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REVISION OF MEIOGYNE (ANNONACEAE)

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SUMMARY

In the present revision of *Meiogyne* (Annonaceae) nine species are recognized, of which one is new, *M. glabra*; five new combinations are made; *M. hainanensis* is re-established. *Meiogyne* in its new sense includes the former genera *Ancana, Chieniodendron, Guamia, Meiogyne, Oncodostigma,* and *Polyaulax.* A key to all species is given.

INTRODUCTION

During my study on the flower morphology of the Annonaceae (Van Heusden, 1992), it became evident that the genera *Ancana* F. Muell., *Chieniodendron* Tsiang & P.T. Li, *Guamia* Merr., *Meiogyne* Miq., *Oncodostigma* Diels, and *Polyaulax* Backer constitute a group of closely related genera, and that the delimitation of these genera needed further study.

This group of six genera (described as '*Meiogyne*-group' by Van Heusden, 1992) is easily recognized by: 1) subequal petals of which the inner surface of the inner petals is glabrous and longitudinally grooved or warty towards the base, and 2) by the elongated apical prolongation in the inner whorl of stamens (Fig. 1). The flowers of these genera show a great overall similarity. Glandular inner petals occur in quite a number of Annonaceae (Van Heusden, 1992), e.g., *Asimina, Asteranthe, Duguetia, Enicosanthum, Fitzalania, Orophea, Pseuduvaria, Sapranthus,* and *Tetrameranthus.* Several of these genera have one or more important characters that exclude them from the *Meiogyne*-group, for instance, the presence of stellate hairs (*Duguetia, Tetrameranthus*), a different ovule-number (one basal ovule in *Enicosanthum* and *Duguetia*), different pollen morphology (*Asimina, Asteranthe,* see Walker, 1971) or a different chromosome number (*Asimina* 2n = 16, *Duguetia* 2n = 16, and *Tetrameranthus* 2n = 14, 28). In *Orophea* and *Pseuduvaria* the inner petals are shaped like mitres with the glands underneath the mitre. *Sapranthus* is distinguished by large petals with a prominent venation and an early dehiscence of the flower. An elongated apical shield of the inner whorl of stamens is, beside in the genera of the *Meiogyne*-group, only found in *Fitzalania.* The latter genus, however, has unequal-sized petals, whereas the shape of the petals and the indument are also quite different. Because of its petals and indument, *Fitzalania* seems closer to *Pseuduvaria.* In non-floral characters *Fitzalania* is not much different from *Ancana.* Although the taxonomical position of *Fitzalania* is still insufficiently known, in the present paper it is not considered to be a species of *Meiogyne.* Further characteristics of the *Meiogyne*-group are the axillary

flowers, 2–4 bracts usually near the base of the pedicel, the subglobose stigma, and several (up to 16) laterally attached ovules per carpel. Two types of monocarps occur within this group of genera (Fig. 2): small, usually cylindrical, more or less glabrescent monocarps with 1-seriate, discoid seeds or large, more or less ovoid, brown puberulent monocarps with 2-seriate, kidney-shaped, flattened seeds. Christmann (1986) reported a middle integument for the seeds of *Guamia*. This feature was not found in *Meiogyne* (Christmann, 1987). Unfortunately, he did not study the other genera of the *Meiogyne*-group. Chromosome numbers are known for representatives of two genera: 2n = 18 for both *Ancana* (Morawetz, 1988) and *Oncodostigma* (Okada, 1987). Walker (1971) observed inaperturate pollen in *Chieniodendron, Guamia, Meiogyne,* and *Oncodostigma*. Waha & Morawetz (1988) observed disulcate pollen in *Ancana*; they supposed, based on preliminary observations, that also *Oncodostigma* has disulcate pollen.

Relationships of *Meiogyne* with other Annonaceous genera are documented for several Asian and Central American genera in studies on flower morphology (Van Heusden, 1992), seed and fruit morphology (Van Setten & Koek-Noorman, 1992), pollen morphology (Waha & Morawetz, 1988), and karyology (Okada, 1987; Morawetz, 1988). Close relationships are found between *Ancana* and the other Australian genera *Fitzalania* and *Haplostichanthus* which agree in seed morphology, pollen morphology, and chromosome number. Affinities with the Central American genera *Desmopsis* and *Sapranthus* are supposed because of similarities in seed morphology, and with regard to *Sapranthus,* similarities in pollen morphology and chromosome number. With regard to the flowers, most affinities are supposed with *Fitzalania* and *Pseuduvaria* (species from New Guinea) because of the grooved base of the inner petals.

TAXONOMICAL CHANGES

The genus *Meiogyne* in its new sense comprises the former genera *Ancana, Chieniodendron, Guamia, Meiogyne, Oncodostigma,* and *Polyaulax*. The former monotypic genera *Guamia* and *Polyaulax* as well as one of the species of *Oncodostigma* proved to be conspecific. *Chieniodendron* in most of its characters agrees with *Meiogyne,* to which it has been referred to in the past by Ban (1973). *Ancana* combines features of both *Meiogyne* and *Oncodostigma*. The differences between these genera are too small and not consistent enough to maintain a distinct generic status for each of them. Therefore, it is preferred to unite these genera into one genus, *Meiogyne*. Moreover, *Desmos palawanensis* and *Polyalthia insularis* were discovered to belong to *Meiogyne*. In Table 1 all taxonomical changes are summarized. The publication of *Meiogyne* (Miquel, 1865) antedates the publication of *Ancana* (Von Mueller, 1865). According to Stafleu & Cowan (1981) the date of publication of *Meiogyne* is 23 April 1865. The fascicle of the publication of *Ancana* is dated as May 1865.

The species delimitation within *Meiogyne* is hampered by two factors: 1) the wide geographical distribution over various islands and the Asian mainland which resulted in local forms and 2) habitat differences which go along with morphological differences. In the latter situation usually two species were described in the past. Finally, nine species are distinguished.

Table 1. List of nomenclatural changes on genus and species level with the situation before (1) and after (2) the present revision.

(1)	(2)
Ancana hirsuta	*Meiogyne stenopetala* subsp. *stenopetala*
Ancana stenopetala	*Meiogyne stenopetala* subsp. *stenopetala*
Chieniodendron hainanensis	*Meiogyne hainanensis*
Desmos palawanensis	*Meiogyne mindorensis*
Guamia mariannae	*Meiogyne cylindrocarpa*
Meiogyne pannosa	*Meiogyne pannosa*
Meiogyne ramarowii	*Meiogyne pannosa*
Meiogyne virgata	*Meiogyne virgata*
Meiogyne lucida	*Meiogyne virgata*
Meiogyne philippinensis	*Meiogyne virgata*
Meiogyne montana	*Meiogyne virgata*
Meiogyne eriantha	*Meiogyne virgata*
Meiogyne subsessilis	*Meiogyne virgata*
Meiogyne monogyna	*Meiogyne virgata*
Oncodostigma leptoneura	dubious species
Oncodostigma mindorense	*Meiogyne mindorensis*
Oncodostigma monosperma	*Meiogyne monosperma*
Oncodostigma wilsonii	*Meiogyne cylindrocarpa*
Polyalthia insularis	*Meiogyne stenopetala* subsp. *insularis*
Polyaulax cylindrocarpa	*Meiogyne cylindrocarpa*

DISTRIBUTION

The genus *Meiogyne* is restricted to the tropical lowland and (lower) montane rain forests, up to 1450 m altitude, of tropical Asia and the western Pacific. *Meiogyne hainanensis* is restricted to Hainan (South China). *Meiogyne pannosa* is found in SW India. *Meiogyne virgata* is distributed in Thailand, Indochina, Malaysia, Singapore, Indonesia (Sumatra, Java, Borneo), and the Philippines. *Meiogyne cylindrocarpa* extends relatively far into the Pacific (Marianas and New Hebrides), compared with other Annonaceae; furthermore, it is found in Malaysia, Sumatra, Java, Borneo, some smaller Indonesian islands, the Philippines, and New Guinea. According to Jessup (1990) *M. cylindrocarpa* (as *Polyaulax cylindrocarpa* and *P. spec.*) occurs in northern Australia as well. *Meiogyne mindorensis* is restricted to the Philippines. *Meiogyne monosperma* is found in Malaysia and Peninsular Thailand. The new species *M. glabra* is restricted to New Britain. In Australia *Meiogyne* is represented by *M. stenopetala*, with its subsp. *insularis* occurring in Fiji. From New Caledonia one collection of *Meiogyne* is available, which, thus far, cannot be referred to any of the currently known species.

It would be interesting to know whether the wide distribution over various islands of *M. cylindrocarpa* and its closest relatives, is due to a very old age of these taxa or whether the fruits or seeds are easily dispersed over long distances.

MEIOGYNE

Meiogyne Miq., Ann. Mus. Bot. Lugd.-Bat. 2 (23 April 1865) 12. — Type: *M. virgata* (Blume) Miq.
Ancana F. Muell., Fragm. 5 (May 1865) 27, t. 35. — Type: *A. stenopetala* F. Muell.; syn. nov.
Ararocarpus Scheff., Ann. Jard. Bot. Buitenzorg 2 (1885) 10. — Type: *A. velutinus* Scheff.
Oncodostigma Diels, Bot. Jahrb. 49 (1912) 143, f. 2. — Type: *O. leptoneura* Diels; syn. nov. (However, see note on page 508.)
Guamia Merr., Philipp. J. Sci., Bot. 10 (1915) 243. — Type: *G. mariannae* (Safford) Merr.; syn. nov.
Polyaulax Backer, Blumea 5 (1945) 492. — Type: *P. cylindrocarpa* (Burck) Backer; syn. nov.
Chieniodendron Tsiang & P.T. Li, Acta Phytotax. Sin. 9 (1964) 374. — Type: *C. hainanense* (Merr.) Tsiang & P.T. Li; syn. nov.

Tree up to 23 m high or shrub. Young twigs densely to sparsely pubescent or hirsute, sometimes glabrous (*M. glabra*), older twigs glabrous, sometimes (numerous) lenticels present. *Leaves* membranous, (sub)coriaceous, or chartaceous, drying green or brown, glabrous on both sides or with (sparse) hairs beneath, sometimes verruculose near the veins (*M. glabra*), lamina (narrowly) ovate, (broadly) elliptic, oblong, obovate, or oblanceolate, 3–23 cm long, 1–10 cm wide, base acute to cuneate to rounded, or slightly cordate, sometimes slightly asymmetrical, sometimes slightly attenuate, apex acute, acuminate, caudate, or tapering, midrib slightly sunken above, hairy or glabrous, prominent beneath, hairy or glabrous, lateral veins faint above, faint or prominent beneath, 5–17 pairs. Petiole 0.5–3 mm thick, glabrous or hairy. *Inflorescence* axillary, sometimes terminal, rami- or trunciflorous, 1–4(–8)-flowered. Bracts 2–4, at various levels on the pedicel, 0.5–9 mm long, 1–10 mm wide, pubescent outside. Pedicel 0–27 mm long, (densely) pubescent, sometimes glabrous. Bud ovoid to conical or globose, or triangular-ovoid, 1.5–11 mm long. *Sepals* 3, valvate or slightly imbricate, (broadly to depressed) ovate to (broadly) triangular-ovate or semi-circular, 1–10 mm long, 2–8 mm wide, hairy outside, sometimes glabrous or glabrescent, glabrous or more or less hairy inside, free or sometimes connate, apex rounded to acute to acuminate. *Petals* 6, in two whorls of 3, valvate or imbricate at the apex, or outer whorl valvate, inner whorl imbricate, both whorls spreading or outer whorl spreading, inner whorl cohering when young, (broadly to narrowly) ovate, lanceolate, elliptic, or (narrowly) triangular-ovate, outer petals 6–40 mm long, 2–14 mm wide, inner petals 5–37 mm long, 2–12 mm wide, (densely) hairy on both sides, sometimes glabrescent or nearly glabrous outside (the outer petals) or glabrous inside (the inner petals), base of inner petals glabrous and grooved and/or warty inside, apex acute to rounded or acuminate. *Stamens* spirally arranged in 3–5 'whorls', 0.7–2.8 mm long, extrorse, apical prolongation shield-like, usually elongated in the inner whorl. *Receptacle* shortly cylindrical, convex, or conical with a truncate apex, densely hairy. *Carpels* 1–15, 1.5–4.5 mm long, ovary cylindrical to obovoid, densely hairy, stigma obconical, subglobose, obovoid, or cushion-shaped, fleshy, sparsely hairy or glabrous, ovules 3–16, 1- or 2-seriate. Fruiting pedicel 2–35 mm long; sepals sometimes persistent. *Monocarps* 1–13, cylindrical and faintly constricted between the seeds, subglobose, (ob)ovoid, or ellipsoid, sometimes tapering towards base and apex, 7–70 mm long, 7–48 mm wide, puberulent, brown, or (sparsely) hirsute, glabrescent or not, smooth or sometimes warty and rugose, pericarp 0.3–6 mm thick, sessile or stipitate, stipes 1–20

mm long. *Seeds* 1–9, in 1 series, discoid to half-globose, 4–10 mm long, 8–12 mm wide, or 6–16, in 2 series, more or less kidney-shaped, flattened, 10–21 mm long, 9–14 mm wide, 3–7 mm thick.

KEY TO THE SPECIES

1a. Secondary veins prominent on the lower side of the leaves; petals velutinous outside; monocarps usually hairy (sometimes glabrescent in *M. pannosa*) .. 2
b. Secondary veins not prominent on the lower side of the leaves (slightly prominent in *M. mindorensis*); petals pubescent outside; monocarps glabrescent 4
2a. Seeds 1–3, discoid, 1-seriate, 8–9 mm long; monocarps densely to sparsely hirsute, (in vivo) red or green turning crimson; flowers hairy or glabrescent; pedicel 1–4 mm long ..... **2. M. pannosa**
b. Seeds 6–16, kidney-shaped, flattened, 2-seriate, 10–21 mm long; monocarps pubescent, in vivo (dark) brown, black, green, or yellow; flowers hairy, rarely glabrescent; pedicel 2–13 mm long 3
3a. Sepals connate; flower buds globose; both whorls of petals spreading; flowers (in vivo) (red- or yellowish) brown; monocarps stipitate, indument usually ferrugineous-brown ..... **1. M. hainanensis**
b. Sepals free (rarely connate); flower buds ovoid, conical- ovoid, or triangular-ovoid; outer petals spreading, inner petals first erect or cohering, later spreading; flowers (in vivo) whitish, greenish, yellowish, pink, or reddish; monocarps sessile or stipitate, indument (dull) brown ..... **3. M. virgata**
4a. Midrib of the leaves not sunken or rarely prominent above 5
b. Midrib of the leaves sunken above (sometimes not sunken above in *M. stenopetala*) 7
5a. Leaves membranous to chartaceous, hairy beneath, base rounded to cordate **8b. M. stenopetala** subsp. **insularis**
b. Leaves (sub)coriaceous, glabrous beneath, base rounded to acute 6
6a. Leaves (broadly) ovate; pedicel 20–27 mm long, sparsely pubescent; carpels 6–9?; fruit unknown ..... **9. M. spec. 1**
b. Leaves broadly ovate to elliptic; pedicel c. 5 mm long, glabrous; carpel and monocarp 1; monocarp tapering towards base and apex ..... **7. M. glabra**
7a. Sepals triangular, 3–6 mm long; petals narrowly triangular-ovate to lanceolate; monocarps often rugose and warty, sometimes smooth **8a. M. stenopetala** subsp. **stenopetala**
b. Sepals (depressed or broadly) ovate, 1–3 mm long; petals (narrowly to broadly) (triangular-)ovate to elliptic; monocarps smooth 8
8a. Leaves generally chartaceous; pedicel 4–7 mm long .. **4. M. cylindrocarpa**
b. Leaves (sub)coriaceous or membranous; pedicel 6–17 mm long 9
9a. Leaves drying green or brownish green; flowers (in vivo) white, cream, or yellow; outer petals 2–5(–7.5) mm wide; young fruits sparsely hirsute **5. M. mindorensis**
b. Leaves generally drying dark brown; flowers (in vivo) red, pink, light orange, or if pale green or yellow than petals > 20 mm long; outer petals 5.5–11 mm wide; young fruits pubescent ..... **6. M. monosperma**

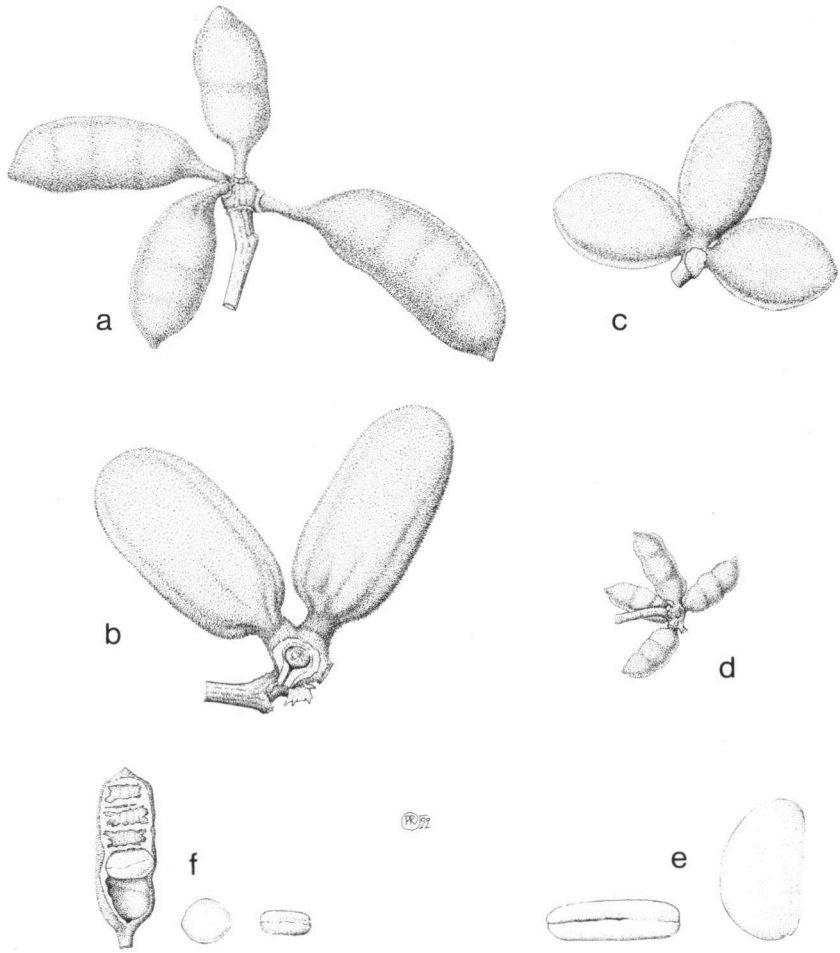

Fig. 1. Fruit types and seeds within *Meiogyne*. Stipitate monocarps of a. *M. hainanensis* (Merr.) Tien Ban (*Liang 63529*, NY) and b. *M. virgata* (Blume) Miq. (*Koorders 30621*, BO); c. sessile monocarps of *M. virgata* (*SAN 80949*, L); d. smaller monocarps of *M. mindorense* (Merr.) Heusden (*Ridsdale 1200*, L); e. kidney-shaped seeds of *M. virgata* (*Elmer 15555*, F); f. discoid seeds of *M. cylindrocarpa* (Burck) Heusden (*Backer 21148*, L); a–d × 0.5; e & f × 1.

1. Meiogyne hainanensis (Merr.) Tien Ban — Fig. 1a

Meiogyne hainanensis (Merr.) Tien Ban, Bot. Zhurn. 58 (1973) 1148. — *Fissistigma hainanense* Merr., J. Arnold Arbor. 6 (1925) 131. — *Desmos hainanensis* (Merr.) Merr. & Chun, Sunyatsenia 2 (1935) 229. — *Chieniodendron hainanense* (Merr.) Tsiang & P.T. Li, Acta Phytotax. Sin. 9 (1964) 375. — *Oncodostigma hainanense* (Merr.) Tsiang & P.T. Li, Fl. Reipubl. Popul. Sin. 30 (2) (1979) 81. — Type: *McClure 9733*, Yik Tsok Mau (= Five Finger Mountains) (holo UC, not seen; iso B, fragm., BM, K, MO), nom. nov. for *F. maclurei* (1923, non 1922).

Fissistigma maclurei Merr., Philipp. J. Sci., Bot. 23 (1923) 241. — *Meiogyne maclurei* (Merr.) J. Sinclair, Gard. Bull. Str. Settl. 14 (1953) 41, p.p. — Type: *McClure 9733*, Yik Tsok Mau, 19 May 1922 (holo UC, not seen; iso B, fragm., BM, K, MO), nom. illeg., non *F. maclurei* (1922).

Tree up to 14 m high. Young twigs pubescent, older twigs glabrous, sometimes lenticels present. *Leaves* subcoriaceous-membranous, dull on both sides, drying brown to greenish brown, glabrous above, with sparse hairs beneath, lamina elliptic-ovate (to narrowly obovate), 4–16 cm long, 1.5–5 cm wide, base rounded to acute, often asymmetrical, apex caudate, tapering, or acute, midrib slightly sunken above, glabrous or hairy, prominent beneath, hairy, lateral veins distinct beneath, 6–9 pairs. Petiole 0.5–1.5 mm thick, pubescent or sometimes glabrous. *Inflorescence* axillary or ramiflorous, 1–4(–8)-flowered. Bracts 3–5, 1.5–6 mm long, 1.5–3 mm wide, pubescent on both sides. Pedicel 4–13 mm long, densely pubescent. Bud subglobose to depressed ovoid, becoming ovoid, 3–10 mm long. *Sepals* imbricate, broadly to depressed (triangular-)ovate, 3–7 mm long, 3.5–5 mm wide, pubescent on both sides, connate, apex acute to nearly rounded. *Petals* slightly imbricate at the apex (outer ones), spreading, (broadly) ovate, outer petals 9–13 mm long, 5–8 mm wide, inner petals 8–12 mm long, 5–7 mm wide, densely velutinous outside, outer whorl hairy inside, inner whorl glabrous and warty inside, apex acute. *Stamens* 1.2–1.8 mm long, apex discoid. *Receptacle* convex, half-globose, or shortly cylindrical, densely hairy. *Carpels* up to 10, 3–4.5 mm long, ovary cylindrical to more or less globose, densely hairy, stigma clavate to conical(-ovoid), fleshy, sparsely hairy. Fruiting pedicel 6–20 mm long. *Monocarps* 2–6, (narrowly) ovoid to obovoid or cylindrical and faintly constricted between the seeds, 20–60 mm long, 15–25 mm wide, densely puberulent, red-brown, pericarp 1.5–2 mm thick, stipes 5–20 mm long. *Seeds* 6–10, in 2 series.

Distribution – China (Hainan). Fig. 2.

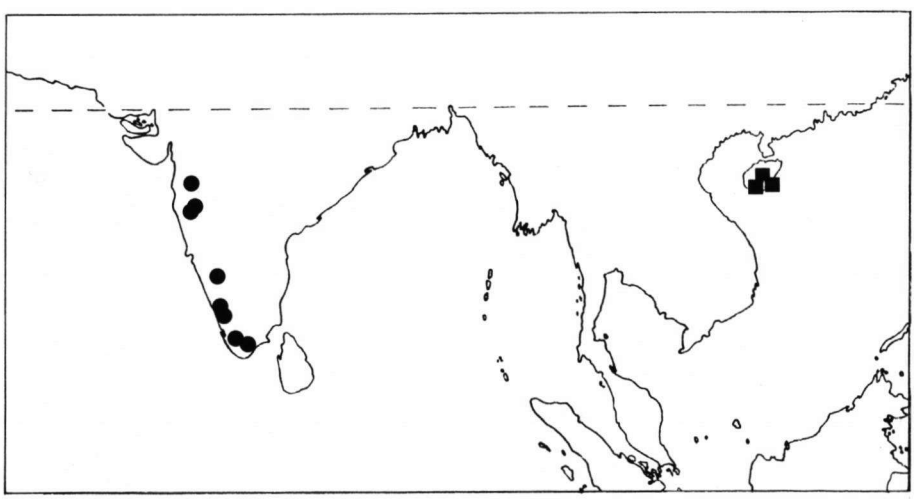

Fig. 2. Distribution of *Meiogyne hainanensis* (Merr.) Tien Ban (■) and *M. pannosa* (Dalzell) J. Sinclair (●).

Ecology – In rain forests, up to 650 m altitude.

Collectors' notes – Flowers brown, red-brown, yellowish brown. Fruits brown, green, or green with brown tomentum.

Note – *Meiogyne hainanensis* differs from the other species in its globose flower buds. Some collections of *M. virgata* from Thailand and Malaya resemble *M. hainanensis* in their leaves and fruits. The only flower bud available, however, was like that of *M. virgata*.

2. Meiogyne pannosa (Dalzell) J. Sinclair

Meiogyne pannosa (Dalzell) J. Sinclair, Sarawak Mus. J. 5 (1951) 604. — *Unona pannosa* Dalzell, Hook. Kew J. 3 (1851) 207. — *Polyalthia pannosa* (Dalz.) Finet & Gagnep., Bull. Soc. Bot. France 53 (1906) 97. — *Desmos pannosus* (Dalzell) Safford, Bull. Torrey Bot. Club 39 (1912) 506. — Type: *Syhadrensi*, Tullawaree, fl. Oct. (holo K, not seen).

Unona ramarowii Dunn, Kew Bull. (1914) 183. — *Desmos ramarowii* (Dunn) D. Das, Bull. Bot. Surv. India 5 (1963) 42, 93. — *Meiogyne ramarowii* (Dunn) K.N. Gandhi in Saldanha & Nicolson, Fl. Hassan Dist. Karnataka India (1976) 38; syn. nov. — Types: India, Travancore, Quilon (fr. Oct.), *Wight*; Pooleary Pass near Quilon, Madras Herb., *Bourdillon 21, Rama Row 1845*; moist forests, 600–1300 m, *Bourdillon 44*; Makara evergreen forests (fl. Sep., Oct.), *Rama Row 1655*; Madras Pres., Malabar Dist., *Wynaad, Beddome*; S Kanara Dist., Ghats, Madras Herb. (no type material seen).

[*Meiogyne ramarowii* (Dunn) L. Ellis, Biol. Mem. 2 (1977) 11, nom. illeg.]

Tree up to 10 m high or shrub. Young twigs (densely) pubescent to hirsute, older twigs glabrous, sometimes numerous lenticels present. *Leaves* membranous to subcoriaceous, drying green or brown, glabrous above, with sparse hairs or glabrous beneath, lamina (narrowly) ovate to elliptic, 3.5–13 cm long, 2–5.5(–7) cm wide, base acute to rounded, apex acuminate to caudate or acute, midrib slightly sunken above, glabrous or hairy, prominent beneath, hairy, lateral veins prominent beneath, 5–8 pairs. Petiole 0.5–1.5 mm thick, pubescent to hirsute, sometimes glabrescent. *Flower* axillary, solitary. Bracts 1–3 mm long, 1–4.5 mm wide, pubescent outside. Pedicel 1–4 mm long, pubescent. Bud globose to conical-ovoid, 6–11 mm long. *Sepals* (triangular-)ovate to depressed ovate to semicircular, 2–9(–12) mm long, 3–5 mm wide, hairy outside, more or less glabrescent, sparsely hairy inside, free, apex acute to rounded. *Petals* valvate (inner whorl), outer whorl spreading, inner whorl erect, ovate to lanceolate, outer petals (5–)10–60 mm long, (3–)4–16 mm wide, inner petals (5–)8–33 mm long, 3–14 mm wide, (densely) velutinous outside, villous or velutinous inside, sometimes glabrescent, base of inner petals glabrous and grooved or warty inside, apex acute to acuminate. *Stamens* 1.2–1.8 mm long, apex shield-like, elongated in the inner whorl. *Receptacle* shortly cylindrical or conical with truncate apex, densely hairy. *Carpels* c. 6–16, ovary cylindrical(-obovoid), densely hairy, stigma more or less obconical to a flat lobe or globose, fleshy, with some hairs. Fruiting pedicel 2–4 mm long. *Monocarps* 2–9, subglobose to (shortly) cylindrical or (ob)ovoid, 11–14 mm long, 7–9 mm wide, densely to sparsely hirsute, pericarp 0.3–0.7 mm thick, sessile or slightly stipitate. *Seeds* 1–3, in one series, discoid, 8–9 mm long, 3–4 mm wide.

Distribution – SW India. Fig. 2.

Ecology – In wet evergreen or semi-evergreen forests, up to 1100 m altitude.

Collectors' notes – Flowers greenish yellow, (pale or dull) yellow, creamy yellow, cream, or dirty white, fleshy. Fruits red or green turning crimson.

Vernacular name – Kadubende (Kan.).

Notes – In India *Meiogyne pannosa* and *M. ramarowii* were described. The latter species was said to differ from *M. pannosa* in the glabrous fruits. Indeed, collections with glabrous fruits are found beside specimens with hairy fruits. Similar differences were found in the petals, as also in the texture of the leaves. The material studied, however, was variable and showed transitions from one type to another and it was not possible to distinguish two species. Within a series of collections of Sasidharan, borrowed from KFRI, a transition from small-flowered to large-flowered specimens could be observed. The large-flowered specimens, identified as *M. pannosa,* were collected above 1000 m altitude in evergreen forests and the small-flowered specimens, identified as *M. ramarowii,* were collected at c. 300 m in semi-evergreen forests.

No type material of *M. pannosa* and *M. ramarowii* could be studied. The examined material of *M. pannosa* agrees with the description of *Unona pannosa*. The description of *U. ramarowii* deviates in the longer leaves from the examined specimens.

3. **Meiogyne virgata** (Blume) Miq. — Figs. 1b, c, e, 3

Meiogyne virgata (Blume) Miq., Ann. Mus. Bot. Lugd.-Bat. 2 (1865) 12. — *Unona virgata* Blume, Bijdr. (1825) 14. — *Uvaria virgata* (Blume) Blume, Fl. Jav. Anon. (1830) 43. — *Cananga virgata* (Blume) Hook. f. & Thomson, Fl. Brit. India 1 (1872) 57. — *Cyathocalyx virgata* (Blume) King, J. As. Soc. Beng. 61 (1892) 28. — Type: *Blume s.n.*, Java, Mt Salak, fl. Dec., 'Kisauwhuing' (holo L).

Uvaria montana Blume, Fl. Java Anon. (1830) 45. — ? *Stelechocarpus montana* (Blume) Miq., Fl. Ind. Bat. 1, 2 (1858) 22. — *Meiogyne montana* (Blume) Backer, Schoolfl. Java (1911) 29, syn. nov. — Type: *Blume s.n.*, Java, Gede, Pangerango, fr. June (holo L; iso B, BM, L).

Ararocarpus velutinus Scheff., Ann. Jard. Bot. Buitenzorg 2 (1885) 10. — Type: *Scheffer,* Java, Tjipantjar, Preanger (holo BO, not seen; iso L).

Meiogyne stipitata Koord. & Valeton, Meded. Lands Plantent. 61 (1903) 305. — Lectotype: *Koorders 30621,* fl., fr. (holo BO).

Polyalthia eriantha Ridley, Kew Bull. 1912 (1912) 384. — *Enicosanthum erianthum* (Ridley) Airy Shaw, Kew Bull. 1939 (1939) 276. — *Meiogyne eriantha* (Ridley) J. Sinclair, Sarawak Mus. J. 5 (1951) 604; syn. nov. — Type: *Haviland 410,* Malaysia, Sarawak, 5 miles from Kuching (holo K; iso L).

Meiogyne lucida Elmer, Leafl. Philipp. Bot. 5 (1913) 1715. — Type: *Elmer 13984,* Philippines, Cabadbaran (Mt Urdaneta), Prov. of Agusan, Mindanao, Oct. 1912 (holo PNH †; iso A, F, K, L, NY, U, US); syn. nov.

Meiogyne philippinensis Elmer, Leafl. Philipp. Bot. 5 (1913) 1714. — Type: *Elmer 11318,* Philippines, Todaya (Mt Apo), Davao Dist., Mindanao, Aug. 1909 (holo PNH †; iso A, BM, BO, K, L, NY, US); syn. nov.

Meiogyne paucinervia Merr., Philipp. J. Sci., Bot. 10 (1915) 241. — Type: *BS 15381 Ramos,* Philippines, Leyte, in forests near Dagami, flowers very fragrant, 23 Aug. 1912 (holo PNH †; iso B, BM, K, US).

Cyathocalyx subsessilis Ast, Not. Syst. ed. Humbert 9 (1940) 80. — *Meiogyne subsessilis* (Ast) J. Sinclair, Gard. Bull. Sing. 15 (1956) 14; syn. nov. — Lectotype: *Poilane 10600,* massif de Dong-che, Annam (holo P, not seen; iso L, P).

Desmos monogynus Merr., J. Arnold Arbor. 23 (1942) 163. — *Meiogyne monogyna* (Merr.) Tien Ban, Bot. Zhurn. 59 (1974) 1778; syn. nov. — Type: *Pételot 2597,* Tonkin, Son tay, Ba vi (holo A; iso LE, P not seen).

Fig. 3. *Meiogyne virgata* (Blume) Miq. a. Habit, × 0.5; b. flower, × 2; c. stamens, × 12.5 (*Ambri & Arifin AA 332*, L); d. monocarp, × 0.5; e. inner petal, × 3 (*Burley et al. 2769*, L).

Tree up to 23 m high or shrub. Young twigs densely to sparsely pubescent to hirsute, or glabrous, older twigs glabrous, sometimes lenticels present. *Leaves* membranous to subcoriaceous, rarely coriaceous, drying green or (greenish) brown, glabrous on both sides or with (sparse) hairs beneath, lamina narrowly to broadly elliptic to ovate or obovate, 3–31.5 cm long, 1–10 cm wide, base acute to rounded or sometimes slightly attenuate, sometimes slightly asymmetrical, apex acuminate to caudate or sometimes acute or tapering, midrib slightly sunken above, hairy or glabrous, prominent beneath, (densely) hairy or rarely glabrous, lateral veins prominent beneath, 5–15 pairs. Petiole 0.5–3 mm thick, densely hairy to glabrous. *Inflorescence* axillary or sometimes terminal or ramiflorous, 1–4-flowered. Bracts 3–4, 1–5 mm long, pubescent outside, glabrous inside. Pedicel (0–)2–12 mm long, densely pubescent. Bud (conical-)ovoid to triangular-ovoid or ovoid-globose, 3–16 mm long. *Sepals* valvate, triangular-ovate or broadly to depressed ovate, 3–10 mm long, 3–10 mm wide, densely hairy outside, free or rarely slightly connate, apex acute to acuminate, rarely to caudate. *Petals* valvate or imbricate, inner and sometimes outer whorl erect when young, later spreading, (narrowly) (triangular-)ovate to lanceolate or broadly elliptic, the inner petals often narrowed above a concave base, outer petals 10–35 (–40) mm long, 2–16 mm wide, inner petals 9–32(–37) mm long, 2–12 mm wide, (densely) velutinous outside, rarely glabrescent, villous inside, base of inner petals glabrous, grooved, and warty inside, apex acute to nearly rounded. *Stamens* 0.7–2 (–2.8) mm long, apex shield-like, elongated in the inner whorl. *Receptacle* (shortly) cylindrical or conical with a truncate apex, densely hairy. *Stamens* 2–10, 1.5–3.2 (–3.8) mm long, ovary cylindrical or obconical, stigma globose to obovoid, fleshy, with sparse hairs, ovules c. 6–16, 2-seriate. Fruiting pedicel 2–16(–25) mm long;

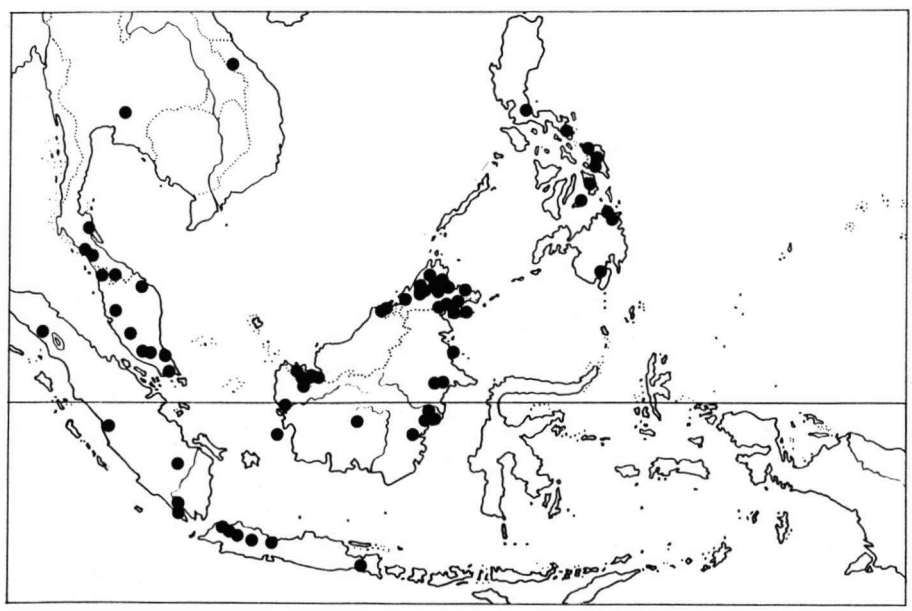

Fig. 4. Distribution of *Meiogyne virgata* (Blume) Miq.

Table 2. Distribution of character states in most specimens of *'Meiogyne virgata'* and *'M. montana'*.

	'M. virgata'	*'M. montana'*
Leaves		
size	small, narrow	large, broad
texture	membranous	coriaceous
Inflorescence		
flowers	1–4-flowered	solitary
Buds	narrowly triangular-ovoid	broadly ovoid
Petals		
aestivation	valvate	imbricate
width	2–4(–7) mm wide, broadest near the base	6–16 mm wide, broadest at 1/3
Number of carpels	1–5	5–10
Monocarps	sessile	stipitate

sometimes sepals persistent. *Monocarps* 1–5(–10), subglobose to ovoid to cylindrical or ellipsoid, rarely fused in young stages, 11–70 mm long, 7–48 mm wide, puberulent, brown, pericarp 0.5–6 mm thick, sessile or stipitate, stipes 1–8 mm long. *Seeds* 7–16, in two series, kidney-shaped, flattened, 10–21 mm long, 8–14 mm wide, 3.5–8 mm thick.

Distribution – Thailand, Indochina, Malaysia (Malaya: Johore, Kedah, Perak, Malacca, Pahang, Selangor, Terengganu; Sabah; Sarawak), Singapore, Indonesia (Sumatra, Java, Borneo), Philippines (Bohol, Leyte, Luzon, Mindanao, Samar). Fig. 4.

Ecology – In primary or secondary rain forest, up to 1300 m altitude.

Collectors' notes – Flowers (very pale greenish) yellow, yellowish green, pale green, greyish, yellowish or greenish white, white, cream with a slight pink tinge, pinkish, red. Warty base red or mauve. Fruits (dark) brown, black, brownish grey, dark green, green speckled with black or dark brown, greenish, yellowish green, or yellow. Thrips observed inside the floral chamber.

Vernacular names – Pisang pisang, mempisang, semukan, karrai, banitan gading.

Notes – The species delimitation between *Meiogyne virgata* and most of the former species of *Meiogyne* sometimes was a problem. The former Philippine species *M. lucida* and *M. philippinensis* are conspecific with *M. virgata*. The remaining species seem to be ecological variants of *M. virgata* as many transitions were observed. Many of these specimens were collected at higher altitudes. Although *M. montana* is usually easy to distinguish from *M. virgata* by a number of characters (Table 2), many collections combine characters of both species, which makes it impossible to separate them. Moreover, the material assigned to *M. montana* was rather diverse. *Meiogyne eriantha* from Sarawak, except for the larger size of the flowers and the denser indument of the twigs and the leaves, could not be distinguished from the former *M. montana*. The single collection of *M. subsessilis* (Indochina) that was studied only differs in the larger and glabrescent flowers from *M. virgata*. For the

time being, it is considered to belong to *M. virgata*. The description of the fruits by Ban (1974) indicates that also the fruits are similar to those of *M. virgata*. The type of *M. monogyna* (Indochina) agrees with that of *M. subsessilis*.

Four collections of *Blume s.n.* of *M. virgata* are preserved (BM, BO, L, and K). These collections represent three different plants. The specimen kept in Leiden (where most holotypes of Blume are kept), a specimen without flowers, agrees most with the description of *Unona virgata* Blume (1825) and the plate of *Uvaria virgata* Blume (1830). The specimen of BO, however, has a label with annotations of the locality and vernacular name, as cited by Blume (1825), whereas this label is absent on the collection kept in Leiden. I consider the specimen from Leiden as the holotype.

The former genus *Ararocarpus* Scheff. from Java, now included in *Meiogyne*, was based on a specimen with fused monocarps. Sinclair (1958) recognized this specimen as an anomalous specimen of *M. virgata*. The more numerous carpels in that particular specimen apparently led to fusion of the monocarps. Among the specimens examined in the present study two more were found with fused monocarps: *Kostermans 28810* (L) from Java and *de Wilde & de Wilde-Duyfjes 18486* (L) from Sumatra.

4. **Meiogyne cylindrocarpa** (Burck) Heusden, *comb. nov.* — Fig. 1f

Mitrephora cylindrocarpa Burck in Lorentz, Nova Guinea 8 (1911) 433, 1036. — *Polyaulax cylindrocarpa* (Burck) Backer, Blumea 5 (1945) 493; syn. nov. — Type: *Branderhorst 107*, SW New Guinea, S coast near Okaba, fr. 27 Sep. 1907 (holo U; iso A fragment, B, K, L). See Diels (1912) for typification.

Papualthia mariannae Saff., J. Wash. Acad. Sci. 2 (1912) 459. — *Papualthia mariannae* (Saff.) Merr., Philipp. J. Sci., Bot. 9 (1914) 83.— *Guamia mariannae* (Saff.) Merr., Philipp. J. Sci., Bot. 10 (1915) 243; syn. nov. — Type: *Costenoble s.n. (Herb. Safford 1180)*, Marianas Islands, Guam, on Pago Road, June 1906 (holo US).

Oncodostigma wilsonii Guillaumin, J. Arnold Arbor. 12 (1931) 224. — Type: *Wilson 986*, New Hebrides, Aneityum, Anelgauhat Bay, lower hills in forest, 500 m, Sep. 1929 (holo P; iso A, B, NY); syn. nov.

Tree up to 20 m high or shrub. Young twigs sparsely to densely pubescent, older twigs glabrous, sometimes numerous lenticels present. *Leaves* chartaceous to membranous (to subcoriaceous), drying brown or green, glabrous on both sides or with sparse hairs beneath, sometimes verruculose, lamina (narrowly) ovate to elliptic, rarely to obovate, 3–14(–20.5) cm long, 1–7 cm wide, base rounded to acute or slightly cordate, often slightly asymmetrical, apex tapering, acute, acuminate, or caudate, midrib slightly sunken above, glabrous to densely hairy, prominent beneath, (sparsely) hairy, lateral veins faint on both sides. Petiole 0.5–1.5 mm thick, densely pubescent to glabrous. *Inflorescence* axillary or terminal, 1(–4)-flowered. Bracts 3–5, 0.7–2 mm long, 0.8–1.4 mm wide, pubescent outside, glabrous inside. Pedicel 4–7 mm long, pubescent. Bud (broadly) ovoid to conical, 3–13 mm long. *Sepals* depressed ovate to ovate, 1–3 mm long, 1–3.5 mm wide, pubescent outside, glabrous inside, free or rarely slightly connate, apex acute to rounded. *Petals* slightly imbricate or valvate? at the apex, spreading, narrowly to broadly (triangular-)ovate to elliptic, outer petals (5–)7–22 mm long, (3–)4–8 mm wide, inner petals (5–)6–16 mm long, 3–6.5 mm wide, pubescent on both sides, base of inner petals glabrous, and grooved and/or warty inside, apex acute to nearly rounded. *Stamens* 1.2–2 mm

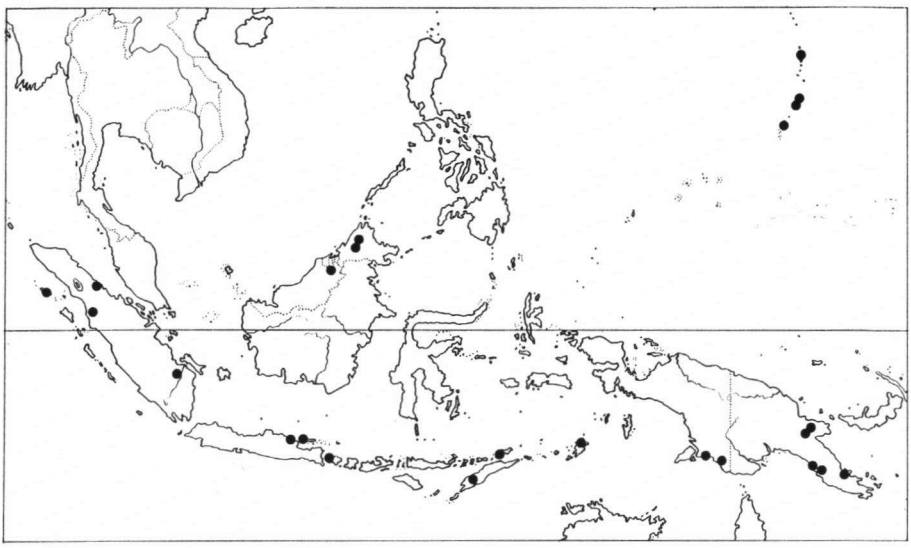

Fig. 5. Distribution of *Meiogyne cylindrocarpa* (Burck) Heusden; the locality on the New Hebrides falls outside the map area.

long, apex shield-like, elongated in the inner whorl. *Receptacle* convex or shortly cylindrical, densely hairy. *Carpels* 2–14, 2–3 mm long, ovary obovoid to cylindrical, densely hairy, stigma globose to discoid or to oblong-obovoid, fleshy, sparsely hairy or glabrous. Fruiting pedicel 4–30 mm long. *Monocarps* up to 14, subglobose to cylindrical, slightly constricted between the seeds, 5–44 mm long, 6–17 mm wide, sparsely hirsute to ± puberulent, pericarp 0.5–1 mm thick, stipes 2–7 mm long. *Seeds* 1–9, in one series, discoid, 6–10 mm long, 2–5 mm wide, ± pitted.

Distribution – Malaysia (Sarawak, Sabah), Brunei, Indonesia (Sumatra, Java, Madura, Borneo, Bali, Nusa Tengara, Timor, Tanimbar Island, Irian Jaya), Philippines (Palawan), New Guinea, Guam and Marianas Islands (Agiguan, Rota, Saipan, Tinian), New Hebrides. Fig. 5.

Ecology – In rain forest, on limestone or on red or sandy soil, from sea-level up to 1450 m altitude.

Collectors' notes – Buds pale green. Flowers cream, yellow white, (greenish) yellow, dull yellowish brown, (light) brown, or outer petals reddish yellow, inner ones dark red, yellow margin. Fruits greenish, green with black, yellow, orange, orange-red, red, purplish, purplish black, or (dark) brown.

Vernacular names – Paipai (Guam), nirasialau (New Hebrides).

Note – Within *Meiogyne cylindrocarpa* the former species *Guamia mariannae, Oncodostigma wilsonii,* and *Polyaulax cylindrocarpa* are united. Despite some small differences both *Guamia mariannae* and *Oncodostigma wilsonii* too much resemble the collections of *Polyaulax cylindrocarpa* from New Guinea to be maintained as separate species. The specimens of *M. cylindrocarpa* from Sumatra and Borneo differ in several ways from those from New Guinea (e.g., size of the trees, shape of

the leaves, and size of the flowers). Probably these differences are due to habitat differences because the leaves of the specimens from Borneo and Sumatra have long caudate apices suggesting a habitat with higher rainfall. The differences are not consistent enough to distinguish two species. The specimens outside Sumatra and Borneo are not more than 7 m high. The specimens from the Marianas have larger flowers and more but smaller monocarps. The monocarps of the specimen (*Wilson 986*) from the New Hebrides tend to be globose, elsewhere they are cylindrical.

5. **Meiogyne mindorensis** (Merr.) Heusden, *comb. nov.* — Fig. 1d

Unona mindorensis Merr., Philipp. J. Sci., Bot. 2 (1907) 273. — *Desmos mindorensis* (Merr.) Merr., Enum. Philipp. Fl. Pl. 2 (1923) 159. — *Oncodostigma mindorense* (Merr.) Tien Ban, Bot. Zhurn. 59 (12) (1974) 1779, syn. nov. — Type: *Merrill 5568*, Philippines, Mindoro, Binabay River, Mt Halcon, in forests at 180 m (holo PNH †; lecto US).

Unona palawanensis Elmer, Leafl. Philipp. Bot. 5 (1913) 1742. — *Desmos palawanensis* (Elmer) Merr., Enum. Philipp. Fl. Pl. 2 (1923) 159; syn. nov. — Type: *Elmer 13125*, Philippines, Palawan, Puerta Princesa, Mt Pulgar, Apr. 1911, fr. (holo PNH †; iso L).

Desmos elegans Elmer, Leafl. Philipp. Bot. 8 (1919) 3070; syn. nov. — Type: *Elmer 17649*, Philippines, Luzon, prov. Lagunas, Los Baños, Mt Maquiling, June/July 1917, fr. (holo PNH †; iso L, MO, U, distributed as *Papualthia elegans* Elmer), nom. illeg., non *Desmos elegans* (Thw.) Safford.

Papualthia irosinensis Elmer, Leafl. Philipp. Bot. 10 (1939) 3689. — Lectotype: *Elmer 15884*, on very steep woody slopes of wet stony ground at 1000 m, Irosin (Mt Bulusan), Prov. of Sorsogon, Luzon, Philippines, April 1916, (NY).

Treelet or shrub up to 5 m high. Young twigs pubescent (hirsute) or glabrous, older twigs glabrous, often lenticels present. *Leaves* subcoriaceous to membranous, drying green to brown, glabrous on both sides or with sparse hairs beneath, lamina elliptic to elliptic-oblong or ovate, 4–21 cm long, 1.5–8.5 cm wide, base rounded to acute, sometimes slightly asymmetrical, apex acuminate to acute or sometimes to caudate, midrib slightly sunken above, glabrous or sometimes with hairs, prominent beneath, densely hairy to glabrous, lateral veins faint on both sides to more or less distinct beneath. Petiole 0.5–3 mm thick, hairy to glabrous. *Flower* axillary, terminal, ramiflorous, or truncifloroous, solitary. Bracts (2 or) 3, 0.5–1.5 mm long, pubescent outside, glabrous inside. Pedicel 6–16 mm long, (sparsely) pubescent. Bud subglobose to ovoid, 2–6 mm long. *Sepals* broadly to depressed ovate, 1.5–3 mm long, 2–3.5 mm wide, pubescent outside, glabrous inside, free or sometimes connate, apex rounded to acute, or rarely acuminate. *Petals* spreading, narrowly oblong-ovate to ovate, sometimes broadly (rectangular-)ovate, outer petals 6–16 mm long, 3–5(–7.5) mm wide, inner petals 5–12 mm long, 2.5–6 mm wide, pubescent on both sides, base of inner petals glabrous, grooved and/or warty inside, apex acute. *Stamens* not measured. *Receptacle* convex to shortly cylindrical, densely hairy. *Carpels* c. 3–14?, ovary densely hairy, stigma discoid to subglobose, lobed, sparsely hairy. Fruiting pedicel 5–24 mm long; sepals sometimes persistent. *Monocarps* 2–14?, cylindrical to subglobose, faintly constricted between the seeds, 8–25 mm long, 7–9 mm wide, hirsute, glabrescent, pericarp sometimes slightly shrunken, 0.2–0.8 mm thick, stipes 0–8 mm long. *Seeds* 1–5, in one series, discoid to half-globose, 6–7 mm long, 3–5 mm wide, more or less shiny.

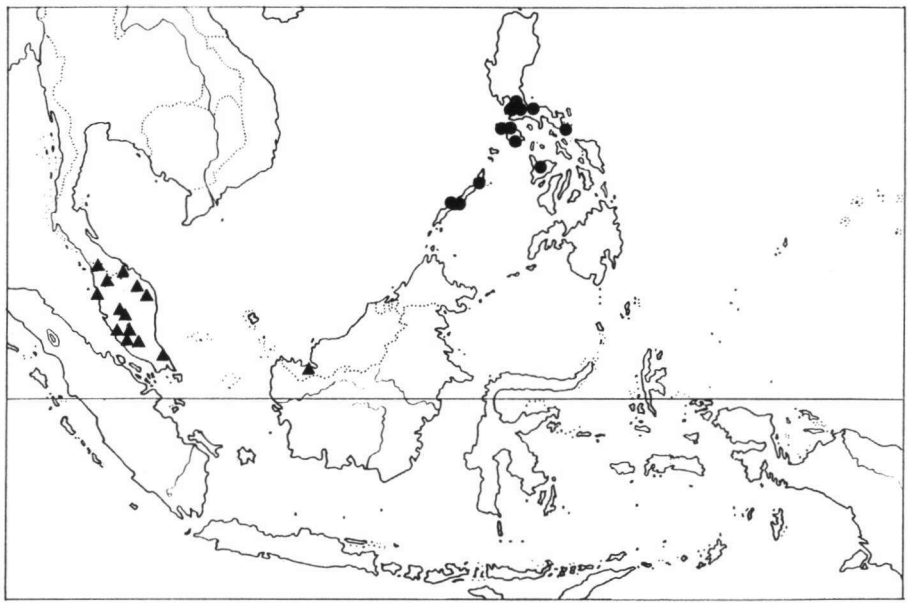

Fig. 6. Distribution of *Meiogyne mindorensis* (Merr.) Heusden (●) and *M. monosperma* (Hook. f. & Thomson) Heusden (▲).

Distribution – Philippines (Alabat, Luzon, Mindoro, Palawan, Panay). Fig. 6.

Ecology – In (primary) rain forest, in Palawan sometimes on ultrabasic soils, 0–1000 m altitude.

Collectors' notes– Flowers white (with yellow centre), cream, or yellow, fleshy, scented. Fruits green or orange.

Notes – *Meiogyne mindorensis* is very close to *M. cylindrocarpa,* but generally has narrower petals and longer pedicels than the latter species, while also the texture of the leaves is somewhat different.

Merrill (1923) included *Desmos elegans* in *D. mindorensis* (Merr.) Merr., now a synonym of *Meiogyne mindorensis*. The small size of the leaves is like that of *M. cylindrocarpa*. The shape and the texture of the leaves as well as the length of the fruiting pedicel (11–13 mm), however, are like that of *M. mindorensis*.

6. **Meiogyne monosperma** (Hook. f. & Thomson) Heusden, *comb. nov.*

Cananga monosperma Hook. f. & Thomson, Fl. Brit. India 1 (1872) 57. — *Oncodostigma monosperma* (Hook. f. & Thomson) J. Sinclair, Sarawak Mus. J. 5 (1951) 605; syn. nov. — Type: *Maingay 100,* Malacca (holo K; iso L).

Unona conchyliata Ridley, Kew Bull. 1912 (1912) 384. — *Desmos conchyliata* (Ridley) Merr., J. As. Soc. Str. Br., Spec. No. (1921) 255. — Type: *Haviland 1779,* Sarawak, Kuching (holo K; iso B, L, SING).

Unona purpurata Ridley, Sarawak Mus. J. 1 (3) (1913) 79, nom. illeg. — *Desmos purpurata* (Ridley) Merr., J. As. Soc. Str. Br., Spec. No. (1921) 256. — Type as sub *Unona conchyliata* Ridley.

Tree up to 20 m high. Juvenile twigs rather densely pubescent, otherwise twigs glabrous. *Leaves* coriaceous to subcoriaceous, dull to more or less shiny on both sides, drying brown or sometimes olive-greenish, juvenile leaves pubescent, soon becoming glabrous on both sides, lamina oblong, ovate, obovate to oblanceolate, or elliptic, 5.5–18 cm long, 2–9 cm wide, base acute to rounded or cuneate, apex acuminate to caudate, midrib slightly sunken above, glabrous, prominent beneath, usually sparsely hairy, lateral veins more or less faint on both sides. Petiole up to 3 mm thick, thickened in large-leaved specimens, sparsely pubescent to glabrous. Flower axillary or ramiflorous, solitary. Bracts 2 or 3, 0.7–3 mm long, 1–2 mm wide, pubescent outside. Pedicel (4–)6–17 mm long, pubescent. Bud ovoid, 4–20 mm long. *Sepals* broadly to depressed ovate, 1–3 mm long, 2–4 mm wide, pubescent outside, glabrous inside, free, apex acute to rounded. *Petals* more or less spreading, outer whorl valvate, inner whorl imbricate, (narrowly) elliptic to ovate, outer petals 10–35 mm long, 5.5–12 mm wide, inner petals 7–33 mm long, 4–10 mm wide, pubescent on both sides, base of inner petals glabrous and grooved inside, apex more or less acute. *Stamens* 1.3–1.8 mm long, filament distinct, 0.2–0.5 mm long, apex elongated in the inner whorl. Receptacle depressed conical to shortly cylindrical to discoid. *Carpels* c. 8–17, 2 mm long, obovoid or cylindrical, stigma subglobose to more or less discoid, fleshy, hairy, glabrescent; ovules 3 or 4, 1-seriate. *Monocarps* up to c. 12(–17?), cylindrical to (ob)ovoid, faintly or not constricted between the seeds, (7–)15–20 mm long, (5–)7–11 mm wide, (densely) pubescent, glabrescent, pericarp 0.5–2 mm thick, stipes 2–5 mm long, peduncle 7–14 mm long. *Seeds* 2–5, in one series, discoid, 7–10 mm long, 3–6 mm wide, shiny, more or less pitted.

Distribution – Thailand (Peninsular), Malaysia (Malaya: Johore, Kedah, Kelantan, Malacca, Pahang, Perak, Selangor; Sarawak). Fig. 6.

Ecology – In rain forests, up to c. 300 m altitude.

Collectors' notes – Flowers red, dull red, red-pink, dark pink, light orange, yellow, or pale green; fragrant. Fruits greenish or pale green. Young leaves light green.

Vernacular names – Yai-Pluak (Thailand), mempisang (Malaysia).

Note – *Meiogyne monosperma* is distinguished by the larger, usually reddish petals and the coriaceous leaves wich are usually dark brown in the dried state. Beside the reddish or pinkish flowers usually found in this species, two collections were found with yellow or pale green flowers (*Kiah SFN 32160* and *Rogstad 920*). These flowers are bigger than the reddish flowers. In vegetative characters these two collections are similar to the specimens with reddish flowers.

7. **Meiogyne glabra** Heusden, *spec. nov.* — Fig. 7

Arbor ad 6 m alta. Ramuli graciles glabri copiose lenticellati. Lamina subcoriacea siccitate viridis utrinque glabra, (late) ovata vel elliptica 5.5–18 cm longis et 3.5–8 cm lata, basi rotundata vel cuneata saepe inaequali, apice acuminato vel acuto, costa supra plana vel subplana glabra subtus prominenti glabra, nervis secundariis inconspicuis. Petiolis 0.5–1.5 mm diametro glabris. Inflorescentiae axillares floribus solitariis bracteis 3, 0.5–1 mm longis extus glabris. Pedicelli 5 mm longi glabri. Sepala 3 mm lata glabra basi connata in calyce subcirculari 1.5 mm longo. Petala patentia apice rotundato, exteriora late ovata 6 mm longa et 3–4 mm lata extus leviter pubescentia intus pubescentia, interiora elliptica 5–6 mm longa et 2.5–3 mm lata extus pubescentia intus glabra.

Stamina circiter 3-seriata apice discoideo sive elongato in staminibus interioribus. Pistillum 1. Pedicelli fructiferi 10–12 mm longi calyce persistente. Monocarpium sessile cylindricum 50–70 mm longum et 13–17 mm diametro basi attenuato apice apiculato pilis paucis, pericarpio circiter 0.2 mm crasso, seminibus 6–11 superpositis discoideis 4–5 mm altis et 8–12 mm diametro. — Typus: *Stevens LAE 58469*, New Britain, Nantambu, District West New Britain, 75 m, tree, 2 m high, 1 June 1973, fl., fr. (holo LAE; iso BRI, not seen, L).

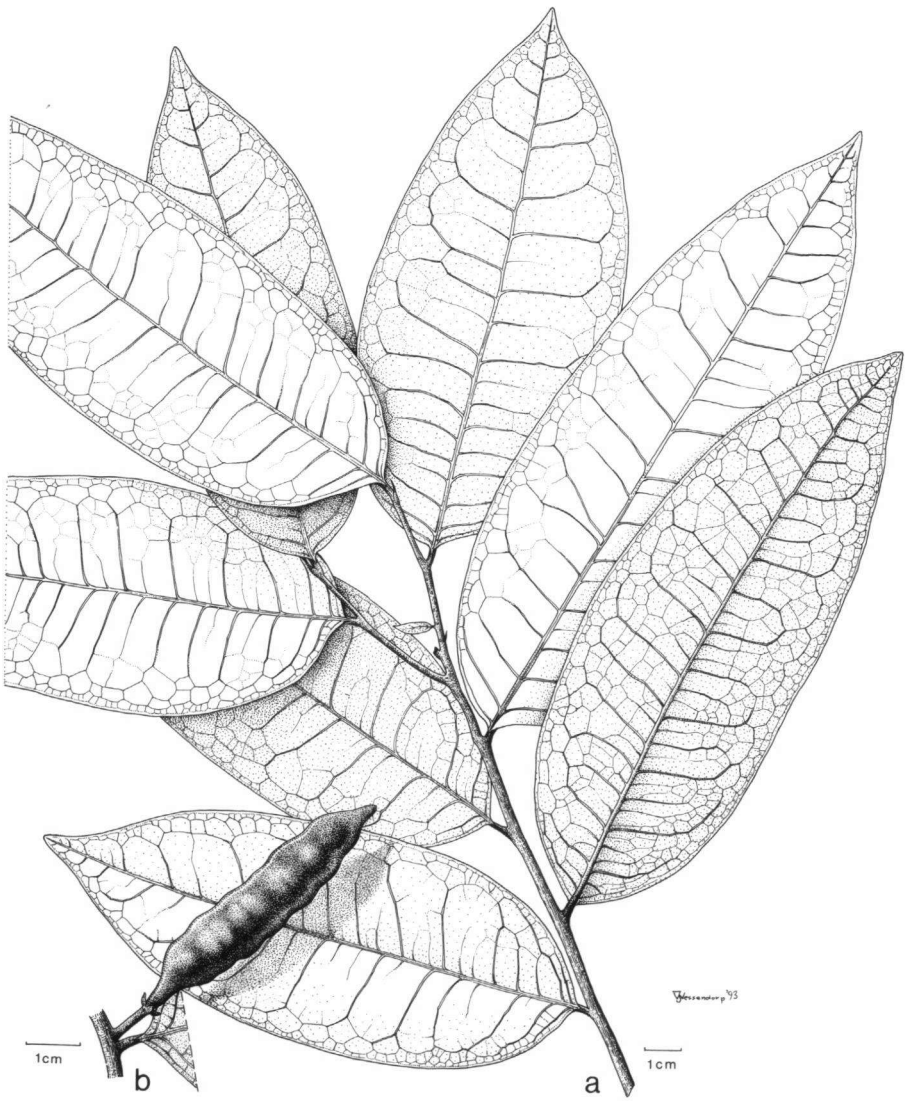

Fig. 7. Meiogyne *glabra* Heusden. a. Habit; b. fruit (*LAE 58469*, LAE).

Treelet up to 6 m high. Twigs glabrous, lenticels numerous. *Leaves* subcoriaceous, drying green, glabrous on both sides, verruculose near the veins, lamina (broadly) ovate to elliptic, 5.5–18 cm long, 3.5–8 cm wide, base rounded to cuneate, sometimes asymmetrical, apex more or less acuminate to acute, midrib not or slightly prominent above, prominent beneath, secondary veins faint on both sides. Petiole 0.5–1.5 mm thick, glabrous. *Flower* axillary, solitary. Bracts 3, 0.5–1 mm long, glabrous outside. Pedicel c. 5 mm long, glabrous. Bud not seen. *Sepals* c. 1.5 mm long, c. 3 mm wide, glabrous, connate to an almost circular calyx. *Petals* spreading, outer petals broadly ovate, 6 mm long, 3–4 mm wide, nearly glabrous outside, (densely) pubescent inside, inner petals elliptic, 5–6 mm long, 2.5–3 mm wide, pubescent outside, glabrous inside, apex more or less rounded. *Stamens* arranged in c. 3 'whorls', apex shield-like, elongated in the inner whorl. *Receptacle* not seen. Pistil 1. Fruiting pedicel 10–12 mm long, sepals persistent. *Monocarp* 1, sessile, cylindrical, tapering towards the base, apex apiculate, 50–70 mm long, 13–17 mm in diameter, with some sparse hairs, pericarp c. 0.2 mm thick. *Seeds* 6–11, in one series, discoid, 4–5 mm long, 8–12 mm in diameter.

Distribution – New Britain. Fig. 8.

Ecology – Rain forest, from sea-level to 800 m altitude.

Collectors' notes – Flowers whitish. Fruits orange.

Vernacular names – Navuvule, maravudi.

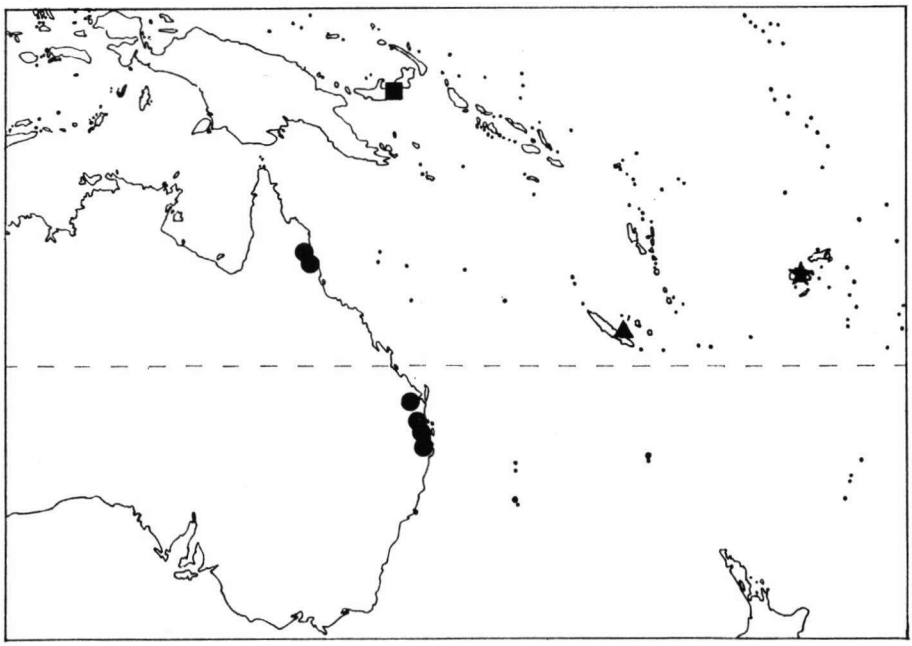

Fig. 8. Distribution of *Meiogyne glabra* Heusden (■), *M. stenopetala* (F. Muell.) Heusden subsp. *stenopetala* (●) and subsp. *insularis* Heusden (★), and *M. spec. 1* (▲).

Note – *Meiogyne glabra* is distinguished from all other *Meiogyne* species by a single cylindrical monocarp which is tapering towards the base and the apex (Fig. 7). In the other species the monocarps are stalked or are ± ovoid and usually sessile. Otherwise, *M. glabra* is in its morphology intermediate between *M. cylindrocarpa* (from New Guinea and further westwards), *M. mindorensis* (Philippines), and *M. spec. 1* (New Caledonia). It shares with *M. cylindrocarpa* the relatively short pedicel, the small flowers, and the high number of seeds. The size, colour, and texture of the leaves is similar to that of certain specimens of *M. mindorensis*. Like in *M. spec. 1* the midrib is not sunken above. The fruit reminds a little of certain species of *Xylopia* and *Goniothalamus*. The epithet '*glabra*' refers to the glabrous vegetative parts.

8. **Meiogyne stenopetala** (F. Muell.) Heusden, *comb. nov.*

Ancana stenopetala F. Muell., Fragm. 5 (June 1865) 27, t. 35; syn. nov. — *Unona ancana* F. Muell. ex Bailey, Syn. Queensl. Fl. Suppl. 3 (1890) 5. — *Fissistigma stenopetala* (F. Muell.) R.E. Fr., Arkiv Bot. Stockholm ser. 3 (1955) 37. — Type: *C. Moore*, Australia, Tweed River (holo ?; iso K, not seen).

Ancana hirsuta Jessup, Austrobaileya 3 (1989) 65; syn. nov. — Type: *Jessup 512* (holo BRI, not seen; iso L).

Treelet or shrub up to 6 m high. Young twigs pubescent, older twigs glabrous, sometimes lenticels present. *Leaves* subcoriaceous to chartaceous, drying (greyish) green to brown, glabrous or with a few sparse hairs above, (sparsely) hairy beneath, lamina narrowly (ob)ovate to (elliptic-)oblong or oblanceolate, 3–14 cm long, 1–4.5 cm wide, base rounded to acute or cordate, apex (tapering to) acute or acuminate, or obtuse, midrib slightly sunken above or not, glabrous or hairy, prominent beneath, (sparsely) hairy, secondary veins faint on both sides. Petiole 0.5–1 mm thick, (sparsely) pubescent. *Flower* axillary, ramiflorous, or terminal. Bracts 2 or 3, pubescent outside. Pedicel 2–6 mm long, pubescent. Bud (narrowly) conical(-ovoid), up to 25 mm long. *Sepals* triangular(-ovate), densely pubescent outside, free or (slightly) connate, apex acute. *Petals* valvate or sometimes outer whorl imbricate at the apex, inner whorl valvate, both whorls spreading, lanceolate to (narrowly) triangular-ovate, pubescent, inner whorl glabrous and grooved towards the base inside, apex acute. *Stamens* 0.5–2 mm long, apex discoid, elongated in the inner whorl. *Receptacle* convex?, shortly cylindrical, or conical with a truncate apex, densely hairy. *Carpels* 5–11, 2.3–3 mm long, ovary cylindrical, densely hairy, stigma ovoid to (semi-) globose, glabrous, fleshy; ovules 2?–6, 1-seriate. Fruiting pedicel 3–20 mm long. *Monocarps* 1–8?, cylindrical, sometimes faintly constricted between the seeds, or subglobose, 9–35 mm long, 6–12(–18) mm in diameter, (densely) pubescent, sometimes glabrescent, smooth to conspicuously tuberculate, pericarp 0.5–1 mm thick, stipes 1–5 mm long, apex apiculate. *Seeds* 1–7, in one series, discoid, 7–10 mm in diameter, 2–4 mm high.

a. subsp. **stenopetala**

Young twigs (rather densely) pubescent. *Leaves* subcoriaceous to membranous, glabrous above, sparsely hairy beneath, lamina narrowly (ob)ovate to (ob)lanceolate or

elliptic-oblong, 4–14 cm long, 1.5–4.5 cm wide, base rounded to acute, apex tapering to acute or acuminate. *Flower* axillary or ramiflorous, solitary. Bracts 1.5–4 mm long. Bud 4–25 mm long. *Sepals* free, apex acute. *Petals:* outer whorls 17–38 mm long, 3–8 mm wide, inner whorl 14–35 mm long, 2–4 mm wide. *Stamens* 1–2 mm long. Fruiting pedicel 3–5 mm long. *Monocarps* smooth to more or less tuberculate, densely pubescent.

Distribution – Australia (NE New South Wales, SE & NE Queensland). Fig. 8.

Ecology – In notophyl or mesophyl vine forests, on alluvial sand or red loamy soil, up to 600 m altitude.

Collectors' notes – Flowers pale green, yellow, cream, or cream-light orange, reddish or pink near the base, fragrant. Fruits green, yellow, orange-yellow, or orange.

Notes – *Meiogyne stenopetala* subsp. *stenopetala* is recognized by its relatively long and narrow petals. Within the former genus *Ancana* two species were distinguished: *A. hirsuta* and *A. stenopetala*. They differ from each other in the shape of the bud, the texture and size of the petals, and the indument of the flowers and twigs. These differences are gradual and are probably ecologically induced as both species occur in a restricted area with a different yearly rainfall (Jessup, 1990).

Although I did not see the type of *M. stenopetala* subsp. *stenopetala*, the studied specimens closely resemble the figure in the first publication of *Ancana stenopetala*.

b. subsp. **insularis** (A.C. Sm.) Heusden, *comb. nov.*

Desmos insularis A.C. Sm., Sargentia 1 (1942) 31; syn. nov. — *Polyalthia insularis* (A.C. Sm.) A.C. Sm., Allertonia 1 (1978) 351. — Type: *Degener 14968*, Fiji, Viti Levu, Mba Prov., near Korovou, east of Tavua, 1 Apr. 1941, fl., fr. (holo A; iso BISH, K, US, all not seen, L).

Young twigs sparsely pubescent. *Leaves* membranous to chartaceous, drying green, glabrous or with few sparse hairs above, hairy beneath, lamina narrowly ovate to oblong, 3–9 cm long, 1–3.5 cm wide, base rounded to cordate, apex obtuse to acute, midrib not sunken above. *Inflorescence* terminal. Bracts c. 0.2 mm long. Pedicel c. 2 mm long. Bud conical, 2 mm long. *Sepals* 1–1.5 mm long, c. 1 mm wide, (slightly) connate. *Petals* valvate, triangular-ovate, 2.5 mm long, c. 1 mm thick, inner whorl slightly narrower. *Stamens* 0.5–0.7 mm long. *Receptacle* and carpels not seen. Fruiting pedicel 8–20 mm long. *Monocarps* conspicuously tuberculate, pubescent, more or less glabrescent, stipe 2 mm long.

Distribution – Fiji (Viti Levu). Fig. 8.

Ecology – In dry forested ravine, at 30–150 m altitude.

Collector's notes – Fruits brownish grey.

Note – Examination of the holotype revealed that this taxon in several ways is similar to *Meiogyne stenopetala* from Australia (e.g., in the tuberculate fruits), but there are some small differences. The leaves are more or less cordate and not acute at the base, and membranous to chartaceous and not coriaceous. According to the field notes, the fruits are brownish grey and not yellowish to orange. The flower buds are either very juvenile or conspicuously smaller than those of *M. stenopetala* (Australia), but seem morphologically not different. As only the type is known, the morphological variation within the Fijian material could not be traced. Therefore, I prefer to consider it as a subspecies of *M. stenopetala*.

9. Meiogyne spec. 1

Treelet up to 5 m high. Twigs glabrous. *Leaves* coriaceous, drying greenish brown above, brown beneath, glabrous on both sides, lamina narrowly elliptic-ovate, 9–16 cm long, 3–4.5 cm wide, base acute, apex acute, midrib glabrous above, prominent beneath, glabrous, lateral veins faint on both sides. Petiole 1.5–2.5 mm thick, glabrous. *Flower* axillary or ramiflorous, solitary. Bracts 1–1.5 mm long, pubescent outside. Pedicel 20–27 mm long, sparsely puberulent. Bud conical, 11 mm long. *Sepals* broadly to depressed triangular-ovate, 1.5–3 mm long, c. 3 mm wide, sparsely hairy, free, apex acute. *Petals* imbricate at the apex, pubescent outside. *Receptacle* shortly cylindrical. *Stamens* c. 6–9?, ovary cylindrical, densely hairy; ovules 9, 1-seriate.

Distribution – New Caledonia. Fig. 8.

Ecology – In rain forest remnants.

Collectors' notes – Perianth brown yellow, flowers banana-scented.

Note – One collection from New Caledonia (with only a flower bud available) could not be accommodated in any of the other species and may be a new one. The leaves remind of some collections of *Meiogyne mindorensis* from Mindoro and Palawan. The size of the bud is intermediate between that of *M. stenopetala* and *M. cylindrocarpa.*

DUBIOUS SPECIES

Oncodostigma leptoneura Diels, Bot. Jahrb. 49 (1912) 143. — Type: *Schlechter 17657,* NE New Guinea, Kani Mts, in forest, c. 800 m, fl., fr., 5 May 1908 (holo B; iso BR).

Note – The status of *Oncodostigma leptoneura* is unclear. The leaves of the holotype closely resemble those of *Goniothalamus grandiflorus* (Warb.) Boerl. The holotype comprises a dissected juvenile flower and globose monocarps. The flower may be a young flower of *Oncodostigma* in its generally accepted sense. Globose monocarps are not found in one of the closely related species. Both flower bud and monocarps are not connected with the plant. It cannot be excluded that the holotype consists of a mixed collection of two different genera. Thus far no other specimens are found that match the holotype of *O. leptoneura.* All specimens that were identified as *O. leptoneura* proved to be specimens of *Pseuduvaria, Papualthia,* or *Goniothalamus.* The isotype from BR has one flower bud connected with the plant. This isotype certainly is a specimen of *Oncodostigma.* Its leaves are larger than usually found in specimens of *Meiogyne cylindrocarpa* from New Guinea and the pedicel is very short (2 mm long). It has several bracts at the base of its pedicel like that figured by Diels (1912) for the flower of *O. leptoneura.*

EXCLUDED SPECIES

Meiogyne kwantungensis P.T. Li, Acta Phytotax. Sin. 14 (1976) 104. — Type: *F. C. 73305,* Hainan, Baoting, How (holo IBSC; iso A), not seen.

Note – The single specimen examined, *Wang 33693* (A), resembles in its fruits those of *Mitrephora* and *Pseuduvaria*. The axillary inflorescence and the nature of the peduncle and pedicels points to *Pseuduvaria* as the most likely. Although the type specimen is not studied, the examined specimen closely resembles the figure in the publication of the type.

Meiogyne macrocarpa Burck in Lorentz, Nova Guinea 8 (1911) 430 = **Pseuduvaria versteegii** (Diels) Merr., Philipp. J. Sci., Bot. 10 (1915) 255. — Syntypes: *Branderhorst 317*, 3 March 1908, fr. (BO); *361*, 9 April 1908, fr. (BO), Irian Jaya, Utumbuwe R., in forest.

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REFERENCES

Ban, N.T. 1973. Chto takoe Fissistigma hainanense Merr. (Annonaceae)? Bot. Zhurn. 58: 1146–1148.

Blume, C.L. 1825. Bijdragen tot de flora van Nederlandsch Indië: 11–21. Batavia.

Blume, C.L. 1830. Flora Javae (Anonaceae) pt 21–24, 28–33: 1–108.

Christmann, M.W. 1986. Beiträge zur Histologie der Annonaceen-Samen. Bot. Jahrb. 106: 379–390.

Christmann, M.W. 1987. Systematische Anatomie der Annonaceen-Samen. Thesis, Kaiserslautern. 84 pp. (unpublished).

Diels, L. 1912. In: C. Lauterbach, Beiträge zur Flora von Papuasien I, 8. Die Anonaceen von Papuasien. Mit einem Beitrag (Abschnitt D) von R. Schlechter. Bot. Jahrb. 49: 113–167.

Heusden, E.C.H. van. 1992. Flowers of Annonaceae: morphology, classification, and evolution. Blumea Suppl. 7: 1–218.

Jessup, L.W. 1990. Habitat preferences and distribution of Australian Annonaceae. Annonaceae Newsl. 8: 55–65.

Merrill, E.D. 1923. An enumeration of Philippine flowering plants 2: 154–178. Manilla.

Miquel, F.A.W. 1865. Anonaceae Archipelagi Indici. Ann. Mus. Bot. Lugduno-Batavi 2: 1–45.

Morawetz, W. 1988. Karyosystematics and evolution of Australian Annonaceae as compared with Eupomatiaceae, Himantandraceae and Austrobaileyaceae. Pl. Syst. Evol. 159: 49–79.

Mueller, F.J.H. von. 1865. Fragmenta phytographiae Australiae 5: 27–28, pl. 35.

Okada, H. 1987. A report of the botanical expedition to Papua New Guinea during 29th July and 2nd September, 1985. Sci. Rep., Col. Gen. Educ. Osaka Univ. 36: 7–32.

Setten, A.K. van, & J. Koek-Noorman. 1992. Fruits and seeds of Annonaceae. Morphology and its significance for classification. Studies in Annonaceae XVII. Bibliotheca Botanica 142.

Sinclair, J. 1958. Ararocarpus – A monstrosity. Gard. Bull. Str. Settl. III, 17: 93–95.

Smith, A.C. 1981. Flora vitiensis nova (A new Flora of Fiji) 2: 13–40. Lawai, Hawaii.

Stafleu, F.A., & R.S. Cowan. 1981. Taxonomic literature III. Bohn, Scheltema & Holkema, Utrecht.

Waha, M., & W. Morawetz. 1988. Pollen evolution and systematics in Annonaceae with special reference to the disulcate Australian endemic genera. Pl. Syst. Evol. 161: 1–12.

Walker, J.W. 1971. Pollen morphology, phytogeography, and phylogeny of the Annonaceae. Contr. Gray Herb. 202: 1–132.

LIST OF COLLECTIONS

1 = *Meiogyne hainanensis* (Merr.) Tien Ban
2 = *Meiogyne pannosa* (Dalzell) J. Sinclair
3 = *Meiogyne virgata* (Blume) Miq.
4 = *Meiogyne cylindrocarpa* (Burck) Heusden
5 = *Meiogyne mindorensis* (Merr.) Heusden
6 = *Meiogyne monosperma* (Hook. f. & Thomson) Heusden
7 = *Meiogyne glabra* Heusden
8a = *Meiogyne stenopetala* (F. Muell.) Heusden subsp. *stenopetala*
8b = *Meiogyne stenopetala* (F. Muell.) Heusden subsp. *insularis* (A.C. Sm.) Heusden
9 = *Meiogyne spec. 1*

Achmad 1693, 1801: 4 — Afriastini 765: 3 — Ambri & Arifin AA 332, AA 366: 3 — Anderson 4008: 3 — ANU series 1669: 3 — Apostol 6729: 3.

Backer 8793: 3; 21148: 4 — Bakhuizen van den Brink 1798, 2315: 3 — Bäuerlen 737 (= NSW 254566), 874 (= NSW 254563): 8a — Bean 1316: 8a — Beddome 62, 63, 71: 2 — Beccari 935bis, 976bis: 3 — Beumée 6061, 6747: 3 — Blake 12906, 15822: 8a — Bloembergen 3813: 4 —Blume 2294, 17985: 3 — Branderhorst 107 (T): 4 — Bremekamp 1919: 4 — Brooks 1068: 3 — BRUN series 5093: 3 — Bryan 1154: 4 — BS series 15381 (T): 3 — Burley et al. 2769: 3 — Buwalda 4237, 4305, 4714: 4 — Byrnes 3106: 8a.

Carr 11292: 4; 26461, 26464: 3 — Catalan 26466: 5 — Celestino & Castro 1943: 5 — Chan FRI 6785, 6820: 3 — Chin & Badarudin 1692: 3 — Chun & Tso 44583: 1 — Clemens 8778: 4; 10457, 26814, 27220, 28279, 29613: 3 — Cockburn FRI 7871: 3 — Conklin 17368, 19197: 5 — Cult. Hort. Bogor 104, 4181, 17984: 3 — Cuming 1738: 3.

Daud 9: 4 — David 110: 6 — Degener 14968 (T): 8b — Dransfield SMHI 1298: 5.

Edaño 3538: 5; 37114, 41670: 3 — Elmer 11318 (T): 3; 13125 (T): 5; 13984 (T), 15321: 3; 15399: 5; 15555: 3; 15884 (T), 17649 (T): 5; 20439, 21136, 21203, 21379, 21859: 3 — Endert 4618: 3.

Fernandez 153: 2 — Forbes 2713: 3 — Frodin UPNG 4383: 4.

Gansau 46338: 3 — Geesink, Hattink & Charoenphol 7185: 3 — Geh & Samsuri 1120: 3 — G.E.S. 290: 4 — Glassman 306: 4 — Guerrero 738: 4 — Gutierra et al. 117074: 3 — Gutierrez & Espiritu 80816: 4.

Hallier 2901: 3 — Hansen 122: 3; 1511: 4 — Harvey 10131: 3 — Haviland 410 (T): 3; 1779 (T): 6; 2041: 3 — HB 424: 3; HB 3532, 3797: 4 — van Helsdingen 10: 3 — Henderson 18360, 19609: 3 — Hosakawa 6606: 4 — Hose 155, 474: 3 — How 70628, 70642, 73210, 73432: 1.

Indu 2459: 2 — Irby 330 (= NSW 254567): 8a — Ismail KEP 109432: 6.

Jacobs 7623: 5; 8128, 8322: 3 — Jessup 418, 512 (T), 706: 8a — Jones 729?, 730: 8a.

Kairo 482, 620: 4 — Kanehira 14, 56, 883, 1805, 2199, 2236, 2259: 4 — Kanis & Ding Hou 49317: 3 — Kartawinata 914: 3 — King's collector 5399, 6177: 3 — Ko 52227: 1 — Kochummen FRI 2204: 6; FRI 2301: 3 — Kokawa & Hotta 4780: 3 — Koorders 614, 663, 10048, 20459, 20460, 20614, 24060, 28716, 30621 (T), 30930, 40784: 3 — Kostermans 5302, 6903, 8907, 8912, 9720, 13298, 13369: 3; 26284: 2; 28810: 3 — Kostermans et al. (KK & SS) 30: 4 — Krukoff 4170: 4.

LAE series 58469 (T), 66735: 7 — Lagrimas 9663: 5 — Lambach 1244: 3 — Lau 292, 1250, 1736, 2900, 5101, 5820, 6326, 27754: 1 — Laumonier TFB 4089: 3 — Liang 62587, 63442, 63529, 65007: 1 — Loher 12231: 3; 14159: 5.

Madani 76322: 4 — Mail 2968: 3 — Main 2064: 4 — Maingay 92, 95: 3; 100 (T): 6 — Mangaradja Ginagan 17: 4 — Martelino & Edaño 35335, 35559: 5 — Mat Salleh & Schatz 1417: 3 — Maxwell 75-510, 86-215: 3 — McClure 9733 (T): 1 — McDonald 2425: 8a — McDonald

& Jessup 2087: 8a — McGregor 27862: 5 — McPherson 5220: 9 — Mendoza 97823, 97887: 5 — Mendoza & Convocar 10560: 3 — Merrill 4060, 5568 (T): 5 — Meijer & Nurta 9097: 4 — Mikil 42056: 3 — Millard KL 2238: 3 — Mondi 216: 3 — G.C. Moore 344: 4 — von Mueller 4, 56: 8a.

Necker 44: 4 — NGF series 26783: 7 — NSW series 153370, 153371, 254570, 254572, 254574, 254576, 254578, 254580, 254581, 254585: 8a — Nur 18865: 3; 35169, 36155: 6.

Ogata 11331, 11483: 3.

Paardt, van der, 34, 43: 4 — Pételot 2597 (T): 3 — Phusomsaeng 40, 101: 3 — Ping Sam & Kapis 19214: 3 — Pleyte 59: 4 — Podzorski SMHI 539, SMHI 721, SMHI 2152: 5 — Poilane 10600 (T): 3.

Quisumbing 2413: 5.

Rameli 2462: 3 — Ramos 1640: 3; 4572, 13616, 24216, 26217, 39775: 5; 15381, 43371: 3; 46378: 5 — Ramos & Convocar 83498, 84081: 3 — Ramos & Edaño 48274: 5 — Raulerson 10604, 14097, 14174: 4 — Remy & Teo KL 4049: 3 — Ridley 8116: 3 — Ridsdale 389, 532: 2; (SMHI) 53, 76, 481, 922, 951, 1200: 5 — Rodin 593: 4 — Rogstad 920, 923, 943, 957, 982: 6.

S series 27662, 35692, 36910: 3; 38066: 4; 38288, 39854: 3 — Sablaya 23: 3 — Herb. Safford 1180 (T), 1203: 4 — Saldanha 13157: 2 — Saldanha & Ramamoorthy HFP 449: 2 — Samsuri & Ahmad Shukar SA 673: 3 — SAN series A2938, 16068, 16486, 19214, 20256, 24542, 26100, 26318, 26340, 30092, 30475, 30703, 32917, 33964, 67241, 67450, 67471, 69935, 70950, 72382, 77322, 77965, 79679, 79714, 80949, 80963, 84913, 87269, 88223, 89293, 89458, 91351, 94685, 95252, 95424, 100161, 100265,109926: 3 — Sangkachan 1261: 6 — Santisuk & B.N. 360: 3 — Sasidharan 1154, 3134, 3410, 4874, 5604: 2 — Sasidharan & Swarup 3088: 2 — Scheffer 7708: 3 — SFN series 32133, 32160: 6; 35692: 3; 40987: 6 — Shah 169: 6 — Sherfesee, Cenabre & Ponce 21657: 3 — Sinanggul 57335: 3 — Sinclair (et al.) 9277: 4; 39472: 3 — Sohadi FRI 17978: 3 — Stanley 80: 8a — van Steenis 7575: 4 — Stone 3810, 4075, 5005, 5169, 5219: 4 — Streimann & Kairo 51522: 4 — Strugnell 12136: 6 — Sulit & Conklin 17743: 5 — Sundara Raghavan 79582, 80751, 97065: 2 — Suppiah FRI 108968: 2 — Suvarnakoses 1813: 3 — Symington KEP 40927: 3.

Teijsmann 105: 3 — J.B. Thompson 209: 4 — Tsutsui 30: 4.

Veldkamp 8319: 3 — Veldkamp & Stevens 5915: 4 — Verhoef I 167: 3.

Walsh 113: 4 — Wang 34525, 36243: 1 — Weber & Sévenet 58: 3 — Wenzel 645, 945, 1553, 2624, 2693: 3 — White 3266: 8a — Whitmore FRI 783, 4312: 6; 4669, 12157: 3 — de Wilde & de Wilde-Duyfjes 18486: 3 — Williams 512: 5 — Wilson 986 (T): 4 — Herb. Wight 20: 2 — Wiriadinata 270: 3.

Yshmull? 69: 4.