

Two *Magnolia* species new to the Flora of Thailand

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ABSTRACT. Recently two species hitherto not found in Thailand were collected, *Magnolia carsonii* Dandy ex. Noot. var. *drymifolia* Noot. and *Magnolia cathcartii* (Hook.f. & Thomson) Noot. Both species are treated here. New keys to the species of *Magnolia* in Thailand based on flowering and fruiting specimens are given.

KEY WORDS: *Magnolia*, Magnoliaceae, Thailand, keys.

INTRODUCTION

In Thai Forest Bulletin (Nooteboom & Chalermglin 2009) a revision of the Magnoliaceae of Thailand was given. This had become necessary because after the treatment in Flora of Thailand by H. Keng several new species and species new record for Thailand were found. Recently, even two more species new record for Thailand, *Magnolia cathcartii* (Hook.f. & Thomson) Noot. and *M. carsonii* Dandy ex. Noot. var. *drymifolia* Noot. were found.

Magnolia cathcartii exhibits a northerly distribution along the Eastern Himalayan track towards China, Burma, N. Thailand and N. Vietnam. Whilst *M. carsonii* var. *drymifolia* has a southerly distribution in lower peninsular Thailand, Borneo, Sumatra and Sulawesi. Surprisingly, the occurrence of *M. carsonii* var. *drymifolia* seems to mark its northernmost distribution with discontinuous range in Peninsular Malaysia.

KEY TO THE SPECIES OF *MAGNOLIA* IN THAILAND

(flowering specimens)

- | | |
|---|--------------------------|
| 1. Flowers pseudoaxillar on a brachyblast, gynoeceum hairy | 2 |
| Flowers terminal on the twig, or terminal but overtopped by the growing new shoot, gynoeceum glabrous | 12 |
| 2. Stipules free from the petiole | 3 |
| Stipules adnate to the petiole | 6 |
| 3. Connective appendage 3 to 4 mm long, twigs pubescent, gynoeceum silvery appressedly pubescent | M. mediocris |
| Connective appendage 0.5 to 1.5 mm long, twigs silky, or puberulous, gynoeceum greyish puberulous, ferrugineously silky, or pubescent | 4 |
| 4. Petiole 30 to 40 mm, leaf blade obovate, peduncle puberulous | M. citrata |
| Petiole 10 to 25 mm, leaf blade elliptic or narrowly elliptic, peduncle silky or pubescent | 5 |
| 5. Leaf blade hairy beneath at least when young (handlens!), twigs silky, stipules silky, peduncle silky, with 1 node, flower white, yellow or yellowish, connective appendage triangular, 0.5–1 mm long, gynoeceum ferrugineously silky or pubescent | |
| | M. philippinensis |
| Leaf blade glabrous beneath, twigs puberulous, stipules puberulous, peduncle pubescent, with 2 nodes, flower orange yellow, connective appendage, narrowly triangular, c. 0.5 mm long, gynoeceum greyish puberulous | M. koordersiana |
| 6. Stipules adnate to petiole for less than 10 %, leaf blade puberulous beneath, base of leafblade attenuate — cultivated. | M. x alba |
| Stipules adnate to petiole for 15 to 100 %, leaf blade minutely (scattered) hairy, pubescent, or tomentose beneath | 7 |
| 7. Leaf blade 11 to 14 cm broad, tomentose beneath, twigs tomentose, connective appendage 3 to 4 mm long | M. rajaniana |
| Leaf blade 2 to 10 cm broad, minutely (scattered) hairy or pubescent beneath, twigs pubescent, silky, villous or puberulous, connective appendage 0 to 2.5 mm long | 8 |

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8. Flower yellow, yellowish, or orange yellow **M. champaca**
Flower white 9
9. Leaf blade minutely (scattered) hairy beneath, petiole glabrous, gynoecium greyish puberulous **M. sirindhorniae**
Leaf blade pubescent beneath, petiole hairy, gynoecium greyish silky or densely golden yellow silky 10
10. Gynoecium densely golden yellow silky, twigs puberulous, leaf blade glaucous below, peduncle puberulous **M. floribunda**
Gynoecium greyish silky, twigs pubescent, silky, or villous, leaf blade not glaucous below, peduncle silky or pubescent 11
11. Outer tepals spatulate, twigs pubescent or silky, apex of leafblade acuminate (undescribed hybrid). **M. champacxbaillonii**
Outer tepals very narrow, nearly linear, twigs villous, apex of leafblade shortly acuminate **M. baillonii** 13
12. Receptacle short, the carpels attached at about the same height 13
Receptacle cylindrical, much longer than wide, carpels attached around it 15
13. Stipules free from the petiole, peduncle 0.5 to 20 mm long, flowers bisexual, carpels 2 to 4 **M. praecalva**
Stipules adnate to petiole, peduncle 25 to 50 mm long, flowers unisexual, carpels 7 to 15 14
14. Leaf blade glaucous below, twigs on stipule scars minutely hairy, stipules hairy at the apex only, petiole 15–25 mm **M. thailandica**
Leaf blade not glaucous below, twigs glabrous, stipules puberulous, petiole 25–45 mm **M. duperreana**
15. Flowers terminal but overtopped by the growing new shoot 16
Flowers terminal on the twig, not overtopped by the growing new shoot 18
16. Twigs glabrous, connective appendage triangular **Magnolia gustavii**
Twigs hairy at least when young, connective appendage triangular with a sharp pointed tip or linguiform 17
17. Gynoecium entirely hidden within androecium, leaf blade not glaucous below, carpels 20 to 30 **M. cathcartii**
Gynoecium exerted from stamens, leaf blade glaucous below, carpels 3 to 9 **M. carsonii** var. **drymifolia**
18. Stipules free from the petiole, gynoecium stipitate **M. elegans**
Stipules adnate to petiole, gynoecium not stipitate 19
19. Peduncle hairy 20
Peduncle glabrous 25
20. Stipules adnate to petiole for 30 to 75 %, twigs pubescent, midrib of leaf blade when dry not or slightly prominent above. 21
Stipules adnate to petiole for 90 to 100 %, twigs glabrous or appressedly long pilose, midrib of leaf blade when dry prominent above, at least towards base 22
21. Peduncle 4 to 5 mm thick, petiole glabrous, leaf blade narrowly obovate, flower pink, or white **M. insignis**
Peduncle 6 to 9 mm thick, petiole hairy, leaf blade elliptic or obovate, flower purple or red **M. garrettii**
22. Twigs hairy at least when young 23
Twigs glabrous 24
23. Carpels 5 to 15, petiole 5 to 30 mm, outer tepals oblong, 1.5 to 3.5 cm long, gynoecium ellipsoid **M. liliifera**
Carpels 85 to 95, petiole 40 to 110 mm, outer tepals obovate or elliptic, 4.5 to 6.5 cm long, gynoecium ovoid. **M. henryi**
24. Peduncle 8 to 12 mm thick, twigs 4–8 mm thick, glabrous **M. siamensis**
Peduncle 2 to 6 mm thick, twigs 3–5(–7) mm thick, appressedly long pilose **M. liliifera**
25. Peduncle 3 to 5 mm thick 26
Peduncle 5 to 16 mm thick 27
26. Stipules adnate to petiole for 30 to 60 %, twigs glabrous, leaf blade minutely (scattered) hairy or glabrous beneath, peduncle glabrous, with 1 or 2 nodes, connective appendage narrowly triangular, 2.5 to 4 mm long **M. utilis**
Stipules adnate to petiole for 90 to 100 %, twigs appressedly long pilose, leaf blade pubescent beneath, peduncle pubescent, with 4 to 7 nodes, connective appendage triangular, 0.5 to 1.5 mm long **M. henryi**
27. Stipules adnate to petiole for 30 to 80 % 28
Stipules adnate to petiole for 81 to 100 % 29
28. Number of ovules per carpel (3–)4 or more, petiole not or only slightly dilated at base, leaves 5–8 cm broad, intramarginal vein not close to the margin, outer tepals white **M. hookeri**
Number of ovules per carpel 2, petiole dilated at base, leaves 7–15 cm broad, intramarginal vein close to the margin, outer tepals greenish **M. betongensis**
29. Twigs 4–6 mm thick in innovations, appressedly long pilose; hairs yellowish, leaf blade pubescent beneath, outer tepals white, gynoecium ovoid **M. henryi**
Twigs 6–10 mm thick, glabrous, leaf blade glabrous beneath, outer tepals tinged red, purple, or greenish, gynoecium ellipsoid, or conical 30
30. Twigs 6.5–10 mm thick in innovations, peduncle with 1–3 nodes, outer tepals tinged red or purple, gynoecium conical **M. hodgsonii**
Twigs 6–7 mm thick in innovations, peduncle with 2–18 nodes, outer tepals greenish, gynoecium ellipsoid **M. betongensis**

KEY TO THE SPECIES OF *MAGNOLIA* IN THAILAND

(fruiting specimens)

1. Fruits pseudoaxillar on a brachyblast, (gynoecium hairy) 2
Fruits terminal on the twig, sometimes terminal bud overtopped by the growing new shoot, (gynoecium glabrous) 12
2. Stipules free from the petiole 3
Stipules adnate to petiole 6

3. Leaf blade obovate, petiole hairy, base of leafblade rounded **M. citrata**
 Leaf blade elliptic or narrowly elliptic, petiole glabrous, base of leafblade cuneate, broadly cuneate, attenuate, or attenuate-cuneate 4
4. Leaf blade glabrous beneath, twigs puberulous **M. koordersiana**
 Leaf blade pubescent beneath, twigs pubescent or silky 5
5. Peduncle with 1 node, twigs silky, peduncle silky **M. philippinensis**
 Peduncle with 2 or 3 nodes, twigs pubescent, peduncle puberulous **M. mediacris**
6. Stipules adnate to petiole for less than 10 %, leaf blade puberulous beneath, base attenuate, — cultivated **M. x alba**
 Stipules adnate to petiole for 15 to 100 %, leaf blade minutely (scattered) hairy, pubescent, or tomentose beneath, base cuneate, broadly cuneate, or rounded 7
7. Fruiting carpels connate, when mature the apical parts of the carpels circumcissile and falling, dehiscing along the dorsal suture or not, the basal parts remaining adnate to the torus **M. baillonii**
 Fruiting carpels at least finally free, dehiscing along the dorsal suture, or staying basally connate, but for the rest free 8
8. Leaf blade minutely (scattered) hairy beneath, petiole glabrous, apex of leafblade rounded or shortly acuminate **M. sirindhorniae**
 Leaf blade pubescent or tomentose beneath, petiole hairy, apex of leafblade acuminate 9
9. Leaf blade glaucous below, narrowly elliptic, narrowly ovate, or narrowly obovate twigs puberulous **M. floribunda**
 Leaf blade not glaucous below, elliptic or ovate, twigs pubescent, silky, or tomentose 10
10. Fruiting carpels in part staying basally connate, but for the rest becoming free and dorsally dehiscent, fruiting peduncles glabrous **M. champacaxbaillonii**
 Fruiting carpels at least finally free when ripe, dehiscing along the dorsal suture, fruiting peduncles hairy 11
11. Leaf blade 11 to 14 cm broad, tomentose beneath, twigs tomentose, peduncle silky **M. rajaniana**
 Leaf blade 4 to 10 cm broad, pubescent beneath, twigs pubescent, peduncle pubescent **M. champaca**
12. Receptacle short, the carpels attached at about the same height 13
 Receptacle cylindrical, much longer than wide, carpels attached around it 15
13. Stipules free from the petiole, carpels 2 to 4, fruiting carpels connate into a loculicidal fruit, splitting into 2-4 valves, the carpels more or less separating from each other later; in the centre a columella persistent with the attached seeds **M. praecalva**
 Stipules adnate to petiole, carpels 7 to 15, fruiting carpels becoming free, after dehiscence forming 2 lobes like 2 laterally recurved horns 14
14. Leaf blade glaucous below, twigs minutely hairy on stipule scars, petiole 15–25 mm **M. thailandica**
 Leaf blade not glaucous below, twigs glabrous, petiole 25–45 mm **M. duperreana**
15. Stipules free from the petiole 16
 Stipules adnate to petiole 19
16. Fruiting carpels connate into a fleshy syncarp, when ripe falling off in irregular masses, fruits terminal on the twig, subglobose or ellipsoid **M. elegans**
 Fruiting carpels at least finally free when ripe, dehiscing along the dorsal suture, fruits overtopped by the growing new shoot, cylindrical 17
17. Carpels 3 to 9, leaf blade glaucous below **M. carsonii** var. **drymifolia**
 Carpels 20 to 35, leaf blade not glaucous below 18
18. Twigs glabrous, fruiting peduncles 4 to 5 cm long **M. gustavii**
 Twigs pubescent or tomentose, fruiting peduncles 2- 3 cm long **M. cathcartii**
19. Fruiting carpels connate, when mature the apical parts of the carpels circumcissile and falling, dehiscing also along the dorsal suture or not, the basal parts remaining adnate to the torus 20
 Fruiting carpels initially clustered close together, then finally becoming free when ripe, dehiscing along the dorsal suture and sometimes also along the ventral suture 24
20. Fruiting peduncles slender, 2–6 mm thick, leaf blade pubescent or glabrous beneath, 12–22 by 3.8–7 cm **M. liliifera**
 Fruiting peduncles stout, (6–)8–12 mm thick, leaf blade glabrous beneath 21
21. Peduncle with 4 to 18 nodes 22
 Peduncle with 1 to 3 nodes 23
22. Peduncle hairy, stipules adnate to petiole for 100 %, leaf blade elliptic or obovate, 21–33 by 8.5–12 cm **M. siamensis**
 Peduncle glabrous, stipules adnate to petiole for 30–80(–100) %, s leaf blade obovate or narrowly obovate, 21–38 by 7–15 cm **M. betongensis**
23. Petiole 45–90 mm, stipules adnate for 90–100%, leaf blade elliptic to narrowly elliptic or obovate to narrowly, obovate 19–50 by 6.5–12 cm (outer tepals tinged red or purple) **M. hodgsonii**
 Petiole (20–)35–55 mm, stipules adnate for 30–80(–100) %, leaf blade obovate or narrowly obovate, 21–38 by 7–15 cm (outer tepals greenish) **M. betongensis**
24. Leaf blade narrowly obovate 25
 Leaf blade elliptic, or obovate 26
25. Peduncle 4 to 5 mm thick, puberulous, with 1 node, apex of leafblade acuminate **M. insignis**
 Peduncle 8 to 12 mm thick, glabrous, with 2 nodes, apex of leafblade acute or shortly acuminate **M. hookeri**
26. Fruits cylindrical, twigs glabrous, peduncle glabrous **M. utilis**
 Fruits ovoid or ellipsoid, twigs pubescent or appressedly long pilose, peduncle pubescent 27

27. Stipules adnate to petiole for 90 to 100 %, twigs appressedly long pilose, leaf blade pubescent beneath, peduncle with 4 to 7 nodes **M. henryi**
 Stipules adnate to petiole for 50 to 75 %, twigs pubescent, leaf blade minutely (scattered) hairy or glabrous beneath, peduncle with 1 node **M. garrettii**

Magnolia carsonii Dandy ex. Noot. var. **drymifolia** Noot., *Blumea* 32: 351, 1987; Sangtae Kim et al., *Blumea* 47: 331. 2002. — Type: Indonesia, Central Kalimantan, Bukit Raya, *Nootboom* 4612 (holotype L; isotype BO).

Evergreen shrub, or tree; up to 4–40 m high, 30–90 cm diam., rarely glabrous, mostly hairy at least in innovations; twigs in innovations 2–4 mm thick, directly under the terminal bud hairy at least when young (rarely glabrous). *Leaves* (broadly) elliptic to obovate. 4.5–9(–16) by 2.5–4.5(–8) cm glabrous, often glaucous, below, apex rounded, or mucronate (or rarely emarginate), acumen 0–10 mm, base broadly cuneate, or rounded; margin thickened, containing a vein; lateral nerves 6–13 per side, meeting in an intramarginal vein, reticulation beneath densely netted, distinct but slightly obscured by the thickness of the leaf; petiole 8–18 mm, glabrous; stipules free from the petiole, hairy in the terminal bud (rarely glabrous). *Flowers* bisexual, terminal but often overtopped by the growing new shoot; peduncle glabrous or pubescent, 20–50 mm long with 1 node; pedicel present or absent, 0–1.5 mm; yellow or yellowish. *Tepals* 9, subequal; outer tepals 3, greenish, oblong, 2–4 by 1 cm; inner tepals 6, obovate, 1.3–3.5 cm by 10 mm, yellow. *Stamens* 20–30, 5–11 mm long; connective appendage triangular with a sharp pointed tip, 1–2 mm long; filaments 1–3 mm long; anthers introrse, 4–8 mm long. *Carpels* 3–9 attached around cylindrical receptacle which is much longer than wide; ovary stipitate or not, glabrous, exserted from stamens, 6–10 mm high; gynophore 0–3 mm long; ovules 2 per carpel. *Fruiting peduncles* glabrous or hairy, 1.9–4.5 cm long, 1.7–2.5 mm thick; fruits cylindrical with carpels at least finally becoming free upon ripening, dehiscing along the dorsal suture, glabrous gynophore under fruit 0–3 mm long; scars of tepals and stamens along torus under fruit 3–4 mm long.

Thailand.— PENINSULAR: Nakhon Si Thammarat [Khao Luang National Park, *P. Chalermglin* 520225 (BKF, BK, L, PSU, QBG)].

Distribution.—Sumatra, Borneo, Sulawesi.

Ecology.— Lower montane rain forest; altitude 1000 m. Flowering: February–March; fruiting April–July.

Vernacular.— Yihup khao luang (ยี่หุบเขาหลวง).

Conservation status.— CR.

Magnolia cathcartii (Hook.f. & Thomson) Noot., *Blumea* 31: 88. 1985; Pham-hoàng Ho, Ill. *Flora Vietnam*: 286. 1991; Santae Kim et al., *Blumea* 47: 333. 2002.— *Alcimandra cathcartii* (Hook.f. & Thomson) Dandy, Bull. Misc. Inform. Kew 1927: 260. 1927; T.B. Nguyen (ed.), Checklist of Pl. Sp. in Vietnam 2: 7. 2003.— *Michelia cathcartii* Hook.f. & Thomson, Fl. Ind. 1: 79. 1855.

Evergreen tree up to 50 m high, 100 cm diam; twigs in innovations 2.8–3.2 mm thick, pubescent or tomentose at least when young; terminal buds 8–30 mm long, 2–4 mm wide, pubescent or tomentose. *Leaves* elliptic to narrowly elliptic, or ovate to narrowly ovate. 8–13 by 3.5–5 cm; base cuneate or attenuate, apex acuminate, acumen 10–15 mm; young leaf underneath probably sparsely hairy, very soon glabrous except midrib which bears some scattered hairs, lateral nerves 12–16 per side, reticulation beneath distinct, densely netted; petiole 7–10 mm long, glabrous; stipules free from the petiole. *Flowers* bisexual, terminal but often overtopped by the growing new shoot; peduncle glabrous, silky, or tomentose; 8–12 mm long, stout, with 1 node; pedicel 1 mm. *Tepals* 9, subequal; outer tepals 3, obovate, 3.5–4.5 by 1.5–2 cm; inner tepals 6, elliptic, slightly smaller than outer ones. *Stamens* 25–35 mm long; connective produced into a linguiform connective appendage 2–3 mm long, filaments 6–8 mm long, anthers introrse. *Carpels* 20–30, attached around cylindrical receptacle which is much longer than wide, entirely hidden within androecium; ovary stipitate, glabrous; carpels 20–30. *Fruiting peduncles* 3 cm long, 2–3 mm thick; fruits cylindrical, 8–10 by 1.5–2.5 cm, with carpels at least finally becoming free upon ripening, dehiscing along the dorsal suture; gynophore under fruit 14–16 mm long; scars of tepals and



Figure 1. *Magnolia carsonii* Dandy ex. Noot. var. *drymifolia* Noot.: A. habit (*Chalermglin* 520222); B. fruit.



Figure 2. *Magnolia cathcartii* (Hook.f. & Thomson) Noot. : A. flower; B. fruit (Chalermglin 530905).

stamens along torus under fruit 6–8 mm long.

Thailand.— NORTHERN: Phitsanulok [Phu Hin Rongkla National Park, Nakhon Thai District, P. Chalermglin 531005 (**BKF, BK, L, PSU, QBG**)].

Distribution.— China, Sikkim, Bhutan, Myanmar, Vietnam.

Ecology.— Lower montane forest (tropical rain forest), altitude 1,450 m. Flowering April; fruiting May–October.

Vernacular.— Champi phitsanu (จำปีพิษณุ).

Conservation status.— CR.

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Figure 3. *Magnolia carsonii* Dandy ex. Noot. var. *drymifolia* Noot.: A. flower; B. fruit; *M. cathcartii* (Hook.f. & Thomson) Noot.: C. flower; D. fruit. Photographed by P. Chalermglin (A–B, D); S. Suesacha (C).