), Palau-isl.!

1. a. Flowers solitary in the axils of the leaves . . . 2.
- b. Flowers in cymose or racemose inflorescences . . . 3.
2. a. Base of leaves acute; lower surface glandular, not pubescent; calyx 2–2.2 cM. long 1. *G. uniflora* p. 217.
- b. Base of leaves cordate or rounded, lower surface pubescent; calyx 0.5 cM. long . . . 3. *G. arborea* p. 219.
3. a. Leaves more or less densely pubescent beneath . . . 4.

- b. Leaves glabrous beneath or pubescent on the nerves only 6.
4. a. Leaves large, 10—25 by 4—18 cM.; petioles 3—7 cM. 5.
 b. Leaves smaller, 3—9 by 2.5—5.5 cM.; petioles 0.5—1 cM.; pairs of nerves 4; corolla 4-lobed, $3\frac{1}{2}$ cM. long
 2. **G. villosa** p. 217.
5. a. Apex of leaves acute; leaves pubescent beneath; corolla 2.3—4.5 cM. long, upper lip longer than the lower one
 3. **G. arborea** p. 219.
 b. Apex of leaves obtuse or rounded; leaves more or less densely pubescent beneath; corolla 1.6—1.9 cM. long, the upper lip shorter than the lower one
 4. **G. macrophylla** p. 220.
6. a. Leaves with small, brown scales beneath, 8—10 by 4—6 cM., acute at base and at apex
 5. **G. lepidota** p. 221.
 b. Leaves without scales beneath 7.
7. a. Leaves 3— $7\frac{1}{2}$ by 1.9—4 cM.; petioles 0.8— $2\frac{1}{2}$ cM.; base acute 6. **G. asiatica** p. 221.
 b. Leaves 8—30 by $4\frac{1}{2}$ — $23\frac{1}{2}$ cM.; petioles 2—7 cM.; base obtuse or cordate, sometimes acute 8.
8. a. Calyx glabrous or nearly so 9.
 b. Calyx pubescent 10.
9. a. Base of leaf cordate-truncate 7. **G. Dalrympleana** p. 223.
 b. Base of leaf acute, decurrent 8. **G. palawensis** p. 224.
10. a. Leaves 14—30 by 10— $23\frac{1}{2}$ cM.; filaments, style and corolla within with glanduliferous hairs
 9. **G. glandulosa** p. 225.
 b. Leaves 8— $19\frac{1}{2}$ by 8— $14\frac{1}{2}$ cM.; no glanduliferous hairs 11.
11. a. Leaves ovate, margins curved; 8—14 by $4\frac{1}{2}$ —9 cM.; corolla 1.4 cM., ovary with stiff hairs at the top
 10. **G. Ledermanni** p. 226.
 b. Leaves obovate-oblong, margins straight, $14\frac{1}{2}$ — $19\frac{1}{2}$ by 8— $11\frac{1}{2}$ cM.; corolla 2 cM.; ovary glabrous
 11. **G. Schlechteri** p. 226.
- DOUBTFUL SPECIES: 12. **G. integrifolia** p. 227.
 EXCLUDED SPECIES: 13. **G. indica** p. 228.

1. *G. uniflora* Stapf in Hook. Icon. Pl. XXIV, t. 2391, (1895). — A little tree; branchlets and petioles yellowy hairy, glabrescent; leaves opposite, membranous, broad-elliptical or obovate-elliptical, base rounded or truncate, apex obtuse or shortly acuminate, upper side glabrous, lower side with dense white glands; pairs of nerves 4, a pair of large glands beneath the lower pair; 10–15 by $7\frac{1}{2}$ –10 cM.; petioles $2\frac{1}{2}$ cM.; flowers solitary in the axils of the upper leaves, pendulous; pedicels 1.3 cM. with 2 ovate bracteoles; calyx for $\frac{1}{3}$ 5-lobed; segments large, deltoid; hirsute-hairy, white-glandular, 2–2.2 cM.; corolla yellowy-white, softly hairy, white-glandular, tube $2\frac{1}{2}$ cM. long; upper lip with two small semicircular lobes, lower lip with 2 semicircular and 1 (the middle) enlarged lobe (1.0 cM. long); stamens included; style slender with subulate apex; ovary narrowed towards the top which is covered with stiff hairs, 4-celled, 4-ovuled.

BORNEO: ? *Haviland* no. 919, Sarawak, near Kuching, with oblong leaves, often subcuneate at base, 20–27 cM. long, 10 cM. broad, petioles $2\frac{1}{2}$ – $3\frac{1}{2}$ cM.; without flowers.

Distribution: Borneo.

2. *G. villosa* Roxb., Fl. ind. III, 86, (1832); Schauer, DC., Prodr. XI, 679; Elbert, Meded. 's Rijks Herb. Leid. no. 12. 16; Hook. f., Fl. Br. Ind. IV, 582; Jack, Calc. Journ. Nat. Hist. IV no. XIII, 42; Koord. en Val., Bijdr. Booms. Java no. 7, 197; *iid.*, Atl. Baumart. Java, II, 6, t. 278; Koorders, Meded. 's Lands Pl. tuin XIX, 559; Hall. f., Med. 's Rijks Herb. Leid. no. 37, 58; King and Gamble, Journ. As. Soc. Bengal, LXXIV, 4, 824; Koorders, Exk. fl. v. Java, III, 137; Kuntze, Rev. Gen. Pl. I, 507; Miquel, Fl. Ind. bat. II, 867 and Suppl. I, 242; Merrill, Bur. Gov. Lab. no. 27, 68; Zollinger u. Moritzi, Syst. Verz., 52. — *G. asiatica* Wall. Cat. no. 1818, (1828), partly. — *G. elliptica* Sm. in Rees, Cyclop. XVI (year?). — *G. inermis* Blco., Fl. d. Philipp., ed. I, 493.

(1837). — An often spinous shrub or little tree, $1\frac{1}{2}$ —2 M. high; branchlets with spines, inflorescences and petioles yellowy pubescent; spines axillary, 0.5—2 cM. long; leaves opposite, small, ovate, base cuneate or subtruncate, apex acute, sometimes (on the young shoots?) more or less acutely 3-lobed, with all intermediate forms to the larger, ovate leaves, chartaceous; pairs of nerves 4; without glands at the base; upper side when young with simple hairs; adult glabrous except on the nerves, eglandular, lower side tomentose with simple hairs; 3—6—9.2 by 2.2—4—5.5 cM.; petioles 0.5—1 cM.; inflorescences small, with many foliaceous bracts, $2\frac{1}{2}$ —5 cM. long; bracts $1\frac{1}{2}$ —2 by 0.4—0.8 cM., lanceolate or ovate-lanceolate, acuminate; calyx \pm 4-toothed, with large glands, grey-pubescent, 0.5 cM.; corolla yellow membranous, softly and sparsely hairy, upper lip entire, lower lip 3-lobed, midlobe larger, the lobes broadly rounded; greatest length of corolla 4 cM.; stamens included, the shorter pair 1 cM., the longer one 1.6 cM.; style slender, with subulate apex, $2\frac{1}{2}$ —3 cM. long, appressed against the middle lobe of the lower lip; ovary glabrous.

SUMATRA: *Elbert* in H. L.—B. sub no. 908.308—433, Tandjong Korang, 75—100 M. in alt. — *Forbes* nos. 1576 and 2342. — *Buitendijk* in H. L.—B. sub no. 914.324—226, Pulu Weh.

JAVA: *Zollinger* nos. 565 and 696, near Rogodjampi. — *Junghuhn*, pl. ined. no. 524. — *Elbert* nos. 465 and 464, Kendeng Trinil, Madiun, 100—150 M. in alt.

LOMBOK: *Elbert* no. 750, mt. Rindjani, Sadjang, northern slope, 500—750 M. in alt., flow. on 30-IV-1909.

SUMBAWA: *Elbert* no. 3909, Bima, Ui-ut, S.-E.-slope towards Waworada-bay, 0—200 M., with buds on 13-XII-1909; *id.* no. 3676, Bima, Kolo-mounts, W.-slope, 200—375 M., fr. on 8-XII-1909. — *Colfs* nos. 126 and 212, the latter with buds in Nov. 1879.

CELEBES: *Elbert* no. 3001, Rumbia, Liano, 25—150 M., fr. on Sept. 12th, 1909; *id.* no. 2619; Buton. isl., Bau-Bau, 0—75 M.; *id.* no. 3038, Rumbia, Pu-ubi, 125—645 M.; *id.* no. 3058, Rumbia, Lankawala-river, flow. on 17-IX-1909. — *Forsten*, in H. L.—B. sub no. 908.267—844, with buds on 12-X-1841. — *Weber*, in H. L.—B. sub no. 898.112—522, Saleyer-isl.

BORNEO: *Winkler* no. 2270, Hayup.

AMBOYNA: *Forsten* in H. L.—B. sub no. 908.267—889, flow. on 13-V-1842.

PHILIPPINES: *Whitford* no. 11809, Cotabato, Mindanao, flow. in March 1912. — *Elmer* no. 9646, Dumaguete (Cuernos Mts.), Negros oriental, Negros, with buds in March 1908.

PALAU-ISLANDS: *Ledermann* no. 14164a, Korrör, 20—40 M. in alt.; native name: kalngebard; with buds on Febr. 11th, 1914. — *Raymundus* no. 44, Korrör; native name: gangabard.

Distribution: Nicobars, Burma, Siam (*King and Gamble*), Malay Peninsula and Archipelago!, Philippines!, Palau-islands!

3. *G. arborea* *Roxb.*, Fl. Ind. III. 84, (1832); *Schauer*, DC., Prod. XI, 680; *Hall. f.*, Med. 's Rijks Herb. Leid. no. 37, 58; *Hook. f.*, Fl. Br. Ind. IV, 581 — *G. Rheedii* *Hook.*, Bot. Mag. t. 4395. — *Premna arborea* *Roth.* Nov. Pl. Sp. 287. — *P. tomentosa* *Miq.* ex *C. B. Clarke* in *Hook. f.*, Fl. Br. Ind. IV, 581 in Pl. Hohenack. no. 554. — A tree; branchlets, inflorescences and petioles farinose; leaves opposite, ovate, base cordate, abruptly decurrent, apex acuminate, upper surface adult glabrous, lower surface grey-hairy, near the base with 2—4 large glands; 10—25 by 4—18 cM.; petioles 5—7 cM.; inflorescences composed, paniculate, 15 cM. long, cymules few-flowered, sometimes reduced to 1 flower, decussate; flowers large, pendulous; calyx without glands, with 5

acute teeth, 0.5 cM.; *corolla* yellow, 2.3 cM., sometimes reaching 4.5 cM., softly pubescent; tube somewhat longer than the calyx; the 2-lobed upper lip larger than the 3-lobed lower lip; *stamens* 4, didynamous, the 2 longer ones as long as the upper lip; *drupe* ovoid, yellow.

Distribution: British India, Malaya, Philippine Islands (*Hallier*).

4. *G. macrophylla* Wall. Cat. no. 1819 (1828); *Schauer*, DC., Prodr. XI, 680; *Miquel*, Fl. Ind., bat. II, 867; *Hall. f. Med.* 's Rijks Herb. Leid. no. 37, 56. — *Vitex moluccana* Bl., Bijdr. 813 (1826); *Schauer*, l.c. 695; *Miq.* l.c., 865. — A tree; branchlets quadrangular, with cymes and petioles densely ferruginous-tomentose; *leaves* opposite, coriaceous or chartaceous, broadly ovate or subrotundate, base truncate or slightly cordate, apex obtuse or rounded; both surfaces pubescent when young, the lower one only when adult, the upper adult glabrous, except on the nerves; pairs of nerves 8—10(—11); 2—4 large glands below the lowest pair; lamina with a distinct reticulation beneath; 14—19—32 cM. long, 10—18 $\frac{1}{2}$ —23 cM. wide; petioles 3—4 $\frac{1}{2}$ —6 cM.; *inflorescences* paniculate, leafed below, terminal, pyramidate, many-flowered, 15—20 cM. long, 13—20 cM. wide; *calyx* subtruncate or with 5 rather large, deltoid, irregular teeth, densely appressedly pubescent without and with some large glands, 0.6—0.9 cM.; *corolla* 2.5—2.7 cM. long, yellow, limb oblique, tube subcylindrical, 0.7—1.2 cM. long, 0.6 cM. wide; lobes 5, subequal, subacute, 0.6—0.9 cM. long; outer side densely golden-yellow pubescent, except for the lower part of the tube; tube with some glanduliferous hairs, lobes minutely puberulous within; *stamens* 4, didynamous, 0.7 and 0.8 cM. long; filaments with some common and some glanduliferous hairs; connectives increased; *style* stout, with glanduliferous hairs; 1.2 cM. long; stigma unequally bifid; *ovary* glabrous, 4-celled, 4-ovuled.

NEW-GUINEA: *Schlechter* no. 16441, near Wobbe, 200 M., flow. on Aug. 30th, 1907.

Distribution: Amboyna!, Molucca-isl.? (*Hallier*), New-Guinea!

Of *G. macrophylla* *Wall.* (1828) and *G. macrophylla* *Benth.* (1870) the first is to be retained. So the latter was to be changed (see under *G. Dalrympleana*). Its affinity is with *G. Dalrympleana*, from which it is different, however, by the texture of the leaves and young parts, the obtuse apex, the subequal corolla-lobes, and the yellow (not blue) corolla.

5. *G. lepidota* *Scheffer*, *Ann. Jard. bot. Buitzg.* I, 41 (1876). — A somewhat climbing shrub; branchlets, cymules and petioles ferruginous-pubescent; leaves ovate or elliptical, both sides acute, or apex shortly acuminate, glabrous above, shining, with minute dense brown scales beneath; pairs of nerves 4–6; 8–10 by 4–6 cM.; petioles 2½ cM.; *inflorescences* paniculate, lax, pyramidate, terminal; *calyx* with 5 short teeth, 0.5 cM.; outer side scaly, in fruit enlarged to 0.8 cM.; *corolla* large, pubescent without, 1.8 cM.; tube thrice the length of the smaller lobes; limb 2-lipped, upper lip 2-lobed, lower lip 3-lobed, midlobe longer; *stamens* 4, with hairy filaments; *ovary* 4-celled, 4-ovuled; *drupe* 1 cM. long, with one 1–3(–4)-celled pyrene.

Distribution: New-Guinea (Faw-island).

Its affinity is with *G. Leichhardtii* *F. v. Muell.* from tropical Australia. The latter species, however, is a tree and differs from the present one in the texture, and in the dimensions of calyx and corolla.

6. *G. asiatica* *L.* sp. pl. ed. I, 873 (626?) (1753); *Blume*, *Bijdr.* 814; *Blanco*, *Fl. Fil.* ed. I, 492; *Schauer*, *DC.*, *Prodr.* XI, 679; *Hook. f.*, *Fl. Br. Ind.* IV, 582; *Hall. f.*, *Med. 's Rijks Herb. Leid.* no. 37, 59; *Hassk.* 2^e *Cat. 's L. Pl. tuin Btz.*, 135; *King and Gamble*, *Journ. As. Soc. Bengal* LXXIV, 4, 823; *Koord.*, *Pl. Jungh. ined.*, *Jungh. gedenk.*, 188; *Miq.*, *Fl. Ind. bat.* II, 866; *Merrill*, *Bur. Gov. Lab.* no. 27, 68; *Roxb.*, *Fl. ind.* III, 87;

Zollinger u. *Moritzi*, Syst. Verz. 52. — *G. bracteata* *Burck*, Ann. Jard. bot. Btz. X, 98, tab. VII, fig. 5—6, (1891). — *G. coromandeliana* *Burman* f., Fl. Ind. 132, (1768). — *G. Finlaysoniana* *Wall.*, Cat. no. 6317, (1828). — *G. Hystrix* *Schult.* ex *Kurz* in Journ. As. Soc. Bengal XXXIX, II, 81, (1870); *Hook. f.*, l.c. 582; *Hall. f.*, l.c. 58; Bot. Mag. tab. 7391; *Williams*, Bull. Herb. Boiss., sér. II. T. V, 431. — *G. lobata* *Gaertn.* Fruct. II, 268, (1788). — *G. parviflora* *Roxb.*, Pl. Corom. II, 32, t. 162, (1795—1819); *Blume*, l.c. 814; *Schauer*, l.c., 679; *Miq.*, l.c. 866. — *G. philippinensis* *Cham.*, Linnæa VII, 109, (1832). — *Michelia spinosa* *Amman*, Act. Petrop., VIII, 218, t. 18, (1878). — A shrub; branchlets, spinous or unarmed, with inflorescences and petioles somewhat pubescent; leaves opposite and sometimes also alternate, coriaceous, dark and glabrous above, glabrous and densely glandular beneath, nerves somewhat pubescent; pairs of nerves 3—4; no glands at the base, but some dispersed ones on the lower side; rotundate or obovate, base decurrently attenuate, apex rounded or shortly, obtusely acuminate; 3—5½—8 by 1.9—3.7—4½ cM.; petioles 0.5—1.6 cM.; inflorescences 2—2½—5 cM. long, terminal; bracts leafy, ovate or ovate-lanceolate, acuminate, softly pubescent on both sides, ultimately subglabrate, 1.8—3.5 by 1—2 cM.; calyx 0.4 cM. long and wide, shortly and irregularly 4-toothed or subtruncate, tomentose, with 1—7 large glands on one side; corolla 3—4 cM., yellow, softly pubescent without, sometimes with some large glands: drupe glabrous, 1.8 cM. long, 0.9 cM. in diam.

BANKA: *Hallier* no. c. 124 (*G. bracteata*).

BORNEO: *Korthals*(?), in H. L.—B. sub. no. 908.266—880.

LUZON: *Ramos* no. 338, Antipolo, Rizal, fr. in July 1910. — *Lilles* no. 13, Lamao, Bataan, flow. in March 1909. — *Elmer* no. 8934, Baguio, Benguet, fr. in March 1907.

Distribution: Mauritius (*Hallier*), Deccan Peninsula, Ceylon, Bengal, Siam (*Hook. f.*), Philippine Islands!, Borneo!, Banka!, Sumatra (*Hallier*), Java (*Miquel, Blume*), Malay Peninsula (*King and Gamble*); often (always?) cultivated.

The species has an affinity with *G. villosa*, with which it is confounded, but differs very distinctly from it, among other things, by its glabrous leaves.

7. *G. Dalrympleana* (*F. v. Muell.*) *H. J. Lam*, nov. nom. — *G. macrophylla* *Bentham*, Fl. Austr. V, 65, (1870); *Pulle* in *Lorentz*, Nova Guinea, VIII, 2, 402; *F. v. Mueller*, Descr. notes on pap. pl. VIII, 46; *Schumann* u. *Lauterbach*, Fl. D. Schutzgeb. Südsee, 524; *Schumann* u. *Hollrung*, Fl. Kais.-Wilh.-land 120. — *Vitex macrophylla* *R. Br.*, Prodr. 512 (1827); *Schauer, DC.*, Prodr. XI, 695. — *V. Dalrympleana* *F. v. Muell.*, Fragma. IV, 128 (1858). — A large tree; branchlets, inflorescences and petioles minutely hairy, glabrescent; leaves broadly ovate, base cordate or rotundate, apex subobtusely acuminate, opposite, coriaceous; both surfaces glabrous, shining; nerves somewhat hairy (simple hairs); pairs of nerves 7, reticulation very indistinct, 0—10 large glands beneath and above the first pair of nerves, concave on the lower, convex on the upper surface (extrafloral nectaries), 10—27 by 7—16 cM.; petioles 2—3 cM.; inflorescences long 15—21, 4—6 cM. in diam.; cymules in the axils of leaves or more or less foliaceous bracts; calyx 0.5 cM., glabrous, truncate or somewhat sinuate, often irregularly cleft, with several large glands; corolla bright-blue, 1.8 cM., appressedly pubescent without, except lower part of tube, glabrous within, throat somewhat papillose; limb oblique, lobes 5 subacute, 0.6—0.8 cM. long, the middle one of the lower lip longer; stamens inserted in the lower part of the corolla-tube; filaments flattened, glabrous; anthers 2-lobed, connectives thickened; style stout, with some glanduliferous

hairs near the unequally bifid stigma; *ovary* glabrous; *drupe* 1.3—1.8 cM. long; central cavity large.

NEW-GUINEA: *Branderhorst* no. 23.

Distribution: tropical Australia (*Benth.* and *v. Muell.*), New-Guinea!

Its affinity is with *G. macrophylla*; for difference see under that species.

Schumann in *Schum. u. Hollrung*, l.c., speaks of *ant-hollows* at the base of the leaves, which should have an opening, but we take them for nothing else but extra-floral nectaries, finding them convex in the upper, and concave in the lower surface of the leaf. (cf. *Burck* in *Ann. d. Jard. bot. Btzg.* X, 98). The species as *Bentham* describes it, seems not to possess the large glands at the base of the leaves; *Schumann* too, found the leaves of australian specimina without glands. As, however, their number is much varying in 1 plant, we described no varieties, concerning the presence and absence of the nectaries.

8. *G. palawensis* *H. J. Lam*, nov. spec. — *Arbor* mediocra, 10—12 M. alta, ramulis cylindricis, cortice griseo-brunneis, multis lenticellis; *folia* membranacea vel subchartacea, late ovata, basi plerumque decurrentia, interdum subrotundata, apice acuminata, interdum obtusa; pagina superiore atroviridia, nitida, glabra, inferiore luteo-viridia, glabra, basi nonnullis glandulis sub et supra nervis primis insidentibus suffulta; nervis utrinque 4—7; 8—23 cM. longa, 6—11 cM. lata, petiolo glabro 2½—8 cM. longo; *inflorescentiæ* longæ, racemiformes, infra foliatæ, nodis puberulis exceptis glabræ, 10—15 cM. longæ, 3—4 cM. latæ, pedunculo 1½—5½ cM. longo; bracteis foliaceis, 0.3—0.8 cM. longis, 0.1—0.3 cM. latis, glabris; pedicellis 0.3—1.2 cM. longis; *calyx* glaber, integer, cupuliformis, glandulis magnis vestitus, 0.35—0.45 cM. longus; *corolla* parte inferiore excepta, extus dense aureo-fulve pubescens, intus glaberrima, alba, labio inferiore cœruleo, maculis sulfureo-luteis; lobis 5 subæqualibus, labii superioris bilobi 0.5 cM. longis, 0.25 cM. latis, labii inferioris trilobi lateralibus 0.65 by 0.3 cM.,

mediano 0.8 by 0.35 cM. dimensionibus; tubo 1—1.3 cM. longo; *stamina* 4, inclusa, didynamia, filamentis crassis, pilis simplicibus infra, glanduliferis supra, 0.7—0.9 cM. longis; *stylus* glaber, crassus, ovario glabro, globoso insidens, stigmatate valde inæqualiter bifido, lobo altero 0.2 cM. longo, altero minuto, lobis subulatis.

PALAU-ISL.: *Ledermann* nos. 14420 (Babelthaop, Ngarsul, 200—300 M. in alt., flow. on 24-II-1914), and 14331 (same locality, with buds on 21-II-1914; native name: blaheos). — *Raymundus* nos. 114 and 310 (Korror; native name: blachaiösch).

9. *G. glandulosa* *Hallier f.* in *Meded. 's Rijks Herb. Leid.*, no. 37, 57 (1918). — A tree?; branchlets round, somewhat quadrangular at the tips, with inflorescences sparsely and minutely pubescent; *leaves* large, thick-chartaceous, ovate-oblong or ovate, often subtetragonous; margins entire; base cordate; apex acuminate; upper side glabrous, nerves channelled, somewhat pubescent; lower side glabrous, nerves with the distinct reticulation, prominent and somewhat pubescent; eglandular; pairs of nerves 6—8; some large glands beneath the lowest pair, rarely also above it; 14—30 cM. long, 10—23½ cM. broad; petioles glabrous; 2—7 cM. long; *panicles* large, ample, with small, 0.4 cM. long, lanceolate bracts; flowers subsessile; *calyx* campanulate or cupuliform, margin irregularly undulate, densely and softly pubescent, with some (often 5—6) large glands on one side (the lower?); 0.5 cM. long, 0.4 cM. wide; *corolla* (only seen in bud) densely, softly pubescent, except the lower part of the tube, inner side with filaments and style with glanduliferous hairs; *stamens* with bilobed anthers; *style* with unequally bifid stigma; ovary glabrous.

BANDA: *de Vriese en Teysmann*, in H. L.—B. sub no. 908.267—280. (*de Vriese*: Java?, Amboyna?) —? *Reinwardt*

no. 1362, in H. L.—B, sub no. 909.109-410. — H. A. R.—T. sub no. 044155, H. Bog. no. 5158.

Distribution: Banda!, (Java?? Amboyna?).

10. **G. Ledermanni** H. J. Lam, nov. spec. — Arbor, 25—30 M. alta; ramuli, inflorescentiæ, petioli minute pubescentes, glabrescentes; *folia* coriacea, opposita, late ovata, vel ovato-rotundata; basi late rotundata vel leviter cordata, apice rotundata, abrupte obtuseque acuminata, adulta supra glabra, eglandulosa, subtus glabra, nervo primario subpubescens, subglandulosa; nervis secundariis utrinque 6—8, glandulis magnis 2, sub nervos infimos; 8—14 cM. longa, 4.5—9 cM. lata, petiolo 2—4 cM. longo; *inflorescentiæ* paniculatæ, pyramidales, 13—25 cM. longa, 2—4 cM. lata, terminales, cymulis in axillis bractearum rotundarum, utrinque pubescentium; *calyx* pubescens, irregulariter 5-dentatus vel sinuatus vel subtruncatus, nonnullis glandulis magnis suffultus, 0.3 cM., post anthesin auctus, 0.5 cM.; *corolla* fulvo-lutea, 1.4 cM. longa, extus appresse pubescens, tubo 0.7 cM. longo, limbo obliquo, margine intus pubescente, bilabiato, labio superiore parvo bilobo, inferiore majore trilobo, lobo medio majore; *stamina* 4, paulo exserta; *stylus* filiformis, apice subulatus, non bifidus; *ovarium* glabrum, apice pilis rigidis vestitum, 4-loculare, 4-ovulatum; *drupa* 1-pyrena, 4-ocularis, 4—1-sperma, loculo centrali, cœrulea.

NEW-GUINEA: *Ledermann*, no. 6537, Malu near Sepik-river, 60 M. in alt., common; flow. on March 3rd, 1912; *id.* no. 10455a, same locality. — *Schlechter*, without nr.; near Dschischugari, 800 M., with buds on May 25th, 1909.

Our species has a close resemblance with *G. Dalrympleana*, but differs from it by its smaller leaves which never have more than 2 basal glands, its narrower inflorescence, its glabrous calyx, and its yellow corolla.

11. **G. Schlechteri** H. J. Lam, nov. spec. — Arbor magna; ramuli, petioli glabriusculi, inflorescentia ferrugineo-

pubescens; folia opposita, solide chartacea, oblonga, vel obovato-oblonga, basi truncata vel late cuneata, apice acuta vel breviter acuminata, adulta utrinque glabra, nervis subpubescentibus, nervis secundariis utrinque 6—7(—8), nonnullis glandulis majusculis sub nervos infimos; *inflorescentiæ* terminales, pyramidales, basi foliosæ, cymulis in axillis bractearum lanceolarum foliacearum, 0.5—1 cM. longarum; *calyx* obsolete 5-dentatus vel truncatus dense adpresse pubescens, interdum nonnullis glandulis majusculis suffultus, 0.4 cM. longus et diametro; *corolla*, tubo 1.0—1.05 cM. longo, parte inferiore glabro, ceteroquin cum lobis extus adpresse pubescente, intus glabro; limbo obliquo bilabiato, laciniis 4 subæqualibus 0.7 cM. longis, majore 1 cM. longo, intus minute pubescente; *stamina* inclusa, filamentis glabris vel nonnullis pilis glanduliferis suffulta; *stylus* filiformis, nonnullis pilis glanduliferis suffultus, stigmate inæqualiter bifidus; *ovarium* glabrum.

NEW-GUINEA: *Schlechter*, no. 17042, in the woods of the Kaiu-mountains, 1000 M., flow. on Dec. 25th, 1908.

A species, well characterized by its obovate-oblong leaves, its truncate, pubescent calyx, and its glabrous ovary.

DOUBTFUL SPECIES:

12. *G. integrifolia* Hunter ex Ridl. in Journ. As. Soc. Straits, LIII, 101 (Sept. 1909); *Hall. f.*, Med. 's Rijks Herb. Leid. no. 37, 58 (sub *G. villosa*). — A large shrub, with awl-shaped, acute, horizontal spines; *leaves* usually entire, opposite, petioled, ovate, obtuse, roughish above, downy below; *racemes* simple, terminal, few-flowered; *flowers* large, yellow; structure as in the generic character; *drupe* rounded, smooth, of a greenish yellow; *pyrene* obovate, 3-celled, smooth; one cell barren; *seeds* solitary, obovate, concave without, flat within.

Distribution: Penang.

Hallier, l.c., thinks that it is identical with *G. villosa*, and decides in this sense, apparently from the description only. It is our opinion, that we are not justified to do so, not having been able to examine an authentic specimen. It certainly is not

the same as *G. asiatica* L., as *Hunter* himself seems to think.

EXCLUDED SPECIES:

13. *G. indica* *Burman* f., Fl. ind., 132 (1768) = ? *Flacourtia* spec., fide *Hall. f.*, Med. 's Rijks Herb. Leid. no. 37, 60.

Subtribe E. CLERODENDREÆ.

XIX. FARADAYA *F. v. Mueller*, *Fragm.* V, 21. (1865); *Bentham* and *v. Mueller*, Fl. Austr. V, 69; *Bentham* and *Hooker*, Gen. pl. II, 2, 1154; *Engler* u. *Prantl*, Nat. Pfl. fam. IV. 3a, 173. — Trees, sometimes shrubs, erect or climbing; innovations glabrous or somewhat pubescent, sometimes tomentose; leaves simple, opposite or verticillate, usually glabrous, chartaceous or coriaceous, entire; inflorescences cymose, axillary or terminal often forming a large terminal panicle; calyx, closed when young with a more or less long and subulate apex, adult cleaving up into 2 or 3 lobes, which may be each 2 or more-toothed; corolla rather large, tube long, widening towards the top, lobes 4, subequal, rarely 5; stamens usually long, didynamous (2 being inserted in the middle of the corolla-tube, and 2 upon its base) or subequal and then inserted either in the throat of the corolla or near its base; rarely 5; filaments often hairy, especially at their basal parts; style long, glabrous; stigma subulate, shortly bifid or sometimes funnel-shaped; ovary 4-celled, 4 ovuled; fruit large, drupaceous, with 1 often 4 (or abortively less)-lobed, 4-seeded pyrene or 4 nearly free, 1 seeded pyrenes.

Distribution: New-Guinea!, tropical Australia.

1. a. Stamens distinctly didynamous 2.
- b. Stamens not distinctly or not didynamous 4.
2. a. Flowers very large, calyx $2\frac{1}{2}$ — $5\frac{1}{2}$ cM. long, corolla-lobes 5 cM. long, 2-lobed down to the middle; stamens 14 cM. long or more . . . 1. *F. magniloba* p. 229.
- b. Flowers smaller, calyx reaching $2\frac{1}{2}$ cM., corolla-lobes $2\frac{1}{2}$ cM., stamens $7\frac{1}{2}$ cM. 3.

3. a. Lower side of leaves with stellate scales
2. **F. squamata** p. 230.
- b. Lower side of leaves without scales
3. **F. Albertisii** p. 230.
4. a. Flowers very large, calyx $2\frac{1}{2}$ — $5\frac{1}{2}$ cM., corolla-lobes 5 cM., 2-lobed down to the middle; stamens 14 cM. long or more 1. **F. magniloba** p. 229.
- b. Flowers smaller, calyx reaching $2\frac{1}{2}$ cM., corolla-lobes $2\frac{1}{2}$ cM. 5.
5. a. Lower side of leaves with stellate scales
2. **F. squamata** p. 230.
- b. Lower side of leaves without scales 6.
6. a. Stamens inserted in the throat 7.
- b. Stamens inserted near the base of the corolla-tube 9.
7. a. Base of leaves 3-nerved; the lowest pair of nerves reaching the middle of the leaf; corolla-tube $\frac{1}{2}$ —1 cM.
4. **F. parviflora** p. 231.
- b. Base of leaves not distinctly 3-nerved; the lowest pair of nerves not reaching the middle of the leaf; corolla-tube 1.5—1.7 cM. 8.
8. a. Leaves 12—15-nerved, without basal glands
5. **F. nervosa** p. 232.
- b. Leaves 5—7-nerved, with basal glands
6. **F. dimorpha** p. 233.
9. a. Filaments stout, glabrous at the base; leaves golden-yellow tomentose beneath 7. **F. chrysoclada** p. 234.
- b. Filaments slender, villous at the base; leaves glabrous beneath 10.
10. a. Leaves opposite; pedicels 0.3—1.4 cM.; corolla glabrous
8. **F. splendida** 234.
- b. Leaves ternate; pedicels very short; corolla pubescent
9. **F. ternifolia** p. 236.
1. **F. magniloba** *Wernham* in *Ridley*, Rep. o. t. Bot. Woll. Exp. in Trans. Linn. Soc. IX, 1, Bot. 2nd Ser., 136 (1906). — A shrub; branchlets striate, glabrous; leaves opposite, solidly chartaceous, elliptical, base obtuse, apex very shortly acuminate; pairs of nerves 6; 18 by 8 cM.;

petioles, often twisted, 3—4 cM.; *flowers* large, white; *calyx* 2-lobed almost down to the base; lobes 2—5 cM., very acutely acuminate; *corolla* glabrous; tube cylindrical, upper part funnel-shaped, folded, $3\frac{1}{2}$ —4 cM.; lobes very large, 5 cM. long, each 2-lobed down to the middle; *filaments* very long, 14 cM. or more, hairy at the base; anthers 0.4—0.5 cM., the cells free at the base; *ovary* sparsely hairy.

Distribution: Dutch New-Guinea.

2. *F. squamata* H. J. Lam, prob. nov. spec. — Frutex scandens; ramuli glabri vel glabrescentes; *folia* ternato-verticillata, coriacea, oblongo-elliptica, basi leviter vel modice cordata, apice acuminata, supra glabra, nitida, subtus glabra, glanduloso-punctata, multis squamis stellatis vestita; nervis valde prominentibus utrinque 8, tomentellis; 24 cM. longa, 10 cM. lata, petiolo $1\frac{1}{2}$ cM. longo, transversaliter pliato-alato, 0.4 cM. diametro; *cymis* pedunculatis, ramulorum apicem versus condensatis, tomentelli, inflorescentiam terminalem compositam subumbelliformem formantes; *calyx* novellus longe subulate acuminatus, tomentellus, 1—1.3 cM. longus, alabastri acumine 0.2—0.4 cM. longo, pedicellis 0.5 cM. longis; *stamina* 4, alba, fauce inserta; flores albi; alabastra tantum videmus.

NEW-GUINEA: *Ledermann* no. 13117, Felsspitze, near Kais.-Augusta-river, with buds on Sept. 24th, 1913.

Although the specimen was an incomplete one, we think to be allowed to base upon it a new species being characterised by its ternate leaves, the stellate scales on their lower side, and its dense inflorescence.

3. *F. Albertisii* F. v. Mueller, Descr. notes on pap. pl., VIII, 46 (1886); *Pulle* in *Lorentz*, Nova Guinea, VIII, 2, 402 and VIII, 4, 686. — A climbing shrub, sometimes a little tree?; young parts sparsely hairy, glabrescent; *leaves* oblong or ovately oblong, base slightly cordate, apex shortly subabruptly acuminate, coriaceous, glabrous on

both sides as are petioles, pairs of nerves 6—9(—10); 11—17—23 by $4\frac{1}{2}$ —10—13 cM.; petioles $1\frac{1}{2}$ — $3\frac{1}{2}$ — $5\frac{1}{2}$ cM.; apex 1—2 cM.; *cymes* axillary, shorter than the leaves, reaching $3\frac{1}{2}$ cM. without the flowers; *calyx* glabrous, adult cleft up to the middle; lobes 2, acuminate; $2-2\frac{1}{2}$ cM. long; pedicels 0.5—1 cM.; *corolla* with long slender tube, funnel-shaped towards the top, glabrous, inner side with papillose hairs near the insertion of the stamens; tube $3-3\frac{1}{2}$ cM., lobes broadly ovate, rounded, 2 cM. long, $1\frac{1}{2}$ cM. broad; *stamens* didynamous, 2 being inserted near the base of the corolla-tube and 2 in the middle part of it; filaments of the longer pair 5—6, that of the shorter one $4\frac{1}{2}$ —5 cM. long, hairy at the base (hairs short and thick); *style* slender, glabrous, with very shortly bifid stigma, 6— $6\frac{1}{2}$ cM.; *ovary* 4-furrowed, densely hairy.

NEW-GUINEA: *Versteeg* no. 1075, Dutch-N.-G., flow. on May 12th, 1907 — *v. Römer* no. 284, Dutch-N.-G. with buds on Sept. 15th, 1909.

Distribution: tropical Australia (*v. Muell.*), New-Guinea!

4. **F. parviflora** *Warburg*, in Engl. Jhrb. XVIII, 208, (1894); *Schumann* u. *Lauterbach*, Fl. D. Schutzgeb. Südsee, 524. — A climbing shrub; branchlets, cymes and petioles sparsely minutely hairy, glabrescent, 3-ribbed towards the top; leaves ternate, ovate, base cordate or cuneate, apex obtusely acuminate or acute, chartaceous, pairs of nerves 4—6; base 3-nerved, the lower pair of nerves reaching the middle of the leaf; some glands in the axils of and beneath the lower pair of nerves; both sides glabrous, shining, the nerves minutely pubescent beneath; 10—15 by $3\frac{1}{2}$ —8 cM.; petioles 2—3 cM.; *cymes* axillary, forming a large terminal inflorescence, with narrow, foliaceous, 2—4 cM. long bracts; main peduncle 12—16 cM., smaller peduncles (of cymes) 2—4 cM. long; pedicels 0.5 cM.; *calyx* glabrous, 1 cM., for $\frac{1}{3}$ or $\frac{1}{2}$ 2—3 lobed, lobes obtuse;

corolla white, tube 0.5—0.7 cM., glabrous, lobes $1\frac{1}{2}$ —2 cM. long with sometimes fimbriate margins; *stamens* white, inserted in the throat, glabrous, $5\frac{1}{2}$ cM. long; *style* slender, $5\frac{1}{2}$ cM. long, with shortly bifid stigma; *ovary* white-hairy, 4-furrowed.

Var. α typica H. J. Lam. nov. var. — *folia* basi cordata, apice obtuse acuminata, 10—14 cM. longa, 8 cM. lata.

Distribution: New-Guinea.

Var. β angustifolia H. J. Lam, nov. var. — *folia* basi cuneata, apice acuta, 12—15 cM. longa, $3\frac{1}{2}$ —6 cM. lata.

NEW-GUINEA: *Ledermann* no. 13021 and 13022; Felspitze near Kais.-Aug.-river, in the woods of the mountains, 1400—1500 M., flow. on Aug. 20th, 1913.

Distribution of the species: New-Guinea.

5. *F. nervosa* H. J. Lam, nov. spec. — Arbor magna, 30 M. alta; *folia* elliptico-oblonga, coriacea, basi subacuta, apice obtusiuscule acuminata, supra glabra, subtus glabra praeter nervos (puberulos), nonnullis pilis crassis vestitos; nervis utrinque 12—15; $13\frac{1}{2}$ —19 cM. longa, $6\frac{1}{2}$ — $8\frac{1}{2}$ cM. lata, petiolo $1\frac{1}{2}$ — $2\frac{1}{2}$ cM. longo; *inflorescentia* ignota; *calycem* per anthesin non videmus; *corolla* alba, glabra, tubo brevi, 1.7 cM. longo, cylindrico, lobis lato-rotundatis, interdum bilobis, $1\frac{1}{2}$ —2 cM. longis; *stamina* 4, fauce inserta, filamentis glabris, 4—5 cM. longis; *stylus* filiformis, stigmatibus subulato; *ovarium* non videmus; *fructus* maximus, 4 vel abortu 3—1 pyrenis basi connatis, elongatis, monospermis, glabris, nonnullis glandulis magnis tectis, 2—8 cM. longis, 0.6—2.5 cM. latis; *calyx fructifer* usque ad basin bilobus, lobis minute puberulis, acuminate bifidus, glandulis magnis tectus.

NEW-GUINEA: *Lauterbach* no. 2822, Bismarck-plain, 150 M.; flowers (corollæ) found on the soil on Sept. 9th, 1896.

Our species, though based upon an incomplete specimen, is well distinguished by its many-nerved leaves, and shows an affinity with *F. dimorpha*, which, however, has only 5—7 pairs

of nerves, and possesses glands in the axils of its lower nerves. Moreover, it has very large fruits.

6. *F. dimorpha* *Pulle*, in *Lorentz*, Nova Guinea, VIII, 4, 686 (1912); *id.* VIII, 2, 402. — A small tree (or climbing shrub?); branchlets, etc. glabrous; leaves coriaceous, ovate-oblong or oblong-lanceolate, base rounded, or slightly cordate, apex abruptly or gradually acuminate; opposite or ternate (not on the same plant?); glabrous on both sides; pairs of nerves 4—7; 0—10 glands in the axils of the lower pair; 9—14 by $2\frac{1}{2}$ — $7\frac{1}{2}$ cM.; petioles 0.4—2.2 cM.; *cymes* axillary on 3—6 cM. long peduncles, crowded, forming a large terminal inflorescence, 9 cM. long, 14 cM. wide, with large, foliaceous bracts, diminishing towards the top; *calyx* in bud subobtusate, for $\frac{1}{2}$ cleaving up into two or three subobtusate lobes; 0.9—1 cM. long, glabrous, with some large glands; pedicels 0.5—0.7 cM.; *corolla* glabrous, white (or red?), tube 1.4—1.5 cM., lobes 1—1.3 cM. long, outer side glabrous or with some long hairs; *stamens* inserted in the throat, glabrous, 4—5 cM.; *style* 5— $6\frac{1}{2}$ cM., with somewhat increased stigma; *ovary* tetragonous, 4-furrowed, densely hairy; *fruit* a deeply 4-lobed drupe or the 4 cells almost free; large, often 1—3 cells abortive; cells 1-seeded, sometimes slit up on the inner side, woody, 4— $5\frac{1}{2}$ cM. long, sometimes sparsely hairy.

NEW-GUINEA: *Versteeg* no. 1045, Dutch-N.-G., with buds on May 9th, 1907. — *v. Römer*, no. 146, North-river, flow. on Sept. 7th, 1909. — ? *Moszkowski* no. 432, Paraido, flow. in Dec. 1910. — ? *Weinland* nos. 180 and 183, near Bumi-river, flow. in May 1890. —

We are not sure about the fact, whether ternate and opposite leaves occur on the same tree. If this should not be the matter — which could not be affirmed by the examination of the specimina seen — this should be a legitimate reason for founding 2 varieties: a *var. α opposita* and a *var. β ternata*. So *Pulle's*

observation, that the leaves of the ternate form should, in shape and in dimensions, be different from those of the opposite form, should agree with this supposition.

7. *F. chrysoclada* K. Schumann in K. Schum. u. Lauterb., Fl. D. Schutzgeb. Südsee, Nachtr. 370, (1905). — A shrub; branchlets, cymes and petioles densely golden-yellow tomentose; leaves opposite, coriaceous, obovate, base cuneate, sometimes cordate, apex obtuse or subrotundate, upper side glabrous except on the nerves, lower side with a dense golden-yellow texture; pairs of nerves 6—8; 13—18 cM. by 9—10 cM.; petioles $1\frac{1}{2}$ — $2\frac{1}{2}$ cM.; inflorescences terminal, cymes crowded towards the top of the branchlets, the peduncles perpendicular to the rhachis; rhachis 1 cM. in diam. or more; panicles 6 cM. long, 10 cM. wide; calyx for $\frac{1}{2}$ 3-lobed, glabrous or with some hairs; inner side glandular; 1.3—1.5 cM.; the 1, 2 or 3 lobes often shortly 2-toothed; corolla glabrous, tube 1.7 cM.; lobes obovate, 1.3 cM. long, 1.1 cM. broad; stamens 5—6 cM., filaments slender, thickened near the base, inserted near the base of the corolla-tube, glabrous; anthers, when ripe, with nearly free cells, which are often divaricating at an angle of 180° or more; style 6— $6\frac{1}{2}$ cM., with funnel-shaped stigma; ovary glabrous.

Distribution: New-Guinea (Astrolabe Range).

8. *F. splendida* F. v. Mueller, Fragm. phyt. V. 21 (1865); Bentham and v. Mueller, Fl. Austr. V, 69; Bot. Mag. t. 7187; Schumann u. Lauterbach, Fl. D. Schutzgeb. Südsee, 524; Schumann u. Hollrung, Fl. Kais.-Wilh.-land, 122; Burck, Ann. J. bot. Btz. X, tab. VII, fig. 2. — *F. papuana* Scheffer, Ann. Jard. bot. Buitzg., I, 42; Schumann u. Lauterb., Nachträge zur Fl. D. Südsee, 370. —

A shrub or little tree; sometimes climbing (*Schlechter, Ledermann*); branchlets, inflorescences and petioles minutely hairy, glabrescent; leaves chartaceous or subcoriaceous, opposite, oblong-elliptical or subrotundate, base rounded

with all transitory forms to deeply cordate, apex acuminate sometimes subobtusate; pairs of nerves 5—7; 1—10 glands in the axils of the lower pair or beneath it, upper side glabrous; lower side glabrous except on the nerves, which are minutely pubescent; sometimes some scattered glands on either side; 11—20—25 cM. by 7—8½—12½ cM.; petioles 1½—4—5 cM.; *cymes* axillary, the upper ones sometimes forming a large panicle; peduncles 2½—6 cM.; pedicels 0.3—1.4 cM.; *calyx* for ½ 2-lobed, minutely puberulous, with some large glands, 1.5—2.5 cM.; lobes acute; *corolla* white or greenish, glabrous; tube slender, funnel-shaped; lobes 4, sometimes 5 (!), in some cases somewhat 2-lobed; both sides with a line of soft hairs or subglabrous; tube 2—4 cM.; lobes 2 cM.; *stamens* 4, sometimes 5 (!) inserted near the base of the corolla-tube; base of filaments, as is insertion of the stamens, with long hairs; filaments 6½ cM.; *style* 6½ cM.; with shortly bifid stigma; *ovary* villous; *fruit* with 4, 1-seeded cells, connated at the base, often 1—3 abortive; glabrous or minutely puberulous.

NEW-GUINEA: *Lauterbach* no. 1695, 100 M, near Ramu-river, flow. on Aug. 26th, 1896; *id.* no. 2528, near River B., 160 M.; a tree 5 M. high; flow. on July 19th, 1896; *id.* no. 2238, Nuru-river, 80 M., a tree — *Hollrung* no. 740, IInd Augusta-station, flow. in Sept. 1887 — *Schlechter*, no. 16411, in the woods of Kelel, 200 M.; a climbing shrub, flow. on Aug. 27th, 1907. — *Gjellerup*, no. 729, Tor-river, flow. on Oct. 10th, 1911, 20 M. in alt.; a climber. — *Moszkowski* no. 117, Pamo; a small shrub; *id.* no. 154, Mana-river; a shrub, flow. on June 26th, 1910. — *Ledermann* no. 12283, Sepik-river, large climber; *id.* no. 7925, camp Malu, 50—100 M., a climbing shrub, fr. on July 15th, 1912.

Distribution: Queensland (*Benth.* and *v. Muell.*), New-Guinea!

Lauterbach, Nachträge l.c. gives only *F. papuana*. In his Flora D. Südsee he expressed the opinion that *F. splendida* and *F. papuana* should be identical. Probably by mistake, the author of *F. splendida* was mentioned as *K. Schumann*. In that case the *F. papuana* should be the older one; and this is probably the reason why *Lauterbach* mentioned only *F. papuana* in the Nachträge, in the supposition, that this was the older species. As *F. splendida*, however, is named by *F. v. Mueller* in 1865, this name should be retained.

9. **F. ternifolia** *F. v. Mueller*, Descr. notes on pap. plants, VIII, 46, (1886). — A climbing shrub; leaves ternate, sometimes subopposite, oblong-lanceolate, shortly acuminate, subchartaceous, lower side with few or without glands; petioles short; inflorescences shorter than the leaves, pedicels very short; calyx small, in the bud pear-shaped, shortly acuminate, 2-lobed; corolla minutely puberulous; stamens inserted near the base of the corolla-tube: filaments densely villous at their base; ovary 4-furrowed, minutely pubescent.

Distribution: Southern New-Guinea.

Its affinity is with *F. splendida* and *F. Albertisii*, but its leaves are not narrower above the middle than beneath it, and its calyx is much shorter.

It has a general resemblance with *F. Vitiensis*, from the Fitchi-Islands.

XX. **HOSEA** *Ridley* in Journ. As. Soc. Straits 50, 124, (1908). — Climbing shrubs; leaves opposite, petioled, simple, the upper ones of each branchlet reddened; cymes long peduncled, axillary from the axils of the upper leaves, spreading, dichotomously branched; calyx campanulate, spathaceous, bilobed, lobes ovate; corolla-tube slender, long; limb 4-lobed, 3 lobes obovate, 1 linear, oblong; stamens 4, filaments far extruded, anthers rounded; style as long as the stamens, stigma lanceolate; ovary 4-lobed, 4-celled,

with one ovule in each of the two cells; *fruits* 1 or 2 in each flower, fusiform, narrowed at both ends, apex acuminate; reaching $7\frac{1}{2}$ cM. in length and 1.2 cM. across the middle; pericarp leathery, deep purple; seed solitary, elongate.

Distribution: Borneo (also P. Penang?).

We did not see any specimen of the genus, but from the description it seems not to bold, to suppose that it might be very closely allied to *Faradaya*. But it seems distinguished by its fusiform (and large) fruits.

1. *H. Lobbii* Ridley in Journ. As. Soc. Straits, 50, 125, (1908). — *Clerodendron Lobbii* (not *Lobbiana*, as Ridley thinks) Clarke in Hook. f., Fl. Br. Ind. IV, 590, (1885); King and Gamble, Journ. As. Soc. Beng. LXXIV, 4, 841. — A tall, slender, woody climber; branchlets minutely pubescent; *leaves* elliptic-ovate, shining and glabrous above, minutely pubescent beneath; base rounded, apex obtuse; margins entire; $5-7\frac{1}{2}$ cM. long. $4-6$ cM. broad; petioles $0.6-2.5$ cM. long; the upper leaves of the branchlets reddened; *cymes* minutely grey-pubescent, 12-flowered (Clarke), axillary, long peduncled, numerous; bracts 0.3 cM. long, linear; peduncles $7\frac{1}{2}-10$ cM. long; pedicels $0.6-1.2$ cM.; *calyx* campanulate, deeply 2-lobed, obovate, minutely grey-pubescent, with scattered round glands, 1.2 cM. long, yellowy-green; lobes 0.6 cM. long, ovate-deltoid, valvate in bud; *corolla*-tube slender, reaching almost $2\frac{1}{2}$ cM., whitish, glabrate; lobes 4, 3 obovate, 1.2 cM. long and 1 cM. broad, and 1 linear-oblong; all lobes orange-coloured; *stamens* 4, filiform, 5 cM. exerted, crimson; pollen orange-coloured; *style* filiform, as long as the stamens, stigmata very small, lanceolate, green; *ovary* 4-lobed, lobes rounded, elevated; *fruits* 1 or 2, elongate, fusiform, deep purple, reaching $7\frac{1}{2}$ cM. in length and 1.2 cM. across the middle.

Distribution: Borneo (Sarawak nr. Kuching) (also Penang?).

According to *Ridley* this species is partly described by *Clarke* as *Clerodendron Lobbii*; he supposed it to have come from Penang. *Ridley* thinks that it is certain, that *Lobb* collected in Borneo.

XXI. CLERODENDRON L., Gen. pl. ed. I, 136 (1737); *Blume*, Bijdr. 807; *R. Brown*, Prodr. Fl. Nov. Holl. 510; *Benth.* et *v. Muell.*, Fl. Austr., V. 31; *Benth.* et *Hook.* Gen. pl. II, 2, 1155; *Blanco*, Fl. Fil. ed. I, 508; *Schauer*, DC. Prodr. XI, 658; *Engler* u. *Prantl*, Nat. Pfl. fam. IV, 3a, 174; *Koorders* en *Valeton*, Bijdr. Booms. Java no. 7, 211; *King* and *Gamble*, Journ. As. Soc. Beng. LXXIV, 4, 825; *Hasskarl*, 2^e Cat. 's L. Pl. tuin, 135; *Miquel*, Fl. Ind. bat. II, 867; *Roxb.*, Fl. ind. III, 57. — Shrubs (sometimes climbing), or trees; leaves simple, opposite or ternate; cymes usually lax, axillary, usually united to a large terminal panicle, which sometimes is very dense, umbelli- or thyriform; bracts often foliaceous; flowers usually large, white, blue, pink or red, the calyx often coloured as the corolla; calyx infundibuliform or cupuliform, sometimes very wide across the middle; 5-toothed or 3- or 5-lobed, sometimes nearly truncate; usually enlarged in fruit, spreading or including the fruit; corolla with narrow, cylindric tube, often very long, sometimes widened near the throat; limb spreading or somewhat recurved, 5-lobed; lobes subequal; stamens 4, inserted in the throat or the upper part of the corolla-tube, exserted, rolled up in bud; anther-cells with parallel fissures; style with shortly bifid stigma; ovary imperfectly 4-celled; cells with 1 high-laterally attached ovule; fruit with 4 furrows or \pm 4-lobed, \pm drupaceous; endocarpium smooth or rippled, hard, splitting up into 4 pyrenes.

Distribution: in the warmer regions of the old world; some species in tropical America and Africa.

1. a. Calyx 5-merous 2.
 b. Calyx 3-merous (section III, *Tridens* H. J. Lam) 100.
 c. Calyx 2-lipped, one lip ovate, the other lanceolate
 63. C. utakwense p. 305.
2. a. Corolla hypocraterimorphous; tube 4 cM. long or shorter
 (for. *C. mindorensis* vide sub b.) (section I, *Euclerodendron* Schauer) 3.
 b. Corolla infundibuliform; tube $4\frac{1}{2}$ — $10\frac{1}{2}$ cM. long
 (in *C. mindorensis* 3 cM.) (section II, *Siphonanthus* L.) 84.
3. a. Cymes axillary or pseudo-terminal 4.
 b. Cymes terminal 5.
4. a. Cymes axillary, few-flowered, shorter than or as long as
 the leaves, the upper ones sometimes forming a leafed
 thyrses (sect. I, subsection 1, *Axilliflora* Schauer) 6.
 b. Cymes axillary or pseudo-terminal, in crowded thyrsi
 (sect. I, subsection 2, *Densiflora*¹) Schauer) 13.
5. a. Cymes in lax, leaf- and bractless, \pm pendulous thyrsi;
 fruiting calyx much enlarged (sect. I, subsection 3,
Penduliflora Schauer) 21.
 b. Cymes in erect, terminal, by bracts and bracteoles
 interrupted, narrow thyrsi; fruiting calyx little enlarged
 (sect. I, subsection 4, *Racemiflora* Schauer)
 21. C. serratum p. 267.
- c. Cymes in capituliform or umbelliform (in *C. Friesii*
 subspicate) thyrsi; leaves usually cordate, pubescent;
 calyx enlarged in fruit (sect. I, subsection 5, *Paniculata*
 Schauer) 24.
 d. Cymes in large, wide, leafless, terminal thyrsi; leaves
 with scales beneath; branchlets with interpetiolar margins
 of hairs (sect. I, subsection 6, *Squamata* Schauer) 76.
6. a. Undershrubs, reaching 5 cM. in height, leaves present
 3—5 **1. C. sarawakana** p. 248.
 b. Shrubs or trees, larger 7.
7. a. Calyx 0.3—0.6 cM. long 8.
 b. Calyx 0.6—1.2 cM. long 10.

¹) See also *Paniculata* 24.

8. a. Corolla-tube 1.25 cM. long, puberulous; calyx acutely 5-toothed, \pm rugose without, with large peltate glands within 2. *C. lankawiense* p. 249.
 b. Corolla-tube 1.5—3.7 cM. long, glabrous 9.
9. a. Calyx deeply 5-lobed (for more than $\frac{1}{2}$); leaves generally membranous, 6—19 cM. long, $2\frac{1}{2}$ —6.2 cM. broad; petioles 1—6 cM. 3. *C. disparifolium* p. 250.
 b. Calyx usually truncate, sometimes irregularly toothed; leaves usually coriaceous, 2—6—13 cM. long, 0.8— $2\frac{1}{2}$ —8 cM. broad; petioles 0.3—2.2 cM. long; cymes 3-flowered
 4. *C. inerme* p. 251.
10. a. Base of leaf broad, truncate or subcordate 11.
 b. Base of leaf narrow, usually acute or attenuate 12.
11. a. Base of leaf characteristically 3-nerved; calyx 1.8—2.7 cM., lobes broad, white; corolla-tube with glanduliferous hairs, as long as the calyx, red 5. *C. Thomsonæ* p. 255.
 b. Base of leaf not distinctly 3-nerved; calyx 1—1.3 cM.; corolla-tube $2\frac{1}{2}$ —3 cM., minutely puberulous
 6. *C. phlomoides* p. 256.
12. a. Leaf usually coarsely, irregularly serrate-dentate; calyx-lobes linear, dark-red; calyx and corolla puberulous
 7. *C. calamitosum* ¹⁾ p. 256.
 b. Leaf entire; calyx lobed for the half; lobes ovate-lanceolate; calyx and corolla glabrous 8. *C. floribundum* p. 258.
13. a. Leaf broadly ovate, base more or less cordate; chartaceous or membranous 14.
 b. Leaf lanceolate-ovate or ovate, base rounded, narrow, or subcuneate; chartaceous or coriaceous 20.
14. a. Base of leaf with some large glands beneath 15.
 b. Base of leaf without such glands 16.
15. a. Leaves entire or abruptly denticulate
 9. *C. fragrans* p. 259.
 b. Leaves irregularly sinuate — dentate
 10. *C. macradenium* p. 260.
16. a. Calyx 1.8—2 cM.; corolla glabrous, 1.8—2.5 cM.
 11. *C. Riedelii* p. 261.

¹⁾ v. also 33. *C. kinabaluense* p. 279.

- b. Calyx 0.6—1.8 cM.; corolla at least 1.2 cM. longer than the calyx. 17.
17. a. Calyx 0.6—0.9 cM. long 18.
 b. Calyx 1.2—1.8 cM. long 19.
18. a. Calyx hardly 5-toothed; leaves glabrous on both sides
 12. C. elliptifolium p. 261.
 b. Calyx deeply 5-toothed, leaves pubescent on both sides
 13. C. condensatum p. 262.
19. a. Calyx 1.2 cM., corolla-tube $2\frac{1}{2}$ cM. long
 14. C. Cumingianum p. 262.
 b. Calyx 1.6—1.8 cM., teeth 0.9 cM., corolla-tube 3 cM. long **15. C. macrostegium** p. 263.
20. a. Leaves 5— $13\frac{1}{2}$ by 4— $6\frac{1}{2}$ cM.; petioles 2—6 cM.; pubescent on both sides, chartaceous
 13. C. condensatum p. 262.
 b. Leaves 18—23 by 7—8 cM.; petioles 5— $7\frac{1}{2}$ cM.; upper side glabrous, lower one pubescent; calyx 0.5 cM., teeth 0.25 cM.; corolla-tube 2 cM. long **16. C. deflexum** p. 263.
21. a. Herbs; calyx 0.2—0.25 cM. **17. C. macrostachyum** p. 264.
 b. Shrubs; calyx 0.65—1.5 cM. 22.
22. a. Calyx 0.65—0.8 cM.; leaves 12—22 by $2\frac{1}{2}$ —10 cM.; corolla \pm pubescent, glandular **18. C. penduliflorum** p. 265.
 b. Calyx 1—1.5 cM., leaves 10—40 by 3.7—15 cM. 23.
23. a. Leaves 20—40 by 5—15 cM.; petioles $2\frac{1}{2}$ — $7\frac{1}{2}$ cM.; calyx 1.5 cM., lobes 0.6 cM. broad; corolla-tube 1—1.5 cM. **19. C. umbratile** p. 265.
 b. Leaves 10—26 by 3.7—10 cM.; petioles $\frac{1}{2}$ —1 cM.; calyx 1—1.2 cM.; corolla-tube 1.6—1.8 cM.
 20. C. lævifolium p. 266.
24. a. Leaves (the nerves excepted) glabrous on both sides 25.
 b. Leaves usually rather densely pubescent on one or both sides 42.
25. a. Corolla 3—5 cM. long, glabrous, white; calyx $2\frac{1}{2}$ cM., pink, sparsely pubescent; leaves densely yellow-glandular beneath **75. C. Preslii** p. 314.
 b. Corolla $2\frac{1}{2}$ cM. long, or less 26.
26. a. Proportion of length and breadth of leaf = 1—2 27.
 b. Proportion of length and breadth of leaf = 3 or more 37.

27. a. Corolla-tube glabrous 28.
 b. Corolla-tube pubescent 34.
28. a. Calyx 0.4—0.65 cM. 29.
 b. Calyx 1.0—1.8 cM. 32.
29. a. Calyx hardly 5-toothed, corolla-tube 1.8 cM.
 12. C. elliptifolium p. 261.
 b. Calyx distinctly 5-toothed for $\frac{1}{2}$ of its length or more 30.
30. a. Petioles 2— $2\frac{1}{2}$ cM.; inflorescences with much leafy bracts;
 corolla-tube 0.7 cM. . **22. C. multibracteatum** p. 270.
 b. Petioles $2\frac{1}{2}$ —20 cM. 31.
31. a. Plant hirsutely hairy; inflorescences $7\frac{1}{2}$ —10 cM. in diam.
 27. C. tracyanum p. 274.
 b. Plant rather glabrous; inflorescences 30—60 cM. in diam.
 23. C. Colebrookianum p. 271.
32. a. Calyx inflated, 1.3—1.7 cM. 33.
 b. Calyx not inflated, 1.0 cM.; corolla-tube, 1.5—1.7 cM.
 long **24. C. adenophysum** p. 272.
33. a. Corolla-tube twice as long as calyx, 2.6 cM.; lower
 leaves 3-lobed **25. C. trichotomum** p. 273.
 b. Corolla-tube as long as calyx or nearly so, 1.4—1.8 cM.;
 all leaves entire. **26. C. magnificum** p. 273.
34. a. Calyx 0.5—0.65 cM. 35.
 b. Calyx 0.8—1.2 cM. 36.
35. a. } (27. **C. tracyanum** p. 274.
 b. } (28. **C. buruamum** p. 274.
36. a. Corolla-tube 1.5—1.9 cM.; calyx 1—1.2 cM.; leaves
 long acuminate . . . **29. C. brunfelsiiflorum** p. 275.
 b. Corolla-tube 2—2.3 cM.; calyx 0.8—1.2 cM.; leaves
 shortly acuminate or acute **30. C. porphyrocalyx** p. 276.
37. a. Calyx 0.3—0.4 cM.; leaves long acuminate at base and
 at apex; calyx- and corolla lobes rounded; inflorescences
 spike-shaped **31. C. Friesii** p. 278.
 b. Calyx 0.6—1.3 cM. 38.
38. a. Leaves very abruptly acuminate; calyx 1.2 cM.
 32. C. Diepenhorstii p. 279.
 b. Leaves not abruptly acuminate 39.
39. a. Calyx 0.6—0.9 cM. 40.

- b. Calyx 1—1.3 cM., pedicels 1—1.8 cM. 33. *C. kinabaluense* p. 279.
40. a. Plant myrmecophilous; branchlets and petioles fistular 34. *C. myrmecophilum* p. 280.
 b. Plant not myrmecophilous 41.
41. a. Leaves largely and distantly dentate (2—6 lobe-like teeth p. leaf); calyx minutely pubescent 35. *C. Williamsii* p. 281.
 b. Leaves entire; calyx glabrous 36. *C. macrophyllum* p. 282.
42. a. Corolla 3—5 cM., white, glabrous; calyx pink, 2½ cM., scarcely pubescent; leaves densely glandular beneath 75. *C. Preslii* p. 314.
 b. Corolla 2½ cM. or less, or, if longer, then leaves eglandular beneath and corolla pubescent 43.
43. a. Calyx toothed for ⅔ or more of its length 44.
 b. Calyx toothed for ½ or less of its length 54.
44. a. Calyx in flower-time 0.3—0.5 cM. 45.
 b. Calyx in flower-time 0.8—1.3 cM. 47.
45. a. Leaves glabrous above (nerves excepted) 37. *C. barba felis* p. 282.
 b. Leaves pubescent above 46.
46. a. Leaves not deeply cordate . 38. *C. papuanum* p. 283.
 b. Leaves deeply sinuate-cordate 39. *C. puberulum* p. 283.
47. a. Lower leaves 3-lobed, upper ones ovate; leaf-base 3-nerved, lower side glandular; corolla-tube twice as long as calyx 25. *C. trichotomum* p. 273.
 b. All leaves entire 48.
48. a. Calyx with large glands or scales 49.
 b. Calyx without such glands or scales 50.
49. a. Calyx pubescent and scaled within and without; leaves obovate, obtusely acuminate, glabrescent above, minutely pubescent beneath 40. *C. Curtisii* p. 284.
 b. Calyx glabrous within; leaves ovate-cordate, acuminate, sparsely tomentose on both sides 41. *C. infortunatum* p. 285.
50. a. Plant myrmecophilous, branchlets and petioles fistular; panicles > 30 cM. 34. *C. myrmecophilum* p. 280.
 b. Plant not myrmecophilous, panicles < 20 51.
51. a. Leaves 9—15 by 4—10 cM.; petioles 2—6 cM.; calyx in flower-time 1—1.3 cM. 52.

- b. Leaves $12\frac{1}{2}$ –37 by 5–16 cM.; petioles $2\frac{1}{2}$ – $9\frac{1}{2}$ cM.; calyx in flower-time 0.8–0.9 cM. 53.
52. a. Inflorescences reaching 10 cM. in length; leaves denticulate; calyx with scarlet hairs **42. C. Wenzelii** p. 285.
b. Inflorescences 15 cM. long; leaves entire; calyx brown pubescent **43. C. Vanoverberghii** p. 286.
53. a. Leaves oblanceolate or lanceolate, 15–25 by 5– $6\frac{1}{2}$ cM., glabrous beneath when adult, except near base
33. C. kinabaluense p. 279.
b. Leaves ovate-acuminate, $12\frac{1}{2}$ –37 by 5.3– $16\frac{1}{2}$ cM., softly pubescent beneath when adult
44. C. hæmatolasium p. 286.
54. a. Proportion of length of corolla-tube and calyx = 3–8 55.
b. Proportion of length of corolla-tube and calyx = 1–2 59.
55. a. Proportion of length of corolla-tube and calyx = 3–4 56.
b. Proportion of length of corolla-tube and calyx = 5–8 58.
56. a. Corolla-tube 1.2– $1\frac{1}{2}$ cM. 57.
b. Corolla-tube 2– $2\frac{1}{2}$ cM.; leaves deeply cordate, distantly dentate **45. C. pulchrum** p. 287.
57. a. Leaves deeply cordate, distantly dentate
39. C. puberulum p. 283.
b. Leaves ovate, base rounded or truncate; entire
46. C. albiflos p. 287.
58. a. Leaves not deeply cordate, 6–16 by 5–12 cM., shortly acuminate; petioles 5–15 cM. **38. C. papuanum** p. 283.
b. Leaves deeply sinuate-cordate, 18–24 by 20–26 cM., apex obtuse; petioles 16–24 cM. **59. C. Blumeianum** p. 292.
59. a. Calyx with large glands without 60.
b. Calyx without large glands without 63.
60. a. Corolla glabrous without, tube $1\frac{1}{2}$ –1.7 cM.; calyx 1 cM.
24. C. adenophysum p. 272.
b. Corolla puberulous without 61.
61. a. Corolla-tube 0.7–1.1 cM., very densely villous without; leaves usually entire 62.
b. Corolla-tube 1.3–2 cM., sparsely pubescent, leaves irregularly serrate **47. C. Curranii** p. 288.
62. a. Corolla-tube very densely pubescent; sinus of leaf-base 0–2 cM. deep **48. C. villosum** p. 289.

- b. Corolla-tube sparsely pubescent; sinus of leaf-base none
49. *C. confusum* p. 290.
63. a. Corolla-tube 0.6—1 cM. 64.
b. Corolla-tube 1.2—3.3 cM. 65.
64. a. Calyx-lobes glabrous 50. *C. brachyanthum* p. 291.
b. Calyx-lobes pubescent; corolla-tube glabrous, -lobes
pubescent 51. *C. Lindawianum* p. 292.
65. a. Calyx $2\frac{1}{2}$ —3 cM., teeth 0.6—1 cM.; corolla-tube 3.3 cM.
52. *C. macrocalyx* p. 293.
b. Calyx $\frac{1}{2}$ — $1\frac{1}{2}$ cM. 66.
66. a. Calyx $\frac{1}{2}$ —0.65 cM. 67.
b. Calyx 0.8—1.3 cM. 68.
67. a. } (27. *C. tracyanum* p. 274.
b. } (28. *C. buruanum* p. 274.
68. a. Lower leaves 3-lobed, upper ones ovate; calyx 1.3
cM.; corolla-tube glabrous, 2.6 cM.
25. *C. trichotomum* p. 273.
b. All leaves entire 69.
69. a. Leaves glabrous on both sides when adult, or pubescent
only on or near the nerves; sometimes somewhat pu-
bescent 70.
b. Leaves rather to very densely pubescent on both sur-
faces 74.
70. a. Calyx glabrous within 71.
b. Calyx with glanduliferous hairs within, as is outer side of
corolla-tube 30. *C. porphyrocalyx* p. 276.
71. a. Proportion of length and breadth of leaf = 4—5
33. *C. kinabaluense* p. 279.
b. Proportion of length and breadth of leaf = 1—2 72.
72. a. Corolla-lobes 0.7—0.8 cM. 43. *C. Vanoverberghii* p. 286.
b. Corolla-lobes 0.45— $\frac{1}{2}$ cM. 73.
73. a. Pedicels 0.3—1 cM.; corolla glabrous; calyx with large
glands 24. *C. adenophysum* p. 272.
b. Pedicels 0.8—2 cM.; corolla sparsely pubescent; calyx
without glands 29. *C. brunfelsiiflorum* p. 275.
74. a. Leaves denticulate 75.
b. Leaves entire 43. *C. Vanoverberghii* p. 286.
75. a. Corolla-tube $1\frac{1}{2}$ —1.8 cM. 53. *C. lanuginosum* p. 294.

- b. Corolla-tube 2—2.4 cM.; leaves rather coarsely dentate; petioles 14 cM. **62. C. Horsfieldii** p. 304.
76. a. Inflorescence a very dense, club-shaped, many-bracted thyrses, 10—20 cM. long, 7—9 cM. wide; bracts leafy; corolla-tube $2\frac{1}{2}$ —3 cM. **54. C. Rumphianum** p. 294.
- b. Inflorescence more or less lax 77.
77. a. Corolla-tube 1— $1\frac{1}{2}$ cM. 78.
- b. Corolla-tube 2— $2\frac{1}{2}$ cM. 81.
- c. Corolla-tube $2\frac{1}{2}$ —3.6 cM. 83.
78. a. Leaves 5—7-lobed; lobes large **55. C. paniculatum** p. 295.
- b. Leaves not lobed 79.
79. a. Leaf-base deeply sinuate, the two lobes at the side of the sinus covering each other; inflorescence and calyx scarlet **56. C. coccineum** p. 296.
- b. Leaf-base \pm cordate, the two lobes at the side of the sinus not covering each other 80.
80. a. Leaves glabrous, with some thick hairs above; calyx 0.8— $1\frac{1}{2}$ cM., in flowering-time 0.6 cM. long, $\frac{1}{2}$ cM. wide; leaves very minutely denticulate
57. C. Bethuneanum p. 297.
- b. Leaves denticulate, teeth mucronulate; calyx in flowering-time 0.2—0.5 cM. long, 0.3 cM. wide, fruiting 0.6—0.8 cM. long **58. C. intermedium** p. 298.
81. a. Calyx 0.25— $\frac{1}{2}$ cM., pubescent; leaves usually coarsely dentate or undulate, upper side with some large hairs and few to many small ones, lower one tomentose.
59. C. Blumeanum p. 299.
- b. Calyx ($\frac{1}{2}$ —)0.8—1.2 cM. 82.
82. a. Leaves with sparse, thick hairs above.
60. C. squamatum p. 302.
- b. Leaves entirely glabrous above. **61. C. illustre** p. 303.
- c. Leaves tomentose on both sides. **62. C. Horsfieldii** p. 304.
83. a. Calyx 2-lipped, 1.6 cM.; stamens 7 cM. exsert; a glabrous shrub **63. C. utakwense** p. 305.
- b. Calyx regularly 5-toothed, 0.6—0.8 cM.; stamens $1\frac{1}{2}$ cM. exsert; a pubescent shrub. **64. C. speciosissimum** p. 305.
84. a. Proportion of length and breadth of leaf = 8—15 : 1.
65. C. Siphonanthus p. 306.

- b.* Plants not myrmecophilous 96.
96. *a.* Calyx 0.7—0.9 cM. 74. **C. Navesianum** p. 313.
b. Calyx $1\frac{1}{2}$ — $2\frac{1}{2}$ cM. 97.
97. *a.* Proportion of length and breadth of leaf = 3 : 1; leaves long acuminate (acumen $1\frac{1}{2}$ —3 cM.), membranous; calyx $1\frac{1}{2}$ —2 cM.; corolla-lobes 1.2—1.3 cM.
 73. **C. Ridleyi** p. 312.
b. Proportion of length and breadth of leaf = 2 : 1 . 98.
98. *a.* Corolla-tube 3—5 cM., glabrous, -lobes $1\frac{1}{2}$ cM.
 75. **C. Preslii** p. 314.
b. Corolla-tube 5—10.2 cM., -lobes $1\frac{1}{2}$ — $2\frac{1}{2}$ cM. . 99.
99. *a.* Corolla-tube $8\frac{1}{2}$ —10.2 cM.; calyx $1\frac{1}{2}$ — $2\frac{1}{2}$ cM.
 76. **C. Minahassæ** var. *α* p. 315.
b. Corolla-tube 5—6 (— $8\frac{1}{2}$) cM.; calyx 2— $3\frac{1}{2}$ cM.
 76. **C. Minahassæ** var. *β* p. 315.
100. *a.* Calyx 1.2— $1\frac{1}{2}$ cM.; corolla-tube 1.8— $2\frac{1}{2}$ cM., -lobes 1.2 by 0.3 cM. 77. **C. Elberti** p. 316.
b. Calyx 1.8— $2\frac{1}{2}$ cM.; corolla-tube 2.8—3.3 cM., -lobes $2\frac{1}{2}$ by 1.1 cM. 78. **C. Hettæ** p. 316.
- Imperfectly known or doubtful species: nrs. 79—88.
 Species of which description not obtainable: nrs. 89—93.
 Species with unknown native country: nrs. 94—99.
 Nomina nuda: nrs. 100—102.

Section I Euclerodendron Schauer.

Subsection 1 *Axilliflora* Schauer.

1. **C. sarawakanum** (*Ridley*) *H. J. Lam*, nov. comb. — *C. pumilum* ¹⁾ *Ridl.* in Journ. As. Soc. Straits, I, 126 (1908). — A small undershrub; stem 5 cM. with whitish longitudinally ribbed bark, pubescent above; leaves 2 or 3, broadly ovate, acute, base rounded; margins undulate, distantly denticulate, 10—15 by 5 — $7\frac{1}{2}$ cM.; petioles

¹⁾ We were obliged to alter this name, since it is already occupied by *C. pumilum* *Spr.*, Syst. Veg. II, 759; so was the name *C. Ridleyi*.

1.2 cM.; both surfaces covered with pale unicellular hairs; *cymes* in a pair, about 5 cM. long and in diam., many-flowered; pedicels and peduncles (1.2 cM.) densely pubescent; *calyx* 5-lobed; segments lanceolate, acute, 0.5 cM., with red hairs; *corolla* 1.8 cM.; tube cylindric, dilated at base, curved above, pinkish, pubescent; upper part crimson; lobes 5—6, obovate, rounded, creamy white, hairy on the back; *stamens* glabrous, crimson; over 1.2 cM. longer than the corolla-tube; anthers linear, deeply bifid, black; *style* filiform, crimson, glabrous, long; stigmata 2, green, subulate, *ovary* subglobose, obscurely 4-lobed.

Distribution: W.—Borneo (Sarawak, Mt. Matang).

If this is really a *Clerodendron* (corolla-lobes 5—6! form of tube!) it is a very remarkable one. In size it should be analogous with *Pygmæopremna*, which can be considered as a dwarf-form of *Premna*.

2. *C. lankawiense* King et Gamble, Kew Bull., 110 (1908) and Journ. As. Soc. Beng. LXXIV, 4, 830. — A shrub; branchlets scabrid-puberulous, obtusely quadrangular, channelled; *leaves* chartaceous, oblong-lanceolate or oblanceolate, acute at apex, attenuate at base; both surfaces sparsely glabrous-hispid, pubescent on the nerves beneath; margins entire; $7\frac{1}{2}$ —10 by 1.2—2.5 cM.; midrib stout; main nerves 8—10 pairs, curving acutely upwards to and along the margin; petioles 0.6 cM., scabrid-pubescent; *panicles* leafy, terminal, pyramidal, thyrsoïd, reaching 25 cM. in length and 10 cM. in diam., scabrid-pubescent; *cymes* trichotomous, few-flowered; bracts leaf-like, lanceolate; bracteoles small, setaceous; pedicels slender, 0.5 cM.; buds clavate up to 1.8 cM. long; *calyx* campanulate, scabrous-hispid without, glabrous and with large peltate glands within, cleft about two-thirds down, prominently nerved; lobes acute, ovate, 0.5—0.6 cM. long, 0.25 cM. broad at base; *corolla*-tube slender, pubescent, cylindric, 1.2 cM. long; lobes spreading, obovate, the midlobe of

the lower lip longer than the rest; *stamens* long-exsert; filaments very slender, glabrous; anthers oblong, 0.18 cM. long; cells parallel; *ovary* rounded, obtuse; *style* very slender; stigmatic lobes very short; *fruit* not seen.

Distribution: Langkawi-Island (Malay Peninsula).

3. *C. disparifolium* Blume, Bijdr. 809 (1826); Schauer, DC., Prodr. XI, 672; Hook. f. Fl. Br. Ind. IV, 589; Hall. f. Med. 's Rijks Herb. Leid. no. 37, 73; Koord. en Val. Bijdr. Booms. Java no. 7, 212 and Atl. d. Baumart. II, 6, t. 277; King and Gamble, Journ. As. Soc. Beng. LXXIV, 4, 829; Koord. Exk. fl. von Java III, 137; Kuntze Rev. Gen. I, 505; Miq. Fl. Ind. bat. II, 871 and Suppl. I, 242; Zoll. u. Mor., Syst. Verz., 53. — *C. acuminatum* Wall. cat. no. 1792 (1828); Schauer l.c. 662; Miq. l.c. 869. — *C. Jackianum* Wall. in Hook., Bot. Misc. I 284 (1830) and Cat. no. 1794; Schauer l.c. 664; Miq. l.c. 872. — *Callicarpa violacea* Korthals ms. partly. — A shrub or small tree; branchlets quadrangular, glabrous or nearly so; leaves ovate or ovate-oblong, sometimes oblong-lanceolate, usually membranous, sometimes subchartaceous; base usually rounded, sometimes acute, apex acuminate; margins entire or distantly denticulate above the middle; both surfaces glabrous or with some sparse hairs; pairs of nerves 5—7; 6—19 by $2\frac{1}{2}$ —6.2 cM.; petioles glabrous, 1—6 cM.; panicles terminal, composed of axillary cymes, glabrous or nearly so, leafy, with foliaceous bracts, $8\frac{1}{2}$ —10 cM. long, 7—11 cM. in diam.; calyx purple, with very slender, 1.2—2.2 cM. long pedicels, which bear two very minute opposite and sometimes 1 or 2 alternate bracteoles, on the also very slender branchlets of the cymes; 0.3—0.6 cM., usually deeply 5-lobed, lobes lanceolate and acute or subovate and subobtuse, 0.1—0.5 cM.; glabrous; enlarged in fruit up to 0.8 cM.; corolla yellow or green; tube slender, 1.5—2.5 cM., glabrous; lobes narrow, 0.6—0.9 by 0.1—0.15 cM., glabrous; *stamens*

1.3 cM. exerted, inserted at $\pm \frac{5}{6}$ of the length of the tube from its base; *style* longer exert than the stamens; stigma bifid; *ovary* glabrous; *drupe* globose, 0.8 cM. long and in diam., seated on the irregularly cleft calyx.

MALACCA: Maingay no. 1186.

SUMATRA: *Junghuhn* in H. A. R.—T. sub no. 043909, Upper Ankola. — *Korthals* in H. L.—B. sub no. 908.266—16 (*Callicarpa violacea*). — *Forbes* no. 2782, Tandjong Ning; a large shrub; flow. yellow; fr. green, becoming black when ripe; 200 M. in alt.

JAVA: v. Hall? no. 93 in H. L.—B. sub no. 909.110—92. — *Kuhl* en v. *Hasselt* in H. L.—B. sub nos. 908.266—679, 677 and 1231. — v. *Hasselt* in H. L.—B. sub nos. 908.267—294 (W.-Java) and 283 (betw. Sadjira and Lebak, flow. in Aug.). — *Blume?* in H. L.—B. sub no. 908.263—492, Salak, flow. in Sept. — *Boerlage* no. 453, Buitenzorg, flow. on 8-X-1888. — *Ploem* in H. L.—B. sub nos. 909.27—95 and 99.

BORNEO: *Rutten* no. 264, G. Runtu, E.-Borneo, flow. on 9-VI-1911; a tree; flow. yellow; calyx and pedicels purple; *id.* no. 219, nr. Bontang, E.-Borneo, flow. green, on 4-V-1911; 10 M. in alt. — *Korthals*, G. Sakumbang, in H. L.—B. sub no. 908.263—435; *id.*, P. Lampei in H. L.—B. sub nos. 908.263—433 and 434. — *Winkler* no. 2260, S.-E.-Borneo, Hayup, flow. on 31-V-1908.

Distribution: Malacca!, Sumatra!, W.-Java!, Borneo!

The axillary cymes, which are usually placed in a distinct terminal, leafy panicle, could afford some doubt, whether this species really belongs to the subsection *Axilliflora*.

4. **C. inerme** (L.) *Gaertn.* Fruct. I, 271 (1788); *Blume* Bijdr. 808; *R. Brown*, Prodr. 511; *Benth.* et v. *Muell.*, Fl. Austr. V, 61; *Blanco*, Fl. Fil. ed. I, 511; *Williams*, Bull. Herb. Boiss. sér. II, V, 431; *Schauer*, DC., Prodr. XI, 660; *Decaisne*, Nouv. Ann. Mus. Par. III, 399; *Engl.*, Engl. Jhrb. VII, 477; *Forbes* et *Hemsley*, Fl. sin. II, 261;

Forbes Wand. Nat. f. Mal. Arch. II, 226; *Hall. f.*, Med. 's Rijks Herb. Leid. no. 37, 61; *Pulle* in *Lorentz*, Nova-Guinea VIII, 2, 402 and VIII, 4, 687; *Hook. f.*, Fl. Br. Ind. IV, 589; *Koord.*, Med. 's Lands Pl. tuin XIX, 558 and Exk. fl. v. Java, III, 138; *Hook.*, Comp. Bot. Mag. I, 348; *Hassk.*, 2e Cat. 's Lands Pl. t., 135; *Miq.*, Fl. Ind. bat. II, 868; *Merrill*, Bur. Gov. Lab. no. 27, 68; *Miq.*, Ann. Mus. L.—B. III, 254; *v. Muell.*, Descr. notes pap. pl. I, 11; *Roxb.*, Fl. ind. III, 58; *Rumphius*, Herb. Amb. VII, 86; *K. Schum.* u. *Lauterb.*, Fl. D. Südsee, 525; *K. Schum.* u. *Hollr.*, Fl. Kais.-W.-land, 122; *Schimper*, Bot. Mitt. a. d. Tr. III, 129; *Spanoghe*, Linnæa XV, 329; *K. Schum.*, Engl. Jhrb. IX, 220; *Val.*, Bull. Dépt. Agr. I.-N. X, 51; *Warb.*, Engl. Jhrb. XIII, 427. — *C. capsulare* *Blco.* l.c. 509 (1837); *Schau.* l.c. 674; *Miq.* Fl. Ind. bat. II, 881; *Merrill* l.c. 68. — *C. Commersonii* *Spr.* Syst. Veg. II, 758 (1825); *Schau.* l.c. 673; *Miq.* l.c. 882; *Merrill*, Phil. Journ. Sci. Bot. IX, 135. — *C. inerme* *R. Br.* Prodr. 511 (1827); *Cham.*, Linnæa VII, 105; *Hemsley* Chall. Rep. Bot. I, 110 and 176. — *C. nereifolium* *Wall.* cat. no. 178, (1828); *Schau.* l.c. 660; *Hook. f.* l.c. 589; *King* and *Gamble*, Journ. As. Soc. Beng. LXXIV, 4, 827; *Miq.* l.c. 869; *Schimper.* l.c. 129. — A straggling shrub often climbing, or a small tree; branchlets ash-grey, round, glabrous or minutely appressedly pubescent as are cymes and petioles; leaves ovate, or ovate-lanceolate, sometimes sublanceolate; base cuneate or acute to rectangular, apex shortly and obtusely acuminate or rounded, sometimes subacute; margins entire; usually coriaceous, rarely membranous; pairs of nerves 5—8; glabrous on both surfaces; 2—13 by 0.8—8 cM.; petioles 0.3—2.2 cM.; cymes axillary, often in a terminal more or less umbelliform panicle, branchlets 3-florous, the 3 pedicels equal in length or the lateral ones longer and sometimes each of them bearing 1—3 flowers, rather

variable; peduncles 2—3 cM.; pedicels 0.3—1 cM., without bracteoles; *calyx* cup-shaped or funnel-shaped, truncate or with 5 more or less distinct, sometimes irregular teeth, often 5-ribbed, glabrous to rather densely pubescent, sometimes glandular, 0.3—0.5 cM., in fruit enlarged to 0.7 cM.; *corolla* white, glabrous or sparsely pubescent, glandular; tube slender, cylindrical, 2—3.7 cM., lobes ovate, obtuse, 0.5—0.8 by 0.2—0.3 cM.; *stamens* slender, 2—3 cM. exsert, as is style; didynamous, inserted between $\frac{1}{2}$ and $\frac{2}{3}$ of the corolla-tube (from its base); filaments at base and insertion somewhat hairy; *stigma* bifid, style 4.4—6.7 cM.; *ovary* glabrous, somewhat 4-lobed; *fruit* obovate or subclavate, for the lower part included in the enlarged calyx, glabrous, distinctly 4-lobed, 1—2 cM. long, 1—1.3 cM. in diam.

MALAY PENINSULA: *Griffith* no. 6057—1.

JAVA: *Teysmann* in H. A. R.—T. sub no. 043908; the seeds are a salutary remedy against the dysentery, from Macassar (nat. name: „rappæ rappæ”), imported into Java (nat. name: gambir laut).

KAJUADI-ISL. (southw. of Celebes); *Docters van Leeuwen-Reijnvaan* no. 1311; a shrub; flow. white, on 3-V-1913.

TANA DJAMPEA-ISL. (southw. of Celebes); *Docters van Leeuwen-Reijnvaan* no. 1652, a climbing shrub in the mangrove; flow. white, on 16-V-1913.

PHILIPPINES: *Merrill* no. 275, Manilla, Luzon.

NEW-GUINEA: *Versteeg* no. 1840, Dutch-N.-G. nr. Merauke; flow. and fr. on 30-X-1907. — *Branderhorst* no. 153, North.-D.-N.-G.; flow. on 10-X-1907. — *Gjellerup* no. 292, Hollandia, North.-D.-N.-G, flow. on 5-VIII-1910; 2 M. in alt., on riverside; a somewhat climbing shrub, 3 M. high; calyx green; corolla white with light-violet spots; filaments light-violet, anthers brown; stigma light-violet; fruit pyriform, grey-brown (if ripe?); also flow. in Sept. 1910; *id.* no. 930, North.-D.-N.-G.,

Sasnie: climbing, $2\frac{1}{2}$ M. high; 5 M. in alt; flow. on 27-XI-1911. — *v. Römer* no. 18, North.-D.-N.-G., flow. on 3-IV-1909. — *Moszkowski* no. 466, Dutch-N.-G., Manokuari, flow. on 11-I-1911; a small tree, 3 M. high, flrs. yellow.

NEW-BRITAIN (NEU-POMMERN): *Weber* no. 26, Rabaul, flow. in April; corolla white, stamens red. — *Lauterbach* no. 164, Ralum, on the shore: buds on 21-V-1890. — *Dahl* no. 52, Ralum, on the shore, flow. in May-June 1896, a shrub.

NEW-IRELAND (NEU-MECKLENBURG): *Peekel* no. 571, Namatanai, Nabuto-forest, 0 M. in alt., flow. white, on 20-VIII-1910.

PALAU-ISL.: ? *Kraemer* in H. Ber. without nr., Kapimangi; a shrub; native name: Aihúa — *Ledermann* no. 14088, Korrör, 20—40 M. in alt., climbing; flrs. white, on 6-II-1914, stamens dark-red; native name: gamwert. — *Raymundus* no. 305, Korrör; native name: chämvert.

MARIANNE-ISL.: *Fritz* in H. Ber. without nr., Saipon.

CAROLINE-ISL.: *Kraemer* no. 3, Uman Truk, Adilmount, 250 (M.?) — *Volkens* no. 132, Yap, flow. on 9-XII-1899; native name: göwie; flrs. white, filaments red; *id.* no. 244, flow. on 18-XII-1899; Yap; filaments purple. — *Ledermann* no. 13660, Ponape, Naponmal, 150 M. in alt., a creeping shrub; flrs. (on 8-XII-1913) white, filaments blue-red, anthers dark-brown, leaves brightgreen, bark brown.

A specimen of *Boerlage* in H. L.-B. sub no. 908.265—719, from Leiden-Isl. nr. Batavia shows a very characteristic fasciation.

Distribution: Brit.-India, Ceylon, Deccan, Siam, Honkong, Hainan, Kwantung, Formosa, (*Matsumara* and *Hayata*), Malacca!, Sumatra!, Java!, Kajuadi- and T. Djampea-Isl.!, Timor, Lombok!, Buton-Isl.!, Tukan-Besie-Isl.!, Celebes!, Buru!, Ceram!, Little-Ceram!, Borneo!, Philippines (Luzon!, Polillo!, Panay!), New-Guinea!, New-

Britain!, New-Ireland!, Palau-Isl!, Marianne-Isl!, Caroline-Isl!, Aru-Isl., Queensland, N.-Australia, N.-S.-Wales, New-Caledonia, Fitchi-, Samoa- and Tonga-Isl. (see *Hallier f.*, l.c.).

The species is a rather polymorphous one, being variable in form of leaves, form and tomentum of calyx, and in the cymes.

5. *C. Thomsonæ* *Balf.*, Edinb. New Phil. Journ. N. 5, XV. 233 (1862); *Bot. Mag.* t. 5313; *King and Gamble*, Journ. As. Soc. Beng, LXXIV, 4, 827; *Merrill*, Phil. Journ. Sci. Bot. XI, 310; *Hall. f. Med.* 's Rijks Herb. Leid. no. 37, 72. — A climbing shrub; branchlets quadrangular, with cymes and petioles minutely pubescent; leaves subchartaceous, broadly ovate, base subcordate or truncate, abruptly attenuate, apex acute; margins entire; upper surface minutely and rather densely pubescent, lower one glabrous, glandular, pubescent on the nerves; base characteristically 3-nerved, the side-nerves curving along the margins up to $\frac{2}{3}$ of the length of the leaf from its base; other nerves short, few, indistinct; 4—8 by 2—5 $\frac{1}{2}$ cM.; petioles 0.7—1.5 cM.; cymes axillary, 7—15 cM. long, peduncles 4—6 cM.; pedicels $\frac{1}{2}$ —2 cM.; bracts foliaceous, pubescent above, lanceolate; calyx subinflated, wide, membranous, white or greenish, 1.8—2.7 cM. long, 1—2.5 cM. wide, with 5 broadly lanceolate, acute segments; glabrous or somewhat minutely pubescent near the margins; corolla red, tube as long as the calyx, somewhat widening towards the throat with minute hairs and some glanduliferous hairs; lobes obovate, 0.3—0.5 cM. long; stamens slender, 2.5 cM. exsert, inserted in the throat; style 1.3 cM. exsert, with bifid stigma.

NEW-IRELAND (NEU-MECKLENBURG): *Peekel* no. 526, Namatanai, Kaselsel, flow. on 23-VII-1910, cultivated.

CAROLINE-ISL.: *Ledermann* no. 13855, Ponape, Pailapalap, Government-garden, 40—50 M. in alt., cultiv., flow. on 26—XII—1913—*Charley Gibbons* no. 1006, same

locality, 10 M. in alt.; a herb, $\pm \frac{1}{2}$ M. high, cultiv., flow. on 12-V-1911.

Distribution: a native of tropical Africa, imported into Asia and known from Penang, Singapore (*King* and *Gamble*), W.-Java! and the above mentioned islands as a cultivated plant.

In the Dutch-East-Indies its name is „gebroken hartjes” (broken hearts).

6. **C. phlomoïdes** *L. f.*, suppl. 292 (1781); *Schauer*, DC. Prodr. XI, 663; *Koord.* Exk. fl. v. Java III, 138; *Miquel*, Fl. Ind. bat. II, 871; *Roxb.* Fl. ind. III, 57; *Hook. f.* Fl. Br. Ind. IV, 590. — A large shrub; branchlets slender, with cymes and petioles grey-tomentose; leaves membranous, ovate or ovate-rhomboid, base broadly cuneate or subtruncate, apex acuminate; margins entire or crenate-serrate in the middle; upper surface somewhat pubescent or subglabrous, lower one pubescent; $2\frac{1}{2}$ — $7\frac{1}{2}$ cM. long, 3—4 cM. broad; petioles 1— $3\frac{1}{2}$ cM.; cymes axillary, in a large, leafy, terminal panicle, 12-flowered, lax, trichotomous; bracts 1.6 cM., lanceolate or obovate-lanceolate; pedicels 0.4—1.2 cM.; peduncles $2\frac{1}{2}$ cM.; calyx somewhat puberulous, 5-lobed, the segments subovate, very acute; 0.8—1.2 cM.; slightly enlarged in fruit; corolla white, puberulous, somewhat glandular on the $2\frac{1}{2}$ —3 cM. long tube; lobes elliptic 0.8 cM.; drupe obovoid, 0.8—1.2 cM., separating into 4 pyrenes, much as in *Cl. inerme*.

Distribution: Br. India, Java (*Koord.*).

7. **C. calamitosum** *L.* Mant. I, 90 (1767); *Blume* Bijdr. 810; *Schauer*, DC., Prodr. XI, 663; *Hook. f.*, Fl. Br. Ind. IV, 591; *Koord.* Med. 's Lands Pl. tuin no XIX, 558; *id.* Exk. fl. Java III, 138; *King* and *Gamble*, Journ. As. Soc. Beng. LXXIV, 4, 827; Bot. Mag. t. 5294; *Miq.* Fl. Ind. bat. II, 870 and suppl. I, 242; *id.* Ann. Mus. L.—B. III, 254; *Hassk.*, 2e Cat. 's Lands Pl. tuin, 136; *Hall. f.* Med. 's Rijks Herb. Leid. no. 37, 74; *Zoll.* u.

Mor. Syst. Verz. 53. — *C. eriosiphon* Schauer, DC., *Prodr.* XI, 662 (1847); *Miq. Fl. Ind. bat.* II, 869; *Hall. f. l.c.* 73. — *C. obtusidens* Miq. l.c. 870 (1856) and suppl. I, 242. — A shrub; branchlets quadrangular, minutely pubescent, as are cymes and petioles; leaves very variable in most characters, membranous to coriaceous, lanceolate to oblong, base usually acute, sometimes narrowly obtuse, apex acute or shortly, acutely or obtusely acuminate; margins entire or from distantly denticulate to coarsely and more or less irregularly serrato-sinuate or undulate; pairs of nerves 5—7, usually little prominent; upper surface with all transitory forms from rugose to nearly glabrous; lower one glabrous, pubescent on the nerves; $5\frac{1}{2}$ — $22\frac{1}{2}$ by 2—8 cM.; petioles $\frac{1}{2}$ —7 cM.; cymes lax, glabrous or \pm pubescent, the upper ones in a terminal, leafy panicle; calyx on very slender, 0.7—1 cM. long pedicel, 0.6—1.2 cM. long, 5-cleft almost down to base; segments narrow, very acute, softly pubescent without; in fruit enlarged and retused; corolla softly pubescent without; tube cylindric, slender, 2—3.1 cM.; lobes elliptical, 0.6—0.8 cM. long; stamens 1—1.5 cM. exerted, as is the very shortly bifid or subtruncate style; inserted in the throat; style 4— $4\frac{1}{2}$ cM.; fruit globose, seated on the to 1.5 cM. enlarged calyx, the segments of which are reflexed.

SUMATRA: *Miquel* in H. A. R.—T. sub no. 049913 (*C. obtusidens*). — *Forbes* no. 2113, Ranau, flrs. yellowish white, 600 M.; *id.* no. 2033, Mt. Besagi, 1100 M., a large shrub, flrs. white; *id.* no. 2470.

JAVA: *Horsfield* in H. A. R.—T. sub nos. 049911 and 049912. — *Reinwardt* in H. L.—B. sub nos. 908.263—428 and 429. — *v. Hasselt* in H. L.—B. sub nos. 908.266—628 and 908.267—625. — *Kuhl et v. Hasselt* in H. L.—B. sub no. 908.265—1166—? *Blume* in H. L.—B. sub nos. 908.263—446 and 481, Salak; also no. —486, Seribu. —

Korthals in H. L.—B. sub no. 908.267—695. — *Boerlage* in H. L.—B. sub. no. 908.265—656, Tjibodas.

BORNEO: *Korthals* in H. L.—B. sub no. 908.266—1320, Martapura.

Distribution: Malacca (*King* and *Gamble*, as garden escape), Sumatra!, Java!, Borneo!, Basilan, Luzon (*Hallier*).

8. *C. floribundum* *R. Br.* Prodr. 511 (1827); *Benth.* and *v. Muell.*, Fl. Austr. V, 63; *Schauer, DC.*, Prodr. XI, 671; *K. Schum. u. Lauterb.*, Fl. D. Südsee, 525; *K. Schum. u. Hollr.*, Fl. Kais.-W.-land, 122. — A large shrub or small tree; leaves oblong-ovate, membranous or subchartaceous; base and apex acute or somewhat attenuate; margins entire; both surfaces glabrous or with some hairs on the nerves; pairs of nerves 7; 12—16 by 5—6½ cM.; petioles 2—5 cM., minutely pubescent, as are the branchlets and the cymes; cymes axillary, the upper ones often in a often subumbelliform panicle; uttermost branchlets 3-florous; peduncles 2½—5½ cM.; bracts foliaceous, somewhat pubescent on both surfaces, 1½—2½ by ½—1 cM., on a 0.2—0.3 cM. long petiole; bracteoles lanceolate, as are bracts, sessile, 0.5 cM. long; pedicels slender, 0.3—0.5 cM., puberulous; calyx 0.9 cM., glabrous or nearly so, the 5 lanceolate, acute segments as long as the tube; corolla glabrous; tube slender, 3.5 cM.; lobes ovate, 0.7 cM. long; stamens 2.3 cM. exerted, inserted about ⅔ of the length of the tube from its base; style slender, 5.8 cM., the apex very shortly bifid or bidentate; ovary glabrous.

NEW-GUINEA: *Schlechter* no. 18903, Kais.-W.-land, in the forest near Sangueti-Etappe, 300 M. in alt., flow. on 1-XII-1908.

Distribution: N.-Australia, Queensland, S.-Australia, (*Benth.* and *v. Muell.*)

Subsection 2 *Densiflora*¹⁾ Schau.

9. *C. flagrans* Vent. Jard. Malm. t. 70 (1804); Schauer, DC. Prodr. XI, 666; Forbes et Hemsley, Fl. Sin. II, 260; King and Gamble, Journ. As. Soc. Beng. LXXIV, 4, 826 (*C. fragr. R. Br.*); Bot. Mag. t. 1834; Kuntze, Rev. Gen. I. 505; Miq., Fl. Ind. bat. II, 875; Hall f., Med. 's Rijks Herb. Leid. no. 37, 71; Maximowicz, Bull. Ac. Imp. Sci. St. Pétr. XXXI, 84; Hassk., 2e Cat. 's Lands Pl.tuin Btzg., 136. — *C. foetidum* Hort. Par. ex Planch. in Fl. d. Serr., sér. I, IX, 17 (1853–54). — *C. Lindleyi* Decne. ex Planch. l.c. — ? *C. fragrans* R.Br. in Ait. Kew. ed. II, IV, 63 (1812) (see under: „Doubtful species”). — A shrub; branchlets quadrangular, with cymes and petioles minutely grey-brown pubescent; leaves broadly ovate, chartaceous; base subcuneate to somewhat cordate and abruptly attenuate, with some large glands on the lower side; apex acute or somewhat acuminate; margins entire or denticulate above the middle, the teeth abrupt; pairs of nerves ± 5 ; both surfaces softly pubescent, densier on the nerves; 8–24 by $3\frac{1}{2}$ –21 cM.; petioles $1\frac{1}{2}$ –11 cM.; inflorescences terminal, very dense, with many large, lanceolate, sessile, on both sides pubescent bracts, which bear large glands on their lower side; 6–9 cM. long, 6–10 cM. in diam.; peduncles 1 cM., bracts 2 cM. long; calyx on 0.2 cM. long pedicel which gradually widens into it, 1.6 cM. long, the 5 very narrow, almost subulate segments as long as the tube; sparsely pubescent and with some large glands; corolla entirely glabrous, simple or double; tube slender, $2\frac{1}{2}$ cM., lobes ovate, 1 cM. long,

¹⁾ This subsection does not seem a uniform one, showing transitory forms to the *Paniculata*, of which it seems to be a particular branch, whilst in the *Siphonanthus*-section occur species, which too, show a very dense inflorescence (see System. notes).

0.7 cM. broad; *stamens* and *style* slender, 2.7 cM. exsert, stigma shortly bifid; *ovary* glabrous.

Var. α typicum H. J. Lam, nov. var. — flores simplices.

Distribution: China, Japan, Formosa (*Matsumara* and *Hayata*), Chittagong, Upper-Burma, Sumatra, E.-Borneo!, Lombok!, Negros; Hawaii (*Hillebrand*). A native of China, imported into all tropical countries and cultivated there (*Hallier*).

Var. β pleniflora Schauer, DC., Prodr. XI, 666 (1847) — flowers double.

Distribution: Sumatra, Java, Oahu, Mexico, W.-India, Dutch-Guyana, Bolivia (*Hallier*).

Hallier (l.c.) gives this species and *G. macrostegium* a place among the *Paniculata*, in the opinion that they have an affinity with *C. villosum*, *C. infortunatum*, *C. Lindawianum*, etc. Perhaps this affinity is a fact, but this — as it seems to us — does not justify its place among the *Paniculata*, since its inflorescences are typically densiflorous, and it is, moreover, connected with the present subsection, by *C. macradenium*, which shows, as well as *C. fragrans* the characteristic large glands on leaves and bracts.

10. **C. macradenium** Miq., Fl. Ind. bat. II, 874 (1856); *Koord. Exk. fl. v. Java* III, 138. — A shrub?; branchlets quadrangular, with petioles and inflorescences softly pubescent; *leaves* rotundate; base cordate or subcordate, apex acuminate; margins irregularly sinuate-dentate; chartaceous; pairs of nerves 3—5; base 3-nerved, the lowest pair almost reaching the middle of the leaf; both surfaces softly pubescent, densier on the nerves, the lower with large glands near the base; 13 cM. long and broad; petioles $2\frac{1}{2}$ —10 cM.; *inflorescences* terminal, very dense, with lanceolate large-glandular and foliaceous bracts; *calyx* 1.3 cM., pubescent; the 5 segments linear-lanceolate, very acute, glandular at the base; *corolla* glabrous; tube $2\frac{1}{2}$ cM.; *stamens* and *style* long exserted.

JAVA: *Horsfield* in H. A. R.—T. sub no. 049910.

Perhaps this species is identical with the preceding one, but as we saw only a leaf (which in its margins was different from *C. fragrans*) we could not combine it with that species. As *C. fragrans* it has an affinity with some *Paniculata*-species, as *C. fallax* and *C. Horsfieldii*, but is well distinguished by its dense inflorescences.

11. *C. Riedelii* Oliv., Journ. Linn. Soc. XV, 100 (1876); Koord. Med. 's Lands Pl. tuin Btzg. XIX, 559. — An undershrub (*Koorders*); branchlets pubescent; leaves ovate-rotundate, base truncate or subcordate, subabruptly, cuneately attenuate, apex acute, margins entire; rather hirsute; 15—20 by 15—20 cM.; petioles 5—6 $\frac{1}{2}$ cM.; inflorescences terminal, dense, hemispherical, shorter than the leaves, 6 $\frac{1}{2}$ cM. in diam.; bracts narrowly ovate, somewhat shorter than the calyx; calyx partly puberulous, 1.8 cM., the 5 lobes acuminate, as long as the tube; corolla glabrous, somewhat longer than the calyx; tube 1.8—2.5 cM.; lobes obovate-rotundate.

Distribution: N.-Celebes.

This species seems very nearly allied to the 2 preceding ones, but seems distinguishable by the little difference in length of calyx and corolla, and by the entire leaves.

12. *C. elliptifolium* Merrill, Phil. Journ. Sci. Bot. VII, 341 (1912). — A shrub or small tree, 1 M. high; branchlets somewhat tetragonous, glabrous; leaves chartaceous or submembranous, elliptical or elliptical-ovate; base rotundate or subcordate, apex acuminate; margins undulate, the undulations 1—1 $\frac{1}{2}$ cM. apart; upper surface glabrous, shining, lower one glabrous, dull; pairs of nerves 5—6; 12—15 by 7—11 cM.; petioles 3—3 $\frac{1}{2}$ cM.; inflorescences terminal, dense, sessile, more or less puberulous, many-flowered; 10 cM. in diam.; flowers white or nearly so; calyx 0.6 cM., hardly 5-toothed, somewhat puberulous without; corolla glabrous, 1.8 cM. long, 1.2 cM. in diam.; ovary glabrous.

Distribution: Mindanao.

It seems, according to *Merrill*, allied to *C. Klemmei*, *C. Navesianum* and *C. mindorense*, all of them belonging to the section *Siphonanthus*, but its corolla-tube is much shorter. Some species of this section too, possess a dense inflorescence, a beautiful illustration of the fact, that all artificial subdivision of living organisms is imperfect.

13. *C. condensatum* *Miq.* Fl. Ind. bat. II, 874 (1856) and suppl. I, 242. — A shrub?; branchlets tetragonous, with petioles and inflorescences densely tomentose; *leaves* oblong-ovate, base subcordate, truncate or subcuneate, apex rather long acuminate; chartaceous; margins entire; upper surface somewhat pubescent, glabrescent, lower one densely tomentose, both sides densely glandular; pairs of nerves 4—6; 5—13½ by 4—6½ cM.; petioles 2—6 cM.; *inflorescences* very dense, subumbelliform, terminal; bracts large, subinvolucral, as long as calyx; *calyx* densely pubescent, glandular, 0.6—0.9 cM.; segments linear-lanceolate, 0.45—0.7 cM. long, acute, ciliate; *corolla* densely pubescent, 1.8—2.2 cM. in bud; tube very slender; lobes narrow, 0.5 by 0.15—0.2 cM.

SUMATRA: *Miquel?* in H. A. R.-T. sub no. 049917 (H. Bog. no. 1167), nr. Alahan-Padjang. — *de Vriese* in H. L.—B. sub no. 908.266—618. — *Beccari* no. 261, Mt. Singalang, flow. in June—July 1878.

14. *C. Cumingianum* *Schauer*, DC., Prodr. XI, 666 (1847); *Miq.*, Fl. Ind. bat. II, 875; *Hall. f.*, Med. 's Rijks Herb. Leid. no. 37, 69. — A shrub?; branchlets quadrangular, woolly; *leaves* membranous, subcordate-ovate, acuminate, margins entire or irregularly dentate; upper side hirsute, lower one softly woolly, glandular beneath the tomentum; 10—15 by 7—10 cM.; petioles pubescent, 2½—4 cM.; *inflorescences* terminal, dense, many-flowered; *calyx* 1.2 cM.; the segments very acute; *corolla* with puberulous, 2½ cM. long tube; limb 0.6 cM.; *stamens* 1.2 cM. long.

Distribution: Philippines (Cebu: *Hallier*, l.c.).

Robinson no. 10000, *Basilan* and *Elmer* no. 13559, *Mindanao* belong to *C. lanuginosum*. Perhaps it will appear that the present species is synonymous with it. At any rate this is another case, from which we may conclude the close affinity (if not identity) of the *Densiflora* (or at least a certain part of them) with the *Paniculata*.

15. **C. macrostegium** *Schauer, DC.*, Prodr. XI, 666 (1847); *Miq.*, Fl. Ind. bat. II, 875; *Hall. f.*, Med. 's Rijks Herb. Leid. no. 37, 71; *Merrill*, Bur. Gov. Lab. Bull. no. 27, 68 and Phil. Journ. Sci. Bot. XI, 310; *Miq.*, Ann. Mus. L.—B. III, 253. — A shrub?; branchlets quadrangular, with petioles and inflorescences hirsutely brownish tomentose; leaves subchartaceous, subrotundate, base truncate or somewhat cordate, apex acute or subabruptly acuminate; margins entire or irregularly denticulate; both surfaces pubescent, the lower one and the (white) nerves denser; upper side sparsely, lower densely glandular; pairs of nerves 6—7; 13—21 by $9\frac{1}{2}$ — $16\frac{1}{2}$ cM.; petioles 2— $12\frac{1}{2}$ cM.; inflorescences terminal, dense, branchlets 3—7-flowered; bracts large, foliaceous, the lower ones rotundate, the upper ones lanceolate, $2\frac{1}{2}$ —4— $5\frac{1}{2}$ by 0.4—1.2—4 cM., petioles 0—0.5—1 cM.; membranous, pubescent on both sides; calyx 1.6—1.8 cM., pubescent and glandular without, on a 0.2—0.4 cM. long pedicel; segments linear, 0.8—0.9 cM.; corolla-tube 3—3.1 cM., slender, with lobes puberulous; lobes 0.75 by 0.3 cM., obovate; stamens and shortly bifid style exsert.

CERAM: in H. A. R.—T. sub no. 011579 (*H. Bog.* no. 5075), corolla white.

MINDANAO: *Elmer* no. 12161, *Todaya* (Mt. Apo), *Davao*, buds in Sept. 1909.

Distribution: *Saparua*, *Ceram!*, *Mindanao!*, *Luzon*, *Romblon*, *Mindoro* (*Hallier* l.c.).

17. **C. deflexum** *Wall.* Pl. As. Rar. III, 10, t. 215 (1832); *Schau. DC.*, Prodr. XI, 665; *Hook. f.*, Fl. Br.

Ind. IV, 593; *King and Gamble*, Journ. As. Soc. Beng. LXXIV, 4, 828; *Miq.*, Fl. Ind. bat. II, 875. — A shrub, reaching 1.3–2 M. in height; branchlets somewhat quadrangular, sulcate, with petioles and inflorescences densely pubescent; *leaves* chartaceous, elliptical or elliptical-oblong, base subtruncate, apex acute or acuminate, margins entire; upper surface entirely glabrous, lower one somewhat pubescent, denser on the nerves; pairs of nerves 6–8; 18–23 by 7–8 cM.; petioles $4\frac{1}{2}$ – $7\frac{1}{2}$ cM.; *inflorescences* many-flowered axillary in the upper axils of the branches, dense, subumbelliform, 5–8 cM. long, 7 cM. in diam.; peduncles 3– $4\frac{1}{2}$ cM.; *calyx* gradually widening from the ± 0.5 cM. long pedicel, 0.5 cM., teeth acute, lanceolate, as long as the tube; minutely puberulous; *corolla* minutely puberulous; tube slender, 2 cM., lobes narrow, 0.4–0.5 cM. long; *stamens* 1– $1\frac{1}{2}$ cM. exsert, inserted in the corolla-tube at about $\frac{4}{5}$ of its length from the base; *style* somewhat longer exsert than the stamens; stigma shortly bifid, *ovary* glabrous.

MALAY PENINSULA: Griffith no. 6049.

Distribution: Malay Peninsula!, Penang (*King and Gamble*).

Subsection 3 *Penduliflora* Schauer.

17. **C. macrostachyum** Turcz. Bull. Soc. Nat. Mosc. XXXVI, II, 220 (1863); *Hook. f.*, Fl. Br. Ind. IV, 591. — A herb; branchlets with petioles densely with glanduliferous hairs; *leaves* very membranous, long petioled, deeply cordate, acute or subacute; margins coarsely dentate, upper surface with papils which bear short hairs, lower one glandular-dotted; nerves pubescent; lower leaves long petioled, upper ones sessile; $22\frac{1}{2}$ by 16 cM.; petioles 16 cM.; *inflorescences* terminal, very long, somewhat pubescent, glandular, $12\frac{1}{2}$ –30 cM. in length; cymes opposite.

dichotomous, 2-flowered („ramulis oppositis prope basin bipartitis bifloris" Turcz.); bracts linear-lanceolate or ovate or oblong, 0.4 cM.; pedicels 1.2 cM.; flowers blue; *calyx* glabrous or nearly so, cup-shaped, subtruncate, 0.2—0.25 cM., red-glandular, \pm unaltered in fruit; *corolla* glabrous; tube 0.5 cM., lobes 0.5 cM., obovate; *stamens* long exserted; *ovary* and *drupe* with red glands, the latter 0.25 c.M. long.

Distribution: Khasia Mts., Moulmein, Singapore.

18. **C. penduliflorum** Wall. Cat. no. 1795 (1828); *Hook. f.*, Fl. Br. Ind. IV, 591; *King and Gamble*, Journ. As. Soc. Beng. LXXIV, 4, 830; *Schauer, DC.*, Prodr. XI, 664. — A shrub; branchlets tetragonous, farinose; *leaves* opposite or ternate, membranous, oblong-lanceolate, long attenuate (*Schauer*) or cuneate and sometimes obtuse (*Hooker f.*), long acuminate; margins crenulate or entire; both surfaces glabrous; 12—22 by $2\frac{1}{2}$ —10 cM.; petioles very long; *inflorescences* terminal, glabrous or nearly so, very lax, pendulous; cymes shortly peduncled, \pm 3-flowered; *calyx* 0.65—0.8 cM., very deeply 5-fid; segments pubescent, acute, ultimately reflexed; *corolla* very sparsely pubescent and glandular; tube 1.25 cM.; *drupe* 0.6—0.8 cM. in diam.

Distribution: Burma, Tenerassim, Tavoy, Nicobar-isl., Penang, Malay Peninsula (K. and G.).

19. **C. umbratile** *King and Gamble*, Kew Bull. 110 (1908) and Journ. As. Soc. Beng. LXXIV, 4, 831. — A shrub or small tree, reaching 2.7—5 M. in height; branchlets pale-brown, smooth, fistular; *leaves* membranous, variable in shape, usually oblong or obovate or oblanceolate, the broadest part about two-thirds up or even higher, long and rather suddenly acuminate at apex, usually rounded, but sometimes attenuate at base; glabrous on both sides; entire; 20—40 cM. long, 5—15 cM. broad; pairs of nerves 8—12; petioles $2\frac{1}{2}$ — $7\frac{1}{2}$ cM., long flaccid; *panicles* from the uppermost axils, elongate, lax, somewhat curving, glabrous, usually 10—15 cM. long and about $7\frac{1}{2}$ cM.

broad; peduncles slender, 10—17½ cM. long; branches divaricate; cymules few-flowered; rhachis flattened and slightly winged; bracts leafy, lanceolate, up to 2½ cM. long, bracteoles many, linear-setaceous; pedicels slender, puberulous, 0.25—1.25 cM.; buds spatulate, curved, 2½ cM. long; flowers white tinged with pink; the calyx white or pale green turning red in fruit; *calyx* large, slightly puberulous, deeply divided nearly to the base; lobes ovate-acuminate, cuspidate about 1.5 cM. long by 0.6 cM. broad, enlarging in fruit to 4 cM. in diam., and then spreading; *corolla*-tube slender, cylindric, 1—1½ cM. long; lobes spatulate, rounded, as long as the tube; *stamens* exsert; *style* very slender, with shortly bifid stigma; *ovary* rounded, obtuse; *drupe* black, smooth, globose, 1.2 cM. in diam.

Distribution: Malay Peninsula, Sumatra (Lampongs).

20. *C. lævifolium* Blume, Bijdrage 808 (1825); Decne. Nouv. Ann. Mus. Nat. Par. III, 399; Schauer, DC. Prodr. XI, 674; Miquel, Fl. Ind. bat. II, 872; Hassk. 2^e Cat. 's Lands Pl. tuin Btzg., 136; Spanoghe, Linnæa XV, 329. — *C. nutans* Wall. Cat. n. 1793 (1828) and Bot. Mag. t. 3049; Schauer, l.c. 663; Hook. f., Fl. Br. Ind. IV, 591; Hall. f., Med. 's Rijks Herb. Leid. no. 37, 72. — A shrub, 2 M. high; branchlets somewhat tetragonous, glabrous; leaves membranous or chartaceous, oblong-obovate or oblanceolate, base attenuate, gradually widening to near the abruptly acuminate apex; margins entire; pairs of nerves 8—12; both surfaces entirely glabrous; 10—26 by 3.7—10 cM.; petioles ½—1 cM.; acumen 0.8—2 cM.; panicles terminal, long, lax, relatively narrow, leafed below; cymules 3-florous; cymes 2- or 3-chotomous; the whole panicle 18—28 cM. long, 7—14 cM. broad; peduncles 5½—9 cM.; bracts leafy, lanceolate, 0.4—4½ cM. long, 0.1—0.8 cM. broad; bracteoles linear-setaceous, 0.2 cM.; *calyx* glabrous, on a slender, 0.8—1.2 cM. long pedicel, 1—1.2 cM. long, lobes 0.8—1 cM. ovate-lanceolate, acute, red-

purple within, in fruit much enlarged, up to $3\frac{1}{2}$ cM. in diam., and then coriaceous and spreading; *corolla* glabrous or very sparsely and minutely puberulous; tube 1.6—1.8 cM. (or more?) subinfundibuliform; lobes ovate, rounded, 1.2—1.3 cM. long, 0.7—0.8 cM. broad; *stamens* and the very shortly bifid style 2—3 cM. exsert, inserted in the corolla-tube at about $\frac{2}{8}$ of its length from the base; *ovary* glabrous (according to the plate in Bot. Mag. (t. 3049) with a yellow annular disc or gynophore; we could not find the same); *drupe* glabrous, black, seated on the enlarged and spreading calyx, and much smaller than it.

JAVA: Blume? in H. A. R.—T. sub no. 049909.

Distribution: Sikkim, Assam, Khasia Mts., Chittagong, Ava, W.-Sumatra (*Hallier f.*), Java!

Subsection 4 *Racemiflora* Schauer.

21. *C. serratum* Spr., syst. II, 578 (1825); Schauer, DC., Prodr. XI, 664; *Elbert*, Med. 's Rijks Herb. Leid. no. 12, 16; *Hook. f.*, Fl. Br. Ind. IV, 592; *Koord. en Val.*, Atl. d. Baumart. II, 6, t. 276; *Koord.*, Exk. fl. Java III, 138; *King and Gamble*, Journ. As. Soc. Beng. LXXIV, 4, 834; *Miquel*, Fl. Ind. bat. II, 873 and suppl. I, 242 and 568; *Hassk.*, 2^e Cat. 's Lands Pl. tuin, 136; *Hall. f.*, Med. 's Rijks Herb. Leid. no. 37, 72; *Merrill*, Phil. Journ. Sci. Bot. XI, 310; *Miquel*, Ann. Mus. L.-B. III, 254. — *C. cuneatum* Turcz., Bull. Soc. Nat. Mosc. XXXVI, II, 221 (1863). — *C. divaricatum*¹⁾ *Jack*, Mal. Misc. I, 48 (1820); *Schauer* l.c. 674; *Miq.* Fl. Ind. bat. II, 882 and suppl. I, 243; *Jack*, Calc. Journ. Nat. Hist. IV no. XIII, 38. — *C. farinosum* Wall. cat. no. 1810 (1828). — *C. grandifolium*¹⁾ *Salisb.* Prodr. 108

¹⁾ This name is older than *C. serratum*, but the latter is used by most authors. So we retained it.

(1796). — *C. javanicum* Walp. Rep. IV. 113 (1844) — *C. macrophyllum* Sims, Bot. Mag. t. 2536 (1825). — *C. ornatum* Wall. Cat. no. 1811 (1828). — *C. serratum* Bl. Bijdr. 810 (1825); Zoll. u. Mor. Syst. Verz. 53. — *C. ternifolium* D. Don, Prodr. Fl. Nep. 103 (1825). — A shrub; branchlets tetragonous, with petioles glabrous; leaves lanceolate or lanceolate-oblong or oblanceolate or -oblong, apex shortly acuminate or acute, base attenuately acuminate; margins entire or denticulate or dentate except near the base, the teeth varying from minute to nearly setaceous and long; membranous or chartaceous; opposite or ternate; glabrous on both sides; pairs of nerves 6–8; 12–30 by 5–12 cM.; petioles 0.8–2 cM.; *inflorescences* long and narrow, minutely pubescent, 17–20 cM. long, 6–7 cM. wide, with many leafy bracts, the lower ones subrotundate, the upper ones lanceolate, glabrous, 1–3 cM. long; bracteoles linear, pubescent, 0.7 cM., pedicels 0.5 cM.; *calyx* cup-shaped, 0.4(–0.7) cM., margin variably shaped, from nearly truncate to distinctly 5-toothed, the teeth deltoid; glabrous or more or less pubescent; *corolla* glabrous; tube rather wide, 0.8 cM. long; lobes broadly ovate, 0.8 cM. long; *stamens* $2\frac{1}{2}$ cM. exsert, slender, inserted in the corolla-tube at about $\frac{1}{3}$ of its length from the base, didynamous; base of filaments and the lines within the tube beneath them with thick short hairs; *style* very long, 3 cM. exsert, slender; stigma unequally bifid; *ovary* glabrous, 4-lobed; *drupe* glabrous, 0.7 cM. long; the lower third included in the somewhat enlarged calyx, distinctly 4-lobed, with a central cavity.

Var. α Wallichii C. B. Clarke in Hook f., Fl. Br. Ind. IV, 592 (1885) — *leaves* minutely denticulate, sometimes dentate, the upper ones often entire; *calyx* subtruncate or with 5 very minute teeth.

forma a *psilocalyx* H. J. Lam, nov. f. — *calyx* glaber vel subglaber.

UPPER-BURMA: *J. C. Prager* in H. A. R.—T. sub no. 049908, Hill s.s.? of Kyati, flow. on 10-X-1890.

SUMATRA: *Diepenhorst*, H. Bog. no. 2363, Priaman — *Elbert* in H. L.—B. sub no. 908.308—458, Tandjong Korong, 75—100 M. in alt.; id. in H. L.—B. sub no. 908.308—382, Telok Betong, Ranggal, 100—350 M.; id. no. 490, Lampongs, flow. in Febr.—March — *Junghuhn* in H. L.—B. sub no. 908.266—1009, Padang, Apenberg — *Korthals* in H. L.—B. sub no. 908.266—1132, Padang.

JAVA: in H. A. R.—T. sub no. 020911, Nusa Kambangan, flow. on 6-VI-1909 — *Buijsman* no. 179, Tengger Mt., 400 M. in alt., flow. on 20-VIII-1907 — *Blume* in H. L.—B. sub no. 908.266—1101 — *Went* in H. L.—B. sub nos. 908.266—1122 (Papandajan) and — 1137 (Tjipetir) — *Junghuhn*, in H. L.—B. sub nos. 908.266—1134 (Weltevreden) and — 1107 (Ungarang) and — 682 and — 683 (Dieng) — *Waitz* in H. L.—B. sub nos. 908.267—284, flow. in July — *Boerlage* in H. L.—B. sub no. 908.266—1095 and 1096 (Pelabuan Ratu) and no. 454, Buitenzorg, flow. on 11-X-1888 — *de Vriese* in H. L.—B. sub no. 908.266—1260, Nusa Kambangan — *Elbert* nos. 462 and 463 (Kendeng Trinil, Madiun, 100—300 M.) and 527 (Pandan, Madiun, 400—900 M.) — *Zollinger* no. 80 — *Forbes* no. 1251, S.-E.-Java.

LOMBOK: *Elbert* no. 752, Sadjang, 500—750 M.

FLORES: *Elbert* no. 4346, Endeh E., Roga, 1475—1500 M., flow. on 8-II-1910; id. no. 4264, Endeh W., Mboa Rado, 300—600 M., flow. and fr. on 3-II-1912.

forma b puberulum *H. J. Lam*, nov. f. — calyx puberulus.

UPPER-BURMA: *Shaik-Mokim* no. 58, Kachin Hills, Metkina, flrs. bluish in Sept. 1898.

Distribution of the variety: India, Malay Peninsula (*King* and *Gamble*), Sumatra!, Java!, Lombok!, Flores!, Celebes, Cambodia (*K.* and *G.*)

Var. β dentatum *H. J. Lam*, nov. var. — folia sæpis-

sime grosse dentata, dentibus abruptis sæpe subsetaceis, 0.3—0.5 cM. longis; *calyx* distincte 5-dentatus, dentibus deltoideis, subacutis; *calyx* usque ad 0.7 cM. longus.

forma a *psilocalyx* *H. J. Lam.*, nov. f. — *calyx* glaber vel subglaber.

BR.-INDIA: in *H. A. R.—T.* sub. nos. 011580, Nilghiri- and Kurg-Mts. — *J. D. Hooker* in *H. A. R.—T.* sub. no. 011569, 1400—1700 M. in alt., Sikkim.

JAVA: in *H. L.—B.* sub no. 908.357—388, G. Tjissalak, native name: Singugu.

SUMBAWA: *Elbert* no. 4181, Batu-Lanteh Mts., N., 800—1400 M., flow. on 20-I-1910.

forma b *puberulum* *H. J. Lam.*, nov. f. — *calyx* *puberulus*.

BR.-INDIA: *J. D. Hooker* in *H. A. R.—T.* sub. no. 011569, Sikkim, 1400—1700 M. in alt. — *J. D. H.* and *T. T.* in *H. A. R.—T.* sub no. 011570, Khasia Mts., 300—400 M. in alt. — *Pl. Hohenack. Miq.* no. 147, nr. Mangalor; native name: nirisa; the roots are a remedy for snake-bites.

FLORES: *Elbert* no. 4211, Endeh W., Vanga Pandau, 0—250 M., buds on 6-II-1910; id. no. 4284, Endeh, Mboa Rado, 400—600 M., flow. on 3-II-1910.

JAVA: *Boerlage* in *H. L.—B.* sub no. 908.267—940, Sukabumi, Baros.

Distribution of the species: Ceylon (*Clarke*), India!, Malay Peninsula (*King* and *Gamble*), Sumatra!, Java!, Lombok!, Flores!, Sumbawa!, Celebes, Cambodia (*K.* and *G.*).

The distribution of the two varieties gives rise to the supposition either that the subdivision in varieties is not the right one, or that the two varieties will be found in several places more between the regions mentioned above.

Subsection 5 *Paniculata* Schauer.

22. **C. multibracteatum** *Merrill* *Phil. Journ. Sci. Bot.* VII, 98 (1912). — A tree, 4—9 M. high; branchlets with

petioles and inflorescences appressedly pubescent; *leaves* oblong or oblong-ovate, subcoriaceous, base acute or \pm rounded, apex acuminate, margins entire or with some irregular teeth; both sides glabrous, pubescent on the midrib, lower one glandular; pairs of nerves 6–8; 8–13 by $3\frac{1}{2}$ –5 cM.; petioles 0.2– $2\frac{1}{2}$ cM.; *panicles* terminal, 10–15 cM. long, 7 cM. in diam., with many membranous, sessile, ovate or lanceolate bracts; the bracts sparsely pubescent and glandular, 1– $2\frac{1}{2}$ cM. long, $\frac{1}{2}$ –1 cM. broad; white in flower, pink in fruit; *calyx* broad, 0.8–1 cM. long; lobes 5, broadly deltoid, acute; membranous, on a 0.2 cM. long pedicel which is somewhat pubescent with the lower part of the calyx; *corolla* white, glabrous or nearly so; tube 0.7 cM. long, 0.2 cM. in diam.; lobes narrow, obtuse or subacute, 0.3–0.6 cM. long, 0.2–0.25 cM. broad; reflexed; *stamens* 0.7 cM. exsert, inserted near the throat; anthers 0.1–0.15 cM.; filaments reflexed; *style* $1\frac{1}{2}$ cM., 0.7 cM. exsert; stigma shortly bifid; *drupe* 0.6 cM. in diam.

Distribution: Luzon.

23. *C. Colebrookianum* Walp. Rep. IV, 114 (1844); Schauer, DC., Prodr. XI, 672; Hook. f., Fl. Br. Ind. IV, 594; King and Gamble, Journ. As. Beng. LXXIV, 4, 837; Hall. f., Med. 's Rijks Herb. Leid. no. 37, 78. — *C. glandulosum* Colebr. ex. Wall. Cat. no. 1806 (1828); Kuntze, Rev. Gen. I, 505. — A shrub or small tree; branchlets glabrous or nearly so; *leaves* membranous, broadly ovate, apex acute, base cordate, margins entire or sinuate; both surfaces glabrous or puberulous, except on the nerves beneath; often some large glands near the base beneath; pairs of nerves 8–10; $12\frac{1}{2}$ –30 by 10–25 cM.; petioles smooth, 5–20 cM.; *panicles* large, 30–60 cM. in diam. or smaller, pubescent; cymes close, many-flowered; bracts lanceolate, caducous; bracteoles lanceolate; pedicels 0.25–0.5 cM., flowers white or rose-pur-

ple; *calyx* pubescent, cleft halfway down, 0.4–0.6 cM., tube often with a large gland under each lobe; fruiting scarcely enlarged; *corolla* nearly glabrous; tube 1.8–2.5 cM., lobes 0.6 cM.; *stamens* long exsert; *style* with shortly bifid stigma; *ovary* glabrous; drupe glabrous, blue, 0.7–0.9 cM. in diam.

Var. α *typicum* H. J. Lam, nov. var. — *ramuli* foliaque glabri; *paniculæ* longæ; *folia calycesque* glandulis magnis vestiti; *corollæ* atro-lilacinæ.

Distribution: Br. India, Singapore (*Hook. f., K. and G.*).

Var. β *Forbesii* King et Gamble l.c. 838. — *Leaves* and branchlets puberulous; panicles reduced to a terminal corymb of closely packed flowers, 10–12½ cM. long; no glands on calyx or leaf; flowers dark scarlet.

Distribution: Sumatra (Lampongs).

Distribution of the species: India, Malay Peninsula, Sumatra.

24. **C. adenophysum** Hall. f., Med. 's Rijks Herb. Leid. no. 37, 66 (1918). — A small tree; branchlets round or obtusely quadrangular, densely and appressedly ochraceous-pubescent; *leaves* subcordate-ovate, acuminate, entire, thinly chartaceous; both sides glabrous (or upper one with some hairs), pubescent on midrib; pairs of nerves 7–8; lower side indistinctly glandular, with some large glands near the base; 12–25 by 8–15 cM.; petioles pubescent, 2½–12 cM.; *panicles* terminal, pyramidate, large, 20 cM. long, 13 cM. wide, the peduncles of the lower cymes 3½–6 cM.; pedicels 0.3–0.8 cM.; *calyx* cyathimorphous, 0.8–1 cM.; teeth 5, deltoid, 0.2 cM., acute; sparsely pubescent; sometimes with some large glands; *corolla* white, glabrous; tube 1.2–1.7 cM.; lobes 0.7 cM., elliptical; *stamens* and the shortly bifid style 2½–4 cM. exsert; filaments inserted in the upper part of the corolla-tube, with some thick hairs at the base; *ovary* glabrous.

Distribution; S.-E.-Sumatra!, W.- and S.-E.-Borneo

25. *C. trichotomum* Thunb. Fl. Japon. 256 (1784); Schauer, DC., Prodr. XI, 668; Forbes and Hemsley, Fl. Sin. II, 262; Bot. Mag. t. 6561; Maxim. Bull. Ac. Imp. Sc. St. Pét. XXXI, 85; Merrill, Phil. Journ. Sci. Bot. III, 432; Miquel, Ann. Mus. L.—B. II, 99; Hassk. 2e Cat. 's Lands Pl. tuin Btzg., 136; Hall. f. Med. 's Rijks Herb. Leid. no. 37, 69 — A shrub?; branchlets glabrous; leaves membranous, entire, pale beneath, upper ones ovate and long acuminate, lower ones 3-lobed; base 3-nerved; both sides glabrous, somewhat pubescent on the nerves, lower side glandular; petioles long; panicles terminal, very large; cymes trichotomous, many-flowered, with small caducous bracteoles; calyx membranous, attenuate at the base, 1.3 cM., on long pedicel, somewhat inflated and 5-angular; segments 5, acute; corolla-tube twice as long as the calyx, glabrous; stamens very long exsert; drupe seated on the spreading and somewhat enlarged calyx.

Distribution: Japan, (Bot. Gardens of Buitenzorg, (Hallier)), Formosa (Matsumara and Hayata), S.-China, Luzon, Batan (Merrill)

26. *C. magnificum* Warb. Engl. Jhrb. XIII, 428 (1891); Pulle in Lorentz, Nova-Guinea VIII, 2, 402 and VIII, 4, 687; K. Schum. u. Lauterb. Fl. D. Südsee, 525. — A shrub, 1–2 M. high, or a small tree (v. Römer); branchlets ± quadrangular, with petioles and panicles glabrous; leaves membranous, broadly ovate, base cuneate or subtruncate, apex shortly acuminate; margins entire; pairs of nerves 5–7; both surfaces glabrous, or the upper one with some hairs; base sometimes subcordate, sometimes attenuate; 13–30 by 8–15 cM.; petioles glabrous, 6–12 cM.; panicles terminal, pyramidate, 15–26 cM. long, 10–15 cM. in diam.; calyx on 0.3–1 cM. long pedicel, very wide, 1.3–1.7 cM. long, 1.5 cM. wide, 5-cleft more than halfway down, the segments membranous, broadly ovate, acute; glabrous; corolla-tube subinfundibuliform, 1.4–1.8

cM. long, glabrous; lobes broadly ovate, rounded, 1–1.5 cM. long, glabrous; *stamens* with the shortly bifid style 7 cM. exsert, inserted in the throat; *ovary* glabrous.

NEW-GUINEA: *Versteeg* no. 1732, Dutch-N.-G., flow. on 18-IX-1907. — *v. Römer* nos. 501 (Dutch-N.-G., a tree, flow. dark red, on 13-VIII-1909) and 593 (same loc., a shrub, flow. on 17-X-1909). — *Gjellerup* no. 216, Dutch-N.-G., Begowri-river, nr. a salt-spring, flow. on 25-VI-1910; 170 M. in alt.; fls. bright red, anthers brown-red, stigma pink, branchlets of inflorescences red-violet; bark whitish; id. no. 819, N.-Dutch-N.-G., Gautier Mts., 300 M. in alt., flow. on 3-XI-1911. — *Verz. J.* no. 170, Giriwori-river, flow. in July 1912. — *Kærnbach* no. 69, Kais.-W.-land, Nuselang-station on Sattel-Mt., road to Sahang, 930 M. in alt., flow. on 11-XII-1893, fls. bright red. — *Schlechter* no. 16895, Kais.-W.-land, Djamu-river, 400 M. in alt., flow. on 26-IX-1907.

27. *C. tracyanum* *F. v. Muell.* in *Benth.* and *v. Muell.* Fl. Aust. V, 62 (1870) and *Descr. Not. pap. pl. V*, 91. — A shrub or small tree; branchlets \pm hirsutely pubescent; *leaves* broadly ovate, base rounded or broadly cordate, apex shortly acuminate, pubescent when young; 10–20 cM. long or more; petioles $2\frac{1}{2}$ –10 cM.; *panicles* terminal; cymes trichotomous, $7\frac{1}{2}$ –10 cM. in diam. (in fruit); bracts small, caducous; pedicels short; *calyx* pubescent without, glabrous within, 0.65 cM., 5-cleft halfway down, enlarged in fruit up to 1 cM. in diam.; lobes acute; *drupe* 0.7–1 cM. in diam.

Distribution: N.-Australia, New-Guinea.

In the description we could not find any difference with the following species.

28. *C. buruanum* *Miquel*, *Ann. Mus. L.-B.* III, 252 (1867). — A shrub?; branchlets obtusely tetragonous, with petioles and panicles greyish pubescent; *leaves* oblong or elliptical, base subcuneate, truncate or subcordate, some-

times somewhat decurrent; apex acuminate; margins entire; subchartaceous; pairs of nerves 6—8; upper surface subglabrous, pubescent on the nerves, lower one sparsely pubescent, denser on the nerves; 13—21 by 5—12½ cM.; petioles 2½—10 cM.; *panicles* lax, few-flowered, 5—10 cM. long; bracts leafy, bracteoles subulate; pedicels shorter or longer than the calyx; *calyx* 0.5 cM., grey-pubescent, without, except on the tips of the segments; teeth deltoid, acute, as long as a half of the tube; *corolla* grey-pubescent 1.2 cM. long (1.5—2 cM., *Miquel*); lobes rounded, 0.4—1 cM. long, less pubescent than the tube; *stamens* exsert; *style* with shortly bifid stigma; *ovary* glabrous.

BURU: H. Bog. no. 5250 (Oki).

SUMATRA: H. Bog. no. 1160, Lubuk-alung; native name: pangi pangi riembo (cf. *C. condensatum*).

29. *C. brunfelsiiflorum* Hall. f., Med. 's Rijks Herb. Leid. no. 37, 68 (1918). — *C. catalpifolium* Hall. f. l.c. 67. — A shrub?; branchlets round or obtusely quadrangular, with petioles and panicles ochraceous- or ferruginous-hirsute; *leaves* ovate-lanceolate, base acute, subrotundate or slightly subcordate, apex long acuminate; margins entire; membranous or thinly chartaceous; both sides with some hairs, the nerves pubescent; glandular and with some sparse larger glands beneath; 8—20½ by 4—12 cM.; petioles 2—6 cM.; *panicles* terminal, pyramidal, 8—16 cM. long, 6—9 cM. in diam., main peduncles 0—4½ cM.; bracts large, leafy; bracteoles 0.4 cM., subulate; pedicels 0.8—2 cM.; *calyx* cyathimorphous, sparsely pubescent, without and within, 1—1.2 cM. long, teeth deltoid, acute, 0.3—0.4 cM.; *corolla* sparsely pubescent; tube slender. 1.5—1.9 cM.; lobes 0.3—0.4 cM. long, pubescent in the middle; *stamens* 1.5 cM. exsert, inserted in the throat; *ovary* glabrous, obconoid, suddenly flattened and somewhat beaked above.

BURU: H. Bog. no. 1874 (Kageli, *Teysmann*) — de

Vriese et Teijsmann in H. L.—B. sub nos. 908.267—1093 and 1094 (*C. catalpifolium*).

30. **C. porphyrocalyx** *Laut. et K. Schum.* in Fl. D., Südsee 526 (1900). — *C. rhytidophyllum* *K. Schum.* in *K. Schum. u. Lauterb.* Nachtr. Fl. D. Südsee, 371 (1905). — An undershrub, 0.8—1 M. (*Ledermann*), a climbing shrub (*Schlechter*); a shrub, 1—2 M. (*Moszkowski, Gjellerup, Lauterbach*), a large tree ¹⁾ (*Moszkowski*); branchlets quadrangular, with petioles and panicles ferruginous-pubescent; leaves variable in shape, usually oblong or elliptical, sometimes subrotundate, oblong-lanceolate or lanceolate, base usually truncate or rounded, sometimes subcordate or obtuse or even cuneate, apex shortly acuminate; margins entire or irregularly sinuate-dentate or scalloped; membranous or chartaceous; pairs of nerves 5—10; both sides glabrous, pubescent on the midrib, sometimes with some hairs above; glandular and sometimes with some peltate scales beneath; upper side sometimes indistinctly glandular; 9—28 by 2.3—18½ cM.; petioles 0.8—10½ cM.; panicles lax, few-flowered, with many caducous, below leafy bracts, becoming linear towards the top of the panicle and pubescent on both sides; 7—13 cM. long, 9—12 cM. in diam.; calyx on a 0.7—2 cM. long pedicel, campanulate, 5-fid] halfway down, the segments acute, deltoid; densely pubescent and with sessile glands without, with glanduliferous hairs within; tube 0.4—0.6 cM.; lobes 0.4—0.6 cM., sometimes reflexed; corolla softly pubescent, glandular, the tube with some glanduliferous hairs as are in the inner side of the calyx; tube 1.6—2—2.5 cM.; lobes elliptical, 0.6—0.8 cM. long, sometimes narrow; stamens 1.7—2½ cM. exsert, inserted in the throat; anthers rather

1) Notwithstanding these quite different qualifications, we could not by any means separate the varieties, as their many transitory forms did not justify us to raise it to the specific rank.

large, the lower half bifid, the cells narrowing and somewhat divaricate below; *style* as long as or somewhat shorter exsert than the stamens; stigma shortly bifid; *ovary* glabrous; *fruit* glabrous, globose, 1.1 cM. long and in diam., seated on the up to 1.2 cM. (in length) enlarged calyx.

Var. α typicum H. J. Lam. nov. var. — *folia* oblonga vel oblongo-elliptica, interdum late oblonga, basi rotundata vel interdum subcordata; nervis utrinque 6—8; margine integra; 14—25 cM. longa, 8½—18 cM. lata; petiolo 1—9 cM. longo; *calyx* lobis non reflexis, pilis glanduliferis intus brevibus vestitus; *frutex*, interdum scandens.

NEW-GUINEA, KAIS.-W.-LAND: *Lauterbach* no. 2256, at Nura-river, 180 M. in alt.; calyx fleshy, red; fruit dark-blue, on 6-VI-1896. — *Hollrung* no. 631, between Babuk and Wollembik, flow. in May 1887. — *Schlechter* no. 14136, Ramu, flow. in Jan. 1902; *id.* no. 16141, scandent, in the forest of Albo, 180 M. in alt., flow. on 19-VI-1907.

Var. β angustius (K. Schum.) H. J. Lam, nov. var. — *C. rhytidophyllum* var. *β angustior* K. Schum., l.c. — *folia* lanceolata vel oblongo-lanceolata, basi acuta vel obtusa, margine integra; 9—23 cM. longa, 2.3—7 cM. lata; petiolo 0.8—6 cM. longo; ceteroquin ut in var. *α*.

NEW-GUINEA, KAIS.-W.-LAND: *Rodatz et Klink* no. 233, Bismarck-Mts., flow. on 7-VII-1899. — *Ledermann* no. 7468, Camp 3 (Frieda) of the Kais.-Augusta-Fluss-exp., 50—150 M. in alt., flow. on 2-VI-1912, white, throat blue or rose; lower side of leaf nearly white.

NEW-GUINEA, N.-DUTCH-N.-G.: *Gjellerup* no. 767, Berkambor, Tor-river, 25 M. in alt., buds yellow-green, persistent calyx („blijvende bloembladen”) dark-red; fruit dark-blue, thinly fleshy, bitter, juicy; fr. on 20-X-1911.

Var. γ reflexum H. J. Lam, nov. var. — *folia* ut in var. *α*, sed supra nonnullis pilis, subtus nonnullis squamis peltatis prope costam vestita, nervisque utrinque 10; *calycis* lobi manifeste reflexi, pilis glanduliferis intus longis; *corollæ*

lobi angusti; *stamina* $2\frac{1}{2}$, *stylus* 2 cM. exserta; *arbor* vel *frutex*.

NEW-GUINEA (DUTCH-): *Moszkowski* no. 388, a large tree, flrs. yellow; Naumoni-station, v. Rees-Mts., 75—300 M. in alt., flow. in Oct. 1910; *id.* no. 280, Tana-station; a shrub with white flowers in July 1910.

Var. δ dentata H. J. Lam, nov. var. — *folia* ut in var. α , sed margine grosse irregulariterque sinuato-dentata; *corollæ* tubus 1.6—1.7 cM. longus; ceteroquin ut in var. α .

NEW-GUINEA (N.-DUTCH-): *Gjellerup* nos. 420 a — b , Hollandia, 75 M. in alt.; a shrub, 1 M. high, calyx green, corolla, stamens and stigma white, anthers brown, style ruddish; lower surface of leaves white; branchlets and petioles brown-red-pubescent, one specimen, flow. on 2-I-1911.

Distribution of the species: New-Guinea! probably endemic.

The cause that *Schumann* considered *C. porphyrocalyx* and *C. rhytidophyllum* as being two separate species, is probably the following that he saw of *C. porphyrocalyx* only the fruiting calyx and of *C. rhytidophyllum* all but this. The 2 species are, however, undoubtedly identical, and *C. porph. s.a.* is a very characteristic, polymorphous species, the varieties of which, though clearly separate, often show transitory forms, and are conform with each other in most important and typical points.

31. *C. Friesii* K. Schum. in K. Schum. u. Lauterb. Nachtr. Fl. D. Südsee, 372 (1905). — A small tree; branchlets round, glabrous, with much pith; leaves lanceolate, subchartaceous, acuminate at base and at apex; margins entire, pairs of nerves 8—11; both surfaces entirely glabrous: 20—27 by $5\frac{1}{2}$ — $8\frac{1}{2}$ cM.; petioles $2\frac{1}{2}$ —4 cM.; *inflorescences* 12 cM. long, $4\frac{1}{2}$ cM. wide, the cymes few-flowered, opposite, small, sessile, thus forming a subspicate raceme, bracts lanceolate, 2— $5\frac{1}{2}$ cM. long, sessile; pedicels 1.5 cM.; *calyx* gradually narrowing into the pedicel.

0.3—0.4 cM., glabrous, 5-cleft halfway down, the lobes subrounded, with ciliate margins; *corolla* clavate in bud, 2 cM. long, subglabrous, the tube subinfundibuliform, the lobes rounded, with ciliate margins; yellow with orange-coloured tips; *stamens* inserted in the middle of the corolla-tube; *style* 4 cM., *ovary* glabrous, gradually narrowing into the style.

NEW-GUINEA: *Nyman* no. 730, Kais.-W.-land, Sattelmt., 600 M. in alt., flow. in July 1899.

This species has in its inflorescence a close affinity with the subsection *Racemiflora*, to which somewhat doubtful group it should be brought perhaps; it differs from it, however, in the shape of the calyx, which is not at all cup-shaped, and may form a transition-form between the above subsection and the 6 following species. (cf. also *C. macrophyllum* Bl. and *C. Williamsii* Elm).

32. *C. Diepenhorstii* Miquel, Fl. Ind. bat., suppl. I, 568 (1860) and Ann. Mus. L.-B. III, 254; *Hall. f.*, Med. 's Rijks Herb. Leid. no. 37, 73. — A shrub?; branchlets \pm round; *leaves* oblong-ob lanceolate, base cuneate, apex abruptly and shortly acuminate, margins entire; subchartaceous; both sides entirely glabrous; pairs of nerves \pm 9; 30—37 by 10—12 cM.; petioles $3\frac{1}{2}$ —5 cM.; *thyse* (terminal?) densely pubescent, peduncles opposite, cymes dichotomous; *calyx* 1.2 cM., 5-partite, the lobes lanceolate, acuminate, pubescent; *ovary* white-pubescent.

SUMATRA: H. Bog. No. 2539.

The species is, in our opinion, not identical with *C. macrophyllum* Bl. (*C. phyllomega* Steud.) as Miquel (Ann. III, 254) supposes and Hallier l.c. thinks. It differs from that species in its leaves, which have only 9 (not 7—15) pairs of nerves and are abruptly acuminate, and in its larger calyx.

33. *C. kinabaluense* Stapf, Trans. Linn. Soc. Ser. II, IV, 216 (1894) — A shrub?; branchlets densely hirsute; *leaves* oblanceolate or lanceolate-oblong, petioles sparsely puberulous sometimes narrowed above the base and near

the apex; leaves acuminate, margins serrulate, upper surface minutely pubescent when young, ultimately glabrous except near the base, lower one tawny-pubescent on the nerves; pairs of nerves 11—13; 15—25 by 5—6½ cM.; petioles 2½—3½ cM.; panicles terminal, reaching 20 cM. in length, 10—13 cM. in diam., puberulous; cymes lax 2—5-flowered; bracts lanceolate to filiform; pedicels 1—1.8 cM.; calyx 5-partite, lobes 1.0—1.3 cM., lanceolate, acute, pubescent, enlarged in fruit; corolla-tube slender, 1½—2 cM. long, pubescent; lobes subequal, subspathulate, apiculate; stamens and style 1.8 cM. exsert.

Distribution: Borneo (Penokok).

As *Stapf* mentions that this species is allied to *C. disparifolium*, *C. calamitosum* and *C. Griffithianum*, it may be that it had better be brought to the subsection *Axilliflora*. But as *Stapf* speaks only of a „terminal panicle” we provisorily placed it among the *Paniculata*.

34. *C. myrmecophilum* *Ridl.*, Journ. Bot. XXXIII, 42 (1895); Bot. Mag. t. 7887; *King and Gamble*, Journ. As. Soc. Beng. LXXIV, 4, 832. — An undershrub; branchlets glabrous; internodes swollen, hollow, fistular; bark white; leaves opposite or alternate, membranous, oblong-lanceolate, base obtuse or acuminate, apex acuminate; 15—30 by 5—10 cM.; petioles fistular, 6—18 cM. long; panicles terminal, pubescent, reaching more than 30 cM. in length and 7½—10 cM. in diam.; cymes rather few-flowered; bracts linear, caducous, 0.6 cM.; calyx with 5 linear teeth, cleft down to the base, 0.8 cM., pubescent, in fruit enlarged to 2½ cM. in diam., lobes red, reflexed; corolla-tube puberulous, 2½ cM. (*Ridley*), 1.2 cM. (*King et Gamble*), red; lobes pubescent, orange-coloured, as long as the tube (*King et Gamble*); stamens 2½ cM. exsert, red; anthers purple, oblong-reniform; style as long as the stamens (*K. et G.*), or shorter (*Ridley*), red; stigmatic lobes setaceous, slender; ovary glabrous; drupe black, globose,

0.6 cM. (R.), 1.2 cM. in diam. (K. et G.); lobes of enlarged calyx 1.3 by 0.3 cM.

Distribution: Malay Peninsula.

The descriptions of *Ridley* and that of *King* and *Gamble* are not always conform.

The fistular internodes and petioles are sometimes inhabited by ants belonging to the genus *Pheidole*.

35. *C. Williamsii* *Elm.* Leaflet. Phil. Bot. II, 684 (1910) — *C. macrophyllum* *Bl.* var. *sinuatolobata* *Hall f.*, Med. 's Rijks Herb. Leid. no. 37, 73. — An under-shrub; branchlets and petioles glabrous; leaves crowded towards the tips of the branchlets, lanceolate or oblanceolate, base narrowly obtuse or acute, apex acute; margins with 2–6 large sinuate lobes in the upper $\frac{2}{3}$, which, however, do not influence the general lanceolate form; membranous; glabrous on both sides; 25–40 by 9–15 cM., broadest above the middle or across it; petioles 3–10 cM.; panicles 40 cM. long, 20 cM. broad; pubescent; peduncles 10 cM., bracts 0.5 cM.; pedicels sparsely pubescent, 0.4–1 cM., calyx 5- (4-, *Elmer*) partite, nearly to the base, segments narrowly lanceolate, acuminate, 0.7–1 cM., minutely and sparsely pubescent; corolla-tube slender, 2 cM., red, minutely pubescent, lobes oblong-elliptical, 1–1.2 cM. long, 0.4–0.5 cM. broad, „saumon” coloured, very minutely and sparsely puberulous; stamens inserted in the throat, 3 cM. exsert; style 2 cM. exsert, sparsely pubescent at base; stigma 2-fid; ovary glabrous, globose.

MINDANAO: *Elmer* no. 14236, Mambajao, Camaguin-isl., flow. in Nov. 1912.

Distribution: Mindanao, Camaguin!

Since we did not see any distinct transitory form between this species and *C. macrophyllum*, we cannot agree with *Hallier*, l.c. in considering it as a var. *sinuatolobatum* (not -a, as *Hall.* writes) of the last-mentioned species, from which it is, moreover separated by its distribution.

36. **C. macrophyllum** Bl. Bijdr. 809 (1825); *Hall. f. Med. 's Rijks Herb. Leid.* no. 37, 73; *Hook., Comp. Bot. Mag.* I, 349. — *C. phyllomega Steud. Nomencl. ed.* II, I, 383 (1841); *Schauer, DC., Prodr.* XI, 674; *Koord. Exk. fl. v. Java* III, 139; *Miq., Fl. Ind. bat.* II, 878; ? *Scheffer, Ann. J. bot. Btz.* I, 41. — A shrub, 2 M. high; branchlets obtusely quadrangular, with petioles glabrous; *leaves* oblanceolate, or oblong-oblanceolate, base narrowly subobtusely, apex acute or shortly acuminate; sometimes oblong, base rounded, apex acute; chartaceous; margins entire; pairs of little prominent nerves 7–15; glabrous on both sides; $16\frac{1}{2}$ –39 by 6.2–12.6 cM.; petioles 2– $7\frac{1}{2}$ cM.; *panicles* 10–34 cM. long, 4–10 cM. broad, minutely pubescent; peduncles 3– $8\frac{1}{2}$ cM.; bracts narrowly lanceolate, lower ones 3 cM. long, upper ones almost setaceous, 0.6 cM.; bracteoles linear, 0.2 cM.; pedicels 0.5–1.3 cM., slender, with 1 bracteole; *calyx* 5-fid down to the base; segments lanceolate, acuminate, glabrous, 0.6–0.8 cM.; *corolla* very sparsely, minutely puberulous; tube 2–2.3 cM.; lobes 0.9 by 0.2 cM., narrow; *stamens* and *style* 1.2? cM. exsert; stigma shortly bifid; *ovary* glabrous; *drupe* seated on the coriaceous, enlarged, $2\frac{1}{2}$ – $3\frac{1}{2}$ cM. in diam., spreading calyx.

SUMATRA: *v. Daalen* no. 497, Batak-countries, fr. on 3-VII-1904. — *Korthals* in H.L.–B. sub nos. 908.266–1201 to 1203.

JAVA: *Ploem* in H. L.–B. sub no. 909.63–249, W.-Java.

37. **C. barba felis** *Hall f., Med. 's Rijks Herb. Leid.* no. 37, 74. — An undershrub?; branchlets densely glandular-hispid; *leaves* ovate or ovate-lanceolate, shortly and rather acutely acuminate, base rounded or somewhat cordate; membranous; upper surface glabrous, lower one minutely pubescent, glandular; pairs of nerves 8; 10–25 by 4–10 cM.; petioles minutely puberulous, 2– $4\frac{1}{2}$ cM.; *panicles* terminal, 11 cM. long, 6 cM. wide; cymes tri-

chotomous; bracts and bracteoles small, almost linear; pedicels 0.3—0.5 cM.; *calyx* deeply 5-partite; lobes lanceolate; calyx with panicle with glanduliferous hairs; 0.2 cM.; in fruit very enlarged, spreading, 1 cM. long, red within; *corolla*-tube 0.8 cM.; lobes 0.7 cM.; *stamens* 2 cM. exsert.; *drupe* globose, black-purple(?), somewhat pulverulent, 0.6—0.7 cM. in diam. (if ripe?).

Distribution: Borneo (Sarawak).

Characterized by its extremely short corolla-tube.

38. **C. papuanum** Scheff. Ann. J. bot. Btzg. I, 41 (1876). — A shrub?; branchlets with petioles and panicles densely and softly pubescent; *leaves* ovato-cordate, shortly acuminate, margins coarsely dentate, mucronate-sinuate; upper side hirsutely, appressedly pubescent, lower one softly pubescent; 6—16 by 5—12 cM.; petioles 5—15 cM.; *panicles* terminal, erect, shorter than the leaves, few-flowered; bracts and bracteoles caducous; *calyx* small, segments 5, ovate, acute; in fruit enlarged but twice as short as the fruit; *corolla* 5 times as long as the calyx.

Distribution: New-Guinea (Mansinama-isl.).

39. **C. puberulum** Merrill Phil. Journ. Sci. Bot. X, 72 (1915). — An undershrub; innovations puberulous; *leaves* ovate, broad, chartaceous, base sinuate-cordate, sinus deep; margins dentate; upper side hirsute with sparse stiff hairs, lower one softly pubescent, glandular; 10—20 by 9—17 cM.; petioles puberulous, reaching 15 cM. in length; *panicles* terminal, narrowly pyramidate; 20 cM. long, 10—14 cM. in diam.; cymes 7 cM.; pubescent; bracts 1—1½ cM., narrow; flowers many, red; pedicels 1—1½ cM.; *calyx*-lobes pubescent, oblong, obtuse, 0.3 cM., in fruit enlarged to 0.5—0.6 cM.; *corolla*-tube 1.2 cM. long, 0.1 cM. in diam., somewhat puberulous without; lobes 0.5—0.7 cM., obtuse; *stamens* 2 cM. exsert.; *drupe* 0.5 cM. long, 0.8 cM. in diam.

Distribution: Mindanao.

Cl. intermedium, with which it should be allied, belongs to the subsection *Squamata*.

40. *C. Curtisii* H. H. W. Pearson, Kew. Bull. 142 (1908); King and Gamble, Journ. As. Soc. Beng. LXXIV, 4, 833. — A small shrub; branchlets fistular, striate, minutely puberulous as are petioles and inflorescences; leaves membranous, obovate, base rounded, apex obtusely acuminate, upper side glabrescent, lower one minutely puberulous; margins entire; pairs of nerves 9–12; petioles stout, striate, 6–7½ cM.; 11–22 by 6–11 cM.; panicles terminal, many-flowered, 12–15 cM. long, 6½ cM. in diam.; bracts leafy below, the upper ones subulate, 0.25 cM.; pedicels pubescent; flowers orange-coloured; calyx campanulate, minutely pubescent within and without, and with many scales on both sides; tube 0.25–0.35 cM.; lobes lanceolate, acuminate, 3-nerved, ciliate at margins, 0.5–0.75 cM. long, 0.25–0.3 cM. broad; corolla-tube 2–2½ cM., on both sides pubescent and with clavate, sessile glands; lobes unequal, obovate-elliptical, minutely ciliate at margins, glabrous, 0.75 cM. long; stamens long exsert; ovary glabrous.

Distribution: Malay Peninsula.

The fistular stems contain ant-nests.

41. *C. infortunatum* L. Fl. Zeyl. 232 (1747) and Sp. pl. ed. I, II, 637 (1753); Blume, Bijdr. 811; Williams, Bull. Herb. Boiss. sér. II, T. V, 432; Schauer, DC., Prodr. XI, 667; Gaertn., Fruct. I, 271; Hook. f., Fl. Br. Ind. IV, 594; King and Gamble, Journ. As. Soc. Beng. LXXIV, 4, 835; Koord. Exk. fl. v. Java III, 138; Miq., Fl. Ind. bat. II, 876; Maxim. Bull. Ac. Sci. Imp. St. Pét. XXXI, 85; Zoll. u. Mor., Syst. Verz., 53; Hall. f., Med. 's Rijks Herb. Leid. no. 37, 64. — *C. calycinum* Turcz., Bull. Soc. Nat. Mosc. XXXVI, II, 222 (1863). — *C. castaneifolium* Klotzsch, Bot. Ergebn. Walden-Reise, 102 (year?) — *C. cordatum* D. Don, Prodr. Fl. Nep. 103

(1825). — *C. depauperatum* Wall. ex Steud. Nomencl. ed. II, I, 382 (1841). — *C. viscosum* Vent. Jard. Malm. t. 25 (1804); Hall. f. l.c. 63. — A shrub, or small tree; branchlets quadrangular, strigosely tomentose; leaves subrotundate or ovato-cordate, upper ones often ovate with subacute or rounded base and entire or shortly acuminate-dentate margins, the lower ones acuminate, denticulate; both sides strigosely pubescent, lower one with some large glands; 20–25 cM. long, 9–20 cM. broad; petioles $2\frac{1}{2}$ –10 cM.; panicles terminal, wide, densely tawny-pubescent, sometimes leafed below; cymes lax; bracts leafy, caducous, ovate-lanceolate, sometimes coloured; 15–30 cM. long, 10–20 cM. wide; bracteoles lanceolate, deciduous; pedicels slender, 0.6–1.2 cM.; flowers white, tinged with pink; calyx coloured, deeply 5-lobed, almost down to the base, pubescent; segments lanceolate acuminate, with large glands without, 0.8–1.3 cM. long; corolla strigosely pubescent and glandular; tube 1.5–2 cM.; lobes oblong, 1 cM., long, 0.5 cM. broad, obtuse; stamens 2.2–2.8 cM. exsert, as is style; drupe 0.8 cM. in diam.

Distribution: India, Burma (*K. and G.*), Siam (*Williams*). Ceylon, Java, Molucca-Isl, Penang (*Miquel*).

For affinity see *C. Curranii*.

42. *C. Wenzelii* Merrill, Phil. Journ. Sci. Bot. IX, 385 (1914). — A shrub; branchlets hirsute; leaves chartaceous or subcoriaceous, ovate or \pm oblong-ovate, cordate at base, acutely acuminate at apex; margins distantly denticulate; upper side with sparse long hairs, hirsute and glandular beneath; pairs of nerves 8; 9–15 by 5–9 cM.; petioles hirsutely pubescent, 2–6 cM.; panicles terminal, few-flowered, reaching 10 cM. in length, dark-purple pubescent; bracts and bracteoles linear, the bracts reaching 1 cM. in length; flowers white; calyx somewhat inflated, oblong-ovoid, 1 cM. long, 0.8 cM. in diam; lobes lan-

ceolate, acuminate, 0.8 cM.; with purple hairs; *corolla-tube* 2 cM. long, 0.2 cM. broad, lower part glabrous, upper part with sparse hairs; lobes rounded-elliptical, 0.8—0.9 cM. long, sparsely pubescent without; *filaments* 0.9 cM. exsert.

Distribution: Leyte (Philippines).

43. *C. Vanoverberghii* Merrill, Phil. Journ. Sci. Bot. VII, 98 (1912). — A shrub; branchlets tetragonous, with panicles softly tawny-pubescent; *leaves* ovate, chartaceous, base rounded or \pm cordate, apex acutely acuminate, margins entire; upper side sparsely, nerves and lower side denser pubescent, lower side glandular; pairs of nerves 7; 10—14 cM. long, 10 cM. broad or less; petioles 4—5 cM.; *panicles* terminal, 15 cM. long and in diam.; bracts narrowly oblong, 0.5—0.6 cM., pubescent; bracteoles smaller with same shape; flowers white, red in throat; *calyx* pubescent, 0.9 cM., lobes ovate, acute, 0.3—0.4 cM. long; *corolla-tube* 1.8—2 cM. long, 0.2 cM. in diam., somewhat puberulous; lobes oblong, obtuse or acute, 0.7—0.8 by 0.3 cM.; *stamens* 1.8—2 cM. long; *fruit* globose, 0.5 cM. in diam.

Distribution: Luzon.

44. *C. hæmatolasium* Hall. f., Med. 's Rijks Herb. Leid. no. 37, 69 (1918). — A shrub; branchlets hirsutely ferruginous-woolly, as are petioles and panicles; *leaves* ovate or oblong-ovate, base rounded or subcuneate and subattenuate, apex long acuminate, margins serrulate, the serrulations mucronulate; membranous; both sides rather densely, softly tawny-tomentose; pairs of nerves 6—8; $11\frac{1}{2}$ —37 by 5.3—17 cM.; petioles 2— $9\frac{1}{2}$ cM.; *panicles* terminal, leafed below, bracts becoming smaller towards the top and there linear, 1.3 cM.; few-flowered; 9—15 cM. long, 6—7 cM. wide; peduncles $\frac{1}{2}$ — $2\frac{1}{2}$ cM.; *calyx* on a 0.4—1 cM. long pedicel, hirsutely tawny-pubescent, wide, 1.2 cM.; lobes 5, lanceolate-acuminate, ribbed, 1.1 cM. long, 0.15—0.25 cM. broad; already enlarging before

flowering-time from 0.2 cM. up to 1.5—2 cM. in fruit, and then including the drupe, the segments 1 cM. long, 0.7 cM. broad; *corolla* somewhat glandular in bud; *ovary* glabrous, 4-lobed; *style* with shortly bifid stigma; *drupe* globose, glabrous, black, 1.2—1.7 cM. in diam.

Distribution: W.-Borneo!

45. *C. pulchrum* Fawc. in Forbes, Nat. Wand. East-Arch., 514 (year?) and (German edition) Wand. Nat. f. Mal. Arch. II, 226 (1886). — A shrub?; branchlets \pm quadrangular, minutely brown-farinose; *leaves* long petioled, cordate-rotundate, sinus 4—5 $\frac{1}{2}$ cM. deep, membranous; apex subacute or rectangular-subobtuse; margins serrate; upper side very sparsely, lower one sparsely pubescent; pairs of nerves 6—7; 14—19 $\frac{1}{2}$ cM. long (without the sinus), 14—21 $\frac{1}{2}$ cM. broad; petioles 7—17 cM. long, with panicles brown-pubescent; *panicles* terminal, 6 cM. long, 9 cM. in diam.; peduncles 3 cM.; flowers clustered at the tops of the branchlets; *calyx* 0.6—0.8 cM., brown-pubescent, not altered in fruit; lobes 5, narrowly deltoid, acute, 0.3—0.5 cM.; *corolla* red, glabrous; tube 2—2 $\frac{1}{2}$ cM., lobes 1.2—1.4 by 0.5 cM., elliptical; *stamens* and the shortly bifid style 1 cM. exsert; *drupe* globose, 4-furrowed.

Distribution: Timor.

46. *C. albiflos* H. J. Lam, nov. spec. — Arbor parva; ramuli teretes, cum petiolis paniculisque dense fusco- vel ferrugineo-pubescentes; *folia* opposita, sæpe inæquimagna et inæquipetiolata, oblonga vel ovato-oblonga, basi truncata vel acuta, apice longe acuminata, margine integra; membranacea vel subchartacea; supra molliter pubescentia, ut in pagina inferiore, subtus singulis squamis peltatis vestita, vel supra sparse pubescentia, nervis puberulis, vel subglabra, subtus sparse pubescentia; nervis utrinque 8—10; 13 $\frac{1}{2}$ —33 $\frac{1}{2}$ cM. longa, 4.7—11.7 cM. lata, petiola 1—9 $\frac{1}{2}$ cM., in eodem pari sæpe altero 1 $\frac{1}{2}$, altero 9 $\frac{1}{2}$

cM. longo; *panicula* terminalis, 10—14 cM. longa, 8 cM. lata, pedunculo $2\frac{1}{2}$ —5 cM. longo; bracteæ parvæ, foliaceæ; cymi oppositi, di- vel trichotomi; pedicelli 0.4—0.6 cM. longi, bracteola una suffulti; *calyx* cyathimorphus, 0.4 cM. longus, sparse pubescens; dentibus 5, deltoideis, 0.1 cM. longis; *corolla* alba, glabra vel sparsissime puberulus; tubus 1.2—1.5 cM. longus, cylindricus; lobii ovati, rotundati; *stamina* 1.5—1.8 cM. exserta, fauce inserta, filamentis gracilibus, antheris ovoideis, 0.125 cM. longis, thecis non divaricatis, connatis; *stylus* 1.5—1.8 cM. exsertus, stigmatate bifido; *drupa* glabra, atra, calyce aucto, 0.9—1.1 cM. diam., insidens.

Var. α *puberulum* H. J. Lam nov. var. — *folia* utrinque molliter pubescentia.

? NEW-GUINEA; Zippel in H. L.—B. sub. no. 908. 266—637.

Var. β *glabrior* (Gibbs) H. J. Lam, nov. var. — *C. Lindawianum* Lauterb. var. *glabrior* Gibbs in Dutch.-N.-W.-New-Guinea, 218 (July 1917) — *folia* supra subglabrata, nervis pubescentia, subtus sparse pubescentia.

NEW-GUINEA (DUTCH-): Gibbs no. 6264, Humboldt-bay, 400 M. in alt., flow and fr. in Jan.

This plant is, though closely allied to *C. Lindawianum*, distinctly different from it by its oblong or elliptical, never cordate leaves, its glabrous corolla-lobes, and longer corolla-tube (in *C. Lind.* 0.6—1 cM.).

47. *C. Curranii* Elm., Leaf. Phil. Bot. V. 1847 (1913); *Hall. f.*, Med. 's Rijks Herb. Leid. no. 37, 66 — An erect and slender shrub, sometimes tree-like; branchlets, petioles and panicles densely yellowish tomentose; *leaves* subcordate- or cordate-oblong, apex long acuminate, margins usually irregularly serrate except near base and apex; both sides pubescent, the nerves white with dense hairs; pairs of nerves 4—5; subchartaceous; $6\frac{1}{2}$ — $17\frac{1}{2}$ by 8—9 cM. (22 by 16 cM., *Elmer*); petioles 4—8 (*Elmer* 10) cM.

long; *panicles* pyramidate, terminal, 14 cM. long, 17 cM. in diam.; *calyx* campanulate, wide, 5-cleft halfway down, 1—1.5 cM. long, 0.9—1.3 cM. wide, pubescent and with many large discoid glands; segments lanceolate-deltoid, acute; pedicels 0.5—0.8 cM.; *corolla* sparsely pubescent; tube 1.3—1.5(—2.5) cM., lobes narrow, obtuse, 0.5(—0.8) by 0.25 (—0.35) cM.; *stamens* and *style* 1½ cM. exsert; stigma bifid; *ovary* glabrous.

Distribution: Palawan.

Allied to *C. infortunatum* (calyx cleft down to base) and to *C. villosum* (calyx 0.7—1.1 cM.; corolla 0.7—1 cM.), moreover differing from both by its serrate leaves.

48. *C. villosum* Blume, Bijdr. 811 (1825); Williams, Bull. Herb. Boiss. sér. II, T. V, 432; Schauer, DC., Prodr., 667; Hook. f., Fl. Br. Ind. IV. 595; King and Gamble, Journ. As. Soc. Beng. LXXIV, 4, 836; Koord., Exk. fl. v. Java III, 138; Kuntze, Rev. Gen. I, 506; Miq., Fl. Ind. bat. II, 877 and suppl. I, 243; Hassk., 2e Cat. 's Lands Pl. tuin, 136; Hall. f., Med. 's Rijks Herb. Leid. no. 37, 62; Merrill, Phil. Journ. Sci. Bot. VII, 342 — *C. ferrugineum* Turcz., Bull. Soc. Nat. Mosc. XXXVI, II, 221 (1863) — *C. infortunatum* Dennst., Schluss. Hort. Malab., 27 (1818) — *C. molle* Jack, Mal. Misc. I, I, 15 (1820) and Calc. Journ. Nat. Hist. IV, no. XIII, 38 — *C. velutinum* Wall., Cat. no. 1797 (1828); Zoll. u. Mor., Syst. Verz. 53 — *C. villosum* Wall., Cat. no. 6315 B. — A shrub, 1—1.6 M. high, a small tree 5—6.6 M. high (Hooker, l.c.); branchlets quadrangular, with petioles and panicles densely tomentose; leaves cordato-subrotundate, sinus 0—1½—2 cM. deep, apex shortly or long acuminate, margins entire; chartaceous; base subtri- or 5-nerved; upper side rather densely appressedly pubescent, sparsely glandular, lower one densely whitish tomentose, and with some large glands; nerves in about 5—7 pairs, white with hairs; 12½—21

by 9–16½ cM., petioles 4½–11 cM.; *panicles* terminal, 18–30 cM. long, 14–20 cM. broad; bracts leafy, pubescent, glandular and with some large glands, bracteoles subulate, caducous; cymes di- or trichotomous; pedicels 0.2–0.8 cM.; *calyx* 0.7–1.1 cM., 5-cleft halfway down, densely tomentose and with large glands without; lobes acute, ovate-lanceolate; *corolla* very densely whitish tomentose, except sometimes near the margins of the lobes; tube 0.7–1 cM., lobes obtuse, elliptical, 0.3 by 0.25 cM.; *stamens* and the shortly bifid style 2–2.3 cM. exsert, stamens inserted in the throat; *ovary* glabrous; *drupe* white, depressed, 0.7 cM. long, 1 cM. in diam.

LUZON: Curran no. 10973, Bontoc, Jan. 1909.

Distribution: Malay Peninsula!, Penang!, Burma (*King and Gamble*), Sumatra, Java!, W.-Borneo!, Luzon!, Culion (*Merrill*).

For affinity see *C. Curranii*.

49. *C. confusum* Hall. f., Med. 's Rijks Herb. Leid. no. 37, 65 (1918). — A shrub?; branchlets ± quadrangular, with petioles and panicles minutely whitish puberulous; *leaves* ovate-rotundate, base rounded or slightly cordate, apex long acuminate, margins entire or somewhat, irregularly serrulate; chartaceous; both sides sparsely and minutely pubescent, denser on the nerves; pairs of nerves 6–7; 9–20 by 6–19 cM., petioles 2–19 cM.; *panicles* terminal, leafed, 11–17 cM. long, 5–8 cM. wide; peduncles 3½–4 cM.; pedicels short, 0.2–0.3 cM.; *calyx* 0.7–0.9 cM., densely whitish tomentose, with large glands, especially on the acute, lanceolate-ovate lobes, which are usually little shorter than the tube; enlarged in fruit to 1.2–1.8 cM. and including it; *corolla*-tube and middle part of the lobes sparsely pubescent; tube 0.9–1 cM., lobes 0.5 by 0.25 cM.; *stamens* and the shortly bifid *style* slender, 2 cM. exsert; stamens inserted near the throat; *ovary* gla-

brous; *fruit* glabrous, shining, included in the subglabrous calyx, 0.8—1.1 cM. in diam.

Distribution: W.-Java!, Karimun djawa-isl., in H. Bog. from Sumatra?

It is allied to *C. adenophysum* (cor.-tube 1.5—1.7 cM.), *C. brunfelsiiflorum* (calyx-teeth $\frac{1}{2}$ of tube, without glands, cor.-tube 1.5—1.9 cM.) and *C. buruanum* (calyx 0.5 cM., without glands, cor.-tube 1.2—2 cM.).

50. *C. brachyanthum* Schauer, DC., Prodr. XI, 668 (1847); Miq., Fl. Ind. bat. II, 878; K. Schum u. Lauterb. Nachtr. Fl. D. Südsee, 372. — A shrub?; branchlets tetragonous, with petioles and panicles hirsutely tawny- or fulvous-tomentose; *leaves* ovate-rotundate, chartaceous, rounded or slightly cordate at base, acute at apex; margins entire; both sides densely and hirsutely pubescent; pairs of nerves 8—10; 9—33 by $6\frac{1}{2}$ —22 cM., petioles stout, 3—8 cM. long, 0.2—0.8 cM. in diam.; *panicles* terminal, rather lax, 9—12 cM. long, 11—20 cM. in diam., peduncles 0— $3\frac{1}{2}$ cM.; bracts and bracteoles lanceolate, small; pedicels short; *calyx* campanulate, pubescent except on the nearly glabrous lobes, with some large glands, 0.6—0.8 cM.; teeth deltoid, 0.1—0.2 cM.; enlarged in fruit to 0.8—1.1 cM., teeth 0.3—0.5 cM., 0.8—1.2 cM. wide, including the drupe; *corolla* glabrous or very sparsely pubescent in the upper part; tube 0.8 cM., lobes 0.4 cM. long, 0.3 cM. broad; *stamens* inserted near the throat, 0.8 cM. exsert; style twice as long exsert as the stamens (Schauer).

PHILIPPINES: Cuming no. 816. — Elmer nos. 13824 (Cabadbaran (Mt. Urdaneta), Agusan, Mindanao, flow. and fr. in Sept. 1912), 9117 and 7486 (Lucban, Tayabas, Luzon, flow. in May 1906). — Merritt no. 18013, Benguet, Luzon, fr. in Dec. 1908. — C. B. Robinson no. 9271, Polillo-isl.

A species, closely allied to *C. Lindawianum*, but distinctly different by its glabrous calyx-lobes, its hirsute tomentum and its less cordate leaves.

51. *C. Lindawianum* *Läuterb.* in *K. Schum.* u. *Läuterb.* Nachtr. Fl. D. Südsee, 372 (1905); *Ridley*, Transact. Linn. Soc. IX, I, 2nd. Ser. Bot., 137; *Gibbs*, Dutch N.W. New Guinea, 218. — *C. Versteegi Pulle* in *Lorentz*, Nova-Guinea, VIII, 2, 403 (1910) and VIII, 4, 687; *Hall. f.*, Med. 's Rijks Herb. Leid. no. 37, 67. — A shrub, 2—5 M. high, sometimes treelike (*Ledermann*), a herb (*Ledermann*, mountain-form? 2070 M.); branchlets round, with petioles and inflorescences appressedly tawny- or fulvous-tomentose; leaves subcordato-ovate, base sometimes rounded, usually somewhat cordate, apex shortly, acutely or obtusely acuminate, margins entire; membranous or thinly chartaceous; both surfaces rather densely appressedly pubescent, denser on the nerves, lower side glandular; pairs of nerves 7—9; 14—22 by 7—16½ cM.; petioles 4—11½ cM.; panicles terminal, pyramidate, 10—21 cM. long, 7—16 cM. wide; peduncles 3—7½ cM.; bracts leafy; bracteoles lanceolate-linear, 0.5 cM., cymes di- or trichotomous; pedicels 0.3—0.5 cM.; calyx 0.5—0.7 cM., lobes 5, 0.2—0.3 cM. long; pubescent, often with peltate scales without, glandular within; corolla-tube 0.6—1 cM., glabrous or nearly so, glandular; lobes rounded, puberulous and glandular along the midrib, 0.4 cM. long; stamens 1.5—2 cM. exsert, inserted in the throat; style somewhat shorter exsert; stigmatic lobes slender, rather long; ovary glabrous; drupe globose, glabrous, usually seated on the somewhat enlarged calyx, the lobes of which are spreading or reflexed.

NEW-GUINEA: *Nyman* no. 831, Simbang (K.-W.-land), fls. white in Aug. 1899. — *Ledermann*, Kais.-W.-land, no. 6615, Camp Malu, 40—60 M., fr. dark-green with red calyx, on 14-III-1912; id. no. 8219, Hunstein-peak, Camp V, 200 M. in alt.; fls. white, bark greyish, flow. on 10-VIII-1912; id. no. 11889, Schrader-Mt., 2070 M., herb, 1 M. high, calyx red with white tomentum, flow.

on 1-VI-1913; id. no. 10457a, flrs. white, Camp Malu. — *Schlechter* no. 14455, flrs. rose in Apr. 1912, Torricelli-Mts., 1000 M. in alt. — *v. Römer* (Dutch-N.-G.) no. 61, fr. on 5-IX-1909; id. no. 222, fr. on 11-IX-1909.

NEW-IRELAND (NEU-MECKLENBURG): *Peekel* no. 160, flrs. white; native name: a malmalu palpalana.

52. *C. macrocalyx* *H. J. Lam*, nov. spec. — Frutex?; ramuli teretes, cum petiolis paniculisque dense hirtelleque fulvo-pubescentes; *folia* cordato- vel subcordato-ovata vel -subrotundata, chartacea, apice acuminata, margine integra vel interdum \pm irregulariter undulata vel denticulata; basi subtri- vel 5-nervia; utrinque, praesertim subtus pubescentia, nervis dense lanata; eglandulosa; nervis utrinque 5—7; 13—19 cM. longa, $9\frac{1}{2}$ —16 cM. lata, petiolo $3\frac{1}{2}$ — $7\frac{1}{2}$ cM. longo; *panicula* terminalis, 10—15 cM. longa, 8 cM. lata, pauciflora; pedunculo $2\frac{1}{2}$ —5 cM. longo; pedicelli 0.3—1.2 cM. longi, bracteolis duobus, alternatis vel oppositis, setaceis, 0.2—0.3 cM. longis suffulti; *calyx* magnus, apice constrictus, basi subinflatus dense pubescens, eglandulosus, $2\frac{1}{2}$ —3 cM. longus, dentibus 5 angustis, lineareis, acutissimis, 0.6—1 cM. longis; fructifer non vel paulo auctus, fructum includens; *corolla* paulo exserta, tubo gracili, 3.3 cM. longo, parte superiore cum lobis sparse villosa; lobi elliptici, 0.6 cM. longi, 0.35 cM. lati, obtusi; *stamina* 1 cM. exserta, medio tubo vel ei parte superiore inserta; *stylus* 0.7 cM. exsertus, stigmatate breviter bifido; *ovarium* glabrum; *drupa* inclusa, globosa, nitida.

MINDANAO: *Elmer* no. 11338, Todaya (Mt. Apo), Davao, flow. in July 1909; id. fr. in Aug. 1909.

A plant, remarkable for its large calyx, in which it is nearly conform with *C. Preslii*; it differs from that species, however, in several points, such as the broader leaves, the puberulous corolla, the insertion of the stamens, the non-glandular calyx and lower side of the leaves and their denser tomentum. Further it is allied to *C. lanuginosum* in almost all characteristics,

except for the extraordinarily large calyx (see *Hallier f.*, *Med. 's Rijks Herb. Leid.* no. 37, 68).

53. **C. lanuginosum** *Blume*, *Bijdr.* 810 (1825); *Schauer*, *DC.*, *Prodr.* XI, 672; *Miq.*, *Fl. Ind. bat.* II, 882 and *Ann. Mus. L.-B.* III, 253; *Hall. f.*, *Med. 's Rijks Herb. Leid.* no. 37, 68. — A shrub?; branchlets obscurely quadrangular, with petioles and panicles woolly; leaves subcordate-ovate, apex acuminate, in sicco often curved; margins denticulate; subchartaceous; pubescent on both sides, glandular beneath; pairs of nerves 7—10; 10—25 by $8\frac{1}{2}$ —17 cM.; petioles 2—11 cM.; panicles terminal; cymes opposite, dichotomous, the lower ones in the axils of small leaves; uttermost branchlets 3—7-florous; bracteoles linear, 0.8—1.2 cM.; pedicels in fruit 0.7—0.8 cM.; calyx 1—1.5 cM. long, densely pubescent, teeth acute, narrowly deltoid, 0.4—0.7 cM., sometimes less pubescent than the tube, but never glabrous; in fruit enlarged to 1.25—1.4 cM., the teeth 0.8 cM.; corolla white, pubescent, glandular; tube 1.5—1.8 cM., lobes 0.5—0.8 cM.; fruit globose, for the lower half included in the calyx, shining, the calyx hirsutely pubescent; 1.5 cM. in diam.

PHILIPPINES: *C. B. Robinson* no. 10000, Basilan, buds on 12-VI-1910. — *Elmer* no. 13559, Cabadbaran (M. Urdaneta), Agusan, Mindanao, flow. in Aug. 1912).

Distribution: Philippines!, Banda-isl.!, Ternate!, Batjan-isl.!, Ceram!

Subsection 6 *Squamata Schauer.*

54. **C. Rumphianum** *de Vriese* in *Miq.*, *Ann. Mus. L.-B.* III, 252; *Hall. f.*, *Med. 's Rijks Herb. Leid.* no. 37, 83. — A shrub; branchlets obtusely quadrangular, with 4 longitudinal furrows and large pith, or hollow, with petioles and panicles glabrous; interpetiolar margins of hairs between the petioles; leaves cordate-rotundate, sinus $2\frac{1}{2}$ —7 cM.

deep; apex shortly acuminate, margins more or less coarsely dentate; membranous; upper side with some thick hairs, lower one glabrous, with some scales; pairs of nerves 6—8, the lowest pair with strong transverse nerflets towards the base; 13—40 by 15—35 cM., petioles $3\frac{1}{2}$ —27 cM., stout; *panicles* large, extraordinarily dense, club-shaped, with numerous leafy ovate-lanceolate bracts, 10—20 cM. long, 7—9 cM. in diam., peduncles 2— $4\frac{1}{2}$ cM.; pedicels 1.2 cM.; *calyx* glabrous, 2 cM. long, segments ovate-lanceolate, acuminate, 1.4 cM.; *corolla*-tube subinfundibuliform, glabrous, $2\frac{1}{2}$ —3 cM., lobes rotundate, 0.6—0.8 cM. long; *stamens* inserted near the throat; *ovary* glabrous, 4-lobed; *drupe* glabrous, deeply 4-lobed, included in the calyx, 0.5 cM. long, 0.8 cM. in diam.

AMBOYNA: de *Fretes* in H. A. R.-T. sub no. 011572.

CERAM: in H. A. R.-T. sub no. 011571.

Distribution: Amboyna, Ceram!, Saparua! (*Hallier*), Buru (*Miquel*).

55. *C. paniculatum* L. Mant. I, 90 (1767); *Blume*, Bijdr. 811; *Williams*, Bull. Herb. Boiss. sér. II, T. V, 432; *Schauer*, DC., Prodr. XI, 668; *Forbes and Hemsley*, Fl. sin. II, 261; *Hook. f.*, Fl. Br. Ind. IV, 593; *King and Gamble*, Journ. As. Soc. Beng. LXXIV, 4, 838; *Hall. f.*, Med. 's Rijks Herb. Leid. no. 37, 81; Bot. Mag. t. 7141; *Miq.*, Fl. Ind. bat. II, 879 and suppl. I, 243 and 568; *Hassk.* 2^e Cat. 's Lands Pl. tuin Btz., 136; *Koord.*, Exk. fl. v. Java III, 138; *Maxim.*, Bull. Ac. Imp. Sci. St. Pét. XXXI, 86; *Zoll. u. Mor.*, Syst. Verz. 53. — *C. pyramidale* *Andr.*, Bot. Rep. t. 628 (1799—1881). — *C. splendidum* *Wall.*, Cat. no. 1803 (1828). — A shrub, 1.3—2 M. high (*King and Gamble*); branchlets quadrangular, with petioles sulcate and glabrous or somewhat puberulous, as are panicles; *leaves* chartaceous, 5—7-lobed, lobes deltoid, subobtusely; base minutely cordate; margins entire, or very minutely denticulate; both surfaces glabrous;

glandular above, scaled beneath; 12—17 by 14—20 cM.; petioles $1\frac{1}{2}$ —19 cM.; panicles terminal, somewhat thyrsoid, leafed below, upper leaves entire, 14—45 cM. long, 10—25 cM. wide; lower peduncles 6 cM. long; bracts lanceolate to linear, 0.2—1.5 cM. long; bracteoles linear, 0.2 cM.; pedicels very slender, 0.3—0.8 cM.; flowers peripherally arranged; *calyx* minutely pubescent, 0.25—0.3 cM., lobes obtuse, twice as long as the tube; *corolla* minutely pubescent; tube subinfundibuliform, 1.3—1.5 cM. long, 0.1 cM. in diam. near the base; lobes rounded, 0.4 cM. long; *stamens* inserted near the throat, with the shortly bifid style $2\frac{1}{2}$ cM. exsert; *ovary* glabrous, somewhat obconoid.

JAVA: in H. A. R.—T. sub no. 043900.

Distribution: Lower Burma, Malay Peninsula, Formosa (*Matsumara* and *Hayata*), Hainan, Siam, Cochin China, Sumatra, Java!, Ternate (*Hallier*).

56. *C. coccineum* H. J. Lam, nov. spec. — Frutex?; ramuli cum marginibus interpetiolaribus, paniculis totis, innovationibus setis multicellularibus coccineis vestiti; *folia* cordato-rotundata, apice breviter acuminata, marginibus denticulata, lobis basalibus duobus partim aliis alios tegentibus, rotundatis; basi sub-3-7-nervia; membranacea; utrinque glabra, subtus dense squamata; nervis utrinque 10—12, in nervum intramarginalem coarctatis; 12—18 cM. longa (sinu incluso), $10\frac{1}{2}$ — $16\frac{1}{2}$ cM. lata; petiolo $1\frac{1}{2}$ —5 cM. longo; *panicula* terminalis, ampla, laxiuscula, pyramidata, usque ad 27 cM. longa, 25 cM. lata; cymis oppositis, in axillis foliorum superiorum bractearumque positis, inferioribus longe pedunculatis, laxis, gracilibus, trichotomis, bracteis linearibus suffultis; paniculæ bracteæ subtus orbiculares, supra lanceolatae; pedicelli gracilissimi, $\frac{1}{2}$ —3 cM. longi; *calyx* membranaceus, 1—1.4 cM. longus, fere usque ad basin 5-partitus, laciniis lanceolato-acuminatis, extus setis coccineis, intus squamis peltatis vestitis; *corolla* extus

puberula, tubo 1.5 cM. longo, cylindrico, lobis oblongis, 0.7—0.9 cM. longis, obtusis; *stamina* 1.4 cM. exserta, fauce inserta, antheris dorso molliter puberulis, thecis in parte superiore connatis, subtus subdivaricatis; *stylus* 3—4 cM. exsertus, stigmatate brevissime bifido; *ovarium* glabrum, 4-lobum; *fructus* non videmus.

JAVA: *Buijsman* no. 74, Tengger Mt., 1200 M. in alt., nr. Nongho Djadjar, flow. on 10-VII-1907.

JAPAN: in H. A. R.—T. sub no. 049914.

This must be a very beautiful and decorative plant, worth cultivating.

57. **C. Bethuneanum** *Lowe*, Hist. of Borneo (Sarawak), 378 (year?); *Hook.*, Comp. Bot. mag. 30 (1848); Bot. Mag. t. 4485 (1849). — A shrub or small tree; branchlets tetragonous, with interpetiolar margins, with panicles very minutely puberulous; *leaves* cordato-rotundate, membranous, apex acute or very shortly acuminate, margins subentire or minutely denticulate, upper side with sparse thick hairs, lower one glabrous sparsely scaled; pairs of nerves 5—7, the lowest pair with rather strong transverse nerflets downward; 17—31 by 17—36 cM.; petioles stout, glabrous, 10—42 cM. long, 0.5—0.6 cM. in diam., with large pith in transversal lamels, as have the branchlets, striate; *panicles* terminal, pyramidate, 15—30 cM. long and wide; peduncles 10—15 cM.; bracts lanceolate, $\frac{1}{2}$ — $1\frac{1}{2}$ cM. long, 0.05—0.1 cM. broad; pedicels slender, 0.2—1 cM.; *calyx* membranous, glabrous, 0.5 cM. wide, 0.6 cM. long, 5-ribbed, 5-cleft halfway down; lobes deltoid, acute; enlarged in fruit up to 0.8—1.5 cM., the lobes 0.5—0.8 cM. broad, including the drupe; *corolla* glabrous, tube 1—1.4 cM. long, very narrow in the lower, subinfundibuliform in the upper part; lobes elliptical, 0.6—0.8 cM. long; *stamens* inserted in the throat, with the shortly bifid style $3\frac{1}{2}$ — $5\frac{1}{2}$ cM. exsert: *ovary* glabrous, 4-lobed; *fruit* deeply 4-lobed, glabrous, 0.5 cM. long, 0.8 cM. in diam., included in the calyx.

PHILIPPINES: *Elmer* no. 12649, Brooks Point (Addison Peak), Palawan, fr. in Febr. 1911.; *id.* no. 13641, Cabadbaran (Mt. Urdaneta), Agusan, Mindanao flow. in Aug. 1912.

CELEBES: (S.-E.): *Elbert* no. 2933, Muna-isl., Raha, 0—75 M. in alt.; *id.* no. 2994, Rumbia, Liano, 25—150 M. in alt., buds on 12-IX-1909; *id.* no. 2998?, same locality and time, fr.

BORNEO: *Rutten* no. 126, upper-Pamaluan-riv., a shrub, flrs. red on May 10th—15th; *id.* no. 242, Bontang, 5 M. in alt., a small tree, inflorescences and flrs red, 5-V-1911. — *Korthals* in H.L.-B. sub no. 908.266—1216, Dussun. — *Haviland* and *Hose* no. 3558E, Rejang, Kapit, flow. in July 1893. — *Amdjah* no. 421, Ulu Sebuku, flow. on 2-IX-1912, *id.* no. 374, G. Lobang, 200 M., flow. on 3-VIII-1912; *id.* no. 96, Pladju, 5 M. in alt., flow. on 3-II-1912. — *Hallier f.*, no. B. 3090, Nanga Ruan; *id.* no. B. 1539, Sungei Rekadjau.

JAVA: ?*Zollinger* no. 2557 (cf. under *C. squamatum*).

58. *C. intermedium* Cham., Linnæa VII, 105 (1832); *Schauer, DC.*, Prodr. XI, 669; *Miq.*, Fl. Ind. bat. II, 880; *Hall. f.*, Med. 's Rijks Herb. Leid. no. 37, 80; *Merrill*, Bur. Gov. Lab. Bull. no. 27, 69 and Phil. Journ. Sei. Bot. III, 431. — A shrub?; branchlets quadrangular, with petioles and panicles glabrous or nearly so; leaves cordato-rotundate, apex acuminate, base with a 0.3—7 cM. deep sinus, minutely attenuate; margins serrulate-denticulate except on the basal lobes; denticulations mucronulate; membranous; sparsely pubescent above, glabrous or with some hairs beneath, and densely scaled on that side; pairs of nerves ± 7 ; 11—27 by 12—26 cM.; petioles $3\frac{1}{2}$ —40 cM., joined by an interpetiolar ring of hairs; panicles terminal, large, leafed below, with leafy bracts towards the top, the uppermost ones nearly subulate and 0.4 cM. long; 11—34 cM. long, 7—22 cM. wide at the base; peduncles $2\frac{1}{2}$ —12 cM.; pedicels 0.3—1.7 cM., with a small, linear

bracteole; *calyx* glabrous, 5-cleft nearly down to the base, 0.4–0.5 (–0.8) cM. long or shorter (*Schauer*); segments lanceolate or ovate-lanceolate, acuminate; shape and dimensions apparently rather variable; *corolla* softly and sparsely, minutely puberulous; tube somewhat infundibuliform in the upper half, (1.2 cM. *Schauer*), 1.5–2.3 cM. long; lobes rather narrow, obtuse, 0.8 cM. long (1.1 cM. *Schauer*), 0.2 cM. broad; *stamens* and the shortly bifid *style* 2–3 cM. exserted; stamens inserted in the throat; anthers 0.2 cM. long; *ovary* glabrous; fruiting calyx enlarged to 0.8 cM.

Distribution: Sumatra!, Celebes! Mindanao!, Negros!, Luzon!, Panay, Cebu, Sulu-isl. (*Hallier*).

A species, closely allied to *C. Bethuneanum*, *C. Blumeanum* and *C. squamatum*, but distinguished by its calyx, which is 5-cleft nearly down to the base.

59. *C. Blumeanum* *Schauer*, *DC. Prodr.* XI, 669 (1847); *Koord.*, Exk. fl. v. Java, III, 138; *Kuntze*, *Rev. Gen.* I, 505; *Hall. f.*, *Med. 's Rijks Herb.* no. 37, 78; *Miq.*, *Fl. Ind. bat.* II, 881; *Valeton*, *Bull. Dépt. Agric. Ind. Néerl.* X, 52 — A shrub or undershrub, 1–4 M. high; branchlets with rather indistinct interpetiolar margins, quadrangular, with petioles and panicles softly pubescent; internodes often clavate, with large pith often in transversal lamels; *leaves* often crowded towards the tips of the branchlets, cordate- or subcordate-ovate or -subrotundate, membranous, apex acuminate, sometimes obtuse or even rounded; margins sinuate or undulate, the undulations often mucronulate; pairs of nerves 6–8, the 2 lowest pairs often close to the base; upper side sparsely pubescent, usually with some thick hairs, intermixed with many minute ones; lower one softly and minutely pubescent and with sparse scales; both sides sometimes glabrous or nearly so; both sides somewhat glandular; margins usually fimbriate; the nerves in sicco often undulate in consequence of the contraction of the intervenium; 12–24 cM. long,

8—26 cM. broad; petioles striate, $2\frac{1}{2}$ —24 cM.; panicles terminal, relatively small and dense, subumbelliform at first, 4—10 cM. long, 5—6 cM. wide, pyramidate afterwards and then 10—20 cM. long, 6—10 cM. in diam.; peduncles $4\frac{1}{2}$ —6 cM.; pedicels slender, 0.4—0.9 cM. long, often widening into the calyx; calyx somewhat cup-shaped, 0.25—0.5(—0.6) cM., pubescent with some scales and (or?) large glands, purple; lobes 5, usually ribbed, lanceolate, subobtuse or acute, shorter than the tube; corolla red or white, minutely puberulous without; tube somewhat funnel-shaped, 2— $2\frac{1}{2}$ (— $3\frac{1}{2}$) cM. long; lobes elliptic, 0.8—1 cM. long, 0.4—0.5 cM. broad; inserted in the throat, with the shortly bifid style 1.7— $2\frac{1}{2}$ cM. exsert; anthers oblong, 0.2—0.3 cM. long, filaments flattened; ovary glabrous, 4-lobed; fruits glabrous, deeply 4-lobed, 0.5—0.7 cM. long and in diam. seated on the slightly enlarged calyx.

Var. α typicum H. J. Lam, nov. var. — *C. fallax* Lindl., Bot. Reg. t. 19 (1844); Schauer, l.c. 666; Engl., Engl. Jhrb. VII, 477; Miq. l.c., 876; K. Schum. u. Lauterb., Fl. D. Südsee, 525; K. Schum. u. Hollr., Fl. Kais.-W.-land, 122; K. Schum., Engl. Jhrb. XIII, '428. — *folia utrinque pubescentia*.

KALAO TOA-ISL. (southw. of Celebes): *Docters van Leeuwen—Reijnvaan* no. 1375, a shrub, 1 M. high, flrs. red, on 6-V-1913, fr. pink; 200 M. in alt.

TANAH-DJAMPEA-ISL. (southw. of Celebes): *Docters van Leeuwen—Reijnvaan* no. 1630, 50 M. in alt., a small shrub, 1 M. high, flrs. red on 14-V-1913.

NEW-GUINEA, DUTCH-: *Gjellerup* no. 695, Hollandia, 100 M. in alt., flow. on 20-IX-1911; a shrub, 3 M. high, flrs. red, bluish black, bark greyish white, nerves and inflorescences violetbrown or brown-red; *id.* no. 422, same locality, 20 M. in alt., a shrub, 1.5 M. high, flow. on 15-I-1911; calyx brown-red, corolla light-red, as are filaments and stigma; style and anthers brown (also col-

lected at Upper-Tani-river (Begowri-riv.) on July 10th).

NEW-GUINEA (KAIS.-W.-LAND): *Weinland* no. 60, Stephansort, flow. in Nov. 1889. — *Lauterbach* no. 1193, Constantinshafen, fr. on 25-X-1890. — *Schlechter* no. 14273, Constantinshafen, flow. in March 1912; *id.* no. 16402, forest of Jawer, 150 M. in alt., flow. red on 10-VIII-1907. — *Ledermann* no. 10808, Camp Malu on Sepik-river, 20–40 M. in alt.; a herb, 1–1.5 M. high, fls. red, as are pedicels and calyces; flow. on 1-II-1913; *id.* no. 6938, same locality and altitude, 0.8–1.2 M. high, fls. red on 9-IV-1912.

NEW-BRITAIN (NEU-POMMERN): *Dahl* no. 117, Ralum, 10 M. in alt., flow. red in June 1896.

NEW-IRELAND (NEU-MECKLENBURG): *Peekel* no. 197, Namatanai, flow. in Oct. 1909; native name: a malmalu dardaran (cf. *C. Lindawianum*: a malmalu palpalana).

PALAU-ISL.: *Raymundus* no. 41, Korrör; native name: buticharchár; the extract of leaves, ground to pieces, is to be drunk in case of stomach-ache. — *Ledermann* no. 14133, Korrör, 20–40 M. in alt., fls. red on 9-II-1914; native name: butegergar; a herb 1–1.5 M. high; very bitter, remedy as mentioned by Raymundus. — *R. (K.?) Gibbon* no. 1201, Arbuget, 40 M. in alt.; a shrub, reaching 4 M. in height, fls. red on 5-VII-1913; extract of leaves „zum abwaschen bei allgem. Schwächegefühl alter Leute.”

CAROLINE-ISL.: *Volkens* no. 157, Tabinifi, Yap, a shrub larger than a man; fls. red on 12-XII-1899; *id.* no. 500, Yap, native name: mǒéu; fls. white(!) on 3-IV-1900; *id.* no. 130, Yap, fls. dark-red on 9-XII-1899; also cultivated; common on all Marianne- and Caroline-islands.

Distribution of the variety (see *Hallier*, l.c.): Sumatra!, Borneo!, Java!, Lombok! (only *Elbert* nos. 591, 676 and 2095), Sumbawa! (all, except *Elbert* no. 3982), Buton!, Kalao Toa!, Tanah Djampea! and Tukan-besi-isl., Ambon!, New-Guinea!, New-Britain!, New-Ireland!,

Palau-! Caroline-! and Marianne-isl., Hawaii (*Hillebrand, cultiv.*).

Var. β glabrum H. J. Lam, nov. var. — *folia* adulta utrinque glabra vel subglabra.

Distribution (see *Hallier, l.c.*): Lombok! (all, except *Elbert* nos. 591, 676 and 2095), Sumbawa! (only *Elbert* no. 3982), Wetar!, Banda!

Distribution of the species: Malay Archipelago!, Bismarck-Archipelago!, W.-Micronesia! and -Melanesia!

This species is rather variable in most features, but we are — in our opinion — not justified in retaining *C. fallax* in the specific rank.

60. *C. squamatum* Vahl. Symb. bot. II, 74 (1794); *Schauer, DC.*, Prodr. XI, 669; *Forbes and Hemsley, Fl. Sin.* II, 262; *Hook. f., Fl. Br. Ind.* IV, 593; *Hall. f., Med.* 's Rijks Herb. Leid. no. 37, 81; *King and Gamble, Journ. As. Soc. Beng.* LXXIV, 4, 827; *Koord., Exk. fl. v. Java* III, 138; *Miq., Fl. Ind. bat.* II, 878; *Hassk., 2^e Cat.* 's Lands Pl. tuin, 136; *Maxim. Bull. Ac. Imp. Sc. St. Pétr.* XXXI, 86; *Miq. Ann. Mus. L.—B.* II, 99; *Zoll. u. Mor., Syst. Verz.*, 53. — *C. coccineum* D. Dietr., Syn. Pl. III, 616 (1839—52). — *C. dentatum* Wall., Cat. no. 1799 (1828). — *C. Kæmpferi* Fisch. ex Morr., Ann. Soc. Gaud. I, 17 (1845). — *C. urticifolium* Wall. Cat. no. 1801 (1828). — An erect shrub; branchlets more or less quadrangular, with interpetiolar margins, glabrous or nearly so; *leaves* cordate-subrotundate, apex acuminate, margins dentate, basal sinus rather deep; membranous or chartaceous; pairs of nerves 5—7; upper side with some thick hairs, lower one glabrous, more or less densely scaled; 10—20 by 8—20 cM.; petioles minutely pubescent, 5—20 cM.; *panicles* terminal, glabrous or nearly so, pyramidal with rounded top, 20—40 M. long, 6—25 cM. wide; pedicels 0.5—1 cM.; *calyx* glabrous or nearly so, 0.5—1 cM., lobes acute, narrow, 0.35—0.7 cM.; *corolla*

glabrous or nearly so, tube cylindric, 1.5—2.2 cM.; lobes elliptical, obtuse; *stamens* inserted at about the middle of the corolla-tube, with the style 2 cM. exsert; *ovary* glabrous; *drupe* glabrous, in sicco irregularly reticulated, partly included in the enlarged calyx (0.9—1.6 cM.), the lobes of which are usually ribbed and not reflexed.

Var. α typicum H. J. Lam, nov. var. — *flores* plurilateraliter ramulis affixi; cymi regulariter di- vel trichotomi.

SUMATRA: H. Bog. no. 1163, Singalang, *Miquel*. — v. *Daalen* no. 487, Gaju-and Alas-countries.

CELEBES: H. Bog. nos. 5267 (Tanawangko, Menado, cor. red) and 5301 (same locality) — *de Vriese et Teysmann* in H.L.-B. sub nos. 908.267—665 and —666.

Var. β scopiferum H. J. Lam, nov. var. — *C. scopiferum* *Miq.*, Fl. Ind. bat. II, 881 (1856) and suppl. I, 343, and Ann. Mus. L.-B. III, 253. — *C. singalense* *Miq.*, Fl. Ind. bat. Suppl. I, 243 and 568 (1860) — *flores* unilateraliter ramulis affixi, quapropter cymi bilaterales paniculæque scopæformes.

SUMATRA: H. Bog. nos. 1162 (Singalang) and 2217 (*Diepenhorst*, Priaman).

Distribution of the species: India, China, Singapore (*King* and *Gamble*), Japan (*Miquel*), Sumatra!, Andamans!, Celebes! (*Elbert!* nos. 2994 and 2998 in our opinion belong to *C. Bethuneanum*; cf. *Hallier*, l.c.), Basilan, Luzon (*Hallier*).

The specimen: *Zollinger* no. 2557, which *Hallier* mentions as *C. squamatum* occurs in our material in 3 specimina, respectively belonging to (in our opinion): *C. speciosissimum*, ? *C. Bethuneanum* and ? *C. Hettæ*. At any rate, *C. squamatum* and many species allied to it can hardly be distinguished from one another.

61. *C. illustre* N. E. Brown, Gard. Chron. XXII, 424 (1884, Oct. 4th). — A shrub; *leaves* cordate-rotundate, apex acute, margins dentate; upper surface glabrous or with

some minute and sparse hairs; lower one with small scales; 12–17 $\frac{1}{2}$ by 15–16 cM.; petioles 10–13 cM.; *panicles* large, branchlets red, minutely and sparsely pubescent; bracts leafy below, lowest ones rotundate, upper ones ovate and spatulate to linear; bracteoles linear; pedicels 1–1.2 cM.; *calyx* violet-red, cupuliform, 0.8 cM. wide, 1 cM. long with 5 deltoid, acute teeth; *corolla* bright-pink, minutely and softly pubescent without; tube 2.2 cM.; limb subregular, 2–2.2 cM. in diam., lobes ovate-spatulate; *stamens* \pm 2 $\frac{1}{2}$ cM. exerted, ultimately reflexed, filaments red, anthers brown.

Distribution: Celebes.

As *Brown* mentions that it is very closely allied to *C. squamatum*, but differs by its more glabrous leaves, of which the margins are distinctly dentate, and its more regular corolla (*Brown* only saw a picture of *C. squamatum*), it perhaps will appear that this species is identical with *C. squamatum* or with one of his allies.

62. *C. Horsfieldii* *Miq.*, Fl. Ind. bat. II, 880 (1856); *Koord.*, Exk. fl. v. Java III, 138. — An undershrub (? *Koorders*), branchlets obtusely quadrangular, with petioles and panicles minutely pubescent; *leaves* subchartaceous, subcordate-rotundate, apex acute, base somewhat cordate, margins dentate; pairs of nerves 3–4; upper side sparsely pubescent, tomentose beneath; 10 by 12 cM., petioles 14 cM.; *panicles* terminal, long-peduncled; cymes 4–7-flowered; pedicels 0.6 cM.; *calyx* campanulate, often gradually narrowing into the pedicel, 1–1.2 cM. long, in sicco dark-red; lobes narrowly deltoid, acute, 0.4–0.5 cM. long; minutely pubescent; *corolla*-tube cylindrical, 2–2.4 cM., with the lobes minutely puberulous without; lobes broadly spatulate, 1.1–1.3 cM. long; *stamens* inserted in the throat, anthers rather long and narrow; filaments 2 cM. exert; *style* with shortly bifid stigma, somewhat longer exert than the stamens; *ovary* glabrous.

JAVA: *Horsfield* in H. A. R.-T. sub no. 049915.

Its affinity is with *C. Blumeanum* var. α , but its calyx is much longer and the corolla-limb broader.

63. *C. utakwense* *Wernham*, Rep. Bot. Woll. exp. Transact. Linn. Soc. Bot. IX, I, 137 (1916). — A shrub; branchlets more or less quadrangular, glabrous; leaves large, elliptical-ovate, base rotundate or somewhat cordate; 8–20 by 7–16 cM.; petioles 1 cM. in the upper to 14 cM. in the lower leaves; panicles large, 20 cM. long and wide; calyx 2-lipped, 1.6 cM.; lower lip broadly ovate, upper one lanceolate-acuminate; corolla glabrous, dark-red, tube very slender, 2 cM. longer than the calyx; lobes unequal, viz. 2 with a length of 1.5 and a breadth of 0.7 cM., and 3 of a length of 1 and a breadth of 0.4 cM.; stamens 7 cM. exsert or more.

Distribution: Dutch-New-Guinea.

We placed this curious *Clerodendron* — if it is one at all — in the *Squamata*-subsection, since *Wernham* informs us that it has an affinity with *C. Bethuneanum*. Its 2-lipped calyx, however, may give rise to the founding of a new section; perhaps it belongs to our section *Tridens*, of which in that case, the diagnosis has to be extended. A final decision is only possible by examining specimens and these we had not to our disposition.

64. *C. speciosissimum* *Paxt.*, Mag. Bot. III, 217 et 271 (1837); *Elbert*, Med. 's Rijks Herb. Leid. no. 12, 16; *Hall* f. *ibidem*, no. 37, 80. — A shrub?; branchlets obscurely tetragonous, hollow, with interpetiolar margins, with petioles and panicles minutely and softly pubescent; leaves cordato-rotundate, basal sinus $\frac{1}{2}$ –2 cM. deep, apex acute or shortly acuminate, margins rather distantly dentate, sometimes coarsely, sometimes minutely; with some long and many minute hairs above, minutely tomentose beneath and with some scales; pairs of nerves 7–8; 12–22 $\frac{1}{2}$ by 9 $\frac{1}{2}$ –21 cM.; petioles 6–26 cM.; panicles terminal, 17 cM. long, 8–12 cM. in diam., peduncles 0–2 cM.;

usually without leaves or with 2 small leaves below; bracts caducous, linear, 0.2 cM.; pedicels 0.5–0.7 cM. with 2 minute, linear bracteoles; *calyx* sparsely pubescent, especially in the lower part, campanulate, 0.6–0.8 cM., 5-cleft about halfway down, lobes narrowly deltoid, acute, 0.3–0.5 cM.; *corolla* densely and minutely puberulous; tube slender, $2\frac{1}{2}$ – $3\frac{1}{2}$ cM., lobes ovate, 1.3 by 0.7 cM.; *stamens* and *style* $1\frac{1}{2}$ cM. exsert; stigma shortly bifid; *fruit* glabrous, 1 cM. long, 1.2 cM. in diam., four-lobed; fruiting calyx slightly enlarged.

Distribution: Java!, Madura!

C. Horsfieldii is closely allied to it, but distinctly different by its larger calyx and its shorter corolla-tube.

Section II. *Siphonantus* L.

65. **C. Siphonantus** R. Br. in Ait. Kew. ed. II, IV. 65 (1812); Williams, Bull. Herb. Boiss. sér. II T. V, 432; Schauer, DC., Prodr. XI, 670; Forbes and Hemsley, Fl. sin. II, 262; Hook. f., Fl. Br. Ind. IV. 595; King and Gamble, Journ. As. Soc. Beng. LXXIV, 4, 839; Koord. Exk. fl. v. Java III, 137; Miq. Fl. Ind. bat. II, 883 and suppl. I, 243; Hassk., 2^e Cat. 's Lands Pl. tuin, 136; Maxim. Bull. Ac. Imp. Sci. St. Pét. XXXI, 83. — *C. verticillatum* D. Don, Prodr. Fl. Nep. 102 (1825). — An erect shrub, 1.3–2.6 M. high; branchlets obtusely quadrangular, glabrous; *leaves* opposite or in whorles of 3–5 leaves; lanceolate, shortly petioled, acuminate at both ends, margins entire or somewhat denticulate; recurved; both surfaces glabrous; membranous; pairs of nerves 8, the nerves straight, very short, at an angle of nearly 90° with the prominent midrib, joining looped intramarginal nerves which start from the base; 10–30 cM. long, 1–3 cM. broad, petioles 0.2–1 cM.; *panicles* terminal, leafy, reaching 20–45 cM. in length and 10–15 cM. in diam.;

cymes verticillate, few-flowered, di- or trichotomous, small, without the corollæ 6–7 cM. long, 3–4 cM. in diam., peduncles $2\frac{1}{2}$ – $3\frac{1}{2}$ cM.; bracts linear, 0.3–0.7 cM.; pedicels 0.5–1.1 cM.; *calyx* 0.8–1.2 cM., pubescent without, glandular within; lobes 0.4–0.7 cM. long, 0.3–0.4 cM. broad, acute; *corolla* glabrous, sparsely glandular, white; tube very slender, $7\frac{1}{2}$ –9 cM. long; lobes 1 by 0.4 cM.; *stamens* and *style* long exsert; stigma shortly bifid; *ovary* glabrous; *drupe* 4-lobed, about 1.2 cM. in diam.

SUMATRA: *Korthals* in H. L.—B. sub no. 908.265–702. — *Prætorius* in H. L.—B. sub no. 908.267–721.

JAVA: in H. L.—B. sub nos. 908.265–761 and 908.266–364 and –331. — *Boerlage* in H. L.—B. sub. no. 908.352–1440, Buitenzorg, flow. on 16-II-1889. — *Junghuhn* in H. L.—B. sub no. 908.265–731.

CELEBES: in H. L.—B. sub no. 908.266–375.

Distribution: India, Burma, Siam (*King* and *Gamble*), S.-China (*Forbes* and *Hemsley*), Sumatra!, Java!, Celebes! often cultivated (e.g. in Hawaii, *Hillebrand*).

66. **C. kalaotoense** *H. J. Lam*, nov. spec. — Frutex, 2 M. alta; ramuli subquadrangulares, cum petiolis paniculisque adpresse puberuli; *folia* subchartacea, ovata, apice acuta, basi attenuata; margine integra; nervis utrinque 6–7; utrinque, præsertim subtus et in nervis pubescentia; $10\frac{1}{2}$ –18 cM. longa, $5\frac{1}{2}$ – $9\frac{1}{2}$ cM. lata, petiolo 2– $6\frac{1}{2}$ cM. longo; *panicula* terminalis, foliosa, 16–17 cM. longa, 12–20 cM. diametro; pedunculo 0– $2\frac{1}{2}$ cM. longo; bracteolæ minutæ, lineares, 0.2 cM. longæ; pedicelli 0.7–1.2 cM. longi, graciles; *calyx* extus dense adpresse pubescens, intus sparse pubescens, 0.7 cM. longus, lobis 5 acutis lanceolatis, 0.4 cM. longis; *corollæ* tubus glaber, gracilis, 4 cM. longus, cum limbo albus; lobi elliptici, extus puberuli, 0.7 cM. longi, 0.35 cM. lati; *stamina stylusque* $2\frac{1}{2}$ cM. exserta; stigma breviter bifidum; *ovarium* glabrum; fructus non videmus.

KALAO TOA-ISL. (southw. of Celebes): *Docters van Leeuwen-Reijnvaan* no. 1373, 150 M. in alt., flow. on 6-V-1913.

This species is closely allied to *C. ingratum*. It has, however, much larger leaves and its calyx and corolla-lobes are smaller, whilst the corolla-tube is glabrous without.

67. *C. ingratum* *K. Schum. et Lauterb.*, Fl. D. Südsee, 526 (1900). — *C. Weinlandii* *K. Schum. ms.* — A shrub, 2 M. high; branchlets round, with panicles and petioles minutely puberulous; leaves ovate, apex, often obtusely, shortly acuminate, base attenuate and decurrent, margins entire; membranous or subchartaceous; both sides pubescent, especially beneath and on the nerves, sometimes subglabrous above; pairs of nerves 5–6; $5\frac{1}{2}$ – $13\frac{1}{2}$ by 3.2–8 cM.; petioles 1–3.2 cM.; panicles terminal, 14–17 cM. in length, 16–20 cM. in diam.; cymes opposite, without the corollæ 9–10 cM. long, peduncles 5–7 cM.; bracts lanceolate, $\frac{1}{2}$ – $1\frac{1}{2}$ cM. long or larger, leafy; the cymes resembling those of *Cl. inermis*, the ultimate branchlets being 3-florous; pedicels 1– $1\frac{1}{2}$ cM.; calyx 0.8–1.3 cM., ultimately red, divided three-fourth or two-thirds down; lobes acute, ovate-lanceolate; densely pubescent without, sparsely within; corolla sparsely and appressedly puberulous without, white, funnel-shaped in the upper part; tube $4\frac{1}{2}$ –5 cM.; lobes ovate, 0.8–1.2 cM. long; stamens didynamous, inserted in the corolla-tube about two-thirds from its base, filaments slender, 3–4 cM. exsert; style very slender, 7–8 cM. exsert; stigma very shortly bifid; ovary glabrous.

NEW-GUINEA (KAIS.-W.-LAND): *Lauterbach* no. 810, Finschhafen, flow. on 25-IX-1890. — *Weinland* nos. 245 and 271 (*C. Weinlandii* *K. Schum. nom. nud.*), flow. in July 1890, Finschhafen. — *Nyman* no. 818, flrs. white in Aug. 1899, Simbang.

Schumann and *Lauterbach*, in their description, mention the

corolla as glabrous, but we found it distinctly puberulous, also in the authentional specimen.

68. *C. mindorense* Merrill, Gov. Lab. Bull. no. 35, 64 (1905) and Phil. Journ. Sci. Bot. VII, 342. — *C. simile* Merrill, Gov. Lab. Bull. no. 35, 64 (1905). — A shrub, branchlets glabrous; *leaves* membranous, lanceolate or ovate-lanceolate, shortly acuminate at apex, acute at base; margins entire; base 3-nerved; both surfaces glabrous; pairs of nerves 7; 13–20 by 3–8 cM.; petioles 2–8 cM.; *panicles* terminal, many-flowered, crowded, minutely and sparsely pubescent, ultimate branchlets 3-flowered; bracts and bracteoles subulate, 0.1–0.3 cM.; *calyx* minutely and sparsely puberulous, funnel-shaped, 0.5 cM.; lobes deltoid, 0.15 cM.; *corolla* 3 cM. long, the tube puberulous below; lobes spreading, oblong, obtuse or acute, 0.6 by 0.2 cM.; *stamens* 0.6 cM. exsert; anthers 0.2 cM.; *ovary* globose, glabrous.

Distribution: Mindoro, Semirara-isl.

Its affinity is with *C. Navesianum* but its corolla-tube is much shorter.

69. *C. Klemmei* Elmer, Leaf. Phil. Bot. II, 514 (1908). — A tree; branchlets glabrous; *leaves* lanceolate or oblong, rather variable in shape, base acute, apex usually acuminate; submembranous; both sides glabrous, pairs of nerves 5–7; 12 by 4 cM., petioles glabrous, 1–3 cM. long; *panicles* terminal, glabrous or nearly so; peduncles 4–7 cM.; bracts linear, 0.5 cM.; pedicels 0.5–0.8 cM., puberulous, usually with 2 bracteoles; *calyx* 0.4 cM., glabrous; lobes acute, 0.15 cM.; *corolla* glabrous; tube 6 cM.; lobes 0.5–0.7 by 0.3 cM.; *stamens* 1 cM. exsert; anthers 0.25 cM.; *stigma* subclavate; *ovary* glabrous; *drupe* 1.3 cM. long. 1 cM. in diam.

Distribution: Luzon.

It is allied to *C. mindorense*, but the leaves are smaller, the panicles larger, and the corolla-tube is twice as long.

70. *C. longiflorum* Decne., Nouv. Ann. Mus. Par. III, 400 (1834); Schauer, DC. Prodr. XI, 670; Forbes, Wand. Nat. f. Mal. Arch. II, 226; Miquel (Cl. spec.), Fl. Ind. bat. II, 884; Pulle in Lorentz, Nova Guinea VIII, II, 402; Hemsley, Chall. Rep. Bot. I, 110 and 176; Hall. f. Med. 's Rijks Herb. Leid. no. 37, 76; Miquel, Ann. Mus. L.—B. III, 251; Spanoghe, Linnæa XV, 329. — A shrub?; branchlets obtusely quadrangular, minutely puberulous, glabrescent; leaves chartaceous or somewhat membranous, ovate, both ends attenuate; both sides entirely glabrous or lower one with some short hairs; margins entire; pairs of nerves 6—8; 7—21 by $4\frac{1}{2}$ —12 cM.; petioles glabrous, $1\frac{1}{2}$ —6 cM.; panicles terminal, subumbelliform, dense, $5\frac{1}{2}$ —13 cM. long, 10—13 cM. in diam.; branchlets stout, sparsely puberulous or glabrous; bracts ovate-lanceolate, leafy, caducous; pedicels 0.2—0.7 cM.; calyx usually membranous, (0.5—)0.7—1.1 cM., glabrous or nearly so, 5-cleft halfway down, lobes broadly ovate, acuminate; corolla glabrous; tube rather stout, 7—10 cM.; lobes ovate, somewhat pubescent without, 0.5—0.9 by 0.3—0.6 cM.; stamens and the shortly bifid style 2 cM. exsert; stamens inserted in the throat; ovary glabrous; drupe black-purple, seated on the spreading, glabrous, enlarged calyx, which is dark-purple and has a diameter of 2.1—2.7 cM., the lobes being coriaceous and broadly deltoid.

TIMOR: *Teysmann* no. 8943, Kupang. — *Decaisne?* in H. L.—B. sub no. 908.265—1154. — *Zippel* in H. L.—B. sub nos. 908.265—1153 and 908.266—37. — *Spanoghe* in H. L.—B. sub nos. 908.265—1158 and ?908.266—112 (Kupang).

NEW-GUINEA: *Branderhorst* no. 74, Dutch-N.-G. — *Zippel* in H. L.—B. sub no. 908.266—648.

Distribution: Timor!, Luzon (*Miquel*), New-Guinea!

According to *Merrill* (Bur. Gov. Lab. Bull. no. 35, 63) this species does not occur in the Philippines. In his opinion

Gaudichaud's and *Perrottet's* specimina belong to *C. Navesianum* (= *C. quadriloculare*).

71. *C. longituba* Valetton, Bull. Dépt. Agric. Ind. Néerl. X, 52 (1907); *Hall. f. Med. 's Rijks Herb. Leid.* no. 37, 76. — A shrub; branchlets stout, glabrous or nearly so; leaves ovate, cuneate or attenuate at base, apex acute or somewhat acuminate, margins entire; chartaceous; upper surface glabrous, lower one more or less densely puberulous with rather long hairs, glandular; pairs of nerves 7; 7—16 by 3—5 cM.; petioles 0.7—3 $\frac{1}{2}$ cM.; panicles terminal, subumbelliform, dense, greyish pubescent, 8—10 cM. long, 15—16 cM. wide; bracts lanceolate, caducous; pedicels 0.2—1.2 cM.; calyx usually coriaceous, rather densely puberulous, 5-cleft halfway down; lobes lanceolate, acute; 0.7—1 cM.; corolla glabrous or nearly so; tube slender, 4 $\frac{1}{2}$ —6 cM.; lobes 0.5—0.6 by 0.3 cM., ovate; stamens and the shortly bifid style 2 $\frac{1}{2}$ cM. exsert.

TIMOR: *Forbes* no. 3762.

LOMBOK: *Elbert* no. 811, Rindjani Mt. N., Sadjang, 500—700 M. in alt., buds on 30-IV-1909.

NEW-GUINEA (DUTCH-): *Koch* nos. 720, 719 and 718, Merauke (no. 719 with abnormally deformed, 2—3 cM. long, 1—1.2 cM. broad corolla-tubes, inhabited by small *Hemiptera*).

This species is very closely allied to the preceding one, but we are in the opinion that it is not (as *Hallier* thinks) identical with it, though its distribution is nearly the same. The rather constant differences are in the dimensions of the leaves, which in the present species have long hairs beneath, the smaller, pubescent, and coriaceous calyx, and the shorter corolla-tube and lobes.

72. *C. fistulosum* Becc. *Malesia* II, 48 (1884), t. 4; *Hall. f. Med. 's Rijks Herb. Leid.* no. 37, 76. — An undershrub, myrmecophilous and with clavate internodes which have a hole on each side of the increased upper

part; branchlets rounded, glabrescent; *leaves* shortly petioled, membranous, oblong-obovate or ovate-lanceolata, base subtruncate or acute and attenuate, apex, sometimes subabruptly, acuminate, margins entire; both surfaces very minutely and sparsely puberulous, glandular below; $9\frac{1}{2}$ —30 by $3\frac{1}{2}$ —10 cM.; petioles 0.3—0.9 cM.; pairs of nerves 8—10; *panicles* small, without the corolla 2 cM long and 3 cM. wide, terminal, dense, short and broad, few-flowered, with bracts, the rhachis suddenly narrowed on the uppermost clavate internode; pedicels 0.8—1 cM.; *calyx* glabrous, or very minutely puberulous, 5-cleft nearly down to the base, 0.8 cM., lobes lanceolate, acuminate, 0.7 cM. long; *corolla* glabrous, or very minutely puberulous, white; tube 8—9 cM. long, lobes narrow or spatulate, 1.1 by 0.2 cM.; *stamens* 0.7 cM. exsert; *style* 0.9 cM. exsert, with shortly bifid stigma.

Distribution: Borneo!

The hollow internodes are inhabited by ants (*Colobopsis Clerodendri* Emery)

73. C. Ridley King et Gamble, Kew Bull., 111 (1908) and Journ. As. Soc. Beng. LXXIV, 4, 840. — A small tree, 5 M. high; branchlets quadrangular, shining; *leaves* opposite, membranous, elliptic, elliptic-lanceolate or ovate, caudate-acuminate at apex, rounded or cuneate at base, margins entire; both surfaces glabrous, the lower one pale; pairs of nerves 5—7; $7\frac{1}{2}$ —20 by $2\frac{1}{2}$ —7 cM.; petioles 1.8—5 cM.; acumen $1\frac{1}{2}$ —3 cM.; *panicles* terminal, few-flowered, with the peduncle at most 15 cM. long (corollæ included) and $7\frac{1}{2}$ cM. in diam., peduncles $1\frac{1}{2}$ —2 cM.; bracts leafy, lanceolate, acuminate, glabrous; bracteoles linear, 0.4 cM.; pedicels slender, 0.3—0.8 cM.; flowers white or pale yellow; *calyx* glabrous, divided nearly to the base, 1.3—2 cM. long; segments narrowly lanceolate, very long acuminate, often with peltate scales (glands, K. et G.), in fruit enclosing the drupe, 4 cM. in diam.,

when opened out, deep red in colour; *corolla* glabrous; tube $7\frac{1}{2}$ –9 cM.; lobes obovate, subequal, 1.2–1.3 by 0.3 cM., obtuse; *stamens* long exsert (*K. et G.*), 0.8 cM. exsert; *style* as long exsert as the stamens, flattened, the stigma very shortly bifid or bidentate; *ovary* glabrous, 4-lobed; *drupe* deep red, smooth, globose, 1.2 cM. in diam.

BORNEO: *Haviland* no. 1841, Sarawak, nr. Kuching, flow. on 2-X-1892; *corolla* pale. — *Haviland* and *Hose* no. 3554 E., same locality, flow. on 11-X-1894.

Distribution: Malay Peninsula, Borneo!

74. *C. Navesianum* *Vidal*, Cat. Prov. Manila, no. 398 (1880); *Merrill*, Bur. Gov. Lab. Bull. no. 27, 69. — *C. Blancoanum* *Villar* in *Blco.* Fl. Fil. ed. III, Nov. app. 161 (1882); *Hall. f. Med.* 's Rijks Herb. Leiden, no. 37, 75. — *C. quadriloculare* *Merrill*, l.c. no. 35, 63 (1905) (*Ligustrum quadriloculare* *Blco.*). — A shrub?; branchlets, petioles and panicles minutely pubescent; *leaves* membranous or chartaceous, ovate-lanceolate or oblong-lanceolate, cuneate or subobtuse at base, acute or shortly acuminate at apex; margins entire; both surfaces glabrous or very minutely puberulous; pairs of nerves 5–7; 8–19 by $3\frac{1}{2}$ –6.7 cM.; petioles 2–7 cM.; *panicles* terminal, subumbelliform, dense, without the corollæ 6 cM. long and in diam.; peduncles $2\frac{1}{2}$ cM.; bracts leafy, lanceolate, 1–1.3 cM. long; pedicels 0.3 cM.; *calyx* minutely pubescent, campanulate, 0.7–0.9 cM.; lobes acute, narrowly deltoid, 0.2–0.3 cM. long, glandular; *corolla* white, sparsely pubescent and glandular, especially towards the top; tube 8–9 cM. long; lobes oblong, 1.3–1.4 by 0.45 cM., obtuse; *stamens* inserted near the throat, 1–1.3 cM. exsert; anther-cells divaricate; *style* 2.4 cM. exsert; stigma very shortly, divaricately bifid; *ovary* glabrous.

LUZON: Com. d. l. fl. for. d. Fil. no. 490 (*C. Blancoanum*), San Mateo.

NEGROS: *Celestino* no. 7350, Cadiz, flow. in Febr.—March 1909.

Distribution: Panay (*Hallier*).

75. *C. Preslii* *Elmer*, *Leafl. Phil. Bot.* II, 515 (1908). — A tree; branchlets, petioles and panicles ferruginously pubescent; *leaves* chartaceous or submembranous, base rotundate, apex long acuminate, margins rather coarsely or minutely dentate or entire; upper side glabrous or sparsely puberulous, pubescent on the nerves, lower one densely yellow-glandular, the nerves pubescent; pairs of nerves 5—7; 9—15 by $5-7\frac{1}{2}$ cM.; petioles 2—10 cM.; *panicles* terminal, with 2 small leaves at the base, few-flowered, 8 cM. long and in diam.; pedicels 0.3 cM.; bracts and bracteoles caducous; *calyx* purple, sparsely pubescent towards the base, 2.5 cM.; lobes acute, nearly glabrous, 0.6 cM.; *corolla* white, glabrous; tube 3—5 cM. long; lobes $1\frac{1}{2}$ cM. long; *stamens* inserted in the throat, 1.5 cM. exsert; anthers 0.25 cM. long; *style* 5 cM. exsert, stigma 2-fid; *ovary* glabrous.

Distribution: Negros!

76. *C. Minahassæ* *Teysm. et Binnend.*, *Tijdschr. Ned. Ind.* XXV, 409 (1863); *Koord., Med. 's Lands Pl. tuin Btzg.*, XIX, 559 and *Exk. fl. v. Java* III, 137; *Miquel, Ann. Mus. L.—B.* III, 251; *Hall. f.*, *Med. 's Rijks Herb. Leid.* no. 37. 76. — A shrub or a small tree; branchlets quadrangular, with many large red lenticels; with petioles and panicles glabrous; *leaves* oblong-ovate, rounded or cuneate at base, acute or shortly acuminate at apex, margins entire; membranous; both sides glabrous and glandular; pairs of nerves 8—10; 7—25 by $4\frac{1}{2}$ —13 cM.; petioles 0.8— $7\frac{1}{2}$ cM.; *panicles* terminal, 10 cM. long, few-flowered, cymes in 3—5 pairs, 1—3 flowered; pedicels 1.8—2.5 cM.; *calyx* inflated, 1.5—3.5 cM., deep-red, glabrous or slightly puberulous, lobes 5, small at first, longer afterwards, 0.3—1.6 cM., acute or acuminate; in fruit almost partite

down to the base; corolla-tube yellowish white, 5—10.2 cM. long; lobes narrow, obtuse, 2.5—4 cM. long, 0.4—0.7 cM. broad; glabrous or pubescent on the lobes; *stamens* inserted in the corolla-tube, about 1 cM. from the throat, with the bifid style 2—2½ cM. exerted; stigma purple, as are anthers; *drupe* blue-black, seated on the very much enlarged, coriaceous calyx, the diameter of which is 4—6½ cM.; *ovary* glabrous, seated on a small annular disc.

Var. α typicum H. J. Lam, nov. var. — *Calyx* 1.5—2.5 cM. longus; *corollæ* tubus 8½—10.2 cM. longus.

CELEBES: in H. A. R.-T. sub no. 043903, Menado. — *Teysmann et de Vriese* in H. L.-B. sub no. 908.266—114, Menado. — *Forsten* in H.L.-B. sub no. 908.266—680 and 681, Gorontalo, flow. on Oct. 12th.

Var. β brevitubulosum H. J. Lam, nov. var. — C. Blancoi *Naves ex Villar* in *Blco.*, Fl. Fil. ed. III, Nov. App. 116, (1882); *Merrill*, Bur. Gov. Lab. Bull. no. 27, 68 and ibidem no. 35, 62. — *Calyx* 2.5—3.5 cM. longus; *corollæ* tubus 5—6(—8½) cM. longus.

CELEBES: *Weber* in H. L.-B. sub no. 908.266—115, gulf of Boni. — *Zippel* in H. L.-B. sub no. 908.266—69. (*C. calycinum* *Zipp.* ms.). — *Forsten* no. 9, Tondano, fr. in June. — *Teysmann et de Vriese* in H. L.-B. sub nos. 908.267—337, —1065 (? or var. *α*) and —1066 (? var. *α*).

PHILIPPINES: *Merrill* no. 332, San Juan del Monte, Rizal, Luzon, flow. in June 1910. — Com. d.l. fl. for. d. Fil. no. 491, Luzon. — *Ramos* no. 14729, Camaguin de Mindanas, flow. in March—April 1912. — *Robinson* no. 11778, Port Banga, Zamboanga, Mindanas, flow. on 5-VII-1910. — *Curran* no. 17443, Negros, fr. in Sept. 1909. — *Topacio* no. 20042, Bataan, Luzon, fr. in Oct. 1909. — *McGregor* no. 10267, Polillo, fr. in Oct. — Nov. 1909.

Section III. *Tridens* H. J. Lam, nov. sect. —
Calyx tripartitus.

77. *C. Elberti* Hall. f., Med. 's Rijks Herb. Leid. no. 37, 83 — A shrub?; branchlets fistular, round, with petioles and panicles glabrous; *leaves* subcordate-rotundate, base slightly cordate or rotundate, apex acuminate; margins entire; both sides entirely glabrous; chartaceous; pairs of nerves 6—7; with small, caducous scales above; $6\frac{1}{2}$ —21 by $4\frac{1}{2}$ — $14\frac{1}{2}$ cM.; petioles 2—10 cM.; *panicles* terminal, reaching 20 cM. in length, 25 cM. in breadth; peduncles 4 cM., bracteoles small; pedicels 0.3—0.5 cM.; *calyx* membranous, wide, 3-partite three-fourths down, the segments acute, ovate, 0.8 cM. broad; 1.2—1.5 cM. long, glabrous, irregularly veined, crimson; *corolla* glabrous; tube slender, somewhat funnel-shaped in the upper part, 1.8—2.5 cM. long, upper part glandular as are the lobes without; lobes spatulate, obtuse, 1.2 by 0.3 cM.; *stamens* inserted in the throat, 4—5 cM. exsert, as is the shortly bifid style; *ovary* glabrous, 4-lobed.

Distribution: Sumbawa!

78. *C. Hettæ* Hall. f., Med. 's Rijks Herb. Leid. no. 37, 82. — A shrub?; branchlets round, fistular, with petioles and panicles glabrous; *leaves* membranous, subcordate-rotundate, base abruptly attenuate, apex acuminate, margins entire; both sides glabrous; with some glands and minutely punctulate beneath; pairs of nerves 7—8; 9—28 by 10—20 cM.; petioles $3\frac{1}{2}$ —30 cM., minutely striate; *panicles* terminal; bracteoles 1 by 0.1—0.2 cM.; pedicels 0.2—0.8 cM.; *calyx* glabrous, membranous or subchartaceous, irregularly veined, 1.8—2.5 cM. long, 1.2—1.7 cM. wide at the top; 3-partite about one-third down; lobes ovate, unequal, sometimes minutely bidentate at apex, acute; *corolla* glabrous; tube cylindric and slender in the lower, funnel-shaped in the upper part, 2.5—3.3

cM. long; lobes rotundate 2—2.5 cM. long, 1—1.1 cM. broad; *stamens* inserted in the upper part of the corolla-tube, with the very shortly bifid style 2.2—2.7 cM. exsert; anthers oblong, divaricate in the lower fourth, 0.35 cM. long; *drupe* glabrous, 4-lobed, included in the calyx, 0.6 cM. long, 0.7 cM. in diam.

Distribution: Lombok!

IMPERFECTLY KNOWN OR DOUBTFUL SPECIES:

79. *C. cruentum* Lindl., Gard. Chron. 456 (1860). — A shrub; *leaves* oblong, reminding those of *C. macrophyllum* Bl., 25 by 10 cM.; *panicles* as in *C. macrophyllum* Bl., terminal; pedicels pubescent and glandular; *calyx* small, narrow, crimson, with 5 very narrow lobes, eglandular; *corolla* rich red; *stamens* included (! *H. L.*)

Distribution: tropical Asia (some part of).

Allied to *C. macrophylla* Bl., but different in the shape and colour of calyx and corolla.

80. *C. fastigiatum* (*Hunter*) *H. J. Lam*, nov. comb. — *Volkameria fastigiata* *Hunter* ex *Ridley* in Journ. As. Soc. Straits LIII, 102 (Sept. 1909). — An herb or undershrub; *leaves* ovate, decussate, petioled, unequally serrate, wrinkled, above smooth, below slightly downy; petioles short, slender, furrowed above, widely spreading; *panicles* terminal, trichotomous, suffastigiate; peduncles brachiate; three cleft pedicels short, slender; flowers large, white, sweet scented; *calyx* 5-cleft; segments lanceolate, when the fruit ripens reflexed; *corolla*-tube long, straight; limb 5-cleft; segments obtuse, inclining to one side; filaments filiform, as long as the corolla-tube, white; anthers small, deep yellow; *drupe* roundish, smooth.

Distribution: brought from Amboyna (into Malay Peninsula).

81. *C. fortunatum* L. sp. pl. ed. I, 889 (1753); *Blume*, Bijdr. 807; *Blco.*, Fl. Fil. ed. I, 508; *Schauer*, DC., Prodr. XI, 671; *Forbes* and *Hemsley*, Fl. sin. II, 260; *Maxim.*, Bull. Ac. Imp. Sci. St. Pét. XXXI, 84. — A shrub?; branchlets greyish; *leaves* opposite, lanceolate, glabrous, entire; somewhat decurrent

at base, $7\frac{1}{2}$ cM. long, $2\frac{1}{2}$ cM. broad; *inflorescences* with axillary peduncles; cymes dichotomous, few-flowered, shorter than the leaves; *calyx* with ovate, acute segments; *corolla*-tube as long as calyx; lobes ovate, obtuse.

Distribution: India (*Schauer*), China, Hongkong (*Forbes* and *Hemsley*), Java (*Blume*), Philippines (*Blanco*).

82. *C. fragrans* Willd., Enum. Hort. Berol., 659 (1809); *Blume*, Bijdr. 811. — A shrub?; *leaves* subrotundate-ovate, acute, dentate, base sometimes subcordate; glandular below, pubescent on both sides; *panicles* terminal, hemispherical.

Distribution: Java (*Blume*), tropical America (Ind. Kew.)

Perhaps identical with *C. fragrans* Vent.?

83. *C. fragrans* R. Br. in Ait. Hort. Kew. ed. 2, IV, 63 (1812); *Zoll.* u. *Mor.*, Syst. Verz. 53; *King* and *Gamble*, Journ. As. Soc. Beng. LXXIV, 4, 826. — A double-flowered shrub, with large leaves of unpleasant odour, the flowers white merging into dark purple and fragrant.

Distribution: Singapore (*K.* et *G.*), Java (*Z.* et *M.*)

Perhaps this species is identical with *C. fragrans* Vent.?

84. *C. grandiflorum* Blanco, Fl. Fil. ed. I, 512 (1837) — A small tree, less than 3 M. high; bark white, branchlets glabrous; *leaves* opposite, broadly ovate, glabrous, entire, rugose; petioles short, with a small gland near the base; *panicles* subumbelliform; bracts acuminate; *calyx* 5-cleft nearly down to the base; lobes lanceolate; *corolla* twice as long as the calyx; limb 2-lipped, 5-lobed; lobes ovate; *stamens* 4, didynamous, inserted in the throat; *style* filiform, with bifid apex; *ovary* semiglobose, seated on a striate disc; *drupe* depressed, 4-ribbed, 4-celled and -seeded.

Distribution: Philippines.

85. *C. javanicum* Spr., Syst. veg. II, 759 (1825—28); *Schauer*, DC., Prodr. XI, 673; *Miq.* Fl. Ind. bat. II, 882; *Zoll.* u. *Mor.*, Syst. Verz., 53 — *C. coriaceum* Poir. Encycl. suppl. IV, 353 (1816) — A shrub?; *leaves* ovate-oblong, entire, coriaceous, glabrous; *panicles* terminal, thyrsoid; *calyx*-lobes ovate, acute.

Distribution: Java.

86. *C. membranifolium* H. J. Lam, prob. nov. spec. —

Frutex?; ramuli graciles, appresse pubescentes; *folia* opposita, valde membranacea, ovato-rotundata, basi rotundata, vel subrotundata, apice acuminata, margine integra; utrinque nervis puberulis exceptis glabra, subtus glanduloso-punctata; nervis utrinque 6—8; $10\frac{1}{2}$ —20 cM. longa, 5—11 cM. lata; petiolo, cum panicula terminale appresse pubescente, $2-12\frac{1}{2}$ cM. longo; *calyx* pubescens; cetera non videmus.

AMBOYNA: *Forsten* in H. L.-B. sub no. 908.267—742, Luha.

87. **C. obovatum** *Walp.* Rep. IV, 112 (1844); *Schauer DC.* Prodr. XI, 674; *Miq.* Fl. Ind. bat. II, 883. — A shrub?; *leaves* obovate, entire, coriaceous, pubescent beneath; *panicles* terminal, pubescent; *cymes* decussate, uttermost branchlets 2-florous; *calyx* obscurely 5-dentate.

Distribution: Molucca-isl.

Hallier (Med. 's Rijks Herb. Leid. no. 37, 40) supposes that it is identical with *Vitex trifolia* L. (*var. β. unifoliolata Schau.*)

88. **C. philippinum** *Schauer, DC.* Prodr. XI, 667 (1847); *Miq.* Fl. Ind. bat. II, 877. — A shrub?; branchlets obtusely quadrangular, with petioles and inflorescences tomentose; *leaves* subrotundate or ovate-cordate, acuminate, entire or distantly serrate, hirsute above, densely and softly tomentose beneath, glandular; *panicles* terminal, large, woolly; *cymes* lax; *calyx* 1 cM., lobes 5, ovate, narrowly acuminate; *corolla* more or less puberulous and glandular above, 1.8 cM.; lobes 0.8 cM.

Distribution: Philippines (*Cuming* no. 1096).

SPECIES, THE DESCRIPTION OF WHICH WE WERE NOT ABLE TO OBTAIN:

89. **C. amicornum** *Seem.* Bonplandia X, 249 (1862).

Distribution: Pacific-isl.

90. **C. ixoræflorum** *Hassk.*, Retzia, 60 (year?).

Distribution: Singapore.

Hallier (Med. 's Rijks Herb. Leid. no. 37, 78) thinks that it is identical with *C. Colebrookianum Walp.* (ex descr.)

91. **C. Powellii** *Benth. and Hook. f. ex Drake del Castillo*, Ill. Fl. Ins. Mar. Pacif., 261 (1892).

Distribution: Pacific-isl.

92. **C. Rumphianum** *Bull.*, Cat. 9 (1887).

Distribution: Java.

93. *C. spicatum* Thunb., Fl. javan. 22.

Distribution: Java.

SPECIES WITH UNKNOWN NATIVE COUNTRY:

94. *C. buxifolium* Spr., Syst. Veg. II, 758 (1825—28).

95. *C. elegans* Manetti ex Lem. Jard. Fleur. IV, 47 (1854)
(= *C. calamistratum* Hort. Belg. ex ibidem).

96. *C. grandiflorum* Schauer, DC., Prodr. XI, 659 (1847). —
A shrub?; branchlets round, glabrous; leaves in whorls of 4 or
5, oblong-subovate, entire, base obtuse or subcordate, apex
acute; coriaceous; 7—10 cM. long; panicles terminal, lax,
glabrous, many-flowered, with long peduncles; calyx small,
minutely 5-toothed; corolla yellow, puberulous, 6 times as
long as calyx.

(= *Aegiphila grandiflora* Hook. Bot. Mag. t. 4230.)

97. *C. Manettii* Vis. Sem. Hort. Patav., no. 2 (1848—49).

98. *C. roseum* Poit. in Rev. Hort. 80 (1876).

99. *C. violaceum* Zeyh. Hort. Schwetz., 54; ex Link, Emem
Hort. Berol. II, 127 (1821—22).

NOMINA NUDA:

100. *C. discolor* Beccari, Nelle for. di Borneo, 203 (1902).
According to Hallier (ms.: Haviland no. 1841) this is a name
for *C. Ridleyi* King et Gamble.

101. *C. macrophyllum* Hook., ms. ex King and Gamble,
Journ. As. Soc. Beng. LXXIV, 4, 834.

102. *C. speciosum* Teysm. et Binnend., Cat. Hort. Bog.
386 (1866) — A hybrid? (Ind. Kew.)

DOUBTFUL SPECIMEN:

Haviland and *Hose* no. 3557 E, Rajang, Kapit, Borneo, flow.
in March 1893.

XXII. **HOLMSKJÆLDIA** Retz, Obs. VI, 31. (1791); Schauer, DC., Prodr. XI, 696; Engl. u. Prantl, Nat. Pfl. fam. IV, 3a, 176; Hook f., Fl. Br. Ind. IV, 596; King and Gamble, Journ. As. Soc. Bengal, LXXIV, 4, 795. — Shrubs; young parts glabrous or whitish-hairy; leaves opposite, simple; cymes short, axillary, often crowded at the tips of the branches, with small bracts; calyx with very short tube, widely obconical, membranous, coloured, subtruncate or indistinctly 5-lobed; corolla with cylindric, curved tube, oblique limb and 5 unequal lobes, one larger; stamens 4, didynamous, inserted in the inferior half of the corolla-tube or about the middle of it, exserted; anthers with parallel fissures; style slender, with shortly bifid stigma; ovary 4-celled, 4-ovuled; ovules laterally attached; drupe with 4 (or by abortion 3—1) pyrenes.

Distribution: Himalaya, Africa, Madagascar.

1. **H. sanguinea** Retz, Obs. VI, 31 (1791); Schauer, DC., Prodr. XI, 696; Hook f., Fl. Br. Ind. IV, 596; King and Gamble, Journ. As. Soc. Bengal, LXXIV, 4, 795; Hall. f., Med. 's Rijks Herb. Leid. no. 37, 84. — A shrub, 3—10 M. high; leaves petioled, ovate, acuminate, base obtuse; somewhat pubescent, entire or denticulate, $7\frac{1}{2}$ by 5 cM.; petioles 1.3 cM.; cymes $2\frac{1}{2}$ —5 cM., puberulous, red, becoming scarlet in fruit; calyx red, large, obconical; corolla red, $2\frac{1}{2}$ cM. long, 0.4 cM. wide; stamens glabrous; style glabrous; ovary glandular; drupe 0.6—0.8 cM. in diam.

Distribution: subtropical Himalaya, 0—1330 M., Prome Hills, Penang (Curtis no. 2872). — Often cultivated, and sometimes escaped.

Tribe III. CARYOPTERIDOIDEÆ.

XXIII. **PERONEMA** Jack, in Malay Misc., II, no. VII, 46, (1822); Benth. and Hook., Gen. Pl. II, 2, 1158;

Schauer, DC., Prodr. XI, 626; *Engl. u. Prantl.*, Nat. Pfl. fam. IV, 3a, 178; *Hook. f.*, Fl. Br. Ind. IV, 599; *Jack*, Calc. Journ. Nat. Hist. IV, no. XIII, 41; *Koorders en Valeton*, Bijdr. Booms. Java, no. 7, 213; *King and Gamble*, Journ. As. Soc. Beng. LXXIV, 4, 857; *Miquel*, Fl. Ind. bat. II, 908. — Small trees; branchlets, inflorescences and petioles minutely grey-tomentose: *leaves* large, opposite, imparipinnately composed; *inflorescences* terminal, large, composed of cymes; bracts subulate; flowers small; *calyx* 5-toothed, somewhat 2-lipped, unaltered in fruit; *corolla* with short tube; limb oblique, 2-lipped, 5-lobed, upper lip with 2 small, lower lip with 3 larger lobes, the middle one larger; *stamens* 2, exerted, inserted in the ventral and basal part of the corolla-tube; *style* slender, with subulate stigma, sometimes bifid; *ovary* 4-celled, cells 1-ovuled; *fruit* a 4-valvate capsule; placenta central, winged, seeds pendulous, without albumen.

Distribution: Malay Peninsula! and western part of Archipelago!

1. *P. canescens* *Jack*, Malay Misc. II, no. VII, 46, (1822); *Schauer, DC.*, Prodr. XI, 627; *Hook f.*, Fl. Br. Ind. IV, 599; *Jack*, Calc. Journ. Nat. Hist. IV, no. XIII, 41; *Koorders en Valeton*, Bijdr. Booms. Java no. 7, 214; *iid.*, Atl. d. Baumart. II, 6, tab. 280 and 281; *King and Gamble*, Journ. As. Soc. Beng. LXXIV, 4, 857; *Koorders*, Exk. fl. v. Java, III, 139; *Miquel*, Fl. Ind. bat. II, 909 and suppl. I, 244 and 570. — *P. heterophyllum* *Miq.*, l.c. suppl. I, 570. — A small tree; branchlets, inflorescences and petioles minutely and densely greyish-brownish-tomentose; *leaves* opposite, imparipinnate, rhachis often winged; leaflets sessile, opposite, the smaller ones near the base of the leaf, lanceolate, entire, acute at both ends, chartaceous, glabrous above, minutely fulvous-tomentose beneath, pairs of nerves 20–30, 3–18½ by 1–4½ cM.; the whole leaf reaching 25–30 by 10–15 cM.; petioles 3–

5 cM.; *inflorescences* large, composed, terminal, 25—35 cM. long, 18—27 cM. wide, bracts pubescent, 0.1 cM.; *calyx* 0.1 cM., almost for $\frac{1}{2}$ 5-toothed, densely hairy, glandular; teeth deltoid, reflexed in fruit; *corolla* pubescent, glandular, 0.2 cM., tube glabrate; 5-lobed, 2-lipped, limb oblique; *stamens* exerted, recurved along the corolla; *style* slender; *ovary* puberulous.

MALAY PENINSULA: *Ridley* no. 3993, Singapore, Bt. Manda.

JAVA: *Junghuhn*, G. Kantjang, Lebak; native name; tjisabrang or ki sabrang, in H. A. R.—T. sub no. 043928, with buds; flow. and fr. in May.

SUMATRA: *Forbes* no. 2655. — *Korthals* no. 1360.

Distribution: Malay Peninsula!, Sumatra!, Java!, Borneo (*King* and *Gamble*).

XXIV. **PETRÆOVITEX** ¹⁾ *Oliver* in *Hook.*, Ic. Pl., XV. 15, t. 1420 (1883); *Engl.* u. *Prantl.*, Nat. Pfl. fam. IV, 3a, 179; *King* and *Gamble*, Journ. As. Soc. Beng. LXXIV, 4, 858; *Schumann* u. *Lauterb.*, Fl. D. Schutzgeb. Südsee, 527; *Pulle* in *Lorentz*, Nova Guinea, VIII, 2, 403 and VIII, 4, 687; *Hall. f.*, Med. 's Rijks Herb. Leid. no. 37, 84. — Shrubs, usually climbing, sometimes creeping; *leaves* opposite, usually ternate, sometimes biter-nate, rarely simple; *inflorescences* either terminal, composed, paniculate, pyramidal, or axillary, cymose or paniculate, with subulate bracts; flowers small, subsessile; *calyx* with short tube, 5-toothed, regular; the lobes in fruit very enlarged, membranous, oblanceolate, elongate; *corolla* oblique, more or less distinctly 2-lipped, lobes 5, subequal; *stamens* 4, subequal, alternating with the lobes; *style* slender with bifid stigma; *ovary* imperfectly 2-celled; cells

¹⁾ not: *Petreovitéx* (see under *Petræa*, p. 25).

2-ovuled; ovules pendulous, attached at a central placenta; fruit capsular with 2 (or by suppression 1) seeds; seeds exalbuminous.

Distribution: Malay Peninsula! and Archipelago!, Philippines!, Bismarck-Archipelago!

1. a. Cymules or cymes composing a terminal panicle; leaflets glabrous, or pubescent on the main nerves or on the lower side near the base only 2.

b. Cymules or cymes axillary; leaflets glabrous or pubescent 4.

2. a. Leaflets $2\frac{1}{2}$ —10 by 1.2—5 cM. 3.

b. Leaflets (7—)10—12 by ($2\frac{1}{2}$ —) $6\frac{1}{2}$ — $7\frac{1}{2}$ cM., glabrous beneath, except on the midrib; lobes of fruiting calyx 1.5—2 by 0.5—0.7 cM. 1. *P. trifoliata* p. 324.

3. a. Leaflets, with plumose hairs on their lower surface near the base, 3— $6\frac{1}{2}$ by 1.6—4.2 cM.; tomentum rusty-coloured; lobes of calyx enlarged already before flowering; in fruit 1.5—1.8 by 0.4—0.5 cM. 2. *P. ternata* p. 325.

b. Leaves 3—9-foliolate; leaflets 6—9-nerved, glabrous on both sides; tomentum grey; inflorescences not leafed; lobes of calyx in fruit 0.5—1 by 0.15—0.3 cM.

3. *P. Riedelii* p. 326.

4. a. Lower side of leaflets glabrous, or pubescent on the nerves only; cymes 12 cM. long, $7\frac{1}{2}$ cM. in diam.; calyx-tube 0.6—0.9 cM., capsule not striate.

4. *P. bambusetorum* p. 328.

b. Leaflets pubescent beneath 5.

5. a. Leaflets 6, usually coarsely serrate; inflorescences 20—30 cM. long; calyx-lobes in fruit 1 cM.

5. *P. pubescens* p. 328.

b. Leaflets 3, entire; inflorescences reaching 15 cM. in length; calyx-lobes in fruit 1.9—2.5 cM. 6. *P. Scortechinii* p. 329.

1. *P. trifoliata* Merrill, Phil. Journ. Sci. Bot. II, 425 (1907) — A scandent shrub; branchlets and axis of inflorescences quadrangular, with petioles and panicles minutely puberulous, glabrescent; leaves opposite, 3-foliolate; leaflets subequal, chartaceous or subcoriaceous, ovate to oblong-ovate, base rounded, often somewhat inequilateral, apex

subobtusely acuminate, acumen broad, ± 2 cM. long; both sides glabrous, or the lower one somewhat puberulous on the midrib; pairs of nerves in the terminal leaflets 5–6, in the lateral ones 3–4; 10–12 by $6\frac{1}{2}$ – $7\frac{1}{2}$ cM. (7 by $2\frac{1}{2}$ –5 cM., *Merrill*); petiolules 1–1.3 cM. (0.4–1 cM., *Merrill*); petioles 7 cM. (3–4 cM., *Merrill*); interpetiolar margins present; panicles large, terminal, 20–40 cM. long, leafed below; flowers purple; calyx puberulent within and without, tube in anthesis 0.4 cM., lobes 0.4 cM., oblong-lanceolate; in fruit tube 1 cM., the lobes oblanceolate, 3-nerved, 1.5–2 by 0.5–0.7 cM.; corolla equalling the calyx; tube 0.5 cM., narrowly funnel-shaped, puberulous without and slightly so at the throat inside; lobes oblong-ovate, 0.3 cM., rounded; stamens 4; filaments somewhat puberulous, 0.4 cM.; anthers 0.1 cM.

PALAWAN: *Merrill* no. 12892, Puerto Princesa (Mt. Pulgar).

Distribution: Mindanao?

Merrill remarks that the same or a very closely allied species has been discovered by *Hallier* in 1904, S. Ramon, Mindanao. This makes it possible that the species is identical with *P. ternata* *Hall. f.* (q. v.)

2. *P. ternata* *Hallier f.*, *Meded. 's Rijks Herb. Leid.* no. 37, 85, (1918) — A shrub, climbing by means of the petioles; branchlets quadrangular, densely, rather minutely ferruginous-pubescent, with interpetiolar margins; leaves 3-foliolate, opposite; leaflets ovate, base rounded or somewhat cordate, apex acuminate; margins entire; chartaceous, when young with sparse simple hairs on both sides, adult glabrous except for some plumose hairs on the lower surface near the base, present in all stages of age; pairs of nerves 4; 3 – $6\frac{1}{2}$ by 1.6–4.2 cM.; petiolules 0.3–0.8 cM.; petioles 1.7–5 cM.; petiolules, petioles and inflorescences ferruginous-pubescent; cymules or cymes composing a large, leafed, terminal panicle, each of them

$2\frac{1}{2}$ — $3\frac{1}{2}$ cM. long; bracts minute; *calyx* densely stellately pubescent and glandular without; lobes 5, somewhat enlarged already before flowering-time, 0.5—0.7 cM.; *corolla* smaller than the calyx, 2-lipped, upper lip 2-lobed or entire, lower 3-lobed, softly pubescent without except on the lower part of the tube; lobes with throat and basal part of filaments sparsely and minutely villous; *stamens* 4; *ovary* densely white-glandular in upper half, glabrous in the lower one, villous at apex; *style* with unequally 2-lobed stigma; *fruit* included in the calyx, the tube of which is enlarged up to 0.6—0.7 cM., the lobes up to 1.5—1.8 by 0.4—0.5 cM.; fruiting calyx sparsely pubescent on all parts, especially on the ribbed tube and the lower side of the 1-nerved, obovate-spathulate lobes.

Distribution: Borneo! (*Winkler* no. 2756, etc.), Mindanao (San Ramon, *Hallier* no. 4722, etc.).

3. *P. Riedelii* *Oliver* in *Hook.*, Ic. Pl. XV, 16, t. 1420 (1883); *Forbes*, Wander. Nat. f. Mal. Arch. II, 225; *Pulle* in *Lorentz*, Nova Guinea VIII, 2, 403 and VIII, 4, 687; *Schum.* u. *Lauterb.*, Fl. D. Schutzgeb. Südsee, 527; *Schum.* u. *Hollr.*, Fl. Kais-Wilh. land, 122; *Warburg*, Engl. Jahrb. XIII, 427; *Hemsley*, Chall. Rep. Bot. I, 110 and 178; *Hall. f.*, Med. 's Rijks Herb. no. 37, 84—A climbing shrub, 5—20 M. high; branchlets, somewhat quadrangular, with petioles and inflorescences minutely and sparsely pubescent, glabrescent; leaves opposite, usually biternate, 9-foliolate, often with less leaflets, with all transition-form from 9- to 3-foliolate, lateral leaflets often inequilateral; leaflets chartaceous, ovate-lanceolate or broadly ovate, base cuneate or subtruncate, apex obtusely apiculate, margins entire, pairs of nerves 6—9; above glabrous except nerves, beneath glabrous, somewhat glandular, sometimes with some scales and simple hairs; nerves minutely pubescent; $2\frac{1}{2}$ —10 by 1.2—5 cM.; petiolules 0— $1\frac{1}{2}$ cM., the lateral leaflets being shorter petioluled,

sometimes sessile; the whole leaf reaching 11–25 by 7–17 cM.; main petioles $2\frac{1}{2}$ –9 cM., the petioles of each pair of leaves being joined by a narrow line of hairs; *inflorescences* terminal, paniculate, pyramidal, lax, very large, 15–50 cM. long and wide; flowers small, subsessile; *calyx* white-tomentose, 0.1 cM., for $\frac{1}{3}$ or $\frac{1}{2}$ 5-toothed, teeth deltoid; in fruit enlarged, tube 0.2 cM., lobes oblanceolate, obtuse, 0.5–1 by 0.15–0.3 cM., somewhat hairy, especially near the base, 3-nerved; *corolla* greenish white, minutely pubescent, 0.2 cM., for $\frac{1}{3}$ 5-lobed, lobes subequal, a fissure almost down to the base of the tube between two of them; throat villous; *stamens* 4, inserted in the throat, exerted, 1.2 cM.; anthers rather broad; *style* slender with bifid stigma, 0.2 cM.; *ovary* glabrous, somewhat hairy at the top.

AMBOYNA: *Forsten*, Laha, in H. L.-B. sub. no. 908.266–1241.

NEW-GUINEA: *v. Römer* no. 122, flow. on 7-IX-1909. — *Pulle* no. 1218, Kloofbivak, a tree?, \pm 20 M. high, flow. on 24-III-1913. — *Versteeg* no. 1026, N.-Dutch-N.-G., flow. on 8-V-1907. — *Schlechter* no. 16944, climbing, near Tanebo, 450 M., flow. on 3-XII-1907 — *Weinland* no. 261, on the shore near the Bumi-estuary, near Finschhafen, with fruits in May 1909; *id.* no. 164^b (or no. 46?), on the shore near the Bossum-river, Finschhafen, flow. in March 1890.

NEW-IRELAND (NEU-MECKLENBURG); *Peekel* no. 743, Namatanai, Salsal, 10 M. in alt., with fruits on 28-XI-10; *id.* no. 503, Namatanai, Salimun, flow. on 9-VII-1910, and no. 536, same locality, flow. on 6-VIII-1910; native name: harharalamas.

NEW-BRITAIN (NEU-POMMERN): *Schlechter* no. 13737, near Masawa, with flow. and fr. in Nov. 1901.

Distribution: Buru (*Oliver Forbes*), Amboyna!, Saparua, Aru-isl. (*Hall.*), New-Guinea!, New-Ireland!, New-Britain!

4. *P. bambusetorum* King et Gamble, Kew Bull., 113 (1908); *iid.* Journ. As. Soc. Beng. LXXIV, 4, 859. — A creeping shrub, 10—17 M. long; branchlets, inflorescences and petioles fulvous-hairy, glabrescent; leaves opposite, 1—3-foliolate; leaflets chartaceous, ovate, base rotundate-cuneate, apex acuminate, margins entire, glabrous on both sides, pairs of nerves 8; 7—10 by 4—6 cM.; petiolules 0.6—1.2 cM., petioles $2\frac{1}{2}$ —5 cM.; the terminal leaflet larger; *cymes* in sessile or peduncled, axillary panicles, reaching 10—12 cM. by $7\frac{1}{2}$ cM., glabrate or puberulous; bracts leafy, lanceolate; *calyx* in bud \pm 0.12 cM., in fruit very enlarged, tube to 0.6—0.9 cM., lobes to 1—1.3 cM., 3-nerved; *corolla* small; 2-lipped, 5-lobed, glabrous; *stamens* 4, subequal with stout filaments; *style* short with bifid stigma, *ovary* rounded; *capsule* 0.7—0.8 cM. long, not ribbed.

Distribution: Malay Peninsula, Borneo! (*Haviland* and *Hose* no. 1913 E; corolla white; Sarawak, Mt. Sugla).

5. *P. pubescens* Warburg, Engl. Jahrb. XIII, 427, (1891). — A climbing shrub; branchlets quadrangular, with inflorescences and petioles pubescent; leaves opposite, biternate, leaflets ovate, base obtuse, rotundate or subcordate; apex gradually narrowing, with obtuse acumen, margins usually coarsely and irregularly dentate, sometimes subentire, with sparse hairs or subglabrous above, pubescent beneath, especially on the nerves, glandular, the terminal leaflets larger, reaching $6\frac{1}{2}$ by $3\frac{1}{2}$ cM.; petioles 3—5 cM., petiolules of 1st degree 1— $3\frac{1}{2}$ cM., petiolules of 2nd degree 0.3—0.6 cM. in the lateral, and 0.6—1.2 cM. in the terminal leaflets; *inflorescences* axillary, paniculate, pyramidal, 20—30 cM. long, 6—8 cM. broad, bracts subulate, flowers subsessile; *calyx* in fruit with narrow-oblongate, 1 cM. long, 0.2 cM. broad, glabrous lobes, tube pubescent.

Distribution: Little Key-Islands.

6. *P. Scortechinii* King et Gamble, Kew Bull. 113 (1908); *iid.*, Journ. As. Soc. Beng. LXXIV, 4, 858. — A shrub; branchlets angular, with inflorescences and petioles fulvous-pubescent; *leaves* opposite, 3-foliolate, leaflets membranous, pubescent on both sides; terminal leaflets ovate, apex shortly and obtusely acuminate, base rotundate-cuneate, margins entire, pairs of nerves 4, 5—8 by $2\frac{1}{2}$ —5 cM.; petiolules 1.2—1.9 cM.; lateral leaflets smaller, base cordate often somewhat unequal, petiolules 0.6 cM.; petioles 4—5 cM.; *panicles* 2- or 3-chotomously branched, axillary composed, reaching 15 cM. in length; bracts leafy, rotundate, 1.3—1.9 cM.; *calyx* fulvous-pubescent, deeply 4—5-lobed; tube 0.6 cM. long, lobes in fruit 1.9—2.5 cM., 3—5-nerved, reticulate; *corolla* very small, 2-lipped; *stamens* 4, exsert, the 2 lower ones being longer than the two upper; filaments short; *style* short with bifid stigma, lobes spreading; *ovary* cylindric, villous; *capsule* 0.6 cM. long, ribbed.

Distribution: Malacca.

„*P. Riedelii* F. v. Muell.” in Index Kewensis is a mistake. In the „Botanisches Centralblatt L, 1892, 195” F. v. Mueller mentions *P. Riedelii* (of Oliver) in his publication.

Tribe IV. SYMPHOREMOIDEÆ.

XXV. **SYMPHOREMA** Roxb., Pl. Corom. II, 46. t. 186, (1798); *Bentham* and *Hooker*, Gen. Pl., II, II, 1159; *Engl.* u. *Prantl*, Nat. Pfl. fam. IV, 3a, 179; *Schauer*, DC., Prodr. XI, 621. — *Szegleewia Turcz.* in Bull. Soc. Nat. Mosc. XXXVI, II, 212, (1863). — Climbing shrubs; *leaves* opposite, simple, entire or sinuate-dentate; *inflorescences* composed, paniculate, terminal, large, with opposite branches, bearing paired, peduncled, 7-flowered heads with 6—8 involucrel bracts, the terminal one of

each three larger; *calyx* obovoid, shortly 3—4—8-toothed, enlarged in fruit; *corolla* with subcylindrical tube, as long as, or somewhat longer than the calyx, limb spreading, 6—18-lobed, lobes narrow; *stamens* 6—18, not always as much as corolla-lobes, varying in number, filaments often connated in pairs for the lower half, inserted in the throat, exsert; *style* long, stigma shortly bifid; *ovary* imperfectly 2-celled, cells 2-ovuled, imperfectly locellated; *fruit* dry, capsular, indehiscent, 1-seeded (by suppression of the other 3), included in the calyx.

Distribution: 2 species in British India, 1 in the Philippines! (*Engl. u. Prantl*).

1. **S. glabrum** Hasskarl, Flora XLVIII, 402, (1835). — ? *S. Cumingianum* Briq. nom. nud. (?) in *Engl. u. Prantl*. Nat. Pfl. fam., IV, 3a, 180, (1897). — *S. luzonicum* F. Vill. in Blanco, Fl. d. Fil., ed. III, Nov. app. 162, (1877); Merrill, Bur. Gov. Lab. no. 27, 69. — *Sczegleewia luçonensis* Turcz. Bull. Nat. Mosc. XXXVI, II, 212, (1863). — *S. luzoniense* Vidal, Synops. t. 75, fig. 7 (year ?). — A scandent shrub, sometimes suberect or tree-like, reaching 3—3½ M.; branchlets more or less quadrangular, with inflorescences and petioles grey-tomentose, glabrescent, *leaves* subcoriaceous or coriaceous, ovate or ovate-oblong, base subtruncate, apex acute or obtusely acuminate, margins entire, pairs of nerves 4, the lower two often more prominent and very long; glabrous on both sides or somewhat hairy on the midrib, 4½—9½ by 2—4 cM., petioles 0.5 cM.; *capitules* opposite, rarely two in the axil of the same bract, or supported by the same peduncle; involucral bracts 2 × 3, each supporting a flower, with one central terminal flower besides; the bracts obovate, rounded, the terminal ones of each three 2.5—3.5 by 0.8—1.4 cM.; the lateral ones reaching 1.5—2.1 by 0.35—1 cM.; softly pubescent on both sides, with a distinct midrib and some smaller nerves arising from it;

peduncles $2\frac{1}{2}$ –4 cM.; *calyx* 0.7–0.8 cM., minutely tomentose without; with long, silvery, upwards pointing hairs within, with 5(–6) short, subequal teeth, sometimes somewhat 2-lipped with 2 larger and 3 smaller teeth; *corolla*-tube glabrous, 0.65–0.8 cM., lobes glabrous within, softly pubescent without, narrow, 0.35–0.5 cM. long, 0.15–0.2 cM. broad, variable in number, 6–8–12, throat more or less villous; *stamens* 8–16, inserted in the throat, the lower part of the filaments often connated in pairs, 0.6 cM. exerted; *style* 1.5 cM., exert, slender, stigma shortly bifid, the lobes flattened at their apex; *ovary* glabrous, supported by a short, narrow gynophore, imperfectly 4-celled and -seeded.

LUZON: *Ramos* no. 289, Antipolo, Rizal, flow. in Febr. 1910. — Com. d. l. Fl. for. de Fil. nos. 501 and 848, San Mateo.

XXVI. SPHENODESME *Jack* in Malay Misc. I, I, 19, (1820); *Benth.* and *Hook.*, Gen. Pl. II, II, 1159; *Schauer, DC.*, Prodr. XI, 622; *Engl. u. Prantl.*, Nat. Pfl. fam. IV, 3a, 180; *Hook. f.*, Fl. Br. Ind. IV, 600; *Jack*, Descr. Mal. Pl., Calc. Journ. Nat. Hist. IV, no. XIII, 43; *King and Gamble*, Journ. As. Soc. Beng. LXXIV, 4, 860; *Miquel*, Fl. Ind. bat. II, 909; *Hall. f.*, Med. 's Rijks Herb. Leid. no. 37, 86. — Climbing shrubs, branchlets glabrate or greyish- or ruddish-tomentose; *leaves* opposite, simple, entire; *inflorescences* paniculate, terminal or axillary, composed of opposite branchlets in the axils of leaves or bracts, each bearing a number of paired, peduncled, heads with 2 deeply 3-lobed or 5–6 simple, leafy involucre bracts, and 3 or 6–7 sessile flowers; *calyx* 5-toothed, sometimes with small recurved teeth in each sinus, inflate in fruit; *corolla*-tube as long as the calyx, lobes 5, subequal, throat somewhat villous; *stamens* 5, equal, inserted in

the throat; *ovary* 2-celled, the cells 2-ovuled, ovary and cells 1-loculated near the apex; *style* filiform, short or long, with bifid stigma; *capsule* or capsular drupe included in the calyx, indehiscent, with 1, rarely 2 seeds, without albumen; exocarp coriaceous.

Distribution: British India, Malayan Peninsula! and western part of Archipelago!

As there is always 1 terminal flower and each bract supports a flower, the number of the latter is always 1 more than that of the bracts. So in *S. triflora* there are 2 (3-lobed) bracts, and 3 flowers; in the other species there are 6 simple bracts, and 7 (or in the head with 2 connated bracts 6) flowers.

1. a. Heads 3-flowered; leaves 4-nerved, 7—13 by 2.8—5 cM.; petioles 1 cM.; adult glabrous on both sides

1. *S. triflora* p. 332.

b. Heads 6—7-flowered; leaves 4—10 by 1.8—5 cM. . 2.

2. a. Calyx 5-toothed, with a horn-like tooth recurved from each sinus 3.

b. Calyx 5-toothed, without horn-like teeth, 10-ribbed, ferruginous-pubescent and glandular without, minutely pubescent within, corolla-lobes pubescent without 2. *S. barbata* p. 333.

3. a. Calyx 5-ribbed; corolla-lobes glabrous without; throat little villous 3. *S. Griffithiana* 334.

b. Calyx 10-ribbed; teeth ciliate; throat of corolla very densely villous. 4. *S. pentandra* p. 335.

1. *S. triflora* *Wight*, Ic. t. 1478 (1850); *Hook. f.*, Fl. Br. ind. IV, 601; *King and Gamble*, Journ. As. Soc. Beng. LXXIV, 4, 861; *Miquel*, Fl. Ind. bat., II, 910. — A climbing, sometimes erect shrub; branchlets and petioles minutely brownish-pubescent; *leaves* chartaceous, lanceolate or lanceolate-oblong, base cuneate or subtruncate, apex acuminate, glabrous on both sides, pairs of nerves 4; 7—13 by 2.8—5 cM., petioles 1 cM.; *panicles* very long, grey-pubescent, the lower branches leafed with ordinary leaves, the upper ones with gradually smaller leaves or leafy bracts, supporting opposite, peduncled capitules;

heads with 2 deeply 3-lobed bracts, which are petioled and bear a flower, attached at its petiole; 1 flower terminal, so that there are 3 flowers in each head; bracts 0.5—0.7 by 0.1—0.15 cM.; *calyx* 0.4—0.5 cM. long, 0.2—0.25 cM. wide, shortly 5-toothed, teeth deltoid; outer side densely grey-pubescent, inner side with long upwards pointing hairs; *corolla* dark purple (bracts and calyx dull red) with glabrous tube and puberulous lobes; throat with a narrow ring of hairs within; lobes 5, rounded; tube 0.6 cM.; *stamens* 5, exserted, the slender filaments being inserted in the throat; *style* slender with bifid stigma; *ovary* glabrous; *drupe* capsular, included in the enlarged, ribbed calyx, with leathery exocarp; the bracts of the head with 3 nerves, reaching in fruit 1.2—1.8 by 0.35—0.75 cM.

Distribution: Malay Peninsula!, Sumatra [?? *Forbes* no. 3083, see *King* and *Gamble* l.c.; perhaps only at Buitenzorg, Java, in the botanical Gardens?! (in H. L.—B. sub no. 908.141—21)], P. Penang (*K.* and *G.*), Borneo? (*Clarke* in *Hook. f.*).

2. *S. barbata* *Schauer, DC.*, Prodr. XI, 623, (1847); *Hook. f.*, Fl. Br. Ind., IV, 601; *King* and *Gamble*, Journ. As. Soc. Beng. LXXIV, 4, 862; *Miquel*, Fl. Ind. bat. II, 910 — *S. ferruginea* *Wight*, Ic. t. 1474, (1850) — *S. Winkleri* *Hall. f.*, Med. 's Rijks Herb. Leid. no. 37, 86 (1918) — *Congea barbata* *Wall.*, Cat. no. 1738 (1828) — A climbing shrub; branchlets, somewhat quadrangular, with petioles and inflorescences densely ferruginous-pubescent with simple hairs; *leaves* shortly petioled, chartaceous, ovate, base cuneate, apex subobtusely acuminate, above subglabrous with sparse long hairs, densier on the nerves, beneath more or less densely ferruginous-tomentose, densier on the nerves, glandular, pairs of larger basal nerves 3, the upper pair branching from the middle of the midrib, smaller, less prominent, apical pairs 2—4;

4—7(—10) by 1.8—3.5(—5) cM.; petioles 0.3—0.5 cM.; *panicles* large, terminal; peduncles 3.3 cM., slender, shorter towards the tips of the branchlets; heads with 6, on both sides, especially on the nerves and near the base pubescent bracts with a prominent midrib, the middle one of each three 1.9—2.2 by 0.8—0.9 cM., the lateral ones 1.5—1.7 by 0.4—0.5 cM., spatulate-obovoid, rounded; flowers 7 in each head; *calyx* 5-toothed, 10-ribbed, outer side densely with long ferruginous hairs, glandular, inner side minutely pubescent, 0.4 cM. long; *corolla*-tube as long as the calyx, glabrous; lobes 5, pubescent without, glabrous within; throat with sparse, long hairs; *ovary* glabrous in the lower, glandular and villous in the upper-part; *style* slender, as long as the stamens, with shortly bifid stigma; *stamens* 5, exsert, inserted in the throat of the corolla-tube, glabrous; *drupe* small, capsular, ferruginous-villous, included in the enlarged calyx, with crustaceous exocarp; seed 1.

Distribution: Malay Peninsula, P.-Penang. Borneo! (*Winkler* no. 2314, Hayup, *S. Winkleri* Hall. f.).

3. *S. Griffithiana* *Wight*, Ic. IV, III, 14, t. 1477 (1850); *Hook. f.*, Fl. Br. Ind. IV, 602. — A scandent shrub; branchlets quadrangular, with inflorescences and petioles somewhat pubescent, glabrescent; *leaves* chartaceous or subcoriaceous, ovate-lanceolate, base acute or subrotundate, apex acute, glabrous on both sides, somewhat pubescent on the lower side of the midrib, axils of the nerves barbellate beneath, pairs of nerves 3—4, $6\frac{1}{2}$ —8 by 2—3 cM., petioles 0.5—0.7 cM.; *panicles* terminal, large, heads 7-flowered with 2×3 , on both sides, especially near the base, pubescent involucrel bracts, peduncles slender, 1.5 cM.; the larger terminal bracts of each three reaching 1.7—2 by 0.4—0.5 cM., the smaller, lateral ones 1.4—1.6 by 0.3—0.35 cM., spatulate, obtuse, with a prominent midrib; *calyx* 0.4 cM., 5-ribbed, 5-toothed, hirsutely hairy without,

minutely pubescent within, the teeth deltoid, 0.1 cM., closely incurved, with a narrow horn-like tooth recurved from each sinus; *corolla* glabrous without, purple, 0.5 cM., with 5 ovate lobes and a slightly villous throat; *stamens* 5, inserted in the throat; *style* short in the bud, with shortly bifid stigma; *ovary* densely villous, glandular; *drupe* not seen.

MALAY PENINSULA: *Griffith* no. 6008.

Distribution: British India (*Clarke* in *Hook. f.*), Malay Peninsula!

4. **S. pentandra** *Jack* in Malay Misc. I, I, 19, (1820); *Forbes and Hemsley*, Fl. Sin., II, 265; *Hook, f.*, Fl. Br. Ind. IV, 602; *Jack*, Calc. Journ. Nat. Hist., IV, no. XIII, 43; *King and Gamble*, Journ. As. Soc. Beng., LXXIV, 4, 863. — *S. acuminata* *Wight*, Ic. t. 1476, (1850). — *S. Jackiana* *Schau. DC.*, Prodr. XI, 622, (1847); *Williams*, Bull. Herb. Boiss., sér. II, T. V, 432; *Miquel*, Fl. Ind. bat. II, 909. — *S. Wallichiana* *Schau. DC.*, Prodr. XI, 622. — *Congea azurea* *Wall.*, Cat. no. 1733 (1828). — *C. Jackiana* *Wall.*, Cat. no. 1735. — *C. pentandra* *Wall.*, Cat. no. 1734. — *Roscoea pentandra* *Roxb.* Fl. Ind. III, 54, (1832). — *Symphorema Jackianum* *Kurz.*, For. Fl., II, 255, (1877). — A climbing shrub; branchlets obtusely quadrangular, sparsely hairy or subglabrate, densier near the nodes; petioles and inflorescences scarcely hairy; *leaves* chartaceous, lanceolate-oblong, base subrotundate, apex acute, sometimes somewhat mucronate, glabrous on both sides, the midrib somewhat hairy and the axils of the nerves barbellate beneath; pairs of nerves 4; $6\frac{1}{2}$ —8 cM. long, 3— $3\frac{1}{2}$ cM. broad, petioles 0.5 cM.; *panicles* axillary and terminal, large, heads on slender, 1.6—2.8 cM. long peduncles, 7-flowered, with 2×3 lanceolate, obtuse-acuminate, sometimes minutely acuminate, glabrate and near the base somewhat pubescent bracts, the larger terminal ones of each three

reaching 1.7—2 by 0.4—0.7 cM., in fruit enlarged to $2\frac{1}{2}$ —3 by 0.7—0.9 cM.; the smaller lateral bracts 1.5—1.7 by 0.3—0.4, in fruit 2.2—2.5 by 0.5—0.7 cM.; *calyx* 10-ribbed, glandular, scarcely pubescent or subglabrate, 5-toothed, the teeth often ciliate, with often a variable and irregular, horn-like, recurved tooth in each sinus, 0.4—0.6 cM. long; *corolla* glabrous without, 5-lobed, throat very densely villous; tube 0.5 cM.; *stamens* 5, exsert, with rather short filaments; inserted in the throat, the hairs of which sometimes cover also the middle part of the corolla-lobes within; *style* 0.6 cM., with shortly bifid stigma; *ovary* densely villous, glandular; *drupe* in the to 0.7—0.8 cM. enlarged calyx, 1-seeded.

MALAY PENINSULA: *Griffith* no. 6009; *Maingay* no. 1159.

Distribution: British India, Hainan (*Forbes* and *Hemsley*), Siam (*Williams*), Malay Peninsula!, Borneo (*King* and *Gamble*).

XXVII. *CONGEA* *Roxburgh*, Pl. Corom., III, 90, t. 293. (1819); *Bentham* and *Hooker*, Gen. pl. II, 2, 1159; *Engler* u. *Prantl*, Nat. Pfl. fam. IV, 3a, 181; *Hook f.*, Fl. Br. IV, 602; *King* and *Gamble*, Journ. As. Soc. Bengal LXXIV, 4, 864; *Miquel*, Fl. Ind. bat. II, 911. — Climbing shrubs, usually densely hairy; *leaves* opposite, simple; *inflorescences* of capitate, peduncled, 5—7-flowered cymes, opposite in the axils of more or less small bracts, together forming a large terminal panicle; capitules with 3-4 involuclral bracts, which are connated at the base, supporting 6—9 flowers; *calyx* in fruit unaltered, or slightly accrescent, 5-toothed; *corolla* bilabiate, oblique, with slender tube, upper lip erect with two large lobes, lower lip shortly 3-lobed, throat usually villous; *stamens* 4, didynamous, inserted in or somewhat beneath the throat of the corolla-tube, exsert, slender, *style* as long as the stamens, slender

with subulate or shortly bifid stigma; *ovary* imperfectly 2-celled; cells 2-ovuled; *fruit* a dry drupe or indehiscent capsule, containing one seed, which entirely fills up the fruit, and the rests of 3 abortive seeds; seeds without albumen.

Distrib.: Burma, Malacca! Sumatra!

1. a. Calyx 0.7—1 cM. long, corolla 0.7—1.4 cM.; heads 3-4-flowered, with 4 bracteoles within the involucrel bracts; stigma subulate 1. **C. Forbesii** p. 337.
- b. Calyx 0.6—0.7 cM. long, corolla 0.6—0.8 cM.; bracteoles none; stigma shortly bifid 2.
2. a. Leaves membranous, $7\frac{1}{2}$ —18 cM. long; involucrel bracts often bilobed at apex, densely white tomentose, reaching 4 by 1.8 cM., 3-nerved 2. **C. vestita** p. 338.
- b. Leaves coriaceous, 5—10 cM. long; involucrel bracts entire at apex or somewhat emarginate, pink, densely pubescent, 1.8—3 cM. long, 0.7—1 cM. broad, 4-5-nerved; heads 7-flowered 3. **C. tomentosa** p. 338.

1. **C. Forbesii** King et Gamble, Kew Bull. 114; (1908). *ibid.*, Journ. As. Soc. Bengal, LXXIV, 4, 866. — A climbing shrub; branchlets, inflorescences, and petioles tomentose; leaves chartaceous, oblong or oblong-lanceolate, base rounded or somewhat cordate, apex shortly and abruptly acuminate, margins entire; upper side glabrous or with sparse simple hairs, densier on the nerves, lower side densely simple-hairy, densier on the nerves, glandular; pairs of nerves 5—7; 7—13 by 2.5—4 cM.; petioles 0.5 cM., heads shortly peduncled, opposite, in the axils of the leaves or leafy bracts, with 4 involucrel bracts and 3—4 flowers; heads forming together a large terminal panicle; between bracts and flowers 4 linear bracteoles, 1.0 cM. long; bracts spatulate, obtuse, tomentose on both sides, 2.1—4 by 0.4—1 cM.; panicles 30 cM. long, 15 cM. wide; peduncles of heads 0.5—0.7 cM.; pairs of capitules $2\frac{1}{2}$ —5 cM. apart; *calyx* 10-ribbed, 0.7—0.8 cM., often 0.9—1.0 cM. long, 0.3—0.5 cM. wide, 5-toothed; teeth

deltoid, 0.2—0.3 cM., outer side with a minute, dense tomentum, inner side with many silvery white hairs, pointing towards the margin of the calyx; *corolla* bright-lilac, both sides glabrous, except in the throat, which is villous; with slender tube, 0.7—1.4 cM.; *stamens* inserted in the throat; *style* slender, 0.8 cM., stigma subulate, not bifid; *ovary* glabrous, glandular towards the top and the base.

Distribution: Sumatra.

2. *C. vestita* Griffith, Notul. IV, 174 and Ic. Pl. As. t. 458, fig. 21 (1854); King and Gamble, Journ. As. Soc. Bengal LXXIV, 4, 865; Hook. f., Fl. Br. Ind. IV, 603. — A climbing shrub; branchlets, petioles and inflorescences hirsute-tomentose; leaves submembranous, ovate or elliptical, base obtuse or somewhat cordate, apex acuminate, upper side hirsute-hairy, nerves (5—6 pairs) ferruginously puberulous, lower side grey-tomentose; $7\frac{1}{2}$ —18 cM. by $3\frac{1}{2}$ — $7\frac{1}{2}$ cM.; petioles 0.6—1.3 cM.; heads in large panicles, with four involucre bracts, without bracteoles; bracts elliptical obovate, apex often bifid, densely white-hairy, 3-nerved, reaching 4 by 1.8 cM.; *calyx* ribbed, 0.6—0.7 cM., 5-toothed, both sides densely white-hairy; *corolla* rose, glabrous except in the throat, which is villous, with slender tube, 0.7—0.8 cM.; *ovary* glabrous, somewhat glandular towards the top.; *style* with shortly bifid stigma.

Distribution: Malay Peninsula (K. and G.), Tenerassim (Hook f.).

3. *C. tomentosa* Roxburgh, Cor. pl. III, 90, t. 293, (1819); Hook. f., Fl. Br. Ind. IV, 603; King and Gamble, Journ. As. Soc. Bengal LXXIV, 4, 866; Miquel, Fl. Ind. bat., II, 911; Hall. f., Med. 's Rijks Herb. Leid. no. 37, 86.

A climbing shrub; branchlets, petioles and inflorescences grey- or \pm ferruginous-hairy; leaves coriaceous, oblong or elliptical, base somewhat cordate, apex acute or acuminate, pairs of nerves 4, sometimes 5—9, upper side glabrous

except on the nerves, which are tomentose, lower side tomentose; 5—10 by $2\frac{1}{2}$ — $6\frac{1}{2}$ cM.; petioles 0.6 cM.; heads 7-flowered, in large paniculate, terminal, trichotomous thyrses, reaching a length of 15, and a width of 22 cM.; peduncles, 1.3 cM. long; involucre bracts 4, lilac, ovate-spathulate, somewhat emarginate, densely tomentose, 4—5-nerved, 1.8—3 by 0.7—1.0 cM.; calyx 0.6 cM., 5-toothed, teeth 0.13—0.25 cM., deltoid; inner and outer side hairy; corolla glabrous except in the villous throat; tube slender, 0.6 cM.; stamens exserted; ovary glabrous, glandular towards the top; style with shortly bifid stigma.

Distribution: India (Chittagong), Malay Peninsula (K. and G.) Burma, Siam. (*Hook f.*), often cultivated.

Tribe V. AVICENNIOIDEÆ.

XXVIII. AVICENNIA *L.*, Syst. éd. I (1735); *Blume*, Bijdr. 820; *R. Brown*, Prodr. 518; *Benth.* and *Hook*, Gen. Pl. II, 2, 1160; *Benth.* and *v. Muell.*, Fl. Austr. V, 69; *Blanco*, Fl. Fil. ed. I, 504; *Schauer*, DC., Prodr. XI, 698; *Engl.* u. *Prantl*, Nat. Pfl. Fam. IV, 3a, 181 and Nachtr. II, 67; *Hook. f.*, Fl. Br. Ind. IV, 604; *Koord. en Val.*, Bijdr. Booms. no. 7, 215; *Koord.*, Exk. fl. v. Java, III, 139; *King* and *Gamble*, Journ. As. Soc. Bengal. LXXIV, 4, 867; *Miq.*, Fl. Ind. bat. II, 911; *Roxb.*, Fl. ind III, 88; *Schimper*, Bot. Mitt. aus den Tropen III, 97; *Turczaninow*, Bull. Soc. Imp. Nat. Mosc. XXXVI, II, 226. — Shrubs or small trees, the roots of which give out conical suckers; leaves coriaceous, very variable in form and size, opposite, simple; lower side usually tomentose; inflorescences capitate or spicate, few-flowered, the cymes axillary or united to terminal trichotomous thyrsi or corymbs; flowers sessile; bracts and bracteoles small; calyx 5-partite, tube very short or nearly none, lobes broad, imbricate, concave; corolla-tube short; lobes 4, subequal, imbricate; stamens 4,

inserted in the corolla-throat; filaments short; anthers shortly exsert; anther-cells ellipsoid, parallel; *style* short and conical or longer, subfiliform, stigma cylindrical (or bifid?); *ovary* imperfectly 4-celled, with a 4-winged central axis; ovules 4, pendulous between the axial wings; *fruit* a capsule, dehiscent by 2 leathery valves; *seed* solitary, erect, albumen none.

Distribution: in estuaries and along the sea-coast of the warmer regions of the Old World.

1. *A. officinalis* L. s.a., Sp. pl. 110 (1735); *Benth.* and *v. Muell.*, Fl. Austr. V, 69; *Williams*, Bull. Herb. Boiss. sér. II, T. V, 432; *Schauer*, DC., Prodr. XI, 700; *Foxworthy*, Distrib. Mangrove-swamps, Ann. J. bot. Btz. suppl. 3, 324 and 337; *Forbes* and *Hemsley*, Fl. Sin. II, 265; *Pulle* in *Lorentz*, Nova-Guinea, VIII, 2, 403; *Hemsley*, Chall. Rep. Bot. I, 110 and 178; *Hook. f.*, Fl. Br. Ind. IV, 604; *Koord. en Val.*, Bijdr. Booms. Java no. 7, 217; *iid.*, Atl. d. Baum. II, 6, t. 273 and 274; *Koord.*, Meded. 's L. Pl. tuin XIX, 558; *King* and *Gamble*, Journ. As. Soc. Bengal, LXXIV, 4, 867; *Miq.*, Fl. Ind. bat. II, 912, and suppl. 244; *Merrill*, Bur. Gov. Lab. no. 27, 69; *Maximowicz*, Bull. Ac. Imp. Sc. St.-Pét. XXXI, 88; *Schumann* u. *Lauterbach.*, Fl. D. Schutzgeb. Südsee, 527; *Schimper*, Bot. Mitt. a.d. Trop. III, 98 and 129; *Scheffer*, Ann. Jard. bot. Btz. I, 43; *Valeton*, Bull. Dépt. agric. Ind. néerl. X, 53; *Warburg*, Engl. Jhrb. XIII, 426. — *A. alba* Bl. Bijdr. 821 (1826); *Wight*, Icones t. 1482; *Koord. en Val.*, Bijdr. l.c. 221; *iid.* Atl. t. 273; *King* and *Gamble*, l.c. 868; *Hook.*, Comp. Bot. Mag. I, 349; *Miq.*, Fl. l.c. 913 and suppl. 244; *Merrill*, Phil. Journ. Sci. Bot. XI, 311; *Hall f.*, Med. 's Rijks Herb. Leid. no. 37, 87¹⁾; *Spanoghe*, Linnæa XV, 330; *Scheffer*,

¹⁾ „*A. tomentosa* (haud *Jacq.* nec *Willd.*, nec *R.Br.* nec *Roxb.* etc.) *Bl.*! Bijdr. 821” in *Hallier f.*, l.c. 88, must be a mistake of *Hallier*;

Ann. Jard. bot. Btz. I, 43; var. *acuminatissima* Merr. l.c. 311. — *A. eucalyptifolia* Zipp. ex Val. l.c. 53; *Hall. f.*, l.c. — *A. intermedia* Griff., Trans. Linn. Soc. XX, no. 6 (nomen nudum); *Schauer*, l.c. 700; *Turczaninow*, Bull. Soc. Imp. Nat. Mosc. XXXVI, II, 226. — *A. (Sceura) marina* Vierh. in Denkschr. Ak. Wien, Math.-Nat. LXXI, 435, 1907. — *A. mindanaense* Elmer, Leaf. Phil. bot. VIII, 2868, (1915), ex descr. — *A. Oepata* Buch-Ham., Trans. Linn. Soc. XVII, 221; *Hall. f.*, l.c. 89. — *A. resinifera* Forst. Herb. Timor, 74; *Spanoghe*, l.c. 330. — *A. Rumphiana* Hallier f., Meded. 's Rijks Herb. Leid. no. 37, 89 (1918). — *A. spicata* Kuntze, Rev. Gén. 502 (1891). — A shrub or a small tree of the mangrove-swamps; branchlets round, with inflorescences and petioles minutely greyish or yellowish farinose; leaves leathery, very variable in form, colour and size, from broadly ovate, to long-lanceolate; base acute or decurrent, apex from round, obtuse, acute, to caudate-acuminate; upper side glabrous, from bright yellowish-green to dark brown when dry; lower side farinose, greyish-yellow or -brown; pairs of nerves 5–13, little prominent; 3.5–13.7 cM. long, 1.2–6.2 cM. broad (see plate III); petioles 0–1.7 cM.; inflorescences capitate or spicate, terminal; heads or spikes axillary, opposite along the branchlets, few (1–27) -flowered; flowers sessile, bracts small; the transition* from capitate into spicate inflorescences usually going parallel with that from ovate and rounded leaves into lanceolate and acuminate ones (pl. III); calyx in the axil of an ovate, at its base increased and pubescent or subglabrous bract, reaching

we could find only the name *A. tomentosa* L. in the „Bijdragen”, 821. We think that the error has risen from specimina, on the labels of which we found „Bl.” near or under the words „*A. tomentosa*” (without author). Apparently Hallier thought that „Bl.” was the author of the species, whilst it was only the paraph of the collector.

half the length of the calyx or somewhat more; bracteoles 2; *calyx* deeply 5-partite, 0.2–0.9 cM., lobes rounded, imbricate, pubescent or subglabrous, margins often ciliate, the base increased and more pubescent than the rest; *corolla*-tube very short, lobes 4, thick, with tube glabrous or somewhat pubescent within, glabrous without or pubescent except near the margins, ovate, acute or rounded, subequal, white; the whole 1.1–1.6 cM. long and 0.5–1.5 cM. in diam. reducing in size together with the sharpening of the leaves; *stamens* 4, little exerted; anthers rounded, the cells opening by a parallel fissure; *style* varying from short conical to rather slender with cylindrical (or bifid?) stigma; *ovary* villous in the upper, glabrous in the lower half, glandular, tapering into the style; *capsules* conical, beaked, 1.3–4 cM. long, greyish, reticulately rippled; seed 1, filling the capsule, when germinating; hypocotyledonous axis short, reaching half the length of the inner cotyledon, pubescent zone short (*Schimper*).

JAVA: *Blume*, in H. L.—B. sub no. 908.265–661 (*A. alba* Bl.).

TIMOR: *Zippel* in H. L.—B. sub no. 908.265–623 (*A. eucalyptifolia* Zipp.) — *Dec.? Forsten?* in H. L.—B. sub. no. 908.265–698 (*A. resinifera* Forst.).

SALEYER-ISLANDS: *Docters van Leeuwen-Reijnvaan* no. 1934, flow. on 29-V-1913, South-Saleyer.

PHILIPPINES: *Elmer* nos. 12006 and 11990, Todaya (Mt. Apo), Davao, Mindanao — *Fénix* no. 15596, Palawan, with fruits in July 1912 — *Elmer* no. 10451^a, Cagayan, Misamis, Mindanao. — Com. d. l. fl. for. de Fil. nos. 496 and 497, Bulacan. — *Curran* no. 17337, Hoilo, Panay-Isl.; *id.* no. 19385, Negros, flow. in June 1910. — *Piper* no. 174, Cagayan, Misamis, Mindanao, with buds in Apr.—May 1911. — *Perrottet* in H. L.—B. sub no. 908.265–636, Manilla (*A. Rumphiana* Hall. f.).

NEW-GUINEA: *Versteeg* no. 1893, Merauke, flow. on

6-XI-1907, (*A. off. var. eucalyptifolia* Val.); *id.* no. 1887. — *Moszkowski* no. 177, Samberi, Geelvinck-bay („a large tree, with white flowers”; with the habit of *A. alba* Bl. or *A. spicata* Ktze.) — *Zippel* no. 59a; *id.* no. 87d (*A. eucalyptifolia* Zipp.). — *Koch* no. E. 36, Merauke, fr. on 8-X-1904 (*A. off. var. eucalyptifolia* Val.). — *Teysmann* no. 7459.

BORNEO: *Hallier f.*, no. B. 281, P. Lemukutan.

CAROLINE-ISLANDS: *Volkens* no. 193, Yap., flow on 15-XII-1899.

Distribution: in tidal creeks and along the sea-coast of E.-Africa, Asia!, Australia, New-Zealand, Polynesia!, in tropical and subtropical regions, forming an element in the mangrove-formation (s. *Foxworthy*, *Ann. J. bot. Btz.*, suppl. 3, p. 324 and 337, with map).

There has always been confusion in the classification of the several forms of *Avicennia* and a large number of „species” has been described. On the other hand there were authors, who endeavoured to combine some or even all of them, for the more materials they happened to gather for their work, the more they found that the species is a very polymorphous one. In relation to this we may quote *Koorders* and *Valeton* (*Bijdr. l.c.*), who also are inclined to combine several of the described „species”, but who hesitate to include also *A. alba* Bl. More exact seems to us the opinion of *Schimper* (*Ind.-Mal. Str. fl. l.c.*), who admits only one species, *A. officinalis* L. for the Old World (eventually with some varieties, one of which should be formed by *A. alba* Bl.), and two for the New World, *A. tomentosa* Jacq. and *A. nitida* Jacq. We agree entirely with this view except in the matter of varieties, finding no reason to separate any with sufficient certainty, as it is often the matter in polymorphous species (c.f. *Premna integrifolia* L. s.a.). In plate III we delineate the several forms of leaves and inflorescences we met

with, together with the mention of the several synonymies belonging to them.

DOUBTFUL SPECIMINA OF THE FAMILY :

1. H. L.—B. sub no. 908.266—756, *Kuhl et v. Hasselt*, epiphytic, Java (*Rhynchosarpus Gesneriacearum?*); folia subtus in nervorum axillis glanduloso-punctata.

2. *Fritz* in H. Ber. without nr., Bonin-isl., Chichijima, July 4th—19th, 1903.

3. *Wiesenthal* no. 66, Alexishafen, Kais.-W.-land, New-Guinea; a shrub, flow. white (on 2-III-1913), umbella 5-partite, „Fruchthülle zähfaserig).

4. *Nyman* no. 245, Stephansort, New-Guinea.

5. *Lauterbach* no. 777 (= preceding), a tree, 20 M. high, fr. red, on 27-VIII-1890, Bonga, New-Guinea.

SYSTEMATICAL NOTES.

About the affinity of the several genera and species we have already said something under those genera and species of which the affinity had something peculiar or needed special explanation. Therefore we need not add much. Yet stress might be laid on the following where there may be some indication about questions, which are not clear and should be examined afterwards.

Geunsia, a genus of which for a long time only one species: *G. farinosa*, has been known, appears to be a rather large one, now being composed of 13 species. We discussed in details its close affinity with *Callicarpa*, to which it is closely allied and enumerated the distinctive features by which it is different from that genus. We got the impression that *Geunsia* is a variable genus since we found e.g. 4- and 5-merous flowers on the same plant. It is apparently also a genus with primitive characteristics, such as the alternate leaves and the often 5-merous and regular flowers. We may consider the opposite leaves and the often 4-merous flowers as a transition to *Callicarpa*: and the fact that there are on the same plant (or even inflorescence) 4- and 5-merous flowers and that the alternate leaves sometimes are nearly opposite whilst the general habit is that of a *Callicarpa*, may indicate that *Geunsia* is a genus in a mutation-period, and that into two directions, giving in the one hand the pure *Callicarpa*-form, on the other 6—7-merous forms which remain true *Geunsia*'s, the original form being 5-merous and with alternate leaves. Another differentiation within the genus is in the developing of pseudo-whorls (of 3 or 4 leaves).

Callicarpa is also a genus with rather primitive features. Its flowers are entirely regular, and it is a rather uniform group of plants, in which it is often very difficult to fix the limit of the several species mutually, this being indistinct.

We could propose a subdivision into species of which the leaves possess a simple and those of which they have a stellate texture and it would be a rather natural one. This would be a subdivision which would also be fit for *Geunsia*, in this way, that *Callicarpa* would have developed polyphyletically from *Geunsia*; but this subdivision gives not the same results as the one we used in our table of determination, where we started from the two different forms of anthers, the long and narrow ones, and the short and the broad ones.

Yet there are, according to the leaves (since the flowers are very conform), some groupes more distinctly limited e. g.:

1^o. the *rubella*-group which may contain *C. rubella*, *C. pilosissima*, *C. caudata*, and to which are related *C. pedunculata*, *C. mollis* and *C. Havilandii*, all probably derivable from *Geunsia Cumingiana*.

2^o. the *longifolia*-group with *C. longifolia*, *C. glabra*, *C. purpurea*, *C. elegans* and *C. japonica*, perhaps derived from *Geunsia pentandra* and in which *C. longifolia* var. β forms a transition to the:

3^o. *lanata*-group, which contains *C. lanata*, *C. longipetiolata*, *C. ramiflora*, *C. micrantha*, *C. formosana*, *C. Blancoi*, *C. cara* and as most differentiated form *C. laciniata* (with deeply divided corolla). *C. cana*, however, shows also a close relation to *C. pedunculata*; *C. subglandulosa* and *C. subalbida* may be derived from the β -*alba* variety of *Geunsia farinosa*.

Schizopremna, though placed among the **CALLICARPEÆ** for its nearly regular flowers, had perhaps better be placed among the **VITICEÆ**, near *Premna* with which it seems (according to the description) to be so nearly related that we hesitated to retain it as separate genus; for the same reason it seems not impossible that it has never been found back since Baillon discovered it in 1892, as the distinguishing characteristic (the style) is hidden. Moreover it seems doubtful, whether the fruit is exactly examined. The same may be said for **Pygmæopremna**, which differs from *Premna* only in its small size (a phenomenon which occurs also in *Clerodendron*, viz.: *C. sarawakanum*). **Tectona** may be considered as a 5-merous *Callicarpa* with terminal inflorescence. Besides there are some more differences,

but they are of less importance. It may, as *Callicarpa*, be derived from *Geunsia*. The occurrence of terminal inflorescences is, for the rest, very common in the order, even within a genus (e.g. *Vitex*, *Clerodendron*). The difference between axillary and terminal inflorescences is a mere gradual one, since the axillary cymes may be united towards the tops of the branches and lose their leaves.

In this genus too, there is the differentiation of whorled leaves (*Tectona Hamiltoniana*). Features which raise it, moreover, above *Callicarpa* and *Geunsia* are its bifid stigma, which in *C.* and *G.* is 2—5-lobed, and the one 4-celled pyrene.

More zygomorphous are the TEYSMANNIODENDREÆ, the *Viticeæ* and the *Clerodendreæ* of which the last-mentioned have the least zygomorphous flowers and the first, which are nearly related to the *Viticeæ*, differs by their capsular fruit. Of the VITICEÆ, *Vitex* and *Gmelina* are the most primitive genera in the features of the 5-merous flowers, less primitive, however, in the often digitately composed leaves and the pronounced zygomorphy.

A remarkable analogon in the groups of the *Viticeæ* and the CLERODENDREÆ is to be considered the behaviour of *Vitex* and *Gmelina* on the one hand, that of *Clerodendron* and *Faradaya* on the other. For we may readily assort that *Gmelina* is to *Vitex*, what *Faradaya* is to *Clerodendron*, viz.: a form with funnel-shaped and wide, instead of narrow and small corolla-tubes.

The subdivision of *Premna* in more than 2 groups seems not possible, but the subdivision according to the shape of the calyx seems a good one. As in *Callicarpa* (*C. cana*) there is a very polymorphous species, *P. integrifolia*. Of its different forms of leaves and calyces we gave several drawings on plate II. The only possible way in which we could separate the several races seems to be that of experimental Genetics, a science which, in our opinion, is to be combined with that of the systematical Botany as a method of examination.¹⁾

The subdivision of *Vitex* in species with axillary and those

¹⁾ e. g. also in the matter of *Callicarpa cana* and *C. laciniata*.

with terminal inflorescences seems to be rather good but is not sharp, since, as we observed before, the difference is only a gradual one. The presence of species with (pseudo-) simple leaves is a secondary feature in those species in which the leaflet is articulated with the petiole. If this is not the case, it may be a primitive one, if it is not so far differentiated, that the articulation too, has disappeared. *Clerodendron* too, has a subdivision which is not very exact, but we dare not give another. Moreover the fact proves the unity of *Clerodendron* as a natural group. So is e. g. the section SIPHONANTHUS, distinguished by its long corolla-tube, probably nearly related (and with transitory forms, e. g. *C. mindorense* and *C. Preslii*) to the subsection DENSIFLORA of the section EUCLERODENDRON, the inflorescences being often very dense. In this characteristic, which is very gradual, the DENSIFLORA have transition-forms to the PANICULATA (*C. Cumingianum* and *C. macrostegium*), which, in their turn, are allied to the AXILLIFLORA, from which they are separated by the same gradual difference of the longer or shorter intervals between the cymes (*C. disparifolia*) and to the PENDULIFLORA, the inflorescences of which are more or less pendulous.

The SQUAMATA are more distinctly circumscribed by the interpetiolar margins, the usually 4-lobed fruit and the scales on the lower side of the leaves, but still have their transitory forms to the PANICULATA (*C. Blumeianum* and *C. Horsfieldii*) which form by far the largest group.

A curious and aberrant form seems to be *C. utakwense* which has a 2-lipped calyx.

Perhaps it would be better that the RACEMIFLORA were given up as a separate subsection since the feature „calyx cup-shaped” is no more valid and *C. Friesii* (PANICULATA) has also narrow, subspicate inflorescences.

Polymorphous species are *C. calamitosum*, *C. inerme* and especially *C. porphyrocalyx*.

Much differentiated are the SYMPHOREMOIDEÆ with their involucre bracts and the 5—18-merous flowers, and the CARYOPTERIDOIDEÆ with their capsules, composed leaves and often enlarged fruiting calyces.

Avicennia officinalis is also a very polymorphous species; above we discussed it in details.

The VERBENOIDEÆ are in some few genera and species imported into the regions dealt with; so we cannot say anything about their affinity. •

For the rest, we may refer to the explanations, given in the text, especially under *Geunsia* (p. 29—30), *Callicarpa cana* (p. 68—75), *Premna integrifolia* (p. 146), *Vitex Negundo* (p. 193) and *Viticipremna* (p. 162).

PHYTOGEOGRAPHICAL REMARKS.

It is very dangerous to draw conclusions from the distribution of one plant-family. Yet, we may say with some reservation several things, worth mentioning.

The number of genera occurring in the regions dealt with, is 28, of which 2, that of the species 305, of which 31 are new to Science.

Of these, 7 genera (nos. 1—7) with 17 species are no natives of the regions but are imported into them from tropical America.

Of the rest, viz. 21 genera with 288 species, we can say the following:

The Philippines have **104** species of Verbenaceæ, 1 of which is doubtful and **65** (= **60** %) are apparently endemic¹⁾.

For the Malay Peninsula these numbers are resp. **73, 1** and **19** (= **24** %)

„ Java „ „ „ „ **62, 2** „ **10** (= **17** %)

„ Borneo „ „ „ „ „ **58, 3** „ **17** (= **28** %)

„ New-Guinea „ „ „ „ „ **56, 1** „ **26** (= **48** %)

„ Sumatra „ „ „ „ „ **55, 3** „ **6** (= **11** %)

„ Celebes „ „ „ „ „ **36, 1** „ **7**²⁾ (= **20** %)

„ Molucca-isl. „ „ „ „ „ **32, 1** „ **8 or 9**

(= **25—27** %)

„ Little Sunda-isl. „ „ „ „ „ **30, 1** „ **5**³⁾ (= **17** %)

„ Micronesia „ „ „ „ „ **18, 0** „ **7** (= **42** %)

„ the Bismarck-archipelago these numbers are

respectively **16, 0** „ **1**⁴⁾ (= **6** %)

The arrangement after the % of endemism is the following:

60 %, Philippines, flora with an affinity with that of Celebes, Borneo, Java (China, Japan, Formosa).

¹⁾ Emphasis may be laid on the fact, that many „endemic” species are either new, or doubtful ones.

²⁾ 3 of which are *Geunsiæ*. ³⁾ 3 of which in Timor. ⁴⁾ new species.

- 48 %, New-Guinea, flora with an affinity with that of Molucca-isl.
Celebes, Borneo, (Polynesia, Australia).
- 42 %, Micronesia, flora with an affinity with that of Polynesia,
N.-Guinea, Bism.-arch.
- 28 %, Borneo, flora with an affinity with that of Philippines, Mal.
Penins., Sumatra.
- 25—27 %, Molucca-isl., flora with an affinity with that of
N.-Guinea, Celebes.
- 24 %/, Malay Peninsula, flora with an affinity with that of
Br.-India, Borneo, Sumatra.
- 20 %, Celebes, flora with an affinity with that of Philippines,
L. Sunda-isl.
- 17 %/, Little Sunda-isl., flora with an affinity with that of Celebes,
Philippines, N.-Guinea.
- 17 %, Java, flora with an affinity with that of Sumatra, Br.-India,
- 11 %, Sumatra, flora with an affinity with that of Mal. Penins.,
Java, Borneo.
- 6 %, Bismarck-arch. flora with an affinity with that of New-Guinea.

As is usual, it seems, also in this case, to be a rule that the endemism is the greater the more the country is removed from the continent. Exceptions are the Malay Peninsula (recently examined by *King* and *Gamble*, and with many new species) and the Bismarck-archipelago (apparently with a flora as concerns the *Verbenaceæ*, nearly conform with that of New-Guinea.

Of the (39) not endemic species of the Philippines it appears that:

22	(or 56 %)	occur also in Java.
21	(„ 53 %)	„ „ „ Sumatra.
20	(„ 51 %)	„ „ „ Celebes.
18	(„ 47 %)	„ „ „ Borneo.
18	(„ 47 %)	„ „ „ Br. India.
17	(„ 44 %)	„ „ „ Mal. Penins.
16	(„ 41 %)	„ „ „ L. Sunda-isl.
13	(„ 33 %)	„ „ „ China, Japan or Formosa.
12	(„ 30 %)	„ „ „ New-Guinea.
9	(„ 26 %)	„ „ „ Molucca-isl.
9	(„ 26 %)	„ „ „ Bismarck-archipelago.
8	(„ 20 %)	„ „ „ Micronesia.
5 (or 6)	(„ 13—16 %)	„ „ „ Australia.

Of the (54) not endemic species of the Malay Peninsula:

30	(or 56 %)	occur also in Br. India.
29	(,, 53 %)	„ „ „ Java.
28 (or 29)	(,, 51—53 %)	„ „ „ Sumatra.
23 (,, 25)	(,, 45—48 %)	„ „ „ Borneo (5 spec. only known from Mal. Penins. and Borneo).
17 (,, 18)	(,, 33—35 %)	„ „ „ the Philippines.
14	(,, 27 %)	„ „ „ Celebes.
14	(,, 27 %)	„ „ „ L. Sunda-isl.
11	(,, 21 %)	„ „ „ Molucca-isl.
11	(,, 21 %)	„ „ „ New-Guinea.
10	(,, 18 %)	„ „ „ China, Japan or Formosa.
9	(,, 17 %)	„ „ „ Bismarck-archipelago.
8	(,, 15 %)	„ „ „ Micronesia.
7 (,, 8)	(,, 13—15 %)	„ „ „ Australia.

Of the (41) not endemic Bornean species:

25	(or 62 %)	occur also in the Malay Peninsula.
22 (or 23)	(,, 55—57 %)	„ „ „ Sumatra.
22	(,, 55 %)	„ „ „ Java.
18	(,, 45 %)	„ „ „ the Philippines.
13	(,, 32 %)	„ „ „ Br. India.
12	(,, 30 %)	„ „ „ Celebes.
11	(,, 27 %)	„ „ „ Molucca-isl.
11	(,, 27 %)	„ „ „ New-Guinea.
9	(,, 22 %)	„ „ „ China, Japan or Formosa.
8	(,, 20 %)	„ „ „ Bismarck-archipelago.
7	(,, 17 %)	„ „ „ Micronesia.
4—5	(,, 10—12 %)	„ „ „ Australia.
4	(,, 10 %)	„ „ „ Little Sunda-isl.

To treat in the same way the several other countries, would take too much room. Besides, they teach us nearly the same. So we chose only some of them, which seemed to be the most interesting.

It may also be of some importance that of the 30 species from the Little Sunda-isl. (especially Timor, Sumbawa and Lom-

bok', 16 occur also in the Philippines (but 6—10 of them are more or less common throughout the whole archipelago). Many of them have also been discovered in countries, situated between the Sunda-isl. and the Philippines, viz. Celebes and the smaller islands southward of it (cf. *Premna timoriensis*, *P. pubescens*, *P. littoralis*, *V. glabrata*, *Clerodendron longiflorum*).

In the case of *Clerodendron longiflorum* and *C. longituba* (q. v.), there is also a distinct relation to New-Guinea.

Further there is a close relation between the *Verbenaceæ* of the Philippines and those of Java, Sumatra and Celebes, etc., whilst the relations east- and north-ward are much less conspicuous.

It is also a remarkable fact that nearly as many species are common to Borneo and the Malay Peninsula, as to the latter and Sumatra, the distance between the former being 450—500 KM., that of the latter hardly 50 KM., these countries being, moreover, joined by a chain of islands.

If it were not that we had to our disposition only the data of one family we should be inclined to say that there is a direction of plant-dispersal which is more distinct than the direction perpendicular to it, viz. the N.-E.—S.-W.-direction. It seems even, that the Philippines, which have by far the largest number of *Verbenaceæ*-species, are a centre, from which, more or less radially ¹⁾, the plants are dispersed towards Malacca, towards Sumatra, towards Java, towards the L. Sunda-isl., via the countries between the last-mentioned and the Philippines and that in this wise, that the more species are common to it and to the Philippines, the more the radius is directed towards the continent of British India. Indeed, we observe from the above-given lists that there are relatively few species common to two countries, situated on the circle, the centre of which is in the Philippines, e.g. Borneo and Celebes.

As most species of the *Verbenaceæ* possess drupaceous, fleshy fruits of an often bright colour, we could suppose a dispersal by birds (cf. *Hallier f.*. Med. 's Rijks Herb. Leid. no.

¹⁾ It is also possible that the direction is a mere N.-E.—S.-W. one, since *Clerodendron longiflorum* and *C. longituba* occur both in N.-Guinea and in, respectively, Timor and Lombok.

37, 83, who mentions under his *Clerodendron Hettæ*: (specimen) „mit Fruchtkelchen, aus denen die Steinfrüchte anscheinend schon durch Vögel herausgepickt sind". So perhaps there is a migration of birds in the apparent direction of dispersal, viz. N.-E.—S.-W.

For the plant-dispersal of this regions we may, for the rest, refer to some works, given in the bibliography [spec. nos. 6, 7, 8, 10, 20, 21, 24, 25 (p. 95)].

Finally we might say some things about the distribution of the several genera:

GEUNSA is a Malayan and Philippine genus which has its western limit in Singapore and Sumatra, and does not extend to Br. India, China, Japan or countries east or south of N.-Guinea. It is rather equally distributed over the archipelago.

CALLICARPA too, is chiefly Malayan. In Br. India occur 12 (*Clarke*), in Ceylon 1 species (*Trimen*). Formosa has 3 (*Matsumura* and *Hayata*), Australia 3 species (*Bentham* and *v. Mueller*), whilst in the regions dealt with, are 38 species, of which 26 occur in the Philippines (19 of them being endemic). In each of the other islands or groupes of islands as mentioned above there are 3—7 species of *Callicarpa*.

PREMNA is a large group, which has a wide extension in all tropics of the Old World. In Br. India it is represented by 35 species (*Clarke*), in our regions totally distributed as follows: Philippines 19 (12 of them endemic), Malay Peninsula 14 (8 of them endemic), Java 13—15 (with 2 endemic species) and Sumatra 10 (2 being endemic).

VITEX is also widely spread throughout British India (18 spec., *Clarke*); Ceylon has 4 species, according to *Trimen*, Formosa 3 (*M.* and *H.*), all of them widely spread in tropical Asia, Australia 4 (*B.* and *v. M.*). Within our regions the Philippines possess 15 or 16 species (9 endemic), the Malay Peninsula 16 (3 or 4 end.), Borneo 14 (6 end.), Java 10 (3 end.), Sumatra 10 (1 end.), N.-Guinea 9 (3 end.) and Celebes 8 (2 end.).

GMELENA has its distribution in Br. India (4 spec., *Clarke*) and Malaya (12 spec., of which 7 occur only in the Molucca-isl., N.-Guinea or the countries eastward of them, and 1 also in Australia); Australia has 3 species (*B.* and *v. M.*).

FARADAYA is nearly endemic in N.-Guinea, except for 2 species

(*F. Albertisii* and *F. splendida*), which occur also in Australia.

CLERODENDRON is widely spread in all tropical countries. Br. India has 22 species (*Clarke*), Ceylon 4 (*Trimen*), Formosa 6 (*Mats.* and *H.*), Hawaii 4 [of which 3 cultivated and 1 widely spread throughout the tropics of Asia (*C. inerme*) *Hillebrand*], whilst Australia has 8 species, and some occur in tropical Africa and America (*Engler*). In the regions dealt with, there are 88 species, 29 of which occur in the Philippines (with 15 endemics), 24 in Java (5 end. and 1 on Karimun-djawa-isl.), 18—20 in Sumatra (2 end.), 19 in the Malay Peninsula (4 end.), 14 in Borneo (5 end.), 14 in N.-Guinea (7 end.) and 11 in Celebes (2 end., 1 on Kalao-Toa-isl.).

PETRÆOVITEX is a genus from the eastern parts of the Malay Archipelago; 2 species occur also in Borneo (1 in Borneo and the Philippines and 1 in Borneo and the Malay Peninsula), 1 species is apparently endemic in the Malay Peninsula.

NOTE.

Dr. E. D. v. Oort, keeper of the „Rijks Museum van Natuurlijke Historie”, Leiden, was so kind to inform us, that there are indeed several birds, which, hatching in the temperate regions of N.-E.-Asia, China and Japan, migrate southward in winter and then may be observed on the Sunda-isl., the Molucca-isl., New-Guinea and even Australia. According to Dr. v. Oort distinct routes of migration seem to pass Malacca and the Philippines, directed southward, and among the migratory birds there are several drupe-eating ones (e.g. thrushes). The one and the other seem to agree pretty much with our observations.

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EXPLANATION OF THE PLATES.

PLATE I.

Xerocarpa avicenniæfoliola H. J. Lam.

- A. = Habit.
- B. = Leaflet.
- C. = Part of inflorescence with young buds.
- D. = Flower.

- E. = Ovary and part of the calyx.
 F. = Lower (glabrous) part of corolla-tube.
 G. = Fruit.
 H. = Subglabrous part of inflorescence after flowering-time.
 J. = Diagram of flower.
 K. = Transverse section of ovary.
 L. = One-fourth part of this section.
 M. = Ovule.

A and B are about $\frac{2}{3}$, C—H about $4-4\frac{1}{2}$ times the natural size.

PLATE II.

Forms of leaves and calyces of *Premna integrifolia* L. s.a.

A. = *Nyman*, no. 32, New-Guinea (former *P. integrifolia* L.).

B. = *Gjellerup* no. 439, New-Guinea (former *P. integrifolia* L.).

C. = *Korthals* in H.L.-B. sub no. 908.266—1348, Borneo (former *P. foetida* *Rw.*, det. *Hall f.*).

D. = *Peekel* no. 342, New-Ireland (former *P. integrifolia* L.).

E. = *Gaudichaud*, Marianne-isl. (former *P. Gaudichaudii* *Schau*).

F. = *Raymundus* no. 85, Palau-isl. (former *P. foetida* *Rw.*).

G. = *Horsfield* in H. A. R.-T. sub no. 049895, Java (former *P. opulifolia* *Miq.*).

H. = *Versteeg* no. 1873, New-Guinea (former *P. integrifolia* L.).

J. = *Raymundus* no. 214, Palau-isl. (former *P. integrifolia* L.).

K. = *Horsfield* in H. A. R.-T. sub no. 049849, Java (former *P. cyclophylla* *Miq.*).

L. = *Peekel* no. 341, New-Ireland (former *P. foetida* *Rw.*).

M. = in H. A. R.-T. sub no. 049891, Java (former *P. abbreviata* *Miq.*).

N. = *Elbert* no. 467, Java (former *P. foetida* *Rw.*).

O. = *Forsten* in H. L.-B. sub no. 908.267—724, Little Ceram (former *P. foetida* *Rw.*).

- P. = *Amdjah* no. 35, Borneo (former *P. fœtida* *Rw.*).
 Q. = *Fénix* no. 15537, Palawan (former *P. integrifolia* *L.*).
 R. = in H. L.-B. sub no. 908.266—275 (former *P. integrifolia* *L.* or *fœtida* *Rw.*).
 S. = *Elbert* no. 2804, Buton-isl. (former *P. fœtida* *Rw.*).
 The leaves are $\frac{1}{2}$, the calyces about $2\frac{1}{2}$ —3 times the natural size.

PLATE III.

Forms of leaves and inflorescences of *Avicennia officinalis* *L. s. a.*

- A. = *Versteeg* no. 1887, New-Guinea (former *A. officinalis* *L.*; with a long style).
 B. = *Hallier f.* no. B.271, Borneo? (former *A. Oepata* *Buch.-Ham.*).
 C. = in H. Bog. sub no. 1753, Madina (former *A. Oepata* *Buch.-Ham.*); infl. $\times 1$.
 D. = *Curran* no. 17335, Panay-isl. (former *A. officinalis* *L.*); fr. $\times \frac{1}{2}$.
 E. = *Forsten* in H. L.-B. sub no. 908.267—690, Little Ceram (former *A. officinalis* *L.*); infl. $\times \frac{3}{2}$, fr. $\times 1$.
 F. = *Forsten* in H. L.-B. sub no. 908.265—626, Gilolo (former *A. officinalis* *L.*); infl. $\times 1$.
 G. = Com. d. l. fl. for. d. Fil. no. 496, Bulacan (former *A. officinalis* *L.*); infl. $\times 1$.
 H. = *Fénix* no. 15596, Palawan (former *A. officinalis* *L.*).
 J. = *Boerlage* in H. L.-B. sub no. 908.191—865, Leiden-isl. (former *A. officinalis* *L.*); infl. $\times \frac{3}{2}$.
 K. = *Kuhl et v. Hasselt* in H. L.-B. sub no. 908.265—691, Java (former *A. officinalis* *L.*); infl. $\times 1$.
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 M. = *Volkens* no. 193, Yap (former *A. spicata* *Ktze.*); infl. $\times 1$.
 N. = in H. A. R.-T. sub no. 022031, Nusa Kambangan (former *A. alba* *Wight*); infl. $\times \frac{3}{2}$.

O. = in H. A. R.-T. sub no. 043826 (former *A. spicata* Ktze.); infl. $\times 1$.

P. = Zippel no. 87d, New-Guinea (former *A. eucalyptifolia* Zipp.); infl. $\times 1$.

Q. = Spanoghe in H. L.-B. sub no. 908.265—613, Timor (former *A. alba* Bl. or *A. eucalyptifolia* Zipp.); infl. $\times \frac{3}{2}$.

R. = L.

S. = L.

T. = L.

U. = Zippel in H. L.-B. sub no. 908.265—623, Timor (former *A. eucalyptifolia* Zipp); fr. $\times \frac{1}{2}$.

The leaves are $\frac{1}{2}$ of natural size.

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ADDENDA-CORRIGENDA.

1. page 27, line 3, after the description of *Petræa volubilis* add:
 2. *P. arborea* (Kunth) Smith et Wills in Forbes, Wand. Nat. f. Mal. Arch. II, 225. Forbes mentions it as common in Java as an escaped plant. Probably it is a ms.-name, and synonymous with *P. volubilis*.
2. page 92, after the descriptions of *Callicarpa*-species, add:

M.S.-NAMES OR NAMES WITH UNKNOWN SYNONYMY:

 39. *C. lanata* Zipp. ms. in Spanoghe, Linnæa XV, 330 (1841), Timor.
 40. *C. tomentosa* Vahl, Symb. III, 13 (1790—94) = ?
 41. *C. villosa* Vahl, Symb. III, 14 (1790—94) = ?
3. page 99, line 16, after: nov. spec. add: (Plate I)
4. page 122, line 32 and page 123, line 1, for: upper lip . . . (. . . mistake), read: lower lip entire, upper one 2-lobed.
5. page 160, after the descriptions of *Premna*-species, add:

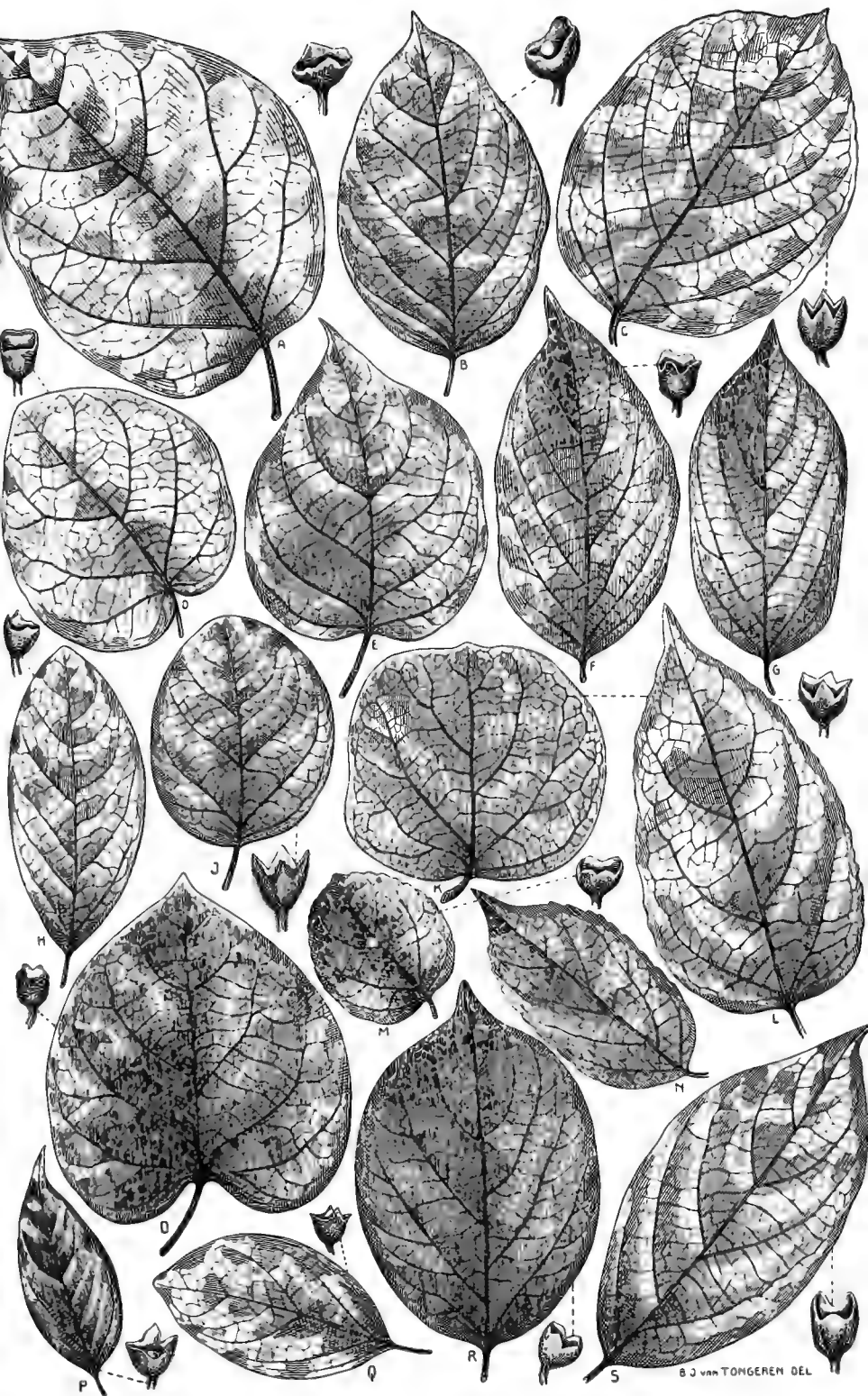
58 *P. multiflora* Zipp. ms. ex Spanoghe in Linnæa XV, 330 (1841), Timor.
6. page 195, line 8, before: A tree!, read: *V. leucoxylon* Spanoghe ex Miq. in Fl. Ind. bat II, 863 (1856).
7. page 210, line 24, before: leaflets, read: *V. acuminata* Korth. ms.
8. page 214, after the descriptions of *Vitex*-species, add:
 47. *V. altissima* L. f., suppl. 294 (1781); Blco. Fl. Fil. ed. I, 516; Schau. DC. Prodr. XI, 685; Hook. f., Fl. Br. Ind. IV, 584; Miq., Fl. Ind. bat. II, 861; Roxb. Fl. ind., III, 71; Hall. f., Med. 's Rijks Herb. Leid. no. 37, 44. — *V. latifolia* Wight ex Steud. Nom. ed. II, II, 777 (1841). — *V. pubescens* Heyne ex Wall., Cat. no. 1755 (1828).

According to Hallier this species does not occur in the Philippines but only in Br.-India.
9. page 266, line 22, after: 72, read: — *C. ellipticum* Zipp. ms. ex Span. in Linnæa XV, (1841), 329.
10. page 306, line 23, after: (1825), read: — *C. indicum* Kuntze, Rev. Gen., 586, (1891).



B. J. VAN TONGEREN. DEL.

XEROCARPA AVICENNIÆFOLIOLA H. J. Lam. — nov. gen., nov. spec.



Forms of leaves and calyces of *PREMNA INTEGRIFOLIA* L. s. a.



Forms of leaves and inflorescences of *AVICENNIA OFFICINALIS* L. s.a.

