

THE GENERA DISCOCALYX MEZ, FITTINGIA MEZ, LOHERIA MERR.
AND TAPEINOSPERMA HOOK.f. (MYRSINACEAE) IN NEW GUINEA

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SUMMARY

A taxonomic revision is presented of the genera *Discocalyx* Mez, *Fittingia* Mez, *Loheria* Merr., and *Tapeinosperma* Hook.f. in New Guinea and partly in the adjacent islands, mainly in the Moluccas and in the Solomon Islands, with keys to the species, detailed descriptions of all taxa, and an enumeration of the collections studied. A key to all genera of the Myrsinaceae occurring in Eastern Malesia is added.

INTRODUCTION

This paper is a continuation of earlier revisions of four Myrsinaceous genera in New Guinea by the author (*Rapanea*: Blumea 31, 1986, 245–269; *Maesa*: l.c. 32, 1987, 39–65; *Embelia* and *Grenacheria*: l.c. 385–396); it comprises the remaining genera of the tribe Myrsineae, *Labisia* excluded, the latter being under revision by other botanists. The four genera, i.e., *Discocalyx* Mez, *Fittingia* Mez, *Loheria* Merr., and *Tapeinosperma* Hook.f. are closely related to each other. Their vegetative characters are similar or practically the same; the reason why sterile specimens can hardly be attributed to one of these genera with certainty. The genera also have several flower and fruit characters in common; well developed flowers and ripe fruits are necessary to recognize them. Instead of discussing these differences here, the author gives a key to all genera of Myrsinaceae occurring in Eastern Malesia.

When apparently female flowers bear stamens, it is sometimes difficult to decide whether the flowers are bisexual or unisexual, even in well prepared herbarium specimens. However, reduction in size of the anthers and especially lack of pollen then indicates dioecism. In male flowers, the rudiment of the ovary generally is short-stipitate, or sometimes absent. This dioecism might be important for separating *Tapeinosperma* with its bisexual flowers from the other three genera, which constantly seem to be unisexual. However, examination in the field will be necessary to decide whether the four genera in question can be maintained as such by the constancy of their sexual behaviour, in combination with more or less constant style and stigma characters, or whether in the case of insufficient reliability of such differences they should be united under the oldest name *Tapeinosperma* Hook.f.

Through the loss of the complete collection of Myrsinaceae at Berlin in 1943 a number of species based on unicates could not be studied or more completely described. Also the type material of several species described by Kanehira and Hatusima and preserved at Fukuoka (FU) has not been at the disposition of the author. Some collections mentioned in the original descriptions have been received from A, BM, BO, K, P, S, and WRS-Lauterbach. Collections cited are deposited in the Rijksherbarium at Leiden (L) unless stated otherwise.

KEY TO THE GENERA OF MYRSINACEAE IN EASTERN MALESIA

- 1a. Ovary half-superior or inferior. Fruit with numerous seeds. Two bracteoles present (almost) immediately below the calyx. *Maesa*
- b. Ovary superior. Fruit one-seeded. Bracteoles generally absent immediately below the calyx 2
- 2a. Anthers transversely septate *Aegiceras*
- b. Anthers not septate 3
- 3a. Petals entirely free *Embelia*
- b. Petals connate to a corolla at least at base 4
- 4a. Herbs with soft stem 5
- b. Woody plants (shrubs, trees, and climbers; very rarely semi-herbaceous with woody stem base: *Discocalyx*) 6
- 5a. Anthers sessile. Ovules 6 or 7 *Labisia*
- b. Anthers with distinct filaments. Ovules more numerous *Ardisia* p.p.
- 6a. Anthers united at least at the base *Conandrium*
- b. Anthers entirely free from each other 7
- 7a. Flowers bisexual 8
- b. Flowers unisexual (not rarely seemingly bisexual, but either the stamens then ± reduced in size and void of pollen, or the ovary rudimentary or absent) 11
- 8a. Climber with remarkably flexuous sharply deflexed lateral branches or branchlets. (Inflorescences strictly racemose.) *Grenacheria*
- b. Erect trees or shrubs, rarely creeping shrublets 9
- 9a. Inflorescences in sessile fascicles (rarely reduced to an axillary solitary flower). Style short; stigma (sub)capitate or sausage-like *Rapanea*
- b. Inflorescences peduncled, racemose or panicled, or umbellate (the flowers may be collected to many-flowered globular heads). Style slender, elongate; stigma small, often point-like 10
- 10a. Stamens with distinct filament *Ardisia* p.p.
- b. Stamens (sub)sessile *Tapeinosperma*
- 11a. Exocarp of drupe spongyous or fleshy, soft, thick (becoming wing-like by pressure and desiccation in dry specimens); endocarp lengthwise ridged, or tubercled *Fittingia*
- b. Exocarp of drupe thin-coriaceous; endocarp usually smooth 12
- 12a. Style thick and (very) short; stigma thickly peltate, discoid, or capitate *Discocalyx*
- b. Style slender, elongate; stigma relatively small *Loheria*

DISCOCALYX

Discocalyx Mez, Pflanzenr. 9 (1902) 211. – T y p e : *D. cybianthoides* (A. DC.) Mez from the Philippines.

Dioecious shrubs or trees, sparsely branched or unbranched. Leaves alternate, crowded at or towards the apex of stem or branches, i.e. 'Schopfbaum' habit, oblong to elliptic, or obovate-oblong, rarely narrowly so, usually with well developed glandular dots visible on both faces, entire, or very rarely dentate or bipinnatisect, lateral nerves numerous in a wide angle from the midrib, subparallel to each other, sometimes joined to a distinct intramarginal nerve; petiole robust in general. Inflorescences racemose or paniculate, erect, usually solitary from the axils of the uppermost 2–5 leaves (which might be reduced to rather large leafy bracts). Flowers 4- or 5-merous. Calyx cup-shaped, expanded or erect, more or less deeply lobed, lobes imbricate in bud. Corolla urceolate to campanulate, or widely tubular, lobed halfway or more, sometimes to almost the base, lobes erect or finally reflexed. Male flowers: filaments shortly adnate to the base of the corolla, free above, thick-filiform to flattened-linear; anthers elliptic to subsagittate, basifix. Ovary rudimentary or absent. Female flowers: stamens reduced in size, without pollen, or absent. Ovary ovoid to subglobose; style relatively short and robust; stigma discoid, or capitellate-peltate. Drupe globose or depressedly so; exocarp thin-coriaceous; endocarp thin-crustaceous, smooth or but slightly ridged; seed 1; endosperm ruminant or not.

Distribution. Borneo (?), Philippines, Talaud Is., Celebes, Moluccas, New Guinea, New Britain, New Ireland, in the Pacific eastwards to Fiji.

KEY TO THE SPECIES IN NEW GUINEA AND NEW IRELAND

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|---|-------------------------|
| 1a. Leaves dissected. (Inflorescence poorly corymbose.) | 1. <i>D. dissecta</i> |
| b. Leaves entire (shallowly sinuate-dentate in <i>D. subsinuata</i>) | 2 |
| 2a. Inflorescence compound | 3 |
| b. Inflorescence strictly racemose | 6 |
| 3a. Inflorescence corymbose, on elongate peduncle 3–13 cm long. Leaves fuscous-puberulous on midrib beneath | 2. <i>D. papuana</i> |
| b. Inflorescence panicled, or at least so in its lower part. Leaves epilose. | 4 |
| 4a. Leaves smooth in the dry state, i.e. practically without a prominent reticulation, their base cuneate to a thick and more or less flattened petiole | |
| 3. <i>D. latepetiolata</i> | |
| b. Leaves finely prominent-reticulate on both faces, their base cuneate to a relatively slender and terete petiole | 5 |
| 5a. Inflorescence panicled, 12–14 cm long | 4. <i>D. brassii</i> |
| b. Inflorescence corymbose to subumbellate, 2–3 cm | 5. <i>D. subsinuata</i> |
| 6a. Racemes short, few-flowered, the flowers densely and umbellately set | |
| 6. <i>D. pygmaea</i> | |
| b. Racemes elongate, the flowers spaced | 7 |
| 7a. Flowers 5-merous | 8 |
| b. Flowers 4-merous | 9 |

- 8a. Rhachis laxly hairy 7. *D. camptobotrys*
- b. Rhachis epilose, very laxly or hardly glandular-punctate. 8. *D. albiflora*
- 9a. Flowers sessile 9. *D. sarcophylla*
- b. Flowers pedicelled for at least 2 mm at anthesis 10
- 10a. Drupe depressed-globose 10. *D. schlechteri*
- b. Drupe globose 11
- 11a. Petiole 1–1.5 cm long. 11. *D. orthoneura*
- b. Petiole (2–)3–6 cm long 12. *D. perseifolia*

1. *Discocalyx dissecta* Kaneh. & Hatus.

Discocalyx dissecta Kaneh. & Hatus., Bot. Mag. Tokyo 57 (1943) 219, f. 6; Steen., Fl. Males. I, 4 (1949) LVII, f. 47. — T y p e : R. Kanehira & S. Hatusima 13873, New Guinea, Vogelkop Peninsula, Arfak Mts, in mossy low forest along Iray R. pouring to Lake Angi Gigi, 1900 m, female fl. & fr. 8 April 1940 (FU, n.v.; A, iso).

Dioecious shrub, herbaceous, 20–80 cm tall, few-branched; branchlets slender, terete, older parts smooth and reddish, youngest ones verruculose-gland-covered and brown red, 1 mm diam. Leaves condensed towards the end of the branchlets, sessile, oblanceolate in circumference, 4–6 by 1–2 cm, pectinately bipinnatisect, the laciniae at apex acute, at base narrowed, 1–2 by 0.3–0.8 cm on each side, membranaceous to thin-chartaceous, subdensely set with glandular fuscous points, midrib raised on both faces. Inflorescences axillary, short-corymbose, 1–3- (rarely –8)-flowered on top of an elongate, slender, glandular-punctate peduncle 1.5–2.5 cm; pedicels very short. Flowers 5-merous, white to yellowish. Calyx lobed to halfway; lobes fleshy, broadly triangular, apiculate, edge membranaceous and gland-dotted, 0.5 mm. Corolla fleshy, lobed to almost the base, c. 1.5 mm, lobes ovate-oblong or lingulate, acute, papillose inside, sparsely gland-lineate outside. Male flowers not known. Female flowers: anthers reduced in size, broadly ovate, thecae divaricate, basifixied; filaments very short. Ovary ovoid-cylindric, glabrous; style thick, very short; stigma broadly capitate. Drupe globular, blackish purplish, c. 1 cm diam.; exocarp and endocarp thin, the latter finely ridged in the dry state, the former densely rather coarsely glandular-punctate.

D i s t r i b u t i o n. West New Guinea.

E c o l o g y. In primary montane, also mossy forest at 850–1900 m, in dark places, also on limestone, locally gregarious.

N E W G U I N E A. W. part: Wandammen Peninsula, Wondiwoi Mts, 1230 m, BW 13713 Koster. Hambar, N of Fak-Fak, 850 m, BW 12169 Vink.

2. *Discocalyx papuana* Kaneh. & Hatus.

Discocalyx papuana Kaneh. & Hatus., Bot. Mag. Tokyo 57 (1943) 220, f. 7. — T y p e : R. Kanehira & S. Hatusima 11829, New Guinea, Chaban, 30 km inland S of Geelvink Bay, fr. 28 Feb. 1940 (FU, n.v.).

var. *papuana*

Shrub 2–3 m tall. Branchlets terete, fuscous, glabrous, 4 mm diam. *Leaves* oblong-lanceolate, chartaceous, reddish-brownish and dull when dry on both faces, very densely fuscous-glandular-punctate beneath (lens), remotely denticulate or subentire, 20–35 by 5.5–9.5 cm, midrib a little impressed above, distinctly prominent and fuscous-puberulous beneath, lateral nerves c. 20 pairs, curved-ascending, raised mainly beneath; petiole glabrous, 5 by 2–3 mm. *Inflorescences* not known. *Inflorescences* 2 or 3 towards the apex of the branchlets, each consisting of a rather long-peduncled corymb, which bears 5–10 drupes, all over densely fuscous-puberulous; peduncles more or less compressed, 3–13 cm by 1.7 mm; pedicels 2–2.5 cm by 0.6 mm, slightly thickened distally. *Calyx lobes* 5, ovate-triangular, obtusely acuminate, connate for their lower 2/5 part, densely set with large dark glandular points on both sides, c. 1.8 mm. *Drupe* globose, apiculate, 5 mm diam., densely ferruginous-puberulous; style very short; stigma hardly dilatate.

Distribution. NW. New Guinea, once found.

Ecology. In primary forest at c. 100 m altitude.

Note. Incompletely known. The description given above is a translation of the original one, including the subsequent variety.

var. *brevipedicellata* Kaneh. & Hatus.

Discocalyx papuana Kaneh. & Hatus. var. *brevipedicellata* Kaneh. & Hatus., Bot. Mag. Tokyo 57 (1943) 221. – *Type*: *R. Kanehira & S. Hatusima* 11590, New Guinea, Geelvink Bay, Nabire, fr. 26 Feb. 1940 (FU, n.v.).

Differs from var. *papuana* by shorter pedicels (c. 1.5 cm), slightly longer petioles, leaves blackish-grayish in the dry state, and more densely set lateral nerves.

Distribution. NW. New Guinea, once found.

Ecology. In diluvial rain forest.

3. *Discocalyx latepetiolata* (Mez) Sleum., comb. nov.

Loheria latepetiolata Mez, Bot. Arch. 2 (1922) 210. – *Type*: *von Roemer* 1133, W. New Guinea, Mt Hellwig (B, lost, syn); *C. Ledermann* 9080, E. New Guinea, E. Sepik Dist., April R. area, 'Etappenberg' (B, lost, syn); *C. Ledermann* 10046, ibid., 'Lordberg' (B, lost, syn; K, lecto); *C. Ledermann* 1180, ibid., 'Hunsteinspitze' (B, lost, syn). Matched by *R.D. Hoogland & L.A. Craven* 11027 from Mt Hunstein (Sunset).

Embelia papuana S. Moore, Trans. Linn. Soc. Bot. 9 (1916) 106. – *Discocalyx papuana* Merr., J. Arnold Arbor. 35 (1954) 148, non Kaneh. & Hatus., Bot. Mag. Tokyo 57 (1943) 220. – *Type*: *C.B. Kloss s.n.*, S. New Guinea, Utakwa R. to Mt Carstensz, camp VI-b, 1200 m, male fl. 29 Jan. 1913 (BM; K iso).

Loheria sessilifolia Mez, Bot. Arch. 2 (1922) 210. – *Type*: *C. Ledermann* 11798 & 11840, E. New Guinea, E. Sepik Dist., Schrader Mts (B, lost, syn).

Dioecious straggling shrub, treelet or tree, 2–6(–20) m tall; trunk to 20 cm diameter; bark gray to brown, with shallow longitudinal cracks. Main branchlets

yellowish-brownish when dry, glabrous, 5–8 mm diam., lateral shorter ones spreading horizontally, 3–5 mm diam., both bearing 3–5 leaves crowded distally. *Leaves* oblong- or elliptic-obovate, apex shortly acuminate or even subcuspidate or not rarely obtuse, base long-cuneate to the thick and more or less flattened petiole, firmly chartaceous to thin-coriaceous when dry, reported to be somewhat fleshy and dull dark green above and glossy beneath when fresh, smooth, yellowish-brownish and dull when dry, entire, densely dark papillose-punctulate on both faces, 10–20 (–28) by 3.5–6 (–7.5) cm, midrib impressed above, strongly raised beneath, lateral nerves 10–15 (sometimes more) pairs, straight, obscurely arching before the edge, slightly or hardly raised on both faces, or often beneath only, reticulation obscure; petiole (1–)3–6 (–10) by 2–4 (–6) mm. *Inflorescences* starting with a shoot of large, reddish to green bracts, terminal, consisting of 2–4 thyrsoid many-flowered panicles, their main axes robust, suffused-red, 6–9 (–14) cm long, their lateral branches laxly racemose and to 8 cm long, all over glandular-punctate, epilose; pedicels rather robust, 2–3 mm at anthesis; bracts subulate, c. 1 mm, caducous. *Flowers* 4-merous, white or cream. *Calyx* lobed about halfway, 1.5 mm, lobes ovate, obtuse, edge translucent, glandular-punctate dorsally. *Corolla* lobed halfway or less, 2–2.3 mm, lobes oblong-elliptic, reflexed, glandular-punctulate outside, glabrous inside. *Male flowers*: filaments broadly linear, c. 1 mm; anthers elliptic, basifix, 0.5 mm. Rudiment of ovary none. *Female flowers*: stamens reduced in size. Ovary ovoid-subglobose; style very short; stigma capitate. *Drupe* globose or depressedly so, red or brown, verruculose by numerous dark prominent glands, 6–8 mm diam., crowned by an almost sessile capitate stigma; exocarp and endocarp thin; endosperm ruminate.

Distribution. New Guinea.

EcoLOGY. In montane, also mossy forest, 1065–2835 m altitude.

Note. Habit and ruminate endosperm of *D. latepetiolata* recall the genus *Lopheria*, but the very short style and the capitate stigma point to *Discocalyx*. It is for the latter characters that the transfer to *Discocalyx* has been made. The occurrence of ruminate endosperm within other species of *Discocalyx* has not been investigated yet.

NEW GUINEA. W. part: Schouten Is., Japen I., Serui, bb 30542. Idenburg R., Bernhard camp, 1450–1800 m, *Brass* 12094, 12095, 13000 (all BM). – E. part: W. Sepik Dist., Star Mts, Folongonom, 2250–2350 m, *LAE* 67531, *Veldkamp* 6705, 6773. Telefomin, Oksapmin, 1950 m, *NGF* 41654. – E. Sepik Dist., Mt Hunstein (Sunset), 1160 m, *Hoogland & Craven* 11027. – Western Dist., Fly R. area, Palmer R., 2 miles below junction Black R., 100 m, *Brass* 7131. – W. Highlands Dist., Wabag area, 2590–2835 m, *ANU* 2353, 2603, *Robbins* 3178. Sirunki, *ANU* 889. – S. Highlands Dist., S slope of Mt Giluwe, 1980–2100 m, *LAE* 60877, *Saunders* 1050, 1054. Anga valley, 1920 m, *Schodde* 1612. Fara Ra., Erave, 1800 m, *Streimann* 8549. Mt Né, 2070 m, *NGF* 32002. Ialibu, Iaro R., *LAE* 67127. – E. Highlands Dist., Chimbu, Kumul Mission, 1830 m, *NGF* 14126. Aiyura, 1830 m, *NGF* 1089. Nondugl, Warrapuri R., 2285 m, *NGF* 18126. Goroka, Daulo camp, 2400 m, *Hoogland & Pullen* 5432. – Gulf Dist., Mt Bosavi, 1600–1800 m, *Jacobs* 8868, 9399. – Morobe Dist., Buang, 1220 m, *NGF* 17847. Boana, 1065–1370 m, *Clemens* 8540 (B), 8679. Wagau, Mumeng, 1065 m, *NGF* 12060. Pindiu, Basaeng ridge, 2200 m, *LAE* 59933. Oge-ramnang, 1800 m, *Clemens* 4839 (A).

4. *Discocalyx brassii* Sleum., spec. nov.

Frutex vel arbor parva dioica 0,6–2 m alta, cortice dilute brunneo. Ramuli crassiusculi, apice folia 3–5 approximata gerentes atque cicatricibus sat magnis foliorum iam delapsorum instructi, inferne teretes et laeves. *Folia* obovato-oblonga, apice breviter attenuata vel subacuminata, ipso apice obtusa vel subacuta, basi in petiolum vix vel haud alatum cuneata, chartacea usque subcoriacea, tactu utrinque rugosula, epilosa, utrinque punctis glandulosis imprimis supra elevatulis sat dense percursa, in sicco rufo-brunnea, subtus pallidiora et nitidula, integra, (8–)10–16 cm longa, 3–4,5(–7) cm lata, costa supra paulo, subtus magis prominente, nervis lateralibus ca. 15-paribus ceteris intercalaribus additis a costa angulo magno subrectis vel parum curvatis inter sese subparallelis, ante marginem curvato-conjunctis, utrinque parum sed distincae prominentibus, rete venarum et venularum sat denso utrinque elevatulo; petioli 5–10 mm longi, 2–2,5 mm crassi. Paniculae ex axillis foliorum summorum 1–3 ortae, singulae, elongatae, inferne tantum breviter ramosae, graciles, laxe multiflorae, totae rubescentes et 12–14 cm longae, ca. 3 cm longe pedunculatae, omnino laxe glandulis rufis obiectae; rhachis tenuis; pedicelli filiformes, sub anthesi 4–8 mm longi. *Flores* 5-meri, purpureo-rubri. *Calyx* fere usque ad basin lobatus, lobis anguste ovato-subacuminatis dorso glanduloso-punctatis 1–1,5 mm longis. *Corolla* fere usque ad basin fissa, lobis oblongis subacutis vel obtusis, patentibus, dense glanduloso-punctatis, 2,5–2,8 mm longis. *Flores masculini*: filamenta crasse filiformia, basi excepta libera, ca. 1 mm longa; antherae ovato-ellipticae, ca. 1 mm longae. Ovarii rudimentum anguste ovoideum, apice in stylum brevissimum attenuatum, stigmate nullo. *Flores feminei* (NGF 18285): antherae rudimentariae. Ovarium subglobosum, stigmate subsessili capitato-peltato. *Drupa* submatura (NGF 18285) depresso-globosa, exocarpio tenui, endocarpio obscure costulato vel laevi, 7–8 mm diam., 5–6 mm alto, stylo perbrevi, stigmate capitato sat parvo.

Distribution. New Guinea (E. Highlands Dist.).

Ecology. In montane forest undergrowth, 2130–2745 m altitude.

NEW GUINEA. E. Highlands Dist., Kraetke Mts, Mt Elandora, 2130 m, male fl. 18 Oct. 1956, L.J. Brass & J.D. Collins 32167 (L, holotype). Confluent of Warapuri and Warranga R., Wahgi-Jimmi divide, N of Nondugl, 2285 m, female fl. & fr. 6 Sept. 1963, NGF 18285 van Royen. Fatima R. near Marafunga, 2745 m, male fl. 26 May 1965, NGF 23902 Buderus. Marafunga, 2590 m, male fl., LAE 53258 Stone.

5. *Discocalyx subsinuata* Sleum., spec. nov.

Frutex vel arbuscula, 60–150 cm alta, patenter horizontaliter ramosa, interdum monocaulis. Ramuli teretes, glabri, 2–3 mm diam. *Folia* 3–5(–7) ad nodos ultimos subverticillatim disposita, oblonga vel oblongo-elliptica, apice breviter acuminata, ipso apice subacuta, basi in petiolum cuneata, chartacea usque subcoriacea, in vivo supra saturate viridia et opaca, in sicco brunnea, vel olivacea, subtus pallidiora, margine imprimis in superiore laminae parte leviter undulata usque distinctius subsinuato-dentata (dentibus haud glanduliferis), interdum subintegra, laxe vel saepius dense

atrescenti-glanduloso-punctulata, magnitudine in eodem verticillo vel in eodem specimine variabilia, (5-)6–10(–15) cm longa, (2-)2,5–4(–6) cm lata, costa supra anguste impressa, subtus prominente, nervis lateralibus 8–10-paribus nonnullisque brevioribus vel minus distinctis auctis, omnibus leviter arcuato-ascendentibus et ante marginem curvato-conjunctis (sed haud nervum intramarginalem proprium formantibus), supra paullo impressis vel generaliter planis, raro levissime elevatis, subtus distincte prominulis, rete venarum et venularum denso, imprimis subtus elevatulo; petioli rugulosi, 6–10 mm longi, 1–1,5 mm crassi. *Inflorescentiae* solariae ex axillis 1 vel 2(–3) superioribus ramulorum lateralium ortae, basi pluribracteatae, corymbum vel quasi umbellam brevem 6–10-floram per 1–5 cm longe graciliter pedunculatam praebentes, ubique laxe vel subdense glandulis sessilibus brevissimis obtectae, epilosae; bracteae lanceolatae, acuminatissimae, usque ad 10 mm longae et 2 mm latae, caducae; pedicelli graciles, basi bracteolis minutis angustissimis suffulti, sub anthesi 4–6 mm longi. *Flores* dioici, 5-meri, albidi vel cremei, interdum rosaceo-suffusi. *Calyx* ca. 1,8 mm altus, usque ad medium lobatus, lobis ovatis, obtusis, dorso dense atrescenti-punctulatis. *Corolla* usque fere ad basin lobata, tota 2,5 mm longa, lobis late oblongis, dense saturate glanduloso-punctulatis. *Flores masculini* haud observati. *Flores feminei*: antherae reductae, filamentis glabris ca. 1,5 mm longis. Ovarium ovoideo-columnare, glabrum, in stylum robustum brevem attenuatum; stigma discoideum. *Drupa* globosa vel paullo depressa, in vivo ex coll. mollis, rosa-cea vel rubra et 10–15 mm diam., in sicco ca. 6 mm diam., exocarpio tenui, endocarpio duro longitudinaliter costulato, stigmate subsessili.

Distribution. New Guinea, from the Western and Eastern Highlands to the Milne Bay District.

EcoLOGY. In undergrowth of montane forest, often on slopes (400–)1400–1980(–2180) m altitude.

New GUINEA. W. Highlands Dist., Togoba, 1900 m, *Hoogland & Pullen* 6200. – E. Highlands Dist., Arau, 1400 m, fl. fr. 20 Oct. 1959, *L.J. Brass* 32190 (L, holotype; A, iso); ibid., fl. buds, *Brass* 31957. Okapa, Wonatabe, 1525 m, *NGF* 17656. Purosa, SW of Okapa, 1595–1950 m, *Brass* 31602, 31703, *Hartley* 13188. – Morobe Dist., Wau-Salamaua road, 1800 m, *NGF* 7877. Wau, head of Baime creek, *NGF* 47590. Murneng, track to Mt Shungol, 1980 m, *NGF* 45375. Gumi divide, W of Bulolo, 2180 m, *Kairo* 760. Menamya, Aseki, 1465 m, *NGF* 39053. – Northern Dist., Kokoda, E side Lake Myola 1, 2000 m, *LAE* 61995. – Central Dist., Lala R., 1525 m, *Carr* 13692. Isuarava, 1400 m, *Carr* 15154. Boridi, 1220–1525 m, *Carr* 13131, 13137, 13339, 14205, 14297, 14759 [erroneously cited sub *Rapanea acrosticta* in *Blumea* 31 (1986) 263], 14760. – Milne Bay Dist., Raba Raba, Mayu I, 400 m, *NGF* 28853, Mayu II, 2100 m, *LAE* 54327, *Veldkamp & Stevens* 5998. Baniara, Opanabu village, 600 m, *Kanis* 1229.

6. Discocalyx pygmaea Kaneh. & Hatus.

Discocalyx pygmaea Kaneh. & Hatus., Bot. Mag. Tokyo 57 (1943) 221, f. 8. – **Type:** *R. Kanehira & S. Hatusima* 11841, W. New Guinea, Chaban, c. 25 km inland S of Geelvink Bay, fr. 28 Feb. 1940 (FU, n.v.).

Shrub c. 20 cm tall, 1-stemmed. Branchlets glabrous, c. 4 mm diam. Leaves broadly oblanceolate or obovate-oblong, apex short-acuminate, base decurrently narrowed to a thick 6–8 mm long petiole, thin-coriaceous, undulate to entire,

brownish-greenish and dull on both faces when dry, very densely dark glandular-punctate, 10–14 by 4–5.5 cm, midrib prominent mainly beneath, densely lineate beneath, lateral nerves 10–11 pairs, arcuately curved towards the edge. *Inflorescences* not known. *Infructescences* pseudoterminal, racemose, several together umbellately arranged, c. 2.5 cm long, each with few fruits; peduncle compressed, c. 1.5 cm long, 1.5–1.7 mm broad, densely glandular; pedicels thick, c. 2 by 1 mm. *Calyx* lobed halfway, lobes broadly triangular, acute, densely glandular-punctate, c. 1 mm. *Drupe* globose, 5–8 mm diam., very densely glandular-punctate; style persistent, c. 1.5 mm long; stigma capitate, c. 0.8 mm diam.

Distribution. NW. New Guinea, once found.

EcoLOGY. In high rain forest at c. 50 m altitude.

Note. Incompletely known. The description given above is a translation of the original one.

7. *Discocalyx camptobotrys* (K. Schum.) Sleum., comb. nov.

Maesa camptobotrys K. Schum., Fl. Deutsch. Schutzgeb. Südsee, Nachtr. (1905) 341; Sleum., Blumea 32 (1987) 65. — T y p e : R. Schlechter 14356, New Guinea, E. Sepik Dist., Torricelli Mts, 1000 m, male fl. April 1902 (B, lost; K, WRSL-Lauterbach, iso).

Shrub or treelet, maybe scandent, apparently dioecious. Branchlets 2–3 mm diam., elongate, younger parts subangular, yellowish in the dry state, set with scattered hairs, older parts terete and covered with brown cork. *Leaves* lanceolate-oblong, apex acuminate, tip acute, base rather suddenly cuneately narrowed and maybe a little inequilateral, chartaceous to thin-coriaceous, glabrous except some hairs on the midrib beneath, no glandular points or lines present even against strong light, pale yellowish olive in the dry state, dull above, shining beneath, entire, edge a little cartilaginous, (5–)6–10 by (2–)2.5–3.7 cm, midrib somewhat impressed in its lower half only, prominent beneath, lateral nerves 6–8 pairs, straight from the midrib and hardly or not decurrent on the latter, much curved towards and anastomosing before the edge, flat above, a little though well visibly raised beneath, reticulation of veins and veinlets dense, minutely raised beneath only; petiole very slender, curved, laxly hairy, 6–8(–10) mm. *Panicles* (i.e. shortly branched racemes) axillary, very slender, flexuous, lax-flowered, 5–8 cm; rachis and pedicels laxly hairy, the latter with one lanceolate hairy bract (1.5 mm) at the base, 4–7 mm; bracteoles 2 (or 3) lanceolate, c. 0.5 mm, inserted immediately at the base of the calyx, not properly opposite to each other. *Flowers* 5-merous, without glandular points. *Calyx* deeply lobed, lobes ovate-acuminate, sparsely short-hairy and ciliolate, 1 mm. *Corolla* campanulate, 2.5–3 mm, lobed to almost the base, lobes oblong-lanceolate, obtuse, each lobe with 3 longitudinal nerves. *Stamens* adnate to the lower third of the corolla, the free part of filaments very short; anthers subquadrate, minute, apparently reduced in size. *Ovary* (rudimentary?) superior, elongately ovoid, narrowed to a short style, seemingly 2-locular, in fact 1-locular with 4 (or 5?) ovules on a basal/central placenta; ovules hemitropous; stigma point-like.

Distribution. New Guinea, once found.

EcoLOGY. In montane forest at 1000 m altitude.

Note. Not matched yet by recent collections from the Torricelli Mts area, and transferred to *Discocalyx* with doubt.

8. *Discocalyx albiflora* Sleum., *spec. nov.*

Arbuscula dioica 3–7,5 m alta, ramis divaricatis, cortice brunneo leviter verticaliter fisso. Ramuli crassi, griseo-corticati, superne cicatricibus foliorum iam delapsorum magnis ornati. *Folia* ad apicem ramulorum 4–6 approximata, novella conspicue rubescens, matura supra saturate viridia, subtus cinerascentia et pallidiora, in sicco brunnea, oblanceolata, apice per 1–1,5 cm longe subcuspidato-acuminata, ipso apice acuta, basin versus in petiolum attenuata paulloque decurrentia, subcoriacea, firma, integra, in foliis immaturis bene micro-glandulosso-punctata, in foliis maturis fere epunctata, (10–)12–20 cm longa, 4–6,5 cm lata, costa utrinque sed subtus magis prominente, nervis lateralibus ca. 10-paribus ceterisque paucis brevioribus intercalariibus additis a costa angulo subrecto abeuntibus, marginem versus curvatis parum vel vix conjunctis, utrinque leviter elevatis, reticulo venarum et venularum sat laxo utrinque parum sed visibiliter prominulo; petioli 1–1,5 cm longi, 2,5–3,5 mm crassi. *Racemi* simplices ex axillis foliorum summorum 1–3 pro parte nondum plane maturorum orti, erecti, in 2/3 parte superiore laxius vel densius florigeri, (4–)5–8 cm longi, glabri vel brevissime vix visibiliter puberuli, valde laxe vel vix glandulosso-punctati; rhachis gracilis; pedicelli sat graciles, sub anthesi 4–6(–8) mm longi. *Flores* 5-meri, albidi vel rarius cremei. *Calyx* cupulatus, usque ad medium lobatus, lobis ovatis obtusis erosulis vix 1 mm longis. *Corolla* tota 2,5–3 mm longa, in superiore 2/3 parte lobata, lobis late oblongis vel ellipticis, obtusis, laxe vel vix glandulosso-punctatis. *Flores masculi*: filamenta crasse filiformia, carnosula, basi corollae per dimidiam partem adnata, tota 1 mm longa; antherae (*Pullen* 7796) ellipsoideae, basifixae, 1 mm longae. Ovarii rudimentum columnare, 1,8 mm longum, stigmate nullo. *Flores feminei*: antherae reductae, cordatae, vix 0,5 mm longae. Ovarium ovoideo-oblongoideum; stylus crassus, 1 mm longus; stigma peltato-capitatum. *Drupa* nondum cognita.

Distribution. New Guinea, only known from the Milne Bay Dist.

Ecology. Understorey in montane rain or mossy forest, 1650–1780 m altitude.

New GUINEA. Milne Bay Dist., Eastern Mt Simpson Ra., Aparamu ridge, 1780 m, female fl. 17 July 1969, *R. Schodde* 5452 (L, holotype; CANB, iso, n.v.); ibid., NE outlying ridge, 1650 m, male fl. 15 July 1969, *Pullen* 7796; ibid., headwaters of Gumini R., Cameron plateau, male fl. 11 June 1964, *NGF* 19305 *Womersley*.

9. *Discocalyx sarcophylla* Sleum., *spec. nov.*

Frutex vel arbor dioica 2–8 m alta, sparse ramosa. Ramuli in superiore parte tantum folia 4–7 approximata vel paullo inter sese distantia gerente, ceterum cicatricibus magnis foliorum delapsorum ornati, 5–7 mm crassi. *Folia* anguste vel late oblonga, vel subobovato-oblonga, paullo inaequilateralia, apice sat abrupte per 1,5–2 cm acu-

minata, ipso apice (sub)acuta, basin versus in petiolum angustata, in vivo ex coll. carnosula et saturate viridia, in sicco tenuiter coriacea, supra olivacea vel brunnescens, subtus brunnea, utrinque nitidula, subdense punctis glandulosis magnis utrinque elevatulis percusa, epilosa, integra, (13-)15-20(-27) cm longa, (4-)5-8,5 cm lata, costa robusta supra sat plana, subtus valde prominente, nervis lateralibus primariis numerosis (plus quam 15-paribus) inferne rectiusculis, marginem versus arcuatis, ceteris intercalaribus brevioribus subparallelis auctis, omnibus utrinque parum elevatis vel obscuris, rete venarum et venularum denso, sub lente bene visibiliter prominulo; petioli saepius transverse rugosuli, (1-)1,5-2,5(-3) cm longi, 2-4 mm crassi. *Racemi* in 1/2-2/3 superiore parte subdense florigeri, ex axillis foliorum summorum pro parte ad bracteas reductorum 3-4 solitarii, erecti, sub anthesi 2-6 cm longi, sub fructu usque ad 8 cm elongati; rhachis gracilis, glaber; pedicelli subnuli, pulvinar parvum incrassatum praebentes. *Flores* 4-meri, albidi, odoriferi. *Calyx* cupulatus inferne breviter tubulosus, erectus, circa usque ad medium lobatus, extus minute glanduloso-punctatus, lobis obtusis ca. 0,6 mm longis. *Corolla* anguste campanulata, fere usque ad basin lobata, tota ca. 2 mm longa, punctis glandulosis in sicco nigrescentibus sat magnis laxe induita. *Flores masculi*: filamenta crasse filiformia, ipsae corollae basi brevissime adnata, ceterum libera, tota ca. 1 mm longa; antherae ellipticae, 0,5 mm longae. *Flores feminei* incogniti. *Drupa* in vivo ex coll. depresso-globosa, cremeo-viridescens, 10-11 mm diam., in sicco subglobosa, brunnescens et 6-7 mm diam., omnino glandulis punctiformibus et linearibus bene elevatis rugosa; exocarpium tenuis; stigma capitatum, subsessile.

Distribution. New Guinea, only known from Rossel I.

Ecology. In rain forest on ridges, 100-700 m altitude.

NEW GUINEA. Milne Bay Dist., Louisiade Archipelago, Rossel I., Abaleti, male fl. & fr. 29 Sept. 1956, L.J. Brass 28241 (L, holotype; A, iso, n.v.); ibid., Mt Rossel, S slopes, male fl., Brass 28412; ibid., Bamba near West Point, fr. submat., NGF 27015 Henty.

10. *Discocalyx schlechteri* K. Schum.

Discocalyx schlechteri K. Schum., Fl. Deutsch. Schutzgeb. Südsee, Nachtr. (1905) 345. — **Type:** R. Schlechter 14681, Central New Ireland, Punam Mts, male fl. July 1902 (B, lost).

Dioecious shrub or treelet to 3 m tall. Branchlets terete, 5-10 mm diam., with brown bark and large scars of fallen leaves. *Leaves* oblanceolate, apex attenuate, tip blunt, base subalate-obtuse, subcoriaceous, brown when dry, paler beneath, finely subdensely glandular-punctate (the glands less visible above), epilose, entire, 11-22(-30) by (4-)7-10 cm, midrib grooved above, robust and much prominent beneath, lateral nerves 20 or more pairs straight from the midrib, curved-ascendent and slightly anastomosing towards the edge, flat above, a little raised beneath, reticulation of veins and veinlets minutely though visibly (lens!) prominent beneath; petiole 1-1.5 cm by 3-4 mm. *Racemes* solitary from the axils of the upper 3 leaves, erect, pedunculate, 6-7 cm long; pedicels 3-4 mm. *Flowers* 4-merous. *Calyx* 1.5-2 mm long. *Corolla* 4 mm long. *Male flowers*: anthers cordate, sessile, 2 mm. *Female flowers* not known. Submature *drupe* (NGF 40488) depressed-globose, red,

smooth with a few faint ribs in the dry state, 8–10 by 5–6 mm; stigma sessile, rather small; endosperm not known.

Distribution. New Ireland.

Ecology. In lowland rain forest.

Note. Incompletely known. Originally described from a male specimen, which is lost. It is probably that the Namanee I. specimen (with submature fruits) matches the type.

NEW IRELAND. Kavieng, Namanee I., NGF 40488.

11. *Discocalyx orthoneura* K. Schum.

Discocalyx orthoneura K. Schum., Fl. Deutsch. Schutzgeb. Südsee, Nachtr. (1905) 344, 'orthoneurus'. — **Type:** E. Nyman 705, New Guinea, Morobe Dist., Sattelberg, 900 m, female fl. July 1899 (B, lost; no duplicate in S).

Dioecious shrub or treelet, 1 m tall. Branchlets terete, glabrous, 3–4 mm diam. distally and bearing there 4–6 closely spaced leaves; bark brown. Leaves lanceolate or obovately so, apex short-acuminate, tip subacute, base cuneate to the petiole, coriaceous, reddish brown when dry, paler beneath, entire, subdensely set with fine dark glandular dots beneath, (10–)12–20 by (3–)4–7.5 cm, midrib a little impressed above, strongly raised beneath, lateral nerves c. 12 pairs, leaving the midrib in a wide or almost right angle, straight below, curved-ascending and anastomosing close to the edge, all nerves flat above, somewhat prominent beneath, reticulation of veins and veinlets lax, finely raised mainly beneath; petiole 1–1.5 cm by 2 mm. Racemes 1–3 from the axils of the uppermost leaves, ascending, lax-flowered, all over laxly to subdensely set with glandular points, without hairs, 5–8 cm long; rhachis very slender, with flowers in the upper half only; pedicels very slender, 2–3 mm at anthesis, to 8 mm in fruit. Flowers 4-merous, reddish or brownish green. Calyx lobes ovate-deltoid, thickly glandular-punctate, 1–1.3 mm. Corolla ex diagn. 2 mm long. Male flowers not known. Female flowers: anthers reduced in size, inserted near the base of the corolla lobes. Ovary globose; style short; stigma capitate. Immature drupe globose, said to be red, rugose by thick glandular points, observed to 4 mm diam., crowned by a short style with a small capitate stigma.

Distribution. New Guinea, only known from the Morobe Dist.

Ecology. In lowland to submontane rain forest, 200–1675 m altitude.

Note. The three specimens cited differ from the original description by a shorter style, which in the type specimen is said to have been 2.5 mm long.

NEW GUINEA. Morobe Dist., Sattelberg area, Samanzing, 1675 m, fr. juven., Clemens 9142 (B). Lae, Buso, ridge to Mt Kawea, 200 m, on ultrabasic soil, fr. immat., NGF 24451. Oomsis logging area, LAE 74817.

12. *Discocalyx perseifolia* Mez

Discocalyx perseifolia Mez, Bot. Arch. 2 (1922) 176. — **Type:** Schlechter 17947, New Guinea, Madang Dist., Finisterre Ra., male fl. (B, lost).

Dioecious shrub, 1.2–2 m tall, with spreading branches; bark pink-brown. Branchlets terete, 3–6 mm diam., smooth, glabrous, brown when dry. Leaves several crowded at the end of lateral branches, elliptic-oblong, apex acutely acuminate, base cuneate to the elongate petiole, though hardly decurrent, firmly chartaceous to subcoriaceous, dark green, paler beneath and dull on both faces when fresh, brownish-olive when dry, entire, glabrous, densely set with rather small glandular points raised on both faces in the dry state, (9–)13–22 by (3.5–)4.5–7.5 cm, midrib slightly impressed above, bold (1–2 mm) beneath, lateral nerves 10–12 pairs, with additional less conspicuous ones between, rather straight from the midrib, arcuately joined to an intramarginal nerve for 2–7 mm before the edge, more or less flat above, prominent beneath, reticulation of veins and veinlets distinct, raised mainly beneath; petiole robust, canaliculate, (2–)3–5(–6) cm by 1.5–2 mm. Racemes spike-like, 1 or 2 from the axils of the uppermost leaf (or leaves), ascending to pendent, many-flowered, the flowers spaced for 3–10 mm along the rhachis, the latter slender (0.5 mm diam.) with numerous slightly raised glandular dots and lines (no hairs!), 6–10 cm; pedicels thickish, 0.3–1 mm; bracts lanceolate, 0.5 mm, caducous. Flowers 4-merous, whitish-greenish or pinkish. Calyx cup-shaped, acutely lobed in its upper third, densely dark glandular-punctate, 2 mm diam. Corolla globose in bud, campanulate when open, lobed to almost the base, densely dark glandular-punctate. Male flowers: stamens attached to the base of the corolla lobes; anthers elliptic, white, 0.5 mm; filaments thick, very short, purplish. Ovary rudimentary. Female flowers not known. Drupe subsessile, on pendulous spikes, globose, bright red, smooth, the soft exocarp thin; endocarp hard, flattened in the upper third, 1–1.3 by 1 cm, with a central short conical style base (2 mm) and a sessile pad-like stigma; seed 1.

Distribution. New Guinea.

EcoLOGY. Undershrub in lowland rain forest, to 485 m, locally common.

NEW GUINEA. Morobe Dist., Buko creek, 3 miles from Gurakor, 485 m, male fl., NGF 14447. Markham R. point, 30–305 m, male fl. & fr., LAE 53076, 54744, NGF 14887, 14890, 32843, Stevens et al. 755.

List of *Discocalyx* collections not identified down to the species

NEW GUINEA. E. Highl. Dist., top of Kassam pass, 1448 m, male fl., LAE 58078. Marafunga mill, 2600 m, fr., Grubb & Edwards 53. – Morobe Dist., Lae, coast opposite Lasanga I., 200 m, fr., Jacobs 9584. Garaina, 2135 m, Hartley 12712. – Central Dist., Boridi, male fl., Carr 14246. Alola, Carr 14108 (BM). – Milne Bay Dist., Baniara, Opanabu, 900 m, fl. bud, Kanis 1210. Raba Raba, Mt Paori, above Mayu I., 1000 m, fr., NGF 28949. Road to Mt Suckling, 366 m, fr., NGF 46956. – Goodenough I., Mt Oiamadawa'a, 1400 m, fr., LAE 67930. Rossel I., Mt Rossel, female fl., LAE 70914.

NEW BRITAIN. Kandrian, Akinum, 150 m, fr., NGF 22442. Fullerborn harbour, fr., LAE 63054.

EXCLUDED

Discocalyx conferta S. Moore, J. Bot. 61 (1923) Suppl. 29 = *Fittingia* sp.

FITTINGIA

Fittingia Mez, Bot. Arch. 1 (2) (15 Feb. 1922) 105. — Lectotype: *F. urceolata* Mez.
Abromeitia Mez, Bot. Arch. 1 (2) (15 Feb. 1922) 100. — Type: *A. pterocarpa* Mez.

Dioecious shrub or treelet, rarely tree, generally unbranched. *Leaves* alternate, crowded at or towards the apex of stem or branches, i.e. 'Schopfbaum' habit, petiolate, oblong to elliptic, or obovately so, with numerous lateral nerves starting from the midrib in a wide angle and subparallel to each other, maybe joined to an intramarginal nerve; fallen leaves leaving big scars on branches or branchlets. *Racemes* simple, solitary from the axils of a few uppermost leaves, obliquely erect. *Flowers* 4- or 5-merous. *Calyx* deeply lobed, more or less expanded. *Corolla* tubular to urceolate or subcampanulate, lobed in the upper 1/4 to 3/5 part, lobes erect or reflexed at anthesis. *Male flowers*: filaments adnate to the base of the corolla in their lower part, free otherwise, short, thick-filiform in general; anthers elliptic to subsagittate, basifix, or dorsifix just above their base. Rudiment of ovary stipitiform or almost absent. *Female flowers*: stamens reduced in size, without pollen. Ovary subglobular; style short, robust in general; stigma subcapitate, discoid, or peltate. *Drupe* globose or depressedly so, relatively large; exocarp thick, soft, maybe juicy, spongy, specked outside with big glandular points, becoming flattened or wing-like and coriaceous by pressure and desiccation during preparation for herbarium specimens; endocarp hard, globular or depressedly so, even disk-like, many-ridged or tubercled; seed 1; endosperm not ruminant.

Distribution. Five species, as far as known, limited to New Guinea, possibly also occurring in New Britain.

Notes. Mez described *Fittingia* and *Abromeitia* in the same volume of the Botanisches Archiv. *Fittingia* was based on two apparently much related species, both on specimens with male flowers, collected in the Kani Mts. *Abromeitia* was based on one species, respectively on one specimen with submature fruits, named '*pterocarpa*', alluding to the 'coriaceous wings', which after Mez are 'unique in the family'. These 'wings' develop when the thick and soft exocarp is pressed and desiccated during the preparation for herbarium specimens. Ripe fruits, collected and preserved in alcohol by M. Jacobs in 1973, have shown their unaltered state for the first time.

The author has preferred to use the name *Fittingia* because this generic name is based on two species and because of both of them type material is still available. *Abromeitia* has been put in synonymy, because it is based on one species, no type material is preserved any more, and the epithet '*pterocarpa*' is misleading.

Fittingia, without being mentioned by Mez, has been named after Johannes (Hans) Fitting (1877–1970), a contemporary of Mez, Professor of Botany at Bonn University, also known as 'Kaiserredner' at the Emperor's birthday in Wilhelminian Germany.

Fittingia is most closely related to *Discocalyx*, a genus from which it differs mainly by fruit characters.

KEY TO THE SPECIES

- 1a. Racemes at least 2.5 cm long 2
 b. Racemes (sometimes umbel-like) 1–2 cm long 4
- 2a. Drupe white. Pedicels at anthesis c. 1.5 mm long 1. *F. urceolata*
 b. Drupe pink to mauve, red, or purple. Pedicels at anthesis 2–4(–6) mm long 3
- 3a. Drupe (sub)globose; endocarp depressedly globose, more or less distinctly lengthwise many-ridged, 5–6 by 7 mm 2. *F. tubiflora*
 b. Drupe depressedly globose; endocarp depressedly conical or disk-shaped, edge irregularly tubercled, 15–20 by 10 mm 3. *F. tuberculata*
- 4a. Leaves ovate to ovate-elliptic or -lanceolate, the lateral nerves excurrent along the edge; petiole 1–1.5 cm 4. *F. conferta*
 b. Leaves lanceolate, the lateral nerves joined to an intramarginal nerve; petiole (2.5–)3–5 cm 5. *F. carnosifolia*

1. *Fittingia urceolata* Mez

Fittingia urceolata Mez, Bot. Arch. 1 (1922) 106. – T y p e s : *R. Schlechter* 17505, New Guinea, Madang Dist., Kani Mts, 800 m, male fl. May 1908 (B; syn, lost); *R. Schlechter* 17676, ibid., 1000 m, male fl. 8 May 1908 (B, lecto, lost; K sub '17677', P, sterile, isolecto).

Dioecious shrub or treelet, 2–3 m tall. Branchlets terete, 3–6 mm diam., set with numerous scars of fallen leaves. Leaves crowded towards the end of the branchlets, oblong to oblong-elliptic, sometimes obovately so, apex shortly acuminate, tip acute, base gradually and elongately cuneate to and a little decurrent on the petiole, chartaceous to subcoriaceous, dark grayish green when fresh, dark brownish olive above, paler beneath and dull when dry, entire, glabrous, with numerous glandular points a little raised on both faces in dry specimens, 12–22 by (3–)4–8 cm, midrib strong, rather flat above, bold beneath, lateral nerves c. 20 pairs, straight from the midrib and parallel to each other, curved-anastomosing only just before the edge and forming there a distinct intramarginal nerve, raised beneath only, reticulation of veins and veinlets rather faint; petiole robust, flattened, 6–10 by 2–3(–4) mm. Racemes 1, or rarely 2 obliquely erect from the axil of the uppermost leaf and subtended by basal ligular leaf-like bracts, simple, the male ones densely to laxly many-flowered and 3–5 cm long, the female ones apparently longer (to 23 cm) and the flowers more spaced; rachis stoutish, glabrous; pedicels robust, at anthesis c. 1.5 mm. Flowers 5-merous, pink, white, or greenish cream. Calyx cup-shaped, minutely gland-punctate, 2.5 mm in diam., lobed about halfway, lobes deltoid, obtuse. Corolla campanulate-urceolate, fleshy, 3.5–4 mm long, glandular-punctate, lobed in the upper third, lobes deltoid, erect, obtuse. Male flowers: stamens adnate to the base of the corolla; filaments thick, free in their upper half; anthers ellipsoid, c. 1 mm. Rudiment of ovary present. Female flowers not known yet. Drupe (sub)globose, 1.5–2.5 cm in diam., white, with a densely glandular-dotted soft (not juicy) exocarp which is 1–1.2 cm thick in fresh specimens and becomes wing-like in dried and pressed specimens for 1–3 mm; endocarp depressedly globose, hard, distinctly rather irregularly

5–6-ridged, 5 by 7 mm, crowned by a short style with a rather small subcapitate stigma; peduncle robust, purplish, 1.5–2 mm.

Distribution. New Guinea, mainly in the eastern part.

Ecology. Scattered in lowland and submontane rain forest undergrowth, also in depleted regrowth forest, to 1220 m altitude.

Note. *Fittingia urceolata* is close to and possibly conspecific with *F. tubiflora*. The type material shows rather slight differences in the lateral nerves: more straight and dense in *F. urceolata*, more curved-ascending in *F. tubiflora*, and in the length of the pedicels. The white colour of the mature fruit of *F. urceolata* has been mentioned on the labels of recently collected material only and might prove to be a character not reliable enough to separate these species.

NEW GUINEA. W. part: Okwalimkan R. headwaters, fr. white, 1220 m, NGF 33155. — E. part: Morobe Dist., Lae, helicopter site 2, NGF 31655. Baden Bay, opposite Lasanga I., fr. white, Jacobs 9644 (mature fr. in alcohol sub nr. 6477 in L). Buso R. valley, fr. white, Conn et al. 284, NGF 45139, 45163, Rau 291. Morobe R., Ana village, LAE 74905. Paiawa, N of Morobe, fr. white, NGF 47301. — Milne Bay Dist., Maneau Ra., Mt Dayman, 900–1200 m, fr. white, Brass 23015, 23602.

2. *Fittingia tubiflora* Mez

Fittingia tubiflora Mez, Bot. Arch. 1 (1922) 106. — T y p e : *R. Schlechter* 17356, New Guinea, Madang Dist., Kani Mts, 1000 m, male fl. 26 Feb. 1908 (B, lost; L, sterile, as *Melodinus landolphioides* sub '17354', iso).

Abromeitia pterocarpa Mez, Bot. Arch. 1 (1922) 100. — T y p e : *C. Ledermann* 11185, New Guinea, E. Sepik Dist., 'Hunsteinspitze', fr. submat. (B, holo, lost). — Matched by R.D. Hoogland & L.A. Craven 10925 from the same locality (Mt Sunset), fr. immat. 11 Aug. 1966 (L; dupl. distr. sub '*Ardisia*' to A, BRI, CANB, LAE, US, n.v.).

Dioecious slender treelet or tree, (1–)4–6(–18) m tall, with diverging branches; bark pale brown, fairly smooth. Branchlets c. 5 mm diam., with numerous broad scars of fallen leaves, older parts smooth. Leaves (3–)5–7 crowded towards the end of the branchlets, elliptic, or mostly obovately so, apex shortly acuminate, tip subacute or obtuse, base cuneately narrowed and more or less decurrent to the thick petiole, firmly subcoriaceous, dull dark green above, semi-glossy and paler beneath when fresh, brownish olive and dull when dry, entire, subdensely set with fine to more coarse glandular points beneath, 12–19(–27) by 4–6(–8.5) cm, midrib flat or slightly grooved above, very prominent beneath, lateral nerves 12–17 pairs, with additional shorter ones between, all moderately curved-ascendent from the midrib, the main ones rather indistinctly joined to an intramarginal nerve close to the edge, all nerves flat or a little depressed above, somewhat raised beneath, reticulation of veins and veinlets rather faint in general, sometimes more obviously raised mainly beneath; petiole stout (1–)1.5–2 cm by 2–3 mm. Racemes 2 or 3 from the axils of the uppermost leaves, obliquely erect, rather distantly set with flowers in their upper 2/3 part, very sparsely appressedly hairy or practically glabrous; basal bracts broadly lanceolate, leafy, caducous; rhachis robust, 1–1.5 mm diam. in fruiting time, 6–8(–10) cm long; pedicels robust, 2–4(–6) mm at anthesis, maybe slightly longer in fruit, leaving thick roundish scars on the rhachis. Flowers pink, usually 5-, rarely 4-

merous. *Calyx* lobed halfway, lobes roundish, obtuse, glandular-punctate, 1 mm. *Corolla* rotate-campanulate, fleshy, 3(–4) mm long in all, lobed for 2/3–3/5 its length, lobes glandular-punctate, obtuse. *Male flowers* (*Brass* 23300, *Veldkamp & Stevens* 5530): anthers ovate-ellipsoid, c. 1 mm; filaments thick-filiform, c. 1.5 mm, adnate to the corolla base for their lower half. Rudiment of ovary minute. *Female flowers* (*LAE* 54148): anthers reduced in size, inserted near the base of the corolla; thecae subsagittate; filaments thickish, very short. Developed ovary globose; style robust, hardly 1 mm; stigma thick, disk-like, 1 mm in diam. *Drupe* (subovoid-)globose, plum-like, succulent, glossy, deep (very rarely pale pink) mauve, maroonish red, or purple, densely set with thick glandular points (no lines), (1.5–)2–3.5 cm diam. when fresh; exocarp fleshy and fibrous, sour, (0.5–)1–1.2 cm thick, becoming wing-like and coriaceous by desiccation and pressure during preparation for herbarium specimens; endocarp hard, depressed-globose, apiculate, ridged, 5–6 by 7 mm; style thick, 1–2 mm, immersed a little on top of the fruit; stigma discoid.

Distribution. New Guinea, from the Cyclops Ra. to the Gulf and Milne Bay Dist.

EcoLOGY. In lowland or mainly in montane rain forest, also ridge forest, to 2000 (rarely –2650) m altitude, locally frequent.

NEW GUINEA. W. part: Cyclops Ra., G. Sinagai (= Mt Sinakor or Baboko), *Atasrip* 217; path Ifar to Ormu, 1240 m, *van Royen & Sleumer* 5878; N of Dozai, Baimungun creek, *van Royen & Sleumer* 6363. – E. part: W. Sepik Dist., Amanab, Kiliwas village, 300 m, *NGF* 48180. – W. Dist., Mt Bosavi, 900–1550 m, *Jacobs* 8832, 9429. – Gulf Dist., Vailala R., Baimuru area, 30 m, *LAE* 61288. – W. Highl. Dist., Merimanta, Poget logging area, 2285 m, *NGF* 11319. Tambul, 2440 m, fr. pale pink, *NGF* 14258. Tomba, S slope of Mt Hagen Ra., 2550 m, *Hoogland & Pullen* 6156. Wabag, Wage valley, 2440 m, *Robbins* 3301. – S. Highl. Dist., Mendi, above Kiburu, 1920 m, *Schodde* 1373. Kagaba camp, 2650 m, *NGF* 39704. Mt Giluwe, 2250 m, *LAE* 60896. – Morobe Dist., Wareo near Sattelberg, 600–760 m, *Clemens* 1430. Lae, Mt Kawea, 300 m, *LAE* 52302. Aseki patrol area, Haumga, *Craven & Schodde* 1088. Kaiapit, Kassam Pass, 2000 m, *LAE* 53552. – Central Dist., Boridi, 1220–1280 m, *Carr* 14266 (BM), *LAE* 60092. Sogere, 760 m, *Forbes* 202, 216a, 486 (all BM). E slope to Lake Myola no. 1, *NGF* 34995. Mt Victoria, below the Gap, 1980 m, *Carr* 13777. – Milne Bay Dist., Alotau, Mt Delaia, 120 m, *LAE* 67144. Mt Suckling area, 1740–2150 m, *LAE* 54148, *Veldkamp & Stevens* 5530. Maneau Ra., Mt Dayman, 1250–1550 m, *Brass* 23084, 23300, 23387. Baniara, Agaun to Bonenau, *W.E. Fisher* 33.

3. *Fittingia tuberculata* Sleum., spec. nov.

Frutex vel arbuscula monocaulis 1–4 m alta, cortice brunneo. Ramuli teretes, robusti, apicem versus distanter foliati, in partibus inferioribus interdum inflati porisque formicis fabricis ornati. *Folia* oblonga vel saepius obovato-oblonga, apice late attenuata, ipso apice subacuminata vel obtusa, basin versus sat longe in petiolum subalatum angustata, chartacea usque tenuiter subcoriacea, in vivo supra saturate viridia et nitentia, in sicco olivaceo-brunnea et opaca, subtus paullo pallidiora, integra, utrinque subdense punctis glandulosis elevatulis adspersa, 18–27 cm longa, (3.5–)4–8 cm lata, costa supra impressa, subtus robusta et prominente, nervis laterralibus 15–20-paribus, ulro similibus brevioribus intercalaribus additis, omnibus angulo magno usque subrecto a costa abeuntibus subparallelis praeter marginem

excurrentibus vel sat obscure inter sese curvato-conjunctis, nervo intramarginali inconspicuo vel nullo, omnibus in sicco supra sat planis, subtus parum prominentibus, rete venarum et venularum paullo elevato sub lente tantum utrinque visibili; petioli 1–1,5 cm longi, 2–3(–4) mm crassi. *Racemi* simplices ex axillis foliorum summorum 1–2(–3) orti, oblique erecti, distanter florigeri, 2,5–4 cm longi; rhachis sub anthesi sat gracilis, sub fructu usque ad 1,5 mm diam. incrassata, glabra; pedicelli sub anthesi 4–6 mm longi. *Flores* 5-meri, rosei. *Flores masculini* (Ijiri & Niimura 407): calyx fere usque ad medium lobatus, lobis expansis subovatis, obtusis, ciliatis, glandulos-punctatis, 1,5 mm longis. Corolla urceolata, in gemma usque ad 2,5 mm longa tantum visa, superne ut videtur per 1/3–1/4 longit. lobata. Stamina basi corollae adnata; filaments brevissima; thecae ovato-subcordatae, 1,5 mm longae. Ovarii rudimentum punctiforme. *Flores feminei*: corolla non observata. Ovarium evolutum ovoideo-subglobosum, dense glandulos-punctatum, stylo crassiusculo ca. 0,5 mm longo, stigmate capitato. *Drupa* matura ex coll. laete rubra, ut videtur depresso-globosa, in vivo 1,5 cm alta, 2,2 cm diam., in sicco discoidea, exocarpio tunc coriaceo marginem subalatum 1–2 mm latum formante, endocarpio duro discoideo, apiculato, 1,5–2 cm diam., 1 cm alto, tuberculis sat irregularibus pluribus margine endocarpii insigniter protrudentibus intusque tubuloso-excavatis praedita.

Distribution. New Guinea, mainly in the Western part.

Ecology. In lowland primary rain forest, on sandy clay or limestone, to 920 m altitude, locally gregarious.

NEW GUINEA. W. part: Vogelkop Peninsula, Maruni creek near Andai, SW of Manokwari, 70 m, BW 13530 Koster. Sidei, 50–65 km W of Manokwari, BW 5552 v.d. Sijde, BW 4399 Koster. Beriat, c. 12 km S of Teminabuan, BW 6291 Kalkman. Wandammen Peninsula, Wondiwoi Mts, 920 m, BW 13742 Koster. Fak-Fak, Kowap, 410 m, fr. 27 Feb. 1962, BW 12192 Vink (L, holotype; dupl. distr. to A, B, BO, BR, BRI, CANB, K, LAE, MICH, PNH, RSA, SING, US, n.v.). McCluer Gulf, Anakasi near Babo, 50 m, Aet (Exp. Lundquist) 96. Geelvink Bay, Napan, Akama, male fl. 20 Apr. 1943, Ijiri & Niimura 407 (L ex TI); ibid., Wati, fr. 18 Apr. 1943, Ijiri & Niimura 681 (L ex TI). Van Rees Mts, Mamberamo R., 30 m, Docters van Leeuwen 9213. – E. part: Western Dist., Nomad, 100 m, LAE 73940.

4. *Fittingia conferta* (S. Moore) Sleum., comb. nov.

Discocalyx conferta S. Moore, J. Bot. 61 (1923) Suppl. 29. — Type: H.O. Forbes 614, New Guinea, Central Dist., Sogere, c. 535 m, male fl. 26 Jan. 1886 (BM).

Dioecious erect shrub c. 1 m tall; bark brown. Branchlets terete, smooth, 3–5 mm diam. below, thickened and set with the scars of fallen leaves distally. Leaves several crowded towards the end of the branchlets, ovate- or lanceolate-elliptic, apex rather shortly abruptly acuminate, tip obtuse, base broadly cuneate or obtuse, thin-coriaceous, dark green and dull above when fresh, dark brown when dry, paler beneath, densely minutely glandular-punctate beneath only, entire to subundulate, 13–17(–25) by (4.5–)6.5–8.5 cm, midrib rather flat above, prominent beneath, lateral nerves 9–12 pairs arcuately ascendent, excurrent before the edge, slightly or not impressed above, a little raised beneath, reticulation of veins and veinlets lax and rather obscure, or finely raised (lens!); petiole 1–1.5 cm by 2–3 mm. *Racemes*

solitary from the axil of the uppermost 3 leaves, 8–12-flowered, shortly peduncled, 1.5–2 cm long in all, of a purplish tinge all over when dry; rhachis slender, laxly glandular-punctate, epilose; pedicels stoutish, 1–2 mm; bracts linear, 1.5 mm, caducous. *Flowers* 4-merous. *Calyx* campanulate, orange-coloured, c. 5 mm long, lobed halfway, lobes erect, oblong, subacute, glandular-punctate dorsally. *Corolla* tubular, white or cream, with pink tip, 3–4 mm long, lobed for the upper 3/4 part, lobes narrowly oblong, obtuse, sparsely or not glandular-punctate. *Male flowers*: stamens adnate to almost the base of the corolla; filaments thick-filiform, 1–1.5 mm; anthers subquadrate, 0.6 mm. Rudiment of ovary stipitiform, c. 1 mm. *Female flowers* not known. *Drupe* (*Forbes* 135) globose, scarlet or purple-red, c. 8 mm in diam. when dry; exocarp fleshy, forming a kind of short wing when dry; endocarp globose, firm, thin, distinctly many-ridged, 5–6 mm diam.

Distribution. New Guinea, only known from the Central Dist. (Astrolabe Ra. and Sogere area).

EcoLOGY. In primary hill forest or forest ridge, scattered, at 535–950 m.

NEW GUINEA. Central Dist., Sogere, fr., 700 m, *H.O. Forbes* 135 (BM), 256 (BM). Astrolabe Ra., coastal scarp, 950 m, *LAE* 50378; ibid., SW of Biribi, 950 m, *Schodde* 5646. – Milne Bay Dist., Raba Raba, Mayu I, 1000–1100 m, *NGF* 28917, 28960.

5. *Fittingia carnosifolia* Sleum., spec. nov.

Frutex vel arbuscula dioica 0,5–1,5 m alta, haud ramosa. Caulis pars distalis tantum distanter 5–8-foliatus, teres, 5–6 mm diam. *Folia* eleganter lanceolata, insigniter longepetiolata, apice subabrupte per 1–2,5 cm longe acuminata, ipso apice acuta, basi in petiolum angustata, in vivo carnosa, in sicco subcoriacea, utrinque olivacea et opaca, integra, imprimis subtus glanduloso-nigro-punctata, epilosa, 15–25 (–30) cm longa, (5–)6–7,5(–8,5) cm lata, costa supra leviter immersa, subtus imprimis basin versus crasse prominente, nervis lateralibus 12–15(–20)-paribus certe risque intercalaribus debilioribus subparallelis additis, inferne a costa subrectis, marginem laminae versus bene in nervum intramarginalem arcuato-conjunctis supra planis subtus parum elevatis, reticulatione venarum venularumque laxa subtus magis prominula; petioli (2,5–)3–5 cm longi, 2–2,5 mm crassi, in sicco striatuli. *Racemi* simplices solitarii ex axillis foliorum summorum 1–3 orti, valde abbreviati, dense, interdum subumbellatim 6–8-flori; rhachis sat robusta, sicut pedicelli laxe usque dense glanduloso-punctata, in sicco rubescens, 0,8–1,8 cm longa; pedicelli robusti sub anthesi ca. 2, sub fructu 3–5 mm longi. *Flores* 5-meri, albidi vel cremei, fragrantes. *Calyx* fere usque ad basin lobatus, lobis ovatis subacuminatis vel obtusis, dorso laxe vel densius glanduloso-punctatis, 1,8 mm longis. *Corolla* anguste campanulata, fere usque ad basin lobata, lobis anguste ovato-oblongis subacuminatis dorso laxe glanduloso-punctatis 3,5 mm longis. *Flores masculini* (*Brass* 27096): filamenta basi corollae adnata, crasse filiformia, fere 2 mm longa; antherae ovato-ellipticae, 1,2 mm longae. Ovarii rudimentum stipitatum. *Flores feminei* incogniti. *Drupa* (*Brass* 25771) globosa, ipso apice paullo depressa, in vivo rubra et 14–15 mm diam., in sicco ca. 8 mm diam.; exocarpium carnosum, in fructu desiccato quasi

annulum vel alam brevem praebens; endocarpium globosum, tenuiter coriaceum, breviter multicostatum; stylus crassus 1–1,5 mm longus; stigma capitatum.

Distribution. New Guinea, only known from the D'Entrecasteaux Islands (Fergusson I., Normanby I.).

EcoLOGY. In oak or mossy rain forest undergrowth, 700–900 m altitude.

NEW GUINEA. Milne Bay Dist., Fergusson I., mountains between Agamoia and Ailulai, male fl. 11 June 1956, *L.J. Brass* 27096 (L, holotype); *ibid.*, fr. immat. 13 June 1956, *Brass* 27125 (L, unicate). Normanby I., Mt Pabinama, 820 m, fl. bud 4 May 1956, *Brass* 25716; *ibid.*, 700 m., fr. submat. 8 May 1956, *Brass* 25771.

List of Fittingia collections not identified down to the species

NEW GUINEA. W. Part: Bernhard camp, Idenburg R., 750 m, fr. soft and red, *Brass* 13676. – E. part: W. Sepik Dist., Amanab, Imonda patrol post, fr. red, *LAE* 52891. – S. Highl. Dist., near Moro, Lake Kutubu, 800 m, fr. immat., *Schodde* 2399. – Manus I., 200–630 m, fr., *LAE* 77337. 77520. – Morobe Dist., Sattelberg to Quembung, 915–1220 m, fr. red, *Clemens & Clemens* 997. – Central Dist., Koitaki, *Carr* 12537 (BM). Lala R., male fl., 1675 m, *Carr* 14007. Isuarava, male fl., 1220 m, *Carr* 15045. – Milne Bay Dist., Agaun-Bonenu, 1500 m, male fl., *W.E. Fisher* 80. Raba Raba, Mt Suckling, 360 m, *NGF* 46956.

NEW BRITAIN. Eliak creek bank near Urin village, *NGF* 10056.

LOHERIA

Loheria Merr., Philipp. J. Sc. 5 (1910) 373; En. Philipp. Fl. Pl. 3 (1923) 270. – **Type:** *L. bracteata* Merr. from the Philippines.

Jubilaria Mez, Fedde Repert. Sp. Nov. 16 (1920) 421, sine descr.

Dioecious shrubs or treelets, generally unbranched. *Leaves* alternate, crowded at the apex of the stem, i.e. ‘Schopfbaum’ habit, oblong-obovate to broadly oblanceolate, elongately narrowed to the stout petiole, or seemingly sessile, relatively large and many-nerved in general. *Panicles* many-branched and rather shortly pedunculate, or condensed to head-like ones on top of an elongate peduncle, one to several from the top of leafy-bracteate short branches; pedicels short. *Flowers* 4- or 5-merous. *Calyx* deeply lobed. *Corolla* deeply lobed, united at the base only to a short tube, lobes more or less reflexed during anthesis. *Male flowers:* filaments affixed to the base of the corolla, free above; anthers cordate to elliptic, basifix or almost so. Rudiment of ovary none. *Female flowers:* stamens reduced in size. Ovary globular; style elongate, slender; stigma rather small, capitate. *Drupe* globular, densely gland-punctate; exocarp thin-fleshy; endocarp thin, hard. *Seed* 1; endosperm ruminant.

Distribution. Philippines, New Guinea. Not known yet with certainty from the Moluccas.

KEY TO THE SPECIES IN NEW GUINEA

- 1a. Leaves shallowly sinuate-dentate in the upper 2/3 part, (16–)22–26 by 4.5–5.5 cm. Corolla 3–4 mm long 1. *L. papuana*
- b. Leaves entire, 30–100 by 10–23 cm. Corolla 0.8–1.5 cm long

2. *L. reiniana*

1. *Loheria papuana* [Mez] Sleum., spec. nov.

Loheria papuana [Mez, Bot. Arch. 2 (1922) 210, nota sub *L. sessilifolia* Mez, sine descr., based on *Emelia papuana* Lauterb. ms, not *Emelia papuana* S. Moore 1916.]

Arbuscula dioica ca. 1 m alta. *Folia* oblanceolata, apice acuminata, ipso apice obtusa vel subacuta, basin versus cuneato-angustata et decurrentia, subsessilia, firme chartacea, in sicco brunnescens, subtus pallidiora, in superiore 2/3 parte glandulosi-sinuato-dentata (1 mm), epilosa, subtus sat dense glandulosi-punctulata, (16-) 22–26 cm longa, 4,5–5,5 cm lata, costa supra impressa, subtus robusta et per 2 mm alte prominente, nervis lateralibus numerosis, moderate curvato-ascendentibus interque sese subparallelis, ante marginem tantum conjunctis, supra leviter impressis, subtus paullo elevatis, reticulatione venarum venularumque utrinque sat obscura; petioli difficiliter a laminae basi 7–10 mm lata et usque ad 5 mm diam. distinguendi. *Flores* 4-meri, albidi. *Inflorescentiae masculinae*: racemi spiciformes, laxiflori, usque ad 4 cm longi; rhachis gracilis; pedicelli 1–1,5 mm longi. *Calycis lobi* haud obseruati. Corolla tubulosa, ca. 3,5 mm longa, usque fere ad basin lobata, intus papillosa. Filamenta filiformia, 3 mm longa; antherae anguste ellipticae, juxta basin dorsifixae, 1 mm longae. Ovarii rudimentum nullum. *Inflorescentiae femineae*: racemi subumbellati, fere globosi, ca. 6-flori, pedunculo crasso 3 cm longo basi bracteis lanceolatis 2 ca. 6 mm longis et 2 mm latis suffuto; pedicelli robusti, 1 mm longi, basi bibracteolati. *Calycis lobi* deltoideo-ovati, glandulosi-punctati, 1,5 mm longi. Corolla tubulosa, 4 mm longa, usque fere ad basin lobata, intus papillosa, lobis reflexis. Ovarium anguste ovoideum, 1,5 mm longum; stylus gracilis, 2,5 mm longus; stigma capitatum. *Fructus* immaturus ovoideus, basi calycis lobis suffultus, dense glandulosi-papillatus, stylo elongato, pedicello ca. 1 mm longo.

Distribution. New Guinea.

Ecology. In montane forest at 800 m altitude.

NEW GUINEA. W. part: Orange Mts, top of Mt Resi, 800 m, female fl. 4 Sept. 1907, G.M. Versteeg 1691 (WRSL-Lauterbach, holotype = fragm. ex B, lost; xerox in L; BO, sterile, iso); ibid., male fl., Versteeg 1692 (WRSL-Lauterbach = fragm. ex B, lost; xerox in L). – E. part: E. Sepik Dist., Upper Sepik/April R. area, Ledermann 9203 (K).

2. *Loheria reiniana* (Jacobs) Sleum., comb. nov.

Tapeinosperma reinianum Jacobs, Blumea 23 (1976) 3, f. 1; Fl. Males. Bull. 29 (1976), flower analysis on frontispiece. – Type: M. Jacobs 8841, New Guinea, Western Dist., Mt Bosavi, 1600–1800 m, female fl. 27 Sept. 1973 (L, holotype; BISH, CANB, LAE, iso, all n.v.).

Dioecious shrub or shrub-like tree of 'Schopfbaum' habit, 0.3–6 m tall; trunk 6–7 cm diam.; bark brown. Leaves numerous, narrowly obovate to oblanceolate, apex short-acuminate, tip blunt to subacute, long-cuneate-attenuate and decurrent towards the base, practically sessile, olive-green when fresh, brown and dull when dry, entire, glabrous, densely set with small glands all over the undersurface, subcoriaceous, 30–100 by 10–23 cm, midrib slightly impressed above, very strongly (to 8 mm) prominent beneath, lateral nerves 25 or more pairs, rather straight ascending, incurved at the very edge, raised mainly beneath, veins tending to be scalari-

form, conspicuous beneath only; petiole subtriangular, indistinct from the midrib, its insertion to 1.5 cm in diam. *Inflorescences* one to several, head-like, 3–5 cm in diam., in appearance rather inside the crown of leaves; peduncle at base with a reddish green reduced leaf (15–22 by 2–3.5 cm), hanging, angular, 10–18 cm long, 3–4 mm in diam. below, widened at the very top, there bearing 1 or 2 reflexed leaves (c. 3 by 0.5 cm), branching into about 10 axes c. 5 mm long on which c. 20 pedicels are crowded. *Flowers* 5-merous, 100–200 per inflorescence, white or with green tinge, near the top with irregular purplish or grayish lines and dots, no scent; pedicels 3–6 mm, with a basal bract to 12 by 2 mm. *Calyx* funnel-shaped, 1.5 cm in diam., lobed to almost the base, lobes oblong, obtuse, glandular-punctate and -lineate, 4–5 by 1.5–3 mm. *Corolla* tubular, outside with 5 ribs between the calyx lobes, 0.8–1.5 cm long, widening from 2 mm at base to 5.5 mm at the top, lobed halfway or less, lobes oblong, glandular-lineate. *Male flowers* not known yet. *Female flowers*: stamens inserted just about the middle of the corolla tube; filaments very short; anthers subbasifix, ellipsoid, 1 mm, void of pollen. Ovary ellipsoid, papillose, 2 mm long, with 5 ovules; style slender, elongate, 3–8 mm; stigma capitate to semiglobose. *Drupe* (*Kairo* 759) ellipsoid-subglobose, with numerous rather irregular ribs in the dry state, c. 1.2 by 1 cm, apparently collected in immature state; exocarp thin-fleshy, densely gland-dotted; exocarp hard, thin; endosperm not developed yet.

Distribution. New Guinea.

EcoLOGY. In primary lowland to montane forest, at 30–1800 m altitude.

NEW GUINEA. Western Dist., Palmer R., 2 miles below junction Black R., 100 m, female fl. June 1936, *Brass* 7110 (BM). – Gulf Dist., Kikori, Mina R., 20 m, sterile (the added fruit excluded), *NGF* 46476. Vailala R., 70 km from Baimuru, 30 m, sterile, *LAE* 61291. – Morobe Dist., Gumi divide, W of Bulolo, 1180 m, fr. immat., *Kairo* 759.

EXCLUDED

Loheria latepetiolata Mez, Bot. Arch. 2 (1922) 210 = *Discocalyx latepetiolata* (Mez) Sleum.

Loheria sessilifolia Mez, Bot. Arch. 2 (1922) 210 = *Discocalyx latepetiolata* (Mez) Sleum.

TAPEINOSPERMA

Tapeinosperma Hook.f. in Benth. & Hook.f., Gen. Pl. 2 (1876) 647. – **Lectotype:** *T. vieillardii* Hook.f.

Bisexual shrubs or trees, often sparsely or not branched. *Leaves* alternate, generally crowded at or towards the apex of stem or branches, i.e. ‘Schopfbaum’ habit, oblong to elliptic, lanceolate or obovate, usually with glandular points on their undersurface, entire, lateral nerves numerous, curved-ascending; petiole robust in general. *Inflorescences* paniculate, rarely subcapitate or congested-racemose or -pin-

nate-paniculate, from the axils of the uppermost, sometimes reduced leaves. *Flowers* 5-merous. *Calyx* tube cupuliform, lobed to various degree. *Corolla* urceolate to campanulate, or tubular, lobed about halfway or less. *Filaments* adnate to the corolla base, or free in their upper part only; anthers dorsifixated near base. *Ovary* attenuate into a slender style at least the length of the ovary; stigma relatively small, truncate or inconspicuously discoid or subcapitate; ovules (2-)5-12. *Drupe* usually depressed-globose; exocarp thin; endocarp hard, smooth or sometimes sharply angled. *Seed* 1; endosperm ruminate or not.

Distribution. Philippines (?), Moluccas (?), Australia, New Guinea incl. New Britain and New Ireland, Solomon Is., New Caledonia, eastwards to Fiji. Absent from Borneo.

KEY TO THE SPECIES IN NEW GUINEA AND THE SOLOMON ISLANDS

- 1a. Leaves cuspidate at apex, pubescent all over beneath 1. *T. cuspidatum*
- b. Leaves more or less obtuse at apex, practically glabrous beneath. 2
- 2a. Leaves 14-30 by 4-6(-12) cm; petiole 1-1.5 cm. 2. *T. commutatum*
- b. Leaves larger, 35-80(-105) by (9-)10-18(-38) cm 3
- 3a. Leaves subsessile or seemingly so, the unwinged part of the petiole to 1 cm long
 3. *T. cristobalense*
- b. Leaves decidedly petiolate, petiole 10-25 cm long, sometimes seemingly shorter when very broadly winged 4. *T. pachycaulum*

1. *Tapeinosperma cuspidatum* Sleum., *spec. nov.*

Discocalyx listeri auct., non (Stapf) Mez & Stapf 1902; Whitmore, Guide to the forests of Br. Solomon Is., For. Record no. 2, For. Dep. Br. Solomon Is. Protect. (1966) 177; Foreman, A check list of the vascular plants of Bougainville, Bot. Bull. Dept. Forest. Lae 5 (1971) 51.

Arbor parva 2,5-6 m alta, trunco saepius tortuoso, cortice laevi saturate brunneo. Ramuli crassi, in partibus inferioribus jam defoliatis cicatricibus subrotundis magnis ornati, distaliter foliis paucis congestis instructi. *Folia* elliptica vel saepius obovato-oblonga, apice acuminata, ipso apice per 0,5-1 cm longe cuspidata, basin versus gradatim attenuata, ipsa basi breviter in petiolum alata, subcoriacea, in sicco brunnea, opaca, utrinque prominenter glanduloso-punctata, supra glabra, subtus per totam faciem pilis rufo-brunneis erectis brevissimis diu persistentibus, secus costam et petiolum quam in lamina haud raro distinctioribus vel densioribus induta, integra, 18-30 cm longa, 6-9(-12) cm lata, costa supra immersa, subtus valde prominente, nervis lateralibus numerosis inter sese subparallelis subrectis vel modice, ante marginem magis curvatis, indistincte vel haud conjunctis, supra sat planis, subtus elevatis, reticulo venarum obscurō; petioli 1-2 cm longi, 2(-3) mm crassi. *Paniculae* ex axillis foliorum superiorum 2-5 solitariae, anguste pyramidales, elongatae, laxe multiflorae, e racemis numerosis apicem inflorescentiae versus sensim brevioribus constitutae, pedunculo sat brevi (2-3 mm crasso) inclusō usque ad 16 cm longae, ramis inferioribus ad 6 cm longis sed saepe brevioribus, corollis exceptis in omnibus

partibus dense pilis rufo-brunneis erectis vel paulo crispulis obsitae; pedicelli sub anthesi 1–2 mm longi. *Flores* bisexuales, 5-meri, lutescentes vel rubescentes. *Calyx* profunde 5-lobus, lobis ovato-acuminatis dorso prominenter glanduloso-punctatis, breviter pilosis, eroso-ciliatis, ca. 2,5 mm longis. *Corolla* in gemma subgloboso-ovoidea, sub anthesi subcampanulata et usque ad medium lobata, lobis ovato-acuminatis, dorso glanduloso-punctatis, epilosis, 2–2,5 mm longis. *Stamina* ima basi corollae filamentis fere omnino inter sese annulatim connatis adnata; filamenta applanata, brevia; antherae subsagittatae, fere basifixae. *Ovarium* ovoideum; stylus graciliter columnaris, ovarium longitudine aequans vel generaliter paulo superans; stigma parvum, quasi truncatum, vix lobatum. *Drupa* (*BSIP* 5542) globosa, rubra, glanduloso-punctata et -lineata, in sicco ca. 6 mm diam.; exocarpium tenuie, carnosulum; endocarpium tenuie, durum.

Distribution. Solomon Islands (Bougainville, Wagina, Santa Ysabel, San Cristobal).

EcoLOGY. In primary rain forest, often on ridge tops, from lowland up to c. 365 m altitude.

SOLOMON ISLANDS. Bougainville, Maisua, 365 m, *Waterhouse* 735-B. *Tupi*, *Waterhouse* 566-B. No locality given, *Waterhouse* 83 (K, as *Discocalyx listeri*, n.v.). — Wagina I., *BSIP* 5542. — Santa Ysabel, Moloforu Bay, fl. 18 July 1966, *BSIP* 7385 (L, holotype). SE of Paehena Point, *BSIP* 7764. Samosodu, *BSIP* 7214. Allardye Harbour, *BSIP* 3663. Kolokofa R., *BSIP* 6834. — San Cristobal, Irorauri, 155 m, fl. 26 Nov. 1968, *BSIP* 12811. Onebia Arosi, 55 m, *BSIP* 12710. Marogu, *BSIP* 10946.

2. *Tapeinosperma commutatum* Sleum., *spec. nov.*

Frutex vel generaliter arbuscula, rarius arbor 2–6(–10) m alta, trunco interdum tortuoso, cortice dilute usque saturate brunneo, laevi. Ramuli teretes, inferne cicatricibus magnis ornati, superne foliis paucis approximatis induti, 3–5 mm crassi. *Folia* oblonga, interdum obovato-oblonga, rarius lanceolata, apice late attenuata vel obtusa, rarius rotundata (nunquam acuminata vel cuspidata!), basi in petiolum angustata breviterque vel vix alata, primo visu subsessilia, in vivo supra laete viridia et nitentia, subtus pallidiora, costa rubescente, in sicco supra saturatius, subtus pallidius brunea, subcoriacea, integra, glabra, utrinque plus minus dense glanduloso-punctata rarius -lineata, 14–20(–30) cm longa, 4–6(–12) cm lata, costa robusta supra paulo immersa, subtus prominente, nervis lateralibus numerosis ceterisque brevioribus intercalaribus additis angulo magno a costa abeuntibus interque sese parallelis, marginem versus curvatis vix conjunctis, nervo intramarginali obscuro vel nullo, nervis omnibus utrinque paulo elevatis vel fere planis, reticulo venarum et venularum inconspicuo; petioli supra bene canaliculati, 1–1,5 cm longi, 2–3(–4) mm crassi. *Paniculae* subpyramidales ex axillis superioribus 2 vel 3(–5) singulatim ortae, per 2–4 cm longe pedunculatae, multiflorae, sat graciles, corollis exceptis ubique rufo-papilloso-puberulace vel omnino subglabrae, (4–)8–12 cm longae, 3–5 cm latae; pedicelli filiformes, 2–5 mm longi. *Flores* 5-meri, bisexuales, cremei vel purpurascentes. *Calyx* sub anthesi rotatus, profunde lobatus, lobis ovatis obtusis ciliatis erosulis, generaliter haud glanduloso-punctatis, 0,7–1 mm longis. *Corolla* in gemma

subglobosa, aperta subcampanulata, profunde lobata, lobis lanceolato-oblongis subacutis dorso glandulis punctiformibus et lineatis irregularibus indutis, (2,5-)3 mm longis. *Stamina* ima basi corollae adnata; filamenta brevissima, inferne in annulum brevem connata; antherae deltaideo-subcordatae, 1,5 mm longae. *Ovarium* ovoidum; stylus gracilis, ovarium longitudine aequans vel paulo superans; stigma parvum, brevissime lobulatum. *Drupa* subglobosa, apiculata, maturitate rubra vel brunnescens, 7-8 mm diam., glandulis punctiformibus breviterque lineatis ornata; exocarpium tenuiter carnosulum; endocarpium tenue, durum; endospermium haud ruminatum.

Distribution. New Britain, Solomon Is. (Bougainville to San Cristobal), Santa Cruz Is. (Santa Cruz, Vanikoro).

EcoLOGY. In lowland primary forest, also in ridge forest, to 890 m altitude.

Note. In habit somewhat similar to *Discocalyx listeri* (Stapf) Mez & Stapf from Tonga (a species with bisexual flowers, a relatively elongate style, and a small stigma, which should be transferred for these reasons to *Tapeinosperma*) but different mainly in flower and fruit characters.

NEW BRITAIN. E. part: Mengen massif, 890 m, LAE 58639.

SOLOMON ISLANDS. Bougainville, Waterhouse 514-B. Korowai hills, W of Toiumonapu Plantation, 60 m, fl. 1 July 1963, NGF 16389 van Royen (L, holotype; A, BO, BRI, CANB, K, SING, SYD, UH, iso, all n.v.). - Southern Shortland I., BSIP 5767. - Ranongga, BSIP 14327, 14476, 15673, 15750. - Kolombangara, BSIP 844, 7508, 8768, 9780, 9788. - New Georgia, BSIP 3781, 5159. Roviana Lagoon, BSIP 1989. - Santa Ysabel, BSIP 6806, 7074. - Malaita, BSIP 3422. Small Malaita, BSIP 16254, 16485. - Guadalcanal, BSIP 676, 4609, R.R.S. 2004. - San Cristobal, BSIP 19381. - Three Sisters, Alite I., BSIP 18051. - Ovau I., BSIP 13341. - Nganvlumba, BSIP 19468.

SANTA CRUZ ISLANDS. Santa Cruz, BSIP 1733, 17056, 17198, 17608, 17685. Vanikoro, BSIP 7007.

3. *Tapeinosperma cristobalense* Stone & Whitmore

Tapeinosperma cristobalense Stone & Whitmore, Reinwardtia 8 (1970) 5, f. 3-5. - Type: R.S.S. 6105 Whitmore, Solomon Is., San Cristobal, ridge at confluence of the Warahito and Pagato R., fr. 22 July 1965 (K, n.v.; L, iso).

Treelet, 1.5-6 m tall, usually unbranched, pachycaul. Leaves clustered near twig ends, oblanceolate, apex subacute, base long-attenuate to the relatively short and gradually winged petiole, i.e. subsessile, chartaceous to subcoriaceous, glabrous, densely and prominently glandular-punctate on both faces, entire, reported to be gray below when fresh, olive-brownish when dry, (35-)60-80 by (9-)10-16 cm, midrib stout, impressed above, rounded-prominent beneath, lateral nerves numerous in a wide angle from the midrib, curved-ascendent before the edge, not properly joined to an intramarginal nerve, reticulation fine; petiole robust, flat, the not winged part to 1 cm long. Panicles bipinnate, solitary from the uppermost 1-3 leaf-axils, to 16 cm long and about as wide, peduncled to 9 cm, branches more or less in a right angle and distally racemose, many-flowered, all over covered with a red brown fine papillose puberulence, the corolla excepted; pedicels almost filiform, (8-)10-13 mm. Flowers (BSIP 6252) 5-merous, bisexual, white to reddish. Calyx cup-shaped,

deeply lobed, lobes ovate-deltoid, acuminate, ciliate, dorsally not glandular-punctate, (2–)2.5 mm. *Corolla* ellipsoid in bud, lobed to almost the base, lobes ovate-oblong, acuminate, finely or not glandular-punctate, 5.5 mm. *Stamens* shortly adnate to the corolla base; filaments broadly ligulate, c. 1 mm, the upper half only free; anthers ellipsoid, 1.8 mm. *Ovary* ovoid, apex truncate; style very slender, 6 mm; stigma finely capitate, sub-3-lobed. *Drupe* subglobose, shortly apiculate, pink to purplish red, 10–11 mm diam.; exocarp thin; endocarp crustaceous; seed 1; endosperm not ruminant.

Distribution. Solomon Is. (Small Malaita, Ulawa, San Cristobal).

Ecology. In lowland rain forest, also in disturbed forest, to 150 m altitude.

Note. Close to *T. pachycaulum*, but differing by subsessile leaves and larger flowers.

SOLOMON ISLANDS. Small Malaita, BSIP 17256. — San Cristobal, BSIP 4250, 4306 (fl. galled). — Ulawa I., BSIP 6252.

4. *Tapeinosperma pachycaulum* Stone & Whitmore

Tapeinosperma pachycaulum Stone & Whitmore, Reinwardtia 8 (1970) 3, f. 1 & 2. — **Type:** BSIP 5475 Whitmore's coll., Solomon Is., Wagina I., fl. 16 March 1964 (SING, n.v.; L, iso).

Treelet or tree to 5 m tall, sparingly or not branched, pachycaul; bark fawn-coloured, with prominent leaf-scars. Leaves rather crowded towards the tips of the branches, oblong-obovate to subelliptic, apex subacute or rounded-obtuse, base long-attenuate to the rather abruptly winged petiole, very base obtuse, sometimes subamplexicaul, thick-chartaceous to subcoriaceous, practically glabrous, entire, dark dull green above, pale grayish green beneath when fresh, brown-olive and dull when dry, densely and prominently glandular-punctate on both faces, 50–105 by 18–38 cm, midrib stout (to 1 cm wide), impressed above, rounded-prominent beneath, lateral nerves in numerous pairs in a wide angle from the midrib, moderately curved-ascending, often forked before the edge, purplish in fresh specimens, intra-marginal nerve obscure, reticulation fine; petiole very robust, winged to 1.5 cm, 10–20(–25) cm long, but not rarely seemingly shorter when very broadly winged. Panicles bipinnate, solitary from each of the uppermost 1–3(–5) leaf-axils, relatively large (to 36 cm long), many-flowered, all over rufous-scabridulous-papillate to glabrescent, with robust peduncle (to 1 cm diam.), ultimate branchlets to 1 mm diam.; pedicels slender, 2–5 mm at anthesis. Flowers 5-merous, bisexual, scented, white to yellowish, or mostly reddish to violet, glabrous. Calyx cup-shaped, lobed half-way or more, lobes ovate-deltoid, obtuse, glandular-punctate, c. 1.8 mm. Corolla ovoid-subglobose in bud, lobed to almost the base, lobes expanding during anthesis, ovate-oblong, subacute, with few rather large glands outside, c. 3 mm. Stamens shortly adnate to the corolla base; filaments flat, free for 0.5–1 mm; anthers ellipsoid, c. 0.5 mm. Ovary ovoid, 1 mm; style slender, 1.5–1.8 mm; stigma rather small, flattened and undulately lobed. Drupe globose, short-apiculate by the stylar remnant, with numerous thick glandular dots and lines, 8–10 mm diam.; exocarp thin; endocarp thin-crustaceous; seed 1; endosperm not ruminant.

Distribution. New Britain, New Ireland, and Solomon Is. (Bougainville to San Cristobal).

Ecology. Mainly in lowland, often riverine or swampy rain forest, not rarely at the bottom of valleys, to 925 m altitude.

NEW BRITAIN. Kandrian, Fullerborn, *LAE 63061*. Kimbe, Kapiura R., *LAE 75314*. Hoskins, Nuau, *LAE 51227*.

NEW IRELAND. Namatanai, Hans Meyer Ra., 925 m, *Sands 859*.

SOLOMON ISLANDS. Bougainville, Pavarai, *NGF 31267*. — Shortland Is., *BSIP 5751*, *13173*. — Choiseul, *BSIP 18928*. Rob Roy I., *BSIP 5318*. — New Georgia Group, Baga I., *BSIP 3021*, *5561*. Kolombangara, *BSIP 2152*. — Santa Ysabel, *BSIP 2608*, *6776*, *7209*. — Malaita, *Stone 2415* (n.v.). — San Cristobal, *BSIP 4305*, *12794*, *R.R.S. 12*.

List of Tapeinosperma collections not identified down to the species

NEW GUINEA. Morobe Dist., Buru R., 400 m, fr., *NGF 14838* (close to *T. cristobalense*). Lae, Butibum R., fr., *Hartley 11893* (close to *T. cristobalense*). Above Bakaia, 15 miles SE of Garaina, 1980 m, fr., *Hartley 12870*. — Northern Dist., Kokoda, W slopes of Mt Kenive (Nisbet), 2400 m, *LAE 65149*. — Milne Bay Dist., Rossel I., 100–700 m, *Brass 28247*, *28413*, *NGF 43302*.

NEW BRITAIN. Kandrian, Pirlongi, 395 m, *NGF 21923*.

NEW IRELAND. New Hanover, *LAE 65365*, *65517*.

SOLOMON ISLANDS. New Georgia group, Baga I., *BSIP 2830*. — Three Sisters, Malaupaina I., *BSIP 17965*. — Santa Ysabel, *BSIP 2570*, *16057*.

EXCLUDED

Tapeinosperma papuanum S. Moore, Trans. Linn. Soc. Bot. II, 9 (1916) 105 = *Ardisia* (§ *Stylandisia*) sp.