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Additions to Annonaceae in the Flora of Thailand

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ABSTRACT

Work toward completion of the Annonaceae treatment for the Flora of Thailand revealed 18 species previously unrecorded for the country, six of them in the genus *Fissistigma*. In addition, several species previously placed in synonymy are re-instated, for which we propose three new combinations in the genera *Mitrella*, *Monoon*, and *Sphaerocoryne*.

KEYWORDS: *Desmos*, *Maasia*, *Mezzettia*, *Phaeanthus*, *Popowia*, *Pseuduvaria*, *Xylopia*

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INTRODUCTION

The Annonaceae are a pantropical plant family comprising approximately 2,500 species in 110 genera. These taxa are about evenly divided among Africa, Asia, and the Americas, with all but eight genera restricted to one of the three areas. Thailand, with its diverse tropical forest habitats, harbors over one-fourth of the known Asian species diversity and all but five of the 43 indigenous Asian genera.

In 1925, Craib enumerated 28 genera and 114 species occurring in the country; the Annonaceae volume for the Flora of Thailand currently in preparation will treat 39 genera and about 300 species. The landmark publication of Volume 1 of Forest Trees of Southern Thailand (Gardner *et al.*, 2015), provided a major update to our knowledge of the family in Thailand. Since then, new species have been described in *Alphonsea* Hook.f. & Thomson (Turner & Utteridge, 2017, Leeratiwong *et al.*, 2020), *Artabotrys* R.Br. (Chen & Eiadthong, 2020; Photikwan *et al.*, 2021), *Dasymaschalon* (Hook.f. & Thomson) Dalla Torre & Harms (Jongsook *et al.*, 2020), *Meiogyne* Miq. (Johnson *et al.*, 2019),

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Miliusa Lesch. ex A.DC. (Damthongdee & Chaowasku, 2018), *Mitrephora* Hook.f. & Thomson (Damthongdee *et al.*, 2019; Saunders & Chalermglin, 2019), *Polyalthia* Blume (Bunchalee *et al.*, 2019), *Pseuduvaria* Miq. (Yoosukkee *et al.*, 2021), *Trivalvaria* (Miq.) Miq. (Johnson *et al.*, 2021), *Winitia* Chaowasku (Chaowasku *et al.*, 2020), and *Xylopia* L. (Johnson & Murray, 2019); descriptions of new species in several other genera are forthcoming.

In addition to new species, collecting efforts supported by the Forest Herbarium (BKF) and the Flora of Thailand Project have revealed new records for the country and allowed us to resolve taxonomic problems. In this paper, we document 18 new species records of Annonaceae for the Thai flora, and propose three new nomenclatural combinations.

Type information follows Turner (2018), unless otherwise indicated. Types inspected by one or more of the authors, either of the actual sheet or a digital image, are marked with "!".

TAXONOMY

Desmos dunalii (Wall. ex Hook.f. & Thomson) Saff., Bull. Torrey Bot. Club 39: 506. 1912; Ridl., Fl. Malay Penins. 1: 45. 1922; J.Sinclair, Gard. Bull. Singapore 14: 263. 1955; K.W.Ng, Systematics of *Desmos* (Annonaceae) in Thailand, Peninsular Malaysia and Sumatra (M. Phil. Thesis, University of Hong Kong): 66. 2010; I.M.Turner, Gard. Bull. Singapore 64: 399. 2012; Gard. Bull., Singapore 70: 459. 2018.— *Unona dunalii* Wall. ex Hook.f. & Thomson, Fl. Ind.: 131. 1855; Hook.f. & Thomson, Fl. Brit. India 1: 58. 1872; Kurz, Forest Fl. Burma 1: 34. 1877. Type: Malaysia, Penang, s.d., *Porter s.n.* [*Wallich Cat. 6425*] (lectotype **K** [K000691358!], designated by Turner [2011]; isolectotypes **BR! CAL**, **GZU**, **K**, **MO!**).

Thailand.— PENINSULAR: Yala [Bannang Sata District, Po Yo village, 500 m, 15 Feb. 2020, *Leeratiwong 20-1520* (**PSU**); ibid., 1 Aug. 2020, *Leeratiwong 20-1628* (**PSU**)].

Distribution.— Peninsular Malaysia (type), Borneo.

Ecology.— Tropical rainforest; 500 m alt. Flowering: August; fruiting: February, August.

Vernacular.— Sai yut tai (สายหยุดใต้)(General).

Notes.— Although *Desmos dunalii* is widespread in Peninsular Malaysia (Sinclair, 1955) and Borneo (Turner, 2012), the collections cited above provide the first documentation of the species for Thailand. The indistinct secondary venation coupled with reticulate tertiary venation of the leaves readily distinguishes *D. dunalii* from all other Thai *Desmos* species except *D. dinhensis* (Pierre ex Finet & Gagnep.) Merr., but the latter has pedicels 45–90 mm long rather than only 6.5–16 mm long.

Fissistigma chrysosericeum (Finet & Gagnep.) Merr., Philipp. J. Sci. 15: 131. 1919.— *Melodorum chrysosericeum* Finet & Gagnep., Bull. Soc. Bot. France 54: 88–89, pl. III fig. C. 1907. Type: Laos, forêts de Pou-nang, 1866–1868, *Thorel 2429* (lectotype **P** [P00411150], designated by Turner [2018]; isolectotypes **MPU**, **P**).

Thailand.— NORTH-EASTERN: Bueng Kan [Phu Wua Wildlife Sanctuary, Boongkla District, 15 June 2004, *Wongprasert et al. 049-119* (**BKF** [145511, 145512]).

Distribution.— Laos (type).

Ecology.—Seasonal rain forest; ca 250 m alt. Flowering: June.

Vernacular.— Kluai ma sang mai thong (กล้วยมะสังไหมทอง)(General).

Notes.— The golden-orange appressed hairs on the abaxial surfaces of the leaves are unlike those of any other *Fissistigma* species in Thailand.

Fissistigma fulgens (Hook.f. & Thomson) Merr., Philipp. J. Sci. 15: 131. 1919.— *Melodorum fulgens* Hook.f. & Thomson, Fl. Ind.: 120. 1855. Type: Malaysia, Malacca, s.d., *Griffith s.n.* (lectotype **K** [K000574633!], designated by Turner [2011]).

— *Magnolia ferruginea* P.Parm., Bull. Sci. France Belgique 27: 203, 263. 1896, **nom. illeg.**, non *M. ferruginea* Hort. ex W.Watson, 1889. Type: "India", without further details, *Ralph s.n.* (holotype **P** [P01964102!]).

— *Melodorum parviflorum* var. *angustifolium* Boerl., Icon. Bogor. 1: 134. 1899. Type: Borneo, Sarawak, near Kuching, 17 Oct. 1894, *Haviland & Hose 416L* (holotype **BO** [sheet no. BO-1349056], fide Turner [2018]).

Thailand.— PENINSULAR: Narathiwat [Chanae District, Mo Tae Mt, 21 Apr. 2020, *Leeratiwong 20-1532* (**PSU**), ibid., 26 Apr. 2020, *Leeratiwong 20-1537* (**PSU**)].

Distribution.— Peninsular Malaysia (type), Singapore, Borneo.

Ecology.— Edges of tropical rainforest; 350 m alt. Flowering: April; fruiting: April to May.

Vernacular.— Nom maeo pa (นมแมวป่า) (Narathiwat).

Note.— *Fissistigma fulgens* differs from other Thai *Fissistigma* species in the more widely spaced, arcuate secondary veins, as well as the petiole constricted at the apex where it meets the leaf blade.

Fissistigma glaucescens (Hance) Merr., Philipp. J. Sci. 15: 132. 1919; P.T.Li & M.G.Gilbert, Fl. China 19: 706. 2011.— *Melodorum glaucescens* Hance, J. Bot. 19: 112. 1881. Type: China, Hong Kong, Mt Victoria Peak, Aug. 1879, *Ford s.n.* [= *Herb. Hance 21141*] (holotype **BM** [BM000547054]).

Thailand.— NORTHERN: Nan [Doi Phu Kha National Park, Sapan Waterfall, Bo Kleua, 19°12′N, 101°12′E, 850 m, 6 July 2001, *Srisanga 1945* (**QBG**)]; NORTH-EASTERN: Nong Khai [Dongsichompu Forest, 28 Apr. 1969, *Bunchuay 1801* (**BKF**, **L**)].

Distribution.— China (type from Hong Kong), Vietnam, Laos.

Ecology.— Evergreen forest. Flowering: July; fruiting: April.

Vernacular.—Tin tang khruea (ตีนตั่งเครือ)(Nan).

Notes.— The glaucous emarginate leaves of *Fissistigma glaucescens* are distinctive among Thai *Fissistigma* species. *Fissistigma obtusifolium* Merr., placed as a taxonomic synonym of *F. glaucescens* by Turner (2018), has non-glaucous leaves that are much larger than those of *F. glaucescens* s.s.

Fissistigma kingii (Boerl.) Burkill, Bull. Misc. Inform. Kew 1935: 317. 1935; J.Sinclair, Gard. Bull. Singapore 14: 358. 1955.— *Melodorum parviflorum* Scheff. in King, J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 61(1): 107. 1892, pro parte as to Peninsular Malaysian material.— *M. kingii* Boerl., Icon. Bogor. 1: 134. 1899. Type: Malaysia, Perak, Mar. 1883, *Kunstler* [*King's Collector*] *4070* (lectotype **BO**, designated by Turner [2011]; isolectotypes **CAL**, **K**).

Thailand.— PENINSULAR: Narathiwat [Sungei Kolok, Nikom Waeng, 5°50′N, 101°50′E, 300–500 m, 4 Mar. 1974, *Larsen & Larsen 32950* (**BKF**); Bala-Hala, 28 Sept. 1997, *Niyomdham 5186* (**BKF**); ibid., 100 m, 21 Aug. 1998, *Niyomdham & Puudjaa 5558* (**BKF**)].

Distribution.— Peninsular Malaysia (type), Borneo.

Ecology.— Evergreen forest; 100–500 m alt. Flowering: August–September; fruiting: March (immature).

Vernacular.— Kluai ma sang nara (กล้วยมะสังนรา) (Narathiwat).

Notes.— The leaves in dried condition often have a pale greenish yellow upper surface that contrasts sharply with the darker lower surface, which is covered by a persistent indument. The types of taxonomic synonyms of this species accepted by Turner (2018) are not listed because the type material was collected outside of Thailand.

Fissistigma lanuginosum (Wall. ex Hook.f. & Thomson) Merr., Philipp. Journ. Sc. 15: 132. 1919; J.Sinclair, Gard. Bull. Singapore 14: 357. 1955; I.M.Turner, Gard. Bull. Singapore 70: 479. 2018.— *Melodorum lanuginosum* Wall. ex Hook.f. & Thomson, Fl. Ind.: 117. 1855. Type: Malaysia, Penang, Dec. 1823, *Porter s.n.* [*Wallich Cat. 6454A*] (lectotype **K-W** [K001123943!], first step designated by Sinclair, Gard. Bull. Singapore 14: 357, 1955, second step designated by Turner, Gard. Bull. Singapore 70: 479, 2018; possible isolectotype **K** [K000574624]).

Thailand.— PENINSULAR: Narathiwat [Chanae District, Mo Tae Mt, 26 Jan. 2021, *Leeratiwong 21-1695* (**PSU**)].

Distribution.— Peninsular Malaysia (type), Singapore.

Ecology.— Tropical rainforest; ca 350 m alt. Flowering: January; fruiting January.

Vernacular.— Yan lueat mo tae (ย่านเลือดเมาะแต) (Narathiwat).

Note.— *Fissistigma lanuginosum* is most similar to *F. ovoideum* (King) Merr. but has larger flowers and globose to pyriform monocarps that are subsessile or short-stipitate.

Fissistigma scandens Griff., Not. Pl. Asiat. 4: 706. 1854. Type: Myanmar, Mergui, s.d., *Griffith 790* (lectotype **K** [K000574649!], designated by Turner [2015]; isolectotype **K!**).

Thailand.— PENINSULAR: Ranong [Banna, Kapur, 13 Dec. 1975, *Indrapong 96* (**BKF**)], Nakhon Si Thammarat [Phub Chang ca 400 m, 28 July 1951, *Smitinand 768* (**BKF**)], Trang [Khao Chong, 150 m, 13 Aug. 1975, *Maxwell 75-826* (**BK**); Khao Chang, 27 Jan. 1969, *Sarmrong 27* (**BKF**)].

Distribution.— Myanmar (type).

Ecology.— Evergreen forest, one collection from along a river; 150–400 m alt. Flowering: January, July, August, and December; fruiting: July and December.

Vernacular.— Kluai ma sang khao chong (กล้วยมะสังเขาช่อง)(General).

Notes.— The specimens cited above, all from peninsular Thailand, were matched with the type material of *Fissistigma scandens* Griff. The species is poorly known, despite being the type of the genus *Fissistigma*. *Fissistigma scandens* is similar to *F. affine* (Craib) Kessler *et al.* but distinguishable by the longer pedicels and outer petals, and by the obovoid versus globose monocarps. *Fissistigma scandens* is confined to Peninsular Thailand, while *F. affine* occurs in the northern part of the country.

Maasia hypoleuca (Hook.f. & Thomson) Mols, Kessler & Rogstad in Mols *et al.*, Syst. Bot. 33: 493. 2008; I.M.Turner & Utteridge, Eur. J. Taxon. 183: 3. 2016.— *Polyalthia hypoleuca* Hook.f. & Thomson, Fl. Brit. India 1: 63. 1872, pro parte florif., non *Guatteria hypoleuca* Miq., Fl. Ned. Ind., Eerste Bijv. 381. 1861 [‘1860’]. Type: Singapore, Sept. 1867, *Maingay 1516A* [Kew Distrib. no. 50] (lectotype **K** [K000691444], designated by Rogstad [1989]).

Thailand.— PENINSULAR: Nakhon Si Thammarat [Thung Song, Yong Falls, 8 Oct. 1972, *Smitinand 11762* (**BKF**)]; Narathiwat [Waeng, Bala-Hala, 100 m, 23 July 2003, *Puudjaa 1185* (**BKF**)].

Distribution.— Peninsular Thailand, Peninsular Malaysia, Singapore (type), Sumatra, Bangka, and Borneo.

Ecology.— Lowland evergreen forest and peat-swamp forest; to 600 m alt. Fruiting: July, October.

Vernacular.— Sang yu khao (สังหยูขาว)(Nakhon Si Thammarat).

Note.— *Maasia hypoleuca* can be distinguished from the more widespread *M. glauca* (Hassk.) Mols, Kessler & Rogstad by the smaller leaves, shorter pedicels, and ellipsoid rather than globose monocarps on shorter stipes. Rogstad (1989) gives the flowering period as March–May elsewhere in the distribution.

Mezzettia herveyana Oliv., Hooker’s Icon. Pl. 16: t. 1560. 1887; King, J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 61(1): 129. 1892; Ridl., Fl. Malay Penins. 1: 101. 1922; J.Sinclair, Gard. Bull Singapore 14: 328. 1955. Type: Malaysia, Malacca, Aug. 1886, *Hervey s.n.* (holotype **K** [K000574875]; isotype **CAL**).

— *Mezzettia curtisii* King, J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 61(1): 129. 1892; Ridl., Fl. Malay. Penins. 1: 101. 1922; J.Sinclair, Gard. Bull. Singapore 14: 330. 1955; S.P.Mathew & D.Mitra, The Indian Forester 117(12): 1077. 1991. Type: Malaysia, Penang, Government Hill, Mar. 1890, *Curtis 2266* (lectotype **CAL**, designated by van der Heijden & Kessler [1990]; isotypes **BM**, **K!**, **SING**).

Thailand.— PENINSULAR: Songkhla [Nathawi District, Khao Nam Khang, ca 200 m, 4 Mar. 2005, *Sidisunthorn ST1607* (**BKF**, **K**, **KEP**, **L**, **QBG**)].

Distribution.— Peninsular Malaysia (type).

Ecology.— Subcanopy of evergreen forest with emergent Dipterocarpaceae, ca 200 m alt. Flowering: March.

Vernacular.— Hua tao khao nam khang (หัวเต่าเขาน้ำค้าง)(General).

Notes.— This species was placed in synonymy under *M. parviflora* Becc. by van der Heijden & Kessler (1990), but recent field observations in southern Thailand support recognition of the two as separate species. Gardner *et al.* (2015: 121) listed the plant as “*Mezzettia* species A.” *Mezzettia*

herveyana can be distinguished from *M. parviflora* Becc. by the densely lenticellate twigs, leaf blades with indistinct tertiary venation, sepals connate at base and ca 1.1 mm long versus free and ca 3 mm long, and the outer petals elliptic and ca 4 mm long versus linear to lanceolate and 12–15 mm long. On the other hand, the type of *Mezzetia curtisii* is not distinguishable from the type of *M. herveyana*, and the name is placed in synonymy under the latter.

Mitrella elegans (Wall. ex Hook.f. & Thomson) D.M.Johnson & N.A.Murray, **comb. nov.**— *Melodorum elegans* Wall. ex Hook.f. & Thomson, Fl. Ind.: 122. 1855.— *Fissistigma elegans* (Wall. ex Hook.f. & Thomson) Merr., Philipp. J. Sci. 15: 131. 1919. Type: Malaysia, Penang, 1822, *Anonymous s.n.* [*Wallich Cat. 6474A*] (lectotype **K** [K000574739!], designated by Turner [2011]; isolectotypes **C**, **CAL**, **GZU**, **K**, **K-W!**, **L**, **NY! PH**).

Thailand.— PENINSULAR: Phangnga [Takua Pa District, Khao Lak/Lam Ru National Park, Chang Fah Waterfall, 8°39′N, 98°16′E, 60 m, 12 June 2004, *Gardner & Sidisunthorn ST0724* (**BKF**–3 sheets, **L**)]; Songkhla [Nathawi, Khao Nam Khang National Park, 6 Dec. 2020, *Leeratiwong 20-1629* (**BKF**, **PSU**); Rattaphum District, Khao Luke Lome, 250 m, 16 Sept. 1986, *Maxwell 86-685* (**BKF**, **CMUB**)]; Yala [N: 06°04′23.1″; E: 101°21′01.4″; Bang Lang Dam area, Chulaporn 7, 538 m, 8 Aug. 2002, *Charoenchai, & Phomphuang 301* (**BK** [263163]); Than To, Ban Chulaphon Patthana 7 area, Khao Hin Yok, 6°05′N, 101°21′E, 600 m, 11 Feb. 2004, *Middleton et al. 2969* (**L** [L3729153]); Narathiwat [Sukhirin, Ban PhukhaoThong near Ban Bala Sukhirin Road, 7 June 2004, *Poopath 45* (**BKF**, **L**)].

Malaysia.— Melaka [Bkt. Senggah F. R., 17 June 1966, *Ng FRI 1225* (**KEP**)]; Pahang [Genting Simpah, *Strugnell 12678* (**KEP**); Jerantut, 10 Jan. 1991, *Teo & Remy KL 3998* (**KEP**)]; Selangor [Ulu Langat, 25 Aug.1959, *Gadoh anak Umbai for Millard KL 1698* (**KEP**); Bukit Langgong [Lagong?] F. R., 26 Jan. 1918, *Hamid CF 2474* (**KEP**); Ulu Gombak F. R., 13 Sept. 1960, *Yong KEP 85245* (**KEP**, **L**)].

Ecology.— Open areas of moist evergreen forest, sometimes in disturbed areas; 50–550 m alt. Flowering: June, August–September, December; fruiting: February, December.

Vernacular.— Lam duan thao (ลำดวนเถา) (General).

Notes.— The genus *Mitrella* has not previously been reported for Thailand. *Mitrella* in Peninsular Malaysia has been treated in recent works as a single species, *M. kentii* (Blume) Miq., based on *Unona kentii* Blume from Java. The Thai specimens of *Mitrella* have leaf blades 2.5–3.5 times as long as wide with a dull surface when dried, outer petals 12–19 mm long and ca 3 times longer than the inner petals, and ellipsoid monocarps 8–12 by 6.5–10 mm long. In contrast, *M. kentii* s.s. (based on the description in Turner 2012 from Borneo, except for the leaf surface description) has leaf blades ca twice as long as wide [with a shiny upper surface when dried], outer petals 9–11 mm long and ca twice as long as the inner petals, and monocarps globose and ca 7 mm in diameter. The Thai material matches the type of *Melodorum elegans* Wall. ex Hook.f. & Thomson from Penang rather than the type of *Unona kentii*, and the combination is accordingly proposed here.

Monoon clavigerum (King) Bunchalee, **comb. nov.**— *Polyalthia clavigera* King, J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 61(1): 60. 1892. Type: Peninsular Malaysia, Perak, Waterfall Hill, June 1888, *Wray 2075* (lectotype **K** [K000691553], designated by Turner [2010]; isolectotypes **CAL**, **SING**).

Thailand.— PENINSULAR: Narathiwat [Chanae District, Dusongyo Subdistrict, Mo Tae Mt, 12 May 2020, *Leeratiwong 20-1545* (**PSU**); Waeng, Bala-Hala, 21 Sept. 2006, *Niyomdham & Puudjaa 7806* (**BKF**)].

Distribution.— Peninsular Malaysia (type).

Ecology.— Tropical rainforest; ca 50 m alt. Flowering: May; fruiting: September.

Vernacular.— Kluai ton (กล้วยต้น)(Narathiwat).

Notes.— *Monoon anomalum* (Becc.) B.Xue & R.M.K.Saunders and *M. clavigerum* are treated as distinct species, differing in both floral and fruit characters. In *M. clavigerum*, the flower pedicels are 2–2.2 mm thick, the sepals valvate and 3–4 by 6–8 mm, the outer petals 30–38 by 14–16 mm and elliptic, and the monocarp stipes 14–16 mm long. In *M. anomalum*, the flower pedicels are 1–1.2 mm thick, the sepals are imbricate and 2–3 by 3–4 mm,

the outer petals are 25–30 by 8–10 mm and oblanceolate, and the monocarp stipes are 5–7 mm long.

Monoon harmandii (Pierre) B.Xue & R.M.K.Saunders, Taxon 61: 1031. 2012.— *Unona harmandii* Pierre, Fl. Forest. Cochinch.: t. 24. 1881.— *Polyalthia harmandii* (Pierre) Finet & Gagnep., Bull. Soc. Bot. France 53, Mém. 4: 94. 1906. Type: Vietnam, Cochinchine, Bien Hoa Province, Song Be, Mar. 1873, *Pierre 1365* (lectotype **P** [P00372687], first step designated by Bân [2000], second step designated by Xue *et al.* [2012]; isolectotypes **A**, **K**, **LE**, **P!**).

Thailand.— SOUTH-EASTERN: Rayong [Kachong Falls, 100 m, 6 Dec. 1997, *Chamchumroon s.n.* (**BKF** [147522]); Chanthaburi [planted tree by house, house between Chanthaburi and Khitchakut, 26 Jan. 2003, *Johnson & Chalermglin 2027* (**OWU**); near rubber experiment station E of Khitchakut, 26 Jan. 2003, *Johnson & Chalermglin 2030* (**OWU**); Khao Srabap, 400 m, 6 Jan. 1930, *Kerr 17982* (**BK**); Khao Soi Dao, 400 m, 14 Dec. 1924, *Kerr 9674* (**BK**); Ban Pluang, Khao Kitchakut District, Khao Kitchakut National Park, 12°55′N, 102°13′E, 400 m, 21 Oct. 2001, *Koonkhunthod 156* (**BKF**); Khao Khichakut head quarter, Khao Khichakut National Park, 12°50′N, 102°08′E, 120 m, 14 Apr. 2008, *Phonsena 5941* (**BKF**)]; Khao Soi Dao Wildlife Breeding Centre, Pong Nam Ron, 12°55′12″N, 102°14′30″E, 50 m, 27 Apr. 2002, *Pooma et al. 3261* (**BKF**); Trat [Khao Saming, 29 Mar. 1925, *Haihoc 21* (**BK**); Huay Laeng, 26 Mar. 1965, *Phengnaren 69* (**BKF**)].

Distribution.— Cambodia, Vietnam (type).

Ecology.— Evergreen forest, 50–400 m alt. Flowering: October–April; fruiting: December–April.

Vernacular.— Luang krachuk (เหลืองกระจุก) (General), luang chan (เหลืองจันท์)(General), kra dang nga pa (กระดังงาป่า)(Trat).

Note.— *Monoon harmandii* exhibits the erect petals, bent inner petals, and greenish yellow monocarps of the species formerly placed in the genus *Enicosanthum* Becc. It is the only member of this species group occurring in the South-Eastern Region of Thailand.

Monoon hypogaeum (King) B.Xue & R.M.K.Saunders, Taxon 61(5): 1032. 2012.— *Polyalthia hypogaea* King, J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 61(1): 62. 1892. Type: Malaysia, Perak, Larut, 1881, *Kunstler* [*King's Collector*] *2437* (lectotype **K** [K000691555], designated by Turner [2011]; isolectotype **CAL**).

Thailand.— PENINSULAR: Narathiwat [Bala-Hala, Waeng, 130 m, 22 Sept. 2005, *Niyomdham & Puudjaa 7591* (**BKF**); Sirindhorn Waterfall, Bala-Hala, Waeng, 100 m, 27 Apr. 2006, *Niyomdham & Puudjaa 7662* (**BKF**); natural study trail 500 m, Waeng, 50 m, 15 Aug. 2006, *Niyomdham & Puudjaa 7788* (**BKF**); 15 m south-east from the camp, Hala-Bala Wildlife Sanctuary, Waeng, 5°48.5′N, 101°48.6′E, 22 Jan. 2004, *Promchua 81* (**CMUB**); Sirindhorn Waterfall, Waeng, 11 Feb. 1997, *Puudjaa 347* (**BKF**)].

Distribution.— Peninsular Malaysia (type), Borneo.

Ecology.— Tropical rain forest; 50–150 m alt. Flowering: February–May; fruiting: April–September.

Vernacular.— Pi sae ka yu (ปีแซกายู) (Narathiwat), kluai chamot (กล้วยชะมด)(General).

Note.— The long inflorescence axes, emerging from the trunk and running along the ground, are unique among Thai *Monoon* species.

Phaeanthus intermedius (P.Parm.) I.M.Turner & Veldkamp, Kew Bull. 66: 577. 2011.— *Magnolia intermedia* P.Parm., Bull. Sci. France Belgique 27: 204, 266, 325, Pl. X, fig. 27. 1896. Type: India [probably an error], *Collector unknown* [T.S. Ralph?, see Turner & Veldkamp 2011] *s.n.* (holotype **P** [P01960440!]).

— *Phaeanthus ophthalmicus* (Roxb. ex G.Don) J.Sinclair, Gard. Bull. Singapore 14: 374. 1955, pro parte as to description but not as to type.

— *Phaeanthus nutans* auct. non Hook.f. & Thomson: Mols & Kessler, Blumea 45: 221. 2000.

Thailand.— PENINSULAR: Narathiwat [Sukhirin, Rom Sri, ca 100 m, 15 July 2020, *Leeratiwong 20-1606* (**PSU**); ibid., 20 Nov. 2020, *Leeratiwong 20-1607* (**PSU**)].

Distribution.— Peninsular Malaysia, Singapore, Sumatra, Riau.

Ecology.— Shaded and moist areas, on edges of remnant evergreen forest; ca 100 m alt. Flowering: November; fruiting: July.

Vernacular.— Hua ling bai khon (หัวลิงใบขน) (Peninsular).

Notes.— This species was formerly known by the name *Phaeanthus nutans* Hook.f. & Thomson, an illegitimate name for *P. ophthalmicus* (Roxb. ex G.Don) J.Sinclair. The confused nomenclatural history of this plant was reviewed by Turner & Veldkamp (2011), who concluded that the Peninsular Malaysian species was distinct from the species of Indonesia and the Philippines, to which the name *P. ophthalmicus* should be restricted. The Thai specimens of *P. intermedius* differ from those of Peninsular Malaysia in having rounded to short-apiculate rather than conspicuously apiculate monocarp apices.

Phaeanthus splendens Miq., Ann. Mus. Bot. Lugduno-Batavi 2: 40. 1865; Ridl., Sarawak Mus. J. 1(3): 88. 1913; Mols & Kessler, Blumea 45: 223. 2000; S.Gardner *et al.*, Forest Trees S. Thailand 1: 187. 2015. Type: Borneo, Gunung Sakoembang, *Korthals s.n.* (lectotype **L** [L0045058], designated by Mols & Kessler [2000]; isolectotypes **A**, **B**, **L** [L0045059], **U**).

— *Phaeanthus crassipetalus* Becc., Nuovo Giorn. Bot. Ital. 3: 191. 1871; Scheff., Natuurk. Tijdschr. Ned.-Indie 34: 85. 1874; Ridl., Sarawak Mus. J. 1(3): 88. 1913; J.Sinclair, Gard. Bull., Singapore 14: 376. 1955; Kochummen in Whitmore, Tree Fl. Malaya 1: 84. 1972. Type: Borneo, Sarawak, *Beccari P.B. 2508* (holotype **FI-B** [FI007566]; isotypes **A**, **B**, **BO**, **K**, **M**, **P**, **S**).

— *Phaeanthus lucidus* Oliv., Hooker's Icon. Pl. t. 1561. 1887; King, J. Asiat. Soc. Bengal., Pt. 2, Nat. Hist. 61(1): 121. 1892; Ridl., Fl. Malay Penins. 1: 96. 1922.— *Miliusa lucida* (Oliv.) Finet & Gagnep., Bull. Soc. Bot. France 53, Mém. 4: 151. 1906. Type: Peninsular Malaysia, Penang, Waterfall, May 1866, *Curtis 839* (lectotype **K** [K000574614], designated by Mols & Kessler [2000]; isolectotypes **K**, **P**, **SING**).

Thailand.— PENINSULAR: Songkhla [Khao Nam Khang National Park, 17 June 2021, *Leeratiwong 21-1736* (**BKF**, **PSU**); Narathiwat [Hala Bala Wildlife Sanctuary, ca 150 m, 9 Nov. 2019, *Leeratiwong 19-1533* (**PSU**), ibid., 5 Jan. 2020, *Leeratiwong 20-1531* (**BKF**, **PSU**); Chanae District, Du Song Yo, ca 150 m, 2 May 2020, *Leeratiwong 20-1608* (**PSU**)].

Distribution.— Peninsular Malaysia, Singapore, Sumatra, Borneo (type).

Ecology.— Shaded and moist areas, on edges of evergreen forest; ca 150 m alt. Flowering: September–December; fruiting: November–February.

Vernacular.— Hua ling (หัวลิง) (Peninsular).

Notes.— Previous reports of this species from Thailand (Chalermglin, 2001; Gardner *et al.*, 2015) were not documented with voucher specimens. *Phaeanthus splendens* is distinguished from *P. intermedius* by having inner petals lacking 5–7 prominent veins, fewer stamens (48–60 vs 80–100) and longer monocarps (2–3 cm vs 1–1.6 cm long).

Popowia fusca King, J. Asiatic Soc. Bengal, Pt. 2, Nat. Hist. 61(1): 94. 1892; J.Sinclair, Gard. Bull. Singapore 14: 1955. Type: Malaysia, Perak, near Ulu Kerling, Mar. 1886, *Kunstler* [*King's Collector*] *8602* (lectotype **CAL**, designated by Kessler *et al.* [1995]; isolectotypes **K**, **SING**).

Thailand.— PENINSULAR: Yala [Betong District, Chulaporn Pattaya 10, forest above village, 650 m, Mar. 2003, *Johnson et al. 2041* (**OWU**)]; Narathiwat [without specific locality, 200 m, March, *Koonkhunthod et al. 384* (**BKF**); Waeng, 50 m, 22 Feb., *Niyomdham & Puudjaa 7623* (**BKF**); without specific locality, *Phusomsaeng 399* (**L**); Waeng, Lo Jud, Ban Bala, Hala-Bala Wildlife Sanctuary, UTM 47, 813463E, 641456N, 40 m, 3 Apr. 2005, *Poopath 247* (**BKF**); Nikhomwaeng, 2 Apr. 1968, *Sangkhchand 1270* (**BK**); Waeng, 300 m, 14 June, *Smitinand 10955* (**BKF**); without specific locality, *Smitinand 46621* (**L**)].

Distribution.— Peninsular Malaysia (type).

Ecology.— Evergreen forest, 50–650 m alt. Flowering: February–April, June; fruiting: June.

Vernacular.— Num (นุ่ม)(General).

Note.— The distinctive bright rusty color of the pubescence eventually fades on the older growth but is pronounced on young shoots and on flower buds, even when dried.

Pseuduvaria glossopetala Y.C.F.Su & R.M.K. Saunders, Syst. Bot. 35: 34–36. 2010. Type: Malaysia, Perak, Gunong Pondok, Padang Rengas, 12 Mar. 1971, *Chin 875* (holotype **L** [L0046924!, L0046886! (on two sheets)]; isotype **KEP!**).

Thailand.— PENINSULAR: Yala [Than To, Bang Lang National Park, Halasa Waterfall area, 6°03′50″N, 101°24′50″E, 120 m, 12 Feb. 2004, *Middleton et al. 2981* (**A**, **E**)].

Distribution.— Peninsular Malaysia (type).

Ecology— Evergreen forest; ca 100 m alt. Flowering: February.

Vernacular.— Sang yu than to (สังหยูธารโต) (General).

Note.— This species was described in 2010 from Peninsular Malaysia and differs from its congeners in having tongue-shaped inner petals.

Sphaerocoryne lefevrei (Baill.) D.M.Johnson & N.A.Murray, **comb. nov.**— *Melodorum lefevrei* ["*lefevrii*"] Baill., Adansonia 10: 108. 1871. Type: Vietnam [Cochinchine], Taillis au point A près de Bien-hoa, Feb. 1865, *Lefèvre 532* (lectotype **P** [372662!], designated by Turner [2011]).

— *Melodorum clavipes* Hance, J. Bot. 15: 328. 1877.— *Sphaerocoryne clavipes* (Hance) Craib, Bull. Misc. Inform. Kew 1922: 168. 1922. Type: Cambodia, *Pierre s.n.* [= *herb. Hance 19770*] (holotype **BM** [BM000554028]).

— *Polyalthia siamensis* Boerl., Cat. Pl. Phan. 1: 26. 1899.— *Unona mesnyi* Pierre, Fl. Forest. Cochinch. 2: t. 17. 1881, **nom. illeg. superfl.**, pro parte excl. type.— *Sphaerocoryne siamensis* (Boerl.) Ridl., J. Straits Branch Roy. Asiat. Soc. 75: 8. 1917.— *Mitrella mesnyi* Bân, Bot. Zhurn. 59: 244. 1974, **nom. illeg. superfl.** Types: Java, cultivated in Bogor Botanical Garden under XI.A.71 and XI.A.41, *Anonymous s.n.* (not traced).

— *Popowia mesnyi* Craib, Bull. Misc. Inform. Kew 1914: 5. 1914. Types: Thailand, Si Racha, Nong Yaiboo, 24 m, *Collins 6* (**TCD!**); Thailand, Bangkok, Palace Gardens, *Murton 30* (not traced).

Thailand.— NORTHERN: Chiang Mai (cultivated); NORTH-EASTERN: Nakhon Phanom, Khon Kaen; EASTERN: Chaiyaphum, Nakhon Ratchasima, Buri Ram, Si Sa Ket; SOUTH-WESTERN: Prachuap Khiri Khan; CENTRAL: Saraburi, Krung Thep Maha Nakhon (cultivated, *Murton 30*, syntype of *Popowia mesnyi*); SOUTH-EASTERN: Sa Kaeo, Chachoengsao, Chon Buri (Si Racha, *Collins 6*, syntype of *Popowia mesnyi* **TCD!**), Rayong, Chanthaburi, Trat; PENINSULAR: Phangnga (cultivated).

Distribution.— Cambodia, Laos, Vietnam (type).

Ecology.— Mixed deciduous forest; 50–500 m alt. Flowering: March, April; fruiting: June, July.

Vernacular.— Hom nuan (Northern), lam duan (ลำดวน)(Central), lam duan dong.

Notes.— The genus *Sphaerocoryne* includes the familiar lam duan (ลำดวน) tree of eastern and central Thailand, long known by the name *Melodorum fruticosum* Lour. Bân (1974) showed that the name *M. fruticosum* applies instead to the plant now called *Uvaria siamensis* (Scheff.) L.L.Zhou, Y.C.F.Su, & R.M.K.Saunders (Zhou *et al.*, 2009). Turner (2012) treated the lam duan tree as taxonomically the same as the climbing *Sphaerocoryne* of Peninsular Malaysia, Singapore, Borneo, and the Philippines, called *Sphaerocoryne affinis* (Teijsm. & Binn.) Ridl. The two taxa are similar, but *Sphaerocoryne lefevrei* is a small tree, and has leaf blades that tend to be narrowly elliptic and acute to short-acuminate, while *S. affinis* is a climber with leaves that are more lanceolate with a pronounced acumen. The two species have different but partially overlapping size ranges for several other characters: In *S. lefevrei* the petioles are 4–8 mm long, the sepals 3–4.5 mm long, the inner petals 9–11 mm long, and the floral receptacle 1.5–2 mm high and ca 3.5 mm in diameter, while in *S. affinis* the petioles are 2.5–5 mm long, the sepals 2–3.5 mm long, the inner petals 5–8 mm long, and the floral receptacle ca 1 mm high and 1.2–2.1 mm in diameter.

Both species occur in Thailand, but in different parts of the country. *Sphaerocoryne affinis* s.s. is limited to Tarutao Island, Satun Province, where it occurs in lowland evergreen forest and reaches the northern limit of its distribution; *Sphaerocoryne lefevrei* is widespread in mixed deciduous forests of eastern and northeastern Thailand and elsewhere in the country as an ornamental.

The name *Unona mesnyi* Pierre cited in synonymy was superfluous when published and thus does not invalidate publication of the name *Polyalthia*

siamensis. The name *Mitrella mesnyi* Bân, intended as a combination but based on the superfluous *Unona mesnyi*, was proposed with the name *Polyalthia siamensis* in synonymy and is thus itself superfluous with the type of *P. siamensis* as its type.

Craib, in proposing the name *Popowia mesnyi*, explicitly distinguished the plant from *Polyalthia aberrans* Maingay ex Hook.f. & Thomson, did not cite the name *Melodorum clavipes* Hance or its type specimen, and accepted *Unona mesnyi* Pierre only in part, with reference to the plate. With the brief diagnosis and citation of two specimens, and the exclusion of types of previously published names, valid publication of the name *P. mesnyi* was effected.

Xylopia subdehiscens (King) J.Sinclair, Gard. Bull. Singapore 14: 345. 1955.— *Alphonsea subdehiscens* King, J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 61(1): 126. 1892. Type: Malaysia, Perak, Ulu Bera, Aug. 1886, *Kunstler* [*King's Collector*] *10818* (lectotype **K** [K000574690!], designated by Turner [2018]; isolectotypes **CAL**, **K** [K000574689]).

Thailand.— PENINSULAR: Yala [Than Ban Toto District, Ban Chulaphon Phattana 7 area, Khao Hin Yok, 520 m, 06°05′N, 101°21′E, 11 Feb. 2004, *Middleton et al. 2952* (**A**, **BKF**)].

Distribution.— Peninsular Malaysia (type).

Ecology.— Dry ridge forest on thin soil over quartzite; 500 m alt. Flowering: February.

Vernacular.— Sa thang thin tai (สะทางถิ่นใต้) (General).

Note.— This species is unusual among Asian *Xylopia* species in having only a single carpel, a condition shared only with *X. championii* Hook.f. & Thomson of Sri Lanka.

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