

Flora of Singapore precursors, 44: Notes on Menispermaceae in Singapore

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ABSTRACT. A nomenclatural synopsis, including typification, of the native species of Menispermaceae in Singapore is presented. Fourteen species in 12 genera are included. Lectotypes are designated for 37 names, and one epitype is designated. A key to the Singapore species of Menispermaceae is also included.

Keywords. Epitype, lectotype, lianas, synonymy, taxonomy

Introduction

The Menispermaceae are a taxonomically challenging family. The species are mostly dioecious lianas climbing by means of twining young shoots. The flowers are typically small but frequently rather complex. The fruits are drupes, often with intricately sculpted and invaginated endocarps and crescent-shaped seeds. A diverse array of secondary chemicals are known from the family reflecting the common usage of the species in traditional medicines and as dye plants.

In Singapore only a few species are common. The known diversity of the family in the native flora has been increased in recent years by the discovery of previously overlooked species (Lim et al., 2018; Turner & Leong, 2022; Turner, 2023). The total has now reached 14 species in 12 genera.

The purpose of the present contribution is to provide a nomenclatural summary of the Menispermaceae in Singapore, including synonymy and typification, as a precursor to the treatment for the *Flora of Singapore*.

Materials and methods

The study was based on the herbarium material collected in Singapore largely from SING, but also K and BM. Specimens from outside Singapore were also studied at K and BM. Type material from other herbaria was largely consulted via online sources including institutional websites and JSTOR Global Plants. Enquiries were made to

various herbaria when types could not be found directly and in some cases images were made available. When no type material could be located, synonym status was based on the published description and earlier revisionary work.

Key to Menispermaceae species native in Singapore

- 1a. Leaves penninerved; inflorescences single-flowered; seeds without endosperm and drupes with style-scar near apex 9.1 *Pycnarrhena fasciculata*
- 1b. Leaves basally 3–7-nerved; inflorescences multi-flowered; seeds with endosperm, or if without endosperm then drupes with style-scar near base 2

- 2a. Leaves beneath densely covered with a felt of woolly pale hairs obscuring lamina surface (visible under magnification); inflorescences branched with flowers aggregated into globose heads; stamens 6 with the inner 3 connate; fruits globose and densely covered with powdery hairs 3.1 *Coscinium fenestratum*
- 2b. Leaves beneath glabrous to densely pubescent with erect or decumbent hairs, not covered with a felt of woolly hairs; inflorescences branched or not but with flowers not aggregated into globose heads; stamens not in this arrangement; fruits globose or not but glabrous or sparsely hairy, not powdery 3

- 3a. Leaves peltate; stamens connate into a peltate synandrium; carpel 1 4
- 3b. Leaves not peltate; stamens free or connate but not as a peltate synandrium; carpels 2 or more 5

- 4a. Twigs hairy; inflorescences and infructescences branched; fruits ripening white 4.1 *Cyclea laxiflora*
- 4b. Twigs glabrous; inflorescences discoid capitula, fruits borne on slender pedicels from disc of old inflorescence; fruits ripening red 10.1 *Stephania capitata*

- 5a. Leaves when dry with upper lamina having minute parallel wrinkles (visible under magnification), particularly near leaf base; recently broken parts revealing elastic white threads of latex 11.1 *Tinomiscium petiolare*
- 5b. Leaves when dry with upper lamina smooth; recently broken parts not revealing latex threads 6

- 6a. Twigs glabrous 7
- 6b. Twigs hairy 11

- 7a. Mature stems with smooth red-brown surface, peeling in thin layers, with abundant and prominent raised pale lenticels; inflorescence axis unbranched; petals (3–)6 8
- 7b. Mature stems brown, not peeling, lenticels absent or sparse, not notably pale; inflorescence axis with side branches; petals absent 10

- 8a. Leaves with pit domatia in axils of main nerves below; flowers distinctly pedicellate 12.1 *Tinospora krispura*
- 8b. Leaves with glandular patches or not in axils of main nerves below, pit domatia absent; flowers subsessile 9
- 9a. Leaves with glandular patches in the axils of main nerves below; endocarps with distinct ventral groove and scattered tubercles 12.2 *Tinospora macrocarpa*
- 9b. Leaves without glandular patches in axils of main nerves below; endocarps with indistinct ventral groove and densely verruculose 12.3 *Tinospora singapura*
- 10a. Wood bright yellow; leaves without domatia; inflorescences branched to third order at least basally; some flowers pedicellate; stamens free; drupes longer than broad, style-scar terminal; endocarps with ventral groove 5.1 *Fibraurea tinctoria*
- 10b. Wood white to brown; leaves with pit domatia in axils of main nerves below; inflorescences with only short second-order side branches; flowers all subsessile to sessile; stamens connate; drupes broader than long, style-scar near base; endocarps without ventral groove 2.1 *Arcangelisia flava*
- 11a. Petiole to 1 cm long; lamina apex generally rounded to emarginate; apex of petals bifid; endocarp dorsal surface tuberculate 8.1 *Nephroia orbiculata*
- 11b. Petiole more than 1 cm long, often much longer; lamina apex acute to acuminate; apex of petals obtuse to rounded, undivided; endocarp dorsal surface smooth or faintly ridged, not tuberculate 12
- 12a. Petiole 8 cm long or more; lamina surface bullate; flowers with 3 fleshy inner sepals forming tubular 'corolla' with small apical opening 1.1 *Albertisia crassa*
- 12b. Petiole less than 8 cm long; lamina surface not bullate; flowers not tubular 13
- 13a. Leaves very shiny, lower lamina surface more or less glabrous; inflorescences generally solitary; sepals 7–12, spirally arranged; fruits sessile, globose, < 1 cm long 6.1 *Hypserpa nitida*
- 13b. Leaves not very shiny, lower lamina surface densely pubescent; inflorescences typically in groups of 3 or 4; sepals 6–9, in whorls of 3; fruits stalked, obovoid, c. 2 cm long 7.1 *Limacia scandens*

Nomenclatural synopsis

1. *Albertisia* Becc., Malesia 1: 161 (1877). – TYPE: *Albertisia papuana* Becc.

1.1 *Albertisia crassa* Forman, Kew Bull. 30(1): 85 (1975). – TYPE: [Peninsular Malaysia], Pahang, Telom Valley, Sungei Chokhai, 28 July 1930, *Kiah & E.J. Strugnell SFN 23974* (holotype K [K000644515, K000644516]).

2. *Arcangelisia* Becc., Malesia 1: 145 (1877). – TYPE: *Arcangelisia lemniscata* (Miers) Becc. (lectotype designated by Diels in Engler (ed.), *Pflanzenr.*, IV, 94: 106 (1910)) (= *Arcangelisia flava* (L.) Merr.).

2.1 *Arcangelisia flava* (L.) Merr., *Interpr. Herb. Amboin.* 222 (1917). – *Menispermum flavum* L., *Herb. Amboin.* 18 (1754). – TYPE: [Published illustration] ‘Tuba flava’, Rumphius, *Herb. Amboin.* 5: t. 24 (1747) (lectotype designated by Forman, *Kew Bull.* 23(2): 325 (1978)).

Menispermum flavescens Lam., *Encycl.* 4(1): 98 (1797). – *Cocculus flavescens* (Lam.) DC., *Syst. Nat.* 1: 520 (1817). – *Anamirta flavescens* (Lam.) Miq., *Fl. Ned. Ind.* 1(2): 79 (1858). – TYPE: [Published illustration] ‘Tuba flava’, Rumphius, *Herb. Amboin.* 5: t. 24 (1747) (lectotype designated by Forman, *Kew Bull.* 23(2): 325 (1978)).

Anamirta lemniscata Miers, *Contrib. Bot.* 3: 54 (1871). – *Arcangelisia lemniscata* (Miers) Becc., Malesia 1: 147 (1877). – TYPE: [Indonesia], Java, *H. Zollinger 2335* (holotype G [G00392479]; isotypes BM [BM000554176, BM000554177], G [G00392480, G00392481], P [P00744885, P00744887]).

Anamirta luctuosa Miers, *Contrib. Bot.* 3: 55 (1871). – TYPE: [Indonesia], Java, *T. Horsfield s.n.* (holotype BM [BM000554178]).

Arcangelisia inclyta Becc., Malesia 1: 147 (1877). – TYPE: [Indonesia], Dutch New Guinea, Andai, September 1872, *O. Beccari P.P. 634* (holotype FI [FI007615, Erb. Coll. Becc. 711, 711B – a single specimen over 2 sheets]).

Anamirta loureiroi Pierre, *Fl. Forest. Cochinch.* t. 110 (1885), as ‘*loureiri*’. – *Mirtana loureiroi* (Pierre) Pierre, *Bull. Soc. Bot. France* 52: 490 (1905), as ‘*loureiri*’. – *Arcangelisia loureiroi* (Pierre) Diels in Engler (ed.), *Pflanzenr.*, IV, 94: 104 (1910), as ‘*loureiri*’. – TYPE: [Vietnam], prov. Bien Hoa, Bao Chang, July 1877, *L. Pierre 1793* (lectotype BM [BM000554164], designated at the first step by Diels in Engler (ed.), *Pflanzenr.*, IV, 94: 106 (1910), and at the second step here; isolectotypes K [K000644508], P [P02373654]).

Notes. Miers (1871) stated ‘v.s. in herb. DeCandolle [sic] (Zollinger 2335)’ in his protologue of *Anamirta lemniscata*. The specimen cited as holotype above came from Herbarium De Candolle, the personal herbarium of the De Candolle family which was not donated to G until 1921. The other two duplicates in G came from the Boissier Herbarium and the general herbarium. I therefore consider the De Candolle herbarium specimen as holotype.

3. *Coscinium* Colebr., Trans. Linn. Soc. London 13: 51 (1822). – *Pereiria* Lindl., Fl. Med. 370 (1838), nom. illeg. superfl. – TYPE: *Coscinium fenestratum* (Gaertn.) Colebr.

3.1 *Coscinium fenestratum* (Gaertn.) Colebr., Trans. Linn. Soc. London 13: 65 (1821). – *Menispermum fenestratum* Gaertn., Fruct. Sem. Pl. 1: 219, t. 46, f. 5 (1788). – *Pereiria medica* Lindl., Fl. Med. 370 (1838), nom. illeg. superfl. – TYPE: [Published illustration] Gaertner, Fruct. Sem. Pl. 1: t. 46, f. 5 (1788) (lectotype designated here). (Fig. 1D)

Coscinium wallichianum Miers, Ann. Mag. Nat. Hist., ser. 3, 13: 129 (1864). – TYPE: Singapore, September 1822, *N. Wallich s.n.* [EIC 4971B] (lectotype K-W [K001104357], designated here, excluding material mounted top right [K001104356] which is *Coscinium blumeanum* Miers ex Hook.f. & Thomson, and as Forman’s annotations indicate probably represents material from the gathering making up EIC 4971A).

Coscinium maingayi Pierre, Fl. Forest. Cochinch. sub t. 112 (1885), as ‘*mangayi*’. – TYPE: Singapore, September 1867, *A.C. Maingay 1511A* [Kew distribution no. 117] (lectotype CAL [CAL0000033996], designated here; possible isolectotypes B [B 10 0272403], K [K000644615], L [L.1750372]).

Coscinium usitatum Pierre, Fl. Forest. Cochinch. (7): t. 112 (1885). – TYPE: [Vietnam], Prov. Bien Hoa, ad montem Lu, March 1877, *L. Pierre 1312* (lectotype P [P00538937], designated at the first step by Diels in Engler (ed.), Pflanzenr., IV, 94: 114 (1910), and at the second step here; isolectotypes B [B 10 0272404], K [K000644614], L [L0038480], MICH [MICH1115909], MPU [MPU026931], P [P00538938, P00538939], US [US00345373]).

Coscinium blumeanum Miers var. *epeltatum* Boerl., Cat. Pl. Bogor. (I): 38 (1899). – TYPE: Cult. Hort. Bogor. sub XI.B.2 and XI.B.12 (not traced).

Coscinium miosepalum Diels in Engler, Pflanzenr., IV, 94: 113 (1910). – TYPE: Cult. Hort. Bogor. XI.B.25, *Anon. s.n.* (lectotype B [B 10 0272406], designated here; isolectotypes BO [BO-1295800], K [K000644621, K000644622], L [L0038482, L0038483 – a single specimen over 2 sheets]).

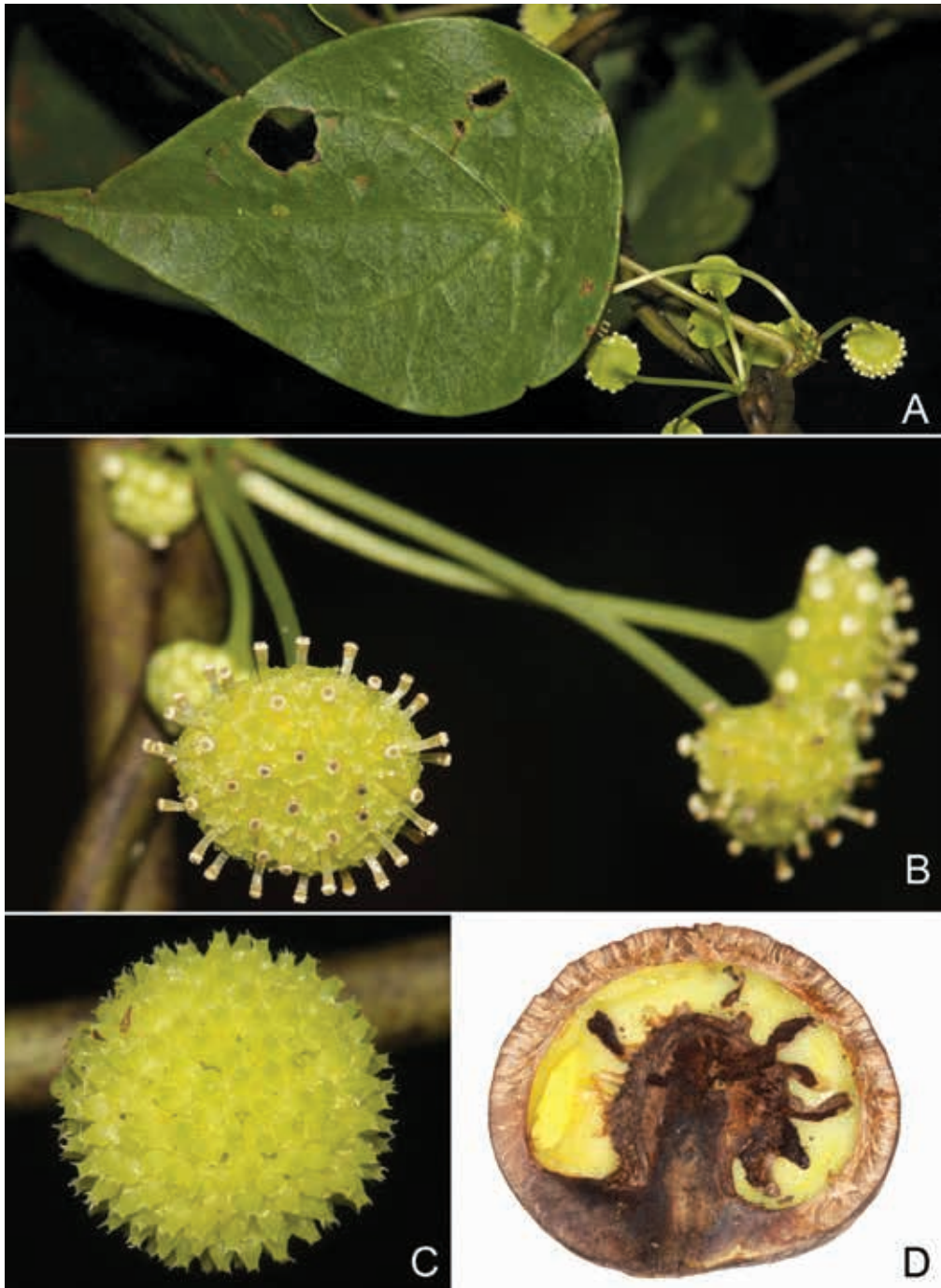


Fig. 1. A–C. *Stephania capitata* (Blume) Spreng. **A.** Peltate leaf. **B.** Staminate inflorescence. **C.** Pistillate inflorescence. **D.** *Coscinium fenestratum* (Gaertn.) Colebr. Sectioned fruit and seed, showing the condyle. A–C from Nee Soon; D from MacRitchie. (Photos: X.Y. Ng)

Coscinium wightianum Miers ex Diels in Engler, Pflanzenr., IV, 94: 112 (1910). – TYPE: ‘Ind. or.’, *Herb. Wight. propr.* 2469 (lectotype K [K000644616], designated here; possible isoelectotypes E [E00179494, E00179495], K [K000644617]).

Coscinium peltatum Merr., Univ. Calif. Publ. Bot. 15: 59 (1929). – TYPE: [Malaysia], Sabah, Elphinstone Province, Tawao, October 1922–March 1923, *A.D.E. Elmer* 21185 (lectotype K [K000644613], designated here; isoelectotypes B [B 10 0272405], BISH [BISH1003387], BR [BR0000005226511], GH [GH00038883], L [L0038481], LE [LE00012383], M [M0239780], MICH [MICH1115878], NY [NY00320550], P [P00744888], PH [PH00006748], S [S08-993], U [U0245343], UC [UC289902], Z [Z-000015231]).

Coscinium fenestratum (Gaertn.) Colebr. var. *macrophyllum* Yamamoto, J. Soc. Trop. Agric. 16: 39 (1944). – TYPE: [Malaysia], Sarawak, Kuching, *N. Hanada* BO 20 (not traced).

Coscinium fenestratum (Gaertn.) Colebr. var. *ovalifolium* Yamamoto, J. Soc. Trop. Agric. 16: 39 (1944). – TYPE: [Malaysia], Sarawak, Kuching, 29 September 1938, *N. Hanada* s.n. (not traced).

Notes. Forman (1995) referred to a specimen in L as type of *Menispermum fenestratum* Gaertn. I presume that this referred to a carpological collection in the Van Royen herbarium. However, no such specimen could be traced among the carpological collections or the general herbarium (R. Bijmoer, pers. comm.). I, therefore, here designated Gaertner’s illustration as lectotype.

4. *Cyclea* Arn. ex Wight, Ill. Ind. Bot. 1: 22 (1838). – *Rhaptomeris* Miers, Ann. Mag. Nat. Hist., ser. 2, 7: 36, 41 (1851), nom. illeg. superfl. – TYPE: *Clypea burmanni* (DC.) Wight & Arn. (= *Cyclea peltata* (Burm.f.) Hook.f. & Thomson).

Lophophyllum Griff., Not. Pl. Asiat. 4: 313 (1854). – TYPE: *Lophophyllum bicristatum* Griff. (= *Cyclea bicristata* (Griff.) Diels).

Peraphora Miers, Ann. Mag. Nat. Hist., ser. 3, 18: 20 (1866). – TYPE: *Peraphora robusta* Miers, nom. illeg. superfl. (= *Cyclea bicristata* (Griff.) Diels).

Paracyclea Kudô & Yamam., Bot. Mag. (Tokyo) 46: 157 (1932). – TYPE: non designatus.

4.1 *Cyclea laxiflora* Miers, Contr. Bot. 3: 241 (1871). – TYPE: [Peninsular Malaysia], Malacca, *W. Griffith* s.n. (lectotype K [K000380269], designated here including the female inflorescence only).

5. *Fibraurea* Lour., Fl. Cochinch. 600, 626 (1790). – TYPE: *Fibraurea tinctoria* Lour.

5.1 *Fibraurea tinctoria* Lour., Fl. Cochinch. 626 (1790). – *Cocculus fibraurea* DC., Syst. Nat. 1: 525 (1817), nom. illeg. superfl. – *Menispermum tinctorium* (Lour.) Spreng., Syst. Veg., ed. 16, 2: 156 (1825). – TYPE: [Vietnam], *J. de Loureiro s.n.* (lectotype BM [BM000554195], designated by Miers, Contr. Bot. 3: 41 (1871)).

Cocculus rimosus Blume, Bijdr. Fl. Ned. Ind. 24 (1825). – *Menispermum rimosum* (Blume) Spreng., Syst. Veg., ed. 16, 4(2, Cur. Post.): 143 (1827). – TYPE: [Indonesia], Java, November sine anno, *C.L. Blume 1642* (lectotype L [L0038492], designated at the first step by Forman, Kew Bull. 40: 549 (1985), and the second step here; isolectotype L [L0038493]).

Fibraurea chloroleuca Miers, Contr. Bot. 3: 42 (1871). – TYPE: [Peninsular Malaysia], Malacca, *W. Griffith s.n.* (lectotype K [K000644604], designated here).

Fibraurea chloroleuca Miers var. *elongata* Miers, Contr. Bot. 3: 42 (1871). – TYPE: [Indonesia], Borneo, Bangarmassing [Banjarmasin], 1857–1858, *J. Motley 153* (lectotype K [K001419202], designated here; isolectotype BM [BM000946109]).

Fibraurea fasciculata Miers, Contr. Bot. 3: 43 (1871). – TYPE: [Peninsular Malaysia], Penang, *W. Phillips s.n.* (holotype K [K000644606]; isotype BM [BM000554189]).

Fibraurea laxa Miers, Contr. Bot. 3: 43 (1871). – TYPE: [Malaysia], Labuan, 1857, *T. Lobb s.n.* (holotype K [K000644600]; isotype BM [BM000554194]).

Fibraurea trotteri Watt ex Diels in Engler, Pflanzenr., IV, 94: 122 (1910). – TYPE: India, Manipur, *W.F. Trotter s.n.* (holotype CAL [CAL0000004769]).

6. *Hypserpa* Miers, Ann. Mag. Nat. Hist., ser. 2, 7(37): 36, 40 (1851). – TYPE: *Limacia cuspidata* Hook.f. & Thomson (= *Hypserpa nitida* Miers).

6.1 *Hypserpa nitida* Miers in Bentham, Hooker's J. Bot. Kew Gard. Misc. 3: 258 (1851). – TYPE: [China], Hong Kong, *J.G. Champion s.n.* (lectotype K [K000644731], designated at the first step by Forman, Kew Bull. 12: 453 (1957), and at the second step here, excluding the flowering shoot mounted above the fruiting shoot; isolectotype BM [BM000554297]).

Limacia cuspidata Hook.f. & Thomson, Fl. Ind. 1: 189 (1855). – *Hypserpa cuspidata* (Hook.f. & Thomson) Miers, Ann. Mag. Nat. Hist., ser. 3, 14: 365 (1864). – TYPE: [Bangladesh or India], Sillet, *F. de Silva s.n.* [EIC 4960] (lectotype K-W [K001104332],

designated at the first step by Diels in Engler, Pflanzenr., IV, 94: 207 (1910), and at the second step here; isolectotypes BM [BM000554299, BM000554301], BR [BR0000005226849, BR0000005227174, BR0000005296958], E [E00438517], GH [GH00423113], GZU [GZU000273980], K [K000644733], K-W [K001104333], P [P00744932]).

Limacia microphylla Miq., Fl. Ned. Ind., Eerste Bijv. 386 (1861). – *Hypserpa cuspidata* (Hook.f. & Thomson) Miers var. *microphylla* (Miq.) Boerl., Cat. Pl. Bogor. 39 (1899). – TYPE: [Indonesia], S. Sumatra, Lampongs, *J.E. Teijsmann s.n.* (lectotype BO n.v., designated by Forman, Kew Bull. 12: 453 (1957); isolectotypes BM [BM000554304], K [K000644727]).

Zanthoxylum triplinerve Turcz., Bull. Soc. Imp. Naturalistes Moscou 36(1): 597 (1863). – TYPE: Philippines, Luzon, [*H. Cuming suppl. no. 2*] (holotype KW [KW001000637]).

Limacia borneensis Miq., Ann. Mus. Bot. Lugduno-Batavi 4: 83 (1868). – *Hypserpa borneensis* (Miq.) Becc., Malesia 1: 149 (1877). – TYPE: Borneo, *P.W. Korthals s.n.* (lectotype L [L0038498], designated here).

Hypserpa heteromera Miers, Contrib. Bot. 3: 104 (1871). – TYPE: [Indonesia], Borneo, Bangarmassing [Banjarmasin], 1857–1868, *J. Motley 710* (holotype K [K000644728]; isotype BM [BM00554306]).

Hypserpa pauciflora Miers, Contrib. Bot. 3: 105 (1871). – TYPE: Ceylon, *G. Gardner s.n.* (lectotype K [K001419200], designated by Forman, Kew Bull. 12: 453 (1957); isolectotype BM [BM000554300]).

Hypserpa praevaricata Miers, Contrib. Bot. 3: 103 (1871). – TYPE: Philippines, Luzon, Prov. Albay, 1841, *H. Cuming 1252* (lectotype K [K0006447127], designated here; isolectotypes A [A00423118], BM [BM000554303, plus specimen ex Herb. Miers mounted on same sheet], K [K000644716], M [M0239791], P [P00744933, P00744934]).

Hypserpa propensa Miers, Contrib. Bot. 3: 105 (1871). – TYPE: [Indonesia], Borneo, Bangarmassing [Banjarmasin], 1857–1858, *J. Motley 179* (holotype K [K000644729]; isotype BM [BM000554305]).

Hypserpa uniflora Miers, Contrib. Bot. 3: 106 (1871). – TYPE: Ceylon, *G.W. Walker s.n.* (lectotype K [K001419199], designated by Forman, Kew Bull. 12: 453 (1957); isolectotype BM [BM000554302]).

Hypserpa jagorii Diels in Engler, Pflanzenr., IV, 94: 211 (1910). – TYPE: Philippines, Leyte, *F. Jagor 1042* (not traced).

Hypserpa laevifolia Diels in Engler, Pflanzenr., IV, 94: 210 (1910). – TYPE: [Vietnam], Annam, Bien Hoa, Bao Chang, July 1877, L. Pierre 1968 (lectotype B [B 10 0272381], designated here; isolectotypes A [A00423114], BM [BM000554298], K [K000644726], P [P02376569, P02376592]).

Hypserpa nandinifolia Yamam., Trans. Nat. Hist. Soc. Taiwan 34: 310, f. 5 (1944). – TYPE: Philippines, Mindanao, Surigao Province, April 1919, M. Ramos & J. Pascasio Bur. Sci. 34614 (lectotype K [K000644720], designated here; isolectotype P [P00744935]).

Notes. In the protologue of *Hypserpa nitida*, Miers (Bentham, 1851) stated that ‘The specimen is in fruit only’. As Forman had already effectively typified the name to material in K, I here restrict the choice to the fruiting specimen.

7. *Limacia* Lour., Fl. Cochinch. 620 (1790). – TYPE: *Limacia scandens* Lour.

7.1 *Limacia scandens* Lour., Fl. Cochinch. 621 (1790). – *Cocculus limacia* DC., Syst. 1: 526 (1817), nom. illeg. superfl. – *Menispermum limacia* Spreng., Syst. Veg., ed. 16, 2: 155 (1825), nom. illeg. superfl. – TYPE: [Vietnam], Cochinchina, J. de Loureiro s.n. (lectotype BM [BM000554310], designated by Merrill, Trans. Amer. Phil. Soc., ser. 2, 24(2): 157 (1935); isolectotype B [B 10 0272364]).

Limacia velutina A.Gray, U.S. Expl. Exped., Phan. 15: 40 (1854). – TYPE: Singapore, Wilkes Explor. Exped. s.n. (lectotype US [US00898600], designated here).

Limacia cerasifera Becc., Malesia 1: 150 (1877). – TYPE: Borneo, J.E. Teijsmann 8084 (lectotype FI [FI007629], designated at the first step by Diels in Engler (ed.), Pflanzenr., IV, 94: 210 (1910), at the second step here; isolectotype B [B 10 0272365]).

Notes. *Limacia velutina* is usually attributed to Hooker & Thomson (1855), but Gray (1854) validated the name in the previous year.

8. *Nephroia* Lour., Fl. Cochinch. 565 (1790), nom. rej. (against *Cocculus* DC.). – TYPE: *Nephroia sarmentosa* Lour. (= *Nephroia orbiculata* (L.) L.Lian & Wei Wang).

Baumgartia Moench, Meth. 650 (1794), nom. rej. (against *Cocculus* DC.). – TYPE: *Baumgartia scandens* Moench (= *Nephroia carolina* (L.) L.Lian & Wei Wang).

Androphylax J.C.Wendl., Bot. Beob. 37, 38 (1798), nom. rej. (against *Cocculus* DC.). – *Wendlandia* Willd., Sp. P1. 2: 6, 275 (1799), nom. illeg. superfl., nom. rej. (against *Cocculus* DC.). – *Cocculidium* Spach, Hist. Nat. Vég. Phan. 8: 16 (1839), nom. illeg.

superfl., nom. rej. – TYPE: *Androphylax scandens* J.C.Wendl. (= *Nephroia carolina* (L.) L.Lian & Wei Wang).

Notes. Recent phylogenetic studies (Lian et al., 2020) have shown the genus *Cocculus* DC. to be polyphyletic. This has led to the resurrection of the genera *Nephroia* Lour. and *Cebatha* Forssk., and the transfer of *Cocculus laurifolius* DC. to *Pachygone* Miers. In the Singapore context, this means that *Cocculus orbiculatus* (L.) DC. becomes *Nephroia orbiculata* (L.) L.Lian & Wei Wang.

Miers (1871: 260) took up Loureiro's generic name but 'corrected' the spelling to '*Nephroica*'. I treat '*Nephroica*' as an orthographic error and correct Miers's combinations as though made in *Nephroia*.

8.1 *Nephroia orbiculata* (L.) L.Lian & Wei Wang, *Molec. Phylogen. Evol.* 148(106825): 7 (2020). – *Menispermum orbiculatum* L., *Sp. Pl.* 341 (1753). – *Cocculus orbiculatus* (L.) DC., *Syst. Nat.* 1: 523 (1817). – *Cissampelos pareira* L. var. *orbiculata* (L.) Miq., *Ann. Mus. Bot. Luduno-Batavi* 4: 85 (1868). – *Cebatha orbiculata* (L.) Kuntze, *Revis. Gen. Pl.* 1: 9 (1891). – TYPE: [Published illustration] 'Cocculi Orientalis Frutex, convolvulaceus, orbiculatis foliis, prona parte villosis, ex una de Insulis Crocodilorum', Plukenet, *Amalth. Bot.* t. 384, f. 6 (1705) (lectotype designated by Troupin, *Bull. Jard. Bot. État Bruxelles* 25: 141 (1955)); China, insula crocodilorum, *J. Cuninghame s.n.* (epitype BM [Herb. Sloane vol. 93, fol. 107, mounted top left], designated here).

Menispermum trilobum Thunb., *Syst. Veg.*, ed. 14, 892 (1784). – *Cocculus trilobus* (Thunb.) DC., *Syst. Nat.* 1: 522 (1817). – *Nephroia triloba* (Thunb.) Miers, *Ann. Mag. Nat. Hist.*, ser. 3, 14: 26 (1867), as '*Nephroica*'. – TYPE: Japan, *C.P. Thunberg s.n.* (lectotype UPS-Thunb. [23663, V-139356], designated by Forman, *Fl. Mascar.* 35: 3 (1980); possible isolectotype UPS-Thunb. [23662, V-139355]).

Nephroia sarmentosa Lour., *Fl. Cochinch.* 2: 565 (1790). – *Cocculus nephroia* DC., *Syst. Nat.* 1: 513 (1817), nom. illeg. superfl. – *Menispermum reniforme* Spreng., *Syst. Veg.*, ed. 16, 2: 156 (1825), nom. illeg. superfl. – *Cocculus sarmentosus* (Lour.) Diels in Engler, *Pflanzenr.*, IV, 94: 233 (1910). – TYPE: [Vietnam], Cochinchina, *J. de Loureiro s.n.* (lectotype BM [BM000554339], designated at the first step by Merrill, *Trans. Amer. Philos. Soc.*, ser. 2, 24(2): 156 (1935), and at the second step here; isolectotypes BM [BM000554340] and an unbarcoded fragment mounted on same sheet ex Herb. Miers).

Menispermum ovalifolium Pers., *Syn. Pl. Ench. Bot.* 2: 628 (1807). – *Cocculus ovalifolius* (Pers.) DC., *Syst. Nat.* 1: 526 (1817). – *Nephroia ovalifolius* (Pers.) Miers in Bentham, *Hooker's J. Bot. Kew Gard. Misc.* 3: 259 (1851), as '*Nephroica*'. – TYPE: India, *F. de Lahaie s.n.* (holotype P-JU [IDC 6206: 801/14]).

Cocculus triflorus DC., Syst. Nat. 1: 529 (1817). – *Menispermum triflorum* (DC.) Spreng., Syst. Veg., ed. 16, 2: 157 (1825). – *Hypserpa triflora* (DC.) Miers, Ann. Mag. Nat. Hist., ser. 3, 14: 365 (1864). – TYPE: Java, *P. Commerson s.n.*, Java (holotype P n.v.).

Cocculus hexagynus Colebr., Trans. Linn. Soc. London 13: 63 (1821). – *Menispermum hexagynum* (Colebr.) Roxb., Fl. Ind. 3: 816 (1832). – *Nephroia hexagyna* (Colebr.) Miers, Ann. Mag. Nat. Hist., ser. 3, 14: 26 (1867), as ‘*Nephroica*’. – TYPE: [Unpublished illustration] Icones Roxburghianae 2560 (lectotype K, designated by Forman, Kew Bull. 15: 480 (1962)).

Cocculus ovalifolius Blume, Bijdr. 25 (1825), nom. illeg. non (Pers.) DC. (1817). – *Menispermum ovalifolium* Spreng., Syst. Veg. 4(2, Curr. Post.): 143 (1827), nom. illeg. non Pers. (1807). – *Cocculus umbellatus* Steud., Nomencl., ed. 2, 1: 392 (1840). – TYPE: [Indonesia], Java, *C.L. Blume 1045* (lectotype L [L.1750489], designated here; isoelectotype L [L.1750490]).

Cocculus ferrandianus Gaudich., Voy. Uranie, Bot. 477, t. 101 (1830). – *Nephroia ferrandiana* (Gaudich.) A.Gray, U.S. Expl. Exped., Phan. 15: 39 (1854), as ‘*Nephroica*’. – *Cebatha ferrandiana* (Gaudich.) Kuntze, Revis. Gen. Pl. 1: 9 (1891). – TYPE: ‘Sandwich Is.’ [Hawaii], *C. Gaudichaud-Beaupré s.n.* (holotype P [P00639262]).

Cocculus cynanchoides C.Presl, Reliq. Haenk. 2: 79 (1835). – *Nephroia cynanchoides* (C.Presl) Miers in Benth., Hooker’s J. Bot. Kew Gard. Misc. 3: 259 (1851), as ‘*Nephroica*’. – TYPE: Philippines, Luzon, *T.P.X. Haenke s.n.* (lectotype PR [sheet no. 360899], designated here; isoelectotypes BM [BM000554341], HAL [HAL0117504], PRC [PRC450497, PRC450498]).

Cocculus diantherus Hook. & Arn., Bot. Beechey Voy. 167 (1833). – TYPE: China, Macao, ‘Beechey’s Voyage’, *Anon. s.n.* (holotype K [K000633680]).

Nephroia pubinervis Miers in Benth., Hooker’s J. Bot. Kew Gard. Misc. 3: 259 (1851). – TYPE: [China], Hong Kong, *J.G. Champion s.n.* (lectotype K [K000644679], designated by Forman, Kew Bull. 15: 480 (1962)).

Cocculus mollis Wall. ex Hook.f. & Thomson, Fl. Ind. 193 (1855). – *Nephroia mollis* (Wall. ex Hook.f. & Thomson) Miers, Ann. Mag. Nat. Hist., ser. 3, 14: 26 (1867), as ‘*Nephroica*’. – *Cebatha mollis* (Wall. ex Hook.f. & Thomson) Kuntze, Revis. Gen. Pl. 1: 9 (1891). – *Cocculus orbiculatus* (L.) DC. var. *mollis* (Wall. ex Hook.f. & Thomson) H.Hara, Bull. Univ. Mus. Univ. Tokyo 2: 35 (1971). – TYPE: Nepal, 1821, *N. Wallich s.n.* [EIC 4973] (lectotype K-W [K001104363], designated at the first step by Forman, Kew Bull. 15: 480 (1962), and at the second step here; isoelectotypes BM [BM000554332, BM000554333], E [E00438514, E00438515], GZU [GZU000273981], K [K000644671, K000644672], MEL [MEL2401037, MEL2401038], US [US00345355]).

Cocculus dichopetalus Turcz., Bull. Soc. Nat. Moscou 27(4): 280 (1855). – TYPE: Japan or Java, *P.F.W. Goering 534* (holotype KW [KW001000858]).

Cocculus cuneatus Benth., J. Proc. Linn. Soc., Bot. 5(Suppl. 2): 50 (1861). – TYPE: Formosa [Taiwan], *C. Wilford s.n.* (lectotype K [K000644678], designated by Forman, Kew Bull. 15: 480 (1962)).

Nephroia cuneifolia Miers, Contr. Bot. 3: 266 (1871), as ‘*Nephroica*’. – *Cebatha cuneifolia* (Miers) Kuntze, Revis. Gen. Pl. 1: 9 (1891). – TYPE: W. coast of Formosa [Taiwan], June 1858, *C. Wilford 526* (lectotype K [K000644677], designated by Forman, Kew Bull. 15: 481 (1962); isolectotype BM [BM000554331]).

Nephroia dilatata Miers, Contr. Bot. 3: 264 (1871), as ‘*Nephroica*’. – TYPE: China, Kianang, *G. Staunton s.n.* (lectotype BM [BM000554329], designated by Forman, Kew Bull. 15: 481 (1962); isolectotype BM [a packet of a few endocarps mounted on same sheet as lectotype]).

Holopeira lonchophylla Miers, Contr. Bot. 3: 274 (1871). – *Cocculus lonchophyllus* (Miers) Hillebr., Fl. Hawaiian Isl. 8 (1888). – *Cebatha lonchophylla* (Miers) Kuntze, Revis. Gen. Pl. 1: 9 (1891). – TYPE: [Hawaiian Is.], *Anon. 135* [leg. Hillebrand] (lectotype K [K000644669], designated here; isolectotype K [K000644667]).

Holopeira fecunda Miers, Contr. Bot. 3: 275 (1871). – TYPE: Cult. Hort. Kew, *Anon. s.n.* (holotype BM [BM000554328]).

Nephroia caudata Miers, Contr. Bot. 3: 263 (1871), as ‘*Nephroica*’. – TYPE: Japan, Nagasaki, June 1862, *R. Oldham 29* [field no. 231] (holotype K [K000644681]).

Nephroia pycnantha Miers, Contr. Bot. 3: 268 (1871), as ‘*Nephroica*’. – TYPE: China, Macao, August 1830, *G.H. Vachell 242* (lectotype CGE [CGE00046360], designated here; isolectotype BM [BM000554330]).

Cocculus integer Hillebr., Fl. Hawaii Is. 7 (1888). – *Cebatha integra* (Hillebr.) Kuntze, Revis. Gen. Pl. 1: 9 (1891). – TYPE: Hawaii, Lanai on the highest ridge (not traced).

Cocculus virgatus Hillebr., Fl. Hawaii Is. 8 (1888). – *Cebatha virgata* (Hillebr.) Kuntze, Revis. Gen. Pl. 1: 9 (1891). – TYPE: Hawaiian Is., Lanai, July 1870, *W. Hillebrand s.n.* (lectotype BM [BM000554345], designated here; possible isolectotypes MEL [MEL587721], US [US00345354]).

Limacia kunstleri King, J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 58: 383 (1889). – TYPE: [Singapore], 1880, *King’s Collector 70* (lectotype K [K000644670], designated here).

Cocculus lenissimus Gagnep., Bull. Soc. Bot. France 55: 36 (1908). – TYPE: China, Yunnan, bois de Ki-chan versant nord-est, près de Ta-pin-tze, 16 May 1889, *J.-M. Delavay* 4359 (lectotype P [P00744939], designated here; isolectotypes K [K000644676], MPU [MPU026882], NY [NY00320546, NY00803878, NY00803879], P [P00744940, P00744941]).

Nephroia elegans Ridl., J. Straits Branch Roy. Asiat. Soc. 54: 15 (1910), as '*Nephroica*'. – *Cocculus elegans* (Ridl.) Ridl., Fl. Malay Penins. 1: 111 (1922). – TYPE: [Peninsular Malaysia], Tringganu, Cherating, 25 August 1889, *H.N. Ridley s.n.* (lectotype SING [SING0067394], designated here).

Cocculus sarmentosus (Lour.) Diels var. *stenophyllus* Merr., Philipp. J. Sci. 13: 10 (1918). – TYPE: Philippines, Luzon, Prov. Ilocos Norte, Burgos, February–March 1917, *M. Ramos Bur. Sci.* 27231 (lectotype K [K000644665], designated here; isolectotypes BM, NY [NY00320549], P [P00744942]).

Cocculus sarmentosus (Lour.) Diels var. *pauciflorus* Wu, Bot. Jahrb. Syst. 71: 173 (1940). – TYPE: China, Kwangsi, Dai-Ming-Shan, 6 August 1933, *S.S. Sin* 25306 (B n.v.).

Cocculus mokiangensis W.Y.Lien, Acta Phytotax. Sin. 13(1): 42 (1975). – TYPE: China, Yunnan, Black River, 30 July 1960, *P.K. Hsiao et al.* 342 (not traced).

Cocculus sarmentosus (Lour.) Diels var. *linearis* Yamam., Trans. Nat. Hist. Soc. Taiwan 34: 200 (1943). – TYPE: not traced.

Notes. As Forman (1968) noted, the Plukenet illustration on which *Menispermum orbiculatum* L. is typified is scarcely interpretable, but there is a corresponding specimen made by Cuninghame [or Cunningham] on the 'isle of the crocodiles' [Matsu islands off the Fujian coast of southern China] in the Sloane Herbarium (the specimen was not cited by Linnaeus). Therefore, this specimen is here designated epitype to support the lectotype that is the Plukenet illustration.

9. *Pycnarrhena* Miers ex Hook.f. & Thomson, Fl. Ind. 206 (1855), nom. cons. prop. (Turner, 2022). – TYPE: *Pycnarrhena pleniflora* Miers ex Hook.f. & Thomson.

Antitaxis Miers, Ann. Mag. Nat. Hist., ser. 2, 7: 37 (1851), nom. rej. prop. – TYPE: *Antitaxis fasciculata* Miers (= *Pycnarrhena fasciculata* (Miers) Diels).

9.1 *Pycnarrhena fasciculata* (Miers) Diels in Engler, Pflanzenr., IV, 94: 50 (1910). – *Antitaxis fasciculata* Miers, Contr. Bot. 3: 356 (1871). – TYPE: [Peninsular Malaysia], Malacca, *W. Griffith s.n.* (lectotype K [K000644555], designated by Forman, Kew.

Bull. 26: 408 (1972); isoelectotypes B [B 10 0294333 in part], BM [BM000554103], K [K000644556].

10. *Stephania* Lour., Fl. Cochinch. 2: 608 (1790). – TYPE: *Stephania rotunda* Lour. (lectotype, designated by Phillips, Gen. S. African Fl. Pl., ed. 2, 335 (1951)).

10.1 *Stephania capitata* (Blume) Spreng., Syst. Veg. ed. 16, 4(2, Cur. Post.): 316 (1827). – *Clypea capitata* Blume, Bijdr. Fl. Ned. Ind. 28 (1825). – TYPE: [Indonesia], Java, Mt Salak, C.L. Blume s.n. (lectotype L [L0038521], designated by Forman, Kew Bull. 11: 46 (1956)). (Fig. 1A–C)

Clypea acuminatissima Blume, Bijdr. Fl. Ned. Ind. 28 (1825). – *Stephania acuminata* Spreng., Syst. Veg., ed. 16, 4(2, Cur. Post.): 316 (1827), nom. illeg. superfl. – *Stephania acuminatissima* (Blume) Walp., Repert. Bot. Syst. 1: 96 (1842). – TYPE: [Indonesia], Java, Boerangrang, C.L. Blume 1417 (lectotype L [L0038522], designated by Diels in Engler, Pflanzenz., IV, 94: 282 (1910); isoelectotype L [L0038523]).

Stephania obvia Miers, Contrib. Bot. 3: 226 (1871). – TYPE: [Indonesia], Java, *T. Horsfield 684* (lectotype K [K001419201], designated by Forman, Kew Bull. 11: 46 (1956)).

Stephania longifolia Becc., Malesia 1: 156 (1877). – TYPE: Borneo [Malaysia], Sarawak, [near Kuching, ‘Gunon Scunjet’], *O. Beccari P.B. 1054* (holotype FI [FI007614 (Erb. Coll. Becc. 687 & 687A) – a single specimen over 2 sheets]).

Stephania truncata Yamam., J. Soc. Trop. Agric. 16: 142 (1944). – TYPE: [Malaysia], Sarawak, Kuching, 10 July or August 1938, *N. Hanada s.n.* (lectotype US [US00385558], designated here).

Notes. Diels (1910: 282) could be taken as lectotypifying *Clypea capitata* to a specimen from Parang, but this location is not given in the protologue, so I accept Forman’s typification here.

Although Diels (1910) did not state in which herbarium the type specimen of *Clypea acuminatissima* was located, the sheet in Leiden is the only one found that has both Blume’s number and locality, as given by Diels, on original labels, and is so accepted as the lectotype here.

11. *Tinomiscium* Miers ex Hook.f. & Thomson, Fl. Ind. 205 (1855). – TYPE: *Tinomiscium petiolare* Hook.f. & Thomson.

11.1 *Tinomiscium petiolare* Miers ex Hook.f. & Thomson, Fl. Ind. 205 (1855). – TYPE: [Peninsular Malaysia], Penang, *G. Porter s.n.* [EIC 4964] (lectotype K-W [K001104339], designated by Diels in Engler (ed.), Pflanzenr., IV, 94: 119 (1910)).

Tinomiscium phytocrenoides Kurz ex Teijsm. & Binn., Natuurk. Tijdschr. Ned.-Indië 27: 36 (1864). – TYPE: [Indonesia], W. Sumatra, Priaman, *H. Diepenhorst s.n.* (not traced).

Tinomiscium pyrrhobotryum Miq., Ann. Mus. Bot. Lugduno-Batavi 4: 81 (1868). – TYPE: [Indonesia], Java, *A. Zippelius s.n.* (lectotype L [L.1743066], designated here; possible isoelectotypes K [K000644609], L [L.1743064, L.1743065]).

Tinomiscium javanicum Miers, Contr. Bot. 3: 45 (1871). – TYPE: [Indonesia], Java, *H. Zollinger 745* (lectotype G [G00392477], designated at the first step by Diels in Engler (ed.), Pflanzenr., IV, 94: 119 (1910), and at the second step here; isoelectotypes BM [BM000554188], G [G00392478]).

Tinomiscium elasticum Becc., Malesia 1: 141 (1877). – TYPE: [Indonesia], New Guinea, Ramoi, 6 June 1872, *O. Beccari P.P. 293* (holotype FI [FI007623; Erb. Coll. Becc. 647A, 647B, 647C, – a single specimen over 3 sheets]; isotype B [B 10 0294293] fragment).

Tinomiscium tonkinense Gagnep., Bull. Soc. Bot. France 55: 43 (1908). – TYPE: [Vietnam] Tonkin, Lat Son, in rupib. Quèn Bê Can, 13 May 1887, *H.F. Bon 3393* (lectotype P [P00744862], designated at the first step by Diels in Engler (ed.), Pflanzenr., IV, 94: 118 (1910), and at the second step here; isoelectotypes B [B 10 0294290], K [K000644610, K000644611], P [P00744861]).

Tinomiscium micranthum Diels in Engler, Pflanzenr., IV, 94: 119 (1910). – TYPE: India, Assam, Rajah Carrie, 13 April 1895, *G. Watt 11267* (holotype CAL [CAL0000004761]).

Tinomiscium philippinense Diels in Engler, Pflanzenr., IV, 94: 116 (1910). – TYPE: Philippines, Luzon, *Alberto 9* (holotype B n.v.).

Tinomiscium molle Diels, Philipp. J. Sci., C 8: 157 (1913). – TYPE: Philippines, Luzon, Prov. Nueva Viscaya, Dupax, March–April 1912, *R.C. McGregor Bur. Sci. 11359* (lectotype B [B 10 0294291], designated here; isoelectotypes B [B 10 0294292], BM [BM000554186], K [K000644602], P [P00744863], US [US00103954]).

Tinomiscium nicobaricum N.P.Balacr., New Botanist, Int. Quart. J. Pl. Sci. Res. 7: 7 (1982 [‘1980’]). – TYPE: India, Nicobar Islands, South Nicobars, Great Nicobar, 25 km on East-West Road near Galathea River, 16 June 1977, *N.P. Balakrishnan BSI (ANC) 5787* (lectotype CAL [CAL0000004760] excluding the leaf-bearing shoot on the sheet (= *Fibraurea tinctoria*), designated here; isoelectotypes L [L0038540], PBL n.v., also excluding foliar material).

Notes. As pointed out by Forman (1985), the original material of *Tinomiscium nicobaricum* represents a mixture of male inflorescences of *Tinomiscium petiolare* and foliage of *Fibraurea tinctoria*. Balakrishnan's name is here lectotypified to the *Tinomiscium* element to fix the name to the fertile material.

12. *Tinospora* Miers, Ann. Mag. Nat. Hist., ser. 2, 7: 35, 38 (1851), nom. cons. – TYPE: *Cocculus cordifolius* (Willd.) DC. (= *Tinospora cordifolia* (Willd.) Hook.f. & Thomson).

Campylus Lour., Fl. Cochinch. 94, 113 (1790), nom. rej. – TYPE: *Campylus sinensis* Lour. (= *Tinospora sinensis* (Lour.) Merr.).

Hypsipodes Miq., Ann. Mus. Bot. Lugduno-Batavi 4: 82 (1868). – TYPE: *Hypsipodes subcordatus* Miq. (= *Tinospora subcordata* (Miq.) Diels).

12.1 *Tinospora krispura* I.M.Turner, Eur. J. Taxon. 900: 183, f. 2, 3 (2023). – TYPE: Christmas Island, 3 August 1981, *D.A. Powell & H'ng Kim Chey 263E* (holotype K [K001129962, K001129963] – a single specimen over 2 sheets).

12.2 *Tinospora macrocarpa* Diels in Engler, Pflanzenr., IV, 94: 141 (1910). – TYPE: [Peninsular Malaysia], Malacca, 7 June 1868, *A.C. Maingay 3133* [Kew distribution no. 111] (holotype K [K000644584]; possible isotype K [K000644583]).

12.3 *Tinospora singapura* I.M.Turner, Eur. J. Taxon. 900: 188, f. 5–7 (2023). – TYPE: Singapore, Jalan Kampong Chantek to Bukit Tinggi Road, 15 September 2016, *H.K. Lua & R. Lim SING2016-152* (holotype SING [SING0253451, SING0253452] – a single specimen over 2 sheets).

Discussion

Forman (1986) provided the last regional summary of the Menispermaceae. The taxonomic treatment he presented has stood the test of time fairly well. Molecular phylogenetic analysis has led to one change of genus for the Singapore species with the recognition of *Nephroia*. Two genera (*Pycnarrhena* and *Tinospora*) required, in my opinion, some revision relative to the Singapore taxa, largely because of the greater number of specimens becoming available.

The main problem remains the lack of sufficient material to describe both male and female flowers and mature fruits for every taxon. If undescribed species of Menispermaceae can still be found in Singapore, it seems likely there are many more to discover in the region.

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References

- Bentham, G. (1851). *Flora Hongkongensis: An enumeration of the plants collected in the Island of Hong-Kong, by Capt. J. G. Champion, 95th Reg., the determinations revised and the new species described. Hooker's J. Bot. Kew Gard. Misc.* 3: 255–264.
- Diels, L. (1910). Menispermaceae. In: Engler, H.G.A. (ed.) *Das Pflanzenreich*, IV, 94, heft 46, pp. 1–345. Leipzig: W. Engelmann.
- Forman, L.L. (1968). Menispermaceae of Malesia: V. Tribe Cocculeae Hook.f. & Thoms. *Kew Bull.* 22: 349–374.
- Forman, L.L. (1985). A revision of tribe Fibraureae (Menispermaceae) in Asia: The Menispermaceae of Malesia and adjacent areas XIII. *Kew Bull.* 49: 539–551.
- Forman, L.L. (1986). Menispermaceae. In: Van Steenis, C.G.G.J. & De Wilde, W.J.J.O. (eds) *Flora Malesiana*, ser. 1, vol. 10(2), pp. 157–253. Dordrecht: Kluwer Academic Publishers.
- Forman, L.L. (1995). Menispermaceae. In: Dassanayake, M.D. (ed.) *A Revised Handbook to the Flora of Ceylon* 9, pp. 301–319. New Delhi: Amerind Publishing Co.
- Gray, A. (1854). *United States Exploring Expedition. Vol. XV. Botany. Phanerogamia.* Philadelphia: C. Sherman.
- Hooker, J.D. & Thomson, T. (1855). *Flora Indica.* London: W. Pamplin.
- Lian, L., Ortiz, R.D.C., Jabbour, F., Zhang, C.-F., Xiang, X.-G., Erst, A.S., Gao, T.-G., Chen, Z.-D. & Wang, W. (2020). Phylogeny and biogeography of Pachygoneae (Menispermaceae), with consideration of the boreotropical flora hypothesis and resurrection of the genera *Cebatha* and *Nephroia*. *Molec. Phylogenet. Evol.* 148: 106825.
- Lim, R.C.J., Lindsay, S., Middleton, D.J., Ho, B.C., Leong, P.K.F., Niisalo, M.A., Van Welzen, P.C., Esser, H.-J., Ganesan, S.K., Lua, H.K. et al. (2018). New records and rediscoveries of plants in Singapore. *Gard. Bull. Singapore* 70: 67–90.
- Miers, J. (1871). *Contributions to Botany*, vol. 3. London: Williams & Norgate.
- Turner, I.M. (2022). (2898) Proposal to conserve the name *Pycnarrhea* against *Antitaxis* (Menispermaceae). *Taxon* 71: 697–698.
- Turner, I.M. (2023). Revision of *Tinospora* (Menispermaceae – Chasmantheroideae – Burasaieae) in Singapore. *Eur. J. Taxon.* 900: 180–193.
- Turner, I.M. & Leong, P.K.F. (2022). *Pycnarrhena* (Menispermaceae), a new generic record for the native flora of Singapore. *Gard. Bull. Singapore* 74: 139–144.