THE CONVOLVULACEAE OF MALAYSIA, I

by

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The genera Cuscuta, Dichondra, Evolvulus, Bonamia, Neuropeltis and Porana.

This is the first contribution to a series of papers dealing with the *Convolvulaceae* of Malaysia (Malay Peninsula and Archipelago, Philippines and New Guinea). As far as possible the contributions will be published in accordance with the systematical arrangement of the genera. For a survey on this arrangement I refer to HALLIER's fundamental work on this matter published in 1893 in the 16th volume of ENGLER's Botanische Jahrbücher, entitled: "Versuch einer natürlichen Gliederung der Convolvulaceen auf morphologischer und anatomischer Grundlage". After all genera will have been published, a determination key will be added, based on the genera of the area under consideration, in which I hope to take especially account of the characters of the Malaysian species. Meanwhile the key published by HALLIER in the above mentioned paper can be provisionally used.

On account of the structure of the pollen grains the *Convolvulaceae* as a whole can be subdivided, as has been proposed by HALLIER, into two groups, viz. the *Psiloconiae* with smooth pollen grains and the *Echinoconiae* with spinose ones. The former of these groups contains seven tribes, viz. 1. *Cuscuteae,* 2. *Wilsonieae* (not in Malaysia), 3. *Dichondreae,* 4. *Dicranostyleae,* 5. *Poraneae,* 6. *Erycibeae* and 7. *Convolvuleae.* Of the six genera worked out here, *Cuscuta* belongs to the *Cuscuteae, Dichondra* to the *Dichondreae, Evolvulus, Bonamia* and *Neuropeltis* to the *Dicranostyleae* and *Porana* to the *Poraneae.* For the limitation and description of the tribes see HALLIER l.c. and in ENGLER's Botanische Jahrbücher, Vol. XVIII, 1894, p. 92, under *Prevostea.*

The materials examined by me, belong to the following herbaria:

(B) the Herbarium of the Botanic Garden, Buitenzorg.

(BD) the Herbarium of the Botanical Museum, Berlin-Dahlem.

(C) the Herbarium of the Botanic Gardens, Sibpur, Calcutta.
(K) the Herbarium of the Botanic Gardens, Kew.
(L) the National Herbarium (Rijksherbarium), Leiden.
(M) the Herbarium, Bureau of Science, Manila.
(P) the Herbarium of the Natural History Museum, Paris.
(Pa) the Herbarium of the Experiment Station for the Java Sugar Industry, Pasoeroean, Java.
(S) the Herbarium of the Botanic Gardens, Singapore.
(U) the Herbarium of the University, Utrecht.

I feel greatly indebted to the Directors and Keepers of these herbaria, for their kind assistance.

I. CUSCUTA L.

L., Spec. Pl. ed. 1 (1753) p. 124; CHOISY in Mém. Soc. Phys. Genève IX (1841) p. 268; id. in DC., Prodr. IX (1845) p. 452; MIQ., Fl. Nederl. Ind. II (1857) p. 631; ENGELMANN in Trans. Acad. Sci. St. Louis I (1859) p. 453; BENTH., Fl. Austr. IV (1869) p. 440; BENTH. et HOOK., Gen. Plant. II (1876) p. 881; CLARKE in HOOK., Fl. Brit. Ind. IV (1883) p. 225; BAILLON, Hist. Pl. X (1891) p. 330; PETER in ENGL.-PRANTL, Nat. Pfl. fam. IV, 3a (1891) p. 38; HALL. f. in ENGL., Bot. Jahrb. XVI (1893) p. 568; TRIMEN, Handb. Fl. Ceylon III (1895) p. 228; BOERL., Handl. Fl. Ned. Ind. II (1899) p. 493, 507; BAKER and RENDLE in THISELT.-DYER, Fl. Trop. Afr. IV, 2 (1905) p. 202; PRAIN in Journ. As. Soc. Bengal LXXIV (1906) p. 286; KOORDERS, Exk. fl. Java III (1912) p. 109; GAGNEP. et COURCHET in LECOMTE, Fl. Indo-Chine IV, 3 (1915) p. 310; RIDLEY, Fl. Malay Penins. II (1923) p. 443; BACKER, Onkruidfl. Jav. Suikerrietgr. (1931) p. 510; YUNCKER in Mem. Torr. Bot. Club XVIII (1932) p. 113.

Herbaceous parasites with slender, often filiform, twining stems, with haustoria. Leaves reduced to small scales. Flowers small, mostly in cymose clusters, 5-merous, rarely 4- or 3-merous. Calyx usually 5-lobed, 5-parted or consisting of 5 free sepals. Corolla tubular, urceolate, globose or campanulate, usually 5-lobed, the tube with 5 crenulate or fimbriate episepalous scales inside. Stamens 5, inserted on the corolla above the scales; pollen smooth. Ovary 2-celled, each cell with 2 ovules. Styles distinct or connate; stigmas capitate or elongated. Fruit an ovoid or globose capsule, opening irregularly or circumscissile, or remaining closed. Seeds 4 or less, generally glabrous; embryo acotyledonous, filiform, enlarged at one end.

Distribution (according to YUNCKER): Cosmopolitan, the

largest number of species in America, from Southern Canada to Northern Chile and Argentina. In the Old World from about the 60th parallel North in Europe and Asia to the Cape region in South Africa; also but less abundant in Malaysia, the Pacific Islands and in Australia. According to MERRILL the genus is not represented in the Philippine Islands: "Although I spent 22 years in the Philippines, for the most part devoted to botanical work, I have never seen a specimen of *Cuscuta* from the islands, and I am confident that the genus is not represented there" (see YUNCKER l.c. p. 109). It is also unknown from Borneo, Celebes and the Moluccas.

In accordance with ENGELMANN (l.c. p. 459—460), who divided the genus into three groups, the *Cuscuta* group, the *Grammica* group and the *Monogyna* group, YUNCKER l.c. p. 119 etc. distinguished three subgenera, under the same names. Only the two last-named of these subgenera occur in the area considered.

Key to the species.

1a. Styles 2, distinct (Subgenus *Grammica*) . . . . . 2.
b. Style 1 (Subgenus *Monogyna*) . . . . . 3.
2a. Corolla lobes obtuse; calyx lobes not overlapping; scales short, deeply bifid with few fimbriae . . . . . **1. C. australis**
b. Corolla lobes acute; calyx lobes slightly overlapping at the base; scales ovate, not bifid, abundantly fimbriate . . . . . **2. C. campestris**
3a. Style longer than the stigmas; corolla tube as long as the lobes, scales represented by narrow wings . . . . . **3. C. timorensis**
b. Style shorter than the elongate stigmas; corolla tube 2.5—3 times as long as the lobes; scales ovate to oblong, abundantly fimbriate . . **4. C. reflexa**

Subgenus **Grammica** (LOUR.) YUNCK.

YUNCKER in Mem. Torr. Bot. Club XVIII (1932) p. 122 — *Grammica* LOUR., Fl. Cochinch. I (1790) p. 170 — *Cuscuta*, group *Grammica* (LOUR.) ENGELM. in Trans. Acad. Sci. St. Louis I (1859) p. 459, 460.

Flowers mostly pedicellate. Styles 2, stigmas mostly globose, capitate; capsule opening or not.

YUNCKER divided this subgenus into two sections, 1. *Clistogrammica* ENGELM. em. YUNCK. [1]) (*Clistogrammica* ENGELM. + *Lobostigma* ENGELM.) with capsules remaining closed at maturity and 2. *Eugrammica* ENGELM. with capsules opening by circumscission. Only the first section is represented in the area considered in this paper.

[1]) Although ENGELMANN published the name *Clistogrammica*, YUNCKER changed it into *Cleistogrammica*, probably because he thought that *Clistogrammica* was a misprint for *Cleistogrammica*. Of course *Clistogrammica* is the valid name.

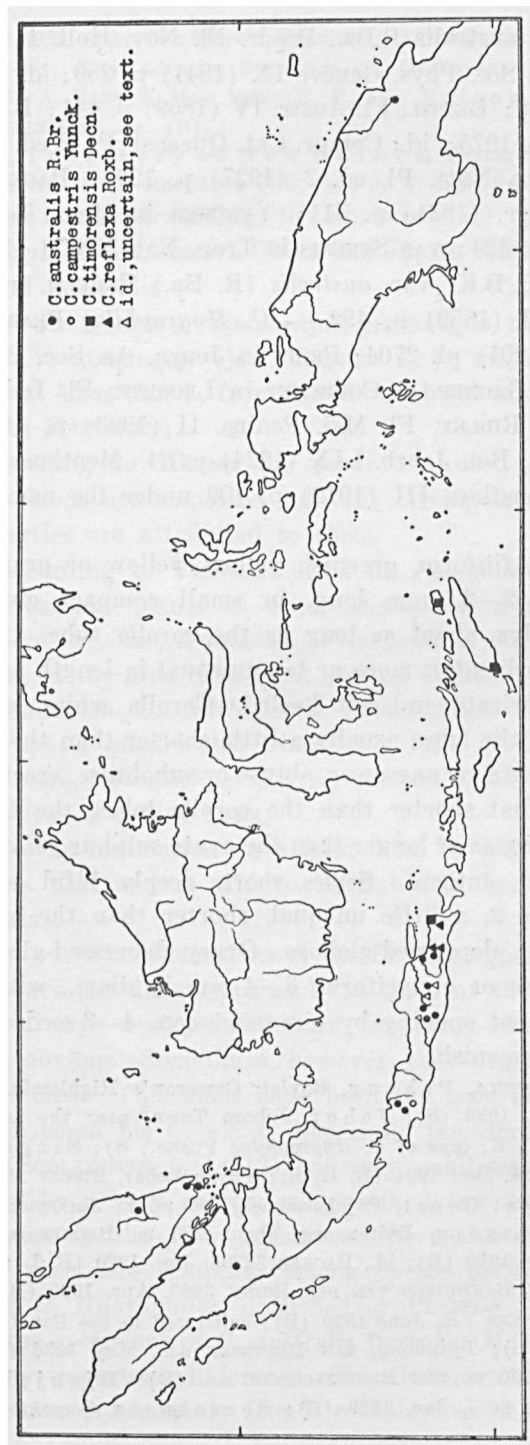


Fig. 1. Distribution of the species of *Cuscuta* in Malaysia.

1. **Cuscuta australis** R.Br., Prodr. Fl. Nov. Holl. I (1810) p. 491; Choisy in Mém. Soc. Phys. Genève IX (1841) p. 280; id. in DC., Prodr. IX (1845) p. 458; Benth., Fl. Austr. IV (1869) p. 441; Bailey, Queensl. Fl. IV (1901) p. 1075; id., Compr. Cat. Queensl. Pl. 2 ed. (1909) p. 353, fig. 330; Heyne, Nutt. Pl. ed. 2 (1927) p. 1298; Backer, Onkruidfl. Jav.-Suikerrietgr. (1931) p. 511; Yuncker in Mem. Torr. Bot. Club XVIII (1932) p. 124; van Steenis in Trop. Nat. XXIII (1934), p. 50 — *C. obtusiflora* H. B.K. var. *australis* (R. Br.) Engelm. in Trans. Acad. Sci. St. Louis I (1859) p. 492 — *C. Hygrophilae* Pearson in Hook., Ic. Pl. IV, 8 (1901) pl. 2704; Prain in Journ. As. Soc. Bengal LXXIV (1906) p. 286; Gagnep. et Courchet in Lecomte, Fl. Indo-Chine IV, 3 (1915) p. 311; Ridley, Fl. Mal. Penins. II (1923) p. 444 — *C. nuda* Pilger in Engl., Bot. Jahrb. LIX (1924) p. 84. Mentioned by Koorders in his Exkursionsflora III (1912) p. 109 under the name *C. chinensis* Lamk.

Stems thin, filiform, greenish yellow, yellow or orange (Backer). Flowers small, 2—2.5 mm long, in small compact clusters, shortly pedicellate. Calyx about as long as the corolla tube, 1.5—2 mm, the lobes ovate to orbicular, more or less unequal in length and in breadth, obtuse, not imbricate and not keeled. Corolla white, greenish white or cream white, the lobes usually a little shorter than the tube or equal to this, broad-ovate, or narrower, obtuse or subobtuse, erect or spreading. Stamens somewhat shorter than the corolla lobes, the filaments well-developed, as long as or longer than the ovate sulphur yellow (Bakhuizen van den Brink) anthers. Scales short, deeply bifid with few long fimbriae. Styles 2, a little unequal, shorter than the ovary; stigmas yellow (Backer), depressed-globose. Ovary depressed-globose. Capsule depressed-globose or obpyriform, 3—4 mm in diam., with large interstylar opening, not opening by circumscission, 4—3-seeded. Seeds oval, 1.5 mm long, brownish.

Malay Peninsula, Pahang, Raylet, Cameron's Highlands, about 3500 ft, A. B. Milne, Oct. 1933 (S); Johor, Johore Town, near the saw-mills, Ridley 9161, Apr. 1898 (C, K, *type of C. Hygrophilae* Pears.; S); Singapore, Victoria Street, Ridley 12124, Dec. 1904 (B, K, S); Payah Lebar, Ridley 13316 (S).

Sumatra, West Coast, Pajokoembocht, 500 m, E. Jacobson 151 (B).

Java, Buitenzorg, Buitenzorg, about 250 m, Backer s.n. (L, U); id., Backer 32297, July 1910 (B); id., Backer 32298, Jan. 1920 (B, L); id., Kartamah, Oct. 1919 (B); id., Bakhuizen van den Brink 3665, Apr. 1920 (B, L, M, U); id., Docters van Leeuwen s.n., June 1929 (B); cultivated in the Bot. Gard., Hallier C 160a, Aug. 1894 (L); Tjibinong, van Heeteren s.n., May 1935 (B,S); Kedoe, Moentilan, about 350 m, van Rijckevorssel s.n. (B); Djogjakarta, Djogjakarta, van Steenis 2657, Jan. 1929 (B); Soerakarta, Soerakarta, van Rijcke-

VORSSEL s.n., Dec. 1929 (B); Madioen, Madioen, DOCTERS VAN LEEUWEN 8623, Dec. 1925 (B, L, U); Soerabaja, Soerabaja, A. OTKEN—VAN LAKERVELD s.n., May 1930 (B); id., A. RANT 2, May 1929 (B, K, L); Malang, Kepandjèn near Malang, G. J. OVERDIJKINK s.n. (B).

NEW GUINEA, Territory of New Guinea, Bismarck Mts, in forest, 1100 m, R. SCHLECHTER 18612, Nov. 1908 (BD, *type of C. nuda* PILGER; K, P).

Distribution: (according to YUNCKER l.c.) Turkestan and India to Manchuria, Korea, eastern China and Japan, southward to Java, New Guinea and Australia.

Vernacular names: djamoedjoe, mamoedjoe, moedjoe-moedjoe (jav., HEYNE l.c.); tjatjingan (jav., BACKER l.c.); majamoejoe (mad., HEYNE l.c.); ramat ĕmas (sund., from ramat = cobweb and ĕmas = gold, according to VAN HEETEREN).

Use: According to HEYNE the seeds are used in the native medicine-trade. Seeds are imported into the Archipelago from China. Softening properties are attributed to them.

Hosts: according to YUNCKER often on *Polygonum* but also on many other herbaceous plants as *Soja, Dianthera, Artemisia, Piper, Genista, Lespedeza, Glycine, Xanthium, Pelargonium,* etc. According to herbarium labels, in the area considered also on *Codiaeum, Croton, Baccaurea, Piper aduncum* L., *Nothopanax Scutellarium* (BURM.) MERR., *Polyscias, Hygrophila quadrivalvis* NEES (the type of *C. Hygrophilae* PEARSON), *Dianthera leptostachya* BENTH., *Tecoma stans* JUSS., *Ocimum Basilicum* L., *Pluchea indica* LESS.

According to an annotation on a field label by MILNE this species is regarded as a pest and is said to be liable to become dangerous (Malay Peninsula).

Remarks. 1. The dimensions of the flowers appear to be rather variable and so are the dimensions and the form of the corolla-scales. The latter are always deeply bifid with fimbriate lobes. In general they are rather obvious. Sometimes, however, they are very small and are easily overlooked. This must have been the case in the specimen on which PILGER based his *C. nuda.* Especially the Berlin specimen of this collection (SCHLECHTER n. 18612) has very small scales, as they are only represented by a very narrow wing with a few fimbriae. In the duplicate specimen in the Kew herbarium the scales are much more developed. The specimens doubtless belong to the present species.

2. Between *C. Hygrophilae,* described by PEARSON from the Malay Peninsula and the specimens of *C. australis* from the Malay Archipelago I do not see any important difference. The flowers sometimes may be slightly smaller than is commonly found in Malaysian or Australian spe-

cimens, but the dimension of the corolla is rather variable, even in the same plant. I agree with YUNCKER, that *C. Hygrophilae* is to be considered as a synonym of *C. australis.*

3. Concerning the form and dimensions of the calyx-lobes, may be said, that in many cases their length and width is rather equal in the 5 lobes of one calyx, in others, however, they can considerably vary.

4. The corolla lobes are, as a rule, obtuse; somewhat acute lobes, however, occur also.

2. Cuscuta campestris YUNCK. in Mem. Torr. Bot. Club XVIII (1932) p. 138 — *C. arvensis* HOOK., Fl. Bor. Am. II (1840) p. 77, as a synonym without description; ENGELM. in A. GRAY, Man. Bot. 2nd ed. (1856) p. 336, in part, not BEYRICH — *C. pentagona* ENGELM. var. *calycina* ENGELM. in Am. Journ. Sci. and Arts XLV (1845) p. 76 — *C. arvensis* ENGELM. var. *calycina* ENGELM. in Trans. Acad. Sci. St. Louis I (1859) p. 495.

Stems thin, filiform. Flowers small, 2—2.5 mm long, in small, compact, globular clusters, short-pedicellate, pedicels shorter than the flowers. Calyx about as long as the corolla tube, ± 1.5 mm, the lobes orbicular, rounded, slightly overlapping at the base. Corolla lobes about as long as the tube, broad-triangular, acute, spreading, the tips erect or inflexed. Stamens somewhat shorter than the corolla lobes, the filaments well-developed, as long as or slightly longer than the ovate anthers. Scales ovate, exserted, not bifid, fimbriate. Styles 2, about equal, about as long as the ovary; stigmas depressed-globose; ovary depressed-globose; capsule depressed-globose, 3 mm in diam., with interstylar opening, not circumscissile. Seeds 2, ovate, flattened on one side.

JAVA, Priangan, Tjiandjoer, Tjikènèrè, HEUBEL s.n., Oct. 1934 (B) (first and only record from the Malay Archipelago).

Distribution: A native of the United States of America, now distributed also through the West Indies, South America, Europe, South Africa, China, Japan, Australia and Polynesia.

Hosts: Often on *Trifolium* and *Medicago sativa,* but also on a great number of other herbaceous hosts; according to YUNCKER on *Ipomoea, Xanthium, Aster, Pelargonium, Beta, Callistephus, Artemisia, Ambrosia, Dianthera, Bidens, Sonchus, Cirsium, Capsicum, Ammi,* etc. The specimens (1 number) from Java on *Cinchona, Cosmos* and *Gynura crepidioides* BENTH.

Subgenus **Monogyna** (ENGELM.) YUNCK.

YUNCKER in Mem. Torr. Bot. Club XVIII (1932) p. 248 — *Cuscuta*, group *Monogyna* ENGELM. in Trans. Acad. Sci. St. Louis I (1859) p. 460.

Flowers sessile or short-pedicellate. Style 1, stigmas globose, ovate, conic or flattened. Capsule circumscissile.

Two sections can be distinguished here, viz. 1. *Monogynella* ENGELM. with the style as long as or longer than the stigmas and 2. *Callianche* ENGELM. with the style shorter than the stigmas. To the first section belongs as only Malaysian species *C. timorensis*, to the second, monotypic section *C. reflexa*.

3. Cuscuta timorensis DECN. ex ENGELM. in Trans. Acad. Sci. St. Louis I (1859) p. 514; BACKER, Onkruidfl. Jav. Suikerrietgr. (1931) p. 511; YUNCKER in Mem. Torr. Bot. Club XVIII (1932) p. 250; VAN STEENIS in Trop. Nat. XXIII (1934) p. 50.

Mentioned by several authors (CHOISY in Mém. Soc. Phys. Genève IX (1841) p. 274; id. in DC., Prodr. IX (1845) p. 455; MIQ., Fl. Ned. Ind. II (1857) p. 632; FORBES, Wander., Germ. ed. II (1886) p. 222; BOERLAGE, Handl. Fl. Ned. Ind. II (1899) p. 507) under the name *C. monogyna* VAHL, which is, however, a different species, occurring in Europe, Central Asia and N. Africa.

Stems coarse, brownish- or yellowish red (BACKER), 1—1.5 mm thick (2 mm or more, BACKER). Flowers in short racemes on very short pedicels in the axils of broad triangular obtuse bracts; the common peduncle rather thick, 1—2.5 cm long, occasionally branched near the base. Calyx cupulate, the lobes orbicular, broadly rounded at the apex, overlapping, thick, the edges more or less unequal; calyx persistent. Corolla yellowish white (BACKER), campanulate, 3—3.5 mm long with lobes as long as the tube, ovate, obtuse, crenulate, erect or reflexed, soon breaking loose and remaining on the developing capsule. Stamens subsessile, or with a very short thick filament, much shorter than the oval anther, inserted at the sinus; anthers much shorter than the corolla lobes. Scales represented only by narrow wings. Ovary ovate-conic, style shorter than the ovary, not divided, stigmas small, depressed-globose. Capsule ovate-oblong, mucronate by the style, circumscissile near the base, 5 mm high, without opening at the top, 1—2 seeded (BACKER).

JAVA, Bondowoso, Asěm Bagoes, c. 10 m alt., BACKER 8276, May 1913 (B, L), the only specimen from Java, growing in a very dry locality.

TIMOR, Koepang, TEYSMANN s.n. (B, K, L); without exact locality, without collector's name (L, probably a duplicate of the type in herb. Paris).

WETAR, RIEDEL s.n. (K).

Distribution: Besides the localities mentioned above also in Central Africa (Nyassa, Usambara, Tanganyika). I did not see the African specimens, but YUNCKER states that he is "unable to distinguish between the Malayan forms of the species and those examined from Africa".

Hosts: *Ficus glomerata* ROXB. (BACKER 8276); the specimens collected by TEYSMANN also on woody plants.

Remarks. YUNCKER l.c. states: "It may be that *C. timorensis* represents a more northern and eastern form of *C. cassytoides* (from South Africa, S. J. v. O.). However, the scales in *C. timorensis* seem to differ in being more reduced: the filaments are slightly longer and the styles are shorter and with smaller stigmas, but there is considerable variation in these characters within the species. Further collections are necessary to clear up this question of relationship".

4. Cuscuta reflexa ROXB., Pl. Coast Corom. II (1798) p. 3, t. 104; id., Fl. Ind. I (1832) p. 446; CHOISY in Mém. Soc. Phys. Genève IX (1841) p. 273; id. in DC., Prodr. IX (1845) p. 454; MIQ., Fl. Nederl. Ind. II (1857) p. 631; ENGELM. in Trans. Acad. Sci. St. Louis I (1859) p. 518; CURTIS, Bot. Mag. XXXVII (1881) t. 6566; CLARKE in HOOK., Fl. Brit. Ind. IV (1883) p. 225; FORBES, Wander., Germ. ed. II (1886) p. 222; PRAIN in Journ. As. Soc. Beng. LXIII (1894) p. 115; TRIMEN, Fl. Ceylon III (1895) p. 229; BOERL., Handl. Fl. Ned. Ind. II (1899) p. 507; KOORDERS in Natuurk. Tijdschr. Ned. Ind. LX (1901) p. 256; COOKE, Fl. Bombay II (1905) p. 224; DUTHIE, Fl. Upper Ganget. Pl. II (1911) p. 100; KOORDERS, Exk. fl. Java III (1912) p. 109, fig. 8; HALL. f. in ENGL., Bot. Jahrb. XLIX (1913) p. 375; KOORD.-SCHUM., Syst. Verz. I (1910—'13) Convolv. p. 1; BASU, Indian Med. Pl. pt. III (1918) pl. 668 A; GAMBLE, Fl. Pres. Madras V (1923) p. 931; YUNCKER in Mem. Torr. Bot. Club XVIII (1932) p. 259; RENNER in Ann. Jard. Buitenz. XLIV (1934) p. 90, t. XIII, fig. 32; VAN STEENIS in Bull. Jard. bot. Buitenz. Sér. III, XIII (1934) p. 194; id. in Trop. Nat. XXIII (1934) p. 50 — *C. verrucosa* SWEET, Brit. Fl. Gard. I, 2 (1823) pl. 6, not ENGELM. — *C. Hookeri* SWEET, Hort. Brit. II (1826) p. 290 — *C. macrantha* DON, Gen. Syst. IV (1838) p. 305; ZOLL., Syst. Verz. (1854) p. 130, 134; MIQ., Fl. Ned. Ind. II (1857) p. 631 — *C. grandiflora* WALL., Cat. no. 1318, not of HBK. — *C. elatior* CHOISY in Mém. Soc. Phys. Genève IX (1841) p. 273 — *C. reflexa* ROXB. var. *grandiflora* ENGELM. in Trans. Acad. Sci. St. Louis I (1859) p. 518.

Stems coarse, to 2.5 mm or more in diam., often on high trees, pale green or yellowish green. Flowers sessile or on a very short pedicel, in small groups or in racemes or in racemes consisting of small groups of flowers. Calyx greenish, cup-shaped, 3—4 mm, the lobes orbicular, obtuse, overlapping, less than half as long as the corolla tube, the margin finely crenate or entire, the back verrucose-carinate. Corolla yellowish white, creamy of white, campanulate-tubular, 6—10 mm long, the tube 2.5—3 times as long as the lobes, lobes narrow-ovate to ovate-triangular, obtuse or subacute, irregularly crenate at the margin or entire, upright, spreading or reflexed. Scales well-developed, ovate to oblong, scarcely reaching the middle of the corolla tube, abundantly fimbriate. Anthers ovate-oblong, on very short thick filaments, inserted just below the sinus. Ovary ovate-conic, style short, thick; stigmas 2, elongated, narrowly ligulate to subulate, much longer than the style, at first erect, afterwards divergent. Capsule globose-conic, 5—10 mm high, circumscissile near the base, in a young stage often carrying the withered corolla at the top. Seeds black, 4 or less, 3—3.5 mm long; hilum a narrow transverse, terminal line.

JAVA, without exact locality, VAN DER PIJL 140c (B); Kedoe, G. Menjir, dessah Aglik, 1000 m, DOCTERS VAN LEEUWEN 137, Sept. 1911 (uncertain, a specimen without flowers in B); Madioen, Sarangan, E. Lawoe, c. 1433 m, RANT s.n. (uncertain, a specimen without flowers in B); Panaraga, Ngebel, c. 833 m, RANT s.n. (uncertain, specimens without flowers in B and L); Pasoeroean, near Ngadisari, 2400 m, KOORDERS 37381 β, Oct. 1899 (B, K, L); id., 1900 m, BACKER 36289, Jan. 1925 (Pa); Tosari, very common, RANT s.n., Apr. 1927 (B); id., ROTHERT s.n., May 1909 (B); id., about 1700 m, BACKER 8344, June 1913 (B, L); above Tosari, JESWIET s.n., 1929 (Pa); above Djarakidjo, S. W. Tengger, c. 2000 m, frequent, BEUMÉE A 630, June 1928 (B); Tengger, KOBUS (B); id., KUYPER B. 406 (B); id., WARBURG 4197, 1886—87 (BD, M); Lebaksari, near Poedjon, RANT s.n., Oct. 1930 (B); Klètak above Nongkodjadjar, 1800 m, WISSE 566, June 1921 (B); Malang-Probolinggo, G. Semeroe, Ajak-ajak, c. 2700 m, DOCTERS VAN LEEUWEN 8497, Sept. 1925 (B); Bondowoso-Djember, Kawah-Idjen, c. 2000 m, common, KOORDERS 43185 β, July 1916 (B, L); Idjen, near Pondok, 2300 m, CLASON—LAARMAN E 71, June 1931 (B); G. Widodaren, c. 1900—2150 m, BACKER 25298, June 1918 (B, L); G. Ranté, near Poeger, c. 2100 m, ZOLLINGER 2839, Apr. 1845 (B, P; in U a specimen ZOLLINGER s.n.).

Distribution: (according to YUNCKER) "From Afghanistan and Baluchistan throughout northern India to Yunnan, China and in Java and Ceylon."

Vernacular name: oelan-oelan (jav., according to KOORDERS, 1901, from oelo (jav.) = serpent).

Use: See WATT, Dict. Econ. Prod. India II (1889) p. 671; as far as I know of no economical value in the Malay Archipelago.

Hosts: On *Lavatera, Duranta, Aquilegia, Fragaria, Nerium, Adhatoda, Viburnum, Parkinsonia, Coffea, Calotropis, Zizyphus, Apluda, Achyranthes, Peristrophe, Capparis, Melia, Carissa, Clerodendron, Cocculus, Thevetia, Citrus,* etc. (YUNCKER). According to herbarium labels moreover on: *Casuarina, Boehmeria clidemioides* MIQ., *Maoutia diversifolia* (BL.) WEDD., *Engelhardtia spicata* BL., *Polygonum chinense* L., *Rubus Horsfieldii* MIQ., *Fuchsia coccinea* AIT., *Cestrum, Justicia gendarussa* L., *Stachytarpheta, Artemisia vulgaris* L. KOORDERS 37381β: in dense clusters, covering a whole tree-crown (of *Engelhardtia,* near Ngadisari). BACKER 25298: covering the host like a net. See the photograph in Ann. Jard. Bot. Buitenz. XLIV (1934) p. 90, t. XIII, representing the species on a large tree of *Engelhardtia spicata* BL.

Remarks. In the Malay Archipelago the species seems to be restricted to the eastern part of Java, where it occurs with certainty between 1900 and 2700 m altitude. The identification of the specimens from lower localities in Kedoe and Madioen is not quite certain, as they have been collected in a sterile state. According to VAN STEENIS "on the E. Javan mountains between 1500 and 2700 m alt., possibly descending to 1100 m and perhaps (in sterile specimens) also found in M. Java (west as far as G. Soembing)". All data concerning the occurrence of the species in the island of Timor (CHOISY, MIQUEL) refer to *C. timorensis.*

II. DICHONDRA FORST.

FORST., Char. Gen. (1776) p. 39, t. 20; id., German ed., transl. by KERNER (1779) p. 39, t. IV, fig. 20; CHOISY in Mém. Soc. Phys. Genève V (1832) p. 497; id. in DC., Prodr. IX (1845) p. 451; MIQ., Fl. Ned. Ind. II (1857) p. 630; BENTH., Fl. Austr. IV (1869) p. 438; BENTH. et HOOK., Gen. Plant. II (1876) p. 879; CLARKE in HOOK., Fl. Brit. Ind. IV (1883) p. 180; BAILL., Hist. Pl. X (1891) p. 330; PETER in ENGL.-PRANTL, Nat. Pfl. fam. IV, 3a (1891) p. 13; HALL. f. in ENGL., Bot. Jahrb. XVI (1893) p. 569; BOERL., Handl. Fl. Ned. Ind. II (1899) p. 494, 507; BAKER and RENDLE in THIS.-DYER, Fl. Trop. Afr. IV, 2 (1905) p. 65; GAGNEP. et COURCH. in LEC., Fl. Indo-Chine IV (1915) p. 310; MERRILL, Enum. Philipp. Fl. Pl. III (1923) p. 357 — *Demidofia* J. F. GMEL. in L., Syst. Nat., ed. GMELIN II (1791) p. 458 — *Steripha* BANKS ex GAERTN., Fruct. et Sem. plant. II (1791) p. 81, t. 94.

Small, prostrate, creeping herbs, glabrous or covered with soft hairs. Leaves generally small, petioled, entire, kidney-shaped or orbicular-cor-

date. Flowers small, solitary in the leaf-axils. Sepals 5, free, subequal, often spathulate. Corolla widely campanulate, deeply 5-lobed, lobes induplicate-valvate or slightly imbricate. Stamens shorter than corolla, filaments filiform, anthers small, introrse, pollen smooth. Disk small, hypogynous. Ovary deeply 2-lobed, each lobe with 2 ovules; styles 2, filiform, gynobasic (inserted between the lobes), stigmas capitate. Capsule 2-lobed, lobes erect, membranous, 1 or rarely 2-seeded, indehiscent or irregularly 2-valved. Seeds subglobose, smooth, with thin testa; cotyledons linear-oblong, plicate.

Distribution: A small genus with 4—5 species, principally American, one species in the tropical and sub-tropical regions of both hemispheres. In the area considered in this paper only one species has been recorded, viz. *Dichondra repens* FORST., collected in the Philippine Islands.

Dichondra repens FORST., Char. Gen. (1776) p. 40, t. 20; id. German ed., transl. by KERNER (1779) p. 39, t. IV, fig. 20; R. BR., Prodr., ed. 1 (1810) p. 491; Wall., Cat. (1828) n. 1339; CHOISY in Mém. Soc. Phys. Genève V (1832) p. 497; HASSK., Cat. Plant. Hort. Bogor. cult. alt. (1844) p. 138; CHOISY in DC., Prodr. IX (1845) p. 451; MIQ., Fl. Ned. Ind. II (1857) p. 630; BENTH., Fl. Austr. IV (1869) p. 438; CLARKE in HOOK., Fl. Brit. Ind. IV (1883) p. 180; PRAIN in Journ. As. Soc. Bengal LXIII (1894) p. 114; HALL. f. in ENGL., Bot. Jahrb. XVIII (1894) p. 82; BOERL., Handl. Fl. Ned. Ind. II (1899) p. 507; MANSON BAILEY, Queensl. Fl. IV (1901) p. 1074; BAKER and WRIGHT in THIS.-DYER, Fl. Cap. IV, 2 (1904) p. 83; BAKER and RENDLE in THIS.-DYER, Fl. Trop. Afr. IV, 2 (1905) p. 65; MANSON BAILEY, Compr. Cat. Queensl. Pl. (1909) p. 353; MERRILL in Philipp. Journ. Sci., Bot., V (1910) p. 225; GAGNEP. et COURCH. in LEC., Fl. Indo-Chine IV (1915) p. 310, fig. 36, 9 (p. 307); MERRILL, Enum. Philipp. Fl. Pl. III (1923) p. 357 — *Sibthorpia evolvulacea* L. f., Suppl. (1781) p. 288 — *Demidofia repens* J. F. GMEL., Syst. (1791) p. 458 — *Steripha reniformis* SOLANDER ex GAERTN., Fruct. et Sem. plant. II (1791) p. 81, t. 94 — *Dichondra evolvulacea* (L. f.) BRITTON in Mem. Torr. Bot. Club V (1894) p. 268.

A small creeping perennial herb, with slender short-pilose stems, rooting at the nodes. Leaves long-petioled, kidney-shaped to orbicular, broadly cordate at the base, broadly rounded or emarginate at the apex, with appressed hairs, especially below, variable in size, 4—25 mm in diam. Flowers axillary, solitary, pedicel mostly shorter than the petiole, filiform; sepals obovate-oblong to spathulate, obtuse, about 2—3 mm

long, hairy on the back and along the margins; corolla shorter to slightly longer than the calyx, yellowish, deeply 5-lobed. Carpels about as long as the calyx, pilose; seeds yellow to brown, glabrous.

PHILIPPINE ISLANDS, Luzon, Bontoc subprovince, Bauco, Father VANOVERBERGH 19, Jan. 1910, first and, so far as I know, only record from the Philippines (BD, L, M). According to MERRILL (1910, 1923) on dry slopes, altitude about 1300 m; very rare or local in the Philippines.

Distribution: America, from the southern United States to Patagonia; tropical Africa (Nile Land, Guinea, East Africa, Socotra, Mascarene Islands, St. Helena), South Africa; Upper Burma, China, Japan, Formosa, Philippines; Australia, Tasmania, New Zealand.

Vernacular names: lutlutud (Bontok language); napalapayag (Iloko language) (Philippines, MERRILL, l.c., 1923).

Remarks. The specimens collected by VANOVERBERGH (n. 19) are very small, their leaves are only 2—5 mm in diameter. The species shows some resemblance in habit with *Merremia emarginata* (BURM. f.) HALL. f., with which it has been confounded in the herbaria.

III. EVOLVULUS L.

See VAN OOSTSTROOM, A monograph of the genus Evolvulus in Meded. Bot. Mus. en Herb. Utrecht, 14 (1934) p. 1—267.

The genus *Evolvulus* is represented in Malaysia by one species:

Evolvulus alsinoides L., of which the typical form (l.c., p. 26) and four varieties have been found, viz. var. *hirsutus* (LAMK.) VAN OOSTSTR. (l.c., p. 29), var. *philippinensis* VAN OOSTSTR. (l.c., p. 30), var. *decumbens* (R. BR.) VAN OOSTSTR. (l.c., p. 38) and var. *javanicus* (BL.) VAN OOSTSTR. (l.c., p. 39). The collector's numbers I could examine may be found l.c., p. 54, 55. To these numbers can be added the following ones, together with some additional remarks:

MALAY PENINSULA, Pahang, Penor, sealevel, in old dunes, CORNER 29916, Aug. 1935 (B, var. *decumbens*). Specimens formerly mentioned as being typical *E. alsinoides* but resembling var. *debilis* (l.c., p. 41 and 54) must be reckoned to var. *decumbens*.

SUMATRA, Atjeh and Dependencies, near Takengon, 1300 m, grassy slope in *Pinus* forest, 1 specimen, VAN STEENIS 5993, Aug. 1934 (B, var. *decumbens*); East Coast, Bila Uplands, 80 m, rare, LÖRZING 9618, Apr. 1923 (B, var. *decumbens*); Tapanoeli, between Baligé and Goergoer, on moist open sand, not common, OUWEHAND 114 (B, var. *decumbens*); Riouw and Dependencies, Anambas Islands: the specimen HENDERSON 20511 represents a form of var. *hirsutus* with rather narrow leaves; HENDERSON 20340 might be considered as an intermediate between var. *hirsutus* and var. *decumbens*.

JAVA. The specimen ZOLLINGER 2794 (l.c., p. 55) is not typical but belongs to

var. *decumbens*. Specimens cultivated in the Botanic Garden at Buitenzorg under number XV KB XII 9, introduced from Ambon, belong to var. *decumbens* (B).

CELEBES, Celebes and Dependencies, Timampoe, 300 m, alang fields, rare, KJELLBERG 4010, Sept. 1929 (B, var. *decumbens*); Pasoei, 600 m, dry alang fields, very rare, KJELLBERG 4005, May 1929 (B, var. *decumbens*); Mori, Mekan, Ensa and Kolaka, dry grassy places, KAUDERN 352, June 1919 (L, Stockholm, var. *decumbens*).

AMBOINA, Amboina, in forest, May 1842, FORSTEN (L, var. *decumbens*); Waai, beach, RANT 755, Nov. 1931 (B, var. *decumbens*).

BALI, Gilimanoek, dry lawns behind beach, 1 m, VAN STEENIS 7589, April 1936 (B, var. *decumbens*).

WETAR, slopes above Iliwaki, in *Eucalyptus* bushes, 150—450 m, on rather dry volcanic soil, ELBERT 4382, Febr. 1910 (L, var. *decumbens*); Ilmedo, in *Eucalyptus* savannah, 0—50 m, on rather dry soil, ELBERT 4666, March 1910 (L, var. *javanicus*).

NEW GUINEA, Papua, Kanosia, savannah, c. 50 ft., CARR 11191, Febr. 1935 (L, var. *decumbens*); id., id., c. 100 ft., CARR 11752, Apr. 1935, L, var. *decumbens*).

IV. BONAMIA DUPETIT-THOUARS

DUPETIT-THOUARS, Hist. veg. Isl. Austr. Afr. I (1806) p. 17, 32, t. 5; POIR. in LAM., Encycl. Méth., Botanique, Suppl. I (1810) p. 677; CHOISY in Mém. Soc. Phys. Genève VI (1833) p. 495; id. in DC., Prodr. IX (1845) p. 439; BENTH. et HOOK., Gen. Plant. II (1876) p. 877; BAILL., Hist. Pl. X (1891) p. 327; PETER in ENGL.-PRANTL, Nat. Pfl. fam. IV, 3a (1891) p. 17, 376; HALL. f. in ENGL., Bot. Jahrb. XVI (1893), p. 527, 573; HALL. f. in Bull. Herb. Boiss. V (1897) p. 804, 996; BOERL., Handl. Fl. Ned. Ind. II (1899) p. 496, 507; BAKER and RENDLE in THIS.-DYER, Fl. Trop. Afr. IV, 2 (1905) p. 78; PRAIN in Journ. As. Soc. Bengal LXXIV (1906) p. 298; KOORDERS, Exk. Fl. Java III (1912) p. 110; GAGNEP. et COURCH. in LEC., Fl. Indo-Chine IV (1915) p. 289; RIDL., Fl. Malay Penins. II (1923) p. 454; MERRILL, Enum. Philipp. Fl. Pl. III (1923) p. 357 — *Breweria* R. BR., Prodr. Fl. Nov. Holl. ed. 1 (1810) p. 487; BLUME, Bijdr. (1825) p. 722; CHOISY in Mém. Soc. Phys. Genève VI (1833) p. 492, t. II, f. 14; id. in DC., Prodr. IX (1845) p. 438; MIQ., Fl. Ned. Ind. II (1857) p. 627; BENTH., Fl. Austr. IV (1869) p. 435; BENTH. et HOOK., Gen. Plant. II (1876) p. 876; CLARKE in HOOK., Fl. Brit. Ind. IV (1883) p. 223; PETER in ENGL.-PRANTL, Nat. Pfl. fam. IV, 3a (1891) p. 16; TRIMEN, Handb. Fl. Ceyl. III (1895) p. 227 — *Trichantha* KARST. et TRIANA in Linnaea XXVIII (1856) p. 437, non HOOK.

Herbaceous or woody twiners or erect undershrubs. Leaves herbaceous or rarely subcoriaceous, entire, lanceolate, ovate or elliptic. Flowers regular, axillary, solitary or in cymes which sometimes form terminal

panicles; bracts generally small. Sepals 5, equal or subequal, rarely very unequal, orbicular to lanceolate, coriaceous or herbaceous, not membranaceous. Corolla funnel-shaped, small or medium-sized, blue or white, 5-lobed, with hairy midpetaline bands outside. Stamens and styles included, very rarely slightly exserted. Filaments glandular or glabrous, anthers oblong, cordate or sagittate at the base. Pollen smooth. Ovary 2-celled, each cell with 2 ovules. Style bifid or 2 free styles, often unequal in length, rarely 1 style. Stigmas 2, globose or peltate, rarely 2-partite or stigmas 4. Disk small or none. Capsule 2-, 4- or 8-valved, 2-celled, 4- or less-seeded. Seeds glabrous or pilose.

Distribution: About 40 species, widely distributed in the tropics.

Bonamia semidigyna (Roxb.) Hall. f. in Engl., Bot. Jahrb. XVI (1893) p. 528; id. in l.c. XVIII (1894) p. 90, excl. syn. *Breweria abscissa* Choisy, cf. Hall. f. in Bull. Herb. Boiss. V (1897) p. 382, 812; id. in Versl. 's Lands Plantent. 1895 (1896) p. 125 (*Bonamina s.*); id. in Bull. Herb. Boiss. V (1897) p. 382, 814, t. 15; Koorders in Meded. 's Lands Plantent. XIX (1898) p. 542 (this is var. *farinacea*); Boerl., Handl. Fl. Ned. Ind. II (1899) p. 507; Prain in Journ. As. Soc. Bengal LXXIV (1906) p. 299; Koorders, Exk. fl. Java III (1912) p. 110; Koorders-Schum., Syst. Verz. I (1910—13) Conv., p. 8; id., III (1914) p. 109; Gagnep. et Courch. in Lec., Fl. Indo-Chine IV (1915) p. 289; Bold., Zakfl. Java (1916) n. 800; Merrill in Journ. Roy. As. Soc. Str. Br. Spec. Numb. (1921) p. 507; Ridl., Fl. Malay Penins. II (1923) p. 454; Merrill, Enum. Philipp. Fl. Pl. III (1923) p. 357 — *Convolvulus semidigynus* Roxb., Hort. Beng. (1814) p. 13, nomen; Roxb., Fl. Ind. II (1824) p. 47; Wall., Cat. (1828) n. 1405; Roxb., Fl. Ind. I (1832) p. 468 — *Breweria cordata* Bl., Bijdr. (1825) p. 722; Choisy in Mém. Soc. Phys. Genève VI (1833) p. 493; id. in DC., Prodr. IX (1845) p. 438; Moritzi, Verz. (1845—6) p. 51; Zoll. in Nat. en Gen. Arch. II (1845) p. 6; id., Syst. Verz. 2. Heft (1854) p. 130; Miq., Fl. Ned. Ind. II (1857) p. 627; Clarke in Hook., Fl. Brit. Ind. IV (1883) p. 223; Curtis in Journ. Straits As. Soc. (1893) p. 121; Trimen, Handb. Fl. Ceyl. III (1895) p. 227, excl. syn. L.; Cooke, Fl. Bombay II (1905) p. 230; Gamble, Fl. Pres. Madras V (1923) p. 923 — *Breweria Roxburghii* Choisy in Mém. Soc. Phys. Genève VI (1833) p. 493; id. in DC., Prodr. IX (1845) p. 438; Wight, Ic. IV, 2 (1850) p. 13, t. 1370; Miq., Fl. Ned. Ind. II (1857) p. 627; Thwaites, Enum. Plant. Zeyl. (1864) p. 213 — *Breweria madagascariensis* Choisy in Mém. Soc. Phys. Genève VI (1833) p. 493, nomen; id. in DC., Prodr. IX (1845)

p. 438 — *Breweria semidigyna* (ROXB.) O. K., Rev. Gen. (1891) p. 440 (*Brewera s.*).

Description of typical specimens (see further under Remarks):

A high climber, to 15 m. Stems stout, terete, covered with a dense, brown or reddish-brown tomentum, the upper flowerbearing parts 2.5—4 mm in diam. Leaves broad- to narrow-ovate, short-acuminate to cuspidate, the acumen with an acute or obtusish, mucronulate apex; broadly cordate or rarely truncate at the base, 6.5—15 cm long, 4—10 cm broad, tomentose on both sides, below more densely and softly than above, the upper surface glabrescent or at last sometimes glabrous; lateral nerves 5—6 pairs; petiole 18—35 (—60) mm, tomentose like the stems. Peduncles axillary, terete or more or less applanate above, variable in length, 4—14 cm long, tomentose; the flowers in a 2—5-flowered umbellate cyme at their end; bracteoles at the base of the primary branches of the cyme small or larger and leaf-like, and then to 2 cm long, pedicels variable in length, 4—15 mm long, short-tomentose. Sepals short-tomentose, 8—14 mm long, the two outer ones herbaceous, ovate or ovate-oblong, acute to acuminate, mostly with waved or reflexed margin, the three inner ones broad-ovate, acute or acuminate, herbaceous with narrow scarious margin, all about equal in length or the inner ones a little shorter. Corolla white, often blue in dry specimens, campanulate to funnel-shaped, 3—4(—5) cm long, the midpetaline areas pilose outside, the other parts glabrous; inside glabrous or with some hairs below the place of insertion of the filaments. Filaments inserted about 5—6 mm above the corolla base, sparsely short-pilose near their base, 8—12 mm long; anthers directed downwards. Ovary hairy; style 2-partite, with some hairs near the base; stigmas globose-peltate. Capsule broad-ovoid to subglobular, hairy at the top, about 12 mm high, 2-celled, 4-seeded, 4-valved, the valves longitudinally splitting into several narrow strips, which are often connate at the top. Seeds black, glabrous, 5.5—6 mm high, with 2 sides plane and one side convex.

MALAY PENINSULA, Kelantan, riverside, HANIFF and MD. NUR, Singapore Field nr. 10063, Jan. 1923 (B, K, S); Kota Bahru, RIDLEY s.n., Febr. 1917 (K); Labu laut, March 1914, GIMLETTE s.n. (K); Perlis, HENDERSON, Singapore Field nr. 22858, Nov. 1929 (B); id. id. 23086 (B, S); Prov. Wellesley, Kubang Ulu, CURTIS s.n., Febr. 1890 (S); Muda river, BURKILL 3075, Jan. 1918 (M, S); Penang, WALLICH 1405b (K, herb. BENTH.); id. 1405.2 (K, herb. HOOKER), leg. PORTER (K; according to HALLIER (1897) also in BD, C, Munich and Genève); Tanjong Bunga, CURTIS 1066, Oct. 1886 (K, S); according to HALLIER (1896) and to PRAIN (1906) wild in the Botanic Garden of Penang, Oct. 1896; Penang, on the coast, CURTIS 1703, March 1889 (C); Pahang, Kuala Lipis, BURKILL and HANIFF 15681, Nov. 1924 (S); Perak, Ipoh, CURTIS 3166, Dec. 1895 (S).

SUMATRA, without exact locality, KORTHALS 48 and 170 (L).

JAVA, Bantam, near Panimbang, ZOLLINGER 1339, June 1843 (BD); Pasir Ajoenan, 150—200 m, BACKER 1944, June 1911 (B, mixed with *Merremia umbellata* (L.) HALL.F.); Bodjangmanik, KOORDERS 40793 β (B); id., KOORDERS 41560 β, June 1912 (B); Batavia, Kandang Sapi, KORTHALS s.n. (L); Buitenzorg, Buitenzorg, BLUME s.n. (L, *type of Breweria cordata* BL.); id., BOERLAGE s.n. (L); id., WARBURG 2372bis (M); id., Tagal sapi, 240 m, BAKHUIZEN VAN DEN BRINK fil. 1622, Aug. 1922 (B); id., hedges along road to Kota batoe, HALLIER 204b, March 1893 (B); id., id., HALLIER 204c, Oct. 1894 (B); id., behind Desa Panaragan, banks of Tjidani, HALLIER 204a, March 1893 (B); id., along road near Tjipakoe, in *Tetracera* thickets, HALLIER 204d, Aug. 1896 (B, L); hills south of Djasinga, in second. forest, 250 m, BACKER 26030, Sept. 1918 (B, L); Barengkok, West of Leuwiliang, common, 250 m, BAKHUIZEN VAN DEN BRINK fil. 770, June 1921 (B, BD, K, L, M, P); cultivated in the Botanical Garden at Buitenzorg n. X F 75 (L); X F 79 (L); XV H 22 (B); HALLIER C 18a, May 1893 (L); HALLIER C 18b, May 1893 (L); HALLIER C 18c, May 1895 (L); WARBURG 1555 (M); WARBURG 1553bis (M); Priangan, Palaboehanratoe, beach near Tjidoean, KOORDERS 34664 β, Apr. 1899 (B); Parakan Teloe near Panjindangan, 600 m, common, BAKHUIZEN VAN DEN BRINK 59, May 1907 (B); hills south of Tjibeber near Tjiandjoer, 600 m, margin of second. forest, BACKER 13426, May 1914. Java, without exact locality, KORTHALS 226 (L).

BORNEO, without exact locality, BECCARI 3053 (P); Sarawak, Baram district, Baram mouth, HOSE 27, Dec. 1894 (BD).

CELEBES, Celebes and Dependencies, without exact locality, RACHMAT 172 (exped. VAN VUUREN) (B).

PHILIPPINE ISLANDS, Culion, on dry places, MERRILL 538, Dec. 1902 (BD, M); in dry thickets, MERRILL 618, Jan. 1903 (BD, M).

Distribution: Madagascar, British India, Indo-China, Malay Peninsula, Malay Archipelago, Philippines.

Vernacular name: aroj baloe (Sund., KOORDERS).

Remarks. 1. The original specimens on which ROXBURGH based his *Convolvulus semidigynus*, were cultivated in the Botanic Garden at Calcutta, raised from seeds, collected in the Shree-nugur mountains by Captain HARDWICKE. I did not see ROXBURGH's specimens, but according to his description, the stems and leaves of them must have been covered by a dense and very soft indument. Specimens, which fully agree with ROXBURGH's description are preserved in the Kew Herbarium (WALLICH n. 1405—1 and 1405—2, the former from Sillet, the latter from Penang; duplicates of the WALLICH collection are preserved in several other herbaria). They show, especially on the lower leaf surface, a very dense tomentum of a beautiful reddish brown colour. Specimens with the same dense tomentum occur in the Malay Archipelago; a fine example is BAKHUIZEN VAN DEN BRINK fil. n. 770 from Barengkok (Buitenzorg, Java), in the Buitenzorg herbarium, duplicates in BD, K, L, M and P.

2. Besides these typical specimens there are others showing a

pubescence of a much less density, and of a more or less paler colour changing from brown into grey, a character sometimes giving to the plant a rather different aspect. For two forms HALLIER proposed the names var. *ambigua* and var. *farinacea*, according to HALLIER both distinguished mainly on account of differences in the indumentum. Fine descriptions of these varieties, both made by HALLIER after living materials in the Botanic Garden at Buitenzorg may be found in Bull. Herb. Boiss. V (1897) p. 817 and 818.

The specimens on which HALLIER based his var. *farinacea* are indeed rather different from typical ones. They may be characterized in this way:

Var. **farinacea** HALL. f. in Verslag Plantent. Buitenz. 1895 (1896) p. 125; id. in Bull. Herb. Boiss. V (1897) p. 818, 1013; KOORDERS in Meded. 's Lands Plantent. XIX (1898) p. 546; BOERL., Handl. Fl. Ned. Ind. II (1899) p. 508; HALL. f. in Bull. Herb. Boiss. sér. 2, I (1901) p. 675 — *Lettsomia bancana* MIQ., Fl. Ned. Ind., Suppl. (1860) p. 561.

Not so densely tomentose as the typical form, but covered with short closely appressed hairs of a paler colour, especially the stems making the impression as being farinose. Finer venation of the sometimes narrower leaves often much more visible by the absence of a dense haircloth. Sepals often somewhat shorter, less acuminate, often with more distinct nerves. Corolla longer than is commonly found in typical specimens, 4.5—5 cm long.

The following specimens might be considered as var. *farinacea*:

BANGKA, without exact locality, HORSFIELD s.n., *type collection of Lettsomia bancana* MIQ. [L (a drawing after the specimen in U); U]; Lepar Islands, Poeloe Iboel, TEYSMANN s.n. (B).

CELEBES, Celebes and Dependencies, Bonto Parang, RACHMAT 4 (exped. VAN VUUREN), June 1913 (B, L); Bonto Djai, RACHMAT 21, June 1913 (B); Pangkadjene, on rocks, TEYSMANN 12197 (B); sandy beach near Pare-pare, KOORDERS 16559 β, May 1895 (B, BD, K, L); Pare-pare, near beach, KJELLBERG 4011, May 1929 (B).

MOLUCCAS, Ceram, W. Ceram, Poeloe Tikoes, beach vegetation, KORNASSI (exp. RUTTEN) 1274, May 1918 (B, L, U).

Specimens cultivated in the Botanic Garden at Buitenzorg under n. XV G 72 (B, L, U) belong here. Moreover specimens collected by HALLIER and by WARBURG in the same garden, HALLIER C 16a, May 1893 (L); HALLIER C 16b, June 1895 (L); WARBURG 1554 (M).

Vernacular names: akar lambai poetie (Bangka, Lepar Isl., TEYSMANN); tamber kaleleng (Celebes, RACHMAT).

Remarks. It is with some hesitation that I put the specimen from Ceram and that collected by RACHMAT under nr. 4 in Celebes under

var. *farinacea*. There are, indeed, many points, which make it probable that we have to do here with true var. *farinacea* (for instance the general habit, the characters of the indument, the form of the leaves, the size of the corolla); but there are also some points of difference. The Ceram plants are, for instance, characterized by their long pedicels (to 20 or occasionally to 30 mm long), much longer than is generally found, whilst the RACHMAT specimen has the sepals of an aberrant form; they are not at all acuminate, but can be described as elliptic and obtuse. These plants might be of importance systematically and phytogeographically when more materials should be available and when the aberrant characters should prove to be constant ones.

The specimen on which MIQUEL based his *Lettsonia bancana* is also the base of HALLIER's var. *farinacea*. HALLIER first mentioned it under this variety (l.c., 1896, p. 125; l.c., 1897, p. 818); later he changed of opinion (l.c., 1897, p. 1013) and put it under var. *ambigua*. I agree with HALLIER's first opinion.

Var. **ambigua** HALL. f. in Bull. Herb. Boiss. V (1897) p. 817.

Concerning this var. can be stated that the specimens of it in the Leiden herbarium, all collected by HALLIER in the Buitenzorg Garden from one plant, fully agree with HALLIER's fine descripion (l.c.).

It is, however, more difficult to draw a satisfactory line between the typical form and this variety, than it was in var. *farinacea*. It is not impossible that HALLIER is right in supposing that we have to do here with a hybrid.

Specimens, all collected from the same plant, cultivated at Buitenzorg in the Botanic Garden under n. X F 75A, *type number of var. ambigua* (the type is in Munich): HALLIER C 17a, May 1893 (L); HALLIER C 17b, April 1893 (L); HALLIER C 17c, March 1893 (L).

V. NEUROPELTIS WALL.

WALL. in ROXB., Fl. Ind. II (1824) p. 43; CHOISY in Mém. Soc. Phys. Genève VI (1833) p. 491; id. in DC., Prodr. IX (1845) p. 437; MIQ., Fl. Ned. Ind. II (1857) p. 626; BENTH. et HOOK., Gen. Plant. II (1876) p. 878; CLARKE in HOOK., Fl. Brit. Ind. IV (1883) p. 224; BAILL., Hist. Pl. X (1891) p. 328; PETER in ENGL.-PRANTL, Nat. Pfl. fam. IV, 3a (1891) p. 16; HALL. f. in ENGL., Bot. Jahrb. XVI (1893) p. 573; BOERL., Handl. Fl. Ned. Ind. II (1899) p. 496, 508; BAKER and RENDLE in THIS.-DYER, Fl. Trop. Afr. IV, 2 (1905) p. 80; PRAIN in Journ. As. Soc. Bengal LXXIV (1906) p. 296; GAGNEP. et COURCH. in

LEC., Fl. Indo-Chine IV (1915) p. 290; RIDLEY, Fl. Malay Penins. II (1923) p. 453.

Large, woody climbers with elliptic, ovate or oblong, chartaceous or coriaceous, penninerved leaves. Flowers small, in rufous tomentose racemes, axillary or subpaniculate towards the ends of the branches. Bract small at first, adnate to the pedicel, in fruit much accrescent, broad-elliptic or orbicular, scarious, reticulately nerved; bracteoles minute, hairy. Sepals 5, imbricate, subequal, suborbicular, hardly enlarged in fruit. Corolla small, rotate to broad-campanulate, deeply 5-lobed, the lobes induplicate-valvate in bud. Stamens 5, glabrous or hairy at the base, adnate to the corolla-tube, exserted or included; pollen smooth. Ovary hairy, perfectly or imperfectly 2-celled, 4-ovuled. Styles 2, short. Stigmas 2, peltate, lobed or kidney-shaped, complanate. Capsule small, glabrous, 4-valved, 1-celled, 1-seeded. Seed black, smooth, opake.

Distribution: S.E. Asia (from Tenasserim and Indo-China to the Malay Peninsula); West Coast of British India (Kanara, Malabar); in the Malay Archipelago only known from Borneo (uncertain, see under *N. racemosa*); W. Tropical Africa from Upper Guinea to Portuguese Congo.

Key to the species.

a. Styles as long as or shorter than the breadth of the stigma. Corolla hairy at the base of the filaments . . . . . **1. N. racemosa**
b. Styles much longer than the breadth of the stigma. Corolla glabrous at the base of the filaments . . . . . **2. N. Maingayi**

1. Neuropeltis racemosa WALL. in ROXB., Fl. Ind. II (1824) p. 44; id., Cat. (1828) n. 1322; CHOISY in Mém. Soc. Phys. Genève VI (1833) p. 491, t. II, n. 12, rather bad; id. in DC., Prodr. IX (1845) p. 437; DELESS., Ic. Sel. V (1846) t. 96 (not seen); MIQ., Fl. Ned. Ind. II (1857) p. 626; CLARKE in HOOK., Fl. Brit. Ind. IV (1883) p. 225, p.p.; BOERL., Handl. Fl. Ned. Ind. II (1899) p. 508, p.p.; PRAIN in Journ. As. Soc. Bengal LXXIV (1906) p. 297, p.p.; GAGNEP. et COURCH. in LEC., Fl. Indo-Chine IV (1915) p. 290, fig. 31, p.p.; MERRILL in Journ. Roy. As. Soc. Str. Br. Spec. Number (1921) p. 507; RIDLEY, Fl. Malay Penins. II (1923) p. 453, p.p. — *? N. intermedia* GRIFF., Notul. Pl. Asiat. IV (1854) p. 285 — *? N. bracteata* GRIFF., Notul. Pl. Asiat. IV (1854) p. 285.

A large woody climber, the young branches more or less tomentellous with rusty brown hairs, the adult ones glabrous, terete, to 5 mm in diam., pale brownish-grey or ash-coloured, often with numerous elevated whitish lenticels. Leaves elliptic or narrow-elliptic, sometimes

elliptic-oblong, acute or short-acuminate at the apex with blunt, mucronulate top, acute at the base or short-attenuate into the petiole, coriaceous, the upper surface often with numerous, very minute, impressed dots, glabrous above and beneath or with a few scattered appressed hairs, (6—)8—12 cm long, (2—)3.5—6(—7) cm broad; midrib impressed above, prominent beneath, lateral nerves (7—)8—10 on each side of the midrib, arcuately connected at some distance from the margin, slightly prominent above, and often grooved, distinctly prominent beneath, finer reticulate nervation distinctly visible above, less visible beneath, only the stronger nerves more prominent here, petiole 1—1.5 cm long or slightly longer, with a groove above, near the leafbase. Inflorescences from the leaf axils or from bare, already leafless branches, racemose, solitary, or 2—4 together, brown-tomentose, shorter than the leaves, 3—6 cm long or slightly longer; pedicels short, 2—2.5 mm long; bract immediately below the sepals, adnate to the pedicel, ovate to ovate-lanceolate, with a distinct mucro, 2—3 mm long, much accrescent in fruit and then broad-elliptic to orbicular, slightly emarginate and minutely mucronulate at the apex, slightly emarginate or obtuse at the base, bearing the calyx with capsule a little below its centre, scarious, finely reticulately nerved, glabrous, except along the pedicel and sometimes along the nerves, 3—4.5(—6) cm long; bracteoles minute, in fruit immediately below the calyx, subulate, densely hairy. Sepals imbricate, tomentose outside, glabrous inside, the two outer ones orbicular or slightly broader than long, 2—2¼ mm long, the three inner ones broader than long, 1¾—2 mm long, with scarious margins, the sepals scarcely enlarged in fruit. Corolla broad-campanulate, about 5 mm long, deeply 5-lobed, the lobes longer than the tube, with incurved, obtuse top, pilose outside, distinctly nerved, the tube inside hairy at the base of the filaments. Stamens inserted a little below the sinus of the corolla, filiform, shorter than the corolla; anthers oblong, with sagittate base. Ovary ovate, hairy, styles 2, short, shorter than or as long as the breadth of the irregularly lobed, more or less kidney-shaped, 1 mm broad stigma. Capsule nearly globose, glabrous, about 3.5—5 mm high, 4-valved, 1-celled, 1-seeded; seed subglobose, smooth, black.

MALAY PENINSULA, P. Penang, WALLICH 1322/1, collected by W. JACK (BD, K, *type*; L, P, S); HANIFF s.n. (K, M); HANIFF 137, Jan. 1928 (M); Penara Bukit, GUARD 12715, Febr. 1905 (B, K, S); Waterfall gardens, HANIFF s.n., June 1915 (S); Kedah, DOHNAN, Forest Department 21518, Jan. 1930 (S); Weng Rd, near Baling, BEST, Singapore Field n. 21270, Nov. 1929 (B, S); Kulim, HANIFF, Singapore Field n. 1270, June 1917 (K); Kedah Peak, Sunling, BELL and HANIFF s.n., March 1911 (K).

BORNEO, Bandjermasin, MOTLEY 1209 (K). With doubt the specimen collected by MOTLEY is mentioned here. It is the only number known from the Malay Archipelago. Was it perhaps a cultivated specimen or have we to do with a confusion of labels?

Vernacular names: akar semting semang (P. Penang, GUARD); perot ayam (Kedah, DOHNAN).

Distribution: The species seems to be restricted to Tenasserim and the N.W. part of the Malay Peninsula (Kedah, P. Penang). I did not see specimens from the southern part of Siam, but probably the species may be found there too. For the occurrence of the species in Borneo see above.

Remarks. *N. racemosa* has always been confounded both in literature and in herbaria with the second species known from the Malay Peninsula, viz. *N. Maingayi,* from which species it can be separated by several well-defined characters (see, for instance, the key to the species).

To the synonyms I put two names of GRIFFITH, *N. intermedia* and *N. bracteata,* both with the addition of a note of interrogation. I did not see the specimens on which GRIFFITH based his descriptions (from Mergue, Tenasserim); these descriptions are rather short and incomplete, but on account of the fact that in both GRIFFITH describes the filaments as being hairy at the base, it is possible that GRIFFITH's plants belong to *N. racemosa.* As a third synonym we often find *N. ovata* WALL. I could examine in several herbaria (BD, K, P, S) the plants on which WALLICH based this species (from Amherst, Tenasserim). It is represented there by leafy branches with mature fruits or by fruits only. The form of the large elliptic, scarious bract, which is not cordate, but rounded at the base, and also rounded at the apex, leads me to keep this species separate.

2. Neuropeltis Maingayi PETER, ex HALL. f. in ENGL. Bot. Jahrb. XVI (1893) p. 500, in obs., nomen [1]) — The name *N. Maingayi* without the addition of an author's name has been used already by SCHLEPEGRELL in Bot. Centralblatt XLIX (1892) p. 296, very probably on account of a specimen labelled by PETER.

A large woody climber, to 30 feet high (KING's collector), the young branches rusty-tomentellous, the adult ones glabrous, terete, to 6 mm in diam., brown to purple-brown, often with white lenticels. Leaves

[1]) A *N. racemosa* praecipue differt foliorum nervis minoribus supra minus prominulis vel impressis, corolla ad basin filamentorum glabra, stylis valde longioribus latitudine stigmatis, fructu paulo majore, ovoideo, circ. 6 mm longo.

elliptic to narrow-elliptic, short- to long acuminate at the apex with acute or obtusish, mucronate to subulate top, acute or obtuse at the base, coriaceous, glabrous or nearly so above and with few scattered, appressed hairs beneath, glabrescent, 6—11(—13) cm long, (2.5—)3—4.5(—6) cm broad, midrib impressed above, prominent beneath, lateral nerves 6—9 on each side of the midrib, impressed above, prominent beneath and arcuately connected at some distance from the margin, the finer nervation not so distinctly visible above as in *N. racemosa*, not or hardly prominent or more or less impressed above; only the stronger veins prominent beneath, equally as in *N. racemosa*; petiole 10—13(—22) mm long, with a longitudinal groove above, at first tomentellous, glabrescent. Inflorescences from the leaf axils, one or few from an axil, racemose, occasionally ramified and then paniculate, brown-tomentose, 3—10 cm long; pedicels short, to 3 mm; bract inserted immediately below the sepals, adnate to the pedicel, ovate to ovate-lanceolate with a distinct mucro, about 3—4.5 mm long, much accrescent in fruit and than broad-elliptic, obtuse or emarginate and mucronulate at the apex, slightly cordate at the base, bearing the calyx with capsule below the middle, scarious, finely reticulately nerved, sparsely pubescent on both sides, glabrescent, about 4—4.5 cm long. Sepals imbricate, tomentose outside, glabrous inside, 2—2.5 mm long, the two outer ones orbicular, the three inner ones broader than long, with scarious margins, the sepals scarcely enlarged in fruit. Corolla broad-campanulate to rotate, about 5—5.5 mm long, to 10 mm in diam., probably larger than in *N. racemosa*, deeply 5-lobed, the lobes longer than the tube, pilose outside, distinctly nerved; tube inside glabrous at the base of the filaments. Stamens inserted a little below the sinus of the corolla, filiform, shorter than the corolla. Ovary globose, hairy; styles 2, longer than in *N. racemosa*, 1¼—2 mm, longer than the breadth (½—¾ mm) of the kidney-shaped, few-lobed stigma. Capsule ovoid, glabrous, about 6 mm high, 4-valved, 1-celled, 1-seeded. Seed ovoid to globular, smooth, black.

MALAY PENINSULA, without exact locality, STOCKS (K); SCORTECHINI 2071 (S); Perak, Larut, dense jungle, within 100 ft., Dr KING's collector 6809, Nov. 1884 (BD, K, L, P); Gopeng, 500—800 ft., Dr KING's collector 4370, June 1883 (K), Selangor, Klang Gates, HUME 7304, May 1921 (S); Sungei Buloh, SYMINGTON, Forest Department 21079, Nov. 1929 (S); Malacca, MAINGAY 1152 (BD, *type*, this specimen is numbered 1152 and 1973 A and bears fruits and flowers; a fruiting specimen in K is also numbered 1152 and 1973 A, another, flowering one bears the number 1973 B; the specimen in L is numbered 1152); MERLIMAN, watchman CANTLEY's, s.n., June 1886 (S); Batu ampur, GOODENOUGH 1988, June 1894 (K).

Distribution: Malay Peninsula, Indo-China (?, see under remarks).

Vernacular names: bungah jonkal (Malacca, MERLIMAN); akar oran merah (Malacca, GOODENOUGH).

Remarks. The name of this species has been given by PETER to the specimen MAINGAY 1152 in the Berlin Herbarium, when studying the Convolvulaceae for ENGLER-PRANTL's Natürliche Pflanzenfamilien. In HALLIER's paper on this family (1893) the name occurs as a *nomen nudum*. The species has been lost sight of for several years because the authors working on Indian Convolvulaceae did not distinguish it from *N. racemosa*. A comparison of the flowers of WALLICH's type of *N. racemosa* with those of PETER's plant leads me to keep the two species distinct. I wish to maintain the epithet *Maingayi*, correctly given by PETER and have added in order to validate this name, a Latin differential diagnosis to the English description of the species.

The corolla is white with a red tinge and the calyx is of a rich brown colour (KING's collector 6809) or the flowers are darkish red (KING's collector 4370).

In specimens secured by KING's collector under n. 6809 the leaves are broad-elliptic with obtuse, shortly cuspidate apex; they seem to be more or less bullate, and are described as to be of a rich glossy deep green. In KING's collector 4370 they are of a middle green.

I am not quite certain that the specimens from Indo-China are fully identic with those from the Malay Peninsula. A more detailed study of materials from Indo-China may clear up this question.

Besides the typical specimens with sparsely hairy or glabrous leaves there are others with a densely rufous- or ferrugineous-tomentose lower leaf surface:

var. **tomentosa** Van Ooststr., nov. var.

Differt foliis subtus dense rufo- vel ferrugineo-tomentosis.

MALAY PENINSULA, Malacca, MAINGAY 1153 (L, *type*). 2 sheets in K, one bearing the numbers MAINGAY 1153 and 1953, collected on June 7, 1865 or 1866, the other bearing the numbers MAINGAY 1153 and 1953 A, collected in 1867 or 1868; Pahang, Raub, BURKILL and HANIFF 938, Nov. 1924 (B, K, S).

Distribution: Malay Peninsula.

Remarks. The flowers of the specimen BURKILL and HANIFF 938 are white, according to a note on the label.

VI. PORANA BURM. f.

BURM. f., Fl. Ind. (1768) p. 51, t. 21*, fig. 1; BLUME, Bijdr. (1825) p. 723; CHOISY in Mém. Soc. Phys. Genève VI (1833) p. 487; id. in

DC., Prodr. IX (1845) p. 436; MIQ., Fl. Ned. Ind. II (1857) p. 625; BENTH., Fl. Austr. IV (1869) p. 434; KURZ in Journ. Bot., New Ser. II (1873) p. 136; BENTH. et HOOK., Gen. Plant. II (1876) p. 876; CLARKE in HOOK., Fl. Brit. Ind. IV (1883) p. 221; BAILL., Hist. Pl. X (1891) p. 326; PETER in ENGL.-PRANTL, Nat. Pfl. fam. IV, 3a (1891) p. 24; HALL. f. in ENGL., Bot. Jahrb. XVI (1893) p. 575; BOERL., Handl. Fl. Ned. Ind. II (1899) p. 497, 508; BAKER and RENDLE in THIS.-DYER, Fl. Trop. Afr. IV, 2 (1905) p. 84; PRAIN in Journ. As. Soc. Bengal LXXIV (1906) p. 296; KOORDERS, Exk. fl. Java III (1912) p. 114; GAGNEP. et COURCH. in Lec., Fl. Indo-Chine IV (1915) p. 292; RIDL., Fl. Malay Penins. II (1923) p. 463; MERRILL, Enum. Philipp. Fl. Pl. III (1923) p. 358 (*Porania*); BACKER, Onkruidfl. Jav. Suikerrietgr. (1931) p. 512 — *Dinetus* BUCH.-HAM. ex D. DON in SWEET, Brit. Fl. Gard. II (1825) t. 127 — *Duperreya* GAUDICH. in FREYC., Voyage autour du monde, Bot., (1826) p. 452, t. 63; CHOISY in Mém. Soc. Phys. Genève VIII (1839) p. 44; id. in DC. Prodr. IX (1845) p. 436.

Tall twiners with slender, woody or herbaceous stems. Leaves herbaceous, mostly cordate at the base and palmately nerved, rarely penninerved. Inflorescences racemose or paniculate, rarely flowers solitary. Bracts leaf-like or subulate or none; bracteoles subulate or none. Sepals 5, small in flower, the 3 outer ones or all much accrescent in fruit, scarious, patent, often spathulate. Corolla mostly white, small, campanulate or funnel-shaped, rarely larger, salver-shaped, the limb plicate, the lobes patent. Filaments 5, filiform, included, rarely exserted, glabrous or glandular or pubescent at the base; anthers oblong or linear; pollen smooth. Ovary mostly glabrous, 1-celled, 2-ovuled or 1- or 2-celled, 4-ovuled. Style 1, entire or divided into two unequal branches; stigma globose, single or one on each branch. Disk annular or none. Capsule small, subglobose, usually 1-seeded, indehiscent or 2-valved. Seed glabrous; cotyledons plicate.

Distribution: More than 20 species, for the greater part in tropical and subtropical Asia, 3 species in Africa and adjacent islands, 1 species in Australia and perhaps 1 species in America.

Remarks. PETER divided the genus into three sections, according to this author distinguished as follows: 1. *Euporana* PETER in ENGL.-PRANTL, Nat. Pfl. fam. IV, 3a (1891) p. 24, with a 2-fid style, 5-lobed, campanulate corolla and flowers in panicles; this section is represented in Malaysia by *P. volubilis* BURM. f.; 2. *Duperreya* (GAUD.) PETER l.c., p. 24, with entire style, solitary, campanulate flowers and narrow leaves; not in Malaysia; 3. *Dinetus* (BUCH.-HAM.) PETER l.c., p. 25, with entire

style, funnel-shaped flowers, several-flowered inflorescences and cordate leaves; represented in Malaysia by *P. racemosa* ROXB. and by the often cultivated *P. paniculata* ROXB.

Key to the species.

1a. Style one, entire. Stamens included in the corolla 2
b. Style 2-fid to the middle. Stamens exserted. 5 sepals enlarged in fruit . . **1. P. volubilis**
2a. Style very short, as long as or shorter than the ovary. Corolla superficially lobed or subentire. Stamens inserted in the corolla tube at about the same height. 3 sepals enlarged in fruit . . . . . **2. P. paniculata**
b. Style longer than the ovary. Corolla deeply 5-lobed. Stamens not inserted at the same height in the corolla tube. 5 sepals enlarged in fruit . . . **3. P. racemosa**

1. Porana volubilis BURM. f., Fl. Ind. (1768) p. 51, t. 21*, fig. 1; BL., Bijdr. (1825) p. 723; ROXB., Fl. Ind. II (1824) p. 40; id., I (1832) p. 465; BLANCO, Fl. Filip. (1837) p. 88; id., ed. 2 (1845) p. 64 (not seen); id., ed. 3, I (1877) p. 119; CHOISY in Mém. Soc. Phys. Genève VI (1833) p. 488; WIGHT, Icon. II (1843) t. 347; CHOISY in DC., Prodr. IX (1845) p. 436; WIGHT, Ill. Ind. Bot. II (1850) t. 168b, fig. 8; ZOLL., Syst. Verz. 2. Heft (1854) p. 130; MIQ., Fl. Ned. Ind. II (1857) p. 625; id., Suppl. (1860) p. 235; KURZ in Journ. Bot., New ser. II (1873) p. 137; CLARKE in HOOK., Fl. Brit. Ind. IV (1883) p. 222; FORBES, Wander., Germ. ed. II (1886) p. 222; VIDAL Y SOLER, Rev. Plant. Vasc. Philipp. (1886) p. 197; HALL. f. in Versl. 's Lands Plantent. 1895 (1896) p. 125; id. in Bull. Herb. Boiss. V (1897) p. 382; BOERL., Handl. Fl. Ned. Ind. II (1899) p. 508; MERRILL in Bur. Gov. Lab. Philipp. 27 (1905) p. 63 (as *Porania volubilis* BLANCO); PRAIN in Journ. As. Soc. Bengal LXXIV (1906) p. 296; HALL. f. in Meded. Rijks Herb. Leiden 12 (1912) p. 14; KOORDERS, Exk. fl. Java III (1912) p. 114; KOORDERS-SCHUM., Syst. Verz. (1910—13), Conv. p. 1; GAGNEP. et COURCH. in Lec., Fl. Indo-Chine IV (1915) p. 295; BOLD., Zakfl. Java (1916) n. 839; MERRILL, Spec. Blanc. in Bur. of Sc. Publ. 12 (1918) p. 320, as to the name only; see remarks; id. in Philipp. Journ. Sc. XIX (1921) p. 373 (*Porania*); id. in Journ. Roy. As. Soc. Str. Br. Spec. Numb. (1921) p. 507 (*Porania*); GAMBLE, Fl. Pres. Madras V (1923) p. 921; RIDLEY, Fl. Malay Penins. II (1923) p. 463; MERRILL, Enum. Philipp. Fl. Pl. III (1923) p. 358 (*Porania*); HEYNE, Nutt. Pl. ed. 2 (1927) p. 1298; HENDERSON in Gardens' Bull., Str. Settlem. IV (1928) p. 293; BACKER, Onkruidfl. Jav. Suikerrietgr. (1931) p. 512; COSTERUS and

SMITH in Ann. Jard. Bot. Buitenz. XLII (1932) p. 11; MERRILL in Contr. Arn. Arbor. VIII (1934) p. 145 — *P. volubilis* BURM. f. var. *Burmanniana* BL., Bijdr. (1825) p. 723; MIQ., Fl. Ned. Ind. II (1857) p. 626; BOERL., Handl. Fl. Ned. Ind. II (1899) p. 508.

A large woody climber, up to 20 m high (BACKER) with stems to 1 or 2 cm thick, the adult branches pale brown or grey, 2—3, occasionally to 6 mm thick, often minutely verrucose; the young parts with short appressed hairs. Leaves ovate, short- or long-acuminate with obtuse or slightly emarginate acumen, mucronulate; broadly rounded or slightly cordate at the base, sometimes abruptly decurrent at the petiole, glabrous or only with a few hairs on the nerves and along the margins, often shining above; pinnately nerved, lateral nerves 5—7 at both sides, venation reticulate. Length of the leaves 3—9 cm, width 2—6 cm; petiole much shorter than the blade, glabrous or hairy above, 1—3 cm long. Flowers fragrant, in often dense lateral and terminal inflorescences, often forming large, broad panicles, which are leafy below. Peduncles and pedicels densely appressed-pilose; the pedicels about 3—5 mm long. Sepals oblong to obovate, obtuse, about 4—5 mm long, glabrous except some hairs at the top and near the base, or sparsely pilose on the whole surface, all accrescent in fruit and then patent, scarious, reticulately nerved, and with 7—8 stronger longitudinal nerves, oblong to spathulate, or obovate, 7—10 mm long. Corolla white, 8—10 mm long, glabrous or the midpetaline areas short-pilose, deeply 5-lobed, the lobes obtuse, spreading. Stamens 5, much unequal in length, the filaments filiform, glabrous, much longer than the anthers, inserted near the corolla base, exserting. Ovary glabrous, globular; style 2-fid to the middle, the branches filiform, unequal; stigmas globular. Disk present. Fruit broad-ovoid to globular, mucronulate, 3—4 mm in diam., glabrous, 1-seeded. Seed ovoid, purple-brown or black, minutely verrucose, about 2—2.5 mm long.

MALAY PENINSULA, Malacca, GRIFFITH s.n., (BD, K); id., in hedges, GRIFFITH cat. 5874/1 (K, P); according to RIDLEY the specimens collected by GRIFFITH from hedges in Malacca are certainly not wild there; RIDLEY states that this species is commonly cultivated in gardens. Singapore, Singapore, cultivated in the Botanic Gardens, MD. NUR, Dec. 1929 (S); id., FURTADO, Nov. 1927 (S); Singapore, without precise locality, Schlesisch botanischer Tauschverein 887, Oct. 1896 (B, M).

SUMATRA, according to MERRILL, 1934, in Atjeh, near Bireuen, sea level, BANGHAM 657, Jan. 1932 (cult.?); East Coast, Tandjoeng morawa, cult. and escaped from culture, LÖRZING 4263, March 1916 (B).

JAVA, without precise locality, BLUME? 98 (L); JUNGHUHN 50 (L); Plant. Junghuhn. ined. 537 (K); LA HAYE 45 (P); LESCHENAULT s.n. (P); HORSFIELD,

Conv. 25 (K); LOBB s.n. (K); MILLET s.n. (K); NAGLER 179 and 180 (BD); DE VRIESE s.n. (K, L); the *type* is a specimen from Java, collected by KLEINHOF (not seen); Bantam, S.-coast, JUNGHUHN (L); Batavia, several specimens without collector's name (L); BACKER s.n., Aug. 1904 (L, M); between Batavia and Weltevreden, Goenoeng Sahari Sentiong, Chinese cemetary, BACKER 32659, June 1903 (B); id., BACKER 32660, July 1903 (B); between Weltevreden and Tandjong Priok, Kliphof, Pepanggo, on dry soil inside the mangrove vegetation, BACKER 32661, Aug. 1904 (B); Weltevreden, Selipi, BACKER 32658, May 1903 (B); N. of Weltevreden, Chinese cemetary, HALLIER s.n., Aug. 1896 (B); Kebajoran, S.W. of Weltevreden, BACKER 32662, Sept. 1904 (B); N. of Pesing, on bushes in the alang fields, BACKER 32663, Sept. 1904 (B); Buitenzorg, Pangipison, foot of G. Sanggaboewana, bank of Tji Beët, VAN STEENIS 5329, June 1933 (B); cultivated in the Botanic Garden, Buitenzorg, X. F. 39a (L, M); XV. K. B. XI. 5; XV. K. B. XII. 7; XVI. A. 8 (B); id., TEYSMANN (BD, L); id., WARBURG 1577 (BD); id., WARBURG 1577 bis (M); cultivated in private gardens (B); Priangan, Bandoeng, cultivated, JACOBSON 223 (B); Tegal, forestry E. Tegal, in teak-woods, BEUMÉE 4480, Sept. 1919 (B); Pekalongan, Dara, DOCTERS VAN LEEUWEN 468, May 1912 (B); forestry Margasari, teak-woods on red volcanic soil, 100 m, BEUMÉE 5187, June 1920 (B); Soebah, 50 m, KOORDERS 22445 β, May 1896 (B, L); id., KOORDERS 27603 β, April 1897 (B, L); id., KOORDERS 27604 β, April 1897 (B, K, L); id., KOORDERS 36856 β, May 1899 (B, BD); on red volcanic soil in teak-woods, 150 m, WOLFF V. WÜLFING 4238, June 1919 (B); Bagelen, Keboemen, cultivated, BRINKMAN 476, July 1931 (B); Semarang, near Semarang, herb. HOUTTUYN (L); Bangkong, DOCTERS VAN LEEUWEN s.n., Aug. 1909 (B); between Welèri and Soebah, margin of forest, BACKER 16581, Sept. 1914 (B); foot of G. Oengaran, JUNGHUHN s.n., Apr. (L); Kedoe, Magelang, cultivated, 380 m, VAN OOSTEN 2, July 1920 (B); Jogjakarta, G. Prambanan, Plant. Junghuhn. ined. 11537 (L); Rembang, forestry Balo, teak-woods on limestone and on marl, 50—150 m, BEUMÉE 5528, Jan. 1921 (B); forestry Banglean, teak-woods on marl, 100 m, BEUMÉE 988, Aug. 1917 (B); forestry Nanas, teak-woods on marl, margin of wood, 100 m, BEUMÉE 849, June 1917 (B); forestry Ngliron, teak-woods on marl, margin of wood, 100 m, BEUMÉE 915, June 1917 (B); Madioen, Kendeng, 100—150 m, ELBERT 367 (L); Trinil, ELBERT 366 (L); Babadan, 80 m, WISSE 439, May 1921 (B); Kediri, N.E. spur of G. Klotok, near Kediri, 100 m, KRAMER 7, Febr. 1922 (B); Gadoengan Pare, KOORDERS 22990 β, June 1896 (B, K, L); Soerabaja, Soerabaja, BOORSMA s.n. (B); Pasoeroean, Djatiroto, BACKER 7977, May 1913 (B); G. Semongkrong, on dry volcanic soil, BACKER 7765, May 1913 (B); Probolinggo, G. Bentar, BACKER 24333, June 1918 (B); Bondowoso, near Soemberwaroe, in forest, ZOLLINGER 2790 (BD, K); Ringgit, CLASON D 7, May 1931 (B); Ardjasa, 10 m, teak-woods, BACKER 24750, June 1918 (B); Pradjekan, 50 m, BACKER 24581, June 1918 (B); Djember, Djember, 85 m, ULTÉE 6 (B); Poeger, BACKER 18258, Dec. 1914 (B); Poeger-Watangan, 10 m, KOORDERS 21329 β, Oct. 1895 (B, BD, L); Balambangan near Banjoewangi, RANT s.n., June 1931 (B); Madoera, Kangean Archipelago, Kangean, Kolo kolo, DOMMERS 20, Sept. 1919 (B); id., S.E. of Kali Sangken, 40 m, BEGUIN D 4, Sept. 1919 (B); id., Pabean, 2 m, BEGUIN J 3, June 1919 (B); id., Pandeman, 60 m, BEGUIN Q 2, June 1919 (B).

BORNEO, without precise locality, KORTHALS 161 (L); S. and E. division, Bandjermasin, MOTLEY 175 (K); Martapoera, KORTHALS 49, 160 (L); British

North Borneo, Kudat, Mt. Kinabalu, CLEMENS 9533, Dec. 1915, cultivated according to MERRILL, 1921 (B, K).

CELEBES, without precise locality and without collector's name (L, named var. *Burmanniana* in BLUME's handwriting); Celebes and Dependencies, Makassar, Mrs. BOUMAN-HOUTMAN 7, July 1925 (B).

SOEMBAWA, Loentoeng andang, COLFS 158, Nov. 1879 (L).

TIMOR, without precise locality, CURTIS s.n. (K); REINWARDT s.n., Apr. 1821 (L); herb. RICHARD (P); a specimen from herb. Paris (L); WALSH 441 (B); ZIPPELIUS s.n. [named *P. Burmanniana* BL. by BLUME, an unpublished name; probably the type of var. *Burmanniana* BL. (L)]; West Timor, Benoe, 400 m, Mrs. BOUMAN-HOUTMAN 100 (B); Koepang, TEYSMANN 441 (K, L); TEYSMANN 11291 (B); LE GUILLOU, Ao. 1841 (Voyage de l'Astrolabe et de la Zélée) (P); NAUMANN, May 1875, labelled var. *microcarpa* ENGL. (BD); S. Middle Timor, Niki-niki, 750 m, WALSH 303, May 1929 (B); Portuguese Timor, Liquica, sea level, NEWTON s.n. (K).

AMBOINA, Amboina, cult., ROBINSON 1821, Sept. 1913 (M).

PHILIPPINE ISLANDS, Luzon, Prov. of Abra, RAMOS, Bur. of Sc. 7246, Jan.-Febr. 1909 (B); id., Bucay, MICHOLITZ s.n., Dec. 1882 (K); Prov. of La Union, VIDAL 1165, Nov. 1884 (K, L); id., LETE 223, Nov. 1916 (M); id., Bauang, FÉNIX, Bur. of Sc. 12952, Dec. 1910 (B, BD, K, L); Benguet Prov., M. RAMOS, Bur. of Sc. 5339, Dec. 1908 (BD, L, M); Prov. Manila, San Mateo, VIDAL 3362, March 1886 (K). According to MERRILL, 1923, in thickets at low and medium altitudes.

BISMARCK ARCHIPELAGO, New Ireland, PEEKEL 61; wild? v. O. (B).

Distribution: From Burma and Indo-China to the Malay Archipelago and the Philippines; in the Malay Peninsula only as a cultivated plant; according to GAMBLE (1923) common in gardens on both sides of the India Peninsula.

Vernacular names: bruidsbloemen (Dutch, HEYNE), schildersverdriet, witte bruidstranen (Dutch, BACKER), bridal wreath (RIDLEY), white corallina (HEYNE), wedosari, widasari, widosari, widasantoen, bidasari (Jav., BACKER, HEYNE, KOORDERS), plilitan, angkeb (Jav., KOORDERS), aroes aroesan (Jav., KRAMER), bidhasarè (Madur., BACKER, HEYNE), widosari (Kangean, DOMMERS), bila sarè (Kangean, BEGUIN), bunga nasi (Amboina, ROBINSON), noeit (Timor, WALSH), kalabanog, kamuras (Philipp.: Iloko language, MERRILL), bulacan (Philipp., BLANCO, MERRILL).

Use: Cultivated in gardens for its flowers. According to HEYNE, who takes his data from VORDERMAN (Madoereesche planten, n. 36), a decoction is used in stimulating the afterbirth. BOORSMA states that the leaves represent one of the ingredients used in pressing *djamoe bagolan* in the Principalities. The plant is eaten in the Principalities against an unpleasant taste.

Remarks. 1. The specimens from Timor on which BLUME based his var. *Burmanniana*, have the leaves longer acuminate than those, which BLUME named typical *P. volubilis*. There is, however, not the

slightest reason to distinguish this variety as it falls fully within the variability of the species.

2. The specimen mentioned by MERRILL (1918) as being an illustrative one for BLANCO's interpretation of *P. volubilis,* belongs to *Rivea corymbosa* (L.) HALL. f.

3. Some of the specimens from the Philippines have the sepals slightly broader than is commonly found.

4. COSTERUS and SMITH, 1932, give a description of a witches' broom found in Bondowoso, Java by ETTY, June 1930.

5. According to BACKER in Java below 200 m altitude especially in M. and E. Java, in parts with strong east monsoon, flowering from May to September.

2. Porana racemosa ROXB., Hort. Beng. (1814) p. 13, nomen; id., Fl. Ind. II (1824) p. 41; WALL., Cat. (1828) n. 1326; ROXB., Fl. Ind. I (1832) p. 466; CHOISY in Mém. Soc. Phys. Genève VI (1833) p. 489; id. in DC., Prodr. IX (1845) p. 436; ZOLL., Syst. Verz. 2. Heft (1854) p. 130; WIGHT, Icon. IV (1850) t. 1376; id., Ill. Ind. Bot. II (1850) t. 168b, fig. 9; MIQ., Fl. Ned. Ind. II (1857) p. 626; KURZ in Journ. Bot., New Ser. II (1873) p. 137; CLARKE in HOOK., Fl. Brit. Ind. IV (1883) p. 222; FORBES, Wander., Germ. ed. II (1886) p. 222; PETER in ENGL.-PRANTL, Nat. Pfl. fam. IV, 3a (1891) p. 24, fig. 11 A, B; BOERL., Handl. Fl. Ned. Ind. (1899) p. 508; DUTHIE, Fl. Upper Ganget. Pl. II (1911) p. 103; KOORDERS, Exk. fl. Java III (1912) p. 114, 115; KOORDERS-SCHUM., Syst. Verz. (1910—13), Conv. p. 1; GAGNEP. et COURCH. in Lec., Fl. Indo-Chine IV (1915) p. 294; BOLD., Zakfl. Java (1916) n. 839 — *P. cordifolia* LEDEB., Ind. Hort. Dorpat. (1824) Suppl. 6 (not seen) — *P. dichotoma* HAM. ex DON, Prodr. Flor. Nepal. (1825) p. 99 — *Dinetus racemosus* (ROXB.) SWEET, Brit. Flow. Gard. II (1825) t. 127; id., Hort. Brit., ed. 1 (1827) p. 289 (not seen) — *P. elegans* ZOLL. in Nat. en Geneesk. Arch. II (1845) p. 571.

Stems herbaceous, terete, twining, up to 10 m high (KOORDERS), more or less hirsute or glabrous, in the first case minutely verrucose by the thickened bases of the hairs, the older parts striate, to 2 or 3 mm thick. Leaves petiolate, petiole slender, patently pilose or almost glabrous, shorter than or as long as the blade; blade ovate to broad-ovate, deeply cordate at the base, short or long acuminate to caudate at the apex with blunt or acute, mucronulate tip, 2.5—10 × 2.5—7 cm, more or less densely pilose on both sides, beneath more densely than above, the hairs appressed, rarely the indument is densely pubescent to almost tomentose; palmately nerved with 7(—9) nerves from the

base, nerves more or less prominent beneath. Inflorescences paniculate, axillary, more or less widely and racemosely branched, few- or many-flowered; the lower bracts of the inflorescences leaf-like, sessile or with a very short petiole, cordate at the base with stemclasping auricles, mucronate at the apex, glabrous or sparsely pilose, in fruit more or less papery; the upper bracts subulate; pedicels filiform, much longer than the sepals, glabrous or appressed pilose, 3—6, later up to 10 mm long. Calyx very small, the sepals equal, linear-lanceolate, 3-nerved, sparsely pilose, 1.5—2.5 mm long, accrescent in fruit and then linear-oblanceolate, obtuse and mucronulate at the apex, attenuate towards the base, scarious, reticulately nerved and with 3 longitudinal main nerves, up to 18 mm long, but often shorter, equal in length, with some white appressed hairs, especially near the base. Corolla white (limb pure white, tube pale yellow, BACKER), funnel-shaped, about 1 cm long, 5-lobed to the middle, the lobes spreading, elliptic, rounded, mucronulate, glabrous. Stamens inserted at different height in the corolla tube, the filaments very short, shorter than the anthers, glabrous, not exserted. Ovary ovoid, glabrous, style 1, rather short, but longer than the ovary, glabrous, stigma clavate, two-lobed. Fruit ovoid, with a mucro, 7—8 mm high, glabrous, 1-seeded. Seed ovoid, brownish-black to black, smooth, to 6 mm long.

MALAY PENINSULA, Singapore, Singapore, cultivated in the Botanic Gardens, 2041, FURTADO, July 1928 (S).

JAVA, without precise locality, BLUME s.n. (L); HORSFIELD, Conv. 24 (K); HORSFIELD s.n. (U); KORTHALS 125 (L); WAITZ 41, 44, 45, 89 (L); Priangan, WARBURG 11076 (BD, M); Bandoeng, 1500 m, SMITH and RANT 164, Apr. 1911 (B, L, M); Tjinjiroean, above Bandoeng, DOCTERS VAN LEEUWEN s.n., June 1910 (B, L); id., ZEYLSTRA 1, Juli 1908 (B); Tjililin, REINWARDT s.n. (L); near plant. Malabar, 1500 m, PULLE 3162, June 1906 (U); Lembang, KORTHALS 117 (B, L), 133 (B); Tangkoeban prahoe, SCHEFFER s.n., June 1871 (B); G. Wajang near Pengalengang, 1800 m, JUNGHUHN s.n. (L); G. Wajang, SCHEFFER s.n., May 1871 (B); G. Papandajan, KORTHALS 134 (L); id., BOERLAGE s.n., July 1888 (L); id., WENT s.n. (L); id., 1500—2000 m, KOENS 452, June 1913 (B); id., above Tjikadjang, 1350 m, THORENAAR s.n., June 1931 (B); Garoet or Telaga bodas, TEYSMANN? 1409 H.B. (B); Telaga bodas, BACKER s.n., Jan. 1909 (B); id., BURCK 156, June 1891 (B); id., 1300 m, KOENS 261, May 1913 (B); Cheribon, G. Tjaremé, above Lingga djati, 800 m, BACKER 5007, Oct. 1912 (B); Semarang, Ambarawa, Telomojo, virgin forest, KOORDERS 27708 β, May 1897 (B, BD, L); id., 1300 m, KOORDERS 35786 β, May 1899 (B); G. Oengaran, N.-slope, 900—1200 m, JUNGHUHN s.n., Apr.-June (L); id., JUNGHUHN 54 (B, L); id., DOCTERS VAN LEEUWEN s.n., Sept. 1910 (B); Kedoe, N.E. Soembing, c. 1700 m, LÖRZING 251, March 1912 (B); Soerakarta, Tawangmangoe, 1300 m, BRINKMAN 801, July 1936 (B); Madioen-Soerakarta, Lawoe, JUNGHUHN 189, June (L); Ponorogo, Ngebel, G. Wilis, 700 m, KOORDERS 23906 β, May 1896 (B); id., KOORDERS 23997 β, May 1896 (B);

id., KOORDERS 29468 β, Aug. 1897 (B, L); id., KOORDERS 29475 β, Aug. 1897 (B, L); Modjokerto-Pasoeroean-Malang, G. Ardjoeno, 1450 m, BREMEKAMP s.n., July 1917 (B); Pasoeroean, G. Ardjoeno, above Poenten, 1250 m, ULTÉE s.n., June 1928 (B); Nangkadjadjar, 1200 m, WISSE 528, May 1921 (B); id., WISSE 552, June 1921 (B); Lawang, BUYSMAN 13 (B); Malang, Poedjon, 1200 m, ULTÉE 172, July 1930 (B); Tengger, 1200 m, BUYSMAN s.n., May 1908 (U); id., WENT s.n. (L); id., Tosari, ZOLLINGER 2560, Nov. 1844 (B, *type number of Porana elegans* ZOLL.); id., KOBUS s.n., June 1900 (B, L); id., common along roads and in maize fields, KOBUS and LOTSY s.n., June-July 1900 (B); between Ngadisari and Tosari, WENT s.n. (L); Bondowoso or Djember, Idjen, c. 1700 m, CLASON-LAARMAN D 90, May 1931 (B); G. Blaoe, VAN DER PIJL 145, June 1929 (B); between Sempol and Djampit, 1200—1400 m, BACKER 25142, June 1918 (B); G. Idjen, W.-slope, frequent, BACKER 25367, June 1918 (B); Gendingan waloeh, c. 1450 m, KOORDERS 43186 β, July 1916 (B, K, L); Bondowoso, Pantjoer-Idjen, distr. Pradjekan, 1700 m, KOORDERS 22250 β, Nov. 1893 (B); id., KOORDERS 28702 β, Aug. 1897 (B); id., KOORDERS 28705 β, Aug. 1897 (B, L); id., 1500 m, KOORDERS 32263 β, Dec. 1898 (B); id., c. 1450 m, KOORDERS 42502 β, July 1916 (B, L); G. Idjen, N.-slope, 1000—1500 m, BACKER 24901, June 1918 (B); Redjengan, c. 1000 m, DAMMERMAN 14, June 1924 (B); G. Baloeran, W.-slope, 500 m, BACKER 24779, June 1918 (B); G. Hijang above Baderan, c. 1800 m, BACKER 13386, Apr. 1914 (B, BD, K, L); N.W. Raoeng, 1500 m, CLASON-LAARMAN 142, May 1932 (B); Djember, S. Idjen, c. 1800 m, KOORDERS 19869 β, Nov. 1893 (B); way to Kawah Idjen, KLEINHOONTE 199, June 1932 (B).

BALI, S. Bali, Kintamani, 1400 m, DE VOOGD 2502 (on a sheet with *Hewittia sublobata* (L.f.) O. K.), May 1936 (B).

SOEMBAWA, Wawa, 400 m, common, Mrs. RENSCH 935, June 1927 (B).

TIMOR, without precise locality, FORBES 4104 (B, L, P); S. Middle Timor, Kaslioe, N. of Moetis, c. 1350 m, WALSH 319, May 1929 (B).

CELEBES, S.W. Celebes, Lambasang, c. 1000 m, BÜNNEMEYER 11730, May 1921 (B, L).

Distribution: Subtropical Himalaya from Garhwal eastwards to Bhotan, up to 6000 ft., and from the Khasia hills to Burma (according to DUTHIE, 1911), S. China, Indo-China, Malay Archipelago.

Vernacular names: snow-creeper (Mal. Peninsula, CLARKE, DUTHIE), tjoenglar, tjloenga, tjoenlar, tjoenlor, tjoenloe (Jav., JUNGHUHN, KOORDERS), rendeng (Jav., JUNGHUHN), srintil (Ponorogo, KOORDERS), ki oke (Madur., KOORDERS).

3. **Porana paniculata** ROXB., Pl. Coast Corom. III (1819) p. 31, t. 235; id., Fl. Ind. II (1824) p. 39; WALL., Cat. (1828) n. 1325; ROXB., Fl. Ind. I (1832) p. 464; CHOISY in Mém. Soc. Phys. Genève VI (1833) p. 489; id. in DC., Prodr. IX (1845) p. 436; MIQ., Fl. Ned. Ind. II (1857) p. 626; KURZ in Journ. Bot., New Ser. II (1873) p. 137; CLARKE in HOOK., Fl. Brit. Ind. IV (1883) p. 222; HALL. f. in Versl. 's Lands Plantent. 1895 (1896) p. 125; BOERL., Handl. Fl. Ned. Ind. II (1899) p. 508; COOKE, Fl. Bombay II (1905) p. 227; DUTHIE, Fl. Upper Ganget.

Pl. II (1911) p. 102; KOORDERS, Exk. fl. Java III (1912) p. 114; GAMBLE, Fl. Pres. Madras V (1923) p. 921; BACKER, Onkruidfl. Jav. Suikerrietgr. (1931) p. 513 — *Dinetus paniculatus* (ROXB.) SWEET, Hort. Brit. ed. 1 (1827) p. 289 (not seen).

This third species, a native of the northern parts of British India, is cultivated in gardens and occasionally escapes.

It is a large, woody twiner with greyish tomentellous, almost downy stems. The leaves are ovate, cordate at the base, obtuse, acute, acuminate or short-cuspidate at the apex, hairy on both surfaces, distinctly palmately nerved with 5—7 nerves from the base, nerves prominent beneath, veins reticulate. Inflorescences lateral or terminal, paniculate, the flowers smaller than in the preceding species, very numerous, white. Calyx only 1—1.5 mm long, the sepals linear, densely tomentellous; three of the sepals much enlarged in fruit; bracteoles 2, small, subulate, at the base of the calyx. Corolla tubular to funnel-shaped, 5—6 mm long, the limb superficially lobed to crenate. Stamens inserted near the corolla base, very short, included in the tube, all of about the same length, the filaments about as long as the anthers or a little shorter. Ovary globose, glabrous; style 1, very short, shorter than the ovary, stigma globose, lobed.

I could examine the following cultivated specimens:

MALAY PENINSULA, Singapore, Singapore, Botanic Gardens, RIDLEY s.n., Jan. 1905 (S).

JAVA, Batavia, Weltevreden, VAN WELSEM (B); Buitenzorg, Buitenzorg, Botanic Gardens X. F. 38a (L, M); Buitenzorg, private garden, BAKHUIZEN VAN DEN BRINK fil. 395, June 1920 (B); foot of G. Salak, garden, BACKER 22004, Jan. 1917 (B); Priangan, Bandoeng, EYKEN, Sept. 1912 (B); Kedoe, Magelang, VAN OOSTEN 11 (B); Djember, Djember, ULTÉE 13 (B).

Distribution: Northern India, westward to the Punjab and Mount Abu and eastwards to Bengal and Upper Burma and on the Himalaya in Kumaon up to 4.000 ft (DUTHIE, 1911); cultivated in the Malay Peninsula and Archipelago, also in other tropical countries.

Vernacular name: bridal creeper.

Use: Cultivated in gardens for its dense masses of white flowers; the panicles of flowers are used in some parts of British India for table decoration (COOKE); the stems are much used in the Saharanpur district in making baskets for rough work (DUTHIE).