

CONTRIBUTIONS TO OUR KNOWLEDGE OF THE FLORA
OF CELEBES (COLL. C. MONOD DE FROIDEVILLE) AND OF SOME
OTHER MALAYSIAN ISLANDS

by

H. J. LAM, c. s.

(Rijksherbarium, Leiden).

(Issued December 31st, 1945).

The following notes are mainly based upon a small but interesting collection of plants, made in 1937—1939 by Mr C. Monod de Froideville, Civil Service Officer in the Netherlands Indies, during his extensive trips in the southern and central parts of the island of Celebes. His hobby was the study of *Leguminosae* and about half of his collection consists of representatives of that natural order. For several reasons, however, they have been left out of the present paper, for one thing since Mr Monod is intending to deal with them later on himself, a task, which circumstances unfortunately prevent him from accomplishing at present; and secondly since they promise geographically less important results than most other families, many of them being anthropochorous.

However, beside *Leguminosae*, Mr Monod collected a good many other plants and though some of his material was necessarily scanty on account of the fact that the proper purpose of his trips lay outside purely botanical observations, it contains enough remarkable specimens, especially from the practically unknown interior of Central Celebes (Mt. Mamboeliling), to justify a record of them. Mr Monod has proved to be a keen observer and a thorough amateur botanist and geologist. Several of the specimens had been provisorily checked by Dr C. G. G. J. van Steenis, Buitenzorg, which was a great help in their final identification. Regarding this, it was my good fortune to win the help of several specialists in identifying specimens belonging to families falling within the scope of their special study. Thus I am indebted to the following investigators for their kind collaboration:

- Miss Dr G. J. H. Amshoff (Utrecht): *Urticaceae*.
Dr R. C. Bakhuizen van den Brink (Leiden): *Melastomataceae*.
Dr C. E. B. Bremekamp (Bilthoven): *Acanthaceae*, *Rubiaceae*.
Dr J. Th. Henrard (Leiden): *Gramineae*.
Dr F. P. Jonker (Utrecht): *Burmanniaceae*.
Miss Dr J. Th. Koster (Leiden): *Compositae*.
Dr S. J. van Ooststroom (Leiden): *Convolvulaceae*, *Violaceae*.
Dr J. J. Smith (Oegstgeest): *Orchidaceae*.
Dr H. Uittien † (Deventer): *Cyperaceae*.

The representatives of the other families were investigated by myself. For the *Pteridophyta* I enjoyed the assistance of Mr C. J. Verhey (Leiden).

It should be emphasized that the present elaboration has been mainly restricted to those specimens which could be identified down to the species or which are of special geographical interest. Description of new species has, in general, been omitted in families for which a specialist was wanting or unapproachable, and in cases of too scanty material. The few exceptions are species which could comparatively safely be checked. This procedure was also necessary because of the interrupted contact with the Buitenzorg Herbarium (B), which possesses duplicates of most of the specimens. Meanwhile, it may be expected that the collection contains several other new species, e.g. of *Alpinia*, *Dichrotrichum*, *Galium*, *Impatiens*, *Justicia*, *Thyrsostachys*, *Vaccinium* and possibly some others.

The arrangement within the main groups is alphabetical throughout. The distribution has been taken from literature — first of all Merrill's Enumeration of Philippine Flowering Plants 1923—1926 — as well as from the collections extant in the Rijksherbarium.

PTERIDOPHYTA

(with the collaboration of C. J. Verhey)

Lycopodiinae

LYCOPODIACEAE

1. *Lycopodium casuarinoides* Spring, Monogr. Lycop. I, 1842, 94; Nessel, Die Bärlappgewächse, 1939, 371.

Celebes: Central Celebes, Mt. Mamboeliling, north of Mamasa, 1500 m, frequent in open secondary forest (*C. Monod de Froideville 277*, climbing, about 3 m high, ster.; B, L); Celebes, without locality (*Id. 270*; L).

Nessel (l.c., p. 372) mentions a var. *penicilliferum* v. A. v. R. from Celebes and Sumatra, which should be distinguished by long ciliate leaf-tips. However, it seems to me that this is largely a matter of age. I found these membranous, hyaline and often ciliate leaf-tips in all specimens extant in the Rijksherbarium, but they seem to fall off with age.

Distribution of the species: Bengal to China, Philippines, Brit. Malaya, Sumatra, Borneo, New Guinea. According to Monod abundant in the C. Celebes mountains. The habitats Malaya and New Guinea are not mentioned by Nessel.

2. *L. cernuum* L., Sp. Pl. 1753, 1103; Nessel l.c. 351.

Celebes: without exact locality, frequent (*C. Monod de Froideville 371*; L).

Distribution: pantropic.

Var. *curvatum* Sw., Syn. Fil. 1802, 178 and 402; Nessel, l.c. 354.

Celebes: S.E. Celebes, Kendari, on sunny wall of cutting of road to waterworks (*C. Monod de Froideville 372a*; L).

Distribution of the variety: several places in the tropics.

3. *L. clavatum* L., Sp. Pl. 1753, 1100.

Var. *tamariscispica* Cesati, Rendic. Ass. Sc. Fis. e Mat. Napoli II, 1877, 6 and 8; Nessel, l.c. 294.

Celebes: S.E. Celebes, Kendari, on sunny wall of cutting of road to waterworks, about 150 m alt. (*C. Monod de Froideville 372*; L).

Distribution of the species: tropics, subtropics and holartic; of the variety: New Guinea; new for Celebes.

4. *L. complanatum* L., Sp. Pl., 1753, 1101; Nessel, l.c. 328.

Celebes: without exact locality (*C. Monod de Froideville 369*; L).

Distribution: cosmopolitan.

5. *L. volubile* Forst., Prodr. Fl. Ins. Austr. 1786, 482; Nessel, l.c. 369.

Celebes: without exact locality (*C. Monod de Froideville 374*, A° 1939; L).

Distribution: Polynesia and Australia to Philippines and Sumatra.

SELAGINELLACEAE

6. *S. elegantissima* Warb., *Monsunia* I, 1900, 128; Hieron. in Engl. & Prantl, Nat. Pfl.fam. I⁴, 1902, 698, fig. 406.

Celebes: S.W. Celebes, along road from Soengoeminasa to Malino, about 600 m, on bank of rivulet (*C. Monod de Froideville 390*, A° 1939; L); Malino, about 280 m alt. (*H. A. B. Bünemeyer 10853*, 6. 4. 1921; B, L).

We did not see the type specimen but the specimens quoted agree perfectly both with the description and with Hieronymus' pictures. Its relation is with *S. Teysmanni* Hieron. (S.W. Celebes; Luzon: *Elmer 8500*, type of *S. Hombroni* Hieron.) with which it is, in my opinion, not conspecific, differing by its more erect and stiffer habit and by its ciliate sporophylls. It is, however, very close to *S. Zollingeriana* Spring from eastern Java, from which it seems to differ only in the stouter habit. Further allies are such species as *S. leptophylla* Bak. (Formosa); *S. ketrayam* v. A. v. R. (Bangka) and *S. lepida* Hieron. (Borneo), all of which seem to differ as to minor points only. The macrospores are light sulphur-yellow, the microspores minium red in colour.

Distribution: thusfar only known from S.W. Celebes (Maros, Malino).

7. *Selaginella opaca* Warb., *Monsunia* I, 1900, 108 and 122; Alston, Bull. Jard. bot. Buit. Sér. III, Vol. XIII, 1935, 437 and XIV, 1937, 183.

Celebes: Central Celebes, Mt. Mamboeliling, north of Mamasa, in subalpine elfin woodland, 2700 m (*C. Monod de Froideville 135*, A° 1938; B, L).

Distribution: Sumatra to Philippines and New Guinea.

8. *S. plana* (Desv.) Hieron. in Engl. & Prantl, Nat. Pfl. Fam. I⁴, 1901, 703; Alston, l.c. 1935, 436 and 1937, 180.

Celebes: without exact locality, frequent in shady places with much humus (*C. Monod de Froideville 275* and *379*; L).

Distribution: Brit. Malaya to Moluccas.

9. *S. singalanensis* Hieron., *Hedwigia* 50, 1910, 18; Alston, l.c. 1937, 184.

Celebes: S.W. Celebes, Bisapoe nr Bonthain, near waterfall, in moist shady place (*C. Monod de Froideville 392*, A° 1939; L).

Distribution: Sumatra, E. Java ?!, S.W. Celebes.

A small, sterile specimen, but most probably this species.

Filicinae

CERATOPTERIDACEAE

10. *Ceratopteris thalictroides* (L.) Brongn., Bull. Soc. Philom. 1821, 186c.

Celebes: S.W. Celebes, Bone, Soppeng, nr Tjitta, about 300 m alt., in pond, submerse, frequent (*C. Monod de Froideville 391*, A° 1939; L).

Distribution: pantropical and subtropical.

GLEICHENIACEAE

11. *Gleichenia linearis* (Burm.) Clarke, Transact. Linn. Soc. II, Bot. 1, 1880, 428.

Celebes: frequent in sunny open vegetations on poor soil (*C. Monod de Froideville 278*, A° 1938; B, L).

Agrees with a specimen from Mindanao (*Elmer 14142*), identified var. *lanigera* (Don) teste Rosenstock in Herb. Lugd.-Bat. (= *G. lanigera* Don, Prodr. Fl. Nep. 1825, 17).

Distribution: pantropical and subtropical.

HYMENOPHYLLACEAE

12. *Hymenophyllum denticulatum* Sw., Schrad. Journ. 1800², 1801, 100.

Celebes: Central Celebes, Mt. Rante Karoea, north of Makale, 2000 m, in forest (*C. Monod de Froideville 177*, A° 1938; B, L).

Distribution: India to Philippines and New Guinea.

MARSILEACEAE

13. *Marsilea crenata* Presl, Rel. Haenk. 1, 1825, 84, t. 12, f. 13; Backer en Posthumus, Varenflora voor Java 1939, 264.

Celebes: S.W. Celebes, nr Bonthain, on wet paddy field, frequent, alt. \pm 10 m (*C. Monod de Froideville 377*, A° 1939; L).

Distribution: India to Philippines and New Guinea.

POLYPODIACEAE

14. *Asplenium praemorsum* Sw., Prodr. 1788, 130.

Celebes: S.W. Celebes, Peak of Bonthain, Mt. Lompobatang, 2900 m, on rocky open summit (*C. Monod de Froideville 237*; B, L).

Distribution: pantropical and subtropical.

15. *Asplenium Psychropolitanum* H. J. Lam et C. J. Verhey, nov. spec. — *Fig. 1* — Rhizoma ?; Stipes ?; Frons minime 30 cm longa, 4 cm lata, rhachide 0.75—1 mm crassa, in sicco fusco-atra, opaca, tereti vel paulo sulcato-angulata, glabra vel paulo pilosa, simpliciter pinnata, in nodis saepe vivipara. Pinnae glabrae, utrinque minime 35, apicalibus 10—15 exceptis omnes aequilongae, oblongo-lanceolatae c. 20 mm longae,

basi usque ad 5 mm latae, parte basali latiore sterili 0.5—0.7 cm

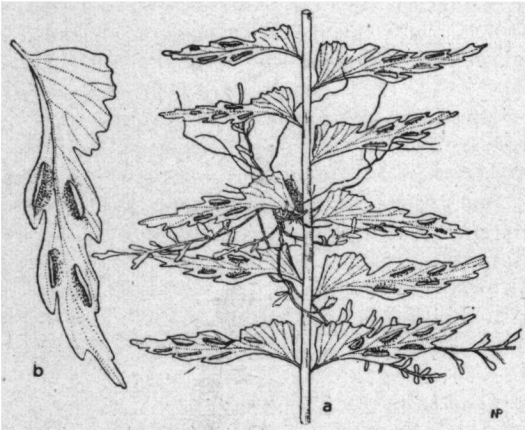


Fig. 1 — *Asplenium Psychropolitanum* H. J. Lam et C. J. Verhey, n. sp. — a. part of frond with one young plant, nat. size; b. pinna, lower side, $\times 2$ — after type specimen.

longa, latere basiscopo usque ad costam oblitterata, acrosco-po margine obtuse irregulariter denticulata, paucis nervis divergentibus percursa, parte apicali angustiore fertili lineari-acuminata 1.3—1.5 cm longa, utrinque c. 3 dentibus erectopatentibus praedita, soris 1—6 (vel plus ?), 0.2—0.5 cm longis, indusiis lato-linearibus, costam versus apertis, costa media subparallelis.

Celebes: Central Celebes, Mt. Bante Karoea, north of Makale, about 2000 m alt., in mountain forest (C. Monod de Froideville 179; type specimen; L).

Apparently related to *A. caudatum* Forst. (pantropical) and to *A. acutiusculum* Bl. (Sumatra to Philippines and

Samoa) but easily distinguishable by the smaller and narrower pinnae with fewer sori, the sterile basal part of which occupies about one third of their length, being quite distinct from the narrow fertile portion. The specimen consists of a portion of a leaf only but it is probable that only few pinnae, if any, are missing.

16. *Calymmodon cucullatus* (Nees et Bl.) Presl, Tent. Pterid. 1836, 204; Copeland, Phil. Journ. Sci. 34, 1927, 261; Backer en Posthumus, Varenflora voor Java 1939, 224 — *Polypodium cucullatum* Nees et Bl., Nova Acta 11, 1823, 121.

Celebes: Central Celebes, Mt. Mamboeliling, north of Mamasa, 2700 m (C. Monod de Froideville 152 and 153, A° 1938; B, L).

Distribution: Ceylon to W. Polynesia.

17. *Dipteris novo-guineensis* Posth., Rec. Trav. bot. néerl. XXVa, 1928, 248, fig. 1.

New Guinea: Central New Guinea, Mt. Doorman, 3260 m, open summit (H. J. Lam 1750, 24-10-1920; type specimen; B); Papua, Soridi, open hill top c. 6000 ft. (C. E. Carr 14415, 5-10-1935; L).

Celebes: Central Celebes, Mt. Mamboeliling, north of Mamasa, 2700 m, frequent in subalpine elfin forest (C. Monod de Froideville 150, A° 1938; B, L).

The Celebes specimen is very similar to that collected by Lam in New Guinea. According to Monod, the leaves are still young, adult leaves being 0.50 m long, their height being 1 m, the stipe inclusive. When dry the colour of the lower side of the leaf is whitish, but the nerves are rusty woolly. Carr's specimen (identified by Posthumus) bears the annotation: "fern c. 2 feet tall"; the leaf is about 13 cm long, the stipe 60 cm, the lower side of the leaf is densely rusty woolly, the upper side only so on the nerves. The identification of the

last-named specimen seems a little doubtful; all specimens are sterile.

This is a most remarkable find, the Celebes specimen being the first record outside New Guinea. It confirms the often stipulated connection of Central Celebes and New Guinea. The species is interesting because it seems to be related to the fossil genus *Hausmannia*, found in the Cretaceous, Lias and Rhät of Europe, and particularly so with *H. crenata* (Nath.) Richt. from the Rhät of Sweden. Posthumus even asserts that the present species seems more closely allied to the fossil forms quoted than to the living *Dipteris* species, but in view of Carr's specimen, which seems to tend to *D. conjugata* Reinw., this seems at least doubtful. Posthumus's suggestion to include the present species in the genus *Hausmannia* should therefore, we think, not be followed.

Distribution: New Guinea, C. Celebes.

18. *Drynaria rigidula* (Sw.) Bedd., Schrad. Journ. 1800², 1801, 26.

Celebes: S.W. Celebes, Loka-Bonthain trail, about 600 m alt., epiphytic (*C. Monod de Froideville 365*, A° 1939; L).

Distribution: Asia to Australia and Polynesia.

19. *Elaphoglossum pumilum* H. J. Lam et C. J. Verhey, nov. spec. —

Fig. 2 — Rhizoma 0.1—0.15 cm crassum, paleis membranaceis brunneis 0.2—0.25 cm longis triangularibus acutis tecta. Folia haud articulata, sterile (unum tantum videmus) ovatum rigidum, basi latum subabrupte in stipitem contractum, apice obtusum, marginibus subcartilagineum in sicco paulo revolutum, 1.6 × 0.9 cm, stipes gracilis 2 cm longus; fertile (unum videmus) paulo longius, oblongum 1.7 × 0.85 cm, stipite 4.3 cm longo, subtus costa media excepta omnino sporangiis dense tectum, nervis inconspicuis, stipitibus glabris vel paucis paleis minutis praeditis.

Celebes: S.W. Celebes, Peak of Bonthain, Mt. Lompobatang, about 2500 m, in mountain forest (*C. Monod de Froideville 253*, type specimen L, June 5—6, 1938; B, L).

A characteristic species distinguished by its exceptionally small leaves, possibly allied to *E. dolichaulon* v. A. v. R. (Bull. Jard. bot. Buitenz. Sér. III, Vol. V, 1922, 203) from East Java.

20. *Hymenolepis revoluta* Bl., Enum. 1827, 201.

Celebes: S.W. Celebes, Loka-Bonthain trail, about 600 m alt., epiphytic (*C. Monod de Froideville 376*; L).

Formerly confused with *H. spicata* (L.) Presl (Africa, Madagascar), cf. Backer en Posthumus, Varenflora voor Java, 1939, 228, note 1.

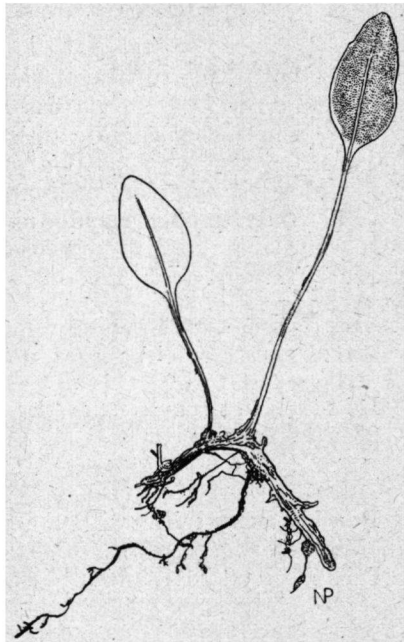


Fig. 2 — *Elaphoglossum pumilum* H. J. Lam et C. J. Verhey, n. sp., nat. size — after type specimen.

Distribution: Sumatra to Philippines and New Guinea.

21. *Polypodium cryptosorum* C. Chr., Ind. Fil. 1906, 520.

Celebes: S.W. Celebes, Peak of Bonthain, Mt. Lompobatang, open summit, 2900 m (*C. Monod de Froideville 225*, June 5—6, 1938; B, L).

Distribution: Java, Borneo, Celebes.

22. *P. enerve* Cavan., Descr. 1802, 245.

Celebes: Central Celebes, Mt. Mamboeliling, north of Mamasa, in subalpine elfin forest, 2700 m (*C. Monod de Froideville 137*, fert., A° 1938; B, L).

See annotation under *P. triquetrum*.

Distribution: Malaysia to Marianas.

23. *P. taeniatum* Sw., Schrad. Journ. 1800², 1801, 26; Backer en Posthumus, Varenflora voor Java, 1939, 221.

Celebes: Central Celebes, Mt. Mamboeliling, north of Mamasa, subalpine elfin forest, 2700 m (*C. Monod de Froideville 138*, A° 1938; B, L).

Distribution: Sumatra, Borneo, Java, Celebes, Moluccas.

24. *P. triquetrum* Bl., Enum. 1828, 124.

Celebes: Central Celebes, Mt. Mamboeliling, north of Mamasa, in subalpine elfin forest, 2700 m (*C. Monod de Froideville 136*, ster., A° 1938; B, L).

Very close to *P. enerve*, in fact only distinguishable by the broader, not caudate paleae on the rhizome. Probably only a variety of that species (f. Backer en Posthumus, Varenflora voor Java, 1939, 200—201).

Distribution: Sumatra to Samoa.

25. *Stenosemia aurita* (Sw.) Presl, Tent. 237, 1836, t. 10, f. 24.

Celebes: S.W. Celebes, Bisapoe Waterfall nr. Bonthain, about 200 m alt., in forest, some specimens (*C. Monod de Froideville 385*; L).

Distribution: Sumatra to Solomons.

26. *Vaginularia paradoxa* Mett., Ann. Mus. Lugd. Bat. 4, 1868—1869, 174.

Celebes: without indication of exact locality (*C. Monod de Froideville 394*, A° 1939; L).

Distribution: Ceylon to Melanesia.

27. *Vittaria angustifolia* Bl., Enum. 1828, 199.

Celebes: S.W. Celebes, Peak of Bonthain, Mt. Lompobatang, in mountain forest 2500 m (*C. Monod de Froideville 224*, June 5—6, 1938; B, L).

Distribution: Sumatra, Java, Bali, Celebes.

28. *V. parvula* Bory, Bél. Voy. Bot. 2, 1833, 35.

Celebes: Central Celebes, Mt. Mamboeliling, north of Mamasa, in mountain forest, about 2500 m (*C. Monod de Froideville 167*; B, L).

Possibly conspecific with the preceding species (f. Backer en Posthumus, Varenflora voor Java, 1939, 185).

Distribution: Java, Sumatra, Borneo, Celebes.

SCHIZAEACEAE

29. *Lygodium japonicum* (Thunb.) Sw., Schrad. Journ. 1800², 1801, 106.

Celebes: S.E. Celebes, Moena, savannah (*C. Monod de Froideville 400*, A° 1938; L).

Distribution: India to Japan and tropical Australia.

GYMNOSPERMAE

Coniferae

ARAUCARIACEAE

30. *Agathis philippinensis* Warb., *Monsonia* I, 1900, 185.

Celebes: Central Celebes, Mamasa, 1000 m alt. (*C. Monod de Froideville* 260, ster., cultivated; L).

Distribution: C. and N. Celebes, Philippines.

According to Monod this species is abundant in the higher mountains of central Celebes; it is a producer of gum copal.

PODOCARPACEAE

31. *Podocarpus imbricata* Bl., *Enum. pl. Jav. I*, 1827, 89; Wasscher in *Blumea* IV, 1941, 388.

Celebes: Central Celebes, Mt. Mamboeliling, north of Mamasa, about 2000 m, rather frequent in mountain forest (*C. Monod de Froideville* 173, A° 1938, ster.; B, L).

Distribution: Burma and China to W. Polynesia.

32. *P. Pilgeri* Foxw., *Phil. Journ. Sci.* 2, 1907, Bot. 259; Wasscher, l. c. 463.

Celebes: Central Celebes, Mt. Mamboeliling, north of Mamasa, 2700 m, sub-alpine bush (*C. Monod de Froideville* 175, small tree or shrub, ster.; B, L).

Distribution: Philippines and Celebes to the Solomon Islands.

ANGIOSPERMAE

Monocotyledoneae

AMARYLLIDACEAE

33. *Curculigo orchioides* Gaertn., *De Fruct. et Sem. I*, 1788, 63, t. 16.

Celebes: S.W. Celebes, Senkang, in the "Tempe depression", about 50 m alt., pretty frequent in grass vegetation (*C. Monod de Froideville* 288, flow. bright yellow; B, L).

Distribution: India to W. Polynesia.

BURMANNIACEAE

(F. P. Jonker)

34. *Burmannia disticha* L., *Sp. Pl.* 1753, 287; Jonker, *Monogr. Burm.* 1938, 115.

Celebes: Central Celebes, Mamasa, 1000 m alt., fairly abundant in grass vegetation (*C. Monod de Froideville* 264, flow. lilac with yellow; B, L).

According to Monod the species is also found nr. Balokan, Makale, at an alt. of 1500 m.

Distribution: tropical and subtropical Asia to Australia, not in the Philippines. In the Netherlands Indies thusfar only known from Sumatra, Borneo, N. and C. Celebes, and New Guinea.

CYPERACEAE

(H. Uittien †)

35. *Cyperus cuspidatus* H. B. K., Nov. Gen. Sp. Pl. I, 1815, 204.

Celebes: S.W. Celebes, Bone, Oedjoeng Lamoeroe, about 200 m alt., frequent on cattle grounds (C. Monod de Froideville 378, A° 1939; L).

Distribution: pantropic.

GRAMINEAE

(J. Th. Henrard)

36. *Thyrsostachys* prob. nov. spec. — Fig. 3.

Celebes: Central Celebes, Mt. Mamboeliling, north of Mamasa, about 2000 m, in mountain forest (C. Monod de Froideville 168, A° 1938, ster.; B, L).

A small and graceful mountain bamboo, according to Monod forming a pretty dense undergrowth in a forest of mossy trees and *Pandani*. Whilst the generic determination seems fairly certainly correct, it cannot be identified with one of the few continental species mentioned by Gamble in his monograph of Indian bamboos (Ann. Roy. Bot. Gard. Calc. VII, 1896, 58).

Our specimen is characterized by extremely slender culms (younger shoots) and narrow leaves (up to 11 cm long and 0.3 cm broad), with pubescent sheaths and long ciliate ears, the cilia being shining-white and as long as or longer than the internodes (0.7—0.9 cm). It agrees with a plant grown in the Government Botanic Garden at Buitenzorg under the name of *Thyrsostachys siamensis* Gamble (sub signo XI. L. 17), which, however, wants the long-ciliate ears. The species should be compared with the material in 1920 collected by Lam in Central New Guinea, under n. 2150, at a similar altitude (cf. Nat. Tijdschr. Ned. Ind. 88, 1928, 290—291 and Sargentia V, 1945, 85—86), of which, unfortunately, no material was available.

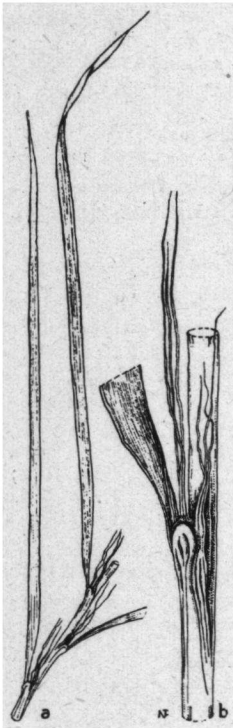


Fig. 3 — *Thyrsostachys* spec. —
a. part of culm with leaves, nat. size;
b. base of leaf so as to show the ciliate ears, $\times 5$ — after Monod de Fr. 168.

LEMNACEAE

37. *Lemna minor* L., Sp. Pl., 1753, 970.

Celebes: Djampea Isl., south of Salijara, 25 m alt., in stagnant water of rivulet, drinking place of wild boars (C. Monod de Froideville 375a, Apr. 1939; L).

Distribution: cosmopolitic.

38. *L. polyrrhiza* L., Sp. Pl., 1753, 970.

Celebes: Djampea Isl., south of Salijara, 25 m alt., stagnant water of rivulet, drinking place of wild boars (C. Monod de Froideville 375, Apr. 1939; L).

Distribution: cosmopolitic.

ORCHIDACEAE

(J. J. Smith)

39. *Bulbophyllum falcicornis* J. J. S., *Blumea* V, 1945, 696, fig. 5.

Celebes: Central Celebes, Mt. Mamboeliling, north of Mamasa, 2700 m (*C. Monod de Froideville 108*, type specimen; L).

Possibly related to *B. perpendiculare* Schltr. (N. Celebes), *B. agapethoides* Schltr. (W. Celebes) and *B. auroreum* J. J. S. (Sumatra).

Distribution: endemic.

40. *Dendrochilum Monodii* J. J. S., l.c., 693, fig. 2.

Celebes: Central Celebes, Mt. Mamboeliling, north of Mamasa, in mountain forest at more than 2500 m alt. (*C. Monod de Froideville 110*, type specimen; L).

Related to the following species.

Distribution: endemic.

41. *D. muriculatum* (J. J. S.) J. J. S., *Blumea*, l.c.

Celebes: Central Celebes, Mt. Mamboeliling, north of Mamasa, in mountain forest on more than 2000 m (*C. Monod de Froideville 111*; L).

On account of this specimen *Basigyne muriculata* J. J. S. was transferred to *Dendrochilum*.

Distribution: endemic.

42. *Microstylis mambulilingensis* J. J. S., *Blumea* l.c. 695, fig. 3.

Celebes: Central Celebes, Mt. Mamboeliling, north of Mamasa, 2700 m (*C. Monod de Froideville 106*, type specimen; L).

Related to many Malaysian species, but particularly to *M. purpureo-viridis* J. J. S. from the Talaud Islands. The latter is allied to Papuan species.

Distribution: endemic.

43. *Octarrhena hastipetala* J. J. S. in *Bot. Jahrb.* LXV (1933), 499.

Celebes: Central Celebes, Mt. Bante Mario, 3000 m (*G. Kjellberg n. 1443*, type specimen, May 1929; L); Mt. Mamboeliling, north of Mamasa, 2700 m, forest of small trees and shrubs (*C. Monod de Froideville n. 164*; L).

Monod's plant is weaker than the type specimen, but I think it belongs here. Related to *O. celebica* Schltr. (Celebes).

Distribution: endemic.

In addition to his herbarium collections, Mr Monod made a number of sketches of Orchids, most of them in colours. Many of these were so exact and well done as to allow an identification. In those cases in which these identifications were certain and the locality of the plant was mentioned, it seemed worth while to insert them in the present list. Some of them represent new records for the Celebes or S. Celebes area. They may follow here:

44. *Acriopsis javanica* Reinw., *Fl. Lit.* II, 1825, 4.

Celebes: S.E. Celebes, Boeton, Bace-bace.

Distribution: Malay Peninsula to Philippines and Moluccas.

45. *Aerides odoratum* Lour., *Fl. Cochinch.* II, 1790, 525.

Celebes: S.E. Celebes, Boeton.

Distribution: India and China to Philippines, S.W. and E. Celebes, Kangean and Java.

46. *Ascocentrum aurantiacum* Schltr., Orch. D. Neu Guinea 1913, 975.
Celebes: Central Celebes, Mamasa, 1000 m, sunny places on granite; S.E. Celebes, South Saponda, limestone rocks nr coast; Moena, limestone nr coast; N. Celebes, Tomohon; Bolaang Mongondou, Modajag, 750 m.

Distribution: endemic.

47. *Bulbophyllum laxiflorum* Lindl., Gen. et Sp. Orch., 1833, 57.
var. *celebicum* Schltr. in Fedde, Repert. X, 1911, 178.

Celebes: Central Celebes; S.W. Celebes, Oeloe Sadang; S.W. Central Celebes, Pinrang hills.

Distribution of the species: Brit. Malaya, Sumatra, Java; of the variety: endemic.

48. *B. macranthum* Lindl., Bot. Reg. XXX, 1844, t. 13.

Celebes: S.E. Celebes, northern Boeton, coastal hills, 100 m alt., in old forest.

Distribution: Brit. Malaya, Sumatra, Java, P. Lepar (Bangka).
New for the Celebes area.

49. *Caladenia carnea* R. Br., Prodr. Fl. Nov. Holl. 1810, 324.

Celebes: S.W. Celebes.

Distribution: Australia and Lesser Sunda Islands to Java and S.W. Celebes.

50. *Calanthe veratrifolia* R. Br., Bot. Reg. IX, 1823, t. 270.

Celebes: S.W. Celebes, Nepo-nepo, S.E. of Pare-pare, 700 m, in old forest.

Distribution: India to Philippines and Australia.

51. *Coelogyne celebensis* J. J. S., Bull. Jard. bot. Buitenz., Sér. II, Vol. XXV, 1917, 3.

Celebes: S.W. Celebes.

Distribution: endemic (S.W., S.E., C.).

52. *Cymbidium Finlaysonianum* Lindl., Gen. et Sp. Orch. 1833, 164.

Celebes: several localities.

Distribution: Malay Peninsula to Philippines, Celebes, Moena, Soela and Java.

53. *Dendrobium anosmum* Lindl., Bot. Reg. XXI, 1844, Misc. 41.

Celebes: S.E. Celebes, Boeton, Lasalimoe.

Distribution: Borneo, Philippines, Celebes, Kabaena, Boeroe, Ceram, New Guinea.

54. *D. celebense* J. J. S., Bull. Dépt. Agr. Ind. néerl. XLV, 1911, 15.

Celebes: S.E. Celebes, Kabaena, Batoe-Sangia, 700 m.

Distribution: endemic (thusfar only known from N. Celebes).

55. *D. crumenatum* Sw. in Schrad., Journ. Bot. II, 1799, 237.

Celebes: S.E. Celebes, Boeton, Moena.

Distribution: Burma and S. China to Philippines, Moluccas, Celebes and Java.

56. *D. heterocarpum* Wall. ex Lindl., Gen. et Sp. Orch., 1833, 78.

Celebes: S.W. Central Celebes, Pinrang, Letta hills, 700 (900?) m. alt., in old forest.

Distribution: India, Malaya, Sumatra, Java, Celebes, Philippines.

57. *D. Koordersii* J. J. S., Orch. Amb. 1905, 67.

Celebes: S.E. Celebes, Kabaena, Kabaena Peak.

Distribution: N. and S.E. Celebes, Ambon.

58. **D. macrophyllum** A. Rich., Sert. Astrol. 1834, 22, t. 9.
 Celebes: S.W. Central Celebes, Pinrang, Letta hills, Sinrang, on ridge, 800 m.
 Distribution: New Guinea, Amboina, S.W. Celebes. A variety in Java.
59. **D. nitidicolle** J. J. S., Bull. Jard. bot. Buitenz., Sér. II, Vol. III, 1912, 7.
 Celebes: S.E. Celebes, Kendari.
 Distribution: S.W. and S.E. Celebes, Soela.
60. **Eria aporoides** Lindl., Journ. Linn. Soc. III, 1859, 60.
 Celebes: S.E. Celebes, Boeton, bay of Kamaroe.
 Distribution: Philippines, N. and S.E. Celebes.
61. **E. litoralis** Teysm. et Binn., Nat. Tijdschr. Ned.-Ind. XXIV, 1862, 312.
 Celebes: S.E. Celebes, Kendari.
 Distribution: Moluccas, Celebes (Singapore ?, Tenasserim ?, India ?).
62. **E. quadricolor** J. J. S., Ic. Bog. III, 1906, 31, t. 213.
 Celebes: S.E. Celebes, Kendari, on rocks; Boeton, Bae-bae.
 Distribution: N. and S.E. Celebes, Boeroe.
63. **Eulophia exaltata** Rehb.f., Bonpl. V, 1857, 38.
 Celebes: S.E. Celebes, plain of Langkowala, Roembia.
 Distribution: Java, S.W. and S.E. Celebes, Philippines.
64. **Habenaria Medusae** Krzl. in Engl. Bot. Jahrb. XVI, 1892, 203.
 Celebes: S.E. Celebes, Boeton, along road Bae-bae to Pasar Wadjo.
 Distribution: Sumatra, Java, S.W. and S.E. Celebes.
65. **Microstylis latifolia** J. J. S., Fl. Buitenz. VI, 1905, 248.
 Celebes: S.E. Celebes, South-Kendari, in bamboo association on the hills, 150 m alt.
 Distribution: India, Ceylon and China to Philippines, New Guinea and Australia.
66. **Nervilia Aragoana** Gaud. in Freyc., Voy. Ur. et Phys., Bot. 1829, 422, t. 35.
 Celebes: S.E. Celebes, Kendari, under high trees.
 Distribution: India to Philippines and Western Polynesia.
67. **Paphiopedilum Lowii** Pfitz. in Engl. Bot. Jahrb. XIX, 1894, 42.
 Celebes: S.E. Celebes, Kabaena, base of Batoe Sangia, 700 m, on rocks.
 Distribution: Malay Peninsula, Sumatra, Borneo, Java, N. and S.E. Celebes.
68. **Peristylus bilobus** Rolfe, Kew Bull. 1899, 132.
 Celebes: S.W. Central Celebes, Letta hills.
 Distribution: Sumatra, Java, Lombok, Celebes, Philippines.
69. **P. candidus** J. J. S., Fl. Buitenz. VI, 1905, 36, fig. XVIII.
 Celebes: S.W. Central Celebes, Letta hills.
 Distribution: Brit. Malaya to Moluccas.
70. **Pholidota imbricata** Lindl. in Hook., Exot. Fl. II, 1825, t. 138.
 Celebes: S.E. Celebes, Boeton, pretty common near coast.

Distribution: India and China to Philippines, New Guinea et Australia.

71. *Sarcanthus selebensis* J. J. S., Svensk Bot. Tidskr. 20, 1926, 480.
Celebes: S.E. Celebes, Boeton, Kalingsoesoe.

Distribution: endemic (N. and S.E. Celebes).

72. *Sarcochilus pallidus* (Bl.) Rehb. f. in Walp., Ann. bot. Syst. VI, 1861, 500.

var. *celebicus* Schltr. in Fedde, Rep. XXI, 1925, 200.

Celebes: S.E. Celebes, Boeton, Lasalimoe.

Distribution of the species: Malay Peninsula to Philippines and Moluccas (Amboina); of the variety: N. and S.E. Celebes.

73. *Trichoglottis geminata* J. J. S., Orch. Amb. 1905, 106.

Celebes: S.E. Celebes, Boeton.

Distribution: Borneo, N. and S.E. Celebes, Moluccas (Amboina, Saparoea).

74. *Vandopsis lissochiloides* Pfitz. in Engl. & Prantl, Nat. Pfl. Fam. II, 6, 1889, 210.

Celebes: S.E. Celebes, Moena, on limestone rocks; S. Saponda Isl., limestone rocks, seaside.

Distribution: Philippines, S.W., S.E. and C. Celebes, Moluccas.

PONTEDERIACEAE

75. *Monochoria vaginalis* (Burm. f.) Presl, Rel. Haenk. I, 1827, 128.

Celebes: Central Celebes, Balokan, north of Makale, 1500 m, locally abundant in stagnant water along road (*C. Monod de Froideville 188*, A° 1938, flow. light lilac; B, L).

Distribution: tropical and subtropical Asia to Philippines and New Guinea.

Dicotyledonae

ACANTHACEAE

(C. E. B. Bremekamp)

76. *Difflugossa Everettii* (Rolfe) Brem., Verh. Ned. Akad. Wet. 2e Sect. XLI, no. 1, 1944, 245.

Celebes: S.W. Celebes, Peak of Bonthain, Mt. Lompobatang, 2000 m, in mountain forest (*C. Monod de Froideville 220* and *221*, erect herb, flow., June 5—6, 1938; B, L).

Distribution: endemic (S.W. Celebes).

Its relation is with *D. celebica* Brem. (S.W. Celebes) and with *D. filiformis* (Bl.) Brem. (Java).

77. *Strophacanthus celebicus* Brem., nov. spec.; *typus*: *Monod de Froideville 195* (L), thecis basi muticis, polline non echinulato ad *Str. membranifolium* (Miq.) Brem. nov. comb. [*Rhaphidospora membranifolia*

Miq.; syn. *Justicia dichotoma* Bl. non Rottl., *Rhaphidospora dichotoma* (Bl.) Nees comb. illeg., *Strophacanthus dichotomus* (Bl.) Lindau comb. illeg., accedens sed foliis subsessilibus et angustioribus, venulis nervos haud transverse connectentibus, inflorescentiis cymosis haud in paniculam confertis, floribus inferioribus cymorum longius pedicellatis, calyce glabro ab ea recedens.

Herba erecta, 50—75 cm alta, ramosa. *Caulis* ramique graciles, subteretes, internodiis bisulcatis. *Folia* subsessilia, inferiora linearia vel lanceolata, 4—7 cm longa et 0.5—1.5 cm lata, basi acuta, superiora interdum ovato-lanceolata, 2—4 cm longa et 0.7—1.4 cm lata, basi rotundata, omnia apicem versus attenuata, discolora, utrimque subglabra et cystolithis sparsa; nervis utroque latere costae 3—5, venulis paucis nervos haud transverse connectentibus. *Inflorescentiae* terminales et axillares, illae foliis magnitudine paulum redactis suffultae. Pedunculus

ramulique graciles, pilis capitatis vix distincte puberuli. Bractee subulatae vel filiformes, 1—2 mm longae. Flores inferiores semper pedicellati, superiores interdum subsessiles. Pedicelli pilis capitatis vix distincte puberuli, usque ad 4 mm longi. *Calyx* glaber, 4.5—5 mm longus, fere usque ad basin partitus, lobis filiformibus. *Corolla* alba, 18 mm longa, extus intusque glabra, labio inferiore 3-fido 7 mm, labio superiore 2-fido 6 mm longo. *Stamina* 6 mm supra basin tubi inserta; filamenta glabra 4.5 mm longa; thecae 0.8 mm longae, utroque extremo muticae, connectivo 0.8 mm longo separatae. Granula pollinis lenticularia, haud echinulata, 27 μ diam. et 17 μ crassa. *Torus* discoideus. *Ovarium* glabrum, 1.5 mm altum. *Stylus* glaber, 8.5 mm longus. *Stigma* capitatum didymum. *Capsula* glabra, 12 mm longa,



Fig. 4 — *Strophacanthus celebicus* Brem., n. sp. — a. habit, nat. size; b. nervation (lower side), $\times 1\frac{1}{2}$ — after type specimen.

retinaculis 2 mm longis, patentibus. Semina 2.5 mm longa, 2 mm lata, rugosa — *Fig. 4*.

Habitat terram celebicam.

Celebes: Central Celebes, Palopo, Makale, Balokan, north of Makale, alt. 1500 m, in partly cleared forest (*C. Monod de Froideville 195*, *typus*: erect herb, 50–75 cm high, flow. white; B, L).

The new species described above comes very near to the Javanese *Str. membranifolius* (Miq.) Brem. Lindau used for the latter the name *Str. dichotomus*, which was based on *Justicia dichotoma* Bl. Blume's specific epithet, however, is illegitimate, as it had already been used for another species.

The genus *Strophacanthus* is represented in the Lesser Sunda Islands and in the Moluccas by some more species, which are all nearly related to *Str. membranifolius* and *Str. celebicus*. From *Str. collinus* (T. And.) Lindau, the only species found outside the Archipelago (Sikkim and Upper Burma), they differ in the smaller size and the glabrous surface of the pollen grains.

BORAGINACEAE

78. *Cynoglossum javanicum* (Thunb.) DC., Prodr. X, 1846, 588.

Celebes: S.W. Celebes, Peak of Bonthain, Mt. Lompobatang, open summit, 2900 m, some scattered specimens (*C. Monod de Froideville 228*, erect herb, about 0.75 m high, flow. bright blue, June 5–6, 1938; B, L).

Distribution: India and Ceylon to Java and S.W. Celebes (Bonthain 1480–2200 m; *Bünnemeyer 12064* and *11843*; Lombasang, 950–1330 m: *Id. 10948* and *11204*).

79. *Cynoglossum micranthum* Desf., Cat. Hort. Par. 2804, 220.

Celebes: Central Celebes, along the road Polewali—Tomonga—Mamasa, about 1000 m, dry sunny roadside, one specimen (*C. Monod de Froideville 269 A°* 1939, erect herb, about 1 m high, flow. pale blue; B, L).

According to Merrill (Enum. Phil. Flow. Pl. III, 1923, 379) this species is a synonym to *C. lanceolatum* Forssk. (1775) and is also distributed in the Philippines.

Distribution: Africa and India to Sumatra and Java. New for Celebes.

CAMPANULACEAE

80. *Pratia borneensis* Hemsl. in Hook., Ic. Pl. XVI, 1886, t. 1532.

Celebes: Central Celebes, Makale, Rantepao, in young forest, about 1600 m (*C. Monod de Froideville 192*, shrub with beautiful blue flowers; L) — Celebes, Mt. Katongkoan (*Rachmat* [Exp. L. van Vuuren] *1007*, Jan. 1914, flow.; B, L); Mt. Batoe (*Id. 485*, Aug. 1913, flow.; B, L).

Borneo: Brit. North Borneo, Mt. Kinabalu, Tenompok, forest trail, 5000 ft (*J. & M. S. Clemens 27474*, shrub, reclining 4 ft high, flow. white, lavender tinged, fr.

green, Dec. 10, 1931); same locality, Marai Parai, 5.500 ft. (*Id.* 32437, flow. purple or white, March 29, 1933) and Colombon riv. 9.500 ft. (*Id.* 35055, flow. white and purple, June 30, 1933).

Distribution: thusfar only known from Mt. Kinabalu, new for Celebes.

81. *P. nummularia* (Lamk.) Kurz, Journ. As. Soc. Beng. 46, 1877, 210.

Celebes: Central Celebes, Balokan, north of Makale, 1500 m. (*C. Monod de Froideville* 193, procumbent herb, flow. lilac; B, L).

Distribution: India and China to Formosa, the Philippines and Java. Probably new for Celebes.

82. *Wahlenbergia gracilis* (Forst.) Schrader, Blumenbachia 1827, 38; A. DC. in DC., Prodr. VII, 1838, 433.

Celebes: S.W. Celebes, Peak of Bonthain, Mt. Lompobatang, 1800 m, between grasses (*C. Monod de Froideville* 219, erect herb, about 30 cm high, flow. lilac, June 5-6, 1938; B, L).

Possibly identical with *W. marginata* (Thunb.) A. DC.

Distribution: palaeotropics and temperate parts of southern hemisphere.

CARYOPHYLLACEAE

83. *Cerastium indicum* Wight & Arn., Prodr. Fl. Pen. Ind. or. 1834, 43.

Celebes: S.W. Celebes, Peak of Bonthain, Mt. Lompobatang, open vegetation below summit, 2800 m, fairly abundant in the grass (*C. Monod de Froideville* 226, small erect herb with white flowers, June 5-6, 1938; B, L).

Distribution: India to Java; probably new for Celebes.

84. *Sagina procumbens* L., Sp. Pl., 1753, 128.

Celebes: S.W. Celebes, Peak of Bonthain, Mt. Lompobatang, open vegetation of summit, 2900 m (*C. Monod de Froideville* 240, flow. white, June 5-6, 1938; B, L).

Distribution: temperate regions of both hemispheres and tropical mountains.

COMPOSITAE

(J. Th. Koster)

85. *Anaphalis longifolia* (Bl.) DC., Prodr. VI, 1837, 274.

Celebes: S.W. Celebes, Peak of Bonthain, Mt. Lompobatang on open summit, 2900 m, frequent (*C. Monod de Froideville* 239, herb, about 75 cm high, flow., June 5-6, 1938; B, L).

Distribution: Sumatra, Java, Lesser Sunda Isl., Celebes, Moluccas, New Guinea.

86. *Gnaphalium involucreatum* Forst., Fl. Ins. Austr. 1786, 55.

Celebes: S.W. Celebes, Kanre-apia nr. Malino, some specimens in grass vegetation at base of Peak of Bonthain, 1300 m alt. (*C. Monod de Froideville* 333; L).

Distribution: New Zealand and Australia to Lombok, Java and Celebes.

87. *G. japonicum* Thunb., Fl. Jap. 1784, 311.

Celebes: S.W. Celebes, Peak of Bonthain, Mt. Lompobatang, open summit, 2900 m, some specimens (*C. Monod de Froideville 243*, herb, about 40 cm high, June 5—6, 1938; B, L).

Distribution: Japan and China and Formosa southward to New Caledonia, New Zealand and Australia, westward to Sumatra (here rare).

88. *Lactuca dentata* (Thunb.) C. B. Rob., Phil. Journ. Sci. III Bot., 1908, 218.

Celebes: S.W. Celebes, Peak of Bonthain, Mt. Lompobatang, abundant on open summit, 2900 m (*C. Monod de Froideville 244*, herb with yellow flow., June 5—6, 1938; B, L).

Distribution: China, Japan, Formosa, Philippines, Celebes, Moluccas, New Guinea.

89. *Myriactis*, prob. nov. spec.

Celebes: Central Celebes, Mt. Bante Karoea, north of Makale, 2000 m, in rain-forest on bank of rivulet (*C. Monod de Froideville 200*, erect herb, A° 1938; B, L).

Close to *M. humilis* Merrill (cf. Enum. Phil. Flow. Pl. 3, 1923, 600) from the Philippines (Luzon to Mindanao).

CONVOLVULACEAE

(S. J. van Oostroom)

90. *Evolvulus alsinoides* L., Sp. Pl. ed. 2, 1762, 392.

Var. *decumbens* (R. Br.) v. Ooststr., Monogr. Evolv. 1934, 38.

Celebes: S.W. Celebes, Tjamba-road (Maras—Watampone), about 300 m alt., some specimens on cattle grounds (*C. Monod de Froideville 381*, A° 1938; L) — Central and S.E. Celebes, Mori, Makan, Ensa and Kolaka (*W. A. Kaudern 352*, June 1919; Stockh., L).

Distribution of the species: tropics and subtropics; of the variety: India and China to Australia and W. Polynesia.

CRUCIFERAE

91. *Nasturtium indicum* (L.) DC., Syst. 2, 1821, 199 and Prodr. I, 1824, 139.

Celebes: Central Celebes, Palopo, Bone-bone, nr. Masamba, some specimens in swampy savannah (*C. Monod de Froideville 393*, A° 1938, flow. yellow; L).

Distribution: Tropical Asia and Malaysia.

CUNONIACEAE

92. *Weinmannia urdanetensis* Elm., Leafl. Phil. Bot. 7, 1915, 2608.

Celebes: Central Celebes, Mt. Mamboeliling, north of Mamasa, subalpine elfin-

woodland, 2700 m, one specimen seen (*C. Monod de Froideville 119*, A° 1938, shrub or small tree, ster.; B, L).

First extra-Philippine record of this species. Although the specimen is sterile and the leaves differ slightly from Elmer's type specimen (up to 23 leaflets in the leaf, the leaflets up to 10 × 6 mm, reddish), I hardly doubt the correctness of the identification. It is a very characteristic small-leaved species.

Distribution: Philippines (Luzon, Mindanao).

EPACRIDACEAE

93. *Styphelia suaveolens* (Hook. f.) Koord., Rec. Trav. bot. néerl. VII, 1910, 65 — *Leucopogon suaveolens* Hook.f., Ic. Pl. 1852, sub tab. 898; Vidal, Sinops. Atl. 1883, 30, t. 60, f. A. — *S. philippinensis* Merrill, Phil. Journ. Sc. 20, 1922, 419.

Borneo: Brit. North Borneo, Mt. Kinabalu, prob. from 12,000 ft. († *Coll. 1062*, March 1892, petals white); Mt. Kinabalu, Base of Victoria Peak, 12,000 ft. (*J. & M. S. Clemens 50874a*, Dec. 17, 1933, flow. & fr.); Mt. Kinabalu, Gurulau spur, upper granite lobang, 12,000 ft. (*J. & M. S. Clemens 50875*, 8. XII. 1933, flow. pink white); Upper Kinabalu, 6000—13,500 ft. (*Id. 27779 = 28995*, Jan. 9, March 29, 1932, flow. white, lvs. green above with purple margins, glaucous; *Id. 27097*, Nov. 14, 1931, flow. white to pinkish, fr. brown, and *27097B*, Nov. 4, 1931, same annot.; *Id. 29150*, March 26, 1932, y. fr.; *Id. 30374*, June 2, 1932, flow. white; *Id. 30375*, Jan. 12, 1932, flow. white); Mt. Kinabalu, Marai Parai, 11,000 ft. (*J. & M. S. Clemens 32380*, May 26, 1933, flow. white).

Mindanao: Davao, Todaya, Mt. Apo (*Elmer 11889*, fr., Aug. 1909).

Celebes: S.W. Celebes, Peak of Bonthain, 2800 m (*Bünne Meyer 12184*, 15. VI. 1921, flow. & fr.); same locality, 2890 m (*Id. 12254*, 17. 6. 1921, flow.); same locality, 2300 m (*Id. 11896*, 7. 6. 1921, flow. & fr.); Peak of Bonthain, Mt. Lompobatang, 2700—2850 m (*Neth. Ind. For. Serv. s. n.*, 27. 9. 1933, flow.); same locality, 2900 m, open vegetation on summit (*Monod de Froideville 232*, June 5—6, 1938, shrub about 1.5 m high, flow. white, fr. pink).

Lesser Sunda Islands: Timor, Fetin, 1800 m (*For. Officer Koepang 8*, 10. IV. 1935, flow. buds).

The above enumeration quotes the material extant in the National Herbarium, Leiden. The material examined is uniform in all essential points and its variability, even in the same specimen shows that there is no reason to keep *S. philippinensis* apart.

S. suaveolens is characterized by white or pinkish flowers, the petals of which are short-woolly inside almost up to the tips; the ovary is 5-celled; in the putamen I found 1—3 cells abortive. In many respects it agrees with *S. pungens* (Jungh.) Koord. from Eastern Java but it misses the very conspicuous spiny leaf tips of the latter and moreover the woolly indumentum on the petals is much less profusely developed than in *S. pungens*. Very close to the latter is a plant from Wetar (Lesser Sunda Islands) described as *S. wetarensis* J. J. S. This species agrees with *S. pungens* by its pungent leaf tips but it has a much stouter habit (which is perhaps due to the fact that it is not a mountainous plant like *S. pungens*), and the leaf margins are entire or nearly so, whilst the nerves are fainter.

In *S. suaveolens* the leaves are ovate to oblong or lanceolate or oblanceolate, the apex being obtuse to acute. The dimensions are 5—16 mm long, 1.4—2.8 mm broad, the petioles 0.5—1(—1.2) mm. Various shapes and dimensions may be found even in the same specimen, but the species is always easily distinguishable by its characteristic venation: three of the nerves are broad and strong and are running straight and parallel up to the very apex, the others are less strong and fanlike diverging towards the margins.

As to the venation two main types are represented among Malaysian *Stypheliae* (Fig. 5, a—g):

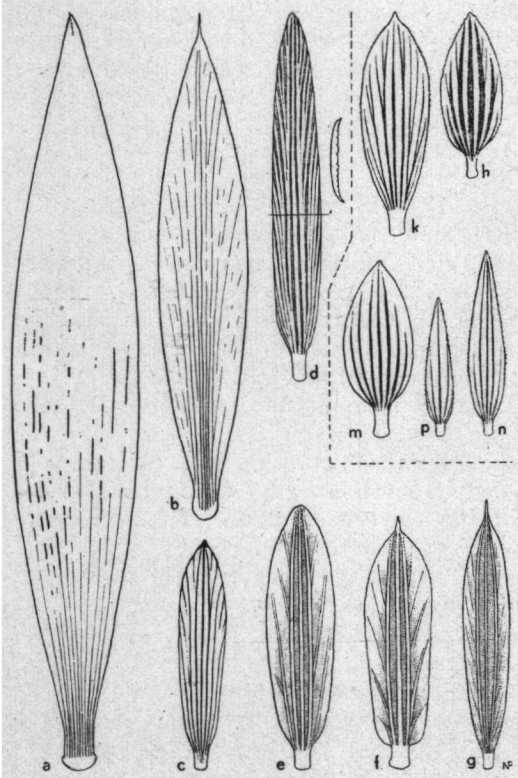


Fig. 5 — Venation types in Malaysian Epacridaceae. a—g. *Styphelia*, h—p. *Trochocarpa*. a. *St. malayana* (Jack) J. J. S.; b. *St. moluccana* (Scheff.) J. J. S.; c. *St. suaveolens* (Hook.f.) Koord.; d. *St. spicata* J. J. S.; e. *St. obtusifolia* J. J. S.; f. *St. pungens* (Jungh.) Koord.; g. *St. wetarensis* J. J. S. — h. *Tr. Vannouhuysii* (J. J. S.) H. J. Lam; k. *Tr. nutans* (J. J. S.) H. J. Lam; m. *Tr. Learmonthiana* (Gibbs) H. J. Lam; n. *Tr. celebica* (J. J. S.) H. J. Lam; p. *Tr. Gjellerupii* (J. J. S.) H. J. Lam — all figures $\times 10/3$.

I. the fanlike type just described, which is found in *S. pungens*, *S. suaveolens*, *S. spicata* J. J. S. (New Guinea), *S. trilocularis* J. J. S. (New Guinea) and *S. obtusifolia* J. J. S.¹⁾ (New Guinea). The two last-named species are very close to *S. suaveolens* and perhaps conspecific with it.

II. a type with numerous very faint nerves, the individual course of which can hardly be traced. It is found in *S. malayana* (Jack) J. J. S. (Malay Peninsula to Java), *S. abscondita* J. J. S. (New Guinea), *S. moluccana* (Scheff.) J. J. S. (Moluccas and Talaud) and

S. lancifolia Hook.f. (Brit. N. Borneo). Possibly the two last-named

¹⁾ The picture in Nova Guinea VIII⁴, tab. CXLIII, fig. 2, is misleading in this respect, at least as regards the authentic specimens extant in the National Herbarium (A. Pulle 970, G. M. Versteeg 2413 [var. *hypoleuca* J. J. S.] and 2529).

species (and *S. abnormis* [Sond.] J. J. S. ?) will prove to be conspecific.

Of the remaining Malaysian species no material or — in this respect — adequate descriptions were available, viz. of *S. abnormis* (Sond.) J. J. S. (Waigeo), *S. obovata* (Fawc.) J. J. S. (Timor) and *S. papuana* (C. H. Wright) J. J. S. (New Guinea). See further under *Trochocarpa*.

94. *Trochocarpa celebica* (J. J. S.) Van Steenis, n. comb. — *Styphelia celebica* J. J. S., Ic. Bog. IV, fasc. 1 (XIII), 1910, 81, tab. CCCXXV.

Celebes: C. Celebes, Mt. Mamboeliling, north of Mamasa, 2700 m, frequent in subalpine thickets (*C. Monod de Froideville* 127, A° 1938, shrub about 0.75 m high, with dull blue-purple berries).

The type locality is Mt. Boeloe Palaka, one of the peaks of the Latimodjong range in C. Celebes.

In Nova Guinea VIII⁴, 1912, 797, J. J. Smith suggested the possibility that *S. celebica*, of which at the time the fruit was unknown, might prove to be a representative of the chiefly Australian genus *Trochocarpa*. The above specimen enables a decision in this matter: the fruits contain 10 distinctly separate pyrenes, on account of which the species had to be transferred to *Trochocarpa*. The new combination, although without an author's name, has already been mentioned by Van Steenis in his "Origin of the Malaysian Mountain Flora", Part 3, p. 69. As far as I can trace it has never been published and this is why we publish it here with Van Steenis as the creator of the new combination. The leaves are provided with minute scales between the nerves underneath.

The same procedure seems to be necessary regarding three Papuan species, as was previously presumed by Smith. They are:

94a. *Trochocarpa nutans* (J. J. S.) H. J. Lam, nov. comb. — *Styphelia nutans* J. J. S., Nova Guinea VIII⁴, 1912, 798 and 800, tab. CXLV.

New Guinea: S.W. New Guinea, Mt. Hellwig, 2600 m (*A. Pulle* 590).

94b. *Trochocarpa Vannouhuysii* (J. J. S.) H. J. Lam, nov. comb. — *Styphelia Vannouhuysii* J. J. S., l.c. 798 and 801, tab. CXLVIA.

New Guinea: S.W. New Guinea, summit of M. Wichmann, 3000 m (*A. Pulle* 973); Oranjebergte, Meervallei, 3000—4000 m (*G. M. Versteeg* 2544).

94c. *Trochocarpa Gjellerupii* (J. J. S.) H. J. Lam, nov. comb. — *Styphelia Gjellerupii* J. J. S., Nova Guinea XII⁵, 1917, 540, tab. CCXXV.

New Guinea: N.W. New Guinea, Arfak Mts., 2500 m (*K. Gjellerup* 1184, type specimen B; L).

Two other species, described as *Styphelia*, are critical in this respect by their 10-celled ovaries: *S. DeKockii* J. J. S. (New Guinea) and *S. Learmonthiana* Gibbs (Brit. N. Borneo, Mt. Kinabalu). Of both the fruits are unknown but there is another character which makes it probable that they too are to be inserted in *Trochocarpa*. Three of the species quoted above (*T. celebica*, *Vannouhuysii*, *Gjellerupii*) and, though to a lesser degree, also *nutans* namely, show a type of venation which is distinctly different from that of the Malaysian *Stypheliae*. The nerves are neither fanlike diverging nor faint and numerous but they are few in number (5—7) and mostly strong and conspicuous and sometimes prominent below. Only the central one is straight, the others are curved more or less parallel to the leaf-margins (*Fig. 5, h—p*; see further under *T. Learmonthiana*). This condition is convincingly extant both in *S. DeKockii*

and in *S. Learmonthiana* and I therefore do not hesitate to propose the following new combinations:

94d. *Trochocarpa DeKockii* (J. J. S.) H. J. Lam, nov. comb. — *Styphelia DeKockii* J. J. S., Nova Guinea VIII⁴, 1912, 802, tab. CXLVI B.

New Guinea: (*De Kock 83*).

I did not examine the specimen quoted.

94e. *Trochocarpa Learmonthiana* (Gibbs) H. J. Lam, nov. comb. — *Styphelia Learmonthiana* Gibbs, Journ. Linn. Soc. Bot. XLII, 1914, 105 (with fig. p. 106).

Borneo: Brit. North Borneo, Mt. Kinabalu, Upper Lobang, Gurulau Spur, nr. Umphoh, 12,000 ft. (*Clemens 50874*, buds pink, fr. purple, on Dec. 8, 1933); Upper Kinabalu, 6000—13,500 ft. (*J. & M. S. Clemens 28956*, ster., 25.3.1932).

I did not see the type specimens (*L. S. Gibbs 4126* and *4305*), both from Mt. Kinabalu. With *T. celebica* the present species occupies the westernmost outposts of this Australian genus. The leaves are minutely pitted below between the nerves. These pits recall those of many *Ericaceae*, particularly *Rhododendron* and may be the places of insertion of fallen scales (cf. *T. celebica*).

I add here with little doubt a seventh species which on account of its 10-loculate ovary probably also belongs to *Trochocarpa*:

94f. *Trochocarpa Lamii* (J. J. S.) H. J. Lam, nov. comb. — *Styphelia Lamii* J. J. S., Nova Guinea XVIII, 1936, 123, Tab. XXXIII¹.

New Guinea: N. New Guinea, Mt. Doorman (*H. J. Lam 1802*).

I did not examine any specimen. According to Smith's picture, the venation seems to be more or less fan-shaped as it is in the closely related *T. nutans*.

The venation-type described above is best developed in *T. Learmonthiana*, *DeKockii* and *Vannouhuysii*. In *T. Gjellerupii* and *T. celebica* the nerves are weaker and less prominent; in *T. nutans* and *T. Lamii*, however, they are many and faint, thus showing a tendency towards type II described under *Styphelia*. In all species, the outermost nerves are more or less distinctly branched on their marginal side.

It should be emphasized here that of the species mentioned, all possess two (one pair) of bracteoles underneath the calyx, except *T. Learmonthiana*, in which there are four (two pairs), and *T. Lamii*, in which there seem to be at least two pairs.

ERICACEAE

95. *Diplycosia undata* J. J. S. in Fedde's Repert. XXX, 1932, 171.

Celebes: C. Celebes, Mt. Mamboeliling, north of Mamasa, 2700 m, in sub-alpine thickets (*C. Monod de Froideville 124*, A° 1933, shrub; L; B).

The type specimen is from the Peak of Bonthain in S.W. Celebes. Closely related to *D. pokapindjangensis* J. J. S. and *D. aperta* J. J. S., both from the Latimodjong range in C. Celebes.

Distribution: endemic.

96. *Rhododendron quadrasianum* Vidal, Rev. pl. vasc. Fil. 1886, 170; H. F. Copeland, Phil. Journ. Sci. 40, 1929, 139 ss. — *Rh. Lindavianum* Koord., Nova Guinea VIII⁴, 1912, 878; XII⁵, 1917, 498; and XVIII, 1936, 89.

In his paper of 1929 H. F. Copeland has united a number of small-leaved *Rhododendra* under the name of *Rh. quadrasianum* Vid. On account of the many transition forms between the extremes this conclusion is probably correct, though H. Sleumer (Engl. Bot. Jahrb. 71, 1941, 139—140) apparently keeps *Rh. rosmarinifolium* Vid. separate.

I am, however, inclined to agree with Copeland and to accept *Rh. quadrasianum* as a large polymorphous species, but I must state that, in my opinion, Copeland's subdivision of the species into forms and varieties, arranged as they are in a more or less haphazard way, seems little adequate. It would, perhaps, have been preferable to combine the small-leaved forms (f. *halconense*, var. *intermedium*, var. *rosmarinifolium*, f. *pulogense*, var. *borneense*, var. *villosum* and var. *selebicum*) as a ssp. *rosmarinifolium*, keeping the larger-leaved ones (f. *typicum*, f. *marivelesense*, f. *negrosense*, f. *malindangense*, f. *davaoense*, f. *banahaense* and var. *cuneifolium*) together as a ssp. *typicum*. These subspecies could then have been subdivided into varieties, and these again, eventually, into forms. As it is, however, it seems preferable to follow Copeland's subdivision, until a monographer undertakes a new revision of the genus (or of its Malaysian species); at any rate, it cannot be considered our present task to give a critical study of this matter.

I will therefore restrict myself to the following notes:

One of the secondary points of distinction used to characterize the varieties and forms — of which I could examine some types and several authentic specimens quoted by Copeland, except of f. *halconense*, var. *cuneifolium* and var. *subspathulatum*. — is whether the pedicels are pubescent and lepidote or not. Although the differences are gradual, this seems to be a fairly useful character. Now f. *pulogense* H. F. Cop. (as well as var. *selebicum* J. J. S., the description of the type of which is, as to this character, not entirely correct) is characterized by non-puberulous pedicels. They are mostly more or less densely lepidote, but in the specimens from Mt. Kinabalu (identified by Sleumer as *Rh. cuneifolium* Stapf), the scales are almost or even entirely lacking, at least when bearing fruits. In our f. *Monodii* the pedicels are of the same type as in f. *pulogense*; in fact, these are the only forms of the species in which the pedicels may be qualified as non-puberulous, with the exception of some plants from New Guinea which will be discussed underneath.

Forma *pulogense* H. F. Copel., l. c. 144 — *Rh. quadrasianum* Vid. var. *selebicum* J. J. S., Bull. Jard. bot. Buit. Sér. III, Vol. XIII, 1935, 443 and in Engl. Bot. Jahrb. 68, 1937, 199 — Pedicelli lepidoti, nonnunquam glabrescentes laeves, interdum basi sparsissime pilosi (diagn. emendata).

Luzon: Mt. Polis (*Mc Gregor* 19736, flow. Febr. 1912); Benguet (*Merrill* 4752, flow. Oct.-Nov. 1905).

Borneo: Brit. North Borneo, Mt. Kinabalu, Mt. Nunkok 5500 ft. (*J. & M. S. Clemens* 32707, flow. red, fr. yellowish green, 17.4.1933); Mt. Kinabalu, Kina Taki river, 7000 ft. (*Id.* 31692, flow. red, 26.2.1933); Upper Kinabalu 6000—13,500 ft. (*Id.* 27912, flow. pink, 7.1.1932).

Celebes: Mt. Baloetoding (*Rachmat* [Exp. L. van Vuuren] 933 [type of var. *selebicum* J. J. S.], flow. Nov. 1913); Central Celebes, road Makale-Bitoeang, in open vegetation, about 1200 m (*C. Monod de Froideville* 187, A° 1938, smal shrub; B, L).

Distribution of *fa. pulogense*: Celebes, Borneo, Luzon.

Forma *Monodii* H. J. Lam, nova forma — Ut *f. pulogense* sed foliis latioribus obovato-spathulatis c. 12 mm longis, 5 mm latis.

Celebes: Central Celebes, Mt. Mamboeliling, north of Mamasa, 2700 m, in subalpine bush (*C. Monod de Froideville* 120, shrub, A° 1938; B, L).

I may add a few remarks concerning:

Var. *villosum* J. J. S., Bull. Jard. bot. Buitenz., Sér. III, Vol. XIII, 1935, 444 — Pedicelli, ovarium, fructus plus minusve dense pilosi (diagn. emend.).

Borneo: W. Borneo, G. Damoes (*Hallier* 575, type specimen of the variety; B, L); Brit. North Borneo, Mt. Kinabalu, Marai Parai, 5000 ft. (*J. & M. S. Clemens* 32326 = 32989, flow. red, March 23 to Apr. 27, 1933); Mt. Kinabalu, Penibukan, head of Dahombong Cr., in crotch of great oak, 5000 ft. (*Id.* 40664, epiphytic shrub 4—6 ft., flow. lemon yellow¹⁾); same locality, 4000—5000 ft. (*Id.* 31944, flow. l. yellow¹⁾), March 7, 1933); same locality, 5000—5500 ft., epiphytic on 200' Dipterocarp (*Id.* 40576, flow. bright yellow¹⁾), Oct. 4, 1933); Mt. Kinabalu, Penataran basin 5500 ft. (*Id.* 32449, fr. Aug. 3, 1933).

Distribution: Borneo.

With var. *borneense* J. J. S. (l.c.) the present variety seems to be the only one with a pilose ovary. In *n.* 32449 the fruits are distinctly villous outside; this character is thusfar unknown in the species as far as I am aware.

The Kinabalu specimens (except *n.* 32326) were identified by Sleumer as *Rh. cuneifolium* Stapf.

In the above delimitation *Rh. quadrasianum* is distributed in Borneo, the Philippines and Celebes. However, there seems to be hardly any doubt whether some small-leaved Papuan species are conspecific with *Rh. quadrasianum*. I will restrict myself here to mention particularly *Rh. Lindavianum* Koord., which with its var. *bantaengense* J. J. S. (Fedde's Repert. XXX, 1932, 163) from S.W. Celebes seems to fall entirely within the specific boundaries of *Rh. quadrasianum*.

As has already been stated by J. J. Smith, *Rh. Lindavianum* is closely related to *Rh. Meliphagidum* J. J. S. (l.c. 162) from Ceram and it is certainly remarkable that the latter possesses yellow flowers (in *Rh. Lindavianum* red), cf. our var. *villosum* f. *lutea* with yellow and f. *bana-haense* H. F. Copel. with orange-coloured flowers.

In the Papuan specimens, however, identified as *Rh. Lindavianum*, which I was able to examine (*Pulle* 574, 578, 820, 828, 895; *Bünnemeyer* [var. *bant.*] 12250 [type], 12223) the pedicels, ovary and fruit seem always to be lepidote but non-pubescent. As to *Rh. Meliphagidum*, this species is distinguished by larger leaves and flowers and, in this respect, is forming a transition to *Rh. retusum* Benn. from Sumatra and Java, in which the leaves are still larger. In *Rh. quadrasianum* they may be said to be

¹⁾ These three nrs. might be considered a forma nova *lutea*, but I failed to detect any other point of distinction with *n.* 32326 which has red flowers (f. *rubra*), or with *n.* 32449, which possesses fruits only. The only difference from the type specimen of the variety, apart from an eventual difference in the colour of the corolla (which is unknown in *Hallier* 575) seems to be that in the type specimen the leaves are dark reddish brown when dried, in the Kinabalu specimens, however, greenish brown.

up to 30 mm long and up to 13 mm broad — in the small-leaved forms they are only 5—12 × 2—5 mm —; the corolla may vary between 8—25 mm in length.

The specimens quoted for *Rh. Lindavianum* are by no means uniform. There are, for instance, such with large and others with small leaves. I leave it to a monographer to arrange these into varieties or forms if such a procedure should appear desirable, the more so, as I am pretty well convinced that still other Papuan species will prove to belong to the present species. In the meantime I would consider the var. *bantaengense* (J. J. S.) as a separate variety, distinguished by non-pubescent pedicels and ovaries and by large obovate leaves (10—22 × 6—10 mm).

97. *Rh. Vanvuurenii* J. J. S., Bull. Jard. bot. Buitenz., Sér. III, Vol. I⁵, 1920, 399, Tab. 48.

Celebes: C. Celebes, Mandar, Mamasa, 1000 m, fairly frequent in open vegetation (*C. Monod de Froideville 398*, A° 1939, shrub, 1.25 m high; L).

The relation of this species is with *Rh. lompoense* J. J. S. from Celebes, *Rh. Loerzingii* J. J. S. from Java, *Rh. javanicum* (Bl.) Benn. from Western Malaysia and *Rh. Schadenbergii* Warb. from Luzon (= *Rh. javanicum* ?).

Distribution: endemic (S.W. and C. Celebes).

98. *Rh. Zollingeri* J. J. S., Ic. Bog. IV, fasc. 1, 1910, 73, tab. CCCXXII.

Var. *latifolium* J. J. S. in Engl. Bot. Jahrb. 68, 1937, 200.

Celebes: S.W. Celebes, Peak of Bonthain, Mt. Lompobatang, steep, stony slope, 2700—2850 m (*J. van Zyll de Jong 6*, shrub, flow. red, y. fr. green, 27. IX. 1933; B); same locality, Mt. Bawakraeng, steep, stony slope, 2800 m, scattered (*Id. 23*, shrub, flow. red, ripe fr. reddish brown; B) — C. Celebes, divide between Palopo and Bantepao, in open vegetation on slopes along the road, 1200 m, several specimens (*C. Monod de Froideville 271*, shrub, about 1.25 m high, flow. red or brick-red; L, B); Mamasa, Oeroeboea, 1600 m (*Neth. Ind. For. Serv. 188*, flow. and fr. on 16. 7. 1936; L, B); G. Sinadji (*Bachmat* [*Exp. L. van Vuuren*] 883, flow. in Nov. 1913; L, B).

Distribution: The type specimen of the variety, which is endemic, is *Kjellberg 3925* from C. Celebes, Mt. Rante Mario, 2500 m. The species is distributed on the higher peaks of Central and East Java (Dieng: *Lörzing 482*, *Van Steenis 4597*, both from ± 2000 m; Kraksaan, 3050 m: *Neth. Ind. For. Serv. Ja. 2997*; Mt. Ijang, 3000 m: *Backer 9725*; Mt. Argapoera, 3000 m: *Zollinger 1684* [*type spec.*]), Bali, (Mt. Batoekaoe, 1360 m: *Sarip* [*exp. R. Maier*] 397) and Lombok (Mt. Rindjani, 2400—3000 m: *Elbert 1094*, 1362 and 2241).

EUPHORBIACEAE

99. *Acalypha boehmerioides* Miq., Fl. Ind. Bat. Suppl., 1860, 459.

Celebes: S.W. Celebes, Bone, Sopeng, nr. Tjitta, in coconut grove about 400 m alt.; one specimen (*C. Monod de Froideville 389*, undershrub, 60 cm high, flow., A° 1938; L).

Distribution: India to Philippines and Western Polynesia.

100. *Euphorbia hirta* L., Sp. Pl. 1753, 454.

Celebes: S.W. Celebes, Bone, Oedjoeng Lamoeroe, about 250 m alt., abundant on cattle grounds (*C. Monod de Froideville 386*, A° 1939; L).

Distribution: pantropical.

101. *E. hypericifolia* L., Sp. Pl. 1753, 454.

Celebes: Central Celebes, along road Makale-Bitoeang, about 1000 m alt., on cattle grounds (*C. Monod de Froideville* #61, bracts of cyathia white; B, L).

Distribution: pantropical.

102. *E. serrulata* Reinw. ex Bl., Bijdr. 1826, 635.

Celebes: without further indication of locality (*C. Monod de Froideville* 396, A° 1938, bracts of the cyathia white; L).

Distribution: S. China to Australia and Polynesia.

FAGACEAE

103. *Quercus acuminatissima* (Bl.) A. DC. in DC., Prodr. XVI², 1864, 102 — *Castanea acuminatissima* Bl., Mus. bot. Lugd. Bat. I, 1850, 283 — *Quercus Junghuhnii* Miq., Fl. Ind. bat. I, 1856, 853.

Celebes: Central Celebes, Palopo, abundant in forest nr. resthouse Balokan, north of Makale, 1500 m (*C. Monod de Froideville* 184, A° 1938, tree, wood used for making sirap = wooden pan tiles; B, L).

Apparently close to but probably not conspecific with *Q. mindanaensis* Elm. from Mindanao and Leyte which differs by the shallow cupula with smooth circular rim and less scaly outer surface.

Distribution: Siam, Sumatra, Java, Celebes, Moluccas, New Guinea.

GENTIANACEAE

104. *Gentiana uncifolia* H. J. Lam, nov. spec. — *Fig. 6* — *Herba* vel *suffrutex* pusilla caespitosa procumbens stolonifera glabra, rosulis c. 1.5—2.5 cm altis. *Folia* coriacea in rosulis dense conferta, in ramulis novellis suberectis distantis decussata, omnia sessilia, duo ejusdem paris basi confluentia, divaricata, linearia vel oblongo-linearia, basi sensim angustata, apice latiore subacuta, saepe sursum plicata, semper apice uncinatim recurvata, 0.6—1.1 cm longa, 0.1—0.2 cm lata, marginibus interdum revolutis, nervo unico vix conspicuo, sub flore nonnulla (2—3 paria) modo paracalycis confertim ad calycem adpressa. *Flores* glabri solitarii apicales sessiles, 1.2—1.5 cm longi, caule sub "paracalyce" saepe 0.2—0.8 cm afoliosa. *Calyx* nonnumquam nullus quod si ita est foliis adpressis substitutus, si adest membranaceus cylindraceo-conicus c. 0.55 cm longus, apicem versus paulo dilatatus, lobis 5 peracutis 0.25 cm longis. *Corolla* cyanea membranacea, tubo anguste infundibuliformi 1—1.2 cm longo, lobis ovatis aestivatione convolutis apice minute apiculatis ogivatis 0.2—0.25 cm longis et latis, plicis interpetiolaribus haud protractis integris. *Stamina* 5 corollae lobis alternantia, filamentis c. dimidio tubi affixis filiformibus, antheris parvis 0.075 cm longis triangularibus basi bilobis, stigmatibus adpressis. *Ovarium* claviforme, stylo filiformi stigmatibus duobus extrorsum arcuatis c. 0.1 cm longis. *Capsula* ignota.

Celebes: Central Celebes, Mt. Mamboeliling, north of Mamasa, rather frequent in open places of subalpine bush, 2700 m (*C. Monod de Froideville* 118, type specimen, L, forming cushions, flow. deep blue; B, L).

Undoubtedly a new species, more or less related to *G. quadrifaria* Bl. (India and Java), *G. lycopodioides* Stapf (Brit. N. Borneo: Mt. Kinabalu)

and the small-leaved species from the Philippines (cf. Merrill, Enum. Phil. Flow. Pl. III, 1923, 318), which seem all to be close together and from which *G. uncinata* differs by its long, narrow and uncinata leaves and its "paracalyx"; probably also to *G. lateriflora* Hemsl. from Bonthain Peak, from which it differs by its much smaller leaves and flowers. It is, however, more closely related to *G. borneensis* Hook.f. from Mt. Kinabalu from which our species is different by the still narrower and longer leaves, the more prominent "paracalyx" and the often for several mm

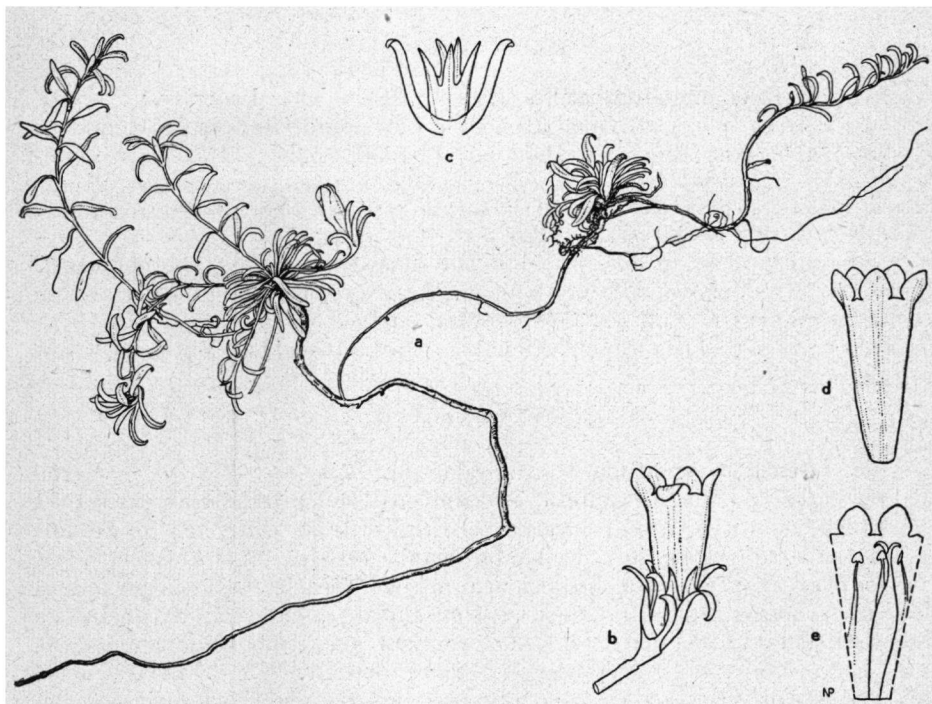


Fig. 6 — *Gentiana uncinata* H. J. Lam, n. sp. — a. habit, $\times 3/5$; b. flower with three pairs of supporting leaves, $\times 1.7$; c. calyx with uppermost pair of supporting leaves, $\times 2.6$; d. corolla outside, $\times 2.6$; e. part of ditto with three stamens and pistil, $\times 2.6$ — after type specimen.

leafless stem below it, the interpetiolar lobes being absent or nearly so, and the relatively large flowers.

GERANIACEAE

105. *Geranium ardjunense* Zoll. & Mor., Nat. en Geneesk. Arch. Neerl. Ind. II, 1845, 585.

Celebes: S.W. Celebes, Peak of Bonthain, Mt. Lompobatang, rather abundant in subalpine elfin woodland below summit, 2800 m alt. (C. Monod de Froideville 229, herb, flow. red-purple, June 5—6, 1938; B, L); Peak of Bonthain, 2500 m (H. A. B. Bünnemeyer 11906, flow., 8. VI. 1921; B, L).

According to Monod also found on Mt. Bawakraeng (northern top of Peak of Bonthain). Close to *G. nepalense* Sweet and possibly only a form of that polymorphous species.

Distribution: Sumatra, Java, S.W. Celebes, Timor (*Forbes 3818*).

GESNERIACEAE

106. *Boea leporina* H. J.

Lam, nov. spec. — *Fig. 7* — *Suffrutex* c. 25 cm altus omnino corollis fructibusque exceptis dense lanuginosus. *Folia* praecipue in rosulas conferta sessilia decussata, lanceolato-oblonga integra, basin versus gradatim angustata, supra medium latiora, apice subacuta, vetustiora persistentia corrugata, in sicco grisea, juniora i. s. ut *Leporis europaei* aures utrinque albo-luteo lanuginosa, 5–6 cm longa, 1–1.3 cm lata, costa media crassa subtus prominens basi glabrescens. E medio rosulae caulis floriger erectus, foliis paulo latioribus plus minusve remotis. *Inflorescentia* terminalis in specimine unico 11 cm longa, 4–5 cm lata, paniculata, inflorescentiae partiales in foliorum gradatim decrescentium vel bractearum axillis racemosae vel rectius monochasiales. *Pedicelli* 0.2–0.3 cm longi. *Calyx* infundibuliformis c. 0.2 cm longus extus dense, intus sparsius pubescens, 5 lobis anguste triangularibus 0.13 cm longis. *Corolla* glabra obscure purpurea, zygomorpha, tubo c. 0.2 cm longo, lobis 4 rotundatis, c. 0.2 cm longis et diametro, uno (labio) c. duplo longiore omnibus aestivatione imbricatis. *Stamina* glabra 2, filamentis 0.2 cm longis sigmoideis in tubi dimidio sub labio inserta, antheris luteis late naviculi-

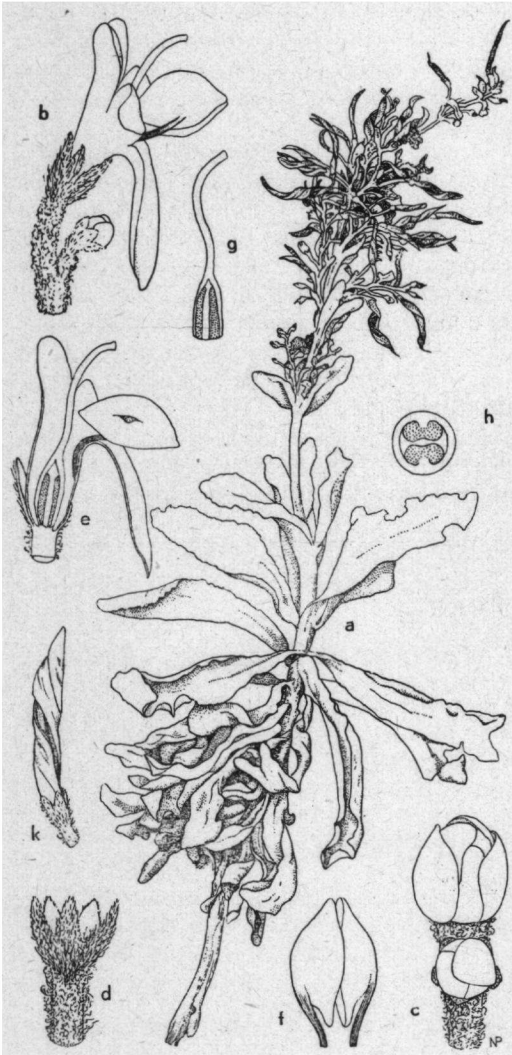


Fig. 7 — *Boea leporina* H. J. Lam, n. sp. — a. habit, $\times \frac{1}{2}$; b. tip of partial inflorescence with terminal flower open, lateral view, $\times 5$; c. ditto, front view, $\times 5$; d. calyx, $\times 5$; e. flower, longitudinal section, $\times 5$; f. androecium, $\times 5$; g. gynaecium, longitudinal section, $\times 5$; h. ditto, cross-section, $\times 10$; k. fruit, $\times 2$ — after type specimen.

formibus 0.3—0.35 cm longis 0.15 cm latis, planitiis cohaerentibus, apicibus plus minusve liberis. *Ovarium* glabrum oblongum uniloculatum 0.2 cm altum, duas placentas parietales adscendentes multiovulatas continens, in stylum 0.4 cm longum cylindricum solidum apice vix dilatatum truncatum ad antheras curvatim se applicantem contractum. *Fructus* capsularis glaber apice styli rudimento 0.2 cm longo ornatum, c. 1.3 cm longus, valvis valde tordatis.

Celebes: Central Celebes, Enrekang, west of Kalosi, on limestone rocks along road Kalosi-Makale, alt. 800 m (*C. Monod de Froideville* 401, type specimen, flow. dark purple, anthers yellow; L).

A species well distinguished from the other *Boea* species by its densely withish woolly leaves, reminding one of rabbit's ears (whence the specific name). As far as we could judge from a fragmentary specimen from Sarawak, Borneo (*Nat. coll.* 1373), this seems to be close to our species. However, the rosette is lacking and the specimen consists only of one large inflorescence, about 40 cm high and 11 across, the lateral branches dichasial and up to 14 cm long. The indumentum is quite that of *B. leporina* and also the flowers are very much alike, though the corolla is considerably larger (lip 0.7 cm long); their colour is unknown to me.

107. *Rhynchoglossum obliquum* Bl., *Bijdr.* 1826, 741.

Celebes: S.W. Celebes, Maros-Tjamba road, frequent in shady places on limestone, about 100 m alt. (*C. Monod de Froideville* 267, flow. blue and white; B, L).

According to Monod also found in Central Celebes and in the island of Boeton.

Distribution: India to Philippines and Moluccas.

GUTTIFERAE

108. *Hypericum Hookerianum* Wight & Arn., *Prodr. Flor. Pen. Ind.* or. 1834, 99.

Celebes: S.W. Celebes, Peak of Bonthain, Mt. Lompobatang, fairly abundant on open sunny summit, 2800 m (*C. Monod de Froideville* 227, erect shrub with drooping branches, flow., June 5—6, 1938; B, L).

Distribution: Himalaya, Java, Lombok, SW. Celebes.

HALORRHAGIDACEAE

109. *Halorrhagis scabra* (Koen.) Benth., *Fl. Hongk.* 1861, 139.

Var. *elongata* Schindl. in *Engl. Pflanzenreich* 23, 1905, 29.

Celebes: Lasao, 100 m (*Kjellberg* 1168, flow., 2.4.1929) — Central Celebes, Mamaša, 1000 m alt., sunny roadside, frequent (*C. Monod de Froideville* 259, erect herb, frequent on poor sandy grounds in the hills, flow. reddish; B, L).

Distribution of the species: India and S. China to New Guinea and Soemba; of the variety: S. China, Tonkin, Borneo, Philippines, Celebes, Soemba, Ceram.

LABIATAE

110. *Plectranthus Teysmanni* Miq., *Fl. Ind. Bat.* II, 1859, 944.

Celebes: S.W. Celebes, Peak of Bonthain, Mt. Lompobatang, sunny savannah, 1800 m alt., several specimens (*C. Monod de Froideville* 218, herb, about 1 m high, flow.

light coloured, June 5—6, 1938; B, L); Peak of Bonthain, 2300 m (*H. A. B. Bünne Meyer 11887*, flow., 7. 6. 1921); Lombasang, 950 m (*Id. 10947*, flow. 13. 4. 1921); Goa, Lembaja, 1600 m (*Neth. Ind. For. Serv. s. n.*, flow. 10. 5. 1936; B, L),

Possibly only a form of *P. rufescens* Benth. (1848) from Java.

Distribution: Java (particularly C. and E. Java), S.W. Celebes.

111. *Scutellaria luzonica* Rolfe, Journ. Linn. Soc. Bot. 21, 1884, 315.

Celebes: N. Celebes, Tondano, in coffee plantation (*Forsten 109*, flow., May 1840; L) — Central Celebes, Balokan, north of Makale, 1500 m alt., more or less shady places along road, some specimens (*C. Monod de Froideville 191*, small erect herb, about 10 cm high, flow. purple, A° 1938; B, L).

Distribution: Formosa (*Linsley Gressitt 441, 488*), Luzon, New Guinea; new for Celebes.

LENTIBULARIACEAE

112. *Utricularia orbiculata* Wall. Cat. 1829, n. 1500.

Celebes: Central Celebes, Mamasá, on wet dripping precipice, about 1000 m alt., locally very frequent (*C. Monod de Froideville 270*, flow. l. lilac with yellow, A° 1938; B, L).

Distribution: India and S. China to Philippines, Borneo and New Guinea. New for Celebes.

According to Monod also found in Todjamboe (nr. Palopo) and in S.W. Central Celebes, Lembango (Pinrang hills), but not in S.W. Celebes.

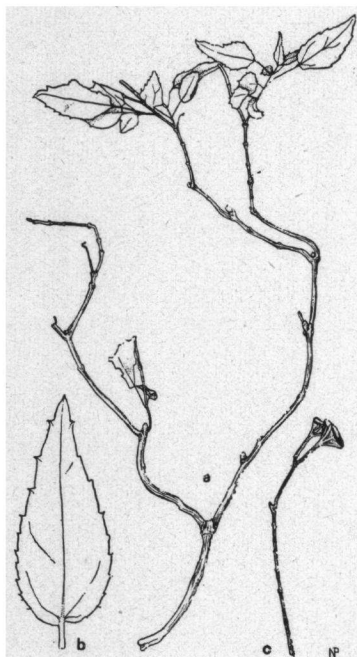


Fig. 8 — *Sonerila celebica* Bakh. f., n. sp. — a. habit, $\times \frac{1}{2}$; b. leaf, nat. size; c. fruits, $\times \frac{1}{2}$ — after type specimen.

MELASTOMATACEAE

(R. C. Bakhuizen van den Brink)

113. *Sonerila celebica* Bakh. f., nov. spec. — Fig. 8 — Suffrutex minime 20 cm altus. Caulis erectus teretiusculus glaber, juvenilis in siccitate rubro-fuscus. Folia herbacea decussata ejusdem paris valde inaequalia, majora ovato-lanceolata, basi subcordata apice acuta, marginibus grosse crenato-serrata breviter ciliata, ciliis 0.02—0.03 cm longis, utrinque glabra tri- vel quintuplinervia, venulis inconspicuis, 2—2.8 cm longa, 0.9—1.2 cm lata, petiolo gracillimo glabro 0.6—1 cm longo; minora ovata vel elliptica vel suborbicularia 0.3—0.5 cm longa, 0.2—0.4 cm lata. Flores terminales 2—3 aggregati, pedicellis tenuibus glabris vel nonnullis pilis munitis, 0.7—0.8 cm longis. Calycis glabri tubus anguste obovatus costatus glaber, 0.35 cm longus, basi cuneatus apice subconstrictus, dentibus 3 triangularibus basi dilatatis c. 0.1 cm longis. Petala glabra (alba ?) 3 late obovata venulata obliqua apice obtusa undulata

longiuscule acute acuminata 0.8 cm longa, 0.65 cm lata. *Stamina* 3 filamentis glabris 0.27 cm longis filiformibus, antheris luteis oblongis basi acute bilobis 2-poris 0.24 cm longis. *Stylus* glaber 0.7 cm longus, stigmatē capitato. *Capsula* obpyramidalis glaber 0.5—0.6 cm longa.

Celebes: Central Celebes, Mt. Bante Karoea, north of Makale, in rain forest about 1800 m (*C. Monod de Froideville 202, type specimen, L, A° 1938, flow, and fr.; B, L*); Mt. Mamboeliling, north of Mamasa, in rain forest, about 2500 m, abundant (*Id. 171a, A° 1938, fr.; B?, L*).

Monod 171a, which was collected together with *n. 171 (S. Froidevilleana)*, differs from the type by having the branchlets and the petioles pretty densely, the leaves on either side sparsely pubescent. The flowers are sometimes solitary. There is little doubt that the specimen belongs to the present species, as it agrees with the type in all essential points available.

S. celebica seems to be most related to *S. tenuifolia* Bl. from Brit. Malaya, Sumatra, Bangka (?) and western Java, which differs from our species by its sagittate and acuminate anthers and non-venulose petals.

114. *S. Froidevilleana* Bakh.f., nov. spec. — *Fig. 9* — *Suffrutex*

minime 10 cm altus. *Caulis* erectus teretiusculus pilis patentibus longis crispis rubro-fuscis minutus. *Folia* herbacea decussata, ejusdem paris aequalia vel subaequalia, ovata vel rarius ovato-oblonga, basi obtusa ad rotundata, apice obtusa, marginibus conferte grosse serrata longe ciliata, ciliis 0.1—0.2 cm longis, subtus in nervis sparse, supra densius pilis ad 0.3 cm longis ornata, 3-nervia, 0.9—1.8 cm longa, 0.6—1.1 cm lata, petiolo tenui sparse piloso 0.4—0.7 cm longo. *Flores* terminales solitarii vel bini, pedicellis glabris vel subglabris 0.7—0.8 cm longis. *Calycis* glabri tubus oblongo-triangularis basi angustatus 0.3 cm longus, dentibus 3 sinibus latis inter se separatis anguste triangularibus basi valde dilatatis 0.1—0.15 cm longis, extus pilis nonnullis vestitus. *Petala* glabra (alba ?) 3 obliqua late obovata apice late rotundata undulata minutissime abrupte apiculata, 0.75 cm longa, 1 cm lata, vena media crassa ceterum avenia. *Stamina* 3, filamentis glabris 0.5 cm longis, antheris ovato-oblongis 1-poris 0.2 cm longis. *Stylus* glaber 1 cm longus, stigmatē capitato. *Capsula* deest.

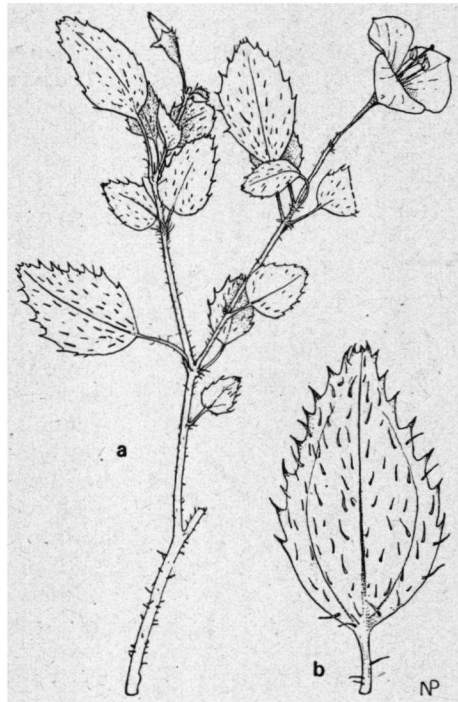


Fig. 9 — *Sonerila Froidevilleana* Bakh.f., n. sp. — a. habit, nat. size; b. leaf, lower side, $\times 2$ — after type specimen.

Celebes: Central Celebes, Mt. Mamboeliling, abundant in rain forest, 2500 m (C. Monod de Froideville 171, type specimen L, A° 1938, flow.; B, L).

This species shows no particular relation with any Malaysian species known to me. It differs from all other species from that region by its small, ovate acutely serrate and ciliate leaves and its broad obovate petals. With *S. celebica* (n. 171a) it shows some resemblance in the pubescence of the branchlets but the last-named specimen is easily distinguished by its obvious anisophylly, its different leaf margins and the characters of the flower. In its habit it recalls *Sarcopyramis delicata* Robins. (Sumatra and Philippines) which differs, however, among other characters, by its 4-merous flowers.

Thusfar only two *Sonerila*-species were known from Celebes, viz. *S. brachyandra* Naud. from S.W. Celebes (Lombosang) and the Philippines and *S. laeviuscula* Zoll. & Mor. var. *grandifolia* Cogn. The latter variety is unknown to me, but both species are undoubtedly quite different from either species described above (cf. Rec. Trav. bot. néerl. XL, 1943 = Med. Bot. Mus. en Herb. Rijksuniv. Utrecht n. 91).

MYRTACEAE

115. *Leptospermum flavescens* Sm., Transact. Linn. Soc. 3, 1797, 262.

Celebes: S.W. Celebes, Peak of Bonthain, Mt. Lompobatang, subalpine elfin woodland, 2900 m (C. Monod de Froideville 231, small tree, dominating the woody flora of the summit, flow. white, June 5—6, 1938; B, L).

Distribution: Burma to Australia.

NEPENTHACEAE

116. *Nepenthes tentaculata* Hook.f. in DC., Prodr. XVII, 1873, 101; Danser, Bull. Jard. bot. Buitenz., Sér. III, Vol. IX, 1928, 379, 428.

Celebes: Central Celebes, Mt. Mamboeliling, north of Mamasa, 2700 m, fairly abundant in subalpine bush (C. Monod de Froideville 117, sterile, rosettes only; B, L).

Although sterile, probably this species.

Distribution: Borneo, S.W. Celebes. New for C. Celebes.

PIPERACEAE

117. *Peperomia reflexa* (L.f.) A. Dietr., Sp. Pl. 1, 1831, 180.

Celebes: S.W. Celebes, Peak of Bonthain, Mt. Lompobatang, in mountain forest, 2000 m alt., rather frequent (C. Monod de Froideville 222, flow. June 5—6, 1938; B, L).

Distribution: pantropical.

PLANTAGINACEAE

118. *Plantago major* L., Sp. Pl., 1753, 113.

Celebes: S.W. Celebes, Loka, 1000 m alt., abundant (C. Monod de Froideville 338, A° 1938).

Distribution: occasional in waste places, at medium altitudes naturalized, introduced from Europe.

POLYGALACEAE

119. *Polygala chinensis* L., Sp. Pl., 1753, 704.

Celebes: S.W. Celebes, "Tempe-depression", Sengkang, Siwa, about 50 m alt., abundant in grass vegetation (*C. Monod de Froideville 284*, small herb, flow. bright blue; B, L) — C. Celebes, west of Palopo (*Id. 471*; L).

Distribution: India and China to tropical Australia.

120. *P. longifolia* Poir. in Lamk., Encycl. 5, 1904, 501.

Celebes: S.W. Celebes, "Tempe-depression", Sengkang, Siwa, about 50 m alt., fairly frequent in grass vegetation. (*C. Monod de Froideville 283*, erect herb, flow. white; B, L).

Distribution: India and Indo China to tropical Australia.

121. *P. paniculata* L., Syst. Nat. Ed. X, 1759, 1154.

Celebes: S.W. Celebes, Bonthain, Loka, about 800 m, frequent in sunny places on poor soil (*C. Monod de Froideville 367*, flow. white, rarely somewhat purple, roots fragrant; L).

Distribution: a native of Brasil, occasionally introduced into other tropical countries, in Malaysia thusfar known from (Coll. Rijksherbarium only) Sumatra, Java (especially western Java) and S.W. Celebes and also from the Solomons (Ysabel Isl.). According to Monod also a common weed in the hills of Central Celebes.

122. *Salomonina cantoniensis* Lour., Fl. Cochinch., 1790, 14.

Celebes: S.W. Celebes, along road Bonthain-Loka, about 800 m alt., in sunny places also on poor soil (*C. Monod de Froideville 368*, flow. purple and white; L).

Distribution: India and S. China to tropical Australia.

POLYGONACEAE

123. *Polygonum minus* Huds., Fl. angl. Ed. 1, 1762, 1; Danser, Bull. Jard. bot. Buitenz. Sér. III, Vol. VIII, 1927, 174.

Subsp. *decipiens* (R. Br.) Dans., l. c. 178.

Celebes: Central Celebes, Balokan, north of Makale, in partly cleared forest near resthouse, abundant (*C. Monod de Froideville 185*, A° 1939, flow. white, fr. bluish; B, L).

Distribution of the species: Europe, Asia to Australia; of the subspecies: New Guinea, Australia; new for Celebes.

PRIMULACEAE

124. *Lysimachia japonica* Thunb., Fl. Jap. 1784, 83.

Celebes: Central Celebes, Balokan, north of Makale, 1500 m alt., roadside, several specimens (*C. Monod de Froideville 201*, A° 1938, procumbent herb, flow. yellow; B, L).

Distribution: India, China and Japan to Sumatra and Java, also in N. Australia (introduced ?). Apparently new for Celebes.

RANUNCULACEAE

125. *Ranunculus diffusus* DC., Prodr. I, 1824, 38.

Celebes: S.W. Celebes, Peak of Bonthain, Mt. Lompobatang, open vegetation on summit, 2900 m, some specimens (*C. Monod de Froideville 384*, flow., June 5-6, 1938; L).

Distribution: Himalaya, Assam, Malay Peninsula, Sumatra, Java, S.E. Celebes (Roembia: *Elbert 3042*), Lombok. Apparently new for S.W. Celebes.

126. *Ranunculus Frigidurbis* H. J. Lam, nov. spec. — *Fig. 10* — *Herba* cauli brevissimo. *Folia* rosulam formantia, petioli teretes 3—4 cm longi, cum petiolulis dense adpresse pilosi, pilis 0.1—0.15 cm longis, lamina ambitu eordata 1.5—1.9 cm longa, 1.1—1.7 cm lata trifoliolata, petioluli laterales 0.1—0.4 cm, terminales 0.3—0.7 cm longi, foliola papyracea supra sparse subtus densius pilis 0.1—0.15 cm longis vestita, omnia

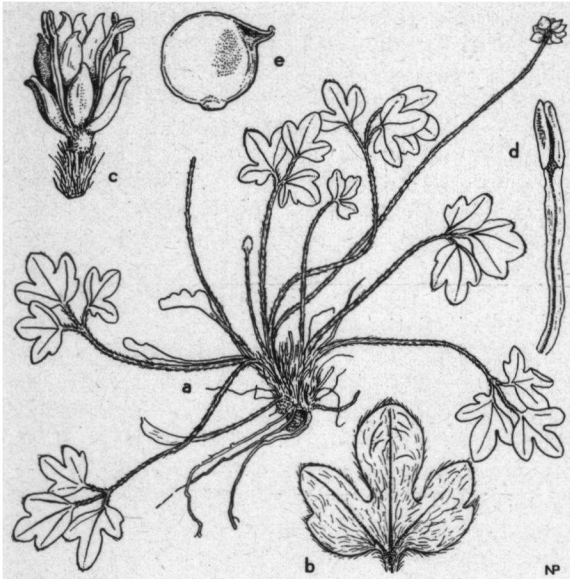


Fig. 10 — *Ranunculus Frigidurbis* H. J. Lam, n. sp. — a. habit, $\times \frac{3}{4}$; b. leaf, $\times 2$; c. flower without petals, $\times 5$; d. stamen, $\times 10$; e. follicle, $\times 5$ — after type specimen.

plerumque triloba ad trifida lobulorum marginibus interdum semel emarginatis plerumque integris, apicibus late ogivalibus vel saepius rotundatis, lateralia paulo obliqua, omnia basi late subcordata vel rotundata, 0.7—1.2 cm longa, 0.8—1.0 cm lata. *Flores* solitarii longopedicellati, pedicelli teretes longiuscule adpresse pilosi 7—8 cm longi, perianthio in specimine unico delapso ex collectoris annotationibus luteo. *Stamina* glabra c. 0.35 cm longa, filamenta vittiformia marginibus hyalinis vasculis opacis c. 0.25 cm longa, 0.02—0.04 cm lata, antheris 0.1 cm longis, 0.05 cm latis oblongis. *Gynaeceum* 0.3 cm longum, carpella c. 17 in flore vetustiori erecta glabra ovata apicem versus sensim acutata stylo demum vix,

deinde paulo, ultimatim valde rigide unciformiter recurvato. *Folliculi* circulares 0.25 cm diametro, stylo rigide recurvato 0.05 cm longo.

Celebes: S.W. Celebes, Peak of Bonthain, Mt. Bawa Kraeng, 2500 m, near origin of rivulet in the saddle between the two tops in grassy and moist, somewhat shady places, several specimens (*C. Monod de Froideville 209*, type specimen L, flow. yellow, A° 1937; B, L).

Apparently related to *R. diffusus* DC. but distinctly different by the small, few-lobed leaves and the strikingly rounded leaf-lobes.

The Sarasin's mention from the same locality *R. Sarasinorum* Warb., a species which, however, has probably never been properly described. I do not know whether it is conspecific with our species.

I deem it a privilege to name this species in honour of Mr Monod de Froideville, who is one of those botanical amateurs whose interest and

keen gift of observation have felicitously enriched botanical science with many valuable data.

ROSACEAE

127. *Potentilla papuana* Focke, Abh. Nat. Wiss. Ver. Bremen XIII, 1896, 162; Th. Wolf, Bibl. Bot. XVI, Heft 71, 1908, 678.

Celebes: S.W. Celebes, Peak of Bonthain, Mt. Bawa Kraeng, abundant in open rocky places, about 2500 m (*C. Monod de Froideville* 210, creeping stoloniferous herb with yellow flowers, A° 1937; B, L).

The specimen is rather poor, but sufficient to allow an identification. The erect branches bear two flowers, the petals of which do hardly exsert from the calyx. The carpels are perfectly glabrous. These characters show that the specimen cannot belong to *P. leuconota* D. Don (Himalaya to Yunnan), a name often given without much critical sense to all Malaysian *Potentillae*. The differences between the two species which, with *P. peduncularis* Don (Himalaya to Yunnan) and a few others, form a group of closely related species, are clearly pointed out by Focke. The above-quoted specimen agrees in all essential points with Focke's description (material was not available) but in that the style is rather long and slender (0.075 cm). The rosette leaves are 8—10-pinnate and the leaflets have about 6 teeth on either side. This is the first record of *P. papuana* outside New Guinea.

P. leuconota D. Don var. *borneensis* Stapf from Mt. Kinabalu superficially resembles the present species. The latter is, however, distinctly different by the hardly or not exsert petals and the glabrous carpels. In a specimen of the Borneo variety of *P. leuconota*, collected by J. & M. S. Clemens (n. 26958) the petals are much exsert and the carpels erectly pilose at the top. This variety is undoubtedly, as has already been stated by J. D. Hooker, intermediate between *P. papuana* and the type of *P. leuconota*; the latter has the flowers aggregated to pseudo-umbels of at least 7 flowers.

Distribution: New Guinea, Celebes.

RUBIACEAE

(C. E. B. Bremekamp)

128. *Argostemma solaniflorum* Elm., Leafl. Phil. Bot. I, 1906, 2.

Celebes: Central Celebes, Mt. Mamboeliling, in mountain forest about 2500 m (*C. Monod de Froideville* 474; L).

Close to *A. montanum* Bl. from western Malaysia.

Distribution: Philippines except the Islands of the Palawan group. First record outside the Philippines proper.

129. *Hedyotis benguetensis* (Elm.) Elm., Leafl. Phil. Bot. III, 1911, 976.

Celebes: S.W. Celebes, Peak of Bonthain, Mt. Lompobatang (*C. Monod de Froideville* 256, small shrub, about 1 m high, flow. white or pale lilac, June 5—6, 1938; B, L).

Perhaps identical with the long-styled form described by Elmer

in Leaflet. Phil. Bot. I, 1906, 18 (sub *Oldenlandia benguetensis* Elm.).

Distribution: Luzon.

130. *Hedyotis* (*Diplophragma*) *coryphocetes* Brem., nov. spec.; *typus*: *Monod de Froideville* 230 (L); cymis terminalibus et axillaribus, corolla satis magna, extus glabra, tubo campanulato, lobis intus dense villosis ad *H. Elmeri* Merr. accedens, foliis multo minoribus utroque latere costa nervis 2 instructis, stipulis anguste triangularibus, cymis trifloris ab ea faciliter distinguenda.

Frutex circ. 1.25 m altus. *Rami* leviter quadricostati, glabri. *Folia* sessilia, basi tamen in pseudopetiolum alatum, 1.5—3 mm longum contracta, supra pseudopetiolum ovato-lanceolata, 2—3 cm longa et 7.5—10 mm lata apice acuta, coriacea, sicc. supra fucescens vel nigrescens, subtus dilute olivaceo-brunnea vel luteo-brunnea, supra glabra, subtus praesertim costa pilis paucis sparsa, nervis utroque latere costae 2, nervis infimis e basi, alteris prope basin partis ovato-lanceolatae orientibus, supra immersis, subtus prominulis, venulis subtus conspicuis. *Stipulae* anguste triangulares, 7.5 mm longae, basi 2.5 mm latae, extus intusque glabrae et raphidibus lineolatae, utroque latere appendicibus 7—8 capitatis, apicem versus longioribus instructae. *Inflorescentiae* cymosae, triflorae, terminales et axillares, in thyrsos 15-floras compositae. *Pedunculi* cymarum glabri, cymae terminalis 4—6 mm, aliarum usque ad 12 mm longi. *Bractae* florum lateralium lineari-lanceolatae, 9.5—12 mm longae et 1.5 mm latae, stipulis munitae; stipulae longitudine redactae, bifidae, bipartitae vel disjunctae, extus ad basin hirsutae, appendicibus paucioribus sed longioribus instructae. *Flores* pedicellati, ebracteolati, 4-meri. *Pedicellus* floris terminalis 2 mm, pedicelli florum lateralium 3.5 mm longi, glabri. *Ovarium* turbinatum 2 mm altum, glabrum, biloculare, utroque loculo ad medium septum placenta carnosae ovulis numerosis obiecta instructo. *Calyx* fere usque ad basin partitus, extus intusque glaber; lobi triangulares 6 mm longi et basi 1.5 mm lati, raphidibus lineolati, sinibus acutis separati et cum glandulis baculiformibus alternantes. *Corolla* dilute coerulea, extus glabra, tubus campanulatus 4 mm longus, intus glaber, lobi ovati patentes 4 mm longi et basi 3 mm lati, intus pilis unicellularibus subclavatis dense villosi. *Stamina* paulo infra incisuras corollae inserta; filamenta glabra, floris longistyli 0.8 mm longa; antherae oblongae, 1.7 mm longae. *Discus* vix conspicuus. *Stylus* glaber, floris longistyli 6 mm longus; stigmata appressa, semi-ovoida, 0.5 mm longa. *Fructus* diococus, calyce coronatus; cocci 4 mm longi, facie interna dehiscentes, seminibus circ. 10 instructi. *Semina* brunnea, angulosa, 1 mm diam., alveolata — *Fig. 11*.

Habitat regionem altissimam terrae celebicae australis.

Celebes: S.W. Celebes, Peak of Bonthain, G. Lompobatang, on the top of the mountain in an association of grass and shrublets, alt. 2900 m (*C. Monod de Froideville* 230, *type specimen*; L; B, L).

On account of our imperfect knowledge of the genus *Hedyotis* the position of the new species is difficult to determine. Regarding the structure of the fruit it is to be referred to the subgenus *Diplophragma*, which, however, is but vaguely distinct from *Dimetia*, the main differential character — the presence or absence of a conical top on the fruit — being unreliable. The various species referred to *Diplophragma*, on the other

hand, differ widely in the position of the inflorescences, which may be combined in a terminal thyrse or panicle or be confined to the axils of the leaves, in the presence or absence of hairs on the inside of the corolla lobes, and in the structure of the stipules. It is not impossible that a satisfactory classification of the species may be based on these characters, but they are at present not yet sufficiently known to be of much use. However, the only other species with terminal inflorescences and inside villous corolla lobes known at present appear to be the Philippine *H. Elmeri* Merr., *H. microphylla* Merr. and *H. benguetensis* Elm. The latter is a plant which is now known both from the mountains of the Philippines and of Celebes, but it is not impossible that *H. Maingayi* Hook.f. from Mt. Ophir in Malacca too may belong to this group: unfortunately the description makes no mention of the presence or absence of hairs on the corolla lobes. That *H. Maingayi* can not be conspecific with the plant collected on the Peak of Bonthain follows from the structure of the stipules, which are described as entire and eglandular. *H. benguetensis* has thinner leaves, entirely different stipules and much smaller flowers, and *H. Elmeri*, which doubtless comes nearer to our new species, has much larger leaves with 5 or 6 pairs of nerves and larger inflorescences.

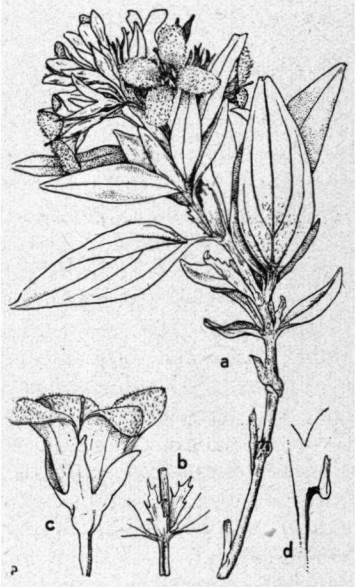


Fig. 11 — *Hedyotis coryphoeoctes* Brem., n. sp. — a. habit, nat. size; b. stipules, nat. size; c. flower, $\times 2$; d. stamen, $\times 3$ — after type specimen.

Inside villous corolla lobes are more common in *Diplophragma*-species provided with axillary inflorescences. Examples are *H. pulchella* Stapf, a plant collected on Mt. Kinabalu, which, apart from the position of the inflorescences, shows a remarkable degree of similarity with *H. benguetensis*, and further some Philippine species like *H. apoensis* Elm. and *H. Banksii* Elm.

131. *H. verticillata* (L.) Lamk., Ill. Gen. I, 1791, 271.

Celebes: Central Celebes, sunny places along road Sengkang-Palopo, about 20 m alt., fairly abundant (C. Monod de Froideville 280, procumbent herb with stiff stems, leaves shining and rigid; B, L).

Distribution: India and S. China to Philippines and Malaysia.

132. *Knoxia corymbosa* Willd., Sp. Pl. I, 1797, 582.

Celebes: Central Celebes, sunny places on fertile soil along road Sengkang-Palopo, low alt., some specimens (C. Monod de Froideville 266, erect herb, about 1 m high, flow. white; B, L).

Most specimens from the Netherlands Indies, commonly attributed to *K. corymbosa*, had probably better be kept separate under the name of *K. lineata* R. Br., which at present is often considered a subspecies to *corymbosa* but which probably deserves specific rank.

Distribution: India and China to tropical Australia. The distribution of the subspecies is not exactly known.

133. *Nertera depressa* Banks & Sol. ex. Gaertn., Fruct. et Sem. Pl. I, 1788, 124.

Celebes: Central Celebes, Mt. Mamboeliling, north of Mamasa, about 2000 m, in mountain forest (*C. Monod de Froideville 129*, creeping herb, fr. bright red, A° 1938; B, L).

Distribution: Sumatra, Java, Borneo, Celebes, Philippines, Australia, New Zealand, South America.

134. *Oldenlandia subulata* Korth., Ned. Kruidk. Arch. II, 2, 1851, 153; Miquel, Fl. Ind. bat. II, 1857, 188 and 353; Boerlage, Handl. Fl. Ned. Ind. II², 1899, 125 — *O. Horneriana* Miq., Fl. Ind. Bat. II, 1857, 190 and Suppl. 1860, 217 and 540 — (non *O. subulata* Korth. apud Valetton in Nova Guinea VIII³, 1911, 440, quae est "*O. herbacea* L." herb.).

Celebes: S.W. Celebes, "Tempe depression", alt. about 50 m, Sengkang, nr. Siwa, in grass vegetation, in wet season with many swampy places (*C. Monod de Froideville 399*, A° 1939, flow. and fr.; B, L).

Undoubtedly closely allied to the common weed known under the name of *Oldenlandia herbacea* (L.) Lamk. as well as to *O. Heynii* (R. Br.) Miq. (India to Burma), *O. dichotoma* Koen. (India and Brit. Malaya), probably also to *O. pusilla* Rottl. (syn. *O. brachiata* Wight) from India, with which Miquel associates his *O. Horneriana*. "*O. herbacea*"¹) is a flaccid, procumbent plant with subterete stems, *O. Heynii* is stiffly erect and has sharply quadrangular stems and leaves which turn black in drying. *O. subulata* is likewise erect and possesses four-ribbed stems, but the leaves are rigid and somewhat rough and the pedicels are densely covered by minute warts.

Distribution: Sumatra, Java, Borneo, S.W. Celebes.

135. *Ophiorrhiza nerterifolia* Brem., nov. spec.; *typus: Monod de Froideville 194*, L; inter species paucas uni- vel bifloras ad *O. perpusillam* Bl. accedens, caulibus sulcis solis hirtellis, foliis ovatis coriaceis, sicc. nigrescentibus, corolla majore ab ea distinguenda.

Herba ramosa parva, ramis e basi repente ascendentibus. *Rami graciles*, 0.5 mm diam., sicc. nigrescentes, internodia 0.5—2 cm longa, bisulcata; sulci pilis curvis hirtelli. *Folia* petiolo glabro, circ. 1 mm longo instructa; lamina ovata, 6—9 mm longa et 4.5—5 mm lata, apice acuta, coriacea, supra sicc. nigrescens, subtus albidia, costa nervisque tamen roseis, margine incrassata, supra apicem versus et praesertim ad marginem pilis paucis sparsa, subtus glabra, nervis utroque latere costae 3—5. *Stipulae* indivisae, filiformes, 2.5 mm longae, glabrae, ad basin margine et facie interiore glandulis aliquibus clavatis instructae. *Inflorescentiae* terminales solum, uni- vel biflorae. *Pedunculus* et *pedicellus* vix diversi, papilloso, plerumque bracteis filiformibus una vel duabus, usque ad 1.5 mm longis instructi, conjunctim usque ad 5 mm longi; *pedicelli* inflorescentiarum biflorarum inaequilongi, longiores usque ad 3 mm longi. *Bracteolae* nullae. *Ovarium* papillosum, 1.5 mm altum et 1.3 mm latum. *Calycis* lobi triangulares,

¹) The name *O. herbacea* is not quite certain; see Trimen's remarks (Handb. Fl. of Ceyl.) on the type specimen in Hermann's herbarium.

1.2 mm longi; carinati, carina labri, ceterum papilloso, sinus obtusis separati, alternantes cum glandulis clavatis. *Corolla* alba, extus glabra; tubus 5—6 mm longus, basi 1 mm diam., sed ad orem subito usque ad 2.5 mm diam. ampliatus, intus ad basin glaber, ceterum dense et longe sericeo-villosus, lobi triangulares 2.5 mm longi, basi 1.2 mm lati, intus pilis marginem versus longioribus papilloso. *Stamina* 0.7 mm supra basin tubi inserta; filamenta glabra 1.4 mm longa; antherae lineares 1.4 mm longae, basi breviter bilobatae. Granula pollinis carunculata. *Discus* conicus, 0.3 mm altus, bipartitus. *Stylus* glaber 3.3 mm longus; stigmata linearia styli vix crassiora 1.7 mm longa, appressa. *Fructus* 7 mm latus, 2.5 mm altus, lobis calycis coronatus, glabrescens. Semina luteo-brunnea angulosa alveolata 0.4 mm diam., numerosa — *Fig. 12.*

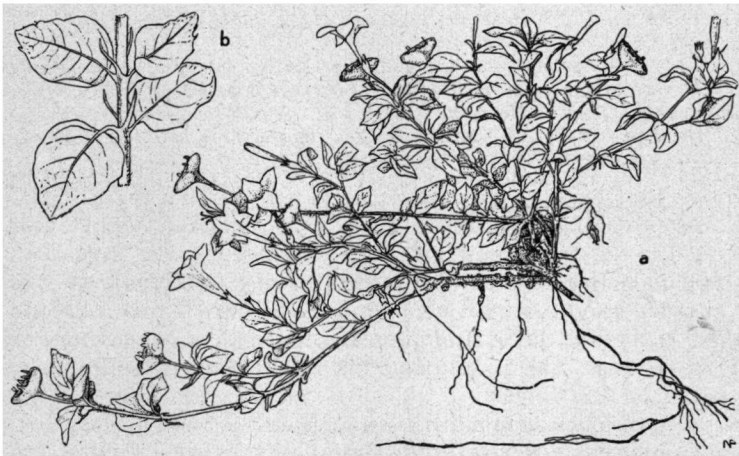


Fig. 12 — *Ophiorrhiza nerterifolia* Brem., n. sp. — a. habit, nat. size; b. leaves and stipules, $\times 2$ — after type specimen.

Habitat terram celebicam.

Celebes: Central Celebes, Makale, Rante Karoea, north of Makale, along road in coffee plantation of Mr van Dijk, alt. 1600 m, abundant (C. Monod de Froideville 194, L, type specimen, creeping herb, flow. white; B, L).

Ophiorrhiza-species with one or two flowers per inflorescence are comparatively rare and apparently confined to the eastern part of the Malay Archipelago. The plant described above resembles *O. perpusilla* Bl., of which the type was collected in Ternate, but which according to Miquel occurs also in Lombok, not however, as stated in De Candolle's monograph, in Java. *O. biflora* Elm. from Negros and Mindanao is but doubtfully distinct from *O. perpusilla* Bl. Another related species is *O. linearifolia* Merr. from Basilan, but this is a much larger plant with linear leaves and very small flowers.

SCROPHULARIACEAE

136. *Adenosma bilabiatum* (Roxb.) Merr., Enum. Phil. Flow. Pl. 3, 1923, 434.

Celebes: S.W. Celebes, Peak of Bonthain, Mt. Lompobatang, about 2500 m (C. Monod de Froideville 241, erect herb, flow. purple, June 5—6, 1938; B, L).

Distribution: India to Philippines and Malaysia (Herb. Lugd. Bat.: Bangka, Borneo, Amboina).

137. *Buchnera urticifolia* R. Br., Prodr. 1810, 437; Merrill, Enum. Phil. Flow. Pl. 3, 1923, 442.

Var. α *typica* H. J. Lam, nov. var. — Planta omnis plus minusve dense minute pubescens.

In the collections of the Rijksherbarium represented from Sumatra, Java, Timor, Soemba, Amboina, Boeroe, Thursday Isl., S. New Guinea, Australia.

Var. β *glaberrima* H. J. Lam, nov. var. — Planta marginibus bractearum paulo pubescentibus exceptis omnis glaberrima.

Lesser Sunda Islands: Lombok, Sembalang, Mt. Rindjani, 1300 m alt. (De Voogd 2078, flow., 12. 6. 1933; B, L).

Celebes: S.W. Celebes, G. Gelosong nr. Malino, about 310 m alt. (H. A. B. Bünemeyer 10809, type specimen of the var., flow. 5. 4. 1921; B, L); Bontoparang, about 50 m alt. (Id. 10687, flow. 29. 3. 1921; B, L); Boeloeparigi nr. Tanette, about 560 m alt. (Id. 12464, flow. 27. 6. 1921; B, L); in the hills of S.W. Celebes, frequent but scattered in grassland and cattle ground (C. Monod de Froideville 290, erect herb, flow. pink; B, L) — Central Celebes, Palopo, nr. Pareman, fairly abundant in rocky grassland, 100—150 m alt. (Id. 289, erect herb, up to 40 cm high, flow. white; B, L).

Philippines: Luzon (Ramos & Edaño 44766, Nov.-Dec. 1922); Culion (Lopez 41354, Oct. 1922).

The two varieties seem to be fairly distinct. Merrill (l. c.) combines with the present species R. Brown's *B. gracilis*, var. ? *glabrior* Benth. (in DC., Prodr. 10, 1846, 497) from the Philippines, and the distribution is indicated as tropical Australia and Philippines, but it is not clear which of the two varieties described above is meant. In spite of its name, *B. gracilis* var. *glabrior* should be distinguished by a slightly longer corolla. Now, Monod indicates for his nr. 290: flowers pink and smaller than those of n. 289 (in which the flowers are white). In fact, in n. 290 the corolla's are 0.8 cm long and the limbs 0.4 cm broad, in n. 289 these dimensions are 1 and 0.6 cm respectively. Of the other specimens quoted above, only Bünemeyer 10809 shows the larger flower type, all others have small flowers. The same homologous variation is found in var. α ; of the 20 specimens at hand 4 showed the larger flower type (which is apparently the rarer one), but 2 others were more or less intermediate or showed small-flowered plants intermixed with larger-flowered ones on the same sheet. I therefore prefer to restrict myself to draw the attention to these points and to leave it to further examination whether these differences will appear sufficiently clear to allow the creation of homologous forms in either variety and whether they are coordinated with the two colours, pink and white, mentioned by Monod de Froideville. The specimens of both varieties turn black when dried.

138. *Limnophila chinensis* (Osbeck) Merr., Am. Journ. Bot. 3, 1916, 581.

Celebes: Central Celebes, Palopo, Balokan, north of Makale, 1500 m alt., abundant on fallow wet paddy field (C. Monod de Froideville 186, erect herb, about 75 cm high, flow. pink, A° 1938; B, L).

Distribution: India and S. China to Java, Celebes and the Philippines.

139. *Lindernia cordifolia* (Colsm.) Merr., Enum. Phil. Flow. Pl. 3, 1923, 437.

Celebes: Central Celebes, Palopo, Balokan, north of Makale, 1500 m. alt. (C. Monod de Froideville 207 and 208, A° 1938; B, L).

Previously collected in S.W. Celebes by H. A. B. Bünnemeyer (ns. 11907, 12047 and 12385).

Distribution: India and China to Philippines, Celebes and Java.

140. *Razumovia cochinchinensis* (Lour.) Merr., Bull. Torr. Bot. Club 64, 1937, 594.

Celebes: S.W. Celebes, "Tempe-depression", grassland, in wet sason with many inundated places, about 50 m alt., fairly abundant (C. Monod de Froideville 231, erect herb, about 60 cm high; B, L).

Distribution: India to China and Japan, Formosa, Philippines, Sumatra, Java, Madoera, with a variety in India to China and another in Australia. The Celebes record is new.

UMBELLIFERAE

141. *Hydrocotyle sibthorpioides* Lamk., Enc. méth., bot. 3, 1789, 153; Buwalda, Blumea II³, 1936, 128.

Celebes: S.W. Celebes, Peak of Bonthain, Mt. Lompobatang, frequent in open subalpine vegetation on summit, 2900 m (C. Monod de Froideville 248 and 249, creeping herb, flow. June 5—6, 1938; B, L).

Distribution: Tropical Asia to Philippines and New Guinea; also in S. America?

142. *Sanicula europaea* L., Sp. Pl., 1753, 235; Buwalda, l.c., 159.

Celebes: Central Celebes, Mt. Bante Karoea, north of Makale, 2000 m alt., abundant in mountain forest (C. Monod de Froideville 173, flow. A° 1938; B, L).

Distribution: Europe to Japan, southward to the mountains of Africa, India and Malaysia to Mindanao, Celebes, Ceram and Timor.

143. *Trachymene celebica* Hemsl., Kew Bull., 1896, 37; Buwalda, l.c., 149.

Celebes: S.W. Celebes, Peak of Bonthain, Mt. Lompobatang, fairly abundant in open subalpine vegetation of summit, 2700—2800 m alt. (C. Monod de Froideville 235, flow. June 5—6, 1938; B, L).

Distribution: endemic (S.W. Celebes). Of this chiefly Papuan genus 6 species are known from Celebes, the northernmost locality is the Poanaa Mountains in Central Celebes. Four of these six species are endemic.

URTICACEAE

(G. J. H. Amshoff)

144. *Chamabainia cuspidata* Wight, Icon. 6, 1853, 11, t. 1981; Robinson, Phil. Journ. Sci. 6, 1911, 11 — *Urtica squamigera* Wall., Cat. 1831, n. 4592, nom. nud. — *Chamabainia squamigera* Wedd. in DC., Prodr. 16¹, 1869, 218; Merrill, Phil. Journ. Sci. I, 1906, 184.

Celebes: S.W. Celebes, Peak of Bonthain, Mt. Lompobatang, on open summit between grasses, 2700 m (C. Monod de Froideville 247, June 5—6, 1938, flow.; B, L).

This species deceivingly resembles *Droguetia pauciflora* (Rich.) Wedd. (Abyssinia, India, Java) and also, but less strikingly, *Pilea Wightii* Wedd.;

from both it is distinguished by the quite different flowers. It represents the first record of the species in the Netherlands Indies.

Distribution: India and Ceylon to S.W. China, Luzon, Mindanao, Celebes, on higher mountains.

145. *Elatostema delicatulum* Wedd. in Ann. Sc. Nat. 4e Sér. I, 1854, 190; DC., Prodr. 16¹, 1869, 187; Robinson in Phil. Journ. Sci. 5, 1910, 520 — *E. obtusum* Wedd., var. *delicatulum* Wedd. in DC., Prodr. l. c.

Celebes: S.W. Celebes, Peak of Bonthain, Mt. Lompobatang, abundant in mountain forest, 2000 m (C. Monod de Froideville 223, ♀, June 5—6, 1938; B, L).

The synonymy and, consequently, the distribution is not fully clear. According to Robinson, *E. delicatulum* is endemic in the Philippines, differing from the closely related *E. obtusum* Wedd. by the short-stalked, less pubescent capitula. The above specimen fully agrees with the Philippine specimens in its sessile, much and silverish pubescent capitula. *E. obtusum* is said to occur in the Himalaya (t. Weddell; cf. also H. Schroeter in Fedde's Rep. Beih. 83, 1935, 30—34), and Merrill (Enum. Phil. Flow. Pl. II, 1923, 80) mentions *E. obtusum* Wedd. only "quoad Phil.". If *E. obtusum* and *delicatulum* should prove to be synonymous, the latter name is the valid one as has been observed by Robinson, since *obtusum* is of 1856 (Arch. Mus. Par. 9, 1856, 324).

VIOLACEAE

(with S. J. van Ooststroom)

146. *Viola arcuata* Bl., Bijdr. 1825, 58.

Celebes: Central Celebes, Mt. Mamboeliling, north of Mamasa, in mountain forest, about 2000 m alt. (C. Monod de Froideville 151, stoloniferous herb, flow. white with dark purple delineation, A° 1938; B, L).

Distribution: India to southern China southward to Luzon, Celebes and Java.

147. *V. betonicifolia* Sm. in Rees, Cycl. 37, 1819, n. 7.

Subsp. *nepalensis* (Ging.) W. Beck., Engl. bot. Jahrb. 54, 1917, Beibl. 120.

Celebes: S.W. Celebes, Loka, on slope of Mt. Lompobatang (Peak of Bonthain), along road nr. resthouse, 1000 m alt. (C. Monod de Froideville 217, fr., June 5—6, 1939 [recte 1938 †], often [certain parts of the year †] only cleistogamous; B, L) — Central Celebes, Balokan, north of Makale, some specimens on premises of resthouse, 1500 m alt. (C. Monod de Froideville 363, flow., A° 1939; L).

Undoubtedly very close to *V. inconspicua* Bl. from India to China, Formosa, Philippines, Brit. Malaya, Borneo, Java and Sumatra, with the type of which (Bl. in Herb. Lugd. Bat. !) it seems to be connected by a series of intermediate forms. In the specimens quoted the leaves are long and narrow, about 4.5 cm long, 2 cm broad across the subsagittate base. For n. 217 cleistogamy is indicated, a character well known in *V. inconspicua*.

Distribution of the subspecies: India and Ceylon to China and Japan, Formosa, Philippines, Celebes, Timor, Java. The other subspecies (*australensis* W. Beck, l. c.) in eastern and southern Australia and Tasmania.

148. *V. serpens* Wall. in Roxb., Fl. Ind. ed. Carey II, 1832, 449.

Celebes: S.W. Celebes, Peak of Bonthain, Mt. Lompobatang, 1600 m alt. (*C. Monod de Froideville* 245, flow., June 5—6, 1938; B, L); Kanreapia forest nr. Malino, about 1200 m alt., some specimens along shady trail (*Id.* 397, flow. & fr., A° 1939; L).

Distribution: India to China, Sumatra, Java, Lesser Sunda Islands (1 specimen in Herb. Lugd. Bat. without further indication of locality, collected by *De Voogd n. 1852*, 14.10.1934; possibly from Bali). New for Celebes.

Discussion on the Collection Monod de Froideville.

Of the collection Monod de Froideville 148 species were identified; 117 of these were represented by specimens, 31 by pictures.

The following is an enumeration of new taxa:

New species (13):

- Asplenium Psychropolitanum* H. J. Lam et C. J. Verhey (Polypod.)
- Boea leporina* H. J. Lam (Gesner.)
- Bulbophyllum falcuicornis* J. J. S. (Orchid.)
- Dendrochilum Monodii* J. J. S. (Orchid.)
- Elaphoglossum pumilum* H. J. Lam et C. J. Verhey (Polypod.)
- Gentiana uncifolia* H. J. Lam (Gentian.)
- Hedyotis coryphocetes* Brem. (Rubiace.)
- Microstylis mambulilingensis* J. J. S. (Orchid.)
- Ophiorrhiza nerterifolia* Brem. (Rubiace.)
- Ranunculus Frigidurbis* H. J. Lam (Ranunc.)
- Sonerila celebica* Bakh.f. (Melastom.)
- Sonerila Froidevilleana* Bakh.f. (Melastom.)
- Strophacanthus celebicus* Brem. (Acanth.)

New variety (1):

- Buchnera urticifolia* R. Br., var. *glaberrima* H. J. Lam (Scroph.)

New form (1):

- Rhododendron quadrasianum* Vid., fa. *Monodii* H. J. Lam (Ericac.)

New combinations (6):

- Trochocarpa celebica* (J. J. S.) H. J. Lam
- „ *DeKockii* (J. J. S.) H. J. Lam
- „ *Gjellerupii* (J. J. S.) H. J. Lam
- „ *Learmonthiana* (Gibbs) H. J. Lam
- „ *nutans* (J. J. S.) H. J. Lam
- „ *Vannouhuysii* (J. J. S.) H. J. Lam

In addition, the following species etc. are probably new for the Celebes flora (20):

- Argostemma solaniflorum* Elm. (Solan.)
- Bulbophyllum macranthum* Lindl. (Orchid.)
- Cerastium indicum* W. et A. (Caryoph.)
- Chamabainia cuspidata* Wight (Urtic.)
- Cynoglossum micranthum* Desf. (Borag.)
- Dipteris novo-guineensis* Posth. (Polypod.)
- Elatostema delicatulum* Wedd. (Urtic.)
- Eulophia exaltata* Rehb.f. (Orchid.)

- Hedyotis benguetensis* (Elm.) Elm. (Rubiace.)
Lycopodium clavatum L., var. *tamariscispica* Ces. (Lycop.)
Lysimachia japonica Thunb. (Primul.)
Polygonum minus Huds., subsp. *decipiens* (R. Br.) Dans. (Polygon.)
Potentilla papuana Focke (Rosac.)
Pratia nummularia (Lamk.) Kurz. (Campan.)
Razumovia cochinchinensis (Lour.) Merr. (Scroph.)
Scutellaria luzonica Rolfe (Lab.)
Selaginella singalanensis Hieron. (Selaginell.)
Utricularia orbiculata Wall. (Lentib.)
Viola serpens Wall. (Violac.)
Weinmannia urdanetensis Elm. (Cunon.)

Collectors' numbers

The species have been referred to by their consecutive number:

- BACKER, C. A. — 9725 (98).
 BOSCHPROEFSTATION, etc., v. FOR. SERV.
 BÜNNEMEYER, H. A. B. — 10687 (137); 10809 (137); 10853 (6); 10947 (110);
 10948 (78); 11204 (78); 11843 (78); 11887 (110); 11896 (93); 11906 (105);
 11907 (139); 12064 (78); 12184 (93); 12223 (96); 12250 (96); 12254 (93);
 12385 (139); 12464 (137).
 CARR, C. E. — 14415 (17).
 CLEMENS, J. & M. S. — 27097 (93); 27097 B (93); 27474 (80); 27779 (93);
 27912 (96); 28956 (94e); 28995 (93); 29130 (93); 30374 (93); 30375 (93);
 31692 (96); 31944 (96); 32326 (96); 32380 (93); 32437 (80); 32449 (96);
 32707 (96); 32989 (96); 35055 (80); 40575 (96); 40664 (96); 50874 (94e);
 50874a (93); 50875 (93).
 ELBERT, J. — 1094 (98); 1362 (98); 2241 (98); 3042 (125).
 ELMER, A. D. E. — 8500 (6); 11389 (93); 14142 (11).
 FORBES, H. O. — 3818 (105).
 FOR. OFFICER KOEPANG — 8 (93).
 FOR. SERV., NETH. IND. — 188 (98), Ja. 2997 (98); s. n. 27. 9. 1933 (93); s. n. 10. 5. 1936
 (110).
 GIBBS, L. S. — 4126 (94e); 4305 (94e).
 GJELLERUP, K. — 1184 (94c).
 GRESSITT, LINSLEY — 441 (111); 488 (111).
 HALLIER, H. — 575 (96).
 KJELLBERG, G. K. — 1168 (109); 1443 (43); 3925 (98).
 KOCK, DE — 83 (94d).
 LAM, H. J. — 1750 (17); 2150 (36).
 LOPEZ — 41354 (137).
 LÖRZING — 482 (98).
 MAIER, v. SARIP.
 MC GREGOR — 19736 (96).
 MERRILL, E. D. — 4752 (96).
 MONOD DE FRODEVILLE, C. — 106 (42); 108 (39); 109 (111); 110 (40); 111 (41);
 117 (116); 118 (104); 119 (92); 120 (96); 124 (95); 127 (94); 129 (133);
 130 (17); 131 (146); 132 (16); 133 (16); 135 (7); 136 (24); 137 (22);
 138 (23); 164 (43); 167 (28); 168 (36); 171 (114); 171a (113); 173 (31);
 175 (32); 177 (12); 178 (142); 179 (15); 184 (103); 185 (123); 186 (138);
 187 (96); 188 (75); 191 (111); 192 (80); 193 (81); 194 (135); 195 (77);
 200 (89); 201 (124); 202 (113); 207 (139); 208 (139); 209 (126); 210 (127);
 217 (147); 218 (110); 219 (82); 220 (76); 221 (76); 222 (117); 223 (145);
 224 (27); 225 (21); 226 (83); 227 (108); 228 (78); 229 (105); 230 (130);
 231 (115); 232 (93); 235 (143); 237 (14); 239 (85); 240 (84); 241 (136);

- 243 (87); 244 (88); 245 (148); 247 (144); 248 (141); 249 (141); 253 (19);
 256 (129); 259 (109); 260 (30); 261 (101); 264 (34); 266 (132); 267 (107);
 269 (79); 270 (112); 271 (98); 275 (8); 277 (1); 278 (11); 280 (131);
 281 (140); 283 (120); 284 (119); 288 (33); 289 (137); 290 (137); 363 (147);
 365 (18); 367 (121); 368 (122); 369 (4); 370 (1); 371 (2); 372 (3);
 372a (2); 374 (5); 375 (38); 375a (37); 376 (20); 377 (13); 378 (35);
 379 (8); 381 (90); 383 (86); 384 (125); 385 (25); 386 (100); 388 (118);
 389 (119); 390 (6); 391 (10); 392 (9); 393 (91); 394 (26); 396 (102);
 397 (148); 398 (97); 399 (134); 400 (29); 401 (106); 471 (119); 474 (128).
 PULLE, A. A. — 574 (96); 578 (96); 590 (94a); 820 (96); 828 (96); 895 (96);
 970 (93); 973 (94b).
 RACHMAT (L. VAN VUUREN) — 435 (80); 883 (98); 933 (96); 1007 (80).
 RAMOS & EDAÑO — 44766 (137).
 SARIP (MAIER) — 397 (98).
 STEENIS, C. G. G. J. VAN — 4597 (98).
 VERSTEEG, G. M. — 2413 (93); 2529 (93); 2544 (94b).
 VOOGD, DE — 1852 (147); 2078 (137).
 VUUREN, L. VAN, v. RACHMAT.
 ZOLLINGER, H. — 1684 (98).
 ZIJLL DE JONG, J. VAN — 6 (98); 23 (98).
 † COLLECTOR — 1062 (93); 1373 (106).

Index to Scientific names

As the above enumeration has been arranged alphabetically throughout, the present index only contains generic names and, in addition, the names of specific synonyms (in italics) as well as those of species mentioned in the discussions to the species. In the two last-named categories, the species they belong to have been indicated by their consecutive number. The genera are referred to by the consecutive numbers of their species.

- | | |
|--|--|
| Acalypha (99) | Coelogyne (51) |
| Aciropsis (44) | Curculigo (33) |
| Adenosma (136) | Cymbidium (52) |
| Aerides (45) | Cynoglossum (78, 79) |
| Agathis (30) | <i>lanceolatum</i> Forssk. (79) |
| Anaphalis (85) | Cyperus (35) |
| Argostemma (128) | <i>Dendrobium</i> (53—59) |
| <i>montanum</i> Bl. (128) | Dendrochilum (40, 41) |
| Ascocentrum (46) | Difflugosa (76) |
| Asplenium (14, 15) | <i>celebica</i> Brem. (76) |
| <i>caudatum</i> Forst. (14) | <i>filiformis</i> (Bl.) Brem. (76) |
| <i>acutiusculum</i> Bl. (14) | Diplycosia (95) |
| <i>Basigyne muriculata</i> J. J. S. (41) | <i>aperta</i> J. J. S. (95) |
| Boea (106) | <i>pokapindjagensis</i> J. J. S. (95) |
| Buchnera (137) | Dipteris (17) |
| <i>gracilis</i> R. Br. (137) | <i>conjugata</i> Reinw. (17) |
| Bulbophyllum (39, 47, 48) | Droguetia pauciflora (Rich.) Wedd. (144) |
| <i>agapethoides</i> Schltr. (39) | Drynaria (18) |
| <i>aureum</i> J. J. S. (39) | Elaphoglossum (19) |
| <i>perpendicularare</i> Schltr. (39) | <i>dolichaulon</i> v. A. v. R. (19) |
| Burmannia (34) | Elatostema delicatulum Wedd. (145) |
| Caladenia (49) | <i>obtusum</i> Wedd. (145) |
| Calanthe (50) | Eria (60—62) |
| Calymmodon (16) | Eulophia (63) |
| <i>Castanea acuminatissima</i> Bl. (103) | Euphorbia (100—102) |
| Cerastium (83) | Evolvulus (90) |
| Ceratopteris (10) | Gentiana (104) |
| Chamabainia (144) | <i>borneensis</i> Hook.f. (104) |
| <i>squamigera</i> Wedd. (144) | <i>lateriflora</i> Hemsl. (104) |

- (Gentiana)
 lycopodioides Stapf (104)
 quadrifaria Bl. (104)
 Geranium (105)
 nepalense Sw. (105)
 Gleichenia (11)
lanigera Don (11)
 Gnaphalium (86, 87)
 Habenaria (64)
 Halorrhagis (109)
 Hausmannia (17)
 crenata (Nath.) Richt. (17)
 Hedyotis (129—131)
 apoensis Elm. (130)
 Banksii Elm. (130)
 benguetensis (Elm.) Elm. (130)
 Elmeri Merr. (130)
 Maingayi Hook.f. (130)
 microphylla Merr. (130)
 pulchella Stapf (130)
 Hydrocotyle (141)
 Hymenolepis (20)
 spicata (L.) Presl (20)
 Hymenophyllum (12)
 Hypericum (108)
Justicia dichotoma (77)
 Knoxia (132)
 lineata R. Br. (132)
 Lactuca (88)
 Lemna (37, 38)
 Leptospermum (115)
Leucopogon suaveolens Hook.f. (93)
 Linnophila (138)
 Lindernia (139)
 Lycopodium (1—5)
 Lygodium (29)
 Lysimachia (124)
 Marsilea (13)
 Microstylis (42, 65)
 purpureo-viridii J. J. S. (42)
 Monochoria (75)
 Myriactis (89)
 humilis Merr. (89)
 Nasturtium (91)
 Nepenthes (116)
 Nertera (133)
 Nervilia (66)
 Octarrhena (43)
 celebica Schltr. (43)
 Oldenlandia (134)
 benguetensis Elm. (129)
brachiata Wight (134)
 dichotoma Koen. (134)
 herbacea (L.) Lamk. (134)
 Heynii (R. Br.) Miq. (134)
Horneriana Miq. (134)
 pusilla Bottl. (134)
 Ophiorrhiza (135)
 biflora Elm. (135)
 linearifolia Merr. (135)
 perpusilla Bl. (135)
 Paphiopedilum (67)
 Peperomia (117)
 Peristylus (68, 69)
 Pholidota (70)
 Pilea Wightii Wedd. (144)
 Plantago (118)
 Plectranthus (110)
 Podocarpus (31, 32)
 Polygala (119—121)
 Polygonum (123)
 Polypodium (21—24)
cucullatum Nees (16)
 enerve Cav. (24)
 triquetrum Bl. (22)
 Potentilla (127)
 leuconota D. Don (127)
 peduncularis Don (127)
 Pratia (80, 81)
 Quercus (103)
Jungkuhnii Miq. (103)
 mindanaensis Elm. (103)
 Ranunculus (125, 126)
 diffusus DC. (126)
 Sarasinorum Warb. (126)
 Razumovia (140)
Ehaphidospora dichotoma (Bl.) Nees (77)
membranifolia Miq. (77)
 Rhynchosglossum (107)
 Rhododendron (96—98)
cuneifolium Stapf (96)
 javanicum (Bl.) Benn. (97)
Lindavianum Koord. (96)
 Loerzingii J. J. S. (97)
 lomphense J. J. S. (97)
 Meliphagidum J. J. S. (96)
 retusum Benn. (96)
rosmarinifolium Vid. (96)
 Schadenbergii Warb. (97)
 Sagina (84)
 Salomonina (122)
 Sanicula (142)
 Sarcanthus (71)
 Sarcophilus (72)
 Sarcopyramis delicata Robins. (114)
 Scutellaria (111)
 Selaginella (6—9)
Hombroni Hier. (6)
 Ketra-ayam v. A. v. B. (6)
 lepida Hier. (6)
 leptophylla Bak. (6)
 Teysmanni Hier. (6)
 Zollingeriana Spring (6)
 Sonerila (113, 114)
 brachyandra Naud. (114)
 laeviuscula Zoll. & Mor. (114)
 Stenosemia (25)
 Strophacanthus (77)
 collinus (T. And.) Lind. (77)
dichotomus (Bl.) Nees (77)
 membranifolius (Miq.) Brem. (77)

Styphelia (93)

- abnormis* (Sond.) J. J. S. (93)
- celebica* J. J. S. (94)
- DeKockii* J. J. S. (94d)
- Gjellerupii* J. J. S. (94c)
- Lamii* J. J. S. (94f)
- lanceifolia* Hook.f. (93)
- Learmonthiana* Gibbs. (94e)
- malayana* (Jack) J. J. S. (93)
- moluccana* (Scheff.) J. J. S. (93)
- nutans* J. J. S. (94a)
- obovata* (Fawc.) J. J. S. (93)
- obtusifolia* J. J. S. (93)
- papuana* (C. H. Wright) J. J. S. (93)
- philippinensis* Merr. (93)
- pungens* (Jungh.) Koord. (93)
- spicata* J. J. S. (93)
- trilocularis* J. J. S. (93)

(Styphelia)

- Vannouhuysii* J. J. S. (94b)
- wetarensis* J. J. S. (93)
- Thyrsostachys* (36)
- siamensis* Gamble (36)
- Trachymene* (143)
- Trichoglottis* (73)
- Trochocarpa* (94, 94a-f)
- Urtica squamigera* Wall. (144)
- Utricularia* (112)
- Vaginularia* (26)
- Vandopsis* (74)
- Viola* (146-148)
- inconspicua* Bl. (147)
- Vittaria* (27, 28)
- Wahlenbergia* (82)
- marginata* (Thunb.) A. DC. (82)
- Weinmannia* (92)