

FLORAE MALESIANAE PRECURSORES XXXVII
MATERIALS TOWARDS THE KNOWLEDGE OF THE
EPACRIDACEAE MAINLY IN ASIA, MALAYSIA, AND THE PACIFIC

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In the present work details are given in the first place for the extra-Australian *Epacridaceae* except *Lebetanthus* (South America), of which a part forms the base for my revision of the family for the 'Flora Malesiana' and for 'Pacific Plant Areas'. Key to the subgenera and sections of the genus *Styphelia*, to the Malaysian species of *Styphelia*, to all species of *Styphelia* subgen. *Cyathodes*, and to the species of the genus *Trochocarpa* are added.

During visits to the following herbaria specimens have been examined: Natural History Museum, London (BM), Brisbane (BRI), Berkeley (UC), Geneva (G), Gray Herbarium, Cambridge (A, GH), Honolulu (BISH), Kew (K), Lae (LAE), Manila (PNH), New York (NY), Paris (P), Sydney (SYD) and Utrecht (U), besides the specimens at Leiden (L) and the ones sent on loan from Bogor (BO) and Singapore (SING).

As a member of the 2nd Expedition of the Rijksherbarium to New Guinea in 1961/62, I had the opportunity to study *Epacridaceae* in the Cycloop Mts, in the Eastern Highlands and in the Vogelkop Peninsula. During a 3-weeks stay in the Hawaiian Islands, thanks to the kind hospitality of Dr Otto & Isa Degener, Waialua, and of Mr Herbert Shipman, Hilo, I was able to visit Oahu, Kauai, Maui, and Hawaii, collecting 'pukeawe' from sealevel up to 3000 m in numerous places. Australian *Epacridaceae* were observed in the field during excursions with Mr S. L. Everist and Mr L. S. Smith around Brisbane, and with Mr K. Mair around Sydney. I wish to express my sincere thanks to all persons who helped me to perform these studies.

I. STYPHELIA

J. E. Smith, Spec. Bot. New Holl. (1793) 45, t. 14 *et aut. sequ.*, *sensu* F. v. M., Fragm. 6 (1867) 50 (*incl.* *Astroloma* R. Br., *Cyathodes* Lab., *Leucopogon* R. Br., *Lissanthe* R. Br., *Melichrus* R. Br., *Stenanthera* R. Br.); Drude *in* E. & P., Pfl. Fam. 4, 1 (1889) 76; Koord., Exk. Fl. Java 3 (1912) 19; J. J. S., Nova Guinea 8, 4 (1912) 798; *ibid.* 12, 5 (1917) 539; *ibid.* 18 (1936) 123; Maiden & Betche, Census N.S. Wales Pl. (1916) 164; Steen., Bull. Jard. Bot. Btzg III, 13 (1933) 52; Back., Bekn. Fl. Java (em. ed.) 7 (1948) fam. 164, p. 1.
Lectotype species: *S. tubiflora* Sm.

Styphelia Sol. *in* Forst., Prod. (1786) 13 (*Stiphelia*) has no nomenclatural status.

F. v. Mueller (1867) grouped most of Brown's genera into *Styphelia*, but retained them at the sectional level. Bentham (Fl. Austr. 4, 1869) did not accept F. v. Mueller's classification, apparently for the sake of convenience. Later Drude (1889) followed F. v. Mueller with minor alterations, and this last classification was accepted by Maiden & Betche (1916).

KEY TO THE SUBGENERA AND SECTIONS

1. Flowers constantly 4-merous. *New Caledonia*
Subgen. *Cyathopsis* (Brongn. & Gris *pr. gen.*) Drude (*Type sp.*: *S. floribunda* (Brongn. & Gris) Sleum.).
1. Flowers generally 5-merous.
 2. Subtending bract and the two bracteoles inserted at some distance from the calyx. *Australia*
Subgen. *Lissanthe* (R. Br. *em. Benth. pr. gen.*) Drude (*Lectotype sp.*: *S. sapida* (R. Br.) F. v. M.).
 2. Subtending bract and bracteoles inserted immediately below the calyx.
 3. Subtending bract 1 (or rarely 0); bracteoles 2, strictly opposite. *Indochina, Burma, Siam, Malaysia, Melanesia (Bougainville), Australia (incl. Tasmania), New Zealand, New Caledonia, New Hebrides, Fiji*
Subgen. *Leucopogon* (R. Br. *pr. gen.*) Drude (*Lectotype sp.*: *S. lanceolata* Sm.).
 3. Subtending bract 1; bracteoles 3 or more, imbricate.
 4. Corolla short, tubular-funnel-shaped, or urceolate, or campanulate, glabrous or hairy inside, the hairs generally found *above* the middle. *SE. Australia (incl. Tasmania), SE. New Guinea, New Zealand (incl. Auckland, Campbell, Chatham, and Stewart Isl.), Micronesia (Marianas: Alamagan), Polynesia (incl. Hawaii, Society and Marquesas Isl., Rapa Isl.)*
Subgen. *Cyathodes* (Lab. *em. R. Br. pr. gen.*) Drude (*Lectotype sp.*: *S. billardierii* F. v. M. = *Cyathodes glauca* Lab.).
 4. Corolla \pm elongate-tubular, provided with hairs, or with 5 (hairy or glandular) scales inside *below* the middle. *Australia (incl. Tasmania)*
Subgen. *Styphelia*. For the sections follow the key.
 5. Stamens far exserted; filaments elongate-filiform. Sect. *Styphelia*.
 5. Stamens included in the corolla tube, at most reaching the base of the corolla lobes; filaments short.
 6. Corolla tube (usually elongate) inside provided with 5 hairtufts or with a dense ring of hairs or with 5 hairy scales
Sect. *Astroloma* (R. Br. *pr. gen.*) Drude (*Type sp.*: *S. humifusa* (Cavan.) Pers.).
 6. Corolla tube inside either glabrous or with scattered hairs (no hairy scales).
 7. Corolla tube inside with 5 glandular scales
Sect. *Melichrus* (R. Br. *pr. gen.*) Drude (*Type sp.*: *S. procumbens* (Cavan.) Pers.).
 7. Corolla tube inside without such scales
Sect. *Stenanthera* (R. Br. *pr. gen.*) Drude (*Type sp.*: *S. pinifolia* (R. Br.) Spr.).

subg. LEUCOPOGON

(R. Br.) Drude in E. & P., Pfl. Fam. 4, I (1889) 78. — *Leucopogon* R. Br., Prod. (1810) 541, *nom. cons.* (*lectotype sp.*: *S. lanceolata* Sm. = *Leucopogon lanceolatus* (Sm.) R. Br.); R. & S., Syst. 4 (1819) xlii; Don, Gen. Syst. 3 (1834) 777; Miq., Fl. Ind. Bat. 2 (1859) 1052, *incl. § Stypheliopsis* Miq., *l.c.* and § *Anacyclodon* (Jungb.) Miq., *l.c.* 1053; Benth., Fl. Austr. 4 (1869) 176; Clarke in Hook. f., Fl. Br. Ind. 3 (1882) 477; K. & G., J. As. Soc. Beng. 74, ii (1905) 83; Ridl., Fl. Mal. Pen. 2 (1923) 223; Guillaumin, Bull. Soc. Bot. Fr. 88 (1941) 657; A. C. Smith, The Scientif. Monthly 73 (1951) 13; J. Arn. Arb. 22 (1952) 105; *ibid.* 36 (1955) 286. — *Styphelia* sect. *Leucopogon* (R. Br.) Maiden & Betche, Census New S. Wales Pl. (1916) 165. — *Anacyclodon* Jungb., Nat. Genesck. Arch. N. I. 2 (1845) 49 (based on *A. pungens* Jungb., *l.c.*).

KEY TO THE ASIATIC AND MALAYSIAN SPECIES

1. Leaves sessile or almost so, with (very) numerous, approximate, equally delicate nerves, the individual course of which can hardly be traced.
 2. Leaves initially ciliate along the whole margin, at full maturity still so at least in the basal part. *New Guinea* I. *S. abscondita*
 2. Leaves eciliate from the beginning.
 3. Ovary glabrous. Style glabrous or patently short-hairy in the lower part. *Indochina, Lower Burma, Siam, Sumatra, Malay Peninsula, Banka, Billiton, Borneo.* 2. *S. malayana* var. *malayana*
 3. Ovary hairy all over the top. Style always patently short-hairy in the lower half. *New Guinea* 2. *S. malayana* var. *novoguineensis*
1. Leaves generally (shortly) petiolate, with fewer nerves, the inner 3—5(—7) straight and parallel from the base to the apex, stronger (or more conspicuous) than the outer ones which are fan-like diverging from them.

4. Leaves either ending in a very short (not caducous or breakable), callose, acute point or tip, or sub-acute to obtuse. *N. Borneo, Celebes, Philippines, Timor, New Guinea, Bougainville* 3. *S. suaveolens*
4. Leaves ending in a conspicuous hair- or needle-like, pungent and rather persistent (though breakable), 1—2 mm long point.
5. Leaves densely and rather coarsely serrulate-ciliate. Corolla 6(—7) mm. *E. Java* 4. *S. javanica*
5. Leaves whether or not finely and appressedly ciliate. Corolla up to 4 mm.
6. Leaves oblanceolate. (Corolla 3.3—3.5 mm.) *Timor, Alor* 5. *S. forbesii*
6. Leaves all or most of them (in the same specimen) lanceolate or linear-lanceolate.
7. Leaves rather densely arranged, (1—)1.5—2 mm wide. Corolla 2.5—2.7(—3) mm. *N. Australia, Wetar* 6. *S. acuminata*
7. Leaves densely to very densely, i.e. imbricately arranged, 2—3 mm wide. Corolla (3—)3.5 mm. *N. Borneo, SE. Celebes (Kabaena), Talaud Isl. (Karakelong), Sula Isl. (Taliabu), Moluccas (Ambon, Ceram, Buru), NW. New Guinea (Gebeh, Waigeu)* 7. *S. abnormis*

1. *Styphelia abscondita* J.J.S., Nova Guinea 18 (1936) 124, t. 33, 2.

NEW GUINEA. Northern part: Doormantop, 3250 m, *Lam 1597* (BO, type; L).

Note. Possibly but a variety of *S. malayana* Jack.

2. *Styphelia malayana* (Jack) Spr., Syst. 4 (1827) Cur. post. 67 ('malaica'); F. v. M., Fragm. 6 (1867) 56; Drude in E. & P., Pfl. Fam. 4, 1 (1889) 78 ('malayica'); Koord., Rec. Trav. Bot. Néerl. 7 (1910) 65, in text: J.J.S., Ic. Bog. 4 (1910) 82 ('malayica'); Nova Guinea 8, 4 (1912) 797; Gibbs, J. Linn. Soc. Bot. 42 (1914) 107; Merr., En. Born. (1921) 467; Steen., Bull. Jard. Bot. Btzg III, 13 (1933) 52; Richards, J. Ecol. 24 (1936) 35 & 352; Masam., En. Phan. Born. (1943) 577; Heine in Fedde, Rep. 54 (1951) 246; Merr., J. Arn. Arb. 33 (1952) 230; Heine, Pflanzensamml. Clemens Kinabalu (1953) 83; Good, Geogr. Fl. Pl. ed. 2 (1953) 193. — *Leucopogon malayanus* Jack, Mal. Misc. 1, 5 (1820) 20, ref. Edinb. Phil. J. 6 (1822) 397, repr. Wall. in Roxb., Fl. Ind. ed. Carey & Wall. 2 (1824) 301, ditto in Hook., Bot. Misc. 2 (1830) 71; G. Don., Gen. Syst. 3 (1834) 777; DC., Prod. 7 (1839) 744; Voigt, Hort. Suburb. Calc. (1845) 334; Miq., Fl. Ind. Bat. 2 (1859) 1052; *ibid.* Suppl. 1 (1860) 250, 585; Kurz, Nat. Tijd. N.I. 27 (1864) 215; Scheff., *ibid.* 31 (1870) 363; Hance, J. Bot. 15 (1877) 335; Kurz, J. As. Soc. Beng. 46, ii (1877) 217, var. α ; For. Fl. Br. Burma 2 (1877) 95; Clarke in Hook. f., Fl. Br. Ind. 3 (1882) 477; Ridl., J. Str. Br. R. As. Soc. 23 (1891) 146; Boerl., Handl. 2, 1 (1891) 274; Stapf, Trans. Linn. Soc. ser. 2 Bot. 4 (1894) 198; Ridl., J. Str. Br. R. As. Soc. 33 (1900) 103; K. & G., J. As. Soc. Beng. 74, ii (1905) 83; Ridl., J. Linn. Soc. Bot. 38 (1908) 314, repr. J. Fed. Mal. St. Mus. 2 (1908) 121; *ibid.* 6 (1915) 49, 158; Merr., Philip. J. Sc. 10 (1915) 191; Ridl., Fl. Mal. Pen. 2 (1923) 223, f. 94; Dop in Fl. Gén. I.—C. 3 (1930) 747, f. 83; Burk., Dict. (1935) 1340; Symington, J. Mal. Br. R. As. Soc. 14 (1936) 355; Fletcher in Fl. Siam. En. 2, 4 (1938) 320; Corner, Ways. Trees (1940) 218, f. 58; Henders., Mal. Nat. J. 6, 1 (1950) 265, f. 248. — *Leucopogon malayanus* Jack var. *moluccanus* (non Scheff. pr. spec.) Kurz, J. As. Soc. Beng. 46, ii (1877) 217 (based on a juvenile narrow-leaved microform); For. Fl. Br. Burma 2 (1877) 96; Clarke in Hook. f., Fl. Br. Ind. 3 (1882) 477; Ridl., J. Fed. Mal. St. Mus. 7 (1916) 46; Fl. Mal. Pen. 2 (1923) 224; Dop in Fl. Gén. I.—C. 3 (1930) 748.

var. *malayana*

INDOCHINA. Cambodia: Ile de Phu quoc, *Harmand (Pierre) 917; Pierre 1390; Poilane 892*. — Cochinchina: Suyer-mot, *Pierre s.n.* — Annam: Massif de Cò Inh près Nhatrang, forêt, 800 m, *Poilane 4622 (P)*.

BURMA. Lower Burma: Tenasserin, *Helper K. D. 3453 (G; K, type of Leucopogon malayanus var. moluccanus Kurz)*.

SIAM. Nakawn Sritamarat: Singora, near sea, *Annandale s.n.*; Ta Samet, under 50 m, *Kerr 14273*. — Pattani: Pattani, under 25 m, *Kerr 7239*.

MALAY PENINSULA. Kedah: Mt Jerai, 760—1220 m, *Ridley 5530*; *Haniff SF 4730*; *Low s.n.*; *For. Dep. F.M.S. 7516 Bell*; *Robinson & B. Kloss 5983*; *For. Dep. F.M.S. 20730 Mustafa*; *For. Dep. F.M.S. 27457 Wilkinson*. — Penang: *Porter in Herb. Wallich 3720(1)*. — Perak: Mt Kerbau, 1370—2133 m, *For. Dep. F.M.S. 32129 Symington*; *Haniff 3911*; *Robinson anno 1913*; *Morgan s.n.*; Mt Chabang, *For. Dep. F.M.S. 10814 Shrubshall*; no locality given: *Scortechini s.n.*; *Cantley 46* (cit. K. & G., not seen); *Kunstler 7428 & 8056* (cit. K. & G., not seen). — Pahang: Ulu Telom, *For. Dep. F.M.S. 27620 Dolman*; Bt. Raka, Bentong, 580 m, *KEP 38040 Symington*; Pekan, *Burkill & Haniff SF 17284*; Kuantan, Karang Res., *For. Dep. F.M.S. 1340 Watson*; *ibid.*, Batoh Res., *For. Dep. F.M.S. 3613 Yeob*; Mt Tapis, 1400 m, *Symington & Kiah SF 28857*; Mt Benom, 1830 m, *For. Dep. F.M.S. 22322 Strugnell*; Mt Tahan, 1000—1830 m, *Wray & Robinson 5316*; *F.M.S. Mus. 12110, 12230 B. Kloss*; *Haniff & Nur SF 7876*; *Ridley 16048, 16262*; *Holtum SF 20611*. — Kelantan: Mt Stang (Sitong), 915 m, summit, *For. Dep. F.M.S. 37675 Symington*; *Nur SF 12204*. — Kemaman: Chuhai, *Corner s.n.* — Johore: Mt Arong, Mersing, 3 m, *KEP 71315 Wyatt Smith*; P. Plandok, seashore, *Holtum SF 24961*. — Selangor: Mt Ulu Kali, *Burn Murdoch s.n.* — Trengganu: P. Redang, 0—100 m, *Yapp 300*; Padang Kandis, *Sinclair & Kiah SF 40435*; Mt Padang, 1220 m, *Hislop s.n.*; *Moysey & Kiah SF 31070*. — Malacca: Mt Ledang, *Ridley 3176*; Mt Ophir, 915 m, *Maingay K.D. 704*; *Fielding anno 1892*; *Derry 598*; *Ridley s.n.*; *Moxon s.n.* (cit. K. & G., not seen); *ibid.*, Paddam Bhattoo, *Griffith 2373*, mentioned by *Griffith in J. As. Soc. Beng. 23 (1854) 638* as *Leucopogon ophirensis*; 'Malacca', *Chr. Smith s.n.*; no locality given: *Lobb s.n.* — Negri Sembilan: Bt Senaling, c. 400 m, *Hudson anno 1903*; Cape Rachado, Port Dickson, 60 m, *KEP 71356 Wyatt Smith*. — Singapore: *Jack s.n.* (type of *Leucopogon malayanus*, not preserved); *Schomburgk 50* (cit. K. & G., not seen); *Finlayson anno 1822 in Herb. Wallich 3720 (3)*; *Wallich anno 1822 in Herb. Wallich 3720 (2)*; *Changi-Tanamerah, Ridley 1832*.

ANAMBAS ISL. Jemaja, Letong, *Henderson SF 20327*.

SUMATRA. Westcoast: Taram, E. of Pajakumbuh, on sandstone, 500—1000 m, *Meijer 6946, 7071*. — Tapanuli: Dairi Lands, near top Dolok Sempunan, common, *Anonymus* (BO).

BANKA. Muntok, 4 m, *Bünnemeijer 1475*; *Teysmann s.n.*; *Kornasi s.n.*; B(e)linju, 2 m, *Burger 24*; Sg. Liat, *Berkhout 512*; *Teysmann s.n.*; *Hetharia 4*; Lobok besar, *Kostermans & Anta 168*; Mt Maras, 600 m, *Kostermans & Anta 1285*; Djebus, *Teysmann 3359* (K); Serdang, *De Leeuw 11*; P. Lepar, 50 m, *Bünnemeijer 2457*; Aer Mesu, *V. d. Vecht 9*; Njamar, *Kobus s.n.*; no locality given: *Coert 1654*; *Ploem s.n.*

BILLITON. Manggar, *Burger 1*; *Ham 15*; no locality given: *Teysmann H. B. 11195*; *Vorderman s.n.*

RIOUW ARCH. P. Bintan, P. Udjan, *Bünnemeijer 6441*.

BORNEO. Sarawak: Kuching, Mt Santubong, summit, 800—850 m, *Sinclair SF 38354*; *Haviland s.n.*; *Anderson 3857*; Mt Bungoh, summit, 1000 m, *Brunig S 9515*; Bako Nat. Park, below 150 m, *Brunig 4814*; *Jacobs 5489*; *Purseglowe 4879*; *ibid.*, Tanjung Po, *Brooke 10576, 10623*; Mt Dulit, 1230 m, in moss forest, *Richards 1619*; Miri Distr., top of Bt Lambir, 450 m, *Bakar 3036*; no locality given: *B. S. 2230 Nat. coll.*; *Beccari P. B. 2109*. — Western part: Singkawang, Pasir Pandjang, N. of Mempawa, 2 m, *F. R. I. bb. 9778*; *Polak 281, 734*, on sandy soil near sea; *Dunselman 70*. — Brunei: Bt Pasir Puteh, Tutong, *Ashton BRUN 284*. — Labuan: *Ridley 9049*; *Barber s.n.* — N. Borneo: Mt Kinabalu, 1220—2745 m, *Clemens 10927 (A), 10972, 30938, 31894, 32338, 32740, 40689*; *Haviland 1263*; *Gibbs 4053*. — Borneo, no locality indicated: *Lobb s.n.*; *De Vriese s.n.* — Karimata Arch.: P. Serutu, *Mondi 173*.

var. *novoguineensis* Sleum., *nov. var.*—A var. *malayana* praeicipue ovario per totum verticem piloso recedit. *Stylus* 1.5—2 mm longus, semper in inferiore media parte patenti-pilosus. *Fructus* maturus globularis, ruber, edulis, in vivo 3.5—4 mm diam. *Folia* 2.5—4.5 cm longa, (0.4—)0.5—1 cm lata interdum in eodem specimine pro parte multo angustiora et lanceolata.

NEW GUINEA. Northern part: Cycloop Mts, *Dumas 19* (BO, L); *ibid.*, S. slope of the Makanoi Ra., above Kotanica, 600—700 m, *fl. fr. 17-7-1961*, *van Royen & Sleumer 6200* (A, BM, BO, CANB, G, K; L, type; LAE, UC), scattered in woody grassland on laterite soil; *ibid.*, *van Royen & Sleumer 6200 a*, with black spots of a fungus (*Polystomellaceae*, det. F. Petrak *in litt.*) on the leaves, rare.

Note. On the label of *Dumas 19* an altitude of 1550 m is indicated. At this altitude, however, the Cycloop Mts are all over covered by a dense (and partly even mossy) forest, as can be seen from the air photographs at hand; these forests are certainly no habitat for such a heliophilous species as is *S. malayana*.

3. *Styphelia suaveolens* (Hook. f.) Warb. in *Sarasin, Reisen 2* (1905) 329, *in text*; *Koord., Rec. Trav. Bot. Néerl. 7* (1910) 65, *in text*; *Exk. Fl. Java 3* (1912) 22; *J. J. S., Nova Guinea 8, 4* (1912) 798; *Gibbs, J. Linn. Soc. Bot. 42* (1914) 107; *Merr., En Born.*

(1921) 468; Masam., En. Phan. Born. (1943) 577; Lam, *Blumea* 5 (1945) 571. — *Leucopogon suaveolens* Hook. f., Ic. Pl. (1852) sub t. 898; Walp., Ann. 5 (1858) 454; Vid., Sinopsis, Atlas (1883) 30, t. 60 f. A. — *Leucopogon obtusatus* Hook. f. in Hook., Lond. J. Bot. 6 (1847) 269, non Sond. (1844/45). — *Leucopogon colensoi* Hook. f., Fl. Nov. Zel. 1 (1853) 165. — *Leucopogon hookeri* Sond., Linnaea 26 (1854) 248, *nom. nov. pro L. obtusatus* Hook. f. (1847), non Sond. (1844/45); Hook. f., Fl. Tasman. 1 (1857) t. 75; Benth., Fl. Austr. 4 (1869) 205; Wright, Kew Bull. (1899) 104; Bail., Queensl. Fl. 3 (1900) 933; Rodway, Tasman. Fl. (1903) 108; Ewart, Fl. Victoria (1930) 931. — *Cyathodes colensoi* (Hook. f.) Hook. f., Handb. New Zeal. Fl. (1864) 177; Cheeseman, Man. New Zeal. Fl. (1906) 412; Ill. New Zeal. Fl. (1914) t. 125; Allan, Fl. New Zeal. 1 (1961) 517. — *S. montana* F. v. M., Fragm. 6 (1867) 45 in part, *excl. basion. Lissanthe montana* R. Br. (1810) 55; Trans. R. Soc. Vict. 1, 2 (1889) 25, as to var. *hookeri* in text. — *S. hookeri* (Sond.) J. J. S., Nova Guinea 8, 4 (1912) 797; Maiden & Betche, Cens. New S. Wales Pl. (1916) 165, non F. v. M. (1867). — *S. obtusifolia* J. J. S., Nova Guinea 8, 4 (1912) 798, t. 143; *ibid.* 12, 5 (1917) 539; Diels, Bot. Jahrb. 62 (1929) 488; J. J. S., Nova Guinea 18 (1936) 123. — *S. obtusifolia* J. J. S. var. *hypoleuca* J. J. S., Nova Guinea 8, 4 (1912) 799; *ibid.* 12, 5 (1917) 539. — *S. trilocularis* J. J. S., Nova Guinea 8, 4 (1912) 798, 799, t. 144. — *S. vandewateri* Wernh., Trans. Linn. Soc. ser. 2, Bot. 9 (1916) 101. — *S. spicata* J. J. S., Nova Guinea 12, 5 (1917) 539, t. 224; Kaneh. & Hatus., Bot. Mag. Tokyo 56 (1942) 484, f. 7. — *S. philippinensis* Merr., Philip. J. Sc. 20 (1922) 419; En. Philip. 3 (1923) 252. — *S. trilocularis* J. J. S. var. *quinquelocularis* J. J. S., Nova Guinea 18 (1936) 123. — *S. obovata* von Malm in Fedde, Rep. 41 (1937) 295, *excl. basion. Leucopogon obovatus* Fawc. — *Leucopogon philippinensis* (Merr.) Hosokawa, Trans. Nat. Hist. Soc. Formosa 30 (1940) 336. — *S. sp.*, Meijer Drees, Comm. n. 33 For. Res. Inst. Bogor (1951) 49.

AUSTRALIA. S. Queensland: Wallangara, *cit.* Bailey. — New S. Wales: Mt Kosziusko to Ben Lomond. — NE. Victoria: Australian Alps. — Tasmania.

NEW ZEALAND. North and South Island.

BORNEO. N. Borneo: Kota Belud, 2590—2745 m, SAN 20406 Meijer; KEP 80358 Wyatt Smith; Mt Kinabalu, 2745—4000 m, Low s.n. (K, type of *Leucopogon suaveolens*); Haviland 1062; Holttum s.n.; Sinclair c.s. 9134; Clemens 10633 (UC), 10667, 27097, 27097 B, 27779, 28995, 29130, 30374, 30375, 32380, 50812, 50874, 50875; Carr SF 27523, 27602, 27618; Gibbs 4179, 4241; Whitehead anno 1888; Haslam s.n.; Topping 1695; Nat. coll. 52; Jacobs 5747; Collette 781; SAN 29296 Meijer.

TIMOR. Western part: Fetin, 1800 m, Bosarchit. Kupang 8; Mt Mutis, 2300 m, De Voogd 2288; Stein 847 (B, †). — Eastern part: Huato-Builico, NW. of Tatamailau, 1800—3000 m, van Steenis 18374; Mt Tatamailau (Ramelan), 2600—2800 m, van Steenis 18409; Stein 1126 (B, †).

CELEBES. Central part: Enrekang, between Pintealón, Pokapindjang and Tinábang, 2600—3000 m, Eyma 595; Mt Latimodjong, top, 3200—3300 m, Eyma 1039; Rantemario, 2700—3200 m, Kjellberg 3982a; Eyma 772. — Southwestern part: Peak of Bonthain, 2300—2890 m, Bünnemeijer 11861, 11896, 11930, 12184, 12220, 12254; Everett 43, 44, 80; van der Pijl 755; *ibid.*, S. top (Mt Lompobatang), 2700—2900 m, van Zijl de Jong 3; Monod de Froideville 232; Sarasin 1291 (K); Bauman-Houtman 181.

PHILIPPINES. Luzon: Benguet Prov., between Suyoc and Pauai, Merrill 4762; F. B. 14443 Darling; Bangui-noc, 2500 m, Loher 3784; Mt Singakals, 2300—2700 m, PNH 4447 Celestino; PNH 82428 Quisumbing & Sulit. — Negros: Canlaon Volcano, 1950—2300 m (summit), Merrill Philip. Pl. 243 (PNH, type of *S. philippinensis*, †); *ibid.*, PNH 16696 Rabor; PNH 21954 Edaña. — Mindanao: Davao Prov., Mt Apo, dominant from 2600—2820 m, Koch s.n. (B, †); Copeland 1040, 1419; de Vore & Hoover 312 & 379 (*cit.* Merrill, not seen); Hosokawa 8562, 8596; Elmer 11389; Williams 2528; Clemens 15680; PNH 34625 Pancho; PNH 1469, 1545 Edaña; Lake Lanao, 2300 m, PNH 1404 Edaña.

NEW GUINEA. Northwestern part: Arfak Mts, Anggi Lakes, 1800—2750 m, Gjellerup 1122 (BO, type of *S. spicata*; L); Pratt anno 1908 (K); Kostermans 2094; Kanehira & Hatusima 13702 (= f. 7, FU), 14052 (A, BO); Mt Koëbré between Anggi Lakes, 2300 m, Sleumer & Vink 4278; Mt Sensenemés above Surerei, Anggi Gigi Lake, 2400—2750 m (top), Sleumer & Vink 4299; Mt Saru-mot near Iray, Anggi Gigi Lake, 2320 m, Sleumer & Vink 4447, in forest. — Western part: Wissel Lakes, Enarotali, Eyma 4781; *ibid.*, Mt Dejai, 3000 m, BW 3257 den Haan; *ibid.*, Tarapadimi, S. of Lake Tage, Eyma 5223 (BO, L; form with smaller leaves); Mt Carstenz, 3350—3810 m, B. Kloss s.n. (BM, type of *S. vandewateri*); *ibid.*, 'Carstenzweide', c. 3500 m, Dozy s.n.; *ibid.*, 'Dajakweide' & 'Merendal', 3700—4450 m, Wissel (*Exp. Colijn*)

5, 80, 81, 105, 119; *ibid.*, 'Zuidwand' & 'Gele Dal', 4500—4700 m, *Wissel (Exp. Colijn)* 56 (BO); Ilaga Valley, on airstrip at 2250 m, *Cooper* 32; Mt Doorman, 3250—3500 m, *Lam* 1616, 1648 (BO, type of *S. trilocularis* var. *quinquelocularis*; L). Habbema Lake area, 3000—3225 m, *Brass* 9033, 9135, 9459, 9460, 10667, 21113 (A); E. & NE. of Mt Wilhelmina top, 3560—3900 m, *Brass & Meijer Drees* 9911, 9931, 9932, 10302; Mt Wilhelmina, N. slope, 3650 m, *van Nouhuys anno 1909* (BO, lectotype of *S. obtusifolia*); *ibid.*, top, 4500 m, *von Römer (leg. Lorentz)* 1341 (BO, syntype of *S. obtusifolia*); *ibid.*, S. slope, 4250 m, *Brass & Meijer Drees* 10099; Mt Goliath, 3000—3500 m, *de Kock* 59 (BO, type of *S. trilocularis*), 60 (BO, type of *S. obtusifolia* var. *hypoglaucula*); Wichmann Mts, 3000 m, *Pulle* 970; Oranje Mts, Quarles Valley, 3800 m, *Pulle (leg. Versteeg)* 2529; Hubrecht Mts, 3100 m, *Pulle* 2413. — Central part: Star Mts, Mt Antares, 3400 m, *Kalkman* 4496. — Western Highlands: Wahgi Valley, *NGF* 5194 *Womersley*; Laiagam Subdistr., Yobobos grassland area, 2600 m, *Hoogland & Schodde* 7451, 7589; Kandep Valley, S. of Laiagam, 2285 m, *Robbins* 3259; Wabag Subdistr., Mt Sugarloaf, 2900—3650 m, *Hoogland & Pullen* 7007, 7119; Minj Subdistr., Central Kubor Ra., Mt Kinkain, 3600 m, *Pullen* 217; Hagen subdistr., above Tomba, 2440 m, *Robbins* 278; S. slopes of Mt Hagen, 2700 m, *Hoogland & Pullen* 6045; *Robbins* 298; Mt Hagen Ra., 3350—3500 m, *Shaw Mayer s.n.* (BM). — Eastern Highlands: near Mt Kerigomna, 3000 m, *Hoogland & Pullen* 5541; Mt Wilhelm, E. slope and top, 3000—4675 m, *Hoogland & Pullen* 5785; *Anderson JARA* 24; *Walker* 216; *Borgmann* 21; *Robbins* 1162; *Brass* 29803, 29927, 30548; *ibid.*, 4480 m, *Brass (leg. Vandeusen & Collins)* 30012; *NGF* 8924 *Womersley*; *Hoogland & Pullen* 5646; *Tuckwell s.n.*; *Barrett* 15 p.p.; *NGF* 15141 *van Royen*; *NGF* 16007 *van Royen*; Dunantina Valley, hills above Yanofi, 1830 m, *Robbins* 902; Sunabiga Rock, near Yontegi village, 2050 m, *Hoogland & Pullen* 5323; Mt Michael, 3290—3650 m, *NGF* 11482 *Womersley*; *Brass & Collins* 31275; Mt Otto, 3470—3540 m, *Brass* 30989; *Brass & Collins* 31012; Okapa area, road to Kainantu, *Brass* 31880. — Southern Highlands: Mt Giluwe, 3050—3150 m, *Schodde* 1723, 1856. — Morobe Distr.: Mt Saruwaged, 2400—3600 m, *Keysser* 14 (B, †); *Clemens* 7418; *Lane-Poole* 501 (BR.I); *ibid.*, Mt Enggom, 3700 m, *NGF* 16213 *van Royen*; Ulap Trail, *Clemens* 41147 (A, UC); Rawlinson Ra., *Clemens* 41380 (A, UC), 41941 (A, UC); Busu R., Tamunac camp, 2135—2745 m, *Clemens* 5304 (A); Samanzing vicinity, 2440 m, *Clemens* 9344 A (A). — Central Distr.: Mt Scratchley, 3050—3960 m, *Giulianetti anno 1896*; Murray Pass, Wharton Ra., 2840 m, *Brass* 4199; Mt Victoria, c. 3960 m, *McGregor anno 1889*; Mt Knutsford, *McGregor anno 1889*; Mt Albert Edward, 3680 m, *P. J. Money* 7 (SYD); *Brass* 4219, 4419 A (BRI, NY). — Milne Bay Distr.: Mt Maneao, 2230—2780 m, *Cruittwell* 529, 738; *Brass* 22235, 22695; Mt Simpson, 2590 m, *Cruittwell* 59.

SOLOMON ISL. Bougainville: Mt Balbi, 150 m, *Kimmorley s.n.* (LAE).

4. *Styphelia javanica* (De Vriese) J. J. S., *l.c.* Bog. 4, 1 (1910) 82. — *Anacyclodon pungens* Jungh., *Nat. Geneesk. Arch. N.I.* 2 (1845) 49. — *Pentachondra javanica* Zoll., *Nat. Geneesk. Arch. N.I.* 2 (1845) 576, *repr.* *Flora* 30 (1847) 601, *nom. ill.* (based on *Anacyclodon pungens* Jungh.). — *Leucopogon javanicus* De Vriese in *Miq.*, *Pl. Jungh.* 1 (1851) 84 (*nom. nov. pro Anacyclodon pungens* Jungh. (1845), *non Leucopogon pungens* Sond. (1845)); *Jungh.*, *Java ed.* 2, 1 (1853) 597, 666; *l.c.* 3 (1854) 734; *Zoll.*, *Syst. Verz.* 2 (1854) 137; *Miq.*, *Fl. Ind. Bat.* 2 (1859) 1053; *F. v. M.*, *Fragm.* 6 (1867) 56, *in text*; *Boerl.*, *Handl.* 2, 1 (1891) 274; *Schimper*, *Pflanzengeogr.* (1898) 768, f. 428; *Koord.*, *Nat. Tijd N.I.* 60 (1901) 263. — *S. pungens* (Jungh.) *Koord.*, *Jungh. Gedenk.* (1910) 185; *Rec. Trav. Bot. Néerl.* 7 (1910) 64; *Exk. Fl. Java* 3 (1912) 21, f. 5; *Koord.-Schum.*, *Syst. Verz.* 1 (1912) *fam.* 234, p. 113; *J. J. S.*, *Nova Guinea* 8, 4 (1912) 798; *Dammerman*, *Pres. Wild Life & Res. Neth. Ind.* (4th Pac. Sc. Congr. Java, 1929) 49, *fig.*; *Sasaki*, *Catal. Govern. Herb. Formosa Dep. For.* (1930) 397; *Docters van Leeuwen*, *Pangrango* (1933) 258, f. 67; *Schimper-Faber*, *Pflanzengeogr. ed.* 3 (1935) 287, f. 56 (*hab.*); *Hochr.*, *Candollea* 6 (1936) 470; *Steen.*, *Trop. Natuur* 25 (1936) 38, f. 2; *Back.*, *Bekn. Fl. Java* (*em. ed.*) 7 (1948) *fam.* 164, p. 1; *non* (Sond.) *F. v. M.* (1867).

JAVA. Surabaya: Mt Penanggungan, 1650 m, *Bremekamp s.n.* (BO). — Malang: Mt Kawi, 2650—2860 m, *Zollinger* 2166 p.p. (P); *Docters van Leeuwen* 12206; *Arens & Wurth s.n.*; *Junghuhn s.n.*; *Rappard* 30; Mt Ardjuno-Welirang, 2700—3350 m, *Zollinger* 2166 p.p.; *Backer* 36214, 37373; *Koorders* 38267, 43779, 43780; *Arens* 40; *van Steenis* 7031; *Hagedoorn & Jeswiet s.n.*; *Posthumus* 317; *Rant s.n.*; Mt Tengger area, 2100—2750 m, *Jeswiet s.n.*; *Beumée A.* 646; *van der Meer Mohr s.n.*; *Rotheri s.n.*; *Kuypers s.n.*; *Docters van Leeuwen* 4577; *Popta* 17; *Hochreutiner* 2639; *Mousset* 1145; *Kreulen* 154; *Zollinger* 2166 p.p.; *Kobus* 6262; *de Voogd* 732; *Koorders* 37505—37508; *Hub. Winkler* 2022; *Wurth s.n.*; *van Slooten* 2377; *Christophersen* 114 (BISH); Mt Smeru, 2500—3100 m, *Coert* 1567; *Hochreutiner* 2675; *Docters van Leeuwen* 8499. —

Besuki: Mt Hijang (Argopuro), 2900—3090 m, Zollinger 2166 p.p.; Koorders 43438, 43498; Backer 9729; van Steenis 10948; Jeswiet 351; Weber s.n. — Java, locality not given: Junghuhn s.n. (L, type of *Anacyclodon pungens*, possibly from Mt Kawi).

5. *Styphelia forbesii* Sleum., *nom. nov.* — *Leucopogon obovatus* Fawc. in Forbes, Wand. (1885) App. 6, p. 509, *non* (Lab.) R. Br. (1810). — *S. obovata* (Fawc.) J. J. S., Ic. Bog. 4 (1910) 82; *ibid.* (1913) 172 in text; Nova Guinea 8, 4 (1912) 798, *non* Lab. (1805).

TIMOR. Eastern part: on top of Mt Tehulah, 1220 m, Forbes 3493 (cit. "3493 a", BM, type).

ALOR. Central Highlands: Pido-Woisika, in *Eucalyptus* forest, c. 1000 m, Jaag 1010, 1313; Bouman-Houtman 124 (BO).

6. *Styphelia acuminata* (R. Br.) Spr., Syst. 1 (1824) 659. — *Leucopogon acuminatus* R. Br., Prod. (1810) 545; Benth., Fl. Austr. 4 (1869) 216; Ewart & Davies, Fl. North. Terr. (1917) 216. — *S. wetarensis* J. J. S., Ic. Bog. 4 (1913) 171, t. 352.

AUSTRALIA. Northern Territory: locality not indicated in R. Brown's manuscript in the Natural History Museum, London: R. Brown n. 2464 (BM, type; K).

WETAR. Slopes above Iiwaki, 150—550 m, Elbert 4387, 4413 (BISH; BO, type of *S. wetarensis*; BRI, K, L, SING, SYD).

7. *Styphelia abnormis* (Sond.) J. J. S., Ic. Bog. 4, 1 (1910) 82, in text; *ibid.* (1913) 172 in text; Nova Guinea 8, 4 (1912) 797. — *Leucopogon acuminatus* (*non* R. Br.) Duperrey, Voy. Coquille Bot. Atlas (1826) t. 53 (*no text*). — *Leucopogon abnormis* Sond. in Lehm., Pl. Preiss. 1 (1845) 325. — *Leucopogon lancifolius* Hook. f., Ic. Pl. (1852) t. 898. — *Leucopogon moluccanus* Scheff., Nat. Tijds. N.I. 32 (1873) 419; Boerl., Handl. 2, 1 (1891) 274. — *Leucopogon malayanus* Jack var. *moluccanus* (Scheff.) Kurz, J. As. Soc. Beng. 46, ii (1877) 217; For. Fl. Br. Burma 2 (1877) 96, *pr. pl. molucc.* — *S. lancifolia* (Hook. f.) J. J. S., Ic. Bog. 4 (1910) 82, in text; Nova Guinea 8, 4 (1912) 797; Gibbs, J. Linn. Soc. Bot. 42 (1914) 107; Merr., En. Born. (1921) 467; Masam., En. Phan. Born. (1943) 577. — *S. moluccana* (Scheff.) J. J. S., Ic. Bog. 4 (1910) 82, in text; Nova Guinea 8, 4 (1912) 798; Lam & Holthuis, Blumea 5 (1942) 224.

BORNEO. N. Borneo: 'North coast', Low s.n. (K, type of *Leucopogon lancifolius*); *ibid.*, Burbidge s.n. Jesselton, 100 m, Gibbs 2578; Clemens 9576, 11264; Haslam s.n.; Wood 2055; Balambangan I., B. Kloss SF 19263; Creagh s.n. (BM); Frazer s.n.

CELEBES. Southeastern part: Kabaena I., Mt Sangia Wita, 700—900 m, Elbert (Gründler) 3483.

MOLUCCAS. Ceram: western part, Hoalmoal, 500—1000 m, F.R.I. bb. 20059 *Salverda*. — Talud Isl.: Karakelang, E. slope Mt Biapi, 400 m, Lam 3280. — Sula Isl.: Taliabu, Atjeh (*Exp. van Hulstijn*) 53. — Buru: Siahoni, 50 m, F.R.I. bb. 41480; Kajeli, Teysmann s.n.; no locality given: D'Urville s.n. (P). — Ambon: Leahari, 0—100 m, Kornasi (*Exp. Rutten*) 1148; Manipa I., 50 m, Curran 3504 (A).

NEW GUINEA. Gebeh: Teysmann H.B. 7583 (BO, type of *Leucopogon moluccanus*; K, L). — Waigeu: Majalibit Bay, village Go, Cheesman 1216 (BM); *ibid.*, ESE. of Kabaré, c. 300 m, van Royen 5411; no locality given: D'Urville & Lesson anno 1825 (P, type of *Leucopogon abnormis*).

Note. Similar in leaf to *S. esquamata* (R. Br.) Spr. (New S. Wales) which, however, has obtuse bracteoles and sepals and a very slender, elongate style; equally similar, if not related, to *S. multiflora* (R. Br.) Spr. (W. Australia), the leaves of which are more strongly nerved, subpetiolate or distinctly narrowed at the base, the style being slender and c. 2 mm long. A third apparently close species is *S. leptospermoides* (R. Br.) Spr. from Queensland with smaller leaves, the style 1—1.3 mm long, and the fruit attenuate at the top, not truncate as in *S. abnormis*.

NEW COMBINATIONS IN STYPHELIA subg. LEUCOPOGON

Styphelia albicans (Brongn. & Gris) Sleum., *comb. nov.* — *Leucopogon albicans* Brongn. & Gris, Bull. Soc. Bot. Fr. 11 (1864) 67; Ann. Sc. Nat. sér. 5, 2 (1864) 155.

Lectotype: Vieillard 833 (P, SYD).

Styphelia behrii (Schlechtendal) Sleum., *comb. nov.* — *Pentataphrus behrii* Schlechtendal, Linnaea 20 (1847) 618. — *Stenantha conostephioides* Sond. in Lehm., Pl. Preiss. 1 (1844/45) 296. — *S. sonderi* F. v. M., Fragm. 6 (1867) 36; Sec. Syst. Census (1889) 178. — *Astroloma conostephioides* (Sond.) F. v. M. ex Benth., Fl. Austr. 4 (1869) 158.

In *Styphelia*, the epithet '*conostephioides*' is already occupied by *S. conostephioides* (DC. 1839) F. v. M. 1867.

Styphelia cinerea (Pritzel) Sleum., *comb. nov.* — *Leucopogon cinereus* Pritzel, Bot. Jahrb. 35 (1904) 472, f. 52 A—D.

Styphelia commutata Sleum., *nom. nov.* — *Leucopogon compactus* Stsche gl., Bull. Soc. Nat. Moscou 32 (1859) i, 13. — *S. compacta* (Stsche gl.) F. v. M., Syst. Census (1882) 106; Sec. Syst. Census (1889) 178, *non* (R. Br.) Spr. (1824), based on *Astroloma compactum* R. Br. (1810).

Styphelia concava (Schltr.) Sleum., *comb. nov.* — *Leucopogon concavus* Schltr., Bot. Jahrb. 39 (1906) 222.

Styphelia coryphila (Guillaum.) Sleum., *comb. nov.* — *Leucopogon coryphilus* Guillaum., Bull. Mus. Nat. Hist. Paris sér. 2, 5 (1933) 248.

Styphelia dammarifolia (Brongn. & Gris) Sleum., *comb. nov.* — *Leucopogon dammarifolius* Brongn. & Gris, Bull. Soc. Bot. Fr. 11 (1864) 67; Ann. Sc. Nat. sér. 5, 2 (1864) 154.

Lectotype: Vieillard 838 (L, P).

Styphelia dielsiana (Pritzel) Sleum., *comb. nov.* — *Leucopogon dielsianus* Pritzel, Bot. Jahrb. 35 (1904) 476.

Styphelia elatior (Sond.) Sleum., *comb. nov.* — *Leucopogon elatior* Sond. in Lehm. Pl. Preiss. 1 (1844/45) 314.

Styphelia elliptifolia Sleum., *nom. nov.* — *Leucopogon ellipticus* Guillaum., Bull. Soc. Bot. Fr. 88 (1941) 658, *non Styphelia elliptica* Sm. (1804).

Styphelia enervia (Guillaum.) Sleum., *comb. nov.* — *Leucopogon enervius* Guillaum., Bull. Soc. Bot. Fr. 88 (1941) 658.

Styphelia exserta (F. v. M.) Sleum., *comb. nov.* — *Soleniscia pulchella* Stsche gl., Bull. Soc. Nat. Moscou 32 (1859) i, 3, *non Styphelia pulchella* (Sond.) F. v. M. (1867). — *Leucopogon exsertus* F. v. M., Fragm. 3 (1863) 143. — *S. leucopogon* F. v. M., Fragm. 4 (1864) 97; *ibid.* 6 (1867) 31; Benth., Fl. Austr. 4 (1869) 149, *nom. ill.*, based on *Leucopogon exsertus* F. v. M. (1863).

Styphelia fasciculata (Forst. f.) Sleum., *comb. nov.* — *Epacris fasciculata* Forst. f., Prod. (1786) 13. — *Leucopogon fasciculatus* (Forst. f.) A. Rich. Essai Fl. Nouv.-Zél. (1832) 215; A. Cunn. Ann. Nat. Hist. 2 (1838) 47. — *Cyathodes fasciculata* (Forst. f.) Allan, Fl. New Zeal. 1 (1961) 515.

Styphelia floribunda (Brongn. & Gris) Sleum., *comb. nov.* — *Cyathopsis floribunda* Brongn. & Gris, Bull. Soc. Bot. Fr. 11 (1864) 66; Ann. Sc. Nat. sér. 5, 2 (1864) 153.
Lectotype: Vieillard 834 (A, L, P, SYD).

Styphelia hamulosa (Pritzell) Sleum., *comb. nov.* — *Leucopogon hamulosus* Pritzell, Bot. Jahrb. 35 (1904) 478.

Styphelia hispida (Pritzell) Sleum., *comb. nov.* — *Leucopogon hispidus* Pritzell, Bot. Jahrb. 35 (1904) 478.

Styphelia lasiophylla (Stschegl.) Sleum., *comb. nov.* — *Leucopogon lasiophyllus* Stschegl., Bull. Soc. Nat. Moscou 32 (1859) i, 16.

Styphelia longistylis (Brongn. & Gris) Sleum., *comb. nov.* — *Leucopogon longistylis* Brongn. & Gris, Bull. Soc. Bot. Fr. 11 (1864) 67; Ann. Sc. Nat. sér. 5, 2 (1864) 154.
Lectotype: Vieillard 836 (P, SYD).

Styphelia macrocarpa (Schltr) Sleum., *comb. nov.* — *Leucopogon macrocarpus* Schltr, Bot. Jahrb. 39 (1906) 223.

Styphelia mollis (Pritzell) Sleum., *comb. nov.* — *Leucopogon mollis* Pritzell, Bot. Jahrb. 35 (1904) 471.

Styphelia nesophila (DC.) Sleum., *comb. nov.* — *Leucopogon nesophilus* DC., Prod. 7 (1839) 752. — *Leucopogon fraseri* A. Cunn., Ann. Nat. Hist. 2 (Sept. 1838) 47, non D.C., Prod. 7 (Dec. 1839) 753 ("Leucopogon fraseri A. Cunn. in litt. 1836" which is *Styphelia multiflora* (R. Br.) Spr.), later homonym. — *S. fraseri* (A. Cunn.) F. v. M., Syst. Census (1882) 107, non F. v. M., Fragm. 6 (1867) 56 (based exclusively on *Leucopogon fraseri* DC.). — *Cyathodes fraseri* (A. Cunn.) Allan, Fl. New Zeal. 1 (1961) 517.

Styphelia nitens Sleum., *nom. nov.* — *Leucopogon nutans* Pritzell, Bot. Jahrb. 35 (1904) 477, f. 52 L, M, non *Styphelia nutans* J.J.S. (1912).

Styphelia oligantha (Pritzell) Sleum., *comb. nov.* — *Leucopogon oliganthus* Pritzell, Bot. Jahrb. 35 (1904) 474.
Lectotype: Pritzell 388.

Styphelia pancheri (Brongn. & Gris) Sleum., *comb. nov.* — *Leucopogon pancheri* Brongn. & Gris, Bull. Soc. Bot. Fr. 11 (1864) 67; Ann. Sc. Nat. sér. 5, 2 (1864) 154.
Lectotype: Pancher 455 (P)

Styphelia parvulifolia Sleum., *nom. nov.* — *Astroloma microphyllum* Stscheegl.; Bull. Soc. Nat. Moscou 32 (1859) i, 7, *non Styphelia microphylla* (Cav.) Spr. (1824).

Styphelia pedicellata (White) Sleum., *comb. nov.* — *Leucopogon pedicellatus* White, Proc. R. Soc. Queensl. 55 (1944) 69.

Styphelia petiolaris (DC.) Sleum., *comb. nov.* — *Leucopogon petiolaris* DC., Prod. 7 (1839) 753. — *Cyathodes adscendens* Hook. f. in Hook., Lond. J. Bot. 6 (1847) 268; Fl. Tasman. 1 (1857) 245, t. 74 A; Benth., Fl. Austr. 4 (1869) 169, *non Styphelia adscendens* R. Br. (1810). — *S. hookeri* F. v. M., Fragm. 6 (1867) 44 (*nom. nov. pro Cyathodes adscendens* Hook. f., *non Styphelia adscendens* R. Br. (1810)), *non* (Sond.) J. J. S. (1912, based on *Leucopogon hookeri* Sond. 1854 (*nom. nov. pro Leucopogon obtusatus* Hook. f. 1847, *non* Sond. 1844/45)). — *Cyathodes petiolaris* (DC.) Druce, Rep. Bot. Exch. Cl. Brit. Isl. for 1916 (1917) 618.

Leucopogon petiolaris is based on a specimen from Tasmania: Hobart-town, leg. D'Urville anno 1829 (G—DC, type; L, P), and certainly belongs to *Styphelia* subgen. *Leucopogon*.

Styphelia planifolia (Sond.) Sleum., *comb. nov.* — *Leucopogon planifolius* Sond. in Lehm., Pl. Preiss. 1 (1845) 322.

Styphelia psammophila (Pritzl) Sleum., *comb. nov.* — *Leucopogon psammophilus* Pritzl, Bot. Jahrb. 35 (1904) 473.

Lectotype: Pritzl 415.

Styphelia recurvisepala (White) Sleum., *comb. nov.* — *Leucopogon recurvisepalus* White, Proc. R. Soc. Queensl. 55 (1944) 70.

Styphelia rodwayi (Summerhayes) Sleum., *comb. nov.* — *Leucopogon rodwayi* Summerhayes, Kew Bull. (1926) 242, f. 1.

Styphelia rupicola (White) Sleum., *comb. nov.* — *Leucopogon rupicolus* White, Proc. R. Soc. Queensl. 55 (1944) 71.

Styphelia salicifolia (Brongn. & Gris) Sleum., *comb. nov.* — *Leucopogon salicifolius* Brongn. & Gris, Bull. Soc. Bot. Fr. 11 (1864) 68; Ann. Sc. Nat. sér. 5, 2 (1864) 155.

Lectotype: Vieillard 839.

Styphelia septentrionalis (Schltr) Sleum., *comb. nov.* — *Leucopogon septentrionalis* Schltr, Bot. Jahrb. 39 (1906) 224.

Styphelia stomarrhena (Sond.) Sleum., *comb. nov.* — *Astroloma stomarrhena* Sond. in Lehm., Pl. Preiss. 1 (1844/45) 301. — *S. lasionema* F. v. M., Fragm. 6 (1867) 40; Sec. Syst. Census (1889) 177.

Styphelia tamminensis (Pritzl) Sleum., *comb. nov.* — *Leucopogon tamminensis* Pritzl, Bot. Jahrb. 35 (1904) 479.

Lectotype: Pritzl 318.

Styphelia vieillardii (Brongn. & Gris) Sleum., *comb. nov.* — *Leucopogon vieillardii* Brongn. & Gris, Bull. Soc. Bot. Fr. 11 (1864) 67; Ann. Sc. Nat. sér. 5, 2 (1864) 154. *Lectotype: Vieillard 841* (L, P).

subg. CYATHODES

(Lab.) Drude in E. & P., Pfl. Fam. 4, 1 (1889) 78. — *Cyathodes* Lab., Nov. Holl. Pl. 1 (1805) 57, t. 81 (*lectotype sp.: C. glauca* Lab. = *S. billardierii* F. v. M.), em. R. Br., Prod. (1810) 539; R. & S., Syst. 4 (1819) xli; Don, Gen. Syst. 3 (1834) 776; DC., Prod. 7 (1839) 740; Hook. f., Fl. New Zeal. 1 (1853) 163; Fl. Tasman. (1857) 244; Handb. N. Zeal. Fl. (1864) 176; Benth., Fl. Austr. 4 (1869) 167; Cheeseman, Man. New Zeal. Fl. (1906) 410; Rodway, Tasman. Fl. (1903) 113; Allan, Fl. New Zeal. 1 (1961) 514. — *Ardisia* Gaertn., Fruct. 2 (1791) 78, t. 94 (*type sp.: A. acerosa* Gaertn.), non Sw. (1788). — *Androstoma* Hook. f., Fl. Antarct. 1 (1845) 44, t. 30 (*type sp.: A. empetrifolium* Hook. f.).

KEY TO THE SPECIES

1. Leaves generally clustered at the ends of the year's growth so as to appear almost whorled (but exceptionally rather more scattered in *S. straminea*). (Outer nerves branched).
 2. Leaves oblong-linear, mucronate or at least mucronulate, (1—)1.5—2.5(—3.6) by 0.2—0.4(—0.5) cm. *Tasmania* *S. billardierii* F. v. M.
 2. Leaves narrowly to broadly oblong, obtuse or with a small apical callose point, (0.5—)0.6—1 (rarely up to 1.2) by (0.2—)0.3—0.4 cm. *Tasmania* *S. straminea* (R. Br.) Spr.
1. Leaves scattered or crowded throughout the branchlets.
 3. Nerves on the undersurface of the leaves few and thickish, not branched distally. (Leaves caducously ciliate or ciliolate; if persistently longish and patently subserrulate-ciliate all along the margin, see *S. douglasii*).
 4. Leaves obtuse by a callose apical point, (2—)3—5 by c. 0.5 mm (short-pubescent between the nerves underneath). *New Zealand, Stewart I., Auckland I., Campbell I.* *S. taxifolia* Sleum.
 4. Leaves acutely apiculate to sharply mucronate.
 5. Leaves besides the midrib with distinct marginal nerves, sometimes moreover with another, much fainter nerve between (so that the leaves become sub-5-nerved), whitish-glaucous or almost silvery (not properly pubescent) beneath.
 6. Leaves \pm 5 mm wide. *New Zealand*. *S. minuta* Sleum.
 6. Leaves 1—1.5 mm wide. *Tasmania* *S. dealbata* (R. Br.) Spr.
 5. Leaves with at least 5 distinct approximate nerves, subglaucous or greenish (glabrous or pubescent) beneath.
 7. Leaves short-pubescent between the nerves underneath. *Tasmania* *S. abietina* Lab.
 7. Leaves quite glabrous beneath.
 8. Bracteoles remote, i.e. not completely covering the pedicel. Pedicel 2—4 mm. *Tasmania*. *S. remota* Sleum.
 8. Bracteoles close together, entirely covering the very short pedicel.
 9. Leaves 0.8—1.3 by 0.1—0.15 cm. *SE. Australia (Victoria), Tasmania*. *S. oxycedrus* Lab. var. *oxycedrus*
 9. Leaves 0.4—0.8 by 0.05—0.1 cm. *Tasmania*. *S. oxycedrus* Lab. var. *parvifolia* (R. Br.) Sleum.
 3. Outer nerves on the undersurface of the leaves branched outward at least distally (less distinct so in microphyllous juvenile forms of *S. juniperina*).
 10. Leaves \pm imbricately arranged, still longish (0.1—0.15 mm) and \pm patently subserrulate-ciliate when adult. *Hawaii Isl.* *S. douglasii* (Gray) F. v. M. ex Skottsb.
 10. Leaves less densely arranged, not imbricate, when adult not cili(ol)ate.
 11. Corolla tube broadly campanulate.
 12. Leaves ending in a callose bluntish point. Stigma subcapitate. *Chatham I.* *S. robusta* (Hook. f.) Sleum.
 12. Leaves ending in a markedly pungent point. Stigma \pm truncate. *New Zealand, Stewart I.* *S. juniperina* (Forst.) Pers.
 11. Corolla tube \pm narrowly tubular-subcampanulate.
 13. Leaves linear to linear-lanceolate, markedly and pungently pointed.

14. Corolla 5—5.5(—6) mm long in all, practically glabrous inside. Leaves \pm 2 mm wide. *Society Isl. (Tahiti)*. **S. pomarae** (A. Gray) Moore.
14. Corolla 3—4 mm long in all.
15. Branchlets glabrous. Corolla 3 mm, glabrous inside. *Tubuai Isl. (Rapa)*.
S. rapae Sleum.
15. Branchlets subdensely short-hairy. Corolla 3.5—4 mm.
16. Leaves (8—)10—15 mm long. Corolla subdensely hairy at the throat inside. *SE. New Guinea* **S. brassii** Sleum.
16. Leaves 6—8(—12) mm long. Corolla practically glabrous inside. *Society Isl. (Tahiti, Moorea (Eimeo), Raiatea)*. **S. brevistyla** Moore
13. Leaves mostly oblong, obovate-oblong or oblanceolate, elliptic or even ovate, rarely lanceolate, apex obtuse or shortly pointed by the midrib which is protracted into a callose, not properly pungent kind of mucro.
17. Corolla 2.5 mm long in all. *Marianas (Alamagan Isl.)*.
S. mariannensis (Kaneh.) Kaneh. & Hatus.
17. Corolla (3—)3.5—4(—4.5) mm long on all.
18. Leaves oblong-lanceolate or oblanceolate, rarely lanceolate, tip generally mucronulate, rarely rather bluntish, *Hawaii Isl., Marquesas Isl. (Nukuhiva)*.
S. tameiameiae (Cham.) F. v. M. var. **tameiameiae**
18. Leaves ovate or mostly ovate-elliptic or elliptic, tip very shortly mucronulate or mostly blunt. *Hawaii Isl.*
S. tameiameiae (Cham.) F. v. M. var. **brownii** (A. Gray) St. John

Styphelia taxifolia Sleum., *nom. nov.* — *Androstoma empetrifolium* Hook. f., Fl. Antarct. I (1844) 44, t. 30. — *Cyathodes empetrifolia* (Hook. f.) Hook. f., Fl. N. Zeal. I (1853) 164; Handb. N. Zeal. Fl. (1864) 177; Cheeseman, Man. N. Zeal. Fl. (1906) 412; Allan, Fl. New Zeal. I (1961) 518. — *S. androstoma* F. v. M., Fragm. 6 (1867) 55, *nom. ill. (nom. nov. pro Androstoma empetrifolium Hook. f., non S. empetrifolia (R. Br.) F. v. M., Pap. R. Soc. Tasman. (1874) 86 (based on Monotoca empetrifolia R. Br.)*.

NEW ZEALAND. North and South Isl., Stewart Isl.
AUCKLAND ISL., CAMPBELL ISL.

Styphelia minuta Sleum., *nom. nov.* — *Cyathodes ?pumila* Hook. f., Handb. N. Zeal. Fl. (1867) 735; Cheeseman, Man. N. Zeal. Fl. (1906) 413; Allan, Fl. New Zeal. I (1961) 518, *non S. pumila* (R. Br.) Spr. (1824, based on *Pentachondra pumila* R. Br. 1810).

NEW ZEALAND. South I.

Styphelia remota Sleum., *nom. nov.* — *Lissanthe divaricata* Hook. f. in Hook., Lond. J. Bot. 6 (1847) 269. — *Cyathodes divaricata* (Hook. f.) Hook. f., Fl. Tasm. I (1857) 246, t. 74 B *in part*; Benth., Fl. Austr. 4 (1869) 170, *non S. divaricata* (R. Br.) Spr. (1824, based on *Acrotiche divaricata* R. Br. 1810).

TASMANIA.

Styphelia oxycedrus Lab., Nov. Holl. Pl. I (1805) 49, t. 69. — *Cyathodes oxycedrus* (Lab.) R. Br., Prod. (1810) 540. — *Cyathodes acerosa* (Gaertn.) R. Br. var. *oxycedrus* (Lab.) Cheesem., Man. N. Zeal. Fl. (1906) 411. — *Cyathodes juniperina* (J. R. & G. Forster) Druce var. *oxycedrus* (Lab.) Allan, Fl. New Zeal. I (1961) 516.

SE. AUSTRALIA and TASMANIA.

Styphelia oxycedrus Lab. var. **parvifolia** (R. Br.) Sleum., *stat. nov.* — *Cyathodes parvifolia* R. Br., Prod. (1810) 540. — *Lissanthe parvifolia* (R. Br.) Spr., Syst. I (1824) 660. — *S. parvifolia* (R. Br.) F. v. M., Pap. R. Soc. Tasman. (1874) 86.

TASMANIA.

Styphelia douglasii (A. Gray) F. v. M. ex Skottsbl., Act. Hort. Gothob. 2 (1925) 255; Medd. Göteborg. Bot. Trädgård. 6 (1930) 52; Act. Hort. Gothob. 10 (1936) 152; Hochr., Candollea 6 (1936) 470; St. John, Occ. Pap. Bern. P. Bish. Mus. 17, 7 (1942) 84, incl. var. *struthioides* (A. Gray) St. John; Skottsbl., Medd. Göteborg. Bot. Trädg. 15 (1944) 426. — *Cyathodes imbricata* Stschehl., Bull. Soc. Nat. Moscou 32 (1859) i, 10, non *Styphelia imbricata* (R. Br.) Spr. 1824; Mann, Proc. Am. Ac. 7 (1867) 188; Hillebr., Fl. Hawaiian Isl. (1888) 273, incl. var. *struthioides* (A. Gray) Hillebr.; Rock, Ind. Trees Hawaiian Isl. (1913) 76, 79, 82; Degener, Pl. Hawaii Nat. Park (1930) 247. — *Cyathodes imbricata* Stschehl. var. *volcanica* Lévl. in Fedde, Rep. 10 (1911) 155. — *Cyathodes douglasii* A. Gray, Proc. Am. Ac. 5 (1862) 325, incl. var. *struthioides* A. Gray l.c.; Wawra, Flora 56 (1873) 59. — *S. grayana* Rock, Ind. Trees Hawaiian Isl. (1913) 366, nom. ill.; Kraebel, Hawaiian For. Agr. 19 (1923) 4.

Cyathodes douglasii was described by Asa Gray from "Hawaii, on Mauna Loa and Mauna Kea, also Maui, on Haleakala". On the type sheet in his herbarium are 5 specimens, or syntypes; on one of them is annotated by A. Gray himself "Mauna Loa, Wilkes Exp. C. *douglasii* n. sp.", on another "Maui", and on a third (the right one at the bottom) "leg. Douglas, *Cyathodes douglasii* n. sp."; two other specimens are without annotation. Of these I consider the specimen collected by Douglas as the holotype (lectotype). Douglas collected it on Mauna Kea; his specimens from there in other herbaria (G, K) bear the number 19, which is cited as type for *Cyathodes imbricata* Stschehl.

The type sheet of *Cyathodes douglasii* var. *struthioides* in A. Gray's herbarium bears several specimens, all collected by the Wilkes Exp. on Mauna Kea, and but slightly different from Douglas' material.

The species has been recollected on Mauna Kea by a number of botanists since. In 1962 I had the privilege to investigate numerous specimens on the E. slope of Mauna Kea between 1900 and 3000 m, among these several more decumbent (*Sleumer 4556*) or loosely branched (*Sleumer 4554*) '*struthioides*' forms, which are connected with the 'typical' erect and compact form by many intergrades, and cannot be separated from it.

The specimen of *Cyathodes douglasii* var.? from Kauai, collected by the Wilkes Exp. and mentioned by Asa Gray under his var. *struthioides* ("perhaps a form on the mountains of Kauai") is also preserved in his herbarium. This is a plant slightly different by its trailing habit and less coriaceous leaves, which are rather greyish beneath in dry specimens, and apparently collected in a swampy habitat. Similar specimens were collected on Kauai by W. Hillebrand on the summit of Mt Eeka at 1830 m, by J. F. Rock (*5526*) in the Kauuluwehi Swamp and by C. N. Forbes (*880*) in the Alakai Swamp. The same form exists on W. Maui on the open bog of the summit of Puukukui at c. 1740 m, collected there a.o. by Wilbur & Webster (*802*). Rock mentions the plants from Puukukui and from the great bog of Waialeale on Kauai at c. 1525 m (collected there before him by Wawra in 1871, nr. 2182) under the name of var. *struthioides* in his Ind. Trees Hawaiian Isl. on p. 76 and 79, but this epithet cannot be applied to this form of swampy ground at relatively low altitudes for the reasons given above. Having failed to meet this special form during my short visit to the Alakai Swamp, I leave it to the Hawaiian botanists to investigate it more closely, especially as to a possible ingression of *Styphelia tameiameia*. The form found on swampy ground on Molokai differs from the one living on Hawaii and Maui by slightly wider leaves. There are several sheets of *Cyathodes douglasii* annotated by Asa Gray in the herbaria of Torrey and Crooke, deposited in the New York Botanical Garden — possibly syntypes or even isotypes —, "*C. douglasii* n. sp., Mts of E. Maui" (apparently collected by the Wilkes Exped.), and from "Sandwich Isl.", and var. *struthioides* from "Sandwich Isl."

Cyathodes imbricata var. *volcanica* Lév. is also based on a plant from Mauna Kea, collected at c. 3000 m by Faurie (442 & 445, A, G, NY, P).

The transfer of *Cyathodes douglasii* to *Styphelia* was made first by Skottsberg (1925) and again by Hochreutiner (1936); *Hochreutiner 3565* from Kauai, cited by himself under *Styphelia douglasii*, however, certainly belongs to *Styphelia tameiameiae*. Besides from Hawaii, *Styphelia douglasii* in its strict circumscription is known from Molokai, Maui, and Kauai, and limited there to the highest parts from c. 2100—3000 m, along gulches sometimes down to c. 1900 m. In their lower parts, from sealevel up to c. 1200 (exceptionally up to 2150) m, lives *Styphelia tameiameiae*. Specimens intermediate between *S. douglasii* and *S. tameiameiae* to various degree were found by the author on the slopes of Mauna Loa, Mauna Kea, and Haleakala between 2100 and 2600 m. The distinction of the two species is based on the following characters:

Styphelia douglasii: —

Rather compact, sometimes cushion-forming, erect shrub with coriaceous, stiff leaves at high altitudes (2400—3000 m) on rock lava and cinders, more loosely branched, or sometimes decumbent and with less coriaceous leaves and slender, elongate branchlets at 1900—2400 m, in dry places, similarly trailing at lower altitudes (1400—1830 m) in swampy places. *Leaves* densely to imbricately arranged, uniformly lanceolate, apex elongate, pungent, nerves few, outer ones only branched outwards, edge persistently subserrulate-cili(ol)ate, generally of a yellowish-greenish, often rather pale colour, slightly or hardly greyish beneath.

On Hawaii, Maui, Kauai, and Molokai.

Styphelia tameiameiae: —

Generally loosely branched, spreading and \pm erect shrub, sometimes a treelet with a slender stem up to 3 m high, from sealevel to c. 1200 m, exceptionally at higher altitudes up to 2150 m (Hawaii: E. slope of Mauna Kea at Puuoo and Huikao, *Sleumer 4558*); occasionally in a dwarf, more trailing form on bogs (Oahu), parallel to the one found in *S. douglasii* in similar places. *Leaves* \pm patently, laxly to subdensely arranged, variable in shape and size, generally subcoriaceous and lanceolate-oblong or oblong, more rarely (especially at higher altitudes) elliptic or subovate-elliptic, apex blunt to mucronulate by the protracted midrib, hardly or not properly pungent, nerves rather numerous, much fan-like branched, edge cili(ol)ate in juvenile stages, becoming eciliate and quite entire with age, dark to medium green, often glaucous or even silvery-grey beneath, generally on clayey (laterite) ground, or on relatively fresh lava. On Hawaii, Maui, Kauai, Molokai, Oahu, and Lanai.

Both species and their hybrids are gynodioecious. During my stay in February/March I found the profusely flowering specimens generally to be $\sigma\sigma$, sometimes bearing young and/or a few almost mature fruits. The profusely fruiting specimens with mature fruits usually were $\rho\rho$, and mostly had no or but few flowers at that time. The same was found in apparently hybrid populations between the two species. In the σ flower the anthers are well developed (± 1 mm) and full of pollen; in the ρ flower the anthers are reduced in size (± 0.5 mm) and empty. The ovary is the same in $\sigma\sigma$ and $\rho\rho$ flowers. No sharp difference can be found between the fruits of *S. douglasii* and *S. tameiameiae*, though the ones of *S. douglasii* seem to be larger in general. A maximum of size in fruits of *S. tameiameiae* with 11 by 9 mm I found on the above mentioned specimen at 2150 m on Mauna Kea. The colour varies from dark purple to pink and pure white in both

species. During the drying process, *i.e.* when preparing specimens for herbarium purposes, the leaves of *S. douglasii* remain almost entirely on the branchlets, whilst those of *S. tameiameiae* in part go off easily.

Styphelia robusta (Hook. f.) Sleum., *comb. nov.* — *Cyathodes robusta* Hook. f., Handb. N. Zeal. Fl. (1864) 177; Cheeseman, Man. N. Zeal. Fl. (1906) 411; Allan, Fl. New Zeal. 1 (1961) 516. — *Cyathodes acerosa* R. Br. var. *latifolia* Hook. f., Fl. N. Zel. 1 (1853) 163; F. v. M., Veg. Chath. Isl. (1864) 43.

CHATHAM ISL.

Styphelia juniperina (J. R. & G. Forst.) Pers., Syn. 1 (1805) 174, *non* (R. Br.) Spr. (1824, based on *Leucopogon juniperinus* R. Br. 1810 = *S. villosa* (Cav.) Dryand.). — *Epacris juniperina* J. R. & G. Forst., Char. Gen. Pl. (1776) 20, t. 10 (*fl.*); Forst. f., Prod. (1786) 13. — *Ardisia acerosa* Gaertn., Fruct. 2 (1791) 78, t. 94. — *S. acerosa* Sol. ex Gaertn., *l.c.*, *pro syn. Ardisiae acerosae*. — *Lissanthe acerosa* (Gaertn.) Spr., Syst. 1 (1824) 660. — *Cyathodes acerosa* (Gaertn.) R. Br. ex R. & S., Syst. 4 (1819) 473; G. Don, Gen. Syst. 3 (1834) 776 (ref. to the notes in R. Br., Prod. (1810) 539, 540, where, however, no proper combination was made); A. Cunn., Ann. Nat. Hist. 2 (1838) 47; DC., Prod. 7 (1839) 741; Raoul, Choix (1846) 44; Hook. f., Fl. Nov. Zel. 1 (1853) 163; Handb. New Zeal. Fl. (1864) 176; Benth., Fl. Austr. 4 (1869) 170, *p. p.*; Cheeseman, Man. New Zeal. Fl. (1906) 411; Ill. N. Z. Fl. (1914) pl. 124; Laing & Blackwell, Pl. New Zeal. (1927) 334, f. 121. — *Leucopogon forsteri* A. Rich., Ess. Fl. Nouv.-Zél. (1832) 216, *nom. ill.*, based on *Epacris juniperina* J. R. & G. Forst. — *Cyathodes articulata* Colenso, Trans. New Zeal. Inst. 28 (1896) 600. — *Cyathodes juniperina* (J. R. & G. Forst.) Druce, Rep. Bot. Soc. Exch. Cl. Brit. Is. for 1916 (1917) 618; Allan, Fl. New Zeal. (1961) 516.

NEW ZEALAND. North and South I., Stewart I.

Styphelia pomarae (A. Gray) Moore, Bull. Bern. P. Bish. Mus. 102 (1933) 36. — *Cyathodes pomarae* A. Gray, Proc. Am. Ac. 5 (1862) 324; Drake del Castillo, Fl. Polynésie Franç. (1893) 116. — *Cyathodes tahitensis* Nadeaud, En. Pl. Tahiti (1873) 62.

SOCIETY ISL. Tahiti: on the mountains, *Pickering s.n.* (U.S. Expl. Exp., GH, *type of Cyathodes pomarae*; K, NY); crêtes de l'Aorai, 1800 m, *fr.*, & au fond de la vallée de Orofero, col de Urechiro, 1100 m, *fl.*, Nadeaud 403 (G, L; P, *type of Cyathodes tahitensis*); S. of Mt Orohena, top of ridge, 1650 m, *MacDaniels* 1327, 1479; Mt Aorai, 1800–2050 m, E. H. Quayle 35; *McCormish* 1, 2; *McKee* 3051; crêtes de Pirae, 1200 m, *Nadeaud anno 1898*; no locality given: *Nelson s.n.*; *Grandjean anno 1893*; *Ribour* 52; *Vesco anno 1847*.

The leaves of *S. pomarae* show an elongate, needle-like, and breakable point, which, once broken, bears something like a tuft of 'hairs'; in reality these are, however, the outstanding sclerotic fibres accompanying the vessel of the midrib.

Styphelia rapae Sleum., *nov. spec.*—Frutex *c.* 1 m altus. Ramuli graciles, subdense foliati, apicibus glabri. *Folia* ± patentia, linearia vel lanceolato-linearia, apice breviter acuminata et in acumen rigidum achlorophyllum pungentem (0.5–1 mm longum) extenuata, basi subtruncata, coriacea, rigida, ab initio ciliata et glabra, supra in sicco saturate brunnea et lucidula, subtus intra nervos albido-cinerascentia vel glaucescentia, 1–1.2 (–1.4) cm longa, 1–1.5 mm lata, iis *S. brassii* et *S. juniperinae* simillima, costa et nervis lateralibus 2–3-paribus marginem parallelis supra saepius leviter impressis, subtus parce prominulis, nervis exterioribus 1 vel 2 plerumque in superiore laminae dimidio paucerasosis. *Floris* solitarii, in axillis superioribus paucis orti, subsessiles.

Bracteolae 7—10, ovatae usque oblongo-ovatae, haud vel indistincte ciliolatae, summae usque ad 1.5 mm longae, sat obscure longitudinaliter venosae. *Sepala* ovato-oblonga, obtusa, ciliolata, \pm 1.7 mm longa. *Corolla* inferne tubulosa, ad lobos infundibuliformi-expansa, cremeo-albida vel lutescens, tota 3 mm longa, dimidio paullo profundius 5-partita, utrinque glabra, tubo sepalis incluso, lobis denique subreflexis. *Antherae* anguste oblongae, 0.7 mm longae; filamenta filiformia, c. 0.5 mm longa, e corollae tubo vix exserta. *Ovarium* ovoideum, glabrum, c. 0.7 mm diam., stylo cum ovario sat abrupto, crasso, 1—1.2 mm longo. *Discus* tenuis cupulatus, superne 5-lobus. *Fructus* depresso-globosus, c. 3 mm altus, c. 4 mm diam.

TUBUAI Is. Rapa I.: Kaimaru mountain ridge, 180 m, fr. 2-11-1921, Stokes 400 (BISH, UC); *ibid.*, Area, hillside near sea, 7—30 m, fl. fr. 6-11-1921, Stokes 421 (BISH, type), mentioned by F. Brown, Bern. P. Bish. Mus. Bull. 130 (1935) 218 sub *S. acerosa* var. *oxycedrus*.

S. rapae, as to leaf-characters, certainly forms a coherent group with *S. juniperina* (New Zealand, Stewart I.; corolla decidedly campanulate, branchlets puberulous), *S. brassii* (SE. New Guinea; corolla tubular-subcampanulate, branchlets puberulous, bracteoles distinctly ciliolate), and *S. brevistyla* (branchlets short-hairy; corolla practically glabrous inside), but is more distant from *S. oxycedrus* Lab. (SE. Australia, Tasmania; nerves not branched) and from *S. pomarae* (Society Isl.; leaves with an elongate, fine, breakable point). In habit, however, all these species are apparently very similar.

8. *Styphelia brassii* Sleum., nov. spec.—Frutex vel arbuscula usque ad 6 m alta. Ramuli graciles, ad apices minute patenter puberuli, ad partes vetustiores cito glabrescentes et corticati, cortice nigrescenti longitudinaliter fisso. *Folia* subdense aggregata, patentia vel subreflexa, linearia vel lanceolato-linearia, apice breviter acuminata et in acumen rigidum achlorophyllum pungentem (0.5—1 mm) extenuata, basi brevissime lateque in petiolum subgracilem 0.5—1 mm longum attenuata, coriacea, rigida, integra, initio caduce ciliata, maturitate omnino glabra, supra in sicco brunneo-olivacea et lucida, subtus griseo-glaucoscentia, (0.8—)1—1.5 cm longa, 1—1.5 mm lata, costa nervisque lateralibus 2—3-paribus margini parallelis supra vix impressis, subtus minute sed bene visibiliter prominulis, exterioribus 1 vel 2 generaliter certe in superiore dimidio marginem versus ramosis, in foliis recentissimis saepius subramosis. *Flores* solitarii in axillis 3—6(—8) superioribus orti, subsessiles. Bracteolae basales 7—10, imbricatae, pedunculum vix 1 mm longum includentes, ovatae vel oblongo-ovatae, obtusae, ciliatae, 1—1.5 mm longae, inferiores minores. *Sepala* oblonga, obtusa, ciliata, \pm 1.8 mm longa. *Corolla* tubuloso-subcampanulata, alba, tota 3.8—4 mm longa, \pm usque ad medium 5-loba, extus glabra, intus ad lobos et superiorem dimidiam partem tubi subdense pilis mollibus crispulis induta, tubo brevissime vel vix e sepalis exserto. *Antherae* anguste oblongae, 1—1.2 mm longae; filamenta filiformia, glabra, 0.5 mm longa et e tubo corollae exserta. *Ovarium* late obovoideum, glabrum, c. 0.7 mm longum, superne in stylum sat gracilem glabrum 0.6—0.7 mm longum abiens. *Discus* tenuis, cupulatus, usque ad medium 5-lobus. *Fructus* globosus, albidus, maturitate purpurascens, c. 4 mm diam., endocarpio duro semina 2 vel 3 continente, mesocarpio tenui.

NEW GUINEA. Southeastern part: Milne Bay Distr., Mt Diriva, *Crutwell* 677; Mt Maneao, 2750—2895 m, *Brass* 22274 (A; L, type; LAE); *Crutwell* 781; Mt Simpson, 2590 m, *Crutwell* 59a (K).

Styphelia brevistyla J. W. Moore, Bull. Bern. P. Bish. Mus. 102 (1933) 36. — *Cyathodes tameiameiae* Cham. var. *societatis* A. Gray, Proc. Am. Ac. 5 (1862) 325; Nadeaud, En. Pl. Tahiti (1873) 62; Drake del Castillo, Fl. Polynésie Franç. (1893) 116.

SOCIETY IS. Tahiti: crêtes de Haamuta, 900 m, *Nadeaud 404* (G, L, P); no locality given: *Vesco anno 1847*. — Raiatea: Mt Temehani plain, 470 m, *J. W. Moore 106* (BISH, type of *Styphelia brevistyla*); *ibid.*, on high moor at 750 m, *H. St. John 17293* (BISH, K); no locality given: *Herb. Savatier 839* (P). — Moorea (Eimeo): *Pickering s.n.* (U.S. Expl. Exp., GH, type of *Cyathodes tameiameiae* var. *societatis*; K, NY, P).

The type and isotype material of *Cyathodes tameiameiae* var. *societatis* consists of two forms, one with narrower, the other with broader leaves. Partly they show a distinct, stiff mucro, as found in the holotype of *Styphelia brevistyla* and the plant collected by *Vesco*, partly they have a finer, needle-like, and breakable point as found in *Styphelia pomarae* and in *Nadeaud 404*.

A. Gray says, that the U.S. Expl. material of his var. *societatis* came "from Eimeo and probably Tahiti". With the scanty material at hand, it is impossible to say, if next to *Styphelia brevistyla* — possibly restricted to Raiatea and Moorea (Eimeo) — there exists a form with smaller leaves and smaller corollas, belonging to *Styphelia pomarae*, on Tahiti.

Styphelia mariannensis (Kaneh.) Kaneh. & Hatus., Bot. Mag. Tokyo 56 (1942) 484, in text. — *Cyathodes mariannensis* Kaneh., *ibid.* 48 (1934) 734, f. 5 (*pessima*); Kaneh., J. Dept Agr. Kyushu Univ. 4 (1935) 386.

MARIANAS. Alamagan I.: near the old crater, up to 700 m, *Kanehira 2182* (FU, type, not seen; K, P), fl. fr.; *ibid.*, *Hosokawa 7913* (BISH), fl.

The species is apparently nearest to *Styphelia tameiameiae* from the Hawaii and Marquesas Isl.

Styphelia tameiameiae (Cham.) F. v. M., Fragm. 6 (1867) 55; Drude in E. & P., Pfl. Fam. 4, 1 (1889) 78; Rock, Ind. Trees Hawaiian Isl. (1913) 365; MacCaughy, Hawaiian For. Agr. 13 (1916) 33; Bull. Torr. Bot. Cl. 44 (1917) 153 p.p.; Kraebel, Hawaiian For. Agr. 19 (1923) 4; Skottsbl., Medd. Göteb. Bot. Trädg. 2 (1925) 254; *l.c.* 6 (1930) 52; *l.c.* 15 (1944) 423. — *S. tameiameiae* (Cham.) F. v. M. var. *hexamera* Fosberg & Hosaka, Occ. Pap. Bern. P. Bish. Mus. 14, 1 (1938) 4. — *S. tameiameiae* f. *marquesensis* F. Brown, Bull. Bern. P. Bish. Mus. 130 (1935) 218. — *Cyathodes tameiameiae* Cham., Linnaea 1 (1826) 539; Hook. & Arn., Bot. Beechey Voy. (1832) 89; Endl., Ann. Wien. Mus. Naturgesch. 1 (1836) 170; DC., Prod. 7 (1839) 741; Nutt., Trans. Am. Phil. Soc. II, 8 (1842) 270; A. Gray, Proc. Am. Ac. 5 (1862) 325, incl. var. *chamissoi* A. Gray; Mann, *l.c.* 7 (1867) 188; Wawra, Flora 56 (1873) 59, incl. f. *collina* Wawra; Hilleb., Fl. Hawaiian Isl. (1888) 272; Drake del Castillo, Ill. Fl. Pacif. 7 (1892) 224; Heller, P. Hawaiian Isl., in Minnesota Bot. Stud. Bull. 1, 9 (1897) 872; Rechingher, Denkschr. Akad. Wiss. Wien 89 (1913) 637; Degener, Pl. Hawaii Nat. Park (1930) 247, pl. 69. — *Cyathodes macraeana* DC., Prod. 7 (1839) 742. — *Cyathodes banksii* Gaud. in Freyc., Voy. Bot. (1827) 98, *nom. nud.*; Endl., Ann. Wien. Mus. Naturgesch. 1 (1836) 170, *nom. nud.*; Gaud. ex DC., Prod. 7 (1839) 742, *descr.*; Nutt., Trans. Am. Phil. Soc. II, 8 (1842) 270. — *Cyathodes imbricata* (non Stschegl.) Heller, Minnesota Bot. Stud. Bull. 1, 9 (1897) 872.

var. *tameiameiae* from the Hawaiian Islands.

Cyathodes tameiameiae is based on a specimen collected by Eschscholtz (or may be by Eschscholtz & Chamisso) "in clivis aridioribus ad radices montium circa Hanaruru (i.e. Honolulu) insulae Oahu" (B, †; G-Boiss, K, L; LE, type, not seen; P). *S. tameiameiae* var. *hexamera* was collected on Oahu, Koolau Ra., on the main divide above Kaipapau

Gulch at 850 m, by Fosberg & Hosaka (13971, BISH). As to the leaves, this variety is intermediate between var. *tameiameiae* and var. *brownii*; 6- and 7-merous flowers occur occasionally both in *S. tameiameiae* and in *S. douglasii*, and cannot form the base of a proper variety. *Cyathodes macraeana* DC. was founded on a specimen collected by Macrae on "Owyhee" (i.e. on Hawaii) "ad montem ignivomem, Junio 1825", i.e. on Kilauea, preserved in G-DC, and is not distinguishable from typical *S. tameiameiae* in the form of the leaves ("foliis linearibus oblongis subobovatisque mucronatis" in the original description). In G-DC also the holotype of *Cyathodes banksii* Gaud. ex DC. is preserved, which hardly differs in the leaves from typical *S. tameiameiae*. *Cyathodes tameiameiae* var. *chamissoi* A. Gray f. *collina* Wawra is based on *Wawra 1817* from Maui, Base of Haleakala, preserved in the Vienna Herb., and corresponds to var. *tameiameiae*. *Cyathodes imbricata sensu* Heller refers to *Heller 2739* from a bog near the head of Wahiawa on Kauai, and equally is a form of var. *tameiameiae*, possibly slightly influenced by the above discussed "struthioloides" form of *S. douglasii* from practically the same place.

Var. *tameiameiae* is known from Hawaii, Oahu, Maui, Kauai, Lanai, and Molokai. I had the opportunity to study extensive and locally often rather homogeneous populations of *S. tameiameiae* on the 4 islands mentioned first, from sealevel (Mackenzie Park near Hilo, on Hawaii, *Sleumer 4559*) up to 2150 m (on E. slope of Mauna Kea, between Puuoo and Huikao, *Sleumer 4558*), and on various soils. There are many local forms (apart from the *douglasii*-influenced hybrids at medium altitudes), which cannot be treated as systematically clear-cut entities due to the numerous transitions in leaf shape and size, the length of the apical mucro, the size of the flowers (smallest ones but 3 mm long in all), and the colour of the fruits, besides a group of forms with larger and more elliptic leaves, chiefly found in the upper mountain forest and/or generally at higher altitudes, which can be united as var. *brownii*.

The species is gynodioecious. In the 'female' specimens the anthers are much reduced in size and without a trace of pollen; generally these shrubs are fruiting profusely. The corolla tube is rather short, and practically not exerted from the sepals. In the bisexual specimens, the corolla tube is mostly a little longer and consequently slightly exerted from the sepals. Such specimens flowered profusely during the time of my visit to Hawaii (February-March), and immature and mature fruits were but rarely found on them.

var. *tameiameiae* from the Marquesas Islands.

MARQUESAS ISL. Nukuhiva: Tovii, 900—950 m, rare, *F. Brown 533* (BISH, type of *f. marquesensis*), *533A*, *533B*; *Decker 379* (BISH); *Quarle 1237* (BISH); *Henry 41* (P). — Maauu: 900 m, *Mumford & Adamson 560* (BISH); E. Tunoa Pahuhitone ridge, 975 m, *Hambuechen 308* (BISH); no locality given: *Henry 5* (P).

Having investigated these materials, I am unable to give any constant character to separate the Marquesas specimens from the Hawaiian forms as collected under var. *tameiameiae* above.

var. *brownii* (A. Gray) St. John, Occ. Pap. Bern. P. Bish. Mus. 17, 7 (1942) 84. — *Cyathodes tameiameiae* Cham. var. *brownii* A. Gray, Proc. Am. Ac. 5 (1862) 325. — *Cyathodes tameiameiae* Cham. var. *macraeana* (non DC. pr. sp. s. str.) Hillebr., Fl. Hawaiian Isl. (1888) 273. — *Cyathodes tameiameiae* Cham. var. *chamissoi* A. Gray f. *montana* Wawra, Flora 56 (1873) 59.

The type material of *Cyathodes tameiameiae* var. *brownii* in the Gray Herbarium consists of plants collected by the U.S. Expl. Exp. under Capt. Wilkes in 1838/42 and by Macrae in 1825 "on Maui, Kauai and especially Hawaii". In the original description var. *brownii*

is distinguished from the typical variety (A. Gray's var. *chamissoi*) by corolla lobes which are glabrous inside, a character which also occurs in var. *tameiameiae* (and in *S. douglasii*). Such forms with glabrous or almost glabrous corollas I found, to my surprise, on the 2 sheets designated by A. Gray himself as var. *chamissoi* in the Gray Herbarium; part of these have broad leaves, as specimens of the U.S. Expl. Exp. and *Remy 488*.

Under var. *brownii*, A. Gray cites "(*C. banksii* Gaud.?) & *C. Macraeana*, DC.)", but it is questionable, if var. *brownii* was a name in the varietal category for *Cyathodes macraeana* DC. and for the doubtful *C. banksii* Gaud. ex DC. If so — as St. John states —, the type of one of these species must be the type of var. *brownii*. I cannot follow St. John in such an argumentation and prefer to consider var. *brownii* as an independently described variety, the type of which must be chosen from the original material in the Asa Gray Herbarium. This material comprises 2 herbarium sheets, one with specimens with broad leaves from Kauai and Maui, collected by the U.S. Expl. Exp., and another with rather narrow-leaved specimens from Hawaii (leg. U.S. Expl. Exp.) and one broad-leaved specimen from Hawaii (leg. *Macrae*).

The broad-leaved variety was named by Hillebrand var. *macraeana* (*Cyathodes macraeana* DC. and var. *brownii* A. Gray being cited by Hillebrand in synonymy). This varietal name *macraeana* is illegitimate, because the varietal name *brownii* is older. Indirectly, Hillebrand in this place enlarged the description of var. *brownii* with leaf characters. Unfortunately the type of *Cyathodes macraeana* DC. (and of *C. banksii* Gaud. ex DC.), conserved in the DeCandolle Herbarium at Geneva and seen by the present author, coincide, as to leaf-characters, with var. *tameiameiae*, the description of which hardly differs from those of *Cyathodes macraeana* and *C. banksii*, if a possibly present pubescence of the inner side of the corolla lobes is neglected.

Wawra has the broad-leaved variety under *f. montana*, collected by him (1661) near Waiolani, Oahu, and preserved in the Vienna Herbarium.

To save the situation both systematically and nomenclaturally, I have selected as *lectotype* of var. *brownii* the broad-leaved specimen from Maui (leg. U.S. Expl. Exp.) from the original material, which Asa Gray designated himself as such. This material is matched by *Degener 18489* and *Degener & Fleming 25308* from Koolau Gap, Haleakala, on Maui.

This broad-leaved variety is known from Hawaii, Maui, Kauai, Lanai, and Oahu.

2. DECATOCA

F. v. M., Trans. R. Soc. Vict. 1, 2 (1889) 25; Baillon, Hist. Pl. 11 (1892) 203; Drude & Harms in E. & P., Pfl. Fam. Nachtr. 2 (1900) 53.

1. *Decatoca spenceri* F. v. M., Trans. R. Soc. Vict. 1, 2 (1889) 25 ('*spencerii*'); C. H. Wright, Kew Bull. (1899) 104; J. J. S., Nova Guinea 8, 4 (1912) 798; Diels, Bot. Jahrb. 62 (1929) 488; Steen., Bull. Jard. Bot. Btzg III, 13 (1934) 203.

NEW GUINEA. Southeastern part: Centr. Distr., Mt Knutsford, 3960 m, *McGregor anno 1889* (K; MEL, type, not seen; P, SYD); Mt Scratchley, 3050—3960 m, *Giulianetti anno 1896*; Wharton Range, 3380 m, *Giulianetti & English anno 1897*; *ibid.*, Murray Pass, 2840 m, *Brass 4675*; Mt Albert Edward, 3680 m, *Brass 4220, 4425* (A). — Northeastern part: Morobe Distr., Mt Saruwaged, 3600—400 m, *Keysser 27* (B, †).

3. TROCHOCARPA

R. Br., Prod. (1810) 548; R. & S., Syst. 4 (1819) xlii; Spr., Syst. 1 (1824) 660 (= *Decaspora* R. Br.); Don, Gen. Syst. 3 (1834) 781; F. v. M., Fragm. 6 (1867) 57; Benth., Fl. Austr. 4

(1868) 165; Bailey, Queensl. Fl. 3 (1900) 928; Rodway, Tasman. Fl. (1903) 112. — *Decaspora* R. Br., Prod. (1810) 548 (lectotype sp.: *D. disticha* (Lab.) R. Br. = *Cyathodes disticha* Lab.); R. & S., Syst. 4 (1819) xlii; Don, Gen. Syst. 3 (1834) 781; DC., Prod. 7 (1839) 758.

Type species: *T. laurina* (R. Br. ex Rudge) R. Br.

KEY TO THE SPECIES

1. Bracteoles 2, opposite. Flowers in spikes, racemes or at least 3-flowered clusters. Subgen. **Trochocarpa**.
2. Leaves (2.5—)3—5(—7.5, rarely up to 8.5) by (0.5—)0.1—2.5(—2.7, rarely up to 3.5) cm, narrow-leaved juvenile microforms excepted. Spikes many-flowered, suberect, (1.5—)2—4(—5) cm. Pyrenes very close together, initially forming a deeply (8—)10-ribbed kind of stone, finally separable from each other. *Australia* (New S. Wales, Queensland), *NW. New Guinea*
 1. *T. laurina* (R. Br. ex Rudge) R. Br.
2. Leaves up to 1.8 by 0.6 cm. Flowers condensed into few-flowered, very short spikes or spike-like, ± recurved clusters. Pyrenes close together, from the beginning separated by a conspicuous layer of pulpy mesocarp, easily separable from each other later on.
3. Main nerves on the undersurface of the leaves few and spaced, sometimes obsolete, whether or not branched, more distinct than their branches.
 4. Corolla quite glabrous inside. (Nervation of the leaves of the type found in *T. disticha*, but generally less raised, or even obscure.) *Tasmania* *T. gunnii* (Hook. f.) Benth.
 4. Corolla laxly to densely hairy inside on the lobes and/or the upper part of the tube.
 5. All main nerves of the leaves provided with numerous short branches on either side and ± from below, ± distinctly raised especially on the upper surface, as is the branching. *Tasmania*. *T. disticha* (Lab.) Spr.
 5. Lateral nerves of the leaves unbranched or branched outward only, the branching in general sparse and mainly in the upper part of the leaves; nerves *incl.* their branching impressed or obscure, never raised above.
 6. Petiole very slender, equalling $\frac{1}{3}$ to almost $\frac{1}{2}$ the length of the blade. *Tasmania*.
 6. Petiole slender to stoutish, (much) shorter than $\frac{1}{3}$ the length of the blade.
 7. Leaves lanceolate-acute, 0.5—1 (rarely in the same specimen partly up to 1.5) mm wide. Fruit pink to light purple at full maturity. (Branchlets covered with a subvillous yellowish tomentum; when patently short-hairy or puberulous, cf. *T. dekokkii*.) *NW. New Guinea*. 2. *T. gjellerupii* (J.J.S.) H. J. Lam
 7. Leaves lanceolate, oblong to ovate, on an average (much) wider, microforms excepted. Fruit blue-purple to almost blackish at full maturity.
 8. Corolla 5-partite ± halfway, the tube ± equalling the sepals and therefore generally ± included by them. *N. Borneo, Central Celebes* 3. *T. celebica* (J.J.S.) Steen.
 8. Corolla 5-lobed to ± $\frac{1}{2}$ (or less), the tube decidedly longer than the sepals and therefore exerted from them.
 9. Uppermost part of the corolla tube inside with a tuft of longish, rather coarse hairs. Corolla campanulate, greenish, lobes purplish. *Australia* (Victoria).
 9. Uppermost part of the corolla tube inside laxly to subdensely set with fine, rather short hairs. Corolla suburceolate-cylindric, creamy-white, white or pink. *New Guinea*. 4. *T. dekokkii* (J.J.S.) H. J. Lam
 3. Main nerves on the undersurface of the leaves rather numerous and close together, always distinct, much fan-like branched, not very different in appearance from their branches.
 10. Corolla ± campanulate, 5-partite ± halfway, with many prominent, longitudinal veins outside. *New Guinea* 5. *T. nutans* (J.J.S.) H. J. Lam
 10. Corolla urceolate-cylindric, 5-lobed to ± $\frac{1}{2}$, not veined at all.
 11. Corolla 4—5 mm long, lobes included. Leaves lanceolate to lanceolate-oblong; nerves hardly prominent, or a little sunk on both faces or underneath only. *New Guinea*.
 6. *T. nubicola* (Wernh.) Sleum.
 11. Corolla 5—6(—6.5) mm long, lobes included. Leaves ovate to elliptic-ovate or ovate-oblong; nerves ± strongly prominent on both faces. *New Guinea*
 7. *T. dispersa* Sleum.
 1. Bracteoles numerous (7—10). Flowers solitary, or rarely in twos. Subgen. **Pseudocyathodes**.

12. Branchlets very densely leaved, practically glabrous. Leaves lanceolate or narrow-lanceolate, (6—) 8—10 by 1—1.5(—2) mm; petiole c. 0.5 mm. *NW. New Guinea.*
8. *T. arfakensis* (Kaneh. & Hatus.) Sleum.
12. Branchlets less densely leaved, ± densely patently puberulous to hirsutulous. Leaves lanceolate to oblong-lanceolate, 8—10 by 2.5—3.5 mm; petiole 1(—1.5) mm. *NW. New Guinea.*
9. *T. papuana* (C. H. Wright) Sleum.

subg. TROCHOCARPA

1. *Trochocarpa laurina* (R. Br. ex Rudge) R. Br., *Prod.* (1810) 548; Hook., *Bot. Mag.* 66 (1834) t. 3324; Loudon, *Arbor. & Frutic. Brit.* 2 (1838) 1075; DC., *Prod.* 7 (1839) 758; F. v. M., *Fragm.* 6 (1867) 57; Benth., *Fl. Austr.* 4 (1869) 166; F. v. M., *Fragm.* 9 (1875) 48; First Census (1882) 107; Bail., *Syn. Queensl. Fl.* (1883) 286; Queensl. Woods (1888) 80; Watkins, *Proc. R. Soc. Queensl. Fl.* 5 (1888) 71; Simmonds, *ibid.*, 6 (1889) 124; Maiden, *Usef. Nat. Pl. Austr.* (1889) 611; Bail., *Rep. Gov. Sci. Exp. Bell.-Ker* (1889) 47; F. v. M., *Sec. Census* (1889) 181; Bail., *Cat. Pl. Queensl.* (1890) 28; Moore, *Hand. Fl. New S. Wales* (1893) 373; Bail., *Queensl. Woods* (1899) 92; *Queensl. Fl.* 3 (1900) 928; *in* Meston, *Exp. Bell.-Ker* (*Parliam. Rep.*, 1904) 14; Wedd & White, *Queensl. Nat.* 1 (1910) 119; Bail., *Queensl. Agric. J.* 28 (1912) 198; *Compr. Cat.* (1913) 295; Maiden & Betche, *Cens. New S. Wales Pl.* (1916) 167; Domin, *Bibl. Bot.* 89 (1928) 496, f. 172 (above); White, *Contr. Arn. Arb.* 4 (1933) 85 (*incl. T. bellendenkerensis*). — *Cyathodes laurina* R. Br. ex Rudge, *Trans. Linn. Soc.* 8 (1807) 293. — *Styphelia cornifolia* Rudge, *l.c.* t. 9. — *Styphelia trochocarpoides* F. v. M., *Pap. Pl.* 1 (1875) 107; J. J. S., *l.c. Bog.* 4 (1913) 173; *Nova Guinea* 12, 5 (1917) 540, *in text*; *in* Gibbs, *Arfak* (1917) 168; Kaneh. & Hatus., *Bot. Mag. Tokyo* 56 (1942) 485 (*'trochocarpoides'*). — *Decaspora laurina* (R. Br. ex Rudge) O. Ktze, *Rev. Gen. P.* 2 (1891) 391. — *T. bellendenkerensis* Domin, *Bibl. Bot.* 89 (1928) 496, f. 172 (below).

AUSTRALIA. New S. Wales, Queensland.

NEW GUINEA. Northwestern part: Vogelkop Peninsula, Kebar Valley, 600—1100 m, *BW 713 Versteegh*; *BW 2327 Smit*; *van Royen 3940*; *BW 6874 Koster*; *BW 5583 v. d. Sijde*; *BW 3280 Mangold*; *BW 7962 Schram*; *ibid.*, above Sulphur Springs, 700 m, *van Royen & Sleumer 7335*; *ibid.*, above Nertoi, 600 m, *van Royen & Sleumer 6750*; *ibid.*, Watjetoni Mts, 1200 m, *BW 10340 Versteegh*; Tamrau Mts East, 1100—1400 m, *van Royen & Sleumer 7135*; *ibid.*, waterdivide, Wamsuf area, 1950—2050 m, *van Royen & Sleumer 7151, 7216*; Nettoti Mts, Mt Nettoti, 1950 m, *BW 10378 Versteegh*; *van Royen & Sleumer 7495*; Arfak Mts, Anggi Gita Lake, 1800—2200 m, *Kostermans 2086, 2102, 2147*; *BW 268 Versteegh*; *Kanehira & Hatusima 13492*; *Gibbs 5583*; *ibid.*, ascent to Mt Mesenuk, 1900—2150 m, *Sleumer & Vink 4222*; Mt Koëbré, 2300 m, *Kanehira & Hatusima 13696*; Tombruk, 1875 m, *BW 2054 Stefels*; Mt Sensenemés above Surerei, Anggi Gigi Lake, 2500—2650(—2750) m, *Sleumer & Vink 4352*; Mt Gwamongga, swampy summit plateau, 2570 m, *Sleumer & Vink 4369*, shrublet, 30 cm, microform with leaves 12—16 by 2.5—4.5 mm; Hatam, 1830 m, *Beccari s.n.* (*Fl. type of Styphelia trochocarpoides*); Mt Lensemoi, Minjambau, 1800 m, *BW 12669 Versteegh*; *ibid.*, Mt Antop, 1700 m, *BW 13857 Koster*; Ransiki, Mt Mundi, 1900 m, *BW 2248 Mangold*.

2. *Trochocarpa gjellerupii* (J. J. S.) H. J. Lam, *Blumea* 5 (1945) 573. — *Styphelia gjellerupii* J. J. S., *Nova Guinea* 12, 5 (1917) 540; *ibid.* (1918) t. 225; *in* Gibbs, *Arfak* (1917) 167; Steen., *Bull. Jard. Bot. Btzg III*, 13 (1934) 203; Kaneh. & Hatus., *Bot. Mag. Tokyo* 56 (1942) 484.

NEW GUINEA. Northwestern part: Tamrau Mts East, in open vegetation on waterdivide above Waumi R., Wamsuf area, 2000—2080 m, *van Royen & Sleumer 7200*; Nettoti Mts, crest of Mt Nettoti, c. 1900 m, *van Royen & Sleumer 7451, 8060*; Arfak Mts, Anggi Lakes, 2100—2500 m, *Gjellerup 1184* (BO, *type*; L); *Kostermans 2059, 2085*; *BW 267 Versteegh*; *BW 2025 Stefels*; Mt Koëbré, 2200—2450 m, *Gibbs 5604*; *Kanehira & Hatusima 13478* (*cit. Kaneh. & Hatus., not seen*), 13493 (*A*), 13701, 13978; *ibid.*, above Testega 2300 m, *Sleumer & Vink 4276, 4277*; ascent to Mt Mesenuk, Anggi Gita Lake, 1950—2150 m, *Sleumer & Vink 4224*; Mt Sensenemés above Surerei, Anggi Lake, 2450—2550 m, *Sleumer & Vink 4312*.

3. *Trochocarpa celebica* (J. J. S.) Steen. in Lam, *Blumea* 5 (1945) 573. — *Styphelia celebica* J. J. S., Ic. Bog. 4 (1910) 81, t. 325; Nova Guinea 8, 4 (1912) 798; Steen., Bull. Jard. Bot. Btzg III, 13 (1934) 203. — *Styphelia learnmonthiana* Gibbs, J. Linn. Soc. Bot. 42 (1914) 105, f. 5; Merr. En. Born. (1921) 467; Masamune, En. Phan. Born. (1943) 577. — *T. learnmonthiana* (Gibbs) H. J. Lam, *Blumea* 5 (1945) 574.

CELEBES. Central part: Latimodjong Range, Mt Bulu Palaka, c. 3500 m, *Abendanon anno 1909* (BO, type of *Styphelia celebica*); Latimodjong, bivouac Heinrich, 3250 m, *Eyma 1046a* (BO, leaves lanceolate, 5–7 by 2 mm); between Tinábang and Rante Mario, 3100–3400 m, *Eyma 678*; Rante Mario, 3000–3300 m, *Eyma 755* (BO); *Kjellberg 3982*; Mt Mambuliling, N. of Mamas, 2700 m, *Monod de Froideville 127* (BO, L, a form with narrow-lanceolate leaves 6–8(–9) by 1–1.8 mm).

BORNEO. N. Borneo: Mt Kinabalu, from Paka Cave to the summit, 2750–4096 m, *Gibbs 4176* (cit. '4126', K, lectotype of *Styphelia learnmonthiana*), 4305 (BM, syntype); *Clemens 10572* (A, cit. Merrill sub *Styphelia suaveolens*), 10638 (A, cit. Merrill sub *Styphelia suaveolens*), 28956 p.p., 50874 p.p., 51179.

4. *Trochocarpa decockii* (J. J. S.) H. J. Lam, *Blumea* 5 (1945) 574. — *Styphelia decockii* J. J. S., Nova Guinea 8, 4 (1912) 802, t. 146 B; Steen., Bull. Jard. Bot. Btzg III, 13 (1934) 203; J. J. S., Nova Guinea 18 (1936) 124; Kaneh. & Hatus., Bot. Mag. Tokyo 56 (1942) 484. — *Styphelia vannouhuysii* J. J. S., Nova Guinea 8, 4 (1912) 789 (*nom. nud.*), 801 (*descr.*), t. 146 A; *ibid.* 12, 5 (1917) 541; Steen., Bull. Jard. Bot. Btzg III, 13 (1939) 203; J. J. S., Nova Guinea 18 (1936) 124. — *Styphelia culminis* Wernh., Trans. Linn. Soc. ser. 2 Bot. 9 (1916) 101. — *T. vannouhuysii* (J. J. S.) H. J. Lam, *Blumea* 5 (1945) 573.

NEW GUINEA. Northwestern part: Tamrau Mts East, on waterdivide above the Waumi R. camp, Wamsuf massif, c. 2000 m, *van Royen & Sleumer 7201*, a narrow-leaved, trailing form in swampy places with stagnant water; Arfak Mts, Anggi Lakes, 2300 m, *Kanehira & Hatusima 13985* (FU, not seen, cit. by K. & H.); Mt Sensenemés above Surerei, Anggi Gigi Lake, 2500–2600 m, *Sleumer & Vink 4327, 4327 A*; on swampy summit plateau of Mt Gwamongga, Anggi Gigi Lake, 2570 m, *Sleumer & Vink 4373 A* (form with narrower leaves); Mt Koëbré between Anggi Lakes, NE. part, 2400 m, *Sleumer & Vink 4409*; *ibid.*, path to Mt Tembruk, c. 2400 m, *Sleumer & Vink 4483*. — Western part: Mt Doorman, 3260–3520 m, *Lam 1584, 1632, 1651, 1752*; Utakwa R. to Mt Carstensch, 3200–3810 m, *B. Kloss s.n.* (BM, type of *Styphelia culminis*); *ibid.*, 3500 m, *Dozy s.n.*; *ibid.*, 3700–4300 m, *Wissel 159* (BO); Oranje Mts, 'Meer-vallei', 3600(–4000) m, *Pulle (Versteeg) 2544*; top of the Wichmann Mts, 3000–3050 m, *Pulle 973*; *van Nouhuys 22* (BO, type of *Styphelia vannouhuysii*); Mt Goliath, 3200 m, *De Kock 83* (BO, type of *Styphelia decockii*); Lake Habbema, 3225 m camp, *Brass 9034 (A), 9185, 9185 A, 21118 (A)*; Mt Wilhelm, 3400–3850 m, *Brass & Meijer Drees 9677, 9930, 9996, 10343*. — Central part: Star Mts, Mt Antares, 3300–3400 m, *Nicolas 20*; *Kalkman 4498*; *van Zanten s.n.* — Western Highlands: Mt Hagen Subdistr., Mt Hagen, 3350–3655 m, *Shaw Mayer s.n.* (BM); *Robbins 1044*; Wabag Subdistr., Mt Sugarloaf summit area, 3650 m, *Hoogland & Schodde 7117*; Minj Subdistr., Central Kubor Ra., Mt Kinkain, 3600 m, *Pullen 221*; *Saunders 713*. — Southern Highlands: Mt Giluwe, 3140–3650 m, *Schodde 1718, 1941*. — Eastern Highlands: Mt Wilhelm, E. slope, 3350–4200 m, *Brass 29898* (US), 29911; *Borgmann 23*; *Hoogland & Pullen 5700*; *Anderson JARA 16*; *Walker 20*; *NGF 8847, 8849, 8851, 8923 Womersley*; *NGF 15146 van Royen*; *Barrett 15 p.p.*; *Sleumer 4150*; *Robbins 1165*; Mt Michael, 3050–3650 m, *NGF 5794 McGrath*; *NGF 11481 Womersley*; *Brass 31409*; *Brass & Collins 31253, 31274*. — Morobe Distr.: Mt Saruwaged, 3600–3960 m, *Clemens 5589, 7288 p.p. (A)*; Ulap trail, *Clemens 41146 (A)*. — Central Distr.: Mt Albert Edward, 3680 m, *Brass 4327, 4405 (A)*. — Milne Bay Distr.: Maneau Ra., Mt Donana, 2700 m, *Crutwell 925*; Mt Aniata, c. 2600 m, *Crutwell 1038*.

5. *Trochocarpa nutans* (J. J. S.) H. J. Lam, *Blumea* 5 (1945) 573. — *Styphelia nutans* J. J. S., Nova Guinea 8, 4 (1912) 798 (*nom. nud.*) & 800 (*descr.*), t. 145; *ibid.*, 12, 5 (1917) 541; Steen., Bull. Jard. Bot. Btzg III, 13 (1934) 203. — *Styphelia varstensis* Wernh., Trans. Linn. Soc. ser. 2 Bot. 9 (1916) 100. — *Styphelia nutans* J. J. S. var. *arfakensis* J. J. S. in Gibbs, Arfak (1917) 167; Kaneh. & Hatus., Bot. Mag. Tokyo 56 (1942) 484.

NEW GUINEA. Northwestern part: Tamrau Mts East, waterdivide above Waumi R. camp, Wamsuf massif, 2000 m, *van Royen & Sleumer 7230*; Nettoti Mts, S. slope and crest of Mt Nettoti, 1850–2100 m, *van Royen & Sleumer 7450, 7977, 8066*; Arfak Mts, Anggi Lakes, 2285–2300 m, *Gibbs 5631* (BM, type of *Styphelia nutans* var. *arfakensis*); *Kanehira & Hatusima 13977*; Mt Koëbré ridge between Anggi Lakes,

2300—2350 m, *Sleumer & Vink 4273, 4282; ibid.*, NE. part, 2430 m, *Sleumer & Vink 4478*; Mt Gwamongga above Surerei, Anggi Gigi Lake, 2550 m (top), *Sleumer & Vink 4373*; Mt Mundi, c. 1900 m (top), *BW 2250 Mangold*. — Southwestern part: Utakwa R. to Mt Carstensz, 2530—3350 m, *B. Kloss s.n.* (BM, type of *Styphelia carstensensis*); Hellwig Mts, top c. 2600 m, *Pulle 590*; *von Römer 1319* (BO, lectotype of *Styphelia nutans* = t. 145); *van Nouhuys s.n.* (BO, syntype of *Styphelia nutans*); Wichmann Mts, top, c. 3000 m, *Pulle 974*.

6. *Trochocarpa nubicola* (Wernh.) Sleum., nov. comb. — *Styphelia nubicola* Wernh., Trans. Linn. Soc. ser. 2 Bot. 9 (1916) 101.

NEW GUINEA. Western part: Utakwa R. to Mt Carstensz, 2530—3810 m, *B. Kloss s.n.* (BM, type); Mt Wilhelmina, 3400—3800 m, *Brass & Meijer Drees 9640, 9665, 9910, 10341*; Lake Habbema, 3000—3225 m, *Brass 9065, 9096, 9101, 9574, 10663*. — Southeastern part: Mt Scratchley, 3050—3960 m, *Giulianetti anno 1896* (K, part of the material on the type sheet of *Leucopogon papuanus* C. H. Wright).

7. *Trochocarpa dispersa* Sleum., nov. spec.—Frutex 0.3—1.5(—2.5) m altus, ramis numerosis iterum ramosis suberectis. Ramuli graciles (c. 1 mm diam.), subdense patentiter pilosi vel subhirsutuli, dense foliati. *Folia* subpatentia, ovata vel elliptico-ovata, rarius ovato-oblonga, apice sensim subacuminato-attenuata, basi rotundata usque late cuneata, ± caduce subserrulato-ciliolata, ceterum glabra, supra lucida, subtus pallidiora et opaca, 7—9(—13) mm longa, (3—)4—5 (raro usque ad 6) mm lata, nervis primariis numerosis, densis, iterum et iterum cincinnato-ramosis, subtus cum ramulis ± aequaliter bene prominentibus, supra (ramificationibus inclusis) minus elevatis; petioli c. 1 mm longi. *Racemi* abbreviati, recurvati, terminales et ex axillis superioribus nonnullis orti, (3—)4—8(—10)-flori; rhachis brevissima, dense pilis brevibus induta, inferne bracteis nonnullis obtecta. Flores (sub)sessiles, bractea basali ovata, c. 1 mm longa, bracteolis 2 suboppositis, ovatis c. 1.5 mm longis. *Sepala* oblongo-ovata, 2—2.5 mm longa, sicut bractee bracteolaeque carinata, ciliolata, dorso glabra et prominulo-venosa. *Corolla* alba, urceolato-cylindrica, tota 5—6(—6.5) mm longa, intus in superiore ½ tubi subdense pilis longis retrorsis induta, ceterum glabra, laevis, lobis ovato-oblongis, obtusis, 1.5—1.8 mm longis, parum patentibus. *Antherae* in fl. ♂ 1.2 mm longae. *Discus* cupularis, leviter 5—10-lobus. *Ovarium* subglobosum, glabrum, stylo crasso 1.5—2 mm longo, stigmatate peltato. *Fructus* depresso-globosus, in vivo pallide caeruleus vel purpurascens, maturitate 3—4 mm longus, 5—6 diam., stylo haud accrescenti coronatus.

NEW GUINEA. Eastern Highlands: Mt Wilhelm, East slope, around the Lakes, 3400—3600 m, *fl. fr. 13/15-9-1961, Sleumer 4147, 4177* (A; L, type; LAE), in fores; *Brass 30145; NGF 14681 Millar*. — Western Highlands: Wahgi Divide, *NGF 5197 Womersley* (K, LAE); Minj Subdistr., Central Kubor Ra., Mt Kinkain, 3400—3600 m, *Pullen 216* (CANB); *Saunders 731* (CANB, LAE).

subg. PSEUDOCYATHODES

Sleum., *subgen. nov.*—Flores solitarii, rarius bini, sessiles. Bracteolae numerosae (7—10). *Ovarium* (8—)10-loculare. *Bacca* carnosae, pyrenae (8—)10 distinctae (pulpa separatas) continens.

Type species: T. arfakensis (Kaneh. & Hatus.) Sleum. = *Styphelia arfakensis* Kaneh. & Hatus.

8. *Trochocarpa arfakensis* (Kaneh. & Hatus.) Sleum., comb. nov. — *Styphelia arfakensis* Kaneh. & Hatus., Bot. Mag. Tokyo 56 (1942) 483, f. 6.

NEW GUINEA. Northwestern part: Arfak Mts, Anggi Lakes, 2100—2300 m, *Kanehira & Hatusima 14042* (A, BO; FU, type of *S. arfakensis*, not seen); Mt Mesenuk, Anggi Gita Lake, 2150 m, *Sleumer & Vink 4225*; Mt Sensenemés above Surerei, Anggi Gigi Lake, 2400(—2600) m, *Sleumer & Vink 4302*; above Ikeremot village, 2050 m, *Sleumer & Vink 4391*; between 'Noordpool' and Inggiris, *BW 2058 Stefels*; Mt Mundi, c. 1900 m, *BW 2255 Mangold*.

9. *Trochocarpa papuana* (C. H. Wright) Sleum., *comb. nov.* — *Leucopogon papuanus* C. H. Wright, Kew Bull. (1899) 104. — *Styphelia papuana* (C. H. Wright) Koord., Rec. Trav. Bot. Néerl. 7 (1910) 65, in text; J. J. S., Ic. Bog. 4, 1 (Nov. 1910) 82; *ibid.* (1913) 172, in text; Nova Guinea 8, 4 (1912) 798; Koord., Exk. Fl. Java 3 (1912) 22, in obs. — *Styphelia lamii* J. J. S., Nova Guinea 18 (1936) 123, t. 33, f. 1. — *T. lamii* (J. J. S.) H. J. Lam, Blumea 5 (1945) 574.

NEW GUINEA. Northern part: Mt Doorman, 3200 m, *Lam 1802* (BO, type of *Styphelia lamii*; L). — Western Highlands: Mt Hagen, 3350 m, *Robbins 295*; Wahgi-Jimmi Div., 3170 m, *NGF 5301 Womersley*. — Morobe Distr.: Mt Saruwaged, 2750 m, *Clemens 5590, 5846*; *ibid.*, Ulap Trail, *Clemens 41145* (A); *ibid.*, Yaneng R., 1525—1830 m, *Clemens 12304* (A); *ibid.*, Samanzing vicinity, 2440—3050 m, *Clemens 9848* (A), *9893* (A). — Central Distr.: Mt Albert Edward, 3680 m, *Brass 4424*; Mt Scratchley, 3050—3960 m, *Giulianetti anno 1896* (K, type of *Leucopogon papuanus*).

DOUBTFUL SPECIES

Trochocarpa parviflora (Stschegl.) Benth., Fl. Austr. 4 (1869) 167. — *Decaspora parviflora* Stschegl., Bull. Soc. Nat. Moscou 32 (1859) i, 10.

AUSTRALIA. Western part: Swan R.: *Drummond 157* (BM, G-Boiss, K, L), fl. immat., fr. mat.

This species was described with flowers in an early bud stage and with ripe fruits. The aspect of the inflorescences and leaves are, as Bentham already stated, almost those of some forms of the widely distributed *Acrotriche cordata* (Lab.) R. Br., which, however, has a (4—)5-celled ovary and a smooth fruit with 5 pyrenes, these \pm united into a central, rather hard stone. Other species of *Acrotriche* (revised by Paterson, Proc. Linn. Soc. New S. Wales 85, 1960, 75—93) show up to 10 and much less compactly coherent pyrenes, which may protrude with as many prominent ribs, covered by a rather scanty dry mesocarp.

In *Trochocarpa parviflora* the 10 pyrenes are separated from each other by a very thin layer of the mesocarp, which is equally thin (and probably pale in colour) all around the fruit, and thus allows to protrude the outer edge of the pyrenes in form of 10 distinct ribs by its desiccation. In all other species of the genus the pulp of the fruit is much more rich both between the pyrenes and around them, and the pyrenes themselves are less hard and faintly or not prominent at all.

The generic status of *Trochocarpa parviflora* depends on the knowledge of the fully developed flower, which is not yet known up till now as the species has not been recollected. It looks, however, justified, to remove this Western Australian species — which might belong to *Acrotriche* R. Br. — from the genus *Trochocarpa* R. Br., which genus is only known from North Borneo, Central Celebes, New Guinea, and the eastern part of Australia (*incl.* Tasmania).

EXCLUDED SPECIES

Trochocarpa ericaefolia (Hook. f.) F. v. M. = *Pentachondra ericaefolia* Hook. f.

Trochocarpa glauca (Lab.) Spr. = *Styphelio billardierii* F. v. M. (= *Cyathodes glauca* Lab.).

Trochocarpa involucrata (R. Br.) F. v. M. = *Pentachondra involucrata* R. Br.

Trochocarpa novae-zelandiae Colenso = *Pentachondra pumila* (J. R. & G. Forst.) R. Br.

Trochocarpa pumila (Forst.) F. v. M. = *Pentachondra pumila* (J. R. & G. Forst.) R. Br. (= *Epacris pumila* J. R. & G. Forst.).

Trochocarpa verticillata (Hook. f.) F. v. M. = *Pentachondra?* *verticillata* Hook. f.

APPENDIX

Monotoca elliptica (Sm.) R. Br., Prod. (1810) 546. — *Lissanthe mucronata* DC., Prod. 7 (1839) 743; Benth., Fl. Austr. 4 (1869) 176, *syn. nov.*

I have examined the holotype specimen of *Lissanthe mucronata* in the De Candolle Herbarium at Geneva.

EXCLUDED GENUS

Nautophylla Guillaumin, Mém. Mus. Hist. Nat. Paris, n.s., sér. B, Bot. 4, 1 (1953) 44, fig. 13, which was described as a monotypic genus of *Epacridaceae* from New Caledonia, has been reduced to the genus *Logania* (*Loganiaceae*) by Leenhouts & Van Steenis, Bull. Jard. Bot. Brux. 32 (1962) 439—440.

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